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The economic appraisal of transport projects: the incorporation of disabled access

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Abstract

The importance for disabled people of accessible transport is now widely recognised, as is the reality that this also benefits many non-disabled people. Many previous commentaries offer a *qualitative* perspective, but *quantitative* evidence, particularly of benefits to the population as a whole, has been lacking. This research, underpinned by the Social Model of disability, established that the absence of such evidence creates a barrier to the inclusion of disabled people in mainstream transport. Further, it demonstrates that there is a way to remove this barrier: by applying stated preference techniques, the benefits of providing access to transport systems can be robustly monetised and successfully incorporated into the economic appraisal of transport projects.

A multiple-case study of tram systems investigated how practitioners currently incorporate disabled access into project appraisals. Analysis showed that isomorphic forces identified by new institutional theory have led to similarity in practice, with the effect that ways of incorporating the *costs* of disabled access are well established, but ways of incorporating the *benefits* remain unclear. Resulting benefit:cost ratios, often apparently unfavourable, may be misleading.

A systematic literature review catalogued methods for valuing non-market goods, and from these identified methods transferable to disabled access. Stated preference, a method of monetisation common in the transport environment, emerged as an appropriate method, with discrete choice modelling a suitable technique.

A discrete choice experiment enabled calculation of monetary values for platform-to-platform access at stations. Using a cross-section of the population and addressing socioeconomic factors such as age, disability, and attitudes to disabled people, willingness-to-pay figures were derived for access methods suited to disabled people's needs.

Finally, these willingness-to-pay figures were incorporated into two appraisals. The amended benefit:cost ratios more accurately represent the value of access provision, and the figures incidentally enable the relative values of different access options to be distinguished.

“I love it when people say to me, “Susan, in Washington DC, they have elevators in every tube station. How much did that cost?” I say, “I do not know. How much did the escalators cost for lazy walkers?” Somebody could throw a nice rope down and let them climb down. If they’re so able, why can’t they climb down a rope?”

Susan Daniels, former US Deputy Commissioner for Disability and Income Security
Employers’ Forum on Disability Independence Day Celebrations 4th July 2000

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Contents

Abstract	i
Acknowledgements	iii
Part I: From practice to research	1
<i>Chapter 1. Rationale</i>	2
1.1. Structure of the thesis	2
1.1.1. Thesis outline.....	2
1.1.2. Diagrammatic layout	5
1.2. Background	6
1.2.1. Research area	6
1.2.2. Research motivation	6
1.3. Social Model perspective	11
1.3.1. The Social Model and appraisal	11
1.3.2. 'Disabled access'	12
1.4. Importance to managers	12
1.5. Research questions and approach	14
1.5.1. Overall research question	14
1.5.2. Appraisal in practice: the tram case study	14
1.5.3. Methods of monetisation: the systematic literature review	14
1.5.4. Willingness-to-pay: the stated preference experiment.....	15
1.5.5. Applying the results: putting a value on disabled access....	15
1.6. Principal contribution of the research.....	16
1.6.1. Principal contribution to knowledge.....	16
1.6.2. Principal contribution to practice.....	16
1.7. A note on chronology	16
<i>Chapter 2. Theoretical perspectives</i>	18
2.1. The Social Model of disability.....	18
2.1.1. Outline of the Social Model.....	18
2.1.2. Towards a theory of disability.....	19
2.1.3. Classifying people as 'disabled'	21

2.1.4.	The Social Model and language.....	22
2.2.	Institutional theory	23
2.3.	Welfare economics.....	27
2.3.1.	Utility	27
2.3.2.	Cost Benefit Analysis	27
2.3.3.	Stated preference	30
2.3.4.	Discrete choice modelling.....	32
2.4.	Linking the perspectives	35
2.4.1.	A critical realist approach	35
2.4.2.	Critical realism and Cost Benefit Analysis.....	36
2.4.3.	Critical realism and evaluation	38
2.4.4.	The 'black box' of appraisal	39
2.4.5.	In summary	40
<i>Chapter 3.</i>	<i>Methodology.....</i>	<i>42</i>
3.1.	Appraisal in practice: the tram case study	42
3.1.1.	Why a tram system case study?	42
3.1.2.	Research question and approach.....	43
3.1.3.	Case study protocol.....	44
3.1.4.	Data collection procedures.....	47
3.1.5.	Analysis.....	50
3.2.	Methods of monetisation: the systematic literature review	51
3.2.1.	Why a systematic literature review?.....	51
3.2.2.	The approach to the review	51
3.3.	Willingness-to-pay: the stated preference experiment	67
3.3.1.	Why a stated preference discrete choice experiment?	67
3.3.2.	Research question and approach.....	67
3.3.3.	Preliminary hypotheses	68
3.3.4.	Utility function.....	69
3.3.5.	Developing the research.....	69
3.3.6.	The sample	72
3.3.7.	Data collection	74

3.3.8.	The research instrument.....	76
3.3.9.	The pilot	79
3.4.	Linking the three methodologies	82
Part 2 –	How value is measured	84
<i>Chapter 4.</i>	Transport appraisal	85
4.1.	The need for appraisal.....	85
4.2.	Transport appraisal in Europe	86
4.3.	Transport appraisal in the UK.....	88
4.3.1.	Framework in use	88
4.3.2.	Two examples of appraisals.....	94
<i>Chapter 5.</i>	Valuing disabled access	97
5.1.	Disability and the valuation of transport benefits....	97
5.1.1.	Ineffectiveness of current measures	97
5.1.2.	Identifying the benefits.....	98
5.1.3.	Existing work on monetisation.....	101
5.1.4.	Standard surveys for valuing benefit: potential bias	107
5.2.	Appraisal in practice: findings from the tram case study.....	111
5.2.1.	Background.....	111
5.2.2.	The context.....	112
5.2.3.	The three scheme appraisals: individual findings.....	117
5.2.4.	Cross-case issues	135
5.2.5.	Coercive forces.....	140
5.2.6.	Mimetic forces.....	144
5.2.7.	Normative forces.....	147
5.2.8.	DiMaggio and Powell’s hypotheses	149
5.3.	Addressing the research question and the propositions	150
<i>Chapter 6.</i>	Valuing non-market impacts	156
6.1.	Current guidance on non-market impacts for transport	156
6.2.	Findings from the systematic literature review	157

6.2.1.	Identifying resources	157
6.2.2.	Contextual analysis.....	158
6.2.3.	Content analysis.....	161
6.2.4.	Cost Benefit Analysis and hypothetical markets	168
6.2.5.	Other monetisation methods	177
6.2.6.	Other frameworks	178
6.3.	Addressing the research question	179
6.3.1.	Summarising the evidence	179
6.3.2.	Which method?	183
Part 3 – Putting a value on disabled access		185
<i>Chapter 7. Deriving a monetary value</i>		186
7.1.	Appraisal practice in transport.....	186
7.2.	Valuation of non-market impacts.....	186
7.3.	Willingness-to-pay: the stated preference experiment	187
7.3.1.	Background	187
7.3.2.	Research question and hypotheses	188
7.3.3.	Sample segmentation: numbers.....	189
7.3.4.	Applying the results in appraisals	190
7.3.5.	Presentation of findings	190
7.4.	Stated preference experiment findings: value of time	190
7.5.	Stated preference experiment findings: willingness-to-pay.....	190
7.5.1.	All respondents	190
7.5.2.	Disability-related findings	192
7.5.3.	Age-related findings	199
7.5.4.	Child-related findings.....	200
7.5.5.	Attitude-related findings	204
7.5.6.	Income-related findings.....	208
7.5.7.	Rail-use-related findings.....	210
7.5.8.	Summary of findings	212

7.6.	The method and technique: review of relevant issues	213
7.6.1.	Advantages of discrete choice modelling	214
7.6.2.	Potential issues in discrete choice modelling	214
7.7.	Comparison with relevant stated preference studies	215
7.7.1.	The Steer Davies Gleave study	215
7.7.2.	The Japanese study	217
7.8.	Addressing the research question and hypotheses	218
<i>Chapter 8. Applying the results</i>		221
8.1.	Considerations in applying the figures	221
8.2.	The Crossrail appraisal	221
8.2.1.	The scheme	221
8.2.2.	The original appraisal	222
8.2.3.	Using willingness-to-pay figures from this research	222
8.3.	Transport for London: Hackney Interchange appraisal	224
8.3.1.	The scheme	224
8.3.2.	The original appraisal	224
8.3.3.	Using willingness-to-pay figures from this research	225
Part 4 – From research to practice		229
<i>Chapter 9. Making transport accessible</i>		230
9.1.	Motivation	230
9.2.	Early investigations	230
9.3.	The research approach	231
9.4.	Appraisal in practice: the tram case study	231
9.4.1.	The place of disabled access in appraisal	231
9.4.2.	Isomorphic forces	232
9.5.	Methods of monetisation: the systematic literature review	232

9.6.	Willingness-to-pay: the stated preference experiment	233
9.7.	Applying the results: putting a value on disabled access	234
9.8.	Addressing the overall research question	234
9.9.	Contribution to knowledge	235
9.9.1.	Applied Social Model research.....	235
9.9.2.	Appraisal in practice: the tram case study	236
9.9.3.	Methods of monetisation: the systematic literature review	237
9.9.4.	Willingness-to-pay: the stated preference experiment.....	237
9.10.	Contribution to practice	238
9.10.1.	Applied Social Model research.....	238
9.10.2.	Appraisal in practice: the tram case study	238
9.10.3.	Methods of monetisation: the systematic literature review	239
9.10.4.	Willingness-to-pay: the stated preference experiment.....	239
<i>Chapter 10. What next?</i>		240
10.1.	Limitations of the research.....	240
10.1.1.	The research as a whole	240
10.1.2.	The tram case study.....	241
10.1.3.	The systematic literature review	241
10.1.4.	The stated preference experiment	243
10.2.	Further research	243
10.2.1.	Appraisal practice	243
10.2.2.	Willingness-to-pay	244
Appendix A	Glossary.....	245
Appendix B	Case study additional information	250
Appendix C	Systematic review protocol	270
Appendix D	Systematic literature review additional information	273

Appendix E	Discrete choice experiment additional information.....	326
References	344

Tables

Table 1:	Case study: rationale for propositions	47
Table 2:	Systematic review: search strings	54
Table 3:	Systematic review: inclusion and exclusion criteria	57
Table 4:	Systematic review: sources, with number of resources identified	61
Table 5:	Systematic review: results of application of quality criteria	66
Table 6:	Stated preference experiment: pilot results (n = 35)..	80
Table 7:	Multi-criteria Appraisal Framework, Transport for London	96
Table 8:	Some of the benefits from transport with disabled access.....	100
Table 9:	Scaled willingness-to-pay figures (Steer Davies Gleave, 2000)	105
Table 10:	Willingness-to-pay for whole station improvements (Suzuki et al., 2007)	105
Table 11:	Willingness-to-pay for lifts (Suzuki et al., 2007)	106
Table 12:	Case study: questions about the disability context	113
Table 13:	Case study: question about the transport context	115
Table 14:	Case study: questions about individual cases	119
Table 15:	Case study: summary table for Nottingham.....	125
Table 16:	Case study: summary table for West London	131
Table 17:	Case study: summary table for Sheffield.....	134
Table 18:	Case study: summary of specific issues for all three cases.....	137
Table 19:	Case study: cross-case questions.....	138
Table 20:	Case study: questions that provide evidence about the presence of coercive forces	141
Table 21:	Case study: questions that provide evidence about the presence of mimetic forces	145
Table 22:	Case study: questions that provide evidence about the presence of normative forces	147
Table 23:	Systematic review: contextual analysis	159
Table 24:	Systematic review: underlying framework and use of stated preference.....	167

Table 25:	Systematic review: methods and techniques	183
Table 26:	Stated preference experiment: all respondents (n =411)	191
Table 27:	Stated preference experiment: people who experience physical barriers (n =187)	192
Table 28:	Stated preference experiment: people who do not experience physical barriers (n =224)	193
Table 29:	Stated preference experiment: willingness-to-pay related to physical barriers	193
Table 30:	Stated preference experiment: people with a long-term impairment (n =82).....	194
Table 31:	Stated preference experiment: people with no long- term impairment (n =329)	194
Table 32:	Stated preference experiment: willingness-to-pay related to impairment.....	195
Table 33:	Stated preference experiment: people who consider themselves disabled (n =39).....	195
Table 34:	Stated preference experiment: people who do not self- identify as disabled (n =372)	196
Table 35:	Stated preference experiment: willingness-to-pay related to self-identification as 'disabled'	196
Table 36:	Stated preference experiment: people who are disabled (Social Model) (n =33).....	197
Table 37:	Stated preference experiment: people who are not disabled (Social Model) (n =378).....	198
Table 38:	Stated preference experiment: willingness-to-pay related to Social Model definition	199
Table 39:	Stated preference experiment: people who were 55 and over (n =107)	199
Table 40:	Stated preference experiment: people who were under 55 (n =304).....	200
Table 41:	Stated preference experiment: willingness-to-pay related to age	200
Table 42:	Stated preference experiment: men and women with children under 5 (n =62)	202
Table 43:	Stated preference experiment: women with children under 5 (n =45)	202

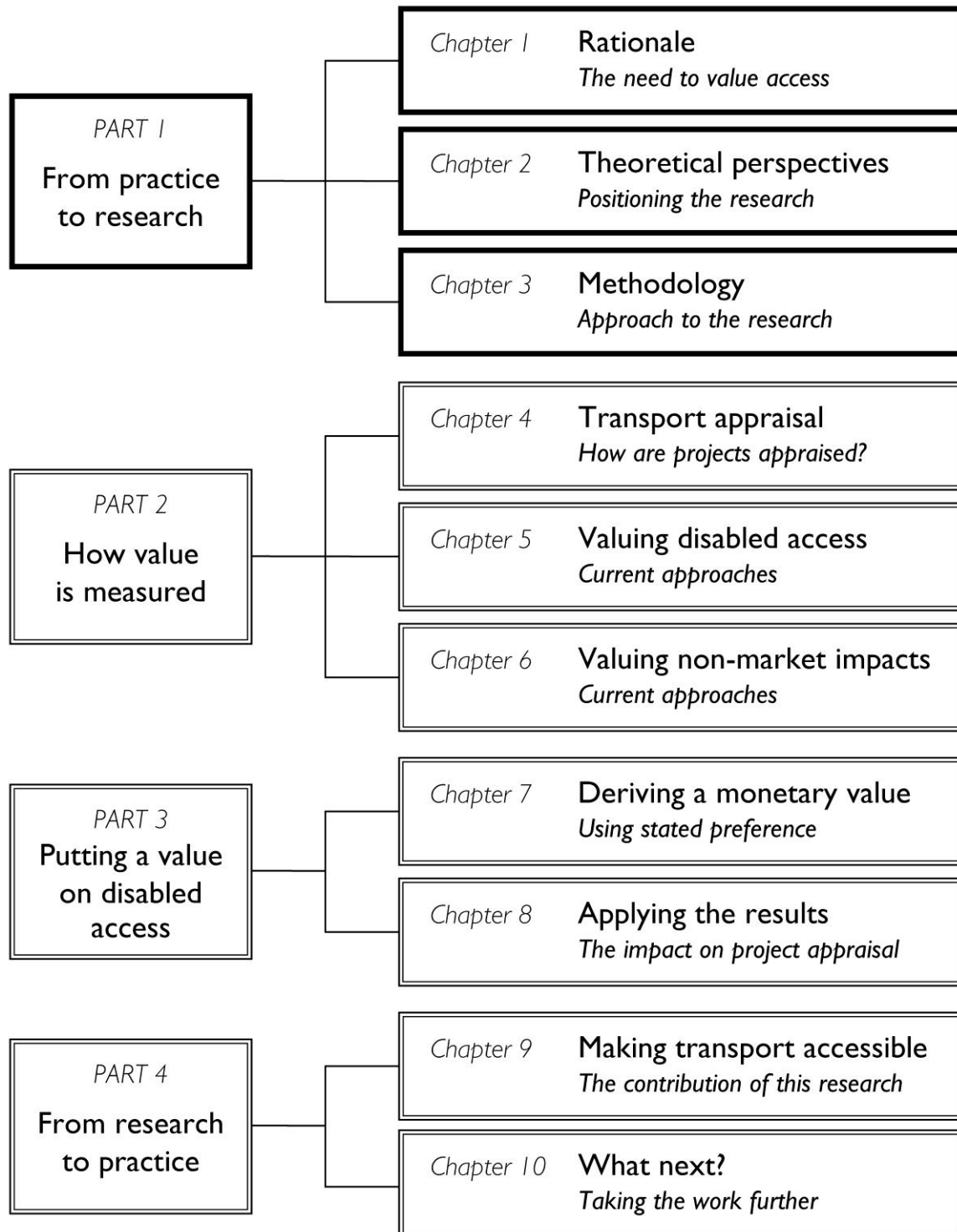
Table 44:	Stated preference experiment: people with no children under 5 (n =349).....	203
Table 45:	Stated preference experiment: people with no children (n =297).....	203
Table 46:	Stated preference experiment: willingness-to-pay related to children.....	204
Table 47:	Stated preference experiment: people with a positive attitude (n =79).....	207
Table 48:	Stated preference experiment: people with a neutral/negative attitude (n =332).....	207
Table 49:	Stated preference experiment: willingness-to-pay related to attitude.....	208
Table 50:	Stated preference experiment: respondents with below-average (<£20k) income (n =213).....	209
Table 51:	Stated preference experiment: respondents with above-average (£20k+) income (n =122).....	209
Table 52:	Stated preference experiment: willingness-to-pay related to income.....	210
Table 53:	Stated preference experiment: people who had used rail in the past 5 years (n =365).....	211
Table 54:	Stated preference experiment: people who had not used rail in the past 5 years (n =46).....	211
Table 55:	Stated preference experiment: willingness-to-pay related to rail use.....	212
Table 56:	Stated preference experiment: willingness-to-pay figures for all segments analysed.....	213
Table 57:	Willingness-to-pay values (Steer Davies Gleave, 2000).....	215
Table 58:	Willingness-to-pay for lifts (Suzuki et al., 2007).....	217
Table 59:	Willingness-to-pay for whole station improvements (Suzuki et al., 2007).....	218
Table 60:	Crossrail appraisal: applying segment willingness-to-pay figures.....	223
Table 61:	Crossrail appraisal: applying 'all respondent' willingness-to-pay figures.....	224
Table 62:	Transport for London Hackney Interchange: existing appraisal.....	225

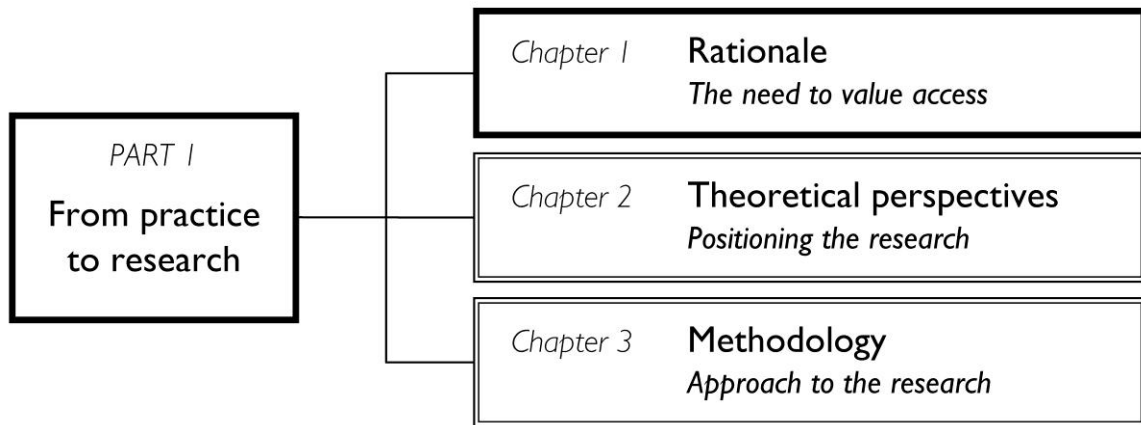
Table 63:	Transport for London Hackney Interchange: expected annual benefit from 'all respondents' figures.....	226
Table 64:	Transport for London Hackney Interchange: applying 'all respondents' figures.....	227
Table 65:	Case study: research timetable	252
Table 66:	Case study: interviewee questions	254
Table 67:	Case study: individual case questions	255
Table 68:	Case study: multiple-case questions	256
Table 69:	Case study: whole study questions	256
Table 70:	Case study: context questions.....	257
Table 71:	Case study: Nottingham interviewees	258
Table 72:	Case study: West London interviewees.....	259
Table 73:	Case study: Sheffield interviewees	259
Table 74:	Case study: Nottingham documentation reviewed	261
Table 75:	Case study: West London documentation reviewed..	262
Table 76:	Case study: documentation review spreadsheet.....	263
Table 77:	Systematic review: databases and their inclusion or exclusion	275
Table 78:	Systematic review: initial database scoping.....	280
Table 79:	Systematic review: data extraction table.....	305
Table 80:	Systematic review: exclusion table.....	325

Figures

Figure 1:	Diagrammatic layout of the thesis.....	5
Figure 2:	The 'black box' of economic appraisal.....	40
Figure 3:	Valuing the benefits of disabled access.....	99
Figure 4:	Systematic review: papers classified by underlying economic framework	161
Figure 5:	Systematic review: papers classified by use of stated preference methods.....	169
Figure 6:	Stated preference experiment: respondents disabled according to Oliver's definition	197
Figure 7:	Stated preference experiment: respondents with children, by gender.....	201
Figure 8:	Stated preference experiment: attitudinal question results	206
Figure 9:	Stated preference experiment: picture of stairs.....	330
Figure 10:	Stated preference experiment: picture of long ramp.....	330
Figure 11:	Stated preference experiment: picture of long ramp and stairs.....	331
Figure 12:	Stated preference experiment: picture of lift	331

Part I: From practice to research





Chapter 1. **Rationale**

This chapter lays out the document structure to guide the reader through the document's logic. It describes the research work as a whole, exploring why it was needed, including how it came about and noting the author's experience in the transport industry. It also outlines how the research was done, and why the particular approach was taken. It outlines the research aims and objectives, and summarises the contribution.

1.1. Structure of the thesis

1.1.1. Thesis outline

Part I: From practice to research

Chapter 1: Rationale

This chapter.

Chapter 2: Theoretical perspectives

Chapter 2 lays out three theoretical perspectives on the research: the social model of disability; new institutional theory; and welfare economics, including the concept of putting a monetary value on utility using stated preference. The literature for each perspective is explored in turn. Finally the chapter explains how the three theoretical perspectives inform the research and describes how the three seemingly disparate theoretical frameworks combine to enhance the research approach.

Chapter 3: Methodology

Chapter 3 describes in detail the methodology for the three pieces of original research: a tram system multiple-case study, a systematic literature review and a stated preference discrete choice modelling experiment. It ends with a discussion of the overall approach, explaining how the three methodologies complement each other in the research.

Part 2: Valuation in the UK

Chapter 4: Transport appraisal

Chapter 4 explains how appraisal is undertaken, with particular reference to the UK. WebTAG (the Department for Transport's web-based transport appraisal guidance), the Department for Transport's 'Value for Money' guidance and the Treasury's guidance on valuing non-market benefits (to which the DfT guidance refers) are explained.

Chapter 5: Valuing disabled access

Chapter 5 discusses the literature on benefits of disabled access and how they can be valued, including the paucity of quantitative work. It describes findings of a multiple-case study into how 'valuation' of disabled access is effected in practice at the moment for transport projects – specifically tram systems – within the context of the DfT guidance.

Chapter 6: Valuing non-market impacts

Having reviewed the way in which disabled access is incorporated into appraisal, and the consequent imbalance of costs and benefits, Chapter 6 asks: What ways of valuing non-market benefits are used, including in other sectors? It reports on a systematic review of the literature on valuing non-market benefits for a range of sectors, including environment and health. It concludes that stated preference using discrete choice modelling is an appropriate tool for valuing disabled access for use in transport projects.

Part 3: Putting a value on disabled access

Chapter 7: Deriving a monetary value

Chapter 7 gives the background to the stated preference experiment and presents the results – the willingness-to-pay figures.

Chapter 8: Applying the results

Chapter 8 explores the issues and the outcome when the figures derived from the stated preference experiment are included in an appraisal. The two appraisals reviewed are Crossrail and one of Transport for London's North London Railway projects (Hackney Interchange). The chapter examines what effect the figures have on the appraisals, and the issues and restrictions that need to be considered.

Part 4: From research to practice

Chapter 9: Making transport accessible

Chapter 9 summarises the process that the research followed. It highlights the need to quantify the value of disabled access as part of the overall economic appraisal of transport projects. It argues that such access can be valued like other non-market impacts, and that doing so has a useful impact on the appraisal of 'real' projects. It lays out the contribution to knowledge and to practice, of the research as a whole and of the individual elements of the research.

Chapter 10: What next?

Chapter 10 explores the limitations of the research as a whole and of the individual elements of the research. It then proposes further research to build on the research reported in this thesis.

1.1.2. Diagrammatic layout

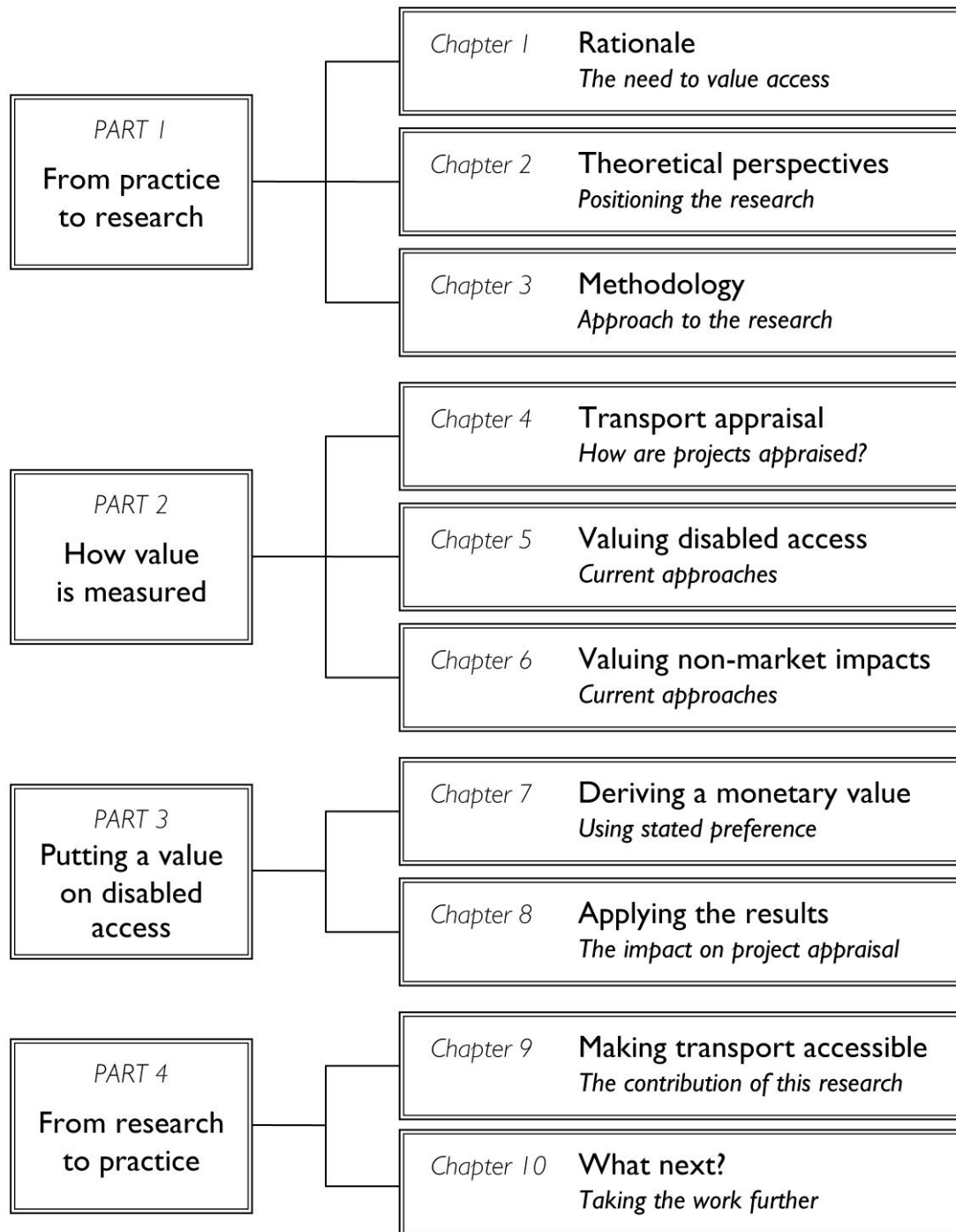


Figure 1: Diagrammatic layout of the thesis

1.2. Background

1.2.1. Research area

The broad area in which this research is positioned is transport and social exclusion. The two are closely linked, since without effective transport provision people who are already socially excluded find it difficult to break out of their circumstances, reduce the isolation they experience and increase their economic participation (Social Exclusion Unit, 2003). Because of the inaccessibility of the built environment (including housing), lack of access to the job market, lack of access to transport and the like, disabled people often experience severe social exclusion (Barnes, 1991).

The policy area of study is transport project economic appraisal in the UK. Economic appraisal as prescribed by the UK Department for Transport uses a multi-criteria framework, but the core of this is value for money based on the benefit:cost ratio (see Chapter 4). In order to derive a benefit:cost ratio, a Cost Benefit Analysis is undertaken. To be able to make a reliable judgement about value for money, it is essential to incorporate both costs *and* benefits into the analysis. Without such a balance, the benefit:cost ratio is biased. In many cases, such as ramps for wheelchair users, effective public announcements for visually impaired people, and pictorial information for people with learning difficulties, the cost of addressing the transport needs of disabled people can be quantified in monetary terms. However, the benefits are more disparate and harder to quantify.

Although the focus of this thesis is the UK, the findings are applicable to other countries that incorporate a Cost Benefit Analysis in their approach to appraisal, including many European countries such as Denmark, Spain, Germany and Ireland (Grant-Muller et al., 2001).

1.2.2. Research motivation

The need

Demographics

Disabled access is fundamental to an economically sustainable society. As the population ages, the numbers of disabled people will increase, since impairment and age are closely related. In the UK, 33% of the population between 50 and 65 have an impairment (Employers Forum on Disability, 2007a) and as the population ages – numbers of people over 65 will increase by 40% in the next thirty years (UK Department for Transport, 2004) – so the number of disabled people will increase.

This is not just a UK phenomenon. For example, the median age will rise by 2050 to 45.5 years (from 37.3 years in 2000) in the developed world and to 37.8 years (from 26.8 years in 2000) in the world as a whole (Weil, 2006). Providing disabled access as standard, so that expensive 'special' provision does not have to be made for increasing numbers of older and disabled people, will become more and more important if societies are not to experience economic stress.

The law

In many countries, including the UK, US, Australia and Ireland, there is now a legal requirement to provide disabled access. Under UK law, access to most transport vehicles is specified through regulation under the Disability Discrimination Act 1995, but how access should be achieved in relation to the transport infrastructure is not specified. The requirement is to make 'reasonable adjustments', of which making physical alterations is only one aspect. Where a physical feature makes it impossible or unreasonably difficult for a disabled person to access a service, the provider must do one of four things: remove the feature; alter it; provide a reasonable means of avoiding it; or provide the service by a reasonable alternative means (Disability Rights Commission, 2006b). In the rail environment, the key case relating to physical features is *Roads vs Central Trains Ltd* in 2004. The case centred on Thetford station where the ticket office side of the station is step-free, but the step-free route to the other platform takes wheelchair-using passengers on a journey of about half a mile of difficult-to-negotiate terrain. Central Trains was found to have failed to make reasonable adjustments, in that it failed to provide a taxi for Mr Roads from one side of the station to the other and instead required him to travel to the next step-free station (Ely) where he could cross to the opposite platform and thus return to the step-free side of Thetford station – a round trip of over an hour. The reasonable adjustment of a taxi to the other side of the station was not without significant cost as there were no cab companies with wheelchair-accessible cabs in the near vicinity of Thetford. A more comprehensive business case might demonstrate that providing step-free access as the reasonable adjustment would be preferable to providing the service by a reasonable alternative means – if not in this case, then in similar circumstances across the network.

In addition, legislation is increasing. The Disability Discrimination Act 2005 places a new positive duty on public bodies to promote equality of opportunity for disabled people (Disability Rights Commission, 2007). In order to fulfil this requirement, public bodies must identify how their functions – including economic appraisal of their various initiatives – impact disabled people. Where that impact is negative, action must be taken to address this. It is therefore important for public sector organisations,

such as the Department for Transport, to be able to demonstrate transparency in expenditure on projects that affect disabled people..

Transport exclusion

There have been a number of different analyses of how people experience transport exclusion. Church et al. (2000) propose a “conceptual framework for social exclusion and transport” (p.198ff) that addresses exclusion on seven grounds:

- physical exclusion – physical and psychological barriers
- geographical exclusion – the absence of transport in the local area
- exclusion from facilities – the absence of (transport to) necessary facilities such as food shops
- economic exclusion – the cost of transport services, especially to access employment opportunities
- time-based exclusion – the absence of transport at the required time
- fear-based exclusion – concerns about personal security
- space exclusion – inappropriate design of transport facilities exacerbating some of the above.

The UK Government's Social Exclusion Unit (2003) spelled out the barriers to social inclusion that poor transport provision creates for individuals and for the state. These barriers include, for individuals, being

“cut off from jobs, education and training and other key activities affecting quality of life. In extreme circumstances people may be left isolated or even housebound.” (p.20)

For the state:

“important government objectives relating to welfare to work, educational attainment and participation, health inequalities and uptake of key social and cultural services by target groups may be undermined. Poor transport as a barrier to work may contribute to higher benefit payments, and reduced tax contributions. Resources are wasted through missed health appointments, delays in patient discharge from hospital, and course drop-outs in education.” (p.20)

There are many such impacts of poor transport on other such as health and education. Cass et al. (2005) argue that

“social inclusion increasingly demands the capacity to form and develop various social networks sometimes stretching across substantial distances” (p.545).

Therefore, they conclude that it is

“significantly a matter of overcoming constraints of space at particular moments of time so as to gain access to the informal networks of work, leisure, friendship and family” (p.548).

Disabled people experience particular problems with the transport environment, and this exacerbates the social exclusion that they experience. The Social Exclusion Unit (2003) claims that 14% of adults have a physical disability or long-standing health problem that makes it difficult for them to go out on foot or use public transport. As people get older this becomes more of a problem. A lack of disabled access to vehicles and infrastructure and a poor-quality pedestrian environment, in particular around transport interchanges, prevent many disabled people from attempting to use public transport.

The absence of transport systems with disabled access is a key barrier to disabled people's participation in mainstream activities (Dryden and Garner, 2004; Social Exclusion Unit, 2003; Heraty, 1989). This results in an inability to access the labour market, and thus to contribute economically (e.g. Branfield and Maynard Campbell, 2000). And in a study of disabled people's employment prospects, Scope found that:

“74% of disabled people thought inaccessible public transport is a barrier to getting work. Only 20% of employers agreed that this was a problem suggesting there is a significant lack of awareness of the access barriers disabled people face daily” (Daone and Scott, 2003)

Disabled people also experience severe restrictions on their ability to access public services such as hospitals and colleges, or commercial services such as leisure facilities and shops. ‘Going out’ is a challenge – for example, a survey by the Joseph Rowntree Foundation found that:

“As is the case for teenagers generally, transport emerged as an issue affecting the lives of many disabled young people. [...] Because public transport is usually physically inaccessible, unwelcoming and does not take people from ‘door to door’, it can be very difficult for disabled young people to go out. For those disabled young people who are able to, learning to drive as early as possible is seen to be a very desirable option. Many disabled young people rely upon their families, usually their mother or their father, to take them to places.” (Murray, 2002, p.47)

Where transport is improved, and those sectors benefit in consequence, these are known as 'cross-sector benefits' (e.g. Fowkes et al., 1994). Such benefits often occur in the public sector in relation to health, education and so on, but they can also accrue to the commercial sector. Where disabled people cannot access leisure activities and services, the £50bn they have to spend each year (Employers Forum on Disability, 2007b) may be less efficiently spent, in the economic sense of the term. Talking about cross-sector benefit, the chief executive of a transport campaigning organisation identified a small but significant economic benefit of access to transport for older people, many of whom are disabled:

“There are cross-sectoral benefits in terms of keeping pensioners active for longer [...]. They go up to Southport, and have a cup of tea and a bun, which spends into the local economy in a rather small but important way.” (Maynard 2004)

Where disabled people are excluded from mainstream transport opportunities, special provision has to be made for their mobility. The costs of this are high. In London each door-to-door journey is subsidised to the tune of £6.50, and yet the needs of many disabled Londoners for transport still go unmet (Lansman, 2004).

Where people with impairments are disabled by poor public transport such that special provision has to be made, they become a financial burden on society. With the increase in the population age and hence people with impairments, society cannot afford to such carry large numbers of unnecessarily disabled people.

The author's practical experience

As a senior manager in the transport industry responsible for strategy and policy in relation to disability, the author's experience was that, although disabled people's needs were recognised, and in many cases colleagues believed it was appropriate to put the necessary provision in place, somewhere between conception and development disabled people's needs were often squeezed out. The justification was often that the provision in question was 'too expensive'. It was not necessarily clear how that judgement was made or what 'too expensive' actually meant, but the essence of the argument was that the provision did not represent value for money.

There is still a great deal of leeway which allows transport professionals not to implement effective disabled access provision. There may be many reasons why provision for disabled people is not made. Ignorance of the needs of disabled people, an underlying belief that it is inappropriate for disabled people to be 'out in public', a fear of engaging with disability (Hughes, 2002; Barnes et al., 1999) – all of these things

may indeed influence transport professionals. Whatever the underlying reason, the result is that disabled people's needs in the transport environment are assumed not to represent value for money, and the methods used to calculate value for money reinforce that assumption. One of the favourite stories amongst colleagues in the rail industry was of the British Rail adviser in the 1980s, himself a wheelchair user, saying that it would be cheaper to pay for a chauffeur-driven Rolls-Royce for every wheelchair user than to make the rail network wheelchair-accessible. The UK Independence Party seems to have adopted this approach in its transport policy:

“The money that is funding adaptations of stations and trains we would use for disabled people to actually go by taxi. It means we would not be paying for hugely expensive lifts in train stations, for example.” (Disability Now, 2004)

It may indeed, on occasion, be economically and socially more appropriate not to provide disabled access on a particular transport mode, but without the tools to support the decision, it is difficult to make the decision-making process transparent. As a transport professional, therefore, the author contends that it is hard to make a good defence against the arguments of disabled activists who expect full access to all transport systems, since alternative provision as the 'reasonable' (in legal terms) approach cannot be convincingly justified. On the other hand, as one such disabled activist, the author recognises that, without transparency in decision-making, there is no means of knowing whether or not the assertion that it is too expensive is justified. This leaves the stark choice between accepting one's lot and remaining excluded or going to Court or chaining oneself to vehicles and parts of the infrastructure to make a point. This can lead to mutual mistrust and places public service managers and their organisations in a difficult position.

1.3. Social Model perspective

1.3.1. The Social Model and appraisal

The research has been undertaken from a Social Model of disability perspective. The Social Model of disability states that disability is socially constructed – that it is caused by barriers in the environment that can be removed by social action. The barriers can be physical, attitudinal, organisational, or relate to information provision and communication. The Social Model contrasts with the Individual Model in which people are assumed to be disabled by virtue of having an impairment – that is, there is assumed to be a causal relationship between impairment and disability. See section 2.1 for a more detailed explanation of these two approaches.

This thesis demonstrates that, from a Social Model perspective, the imbalance in the benefit:cost ratio creates an organisational barrier to the provision of barrier-free public transport environments in the economic appraisal of transport projects, thus 'disabling' people with impairments. Monetising the benefits of disabled access gives a more accurate benefit:cost ratio, a central element of transport project investment decisions, and thus removes this barrier.

Practice based on the Social Model has begun to gain currency in public sector organisations in the UK. Some, particularly local authorities, explicitly espouse the Social Model as the basis for their dealings with disabled people (e.g. the Greater London Authority, Birmingham City Council and Manchester City Council), even if their practice sometimes falls short (Barnes and Mercer, 2004, throughout). Despite increasing acceptance of the Social Model, however, it has not been widely applied to research in the transport environment, and there is little quantitative work using it. The majority of information available is gathered from an Individual Model approach. These approaches are neither complementary nor compatible (see section 2.1.1 for an explanation). This means that managers in the public sector are expected to bring a Social Model approach to their work, but the information base with which they have to work militates against them doing this and pulls them back into an individual approach to disability. Another advantage of the research described in this thesis is that it will provide a better information base for transport practitioners in organisations that take a Social Model approach to transport planning and investment decisions.

1.3.2. 'Disabled access'

Use of the term 'disabled access' may seem odd for an advocate of the Social Model, implying as it does that the *access* is disabled. The author prefers the term 'accessibility' but this has a specific meaning in transport planning, to do with ease of reaching places, which tends not to include the ease of reaching places for disabled people. To avoid confusion, therefore, the term 'disabled access' is used throughout this thesis.

1.4. Importance to managers

There are a number of reasons why having a robust but easy-to-apply method of incorporating disabled access into transport project economic appraisal is important to all managers in the transport field – not only those in organisations that espouse a Social Model approach as described above. Transport practitioners use economic and financial tools such as evaluation frameworks every day to help them make decisions.

Improving those tools to incorporate disabled access is a valid goal of management research.

The multiple-case study of tram systems described in Chapter 5 demonstrates that disabled access tends not to be included in economic appraisals. Notwithstanding, whilst the UK political climate favours such improvements, practitioners with the political will to improve provision for disabled people are not deterred from doing so. The funding provided for improved access on the rail network over the next 10 years (Strategic Rail Authority, 2005) is a clear case of this, as it was not justified with a 'business case'. However, the justification for such provision is almost invariably qualitative and does not fit the figures-orientated culture of many transport organisations.

More importantly, in December 2006 the new public sector duty to promote disability equality came into force (Disability Rights Commission, 2007). A number of the organisations concerned with funding transport now have this duty, such as local authorities and public transport authorities. Under the duty:

“Public authorities are expected to have ‘due regard’ to the six parts of the general duty. ‘Due regard’ comprises two linked elements: proportionality and relevance. In all their decisions and functions authorities should give due weight to the need to promote disability equality in proportion to its relevance. This requires more than simply giving consideration to disability equality.” (Disability Rights Commission 2005, p.33)

Economic appraisal as a function is covered by the duty. In Appendix E ‘Functions and policies and their relevance to disability equality’, the DfT’s Disability Equality Scheme lists ‘Transport Appraisal, research and economic advice’ as low-priority in relation to meeting the general disability equality duty (UK Department for Transport, 2006a). However, it is difficult to see how they will be able to address some of the high- and medium-priority issues such as ‘Strategic Policy Advice with regard to Rail’ or ‘Investment Frameworks’ (within Rail) if the underlying appraisal approach is inadequate to deal with disabled access issues because the benefit:cost ratio is biased towards cost. For example, in relation to investment frameworks it will be important to have a balanced appraisal that takes into account benefits of schemes as well as costs, including benefits of disabled access.

Public Authorities will have to demonstrate that their performance of a function does not adversely impact disabled people. Having a separate appraisal route that is not clearly and directly linked to the mainstream appraisal system is likely to be unacceptable if challenged.

1.5. Research questions and approach

1.5.1. Overall research question

The overall research question is:

“How can disabled access be incorporated into the economic appraisal of transport schemes within a Social Model framework, to enable a more accurate value-for-money judgement, given the isomorphic forces acting upon transport organisations?”

Isomorphism is the tendency of organisations to become similar to one another as a result of coercive, mimetic or normative pressure. See section 2.2 for a discussion of new institutional theory and the concept of isomorphism.

1.5.2. Appraisal in practice: the tram case study

In order to address the question, it was decided to investigate how transport professionals currently address disabled access in economic appraisal. To do this, a multiple-case study of tram systems was undertaken using new institutional theory as the lens through which to study the issue. The research question for this study was:

“On what basis (methods, data and planners’ consultation of disabled people) have the costs and benefits of disabled access been incorporated into the project appraisal process for three tram projects, and how, in the context of new institutional theory, has the environment in which the organisations operate influenced their approach?”

Findings from the study are in Chapter 5.

1.5.3. Methods of monetisation: the systematic literature review

It was also decided to investigate how other non-market impacts, such as environmental or heritage issues, are quantified such that they can readily be incorporated into economic appraisal. To do this, a systematic literature review was undertaken, focusing on methods of incorporating non-market impacts into economic appraisal frameworks that would be transferable to the issue of disabled access in transport. The research question for the review was:

“What methods have been used to quantify non-market impacts for incorporation into evaluation frameworks for projects and can these methods be adapted to address disabled access in transport projects?”

Findings from this review are in Chapter 6.

1.5.4. Willingness-to-pay: the stated preference experiment

The systematic review uncovered a number of different types of benefit that might be addressed, in particular a paper by Fleischer and Felsenstein (2002). They distinguished between government, producer and consumer surplus. Government surplus and, arguably, also producer surplus are the cross-sector benefits mentioned above. The valuation of cross-sector benefits (specifically government surplus) was considered, but the problems inherent in government spending approaches indicated that this might not be an effective research route. In the foundation stages of this research, an interview with a senior civil servant involved in disability issues indicated that cross-sector benefits, though important, are difficult to address in the context of government budgets:

“[The] way that government and local government and health service budgets work, you know saying that if we provide this transport service next year, your client will benefit therefore you should pay for the transport service – we’ve tried that for a number of years and it is – to date – impossible to make that connection. Other than in the broad sense of saying this is a good thing because – but actually getting the money to move is very, very difficult.”
(Maynard, 2004)

A focus on consumer surplus was deemed a more practically useful route to take. Having identified, through the systematic literature review, that stated preference is a technique for valuation widely used for non-market impacts in other sectors as well as transport, such as health and the built environment, the third stage of the research was to instigate a research study using that technique.

A discrete choice experiment was therefore undertaken, looking at the consumer surplus in means of platform-to-platform access suitable for disabled people in the heavy-rail environment – that is, the standard overground railway in the UK. The research question for this study was:

“Is it possible to use choice modelling methodology to derive a robust range of values (i.e. internally and externally validated) of willingness-to-pay for specific features of disabled access at heavy-rail stations, disaggregated by specific groups defined within a Social Model of disability framework?”

Findings from the study are in Chapter 7.

1.5.5. Applying the results: putting a value on disabled access

Having derived willingness-to-pay figures using the discrete choice experiment, the question remained whether they would actually make a difference to an appraisal.

The final stage of the research therefore involved taking the figures derived and using them in two current economic appraisals. The first is the economic appraisal for Crossrail, a major project involving both under- and overground rail – much of it new-build – linking Shenfield in Essex with Maidenhead in Berkshire, through the middle of London. The second is an appraisal of a project to improve the links between Hackney Downs and Hackney Central stations, including step-free access. This is part of the programme of works by Transport for London following its assumption of responsibility for the North London Railway in autumn 2007. The application of the results is discussed in Chapter 8.

1.6. Principal contribution of the research

1.6.1. Principal contribution to knowledge

From a Social Model perspective, the research identified an organisational barrier to the inclusion of disabled people in mainstream transport provision within appraisal practice. It also developed a potential way of removing that barrier.

The research as a whole provides a *quantitative* approach to valuing the benefits of providing access for disabled people at heavy-rail stations. Almost all previous work has been *qualitative*. In doing this, it applies a stated preference technique – in particular discrete choice modelling – explicitly to specific aspects of disabled access. This technique has not been applied in this way before within the transport environment.

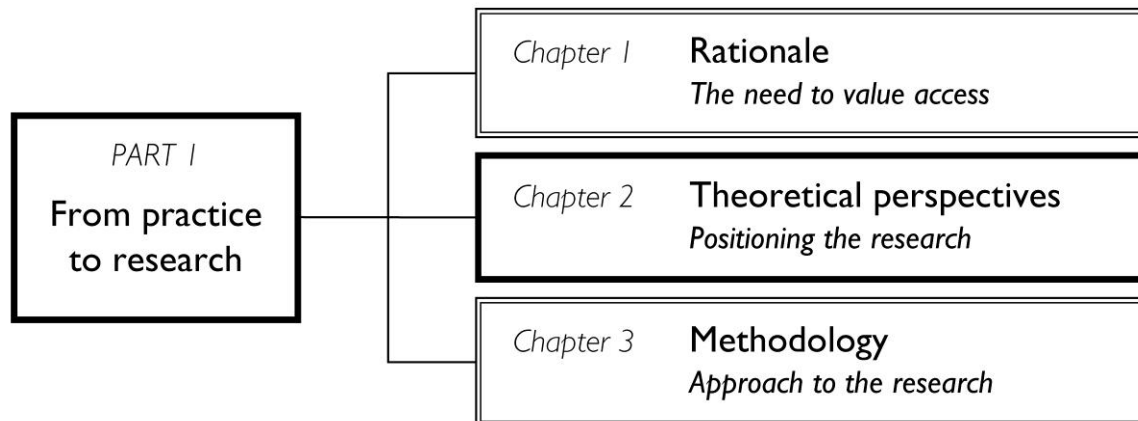
1.6.2. Principal contribution to practice

The research identified a mainstream method of valuing non-market impacts and applied it to disabled access, thus demonstrating that an existing mainstream technique for valuation can be used. Disability is not a 'special case'. Moreover, a Social Model approach to classification is possible in determining willingness-to-pay, and enables the disaggregation of the willingness-to-pay values derived. This will assist practitioners in undertaking their transport planning function in a way that better fulfils their Disability Equality Duty.

1.7. A note on chronology

The three research projects were not undertaken in the order presented in the thesis. The systematic literature review was undertaken first, then the tram multiple-case study and finally the stated preference experiment. The case study required a certain amount of groundwork such as identifying and making contact with the key informants. The systematic review, on the other hand, could be undertaken 'in

isolation' and was therefore an ideal starting point. The projects are presented in a different order in the thesis to enable the reader to follow the research reasoning more easily.



Chapter 2. **Theoretical perspectives**

This chapter lays out three theoretical perspectives on the research: the social model of disability; institutional theory; and welfare economics including the concept of putting a monetary value on utility using stated preference. The literature for each perspective is explored in turn. Finally the chapter explains how the three theoretical perspectives inform the research and describes how the three seemingly disparate theoretical frameworks combine to enhance the research approach.

2.1. The Social Model of disability

The Social Model of disability underpins this research. The lack of attention paid in economic appraisal to the value of disabled access, as demonstrated in this research, creates an organisational barrier to disabled people’s inclusion in the mainstream transport system. The derivation of monetary values for infrastructure features that benefit disabled people will facilitate the removal of that barrier.

2.1.1. Outline of the Social Model

Within the field of disability studies, the dominant discourse in the UK over the past 15 years or so, although to a lesser extent in the US, has been the Social Model of disability. The Social Model of disability states that people with impairments are disabled by physical and social barriers.

“An analysis of oppression within capitalist societies, it has shown how the previously taken for granted, naturalistic category ‘disability’ is in reality an artificial and exclusionary social construction that penalises those people with impairments who do not conform to mainstream expectations of appearance, behaviour and/or economic performance” (Tregaskis, 2002, p.457)

The Social Model draws a distinction between impairment and disability:

“Impairment is the functional limitation within the individual caused by physical, mental or sensory impairment.

“Disability is the loss or limitation of opportunities to take part in the normal life of the community on an equal level with others due to physical and social barriers.” (Barnes, 1991, p.2)

The Social Model was developed by disabled people in opposition to what came to be known as the Individual (or Medical) Model of disability. The key difference between these two models is the location of the ‘problem’.

In the Individual Model, disabled people are unable to participate in society as a direct result of their impairment. Impairment causes disability. In effect it is thus each disabled person’s personal tragedy that her or his level of participation is limited. The solution to the ‘problem’ of disability is thus to adapt disabled people to ‘fit’ into society, through cure, or at least some approximation thereof – to ‘normalise’ them. Where this is not possible, they must be cared for outside society; hence the proliferation last century of segregated institutions designed to care for disabled people out of sight of the rest of society (e.g. Brisenden, 1986).

In contrast, the Social Model places the responsibility for alleviating disability squarely in society’s lap. Disability is caused by social oppression, and can be ‘cured’ though changing social structures to accommodate the needs of people with impairments (Finkelstein, 2001).

2.1.2. Towards a theory of disability

The original Social Model was not intended as a comprehensive disability theory (Finkelstein, 2001). In attempts to develop the model into a theory, a number of amplifications have been developed, one of which focuses on the economic exclusion of disabled people that results from capitalist structures. Others have: explored the cultural exclusion of disabled people, that results from stigma or ‘otherness’; attempted to incorporate disabled people’s subjective experience (including feminist approaches); or attempted to integrate an analysis of the impaired body into the model (Tregaskis, 2002). In addition, there is a significant challenge to a ‘pure’ Social Model in the form of the contention that impairment itself is not a naturalistic category, but is also socially constructed (e.g. Tremain, 2001):

“In short, impairment has been disability all along. Disciplinary practices [of division, classification and ordering, predominantly in medicine] into which the

subject is inducted and divided from others produce the illusion that they have a prediscursive, or natural, antecedent (impairment)” (p.632)

The arguments for a social construction of impairment are persuasive, and the classification of someone as having an impairment or not is a result of social practices and cultural values. At the time of writing, the status of dyslexia, which has only in the past 10 to 20 years become an ‘accepted’ impairment covered by the Disability Discrimination Act, is being challenged (Blair, 2007).

In this research, the decision was taken to accept impairment as a naturalistic category. Although the research deviates from current research practice in the transport field by using a Social Model approach to the classification of disabled people, the use of the category ‘impairment’ enables a link to be made to previous research (section 3.3.8). Regarding impairment as a social construction does not lend itself readily to applied research. However, in using the term ‘impairment’, the author recognises that this thesis contributes to its ongoing establishment as a ‘real’ phenomenon:

“it seems politically naive to suggest that the term ‘impairment’ is value-neutral, that is, ‘merely descriptive,’ as if there could ever be a description that was not also a *prescription* for the formulation of the object (person, practice, or thing) to which it is claimed to innocently refer. Truth-discourses that purport to describe phenomena contribute to the construction of their object.” (Tremain, 2001, p.621, original emphasis)

In addition, it could be argued that where the thesis analyses the data from people who experience barriers in the environment, it effectively ignores impairment as a ‘prescription’ and focuses only on people’s perceptions of their circumstances.

It is relevant at this point to highlight one further development in disability theory. Corker and Shakespeare (2002) are concerned to incorporate postmodernist and post-structuralist scholarship into disability studies. They maintain that this may redress the theoretical deficit that they judge exists in disability studies. However, as they point out in their introductory chapter, postmodern theories of disability are in the early stages of formation:

“We believe that existing theories of disability – both radical and mainstream – are no longer adequate. Both the Individual Model and the Social Model seek to explain disability universally, and end up creating totalizing, meta-historical narratives that exclude important dimensions of disabled people’s lives and their knowledge. The global experience of disabled people is too complex to be rendered within one unitary model or set of ideas. [...] The future challenge for disability studies is to benefit from the new theoretical toolbox, without

losing its audience among disabled people, the poorest of the poor in every society, and without losing its radical edge. Theory has to be conceived as a means to an end, rather than an end in itself.” (p.15)

That “important dimensions of disabled people’s lives and their knowledge” have been excluded from a ‘pure’ Social Model is evident from the proliferation of variants. But as Danermark et al. say:

“abstract concepts are criticised for not working in a way which means they exhausted every single concrete particularity and variant, in advance. Such a reduction of the abstract of the concrete comes from the fact that an empiricist view of knowledge is predominant both in many scientific contexts and in everyday reasoning. [...] But abstract concepts are isolations of aspects of concrete phenomena and thus will never live up to such expectations.” (p.49)

This thesis therefore takes a view that, broadly speaking, we share a common understanding of what impairment is, and that it is people who are currently defined as impaired, also broadly speaking, who are excluded by disabling social barriers, the very real effects of which have been identified extensively in the literature quoted in this thesis. Importantly, those who challenge the immutability of impairment do not argue that the exclusion of disabled people is just or appropriate. At the moment, however, their approach makes it harder to find practical ways in our established institutions to reduce that exclusion. And as Iris Marion Young says in her foreword to Corker and Shakespeare:

“Thus I would propose that the assertion of a ‘postmodern’ approach to disability studies not be concerned as a displacement of the Social Model of disability, on analogy with the way that Social Model displaces a model of disability as that of having malformed or unfortunate bodies and functionings. The Social Model of disability seems necessary for activists to maintain in their arguments with employers, educators, legislators and judges.” (Young, 2002, p.xiv)

2.1.3. Classifying people as ‘disabled’

In the stated preference experiment, socioeconomic data were gathered about respondents (section 3.3.8). Whether or not a respondent was disabled was one element of the data gathered.

Where research in the transport field has classified people as disabled (or not), it has tended to focus on an Individual Model approach. Following Transport for London’s

standard disability question for research, the original question proposed in relation to disability was: “Do you have any long-term illness, health problem or disability which limits your daily activities or the work that you can do?” This wording implies a causal link – that is, that the ‘disability’ itself limits the person’s activities – and thus arises from an Individual Model conceptualisation. Where greater granularity has been required, disabled people have been classified according to their impairment, such as ‘confined to wheelchair’, ‘blind or partially-sighted’ and so on. Danermark et al. (2002) state:

“An essential aspect of social life is the very existence of conflicts and power struggles over whose concepts will be valid and who will consequently have the power to define reality” (p.29)

This research uses the Social Model conceptualisation of disability and one aim was to link this to levels of willingness-to-pay. Oliver’s (1996) three-fold definition was used to ask respondents whether they were disabled within the framework of the Social Model:

“Following on from [the distinction between impairment and disability made by UPIAS], my definition of disabled people contains three elements; (i) the presence of an impairment; (ii) the experience of externally imposed restrictions; and (iii) self-identification as a disabled person.” (Oliver, 1996, p.5)

Using this definition also made it possible to analyse the link between willingness-to-pay and barriers where not all the respondents had declared an impairment or self-defined as disabled. It could also be seen as providing a way of operationalising the concept of impairment as a social construction for the research.

2.1.4. The Social Model and language

Danermark et al. (2002) maintain that:

“whereas language is no doubt a medium of communication, it is by no means an independent, passive or impartial medium.” (p.28)

Writing about politics and language, Oliver (1994) says language is:

“a political issue structured by relations of power [...] inextricably linked to both policy and practice” (section 5)

Also,

“It can enable us to conceptualise a better world and begin the process of reconstructing it.” (section 5)

In the stated preference research instrument, it was important to use language that reflected the Social Model approach of the research as a whole. As Danermark et al. say:

“Language may appear neutral and relatively uncomplicated medium for communication between people. [...] mostly we use language as if words and concepts were labels with a meaning given to them beforehand. This, however, overlooks the fact that meaning is never definite or fixed, and also that there is an inherent relation between practice, meaning, concept and language.” (p.27)

As well as the use of Oliver’s three-fold definition to classify people as disabled, the questions needed to avoid implying a causal link between impairment and disability. An example of this was the restructuring of the question about barriers in the environment following the pilot using the word ‘difficulty’ rather than ‘problem’ (section 3.3.9).

2.2. Institutional theory

The multiple-case study into the place of disabled access in tram project economic appraisal was undertaken from an institutional theoretical perspective as outlined by DiMaggio and Powell (1991). The case study methodology is outlined in Chapter 3 and the findings in Chapter 5.

New institutional theory was chosen as the lens through which to study the projects. This was in order better to understand the impact on the appraisal process, and on the organisations’ application of that process, of:

- the introduction of legislation in the form of the Disability Discrimination Act 1995;
- changes in the regulatory approach to appraisal with the introduction of the ‘New Approach To Appraisal’;
- the cross-organisational influence of professional input by, for example, expert transport consultants;
- the disability lobby, which was growing in strength during the 1990s.

Other perspectives were considered. For example, it might have been interesting to study the projects through the lens of resource dependency theory. The level of ‘resource’ – such as local topography or the availability of experienced staff, as well as funding – available to an organisation is an important factor in whether or not access can be effectively addressed. Indeed, that point comes out of this research.

Furthermore, studying the projects through the lens of resource dependency theory might have shed light on the level of influence that the Department for Transport had

over the inclusion of access in the project because they ultimately controlled the essential financial resources. However, the main focus of the research was intended to be the appraisal process and how disability is incorporated into it. In relation to this, the changing regulatory and social environment had shown itself to be extremely significant in early investigations and thus new institutional theory was an appropriate and interesting theoretical lens to apply.

In their introductory chapter, Powell and DiMaggio (1991) highlight differences between various 'new institutionalisms', including new institutional economics, and new institutionalism in organisation theory (the new institutionalism of sociologists).

New institutional economics, according to Powell and DiMaggio (1991, p.4), is essentially about reducing transaction costs – broadly, the human costs of doing business. The purpose of Cost Benefit Analysis – a core element in the economic appraisal of transport projects – is “the efficient allocation of society’s resources” (Boardman et al., 2001, p.2). From an institutional economics perspective, Cost Benefit Analysis would also help in the allocation of society’s resources by reducing transaction costs of government departments wishing to invest – in this case in transport projects. Having a consistent framework within which all those who apply for funding must structure their bids renders the process of decision-making easier (theoretically less resource-hungry) for the Department for Transport thereby reducing the human costs of doing business, so Cost Benefit Analysis can be considered as an institution within a new institutional economic framework. The Department for Transport’s ‘New Approach To Appraisal’ and its current expression in WebTAG (UK Department for Transport, 2007) are further developments of the ‘institution’ of Cost Benefit Analysis with increased levels of complexity around the inclusion of qualitative measures and of quantitative measures outside the Cost Benefit Analysis *per se*.

Powell and DiMaggio (1991) highlight the difference between the institutions of new institutional economics and the institutions of sociologists, as found in the new institutionalism in organisation theory. In the former, institutions are explicitly devised by people and, Powell and DiMaggio suggest, the term ‘institution’ is used synonymously with ‘convention’. In sociology, the term ‘institution’ is restricted to conventions that take on the behaviour of rules in society so, “only certain kinds of conventions qualify” (p.9). Further, the new institutional economics restricts institutions to explicitly established ‘rules’ – North (1990, p.3) defines ‘institution’ as “the rules of the game in a society or, more formally, [...] the humanly devised constraints that shape human interaction”. – whereas “sociologists find institutions everywhere, from handshakes to marriages to strategic-planning departments” (Powell

and DiMaggio, 1991, p.9). But whereas Cost Benefit Analysis is a convention devised intentionally, the way it is used, and the emphasis placed on the different elements of the overall economic appraisal framework, are more like 'conventions' such as handshakes. Although the various approaches to transport appraisal begin as a set of rules established by the government of the day, they tend to take on a life of their own such that their use and, more importantly, the mode of their use become "taken-for-granted expectations" (p.10).

In their introductory chapter, Powell and DiMaggio (1991, p.10) also pose the question "Do institutions adapt to individual interests and respond to exogenous change quickly, or do they evolve glacially and in ways that are not typically anticipated?" to highlight the difference between new institutional economics, and sociological variants of new institutionalism. They suggest that "behaviors and structures that are institutionalized [in the sociological sense] are ordinarily slower to change than those that are not". The case studies in this research indicate that when the economic institution of appraisal features Cost Benefit Analysis it is slow to change and lags behind the various attempts by government to change it (e.g. the introduction of qualitative aspects in the 'New Approach To Appraisal'). The focus on the monetary aspects of appraisal, for example, has changed little, despite an increasing emphasis in the explicit 'rules of the game' on qualitative aspects (section 4.3). In addition, "Institutionalized arrangements are reproduced because individuals often cannot even conceive of appropriate alternatives (or because they regard as unrealistic the alternatives they can imagine)." This research identified a perception amongst participants that the extended framework in the 'New Approach To Appraisal' and WebTAG is regarded as unrealistic by central government decision-makers, as compared with Cost Benefit Analysis with its emphasis on the 'real' issues of allocating society's (monetary) resources.

The author therefore takes the view that the 'institution' of economic appraisal of transport projects may have begun as the institution of new institutional economics, but has become embedded in the transport economics and planning community as an institution of the sociological kind.

DiMaggio and Powell (1991, p.64) discuss the ways in which organisational forms and practices are similar to each other, and apply this to "organizational field[s]", which are institutionally defined. Four elements contribute to the institutional definition of an organisational field. These are: interaction between organisations; structures of dominance or coalition; increase in information load; and mutual awareness of a common enterprise. Applying these elements, transport can be clearly defined as an organisational field. Local transport authorities interact extensively and form coalitions

(e.g. the Passenger Transport Executive Group). The information load has increased such that there are a number of publications aimed solely at practitioners in the field, such as *Local Transport Today* and *Modern Railways*. There is both a formal manifestation of 'common enterprise' – similarity of goals and values – in the academic courses available to train transport professionals and an informal manifestation in the networks of, for example, email lists where people share problems, solutions and visions for the future (www.newmobility.org).

The focus of the research is on an organisational practice – that is, the economic appraisal process – and the similarities, in relation to the treatment of disabled access, that exist between three tram systems that were developed in different locations and at different times. The research explores the isomorphic forces – coercive, mimetic and normative – that drive those similarities.

Coercive forces are those that place “both formal and informal pressures [...] on organizations” (Powell and DiMaggio, 1991, p.67). These are exerted “by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function”. The social, legal and regulatory environment in which the transport organisations in question existed affected the way they were planned and constructed – and the extent to which this happened is discussed in section 5.2.

Mimetic forces are those that encourage imitation because of the desire to minimise uncertainty. This uncertainty may result from “organizational technologies [that] are poorly understood”, or from ambiguous goals, or from an environment that “creates symbolic uncertainty” (p.69). New institutionalism maintains that, in order to increase their own legitimacy, organisations adopt innovations from other organisations that they perceive as having created success for those organisations. The scarcity of modern working tram systems in the UK presents uncertainty about how organisations could successfully introduce them in the context of UK rules and structures, leading those organisations to seek existing successful solutions in or outside the UK.

Normative forces result primarily from professionalisation, whether through education or through professional networks. The impact of university and professional training structures and of professional and trade associations means that “while various kinds of professionals within an organization may differ from one another, they exhibit much similarity to their professional counterparts in other organizations”. Not only is transport planning professionalised, but increasingly since the 1990s there has been professionalisation in diversity, including disability. This can be seen in the increase in

diversity posts and departments in organisations – for example, the creation of the Equality and Inclusion team in Transport for London in 2002.

2.3. Welfare economics

This research focuses on the economic appraisal of transport projects. The predominant approach to economic appraisal used in the UK transport sector is founded on welfare economic theory. Welfare economics deals with normative issues – it is “concerned with the way economic activity ought to be arranged so as to maximise economic welfare” (Pass et al., 2000, p.548). Challenges have been made to the dominance of welfare economics, e.g. Sen (1999) and Bürgermeier (2000), but consideration of such challenges is outside the scope of this research, which is seeking solutions that transport professionals can use within current frameworks.

2.3.1. Utility

Economic welfare is measured by individuals' utility, which is not always well defined, but which can encompass happiness or desire-achievement (Sen, 1999). A *change* is an economic good if it increases utility such that a person is willing to give something up to get it – and whatever they are prepared to give up is its *value*. A change is said to be 'Pareto efficient' if at least one person gains from it and no one loses. Change rarely increases everyone's utility, however, and so a modification to the Pareto test states that provided the winners from a change can compensate the losers, the change is positive. Such compensation may or may not be monetary, but it is theoretical and does not normally occur in practice. This modification is known as the Kaldor-Hicks principle or criterion (Adler and Posner, 1999; Boardman et al., 2001; Pass et al., 2000).

2.3.2. Cost Benefit Analysis

Background

Boardman et al. (2001, p.2) define Cost Benefit Analysis (CBA) as:

“a policy assessment method that quantifies in monetary terms the value of all policy consequences to all members of society.”

CBA was developed as a tool within welfare economics to measure the efficiency (welfare/utility maximisation) of a proposed change that affects public goods, where a fully efficient market does not exist (Bateman et al., 2002). It aggregates the gains and losses in the welfare (utility) of people affected by that change, and uses the aggregated figure to inform investment or policy decisions. Essentially, the principle

behind CBA is that for an investment decision to be economically efficient, benefits should exceed costs over the lifetime of the project, such that those who gain could compensate those who lose (in theory) and still be better off (the Kaldor-Hicks criterion). CBA informs decision-makers whether the project is worthwhile based on its opportunity cost (that is, what else the money could have been spent on, or the alternative policy decision that could have been made).

CBA is used extensively in the transport industry in the UK, USA and Europe to assess the viability of transport projects (Pearce, 1998a). It is the basic element in appraising larger transport projects in the UK to determine whether they should proceed. This is done by measuring the benefit:cost ratio resulting from CBA against the 'Value for Money' criteria (UK Department for Transport, 2005a).

Caltrans (California Center for Innovative Transportation, 2004) identifies the following situations as appropriate for the use of CBA:

“[Cost Benefit Analysis] is most applicable for evaluating proposed projects that meet the following criteria: (1) The potential project expenditure is significant enough to justify spending resources on forecasting, measuring and evaluating the expected benefits and impacts. (2) The project motivation is to improve the transportation system’s efficiency at serving travel and access-related needs, rather than to meet some legal requirement or social goal. (3) Environmental or social impacts that are outside of the transportation system efficiency measurement are either: (a) negligible in magnitude, (b) measurable in ways that can be used within the benefit-cost framework, or (c) to be considered by some other form of project appraisal outside of the benefit-cost analysis.”

In particular, it considers that CBA alone may not be appropriate for:

“Projects motivated primarily by a need to address distributional equity concerns — i.e., legal, political or moral desires for fairness. [...] Finally, some decisions are based on the desire (and in some cases, the legal need) to avoid selection of projects and project designs that focus undue negative impact on socially vulnerable groups (such as low income, elderly, or minority groups).”

Modern CBA, according to Adler and Posner (1999), grew out of increased centralisation in (US) government, progressivism and the rise in welfare economics. Progressivists believed that it was possible to develop administrative systems, divorced from “value-laden politics” and based on scientific principles, and welfare economics was to supply those principles (p.3). Welfare economics is concerned with how economic activity should be arranged so as to maximise economic welfare.

CBA is, as Adler and Posner point out, a decision procedure, not a moral standard (p.2). A problem with CBA in relation to disabled access is that “CBA will on average attach higher valuations to wealthier people because they can afford to pay more to reduce risk” (Adler and Posner, 1999, p.9). As they acknowledge:

“The claim was not that distributional questions were unimportant, and that redistribution of wealth was unjustified; it was rather that the economist had nothing useful to say about how wealth should be distributed.” (p.22)

However, in relation to CBA used by ‘agencies’ (generally government agencies), they do point out that distributional considerations should be taken into account, since their decisions generally affect distribution (p.24). They argue that in certain cases, agencies should depart from standard CBA and, for example, weight people’s preferences where a project will impact people with significantly different levels of wealth, or where the positive impact of a proposed project is not well understood.

This may indeed be appropriate in relation to disabled access, as disabled people are more likely to live in low-income households (UK Department for Work and Pensions, 2007). However, improving the way in which CBA accounts for the benefits of disabled access can only increase the accuracy of the resulting information for decision-makers.

The need for monetisation

One of the key features of CBA is that it uses units of money to compare benefits and costs. A key concept in monetisation is people’s willingness-to-pay for a gain (or not to experience loss) or willingness to accept compensation from a loss (or not to obtain a gain). The level of willingness-to-pay that people identify is their ‘consumer surplus’ – the additional utility or benefit they gain from the change. Willingness-to-pay can be compared with the costs and the direct monetary benefits of the project to determine whether, in theory, the winners’ consumer surplus is large enough for them to compensate the losers, at least theoretically. In making these estimations, CBA aggregates the preferences of individuals, so that any ‘social’ preference will be the aggregation of individual preferences. Any significant difference in preferences between people of, for example, different social groups is therefore normally lost. CBA also discounts future effects, so that the investment ‘value’ can be understood in present terms (Pearce, 1998a).

Cost Effectiveness and Cost Utility Analysis

It is worth noting here two other approaches to appraisal: Cost Effectiveness and Cost Utility Analysis. These two approaches rely not upon an individual’s estimation of her

or his own well-being, or utility, but upon a socially (or politically) determined outcome. For this reason, they are sometimes known as non-welfarist, or extra-welfarist approaches, since they are not about maximising welfare/utility, although not all economists agree about this (Birch and Donaldson, 2003; Kenkel, 1997). The two methods are in common use in health economics. Cost Utility Analysis is a specific form of Cost Effectiveness Analysis where a 'QALY' (Quality Adjusted Life Year – a combination of length of life and quality of life where 0 is dead and 1 is perfect health) is used as the outcome measure. Both methods

“compare the costs of two programmes, measured in monetary units, and the consequences of the two programmes, using nonmonetary units such as quality adjusted life years (QALYs).” (Donaldson et al., 2002, p.55)

Caltrans (California Center for Innovative Transportation, 2004) considers that Cost Effectiveness Analysis may be more appropriate when

“[p]rojects [are] motivated primarily by a need to address distributional equity concerns”.

They suggest that it may be used instead of, or in addition to, CBA in the following circumstances:

“If a given amount of money is available, the discounted benefits that can be achieved with that amount of money can be compared. On the other hand, if a given benefit is desired, the discounted costs required to achieve that benefit can be compared. This approach can be used even if the benefits cannot be monetized. An example would be cost per new transit rider.”

It would appear from this that the most appropriate form of analysis for disabled access is, therefore, Cost Effectiveness Analysis. However, this requires that a decision be taken to incorporate disabled access regardless and, as has been noted, that is not always the case. Furthermore, CBA is the predominant approach in the UK transport environment, so Cost Effectiveness Analysis is not explored further in this thesis.

2.3.3. Stated preference

The core of this research is a stated preference experiment. The experiment was designed to establish a monetary value for certain aspects of rail infrastructure accessible to disabled people (see Chapter 7).

Stated preference is a technique that is grounded in the notion of utility as used in welfare economics using a 'hypothetical market'. Within welfare economics, an individual is considered to be best placed to judge her or his level of utility (welfare)

and is expected always to make decisions that maximise that utility. Willingness-to-pay for a particular attribute can be determined using stated preference if one of the attributes offered in the stated preference experiment is a monetary value.

Stated preference contrasts with an approach called 'revealed preference' which uses 'surrogate markets'. Revealed preference values consumers' utility by observing their behaviour. The two main revealed preference techniques are: hedonic pricing, where the underlying value is estimated how much consumers are prepared to spend on double glazing, for example, to alleviate a problem such as traffic noise; and the travel cost method, where the underlying value is estimated by observing how much consumers are prepared to spend on travel to amenities such as a National Park.

Approaches to stated preference

There are two main stated preference methods. These are contingent valuation and choice modelling.

Contingent valuation involves asking people directly for her or his willingness-to-pay for a good, using some kind of bidding process such as dichotomous choice where people are given a single price option (single-bounded) or, depending on her or his response to one option, are offered a further option either higher than the first, or lower (double-bounded). Section 6.2.4 provides more information about contingent valuation.

Choice modelling involves inviting respondents to choose between a range of different options, by choosing one only, or by ranking or rating options (Alpizar et al., 2001; Hanley et al., 2001). Where a price is included in the option, a value for willingness-to-pay can be estimated through the analysis of the choices that the respondent makes. This is a less direct method than contingent valuation, and so it is difficult for respondents to identify a specific price. Thus it is less open to 'manipulation' by respondents, such as 'free riding' whereby respondents give an unrealistically high willingness-to-pay because they believe the good should be provided and are aware that in reality they are unlikely to be asked to pay (Alonso, 2002; Hanley et al., 2003). Choice modelling also provides a way to value different features of a change separately, as it uses a combination of features (attributes) in each choice offered to respondents, and as a separate willingness-to-pay figure can be obtained for each of the features.

There are a number of different choice methods that can be offered to respondents in stated preference experiments. Hanley, Mourato et al. (2001) identify the following possibilities:

- choose between two or more alternatives where one is the status quo (choice experiment)
- rank a series of alternatives (contingent ranking)
- score alternative scenarios on a scale of 1 to 10 (contingent rating)
- score pairs of scenarios on a similar scale (paired comparisons).

Of these, they state that only the first – choice experiments – and under certain circumstances the second – contingent ranking – provide welfare-consistent estimates of willingness-to-pay (section 3.3.1). For this reason, the method chosen for this research was a choice experiment.

Total economic value

One of the advantages of stated preference is that it addresses the ‘total economic value’ someone assigns to a change. Total economic value includes not just the value that people who *use* the feature being studied would place on it, but also the value people who do not currently use it – who would like the *option* of doing so, or think that it should be in *existence* for others – would place on it. These are known as ‘use’, ‘option’ and ‘existence’ values. The distinction between these aspects of total economic value underlay one of the hypotheses in the stated preference experiment undertaken as part of this research (section 3.3.3).

2.3.4. Discrete choice modelling

The stated preference experiment at the core of this research used discrete choice modelling to elicit willingness-to-pay for the different features of disabled access. The methodology is described in section 3.3 and the findings are laid out in Chapter 7.

General principles

Discrete choice theory has its origins in Lancaster’s theory of the characteristics of goods, modified by Rosen – that goods are divisible into attributes, and that utility derives from those attributes rather than from the goods *per se* (Louviere et al., 2000). Consumers’ choices are influenced by their expectations of these attributes with the aim of maximising their utility, where:

“utility (assuming deterministic utility maximisation) is a function of the expectation of consuming a required level of service provided by characteristics which group to define a commodity.” (Louviere et al., 2000, p.5)

Underlying the choices that people make is an indirect utility function. It is this utility function that is of interest in stated preference experiments – the intention is to

identify how people trade off one attribute against another and this information is provided in the form of coefficients derived from estimating the function. The utility function is commonly represented as:

$$U_{iq} = V_{iq} + \epsilon_{iq}$$

where U_{iq} is the utility of the i th alternative for the q th individual, V is the systematic, or deterministic, element of utility, which can be observed (that is, derived by experiment), and ϵ is the random, or stochastic, element that cannot be observed. For example, in relation to this research the random element might reflect an individual's preference based on past experience, such as a dislike of enclosed spaces, and thus lifts.

The deterministic element V is the sum of the vectors of the attributes and can be represented as:

$$V_{iq} = \sum \beta_k s_{ikq} \quad k = 1 \text{ to } K$$

where s is the value, or level, of the attribute k and β is a utility parameter for that attribute – the coefficient of change, or the relative utility. β is different for each individual and represents the value she or he assigns to each observed attribute.

It is assumed that any individual q will select the i th option if and only if

$$U_{iq} > U_{ij} \quad \forall j \neq i \in A$$

that is, if the utility they will gain from option i is greater than the utility they will gain from option j for each option j that is not equal to option i and that is a member of the individual's choice set A .

Thus, expanding U_{iq} and U_{ij} , an individual will choose option i if:

$$(V_{iq} + \epsilon_{iq}) > (V_{jq} + \epsilon_{jq})$$

During the experiment a number of 'observations' – responses to the choice questions – are gathered. These are used to calculate the probability that respondent q will choose option i rather than any other option j for all options j that are not equal to option i in the choice set. The probability function used to analyse the data for the experiment is a Multinomial Logit function (MNL).

The MNL model is generally written as:

$$P_{iq} = \exp(V_{iq}) / \sum \exp(V_{jq}) \quad j = 1 \text{ to } J$$

where P_{iq} is the probability that respondent q will choose option i .

A method called Maximum Likelihood Estimation (MLE) is used to calculate the values of the coefficients of the different attributes that form the deterministic element (V_{iq}) of the utility function.

The aim of MLE is to establish the distribution of a particular variable by estimating coefficients, that is, by plotting the distribution which all the observations most closely match.

Underlying assumptions

A number of assumptions have been made by theorists (Louviere et al., 2000, p.44) in order to simplify the modelling process. The key assumption is known as 'IIA' – Independence from Irrelevant Alternatives – that is:

“the ratio of the probabilities of choosing one alternative over another (given that both alternatives have a non-zero probability of choice) is unaffected by the presence or absence of any additional alternatives in the choice set”
(Louviere et al., 2000, p.44)

This requires that the random elements in the utility function (the ϵ_s) are “independent across alternatives and are identically distributed” (Louviere et al., 2000, p.45; but see Louviere, 2006). This property is known as 'IID'.

Deriving monetary values for time and access method

Where one of the attributes in the choice set is a monetary value – in the case of this research, 'Journey cost' – the coefficients estimated by the software can be used to derive a monetary value (willingness-to-pay) for one of the other attributes. Where time is one of the other attributes, it is thus possible to calculate the respondents' willingness-to-pay for time – that is, how the respondent will trade off money against time – and derive a value of time. This is done by dividing the coefficient of 'Journey time' by the coefficient of 'Journey cost'. Thus:

$$WTP = \beta(\text{Journey time}) / \beta(\text{Journey cost})$$

Likewise, it is possible to calculate how a respondent will trade off money against a particular access method and derive willingness-to-pay for that access method. This is done by dividing the coefficient of 'access method' by the coefficient of 'Journey cost'. Thus:

$$WTP = \beta(\text{Access method}) / \beta(\text{Journey cost})$$

2.4. Linking the perspectives

2.4.1. A critical realist approach

In developing this research, the author has taken a critical realist approach. Kazi (2003, p.4) quotes Outhwaite (1987), who says:

“Realism is [...] a common-sense ontology in the sense that it takes seriously the existence of the things, structures and mechanisms revealed by the sciences at different levels of reality [...] the task of science is precisely to explain ‘facts’ in terms of more fundamental structures, and in the process it may reveal some of these ‘facts’ [...] to be, in part, illusions”.

Critical realism holds that there are three levels of reality: the empirical domain, which consists of the events that can be observed; the actual domain, which consists of events whether they are observable or not; and the real domain, which consists of the structures and processes (‘mechanisms’) that make up reality and produce events (Blaikie, 1993, p.61). A positivist approach holds that it is possible to get at the ‘truth’ – that is, the domain that makes up social reality – by *observation* alone. At the other end of the spectrum, an interpretivist approach holds that social reality is *determined* by the concepts that we use. In contrast to both these views, critical realism maintains that our observations *depend upon* the constructs that we use and are therefore always ‘theory-laden’ – that is, we interpret what we see according to our conceptual framework (Danermark et al., 2002, pp.39 and 41).

The Social Model of disability is an example of “movements aimed at the emancipation of oppressed people” and is intended to “raise [disabled people and those interacting with them] from the various forms of false consciousness they have due to their oppressions, to the level of true consciousness” (Kazi, 2003, p.18). The underlying belief in a ‘true’ consciousness – a right way of thinking about disability – reflects a critical realist ontology. The way in which people (including disabled people) ‘construct’ disability stems from their underlying ‘consciousness’ or conceptual framework, and the ‘facts’ of disability may be ‘real’ or may turn out to be illusion. Danermark et al. (2002) remark:

“[That the reproduction of reality through language is a social construction] does not mean, however, that [reality] exists only in people’s minds. Social constructions are constructions of something. They are constructions of a reality existing independently of what the constructions look like at the moment.” (p.30)

Although socioeconomic relations and social structures are created by people, and although cultural values and representations are key to their initial creation and their perpetuation, the *result* is very real. In the empirical domain, the absence of disabled or frail older people at stations without step-free access or on buses with inadequate seating. In the actual domain, the lack of access is a barrier disabled people who experience exclusion as a result. In the real domain, the designs of the station and the bus may originally have come about, for example, because disabled people were invisible or undervalued in society. Even if there is a change in the real domain, and disabled people become visible and valued members of society, the barrier will continue to exist, however. The impact in the empirical domain of the mechanism in the real domain that led to the lack of access may not be removed for a long period of time (for example, when a station eventually needs to be rebuilt) unless specific action is taken. And when the barrier *is* removed, disabled people may be unaware of this and still believe that the barrier exists – such that the ‘fact’ of disability is, in that case, an illusion.

2.4.2. Critical realism and Cost Benefit Analysis

Naess (2006) challenges the “ontological and epistemological foundations“ of Cost Benefit Analysis from a critical realist perspective. Whilst this thesis does not set out to defend Cost Benefit Analysis as a decision-making tool, three issues from the critique that Naess puts forward are relevant here.

First, Naess raises the issue that human beings are not “fully informed, utility-maximising consumers”. He argues that “Along with instrumental rationality, human actions are guided by social rationality as well as communicative rationality and influenced by traditions and habits” (p.39). ‘Utility’ is a concept that encompasses a range of issues, however, such as people’s circumstances, their values and their worldview, and the principle behind discrete choice modelling is that there is something essentially ‘real’ that can be captured and represented with a single measure. In discrete choice modelling (section 2.3.4) the random element incorporates the ‘actual’ as it represents aspects of choice that embody the ‘real’ but may not be observable. Recent developments in discrete choice analysis seek to incorporate more of the ‘actual’ into the analysis by addressing latent constructs, that is, individuals’ attitudes and perceptions as well as their preferences (Walker, 2001). The research in this thesis used attitudes as a differentiator in the analysis of the stated preference data, as well as socioeconomic indicators, to identify differences in willingness-to-pay.

Secondly, Naess challenges the assumption that the value of something to society is the aggregation of its value to each of the individuals in that society. He argues that individuals and society belonged to different strata of reality and therefore “[t]he value of something to society is not reducible to the aggregate preferences of individuals, let alone [the] willingness [...] of individuals to pay for it.” Naess proposes a process of impact analysis in which the categories “correspond to a goal hierarchy reflecting the multitude of needs affected by the project”. This goal hierarchy is “based on inputs from various stakeholder groups” and the groups say “how the different dimensions should be weighted against each other”. Naess admits that the process would not be suitable for “arriving at firm conclusions”.

Cost Benefit Analysis does indeed aggregate individuals’ values, but by definition any decision-making process that takes individuals’ values into account at all aggregates them in some way prior to making the decision (and this is true of the approach proposed by Naess also). In Cost Benefit Analysis, the aggregation is effected with monetary units, which may not be morally acceptable to some people. In Cost Utility Analysis, the aggregation is effected with QALYs, an approach that is not morally acceptable to some people either. It might be appropriate to alter the units in both frameworks, but it would be challenging to avoid aggregation altogether, whatever decision-making tool is used. The important consideration in the process of aggregation is whether any group’s needs or preferences are being overshadowed and, again, this should be considered whatever decision-making tool is used. It is likely that the needs and preferences of those with lower incomes do not ‘shout as loudly’ as those with higher incomes, but this can be measured and addressed by applying a weighting. With a different unit of aggregation, it might be more difficult to determine how to balance the inequities that are so prevalent in our society.

Thirdly, when Naess discusses stated preference and willingness-to-pay he refers only to contingent valuation, where people are asked directly for their willingness-to-pay for a good. Many of the issues that he raises, such as not recording negative willingness-to-pay (p.50), are not an issue in choice modelling where negative willingness-to-pay is evident from the estimated coefficient of an attribute. In Chapter 7 where the findings of the stated preference experiment are laid out, using the coefficients of cost and access method to calculate willingness-to-pay would in several cases result in a negative amount. As discrete choice modelling avoids the use of questions as bald as “What are you prepared to pay?” or variations thereof, it cuts past the concepts triggered by such a question to the deeper reality in which respondents understand the trade-offs they are being asked to make between, for example in this research, time, cost and platform-to-platform access method. The

abstract research concept of 'value' – for instance of platform-to-platform access – could, in discrete choice, be converted into any unit (provided that the unit was included in the experimental design), as the coefficients derived denote only strength of preference.

For Cost Benefit Analysis purposes this strength of preference is converted into monetary units. But money is merely an 'everyday concept' which is used to represent value. Although not everyone may agree that things *should* be valued in monetary terms, money is a common 'currency'. For example, we are used to valuing our well-being in such contexts as compensation for injury. As Danermark et al. (2002, p.33) argue:

“everyday concepts must be included in the very manner we conduct research and form concepts. The concepts of reality that people, including researchers, have formed and are forming – 'science', 'everyday knowledge', 'common sense', and so on – are not only concepts 'about' or 'within' society. They are often *constitutive* for the social phenomena making up the field of research as such. The *concept dependency* of social phenomena is another factor which fundamentally distinguishes the objects of social science from those of natural science.

Social practices, like using money, [...] are what they are by virtue of what they mean to the members of society.”

2.4.3. Critical realism and evaluation

This thesis is concerned with evaluation as well as intervention. It evaluated current appraisal practice and, indeed, found it wanting in relation to disabled access. Kazi (2003, p.1) quotes Robson (2002) as saying that:

“the purpose of realist evaluation is reportedly to investigate 'what works best, for whom, and under what circumstances' ”.

Additionally, Pawson (2001, p.4) states that:

“the causal power of an initiative lies in its underlying mechanism (M), namely its basic theory about how programme resources will influence the subject's actions. Whether this mechanism is actually triggered depends on context (C), the characteristics of both the subjects and the programme locality. Programmes, especially over the course of a number of trials, will therefore have diverse impacts over a range of effects, a feature known as the outcome pattern (O)”.

In relation to this thesis, the outcome pattern is whether or not disabled access is incorporated into the economic appraisal of the transport project, and if so how – that is, whether the benefits and costs are both incorporated in an appropriate way. The context is the circumstances of the organisation implementing the transport project. This thesis takes the approach that there is an underlying ‘mechanism’ that influences the approach of transport practitioners to produce the ‘outcome’. This mechanism can be identified through exploration and inquiry, and whether the mechanism is, for example, related to the prevailing view of disabled people’s rights or the nature of professional training, it affects the outcome – that is, the way in which access is incorporated into the economic appraisal of transport projects. The current outcome is inappropriate – the result of a flawed mechanism.

The intention of the thesis is to determine, given the context (Robson’s ‘circumstances’), what mechanism will produce the desired outcome pattern – that is, that the benefits of disabled access, as well as the costs, are incorporated into the economic appraisal of transport projects in such a way that the benefit:cost ratio is not artificially low.

The multiple-case study explores elements of the underlying ‘mechanism’ in the form of DiMaggio and Powell’s (1991) ‘isomorphic forces’ – forces that cause organisations to become more like one another. Coercive forces are exerted by other organisations and cultural expectations. Mimetic forces are exerted because of organisations’ perceptions of others’ success. Normative forces are exerted by social structures in education and in the professions.

It also provides insight into the ‘context’ in which the particular ‘mechanism’ is triggered, by exploring the circumstances – the transport and disability context as well as the isomorphic forces – of the transport practitioners undertaking the tram appraisals.

2.4.4. The ‘black box’ of appraisal

Scriven (1994, p.76) describes ‘black’ versus ‘grey’ versus ‘clear box’ evaluation:

“In black box evaluation, one knows nothing about the inner workings of the program. In clear box evaluation, the inner workings are fully revealed. In gray box evaluation, one can simply discern the components, although not their principles of operation.”

The incorporation of disabled access into the economic appraisal of transport projects is a ‘black box’. The research in this thesis evaluates the appraisal process, identifying some of the components and, indeed, their principles of operation, such that the inner

workings of the process are, if not fully revealed, then substantially more so than previously. Thus the 'black box' of appraisal becomes 'clearer'.

Three components – the available measures of value in relation to disabled access and the isomorphic forces prevailing upon the organisation and the understanding of disability – are examined, as depicted in Figure 2. Of course, these are only three possible dimensions, and in the 'real' 'black box' many other factors exist that are not subject to scrutiny in this thesis.

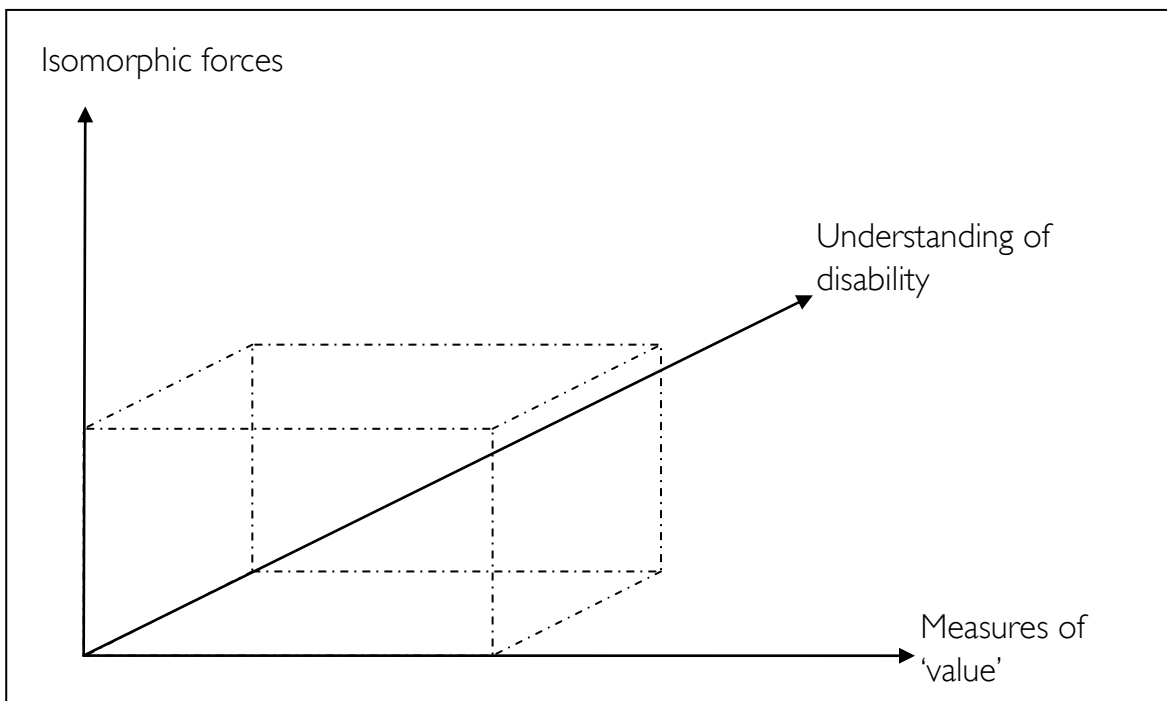
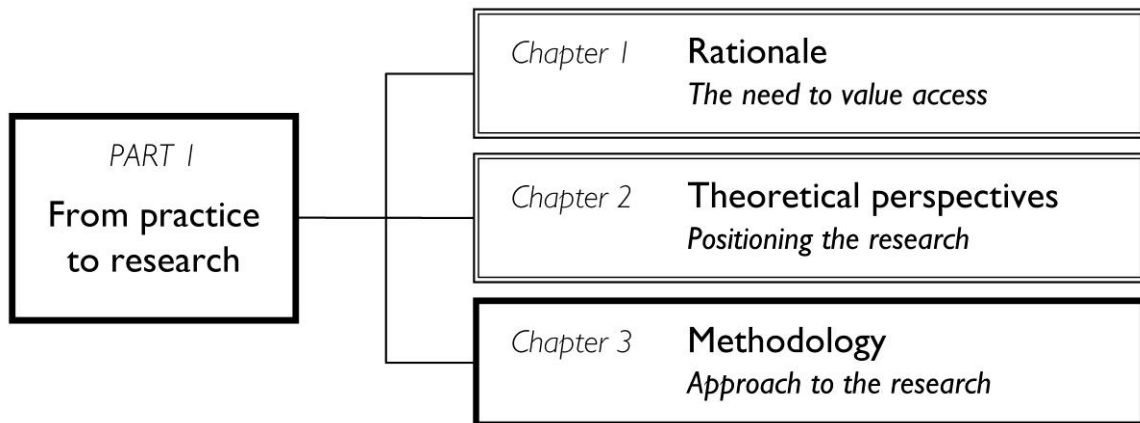


Figure 2: The 'black box' of economic appraisal

2.4.5. In summary

To summarise, in this thesis the author attempts to identify the mechanism underlying economic appraisal, the outcome of which at the moment is to ignore, broadly speaking, the benefits of disabled access. The isomorphic forces are part of the mechanism that acts upon the process. There is a 'real' truth that there is a value in the various elements of an appraisal and this value can be represented in monetary terms. However, the thesis goes beyond identifying the absence of disabled access in appraisal to provide a way in which it can be incorporated, given the context and the mechanism(s), that will achieve a different outcome pattern that better reflects underlying 'reality'. With this in mind, the thesis reviews techniques used to value

other non-market impacts in order to identify a way that can be transferred to the context of appraisal and disabled access. The technique identified is discrete choice modelling, an aspect of a mechanism from a similar context with an apparently successful outcome pattern.



Chapter 3. **Methodology**

This chapter describes in detail the methodology for the three pieces of original research: a tram system multiple-case study, a systematic literature review and a stated preference discrete choice modelling experiment. It ends with a discussion of the overall approach, explaining how the three methodologies complement each other in the research.

3.1. Appraisal in practice: the tram case study

In order to answer the overall research question, it was clearly important to understand how transport practitioners apply appraisal techniques and guidance in practice, in relation to disabled access. This contributed to an appreciation of the context (section 2.4.1) in which Cost Benefit Analysis is performed. The tram case study was undertaken to establish that understanding.

3.1.1. Why a tram system case study?

Yin (2003. p.1) contends that

“case studies are the preferred strategy for social science research when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context”

All three of these conditions were true for this piece of the research. The research question was about ‘how’ disabled access is incorporated into appraisal; the author had no control over the events under study; and the focus was current approaches to appraisal for ‘real-life’ transport projects. A case study was therefore considered appropriate.

In order to investigate the place of disabled access within transport project appraisal, it was considered advantageous to select a project with clear boundaries. In many projects, the issues of cost and benefit can be blurred because there are existing constraints (such as the presence of lineside or overhead equipment in a rail station) that prevent access being effectively provided or that make providing it particularly costly. Many tram projects, with the exception of interchanges such as stops at rail stations, are essentially closed systems – that is, they are independent of other transport infrastructure – and are built from scratch. For the most part, therefore, the appraisal incorporates issues that relate to the system itself: vehicles, infrastructure and equipment. Costs associated with, for example, street works are influenced by existing infrastructure, but such works are fundamental to the tram system, not to the implementation of disabled access – without those costs there would be no tram.

In addition, tram systems comprise a large enough investment to warrant an economic appraisal, and are obliged to follow the DfT's economic appraisal process.

3.1.2. Research question and approach

The research question for the case study was:

“On what basis (methods, data and planners' consultation of disabled people) have the costs and benefits of disabled access been incorporated into the project appraisal process for three tram projects, and how, in the context of new institutional theory, has the environment in which the organisations operate influenced their approach?”

Using a multiple-case study approach (Yin, 2003), the research examined how the costs and benefits of disabled access have been taken into account and incorporated into economic appraisal by practitioners. A new institutional theory perspective was taken to investigate whether external forces – the isomorphic forces of DiMaggio and Powell (1991) that drive organisational systems to become alike – had affected the way that project appraisals were undertaken, making them more alike. The research focused on tram (light rail) systems – an older system in Sheffield, conceived in the mid-1980s with the initial section opening in 1994; a newer system in Nottingham conceived in 1989–90 and opened in 2004; and a system conceived in the late 1990s, plans for which were revived by the Mayor in 2004 but which has not yet been built, in West London. The research posited a number of propositions that reflect the theoretical framework and informed data gathering and analysis.

Even now there are only a few modern tram systems in Britain: Manchester Metrolink, Sheffield Supertram, Midland Metro, Croydon Tramlink and Nottingham Express

Transit. The three systems in this study were chosen because of the order in which they were developed – which enabled the consideration of historical changes in the environment in relation to isomorphic forces – and because they are essentially closed systems. Manchester Metrolink and Midland Metro both used existing infrastructure, which had implications for accessibility. Croydon Tramlink opened in May 2000: because it was essentially designed before the coming into force of the Rail Vehicle Accessibility Regulations 1998, as was Sheffield, it was not a useful addition from an historical perspective. In addition, as it is part of the Transport for London ‘family’ it is likely to demonstrate similar influences to those affecting West London Tram.

The chosen cases, being high-profile major investments, are each large enough to warrant a full appraisal, and are similar enough to enable exploration of the extent to which different environmental factors, such as social expectation, accessibility standards, and regulation, have influenced the approach of the organisations. It was clear at the outset that the amount of data available for Sheffield and West London would be limited because of the age of the systems – the former built some time ago, and the latter still embryonic. However, it was considered that a multiple-case study was preferable to focusing on Nottingham only:

“[...] when you have the choice (and resources), multiple-case designs may be preferred over single-case designs. [...] the analytic benefits from having two (or more) cases may be substantial.” (Yin, 2003, p.53)

The research took a descriptive approach, seeking to answer the ‘how’ question about incorporating disabled access into the economic appraisal for the tram systems. The research also explored the ‘why’ questions arising from the underlying theoretical framework, through reviews of documents and interviews with practitioners involved. The unit of analysis is the appraisal process.

3.1.3. Case study protocol

A case study protocol (Yin, 2003, p.67) was developed. A protocol “is essential if you are doing a multiple-case study”. A protocol “is a major way of increasing the *reliability* of case study research” (original italics). The protocol outlined the purpose of the research and the cases to be included. It also outlined data collection procedures, the proposed structure for this piece of research, and the timetable for the work. The protocol is described in detail in Appendix B with the key points noted in this section.

Research propositions

A number of propositions were developed that would form the basis of analysis of the research and these were incorporated into the protocol and linked to the study questions. There are two foundations for the propositions:

- a reading of the guidance on transport project appraisal and transport system development;
- the theoretical 'lens' through which the case studies were viewed, namely new institutionalism.

Propositions 1, 2 and 3 arise from the guidance and the remaining propositions from the theoretical 'lens'. The propositions and their rationale are in Table 1. Although they did not arise directly from the theoretical lens of new institutional theory, these propositions still provide evidence for the presence of isomorphic forces (section 2.2) in the studies. For example, the assessment of costs and benefits, as considered by the following question, stems from a reading of the guidance on appraisal:

Did the assessment of costs and benefits of disabled access reflect the methods used for the assessment of costs and benefits of other aspects of transport projects (e.g. environmental aspects)?

However, an analysis of the data gathered for this question could indicate that mimetic forces were at work because of the uncertainty about how to assess disabled access.

Within the case study protocol, questions were developed – these were to be asked: of interviewees; of individual cases; of the pattern across multiple cases; of the entire study; and of the social and policy context of the cases. These questions are referred to in the relevant sections of the report and their relationship with the propositions is explored in those sections.

No pilot case study was undertaken. As already noted, the number of available tram systems in the UK is limited (only three besides the two existing tram systems studied), and in addition, only two main consultancies operate in the field of tram system development (Steer Davies Gleave and MVA), both of which were involved in the development of the three systems in the study. In consequence, the likelihood that a pilot study would 'contaminate' the pool of respondents for the main study was quite high.

Proposition	Rationale
Propositions arising from the guidance on disabled access	
1. Disabled access is largely unaccounted for in the economic appraisal of tram systems.	Guidance available to practitioners (e.g. WebTAG) does not mention disabled access which could lead to it not being accounted for in appraisal.
2. Where disabled access is taken into account, greater emphasis is placed on the costs than on the benefits.	Organisations tendering to design and build a tram system will ensure that all elements of the system – including disabled access – are incorporated into the price. The cost estimate for the system, developed through appraisal, will need to reflect as closely as possible the price that the tendering organisation will charge. Thus there is likely to be an emphasis on ensuring that all costs are accounted for. In addition, costs of largely tangible elements are easier to account for than benefits, which are largely intangible.
3. Greater weight is given to disabled access during construction than would logically be assumed from the (lack of) weight given in the economic appraisal process.	Extensive guidance is available on implementing disabled access in the transport environment – for example, Train and Station Services for Disabled Passengers (Strategic Rail Authority, 2002) and Inclusive Mobility (UK Department for Transport, 2005b). This makes it easier for practitioners to design access into the system than to incorporate it in appraisal (for which guidance is lacking).
Propositions arising from new institutional theory	
4. Pressure from disabled people's organisations, and other pressure groups, has	This proposition is designed to gather evidence about stakeholders as a source of coercive pressure.

Proposition	Rationale
increased the weight given to disabled access at all stages of tram system construction, including planning.	
5. Additional legislation has increased the weight given to disabled access at all stages of tram system construction, including planning.	This proposition is designed to gather evidence about legislation and regulations as a source of coercive pressure.
6. The movement of professionals from one tram system development project to another has created similarities in treatment of disabled access between subsequent projects.	This proposition is designed to gather evidence about the sharing of professional resources across projects as a source of normative pressure.
7. Organisations developing tram systems rely heavily on the past experience of tram systems and other transport projects to shape their approach, both where things have gone right and where things have gone wrong.	This proposition is designed to gather evidence about 'copying' of practices or design as a response to mimetic pressure.

Table 1: Case study: rationale for propositions

3.1.4. Data collection procedures

Data collection involved four of the six sources of evidence outlined by Yin (2003): documentation, archival records, interviews and physical artefacts. For Nottingham, archival records were used, since the appraisal had been undertaken some time previously. For West London, current documentation was used, but no archival records as there were none. Unfortunately it proved impossible to obtain archival records for the appraisal from Sheffield as they had been lost. Although physical

artefacts were reviewed for both Nottingham and Sheffield (not for West London as the system has not yet been built), they did not play a significant part in the studies as they provided confirmation only of the focus on disabled access in construction. Yin's fifth source of evidence, direct observation (of the issue or activity under study), was not possible for either Nottingham or Sheffield as the process of appraisal had been completed some time previously, so it was not included for West London either. Participant observation, the sixth source of evidence, was not appropriate because the author was not a part of the team developing the appraisal in any of the three cases.

Access to the case study sites was obtained through the primary contacts: the Director of Strategy, South Yorkshire Passenger Transport Executive, the Deputy Team Leader, Nottingham Express Transit, and the Deputy Project Director for West London Tram, Transport for London. The last two were also interviewees, as they were involved in the appraisals.

In the autumn of 2005, initial meetings were held with Nottingham and West London to determine what documentation was available for the case studies and who would be appropriate interviewees. Based on what was provided for these two sites and on what had proved useful for Nottingham – which was the first case to be addressed – the contact at Sheffield was asked for appropriate documentation and contacts.

Documentation and archival records obtained included the business case for the tram system, working papers relating to the business case, environmental impact statements to understand how heritage and environment issues had been handled, information about stakeholder consultation and other stakeholder involvement activities to determine the social pressure on the organisations, and minutes of meetings relating to disabled access to the system to identify influences on the provision of access. A list of the documentation reviewed is provided in Appendix B and the numbers in the following discussion refer to that list.

In the event, no interviews were conducted with external disabled stakeholders as no contacts were provided by the primary contacts or other interviewees. Some information from consultation with disabled people and their organisations and from surveys that included disabled people was available in the documentation for both Nottingham and West London. This provided the author with a clear understanding of the views of disabled stakeholders at the time of development of the Nottingham system, and of the current considered views of the principal organisation of disabled Londoners for the West London system. Consideration was given to whether the author should make her own contacts with organisations. This was not considered to be necessary, as in general (and this was borne out by the documentation reviewed) disabled people and their organisations do not engage with the economic appraisal

process. The attitude of disabled people's organisations to the analysis of the economic value of disabled people's participation (and thus to the incorporation of, for example, accessibility into economic appraisal) is almost exclusively a clear call for a social justice approach, rather than economic justification, as evidenced by the Disability Rights Commission's response to the 2006 Equalities Review (Disability Rights Commission, 2006a). Thus it was considered that the evidence available was sufficient to gauge the involvement of disabled people in the development of the three tram systems.

The principal methods of data collection for the cases were thus interviews with project personnel, documentation and archival records.

Interviews

Four interviews were conducted for Nottingham, one with two interviewees present making a total of five interviewees; two for West London, with additional material obtained from one source by email; and one for Sheffield. Interviewees are listed in Appendix B. In all, approximately eleven hours of interviews were undertaken.

Interview questions were provided to all interviewees before the interviews took place. It was considered that this would enable interviewees to recall, prior to the interviews, the relevant aspects of the process and their involvement and that this would provide richer data than asking the questions out of the blue. In a number of cases, interviewees had thought deeply about the questions and had brought with them related documentation, which was very helpful.

All interviewees were asked whether they were prepared for their comments to be identified in the report unless they specified otherwise and all agreed. The interviews were semi-structured, and the interview questions can be found in the case study protocol in Appendix B.

With the permission of the interviewees, the interviews were recorded and transcribed. The transcription was imported into the qualitative analysis software NVivo (version 2). All quotes used are verbatim. The final report on this part of the research was sent to all interviewees and their permission sought and obtained to publish. No changes to the report were requested.

Documentation and archival records

Nottingham and West London both provided a significant amount of documentation that gave a clear idea of the extent to which disability was accounted for in the written elements of the tram projects. All the documentation provided was reviewed

and the references (or significant lack of reference) to disability identified and recorded in a spreadsheet with the date and title of the document, its purpose and the presence or absence of reference to disability. The spreadsheets were imported into NVivo for analysis.

No documentation was available from Sheffield, as the papers had been lost over time. However, some historical background to the project was obtained from the internet, and a very small amount of input from the consultants involved in developing the appraisal, explaining the approach taken, was obtained by email.

The type of documentation reviewed for Nottingham and West London included:

- the business case and supporting documentation
- design documents, including feasibility studies
- market research and consultation documents
- board papers
- meeting notes
- correspondence.

Appendix B contains the list of documentation received from Nottingham and West London with an example page of the spreadsheet format for the review of documentation. Document numbers refer to the documents reviewed for each case, as listed in the Appendix.

3.1.5. Analysis

Interview and documentation data were analysed using NVivo software. Attempts to import actual documentation into NVivo failed because the version of NVivo available at the time could not handle the tables. An initial coding structure – a way of organising the material by theme – was developed based on the propositions established in the case study protocol. This was reorganised, extended and compacted down again a number of times. 'Nodes', or theme headings, to identify specific issues relating to isomorphic forces were incorporated. The final coding structure is provided in Appendix B. Conclusions were drawn from the analysis and are outlined in 5.2.

3.2. Methods of monetisation: the systematic literature review

3.2.1. Why a systematic literature review?

Systematic review techniques can strengthen the effectiveness of management research and provide advantages over traditional narrative literature reviews (Tranfield et al., 2003).

The aim of the research was to identify a way to incorporate disabled access into the economic appraisal of transport projects. The initial approach was to review the literature on the topic of transport, disability and evaluation frameworks to see what work had already been done on measurement of benefits – as costs were broadly included already – but the search produced few useful results. Seeking insight from other disciplines that had attempted to ‘quantify the unquantifiable’ seemed a constructive way forward, but there seemed likely to be a significant amount of literature, especially in, for example, environmental economics. A systematic approach would be helpful in both ensuring that the ground was covered and providing a framework to ‘see the wood for the trees’.

Pawson (2001) states “The basic idea of systematic review is to draw transferable lessons from existing programmes and initiatives.”.

The review was undertaken in the summer of 2005. The objectives were:

- to explore through academic and practitioner literature the methods that have been proposed or used to incorporate non-market impacts into project appraisal in a range of sectors and, in so doing,
- to identify methods that could be transferred and applied to the impact of including disabled access in transport project appraisal.

A systematic review provides an improved audit trail over a traditional narrative review such that it is, at least in theory, repeatable. In addition, in systematic review, the researcher develops a review protocol that shapes and delimits the review, and this helps to ensure that “reviews be less open to researcher bias than are the more traditional narrative reviews” (Tranfield et al., 2003, p.215).

3.2.2. The approach to the review

Within the management field a systematic review is guided by a review protocol (Tranfield et al., 2003, p.215). Foundational work in the first year of the research constituted the protocol and a summary can be found in Appendix C.

In addition to the protocol, and in order to crystallise the purpose of the review, a research question for the review was devised:

What methods have been used to quantify non-market impacts for incorporation into evaluation frameworks for projects and can these methods be adapted to address disabled access in transport projects?

A systematic review identifies resources and synthesises them to establish an evidence base for a particular course of action. The topic fits well into the realist synthesis approach for reviews proposed by Pawson (2001). The intention was to discover 'mechanisms' that were effective in particular 'contexts' (such as aspects of the environment or health), which might be transferable to a new context. Pawson suggests that others' mistakes and potential learning can also be useful – "The key atom of evidence, by my calculation, is when the source research is able to demonstrate the circumstances that blunt the effectiveness of a particular [...] mechanism" (p. 19), and others' learning was indeed a rich source of evidence gathered during the course of the review. For example, as a result of the findings, the stated preference experiment that formed part of this thesis was designed as a discrete choice experiment rather than using contingent valuation (section 3.3).

The review followed the three-stage approach outlined by Tranfield et al. (2003): Stage 1, planning the review; Stage 2, conducting the review; and Stage 3, reporting and dissemination.

Stage 1: Planning the review

In this stage, the review protocol is established and the researcher sets up a review panel to help direct the review process. A 'scoping study' is also undertaken that "[assesses] the relevance and size of the literature and [delimits] the subject area or topic" (Tranfield et al., 2003, p.214).

The review panel consisted of both academics and practitioners (see Appendix D). Three members had a background in transport economics – two were academics and one a practitioner now working in transport strategy. A second practitioner member was an expert in social inclusion and transport. The final panel member was an academic working in corporate social responsibility, an area of potential interest because of the links between valuing corporate activities for corporate social responsibility purposes (some of which relate to disability) and valuing disabled access. Later it became apparent that links were not as useful as originally anticipated, but the panel member was extremely valuable to the review. A health economist was also sought to give a broader sector base to the panel, but none of those identified was able to contribute at the time.

Terms of reference for the advisory panel were developed. There was no specific guidance available on this so Dr David Denyer of Cranfield University, an expert in systematic review, was consulted on the content of the terms in order to ensure that they reflected good practice. The final terms of reference are in Appendix D.

During the scoping study, likely keywords, search strings and databases were identified, and a process determined for the review that was likely to be most productive most quickly. This included testing the databases with some of the potential search strings. Output from the scoping test of the database is in Appendix D.

Stage 2: Conducting the review

The review framework

During this stage of a review, the list of keywords and search terms is finalised, together with the choice of databases and other locations where the search will be conducted.

With assistance from the review panel, the following list of places to search for possible methods was developed:

- 'Scholarly' journal articles
- Websites (using Google, Lycos and Yahoo)
- Books – references obtained from papers
- Conference papers
- Non-internet practitioner papers acquired through:
 - contacts from the advisory panel
 - New Mobility Forum
 - Disability-Research Forum
 - website searching
- Government sources acquired through:
 - contacts from the review panel
 - website searching
 - reference lists.

A list of 44 keywords combined into 10 search strings (Table 2) was constructed. This was submitted to the review panel.

1.	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic))
2.	(social AND (justice OR benefit OR inclusion)) OR (environmental AND (justice OR racism OR equity OR discrimination)) OR (interpersonal AND utility)
3.	cost AND (benefit OR utility OR consequences) AND analysis
4.	(evaluat*) AND ((project OR method OR criteri* OR economic OR socioeconomic))
5.	intangible OR non-financial OR qualitative OR non-monet*
6.	environmental AND (impact OR valuation)
7.	valuation AND intangible* AND ((corporate social responsibility OR CSR) OR equit* OR sustainability)
8.	internali* OR externali*
9.	(excluded OR minority) AND (groups OR populations)
10.	(disabled people) OR (people with AND (reduced mobility OR restricted mobility)) OR (mobility impairment)

Table 2: Systematic review: search strings

At this stage, inclusion criteria were formally established, and the output of the searches was compared to the criteria (Table 3).

Reasons for inclusion <i>The paper should:</i>		Justification
1.	Use, or describe the use of, a theoretical framework that might be applicable to the (e)valuation of disabled access in transport	Directly provides a 'mechanism' that could be transferred and tested

Reasons for inclusion <i>The paper should:</i>		Justification
2.	Apply a method that might be applicable to the (e)valuation of disabled access in transport e.g. incorporating concepts of equity into Q(uality)A(djusted)L(ife)Y(ears) model for economic evaluation of health care	Directly provides a 'mechanism' that could be transferred and tested
3.	Be transferable to a European environment e.g. a study on social capital as measured by memberships in agrarian syndicates in Bolivia will be <i>excluded</i>	Ensures that part of the 'context' can remain broadly stable
Reasons for exclusion <i>The paper should not:</i>		Justification
4.	Focus on costs, or on pricing, rather than on benefits e.g. measuring treatment costs at remaining hospitals when one local hospital is closed	The key issue for the review was the valuation of benefit – costs in relation to disabled access are more readily identifiable
5.	Address corporate issues such as brand value, marketing, the value of stocks, the value of IT investment, product development, or financial reporting e.g. a study on whether and how to place brands on the balance sheet	An assessment with the review panel of some of the initial results which included papers focusing on corporate issues indicated that they would not be a productive source of transferable frameworks or methods
6.	Address public or private taxation, or liability, or corporate or private insurance	Taxation issues follow an understanding of costs and benefits, which had not yet been established

Reasons for exclusion <i>The paper should not:</i>		Justification
7.	Focus on employment issues, rather than customer service e.g. a study on the value generated by the introduction of a crèche facility for staff	Disabled access to transport is essentially a service issue, and again an initial scan of results with the advisory panel indicated that these papers would be less useful
8.	Focus on 'pure' measurement, or correlation of one variable with another e.g. a study of whether traffic calming measures prevent road deaths	Most of the benefits of disabled access are currently not measured – hence the need for the review
9.	Be about regulation resulting from analysis of costs and benefits rather than the analysis itself e.g. whether 'perfect knowledge' of the market can be achieved in order to best internalise pollution cost	Regulatory issues would have to be considered based on the specific costs and benefits associated with disabled access to transport: those associated with other sectors are not relevant
10.	Be very specific to an issue, rather than elaborating on the method used or critiquing it e.g. WTP for hiking trips in the Cascade Mountain Range	These papers did not add to the understanding of 'mechanisms' or 'contexts': this was better addressed by those papers that examined or critiqued the methods
11.	Explain issues, but not use or propose frameworks or methods to address them e.g. expound importance of (and catalogue but do not evaluate) external benefits of hydroelectric power	Issues in disabled access to transport have been well described, but not quantified, and differ from issues in environment, health. etc.

Reasons for exclusion <i>The paper should not:</i>		Justification
12.	Fail to add to understanding about a topic or method e.g. yet another contingent valuation study that shed no new light on the design of or issues around such studies	The paper contributed nothing further to the debate

Table 3: Systematic review: inclusion and exclusion criteria

Searches were run on ‘citation and abstract’ in ABI ProQuest, and ‘title and abstract’ in EBSCO, the two main databases chosen for the search. Only title and abstract were used for the initial comparison.

Searches were limited to peer-reviewed articles only and, where the option was available, to 1995 or later. Evaluation, particularly in health and environment, had developed rapidly in the 1990s and 2000s, and earlier articles were likely to have been superseded. In addition, some of the scoping work had indicated that there were some excellent summaries of early work in articles from the late 1990s and early 2000s, which covered key issues.

Where the search produced 200 articles or fewer, the title of each article identified was checked against the selection criteria for likely relevance. The number 200 was chosen for this research as the upper limit for searches. Where more than 200 were produced, the search was limited by combining search strings to produce a more manageable number of results. Abstracts of all titles that appeared relevant were read and again compared to the selection criteria, and the full texts of those that met the criteria were downloaded or obtained using the interlibrary loan service.

Only material that appeared to meet the selection criteria was used as a basis for the review. The criteria were then applied to the full text of the articles that had been identified so far and, as a result, further articles were excluded. For those papers that met the selection criteria, the author developed a data extraction form to summarise the approach in the paper and the potential value of the framework, method or insights to disabled access in transport. The form is provided in Appendix D.

Quality criteria were then applied to the included material. There is some debate about the best approach to applying quality criteria within management research (Tranfield et al., 2003, p.216). In this review, the method or framework in the paper did not have to be rigorously tested – for example, the sample did not have to be

well-defined or faultlessly selected. What mattered was that the framework or method employed be clearly explained, valid and evidently transferable to disabled access in transport. The following criteria were agreed with the advisory panel:

- It (the method or issue) is clearly articulated (for the non-specialist).
- It is explained in enough detail to be applicable in a different context (e.g. transfer from environment to transport and disabled access).
- Rules about how decisions are made are clear.
- The way that elements within the method are combined is explicit and clear.
- It is clear how to apply the method, or how the issue relates, to disabled access in transport.
- It is clear how the method or issue could fit into a larger evaluation framework (such as DfT's Transport Analysis Guidance or TfL's Multi-Criteria Appraisal Framework).
- The method or issue builds on accepted research or methods.

Conscious of being new to the field and thus not familiar with 'accepted' research or methods, the author adopted two indicators for this last criterion: first, the nature of the journal, and secondly, that the article referenced one or more apparently recognised and respected authors. It is recognised that there might be greater margin for error in the application of this criterion.

The papers were scored against the criteria using 0 to 3 where:

- 0 - Does not meet the criterion at all
- 1 - Somewhat meets the criterion
- 2 - Meets the criterion fairly well
- 3 - Meets the criterion very well

To be included in the review process a paper had to average a score of 2 or more for each criterion. The results of applying the quality criteria to the papers included up to this stage are in Table 5. It is important to note that the objective of the review was to identify methods that could be transferred to disabled access in transport, so the 'how to' element needed to figure largely in the paper in question. Many papers are not written with this in mind, and tend to focus more on results, so 'failure' on the quality criteria makes no comment on the quality of the paper but only on its appropriateness for this review.

The review implementation

The search process began with ABI ProQuest and EBSCO. To make best use of the available time, the author undertook a further review of the scoping search for the remaining databases. Many of the results that Ingenta, Web of Science and Science Direct produced were repeats of what ABI and EBSCO had offered. Likewise, searching CAB produced a wide range of additional papers, but those that were relevant were again repeats. Given the small number of relevant papers in the scoping search and the likely repetition, searching CSA (ERIC, LISA, PsychInfo, Social Science Abstracts and Sociological Abstracts) was considered unnecessary. From the searches of ABI and EBSCO, 105 papers passed the initial selection scan of titles and abstracts.

All back issues of the web-based transport journal *World Transport Policy and Practice* were reviewed and this produced 7 possible papers, none of which met the criteria on closer study. Leeds Disability Studies Archive produced 2 papers that initially met the selection criteria; both were excluded on further study, although one, Salvage and Zarb (1995), proved useful as background. Incidentally, this paper was an indication of how little the field has moved on in the past ten years – it was part of an unfinished research project about which no further information is available.

In order to identify practitioner papers, requests were made on both the Leeds Disability Research discussion list and the New Mobility discussion list for any material addressing disabled access in appraisal or evaluation frameworks. Disappointingly, no one responded. A request to the University Transport Studies Group discussion list was more productive, with 4 resources resulting from the suggestions received. Of these, 2 were included in the review: Kim and Min (2004) and DeCorla Souza et al. (1997).

The Department for Transport website was reviewed, and this provided WebTAG (Transport Appraisal Guidance: UK Department for Transport, 2007) – a fully worked-up framework for appraisal. WebTAG units 2.5 and 2.7.1, covering the Appraisal Process overall and the relationship to HM Treasury *Green Book* (HM Treasury, 2003) guidance respectively, were used as they were the most relevant units on the website, and they passed the initial selection criteria. Transport for London's website provided some worked examples of appraisals for projects. These examples were useful as background.

There were 13 references directly identified that were also followed up, including 2 books and 1 book chapter. These produced 5 papers for inclusion in the review.

Searches were run in Google Scholar using 3 different search strings: 'disability and transport'; '(intangible OR non-monetary) AND economic evaluation'; and 'cost benefit of accessible transport'. These strings were narrowed to: "'cost benefit" "accessible transport"; and "'economic evaluation" "accessible transport"' and the results checked until no new relevant material was identified. In total, Google Scholar searches resulted in 12 possible papers.

Searches were run in Google, Lycos and Yahoo using the single search string '(intangible OR non-monetary OR non-market) AND economic evaluation'. The search was limited to post-1995 to mirror the journal article criteria. The first 50 results from each search engine were scanned. By the fiftieth result, there was considerable repetition and no new relevant material was forthcoming. These searches resulted in a further 14 resources.

Lastly, prior to the formal start of the review a search had been run on the database in the King's Fund Centre library, using the search string 'valu\$ and benefit\$', and the first 200 items checked. This produced 2 papers (Coast, 2004; Hanley et al., 2003) for incorporation into the review process.

In total, therefore, 161 resources were identified through the initial selection process. Following closer study of the identified resources, a further 125 did not fully meet the selection criteria. A table of the resources that were excluded at this stage, with the reason for exclusion (using the numbers from the selection criteria list above), is given in Appendix D.

Table 4 shows the sources and the numbers of resources identified from each.

Source	Strings	Results checked	Resources identified	Resources after filtering
ABI	Main search strings	200 or fewer	63	14
EBSCO	Main search strings	200 or fewer	42	11
Google Scholar	4 alternative search strings	First 100 or fewer	12	0
Google	} 1 alternative search string	First 50	7	1
Lycos			6	0
Yahoo			1	0
WTPP	N/A – full scan	All	7	0
Other web	N/A – full scan	All	4	1
References	N/A	N/A	13	5
Practitioner requests	N/A	N/A	4	2
Kings Fund	1 alternative search string	First 200	2	2
Total resources identified			161	
Total resources included in review pre-quality check				36

Table 4: Systematic review: sources, with number of resources identified

The data extraction form used for the included resources is set out in Appendix D.

Table 5 shows how applying the quality criteria affected the papers that passed the initial selection test. Of the quality criteria, numbers 4 to 6 did not always apply. For example, all seven criteria apply to Alonso (2002), but criterion 6 does not apply to

DeCorla-Souza et al. (1997) because it *is* the framework, and criteria 4 to 6 do not apply to Hanley et al. (2001) as it does not apply the method discussed – it is essentially a theoretical discussion.

Stage 3: Reporting and dissemination

In this stage of the review, findings are assembled, synthesised and analysed.

As a preliminary analysis, the source of the papers, whether they were empirical or theoretical, and their context (e.g. health or environment) were considered. They were then analysed by content – looking at the underlying economic framework and the method that they used, and synthesising the lessons that their authors drew from their research.

A full analysis of the included papers that met the quality criteria is in section 6.2. Consideration of how the methods identified in the review can be used to value disabled access in transport project appraisal is in section 6.3.

Author	Year	The method or issue is clearly articulated (for the non-specialist)	It is explained in enough detail to apply in a different context e.g. transport/disabled access	Rules about how decisions are made are clear	The way that elements within the method are combined is clear and explicit	It is clear how to apply the method or how the issue relates to transport/disabled access	It is clear how the method/issue could fit into a larger evaluation framework	It builds on accepted research or approaches	Result
Alonso	2002	3	3	2	3	2	2	1	IN
Alvarez-Farizo & Hanley	2002	2	3	2	3	2	3	2	IN
Beckman et al.	2002	3	2	3	N/A	N/A	N/A	2	IN
Brouwer	2000	3	3	2	N/A	N/A	N/A	2	IN
Chilton & Hutchinson	1999	3	3	3	N/A	3	N/A	2	IN
Clark et al.	2000	3	3	2	N/A	3	N/A	3	IN
Clinch & Murphy	2001	3	3	3	2	2	3	3	IN
Coast	2004	3	1	1	N/A	1	N/A	2	OUT
DeCorla-Souza et al.	1997	3	2	1	2	2	N/A	2	IN
Del Saz-Salazar & Garcia-Menendez	2001	2	2	2	2	2	2	2	IN

Author	Year	The method or issue is clearly articulated (for the non-specialist)	It is explained in enough detail to apply in a different context e.g. transport/disabled access	Rules about how decisions are made are clear	The way that elements within the method are combined is clear and explicit	It is clear how to apply the method or how the issue relates to transport/disabled access	It is clear how the method/issue could fit into a larger evaluation framework	It builds on accepted research or approaches	Result
Ding	2005	2	2	2	1	2	2	2	OUT
Dolan & Edlin	2002	1	2	1	N/A	0	N/A	3	OUT
Donaldson et al.	2002	2	2	1	N/A	N/A	N/A	3	IN
Fleischer & Felsenstein	2002	3	3	2	3	2	2	1	IN
Glaister	1999	3	3	3	2	1	N/A	1	IN
Hanley et al.	1998	2	3	3	3	2	3	3	IN
Hanley et al.	1998b	2	3	3	2	2	3	3	IN
Hanley et al.	2001	3	3	3	N/A	N/A	N/A	3	IN
Hanley et al.	2003	2	3	1	N/A	N/A	N/A	3	IN
Israeli	2002	1	2	2	3	2	2	1	OUT
Junankar & Liu	2003	2	1	2	2	2	3	3	IN
Kenkel	1997	2	2	1	N/A	N/A	N/A	3	IN

Author	Year	The method or issue is clearly articulated (for the non-specialist)	It is explained in enough detail to apply in a different context e.g. transport/disabled access	Rules about how decisions are made are clear	The way that elements within the method are combined is clear and explicit	It is clear how to apply the method or how the issue relates to transport/disabled access	It is clear how the method/issue could fit into a larger evaluation framework	It builds on accepted research or approaches	Result
Kijak & Moy	2004	2	2	1	2	1	1	2	OUT
Kim & Min	2004	1	1	2	2	1	2	2	OUT
Lopes & Flavell	1998	2	2	1	1	2	1	1	OUT
Mathieson	2001	3	3	3	2	2	2	2	IN
Mathieson	2004	3	2	2	1	2	2	2	IN
Mogas et al.	2005	3	2	2	2	2	2	2	IN
Powe & Bateman	2004	2	1	2	2	2	3	3	IN
Ratcliffe	2000	3	3	2	N/A	N/A	N/A	2	IN
Rendel Planning	1992	2	2	1	2	1	3	3	IN
Richardson	1999	3	3	3	N/A	N/A	N/A	2	IN
Svedsater	2003	3	3	3	2	3	3	2	IN

Author	Year	The method or issue is clearly articulated (for the non-specialist)	It is explained in enough detail to apply in a different context e.g. transport/disabled access	Rules about how decisions are made are clear	The way that elements within the method are combined is clear and explicit	It is clear how to apply the method or how the issue relates to transport/disabled access	It is clear how the method/issue could fit into a larger evaluation framework	It builds on accepted research or approaches	Result
UK DfT WebTAG 2.5/2.7.1	2004	2	1	1	0	1	N/A	3	OUT
Whitelaw & MacMullan	2002	3	2	2	2	1	2	1	OUT
Willis et al.	2002	2	3	2	2	1	3	2	IN

Table 5: Systematic review: results of application of quality criteria

3.3. Willingness-to-pay: the stated preference experiment

The research question specified the need to value disabled access in order to provide a more accurate value for money judgement in appraisal. Findings from the systematic literature review indicated that stated preference would be an effective way to monetise the benefits of disabled access, so an experiment was designed using stated preference in the form of discrete choice modelling. The findings from the experiment are outlined in section 7.3.

3.3.1. Why a stated preference discrete choice experiment?

Of the two main stated preference methods, contingent valuation and choice modelling, choice modelling is a less direct method than contingent valuation and so it is difficult for respondents to calculate the underlying price they opt for: it is therefore less open to manipulation by respondents. As it uses a combination of features (attributes) in each choice offered to respondents, choice modelling also provides a way to value different features of a change separately and a separate willingness-to-pay figure can be obtained for each of the features. In addition, Morrison et al. (2002) demonstrated that choice modelling is “most suitable for benefit transfer when the objective is the extrapolation of implicit prices” (p.170). That is, the willingness-to-pay values derived using choice modelling can be transferred from one context into another.

Of these various choice modelling methods, Hanley et al. (2001) argue that only choice experiments (also called discrete choice modelling), or under certain circumstances contingent ranking, provide welfare-consistent estimates of willingness-to-pay. In discrete choice modelling, respondents are offered a choice between a number of options, plus a ‘do nothing’ option (the status quo or, as in this research, ‘neither’). The ‘do nothing’ option needs to be included in order to ensure that the experiment is welfare-consistent (that is, consistent with random utility theory). In order to be able to maximise her or his utility in any given choice, a respondent has to be able to decline a change in her or his situation (Alpizar et al., 2001; Hanley et al., 2001) where the options presented would not increase her or his current utility. For this reason, the method chosen for this research was a discrete choice experiment.

3.3.2. Research question and approach

The research question for this piece of research was:

“Is it possible to use choice modelling methodology to derive a robust range of values (i.e. internally and externally validated) of willingness-to-pay for specific

features of disabled access at heavy-rail stations, disaggregated by specific groups defined within a Social Model of disability framework?"

Internal validation relates to the direction and magnitude of the utility coefficients derived, where the relative magnitude of the coefficients provides an indication of the validity of the underlying research assumptions (section 2.3.4).

"Comparing the expected sign to the actual sign and significance of the coefficient can be seen as a weak test of monotonicity." (Alpizar et al., 2001, p.97)

External validation relates to deriving values of time to provide comparison with the standard 'Value of Time' endorsed by the UK Department for Transport.

Accent, a market research company with expertise in stated preference techniques, was engaged to provide guidance on the design of the experiment and to undertake the fieldwork. As the author is a wheelchair user, taking the role of interviewer might have biased the responses by providing a visual cue which prompted an atypical response to the access methods.

The research process was guided by an advisory group with members drawn from Transport for London, the Department for Transport and Cranfield University. The members are listed in Appendix E.

3.3.3. Preliminary hypotheses

Barrier-free infrastructure provision assists not only disabled people but others who find the transport environment difficult to negotiate because, for example, they have heavy luggage, or small children.

The main research hypothesis was therefore that improved access at stations positively impacts willingness-to-pay (section 2.3.4) for rail travel. That is, where the access method is easier for disabled people, disabled people not the only people who are willing to pay. The order of preference was hypothesised to be:

'Stairs with lift' > 'Stairs with ramp' > 'Ramp only' > Stairs

A number of other hypotheses were proposed during the development of the research instrument which related to the level of impact particular socioeconomic characteristics would have on the level of willingness-to-pay. People expected to have higher willingness-to-pay values included:

- people who experience physical barriers, who may or may not be disabled
- people who have a long-term impairment (section 2.1.3)

- people who self-identify as disabled (section 2.1.3)
- men and women with children under 5 years of age
- women with children under 5 years of age
- those who (strongly) support the inclusion of disabled people in mainstream provision, such as mainstream public transport – that is, those with a high existence value (section 2.3.3) for accessible access methods.

In addition, given that impairment and increasing age are linked (section 1.2.2), it was considered reasonable to expect greater willingness-to-pay from respondents aged 55 and over.

3.3.4. Utility function

The utility function (section 2.3.4) for the choice experiment undertaken for this piece of research is:

$$U_{iq} = V_{iq} + \beta_{iq}$$

where V_{iq} expands to:

$$V_{iq} = \beta_{iq} \text{Journey Time} + \beta_{iq} \text{Journey Cost} + \beta_{iq} \text{Ramp} + \beta_{iq} \text{Ramp\&Stairs} + \beta_{iq} \text{Lift\&Stairs}$$

where β is the coefficient, or relative utility, of each attribute in that choice. 'Stairs only' was the base attribute against which the changes in utility were measured for the other attributes.

3.3.5. Developing the research

Hanley et al. (2001) list the following stages in a choice modelling exercise:

1. selection of attributes
2. assignment of (attribute) levels
3. choice of experimental design
4. construction of choice sets
5. measurement of preferences
6. estimation procedure.

Stages 5 and 6, measurement of preferences and estimation procedure, are addressed in 7.3.

Selection of attributes

The attributes for this stated preference experiment were platform-to-platform 'access method', 'Journey cost' and 'Journey time'. Platform-to-platform access method was the key attribute under scrutiny in the experiment – the intention was to determine willingness-to-pay for different methods of access. Many people – not just wheelchair users – find stairs difficult to use at some time or another and it is a relatively easy attribute to portray to respondents. It also represents a significant proportion of the cost of station access improvements (Maynard, 1999). 'Journey cost' was selected as the payment vehicle in order to determine willingness-to-pay. 'Journey time' was included in order to enable external validation of the results against the standard 'Value of Time' used by the Department for Transport.

Assignment of (attribute) levels

In any discrete choice experiment, the number of possible combinations of attributes and levels can result in a very large number of choices to be presented to respondents. In this experiment, three attributes, two with three and one with four levels were used. This produces $3 \times 3 \times 4 = 36$ possible choices. Although this is relatively few compared with some stated preference experiments, this would still be too many choices to present to respondents. Instead, a 'fractional factorial' design is employed in which a reduced set of choices is presented to respondents whilst maintaining an orthogonal experimental design – that is a design in which "each of the variables has zero correlation with any of the others" (Bateman et al., 2002, p.263).

The platform-to-platform 'access method' levels were set at:

- stairs
- ramp only
- stairs with ramp
- stairs with lift.

The levels accord with the current means of access from platform to platform available across the national UK rail network. Escalators are only used at larger National Rail stations, which tend to be step-free and very unlike the stations in the area of study, so they were not considered to be an important attribute to measure. An alternative step-free access method is a barrow crossing – a level crossing at a station not intended for public use, originally used for taking goods across the tracks. These are used at stations such as Wakefield Westgate and Leighton Buzzard, with staff assistance, for people who cannot use stairs. However, barrow crossings are being closed across the rail network, and new ones are unlikely to be introduced. A

lift is never available without stairs – thus the lift was presented as ‘Stairs with lift’. There is a significant difference between a ramp on its own and a ramp with an additional stair option – some people find long ramps difficult to walk up and down, and there is a time consideration for non-disabled people, as the travel distance is much greater. Nevertheless, at certain stations a long ramp on its own is the available option. In the experiment, a brief description of the salient features of the ramp and the lift were part of the script that interviewers read to respondents prior to the presentation of the stated preference choices. The choices included photographs of the four platform-to-platform access methods (see Appendix E).

The levels for ‘Journey cost’ and ‘Journey time’ were based on the real ticket price and journey time respectively for journeys into Euston from the chosen geographical area – South Kenton Station was chosen as the base. Three levels of ‘Journey cost’ and three levels of ‘Journey time’, including the current levels (£3.00 and 28 minutes respectively), were incorporated into the design. In the case of ‘Journey cost’, the current level was set as the lowest of the three, the others being £3.40 and £4.00. In the case of ‘Journey time’, the current level was set as the highest of the three, the others being 24 and 20 minutes.

Choice of experimental design

The attribute levels were combined in a fractional factorial design using ALogit software, a standard software package for designing and estimating stated preference experiments. Fractional factorial designs do not enable the testing of all combinations of attributes, and thus do not estimate all interactions of the different options, but it is possible to maintain an orthogonal design such that the influence of changes in any of the different attributes on the respondents’ choices can be identified and measured (Bateman et al., 2002, p.263).

For this research the number of choices in the orthogonal design was 9, from a total of 36 possible choices (see above).

Construction of choice sets

Once the specific options to be incorporated in the design had been determined using a fractional factorial process, the choice sets were put together. Again, ALogit was used to generate the choice sets. The more choice sets in total that can be presented to respondents, provided that potential respondent fatigue is taken into consideration, the richer the data that results. For this research, it was decided to present 10 choice sets to each respondent – that is, 10 combinations of two options A and B, each consisting of a journey time, a journey cost and an access method. A ‘neither’ option

– choose not to travel – was also offered as an alternative in each choice set to ensure welfare-consistency (section 3.3.1).

In total, 10 sequences of 10 choice sets were generated by ALogit and from these 6 sequences were selected by the author for the experiment. In selecting these 6 final sequences, consideration was given to the number of dominant choices in each choice set - that is, choice sets offered to participants where the method of platform-to-platform access was the same, and the journey time or cost were the same, or respectively shorter or cheaper, in one option as in the other. The sequences chosen contained the fewest choice sets with dominant choices. An example of one of the sequences of choice sets selected for the experiment is shown in Appendix E.

Research (e.g. Hensher et al., 2005) has shown that, with a large number of attributes, respondents sometimes focus only on some of the attributes in making their choice. With only three attributes, that was not considered to be an issue for this experiment.

3.3.6. The sample

Sample sizes and stratification

Bateman et al. (2002, p.107) highlight three considerations in relation to choosing the sample size for a stated preference experiment. These are:

1. The smallest subgroup within the sample for which estimates are needed.
2. The precision with which estimates are needed – how much sampling error can be tolerated.
3. How much variation there is in the target population with respect to the characteristic of interest.

They note that more information is gathered per respondent with a choice experiment than with contingent valuation, because several discrete responses are obtained from each respondent (e.g. 400 respondents making 10 choices each amounts to a total of 4000 observations), so smaller sample sizes are possible. However, they add the caveat that, because there may be a correlation between the different responses of an individual respondent,

“To the extent that such correlation occurs, it reduces the amount of *statistical information* in the data obtained from each subject and entails that obtaining 10 responses, say, from each of 100 subjects is *not* as informative as obtaining one response from each of 1,000 subjects” (p.111)

For this research, the sample size proposed was 400 respondents. This sample size represented a trade-off between the budget available for the fieldwork and the need for robust disaggregated coefficients, given the proposed stratification of the sample. The main stratification selected for the research was age range. A 25% quota for each age range ensured that there were at least 100 respondents in each segment. Accent advised that 75 would be acceptable as the number in any given stratum.

To use impairment as the stratification would perhaps have been more pertinent, but it would have required asking about impairment at recruitment stage (section 3.3.8). Impairment is a sensitive issue and asking about it 'on street' might have put many people off. However, age is a reasonable indicator of impairment – quoting the Labour Force statistics for 2005, the Employers' Forum on Disability web site says:

“33% of people in the UK aged 50–65 have a disability; 42% of people over 65 have a disability” (Employers Forum on Disability, 2007c)

This compares with approximately 15% of the population as a whole, indicating that the incidence of impairment increases with age. Hence age was selected as the stratification method.

Nature of the sample

The research addressed platform-to-platform access methods designed to accommodate disabled people. However, provision for disabled people also assists others who find the transport environment difficult to negotiate because, for example, they have heavy luggage, or small children. With limited exceptions such as tactile paving, providing access for disabled people always improves access for others (Rickert, 1999). The study therefore involved a broad sample of the population as it was anticipated that results would demonstrate consumer surplus across the sample, and this would be of greater benefit to transport practitioners than just a specific figure for disabled people.

Sample frame

The sample frame for the research was those living in the catchment area for the rail service between Euston and Watford Junction for which Transport for London will assume responsibility in autumn 2007 – the London Overground (Transport for London, 2007).

The Association of Train Operating Companies' map of step-free and staffed stations (ATOC, 2004), together with the *Greater London A–Z*, was used to identify the specific postcodes from which the sample should be drawn. The ATOC map shows

three 'accessible' stations (in this case, step-free) between Euston and Watford Junction: Willesden Junction, Harrow and Wealdstone, and Carpenders Park. However, the only one of these identified on the National Rail website as having staff assistance consistently available (an important aspect of access for disabled people) is Harrow and Wealdstone. Thus the postcode areas south of Harrow and Wealdstone and north of Euston were selected: HA0, HA9 and NW10. Selecting respondents in this area would tend to avoid those whose expectations have already been raised by the provision of good access.

Respondents were shown a map of the relevant postcode areas to assist them in identifying whether they lived in the appropriate area.

Quotas

Quotas were used in order to get a balance of male and female respondents, a spread of ages, as well as people who had and people who had not used rail services in the previous 5 years. This last group (those who had not used rail in the past 5 years) was considered important in order to increase the likelihood of including people who might not be able to use the rail network because of lack of access. Additionally a quota was used for 'journey purpose' – leisure or commuting – in order to fulfil the requirement to validate the results against DfT 'Value of Time' figures which differentiate between employer's business, commuting and leisure journeys. At the outset, it was considered that including respondents who were travelling on employers' business as their main journey purpose into Central London was not appropriate, as they would generally have their journey cost reimbursed. People who identified this as the reason for travel into Central London were therefore excluded from the experiment, as were people who received free or subsidised travel as part of their employment package.

3.3.7. Data collection

Method of data collection

Initially, data collection by telephone was considered, whereby respondents could be recruited by phone and a time would be set for the experiment to be conducted. The respondents would then be sent the materials by post prior to the chosen interview time. Following discussion with the advisory group, however, a face-to-face approach was selected instead. Face-to-face interviewing provides the fieldworker with a clearer indication of whether the respondent understands the questions in the experiment and allows the fieldworker to address any misunderstandings or problems when they arise – for example, is the respondent looking at the right choice set?

Selection of respondents

Given the decision to interview face-to-face and in order to achieve some economy of scale, the approach taken was a 'hall test'. Respondents were identified by fieldworkers 'on street' in the two areas in which the experiment was conducted and asked if they wanted to take part in the experiment. If they agreed, their eligibility was checked against a number of criteria including the quotas (section 3.3.8). They were then taken a short distance to the 'hall' – that is, the location where the interview was to be conducted.

Venues

Two venues were chosen that were located within the catchment area for the sample – a small hotel in Wembley and Willesden Green Library. The Wembley venue had been used for the pilot (see below) and had proved a very productive location for recruitment. It was important not to exclude automatically people who used wheelchairs or scooters from the experiment, so the venues had to be wheelchair-accessible. Avoiding venues such as pubs or churches, which might deter people from certain faith groups, was also seen as desirable. This limited the available venues, hence two were used rather than four as originally planned.

Presentation media

Laptops versus showcards

The research instrument was composed by Accent using its in-house software and administered using laptops. Respondents' preferences for screen or printed showcard for the stated preference experiment were checked out by the author during the pilot (section 3.3.9).

Photographs versus drawings

The different means of platform-to-platform access were shown by means of photographs. The relative merits of photographs versus drawings were discussed at an advisory group meeting, but no strong views were expressed. The decision to use photographs was taken on practical grounds – photographs were already available, whereas drawings would have had to be specially prepared (which would have increased the cost). One caveat, however, is that the nature of the access features in the photographs may have influenced people's responses (although perhaps the same is true of drawings). The photographs used are in Appendix E.

3.3.8. The research instrument

The research instrument was in two parts, one to identify suitable respondents on street, the 'Recruitment Questionnaire', and the second the 'Main Questionnaire'.

The recruitment questionnaire

A number of criteria were used to screen possible respondents *out* of the experiment because they did not fall within the parameters of the research. These were:

- The respondent did not live in one of the chosen postcode areas (section 3.3.6).
- The respondent had never made a journey into Central London (by whatever mode of travel – she or he had to be able to understand the concept of such a journey).
- The respondent's reason for travelling into Central London was solely or mainly her or his employer's business.
- The respondent received subsidised or free travel from her or his employer.
- The respondent was under 18.
- The respondent was not willing to take part.

In addition, a number of quotas had to be fulfilled to ensure the required spread of respondents, so further recruitment questions covered these issues:

- journey purpose – commuting or leisure;
- age;
- gender;
- whether the respondent had travelled by rail in the last 5 years.

An incentive (a £5 Boots token) was offered to those who agreed to take part. There is a possibility that this might have resulted in some bias within the sample, for example people on low incomes might have been more attracted to take part. However, some form of 'reward' is established practice in market research. In addition, the incentive was not ethically inappropriate. In a discussion of incentives in research using people ('human subjects research'), Grant and Sugarman (2004) consider the use of incentives in research in general. They conclude that provided the incentive does not constitute bribery or a threat and does not seek unduly to influence potential participants it is ethically legitimate (p.723).

The recruitment questionnaire in its final form is reproduced in Appendix E.

The main questionnaire

The main questionnaire consisted of the discrete choice experiment, a number of socioeconomic questions, and a set of questions to elicit the attitudes of the respondents towards access for disabled people.

The discrete choice experiment

The first set of questions posed to respondents was the discrete choice experiment itself. The attributes in the experiment were: 'Journey time', 'Journey cost' and the platform-to-platform access method. Respondents were offered 10 choice sets, one after the other, each having three options: 'A', 'B', or 'neither'. 'A' and 'B' were different combinations of a journey time, a journey cost, and an access method.

There were 6 different sequences of choice sets. This was in order to increase the number of choices presented in the entire experiment. An example sequence can be found in Appendix E.

Socioeconomic questions

Specific age ranges, ethnic origin and income bands offered to respondents were taken from previous Transport for London research. This was in order to accord as closely as possible with their existing data collection methods for later cross-comparison should they wish to undertake this.

Because the research was undertaken within a Social Model framework, and because three of the research hypotheses related to Oliver's three-fold definition (1996), the questions on disability were designed to identify disabled people in this way. Three questions satisfied this criterion:

- Did the respondent have an impairment?
- Did the respondent experience barriers in the external environment?
- Did the respondent self-define as disabled?

This approach diverged from Transport for London's current Individual Model approach to classifying disabled people. There was however the possibility of linking this research to previous research using 'impairment'. This is the closest to the concept in existing research of limiting long-term illness. It is also the closest to the Disability Discrimination Act definition of a long-term impairment having a substantial adverse effect on normal day-to-day activities. It is important to note, however, that there are some key differences between the Social Model use of 'impairment' and that in the Individual Model or Disability Discrimination Act definitions – the key one being

the causal implication in previous research – and therefore they are not precisely equivalent.

The design of the question about barriers was informed by Social Model research into the experiences of disabled people in London in relation to employment, housing and post-16 education for the Greater London Authority (Equal Ability et al., 2006). During the pilot, however, it became clear that the concept of barriers – so familiar to disabled people, especially in a politicised environment like London – was unfamiliar to the respondents and several reported being confused by those questions. In addressing this issue, it was important to ensure that the language truly reflected a Social Model approach. The word 'problems' was considered but, after consultation with disabled people, the word 'difficulties' was chosen because of the connotations of the word 'problem' such as 'I *am* a problem' or 'the problem is *mine because of* my impairment' (an Individual Model approach) as opposed to 'I *have* difficulty *with*' (a Social Model approach). In addition, the word 'problem' is often associated, for example in the rehabilitation literature, with the medicalisation of disability (Oliver, 1996), and it was felt that the word 'difficulty' would be a less medical word to use.

Attitudinal questions

Questions about respondents' attitudes were included in the survey to explore the possibility of a link between willingness-to-pay and existence value (section 2.3.3). The hypothesis was posited that respondents with a positive attitude towards the inclusion of disabled people in mainstream transport provision would have a higher willingness-to-pay value because they would place an existence value on the access feature.

A literature search was undertaken on attitudes towards disabled people using ABI ProQuest (an electronic research database). From the results, six statements were drawn up reflecting attitudes held about disabled people. The documents from which the statements were drawn are listed in Appendix E. Three statements were worded negatively and three positively to discourage respondents from agreeing or disagreeing with every statement regardless of content. Respondents were invited to agree or disagree with the statements on a five-stage scale.

Question ordering

The ordering of the questions was considered carefully in order to minimise the influence of any one question on respondents' answers to subsequent questions.

Because one of the research hypotheses was to explore the willingness-to-pay of people who find the rail environment difficult who may or not be disabled, a question

on barriers was asked first. Putting the question about barriers first ensured that people thought about them in relation to their own situation, rather than associating the barriers with 'having an impairment' or being 'disabled', with which they might not have wanted to identify. The barriers question was followed by the attitudinal questions, still placed before the question on the respondent's own impairment and self-identification as 'disabled' in order not to influence respondents unduly either in favour of or against disabled people.

As there was a quota for ages, age had to be established at recruitment stage. Questions about income and age can be sensitive, so possible responses were banded to reduce specificity and thus sensitivity. There were 36 refusals in the final sample of 411 to provide income data, but none for age, across respondents.

3.3.9. The pilot

Numbers and quotas

The pilot venue was a small hotel in Wembley (used later for half of the interviews). There were 35 respondents. The quotas for gender and age were met. The quota for commuting was not met (28% of the sample versus 40% required quota), and the approach to the fieldwork was changed in order to address this in the main experiment by running one session slightly later to catch the evening commuters. The quota for people who had not used rail in the past 5 years was also missed (8.6% of the sample versus 25% quota). As a result the original quota was reviewed: it was felt that it would be difficult to achieve. The national figure for rail usage is around 6% of the population (Economist, 2006), but in the area chosen this percentage was likely to be significantly higher – for example, 44% of London residents' trips to Central London in the morning peak are by train (Transport for London, 2006b). In addition, the purpose of the quota was to ensure that at least some people who might not be able to use or might be put off using rail because of the lack of access would be captured. A revised quota of 10% was considered to be adequate to achieve that.

Format of the research instrument

Following the administration of the questionnaire, each respondent was asked whether she or he preferred seeing the stated preference choices on screen or on showcards, an example of which was shown to them at the end of the interview. Over 70% preferred the screen version, so the decision was taken to undertake the main experiment using laptops.

Pilot results

The pilot showed good results from the stated preference experiment. Table 6 shows the coefficients obtained using ALogit, taking Stairs on their own as the basis for comparison. The coefficient of a variable is its value relative to a unit change in the value of the independent variable – in this case Stairs.

Variable	Coefficient	Significant (p<0.05)?
'Journey time'	-0.150	y
'Journey cost'	-0.0136	y
'Ramp only' versus stairs	0.336	n
'Stairs with ramp' versus stairs	0.526	y
'Stairs with lift' versus stairs	1.24	y

Table 6: Stated preference experiment: pilot results ($n = 35$)

As can be seen, the following criteria were satisfied by the pilot:

- 'Journey time' and 'Journey cost' had the expected sign and are significant (the significance level was set at 0.05)
- Platform access: 'Ramp only', 'Stairs with ramp' and 'Stairs with lift' (all versus Stairs) each had a positive coefficient that increased as the utility level increased given the underlying utility assumption of

'Stairs with lift' > 'Stairs with ramp' > 'Ramp only' > Stairs.

- The implied value of time was 11 p per minute i.e. £6.60 per hour. This compared with DfT 'Value of Time' of between £5.94 (Commuting) and £5.22 (Leisure), which was a little high but did not give cause for concern given the sample size.

On this basis, the decision was taken to proceed with the main experiment with no changes to the stated preference element of the experiment.

Issues identified

Of the respondents who attended the pilot, 11 were selected at random by the author and asked: whether they found the descriptions of the platform-to-platform

access methods useful, and whether they found the wording of the attitudinal questions easy to understand. Of these, 8 found the descriptions useful and only 2 said they were not useful (one was non-committal). In relation to the attitudinal questions, 9 found them easy to understand. However, 2 respondents found one of the questions challenging: specifically the term 'political correctness'. As this was also picked up by the interviewers during the debrief, the decision was taken to review the wording of that question. One respondent also found the final question about a civilised society challenging, so this too was simplified.

Additionally during the debrief some of the interviewers identified problems with the barriers questions. All interviewers also felt that the introductory screen text was too long, and suggested shortening it and/or breaking it up into smaller chunks.

Changes resulting from the pilot experience

As a result of the pilot, a number of changes were made for the main experiment. These were:

- The quota for non-rail use was reduced from 25% to 10%.
- The introductory text was reviewed and shortened and broken across three screens.
- The barriers question was modified to make it more understandable (Appendix E has the 'before-and-after' questions).
- Question 4 in the attitudinal questions was changed to remove reference to 'political correctness' and question 6 was simplified. The revised questions were tested on 7 people, 3 of whom speak English as a second language and one of whom has dyslexia – Appendix E has the 'before-and-after' questions.
- The interviewers' shifts were changed to ensure that the quota for commuters was met.

Analysis

Method of analysis

A software package called Biogeme (Bierlaire, 2003; see also Bierlaire, 2005) was used to estimate the utility coefficients using multinomial logit. The author had attended a course on discrete choice modelling at which she was introduced to the software by its author, Michel Bierlaire, and Moshe Ben-Akiva, a leading expert on discrete choice modelling. An example Biogeme model file is included at Appendix E.

'Neither' responses

Respondents were offered a 'neither' option in order to preserve welfare-consistency (section 3.3.1). However, selecting 'neither' provides no data for analysis (because with 'neither' no journey time, journey cost or access method are selected). There were 18 'neither' responses in total.

'Illogical' responses

For this research, a respondent's selection was deemed to be 'illogical' if she or he chose the non-dominant option (section 3.3.5). There were 7 such responses and they were removed from the data set prior to analysis. All of the 'illogical' responses were from different respondents, so none of these respondents was consistently choosing the non-dominant option despite there being more than one such option in two out of the three relevant choice sets. None of these choices included different platform-to-platform access methods, where the researcher's hypothesis about the relative utility of the access methods (section 3.3.3) might have prejudiced the decision about illogicality (Lancsar and Louviere, 2006).

The data from the market research company – and thus the pilot results – identified 'neither' as an illogical response. However, in the main analysis this approach was not taken. Where the respondent chose 'neither' the response was *not* removed, as choosing neither option is not an illogical response even where one travel option is 'obviously' better than the other – the respondent may consider that neither of them increases her or his current utility.

Deriving a willingness-to-pay figure

'Journey cost' was an attribute in the choice set and is a monetary value. Thus its coefficient could be used as denominator with the other coefficients estimated by the software as numerator, to derive a willingness-to-pay for the other attributes. So, the respondents' value of time was derived using the coefficient of 'Journey time', and the willingness-to-pay for the different platform-to-platform access methods derived using the coefficient of each method.

3.4. Linking the three methodologies

This chapter has described the methodology for each of the three independent pieces of research that contributed to the valuation work described in this thesis. For each piece of research, the reason why the particular methodology was chosen has been explained.

Section 2.4 describes the critical realist ontology underlying this thesis. A critical realist approach encompasses a range of methodologies and can incorporate qualitative or quantitative methods, straddling as it does the epistemological divide between the empirical (positivist) and social constructivist (interpretivist) approaches. Kazi (2003) says:

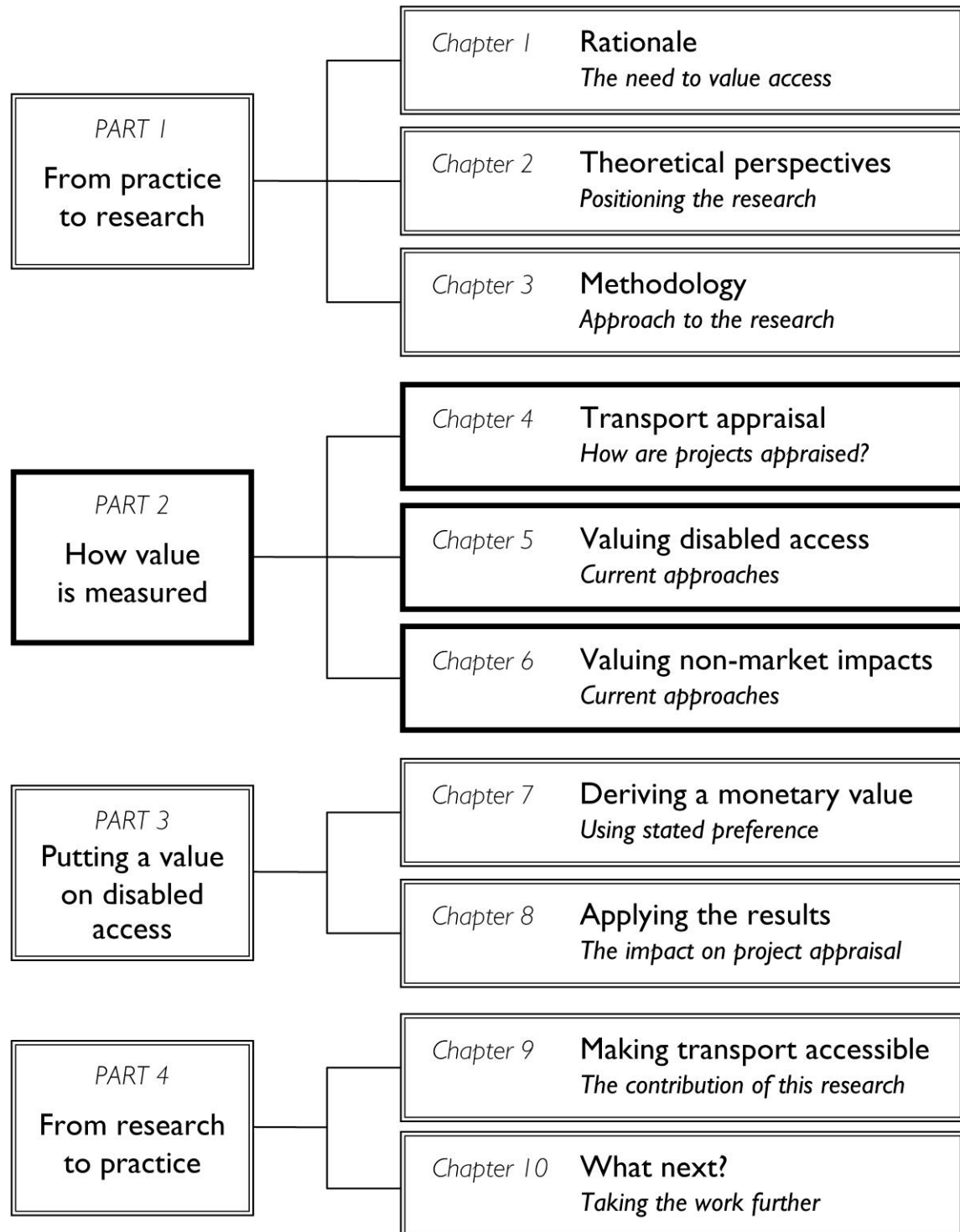
“realists tend to be in favour of a wide range of research methods, both qualitative and quantitative, and typically a wider range than that preferred by researchers of either the empirical or interpretivist persuasions” (p.31)

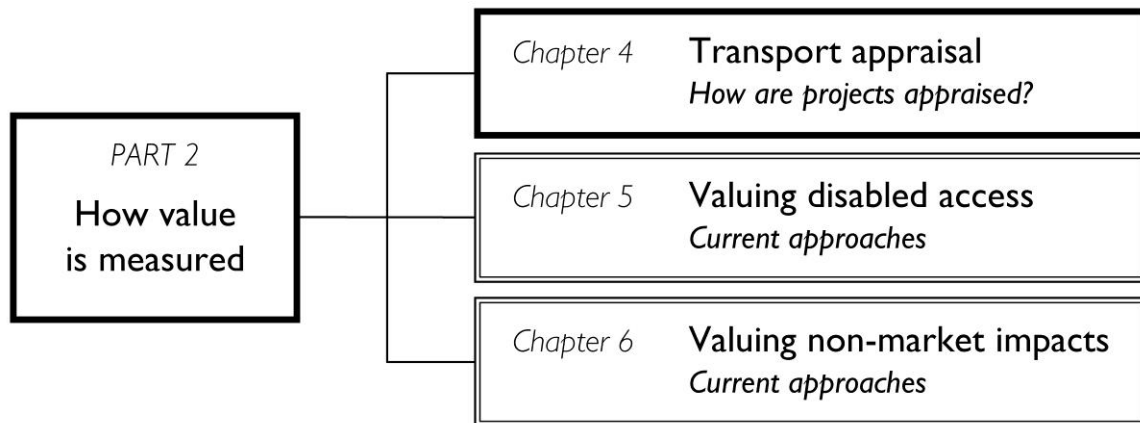
Danermark et al. (2002) remark on the importance of selecting methods that suit the particular phenomena being investigated:

“The basic methodological argument [...] is that the nature of the object of study determines what research methods are suitable and also what kind of knowledge it is at all possible to have of different phenomena in the world. [...] The possibilities for the social sciences to produce practically relevant knowledge is a question of having both our expectations of knowledge, as well our methods, adapted to the specific character of social phenomena” (p.41)

In the tram case study, the intention was to identify causal mechanisms, and thus a qualitative approach was taken (Kazi, 2003, p.32). The other methods – systematic literature review and discrete choice modelling – were established methods appropriate to the research questions. The systematic review was required to find evidence from the literature of methods of addressing non-market impact. The stated preference experiment was to derive a willingness-to-pay figure – the underlying value that respondents placed on the platform-to-platform methods of access with which they were presented ‘translated’ into monetary units (see section 2.3.4).

Part 2 – How value is measured





Chapter 4. **Transport appraisal**

This chapter explains how appraisal is undertaken, with particular reference to the UK WebTAG (the Department for Transport’s web-based transport appraisal guidance), the Department for Transport’s ‘Value for Money’ guidance and the Treasury’s guidance on valuing non-market benefits (to which the DfT guidance refers) are explained.

4.1. The need for appraisal

A fundamental expectation of neoclassical economic theory is that where the market functions ‘correctly’, the implementation of an improvement, such as the introduction of new products or services, will be efficient and will not require government intervention or regulation. Where the benefits of a project accrue predominantly in the *social* realm, however, or where there is a monopolistic tendency in the market – both of which are true of public transport – intervention is required. The rationale for government intervention may be economic efficiency or addressing an equity objective such as regeneration (Bhasin, 2003).

Once the government chooses to intervene, the question of resources arises. Resources for social projects, including transport, are limited, so those who make decisions on society’s behalf need to determine the best use of those resources. Resources spent on transport cannot be spent on health, for example, and resources spent on one transport project cannot be spent on another. In the transport sector, the main purpose of project appraisal is to help decision-makers decide between competing transport projects – that is, to ensure the ‘best use’ of resources.

One aspect of ‘best use’ is the economic cost of the project. Cost Benefit Analysis, described in section 2.3.2, is one way that has been developed to ensure that the

money spent on the project in hand would not be better spent in some other way (its 'opportunity cost'). However, the difficulties inherent in ascribing monetary values to some of the costs and benefits of transport projects has led to criticism of Cost Benefit Analysis and to the development of appraisal approaches that can address non-market impacts.

In transport, appraisal frameworks encapsulate the criteria that will be used to evaluate a particular option, the methods that will be applied in determining whether a project fulfils those criteria, and a number of technical specifications such as modelling techniques, discount rates, and the use of sensitivity analyses. The appraisal for a given project will outline the base case: that is, the 'do nothing' case – staying with the status quo. It will also outline the options which are to be compared against the base case.

The UK Department for Transport's Transport Appraisal Guidance gives the following steps for a transport project:

- "agreement on a set of objectives which the solution should seek to satisfy;
- analysis of present and future problems on, or relating to, the transport system;
- exploration of potential solutions for solving the problems and meeting the objectives;
- *appraisal of options*, seeking combinations which perform better as a whole than the sum of the individual components; and
- selection and phasing of the preferred solution, taking account of the views of the public and transport providers" (UK Department for Transport, 2007, Unit 1.1, emphasis added).

4.2. Transport appraisal in Europe

Grant-Muller et al. (2001) review the use of economic appraisal frameworks across Europe including the UK. They highlight three key points: that the appraisal frameworks used all involved a mixture of monetised impacts and impacts measured in both physical and qualitative terms; that practice differs across countries, although in general the environmental and socioeconomic impacts tend not to be monetised; and that there is considerable variation between the use of Cost Benefit Analysis and Multi-Criteria Analysis. However, most countries use Cost Benefit Analysis as the core of appraisal (p. 241).

They state that there is "a separation between the roles of the decision-maker (whether an individual or committee) and the analyst" (p. 243), since the decision-maker takes into account additional priorities such as political and cultural issues. However, they do acknowledge that, in practice, the distinction between analysts and

decision-makers may not be particularly clear, and the precise point at which analysis ceases and decision-making begins may vary from country to country.

Banister (1994) questions the influence of, in particular, Cost Benefit Analysis, and says “There seems to be a kind of inevitability about the outcomes of various decisions, and analysis may only be appropriate where it supports the preferred outcome”. This accords with Swedish research (Ljungberg, 2003) which shows that Cost Benefit Analysis, although advocated by the national Swedish transport authority, is only sporadically used by regional transport authorities: regional authorities are more inclined to consider the outcome that they want to achieve and to use Cost Benefit Analysis, if at all, to demonstrate that it is the best outcome.

That diverges from the experience of some transport professionals. Although the Transport Analysis Guidance advocated by DfT (UK Department for Transport, 2007) is essentially a multi-criteria approach (Glaister, 1999) with five criteria: environment, safety, economy, accessibility and integration (section 4.3.1). In practice, however, Cost Benefit Analysis remains an important element for large projects. For example, in an interview with the author (Maynard, 2004), the Strategy Director of one of the Public Transport Executives said:

“In terms of monetising benefits, that is more an issue for major schemes which cost more than £5m [...] So what tends to happen in such schemes is that in theory the government has five criteria all of which are important, in practice they tend to have to meet the cost benefit criteria on the monetised benefits, and then the other things which make it more or less desirable.”

This view was supported by the case study research into tram system appraisal (section 5.2).

Despite the existence of broader, not purely monetary, evaluation frameworks, use of evaluation techniques within the transport industry has tended to exclude external costs or benefits, and where these cannot be easily quantified their omission has been the norm. Litman (2003b) states:

“Some transport impacts have been widely studied and estimates of their magnitude are easily available. For example, standard methods exist to measure vehicle operation and travel time costs, so it is relatively easy to calculate the value to motorists of increasing road capacity and traffic speeds. Other impacts, such as changes in walking conditions or pollution emissions, are more difficult to quantify. If they are considered at all in transport economic studies, such impacts tend to be described as ‘intangibles,’ with the implication that they are less important than ‘tangible’ costs and benefits. The result is decision-making

biased in favor of easy-to-measure impacts at the expense of more difficult-to-measure impacts.” (p.1-1)

4.3. Transport appraisal in the UK

4.3.1. Framework in use

In the UK, appraisal has developed from the use of Cost Benefit Analysis alone to appraise road schemes, to a multi-criteria framework covering all forms of transport (Bhasin, 2003). The appraisal framework in use in the UK is essentially a multi-criteria framework. This is embodied in the Department for Transport’s ‘New Approach To Appraisal’ (NATA). This is variously referred to as the ‘New Approach To Appraisal’, the ‘New Approach to Appraisal’ and the New Approach to Transport Appraisal. WebTAG uses ‘New Approach To Appraisal’ which is the term used in this thesis, occasionally abbreviated to NATA.

In NATA five criteria are identified against which projects are to be assessed: ‘Environment’, ‘Safety’, ‘Economy’, ‘Accessibility’ and ‘Integration’. DfT provides a summary definition of these five objectives as follows:

- “environmental impact – to protect the built and natural environment;
- safety – to improve safety;
- economy – to support sustainable economic activity and get good value for money;
- accessibility – to improve access to facilities for those without a car and to reduce severance; and
- integration – to ensure that all decisions are taken in the context of the Government’s integrated transport policy” (UK Department for Transport, 2007, Unit 2.2).

It is not possible clearly to place disabled access under only one of these headings. It can be incorporated into either ‘Accessibility’ or ‘Integration’, or both, depending on the nature and the context of the improvement.

Following NATA, Transport for London applies the same five criteria, although it interprets them slightly differently (see below). South Yorkshire Passenger Transport Executive applies standard Cost Benefit Analysis followed by a ‘tick box’ approach covering accessibility, environment, integration and safety (Maynard, 2004).

The core approach to appraisal under the economy objective is Cost Benefit Analysis (UK Department for Transport, 2007). Unit 3.5.4 quotes the (UK) Treasury’s definition of Cost Benefit Analysis as:

“Analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, including items for which the market does not provide a satisfactory measure of economic value.” (paragraph 2.1.1)

In Cost Benefit Analysis, standard values can be used to value such things as time savings, using the ‘Value of Time’, and fatal accident reduction, using the ‘Value of a Statistical Life’.

The UK Department for Transport provides three standard ‘Values of Time’: working, commuting and ‘other’ (UK Department for Transport, 2007. Unit 3.5.6). The value of working time “applies only to journeys made in the course of work” – that is, during the working day – and is “the value as perceived by the employer” (Unit 3.5.6, p.2). The value of commuting time applies to time spent “travelling to and from the normal place of work”, and the value of ‘other’ time applies to “travel for other non-work purposes, for example leisure trips” (Unit 3.5.6, p.5). The values of commuting and ‘other’ time are used in this thesis to validate the results of the stated preference experiment (see Chapter 7).

‘Value of a Statistical Life’ can be estimated from a variety of different sources such as people’s behaviour in purchasing life-saving equipment like air-bags, or the payment of wage premiums for risky jobs (Boardman et al., 2001).

WebTAG Unit 3.5.4 states that Cost Benefit Analysis

“subsumes the accessibility impacts to the extent that the cost benefit analysis takes account of all significant behavioural responses” (paragraph 2.1.4).

It is not clear what ‘accessibility impacts’ are referred to here, but they are unlikely to account for disabled access (or the lack of it).

Non-market impacts

The Treasury’s *Green Book* refers to

“Wider social and environmental costs and benefits for which there is no market price” (HM Treasury, 2003, paragraph 5.12)

as ‘non-market impacts’. It stresses that they are

“a challenging but important element of appraisal [which] should be attempted wherever feasible” (Annex 2).

WebTAG (UK Department for Transport, 2007) requires consideration of non-market impacts. Unit 3.5.4 quotes the Treasury’s definition of Cost Benefit Analysis as:

“Analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, *including items for which the market does not provide a satisfactory measure of economic value.*” (paragraph 2.1.1, italics added)

The broader benefits of providing access for disabled people to the public transport environment are non-market impacts, and the DfT’s framework allows for the inclusion of such benefits. However, methods for assessing the benefits are not well developed.

WebTAG provides guidance on transport project analysis that will meet the Government’s objectives for transport in relation to the five areas: environment, safety, economy, accessibility, and integration. It explicitly states that the information summarised in the Appraisal Summary Table covering the five areas, completion of which is part of the appraisal process, is to be used to form a judgement about the value-for-money of the project. WebTAG follows the recommendations in HM Treasury’s *Green Book*, which recognises the need to take account of a range of impacts including social impacts. However, in Unit 2.7.1, Section 1.2 it notes that the *Green Book* recommends Cost Benefit Analysis and emphasises the need for monetary valuation. It states that the DfT “is committed to extending valuation to a wider range of the impacts of transport investment”. This will, it claims, bring “greater transparency to decision-making”.

Where impacts cannot be valued they must still be taken into account, and the Appraisal Summary Table (Unit 2.7.2) provides the mechanism to present all the impacts, whether monetised or not, to decision-makers so that they can form a judgement. Within the Appraisal Summary Table, disabled access is probably split across two of the five areas: ‘Accessibility’ (specifically access to the transport system) and ‘Integration’ (specifically other government policies). However, within ‘access to the transport system’, disabled access is not explicitly mentioned - the primary focus of this element is how readily any public transport user can gain access to the system. And within ‘other government policies’, again, no explicit mention is made of disabled access.

The problem with the term ‘accessibility’ stems in part from its traditional use amongst transport practitioners. As the authors of a report on social exclusion and transport for the UK Department for Transport point out:

“Conventionally, transport analysts have regarded accessibility purely in spatial terms, focusing principally on motorised movements within the transport system. However, it is clear that in order to capture the full range of issues associated with social exclusion, the concept of accessibility must be broadened

to include temporal, financial and *situational* factors and to include consideration of access to [sic – probably ‘within’] the transport system, as well as access within [sic – probably ‘to’] it.” (Centre for Transport Studies, Imperial College et al., 2006, p.22, emphasis added)

‘Situational factors’ will need to include aspects of physical access to the transport sector in order to address disabled access effectively. They recommend that:

“An additional access sub-objective [in the Appraisal Summary Table] is critical for analysing what may be socially excluded groups such as the disabled and elderly populations. This is the type of access *within* the transport system (as opposed to access *to* the system). This would include consideration of the physical constraints within the system that may face various individuals in actually using transport systems (e.g. availability of wheelchair access at transport interchanges). These considerations may overlap with the transport interchange sub-objective, but the latter generally deals with less detailed design issues.” (p.35)

WebTAG Unit 1.4 covers the appraisal of major schemes in local transport plans, but nowhere does it explicitly mention disabled access, not even to note as the Strategic Rail Authority’s Appraisal Criteria (2003) did that, following the White Paper, disabled access is a condition of public money being spent (UK Department for Transport, 2000, paragraph 6.5). Thus currently little or no guidance is provided to those undertaking transport project appraisals in the UK on how to deal with disabled access issues.

In May 2007 the UK Department for Transport proposed a reworking of the ‘New Approach To Appraisal’ (UK Department for Transport, 2007, What’s New?). One focus of the reworking is to

“[align] with DfT’s new objectives, including the Department’s social and accessibility objective”

It is to be hoped that this will tighten up the guidance on incorporating disabled access into the economic appraisal of transport projects.

Distributional impacts

Distributional impacts are the differential impacts that proposals have on individuals. Upton and Jones (2007) review the literature on assessing the distributional impacts of transport policy and projects. HM Treasury (2003, p.91) lists income, gender, ethnic group, age, geographical location and disability as characteristics of individuals for whom the differential impacts of proposals should be considered.

Much of the work on distributional impacts identified by Upton and Jones has been done in the US under the heading of environmental justice. It tends to focus on the geographic distribution of minority populations (mainly black and minority ethnic communities) around proposed transport interventions. This is similar to work now being undertaken in the UK under the heading Equality Impact Assessment (e.g. Crossrail, 2006). There are instances of higher than average numbers of disabled people (using the census definition of 'limiting long-term illness') in particular geographic areas – either living there or needing to travel to and from because of a facility located there. For example 24.5% of Durham's population has a limiting long-term illness, as opposed to 12.8% of Buckinghamshire's population (ONS, 2003). Stoke Mandeville Hospital houses the premier spinal injury unit in the country, so a significant number of wheelchair users as well as other disabled people travel to and from Stoke Mandeville. The figures derived in the stated preference experiment disaggregated by one or more of the socioeconomic categories of experience (barriers, impairment, or self-definition as disabled) could be used where the relevant proportion of the population is known.

Upton and Jones's review concludes, however, that:

“Although the U.K. government recognises the need to measure how the impacts of transportation projects are distributed amongst different social groups, current guidance is both vague and limited to measuring economic effects, the impacts upon groups that can be defined on a geographical basis or the impacts of road pricing. Official guidance also fails to provide any kind of framework for undertaking analysis to ensure that the most vulnerable groups and most relevant impacts are fully identified. It also fails to provide guidance on what is classified as unfair or inequitable and how researchers can measure the actual consequences of inequitable projects.” (p.39)

This thesis supports that conclusion. It is noteworthy that the WebTAG Unit (UK Department for Transport, 2007, Unit 3.8.3) covering distributional and equity analysis has not yet been developed. Furthermore, where the benefit:cost ratio incorporates neither the benefits of providing disabled access *nor the costs of not providing access* (e.g. to the public purse because of the increased need for 'special' provision), it does not reflect the true impact of the transport project.

'Value for Money' guidance

The UK Department for Transport provides guidance on assessing the value for money of a transport project (UK Department for Transport, 2005a). 'Value for money' as defined by DfT depends heavily on the benefit:cost ratio. Projects with a

benefit:cost ratio of less than 1.5 are highly unlikely to be funded, and only when a project has a benefit:cost ratio over 2 does it count as 'high value for money'. Theoretically, most projects with a benefit:cost ratio over 2 will be funded.

Where non-monetised impacts are "significant *relative to costs*" (UK Department for Transport, 2005a, original emphasis) they may change the value for money of a project. However,

"[H]ow much the non-monetised impacts affect value for money will always be to some extent a subjective assessment and is very dependent on the case being considered" (UK Department for Transport, 2005a, paragraph 19)

Rail appraisal

As there is specific guidance on the appraisal of rail projects, and the valuation of disabled access in this thesis relates to rail, it is appropriate here to consider the rail guidance.

Until February 2007, the appraisal criteria in effect in the rail environment were those developed by the Strategic Rail Authority. In these appraisal criteria, non-market impacts, including the benefits of disabled access improvements, were expected to be included.

"Where the equity effects of changes in accessibility are considered material, the SRA would expect the appraisal to indicate, as clearly as possible, the accessibility impacts for groups such as mobility impaired people" (p.38)

However, their own worked example belied this (Strategic Rail Authority, 2003, Annex 2 p.41ff). The improvements proposed in the example involve "an improvement to a single major interchange station", including "improving the range and quality of facilities on offer" covering real-time information and staff (p.49). Both of these have potential implications for disabled passengers, so although improvements to disabled access are not explicitly mentioned, they should be, since:

"accessibility for disabled people should be built into all new investment, and [...] this is a condition of public money being spent" (p.38).

It would be reasonable to expect improvements like this to be highlighted in an appraisal, but it is not mentioned explicitly in the Appraisal Summary Table (p.61) and is therefore in danger of being overlooked by practitioners using the guidance.

WebTAG Unit 3.13.1 was introduced in February 2007 and provides guidance on rail appraisal that covers all projects requiring £5 million or more of public money. The guidance requires non-market impacts to be monetised "where robust methods exist

to do so” (p.6). Sources cited by the guidance for monetising benefit include the *Passenger Demand Forecasting Handbook* (ATOC, 2005) and willingness-to-pay figures (including for ramps and lifts) derived from research by Steer Davies Gleave (2000), discussed below in section 5.1.3.

Rail projects requiring less than £5 million of public money are subject to separate guidance for the Network Rail Discretionary Fund (UK Department for Transport, 2006b). For projects requiring less than £1 million of public money, quantification but not monetisation is required for most indicators. For projects requiring between £1 million and £5 million of public money, monetisation is required for most of the benefits ‘where appropriate’. Willingness-to-pay figures for the appraisal process are the same as for larger rail projects. The ‘Value for Money’ criteria remain the same as for other appraisals (UK Department for Transport, 2005a).

The practical effects of ambiguity

Incorporating the costs but not the benefits of disabled access into economic appraisals has a potentially negative effect on investment decisions. In particular, a failure to monetise benefits biases the benefit:cost ratio towards the costs of the project. The benefit:cost ratio is a key decision factor in calculating value for money in Cost Benefit Analysis. This can lead to ambiguity in the approach of transport practitioners. Adler and Posner (1999, p.7) state that “for all their enthusiasm for CBA, it is not clear whether agencies use it properly”. DeCorla-Souza et al. (1997) noted that decision-makers rarely used Cost Benefit Analysis, for three reasons: they were unfamiliar and uncomfortable with the concept; they wanted to take non-monetised factors into account; and they wanted to preserve their flexibility to make their own decisions. On the other hand, Jacobs (1991) states that monetised impacts are more readily taken into account by decision-makers, and this is supported by Litman’s (2003b) comments in 4.2 above.

4.3.2. Two examples of appraisals

The place of disabled access in transport project economic appraisal in the UK will be explored in Chapter 5 in the review of the multiple-case study of tram system appraisal. However, two examples of appraisals highlight the apparent absence of disabled access in transport appraisal more generally. First, Greater Manchester Passenger Transport Executive’s appraisal of the Leigh Busway (Greater Manchester PTE, 2002), which follows the ‘New Approach To Appraisal’, includes an environmental impact assessment, and in the section covering ‘Other impacts and benefits of the scheme’ (p.75) it lists a range of impacts including social exclusion.

However, it only mentions disabled access briefly, in a summary table of the impacts of the Leigh Busway on the core transport objectives for Greater Manchester (p.82), and makes no attempt to disaggregate the benefits. This accords with the findings of Ravetz et al. (2004, p.594) in a review of evaluation practice:

“Current evaluation practice in Greater Manchester mainly uses checklists and univariate indicators [...]. Trade-offs and transfers between objectives were handled by discounted net present value, cost benefit analyses and economic multipliers, which have their roots in economic evaluation of roads. [...] The difficulties are compounded by the eclectic approach and opaque methods of evaluators.”

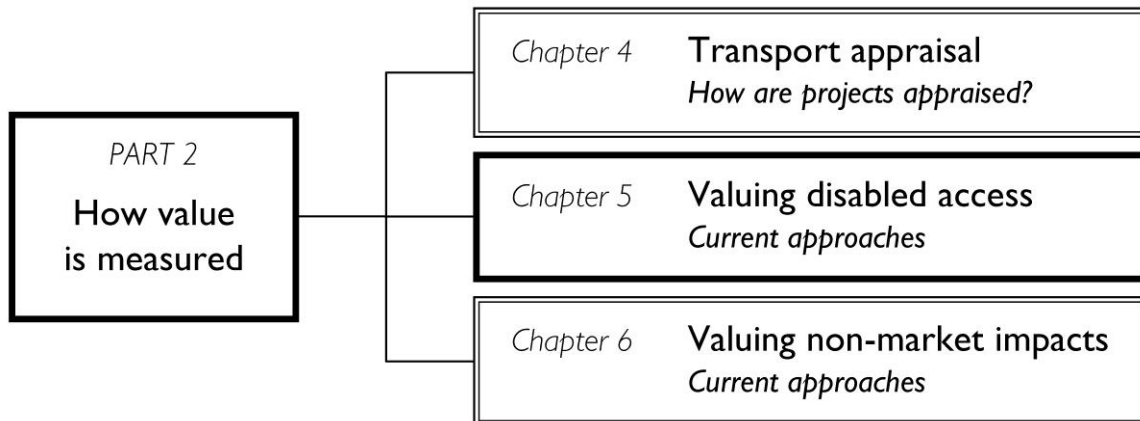
Secondly, Transport for London also uses the framework in the ‘New Approach To Appraisal’ as a basis for its own appraisal process, called Multi-Criteria Appraisal Framework. Its appraisal of the Cross River Transit proposals (Transport for London, 2000, p.20) outlines Multi-Criteria Appraisal Framework criteria and indicators in the table reproduced below.

Criteria	Sub-criteria	Indicators
Environmental impact	Natural environment	Noise, local air pollution, global emissions, energy and fuel consumption, land-take, townscape, ecology
Safety and security	Accidents and personal security	Public and private transport accidents, personal security
Economic	Costs, time savings and revenue	Capital and operating costs, public and private use, public and private journey times, revenue, cost benefit analysis
	Transport capacity	Capacity of corridor, crowding, frequency
Accessibility	Public transport accessibility	Pedestrian access to public transport, access to local centres

Criteria	Sub-criteria	Indicators
	Accessibility to other modes	Community severance, pedestrian space, parking and servicing access
Integration	Integration with other modes	Interface with other modes
	Accessibility impacts on regeneration and social inclusion	Access to development sites, access to deprived areas, access to employment
	Other local policies/plans	Local policies, tourism
	Regional economic impact	National/EU objectives

Table 7: Multi-criteria Appraisal Framework, Transport for London

Disabled access is not explicitly mentioned. Some of the benefits to disabled people themselves will be subsumed in some of the criteria and indicators – for example, access to employment or pedestrian access to public transport – but it is unlikely that *all* such benefits, or more importantly the benefits to society of increasing the mobility of disabled people, will be included. For instance, in relation to pedestrian access to public transport, an experienced professional in the disability field would automatically consider issues in the pedestrian environment for disabled people, whereas those with limited experience of disability might not be alert to issues such as poor positioning of bollards, which can cause collision hazards for visually impaired people, and might therefore fail to consider such issues.



Chapter 5. **Valuing disabled access**

This chapter discusses the literature on benefits of disabled access and how they can be valued, including the paucity of quantitative work. It describes findings of a multiple-case study into how ‘valuation’ of disabled access is done in practice at the moment for transport projects – specifically tram systems – within the context of the DfT guidance.

5.1. Disability and the valuation of transport benefits

5.1.1. Ineffectiveness of current measures

The specific problems of disabled people are widely understood. Many attempts have been made to address them – including legislation, campaigning and persuasion. The European Union has supported a number of COST actions (Co-Operation in the field of Scientific and Technical research) that have addressed problems disabled people experience in the transport environment, including buses, heavy-rail systems and long-distance coaches. The UK Disability Discrimination Act (1995 and the amending 2005 Act), the Americans with Disabilities Act 1990, the Irish Equal Status Act 2000–2004 and Disability Act 2005, and the Australian Disability Discrimination Act 2002 all contain provisions that apply to public transport.

Guidance on the implementation of disabled access measures proliferates. The UK, for example, has both Rail Vehicle Accessibility Regulations – which are explicit and stringent requirements on operators – and Guidance on those regulations. There is also a Code of Practice (originally developed by the Strategic Rail Authority, but now owned by DfT) that covers features of trains and stations (Strategic Rail Authority, 2002). The Irish National Disability Authority has developed guidance for transport

operators in relation to fulfilling their legal and social obligations (Koomneef et al., 2005). These attempts to effect change in the implementation of disabled access have been successful to an extent, but the extent of regulation raises concerns with operators on cost grounds. A comment by the Director, London Trams, highlights this. In the case study (section 5.2.3) he proposed that regulation is

“adding to the cost of providing accessible systems with potentially no additional benefit”

5.1.2. Identifying the benefits

When undertaking economic appraisal of public transport infrastructure improvements, it is fairly easy to identify the *costs* associated with access for disabled people – lifts, tactile paving, colour contrast, particular materials, and so forth – but the *benefits* are less easy to quantify. The benefits can include: increased employability, and thus reduced reliance on state benefit; increased ability to use goods facilities and services, and thus input into the local and national economy; and improved health through greater mobility, and thus reduced use of domiciliary and specialist services. These benefits have been described qualitatively in a number of places (e.g. Salvage and Zarb, 1995; Social Exclusion Unit, 2003; Heraty, 1989), but few attempts have been made to quantify them (e.g. Carter and Le Masurier, 2006) or monetise them (e.g. Fowkes et al., 1994).

Source of value

Following Fleischer and Felsenstein (2002), it is possible to identify three aspects to the value of benefits from disabled access to transport: government surplus, producer surplus and consumer surplus. In relation to disabled access, these can be considered as follows:

- *government surplus* is the benefit accruing to government that it does not (directly) pay for, such as the savings mentioned above to the public purse from reducing domiciliary visits by health professionals because disabled people are enabled to use accessible public transport to get to on-site appointments (Fowkes et al., 1994);
- *producer surplus* is the additional benefit generated for the private sector because disabled people are able to access services and spend money – and perhaps get jobs, thereby increasing their disposable income; and
- *consumer surplus* is the benefit derived by individual consumers that they do not actually pay for, such as improved quality of the station environment as a result of

the installation of lifts, which is not directly reflected in the ticket price but which does have an underlying value, the “willingness-to-pay”.

Combining these three forms of surplus with the notion of ‘total economic value’ (section 2.3.3), the value added by disabled access to public transport is shown in Figure 3.

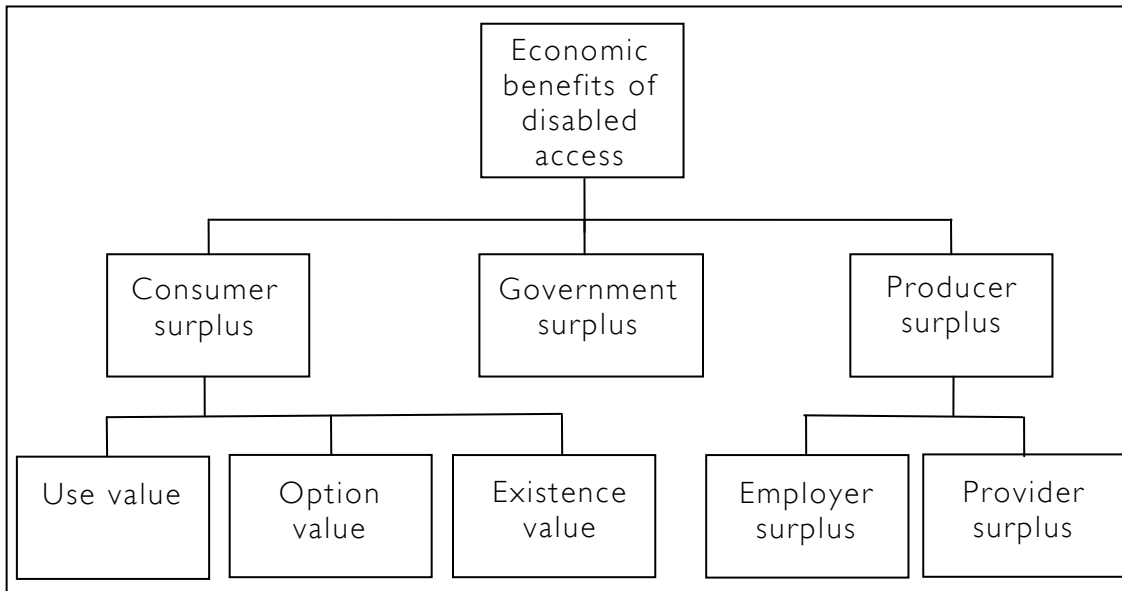


Figure 3: Valuing the benefits of disabled access

Table 8 (drawing on Heraty, 1989; Social Exclusion Unit, 2003) identifies some of the potential beneficiaries of providing access for disabled people to public transport, saying why they benefit, and classifies the beneficiaries as ‘government’, ‘consumer’ or ‘producer’.

Category	Beneficiary	Reason
Government	Treasury	Increased income from taxation (more disabled people paying employment taxes and purchasing goods subject to tax)
	Department for Work & Pensions	Reduction in Fares to Work (part of the Access to Work programme)
		Reduction in expenditure on benefit through increased employment of disabled people

Category	Beneficiary	Reason
Government	Local Authorities	Reduced expenditure on concessionary transport fares
		Reduced expenditure on community and education transport services
		Reduced expenditure on care support (e.g. for shopping, travelling)
	NHS	Reduced expenditure on patient transport services
		Reduced expenditure on domiciliary visits
		Reduced expenditure on poor health of disabled people resulting from lack of mobility
Consumer	Disabled person	Improved quality of life through greater independence and mobility
		Improved access to employment
		Reduced personal expenditure on other forms of transport (e.g. taxis, private car)
Producer	Service providers	Wider market leading to increased revenue through improved access to services (e.g. shops, leisure, health education)
	Employers	Wider employment 'talent' pool
	Employers & service providers	Less expenditure on responding to regulation 'forcing' accessibility
	Transport providers	Increase in revenue from fares

Table 8: Some of the benefits from transport with disabled access

5.1.3. Existing work on monetisation

Cross-sector benefits

The impact of disabled people's transport exclusion on society's 'bottom line' has been examined by Heraty (1989). In response to a resolution from the European Ministers of Transport that:

“wider socio-economic cross sector benefits for transport provision for disabled people should be taken into account by Member governments [...] and that, where appropriate, measures should be taken positively to identify these benefits” (p.95).

she outlines some of the ways in which benefits can be identified, classified, measured and evaluated. She distinguishes between direct benefits, including derived benefits, indirect benefits, benefits in the private sector (e.g. replacing a shopping trip undertaken by a carer with a shopping trip undertaken by the person themselves on transport with disabled access), and cross-sector benefits. Of cross-sector benefits she says:

“It seems likely that the cross sector benefits produced by transport systems for disabled people are relatively large. These are the economies achievable in sectors such as the health service, local authority social services and (in the UK) the Department of Health and Social Security, as a result of expenditure in the transport sector.” (p.100)

A project in the 1990s, led by the Policy Studies Institute and the Disability Studies Unit at Leeds University, and funded by ESRC, aimed, within a Social Model framework, to:

“produce effective and usable measures with which to monitor policies and initiatives designed to promote equal opportunities for disabled people.”
(Barnes and Oliver, 1995, p.3)

As part of this project, Salvage and Zarb (1995) reviewed the available literature on disabled people and transport and concluded:

“The vast bulk of available literature on disabled people and public transport focuses on the extent to which improvements on inadequate systems have been implemented.

Up-to-date information on the consumer view and the extent to which improvements have affected disabled people's travel patterns and quality of life appears to be in short supply.” (p.12)

However, despite an earlier section on the importance of cross-sector benefits, they do not mention the paucity of literature on the economic policy implications of disabled access to transport. It is possible that this was because a quantitative study by Fowkes et al. (1994) had just been published and presaged further such work.

Fowkes et al. (1994) addressed the cross-sector benefits of accessible public transport. They looked at a number of areas – domiciliary care, shopping and home care services, meals in the home, daycare centres, residential care, informal care, hospital outpatients, employment and social integration – and estimated what the savings would be if disabled people had access to suitable transport systems, whether on accessible public transport or specialist transport. Their estimate of overall savings for all these activities ranged from £256 million for the lowest estimate to £1.16 billion for the highest estimate. They emphasised that:

“The additional cost of bringing services to people are hidden in budgets for services other than public transport, particularly social services, health services and social security.” (p.1)

Since 1995, however, very little further work has been done on the cross-sector economic aspects. The Measuring Disablement in Society project has produced no further output on transport issues. Readers in disability studies (e.g. Barnes et al., 2002; Barnes et al., 1999) refer to transport issues but do not address the economic policy implications. A 2004 review of the application of the Social Model of disability in policy and practice (Barnes and Mercer, 2004) does not report any work on transport.

Revenue benefits

‘The Tyne and Wear assumption’

In the mid-1990s a study was undertaken by London Underground of the likely increase in passenger numbers were the infrastructure step-free (Reeder, 1996). It compared the proportion of people with an impairment using the Tyne and Wear Metro (a fully step-free underground network) with the proportion of impaired people on the London Underground. At that stage, the Jubilee Line Extension – the only part of the network totally step-free – had not been completed. Tyne and Wear Metro was found to have 8.4% passengers with ‘mobility impairments’ (these included disabled people and people with baby buggies or pushchairs), whilst London Underground had at the time only 4%. From this it is assumed that making the London Underground network fully accessible would generate an additional 4.4% of passengers with the associated revenue.

There are two potential problems with this approach. First, it relies on a fully accessible network, whereas infrastructure improvements are generally made piecemeal across a network and a business case needs to be made at each stage. Secondly, the survey fieldworkers only recorded people with visible mobility impairments. Many people with impairments who have difficulty with steps and stairs (for example, people with heart conditions) do not necessarily appear disabled. Essentially, this approach is a rather blunt instrument, but perhaps better than not estimating benefit for impaired people at all.

Consumer surplus

Stated preference

Stated preference is an accepted way of monetising consumer surplus. A more detailed explanation of stated preference and the two techniques mentioned below, choice modelling and contingent valuation, can be found in section 6.2.4.

Choice modelling

Stated preference surveys in the transport industry often address a wide range of transport features, and it can be difficult to extract disabled access features from the broader survey results. An example of this is the Steer Davies Gleave report for London Buses, which looked at proposed improvements to bus routes in the London area as part of the London Bus Initiative Programme (Steer Davies Gleave, 2001). Low-floor buses were included in this as one of a package of measures that included such things as improved timetables and driver training, making it impossible to separate out willingness-to-pay for low-floor buses *per se*.

Two exceptions to this were found during the research. The first of these is the Transport for London Business Case Development Manual (Transport for London, 2004) which incorporates in Appendix E willingness-to-pay figures derived from a major stated preference survey of Underground passengers in 1996. The figures include willingness-to-pay for 'step-free access in the origin station' at a maximum value of 0.649p and 'step-free access between the platform and train' at a maximum value of 0.646p, where the improvement takes the attribute from the worst to the best level – that is, from no step-free access at all, through step-free access to the ticket hall but no further, to step-free access throughout the station. These levels are determined by “positioning” using “other market reports, commissioning market surveys or using judgement and observation”. It is important to note that the survey was carried out with *existing* Underground passengers – indeed, the requirement from London Underground was that the sample should reflect the demographic of

existing customers – and that the values were averaged across the sample. As the Underground had very limited step-free access in 1996 – by July 2003 only 39 of the 253 London Underground stations had step-free access (Hansard, 2003) – the number of passengers using the Underground who experienced barriers in the physical environment (section 3.3.8) was likely to be quite low, and the consequent average willingness-to-pay figure also likely to be low.

A second exception is a study by Steer Davies Gleave for the Strategic Rail Authority (Steer Davies Gleave, 2000). This study does value specific aspects of station facilities that assist disabled access, namely providing ramps or providing lifts and escalators. The study was apparently not intended to value disabled access *per se*, however. It is not mentioned in the table in the SRA's Appraisal Criteria (2003, p.15), which cites 'Reduction of barriers e.g. disabled or encumbered passengers affected' but in the valuation column says 'N/A'. The study was not in the public domain when the research for this thesis was begun but is now referred to in the WebTAG unit that deals with rail appraisal (UK Department for Transport, 2007, Unit 3.13.1), which was released in February 2007 and is available on the Department for Transport's website.

Steer Davies Gleave surveyed a mix of South-East commuters: first-class Intercity travellers; second-class Intercity business travellers; and second-class Intercity 'other' travellers. 'Commuters' applies to people making journeys *to* work; 'business' applies to people making journeys *for* work purposes; and 'other' applies to people making journeys on personal business or for leisure purposes. The experiment valued 22 attributes in 5 'themes': station information; station security; station facilities; train condition; and train information. The theme 'station facilities' included 'movement around the station' for which the options were: "around 20 steps to reach platform or to cross track"; "ramps as alternatives to all steps"; and "lifts and escalators as alternatives to all steps". The unscaled values derived in the research were scaled using an estimated maximum willingness-to-pay to overcome the potential problem that, added up, the individual willingness-to-pay values for each improvement would amount to more than the respondents were willing to pay overall (section 6.2.4). The scaled willingness-to-pay values in pence thus derived (p.44) are as shown in Table 9.

Access improvement	South-East commuters	First-class Intercity	Second-class Intercity business	Second-class Intercity 'other'
Stairs → ramp	0.0	17.9	14.4	23.6
Stairs → lift and escalators	0.0	21.7	23.0	21.2

Table 9: Scaled willingness-to-pay figures (Steer Davies Gleave, 2000)

Chapter 7 discusses how these figures compare with the figures derived in the stated preference experiment that formed part of this research.

Contingent valuation

A recent study in Japan (Suzuki et al., 2007) used Contingent Valuation (section 2.3.3) to estimate willingness-to-pay amongst users of a rail station where disabled access had been improved during a rebuild following the Kobe earthquake. 62 respondents who had used the station prior to the earthquake answered the question about how much (of the fare) the improved disabled access was worth. Respondents were split into disabled people, older people and non-disabled people. Willingness-to-pay figures are shown in Table 10.

Respondents	Yen	Approximate £
All respondents	¥78.9	33p
Disabled people	¥86.6	36p
Older people	¥106.2	44p
Non-disabled people	¥61.8	26p

Table 10: Willingness-to-pay for whole station improvements (Suzuki et al., 2007)

Respondents were also asked about specific station features, ranging from lifts to information displays. It appears from the paper that respondents were not asked directly for their willingness-to-pay for each feature, but were asked about the relative importance to them of each feature. Weights were then assigned to each feature based on its relative importance and the total willingness-to-pay figure was disaggregated accordingly. Willingness-to-pay for lifts is provided in Table 11.

Respondents	Yen	Approximate £
Disabled people	¥31.7	13p
Older people	¥27.6	11p
Non-disabled people	¥13.8	6p

Table 11: Willingness-to-pay for lifts (Suzuki et al., 2007)

Chapter 7 discusses how these figures compare with the figures derived in the stated preference experiment that formed part of this research.

Generalised cost

Generalised cost is a way of expressing the ‘cost’ of a journey in either time or monetary units. Monetisation is achieved using the DfT’s standard ‘Value of Time’. Different aspects of the journey (e.g. getting to the transport access point, waiting time and in-vehicle time) are weighted. These weightings are derived using stated or revealed preference experiments (section 2.3.3) and the weighted values are added to the fare to establish the total ‘cost’ of the journey to an average passenger (Harris, 1991, p.11).

The Passenger Demand Forecasting Handbook (ATOC, 2005) uses a generalised cost approach when valuing improvements to service quality and accessibility (Chapters B5 and B6). The figures are derived using stated preference. Chapter B5 refers to “the mobility-impaired, who have higher levels of need for accessibility [*sic*, probably: disabled access]”. Even so, step-free access is not mentioned as one of the station facilities. In Table B5.3, values *are* given for some facilities that are relevant to disabled access such as additional staff, better lighting and ‘plenty of seats’ on the platform, but the accompanying text does not refer to disabled access in any way. Chapter B6, covering new services and access, only relates to accessibility in the sense of ‘ease of reaching’, not disabled access.

Generalised cost has also been used in the franchise bidding process to establish the business case for disabled access provision at particular stations (Smith, 2007).

In relation to disabled access, however, assumptions have to be made that the weightings used are applicable to the whole population. This may not be the case, particularly where revealed preference has been used to derive them. People who experience physical barriers may be excluded from the surveys by default because

they are prevented from using the environment in question and hence cannot be present in the sample.

5.1.4. Standard surveys for valuing benefit: potential bias

Standard survey work, such as the London Underground work above, may unwittingly exclude people for whom disabled access provides the greatest benefit. This will lead to inaccurate valuation of potential benefits.

In designing the stated preference experiment, a number of issues arose that revealed ways in which the systematic exclusion of certain groups of people could have taken place. There were also other aspects of the research that only provided an appropriate level of access 'by chance'. This suggests that results from standard surveys may be biased towards those who have less need for inclusive design solutions and the evidence for this is explored below.

Access to the venue

Physical access

The pilot took place in a small hotel not far from Wembley Station. Because the author was planning to attend the pilot, a wheelchair-accessible venue was required. The venue in which the pilot took place had claimed to be accessible, but in the event did not have a wheelchair-accessible toilet; fortunately the local Jobcentre was better equipped. When it came to the fieldwork proper, however, the author was asked whether the venue needed to be wheelchair-accessible because it is so difficult to find accessible venues. Bearing in mind that the intention of the research was to capture a reasonably representative sample of the population, the lack of wheelchair access at the venue would have automatically excluded people who use wheelchairs or scooters, and might therefore have excluded some disabled and older people. As a quota had been established for age, such exclusion might also have made it harder to achieve this quota.

Venue use

Another issue related to venue was the 'normal' use of the venue itself. Discussions about possible venues indicated the apparent suitability of both pubs and churches. However, both types of venue have the potential to be less acceptable to people from certain religious groups. Of the population in Brent (the Borough in which the research took place) that self-identifies as having a particular faith, more than 34% is from a faith group other than Christian (Brent Council, 2006). Alcohol is prohibited

in some religions, so a pub would be unacceptable; and some people from non-Christian religions would not be prepared to enter a Christian church. Consequently, the author had to specify that pubs and churches were not suitable venues for the hall tests. In the event, the hotel was used (the lack of a wheelchair-accessible toilet was not considered a problem as the survey instrument took at most 15 minutes to administer), as well as a public library.

Access to the survey instrument

Telephone survey

One possible approach to the fieldwork was to use a phone survey in which participants would be recruited and sent the survey materials prior to a pre-arranged phone interview. In discussion with the advisory group, however, it was decided to use a face-to-face approach. One of the arguments against a phone survey was the level of accessibility of printed materials. People with visual impairments who could not access the printed material might be excluded. Deaf people and those with hearing impairments who use text telephones, or who find telephone calls more difficult, would also be more likely to be excluded. It is possible that they would not even have been recruited in the first place, as one recruitment method for such a survey is by phone. People with learning difficulties were also likely to be excluded from such a survey, as they would be less likely to be contactable by phone, or to be able to access the printed material easily. On the other hand, an argument could be made for the greater *inclusion* of some disabled people such as those who find getting around the built environment difficult. As they would be less likely to be out and about on the Harrow Road, they would be less likely to be recruited for a face-to-face hall test. However, the author would contend that such people are also less likely to be able to use rail services at all, so that barriers in platform-to-platform access would be of less importance to them.

Screen versus showcard

Laptops were used to present the questionnaire to respondents. During the pilot, respondents' preferences for viewing the questionnaire on the screen rather than on paper using showcards were verified by showing them an example card at the end of the questionnaire and asking which they preferred. The showcard was originally designed with pictures to represent the journey cost and journey time, using pictures from the CHANGE picturebank designed to make printed material more accessible to people with learning difficulties (CHANGE, 2007). Pictures also assist people whose first language is not English. There was some concern that the pictures were

patronising to those who can access 'normal' formats, however, so the pictures were not used. A lack of such visual aids has the potential to exclude some respondents.

Access to the screen

In principle, using a screen-based questionnaire where the interviewer reads out what is on the screen is an inclusive approach. For people with hearing impairments, the potential barrier of not hearing the interviewer is removed by being able to read the questionnaire text for themselves. For people with visual impairments or specific learning difficulties such as dyslexia, the potential barrier of a screen-based interview is removed by hearing the interviewer read the text. The use of photographs for the stated preference choice sets could also be a barrier to people with visual impairments, but the access methods in the photographs were described to respondents prior to showing them the choice sets, so this barrier was alleviated if not removed altogether. The use of photographs would assist people with a wide variety of learning difficulties including dyslexia.

Initially, the size of text on the laptop screen was small (about 10 point). The size of font did not seem to have been a consideration in composing the laptop version of the questionnaire. Small font sizes exclude many people with visual impairments or learning difficulties, as well as older people whose sight may be deteriorating; therefore a larger font size was used for the questionnaire.

Questionnaire wording

The research used Oliver's (1996) three-fold definition of disability in classifying respondents.

“Following on from [the distinction between impairment and disability made by UPIAS], my definition of disabled people contains three elements; (i) the presence of an impairment; (ii) the experience of externally imposed restrictions; and (iii) self-identification as a disabled person.” (Oliver, 1996, p.5)

In the original survey draft, the following questions about disability were included:

Do you have any long-term physical impairment which limits your daily activities or the work you can do, including problems due to old age?

- Mobility impairment
- Age-related mobility difficulties
- Visual impairment
- Hearing impairment

- Serious long-term illness
- Other (Specify)
- (None)

Do you ever use a wheelchair when travelling around London?

These questions were taken from previous research for Transport for London. However, they clearly come from a medical model paradigm – note in particular the causality between impairment and the limitation on daily activities or work. There were two issues with this approach. First, it ran counter to the theoretical perspective from which this research was developed. Secondly, the impairment question in particular establishes an imbalance between interviewer and respondent. The limitation on “your daily activities or the work you can do” is substantially dependent on the facilities available to the individual (Abberley, 1992), whereas wording the question in this way places the onus for achieving specific tasks on the individual. To be asked a question in this way is rather like asking “When did you stop beating your wife?” – in order to answer the question one must first accept the underlying proposition.

Instead of these questions, the author provided the following:

What, if any, are the main difficulties you have using public transport?

1. Physical barriers (e.g. steps and stairs, lack of seating, too far to walk)
2. Barriers in accessing audible information (e.g. PA announcements, conversations, warning sounds)
3. Barriers in accessing visual information (e.g. train departure boards, timetable posters, numbers on buses)
4. Barriers in wayfinding (e.g. signage, directions)
5. Stressful situations (e.g. overcrowding, late changes of platform, disruption)
6. Other barriers (DESCRIBE)
7. None of the above / Not known (e.g. not a public transport user)

Do you have any long-term impairment, health or medical condition?

and

Are you a disabled person?

The impairment question used the terms ‘health or medical condition’ in addition to ‘impairment’ as some people do not understand the term ‘impairment’. There was a

small modification to the disability question for the final version of the survey instrument, so that it became:

Do you consider yourself to be a disabled person?

It was thought that respondents would find this a less challenging question than the original.

5.2. Appraisal in practice: findings from the tram case study

5.2.1. Background

Section 5.1 outlined current approaches to valuing the benefits of disabled access in appraisal in the UK. Section 5.2 explores actual practice, as it relates to the appraisal of tram systems. Three tram systems were investigated in a multiple-case study: Nottingham Express Transit (NET), West London Tram and Sheffield Supertram.

The research examined how the costs and benefits of disabled access had been taken into account and incorporated into economic appraisal by practitioners. A new institutional theory perspective was taken to investigate whether external forces – the isomorphic forces of DiMaggio and Powell (1991) – had affected the way the project appraisals were undertaken. The research focused on tram (light rail) systems: an older system in Sheffield, conceived in the mid-1980s with the initial section opening in 1994; a newer system in Nottingham, conceived in 1989/90 and opened in 2004; and a system conceived in the late 1990s, and revived by the Mayor in 2004 but not yet built, in West London. The research posited a number of propositions that reflected the theoretical perspective and informed data gathering and analysis. The propositions were:

1. Disabled access is largely unaccounted for in the economic appraisal of tram systems.
2. Where disabled access is taken into account, greater emphasis is placed on the costs than on the benefits.
3. Greater weight is given to disabled access during construction than would logically be assumed from the (lack of) weight given in the economic appraisal process.
4. Pressure from disabled people's organisations and other pressure groups has increased the weight given to disabled access at all stages of tram system construction, including planning.

5. Additional legislation has increased the weight given to disabled access at all stages of tram system construction, including planning.
6. The movement of professionals from one tram system development project to another has created similarities in treatment of disabled access between subsequent projects.
7. Organisations developing tram systems rely heavily on the past experience of tram systems and other transport projects to shape their approach, learning from both the successes and the failures of those projects.

The methodology, including the rationale for the propositions, is described in more detail in 3.1. As an already built but fairly recent tram system, the Nottingham scheme, NET, was taken as the core case in this study. West London and Sheffield were used as comparators for Nottingham.

The results show the way in which “institutionalization tends to reduce variety, operating across organizations to override diversity in local environments” (DiMaggio and Powell, 1991, p.14) – in some ways the approach to disabled access in the economic appraisal of the systems studied was similar across the three, over and above what might be expected from the use of common frameworks – and the research explored the reasons why. In this exploration, the concept of isomorphic forces – coercive, mimetic and normative – was used in the analysis of the case study data.

5.2.2. The context

In order to be able to identify the influence of the three isomorphic forces on the tram projects, it is important to understand the context in which the projects were developed. This section explores the context in relation to disability policy and transport policy in the UK during the planning and implementation of the three projects.

The disability context

This section addresses questions in the Case Study Protocol about policy and about the environment in which the projects were developed, as these relate to disability. These questions and their relationship to the seven propositions in the research are in Table 12.

Question	Relationship to propositions
What legislation and regulations were in force at the time the project was planned?	This provides evidence for proposition 5, relating to pressure from legislation.
What was government policy on access for disabled people?	This provides evidence for proposition 3, relating to weight given during construction, and 4, relating to stakeholder pressure.
What was the view in the disabled people's movement, and in disabled people's organisations, about access to transport, and were they agitating for greater inclusion?	This provides evidence for proposition 4, relating to stakeholder pressure.
Were any of the mainstream transport pressure groups or statutory advisory groups agitating for improved disabled access at the time of planning?	This provides evidence for proposition 4, relating to stakeholder pressure.

Table 12: Case study: questions about the disability context

1981 was the International Year for/of Disabled People (the name was changed part way through, following pressure from disabled people). Despite the perception among politicised disabled people that the Year was essentially the brainchild of non-disabled people and perpetuated their power over disabled people (UPIAS, 1983), during the two decades that followed, disabled people's organisations – including the British Council of (Organisations of) Disabled People, established in 1981 – gained strength and influence (Elder-Woodward, 2000). By the late 1980s and early 1990s, there was a substantial movement of disabled people, and they were beginning to have an impact on the development of legislation. VOADL (Voluntary Organisations for Anti-Discrimination Legislation) was a coalition of disabled people's organisations set up in 1985 to press for anti-discrimination legislation.

Early in the 1980s, a group was established within the DfT to provide advice and guidance on disability issues. This group was formally constituted as DPTAC (the Disabled Persons Transport Advisory Committee) in the 1985 Transport Act (Frye, 2005). On the less formal side, in the early 1990s the Campaign for Accessible

Transport (later DAN, the Direct Action Network) was active in campaigning for accessible transport, with some notable actions that included disabled people lying in the road in front of buses and chaining themselves to trains.

In the late 1980s and early 1990s no legislation existed to protect disabled people against discrimination. Despite a (Labour) Government-commissioned report from the Commission on Restrictions Against Disabled People (CORAD, 1982) which found widespread discrimination against disabled people, the succeeding Conservative Government, during whose tenure CORAD reported, did not agree with the findings of the report. Legislation that did exist, such as the Chronically Sick and Disabled Persons Act 1970, was about social obligations to provide for disabled people: it was not anti-discrimination legislation. Fifteen attempts were made to introduce anti-discrimination legislation through private members' bills during the 1980s and 1990s, without success. It became increasingly apparent that the issue was not going to go away, however, and the Government introduced its own Bill in 1994, which became the Disability Discrimination Act (DDA) in 1995.

The DDA was originally going to omit transport completely, but as a result of pressure from disabled people's organisations it was included, though as a 'special' case. Part III, which offers protection from discrimination in the provision of goods, facilities and services, covered transport infrastructure only. Means of transport was specifically excluded from Part III and included in Part V. The DDA was, in consequence, dubbed 'the train spotters' charter' by some disabled people (Hurst, 2006). Powers were given to the Secretary of State in Part V (Transport) to make regulations for the various different means of transport, and in 1998 the Rail Vehicle Accessibility Regulations (RVAR) were laid before Parliament. All new rail vehicles – including light rail (trams) – had to comply with these Regulations from 1 January 1999. This left some anomalies, one of which was subsequently addressed in the Disability Discrimination Act 2005 – that of protection from discrimination in the provision of service when on vehicles complying with the RVAR.

Also in the Disability Discrimination Act 2005, a duty was placed on public bodies to promote disability equality. This has the effect of requiring public bodies to examine what they do to ensure that their activities increase disabled people's equality and do not discriminate against disabled people. All three bodies involved in the case study are affected by the duty, which also impacts directly on the development of the West London tram system.

It is worth noting that the enforcement mechanisms for the two elements of transport covered by the Disability Discrimination Act – infrastructure and vehicles – are different. Under Part III, a disabled individual who wishes to pursue a discrimination

complaint must take a service provider to Court, whereas it was originally a criminal offence to breach the Rail Vehicle Accessibility Regulations. That changed as a result of the Disability Discrimination Act 2005, but an individual disabled person still cannot address breaches of the Regulations – that is up to the Department for Transport.

The Nottingham and Sheffield schemes were developed against this background of social pressure to implement anti-discrimination legislation. Both were developed whilst the disabled people’s movement was strong and growing and in particular, whilst the Nottingham scheme was being developed, the Disability Discrimination Act first appeared on the horizon and later reached the statute books.

More recently, disabled people’s organisations have experienced difficulties, in part with lack of funding, but in part through conflict within the organisation (Disability Now, 2005a). The development of West London tram has occurred against a background of increasing legislation and regulation, and an increasing understanding of how to address this, but also against a background of an increasingly fragmented disabled people’s movement. The problems being experienced hit the pan-London organisation GLAD (Greater London Action on Disability: Disability Now, 2005b) at the time the research was being undertaken. One of the interviewees from Nottingham mentioned the fragmentation of what used to be a coalition of disability groups in the city. In addition, DAN has now switched its key focus to residential accommodation rather than transport. It remains to be seen whether the stronger legislative framework will compensate for the decrease in co-ordinated social pressure.

The transport context

This section addresses the question in the Case Study Protocol about policy and the environment in which the projects were developed, as they relate to transport. This question, and its relationship to the seven propositions in the research, is shown in Table 13.

Question	Relationship to propositions
What legislation and regulations were in force at the time the project was planned?	This provides evidence for proposition 5, relating to pressure from legislation.

Table 13: Case study: question about the transport context

The transport background against which appraisals for Nottingham and Sheffield were undertaken was also changing. Public funding for transport projects was being

reduced and the concept of private finance initiatives (even if not called such) was being introduced by the government.

When the Sheffield and Nottingham schemes were begun, funding from government was through Section 56 of the Transport Act 1968. This required a Restricted Cost Benefit Analysis (RCBA) to be undertaken. The Restricted Cost Benefit Analysis was, as the name suggests, quite restrictive, in that user benefits could only be recaptured through the farebox – that is, directly through what people paid to travel. The key area where other benefits could be captured was ‘non-user benefits’. These were the cross-sector benefits of the system, which would recoup the funding provided through lower (government) spending on other areas. This directly impacted on Nottingham, as can be seen in section 5.2.3.

The process for introducing a new transport system was also more onerous at the time, and such systems generally had to be financed at the risk of the authority putting forward the scheme. Each scheme required its own Parliamentary Bill, which was usually a private member’s bill. Although funding in principle might be agreed prior to the Bill process, there were a great many opportunities for change during that process that might affect the scheme, and thus the funding. This was an issue for Sheffield, as can be seen in section 5.2.3.

In 1999, shortly before the Nottingham system was finalised, the (by now Labour) Government introduced the ‘New Approach To Appraisal’ (NATA). NATA reflected the Government’s five objectives for transport: economy, environment, safety, accessibility and integration. It included the Appraisal Summary Table in which both monetised and non-monetised impacts could be included. This was intended to enable decision-makers to weigh up the non-monetised impacts alongside monetised ones to form a judgement about the value for money of the scheme. NATA has since been developed into the Transport Appraisal Guidance (WebTAG), which is now available on the internet (UK Department for Transport, 2007).

Whereas the appraisal process was expanding and becoming more complex, the parliamentary process was becoming slightly simpler. Instead of a separate Act, an Order can be made under the Transport and Works Act 1992. However, government (financial) approval for the scheme must be obtained before the Transport and Works Act Order is applied for.

In addition, the government aims to fund tram schemes such as Nottingham using private finance. Section 56 funding is no longer available, and private companies – usually consortia and sometimes including the local authority – fund and run the schemes.

There is a drive to increase monetisation in appraisal, if only to include those monetary measures in the wider Appraisal Summary Table as opposed to the benefit:cost ratio itself. A Commission for Integrated Transport report (CfIT, 2004) advocated the extension of monetisation where possible, albeit not at the expense of paying attention to non-monetised impacts.

However, there is still a strong focus on the benefit:cost ratio. In the DfT's 'Value for Money' guidance (UK Department for Transport, 2005a), the question of whether a project offers value for money depends substantially on the benefit:cost ratio (section 4.3.1). For a tram system, the benefits side of the benefit:cost ratio calculation depends on calculations of time savings, safety improvements and farebox revenues.

Finally, there is a requirement to submit an environmental impact assessment when applying for a Transport and Works Act Order, which covers heritage and environmental issues. There is no such requirement in relation to disability or equality in general, although this may yet come about. Some projects, for example Crossrail, already undertake Equality Impact Assessments that include disability, and Crossrail's was included as part of the package that accompanied the Crossrail Bill on its entry into the parliamentary system, (even though it was not a requirement).

5.2.3. The three scheme appraisals: individual findings

Table 14 sets out the questions asked of individual cases in the study, with their relationship to the seven preliminary propositions. Section 5.2.3 addresses these questions for each of the cases in turn. The descriptions of the cases are organised into four themes: focus and drivers; accounting for disabled access; external influences; and post-implementation evaluation. The questions are classified into those four themes in the table.

Question	Relationship to propositions
Focus and drivers	
Did the project take account of disabled access at all?	This provides evidence for proposition 1, relating to the absence of disabled access in appraisal; and 3, relating to weight given during construction.

Question	Relationship to propositions
Accounting for disabled access	
What guidance was available to the project team and how was it used?	This provides evidence for proposition 3, relating to weight given during construction; 5, relating to pressure from legislation; and 7, relating to reliance on past experience.
Was account taken of both benefits and costs?	This provides evidence for proposition 2, relating to emphasis on costs.
What methods were used to calculate the costs?	This provides evidence for proposition 1, relating to the absence of disabled access in appraisal; and 2, relating to emphasis on costs.
Were (any of) the benefits quantified or monetised?	This provides evidence for proposition 1, relating to the absence of disabled access in appraisal; and 2, relating to emphasis on costs.
What methods were used to quantify or monetise the benefits?	This provides evidence for proposition 1, relating to the absence of disabled access in appraisal; and 2, relating to emphasis on costs.
External influences	
What role did legislation and regulation play in the account that was taken of disabled access?	This provides evidence for proposition 5, relating to pressure from legislation.
What role did experience with other tram systems play in the account that was taken of disabled access?	This provides evidence for proposition 7, relating to reliance on past experience.
What role did external stakeholders play in the account that was taken of disabled access?	This provides evidence for proposition 4, relating to stakeholder pressure.

Question	Relationship to propositions
Were groups of disabled people consulted in the planning, design or construction of the project, and if so, what impact did that consultation have on the process?	This provides evidence for proposition 3, relating to weight given during construction; and 4, relating to stakeholder pressure.
Post-implementation evaluation	
Was the approach to disabled access in the appraisal evaluated after the project was built (or peer-reviewed for the West London Tram)?	This provides evidence for proposition 1, relating to the absence of disabled access in appraisal.

Table 14: Case study: questions about individual cases

Nottingham

Focus and drivers

Although the key driver was concern about congestion, disabled access played quite a significant part in the development of the Nottingham tram scheme. Its inclusion was largely driven by the local authority officers who were involved in the scheme development, but the vision for accessibility was inextricably woven into the scheme from the outset. As the Deputy Team Leader, Nottingham, who had specific responsibility for appraisal, says:

“that was one of a number of overarching principles of the scheme as it developed and I think that was the thread that goes all the way through this”.

This was backed up by the Town Planner, Nottingham:

“Once we knew we’d got an approved system and it looked like we were going to get the money – we were getting a real project – it was just axiomatic that the system would be accessible – not because we’re forced to do it with our arms behind our backs, but because it was an opportunity to create as far as it can be a fully accessible system.”

The vision is also reflected in the documentation, for example:

“Provisions for people with impaired mobility will form an integral part of the system.” (Document no. 18)

Considerable effort went into making the design accessible. Much of the documentation addressed the specification of access issues and the involvement of specialists and disabled people in getting it right. Interviewees also commented:

“There was a big involvement of a variety of people to get the design right”
(Deputy Team Leader, Nottingham)

“when the contractors were brought on board there were models made – mock-ups – of the tram stops and of the trams themselves, but the tram stops were particularly helpful again for people who found it difficult to interpret plans – they could literally walk through with their fingers if necessary” (Town Planner, Nottingham).

Accounting for disabled access

The original appraisal was made before the ‘New Approach To Appraisal’ was introduced, and so relied solely on the Restricted Cost Benefit Analysis required for the Section 56 funding application. In the absence of any guidance from the DfT (or elsewhere) on incorporating disabled access into the economic appraisal, Nottingham used an estimate. Initially, this estimate was a figure of net present value £1.1m, using the additional cost of having a fully low-floor tram as a proxy. Later this was changed, and instead certain cost savings were included as a benefit. The savings were calculated by assuming that a certain proportion of the Dial-a-Ride journeys made at the time within a certain area around the proposed tram route would no longer need to be made, as people would be able to use the tram instead. The figure was estimated at £0.3m. It was not substantial but it was, for those developing the scheme, symbolic – “It was almost put in there as something that should be in there” (Deputy Team Leader, Nottingham). The Transport Consultant supports this:

“looking at the avoided costs of Dial-a-Ride [...] was never written in any guidance, it was what we could argue with the DfT”.

An attempt was made during the project to increase the amount identified for such benefits in the appraisal, as the project team recognised their importance:

“In effect, then, the existing [Section 56] methodology would appear to be incomplete and inequitable in its approach towards mobility impaired persons and the benefits which would accrue to them from improved access [to] transport systems.” (Deputy Team Leader, Nottingham in Document no.15)

However, although the DfT allowed the figure of £0.3m in the Restricted Cost Benefit Analysis for the Section 56 funding application as a non-user benefit (since it accrued, not to disabled people themselves, but to the local authority), it would not allow any

other consideration of “benefits enjoyed by the mobility impaired who use GNRT [Greater Nottingham Rapid Transit] [...] except to the extent that they are captured through the farebox” (DfT in Document no.15).

The appraisal was updated prior to the system being built (May 2000), by which time the ‘New Approach To Appraisal’ had been introduced. In the Full Business Case (Document no. 20), disabled access is identified as a benefit of the scheme in the Appraisal Summary Table under ‘Accessibility’ in relation to social inclusiveness, and under ‘Integration’ in relation to other government policy. In the Cost Benefit Analysis table, the £0.3m remains as a non-user benefit, and other non-user benefits are briefly acknowledged in the text. The limited guidance available from, and previous correspondence with, DfT would not obviously have led to this interpretation of the Appraisal Summary Table, or the commentary in the Cost Benefit Analysis, and indicates the focus of the Nottingham team on disabled access.

User benefits were calculated as farebox revenue and time-savings. No account was taken of any additional benefits for disabled people.

“One person in a wheelchair generates some time savings the same as anyone else in appraisal terms, but it’s that quality of life issue, meaning that [the interviewer, a wheelchair user] or anyone else in a similar situation could go out on their own, that’s not valued.” (Transport Consultant, Nottingham).

Certain costs of disabled access were accounted for explicitly, such as the original figure for fully low-floor vehicles. However, there were other costs, including add-on costs such as the implications for depot design of having low-floor trams:

“The fact that all the kit’s on the roof means that the depot has to be built in a different way with far more access to the heavy lifting stuff on the roof of the tram. [...] so there’s all those issues and there must be a cost – not just a one-off design cost, but an ongoing cost in creating a low-floor tram” (Team Leader, Nottingham)

The documentation reviewed indicated that some concerns were expressed early on about the potential costs of:

“the desire to facilitate the movement of mobility impaired passengers, which embraces the disabled, wheelchair users and active passengers encumbered with prams, pushchairs and bulky packages. The effect is to demand advanced and sometimes complicated designs, which naturally incur cost penalty” (Document no. 6).

In addition, the costs of getting “through the regulatory minefield” – a reference from the Deputy Team Leader, Nottingham to Rail Vehicle Accessibility Regulations – though not explicitly calculated, were not, in his estimation, insignificant.

Nonetheless, all costs anticipated at the time will have been included in the final price offered by the contractors:

“I’m not sure we ever costed the additional things that we were putting in. I daresay we could find it – but because of the PFI we didn’t actually build the thing – we were paying an amount to have it built. [...] it was in the spec [...] and by then it was a requirement” (Team Leader, Nottingham)

External influences

As noted above, the original impetus for Nottingham’s tram system came from Nottingham Development Enterprise – a collaboration between the private sector and the two local authorities, County and City – which was concerned about future congestion and economic growth. The inspiration for a tram system came from mainland Europe, and in particular Karlsruhe, with which Nottingham is twinned. Karlsruhe trams were not accessible for many disabled travellers, but the politicians and local authority officers visited other European cities with newer and more accessible tram systems, and this did play a part in the level of disabled access to which they aspired:

“Grenoble was the one that everybody was pointing towards actually, and subsequently Strasbourg as well. And they were 100% low-floor vehicles, the colour schemes etc. met DDA – what was going to become the regulations – so that was the inspiration.” (Deputy Team Leader, Nottingham).

Those involved in the project team had experience of other transport systems, such as the Robin Hood Line (a heavy-rail system running from Nottingham to Worksop), but no previous experience of tram systems. The consultants on the other hand, MVA, had some experience of tram systems:

“our consultants were very good – they were at the forefront of what had been happening” (Team Leader, Nottingham).

NET was developed at an interesting time for the (light) rail industry in relation to legislation and regulation. The Disability Discrimination Act had been on the statute books for some time, but had not yet been fully enacted – the elements of Part III relating to physical features were due to come into force just around the time the Nottingham system opened.

In addition, the Rail Vehicle Accessibility Regulations were being developed at about the same time as the trams were being designed, and Nottingham to some extent was a guinea pig in implementing them. There was a clear understanding that this legislation was on the horizon and must be addressed. The tender document (Document no. 19) states that the concessionaire must:

“take cognizance of the pending disabilities act legislation which is due to be enacted early in 1998”.

In addition, a number of the documents reviewed related to meetings about tram design and the impact of the Rail Vehicle Accessibility Regulations. Two examples from a series of similar meeting notes follow:

“DETR stated that the proposal to have a small variation in height between the tram floor level and the outside treadplate was NOT compliant with the RVAR for wheelchair-accessible doors.” (Document no. 24)

“The type of perforated banding on the door complied with the requirements of the RVAR and was also acceptable to the JMU [the access consultants].” (Document no. 26)

Nottingham had an advisory group of disabled people who were consulted during the planning process.

“the City Council has always had a strong consultation process with disabled people, and when the tram was first a dream we got the disability group involved in it and they helped formulate the book of designs for station infrastructure and that kind of thing” (Accessibility Officer, Nottingham).

Their input was limited in the beginning, however, because they were more interested in detail than in the ‘bigger picture’:

“we would have had a number of meetings with them about the vision for the tram system. And the questions would always come back ‘Well, what is the detail – what are we going to get? What is the platform going to look like? How will a disabled person know where the doors are if they’re visually impaired [...]?’ ” (Town Planner, Nottingham)

In consequence, the advisory group did not contribute to the appraisal. However, they had an impact on it, as the Deputy Team Leader, Nottingham, comments:

“They [disability groups] had input on the scheme as it evolved but not on the appraisal. So I suppose they added to the cost of the scheme.”

There was some evidence that local people were in favour of disabled access to the tram system, and surveys prior to its being built indicated that people “with mobility problems” were more in favour of the tram in general than other people and more likely to say they would use it (Documents nos. 4 and 5). In addition, when the Bill went to Parliament, no petitions were raised about disabled access (Document no. 10), which suggests that people were satisfied with the proposed provision.

Post-implementation evaluation

There is a clear sense that the tram has brought benefits:

“Overall, just a personal comment, I’m really pleased with how it’s turned out – the tram system – and every time I go on it there is at least one or two wheelchair users on it, which speaks for itself.” (Town Planner, Nottingham).

Nottingham recognised the importance of more formal evaluation and has (since the case study was completed) undertaken a survey of benefits to disabled people – in part to input into the appraisal for the proposed extension (Carter and Le Masurier, 2006). This was a quantitative and qualitative survey covering how many people with ‘a clear form of impairment’ use the system, how much they use it, what kinds of journey they make and how it affects their quality of life. They recognise however that, even in a closed system like a tram, there are other issues that affect disabled access, such that robust evaluation is difficult.

“But obviously the journey starts from when you leave your house to when you get to your place of work or a shop. And it would be difficult to separate out the different factors” (Team Leader, Nottingham).

However, there is a clear recognition that the information gained would support the case for further work – and that it would have been useful had this sort of evidence been available before:

“we think there’s a good message that may well help inform the phase two debate – if we can turn round and say, on an average day there’s 20 people with a wheelchair who may not have travelled, of which three quarters think it’s changed their quality of life. [...] If anyone else had had anything like that, it could have been helpful in selling the case – at the moment all you can say in the documentation is that there will be some general benefits for mobility impaired travellers.” (Transport Consultant, Nottingham)

No post-implementation evaluation of the figure for Dial-a-Ride savings has been undertaken because of the time lag and the consequent changes that would have taken place between the original estimate and the inauguration of the system:

“remember, that number would have been input in 1995 and it took us that long to get the justification [for the system].”

Theme	Summary
Focus and drivers	<p>Key driver – solving capacity problems.</p> <p>Disabled access was an integral part of the vision for the tram.</p> <p>Considerable effort was made to ensure disabled access in the construction process.</p>
Accounting for disabled access	<p>There was no guidance on incorporating disabled access into the appraisal.</p> <p>Several ways of incorporating a monetary figure for the benefits of disabled access were tried despite lack of guidance and some resistance from DfT.</p> <p>Costs were incorporated in the bid price.</p>
External influences	<p>European tram systems heavily influenced Nottingham’s development, but not the appraisal.</p> <p>Newly developing disability legislation affected design but not directly the appraisal, although costs of advice and compliance were included implicitly.</p> <p>Disabled people provided input into the design process, but not into the appraisal.</p>
Post-implementation evaluation	<p>Evaluation that will include disabled access is planned and considered to be important for future expansion.</p>

Table 15: Case study: summary table for Nottingham

West London

Focus and drivers

The West London Tram was, at the time of the study, in the early planning stages, and had not yet received government approval to go ahead. A public enquiry is anticipated towards the end of 2008. Although “not a core driver of the decision to

invest in a tramway project” (Director, London Tram, Transport for London), disabled access is fully taken into account in the process – this is part of the vision for the tram, in large measure driven by the Mayor, who has a strong focus on equality issues:

“it’s fundamental – part of the mayoral policy that the tram must be fully accessible”.

Reflecting this senior-level concern with disabled access, a paper to Transport for London’s Board (Document no. 34), which is chaired by the Mayor, mentions the “reliability advantage” of disabled access in relation to boarding and alighting times:

“accessibility to the mobility impaired (motorised buggies made over 2000 trips on Croydon travelling last year)”.

In addition, Transport for London has as part of its project management process an Equality Impact Assessment. This assesses the positive and negative impacts of schemes on the equality ‘priority groups’ identified by Transport for London, which include disabled people. The Equality Impact Assessment is relevant to the Disability Discrimination Act 2005 public sector duty (section 5.2.2).

Considerable effort is going into the design of the tram to ensure access, and the Deputy Project Director points out:

“We are lucky, in that we’re introducing a new system [...] So we’ve got to go for the gold standard. And it is that gold standard that benefits everybody.”

“We work very closely with the Department for Transport in all our designs to ensure that we get the gaps right and the levels right” (Deputy Project Director, West London).

Accounting for disabled access

The project uses WebTAG for appraisal, which has no explicit guidance on how to measure costs and benefits of disabled access.

Benefits of disabled access – and non-monetised costs – are described in the business case:

“What you tend to do is just have a description of the benefits: at the stops and on the vehicles it will be better than a bus, but then we would caveat to say walk time to the stops will mean there are countervailing forces at work.” (Transport Consultant, West London)

Disabled access is considered by the consultants developing the appraisal to be implicit in the costs, because of the legislation and regulation that has to be complied with.

“In terms of costs, the capital and operating costs of the system will take on board the costs of meeting any of the regulations or compliance with them. So in that sense it’s implicit in the costs that come out.” (Transport Consultant, West London)

He noted, however, that the inclusion of costs in the Cost Benefit Analysis but the absence of monetised benefits would have a negative impact on the benefit:cost ratio.

Monetised benefits are calculated mainly as time savings (following current DfT guidance for calculating the benefit:cost ratio – section 5.2.2). The draft business case (Document no. 37) mentions a range of transport mode users who will benefit from the tram, and states that their journey time savings will be monetised. The other monetised impact is the net change in revenues for different modes – both revenue from the tram and any reduction in revenues on buses and other modes.

These monetised benefits are also considered to include the benefits accruing from improved disabled access:

“Benefits of compliance with legislation are not readily monetarised however a compliant system will tend to operate more efficiently, improving journey times and attracting more users – these features will tend to be captured in the transport and traffic models underpinning the business case.” (Director, London Tram, Transport for London)

No distinction was made in calculating time savings between disabled and non-disabled people. Indeed, it could be that taking disability issues into account might have had a detrimental effect in time savings, as fewer tram stops are planned than there are bus stops currently, and people will have to walk further to access public transport. From a Social Model perspective this is effectively creating more barriers, rather than removing them. It is thus appropriately identified as a negative impact in the Equality Impact Assessment.

The monetised benefits (time savings, safety improvements and farebox revenues) are incorporated into the business case in the Appraisal Summary Table under the Economy heading. Other benefits are identified qualitatively or, occasionally, quantitatively under other headings. However:

“In terms of current guidance – the WebTAG guidance and the AST – five objectives and sub-objectives – clearly there is the main objective of

Accessibility, but it isn't clear where you put [disabled access] in." (Transport Consultant, West London)

This leaves the practitioner with a quandary:

"I would not ignore the guidance, but arguably we need to incorporate somewhere in the appraisal the benefits that come from improved access to the system. [...] I would seek to do it there [Accessibility], even though the guidance doesn't explicitly discuss that, which to my mind does seem rather bizarre." (Transport Consultant, West London)

Disabled access has been debated in the regular business case working group meetings, "mostly in boarding penalties calculations" (Deputy Project Director, West London). The use of boarding penalties in the business case – the "intangible value or preference for one mode over another, over and above the explicit and quantifiable 'costs' of those modes (such as walk time, wait time and in-vehicle time)" (Document no. 41) – is still being debated, but it would incorporate some of the attributes that contribute to good disabled access, in particular level boarding. The boarding penalty paper makes no explicit mention of disabled access, however. In addition, apart from the Board paper mentioned above, none of the other documentation that the author reviewed makes explicit mention of disabled access.

The comment was made that the lack of use of transport systems by disabled people because of inaccessibility makes it difficult to predict demand for an accessible system. This may add to the reluctance of those involved in appraisal to attempt to quantify benefits.

"There is an interesting issue of appraisal here – it's a Catch-22 in that, because it's difficult to access the system, the level of demand by disabled people, for example, may be low because it's very hard to access it. If you made it better, demand might go up – it's a bit of chicken and egg – so it would be useful to perhaps draw that out in the business case." (Transport Consultant, West London)

External influences

The genesis of the West London Tram lies in capacity planning reports from the mid-90s. It has been given additional impetus following the establishment of Transport for London, one of the Greater London Authority 'functional bodies', which developed the Mayor of London's transport strategy. This, together with "policy objectives, for example the London plan which effectively provides a planning framework for London to 2016" (Transport Consultant, West London), put the tram back on the agenda.

Within the project team, the Deputy Project Director has experience of working on the Manchester Metrolink, and several of the consultancy firms involved in the project (on design and engineering) have significant prior experience. In addition, the corporate directorate responsible for trams – London Trams – oversees both Croydon Tramlink and future tram development in London. Its director has worked on Croydon Tramlink for almost ten years, and all technical staff within the directorate are encouraged to take an active part in professional networks.

In relation to appraisal, qualitative evidence for benefits is provided in the draft business case drawn from a survey of passengers' experience of Croydon Tramlink:

“Provided independence to many mobility impaired individuals” (Document no. 37).

However, the consultants preparing the appraisal did not consider the approach past tram or other systems had taken, as:

“we take it on face value that all past lessons and experience has been embodied in current policy and guidance and legislation” (Transport Consultant, West London).

Disability legislation is an important consideration in the development of the tram, and there is a concern that the Rail Vehicle Accessibility Regulations cause unnecessary cost:

“it appears that the UK regulations are significantly at odds with those on mainland Europe, adding to the cost of providing accessible systems with potentially no additional benefit.” (Director, London Tram, Transport for London)

It is taken as read that the existence of the legislation will ensure that disabled access is implicitly incorporated into the business case development process:

“So, to answer the explicit question [‘how is disabled access being considered in the economic appraisal?’], I suppose it’s being considered only in the sense of how you design the system to be compliant with the regulations. It’s implicit in the system that it will be compliant with all the regs and therefore disabled access.” (Transport Consultant, West London)

Consultation is a core element of the planning process, and a major consultation took place in summer 2004. The consultation process was made accessible (alternative formats, textphone contact details, and so on) but disabled people were not identified as a specific interest group to consult. However, the pan-London umbrella organisation of disabled people, Greater London Action on Disability (GLAD),

responded to the consultation. As with Nottingham, they welcomed the proposals for a tram system, and their concerns were largely about design, such as pavement narrowing at Shepherd’s Bush. GLAD did not comment on potential benefits, or costs – and this was not a question asked in the consultation. However, the Head of Consultation said of the process:

“Perhaps the most significant debate that arose was around whether the benefits we have claimed for the tram in terms of level access are outweighed by the greater distance between stops, compared to the bus. It has to be said that many of the people [arguing this] were not themselves disabled, but were convinced they knew what was good for those that were.” (Head of Consultation, Transport for London)

The response from GLAD included substantial reference to the Croydon tram, highlighting what was good and what could be improved about that system. At the time of the study there was no indication as to whether these comments specifically were informing development of the West London tram – or, indeed, whether they provided new information to the project team.

Post-implementation evaluation

Transport for London expects to have to account for the success of the project to DfT, especially in the light of the other (tram) projects it is planning. Post-implementation evaluation is part of the Transport for London project management process, but as yet it has only been applied to small schemes. The time span for the business case is 60 years, so a series of milestones needs to be established against which the project can be evaluated, rather than waiting the full 60 years to review success.

Theme	Summary
Focus and drivers	<p>Key driver – solving capacity problems.</p> <p>Disabled access is not a core driver of the project but is a fundamental element of the vision.</p> <p>The design is being developed to ensure full access when the system is constructed.</p>

Theme	Summary
Accounting for disabled access	<p>No guidance is available for disabled access <i>per se</i>.</p> <p>No specific monetised benefits are being included – an assumption is currently made that monetised benefits for the general population include disabled people. The use of other benefit measures (boarding penalties) that would better reflect disabled access is being considered, but not for that reason.</p> <p>Costs of disabled access are assumed to be implicitly included in the overall cost estimates.</p>
External influences	<p>The business case consultants working on the scheme have worked on a number of previous schemes. Some other staff with influence have experience of previous tram systems.</p> <p>Legislation had led to an assumption that disabled access is automatically incorporated into the business case – and some perceive that it is overly onerous in cost terms.</p> <p>Disabled stakeholders are contributing as part of the general consultation process, but not to the appraisal.</p>
Post-implementation evaluation	<p>Evaluation will take place as part of the project management process in Transport for London.</p>

Table 16: Case study: summary table for West London

Sheffield

Focus and drivers

The Director of Planning – the sole interviewee for Sheffield – was clearly in favour of disabled access. In addition, the decision was made early on to have level boarding, and the other issues of access such as tram stops followed from that.

Considerable effort was put into ensuring the accessibility of the scheme during design and construction, for example:

“We were determined to get a reliable tram *and* to have level boarding” and

“we did consult before we actually finalised the order of the tram, we actually built a mock-up of the floor pan of the tram – the whole lot – and we researched how quickly people could get on and so on.”

Accounting for disabled access

Guidance on costs and benefits was “very limited”. It was to an extent a given that the system would be accessible to disabled people, but sometimes cost precluded full disabled access. When the system opened, for example, the interchange at Sheffield Station was inaccessible, although that has since been addressed.

“It was agreed with government that the outturn price would be £241m [...]. We did actually have to take one or two things out to stay within that price – the nice-to-have things, and I think that’s where some of the access things like information systems did actually suffer. Sheffield Station was a good example of that – we had to prune a few costs there.”

The costs and benefits of disabled access were not accounted for separately:

“when it came to methods of estimating costs and benefits of disabled access, to be frank, even on the stop design, we didn’t really. [...] We didn’t say: what if we do not have level boarding? In terms of assessing the costs and benefits these were all given.”

The absence of any way of monetising benefits was seen as a disadvantage:

“I think it’s on the benefits side, really, that one should concentrate: by having this sort of access and inclusivity for all, are we sure that we’ve got the benefits correct, for the quality of life improvements that you get for people with disabilities?”

There is some difference of opinion between the Director of Planning and the consultants who developed the appraisal as to whether a proxy figure was used, such as a figure for savings in transport provision for disabled people who would be served by the tram. The Director of Planning, in his interview, said not as these “were not well enough developed really to be of any significance in the Cost Benefit Analysis at that time”. However, the consultant who worked on the appraisal recalled using a figure similar to that used on Nottingham (it was the same consultancy firm). In the absence of the documentation it is impossible to be certain.

External influences

The impetus for the Sheffield Supertram mainly came from the South Yorkshire Passenger Transport Executive, then part of the County Council, following a transportation study in the early 1970s (The Trams, 2006; Tramzene, 2003).

The experience of European trams, and of tram systems on the West Coast of the United States, had an influence on the design of the tram in relation to disabled access – some of the US systems were perceived as being very cumbersome – although not on the appraisal process. In addition, the negative experience with high platforms in Central Manchester to deal with the problem of high-floor trams informed the choice of a partially low-floor tram in Sheffield. Low-floor throughout was considered to be too risky, given the gradients in Sheffield – to provide enough power to cope with the hills, every bogey on the Sheffield tram needed to be motored, so a totally low-floor tram was not at the time possible.

The planning and construction phases of the Supertram, right up to its opening, predate the Disability Discrimination Act. Contracts were placed in 1991 and the scheme was opened in 1994/5. This legislation had no impact, therefore.

Various interest groups in Sheffield ensured that disabled access was kept on the agenda. The team developing the scheme included a 'special needs officer' whose responsibility it was to liaise with disability groups. The team as a whole had a clear understanding of the need for access and kept each other on track:

“We had a wonderful project guy, and we delivered to time, but he was always flashing around the programme and the costs, and we had to say to him you can't ignore this – he had been doing major projects in the Middle East. 'You might have got away with it there, but you can't ignore it here!' ”

Politicians also kept the issue on the agenda:

“when you've got people like David Blunkett who was still involved very much in Sheffield then, inevitably you're going to be asked questions about it”.

Disabled people's organisations were consulted on the design of the tram, but had no input into the appraisal, or the estimation of benefits.

Post-implementation evaluation

There was an evaluation of the system post-implementation, by the consultants who advised on the economic appraisal. However, the system was not performing as well, in terms of passenger numbers, as had been anticipated in the business case. So the

focus of the evaluation was largely on determining why that was, rather than on the benefits to disabled people, which were considered to be obvious:

“even within the context of good access, it’s quite visible to see that level boarding was excellent as far as not just benefits for wheelchair users, but mothers pushing buggies. So we didn’t discriminate in terms of asking what are the specific benefits for those particular groups.”

Theme	Summary
Focus and drivers	<p>Key driver – solving capacity problems.</p> <p>An early decision to have level boarding and other elements of disabled access was taken, although this was not a driver of the system.</p> <p>Considerable effort was made to ensure disabled access in the construction process.</p>
Accounting for disabled access	<p>There was very limited guidance on incorporating disabled access.</p> <p>Some elements of access were excluded from the final scheme on cost grounds.</p> <p>It is unclear whether a monetary figure for the benefits of disabled access was included.</p>
External influences	<p>The design of US and European tram systems was influential on the design of the Supertram, but not on the appraisal.</p> <p>No legislation was in place at the time of development.</p> <p>Disabled stakeholders influenced the design, but not the appraisal. A local (disabled) MP was also influential in keeping access on the agenda.</p>
Post-implementation evaluation	<p>The post-implementation evaluation focused on system performance and did not consider disabled access.</p>

Table 17: Case study: summary table for Sheffield

5.2.4. Cross-case issues

This section considers the questions posed in the Case Study Protocol of the pattern across multiple cases and of the entire study. Table 18 provides a summary of the themed issues for all three cases described above in Table 15–Table 17.

Theme	Nottingham	West London	Sheffield
Focus and drivers	Key driver – solving capacity problems.	Key driver – solving capacity problems.	Key driver – solving capacity problems.
	Disabled access was an integral part of the vision for the tram.	Disabled access is not a core driver of the project but is a fundamental element of the vision.	A decision was taken early on to have level boarding and other elements of disabled access, although this was not a driver of the system.
	Considerable effort was made to ensure disabled access in the construction process.	The design is being developed to ensure full access when the system is constructed.	Considerable effort was made to ensure disabled access in the construction process.
Accounting for disabled access	There was no guidance on incorporating disabled access into the appraisal.	No guidance is available concerning disabled access <i>per se</i> .	There was very limited guidance on incorporating disabled access.
	Several ways of incorporating a monetary figure for the benefits of disabled access were tried, despite lack of guidance and	No specific monetised benefits are being included – an assumption is currently made that monetised benefits for the general	It is unclear whether a monetary figure for the benefits of disabled access was included.

Theme	Nottingham	West London	Sheffield
	some resistance from DfT.	population include those for disabled people. The use of other benefit measures (boarding penalties) that would better reflect disabled access is being considered, but not for that reason.	
	Costs were incorporated in the bid price.	Costs of disabled access are assumed to be implicit in the overall cost estimates.	Some elements of access were excluded from the final scheme on cost grounds.
External influences	European tram systems heavily influenced Nottingham's development, but not the appraisal.	The business case consultants working on the scheme have worked on a number of previous schemes. Some other staff with influence have experience of earlier tram systems.	The experience of US and European tram systems was influential on the design of the Supertram, but not its appraisal.
	Newly developing disability legislation affected design but not directly the appraisal, although costs of advice and compliance were	Legislation had led to an assumption that disabled access is automatically incorporated into the business case – and some perceive that this legislation is	No legislation was in place at the time of development.

Theme	Nottingham	West London	Sheffield
	included implicitly.	overly onerous in cost terms.	
	Disabled people provided input into the design process, but not into the appraisal.	Disabled stakeholders are contributing as part of the general consultation process, but not to the appraisal.	Disabled stakeholders influenced the design, but not the appraisal. A local (disabled) MP was also influential in keeping access on the agenda.
Post-implementation evaluation	Evaluation that will include disabled access is planned and considered to be important for future expansion.	Evaluation will take place as part of the project management process in Transport for London.	The post-implementation evaluation focused on system performance and did not consider disabled access.

Table 18: Case study: summary of specific issues for all three cases

Table 19 sets out the general cross-case questions in the Case Study Protocol, with their relationship to the seven propositions in the research.

Question	Relationship to propositions
Was guidance on the appraisal of non-market costs and/or benefits used in a similar way by all three projects?	This provides evidence for proposition 4, relating to stakeholder pressure; 5, relating to pressure from legislation; 6, relating to movement of professionals; and 7, relating to reliance on past experience.

Question	Relationship to propositions
Did the projects use the same or similar methods to calculate costs and benefits of disabled access?	This provides evidence for proposition 4, relating to stakeholder pressure; 5, relating to pressure from legislation; 6, relating to movement of professionals; and 7, relating to reliance on past experience.
Was disabled access used to promote the development of the tram projects?	This provides evidence for proposition 4, relating to stakeholder pressure; and 7, relating to reliance on past experience.

Table 19: Case study: cross-case questions

Guidance

The nature of guidance for appraising non-market costs and benefits other than disabled access improved during the period of development of these three systems. With the advent of the 'New Approach To Appraisal' in 1999, some guidance became available on appraising, for example, environmental effects. However, guidance on appraising disabled access was – and is – still lacking. It remains unclear where disabled access is best included in the Appraisal Summary Table, and its inclusion varies depending on the approach of the practitioner undertaking the appraisal, as can be seen from the accounts of Nottingham and West London above.

Costs of disabled access have not been separately identified in any of the appraisals for the projects, although all of the projects recognised that there was additional cost. The West London project indicates that there is increasing concern that the additional cost may be unnecessarily onerous, particularly in relation to legislation and the vehicle regulations, and a study is being undertaken by UKTram (2007), a public–private sector partnership to represent tramways and to address issues raised by a report into trams by the National Audit Office (2004).

Benefits are not monetised unless, as in the case of Nottingham, the practitioners explicitly decide to do so. Evidence from West London indicates that, since the Disability Discrimination Act, practitioners are inclined to believe that the legislation and regulations will implicitly lead to the costs of disabled access being incorporated into the appraisal. There is also a conviction in West London that the benefits will

automatically be included in the mainstream monetised benefits of the system (time savings, farebox revenues or both).

One of the clear messages that emerged from the interviews was the pre-eminence of the economic element – the benefit:cost ratio – in the appraisal process. Both consultants – from Nottingham and West London – stressed the importance of the benefit:cost ratio in decision-making:

“Essentially you’ve got five equal objectives, except for one of them you have to get above one in benefit:cost terms, so that’s not equal, is it? And now because of changes in appraisal rules, it’s not one, it might be two and a half, or it might even be three. So they are all equal, but one of them is very important.” (Transport Consultant, Nottingham)

“When it comes to decision-making, there are one or two things that clearly have a much higher priority than others, which as you probably know is the economic stuff about the BCR [benefit:cost ratio] – what are the monetised benefits compared to the cost of the scheme?” (Transport Consultant, West London)

Even for the Sheffield scheme, it was the “big numbers” that mattered, such as, on the cost side, the cost of shifting utilities, overhead lines, track laying and so on, and on the benefit side, modal shift from car use. As costs and benefits of disabled access were not addressed comprehensively in the appraisal, there was no way of determining how big this particular number was.

This emphasis on monetary values was considered inequitable and disappointing:

“in terms of the effort you go into for all of these, you should give them all equal effort and equal weight and work them up to the same level of robustness and completeness” (Transport Consultant, West London).

“I think one of the disappointments is that if you follow the guidance very strictly you do not actually score any benefits because the definition of accessibility is very narrow. [...] I think it [disabled access] can get lost, really. And it always gets lost in the economy side of things.” (Transport Consultant, Nottingham).

However, the Transport Consultant from Nottingham suggested that non-monetised values would be of interest to DfT:

“It would be interesting to try and get a DfT view because I’m sure the formal response is definitely a lot of notice [of non-monetised impacts].”

He also commented that, in certain circumstances, the other elements of the Appraisal Summary Table would come into play.

“I suspect that if one were to have two equal schemes, Nottingham phase two and Anyville phase three, with similar performing benefit:cost ratios, attempting to meet similar sorts of objectives, and there were lots of positives elsewhere [than economy] in one scheme but not in the other, one can see how it could make a difference in the selection of scheme.”

Promotion

Two of the interviewees from Nottingham mention the advantage of disabled access as a form of PR:

“[...] helped to sell the scheme locally, so accessibility was a key thing in selling it, even though it wasn't valued numerically” (Deputy Team Leader, Nottingham).

“And that's the sort of thing where, if there is a positive message, we just have to build on it, and enhance it, and deliver it as a good message” (Transport Consultant, Nottingham).

The 'good message' was considered by the Transport Consultant, Nottingham, to be ambiguous in terms of the advantages to the business case:

“it's useful, but not valuable in terms of enhancing at least the headline case. It might work on hearts and minds, but not formally in any great way in this document [the appraisal]”.

The Nottingham documentation also indicated that people viewed the provision of disabled access favourably (Document nos. 4 and 5). However, this was not identified by any interviewees from the other two projects, although the GLAD (Greater London Action on Disability) consultation response in the documentation for West London indicated that GLAD was favourably disposed to the concept of a new tram system.

5.2.5. Coercive forces

“Coercive isomorphism results from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function.” (DiMaggio and Powell, 1991, p.67)

This section addresses the cross-case questions in the Case Study Protocol that relate to coercive forces, set out in Table 20, with their relationship to the seven propositions in the research.

Question	Relationship to propositions
What role did legislation and regulation play in the account that was taken of disabled access, and did that change as the legislation or regulations changed?	This provides evidence for proposition 5, relating to pressure from legislation.
Did methods to calculate costs and benefits change as the legislation or regulations changed?	This provides evidence for proposition 5, relating to pressure from legislation.
What role did external stakeholders play in the account that was taken of disabled access?	This provides evidence for proposition 4, relating to stakeholder pressure.
Were groups of disabled people consulted in the planning, design or construction of the projects, and if so, what impact did that consultation have on the process?	This provides evidence for proposition 4, relating to stakeholder pressure.
Did external stakeholders change their approach or views as a result of legislation or regulation changes?	This provides evidence for proposition 4, relating to stakeholder pressure; and 7, relating to reliance on past experience.

Table 20: Case study: questions that provide evidence about the presence of coercive forces

Legislation

In the first of the projects, Sheffield, the legislation was not on the statute books. Because the legislation was a late introduction by the then Conservative Government, it is unlikely that it was anticipated, although the pressure for legislation and the frequency of private members' bills had been increasing. Nevertheless, there was a desire to incorporate access for disabled people, which reflected the move towards greater equality for disabled people during the 1980s and 1990s (section 5.2.2).

In contrast, for the project teams in Nottingham and West London, legislation is key – the Team Leader, Nottingham, refers to legislation as an “absolute influence”. It is implicit in the development of the West London Tram, affecting the approach to the appraisal (section 5.2.3). In Nottingham, its impact was felt substantially in design and construction, and in the costs of appraisal, but not in any approach to the benefits of disabled access in the scheme (section 5.2.3). In terms of transaction costs for organisations, the impact of changing legislation, especially in terms of overlapping regulations, was acknowledged by the Deputy Team Leader, Nottingham:

“It’s all the thinking and changing and thinking about this regulation and that regulation and how it affects this regulation – they present difficulties for people. There is a cost and it’s quite significant.”

However, legislative changes seem to have had little or no positive impact in relation to appraisal methods for disabled access. If anything, the evidence indicates that disabled access has been shifted further out of the Cost Benefit Analysis and into the more qualitative elements of the Appraisal Summary Table, especially if Sheffield – also before the introduction of the ‘New Approach To Appraisal’ – did use a similar method of quantifying benefits to Nottingham (section 5.2.3). Arguably, though, this could be a result of legislation. Requiring inclusion in the Cost Benefit Analysis might highlight the absence of adequate measures of benefit for disabled access. The lack of rigour in quantification could raise concerns for those developing the guidance, as it could expose organisations to legal challenge on the grounds that they were not making adequate provision for disabled people.

The obligation to follow the guidance may have the opposite effect from that desired by the project team:

“I think one of the disappointments is that if you follow the guidance very strictly you do not actually score any benefits because the definition of accessibility is very narrow.” (Transport Consultant, Nottingham).

Stakeholders

The only external stakeholder that had an impact on the inclusion of disabled access in the appraisal process seems to have been the DfT. As the Deputy Team Leader, Nottingham, put it:

“the process that we were in was primarily to get government funding, and so the rules around that were the rules we followed”.

In the case of Nottingham, this had a negative impact, leading to the exclusion of wider benefits of disabled access from the Restricted Cost Benefit Analysis:

“The benefits enjoyed by the mobility impaired who use GNRT [Greater Nottingham Rapid Transit] cannot be included in the RCBA, except to the extent that they are captured through the farebox.” (DfT in Document no. 15)

Disabled access was not, however, the only impact that suffered from the “tough exercise” that the Restricted Cost Benefit Analysis presented:

“we had a lot of regeneration benefits, and we said ‘we should be able to rely on this’. The coalfields were closing etc. and as it has proven this would create a stimulus for economic activity, but that was not allowed above the line at all.” (Deputy Team Leader, Nottingham)

Given that in many local authority areas (London particularly) disabled people enjoy fare concessions on public transport, the increase in the farebox is – and would have been at the time of development of Nottingham and Sheffield – unlikely to reflect the true usage by disabled people. In addition, the estimation of benefits through time savings may better capture benefits for disabled access but, as seen in the West London example, there may be time penalties for disabled people depending on design.

Otherwise, the influence of external stakeholders extended to the incorporation of disabled access in the overall system, through the vision for an accessible system in all three cases – and this was mainly politically driven. In Sheffield, there was pressure from local and national politicians, including one of the local MPs, David Blunkett. In Nottingham the role of politicians was acknowledged by the Team Leader, as well as by other interviewees:

“The aspiration of elected representatives was extremely important in taking us down that route [to disabled access] and there was a presumption that it would be accessible.”

In West London the influence of the Mayor have been strongly felt, but the views of other politicians – such as elected representatives in Ealing – have also been considered to be important. The West London Tram will be subject to a public inquiry, and internally the figures are thoroughly challenged to ensure they will stand up to public scrutiny.

Specialist disability consultants and groups of disabled people were more involved in the design and construction in Nottingham and Sheffield and, in addition, significant effort was made on the part of the project teams to engage local disabled people in the design of the system. Design of West London Tram has not yet reached the stage of involvement of specialists.

DiMaggio and Powell (1991, p.68) also highlight less formal responses to coercive mechanisms, such as the need to have someone in the organisation to manage external pressures from lobby groups and so forth. In all three organisations there were staff whose role was to deal with disabled people and their organisations – a “special needs” officer in Sheffield, an accessibility officer (one of the interviewees) in Nottingham, and the Equality and Inclusion team in Transport for London.

Other issues

One area where little work had been done at the time of the study is post-implementation evaluation. Although it was planned by Nottingham, the absence of coercive forces is acknowledged by the Deputy Team Leader:

“we would only be doing it because we want to. There is no requirement to do it and there’s not really much of a clamour to be perfectly honest, both locally and nationally.”

Since the study, however, evaluation of numbers of disabled (and other) people who have benefited from NET has been undertaken, and clear benefit has been identified (Disability Now 2006; Carter and Le Masurier, 2006).

In summary

The research therefore found evidence of considerable influence from coercive forces on the three projects in relation to design and construction, but little evidence in relation to economic appraisal.

5.2.6. Mimetic forces

“Uncertainty is also a powerful force that encourages imitation. When organizational technologies are poorly understood [...], when goals are ambiguous, or when the environment creates symbolic uncertainty, organizations may model themselves on other organizations.” (DiMaggio and Powell, 1991, p.69)

This section addresses the cross-case questions in the Case Study Protocol that relate to mimetic forces, set out in Table 21, with their relationship to the seven propositions in the research.

Question	Relationship to propositions
Did external stakeholders change their approach or views as a result of experience with other tram systems?	This provides evidence for proposition 4, relating to stakeholder pressure; and 7, relating to reliance on past experience.
Did the assessment of costs and benefits of disabled access reflect the methods used for the assessment of costs and benefits of other aspects of transport projects (e.g. environmental aspects)?	This provides evidence for proposition 1, relating to the absence of disabled access in appraisal; and 2, relating to emphasis on costs.
Were there other transport projects being developed at the time that influenced (positively or negatively) disabled access in the development of these projects?	This provides evidence for proposition 4, relating to stakeholder pressure; 5, relating to pressure from legislation; 6, relating to movement of professionals; and 7, relating to reliance on past experience.

Table 21: Case study: questions that provide evidence about the presence of mimetic forces

Learning from other tram systems

There are only a few modern tram systems in Britain even now – Manchester Metrolink, Sheffield Supertram, Midland Metro, Croydon Tramlink and Nottingham Express Transit. The tram system in Blackpool is the original system, built in the 19th century. While Sheffield Supertram was being developed, Manchester Metrolink opened, but at about the same time as contracts were let for the Sheffield system. At around the time Nottingham’s final full business case was being developed, both Midland Metro and Croydon Tramlink were just opening. As work on the different systems overlapped, this is likely to have introduced an element of uncertainty in relation to the appraisal processes, as well as the design and operation of tram systems. As discussed above, Europe still had some of the older tram systems, for example in Karlsruhe, and new systems were being developed, particularly in France. Grenoble and Strasbourg, both modern systems, were influential for both Sheffield and Nottingham.

There is some evidence that the lessons learned from other tram systems by project team members and internal advisors influenced the approach to disabled access in design and construction – often in relation to what *not* to do. In particular, interviewees from all three projects mentioned the high-floor trams in Manchester with their concomitant high platforms in the street. The developers in Sheffield learned what to avoid in their tour of US tram systems. In identifying good practice to follow, the French schemes led the field.

Of the economic appraisal itself, neither of the consultants felt that learning from past experience had assisted them.

“So in terms of reviewing disabled access in past trams and whether it influenced appraisal methods, there just weren’t many systems at the time that you could look at.” (Transport Consultant, Nottingham)

“This project that we’re doing for West London Tram [the economic appraisal] hasn’t specifically gone out and looked at any other tram systems to see how they considered this issue.” (Transport Consultant, West London).

The response from Greater London Action on Disability (GLAD) to the West London Tram consultation draws heavily on the experience of disabled people on the Croydon Tram. This is the clearest indication that other tram systems influenced disabled stakeholders. The visits that were made by disabled people in Nottingham to the Sheffield system suggest that a previous system may have had an influence there as well. In all three cases, that influence was on the design and construction, not on the appraisal process, and the modifications to design did not explicitly change the appraisal for Nottingham or Sheffield.

Learning from other hard-to-measure impacts

Although other ‘hard-to-measure’ aspects of appraisal, such as heritage or particularly environment, were addressed to a limited extent in the appraisal, there was little if any transfer of learning of ‘how to do disabled access’. This comment was made by the Deputy Project Director, West London:

“In terms of planning, we’re going through conservation areas and heritage buildings are going to be affected, and that is a well known and very mature planning process, well documented. We’re having to feel our way a bit more in the equality and inclusion process.”

In summary

The research therefore found evidence that mimetic forces had had an impact on the projects in relation to design and construction. However, there was little evidence of their having had any impact on economic appraisal.

5.2.7. Normative forces

“[W]hile various kinds of professionals within an organization may differ from one another, they exhibit much similarity to their professional counterparts in other organizations.” (DiMaggio and Powell, 1991, p.71)

This section addresses the cross-case question in the Case Study Protocol that relates to normative forces, set out in Table 22, with its relationship to the seven propositions in the research.

Question	Relationship to propositions
To what extent were professionals working on one tram system also involved in other systems and did this influence the approach to disabled access in particular in relation to appraisal?	This provides evidence for proposition 6, relating to movement of professionals.

Table 22: Case study: questions that provide evidence about the presence of normative forces

Normative mechanisms

DiMaggio and Powell (1991) identify three key mechanisms for normative isomorphism: the influence of university education; professional networks; and “filtering of personnel” – that is, the narrowing of sources from which personnel are drawn.

Within the transport field, universities have trained transport planners for many years. Now, increasingly, there are professional programmes for equality and (disabled) access specialists, as well as departments of Disability Studies (such as at Leeds, Lancaster and Sheffield Universities). ‘Equality’ is also a module of some courses such as the MA in Citizenship Studies at Northumbria University.

Networks of both transport and disability professionals abound – formal such as the Institution of Highways and Transportation, or the Access Association, and informal such as the internet based New Mobility (www.newmobility.org) or the email

discussion list Disability-Research. This increasing professionalisation is mirrored in organisations – for example the Equality and Inclusion team in Transport for London.

The use of consultancies is a key way in which 'filtering of personnel' takes place. Also, transport professionals tend to move within the industry, and past experience of transport issues is considered to be an important qualification.

Movement of personnel – consultancies

Of the consultancies that operate in the transport field, a small number have expertise on trams. There are essentially two companies – Steer Davies Gleave and MVA – who have undertaken the appraisal for existing modern UK tram systems and those currently on the drawing board. Both have also worked with the DfT on issues that directly relate to the appraisal process (MVA, 2006; Steer Davies Gleave, 2006).

“SDG as a company has been involved in virtually all the tram systems in the UK that are either built or have been considered – Merseytram, Manchester Phase 3, South Hampshire, Leeds, West London Tram – between the two firms [Steer Davies Gleave and MVA] I do not think anyone else gets much of a look in.” (Transport Consultant, West London)

In relation to this research, Steer Davies Gleave is engaged by Transport for London for West London and MVA worked on both Nottingham and Sheffield. Because of their pedigree with other organisations and “agencies of the state”, engaging such companies helps to legitimise the organisation in the eyes of the decision-makers (DiMaggio and Powell, 1991, p. 76). Similarly, the involvement of consultancies in the design and build of the systems, which West London highlighted in particular but which was evident in the other systems, is likely to bring an element of similarity to the design solutions. This had a negative impact on the projects in relation to disabled access:

“I think a lot of the challenge was getting your traditional designers to think, and then move. It was difficult.” (Deputy Team Leader, Nottingham)

The involvement of access consultancies such as JMU Access Partnership, mentioned by Nottingham, helped to shift the thinking of the mainstream designers, resulting in more accessible systems.

Movement of personnel – project teams

Within the project teams there is less past experience of tram systems, although there is experience of heavy-rail in Nottingham, with several of the project team members having had experience of the Robin Hood Line between Nottingham and Worksop.

West London has the greatest level of tram-specific past experience – unsurprisingly, as the more recent the system, the more opportunity there is for people to have worked on earlier systems. The London Tram Directorate provides a great deal of past and current experience to the project, in particular through its involvement with Croydon Tramlink.

In summary

The research therefore found evidence that the economic appraisal in particular was heavily influenced by normative forces, largely through the use of consultancy firms.

5.2.8. DiMaggio and Powell's hypotheses

DiMaggio and Powell (1991) point out that the potential strength of their theory is in its predictive capability. They posit a number of hypotheses, of which two in particular are relevant to this research:

- Hypothesis B-2 The greater the extent to which the organisations in a field transact with agencies of the state, the greater the extent of isomorphism in the field as a whole. (p.76)

In the transport field – in particular in relation to investment – organisations such as Sheffield, Nottingham and Transport for London are dependent on the DfT for approval and funding (although all have to a greater or lesser extent – and indeed are required to have – access to private funding). Each of the organisations used the 'approved' method of appraisal that was current at the time. However, more importantly from a new institutional theory perspective, all three organisations used consultants to develop the appraisal – Sheffield and Nottingham used MVA and West London is using Steer Davies Gleave. As the consultants from these two organisations pointed out, and as evidenced by their websites (MVA, 2006; Steer Davies Gleave, 2006), they are the dominant organisations in the field. This leads to a similar approach across the field: the more they are used, the greater the legitimacy that attaches for organisations that use them. Both companies also undertake work for DfT and this, too, increases their legitimising effect and further contributes to isomorphism as they become associated with "agencies of the state".

- Hypothesis B-4 The greater the extent to which technologies are uncertain or goals are ambiguous within a field, the greater the rate of isomorphic change. (p.77)

For the tram systems, this hypothesis is applicable to the technologies, in relation to the physical system, and to the 'technologies' of appraisal. As several interviewees pointed out, there were (and are still) few modern tram systems in the UK.

Furthermore, the provision of disabled access was an aspiration that had gained strength following the International Year of Disabled People in 1981 – and for which pressure from disabled people’s organisations had grown (section 5.2.2) – but the technology for achieving that was new and relatively untested. The introduction of low-floor trams, and the use of tactile paving at tram stops, were both issues that challenged and stretched the organisations in the study – with Sheffield avoiding a fully low-floor tram because of the concerns around the capability of such vehicles to operate in the local environment. It could be assumed that Sheffield would be different because it was planned, designed and built before the ‘New Approach To Appraisal’ and the Disability Discrimination Act, but the social pressure – coercive force – for disabled access was still strong at the time. In addition, Nottingham began to be planned at about the same time as Sheffield, and in many ways the vision for disabled access was established at that time (the late 1980s). The ‘goal’ was clear, but the technology to achieve it – how this should be done – was far from clear, especially in relation to economic appraisal.

5.3. Addressing the research question and the propositions

The research question for the case study was:

“On what basis (methods, data and planners’ consultation of disabled people) have the costs and benefits of disabled access been incorporated into the project appraisal process for three tram projects, and how, in the context of new institutional theory, has the environment in which the organisations operate influenced their approach?”

The research found that relevant *costs* were incorporated into appraisals ‘automatically’ and rarely identified as specifically related to disabled access. In contrast, *benefits* were not quantified in the appraisal: although Nottingham attempted to incorporate monetised benefits, this attempt was thwarted by DfT. Where the benefits of disabled access were included, the assessment of them was qualitative. Practitioners had inadequate data to quantify the benefits. Disabled people’s organisations were more focused on the design of the systems than the appraisal process. The following discussion of the seven propositions, posited at the outset of this research, addresses the impact of the isomorphic forces of new institutional theory.

Disabled access is largely unaccounted for in the economic appraisal of tram systems

The research provides good evidence to support this proposition.

For the most part, disabled access is unaccounted for in the three projects' economic appraisals. The costs are absorbed into the overall costs of the project, but the benefits are not effectively monetised, even where the desire exists to do this, as with Nottingham. Although the 'New Approach To Appraisal' offers the option of including qualitative data in the Appraisal Summary Table and the corresponding business case, there is little guidance as to how this should be done and so it can easily get overlooked. The dominance of the benefit:cost ratio, as demonstrated in the DfT's 'Value for Money' guidance (UK Department for Transport, 2005a), also negatively impacts on disabled access, as the benefits of disabled access are not necessarily reflected either in time savings or in ticket revenue.

In relation to the practice of appraisal, the inclusion of disabled access was not common practice in Section 56 funding applications, as witness the exchange between DfT and the Deputy Team Leader, Nottingham, in relation to Nottingham (Document no. 15). The 'New Approach To Appraisal' was supposed to bring clarity to the inclusion of non-market impacts into the appraisal but, as discussed above, guidance on disabled access is lacking: this results not only in its being included in different places in the Appraisal Summary Table by different practitioners, but also in the potential for its total omission, as the consultants involved in the appraisal for Nottingham and West London pointed out.

Where disabled access is taken into account, greater emphasis is placed on the costs than on the benefits

The research provides good evidence to support this proposition.

In one sense the proposition is *not* true: because the costs of disabled access tend to be absorbed into the overall costs of the project, little or no 'emphasis' is placed on the costs. When the project goes out to tender, however, the final price has to be fairly certain, so at that point costs do figure in the process. For example, as the Deputy Team Leader, Nottingham, points out:

“There was a big involvement of a variety of people to get the design right, and there's a cost to that and that certainly wasn't something that was ever considered. I'm sure the contractors put something in their costs for that but we never saw it, we do not know what it was, or ever knew if it was right.”

The benefits, on the other hand, do tend to be excluded, apart from some qualitative comments:

“ And there are also some minor passing references in here [the full business case] – 'table 3.1: social inclusiveness: significant improvements for some groups

e.g. mobility impaired'; there's another reference in the promoter's performance chart in terms of accessibility; and then in one of the appendices a very short section on looking at social inclusion issues – 'wide access to all doors, on-vehicle space will be available for wheelchairs and those with prams' – but it's all very superficial." (Transport Consultant, Nottingham)

The Team Leader, Nottingham, summarises it:

"So in terms of the wider accessibility issue – all the features that make it easy for people to use with whatever disability they have – it is not accounted for in any way in terms of specific monetary value. It's in 'cost', but it's not in 'benefit'."

Greater weight is given to disabled access during construction than would logically be assumed from the (lack of) weight given in the economic appraisal process

The research provides good evidence to support this proposition.

In both Sheffield and Nottingham, considerable emphasis was placed on disabled access during the construction process. This resulted in part from the organisations' own vision for accessibility, but in part also from the involvement of disabled people's organisations in the design process. In West London, there is a clear intention to design and build with comprehensive access. As has been indicated, however, there is little or no weight given to disabled access in the appraisal process.

Pressure from disabled people's organisations and other pressure groups has increased the weight given to disabled access at all stages of tram system construction, including planning

The research provides limited evidence to support this proposition.

Disabled people's organisations were not contacted during the project, so the evidence in relation to this proposition is purely from the perspective of the developers. It appears that there was less pressure than the author originally expected. What pressure there was focused on the detail of design and construction rather than on appraisal. It could be argued that the vision for accessibility in all three projects obviated the need for such pressure in the planning phase:

"I do not think there was a great campaign or anything – again in public we had always said it would be [accessible] and therefore there was a presumption, and so you do not get people banging on doors and saying, 'why isn't it?' (Team Leader, Nottingham)

Disabled people's interest tended to focus on *outcomes* – will there be enough spaces for wheelchair users? how will a visually impaired person know the tram is arriving? – rather than *process*, as evidenced by the meeting notes from Nottingham, even in the early stages of the tram development.

Additional legislation has increased the weight given to disabled access at all stages of tram system construction, including planning

The evidence from the research does not bear out this proposition in relation to economic appraisal.

The advent of legislation has increased weight given to disabled access in the construction phase of the tram systems in the project. The Disability Discrimination Act was not on the statute books at the time that the Sheffield tram was opened, but by the time the Nottingham system was being developed it had become a significant issue:

“I was trying to make sure that the tram that was developed was something that we were comfortable with. And the DDA issues were incredibly prominent in that exercise.” (Deputy Team Leader, Nottingham)

And of West London, the Transport Consultant says:

“I'm sure that the elected representatives of Ealing and to some degree public opinion would want it [accessibility], but whether they would get it without legislation is a moot point.”

However, the impact of legislation on planning – in the sense of the appraisal – is ambiguous. Given the absence of clear guidance in WebTAG as to where disabled access should be included in the appraisal process, it seems that legislation has had little impact on the appraisal framework. The assumption that access will be included in the system, made by several interviewees, seems to underlie the appraisal guidance as well. On the other hand, it could be argued that legislation *has* had an impact, in that there is an assumption that disabled access will be included and so practitioners do not feel the need to address the issue actively themselves.

The guidance emphasises quantitative measures yet there is little quantitative material available relating to disabled access, which militates against requiring practitioners to provide evidence. Potentially this means that benefits will not be included; and even costs may not be properly identified, leading to an incomplete appraisal. If decision-makers rely on the Appraisal Summary Table to understand the value of the project, they may be misled.

The movement of professionals from one tram system development project to another has created similarities in treatment of disabled access between subsequent projects

The evidence from the research bears out this proposition in relation to economic appraisal only.

There has been less movement of professionals from one tram system development to another than the author anticipated. This may be because tram systems were so new in the UK. Nottingham might have been expected to draw some experienced staff from Sheffield, but as the Nottingham scheme had quite a long gestation period, it was already being developed at around the same time as the Sheffield scheme. Nottingham's project team were long-serving at the time of the tram development and have remained in the organisation since. In Transport for London there is more past experience, partly because the Croydon Tram is run by Transport for London and that experience resides in the corporate directorate, London Trams. The Deputy Project Director had previously worked on the Manchester tram system. However, to her knowledge, no other staff working in the project team had worked on tram systems previously. A number of the consultancy firms working on the design and development of the West London tram also have extensive experience with other tram systems.

In relation to the design of systems, the coercive force of changing legislation (e.g. the introduction of the Rail Vehicle Accessibility Regulations 1998) and the mimetic force of technological imitation and development (e.g. progress in low-floor technology) are likely to have exerted a greater influence than movement of professionals.

Where movement of professionals does make a clear difference for this research, and leads to isomorphism, is in the use of consultants, with the two consultancy companies Steer Davies Gleave and MVA essentially dominating the market for business cases on tram systems: this affects the appraisal process.

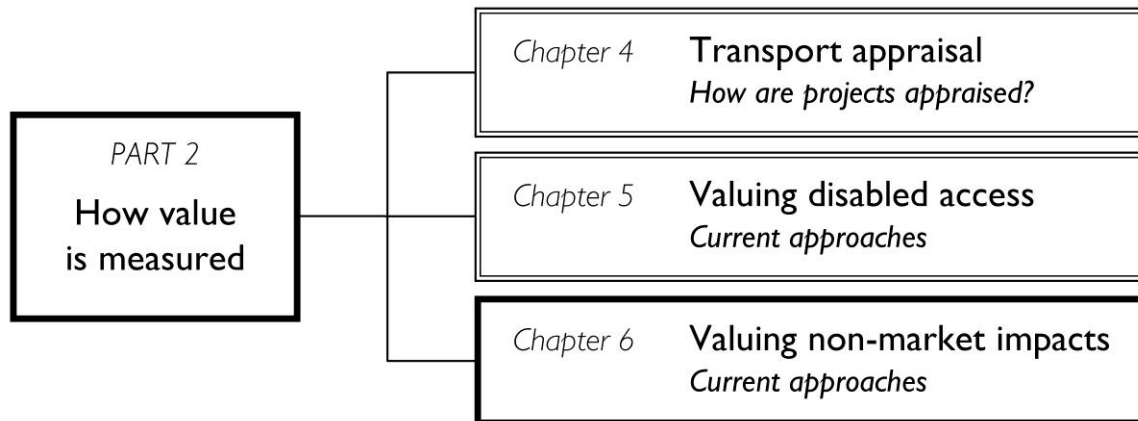
Organisations developing tram systems rely heavily on the past experience of tram systems and other transport projects to shape their approach, both where things have gone right and where things have gone wrong

The evidence from the research bears out this proposition more in relation to design and construction than to planning (appraisal).

All three tram projects reviewed previous tram systems: Sheffield and Nottingham did this explicitly for the design of their systems, whereas West London does it more generally through the work that goes on in Transport for London's London Trams

directorate. According to the two transport consultants, past experience has had little influence on the appraisal, which may relate to the general lack of inclusion of disabled access in the appraisal – essentially there is little practice to copy. However, the use of consultants has led to some similarities for other hard-to-measure impacts:

“In the full business case there is a bit on health, which certainly went into the NATA appraisal – [...] savings for pollution-related diseases, if you reduce that, you have the potential to make a saving on the health budget – similar to the Dial-a-Ride – which MVA had used on some work they were doing on the Bristol scheme, just to try and put a value on it.” (Deputy Team Leader, Nottingham)



Chapter 6. Valuing non-market impacts

Having reviewed the way in which disabled access is incorporated into appraisal, and the consequent imbalance of costs and benefits, this chapter asks: what ways of valuing non-market benefits are used, including in other sectors? It reports on a systematic review of the literature on valuing non-market benefits for a range of sectors, including environment and health. It concludes that stated preference using discrete choice modelling is an appropriate tool for valuing disabled access for use in transport projects.

6.1. Current guidance on non-market impacts for transport

With a view to capturing the economic benefits that transport confers on society (Button, 1994), HM Treasury has provided guidance to other public sector bodies on how proposals should be appraised before significant funds are committed, and how past and present activities should be evaluated. This guidance is known as the *Green Book* (HM Treasury, 2003). In 2003, the UK Government modified the *Green Book* to require the inclusion of social benefits for which there is no market price:

“Wider social and environmental costs and benefits for which there is no market price also need to be brought into any assessment. They will often be more difficult to assess but are often important and should not be ignored simply because they cannot easily be costed.” (paragraph 5.12)

“The valuation of non-market impacts is a challenging but important element of appraisal, and should be attempted wherever feasible. This Annex outlines techniques on how to value non-market impacts, and some typical applications such as time-savings, health benefits, prevented fatality, design quality, and the

environment. These approaches can be complex but are equally as important as market impacts.” (Annex 2, paragraph 1)

The Department for Transport followed suit with the modification of its own guidance, available on its website (UK Department for Transport, 2007):

“The Department’s Sustainable Development policy statement sets out the Department’s approach to the achievement of the Government’s overall sustainable development objectives. It has three criteria at its core: economic, social and environmental. The Policy requires decision-makers to take a balanced approach to ensure that all three are given equal consideration.” (1.3)

Without a fairly straightforward method for including intangible benefits in project appraisal – preferably by proxy monetisation for inclusion in Cost Benefit Analysis, or at least quantitatively for the broader evaluation framework – and a clear mandate within the guidance to address disabled access, transport professionals will continue to count the *cost* and not the *benefits* of disabled access, and projects that would otherwise increase social inclusion may fail on the basis that they do not provide ‘value for money’.

6.2. Findings from the systematic literature review

6.2.1. Identifying resources

The systematic review was undertaken in the spring of 2005. A full description of the methodology for the review is in section 3.2. This section summarises the approach and describes the detailed analysis and findings.

The research question for the review was:

“What methods have been used to quantify non-market impacts for incorporation into evaluation frameworks for projects and can these methods be adapted to address disabled access in transport projects?”

The review was based on the method described by Tranfield et al. (2003). Sources for the review included scholarly journals and web-based literature, including practitioner and government resources. Practitioners were also asked for information via three online discussion fora – one on disability research, and two on transport. In order to gather relevant resources, 10 search strings were input into the databases and the results sifted against selection criteria. Resources that met the selection criteria were then compared against quality criteria. See section 3.2.2 for a detailed description of the review process.

In total, 161 resources were identified in an initial scan. The most productive source of resources was electronic databases. Responses from practitioners and disability researchers were disappointing.

Of the 161 resources, 125 were excluded because they did not, on further examination, meet the selection criteria. This left 36 resources to include in the review. After applying the quality criteria, 9 more resources were excluded, leaving 27 for detailed analysis.

6.2.2. Contextual analysis

Table 23 shows the sources of the 27 papers that met the quality criteria, the split between theoretical and empirical, and the context in which they are set.

Author	Year	Journal	Theoretical or empirical	Context
Alonso	2002	<i>European Journal of Housing Policy</i>	Empirical	Spanish housing market
Alvarez-Farizo & Hanley	2002	<i>Energy Policy</i>	Empirical	Wind farms in Spain
Beckman et al.	2002	<i>Social Choice and Welfare</i>	Empirical	Pay levels in Russia, Taiwan, China, US
Brouwer	2000	<i>Ecological Economics</i>	Theoretical	Environmental economics
Chilton & Hutchinson	1999	<i>Journal of Economic Psychology</i>	Empirical	Forestry in the UK
Clark et al.	2000	<i>Ecological Economics</i>	Empirical	Wildlife enhancement scheme in UK
Clinch & Murphy	2001	<i>The Economic Journal</i>	Empirical	Forestry in Ireland
DeCorla-Souza et al.	1997	<i>Transportation</i>	Empirical	Toll roads in USA
Del Saz-Salazar & Garcia-Menendez	2001	<i>Environmental and Resource Economics</i>	Empirical	Environmental improvements in Spain
Donaldson et al.	2002	<i>Health Economics</i>	Theoretical	Health economics
Fleischer & Felsenstein	2002	<i>Journal of Cultural Economics</i>	Empirical	Staging the Eurovision song contest in Israel
Glaister	1999	<i>Journal of Transport Economics & Policy</i>	Theoretical	Transport policy

Author	Year	Journal	Theoretical or empirical	Context
Hanley et al.	1998	<i>Journal of Agricultural Economics</i>	Empirical	Environmentally Sensitive Areas in Scotland
Hanley et al.	1998b	<i>Environmental and Resource Economics</i>	Empirical	Forest landscapes in UK
Hanley et al.	2001	<i>Journal of Economic Surveys</i>	Theoretical	Environmental economics
Hanley et al.	2003	<i>Health Economics</i>	Theoretical	Health and environmental economics
Junankar & Liu	2003	<i>Education Economics</i>	Theoretical	Education of indigenous Australians
Kenkel	1997	<i>Journal of Health Economics</i>	Theoretical	Health economics
Mathieson	2001	<i>OR Insight</i>	Theoretical	Defence
Mathieson	2004	<i>Journal of the Operational Research Society</i>	Theoretical	Defence
Mogas et al.	2005	<i>European Environment</i>	Empirical	Forestry in Spain
Powe & Bateman	2004	<i>Land Economics</i>	Empirical	Wetlands in East Anglia
Ratcliffe	2000	<i>International Journal of Technology Assessment in Health Care</i>	Theoretical	Health economics
Rendel Planning	1992	Transport and Road Research Laboratory	Theoretical	Environmental economics
Richardson	1999	Centre for Health Program Evaluation	Theoretical	Health economics
Svedsater	2003	<i>Land Economics</i>	Empirical	Environmental economics
Willis et al.	2002	<i>Journal of Environmental Planning and Management</i>	Empirical	Water industry in the UK

Table 23: Systematic review: contextual analysis

Of the journals represented, 16 had an economic focus. There were 10 journals with an environmental focus. Of the papers published in the non-environmental journals, 4 addressed environmental issues, giving 14 with an environmental focus. This reflected the significant amount of work undertaken on monetisation in the environmental field since the early 1990s.

There were 4 papers from health journals, and one further paper from a Health Department in an Australian University (Richardson, 1999), giving 5 with a health focus. Health economics has developed considerably in the past 10 years and many of the papers identified in the searches related to health.

There were 2 papers from transport journals, with one further paper by the Transport and Road Research Laboratory (Rendel Planning and Environmental Appraisal Group, 1992). Although the searches were not designed to identify transport in particular, it is interesting that so few transport papers were identified, given that monetisation is a key element of transport project appraisal.

There were 2 papers from Operational Research journals, but these were by the same author (Mathieson, 2001 and 2004) and one was a reference taken from the other.

Of the papers, 15 were empirical, and 12 theoretical. All but one of the empirical papers also examined the theory, at least to some extent – the exception was Fleischer and Felsenstein (2002).

6.2.3. Content analysis

Figure 4 displays in diagram form the underlying economic frameworks used in the identified papers.

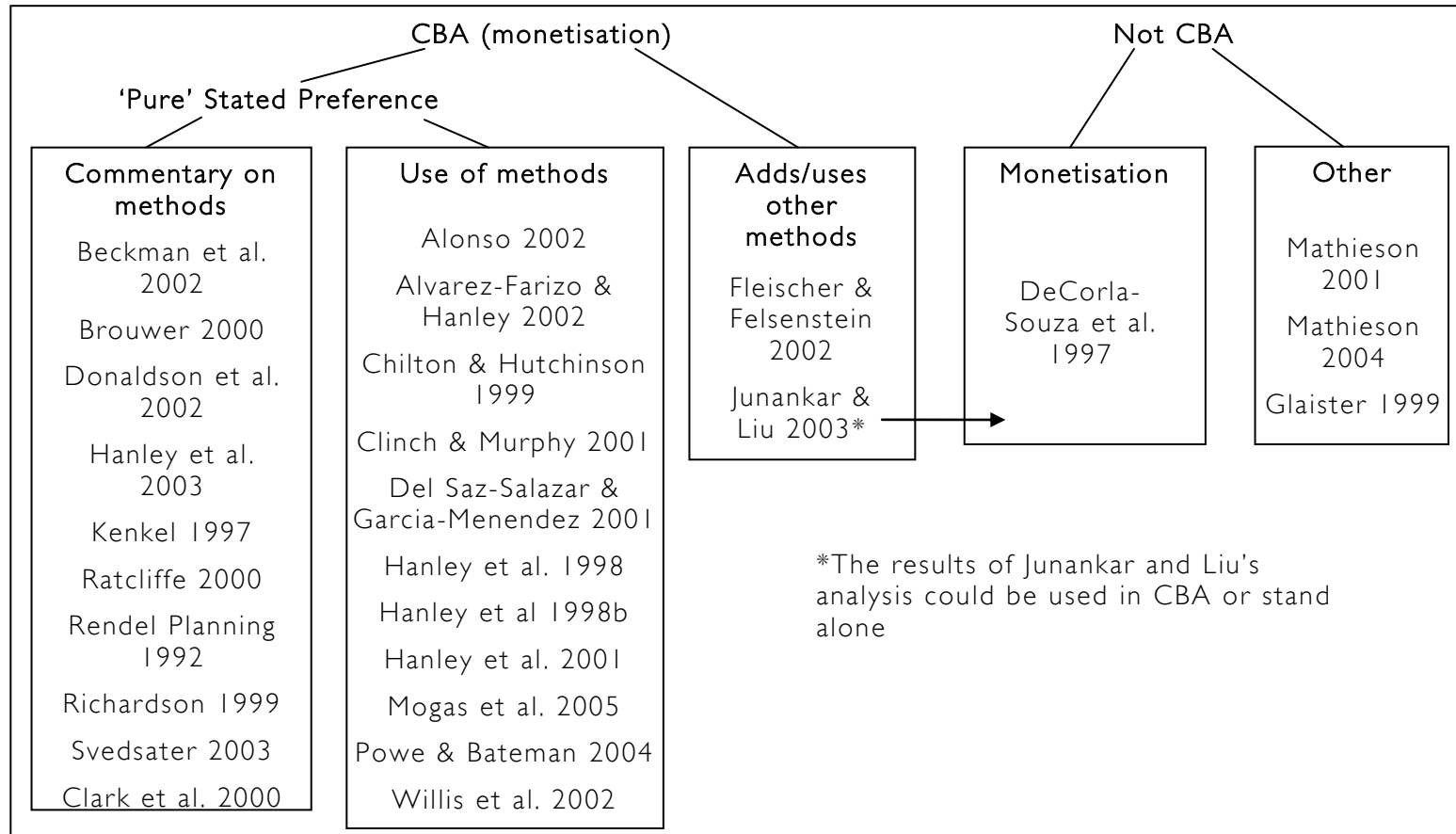


Figure 4: Systematic review: papers classified by underlying economic framework

Table 24 lists, alongside the underlying economic framework for each of the included papers, the use of stated preference (SP) and the specific method and/or technique where applicable, and the basic proposition put forward.

Table Key	
<i>Abbreviations:</i>	<i>How is SP addressed?</i>
CBA Cost Benefit Analysis	Using – Uses SP to derive WTP
CE Choice experiments	Explaining – Explains the theory or appropriate use of SP methods
CM Choice modelling	Adapting – Makes a modification to the method to address a particular issue
CR Contingent ranking	Critiquing – Challenges the use of SP
CV Contingent valuation	
SC Stated choice	
TCA Total Cost Analysis	
WTP Willingness-to-pay	

Author	Year	Underlying economic framework	Focus on SP?	How is SP addressed?	Estimate of WTP?	Proposition
Alonso	2002	CBA	CV	Using	Yes	Uses photographs of barriers in housing in CV survey to establish WTP for barrier-free housing
Alvarez-Farizo & Hanley	2002	CBA	CR / CE	Explaining / using	Yes	Uses case studies to compare CR and CE methods

Author	Year	Underlying economic framework	Focus on SP?	How is SP addressed?	Estimate of WTP?	Proposition
Beckman et al.	2002	CBA	No	N/A	N/A	Uses experiment to identify the existence of envy and malice in participants' responses to rises or falls in pay levels
Brouwer	2000	CBA	CV	Explaining	No	Considers how valid outcomes from CV studies are, and factors that will make the outcomes more reliable and hence more transferable
Chilton & Hutchinson	1999	CBA	CV	Adapting / using	Yes	Uses focus groups to enable more secure reliance on understanding of questions in CV
Clark et al.	2000	CBA	CV	Critiquing	No	In-depth focus groups post-CV survey to identify whether respondents knew what they were doing
Clinch & Murphy	2001	CBA	CV	Adapting	Yes	Enabled respondents to select negative, zero or positive WTP bid to ensure winners and losers catered for

Author	Year	Underlying economic framework	Focus on SP?	How is SP addressed?	Estimate of WTP?	Proposition
DeCorla-Souza et al.	1997	TCA	N/A	N/A	N/A	Advocates an alternative approach to CBA whereby all impacts, including benefits, are presented as costs (i.e. benefits are negative costs) – non-quantified impacts are presented as measures of magnitude
Del Saz-Salazar & Garcia-Menendez	2001	CBA	CV	Using / adapting	Yes	Estimates WTP for remodelling waterfront, with timescale and zero WTP offered
Donaldson et al.	2002	CBA	No	N/A	N/A	Distributional effects are as much a 'problem' for CEA as for CBA
Fleischer & Felsenstein	2002	CBA	CV	Using	Yes	A three-pronged approach to estimating CBA using government, consumer and producer surplus
Glaister	1999	MCA	N/A	N/A	N/A	Argues that MCA is an appropriate tool for transport policy, with CBA taking a key role

Author	Year	Underlying economic framework	Focus on SP?	How is SP addressed?	Estimate of WTP?	Proposition
Hanley et al.	1998	CBA	CV / CE	Explaining / using	Yes	Considers the applicability of CV versus CE to whole policy or issue versus characteristics of a policy or issue
Hanley et al.	1998b	CBA	CV / CE	Explaining / using	Yes	Reviews theoretical background to CE and considers whether they can be used effectively in environmental work
Hanley et al.	2001	CBA	CM	Explaining	No	Considers four types of CM and whether they can be used in environmental work
Hanley et al.	2003	CBA	CV/CM	Explaining	No	Argues that with careful design and analysis (learned from environmental economics), estimating WTP for health can be effective
Junankar & Liu	2003	CBA	No	N/A	N/A	Estimates the benefit of education for indigenous Australians from evidence in national statistics

Author	Year	Underlying economic framework	Focus on SP?	How is SP addressed?	Estimate of WTP?	Proposition
Kenkel	1997	CBA	No	N/A	N/A	Argues that the reasons advanced for using CEA in health economics are weak and CBA is preferable
Mathieson	2001	MCA	N/A	N/A	N/A	Reviews use of assessment hierarchies and proposes ways to make their use more robust
Mathieson	2004	MCA	N/A	N/A	N/A	Argues that Benefits Analysis is now well enough established to be considered a valid method that can be used within an evaluation framework
Mogas et al.	2005	CBA	CV/CM	Using	Yes	Checks consistency of the estimate of welfare changes between CV and CM and concludes that CM has higher estimates
Powe & Bateman	2004	CBA	CV	Adapting / using	Yes	Argues that determining whether respondents consider a scheme to be realistic/likely should be standard in all CV studies

Author	Year	Underlying economic framework	Focus on SP?	How is SP addressed?	Estimate of WTP?	Proposition
Ratcliffe	2000	CBA	CV/CM	Critiquing	No	Considers cost versus value: CV asks people to value, but CM is essentially about cost
Rendel Planning	1992	CBA / MCA	CV/CM	Explaining	N/A	Concludes that MCA with CBA as a key element is an appropriate framework for environmental appraisal in transport projects
Richardson	1999	CBA/CEA/ CUA	No	N/A	N/A	Considers additional factors that might influence response to CB/E/UA outcome
Svedsater	2003	CBA	CV	Adapting / using	Yes (by-product)	Finds that respondents in CV studies may not understand the questions and their responses may have other meanings than those attributed to them by the researchers
Willis et al.	2002	CBA	SC/CR	Using	Yes	Uses focus groups to establish appropriate choices for SC and CR

Table 24: Systematic review: underlying framework and use of stated preference

The dominant framework in use was Cost Benefit Analysis. Exceptions to this were DeCorla-Souza et al. (1997), who advocate the use of Total Cost Analysis; Glaister (1999), who critiques the UK Department for Transport's 'New Approach To Appraisal' which is a Multi-Criteria Analysis approach; and Mathieson (2001 and 2004), who addresses the use of assessment hierarchies in Multi-Criteria Analysis and Benefits Analysis. Rendel Planning (1992), in its review of monetisation methods, explores both Cost Benefit Analysis and Multi-Criteria Analysis; and Richardson (1999) outlines the use of Cost Benefit, Cost Effectiveness and Cost Utility Analysis.

Neither Cost Effectiveness Analysis nor Cost Utility Analysis figured significantly in the papers selected. This may be a function of the search strings employed in the review, but is more likely to result from the way that the selection of papers was made. Cost Effectiveness Analysis is outcome-focused, and so monetisation of the benefits is not as significant as comparison of the costs. Papers might, therefore, have been deselected on criterion 4 – 'focus on costs, or on pricing, rather than on benefits'. The three papers that do reference CEA are all from the field of health economics. Richardson (1999) is an introductory paper for health professionals, which outlines three frameworks. The other two, Donaldson et al. (2002) and Kenkel (1997), attempt to demonstrate that CEA does not improve on Cost Benefit Analysis.

Methods of quantifying other than monetisation did not figure largely in the final selection. One of the papers originally included (Ding, 2005) did address the combination of monetary and non-monetary measures, but it was not clear how to apply the methods outlined, so this paper was excluded when the quality criteria were checked during the review. Likewise, in the paper by Kijak and Moy (2004) the way in which the data were analysed was opaque to the author (section 3.4.1), so this too was excluded on quality grounds.

6.2.4. Cost Benefit Analysis and hypothetical markets

Rendel Planning (1992) is the only selected paper that addresses surrogate markets (section 2.3.3) in any depth as part of its overview of monetisation techniques. Again, this is essentially a consequence of the selection method. From the review of the theoretical background and use of frameworks, it was apparent that use of surrogate markets was unlikely to be transferable to disabled access because of additional barriers in the environment that affect the choices of disabled people, and so any paper dealing with these would have been deselected on criterion 2 – 'apply a method that might be applicable to the (e)valuation of disabled access in a transport environment'.

All the other papers that have Cost Benefit Analysis as the underlying economic framework focus on stated preference (hypothetical markets). Figure 5 shows which stated preference methods are addressed in which papers.

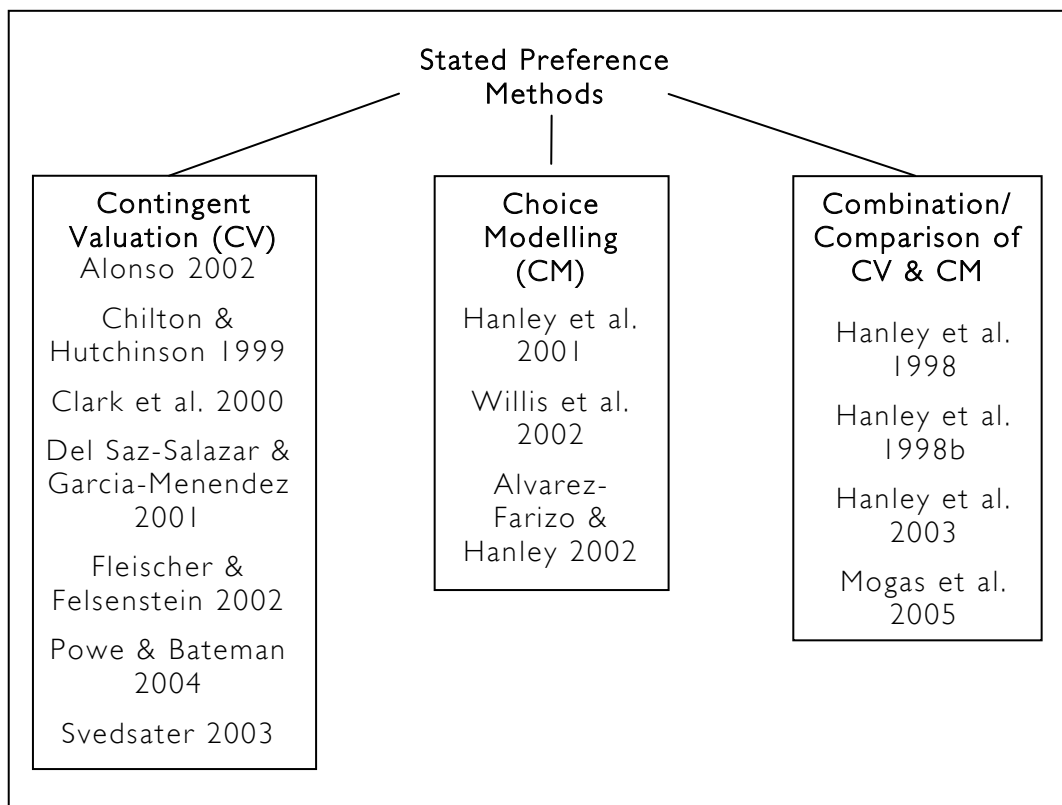


Figure 5: Systematic review: papers classified by use of stated preference methods

Contingent valuation

A good example of a contingent valuation (CV) study found in the review is Alonso (2002). The paper reports a CV study of willingness-to-pay for housing with improved access for disabled people. The sample was mostly randomly selected households, but included 97 households specifically chosen because each had a disabled member. Respondents were asked to make a purchasing choice between two houses which were similar except that one provided an improved level of disabled access (barrier-free housing), but at a higher price. (Prior to the survey, appropriate differences in price levels had been determined using focus groups.) Photographs were used to help respondents make their decisions. The survey used a double-bounded approach – that is, if a respondent answered positively to the first price they were offered they were then offered a second, higher, price. Alternatively, if they had responded negatively, they were offered a second, lower, price. An additional question was asked, in a similar way, to determine whether people were willing to pay more for housing that could be

adapted to meet the needs of a disabled person, rather than barrier-free housing. Results showed that people would be willing to pay more for both sorts of housing.

Eight of the papers use or discuss CV exclusively. The approach to CV in these is essentially optimistic – that is, although the writers of the papers propose modifications to the way that CV studies are undertaken, the implication is that, provided those modifications (and perhaps some others) are made, CV studies can give the ‘right’ answer in relation to willingness-to-pay. Two papers present a contrary view to this. Svedsater (2003) demonstrates that respondents are often unclear about what CV study questions mean and how to answer them. Clark et al. (2000), using post-survey in-depth focus groups, challenge the notion that respondents in a CV survey either understand what is required of them or respond in a meaningful way. Although Chilton and Hutchinson (1999) also indicate a lack of understanding amongst respondents to CV studies, they take a more optimistic stance, implying that, with careful pre-design, this problem could be minimised (although not necessarily eliminated altogether).

A number of specific concerns are raised about CV in the papers, which may apply, and possibly be compounded, in relation to disabled access. The following review of the concerns arising from the papers gives examples of the potential issues for disabled access in the transport environment.

Scope People’s willingness-to-pay may be affected by the scope of the options on offer (Hanley et al., 1998; Powe and Bateman, 2004).

In relation to disabled access People may find it difficult to make an appropriate distinction between, for example, having lifts at a train station, having lifts installed and the kerb at the entrance to the station dropped as well, or having the whole station made ‘accessible’ including access to information and such like provision to cover all access needs. In consequence, willingness-to-pay for the sum of the individual elements of accessibility may be greater than willingness-to-pay for the whole station.

Reality Powe and Bateman (2004) point out that respondents also need to believe that the options they are being offered are realistic – they must believe that the project really could take place. Del Saz-Salazar and Garcia-Menendez (2001) note the importance of incorporating a realistic timescale into the survey. For their research, which was about remodelling a waterfront, they also selected a payment vehicle for the project that was more realistic than taxation (a common payment vehicle in CV): a trust fund.

In relation to disabled access Timescale is key, as access improvements in the transport environment traditionally have a long lead time (20 years for full train accessibility, for instance). In addition, many people would not consider full

accessibility of the rail network to be realistic, for example, so the outcome of the survey might be adversely affected.

Validity (of the willingness-to-pay figure provided) There may be a tendency for people to 'up' their willingness-to-pay in a hypothetical context. Two factors make this more likely: where the good on offer is considered socially desirable and a higher willingness-to-pay may appear to be a vote in favour of this good; and where people are aware that they are unlikely to have to pay themselves for the good in question, a phenomenon known as 'free-riding' (Alonso, 2002; Hanley et al., 2003).

In relation to disabled access It is difficult to determine what the impact of this might be. Many people do consider that providing disabled access is socially desirable. There are others, however, who consider that disabled people are better served by segregated provision, and a few who believe that disabled people should not be permitted on mainstream transport because they inconvenience others. Determining the 'spread' of those who believe access is socially desirable and those who do not would not be straightforward, although the stated preference experiment that forms part of this research (Chapter 7) does include attitude measures.

Use, non-use and option Willingness-to-pay may depend on whether people actually need the good on offer, do not currently need it and believe they never will, or do not need it at the moment but would like the option for the future (Hanley et al., 2003). Those who believe they will never use it may nonetheless believe it is socially desirable, as above. Use, non-use and option values together constitute total economic value, as described in section 2.3.3. Values derived using stated preference (both contingent valuation and choice modelling) incorporate total economic value. Brouwer (2000) comments that, because these different values are expressed in the same monetary unit, they are assumed to be commensurable. However, he questions whether this is the case (but does not answer his own question).

In relation to disabled access Total economic value is particularly pertinent as disability – whether temporary or permanent – can happen to anyone, at any time. Someone who does not currently use disabled access may well need it in the future – especially as the incidence of disability increases with age (Metz, 2003). Some of the same issues pertain here as pertain to the validity question – some people are fearful of engaging with disability (Hughes, 2002; Barnes et al., 1999) and do not like to entertain the concept that they themselves might become disabled. In the stated preference experiment, questions about people's attitudes towards disabled people's rights, especially in relation to transport, were included to try to identify whether existence values in particular increased respondents' willingness-to-pay (section 3.3.8).

Benefits transfer There are currently doubts as to whether a study undertaken in one place is transferable to another (Hanley et al., 2003). Brouwer (2000) proposes a number of factors for improving reliability of CV results so that they can accurately be transferred: defining the (environmental) goods and services; identifying stakeholders; identifying values held by different stakeholder groups; stakeholder involvement in determining the validity of monetary (environmental) valuation; study selection; accounting for methodological value elicitation effects (that is, the approach taken to estimating willingness-to-pay values); and stakeholder involvement in value aggregation (that is, involving stakeholders in the way in which willingness-to-pay values are attributed to the whole population affected by a change).

In relation to disabled access This is significant. For example, if a study were undertaken at Salisbury station to determine local people's willingness-to-pay for disabled access, how transferable would the results be to Thetford station? This is complicated further because in some contexts additional factors can have a significant impact on ease of access. For example, in a place where the environment is naturally flat and people with mobility impairments are able to get around more easily, a small difference in disabled access at the local railway station might be particularly desirable and increase some people's willingness-to-pay.

Understanding Respondents may differ in their understanding of the questions or propositions that are put to them in CV studies (Chilton and Hutchinson, 1999; Svedsater, 2003). Chilton and Hutchinson used content analysis of focus-group output (paying specific attention to what focus group participants say and to their meaning) in proposing a way of addressing this. Svedsater asks respondents directly to "think aloud" when they are answering the willingness-to-pay questions. Clark et al. (2000), on the other hand, challenge the notion that respondents can genuinely provide valuations.

In relation to disabled access Understanding is indeed likely to be an issue, as disabled people's access needs can be very different depending on the specific environment. Presented with a change, a disabled respondent might have difficulty identifying how effectively it will address her or his access needs, and this might affect their willingness-to-pay. Either Svedsater's or Chilton and Hutchinson's approach could make a useful preliminary to a CV survey design, whilst bearing in mind the more pessimistic view of Clark et al.

(Participants') Ethical considerations People who believe that society should provide the good, or preserve it, regardless of cost may refuse to participate, or give a willingness-to-pay as zero (Hanley et al., 2003). To overcome this, Del Saz-Salazar and Garcia-Menendez (2001) allow respondents to give a zero rating for willingness-to-pay (which leads to a particular method of analysis), whereas Clinch

and Murphy (2001) advocate allowing negative, zero or positive willingness-to-pay, where there may be 'winners and losers' from a project.

In relation to disabled access Many disabled people (and some non-disabled people) believe that access is a fundamental civil right, and will be unwilling to put a price on it: allowing a zero willingness-to-pay would therefore be important. And sometimes access improvements do produce 'losers' – for example, tactile paving is important for the safety of visually impaired people, but can cause discomfort to people with walking difficulties.

Equity considerations One of the challenges to CV is that those with higher income will respond with a higher willingness-to-pay, which inequitably gives the preferences of the rich precedence over those of the poor. This is one reason why, in a health context, Cost Effectiveness Analysis is often preferred over Cost Benefit Analysis. In Cost Effectiveness Analysis the outcome is a given, and it is used to determine the most cost-effective route to that outcome. Thus income differences will not lead to different (and potentially inequitable) outcomes. Donaldson et al. (2002) argue that there are distribution problems in whatever method is used. They offer ways to reduce the distributional impact, whereas Kenkel (1997) claims that taking income into account may be appropriate.

In relation to disabled access Given the lower average income of disabled people (e.g. Barnes, 1991), this is an important consideration. In a willingness-to-pay survey of the population as a whole, disabled people would be disproportionately represented at the lower income levels.

Justice Richardson (1999) notes that, in relation to a health intervention, giving priority to people with more severe conditions appears 'to be consistent with social values'.

In relation to disabled access social values, in conjunction with the Social Model of disability with its emphasis on removing barriers, might lead to the prioritisation of access for those who experience the greatest barriers – for example, step-free access removes what for some people is a total barrier to access, whereas improved signage addresses a disadvantage that is usually a deterrent rather than a total barrier. To pursue that example, however, generally fewer people will benefit from step-free access than will benefit from improved signage, so the balance of advantage depends on whether *numbers* who will benefit or *level* of benefit is considered the priority.

Choice modelling

A good example of a choice modelling (CM) study is Alvarez-Farizo and Hanley (2002). This paper's focus was on the environmental costs of generating energy from renewable sources, specifically wind farms. The use of choice modelling

enabled the separate valuing of different 'attributes' in the form of different environmental factors. Both choice experiments (discrete choice) and contingent rating were used in the survey. Photographs of the existing situation and simulated photographs of the wind farm development were used to elicit respondents' views. The payment vehicle was an increase in taxes. The authors demonstrated that certain environmental attributes were valued more highly than others.

Of the 27 resources identified for the review, 8 use or discuss CM techniques and of these, 4 advocate choice experiments (CE). These papers all argue that CE is the only reliably welfare-consistent method (section 3.3.1), although one (Alvarez-Farizo and Hanley, 2002) uses both CE and contingent rating.

Willis et al. (2002) use CE (which they call stated choice) and contingent ranking to value service levels and nature conservation in the water industry. They do not comment on the techniques used except to suggest briefly that, for their purposes, the approach was preferable to using CV because of the inability to disaggregate values in CV.

Of the resources, 4 consider the advantages and disadvantages of CM (Hanley et al., 1998b; Hanley et al., 2001; Ratcliffe, 2000; Hanley et al., 2003). The main ones are set out below, with comments on issues for disabled access in transport project appraisal.

Both Mogas et al. (2005) and Hanley et al. (1998) directly compare the results of CV and CE surveys, finding that CV bids are in general lower than CE bids.

Advantages

Multi-dimensional change Where a change has a number of identifiable attributes, CM enables valuation of those changes individually within a single survey, whereas in CV each attribute would have to be valued in a separate survey.

In relation to disabled access It would be useful to be able to compare levels of access in different aspects of the transport environment being studied – for example, lifts versus ramps, or fixed signage versus electronic systems – and to identify the level of utility for each. The stated preference experiment undertaken for this thesis (sections 3.3 and 7.3) measures willingness-to-pay for different types of step-free access.

More information CM provides more information than CV, as respondents are offered choices several times over, and are therefore able to express their preference over a range of payment amounts.

Less obvious elicitation As CM does not ask respondents directly for their willingness-to-pay but includes the payment amount in a range of options, it may be less open to some of the problems outlined above in relation to CV (protest bids, free-riding, etc.).

In relation to disabled access given the potential problems arising from perceptions of access as a civil right, this might be a more effective route in eliciting willingness-to-pay.

Disadvantages

Design considerations Unless restricted, the number of possible choices offered to respondents can result in too great complexity. Hanley et al. (2001, p.448) point out that: “Both experimental economists and psychologists have found ample evidence that there is a limit to how much information respondents can meaningfully handle while making a decision”. The number of choices can be limited, but routes imposing such restrictions are complex. The choice of attributes, the levels given to attributes and the way in which choices are presented can also have a significant impact on the results of a CM survey.

In relation to disabled access Such design considerations would need to be taken into account, and significant pre-survey work would be needed with experts and focus groups.

Separability of individual attributes There may be instances where it does not make sense to separate out different attributes of a project, as for example when you cannot have one without another, or a certain level of another (Hanley et al., 1998b).

In relation to disabled access this is an important issue – lifts at a transport interchange, for example, are less useful if there are kerbs to negotiate to enter the interchange – people with walking difficulties would be able to take advantage of them, but not wheelchair users.

Data analysis The results of a CM survey can require complex analysis. A key reason for this is to deal with the problem of independence of irrelevant alternatives (section 2.3.4) – the relative probability of two options must not be affected by the introduction or removal of a third.

In relation to disabled access This is a potential issue as the relative probability of choosing, say, a ramp rather than a lift is unlikely to be affected by whether the trains have buffet cars, for example – whereas it might be affected by the presence or absence of seating on the station. Where there are long distances to walk, as with ramps, respondents with walking difficulties may need seating so that they can rest, more so than they would were lifts available.

Whole and parts There is some evidence (Hanley et al., 2001) that the value of a *whole* project that comprises attributes valued as part of a CM survey cannot be assumed to be equal to the *sum* of the values for the component attributes. CV studies value the whole project at once, and when CV and summed CM results have been compared for the same project, CV results are generally found to be

lower. The comparisons in Mogas et al. (2005) and Hanley et al. (1998) bear this out.

In relation to disabled access As noted above, the ability to value individual attributes is useful, but potential over-valuation of the whole project would need to be taken into consideration – and a CV study run in parallel with a CM study could be a useful way to compare values. (This was considered for the stated preference experiment in this research, but it could not be undertaken because of lack of resources.)

Benefits transfer Because CM enables the disaggregation of values for individual attributes, it apparently provides more valuable information for benefits transfer. This may not be the case, however, for at least two reasons (Hanley et al., 2003): first, respondents' preferences in one location may differ from the preferences of respondents in another location; and secondly, socioeconomic factors, which CM has only limited ability to address, may vary from location to location. Since the review took place, a paper by Morrison et al. (2002) has addressed ways in which the transfer of benefits valued using CM can be successfully achieved.

In relation to disabled access Preferences may differ from one location to another depending on the respondents' experience of disabled people in a given area. For instance, many people near the Sussex coast may be aware of St Dunstan's, a well-known institution for visually impaired people, and those in the area might be particularly disposed to value access improvements that benefit people with visual impairments, whereas in Milton Keynes, the presence of the Spinal Injuries Association headquarters might alert people to the needs of wheelchair users. Additionally, socioeconomic factors such as age would be influential in relation to preferences in access improvements, given the link between disability and age (e.g. Metz, 2003).

Value versus cost Ratcliffe (2000) challenges the usefulness of CM studies on the grounds that, whereas CV studies ask respondents to *value* an intervention with a health benefit, CM studies attach *cost* to the intervention. Ratcliffe states "Cost and value are two different concepts with different meaning and therefore potentially different interpretations" (p.272).

In relation to disabled access This should be borne in mind in any willingness-to-pay study, although the 'value' of access might be significantly greater than a person's willingness-to-pay for it. In essence, the choice of technique would depend on whether the willingness-to-pay is being identified for the purpose of prioritisation – where the amount of investment has already been decided (e.g. in Cost Effectiveness Analysis), in which case people's 'valuation' of it is key – or for monetising the benefit (in Cost Benefit Analysis).

6.2.5. Other monetisation methods

Both Junankar and Liu (2003) and Fleischer and Felsenstein (2002) consider other ways of monetising benefits.

Junankar and Liu (2003) estimate the social rate of return – the net benefits to society, and thus in effect government surplus, although they do not use the term – of improving the education of indigenous Australians. They use census data to estimate earnings potential relative to levels of education, and extrapolate from this the potential increase in earnings for indigenous Australians should their education levels be improved. They then assess the additional social benefits and costs of the additional earnings or education respectively, from which they calculate the social rate of return.

In the study, the link between education and earning potential is established at the outset through national statistics. Although there is an acknowledged link between transport for disabled people and employment (e.g. Peck and Bashall, 2000) it is not a straightforward 'one-to-one' link and, using existing data, it may not be possible to show clearly how an increase in mobility through improved transport access improves employment prospects.

Fleischer and Felsenstein (2002) use proxy measures to estimate the net benefits to Israel of staging the Eurovision Song Contest in 1999. They do this from three aspects: consumer surplus (benefits derived by consumers for which they do not actually pay), government surplus (benefits accruing to government for which it does not pay – often savings to the public purse) and producer surplus (additional benefits generated for the private sector by the Contest). In order to estimate government surplus, the authors considered how, by promoting Israel in the countries that screen the Contest, advertising costs were saved. Between songs, short clips of the country were shown, and the cost of advertising Israel in each country for that length of time was estimated. In order to estimate producer surplus, they took the private sector incremental profits, from the additional expenditure that the foreign visitors made whilst in Israel for the duration of the Contest. In order to estimate consumer surplus they undertook a CV study.

In appraisal all three aspects of surplus are important. In relation to government surplus from disabled access, a possible parallel to the opportunity cost of advertising identified by Fleischer and Felsenstein (2002) is the opportunity cost of government expenditure on specialist transport services for, for example, health or education. Its estimation is challenging, however, as there are many factors involved in whether, for example, a disabled person can get a job and stop receiving benefit – transport is just one of them. In relation to producer surplus, a study by the UK Department for Work and Pensions considered the cost benefit for employers of employing disabled people (Needels and Schmitz, 2006). Additionally for producer surplus, the literature on Corporate Social Responsibility

might give some indication of the benefits deriving from improved access to services, yet transport is just one factor of many even though access cannot be secured unless transport is available,. Finally, data on numbers and categories of disabled people are gathered on many different bases for different research projects, and as definitions of disability and classifications of impairment differ widely, it is not clear whether different studies are, in fact, commensurable. In essence, some approximations could be made, but at present they would be rough approximations only.

6.2.6. Other frameworks

Multi-Criteria Analysis

Glaister (1999) reviews the UK government's 'New Approach To Appraisal', which was the first time the Department for Transport had advocated a Multi-Criteria Appraisal framework. At the time, the framework was intended for use in relation to highways, but the principles that Glaister outlines, such as acknowledging the rights and aspirations of affected individuals, can equally well be applied to public transport. However, as Glaister points out, the 'New Approach To Appraisal' acknowledges that many impacts are not currently quantified, and although it proposes a seven-point scale for such impacts, this is not to be considered as *scoring* or *weighting* the impacts, so this still leaves practitioners without means of quantifying benefits of disabled access.

Both papers by Mathieson (2001 and 2004) address methods that could be used within a Multi-Criteria Appraisal framework. The 2001 paper reviews the appropriate use of expert opinion in assessment hierarchies, and ways to ensure greater rigour in the assessment process. Mathieson also considers the appropriate role of analysts, where options can be combined logically, and the institution, where institutional preference has to be exercised. In relation to disabled access, for example, issues of aesthetics or branding, such as the overall colour scheme, are a matter for institutional preference; whereas issues of functionality, such as the colour contrast of different elements of a building interior, can be considered by 'experts'.

The 2004 paper outlines a method known as Benefits Analysis, which "is a systematic method for formulating complex, multi-factor investment appraisal problems where decision-makers seek to realize non-financial benefits". Benefits Analysis models a problem so that the analyst can draw inferences about value. In modelling the problem, chains of cause and effect are built up "which link investment variables to value variables in such a way that analysis can be applied to quantify benefits" (p.392).

Both of Mathieson's papers assume the input of experts in the decision-making process. In the field of disabled access there is some dispute as to who is the 'expert' – access consultants, disability professionals (such as medical professionals), or disabled people themselves – and this would present a challenge for the implementation of these methods.

Total cost analysis

DeCorla-Souza et al. (1997) advocate the use of Total Cost Analysis (TCA). There are two essential differences between Cost Benefit Analysis and Total Cost Analysis. First, all impacts, including benefits, are presented as costs, providing one figure – hence 'total cost'. Benefits are presented as negative costs – that is, they are subtracted from the costs. As a consequence, a project with benefits that outweigh its costs will result in a negative total. The authors claim that a single cost figure is easier for policy makers to understand than concepts like 'benefit:cost ratio' or 'net present worth' (value). Secondly, and importantly in relation to disabled access, they claim that "there is no suggestion that all benefits or impacts of significance have been considered and that the results may be used as the sole decision criterion" – decision-makers are free to balance the total cost figure against other criteria they consider important.

What is not clear, however, is whether since the article was written the concept has been widely adopted by decision-makers in the transport industry. In addition, benefits are not necessarily incorporated into the appraisal, so in relation to disabled access, there is still considerable dependence on practitioners actively incorporating these benefits.

6.3. Addressing the research question

6.3.1. Summarising the evidence

The purpose of the review was to answer the research question:

"What methods have been used to quantify non-market impacts for incorporation into evaluation frameworks for projects and can these methods be adapted to address disabled access in transport projects?"

Of the 27 papers that were included in the review analysis, two of these, DeCorla-Souza et al. (1997) and Glaister (1999), accept unquantified non-market impacts in the framework, but the treatment of these impacts is left up to the decision-makers. These papers, though valuable, do not assist in answering the research question.

The predominant methods for quantifying non-market impacts for use in appraisal frameworks, as identified in this review, were explicitly linked to Cost Benefit Analysis and involved monetisation through stated preference.

Quantification of non-market impacts that did *not* involve monetisation was noticeably rare in the output from the review. Mathieson (2004) deals with a method that can attribute value, but although it is clear how the method can be applied to achieve a qualitative value, it is not clear how that value is quantified or monetised. The thrust of an earlier paper (Mathieson, 2001) is essentially to provide an approach to decision-making that uses expert input to enable prioritisation, and that approach could also be applied to the quantification of non-market impacts.

Other papers identified during the initial selection process used non-monetary methods to quantify non-market impacts (Ding, 2005; Kijak and Moy, 2004), but they were not retained in the review following the application of the quality criteria, largely because of the difficulty of understanding how the methods were to be applied.

Most of the papers focus solely on estimating consumer surplus through the application of stated preference methods. Fleischer and Felsenstein (2002) address monetisation using stated preference to calculate consumer surplus, but they also monetise government and producer surplus. Junankar and Liu (2003) address the social rate of return (broadly, government surplus), deriving monetary values from assumptions based on national statistics.

Table 25 summarises the methods identified through the review that could be used to quantify the impacts of disabled access. It highlights the strengths and weaknesses of each method in relation to disabled access, and records papers that provide insight into the practical use of the method. Two frameworks are considered – Cost Benefit Analysis and Multi-Criteria Analysis. Cost Effectiveness Analysis is not considered: because it involves determining a desired outcome at the outset, it requires a prior decision in principle to address disabled access, and following that decision, any methods used to quantify – where that is appropriate – are the same as those used in Cost Benefit Analysis. ‘Strengths’ and ‘weaknesses’ in the table relate solely to the method’s possible transfer to the field of disabled access, and are not a comment on the methods *per se*.

Where a paper addresses more than one method, it is linked in the table with the method it most clearly espouses or most fully explains. Papers that do not provide insight into the practical use of the method, such as Richardson (1999), are omitted from the table; so is Rendel Planning (1992), which is essentially a summary of methods.

Frame-work	Purpose	Method	Strengths	Weaknesses	Papers
CBA	Monetise consumer surplus	Contingent Valuation	Provides a monetary value Fewer choices to be made (than for CM)	Best used to value a project as a whole It may be difficult for people to set a value so directly Open to 'protest bids' and 'free riding' Requires large-scale survey Benefits identified may not be transferable to other projects	Alonso (2002) Brouwer (2000) Chilton & Hutchinson (1999) Clinch & Murphy (2001) Del Saz-Salazar & Garcia-Menendez (2001) Fleischer & Felsenstein (2002) Hanley et al. (2003) Powe & Bateman (2004) Svedsater (2003)
		Choice Modelling: choice experiments	Provides a monetary value Enables valuation of individual attributes Easier (than CV) for people to understand what they are being asked 'Status quo' choice is legitimate	The number of choices may cause fatigue Correct choice of attributes is crucial Requires large-scale survey Benefits identified may not be transferable to other projects	Alvarez-Farizo and Hanley (2002) Hanley et al. (1998) Hanley et al. (1998b) Hanley et al. (2001) Mogas et al. (2005)

Frame-work	Purpose	Method	Strengths	Weaknesses	Papers
				When attribute values are combined, can give inflated figure for the 'whole'	
		Choice Modelling: other techniques	Provides a monetary value Enables valuation of individual attributes	Not considered to be 'welfare-consistent' (section 3.2.4) Other issues are the same as for choice experiments	Willis et al. (2002)
	Monetise government surplus	Social rate of return	Provides a monetary value Captures 'cross-sector' benefits	Data base likely to be inconsistent, leading to unreliable results Possible 'double-counting'	Junankar & Liu (2003)
		Opportunity cost	Provides a monetary value Some work has been done already (Lansman, 2004, Fowkes et al. 1995)	May result in 'double-counting' Data may not be complete or wholly reliable Possible 'double-counting'	Fleischer & Felsenstein (2002)
	Monetise producer surplus	Increased revenue	Provides a monetary value Captures cross-sector benefits	Data may be unavailable Possible 'double-counting'	Fleischer & Felsenstein (2002)

Frame-work	Purpose	Method	Strengths	Weaknesses	Papers
MCA	Quantify benefits	Benefits analysis	Focused, can be done on a reasonably small scale	Does not directly provide a monetary value Relies heavily on experts	Mathieson (2004)
		Assessment hierarchies	Focused, can be done on a reasonably small scale	Does not directly provide a monetary value Relies heavily on experts	Mathieson (2001)

Table 25: Systematic review: methods and techniques

6.3.2. Which method?

Indications from the review

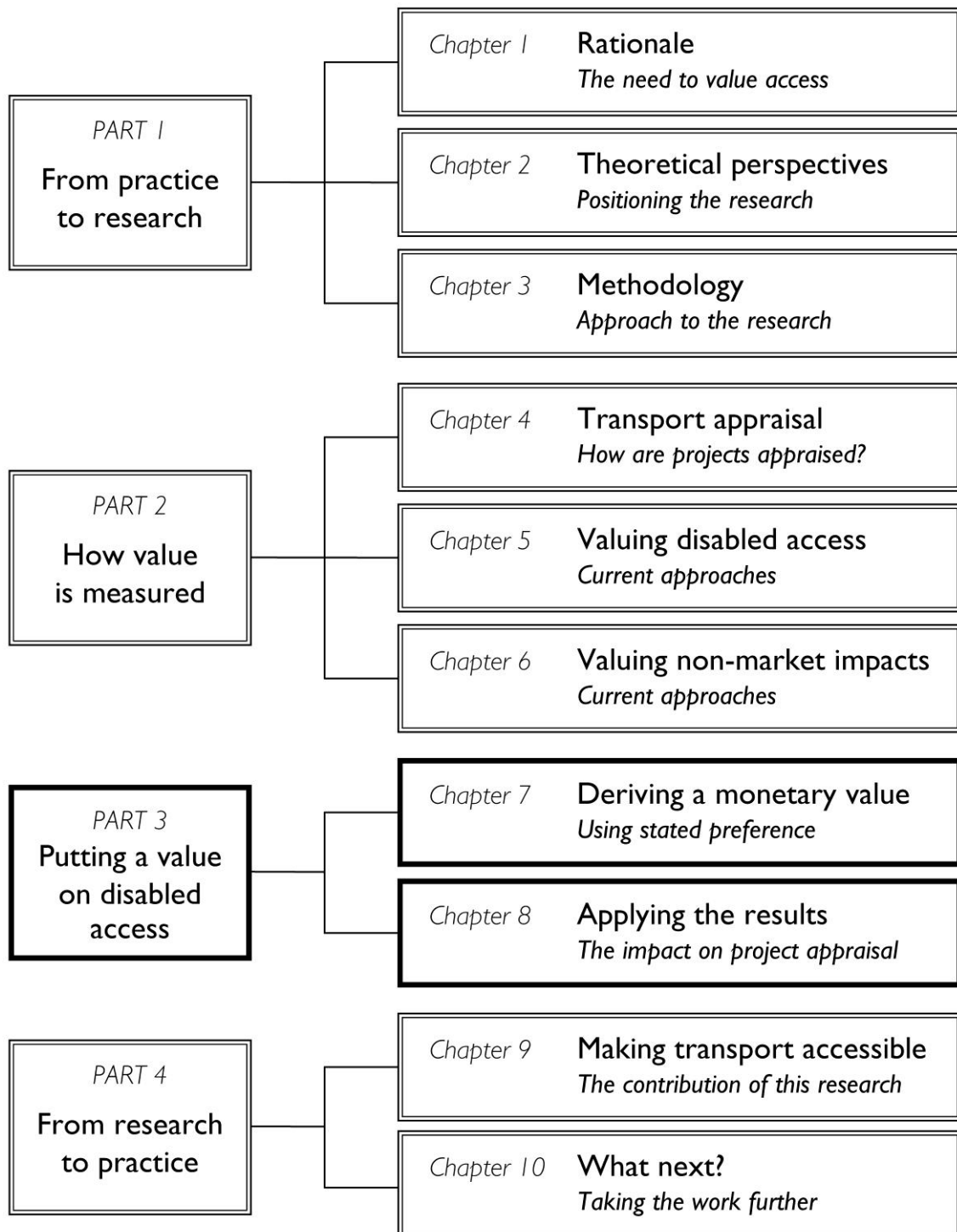
The review identified a number of possible ways of quantifying impacts, most of which involve monetisation using stated preference methods. In terms of disabled access, monetisation is appealing because of the apparent dominance of Cost Benefit Analysis in the UK Transport Industry. Neither paper by Mathieson (2001 and 2004) offers an immediate route to monetisation.

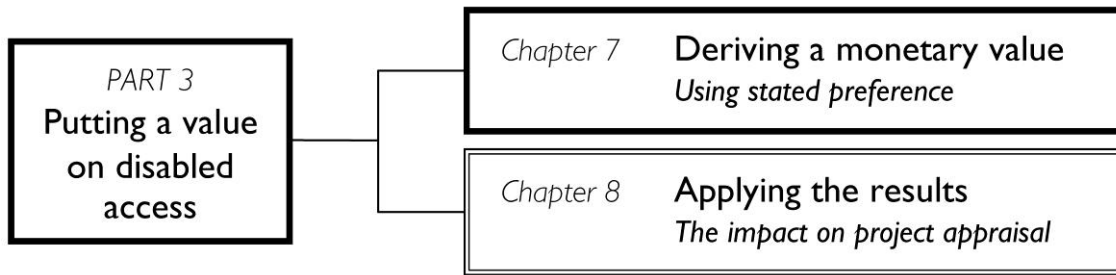
The range of sectors where the benefits of accessible transport would have an impact (section 5.1.2) suggests that a comprehensive approach to monetising should capture all three areas of surplus: consumer, government and producer. Because of the significant difficulties associated with estimating government and producer surplus already outlined, however, figures derived would be approximations only, as with the work of Fowkes et al. (1994) in estimating government surplus.

One advantage of stated preference over revealed preference is that it captures 'total economic value', not just use value – because it asks people to value goods in a hypothetical situation, they do not already have to be using them, as they do with revealed preference. Additionally, because of the multiplicity of barriers that disabled people experience, there are potential problems obtaining sufficient or robust revealed preference data, so the decision was taken to use stated preference.

The method chosen for this research was a stated preference survey, using discrete choice modelling, to estimate willingness-to-pay for disabled access at heavy-rail stations. The focus of the study was platform-to-platform access methods – a major element of expenditure in a station upgrade – with a view to extending the same valuation approach to other aspects of disabled access in the future.

Part 3 – Putting a value on disabled access





Chapter 7. Deriving a monetary value

This chapter gives the background to the stated preference experiment and presents the results – the willingness-to-pay figures.

7.1. Appraisal practice in transport

It is important to managers in the transport field to have a robust method of incorporating the value of disabled access into the economic appraisal of transport projects. The research outlined in the previous chapter demonstrated that without adequate guidance on incorporating disabled access into the economic appraisal, practitioners are unclear how to deal with it (section 5.2). Currently, disabled access is not explicitly included in mainstream transport appraisal methodology in the UK. There are two possible headings under which to incorporate it in the Appraisal Summary Table (section 4.3.1), but the available evidence of benefit is almost exclusively qualitative. Individual practitioners approach valuation in different ways, and this lack of consistency can distort the value-for-money calculations that underlie investment decisions. In the tram case study, practitioners were clear that the lack of monetisation of benefits had a detrimental effect on the business case for the projects (section 5.2). If monetised *costs* form part of the Cost Benefit Analysis, whereas *benefits*, because they are *not* monetised, are omitted from the analysis, the resulting benefit:cost ratio will be misleading, and decisions based upon it may be skewed.

If practitioners are to develop a robust and reliable appraisal for transport projects, supplying an evidence-based monetary figure for the benefits of disabled access is essential.

7.2. Valuation of non-market impacts

Access for disabled people at rail stations cannot readily be given a market value – disabled access features do not attract a higher ticket price, for example. Because they are non-market impacts, they must be treated accordingly.

In the systematic literature review described in the last chapter, the predominant methods for quantifying non-market impacts for use in appraisal frameworks were explicitly linked to Cost Benefit Analysis and involved monetisation through stated

preference. Additionally, WebTAG Unit 3.5.4 on Cost Benefit Analysis (UK Department for Transport, 2007) espouses “a calculus of willingness-to-pay” and says:

“The principal advantage of the calculus of willingness-to-pay is that it leads naturally to a presentation of results which makes clear how a project impacts on the members of different economic interest groups (e.g. car users, public transport users, taxpayers), rather than hiding distributional impacts in the aggregation of resource costs and benefits.” (paragraph 3.1.8)

Most of the papers focused solely on estimating consumer surplus through the application of stated preference methods. This research therefore included a stated preference experiment, in which choice modelling was preferred to contingent valuation for the following reasons (see also Table 25):

- it provides a monetary value;
- it enables valuation of individual attributes;
- it is easier for people to understand what they’re being asked;
- maintaining the ‘status quo’ is a legitimate choice;
- people are less able to ‘guess’ what monetary value they are applying to the attribute in question.

Discrete choice was selected as the specific technique to use because of its welfare-consistency (section 3.3.1). This technique has some weaknesses, however. The number of choices presented to respondents, the choice of attributes, the size of the survey and the potential for inflated monetary values (the individual willingness-to-pay amounts for different attributes adding up to a higher overall value than willingness-to-pay for the ‘perfect journey’) all need to be taken into account. Issues about the design of the experiment are discussed in detail in section 3.3 and summarised in section 7.3. Sections 7.4 and 7.5 discuss the findings from the experiment.

7.3. Willingness-to-pay: the stated preference experiment

7.3.1. Background

Heavy-rail was chosen as the environment in which to locate the research, in part because that is the transport environment with which the author is most familiar and in which she had relevant contacts. Although selecting trams instead would more obviously have complemented the research on the incorporation of disabled access into appraisals, as noted in the discussion of the case study, tram systems have been purpose-built and so present few good examples of modifying existing infrastructure for disabled access. Step-free access from platform to platform at heavy-rail stations requires modification that can be clearly costed, and it is the most expensive element of disabled access provision (Maynard, 1999).

A considerable amount of public money has been committed for infrastructure improvements that address the needs of disabled people across the UK rail network over the ten years through the Access for All Fund (Strategic Rail Authority, 2005). In addition, Transport for London assumes responsibility for the National Rail service between Euston and Watford Junction in November 2007 (Transport for London, 2007) and plans to make significant improvements to disabled access at intervening stations (Transport for London, 2006a). The catchment area of the rail service between Euston and Watford Junction thus offered an excellent opportunity to carry out this experimental research.

Transport for London generously provided financial sponsorship for part of the fieldwork for this research, and contributed to the project through membership of the advisory group. The Department for Transport also contributed to the project through membership of the advisory group.

More detail on the methodology for this piece of research is given in section 3.3. The detailed findings are presented in section 7.4 and section 7.5.

7.3.2. Research question and hypotheses

Research question

The research question was:

“Is it possible to use choice modelling methodology to derive a robust range of values (i.e. internally and externally validated) of willingness-to-pay for specific features of disabled access at heavy-rail stations, disaggregated by specific groups defined within a Social Model of disability framework?”

Internal validation was to be achieved by verifying that the direction and magnitude of the utility coefficients (section 2.3.4) was appropriate for each attribute.

External validation would be achieved by comparing values of time derived in the research with the Department for Transport’s standard ‘Value of Time’.

Research hypotheses

The main research hypothesis was that improved access at stations positively impacts willingness-to-pay for rail travel: that is, where the access method is easier for disabled people, *not just disabled people* are willing to pay. The order of preference was hypothesised to be:

‘Stairs with lift’ > ‘Stairs with ramp’ > ‘Ramp only’ > Stairs

Other hypotheses related to the level of impact particular socioeconomic characteristics would have on the level of willingness-to-pay. People expected to have higher willingness-to-pay values included:

- *People who experience physical barriers* – these people may or may not be disabled; step-free access would benefit them by reducing the physical barriers.
- *People who have a long-term impairment* (section 2.1.3) – many of these people have difficulty with steps.
- *People who self-identify as disabled* (section 2.1.3) – many of these people have difficulty with steps.
- *Men and women with children under 5 years of age* – these people often have difficulty negotiating steps with toddlers or pushchairs, for example.
- *Women with children under 5 years of age* – women are still the main providers of child care in the family, so women would be expected to have a higher willingness-to-pay than both men and women together who have children under 5.
- *Those who (strongly) support the inclusion of disabled people in mainstream provision, such as mainstream public transport* – these people have a high existence value (section 3.3.1) for accessible access methods.

7.3.3. Sample segmentation: numbers

For each segment analysed (section 3.3.6), the number of respondents in that segment is provided at the head of the table. Numbers of respondents vary substantially in the disability-related segments: people who experience physical barriers (187: 45.4%); people who have a long-term impairment (82: 19.9%); and people who self-identify as disabled (39: 9.4%). People who experience physical barriers make up almost half the sample; this may explain to some extent the level of consumer surplus in the findings. The Census results for the London Borough of Brent, where this stretch of railway is located, indicate that 15.6% of the population has a 'limiting long-term illness' (although based on the 2002 General Household Survey, the Prime Minister's Strategy Unit (2005) reported 21% of the UK population as a whole as disabled). The question on impairment is the closest to the Census question, so it might be expected that the percentage having an impairment in the sample (19.9%) would be similar to that for the Census (15.6%), whereas in fact it is significantly higher. One possible explanation for this is that the survey question did not make a causal link between impairment and lack of capacity, whereas the Census question classifies people as having a health problem or disability that limits their daily activities or the work they can do (a medical model approach). In responding to the Census question, therefore, people must implicitly accept that the restriction is 'their fault', which some people may be reluctant to do. The lower percentage of people self-identifying as 'disabled' could be explained by the reluctance of many people with impairments to accept the stigma often associated with being 'labelled disabled' (e.g. Caras, 1994).

7.3.4. Applying the results in appraisals

The figures derived in this experiment could be used in a more detailed appraisal where, for example, it was known that a given proportion of older people use the station, or where a station was being made step-free for the first time and where an estimate could be made of the number of people who need step-free access and might use the station.

7.3.5. Presentation of findings

Findings from the experiment are given below. They are first discussed in relation to all respondents across the sample, as these are the findings that would be used in the 'top line' of an appraisal for a station improvement. Thereafter, findings are discussed in relation to the data, disaggregated into the segments indicated by the preliminary hypotheses.

7.4. Stated preference experiment findings: value of time

The value of time (coefficient of 'Journey time'/coefficient of 'Journey cost') across the sample is $(0.1273)/(-0.0136) = 9.33\text{p per minute} = \text{£}5.60/\text{hour}$ (see Table 26). The disaggregated values were 9.54p per minute for commuting and 9.04p per minute for leisure travellers.

The DfT standard 'Value of Time' is currently 9.12p per minute for commuting time and 8.07p per minute for non-work-related journeys. These values were calculated by increasing the 2002 'Value of Time' figures in WebTAG Unit 3.5.6 (UK Department for Transport, 2007) by the annual uplift percentages provided to bring them up to 2006 values. The Department for Transport's values are not significantly different ($p < 0.05$) from the values derived in this research, demonstrating convergent validation – that is, the research results are externally validated as required by the research question.

7.5. Stated preference experiment findings: willingness-to-pay

7.5.1. All respondents

Table 26 shows results across the sample.

Variable	Coefficient	Significant? (p<0.05)
'Journey time'	-0.1273	Y
'Journey cost'	-0.0136	Y
'Ramp only' versus Stairs	0.0730	N
'Stairs with ramp' versus Stairs	0.2056	Y
'Stairs with lift' versus Stairs	0.6510	Y

Table 26: Stated preference experiment: all respondents ($n=411$)

The relative utility of the different attributes was expected to be as follows:

'Stairs with lift' > 'Stairs with ramp' > 'Ramp only' > Stairs

A higher coefficient indicates greater utility, so the expectation of relative utility is confirmed across the sample, although the coefficient for 'Ramp only' is not significant, indicating that it is not robust. This is not entirely surprising: a long ramp (without stairs) lengthens the route for many people who could otherwise use stairs, which adds a time penalty. In addition, some people with walking difficulties find ramps more difficult than stairs.

For 'all respondents' willingness-to-pay for the two significant access methods ($p<0.05$) is:

'Stairs with ramp' $0.2056/(0.0136) = 15p$

'Stairs with lift' $0.6510/(0.0136) = 48p$

Willingness-to-pay values may seem high for the lift option across the sample. Anecdotally, however, the author's experience at her local rail station, Milton Keynes Central, supports the findings. Until the lifts were refurbished in 2006–7, they were 'old-style' goods lifts, with heavy folding doors that were manually operated. They were also extremely slow (the question 'are we moving?' was often asked by new lift users). The average number of users when a train had come into the station during the evening peak period was around four to six, mostly people who could not manage stairs, or who had bicycles or luggage. Since the refurbishment it is normal for the author to have to wait, with around four to six other people, for the 'next' lift as the *sixteen-person* lift is already full.

7.5.2. Disability-related findings

The preliminary hypotheses predicted that disability as defined in the experiment (experience of barriers, having an impairment and/or self-identification as 'disabled') would have a higher willingness-to-pay for disabled access.

People who experience barriers in the physical environment

Of all the respondents, 187 experience barriers in the physical environment, such as steps and stairs, lack of seating, long walking distances. Table 27 shows the results for these respondents; Table 28 shows the results for the 224 people who do not experience physical barriers. Willingness-to-pay comparisons are shown in Table 29.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1163	Y
'Journey cost'	-0.0119	Y
'Ramp only' versus Stairs	0.3876	Y
'Stairs with ramp' versus Stairs	0.4902	Y
'Stairs with lift' versus Stairs	1.1040	Y

Table 27: Stated preference experiment: people who experience physical barriers ($n = 187$)

For people who experience physical barriers, the coefficients for all three forms of access are significant and increase in magnitude as the access provision improves. This indicates that these respondents derive utility from all forms of platform-to-platform access in the predicted order (section 7.5.1).

Variable	Coefficient	Significant? (p<0.05)
'Journey time'	-0.1440	Y
'Journey cost'	-0.0161	Y
'Ramp only' versus Stairs	-0.4715	Y
'Stairs with ramp' versus Stairs	-0.0420	N
'Stairs with lift' versus Stairs	0.2689	Y

Table 28: Stated preference experiment: people who do not experience physical barriers ($n=224$)

For people who do not experience physical barriers, the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) and significant. The coefficient for 'Stairs with ramp' is also negative, but not significant. The coefficient for 'Stairs with lift' is positive and significant. This indicates that these people derive utility only from a lift, preferring not to have a ramp at all, even with stairs.

There is consumer surplus, therefore, in all forms of platform-to-platform access for people who experience physical barriers, but only in 'Stairs with lift' for those who do not. Willingness-to-pay values are shown in Table 29.

Type of Access	WTP with physical barriers	WTP no physical barriers
'Ramp only' versus Stairs	$0.3876/(0.0119) = 33p$	N/A
'Stairs with ramp' versus Stairs	$0.4902/(0.0119) = 41p$	N/A
'Stairs with lift' versus Stairs	$1.1040/(0.0119) = 93p$	$0.2689/(0.0161) = 23p$

Table 29: Stated preference experiment: willingness-to-pay related to physical barriers

People with long-term impairments

In the sample, 82 people had a long-term impairment or a health or medical condition. Results for this group are shown in Table 30; results for the remaining

329 are shown in Table 31. Willingness-to-pay comparisons are shown in Table 32.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.0967	Y
'Journey cost'	-0.0114	Y
'Ramp only' versus Stairs	0.5118	Y
'Stairs with ramp' versus Stairs	0.5472	Y
'Stairs with lift' versus Stairs	1.4987	Y

Table 30: Stated preference experiment: people with a long-term impairment ($n = 82$)

For people with an impairment, the coefficients for all three forms of access are positive and significant and increase in magnitude as the access provision improves. This indicates that these respondents derive utility from all forms of platform-to-platform access in the predicted order (section 7.5.1).

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1391	Y
'Journey cost'	-0.0148	Y
'Ramp only' versus Stairs	-0.2150	Y
'Stairs with ramp' versus Stairs	0.1169	N
'Stairs with lift' versus Stairs	0.4458	Y

Table 31: Stated preference experiment: people with no long-term impairment ($n = 329$)

For people with no impairment, the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) and significant. The coefficient for 'Stairs with ramp' is positive but not significant. The coefficient for 'Stairs with lift' is positive and significant, indicating that they derive utility from this option. The coefficients

for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Type of Access	WTP with impairment	WTP no impairment
'Ramp only' versus Stairs	$0.5118/(0.0114) = 45p$	N/A
'Stairs with ramp' versus Stairs	$0.5472/(0.0114) = 48p$	N/A
'Stairs with lift' versus Stairs	$1.4987/(0.0114) = 131p$	$0.4458/(0.0148) = 30p$

Table 32: Stated preference experiment: willingness-to-pay related to impairment

People who self-identify as 'disabled'

In the sample, 39 respondents considered themselves to be disabled. Of these, 33 also stated they had an impairment. Results for those who considered themselves disabled are shown in Table 33; results for the remaining 372 are shown in Table 34. Willingness-to-pay comparisons are shown in Table 35.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1020	Y
'Journey cost'	-0.0145	Y
'Ramp only' versus Stairs	0.8189	Y
'Stairs with ramp' versus Stairs	0.9338	Y
'Stairs with lift' versus Stairs	2.0383	Y

Table 33: Stated preference experiment: people who consider themselves disabled ($n = 39$)

For people who self-identify as 'disabled', the coefficients for all three forms of access are positive and significant and increase in magnitude as the access provision improves. This indicates that these respondents derive utility from all forms of platform-to-platform access in the predicted order (section 7.5.1).

Variable	Coefficient	Significant? (p<0.05)
'Journey time'	-0.1325	Y
'Journey cost'	-0.0138	Y
'Ramp only' versus Stairs	-0.1587	Y
'Stairs with ramp' versus Stairs	0.1368	N
'Stairs with lift' versus Stairs	0.5228	Y

Table 34: Stated preference experiment: people who do not self-identify as disabled ($n=372$)

For people who do not self-identify as 'disabled', the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) and significant. The coefficient for 'Stairs with ramp' is positive but not significant. The coefficient for 'Stairs with lift' is positive and significant, indicating that they derive utility from this option. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Type of Access	WTP: 'disabled'	WTP: not 'disabled'
'Ramp only' versus Stairs	$0.8189/(0.0145) = 57p$	N/A
'Stairs with ramp' versus Stairs	$0.9338/(0.0145) = 65p$	N/A
'Stairs with lift' versus Stairs	$2.0383/(0.0145) = 141p$	$0.5228/(0.0138) = 38p$

Table 35: Stated preference experiment: willingness-to-pay related to self-identification as 'disabled'

Social Model definition

Oliver's (1996) three-fold Social Model definition of disability (section 2.1.3) was fulfilled by 33 respondents. Results for those who fulfilled Oliver's definition are shown in Table 36; results for the remaining 372 are shown in Table 37. Willingness-to-pay comparisons are shown in Table 38.

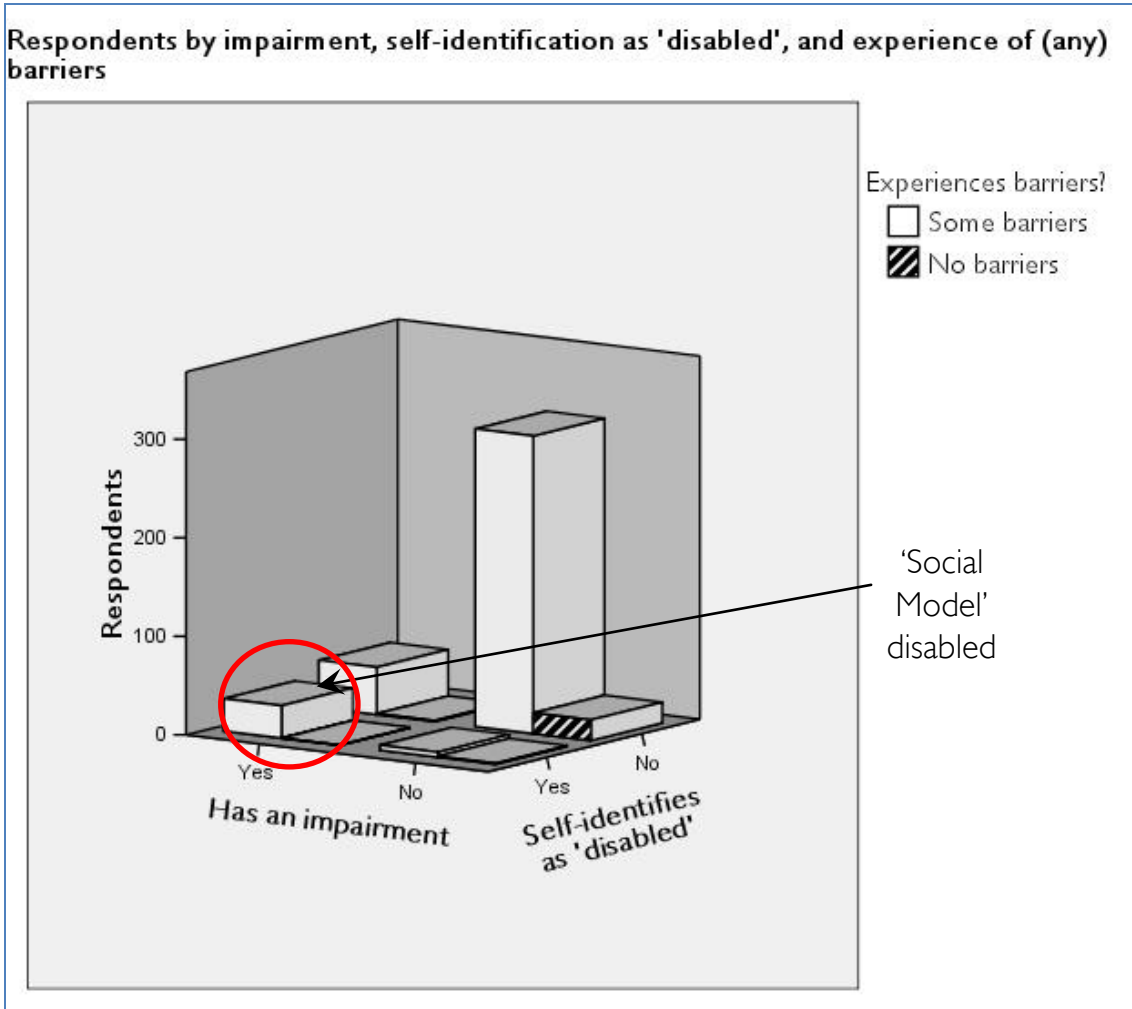


Figure 6: Stated preference experiment: respondents disabled according to Oliver's definition

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1078	Y
'Journey cost'	-0.0150	Y
'Ramp only' versus Stairs	1.2400	Y
'Stairs with ramp' versus Stairs	1.0746	Y
'Stairs with lift' versus Stairs	2.4251	Y

Table 36: Stated preference experiment: people who are disabled (Social Model) ($n = 33$)

For people who fulfil the three-fold definition of disability, the coefficients for all three forms of access are significant. The coefficient for 'Ramp only' is larger than the coefficients for 'Stairs with ramp' indicating that they derive more utility from what appears to be a less attractive form of access. It might be argued that if people who fulfil the three-fold definition need access they strongly prefer 'Stairs with lift' (the coefficient is much larger), whereas if they need access and a ramp fulfils that need, the addition of stairs is not particularly attractive.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1317	Y
'Journey cost'	-0.0139	Y
'Ramp only' versus Stairs	-0.1721	Y
'Stairs with ramp' versus Stairs	0.1434	Y
'Stairs with lift' versus Stairs	0.5241	Y

Table 37: Stated preference experiment: people who are not disabled (Social Model) ($n = 378$)

For people who do not fulfil the three-fold definition of disability, the coefficient for 'Ramp only' is again negative (that is, they prefer *not* to have a ramp only) and significant. The coefficient for 'Stairs with ramp' is positive and significant. The coefficient for 'Stairs with lift' is positive and significant, indicating that they derive utility from this option. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Type of Access	WTP: disabled (Social Model)	WTP: not disabled (Social Model)
'Ramp only' versus Stairs	1.2400/(0.0150) = 104p	N/A
'Stairs with ramp' versus Stairs	1.0746/(0.0150) = 90p	0.1434/(0.0139) = 12p
'Stairs with lift' versus Stairs	2.4251/(0.0150) = 204p	0.5241/(0.0139) = 44p

Table 38: Stated preference experiment: willingness-to-pay related to Social Model definition

7.5.3. Age-related findings

As age is one predictor of impairment (section 1.2.2), information about respondents ages was gathered in order to determine whether older people have higher willingness-to-pay for disabled access. The age ranges used in the experiment were based on age ranges used by Transport for London in previous research in order to facilitate comparison.

In the sample, 107 respondents were aged 55 and over. Results for these respondents are shown in Table 39; results for the remaining 304 are shown in Table 40. Willingness-to-pay comparisons are shown in Table 41.

Variable	Coefficient	Significant? (p<0.05)
'Journey time'	-0.0969	Y
'Journey cost'	-0.0105	Y
'Ramp only' versus Stairs	0.4556	Y
'Stairs with ramp' versus Stairs	0.3902	Y
'Stairs with lift' versus Stairs	1.1620	Y

Table 39: Stated preference experiment: people who were 55 and over ($n = 107$)

For people who are aged 55 and over, the coefficients for all three forms of access are positive and significant. The coefficient for 'Ramp only' is larger than that for 'Stairs with ramp'; this is interesting as it indicates that they derive more utility from a less attractive form of access. As with people who fulfil the three-fold definition

of disability, it could perhaps be postulated that if older people need access they strongly prefer 'Stairs with lift' (the coefficient is much larger), whereas if a ramp is adequate to fulfil their need for access, the addition of stairs is not particularly attractive.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1438	Y
'Journey cost'	-0.0156	Y
'Ramp only' versus Stairs	-0.2608	Y
'Stairs with ramp' versus Stairs	0.1319	N
'Stairs with lift' versus Stairs	0.4710	Y

Table 40: Stated preference experiment: people who were under 55 ($n = 304$)

For people who are aged under 55, the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) and significant. The coefficient for 'Stairs with ramp' is positive but not significant. The coefficient for 'Stairs with lift' is positive and significant, indicating that they derive utility from this option. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Type of Access	WTP: 55 and over	WTP: under 55
'Ramp only' versus Stairs	$0.4556 / (0.0105) = 38p$	N/A
'Stairs with ramp' versus Stairs	$0.3902 / (0.0105) = 33p$	N/A
'Stairs with lift' versus Stairs	$1.1620 / (0.0105) = 98p$	$0.4710 / (0.0156) = 40p$

Table 41: Stated preference experiment: willingness-to-pay related to age

7.5.4. Child-related findings

The preliminary hypotheses included predictions that people who have responsibility for children will have higher willingness-to-pay as disabled access makes the transport environment easier for them to use.

In the sample, 62 respondents, 45 of whom were women, had children under 5. The distribution of respondents by gender and by age of children is shown in Figure 7. Results for both male and female respondents are in Table 42; results for the women are in Table 43; and results for the 349 respondents with no children under 5 are in Table 44. Of those with no children under 5, 297 had no children under 16 either, and the results for these are in Table 45. Willingness-to-pay comparisons are shown in Table 46.

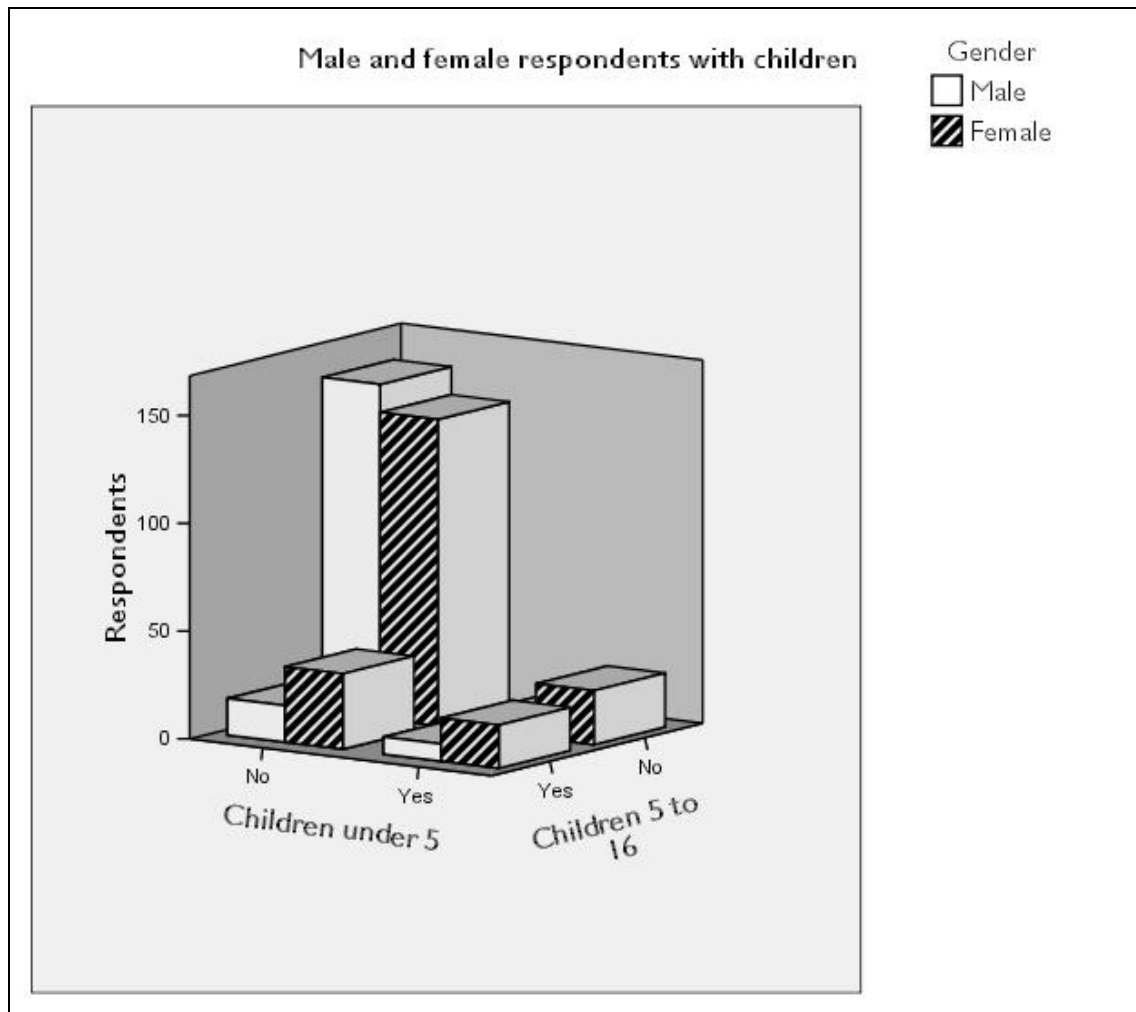


Figure 7: Stated preference experiment: respondents with children, by gender

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1185	Y
'Journey cost'	-0.0129	Y
'Ramp only' versus Stairs	0.0872	N
'Stairs with ramp' versus Stairs	0.3847	Y
'Stairs with lift' versus Stairs	1.3062	Y

Table 42: Stated preference experiment: men and women with children under 5 ($n = 62$)

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.0957	Y
'Journey cost'	-0.0096	Y
'Ramp only' versus Stairs	0.4603	Y
'Stairs with ramp' versus Stairs	0.7664	Y
'Stairs with lift' versus Stairs	1.4868	Y

Table 43: Stated preference experiment: women with children under 5 ($n = 45$)

For people who have children under 5, the coefficients for 'Stairs with ramp' and 'Stairs with lift' are positive and significant, indicating that they derive utility from both these access methods, but greater utility from the latter (the coefficient is larger). The coefficient for 'Ramp only' is positive but not significant. For women with children under 5, however, coefficients for all forms of access are positive and significant and increase in magnitude as the access provision improves. This indicates that these respondents derive utility from all forms of platform-to-platform access in the predicted order (section 7.5.1).

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1307	Y
'Journey cost'	-0.0138	Y
'Ramp only' versus Stairs	-0.1048	N
'Stairs with ramp' versus Stairs	0.1764	Y
'Stairs with lift' versus Stairs	0.5442	Y

Table 44: Stated preference experiment: people with no children under 5 ($n = 349$)

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1375	Y
'Journey cost'	-0.0143	Y
'Ramp only' versus Stairs	-0.1419	N
'Stairs with ramp' versus Stairs	0.1302	N
'Stairs with lift' versus Stairs	0.5424	Y

Table 45: Stated preference experiment: people with no children ($n = 297$)

For people with no children under 5, the coefficient for 'Ramp only' is negative (indicating that they prefer *not* to have a ramp only), but not significant. The coefficient for 'Stairs with ramp' is positive and significant, as is the coefficient for 'Stairs with lift', indicating that they derive utility from both these options. Those with no children under 16 prefer not to have a ramp only. In addition, the coefficient for 'Stairs with ramp' is not significant. Again, the coefficient for 'Stairs with lift' is positive and significant, indicating that these respondents derive utility from this option. The coefficients for access methods for both groups of respondents increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

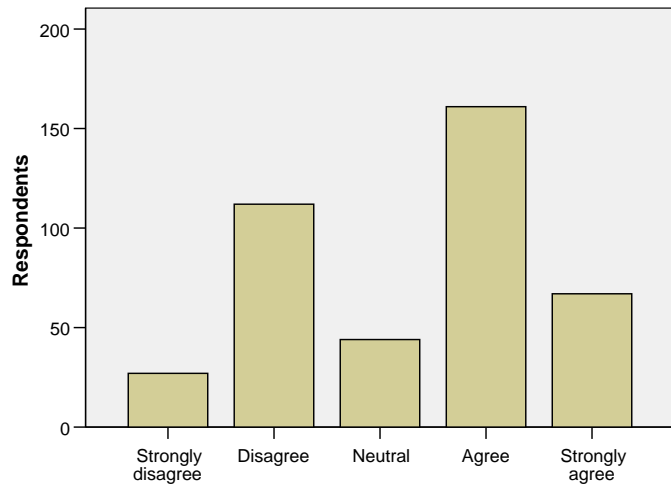
Type of Access	WTP: people with no children	WTP: people with no children under 5	WTP: men and women with children under 5	WTP: only women with children under 5
'Ramp only' versus Stairs	N/A	N/A	N/A	39p
'Stairs with ramp' versus Stairs	N/A	15p	32p	64p
'Stairs with lift' versus Stairs	46p	46p	110p	125p

Table 46: Stated preference experiment: willingness-to-pay related to children

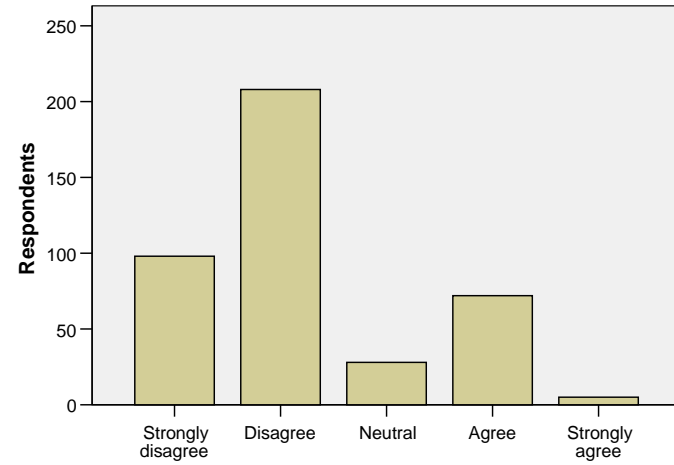
7.5.5. Attitude-related findings

The preliminary research hypotheses predicted that people with a 'positive attitude' towards providing access for disabled people in the mainstream transport environment would have a higher willingness-to-pay because they would derive existence value (section 2.3.3) from the access methods.

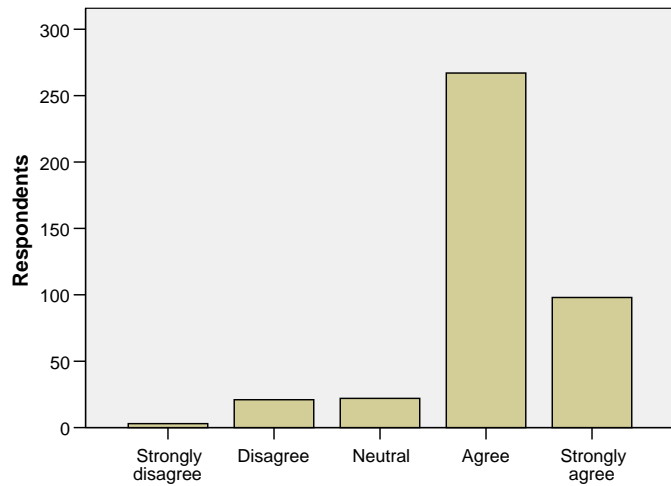
For the attitudinal questions, respondents who agreed or strongly agreed with questions 1, 3 and 6 and disagreed or strongly disagreed with questions 2, 4 and 5 were considered to have a 'positive attitude'. In the sample, 79 respondents met this criterion. Figure 8 shows the results for the attitudinal questions.



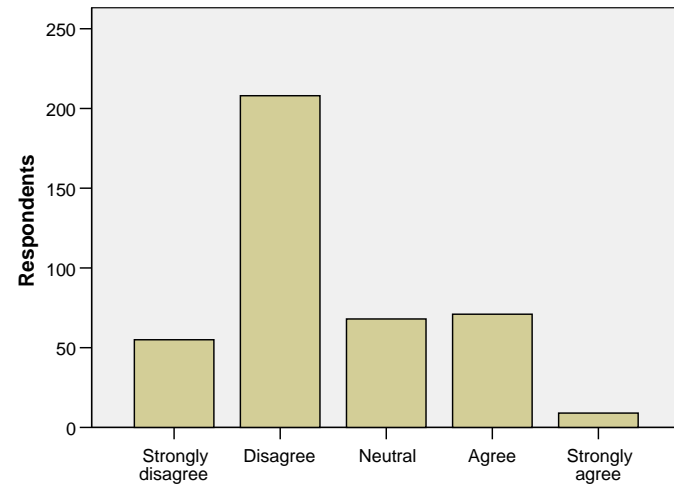
Difficulties with public transport stop disabled people being useful members of society



Disabled people shouldn't complain about public transport because a lot has already been done to make it easy for them



Accessible public transport for disabled people benefits the whole community



People who spend taxpayers' money making transport easier for disabled people are just doing it to look good

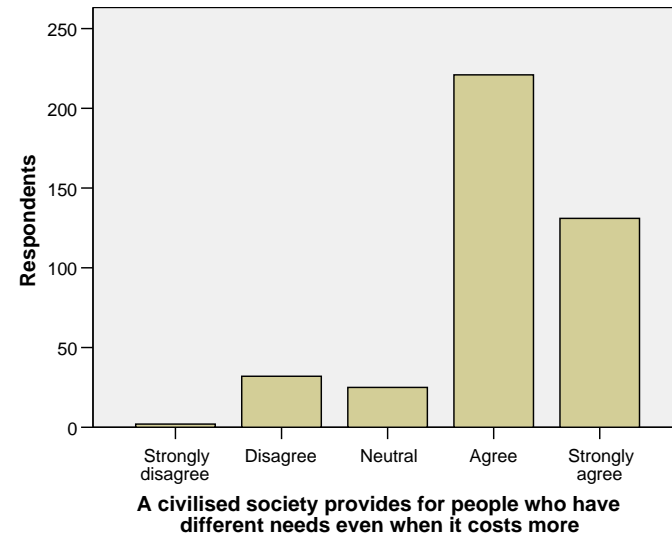
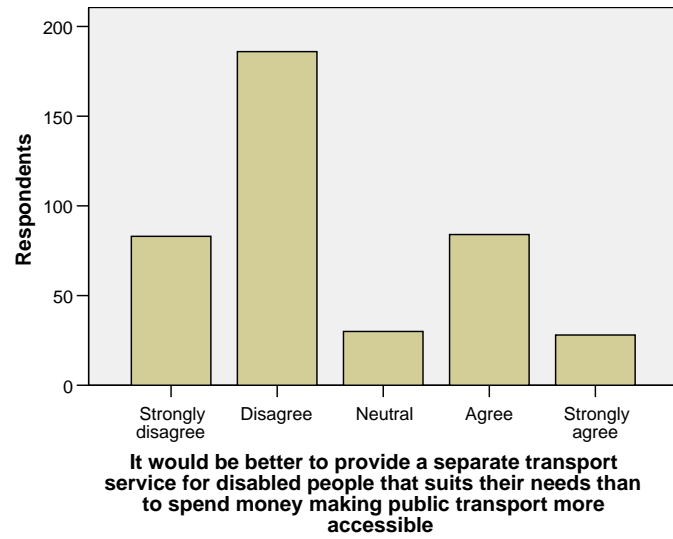


Figure 8: Stated preference experiment: attitudinal question results

Of the 79 respondents with a 'positive attitude', 48 also experienced physical barriers and/or had an impairment and/or self-identified as 'disabled'. For the other 31 respondents, therefore, this is likely to be an issue of option or existence value (both aspects of total economic value – section 3.3.1). Results for respondents with a positive attitude are shown in Table 47; results for the remaining 332 are shown in Table 48. Willingness-to-pay comparisons are shown in Table 49.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1077	Y
'Journey cost'	-0.0123	Y
'Ramp only' versus Stairs	0.6789	Y
'Stairs with ramp' versus Stairs	0.8497	Y
'Stairs with lift' versus Stairs	1.1840	Y

Table 47: Stated preference experiment: people with a positive attitude ($n = 79$)

For people with a positive attitude, the coefficients for all three forms of access are positive and significant and increase in magnitude as the access provision improves. This indicates that these respondents derive utility from all forms of platform-to-platform access in the predicted order (section 7.5.1). For those who do not need the access, this is likely to encompass some existence value because of their stance on access to the transport system, as well as possible use value (section 2.3.3).

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1362	Y
'Journey cost'	-0.0143	Y
'Ramp only' versus Stairs	-0.2496	Y
'Stairs with ramp' versus Stairs	0.0529	N
'Stairs with lift' versus Stairs	0.5356	Y

Table 48: Stated preference experiment: people with a neutral/negative attitude ($n = 332$)

For people who do not have a positive attitude (that is, are neutral or negative), the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) and significant. The coefficient for 'Stairs with ramp' is positive but not significant. The coefficient for 'Stairs with lift' is positive and significant, indicating that they derive utility from this option. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1). This supports the hypothesis that people who agree that disabled people's need should be addressed in mainstream transport provision have higher willingness-to-pay and exhibit existence value (section 2.3.3) for disabled access provision.

Type of access	WTP: positive	WTP: neutral/negative
'Ramp only' versus Stairs	$0.6789/(0.0123) = 57p$	N/A
'Stairs with ramp' versus Stairs	$0.8497/(0.0123) = 71p$	N/A
'Stairs with lift' versus Stairs	$1.1840/(0.0123) = 99p$	$0.5356/(0.0143) = 45p$

Table 49: Stated preference experiment: willingness-to-pay related to attitude

7.5.6. Income-related findings

Because willingness-to-pay uses money to represent strength of preference, those with less money available are likely to have lower willingness-to-pay values. The experiment therefore gathered information about respondents' incomes in order to determine whether the level of willingness-to-pay differed between those with higher and those with lower incomes.

There were 9 income bands in the experiment from under £5,000 to £75,000 and over. For the purposes of analysis, income was divided into 'below average' up to £19,999 and 'above average' from £20,000 upwards. This is because the mean income in London in 2005 was £27,894 but the median was £19,685 "suggesting that the mean is skewed upwards by very high incomes at the top end" (Fordham Research Ltd., 2005). There were 213 respondents with below-average income and 122 with above-average income (76 did not know or declined to say). Results for respondents with below-average income are shown in Table 50; results for those with above-average income are shown in Table 51. Willingness-to-pay comparisons are shown in Table 52.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1429	Y
'Journey cost'	-0.0145	Y
'Ramp only' versus Stairs	-0.0128	N
'Stairs with ramp' versus Stairs	0.0589	N
'Stairs with lift' versus Stairs	0.8120	Y

Table 50: Stated preference experiment: respondents with below-average (<£20k) income ($n = 213$)

For people with below-average income, the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) but not significant. The coefficient for 'Stairs with ramp' is positive but not significant. The coefficient for 'Stairs with lift' is positive and significant, indicating that they derive utility from this option. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1295	Y
'Journey cost'	-0.0138	Y
'Ramp only' versus Stairs	-0.0726	N
'Stairs with ramp' versus Stairs	0.2039	Y
'Stairs with lift' versus Stairs	0.6525	Y

Table 51: Stated preference experiment: respondents with above-average (£20k+) income ($n = 122$)

For people with above-average income, the coefficient for 'Ramp only' is negative but not significant. The coefficient for 'Stairs with ramp' is positive and significant, as is the coefficient for 'Stairs with lift' indicating that they derive utility from both these options. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Willingness-to-pay is shown in Table 52. People with below-average income are willing to pay more for 'Stairs with lift' than people with above-average income. However, they are not willing to pay for 'Stairs with ramp', whereas those with above-average income are. Perhaps, for those respondents with below-average income, the utility of a ramp is too marginal to be worthwhile, whereas the lift is perceived as a valuable provision. It is interesting to note here that only 10% of people with above-average income have an impairment, as opposed to 23% of those with below-average income. People with an impairment across the sample as a whole are willing to pay for both 'Ramp only' and 'Stairs with ramp'. Income seems to have a significant bearing on willingness-to-pay in this context.

Type of Access	WTP: below avg.	WTP: above avg.
'Ramp only' versus Stairs	N/A	N/A
'Stairs with ramp' versus Stairs	N/A	$0.2039/(-0.0138) = 17p$
'Stairs with lift' versus Stairs	$0.8120/(-0.0145) = 68p$	$0.6525/(-0.0138) = 55p$

Table 52: Stated preference experiment: willingness-to-pay related to income

7.5.7. Rail-use-related findings

Because other stated preference surveys have sampled only rail users (sections 5.1.3 and 7.7), analysis of the difference between willingness-to-pay values for those who had used rail in the past 5 years and those who had not was undertaken for comparison.

Most of the respondents (365) had used rail in the past 5 years. Results for these respondents are shown in Table 53; results for the 46 who had not are shown in Table 54. Willingness-to-pay comparisons are shown in Table 55.

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1297	Y
'Journey cost'	-0.0145	Y
'Ramp only' versus Stairs	-0.0444	N
'Stairs with ramp' versus Stairs	0.2692	Y
'Stairs with lift' versus Stairs	0.6351	Y

Table 53: Stated preference experiment: people who had used rail in the past 5 years ($n = 365$)

For people who had used rail in the past 5 years, the coefficient for 'Ramp only' is negative (that is, they prefer *not* to have a ramp only) but not significant. The coefficients for 'Stairs with ramp' and 'Stairs with lift' are both positive and significant, indicating that they derive utility from both these options. The coefficients for access methods increase in magnitude from 'Ramp only' to 'Stairs with lift' as expected (section 7.5.1).

Variable	Coefficient	Significant? ($p < 0.05$)
'Journey time'	-0.1301	Y
'Journey cost'	-0.0089	Y
'Ramp only' versus Stairs	-0.2852	N
'Stairs with ramp' versus Stairs	-0.2957	N
'Stairs with lift' versus Stairs	0.8098	Y

Table 54: Stated preference experiment: people who had not used rail in the past 5 years ($n = 46$)

For people who had not used rail in the past 5 years, the coefficients for both 'Ramp only' and 'Stairs with ramp' are negative (that is, they prefer *not* to have either) but not significant. The coefficient for 'Stairs with lift' is positive and significant.

Willingness-to-pay figures are shown in Table 55. Rail users invest value in 'Stairs with ramp' whereas non-rail users do not. Those who have not used rail in the

past 5 years may have been discouraged by a lack of access in the rail environment, and this could be why they are only willing to pay for the easiest form of access – that is, a lift. Another explanation might be that 35% of those who had not used rail in the last 5 years had an impairment, as opposed to only 18% of those who had used rail. The difference in relation to physical barriers is not as striking – 46% of those who had used rail experienced physical barriers, as compared with 39% of those who had not.

Type of Access	WTP: rail user	WTP: non rail user
'Ramp only' versus Stairs	N/A	N/A
'Stairs with ramp' versus Stairs	$0.2692/(-0.0145) = 23p$	N/A
'Stairs with lift' versus Stairs	$0.2692/(-0.0145) = 53p$	$0.8098/(-0.0089) = 68p$

Table 55: Stated preference experiment: willingness-to-pay related to rail use

7.5.8. Summary of findings

A summary of all willingness-to-pay figures is given in Table 56. These figures can be incorporated into a Cost Benefit Analysis in a transport project appraisal, to provide a way of quantifying benefit in monetary terms. '–' is used to indicate that the willingness-to-pay was not significant (including negative figures).

Segmentation	WTP: 'Ramp only'	WTP: 'Stairs with ramp'	WTP: 'Stairs with lift'
All respondents	–	15p	48p
Impairment	45p	48p	131p
No impairment	–	–	30p
'Disabled'	57p	65p	141p
Not 'disabled'	–	–	38p
Physical barriers	33p	41p	93p
No physical barriers	–	–	23p

Segmentation	WTP: 'Ramp only'	WTP: 'Stairs with ramp'	WTP: 'Stairs with lift'
Social Model	104p	90p	204p
Not Social Model	–	12p	44p
No children	–	–	46p
No children under 5	–	15p	46p
Children under 5	–	32p	110p
Women with children under 5	39p	64p	125p
Aged 55 and over	38p	33p	98p
Aged under 55	–	–	40p
Positive attitude	57p	71p	99p
Neutral or negative attitude	–	–	45p
Below-average income	–	–	68p
Above-average income	–	17p	55p
Has used rail in past 5 years	–	23p	53p
Has not used rail in past 5 years	–	–	68p

Table 56: Stated preference experiment: willingness-to-pay figures for all segments analysed

7.6. The method and technique: review of relevant issues

The systematic literature review (section 6.2.4) highlighted certain advantages and disadvantages of the chosen method (choice modelling) and technique (discrete choice). The experiment took these into account as follows.

7.6.1. Advantages of discrete choice modelling

Choice modelling was selected over contingent valuation because of its ability to value specific attributes individually. For disabled access this is potentially an important feature. Stations are rarely built from scratch, so practitioners often have to decide which aspects of a station to improve. Although only one disabled access attribute was included in this experiment, this was valuable in establishing the usefulness of choice modelling as a technique to use in future, more complex experiments. In addition, it enabled the measurement of respondents' value of time so that the results could be externally validated against the DfT's 'Value of Time'.

It was also vital to have an indirect way of eliciting monetary values from the respondents. Disabled access to transport is considered by many to be a civil right, so being asked explicitly to pay (extra) for it could have resulted in a high level of protest responses, not only from disabled people themselves but also from others who take this moral stance.

Discrete choice was chosen because of its welfare-consistency (section 3.3.1) and its relative simplicity for respondents in comparison with ranking techniques.

7.6.2. Potential issues in discrete choice modelling

The issue of separating out attributes – whether it makes sense, for example, to measure willingness-to-pay for step-free access from platform to platform without considering access from street to platform – was not incorporated into the experiment. Self-evidently, however, there is little value to step-free platform-to-platform access unless the traveller can first reach one or other of the platforms. At least one platform must therefore be accessible from the street, and this street-to-platform access can usually be provided by modifying only a single step or kerb, or by providing an alternative route onto the platform.

Given the simple nature of the experiment as designed, with just three attributes – 'Journey cost', 'Journey time' and 'access method' – it is a reasonable assumption that the attributes are 'independently and identically distributed' (IID – section 2.3.4), satisfying the 'irrelevance of independent alternatives' condition. In a future experiment with more, and potentially interdependent, attributes such as seating and platform-to-platform access (section 6.2.4), tests can be run to ensure that IID holds (e.g. Hausman and McFadden, 1984).

When applying the results in appraisals, it will be necessary to bear in mind the slightly higher values that may be attributed to the individual attributes (the 'whole and parts' problem highlighted in section 6.2.4). This is a common problem with stated preference choice modelling and the issue can be explored in further research, for example using contingent valuation to value a 'fully accessible' station

(that is, one with access for disabled people to all parts of the station). Whether the willingness-to-pay values obtained through this research are transferable to a different situation – either geographically different or qualitatively different (for example, heavy to light rail) – would need to be explored through further research.

7.7. Comparison with relevant stated preference studies

7.7.1. The Steer Davies Gleave study

The study background

In section 5.1.3 a study by Steer Davies Gleave (2000) was described in which choice modelling was used to value a range of service improvements at rail stations. There were four segments in the sample: South-East commuters; first-class Intercity travellers; second-class Intercity business travellers; and second-class Intercity ‘other’ travellers. The study valued 22 attributes, including ‘movement within the station’ with three levels: around 20 steps to reach platform or to cross tracks; ramps as alternatives to all steps; and lifts and escalators as alternative to all steps. Photographs were provided, although the only picture shown in the report is that of the ramp.

Willingness-to-pay values derived

The willingness-to-pay values derived in the study were scaled using an estimated maximum willingness-to-pay. The scaled willingness-to-pay values in pence thereby derived (p.44) are as shown in Table 57.

Movement within station	South-East commuters	First Class Intercity	Second Class Intercity business	Second Class Intercity other
Stairs → ramp	0.0	17.9	14.4	23.6
Stairs → lift and escalators	0.0	21.7	23.0	21.2

Table 57: Willingness-to-pay values (Steer Davies Gleave, 2000)

Comparison with this research

Potential issues

Only *existing* rail passengers were included. Socioeconomic information gathered included age and gender. Questions about disability, impairment or responsibility for children were not asked. The four sample segments were analysed according

to their socioeconomic make-up, but the stated preference data were not, so it is not possible to compare the study results with any of the segments in this research, except perhaps those who had used rail in the past 5 years.

The attribute level 'lifts and escalators' does not reflect normal provision in the rail environment. In considering the attribute levels for platform-to-platform access in this experiment, escalators were omitted as they are not used at stations other than mainline stations. The study focused on regional stations (paragraph 2.9) and thus escalators were not, in this author's view, an appropriate access method to include. This may have affected respondents' perception of the reality of the 'lifts and escalators' option.

The values derived

In relation to providing a ramp or a lift instead of stairs, the report states:

"The replacement of stairs in the station with ramps or lifts and escalators was not valued at all by South-East commuters with the parameters on both improvements being statistically insignificant. Standard class Intercity other placed the highest value on the replacement of the stairs, with ramps being the most preferred option. This is possibly because these travellers were the most likely to be travelling with substantial amounts of luggage. No information the respondent's luggage was collected in the questionnaire." (p.36)

Respondents *were* asked to rank 13 improvements in order of preference, however. These included train luggage areas, which were ranked the lowest by all four segments, suggesting that 'substantial amounts of luggage' was not an issue, even for standard-class Intercity 'other' passengers. An alternative explanation for the higher valuation of ramps by standard-class Intercity 'other' travellers may have been that this segment included the highest percentage of women (48%) and, given their greater caring responsibilities, disabled access features may have been more important for them (section 7.5.4 above).

South-East commuters show no willingness-to-pay for either improvement. A large number of station and train improvements other than ramps, and lifts and escalators, were included in the Steer Davies Gleave research, and willingness-to-pay values for South-East commuters are lower for all the improvements in the study than values for the three other categories of passenger. The lack of value attached by these passengers to either ramps or lifts and escalators might be due to the weight of their other concerns – in particular, capacity issues – combined with concerns about fare levels (e.g. London Travelwatch, 2007). In addition, the kind of rail environment that exists in the South-East is not easy for people who need access arrangements other than stairs. The report lists the origin stations of 'South-East commuters', of which only around 40% are step-free (accounting for

approximately 40% of respondents). A further 25% of these stations are unstaffed, and this can make it harder for people who need physical access to use these stations. It is therefore unlikely that people who need physical access will commute by train in this area.

For an improvement from stairs to ramps, the figures for first-class Intercity travellers and standard-class Intercity business travellers are broadly similar to the figures derived in this research for 'all respondents', but somewhat higher for standard-class Intercity 'other' respondents. This last figure is more comparable with the figure for people who had used rail in the last 5 years, however. The figures for an improvement from stairs to lifts and escalators in the report are much lower than the figures derived in this research either for rail users or for 'all respondents'. For standard-class Intercity 'other' travellers, they are also lower than the figures in the study for ramps. This is counter-intuitive given the additional time and effort required to use a ramp rather than a lift. A possible reason for this might be the unrealistic nature of the choice 'lifts and escalators' as mentioned above.

7.7.2. The Japanese study

Also in section 5.1.3 a recent Japanese study (Suzuki et al., 2007) was described, in which contingent valuation was used to value a wide range of features at rail stations. The study focused on a specific station and weighted the relative importance of the various disabled access features so that the willingness-to-pay for the whole station could be disaggregated. The figures derived for lifts are lower than the figures derived in this study, and are shown in Table 58.

Respondents	Yen	Approximate £
Disabled people	¥31.7	13p
Older people	¥27.6	11p
Non-disabled people	¥13.8	6p

Table 58: Willingness-to-pay for lifts (Suzuki et al., 2007)

This may to an extent be attributable to the 'whole and parts' issues identified above. It might also be a function of the particular station where the survey was undertaken or some specifically Japanese cultural issue. Interestingly, in relation to disabled access across the whole station, shown in Table 59, the figure for older people is higher than that for disabled people. In Japan, many people with physical impairments, who would need the step-free access, do not participate actively in society:

“The majority of disabled people, I was told, stay at home or in institutions. [...] there seems to be more ambivalence in Japanese culture about people with physical impairments or disfigurements, who challenge the concepts of purity, order, and balance” (Shakespeare, 2006).

In the UK, by contrast, disabled people have been campaigning for access and have been more in the public eye since the late 1970s (section 5.2.2).

Respondents	Yen	Approximate £
All respondents	¥78.9	33p
Disabled people	¥86.6	36p
Older people	¥106.2	44p
Non-disabled people	¥61.8	26p

Table 59: Willingness-to-pay for whole station improvements (Suzuki et al., 2007)

7.8. Addressing the research question and hypotheses

Research question

The research question was:

“Is it possible to use choice modelling methodology to derive a robust range of values (i.e. internally and externally validated) of willingness-to-pay for specific features of disabled access at heavy-rail stations, disaggregated by specific groups defined within a Social Model of disability framework?”

The values of time derived were compared against the Department for Transport’s standard ‘Value of Time’ and were not significantly different ($p < 0.05$), which gives confidence that the other values derived in the research are robust. The coefficients of the access methods had intuitively appropriate directions and signs – although they did not all accord with the hypotheses, in all but two, plausible explanations could be given for the variations. For example, where the coefficient for ‘Ramp only’ was negative, this was quite probably because a respondent who could manage stairs would find that a long ramp *increased* her or his walking time and effort. The two cases in which the coefficients were harder to explain were respondents who were disabled by Oliver’s (1996) Social Model definition and respondents aged 55 and over – for which the coefficient for ‘Ramp only’ was larger than for ‘Stairs with ramp’. This is counter-intuitive as the addition of stairs does not reduce the utility in the ramp, and might therefore be expected to increase overall utility. However, the coefficient for ‘Stairs with lift’ was in both these cases much larger than either of the other two (which were not, in either

case, much different from one another), so it could be postulated that a lift is much preferred, and the difference between a ramp with stairs and a ramp only is not particularly important to these respondents.

Research hypotheses

The research hypothesis – that willingness-to-pay increases as the access method improves – is supported by the preliminary findings across all respondents for all but the long ramp. As noted in section 7.5.1, this is perhaps not surprising: a long ramp on its own increases the distance that must be travelled by everyone, and is therefore likely to decrease utility for all but those for whom stairs are an absolute barrier – that is, wheelchair users and those who are totally unable to use stairs. The signs on the coefficients for ‘Ramp only’ for the different groups and the willingness-to-pay levels support this explanation.

A number of other hypotheses were proposed at the outset of the research (section 3.3.3). These postulated that people who would be willing to pay more would include:

- people who experience physical barriers who may or may not be disabled;
- people who have a long-term impairment (section 2.1.3);
- people who self-identify as ‘disabled’ (section 2.1.3);
- men and women with children aged under 5;
- women (only) with children aged under 5;
- those who (strongly) support the inclusion of disabled people in mainstream provision, such as mainstream public transport – that is, those with a high existence value (section 2.3.3) for accessible access methods.

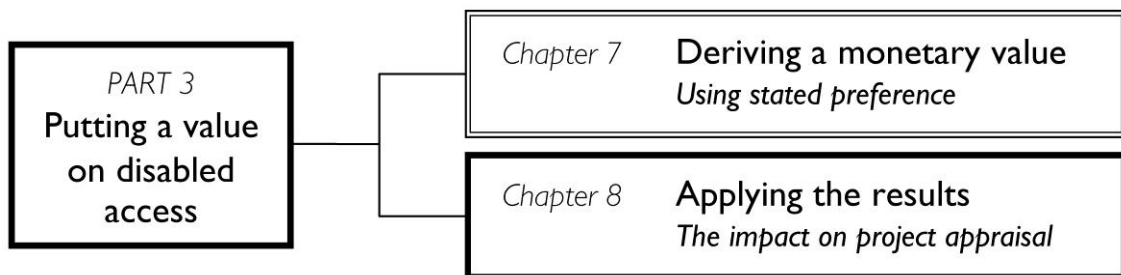
People who experience physical barriers, who may or may not be disabled, are willing to pay more than those who do not, as are people who could be classified in a range of different ways as ‘disabled’ (having an impairment, self-identifying, or fulfilling Oliver’s (1996) three-fold definition of disability).

Given that impairment and increasing age are linked (section 1.2.2), it was considered reasonable to expect greater willingness-to-pay from respondents aged 55 and over: that expectation was borne out by the data.

People (men and women) with children under 5 were willing to pay for ‘Stairs with ramp’, and for ‘Stairs with lift’. Women with children under 5 had higher values for ‘Stairs with ramp’, and for ‘Stairs with lift’, and were also willing to pay for ‘Ramp only’. Given that the onus of caring for children tends to fall on women (EOC, 2005), this is unsurprising.

Finally, those who demonstrated a positive attitude towards the inclusion of disabled people in mainstream transport provision were also willing to pay more.

In all cases, people were willing to pay for 'Stairs with lift' – the lowest amount being 23p for those who do not experience physical barriers.



Chapter 8. **Applying the results**

This chapter explores the issues and the outcome when the figures derived from the stated preference experiment are included in an appraisal. The two appraisals used are Crossrail and one of Transport for London's North London Railway projects (Hackney Interchange). The chapter examines what effect the figures have on the appraisals, and the issues and restrictions that need to be considered.

8.1. Considerations in applying the figures

The 'all respondents' figures derived from the stated preference experiment can be incorporated into the Cost Benefit Analysis of a standard transport project economic appraisal, and this offers a way of quantifying benefit in monetary terms.

The other figures can be used if (a) the different types of people who will benefit from a transport project are known, and (b) they accord with the different segments in the research. The results could then be used in their disaggregated form, as set out in the previous chapter. For example, if it were possible to estimate how many people over 55 would be using a particular station following improvements, the 'age-related' figures could be used.

In the context of an appraisal, it is important to note that the research 'journey' was into from the research location into Euston in central London. Euston station is step-free. The basis for the figures is therefore a journey that is step-free at the origin *and* at the destination. Clearly those who need step-free access need it at both ends of the journey. Those who do not actually *need* step-free access – such as non-disabled people – may derive some consumer surplus in a journey where just one end is step-free, but this cannot be assumed without testing.

8.2. The Crossrail appraisal

8.2.1. The scheme

Crossrail is new railway proposed for London and the South-East:

“It will deliver a world-class, affordable railway, with a frequent and reliable train service across the capital by 2015.” (Crossrail, 2007)

The route runs from Maidenhead and Heathrow in the west, across London, to Shenfield and Abbey Wood in the east. Between Paddington and East London the route will be newly built under the ground. Elsewhere, it will share infrastructure with the existing overground railway (including some London Underground lines). Step-free improvements are being made at some of the overground stations specifically for Crossrail.

8.2.2. The original appraisal

The current appraisal was undertaken by Crossrail in preparation for the Parliamentary Bill process and was submitted as one of the papers accompanying the Crossrail Bill in February 2005.

In developing this appraisal, Crossrail estimated the benefits from increased usage by people with 'mobility impairments' (both disabled people and people pushing baby buggies or pushchairs) in the following way. To estimate the number of Crossrail boarders who would be travelling to and from a step-free station on the route, the forecast number of boarders in the central area (the newly built area that will have full disabled access) was reduced by 40% to exclude all interchanging passengers and then by a further 40% to allow for passengers travelling to or from stations that would not be step-free. This left 36% of the Crossrail boarders in the central area to which the 4.4% uplift (the 'Tyne and Wear assumptions' – section 5.1.3) were applied, giving an additional 3,341 passengers.

In the appraisal, revenue was calculated using the proposed fares and benefits were calculated by multiplying the revenue by 2 – the so-called 'social benefit' multiplier. The origin of this is a London Underground Business Case for improved accessibility at existing Underground stations, in which it was estimated that for every £1.00 increase in revenue there was a social benefit of approximately £2.01 (Hayden, 2007). The benefits were only claimed for 30 years because it was assumed that the planned improvements from London Underground's step-free access programme would have been implemented by then and that these would have moderated or removed the benefits from Crossrail's step-free access. Using this method, £299m of benefit was identified.

8.2.3. Using willingness-to-pay figures from this research

The willingness-to-pay figures for the four categories of respondent in the stated preference experiment related to disability: having an impairment; experiencing physical barriers; self-identifying as 'disabled'; and fulfilling Oliver's (1996) three-fold definition. These were applied to the 3,341 new passengers instead of the social benefit multiplier and added to the other benefits to produce the values in Table 60. This shows that only the Social Model willingness-to-pay value comes close to the current Hybrid Bill values for benefits/revenue. This is unsurprising as only the

Social Model willingness-to-pay figure is greater than the social benefit multiplier. It should be borne in mind, however, that the social benefit multiplier is likely to include benefits other than just consumer surplus.

	Feb. 05 Bill Value	Applying WTP to additional 3,700 passengers			
Segment		Impairment	Disabled	Physical Barriers	Social Model
WTP (pp)	N/A	131	141	93	204
Benefits (£m)	299	258	277	183	401

Table 60: Crossrail appraisal: applying segment willingness-to-pay figures

One strength of the research reported in this thesis, however, is that it is possible to apply the consumer surplus for *all* passengers – not just passengers who obviously need the access. The ‘all respondents’ willingness-to-pay figure is applicable to all Crossrail boarders, in particular those who are travelling between step-free stations. The former assumes that everyone using Crossrail would be prepared to pay for step-free access. In reality, as not every Crossrail trip will be between stations with step-free access, it may be that not all users wish to pay for something from which they would derive no benefit – and some of the boarders will in any case be unable to make a journey unless it is step-free both ends. The latter approach is therefore likely to be more accurate. The ‘all respondents’ figure was then applied to the total number for boarders that Crossrail forecasts will use the system (155,474) and to the number of boarders that Crossrail forecasts will travel between step-free stations (65,058). It should be noted that the forecast boarders will include people travelling on employers’ business, and that the sample for the stated preference experiment did not include in-work trips. This is likely to affect the ‘true’ level of benefits, although it is difficult to say by how much.

	Feb. 05 Bill Values	All Crossrail boarders (155,474 people)	Crossrail 'step- free' boarders (65,058 people)
Segment		All respondents	All respondents
WTP for Lift/Stairs (pp)	N/A	48	48
Benefits (£m)	299	4,074	1,866

Table 61: Crossrail appraisal: applying 'all respondent' willingness-to-pay figures

As can be seen in Table 61, using the 'all respondents' willingness-to-pay for all Crossrail boarders results in over 13 times as much benefit as the current approach. Even with the more conservative level of benefits estimated from Crossrail journeys between step-free stations, using the 'all respondents' figure still results in over 6 times as much benefit as the current approach.

8.3. Transport for London: Hackney Interchange appraisal

8.3.1. The scheme

A possible scheme at Hackney represented an opportunity to test two of the willingness-to-pay values derived in this research and evaluate their overall impact.

The primary objective of this scheme is to increase the level of accessibility between Hackney Downs and Hackney Central National Rail stations, as the two stations are currently separated by a long stretch of road which constitutes a barrier to the use of the two stations as an interchange. The scheme will improve the links between rail routes through and around London, thereby providing better journey opportunities and time savings. The scheme will provide a step-free pedestrian link between the two stations to allow interchange, although it will still not be possible to reach either station from street level. The two options being considered for the Hackney Interchange project are (1) to install stairs and ramps or (2) to install stairs and lifts. The focus of the research on platform-to-platform access methods, therefore, makes this scheme an appropriate one in which to apply the willingness-to-pay figures from the research described in Chapter 7, which addresses step-free access from platform to platform.

8.3.2. The original appraisal

The current willingness-to-pay values from the Transport for London Business Case Development Manual (2004) only cover step-free access from the platform to the train and vice versa, and to and from the ticket hall in the station of origin. The value based on improving from the worst case (that is, no access) to the best

level of step-free access from platform to train is 0.646p, and that of improving to the best level of step-free access throughout the station is very similar – 0.649p. These values were derived from London Underground surveys. Section 5.1.3 for a discussion of the possible reasons for the difference in willingness-to-pay levels between the London Underground research and the stated preference experiment results in this thesis.

The current number of interchange passengers per year is 672,700 and the estimated number of new passengers from completion of the interchange is 320,000 (using Railplan modelling software). These forecasts were used to calculate the benefits of the scheme by taking into account time savings, crowding, road decongestion and accident benefits, as well as the step-free benefits described above.

In calculating costs and benefits, Transport for London assumes that 35% of revenues and benefits to new passengers will be realised in year 1, 70% in year 2, 90% in year 3, and 100% in year 4 and subsequent years.

Table 62 shows the relative costs (capital expenditure and per annum operating expenditure) of the two options under consideration:

Costs	Option 1 (Ramp)	Option 2 (Lift)
Capital expenditure (£000)	5,100	6273
Operating expenditure p.a. (£000)	155	155

Table 62: Transport for London Hackney Interchange: existing appraisal

The benefit:cost ratios of the two options in the original appraisal are therefore:

- Option 1 – 14.6:1
- Option 2 – 1.9:1

8.3.3. Using willingness-to-pay figures from this research

Instead of the London Underground step-free willingness-to-pay values, the willingness-to-pay values from the research were added into the appraisal, in addition to the benefits from time savings, crowding, road decongestion and accident benefits. The research values were applied to the number of passengers who currently use the interchange as well as to all the estimated new passengers who would use the interchange as a result of the scheme. For the new passengers, only half the calculated benefits are applied, following guidance in the Transport for London Business Case Manual (2004). It should be noted that the new passengers

will include people travelling on employers' business, and that the sample for the stated preference experiment did not include in-work trips. This is likely to affect the 'true' level of annual benefit and the consequent benefit:cost ratio, although it is difficult to say by how much.

In the original appraisal Option 1 (introducing ramps) was seen as the most favourable option. The benefit:cost ratio was not wholly reliable, however, as the costs of the scheme were lower, but the same benefits were assumed. This research enabled the benefits of the two options to be valued differently because this new method provides different willingness-to-pay figures for the different means of access.

The expected annual benefits from each of the different schemes, using the research figures of 15p for 'Stairs with ramp' and 48p for 'Stairs with lift', are as follows:

Scheme	Result (£000) per annum
Ramp	125
Lift	400

Table 63: Transport for London Hackney Interchange: expected annual benefit from 'all respondents' figures

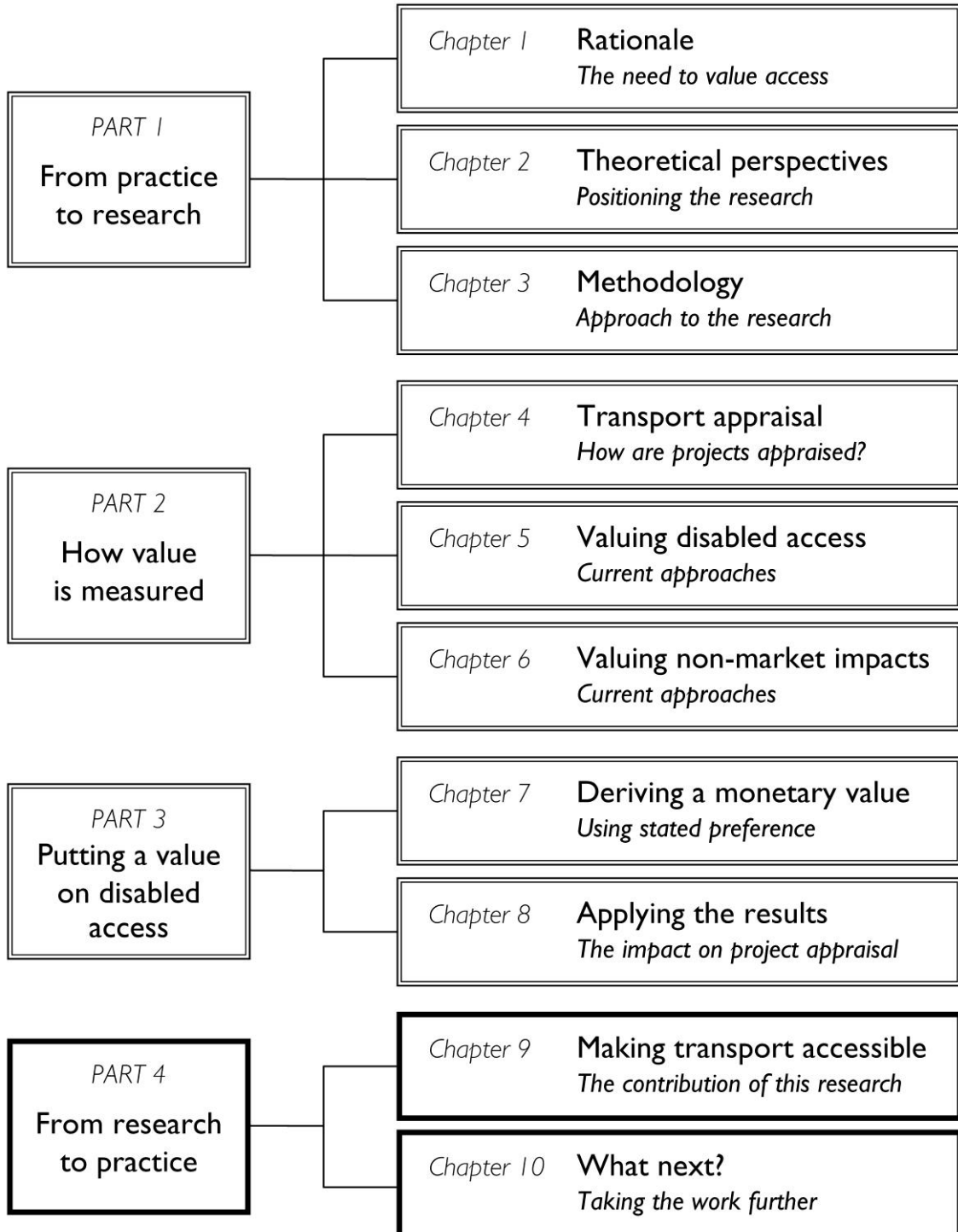
These benefits were added to the original appraisal and the result is shown in Table 64.

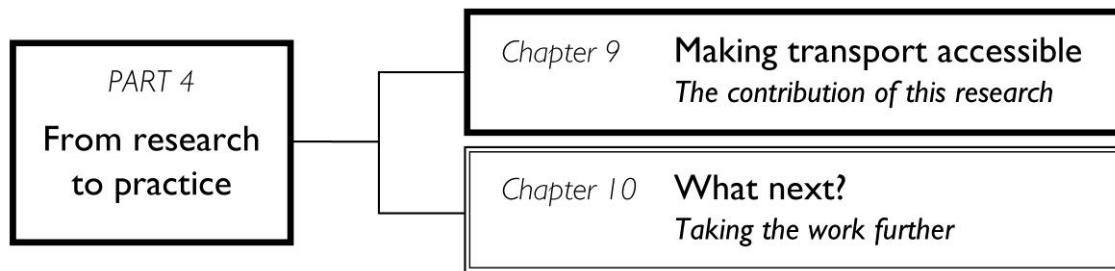
	Option 1 (Ramp)	Option 2 (Lift)
Costs and revenue		
Capital expenditure (undiscounted £000)	-5,223	-6473
Operating expenditure p.a. (undiscounted £000)	-143	-177
Revenue from increased demand p.a. (undiscounted £000)	317	317
Total discounted cost and revenue (£000)	-196	-1476
Social benefits		
Time savings (£000)	82	82
Crowding (£000)	-82	-82
Road decongestion (£000)	165	165
Accident savings (£000)	10	10
Total benefits discounted (£000)	2,864	2,864
Value of step-free access (expected annual benefit from Table 63 £000)	125	400
Total benefits discounted (£000)	4,788	9,022
Benefit:cost ratio with step-free access	24.4:1	6.1:1

Table 64: Transport for London Hackney Interchange: applying 'all respondents' figures

The willingness-to-pay values from the research have a very significant effect on consumer benefit and the resulting benefit:cost ratio. Applying them in the appraisal does not make the lift scheme the better value for money of the two options, despite the willingness-to-pay value for 'Stairs with lift' being higher than that for 'Stairs with ramp'. It does, however, give a clear insight into the difference in benefits between installing ramps and installing lifts.

Part 4 – From research to practice





Chapter 9. **Making transport accessible**

This chapter summarises the process that the research followed. It highlights the need to quantify the value of disabled access as part of the overall economic appraisal of transport projects. It argues that such access can be valued like other non-market impacts, and that doing so has a useful impact on the appraisal of 'real' projects. It lays out the contribution to knowledge and to practice, of the research as a whole and of the individual elements of the research.

9.1. Motivation

This research was motivated by a concern that access to public transport for disabled people has been inadequately addressed in the economic appraisal of transport projects. This is not just a matter of practical or moral concern for disabled people alone, but also a matter of practical and economic concern for *all* transport users: some projects have an artificially low benefit:cost ratio and may not be implemented, even though they would be beneficial for all passengers. The absence of effective valuation of the *benefits* of disabled access to the travelling public as a whole places undue emphasis on the *cost* of providing that access.

9.2. Early investigations

A preliminary review of the relevant literature was undertaken in the early stages. This included literature on the benefits of disabled access to transport, appraisal guidance, and existing appraisals. The review indicated that the place of disabled access within the current UK guidance is at best uncertain, and at worst leads to disabled access being incorporated as a cost, without the corresponding benefits to all passengers being acknowledged.

UK guidance from the Department for Transport (WebTAG: UK Department for Transport, 2007) imposes a requirement to value non-market impacts where possible. Although much has been written about the benefits of disabled access (e.g. Heraty, 1989), including benefits for society as a whole, those benefits have not generally been quantified (with the notable exception of Fowkes et al., 1994). For the environment, quantitative valuation is increasingly being undertaken and gradually figures are being produced that are more widely accepted for use in

appraisal; for disabled access however, most of the work on benefit has remained purely qualitative. The available figures for such provisions as step-free access are derived from larger surveys of willingness-to-pay. In these surveys it is not possible to clearly identify benefits to all travellers, because the survey has targeted a specific group of travellers, or in relation to individual features of disabled access, because of the nature of the attributes used in the survey. This was the case for the work undertaken by Steer Davies Gleave on rail use (section 7.7.1), by London Underground on step-free access, and by Transport for London on bus quality (section 5.1.3).

9.3. The research approach

This thesis began by exploring how disabled access is currently addressed in the economic appraisal of transport (specifically tram) projects. It then explored the literature to discover how other non-market impacts are quantified and in particular monetised. This identified stated preference as an accepted method of monetisation for non-market impacts such as environmental impacts, and discrete choice modelling as a stated preference technique that could appropriately be applied to disabled access. The thesis then described a stated preference, discrete choice, experiment to derive willingness-to-pay figures for platform-to-platform access methods at (heavy) rail stations. Finally, the figures thus derived were incorporated into existing appraisals to evaluate what difference they made. Each of these stages is described in summary below.

9.4. Appraisal in practice: the tram case study

9.4.1. The place of disabled access in appraisal

Following from the indications in the literature, a multiple-case study of tram projects was undertaken to explore how disabled access is currently treated in economic appraisal. Findings are given in Chapter 5. This study confirmed that current guidance leaves practitioners unclear about the place of disabled access in appraisal. The practitioners in the study were keen to incorporate the benefits of disabled access, but not clear which of the appraisal objectives it should come under: accessibility, economy, environment, integration or safety (UK Department for Transport, 2007), in the main plumping for 'accessibility'. In the absence of a way to monetise or even otherwise quantify the *benefits* of disabled access, these were included as a qualitative statement within the Appraisal Summary Table. In contrast, the *costs* were incorporated into the overall project costs in the Cost Benefit Analysis (under the 'economy' objective). This introduced bias into the benefit:cost ratio (the key value for money indicator), making provision of disabled access seem economically less attractive.

9.4.2. Isomorphic forces

The research examined the three tram projects through the lens of Powell and DiMaggio's (1991) new institutional theory. It found evidence that all three types of isomorphic forces – coercive, mimetic and normative – influenced the three projects. There was a difference, however, in the areas of the project *most* influenced by the different forces. In relation to design and construction, the influence was largely from coercive and mimetic forces, whereas in relation to economic appraisal, the influence was largely normative. The relative influence of mimetic and normative forces is somewhat difficult to disentangle. This thesis has argued that normative forces – the use of the same consultancy firm, and therefore, in effect, 'movement' of professionals from one project to another – was the main isomorphic influence in relation to economic appraisal. It could be argued, however, that the main isomorphic influence in appraisal arose rather from the project team's imitation of the appraisal work on previous tram systems. The boundary between mimetic and normative forces is blurred.

The research also provided evidence to corroborate the two of DiMaggio and Powell's (1991) hypotheses that were relevant to this research design (section 5.2.8).

9.5. Methods of monetisation: the systematic literature review

A second strand to the research sought to identify, by means of a systematic literature review of the valuation of non-market impacts in a number of different sectors, ways in which disabled access might be valued quantitatively. Findings from the review are given in Chapter 6. Quantification of the value was important, and monetisation was the type of quantification that would best redress the balance in the value-for-money calculation.

In the papers and other resources identified through the review, the predominant underlying framework was Cost Benefit Analysis. Most of the resources attempted some form of monetisation. The review indicated that willingness-to-pay surveys using stated preference (measures using either contingent valuation or choice modelling) is a well-accepted means of monetisation in both environmental and health economics, as well as being in common use in the transport sector. Of the two techniques, contingent valuation seemed less suited to valuing disabled access, as it asks directly for respondents' willingness-to-pay for a change which, in the context of disabled access, might result in a number of 'free-riding' or 'protest' responses (section 6.2.4). Also, as an improvement in access for disabled people is often only one part of a larger infrastructure improvement, the capacity to value it separately is highly desirable. It is easier to do this with choice modelling than with contingent valuation, therefore discrete choice, a form of choice modelling that is welfare-consistent (section 3.3.1), was selected as the technique to be used.

9.6. Willingness-to-pay: the stated preference experiment

Platform-to-platform access is the most expensive element of disabled access at heavy-rail stations (Maynard, 1999). From a research perspective this feature also has the advantage that it is fairly straightforward for a researcher to offer people the choice between alternative access methods for platform-to-platform access – other forms of access, such as accessible customer information systems, require more complicated representations and are difficult to picture. This feature was therefore selected as the focus of a stated preference experiment designed to elicit willingness-to-pay values for specific elements of disabled access at heavy-rail stations. The most common types of platform-to-platform access in the National Rail environment were selected as attributes: 'Ramp only', 'Stairs with ramp' and 'Stairs with lift'. These were compared against Stairs as the base access feature.

The research took a Social Model approach to the definition of disability, specifically following Oliver's (1996) three-fold definition: the presence of an impairment, the experience of barriers in the environment, and self-identification as 'disabled'. This was a departure from existing Individual Model approaches to such research in the transport environment.

Time values were incorporated into the experimental design so that, when combined with the monetary value represented by the journey cost, values of time could be calculated and compared with the Department for Transport's standard 'Value of Time'. This provided external validation of the results.

The survey was conducted on part of the National Rail network for which Transport for London takes responsibility in November 2007 and for which it already had plans for significant improvements. There were 411 people in the sample. The fieldwork was conducted by a commercial market research company and the analysis undertaken by the author using Biogeme, a software package developed by leading experts in discrete choice modelling.

Willingness-to-pay figures were derived for all respondents. As much has been written about improvements for disabled people assisting non-disabled people as well, it was assumed that disabled access would yield some consumer surplus across the sample. That was shown to be the case for all the platform-to-platform access methods in the experiment except 'Ramp only', for which there was surplus but with a coefficient that was not significant at the selected level ($p < 0.05$).

During the analysis, the results were broken down by segment, and willingness-to-pay figures were identified for age bands, responsibility for children, various measures of disability, and attitudes towards disabled people. The results supported the research hypothesis that the order of utility, from most to least, would be 'Stairs with lift', 'Stairs with ramp', 'Ramp only', Stairs. An exception to this was that some segments (for example, people who experience no physical

barriers) would have preferred not to have a ramp only, perhaps because of the additional time and effort required in using a long ramp if one can more quickly climb stairs. Across the sample as a whole there was nonetheless some consumer surplus in 'Ramp only' (as above).

9.7. Applying the results: putting a value on disabled access

The results for all respondents were then incorporated into two appraisals to see whether they would make any difference to the outcome. One of these was Crossrail, a major new railway across London – both underground and overground – and the other an improvement to an interchange between two rail stations that would form part of the new Transport for London 'London Overground'.

The original Crossrail appraisal used a 'social benefit' multiplier of two times revenue (section 8.2). When the willingness-to-pay figures were substituted for these figures for all Crossrail boarders travelling between step-free stations, using the 'all respondents' figure for 'Stairs with lift', the quantified benefit was increased more than six-fold. This was so even though the 'social benefit' multiplier serves as a proxy for *all* social benefit – subsuming benefits that are termed government, producer and consumer surplus in this thesis – whilst the willingness-to-pay figure from this research represents only consumer surplus.

In the Transport for London appraisal, the two different 'all respondents' figures for 'Stairs with ramp' and 'Stairs with lift' were substituted for a single 'step-free access' figure obtained from a survey of London Underground passengers. The *costs* for the two options remained the same, the lift option being higher in cost than the ramp option. The benefit:cost *ratio*, however, was substantially increased in both cases – it almost doubled for 'Stairs with ramp' and more than trebled for 'Stairs with lift'. In addition, using the figures increased the accuracy of the appraisal because the difference between the *benefits* for each option, as well as the respective costs, could be distinguished. In a different appraisal, therefore, this could mean being able to justify economically implementing one rather than another improvement, or even to justify implementing any improvement at all.

9.8. Addressing the overall research question

In section 1.5.1, the overall research question was stated as:

“How can disabled access be incorporated into the economic appraisal of transport schemes within a Social Model framework, to enable a more accurate value-for-money judgement, given the isomorphic forces acting upon transport organisations?”

The research has shown that there is currently no clear way of incorporating disabled access into the economic appraisal of transport projects. In addition, it has established that *benefits* of disabled access are generally only incorporated as

qualitative evidence, whereas the *costs* are incorporated as quantitative (monetary) values, an imbalance that creates a bias in the resulting benefit:cost ratio and affects the perceived overall value for money of the project. This means that project proposals that improve disabled access *and* are in fact economically justifiable may be mistakenly rejected.

Section 2.4 described 'realist evaluation' as identifying 'what works best, for whom, and under what circumstances'. The multiple-case study of tram system appraisals indicated that in the current 'circumstances' of economic appraisal in the UK the benefit:cost ratio is a significant determinant of project viability. A willingness-to-pay figure for the benefits of disabled access that can balance the costs and thereby increase the accuracy of the benefit:cost ratio will produce a more reliable result, and this in turn will produce better economic decisions. As the case study also indicated that normative forces, in the form of the movement of consultants from project to project, influence the way that appraisals are carried out, the use of a method of monetisation with which the major consultancy firms are familiar will assist in successfully integrating the results into appraisal practice.

The research has provided willingness-to-pay figures for specific elements of platform-to-platform access that suit many disabled people's – and non-disabled people's – needs but that add significant costs to a project. When these willingness-to-pay figures are incorporated into an existing appraisal, however, their effect is to correct the distorted benefit:cost ratio and demonstrate that the desired access features *will* pay their way.

9.9. Contribution to knowledge

9.9.1. Applied Social Model research

This research has identified a barrier in organisations' practice to the inclusion of disabled people in mainstream transport provision: that practitioners do not currently have a clear way to incorporate disabled access into the economic appraisal of transport projects creates an artificial – socially constructed – barrier to disabled people's inclusion. The research demonstrates that the barrier can be removed by applying mainstream methods for monetising benefit.

Although a Social Model approach has informed some writings about disability and transport (e.g. Heiser, 1995; Wilson, 2003), there has been little research into the problems that disabled transport users experience using an explicit Social Model framework (that is, one that identifies the existence of impairment, the experience of barriers, and the identification as 'disabled'). In addition, the research that has been undertaken has generally been qualitative rather than quantitative.

9.9.2. Appraisal in practice: the tram case study

This research applies the new institutional theory of DiMaggio and Powell (1991) – sociological new institutionalism – to the use of an economic instrument. As can be seen in 2.2, new institutional economics addresses the ‘rules of the game’ and does not consider those practices that evolve rather than those that are devised for a specific purpose. This research considers the more implicit ‘rules’ that transport practitioners follow and applies to those rules the concept of isomorphic forces. This is a new application of DiMaggio and Powell’s theory.

In applying their theory in this way, through the use of the propositions (section 3.1.3) to investigate the influence of the three isomorphic forces, the research has demonstrated clear evidence of isomorphism in the practice of incorporating disabled access into economic appraisal. The research contrasts the omission of disabled access from the economic appraisal process with the focus placed on disabled access during construction in all three projects. Two of the three isomorphic forces had a significant impact on this discrepancy, as the exploration of evidence for the propositions uncovered:

- Coercive pressure (from the Department for Transport) to exclude the benefits of disabled access in appraisal (as witness, in particular, the correspondence between Nottingham and the Department). This is in contrast with coercive pressure from legislation and from lobbying by disabled people for disabled access to be incorporated into the design.
- The influence of imitation – mimetic forces – in *design*, specifically in learning from past experience, contrasted with the apparent absence of imitation in *appraisal*. Where disabled access was not incorporated, however, it was difficult to judge whether there was imitation or not – lack of disabled access could result either from a failure to consider it or from following earlier examples that had excluded it.

The research did not set out to test DiMaggio and Powell’s hypotheses, but it does provide corroborative evidence for two of them:

- “Hypothesis B-2 The greater the extent to which the organisations in a field transact with agencies of the state, the greater the extent of isomorphism in the field as a whole.” (p.76)
- “Hypothesis B-4 The greater the extent to which technologies are uncertain or goals are ambiguous within a field, the greater the rate of isomorphic change.” (p.77)

For the tram systems, the organisations involved with the appraisal ‘transacted’ extensively with ‘agencies of the state’ in the form of the Department for Transport, and there is similarity in their approaches to appraisal. The ‘technology’ in relation to disabled access was uncertain, both for economic appraisal and for

construction, although the similarity resulted largely from coercive forces in the former case and mimetic forces in the latter.

The research identified value for money as the key criterion in the current appraisal process and this is one of the underlying 'mechanisms' (Pawson, 2001), which impacts the incorporation of disabled access.

9.9.3. Methods of monetisation: the systematic literature review

The systematic literature review built on previous reviews that had been undertaken, for example, reviews of valuation in environmental economics for transfer to health economics (e.g. Hanley et al., 2003). It incorporated methods of valuation from a wider range of sectors, including health, education and environment. The review covered all available public sector areas.

The review synthesised lessons from valuation in other sectors and applied them to disabled access in transport: this had not previously been done.

9.9.4. Willingness-to-pay: the stated preference experiment

This research set out to demonstrate that it is possible to use choice modelling methodology to derive a robust range of values (i.e. internally and externally validated) of willingness-to-pay for specific features of disabled access at heavy-rail stations, disaggregated by specific groups defined within a Social Model of disability framework. The findings across the sample clearly demonstrate that it is possible to derive a robust overall range of willingness-to-pay values that can be validated against the UK Department for Transport's standard 'Value of Time'.

The research set out with a number of hypotheses. Almost all of these were borne out by the results – with the exception of 'Ramp only' for certain segments of the sample. However, a plausible explanation for this is available (specifically, that a person who could climb stairs would be unwilling to expend extra time or effort, or both, in using a long ramp instead), and the results provide support for this explanation.

Research had not previously been undertaken in the UK that clearly addressed the quantitative measurement of specific forms of access provision for disabled people in the transport environment. Prior research specifically looking at disabled access (Fowkes et al., 1994) considered the provision of accessible transport in general, and it would have been difficult to use the findings in an individual transport project appraisal. Existing research of a similar nature does not set out to value aspects of disabled access specifically, nor does it address the consumer surplus of the broader population rather than existing system users. For instance, prior research by London Underground (Transport for London, 2004) surveyed existing customers in what was then and still is a fairly inaccessible environment.

This research also provides explicit monetary figures that can be linked to specific design solutions.

Stated preference techniques, and specifically choice modelling, have been applied to a range of issues in the transport environment, for example in relation to quality and the environment. However, choice modelling has not been applied specifically to methods of providing access for disabled travellers in the rail environment.

The research demonstrates that there is value for the broader population in improving access for disabled people within the transport environment, something that previously had only been demonstrated qualitatively in the UK and Europe.

The research enables the identification of the difference between willingness-to-pay for disabled access amongst those who need it (such as those who have impairments, those who experience barriers in the physical environment, and those who self-identify as 'disabled') and those for whom it is an 'optional extra'.

The research also enables differentiation between different types of access (e.g. ramp and lift), as seen in the application of the research to the London Overground appraisal. This is of benefit in the decision-making process, as the relative costs and benefits of implementing different disabled access solutions can be compared.

9.10. Contribution to practice

9.10.1. Applied Social Model research

Many public authorities espouse a Social Model approach to disability; Transport for London is one of these. There is an absence of research undertaken within a Social Model framework. The Individual Model of disability is located within a different paradigm, and research undertaken within this framework is essentially not compatible with a Social Model approach to practice. Section 2.1 includes a discussion of the two Models. This research provides information to support a Social Model approach to planning.

9.10.2. Appraisal in practice: the tram case study

The research highlights the absence of clarity in relation to the inclusion of disabled access in the appraisal process. It identifies the potential for the benefits of disabled access to be omitted even when the team implementing the project wish to ensure that they are addressed. The research highlights the reality that, if anything, this risk of omission is becoming more serious, as costs are included as a result of compliance with legislation and regulation whereas benefits are assumed to be the same as benefits for non-disabled people – principally, time savings.

9.10.3. Methods of monetisation: the systematic literature review

The review shed light on the ways that valuation of disabled access could be effected in economic appraisal for transport projects. Importantly, having such a method available would enable practitioners to incorporate disabled access into the mainstream rather than treating it as a special case – thereby fulfilling their duties in this respect under the new public sector duty in the Disability Discrimination Act 2005.

9.10.4. Willingness-to-pay: the stated preference experiment

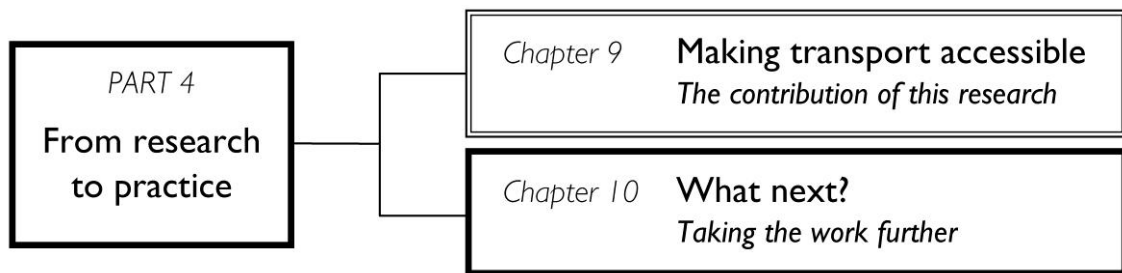
The research provides monetary figures that may be used in transport project appraisal and that make it easier for the benefits of particular forms of access to be compared with other aspects of the appraisal, including cost.

The research demonstrated that the figures make a difference to a standard appraisal. They address the imbalance in the benefit:cost ratio and, more importantly, they improve the ability to choose between different ways of achieving step-free access, as with the London Overground scheme.

Transport project appraisal is a function of public authorities such as the UK Department for Transport and the Passenger Transport Authorities. Since the passing of the Disability Discrimination Act in April 2005, these public authorities are subject to the Disability Equality Duty:

“The [Disability Equality Duty] is meant to ensure that all public bodies [...] pay ‘due regard’ to the promotion of equality for disabled people in every area of their work.” (Disability Rights Commission, 2007)

This research has provided a means of incorporating disabled access into the core of the appraisal process that will assist public authorities in fulfilling this obligation.



Chapter 10. **What next?**

This chapter explores the limitations of the research as a whole and of the individual elements of the research. It then proposes further research to build on the research reported in this thesis.

10.1. Limitations of the research

10.1.1. The research as a whole

Overstating benefit

Discrete choice modelling is known to overestimate the benefit of individual attributes in the experiment (section 6.2.4). It is possible therefore that the willingness-to-pay figures obtained in this research may be inflated to some extent. This could be explored using a combination of discrete choice modelling to value the full range of disabled access provision at stations and contingent valuation to value a 'fully accessible' station. Any adjustments could then be made by scaling accordingly the willingness-to-pay figures in this research.

Forms of surplus

The research focuses on consumer surplus, to the exclusion of government and producer surplus (section 5.1.2). These other forms of surplus are also important; government surplus in particular would be likely to have a significant impact on the benefit:cost ratio.

Use of Cost Benefit Analysis

Reportedly, decision-makers do not use Cost Benefit Analysis 'properly' or perhaps, in some cases, at all (sections 4.2 and 4.3). Providing a way to obtain a more accurate benefit:cost ratio may not, therefore, improve economic decision-making in relation to disabled access if other 'mechanisms' that underlie observed 'outcome patterns' (Pawson, 2001) are more powerful than the need for accuracy. More exploration of influences on the appraisal process might provide some insight, enabling additional interventions to be developed that would improve the decision-making process.

10.1.2. The tram case study

Number and nature of cases

The Nottingham and Sheffield trams were already established systems when the research began. As a result, for the Sheffield case some of the documentation was not be available and relevant staff had left the organisation. This limited the value of the Sheffield case to the overall research, although the ex-member of staff who was interviewed, who had been central to the project's development, was extremely helpful. In view of the lack of data for Sheffield, it might have been helpful to have included another tram system (or perhaps more than one) in order to get a broader picture of the processes involved in the economic appraisals.

Contact with stakeholders

The project teams provided no introductions to stakeholders, such as disabled people's organisations. In the case of West London, the author could have made her own contacts, but the personnel in the relevant disability organisation had changed under difficult circumstances. For Sheffield, it might have been possible to identify contacts, but the project had been developed more than 10 years before the research and personnel would undoubtedly have changed. In addition, the author felt it was inappropriate to make contact with disabled people's organisations 'uninvited' by her project contacts. This affected the nature of the evidence available to support or counter the propositions relating to stakeholders, although in practice disabled people's organisations tend to focus on the design of systems and the outcome of projects, not on the appraisal process, as demonstrated by the available documentation.

10.1.3. The systematic literature review

Using systematic review

The systematic review process was used for what was quite a broad search. This was a useful approach because it provided an audit trail such that it would be broadly possible to repeat the search, perhaps with a specific modification if desired. However, this approach makes the analysis of the papers quite challenging, as they do not lend themselves to thematic analysis, for example along contextual lines, coming as they do from a wide range of sectors. Although context was identified in this review, therefore, it was not a significant factor in the analysis.

Congruency of the review process

The selection and quality criteria were designed to identify papers that would answer the research question. At the analysis stage, it became apparent that some

of the papers that had 'passed' those criteria did not answer the research question (for example, Glaister, 1999). There are three plausible reasons for this lack of congruence: the criteria may not have been defined appropriately for the research question; the criteria should perhaps have been reviewed following an apparently minor modification of the research question; or the criteria may not have been applied consistently as the author became more familiar with the material.

Possible omissions

The papers reviewed were those that were evidently about specific methods, such as contingent valuation or techniques such as choice experiments. From those, only the first few were reviewed and the rest disregarded. It is therefore possible that the 'best' of the papers on the topic may have been omitted and less significant ones reviewed instead.

Some papers were included at the beginning of the process that would definitely have been excluded towards the end – the author became clearer about the criteria as the process wore on and applied them more stringently. For example, Lett and Swack (2005), identified in the early stages, is exclusively about tax policy and so should have been disregarded. Conversely, that may also have led to some relevant papers being *omitted* later in the process that should have been included.

Some areas, such as revealed preference (section 2.3.3), were identified early on as not transferable to disabled access, and papers covering these were excluded. This may have resulted in the exclusion of some papers containing insights in the 'full text' that might have been useful.

Subjective judgement

Although the definition of the search strings was undertaken in conjunction with the advisory panel, and their application to the databases was mechanical, the subsequent selection process depended on the author's subjective judgement. Applying the *selection* criteria seemed a more reliable process than applying the *quality* criteria (section 3.2.2), which at times felt a bit like 'pin the tail on the donkey' – particularly criterion 7, "The method or issue builds on accepted research or methods". Repeating the review might therefore generate somewhat different results.

Working alone

Tranfield et al. (2003) suggest that more than one researcher carry out the systematic review. As a lone researcher, the author found it difficult to maintain consistency in the selection of papers, in particular as she became more familiar with the topics that the search was generating. It might have been easier with a co-researcher. Being able to discuss the application of the quality criteria in detail

with someone else who shared the same understanding of, and goals for, the review might also have resulted in more demonstrably consistent results.

10.1.4. The stated preference experiment

Use of photographs for the stated preference experiment

Photographs were selected for the experiment rather than drawings. The potential advantage of drawings is to remove any suggestion of an existing station, and to 'sanitise' the environment that is being shown. The potential advantage of photographs is that they appear more realistic to respondents, and less like an artist's impression. In the best of all possible worlds the two options would have been put to one or more focus groups with real examples of each medium. The choice made in this research was for practical reasons – the photographs were available to the author, whereas drawings would have had to be commissioned and funded.

Other factors that might influence the results

As respondents imagined themselves making the proposed journey, it is possible that they considered other factors that were not obvious to the researcher – factors such as station security or journey comfort, for example, perhaps brought to their attention by one of the photographs. Such unknown factors may have affected the choices they made. In choice experiments, such extraneous information is essentially incorporated into the random element of the utility function (section 2.3.4), but if the issue were significant enough it could affect the results.

Size of sample

In several of the segments analysed, there were fewer than 75 respondents (section 3.3.6). This may affect the validity of the responses. If robust willingness-to-pay figures were required for those specific segments in an appraisal, re-running the research with quotas for those segments would address this potential issue.

10.2. Further research

10.2.1. Appraisal practice

Research could be undertaken to understand whether and how disabled access is incorporated into the economic appraisal of transport projects in countries other than the UK. This might shed some light on other ways to improve the UK position.

DiMaggio and Powell's (1991) isomorphic forces (section 2.2) could be applied to aspects of transport project economic appraisal *other* than disabled access. This

would demonstrate whether and how the isomorphic forces influence appraisals overall.

Research could explore the way in which public sector transport bodies are addressing the inclusion of disabled access in economic appraisal in relation to their 2005 Public Sector Duty.

10.2.2. Willingness-to-pay

Research could be undertaken to obtain a willingness-to-pay figure for other access issues that benefit everyone, such as access to toilets, customer information systems, public address systems, and help points.

Obtaining a willingness-to-pay figure for access issues that benefit only disabled people, such as disabled parking, induction loop systems and tactile paving, would identify use and option values for respondents who need these forms of access provision, and option and existence values for those who do not.

The research could be repeated with quotas for other segments to address the potential problem of having fewer than 75 respondents in a given segment (such as women with children under 5).

A contingent valuation survey of a 'fully accessible' station could be undertaken to obtain a willingness-to-pay value for disabled access across the whole station. This could then be compared with the sum of the values for individual attributes obtained using discrete choice modelling, to determine whether there is an 'inflation effect' and if there were, the figures could be scaled accordingly.

Appendix A Glossary

Words in **bold** are defined in this glossary.

accessibility The capacity to reach a destination using (public) transport, in particular being able to reach essential services such as shops, hospitals, education facilities and employment. (This is the transport industry sense – cf. **disabled access**.)

Access to Work A government scheme that targets both employers and **disabled people** and provides funding for such ‘extras’ as specialist equipment and travel-to-work costs over and above the cost of public transport.

appraisal An approach to assess the validity of investment in a project (for example, a transport interchange improvement) that generally includes consideration of economic, technical and social issues.

appraisal method A particular approach to economic **appraisal** such as the ‘**New Approach To Appraisal**’.

attribute A constant feature of the different sets of circumstances between which consumers’ are asked to choose in **choice modelling** such as, in this research, platform-to-platform access.

attribute level The nature of an **attribute** or how much of the attribute a consumer is offered in a specific option during a **choice modelling** experiment, such as ‘Stairs with lift’ in this research.

choice modelling A ‘**stated preference**’ method used to value **non-market** impacts in which people are offered choices between different options, such that each option represents a particular set of circumstances. Each set of circumstances comprises different **attributes** and each choice offered is between options with different **attribute levels**. The consumers’ aggregated strength of preference for the each of the attributes can be calculated from their responses. See section 6.2.4. Cf. **technique**.

consumer surplus The additional benefit that a consumer gains from a change, such as investment in a project (whether their own investment or another’s) for which she or he does not pay. For example, an improved transport service may provide the additional benefit of reducing travel times without this benefit being reflected in the price of the ticket. Cf. **government surplus** and **producer surplus**.

contingent valuation A ‘**stated preference**’ method used to value **non-market** impacts, in which consumers are asked for their ‘**willingness-to-pay**’ or how much compensation they are ‘willing-to-accept’ for a change in their circumstances. See section 6.2.4. Cf. **technique**.

Cost Benefit Analysis A **framework** that uses monetary **methods** to determine whether a project merits investment – that is, whether the opportunity cost of investing is outweighed by the benefits obtained.

cross-sector benefits The benefits that accrue in one sector from changes in another. For example, access improvements in the transport sector may result in a reduction in the need for, and thus cost of, domiciliary visits by health professionals.

Department for Transport Within the timeframe of the tram case study, the government department responsible for transport changed its name several times. At the outset it was the Department *of* Transport (DoT), then the Department for Environment, Transport and the Regions (DETR), then the Department for Transport, Local Government and the Regions (DTLR) and finally it was split into the Office of the Deputy Prime Minister (ODPM) and today’s Department *for* Transport (DfT). For the sake of readability, the name ‘UK Department for Transport’ is used (occasionally abbreviated to DfT) throughout, unless in a quote where a different name was used.

disability “the loss or limitation of opportunities to take part in the normal life of the community on an equal level with others due to physical and social barriers” (Barnes, 1991, p.2). Cf. **impairment**.

disability studies A branch of sociology concerned with the study of **disability** in its political, social and cultural contexts.

disabled access Access for **disabled people** to the physical environment and to social participation. Cf. **accessibility**.

disabled person A person with an **impairment** who experiences disadvantage – because of barriers in the environment, whether physical or related to information and communication, attitudes and norms, policies and practices.

(economic) good An intervention that results in an increase in people’s **utility**.

epistemology The study of what knowledge is and how we can obtain it. Cf. **ontology**.

existence value The value that a consumer derives from an **economic good** because they believe that it should *exist* for the welfare of society. Cf. **total economic value**, **use value** and **option value**.

- framework** An approach to **appraisal** such as **Cost Benefit Analysis** or **Multi-Criteria Analysis** that uses a combination of **methods** to evaluate the soundness and validity of a proposed project.
- free-riding** The practice of giving a larger **willingness-to-pay** value than the respondent would actually be prepared to pay, because she or he believes the **economic good** on offer to be desirable and knows that she or he would not really be asked to pay.
- government surplus** The benefit (generally savings), over and above the cost of a project, that accrues to the public purse as a result of a change. For example, investment in a new transport system may open up job opportunities to unemployed people and result in a reduction in unemployment that in turn reduces expenditure on welfare benefits. Cf. **cross-sector benefits**, **consumer surplus** and **producer surplus**.
- hypothesis** A prediction that can be tested quantitatively or using scientific methods. Cf. **proposition**.
- impairment** “the functional limitation within the individual caused by physical, mental or sensory impairment” (Barnes, 1991, p.2). Cf. **disability**.
- Individual Model (of disability)** The view that **disability** is caused by **impairment**.
- interpretivism** The belief that reality is different for each individual and knowledge is obtained by seeking to understand other people’s perceptions and interpretations of their experiences and to relate them to one’s own. Cf. **positivism**.
- method** A way of gathering information (often monetary values) for inclusion in appraisal, such as **contingent valuation**. Cf. **technique**.
- Multi-Criteria Analysis** A framework that combines monetary and non-monetary methods (sometimes quantified) in order to determine whether a project is worth investment.
- ‘New Approach To Appraisal’** An approach to transport appraisal using **Multi-Criteria Analysis** introduced by the UK government in 1998. In the literature, this is variously referred to as the ‘New Approach To Appraisal’, the ‘New Approach to Appraisal’ and the ‘New Approach to Transport Appraisal’. WebTAG uses ‘New Approach To Appraisal’ which is the term used in this thesis, occasionally abbreviated to NATA.
- new institutional theory** The theory “that organizations are deeply embedded in social and political environments [suggesting] that organizational practices and structures are often either reflections of or responses to rules, beliefs, and conventions built into the wider environment” (Powell, 2007).

non-market “[...] a wide variety of situations wherein markets are nonexistent, incomplete or institutionally restrained from reflecting interactions between supply and demand” (Asian Development Bank, 1999).

ontology The study of the nature of existence, reality and truth. Cf. **epistemology**.

option value The value that a consumer derives because she or he knows that she or he has the *option* to use the **economic good** should she or he need or choose to do so. Cf. **total economic value**, **use value** and **existence value**.

positivism The belief that the material world constitutes reality and that knowledge is obtained through observation and (scientific) experimentation. Cf. **interpretivism**.

producer surplus The benefit (often additional profit or shareholder value) that accrues to ‘producers’ (generally private sector employers or service providers) from a change. For example, a transport system upgrade may lead to an increase in the number of customers who can reach a shopping centre, and this will generate additional income for the shop owners. Cf. **government surplus** and **consumer surplus**.

proposition A provisional idea for which evidence can be gathered qualitatively. Cf. **hypothesis**.

Social Model (of disability) The view that **disability** is caused not by an **impairment** or medical condition, but by barriers in the environment (physical, or related to information and communication, attitudes and norms, policies and practices) that disadvantage people with impairments.

stated preference A way of identifying **willingness-to-pay** for an **economic good**. The two stated preference **methods** are **contingent valuation** and **choice modelling**. See section 2.3.3.

technique A particular way of applying a **method**, for example, ‘open ended’ and ‘dichotomous choice’ are two techniques for **contingent valuation**. ‘Contingent ranking’ is a technique for **choice modelling**.

total economic value The value that a consumer derives from an **economic good**: it incorporates **use**, **option**, and **existence** values.

use value The value that a consumer derives from her or his actual *use* of an **economic good**. Cf. **total economic value**, **option value** and **existence value**.

utility Well-being – fulfilment of desire, or goal achievement. The concept is not well-defined. See section 2.3.1.

welfare economics A branch of economics that is concerned with how decisions maximise people’s welfare or **utility**.

willingness-to-pay The amount of money a consumer is prepared to give up in order to gain an improvement in her or his circumstances.

Appendix B Case study additional information

1.1. Case study protocol

Introduction and purpose

The purpose of the research is to explore how practitioners take disabled access into account in the transport project appraisal process and what may have influenced any changes from one project to another, in relation to three tram projects.

The research question is:

“On what basis (methods, data and planners’ consultation of disabled people) have the costs and benefits of disabled access been incorporated into the project appraisal process for three tram projects, and how, in the context of new institutional theory, has the environment in which the organisations operate influenced their approach?”

A number of frameworks for transport project appraisal, such as the UK Department for Transport’s (DfT) ‘New Approach To Appraisal’, require consideration of non-market impacts (UK Department for Transport, 2007). The broader benefits of providing access for disabled people to the public transport environment are non-market impacts, and the DfT’s framework allows for the inclusion of such benefits. However, methods for assessing the benefits are not well developed. The guidance provided by DfT, and the UK Treasury in its ‘*Green Book*’ (HM Treasury, 2003), is insufficient for disabled access. In the absence of effective ways to assess the benefits of disabled access, the development of a business case for a public transport project may take into account the costs of providing access, but it is not clear how these costs are offset against the potential benefits.

Using a multiple-case study approach, the research will examine how the costs and benefits of disabled access have been taken into account and incorporated into economic appraisal by practitioners. The research will focus on tram (light rail) systems - an older system in Sheffield, a newer system in Nottingham and a system not yet built in West London.

The research will review the tram systems from a new institutional theory perspective, examining the impact of the coercive, mimetic, and normative forces that the organisations have been subject to. A number of propositions will be tested:

1. disabled access is largely unaccounted for in the economic appraisal of tram systems;

2. where disabled access is taken into account, greater emphasis is placed on the costs than on the benefits;
3. Greater weight is given to disabled access during construction than would logically be assumed from the (lack of) weight given in the economic appraisal process;
4. pressure from disabled people's organisations, and other pressure groups, has increased the weight given to disabled access at all stages of tram system construction, including planning;
5. additional legislation has increased the weight given to disabled access at all stages of tram system construction, including planning;
6. the movement of professionals from one tram system development project to another has created similarities in treatment of disabled access between subsequent projects;
7. organisations developing tram systems rely heavily on the past experience of tram systems and other transport projects to shape their approach, both where things have gone right and where things have gone wrong.

Data collection procedures

Access to the case study sites will be through the primary contacts: the Director of Strategy for South Yorkshire Passenger Transport Executive, the Deputy Team Leader, Nottingham and the Deputy Project Director for West London Tram (Transport for London). Only one researcher will be undertaking the work, and introductions will be made through the primary contacts or directly with named individuals.

Initial contact will be made with primary contacts to determine what resources are available for the case studies. It is anticipated that there will be limited documentation available for Sheffield, and that identifying and finding interviewees will be difficult, given the elapsed time since the project was planned and implemented. However, the organisation has agreed to provide as much as possible, and to put the researcher in touch with ex-employees who were involved where they can obtain permission. It should be possible to obtain more data for Nottingham, and a preliminary meeting will be held on 10th October 2005 to ascertain what will be available both in the way of documentation and interviewees. A meeting has already been held with Transport for London and a preliminary batch of documentation is on the way.

Documentation and archival records of most use to the research are expected to include the business case for the tram system, working papers relating to the business case, details of stakeholder consultation and other stakeholder involvement activities and minutes of any meetings relating to disabled access to, or the overall costs and benefits of, the system.

The timetable for the research follows:

October 2005	<ul style="list-style-type: none">▪ Set up interviews▪ Begin interviewing▪ Continue gathering documentary and archival evidence
November 2005	<ul style="list-style-type: none">▪ Final interviews▪ Final data gathering
December 2005	<ul style="list-style-type: none">▪ Analyse results
January 2006	<ul style="list-style-type: none">▪ Draft research report▪ Gather further evidence if required
February 2006	<ul style="list-style-type: none">▪ Finalise report and submit

Table 65: Case study: research timetable

Outline of report

Introduction

This section will establish the purpose and the structure of the study, and set out the research question. It will outline the structure of the report.

Industry context

This section will set out the context in which the case studies were undertaken, including the legislative and regulatory context.

Theoretical framework

This section will outline the theoretical framework of new institutional theory, and identify how the case studies were designed to provide evidence

Methodology

This section will outline the methodology used and introduce the case study protocol.

Findings

This section will explain the findings, both within individual cases, and patterns across the three cases.

Conclusions

This section will seek to answer the research question, based on the findings of the three case studies.

Questions

1) Questions for interviewees

Question	Proposition(s) addressed
How was disabled access considered during the planning process for the <name of> tram system?	1,2,4
What guidance was available to you on assessing the costs and benefits of disabled access?	2,7
Did you review disabled access in past tram – or other transport - systems and learn lessons from them? If so, did that influence the appraisal process or methods?	4,5
Were disability specialists or disabled people and their organisations consulted, and if so, did they contribute on the costs and benefits of disabled access?	4,5,6
What methods were actually used to assess costs and benefits of disabled access?	1,2
How were the data about the costs and benefits of disabled access integrated into the business case for the project?	1
What evaluation of the appraisal process or business case took place following completion?	1
Did you or your colleagues do any work on tram systems prior to working on this one?	6
How did the treatment of disabled access compare with the treatment of other hard-to-measure impacts such as some impacts relating to environment, heritage or health?	1,2,3
What were the key influences that resulted in the implementation of disabled access in the system? (For example, pressure from elected representatives, legislation, public opinion etc.)	1,4,5

Question	Proposition(s) addressed
Were these different from the key influences that led to the development of the system? (For example, the availability of European money, regional policy, elected representatives etc.)	1,4,5

Table 66: Case study: interviewee questions

2) Questions of an individual case

Question	Proposition(s) addressed
Did the project take account of disabled access at all?	1,3
What guidance was available to the project team and how was it used?	3,5,7
Was account taken of both benefits and costs?	2
What methods were used to calculate the costs?	1,2
Were (any of) the benefits quantified or monetised?	1,2
What methods were used to quantify / monetise the benefits?	1,2
What role did legislation and regulation play in the account that was taken of disabled access?	5
What role did experience with other tram systems play in the account that was taken of disabled access?	7
What role did external stakeholders play in the account that was taken of disabled access?	4
Were groups of disabled people consulted in the planning, design or construction of the project, and if so, what impact did that consultation have on the process?	3,4

Question	Proposition(s) addressed
Was the approach to disabled access in the appraisal evaluated after the project was built (or peer reviewed for the West London Tram)?	1

Table 67: Case study: individual case questions

3) Questions asked of the pattern across multiple cases

Question	Proposition(s) addressed
Was guidance on the appraisal of non-market costs and/or benefits used in a similar way by all three projects?	4,5,6,7
Did the projects use the same or similar methods to calculate costs and benefits of disabled access?	4,5,6,7
What role did legislation and regulation play in the account that was taken of disabled access, and did that change as the legislation/regulation changed?	5
Did methods to calculate costs and benefits change as the legislation/regulation changed?	5
What role did external stakeholders play in the account that was taken of disabled access?	4
Were groups of disabled people consulted in the planning, design or construction of the projects, and if so, what impact did that consultation have on the process?	4
Did external stakeholders change their approach or views as a result of legislation/regulation changes?	4,5
Did external stakeholders change their approach or views as a result of experience with other tram systems?	4,7

Question	Proposition(s) addressed
To what extent were professionals working on one tram system also involved in other systems, and did this influence the approach to disabled access, in particular in relation to appraisal?	6

Table 68: Case study: multiple-case questions

4) Questions of the entire study

Question	Proposition(s) addressed
Did the assessment of costs and benefits of disabled access reflect the methods used for the assessment of costs and benefits of other aspects of transport projects (e.g. environmental aspects)?	1,2
Were there other transport projects being developed at the time that influenced (positively or negatively) disabled access in the development of these projects?	4,5,6,7
Was disabled access used to promote the development of the tram projects?	4,7

Table 69: Case study: whole study questions

5) Normative questions about policy, etc., outside the studies

Question	Proposition(s) addressed
What legislation and regulations were in force at the time the project was planned?	5
What was government policy on access for disabled people?	3,4
What was the view in the disabled people's movement, and in disabled people's organisations, about access to transport, and were they agitating for greater inclusion?	4

Question	Proposition(s) addressed
Were any of the mainstream transport pressure groups or statutory advisory groups agitating for improved disabled access at the time of planning?	4

Table 70: Case study: context questions

1.2. Interviewees

Nottingham

Interviewee	Job role	Interview date	Interview method
Pat Armstrong	Project Team Leader from the inception of the NET project	22/11/05	Face to face
Dave Carter	Transport Consultant with MVA, who assisted with economic appraisal	1/12/05	Face to face
Chris Deas	NET project second-in-command to Pat Armstrong, responsible for economic appraisal	22/11/05	Face to face
John Devonport	Accessibility Officer for Nottingham City Council	22/11/05	Face to face (along with Richard Wood)
Richard Wood	Town Planner for Nottingham City Council	22/11/05	Face to face (along with John Devonport)

Table 71: Case study: Nottingham interviewees

West London

Interviewee	Job role	Interview date	Interview method
Mike Bartram	Head of Consultation, Transport for London	9/01/06	Email
Les Buckman	Transport Consultant with Steer Davies Gleave, project manager working on economic appraisal	11/01/06	Face to face

Interviewee	Job role	Interview date	Interview method
Catherine Hallett	Deputy Project Director, West London Tram Project, Transport for London	17/01/06	Face to face
Phil Hewitt	Director, London Trams, Transport for London	16/02/06	Email

Table 72: Case study: West London interviewees

Sheffield

Interviewee	Job role	Interview date	Interview method
Phil Haywood	Director of Planning, South Yorkshire Passenger Transport Executive	15/12/05	Face to face

Table 73: Case study: Sheffield interviewees

1.3. Documentation reviewed

Nottingham		
No.	Date	Document Title
1	Aug-89	Feasibility study into an LRT system for Greater Nottingham
2	Jun-90	Feasibility study into an LRT system for Greater Nottingham
3	Aug-90	Report to the environment committee
4	Sep-90	Results of a public opinion survey
5	Nov-90	Results of a public opinion survey
6	May-91	Appraisal of requirements for a light rail vehicle for Nottingham
7	Nov-91	Environmental statement in support of the Bill: Volume 1 Final report
8	Nov-91	Environmental statement in support of the Bill: Volume 2 Figures and plans
9	Nov-91	Environmental statement in support of the Bill: Volume 3 Technical annexes
10	Apr-92	Report to the policy and general purposes committee
11	Oct-92	Report to the policy and general purposes committee
12	Jun-93	Public transport stated preference study
13	Dec-93	Final Section 56 Submission
14	Jul-95	Revised Section 56 Submission
15	Dec-95	Letters to and from DfT and Deputy Team Leader, Nottingham
16	Jul-96	Nottingham express transit line one system description
17	Jul-96	Nottingham express transit line one rolling stock
18	Jan-97	Tender document section B: instructions to tenderers, general requirements
19	Jan-97	Tender document section D: performance specification volume one

Nottingham		
No.	Date	Document Title
20	May-00	Full Business Case
21	Oct-00	NET-DETR [DfT] meeting notes
22	Nov-00	NET-DETR [DfT] meeting notes
23	May-01	Letter to Her Majesty's Railway Inspectorate
24	Jun-01	Meeting notes of mock-up review
25	Aug-01	Memo about the mock-up
26	Sep-01	Meeting notes of mock-up review
27	Sep-01	Tram Stops Detailed Design Rationale
28	Sep-01	Letter from DTLR [DfT] to Daimler-Chrysler Rail
29	Apr-01	Fax from Joint Mobility Unit to Carillion
30	Feb-02	Meeting notes - tram stop design
31	Apr-02	Meeting notes - tram stop design
32	Jan-02	Disabilities Advisory Access Resource Group Meeting minutes
33	Mar-02	Disabilities Advisory Access Resource Group Meeting minutes

Table 74: Case study: Nottingham documentation reviewed

West London		
No.	Date	Document Title
34	Apr-04	Transport for London board paper - West London tram project
35	Apr-04	Outline Business Case - Economic analysis version 3.2
36	Oct-04	Greater London Action on Disability response to Consultation
37	Mar-05	Business Case Version 4.4
38	Apr-05	Consultation summary report 2004
39	Apr-05	Consultation full report 2004

West London		
No.	Date	Document Title
40	Aug-05	Economic Impact Report - wider economic and regeneration impacts
41	Jan-06	Use of Mode Constants within the WLT Business Case

Table 75: Case study: West London documentation reviewed

1.4. Document review spreadsheet

Example extract taken from the documentation review spreadsheet for Nottingham

This is a verbatim reproduction of an extract from the notes taken by the author to support the case study analysis.

Date	Document Title	Document Purpose	Reference to Disability
Oct-00	NET-DETR meeting notes	Review of plans for the tram vehicles	A number of issues were raised about design, in particular areas of non-compliance with RVAR 1998. Covers wheelchair area, floor colour, handrails, priority seating, tip up seats, glass.
Nov-00	NET-DETR meeting notes	Follow up for Oct-00 meeting	Further discussion of areas of non-compliance with RVAR 1998 and possible solutions – MIU involved. Covers wheelchair area, priority seating, floor colour, handrails, visual markings, colour contrast, emergency call, exterior colour scheme
May-01	Letter to HMRI	Notes issue on meeting agenda about vertical stepping height at tram stops	Provides diagram of stepping distance to the tram under different wear and load conditions.
Jun-01	Meeting notes of mock-up review	To enable a design freeze on the mock-up	Further discussion of the design of the vehicle - JMU involved. Covers exterior colour scheme, stepping distance, wheelchair area, floor, grab poles, stop request buttons, door buttons, emergency call, audible warnings, seat design, cab door banding.
Aug-01	Memo about the mock-up	Clarifies arrangements for exhibition	Arrangements for a series of events - including 'special needs group' event - looking at the tram (vehicle).
Sep-01	Meeting notes of mock-up review	Seeking approval of design and compliance with RVAR	Further discussion of the design of the vehicle - JMU involved. Covers seating, grab rails, buttons, wheelchair area, colour schemes and marking, passenger door stepping distance (6-8mm), notices.

Table 76: Case study: documentation review spreadsheet

1.5. Coding structure

NVivo revision 2.0.161 Licensee: Alice Maynard

Project: Project 2 User: Administrator Date: 10/03/2006 - 12:21:26

NODE LISTING

Nodes in Set: All Nodes

Created: 13/01/2006 - 17:08:45

Modified: 13/01/2006 - 17:08:45

Number of Nodes: 77

1 (1) /Influences

Description:

Internal and external influences on accessibility

2 (1 2) /Influences/Pressure

3 (1 2 3) /Influences/Pressure/Pressure from external groups

Description:

Proposition 3 - pressure from disabled people's organisations, and other pressure groups, has increased the weight given to disabled access at all stages of tram system construction, including planning.

4 (1 2 3 1) /Influences/Pressure/Pressure from external groups/Absence of pressure

5 (1 2 3 3) /Influences/Pressure/Pressure from external groups/Positive

6 (1 2 3 3 1) /Influences/Pressure/Pressure from external groups/Positive/Disability

7 (1 2 3 3 2) /Influences/Pressure/Pressure from external groups/Positive/Mainstream

8 (1 2 3 4) /Influences/Pressure/Pressure from external groups/Negative

9 (1 2 4) /Influences/Pressure/Pressure from legislation

Description:

Proposition 5 - additional legislation has increased the weight given to disabled access at all stages of tram system construction, including planning.

- 10 (1 2 4 1) /Influences/Pressure/Pressure from legislation/Absence of pressure
- 11 (1 2 4 3) /Influences/Pressure/Pressure from legislation/Positive
- 12 (1 2 4 3 1) /Influences/Pressure/Pressure from legislation/Positive/Disability
- 13 (1 2 4 3 2) /Influences/Pressure/Pressure from legislation/Positive/Mainstream
- 14 (1 2 4 4) /Influences/Pressure/Pressure from legislation/Negative
- 15 (1 4) /Influences/Resistance
- 16 (1 5) /Influences/Movement of professionals

Description:

Proposition 6 - the movement of professionals from one tram system development project to another has created similarities in treatment of disabled access between subsequent projects.

- 17 (1 5 1) /Influences/Movement of professionals/Employees
- 18 (1 5 2) /Influences/Movement of professionals/Consultants
- 19 (1 6) /Influences/Relying on past experience

Description:

Proposition 7 - organisations developing tram systems rely heavily on the past experience of tram systems and other transport projects to shape their approach, both where things have gone right and where things have gone wrong.

- 20 (1 6 1) /Influences/Relying on past experience/Trams
- 21 (1 6 1 1) /Influences/Relying on past experience/Trams/UK
- 22 (1 6 1 2) /Influences/Relying on past experience/Trams/Non-UK
- 23 (1 6 2) /Influences/Relying on past experience/Other transport
- 24 (1 8) /Influences/Drivers for accessibility

Description:

Question 10/11 - what were the key influences that drove the implementation of disabled access? Were these different from the key influences that led to the development of the system?

- 25 (1 8 1) /Influences/Drivers for accessibility/Vision
- 26 (1 8 2) /Influences/Drivers for accessibility/Political commitment
- 27 (1 8 3) /Influences/Drivers for accessibility/Compared to drivers for system
- 28 (1 8 4) /Influences/Drivers for accessibility/Legislation
- 29 (1 9) /Influences/Support

Description:

Question 2/4 - what guidance was available on assessing costs and benefits? were disability specialists/organisations consulted and did they contribute to costs and benefits?

- 30 (1 9 1) /Influences/Support/Consultants
- 31 (1 9 1 1) /Influences/Support/Consultants/Disability
- 32 (1 9 1 2) /Influences/Support/Consultants/Transport
- 33 (1 9 2) /Influences/Support/Guidance

Description:

Question 2 - what guidance was available to you on assessing the costs and benefits of disabled access?

- 34 (1 9 2 1) /Influences/Support/Guidance/From government
- 35 (1 9 2 2) /Influences/Support/Guidance/From elsewhere
- 36 (1 9 2 3) /Influences/Support/Guidance/On construction issues
- 37 (1 9 3) /Influences/Support/Disability groups
- 38 (2) /Isomorphic forces
- 39 (2 1) /Isomorphic forces/Mimetic
- 40 (2 1 1) /Isomorphic forces/Mimetic/Presence of
- 41 (2 1 2) /Isomorphic forces/Mimetic/Lack of

Description:

Mimetic forces are clearly not present or act against disabled access in appraisal

- 42 (2 2) /Isomorphic forces/Normative
- 43 (2 2 1) /Isomorphic forces/Normative/Presence of
- 44 (2 2 2) /Isomorphic forces/Normative/Lack of

Description:

Normative forces are clearly not present or act against disabled access in appraisal

45 (2 3) /Isomorphic forces/Coercive

46 (2 3 1) /Isomorphic forces/Coercive/Lack of

Description:

Coercive forces are clearly not present or act against disabled access in appraisal

47 (2 3 2) /Isomorphic forces/Coercive/Presence of

48 (1 1) /Evaluation

49 (1 1 1) /Evaluation/Cost and Benefit

Description:

Proposition 2 - where disabled access is taken into account, greater emphasis is placed on the costs than on the benefits

50 (1 1 1 1) /Evaluation/Cost and Benefit/Benefits

Description:

Were there benefits, and how were they accounted for?

51 (1 1 1 1 1) /Evaluation/Cost and Benefit/Benefits/Quantification

Description:

(How) were benefits quantified?

52 (1 1 1 1 1 1) /Evaluation/Cost and Benefit/Benefits/Quantification/Importance of

53 (1 1 1 1 2) /Evaluation/Cost and Benefit/Benefits/Quantification/Non-importance

54 (1 1 1 2) /Evaluation/Cost and Benefit/Benefits/Qualitative

Description:

Anecdotal evidence available of benefits - people's 'gut feel'

55 (1 1 1 2 1) /Evaluation/Cost and Benefit/Benefits/Qualitative/Use as PR

56 (1 1 1 3) /Evaluation/Cost and Benefit/Benefits/Treatment of disabled

Description:

Question 12 - are benefits for disabled people treated differently from benefits for other 'encumbered' passengers?

- 57 (11 1 1 4) /Evaluation/Cost and Benefit/Benefits/Range of factors involved
- 58 (11 1 1 5) /Evaluation/Cost and Benefit/Benefits/Post-hoc evaluation
- 59 (11 1 1 6) /Evaluation/Cost and Benefit/Benefits/Equality Impact Assessment
- 60 (11 1 2) /Evaluation/Cost and Benefit/Costs
Description:
Evidence of incorporation of actual costs of disabled access
- 61 (11 1 2 1) /Evaluation/Cost and Benefit/Costs/Direct
- 62 (11 1 2 2) /Evaluation/Cost and Benefit/Costs/Indirect
- 63 (11 1 2 3) /Evaluation/Cost and Benefit/Costs/Responsibility
- 64 (11 7) /Evaluation/Disabled access in appraisal
Description:
Proposition 1 - disabled access is largely unaccounted for in the economic appraisal of tram systems.
- 65 (11 7 1) /Evaluation/Disabled access in appraisal/Evidence
- 66 (11 7 1 2) /Evaluation/Disabled access in appraisal/Evidence/Methods
Description:
Question 5 - what methods were used to assess costs and benefits of disabled access?
- 67 (11 7 2) /Evaluation/Disabled access in appraisal/Absence
- 68 (11 7 2 4) /Evaluation/Disabled access in appraisal/Absence/Hard-to-measure
- 69 (11 7 3) /Evaluation/Disabled access in appraisal/Compared to other hard-to-measure
- 70 (11 7 4) /Evaluation/Disabled access in appraisal/Officer motivation
- 71 (11 7 5) /Evaluation/Disabled access in appraisal/Compared to economy
- 72 (11 7 6) /Evaluation/Disabled access in appraisal/Stage
- 73 (11 7 6 2) /Evaluation/Disabled access in appraisal/Stage/Design and construction

Description:

Proposition 3 - Greater weight is given to disabled access during construction than would logically be assumed from the (lack of) weight given in the economic appraisal.

- 74 (11 7 6 2 1) /Evaluation/Disabled access in appraisal/Stage/Design and construction/Result
- 75 (11 7 6 2 2) /Evaluation/Disabled access in appraisal/Stage/Design and construction/Effort
- 76 (11 7 6 10) /Evaluation/Disabled access in appraisal/Stage/Planning
- 77 (11 7 6 10 1) /Evaluation/Disabled access in appraisal/Stage/Planning/Process – risk

Appendix C Systematic review protocol

1.1. Research outline

This project will explore the methods that have been proposed or used to incorporate intangible, non-monetised benefits into project appraisal in a range of sectors. The aim is to identify methods that can be applied to the impact of including disabled access in transport project appraisal.

1.2. Background

The problem of how to incorporate intangibles into project appraisal is not a new one, and is not confined to transport. My preliminary literature search has identified a number of studies that may assist in developing an evaluation framework. Outside transport, similar issues exist in, for example, valuing heritage features (Abelson, 2001) and environmental issues in relation to forestry (e.g. Kriström, 1998). Within transport, the problems of addressing environmental costs and benefits – but most particularly costs – has received quite a lot of attention (e.g. Daniels and Adamowicz, 2000; Button, 1994). Specifically in relation to social inclusion – known in some countries, including the USA, as environmental justice – and transport, some attempts have been made to develop frameworks for considering social inclusion issues (e.g. Liu, 2001; Amekudzi and Dixon, 2001). However, these studies address the issue from different perspectives, with different definitions, differing assumptions and so on. It's chaotic, because they were not developed from the same perspective or with synthesis in mind.

1.3. Research question

The question that the review will address is: 'How have intangible (non-monetary) benefits been incorporated into evaluation frameworks for projects?' My objective is to gain an understanding of the approach people have taken to including intangibles in appraisal methods. There is a requirement for social benefits (intangibles) to be incorporated into transport project appraisals (HM Treasury, 2003; Transport for London, 2000; UK Department for Transport, 2007) but little or no guidance on how this should be done. There is some concern (Litman, 2003b) that such qualitative material is considered to be of less importance when undertaking transport appraisal, merely because it cannot be monetised. In consequence, it could be argued that society loses out if the benefits are not secured during project selection.

Project I will therefore consist of a study of 'evaluation frameworks' in order to exploit and organise the resources that currently exist. I will review the ways in which other fields such as environment, health and heritage have addressed the

inclusion of qualitative data in appraisals or have applied proxy monetisation methods.

1.4. Research method

The method I propose to use is a systematic literature review supplemented by a trawl of international transport professionals to identify evaluation frameworks currently in use that address the inclusion of non-monetised benefits. Through the review, I intend to:

- Provide an understanding of the extent of the work that has been done to value intangibles (such as environmental impacts)
- Identify aspects of that work that could be transferred to valuing disabled access in transport projects.

Professor David Tranfield, in the introduction to the Cranfield Systematic Review Workshop course notes, states:

“Systematic reviews differ from traditional narrative reviews by adopting a replicable, scientific and transparent process, in other words a detailed technology, that aims to minimise bias through exhaustive literature searches of published and unpublished studies and by providing an audit trail of the reviewers decisions, procedures and conclusions.”

The Cranfield Systematic Review Workshop identifies the principles underlining systematic review as:

- explicit a priori criteria for planning the review
- exhaustive searches for published/unpublished studies
- explicit selection criteria
- evaluation of study quality
- listings/tables of included studies with their characteristics
- balanced and impartial synthesis based on a pre-determined analytic framework
- transparency of the reviewer's procedures and justifications for all decisions taken and the conclusions drawn

The review will cover published literature including journals, trade press, books and web sites and, where possible, unpublished literature in the form of internal documents, probably from government organisations, outlining their own approaches to project appraisal in a range of sectors including planning, health, education, employment and transport. I will also use my networks of transport professionals to identify additional frameworks that may currently be in use.

Because this is a much wider range of literature than might be expected in a systematic literature review, the discipline of the systematic review in applying consistent quality criteria, and ensuring an audit trail, becomes even more important.

1.5. Advisory panel

Systematic literature review normally involves the use of an advisory panel, consisting of academics working in the area, practitioners working in the area and librarians. I intend that my panel should comprise people with expertise in:

- transport economics
- social inclusion and transport
- valuing intangibles
- the economics of other sectors, for example health and / or the environment
- corporate social responsibility (e.g. someone from AccountAbility)

I have already identified a panel member with expertise in social inclusion and transport (one of my interviewees from my qualitative project). I have some possibilities in mind for the other panel members but have not yet approached them.

The advisory panel has a role in determining the search strings to be used in the electronic literature search, the selection criteria and the quality standards. Initial proposals for the search strings and databases can be found in Appendix 2, and these will be submitted to the panel for their consideration.

1.6. Outputs

I anticipate that at the end of project 1 I will have identified a number of criteria used in evaluation frameworks that either are, or could be, used to assess the 'value' of disabled access in transport project appraisal. I anticipate having a broad understanding of how these criteria are currently used - that is, what they 'mean'. It is my intention to work with a transport organisation for project 2 to select the criteria that best 'fit' into its existing evaluation framework. For this it will be important to work with an organisation that has a positive and innovative approach to social inclusion in general and disabled access in particular. Currently I am in discussion with Transport for London, who are seeking to find ways of incorporating the evaluation of disabled access into their business planning cycle.

[In the event, the author worked with three organisations to identify how they incorporated disabled access into project appraisal – the tram multiple-case study.]

Appendix D Systematic literature review additional information

1.1. Review panel: terms of reference

Purpose

- To provide advice and support during the extended systematic literature review.

Objectives of the review

- To explore the methods that have been proposed or used to incorporate intangible and non-monetised benefits into project appraisal in a range of sectors.
- To identify methods that can be applied to the inclusion of disabled access in transport project appraisal.

Activities

- Review proposed objectives, search parameters and selection criteria and recommend changes if appropriate.
- Recommend sources of practitioner papers and other useful data if appropriate.
- Propose and agree quality criteria.
- Review output at various stages and comment on progress.

Operation

- The panel will meet three times during the review:
 - Early January 2005 to agree Terms of Reference and operation, databases, search strings and selection criteria.
 - Early March 2005 to review progress and agree quality criteria.
 - Late April 2005 to review and finalise output.

1.2. Review panel: membership

Ian Black: Transport economist

Mark Brown: Halcrow, Director of Consulting Development

Ann Frye: Department for Transport, Mobility and Inclusion Unit

Vicki Holton: Ashridge Centre for Business and Society

John Towriss: Cranfield University, School of Management

1.3. Databases considered

Heather Woodfield of King's Norton Library, Cranfield University assisted in identifying a list of databases to search. Because the review was not focused on a particular industry sector – indeed the point was to cover a wide range of sectors – a large number of databases were potentially relevant. There initial a list comprised 20 databases to search to be sure of casting the net wide.

Environmental sciences, health, and economics were likely to be rich sources, and there was a particular focus on them.

The initial list of 20 databases, showing which were excluded from the final list during the scoping study and why, is in Table 77. Later, during the review proper, other databases were also excluded (section 3.2.2).

Database	Coverage	Include?	Reason for exclusion
ABI (ProQuest)	Very wide range of journals	Yes	
CAB Abstracts	Possible valuation of environmental issues	Yes	
CSA	Possible valuation of environmental issues	Yes	
EBSCO Business Source Premier	Very wide range of journals	Yes	
Ingenta Connect	Very wide range of journals	Yes	
Science Direct	Possible valuation of scientific, technical and medical issues	Yes	
Web of Knowledge (ISI)	Very wide range of journals	Yes	
Cochrane Library	Possible valuation of health issues	No	Search mechanism did not allow sufficient restriction in results
Compendex	Possible valuation of scientific or engineering issues	No	Search mechanism did not allow sufficient restriction in results

Database	Coverage	Include?	Reason for exclusion
Conference Papers Index	Access to conference papers	No	Few or no papers identified on initial scope
Cranfield School of Management Publications	Access to previous research into transport and access	No	Few or no papers identified on initial scope
Ecology Abstracts (CSA)	Possible valuation of environmental issues	No	Few or no papers identified on initial scope
EIS: Digests	Possible valuation of environmental issues	No	Few or no papers identified on initial scope
Environmental Sciences & Pollution Management	Possible valuation of environmental issues	No	Papers in initial scope available through EBSCO
Economic and Social Research Network (ESRN)/ Social Science Research Network (SSRN)	Economic articles	No	Either too many or too few results, depending on terms – difficult to limit effectively
Health & Safety Science Abstracts	Possible valuation of health and safety issues	No	Few or no papers identified on initial scope
Index to Theses	Previous research not necessarily available in journals	No	Initial scope indicated that search terms were not specific enough
International Bibliography of the Social Sciences	Access to journals and conference papers on the social sciences	No	Few or no papers identified on initial scope
JSTOR (Business Collection)	Archives of journals for past research	No	Few or no papers identified on initial scope
ZETOC	Very wide range of journals	No	Few or no papers identified on initial scope

Table 77: Systematic review: databases and their inclusion or exclusion

1.4. Application of search strings: results

	Search for	In	Collections (if applicable)	Time frame	Date	No. of entries	No. of relevant entries
ABI (ProQuest)	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (justice OR benefit OR inclusion)) OR (environmental AND (justice OR racism OR equity OR discrimination)) OR (interpersonal AND utility))	Abstract	Abi global, Trade & Industry and Applied science	from 1995	02/02/2005	108	15
CAB Abstracts	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Default fields	All CAB databases	1995–date	02/02/2005	38	8
Cochrane Library	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Note: 'and' and 'or' are ignored			17/01/2005	3937	N/A

	Search for	In	Collections (if applicable)	Time frame	Date	No. of entries	No. of relevant entries
Compendex	"appraisal method" OR "project appraisal" OR "appraisal criteria" OR "economic appraisal" OR "socioeconomic appraisal" OR "social benefit" OR "social inclusion" OR "environmental justice"	Default	Compendex only	All dates	17/01/2005	401	N/A
Conference Papers Index	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)				17/01/2005	0	0
Cranfield School of Management Publications	project appraisal			All	17/01/2005	1	0
CSA	cost AND (benefit OR utility OR consequences) and (intangible OR non-monetary OR non-financial)	Journal articles only	PsycInfo; ERIC; LISA; Social Services Abstracts; Sociological Abstracts; Ecology Abstracts	1995–date	17/01/2005	34	4

	Search for	In	Collections (if applicable)	Time frame	Date	No. of entries	No. of relevant entries
EBSCO	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Electronic journals		1997–2003	16/01/2005	30	9
Ecology Abstracts (CSA)	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Journal articles only		Earliest	17/01/2005	0	0
EIS:Digests	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic))	Default		All dates	17/01/2005	9	0
Environmental Sciences & Pollution Managementt	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Journal articles only		All dates	17/01/2005	8	2 also available via EBSCO
ESRN/SSRN	cost benefit analysis	Title and abstract			17/01/2005	363	N/A

	Search for	In	Collections (if applicable)	Time frame	Date	No. of entries	No. of relevant entries
Health & Safety Science Abstracts	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Journal articles only		Earliest	17/01/2005	3	0
Index to Theses	"appraisal method" OR "project appraisal" OR "appraisal criteria" AND "social benefit" OR "social inclusion" OR "environmental justice"	Default search	Not Irish		17/01/2005	-	Could not narrow down search enough
Ingenta Connect	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Title keywords and abstract		1995-date	17/01/2005	22	6
Intern'l Bibliography of the Social Sciences	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Title keywords and abstract		1951–2005	17/01/2005	3	0

	Search for	In	Collections (if applicable)	Time frame	Date	No. of entries	No. of relevant entries
JSTOR (Business Collection)	project appraisal AND social benefit				17/01/2005	0	0
Science direct	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (justice OR benefit OR inclusion)) OR (environmental AND (justice OR racism OR equity OR discrimination)) OR (interpersonal AND utility))	Title Keywords and Abstract	Business, Management & Accounting, Civil Engineering, Decision Sciences. Economics & Finance, Psychology, Social Science	1995– date	16/01/2005	13	1
Web of Knowledge (ISI)	(appraisal) AND ((project OR method OR criteri* OR economic OR socioeconomic)) AND ((social AND (benefit OR inclusion)) OR environmental justice)	Title Keywords and Abstract	Web of Science ISI Proceedings	1995– date	17/01/2005	31	8
ZETOC	appraisal criteria social benefit	General			17/01/2005	1	0
Databases	20	Total relevant papers					47

Table 78: Systematic review: initial database scoping

1.5. Data extraction

This is a verbatim reproduction of the notes taken by the author to support the systematic literature review. Comments are about the relevance or applicability of the resource to disabled access and should be read as such, not as comments on the resource *per se*.

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Alonso</p> <p>The Benefits of Building Barrier-free: A contingent valuation of accessibility as an attribute of housing</p>	2002	<i>European Journal of Housing Policy 2(1)</i>	WTP for accessible housing	<p>Showed photos of "different types of residents in everyday life inconvenienced by barriers in their buildings" - these were disabled people (wheelchair, crutches, elderly); temporary mobility problems (prams, children, broken leg, walking stick); and other people inconvenienced by design (badly positioned switches etc.).</p> <p>Discusses the 'free-rider effect' - people upping WTP in order to improve society when they do not think they'll have to pay. Housing is 'private market' so less of an issue.</p>	<p><i>Could be done for stations, but wouldn't disaggregate the different types of access - might be difficult for information and customer service?</i></p> <p><i>How much is this a factor for stations?</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Alvarez-Farizo & Hanley</p> <p>Using conjoint analysis to quantify public preferences over the environmental impacts of wind farms. An example from Spain</p>	2002	<i>Energy Policy 30</i>	Use of contingent rating and choice experiments to value wind farm development	Briefly covers the theory behind CR and CE methods. Describes the case study site and the results of the two surveys. Useful insights into some of the design considerations especially for CE.	<i>Transferable in relation to issues of design, e.g. people's attitude towards environmental issues</i>
<p>Beckman et al.</p> <p>Envy, malice and Pareto efficiency: An experimental examination</p>	2002	<i>Social Choice and Welfare 19</i>	Empirical test of the effect of envy and malice in economic decisions	<p>Considers the lack of universal support for Pareto efficient propositions, speculated to be envy and malice.</p> <p>Reviews the theoretical background.</p> <p>Tests the proposition that envy and malice play a part by offering people different options - knowledgeable or not as to their own relative position as recipient of the Pareto improvement. Tests in US, China and Russia. Evidence that envy and malice play a part.</p>	<i>May have relevance in relation to different access improvements and people with different access needs.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Brouwer</p> <p>Environmental value transfer: state of the are and future prospects</p>	2000	<i>Ecological Economics 32</i>	Reviews current methods of environmental value transfer	<p>Looks at methods of valuation from the perspective of identifying valid outcomes or amounts for environmental value transfer. Reviews existing studies. An issue for transfer is the variability in amounts of WTP, which arises in part from the different values and interpretations respondents have.</p> <p>Considers the meaning, interpretability and stability of environmental values. WTP as a reliable outcome of people's valuation; the commensurability of different aspects of a valuation (e.g. use and non-use values, or values across different sectors); practical problems such as people's ability to value, double counting, and the transitory nature of WTP.</p> <p>Identifies a number of factors that will make value transfer more reliable, and process for doing CV.</p>	<p><i>Identifying underlying values and interpretations pre-study is key.</i></p> <p><i>Important to consider for limitations of possible WTP study.</i></p> <p><i>Useful process outline</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Chilton & Hutchinson</p> <p>Do focus groups contribute anything to the contingent valuation process?</p>	1999	<i>Journal of Economic Psychology 20</i>	Review of use of qualitative data in CV especially focus groups	Reviews the uses that focus groups have been put to in the past: questionnaire testing; post-survey for validation or feedback. Focuses on the use of focus groups to identify 'knowledge, definitions and heuristics' brought to the CV survey by respondents. Proposes grounded theory or content analysis techniques for analysing the output from groups.	<i>May be of use for setting parameters for WTP approach that would work with disabled access.</i>
<p>Clark et al.</p> <p>"I struggled with this money business": respondents' perspectives on contingent valuation</p>	2000	<i>Ecological Economics 33</i>	Use of in-depth focus groups to determine what individuals' WTP responses meant	<p>Questions whether respondents in a CV survey understand how to put meaningful values on environmental goods. Exploration of whether respondents' voices are heard in the literature about valuation - concludes that much of the research is about improving the method rather than questioning how CV is supposed to work.</p> <p>Used in-depth focus groups - small groups that meet over a number of weeks to explore the issue - with participants who had been respondents in a CV study.</p>	<i>Qualitative pre-work as per Chilton & Hutchinson - better than nothing?</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				<p>Participants challenged the basis of the CV survey - was this the right way to value nature - and how they were supposed to put a monetary value on the good in question. They wanted to contribute to the valuation but to do so in a more collaborative way with others and not as isolated individuals.</p>	<p><i>May be important for designing a WTP survey for disabled access - should decision-making be done in a group? Of whom?</i></p>
<p>Clinch & Murphy Modelling winners and losers in contingent valuation of public goods: appropriate welfare measures and econometric analysis</p>	<p>2001</p>	<p><i>The Economic Journal</i> 111</p>	<p>Discussion of use of CV when public goods result in costs to some and benefits to others</p>	<p>Theoretical discussion of WTP/WTA and similarities and differences between the two - when are they likely to diverge?</p> <p>Empirical test using Irish forestry with a split sample some of whom thought more forests were good and some bad. Some socioeconomic data also included e.g. age, perception of environmental issues, income.</p> <p>Concludes that "where a project or policy may result in winners and losers, the elicitation format used should enable respondents to make explicit positive, negative and zero bids" (p.441). This can have a significant impact on the results of a cost-benefit test.</p>	<p><i>Of importance in disabled access in transport – positive negative and zero should be 'allowed' in CV study.</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Coast, Joanna</p> <p>Is economic evaluation in touch with society's health values?</p>	2004	<i>BMJ 329</i>	Advocates cost consequences	<p>Welfare: Cost benefit analysis - Use of WTP skews to wealthy; People dislike explicitly valuing Quality of Life.</p> <p>Non-welfare: Cost effectiveness/utility analysis - Uses QALY to achieve societal objectives; Decision-makers' objectives may not mirror society's; QALY is a simplistic outcome; Decision-makers may not understand economic representation</p> <p>Alternative: Cost consequences - table of costs and consequences for different options - decision-makers can impute their own values to costs/consequences; they can see what is (not) included; more information can be provided.</p>	<p><i>Disabled people are typically less well-off; doesn't deal with distributional issues or equity</i></p> <p><i>Probably isn't one simple outcome to use for transport and disabled people especially given differences between access needs</i></p> <p><i>Could be of use: need further exploration</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>DeCorla-Souza et al.</p> <p>Total cost analysis: An alternative to benefit-cost analysis in evaluating transportation alternatives</p>	1997	<i>Transportation</i> 24	Use of TCA rather than CBA for e.g. ease of comprehension	<p>Introduces concept of TCA - unlike CBA does not attempt to balance benefit against cost, but presents different cost scenarios. Monetised benefits presented as negative costs. This in order to address problems with CBA: decision-makers' unfamiliarity; CBA's inability to address other values; decision-makers' desire to preserve judgement not respond to 'right' answer from CBA black box.</p> <p>Cost savings (e.g. value of time saved) are presented as negative costs, but other non-monetisable benefits are presented with measure of magnitude (qualitative or quantitative)</p>	<p><i>Provides 'more acceptable' way of presenting essentially CBA information to decision-makers?</i></p> <p><i>Still leaves non-monetisable benefits unmonetised, but may not be as isolated, as all monetisable is on one side of the equation.</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Del Saz-Salazar & Garcia-Menendez</p> <p>Willingness-to-pay for Environmental Improvements in a Large City</p>	2001	<i>Environmental and Resource Economics 20</i>	Uses CV to assess WTP for remodelling a waterfront	<p>Straight WTP survey using CV but key issue to note: importance of time span (construction would be complete by...);</p> <p>Funding would be via trust not taxes;</p> <p>WTP of 0 was offered for people not willing to pay, so 'Spike' model used for analysis.</p>	<p><i>Important consideration for disabled access in relation to use, non-use and option - if in someone's lifetime or not for example</i></p> <p><i>Possible alternatives (not necessarily trust) for funding option for disabled access?</i></p> <p><i>WTP of 0 should be offered so people can e.g. 'vote' for access by right</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Ding, Grace</p> <p>Developing a multicriteria approach for the measurement of sustainable performance</p>	2005	<p><i>Building Research and Information</i> 33(1)</p>	Advocates and tests a multicriteria model	<p>Construction is typically linked to environmental degradation. CBA is conventionally used for construction. But monetary value is difficult to ascertain for environmental assets. MCA “uses a weighted score approach to evaluate environmental issues”. CBA and MCA are in practice used as complementary tools. Financial considerations should not be wholly excluded from analysis. Sustainability indices have been used in e.g. farming. A sustainability index identifies, quantifies and incorporates (environmental) issues into decision-making.</p> <p>How? She identified economic and environmental criteria from the literature; surveyed construction professionals to rank the criteria.</p>	

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				<p>Used a pairwise comparison matrix to rank the criteria to determine significance and allocated points according to importance. The “Kendall coefficient of concordance” is used “consider the relationship amongst the rankings expressed by building professionals in the survey”. She took the top criteria, but amalgamated the others into one (‘external benefits’). Expert opinion is key.</p> <p>Criteria can also be determined by the community - local council, those affected etc. “weights for criteria will reflect the level of impact of a development on individuals”. “The methodology allows information from heterogeneous qualitative sources, such as community questionnaires and surveys, to form part of the appraisal.” Weighting must be done with care - potential source of bias.</p> <p>The four criteria are in different units, so must “transform them into a common dimension or a common dimensionless unit” - this can be done with ‘available standardization procedures’. They can then be used in a decision-making model (p.14 explains how).</p>	<p><i>Who is the expert – transport practitioners or disabled people? Presumably would be based on barriers? Is financial return an important factor? That would have to be practitioner estimated.</i></p> <p><i>How do you determine who is most impacted by a development? In transport as it relates to disability does the level or type of access need affect this judgement?</i></p> <p><i>Promising model, but requires quite a lot of interpretation - and how to test?</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Dolan & Edlin</p> <p>Is it really possible to build a bridge between cost-benefit analysis and cost-effectiveness analysis?</p>	2002	<i>Journal of Health Economics 21</i>	Technical proof of non-compatibility of CBA and CEA	States important ?fact? that CBA and CEA are not linkable, but proof is dense and highly technical.	<i>Useful only for ?fact? if taken at face-value, but if accepted, then it is important.</i>
<p>Donaldson et al.</p> <p>The distribution problem in economic evaluation: income and the valuation of costs and consequences of health care programmes</p>	2002	<i>Health Economics 11</i>	CEA is not preferable to CBA on distributional grounds	Compares CBA and CEA in relation to the way they address distributional problems. Contends that CEA also has distributional problems, and is not necessarily preferable to CBA on those grounds. Proposes 3 ways of discounting income distribution in evaluation (AM not convincing). Claims that the numeraire is not significant - that there are always distributional problems regardless of whether money is taken as the numeraire or not.	<i>Useful contribution to the decision-making process between CEA and CBA.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Fleischer & Felsenstein</p> <p>Cost-benefits analysis using economic surpluses: a Case study of a televised event</p>	2002	<i>Journal of Cultural Economics 26</i>	Calculates social benefit of staging the Eurovision Song contest in Israel through cost benefit approach	Considers three types of surplus: government, consumer and producer. Producer: approximated by incremental profit (of e.g. additional hotel beds sold); consumer: approximated by WTP for having the event in Israel; Government: approximated by the cost of advertising Israel on other participants' national networks.	<i>Potentially useful to consider those three types of surplus / benefit in relation to disabled access. Producer: additional expenditure ('£80bn') by disabled people; consumer: Disabled People's (and Non-Disabled People's) WTP for access; Government: savings in benefits, health service, 'special' provision.</i>
<p>Glaister</p> <p>Observations on the New Approach to the Appraisal of Road Projects</p>	1999	<i>Journal of Transport Economics and Policy 33(2)</i>	Descriptive review of NATA in relation to road projects	Raises some principles that need to be considered in appraisal, and discusses what the place of CBA should be in appraisal.	<i>Good basis for discussion of NATA and modification / extension for disabled access, despite being road based - likely to be transferable to public transport.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Hanley et al.</p> <p>Contingent Valuation Versus Choice Experiments: Estimating the Benefits of Environmentally Sensitive Areas in Scotland</p>	1998	<i>Journal of Agricultural Economics 49</i>	Use of CV (both dichotomous choice and open-ended) to value ESAs in Scotland and comparison with choice experiments	<p>Discusses the theory of choice experiments (but not of CV). Identifies likely advantages. Describes surveys and results in comparison. CV results rejected because range of payment not high enough (too many respondents at top of range). Describes adjustment for CV's part/whole bias.</p> <p>Discussion of applicability in benefits transfer - CE is better because you can disaggregate individual characteristics of the thing being valued and estimate a value for each characteristic</p> <p>Concludes that CV may be better where whole policy is being valued and CE for characteristics.</p>	<p><i>Part/whole issue likely to be of relevance for disabled access</i></p> <p><i>Considering individual improvements is important for disabled access.</i></p>
<p>Hanley et al.</p> <p>Using Choice Experiments to Value the Environment</p>	1998b	<i>Environmental and Resource Economics 11(3-4)</i>	Review of theoretical background to choice experiments	Establishes that CE fits within random utility theory (like dichotomous choice CV).	

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				<p>Reviews design issues in CE studies. Need to keep the number of choices to a manageable level.</p> <p>Can the thing to be valued be described in terms of individual components? Does that make sense? Must certain things be present (and to what extent) for other things to be of value?</p> <p>They provide a specific way of allowing for non-participation.</p> <p>Reviews recent use of CE in environmental work and presents results of CE for forest landscapes in UK and compares it to CV study.</p>	<p><i>This may be an important issue for disabled access - e.g. accessible ('disabled') toilet of less use if no access to platform.</i></p>
<p>Hanley et al.</p> <p>Choice Modelling approaches: a superior alternative for environmental evaluations</p>	<p>2001</p>	<p><i>Journal of Economic Surveys 15(3)</i></p>	<p>Reviews the use of choice modelling for the environment</p>	<p>Considers four types of choice modelling: choice experiments; contingent ranking; contingent rating; paired comparison. Only CE is considered to be wholly consistent with welfare economic principles (maximisation of utility).</p>	<p><i>Very useful discussion of CE and its advantages/disadvantages over CV.</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				<p>Theoretical discussion of choice experiments and proof of their consistency with utility maximisation and demand theory (provided a status quo option is incorporated).</p> <p>Discusses advantages and problems - claims that minimisation of response difficulties in CV has yet to be demonstrated. Brief discussion of use to policy makers.</p>	
<p>Hanley et al. Estimating the monetary value of health care: lessons from environmental economics</p>	<p>2003</p>	<p><i>Health Economics 12</i></p>	<p>Method comparison from environmental economics - SP only</p>	<p>Contingent valuation method (CV): open-ended; payment card; dichotomous choice; payment ladder. Preferences are more stable if people can discuss. Need for researcher to identify underlying WTP range; need-to-please researcher, or appear to be 'good' by saying 'yes' to interventions; utility maximisation of welfare economics may be inappropriate (rights-basis); sequencing and nesting (part-whole) problems; use v. non-use v. option v. availability; distance-decay functions: possibly relate to social distance re values held; benefits transfer: how close is close enough for policy makers?</p>	<p><i>Use v. non-use etc. an important consideration. Many people do not consider that they will need access - or do not want to think about it - so some will need (use); some will think they'll never need and not care; some will want the option; and some will like to have it around for the benefit of disabled people.</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				Choice experiments (CE): Design is important - but no certainty around how important; statistical complexity; probably internally valid; may be better for benefit transfer; limited ability to handle socioeconomic variation	<i>Too complex for policy makers? Need further thought / investigation on this one.</i>
<p>Israeli</p> <p>A preliminary investigation of the importance of site accessibility factors for disabled tourists</p>	2002	<i>Journal of Travel Research 41</i>	Proposes a model for evaluating accessibility factors	<p>“model for evaluating the relative importance of accessibility factors in tourist sites”. Some assumptions about the nature of disabled people’s choices - that some accessibility factors are absolute (e.g. lifts for wheelchair users). Models with equations. Discussion of different evaluation methods - compensatory (tradable factors) v. non-compensatory (advantages cannot be traded against disadvantages). Settles on non-compensatory EBA (elimination by aspect), which “examines all the alternatives, one attribute at a time, and eliminates the alternatives that do not satisfy a certain standard” - until all but one alternatives have been eliminated.</p>	<i>Might be of interest for ranking of accessibility factors in the transport environment, but some rather simplistic assumptions - a tourist might still visit somewhere without a lift if they could see a great deal of the rest of the site, or had relatives/friends who wanted to visit it.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Junankar & Liu</p> <p>Estimating the social rate of return to education for Indigenous Australians</p>	2003	<i>Education Economics 11(2)</i>	Looks at 'bigger picture' variables to estimate social rate of return	<p>Identifies a number of factors: likely earning of someone with differing levels of education and work experience at different ages; consequent tax contribution; reduction in involvement in crime; increased life expectancy with consequent longer working life contribution.</p> <p>Identifies 3 types of benefit: additional income stream; external benefits (literacy leads to increased filing of tax returns; increased life expectancy); indirect/intangible benefits (diffusion of skills; social cohesion etc etc)</p> <p>Uses Census data to estimate social rate of return.</p>	<p><i>Might be difficult to know where to find comparator data that was valid - e.g. increased earnings to national unemployment levels, but not all attributable to transport.</i></p> <p><i>A bit rough and ready, but possibly of use as 'govt surplus' element of a calculation</i></p>
<p>Kenkel</p> <p>On valuing morbidity, cost-effectiveness, and being rude</p>	1997	<i>Journal of Health Economics 16</i>	Advocates CBA for health projects	Suggests that the relationship between WTP and income for health is weak, and taking income into account may be appropriate.	<i>Notable contribution to the decision-making process between CEA and CBA.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Kijak & Moy</p> <p>A Decision Support Framework for Sustainable Waste Management</p>	2004	<i>Journal of Industrial Ecology</i> 8(3)	Integrates Life-Cycle Assessment with tools for environmental, social and economic impacts	<p>Gives a short account of incorporating social impacts into a full assessment. Factors to be considered were gathered through survey, and then prioritized by stakeholders (apparently experts, not members of the community). These ratings are used to weight various waste management activities. Integration of social factors into the overall decision support mechanism uses Multi Attribute Utility Theory. The social impact factors become decision attributes of decision alternatives designed to reach a decision goal. A commercial software program is used to calculate the decision score.</p>	<i>Doesn't add much to existing resources, but is a possible way of accounting for non-monetised impacts.</i>
<p>Kim & Min</p> <p>Determining Multi-Criteria Priorities in the Planning of Electric Power Generation</p>	2004	<i>International Journal of Management</i>	Theoretical discussion of the use of multi-expert opinions and suitable weighting	<p>Uses Analytic Hierarchy Process - extending from single expert input to multi-expert input.</p>	<i>Essentially about handling the use of expert opinion - only relevant in that circumstance.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Lopes & Flavell</p> <p>Project appraisal - a framework to assess non-financial aspects of projects during the project life cycle</p>	1998	<p><i>International Journal of Project Management</i> 16 (4)</p>	<p>Proposes a framework for evaluation that does not use measures and weightings</p>	<p>Comments on the criticism of emphasis on financial and technical aspects of projects to the exclusion of social, political and other aspects. Expresses concern that weighting and measuring for non-financial aspects is too complex for most practitioners and they will avoid it. Proposes a framework that avoids this.</p>	<p><i>Framework is descriptive, but may be of use.</i></p>
<p>Mathieson</p> <p>Benefits analysis - a robust assessment approach</p>	2004	<p><i>Journal of the Operational Research Society</i> 55</p>	<p>Approach to estimating non-financial benefit in complex multi-factor investment appraisal</p>	<p>Describes Benefits Analysis as part of the problem-solving process: elicitation, modelling and solving - BA is essentially the modelling part, but includes elements of the other parts also. Describes it as assessing "an investment option on the basis of the value accruing from it rather than its immediate characteristics".</p> <p>Consensus-forming is a key element of the analysis.</p>	<p><i>May be useful particularly in relation to "policy-level measures of effectiveness"</i></p> <p><i>Would probably require consensus from different groups of disabled people</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				Essentially cause-and-effect approach: "the map [must] be causal and not simply an influence diagram or cognitive map". Linking is between elements of investment and value criteria.	<i>Positivist approach - fits in critical realist framework?</i>
Mathieson Best Practice for using Assessment Hierarchies in Operational Analysis	2001	<i>OR Insight 14(2)</i>	Issues in MCA - appropriate use of assessment hierarchies	<p>Consideration of the logical combinability of some criteria (which can be done by analysts) versus the non-combinability that has to be done by personal or institutional preference - i.e. opinion.</p> <p>Stresses rigour required in analysis and provides mnemonic. Fairly relaxed about some of the elements though e.g. objectivity - "However, the presence of subjectively derived data (such as expert judgement) does not prevent rigorous analysis provided the subjectivity is documented and the treatment of the data is objective." (p.8)</p> <p>Considers the 'real costs' of judgemental methods (assessment hierarchies). Suggests ways of increasing rigour.</p>	<p><i>May be of use in analysing disabled access issues.</i></p> <p><i>Significant level of subjectivity in disabled access therefore this is just as well.</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Mogas et al.</p> <p>Accounting for Afforestation Externalities: A comparison of contingent valuation and choice modelling</p>	2005	<i>European Environment 15</i>	Uses a combination of CV and CM to value afforestation	Applies both CM and CV to a particular afforestation project in Spain, to check consistency of CV and CM welfare changes estimates. CV dichotomous choice method was used on two options that had the same attributes as the CM options. The welfare estimates from both are not consistent - CM produces higher levels than CV.	<i>Potentially useful way of addressing validity of results from SP survey (whichever) for disabled access.</i>
<p>Powe & Bateman</p> <p>Investing in sensitivity to scope: a split-sample test of perceived scheme realism</p>	2004	<i>Land Economics 80(2)</i>	Methodological problems with CV and overcoming them	Considers whether the scope of a project affects WTP and what the various factors might be that influence WTP. Likelihood of the scheme being developed is one of those factors. They argue that 'perceived realism' should be included as standard in all CV studies.	<i>Might influence WTP levels for disabled access assuming WTP considered to be a reasonable approach.</i>
<p>Ratcliffe</p> <p>The Use of Conjoint Analysis to Elicit Willingness-to-pay Values</p>	2000	<i>International Journal of Technology Assessment in Health Care 16(1)</i>	Discussion of use of CM and some of the problems associated	Raises issues of cost versus value - CV asks for people's value, but CM is essentially about cost. CM also limits cost options offered and may restrict responses of those who do not like options and can't choose alternative	<i>Useful comments on CM, to ensure design addresses the issue</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
Rendel Planning <i>Environmental appraisal: a review of monetary evaluation and other techniques</i>	1992	<i>TRL Report 290</i>	Analysis of different methods of appraisal to identify appropriate methods for DoT	<p>Compares different valuation techniques available at the time: surrogate markets (hedonic pricing/TCM); hypothetical markets (WTP/CV); dose-response (productivity losses, replacement costs); public preference value identification via expert opinion.</p> <p>Apply four 'acceptability criteria': technical acceptability; institutional acceptability; user-friendliness; costs of implementing</p>	<p><i>Potentially useful comparison: surrogate markets - difficult to identify; hypothetical markets - usual problems with WTP but may be worth pursuing; dose-response - possibly relates to 'accessible bus = job increases?'; public preference value identification - may be of use - needs further exploration.</i></p> <p><i>May be of use for SLR output as quality criteria.</i></p>
Richardson <i>The Economic Framework for Health Service Evaluation and the Role for Discretion</i>	1999	<i>http://www.busec.o.monash.edu.au/centres/che/pubs/wp105.pdf</i>	Review of issues associated with CBA, CEA and CUA in health	Considers additional factors that might alter the apparent course of action dictated by an economic evaluation using CBA, CEA or CUA. Importantly looks at justice based considerations, including priority given to people with more severe conditions	<i>Should priority be given to people with more severe impairments? Or who experience more or more problematic barriers in the environment?</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
Svedsater Economic Valuation of the Environment: How Citizens Make Sense of Contingent Valuation Questions	2003	<i>Land Economics</i> 79(1)	Exploration of whether respondents understand CV	Focuses on 'respondents' thoughts and discussions that revolves around the valuation task'. Builds on previous work that suggests that WTP responses are 'gestures in a political process toward which people respond as citizens, not as self-oriented consumers'	
UK Department for Transport <i>Transport Analysis Guidance 2.5 & 3.7.1</i>	2004	www.webtag.org.uk	Overall view of the appraisal process using MCA and relationship to HMT guidance	Appraisal Summary Table gives 'framework for assessing the impact of a particular strategy or plan on objectives for social inclusion' - AST has qualitative impacts column. Social inclusion is primarily economic disadvantage (as per SEU definition). No explicit mention of disability. Identifies recommendation in <i>Green Book</i> that impacts that cannot be valued in monetary terms are still taken into account, through CEA or MCA approaches. But "Decision takers must apply their judgement, taking account fo the views of stakeholders	<i>Not clear how such qualitative impacts can effectively be balanced against the quantitative effects in the table. Also, no specific guidance on disability. Depends on decision takers recognising the issues and appropriately a) involving stakeholders (which?) and b) valuing in the broad sense the responses.</i>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
				determined through participation, to weigh up the impacts to reach an assessment of the overall value for money of the proposal".	
<p>Whitelaw & MacMullan</p> <p>A framework for estimating the costs and benefits of dam removal</p>	2002	<i>Bioscience 52(8)</i>	Outlines 6 principles to be taken into account when doing CBA	<p>Asked people to think aloud when answering WTP questions - to provide commentary on how they were answering the question. Respondents rarely consider standard economic issues (e.g. affordability) and considered e.g. fairness instead / as well. Around 20% guessed.</p> <p>6 principles: Assess benefits as well as costs; Positive as well as negative impact on jobs; Distribution of consequences and fairness; Rights and responsibilities; Uncertainty and sustainability; More than just [the specific issue under consideration]</p> <p>Demonstrates that a US application of CBA to dam removal does not take into account those 6 principles</p>	<p><i>Important consideration - similar to Chilton & Hutchinson's focus groups, but direct questioning. If WTP to be used, some identification of how people are answering will be important.</i></p> <p><i>Possible application to disabled access to transport as part of overall framework</i></p> <p><i>Some potentially useful detail in relation to applying the principles</i></p>

Author/Title	Year	Journal	Approach/ Method	Author Analysis	Applicability to disabled access
<p>Willis et al.</p> <p>Water Companies' Service Performance and Environmental Trade-offs</p>	2002	<p><i>Journal of Environmental Planning and Management</i> 45(3)</p>	<p>Stated choice to evaluate options for water supply that affect the environment and water availability</p>	<p>Outlines position in industry (at length). Describes HARS project and its potential impact on domestic service and the environment.</p> <p>Stated choice is chosen because it enables the evaluation of several goods simultaneously. Design of the SC and contingent ranking survey aided by preliminary focus groups.</p> <p>Results are considered intuitively and found mostly OK (although one coefficient off, but not significantly). Results then applied with CBA.</p>	<p><i>This may be useful, as could consider evaluating several different aspects of accessibility simultaneously and calibrating them to barriers/impairment.</i></p>

Table 79: Systematic review: data extraction table

1.6. Excluded resources

This is a verbatim reproduction of the author's table of excluded resources developed during the systematic literature review.

Author(s)	Year	Source	Title	Reason	Comments
Abelson	2003	<i>Economic Record</i>	The value of life and health for public policy	12	Good summary of existing value of life data, but little to build theoretical model for transport
Alcamo	2001	<i>Agricultural Resources, Governance and Ecology</i>	Environment, security and the question of quantification	11	Specific to environmental security – more about qualification of risk than benefit
Asian Development Bank	1999	(Lycos)	Economic evaluation of environmental impacts	13	Does not add to existing information, although shows various methods clearly – some useful definitions for theoretical background
Baublys & Isoraite	2005	<i>Transport Reviews</i>	Improvement of external transport cost evaluation in the context of Lithuania's integration into the European Union	4	Focus on costs and internalisation through taxation etc.
Berechman & Paaswell	2005	<i>Transportation</i>	Evaluation, prioritization and selection of transportation investment projects in New York City	11	Equates benefits to time savings and increased ridership

Author(s)	Year	Source	Title	Reason	Comments
Berger	1999	<i>Pharmaco-economics</i>	Socioeconomic evaluation in medicine in Europe	4	Focus on costs of healthcare programmes and how economic evaluation helps to quantify/control/compare them
Bhasin	2003	<i>Focus</i>	Appraisal framework for transport objectives	12	No framework but good background for use of frameworks
Bimonte	1999	<i>Environmental and Resource Economics</i>	An Algorithm for Optimal Pigouvian Taxes Without Benefits Data	6	About imposing tax to prevent pollution
Birch & Donaldson	2003	<i>Social Science & Medicine</i>	Valuing the benefits and costs of health care programmes: where's the 'extra' in extra-welfarism?	12	Critique of extra-welfarism & some of its propositions in relation to health. Useful as background
Bishop & Syme	1995	<i>Journal of Economic Psychology</i>	The social costs and benefits of urban consolidation: A time budget/contingent valuation approach	Not 2	Not transferable to disabled access to transport
Bleichrodt et al	2004	<i>Journal of Health Economics</i>	Equity weights in the allocation of health care: the rank-dependent QALY model	11	Deals with equity concerns about QALYs – could be interesting for “how much access?”
Blomquist & Whitehead	1995	<i>Growth and Change</i>	Existence value, contingent valuation and natural resources damages assessment	13	Some useful background
Bockstael &	1998	“Valuing	The behavioural basis of non-market	Not 2	Hedonic/behavioural models which

Author(s)	Year	Source	Title	Reason	Comments
McConnell		Recreations and the Environment''	valuation		cannot easily be measured for disabled access and are likely to be distorted by other factors
Boemer & Lambert	1995	<i>Public Interest</i>	Environmental injustice	12	Discusses different dimensions of pollution affecting minority communities
Bowker & Leeworthy	1998	<i>Journal of Leisure Research</i>	Accounting for Ethnicity in Recreation Demand: A Flexible Count Data Approach	Not 2	Travel Cost Method not really applicable as disabled people can't travel
Brouwer & van Ek	2004	<i>Ecological Economics</i>	Integrated ecological, economic and social impact assessment of alternative flood control policies in the Netherlands	12	No useable framework – social benefits estimated by 2 'experts' and scored for use in MCA
Brouwer et al.	1997	<i>Economic Evaluation</i>	Productivity costs measurement through quality of life? A response to the recommendation of the Washington Panel	7/11	Focus on productivity costs and specific to definitions of cost type as productivity of health
Brown	2004	<i>California Law Review</i>	Cost-benefit analysis in criminal law	12	Broadly descriptive argument for use of CBA in US law system – no framework
Burgenmeier	2000	<i>International Journal of Sustainable Development</i>	Market versus non-market values: where to draw the line?	12	Useful background

Author(s)	Year	Source	Title	Reason	Comments
Butler & Garnett	2003	<i>Atlantic Economic Journal</i>	Teaching the Coase Theorem: Are we getting it right?	6	Rethinking negative externality with a view to taxation implications/liability
Carstein	2003	(Lycos)	Economic evaluation of Homeshare Victoria	Not 2	Uses surrogate market (live-in care) for householders and does not estimate intangible benefits to homesharers.
Chan et al.	2000	<i>Journal of Materials Processing Technology</i>	Evaluation methodologies for technology selection	5	Set in corporate environment predominantly
Clarke	1998	<i>Journal of Health Economics</i>	Cost-benefit analysis and mammographic screening: a travel cost approach	Not 2	Travel cost method is not appropriate for disabled access
Coleshill & Sheffield	2000	<i>Financial Accountability & Management</i>	Project Appraisal and Capital Investment Decision-making in the Scottish Water Industry	11	Specific to water industry in Scotland
Corcoran	2000	(Google Scholar)	Accessibility for All: The Australian Experience	12	Discusses Australian issues but no framework
Cunningham	2001	<i>Journal of Orthodontistry</i>	An introduction to economic evaluation of health care	13	Discussion of application of (types of) economic evaluation to health care and its value

Author(s)	Year	Source	Title	Reason	Comments
Dasgupta et al.	2004	<i>Environment & Development Economics</i>	The economics of environmental change and pollution management - issues and approaches from South Asia	12	No mechanisms or models or frameworks - overview of economic impact of poverty in S Asia
Dawe	2002	<i>World Transport Policy & Practice</i>	Strategic Environmental Assessment: a paradigm for the EU?	12	No models or frameworks for evaluation
Defrancesco & Rosat	2001	(Lycos)	Recreation management in Venice Lagoon	11	WTP estimated but no critique of approach or results
Delucchi	2000	<i>Journal of Transport Economics and Policy</i>	Environmental Externalities of motor-vehicle use in the US	4	Focus on specific costs
Dipper et al.	1998	<i>Journal of Environmental Planning and Management</i>	Monitoring and post-auditing in environmental impact assessment: A review	8	Specifically impact assessment - no costs or benefits
Dixon-Woods & Fitzpatrick	2001	<i>British Medical Journal</i>	Qualitative research in systematic reviews	12	Discusses problems - no solutions
Downs	2000	<i>Annual Review of Political Science</i>	Constructing effective environmental regimes	12	More about political processes (& therefore useful background) than economic frameworks

Author(s)	Year	Source	Title	Reason	Comments
Elster	1989	<i>Journal of Economic Perspectives</i>	Social norms and economic theory	12	No framework but may be of interest for Project 2
Enserink	2003	<i>Journal of Environmental Planning & Management</i>	Information Management for Public Participation in Co-design Processes: Evaluation of a Dutch example	12	Describes effective participation – but no framework
Fergus	2001	(Yahoo)	Monetization of environmental impacts on roads	11	Specific to environment but some useful concepts for background
Forkenbrock & Schweitzer	1999	<i>Journal of the American Planning Association</i>	Environmental justice in transportation planning	Not 2	Method provided but specific to environmental impacts. Not transferable except as regards population data in specific transport areas
Forkenbrock & Weisbrod	2001	TRB – NCHRP Report 456	Guidebook for assessing the social and economic effects of transportation projects	Not 1	Consigns disabled access to 'project specific' – brief mention only in chapter on transportation choice
Gafni	?	(Google)	Economic evaluation of Programs: Principles and methods	13	Does not add to existing information – broad presentation of the issues
Garcia-Sobrecases & Lee	2000	<i>Seoul Journal of Economics</i>	Art, museums and contests: Private vs. public provision	9	Deals with merits of encouraging competition in museum funding

Author(s)	Year	Source	Title	Reason	Comments
Gardner & Quinn	2000	(UTSG)	Barriers to cost-effective transport	12	Not particularly useful. No framework
Graham et al.	1996	<i>Tele-communications Policy</i>	The socio-economic benefits of a universal telephone network	12	Describes potential benefits - does not quantify.
Grant-Muller et al.	2001	<i>Transport Reviews</i>	Economic appraisal of European transport projects: the state-of-the-art revisited	12	Itemises frameworks used in Europe, but no framework described
Gyrd-Hansen	2000	<i>International Journal of Technology Assessment in Health Care</i>	Cost-benefit analysis of mammography screening in Denmark based on discrete ranking data	11	Does not raise broader issues of using conjoint analysis to obtain WTP
Hall et al.	2004	<i>Journal of Business Research</i>	Using stated preference discrete choice modeling to evaluate health care programs	13	Considers WTP in health but does not add to existing material
Hansen et al.	1998	<i>Practice Periodical of Hazardous, Toxic and Radioactive Waste Management</i>	Cost effectiveness and incremental cost analyses: Alternative to benefit-cost analysis for environmental remediation projects	4	Focus on costs – albeit it related to output but for pre-defined output – no estimation of benefits as such

Author(s)	Year	Source	Title	Reason	Comments
Hathway	1996	<i>World Transport Policy & Practice</i>	Assessing the costs and benefits of cycle networks	Not 2	Framework presented, but proposition (estimating cost of NMT users switching to motorised transport) not transferable.
Healey & Chisholm	1999	<i>The Journal of Mental Health Policy and Economics</i>	Willingness-to-pay as a measure of the benefits of mental health care	13	Adds nothing to existing WTP papers
Healy & Ascher	1995	<i>Policy Sciences</i>	Knowledge in the policy process: Incorporating new environmental information in natural resources policy making	12	Discusses issues but no framework
Hill	1999	<i>Economics of Planning</i>	Project appraisal for the Keynesian Investment Planner	Not 1	Essentially dealing with appraisal of public investment that will prioritise public spending in relation to unemployment
Hillman	1996	<i>World Transport Policy & Practice</i>	The future of public transport: the dangers of viewing policy through rose-tinted spectacles	12	Transport policy - not evaluation
Hoegh-Krohn & Knivsfla	2000	<i>The International Journal of Accounting</i>	Accounting for intangible assets in Scandinavia, the UK, the US, and by the IASC: Challenges and a solution	5	Relates to corporate accounting

Author(s)	Year	Source	Title	Reason	Comments
Hook	2003	(UTSG – Institute for Transportation and Development Policy website)	Appraising the social costs and benefits of road projects	12	No framework – but good criticism of existing use of CBA especially in relation to economically disadvantaged
Huber & Wirl	1998	<i>Journal of Environmental Economics and Management</i>	The polluter pays versus the pollutee pays principle under asymmetric information	Not 2	Specific to pollution with a two party situation and not transferable to multi party disabled access.
Hutton	2001	(Google)	Economic evaluation and priority setting in water and sanitation interventions	13	Does not add to existing information significantly – review methods for evaluating but no new insights
Issel & Kahn	1998	<i>Health Care Management Review</i>	The economic value of caring	8	Framework presented but limited usefulness to transport - focus on calculations w.r.t. specific caring behaviour
Jacklin et al.	2003	<i>British Medical Journal</i>	Virtual outreach: Economic evaluation of joint teleconsultations for patients referred by their general practitioner for a specialist opinion	4	Cost consequences -> decision to proceed already taken

Author(s)	Year	Source	Title	Reason	Comments
Jackson & Bell	2002	<i>The Appraisal Journal</i>	The Analysis of Environmental Case Studies	11	Specific to the use of environmental case studies – issues relate to environment. No expansion on case study
Jacobs	1991	Book	The Green Economy: environment, sustainable development and the politics of the future	12	Chap 16 - comments on the lack of importance accorded to environmental effects compared with the importance place on a positive NPV.
Jen & Kai-Chieh	2003	<i>Transportation</i>	Application of perceived value model to identify factors affecting passengers' repurchase intentions on city bus: A case of the Taipei metropolitan area	Not 1	Application to benefits in relation to consumer choice and not monetary valuation
Johnson & Whitehead	2000	<i>Contemporary Economic Policy</i>	Value of public goods from sports stadiums: the CV approach	11	Uses CV but does not reflect on design etc. of study
Joseph & Coleman	1997	<i>Public Productivity & Management Review</i>	Affirmative action and economics: A framework for analysis	12	Focus on use of economic indicators such as employment pay gap & educational attainment - no real framework as such
Kauko	2003	<i>Journal of Property Investment and Finance</i>	Residential property value and locational externalities	Not 2	Applies AHP in conjunction with hedonic pricing. Useful background on AHP?

Author(s)	Year	Source	Title	Reason	Comments
Kennedy	2002	<i>Transportation</i>	A comparison of the sustainability of public and private transportation systems: Study of the Greater Toronto area	Not 2/12	Framework for other issues but unclear for 'social' issues, so not transferable
Kingwell	1999	<i>The Australian Journal of Agricultural and Resource Economics</i>	Institutional and social influences on R & D evaluation in agriculture	12	Useful background on use of CBA in institutions
Koopman	1995	<i>World Transport Policy & Practice</i>	Economic instruments for sustainable mobility	Not 1	Examines specific instruments for environment - not transferable
Labonte	2004	<i>Health Promotion International</i>	Social inclusion / exclusion: dancing the dialectic	12	Discusses the rationale for 'disciplining economic practices' to encourage greater fairness.
Lee	2002	<i>European Planning Studies</i>	The Economic and Social Justification for Public Financed Stadia: The Case of Vancouver's BC Place Stadium	12	Financial arguments pro and con but no analysis or framework
Lee	2003	<i>Transportation Planning and Technology</i>	An approach to the economic appraisal of ACVS Maglev	Not 2/11	Use of method that is very specific to US transportation. Considers non-user benefits but based on US National Development model causal diagram

Author(s)	Year	Source	Title	Reason	Comments
Lett & Swack	2005	<i>World Institute on Disability</i>	Using tax policy to promote asset building strategies for people with disabilities	6	Tax issue only: no other useful information
Ling Suen & Mitchell	2000	Transportation in the New Millennium	Accessible transportation and mobility	12	Lists progress and future issues – no framework/evaluation
Litman	2003	(Google)	Evaluating urban transportation quality: I – Overview	12	Description of process – no framework for non-market impacts
Madden	2005	(Google)	Topic 5 – Economic evaluation	13	Summary of CBA, CEA and CUA
Makowski & Ostroy	1995	<i>The American Economic Review</i>	Appropriation and efficiency: A revision of the First Theorem of Welfare Economics	7	Focus on employment economics
Markandya & Murty	2004	<i>Environment & Development Economics</i>	Cost-benefit analysis of cleaning the Ganges: some emerging environment and development issues	11	'Pure' CBA using WTP for cleanliness, some direct health benefit costings and other monetary proxies - very situationally specific
Maxwell	1996	<i>Business Horizons</i>	What to do when win-win won't work: Environmental strategies for costly regulation	10	Regulation
McGranahan et al.	1998	<i>Journal of Environmental Planning and Management</i>	Green grass and brown roots: Understanding environmental problems in deprived neighbourhoods	13	Does not add to existing information in relation to economic evaluation – only CV considered very useful

Author(s)	Year	Source	Title	Reason	Comments
McMahon	2000	(Lycos)	The impact of human capital on non-market outcomes and feedbacks on economic development	Not 2	Impact of education is measured according to how it enhanced job prospects and personal time use. Transport gives access but does not enhance in the same way.
McMichael et al.	2003	<i>Science</i>	New visions for addressing sustainability	12	No framework
McMillen	2001	<i>World Transport Policy & Practice</i>	Making pedestrian facilities more usable and safer for all	12	Exclude for review (no models) but possible use for barriers study
Metz	2003	<i>Transport Reviews</i>	Transport policy for an ageing population	12	Discusses problems and efforts to mitigate but no evaluation framework
Mills & Howe	2000	<i>Journal of Transport Economics and Policy</i>	Appraisal of Non-commercial Passenger Rail Services in Britain	12	Reference to but no description of a framework but useful review of early post-privatisation rail industry structure and some of the funding issues. May be useful in the future
Munda et al.	1998	Sustainable development: concepts, rationalities and strategies. Kluwer Academic Boston	Environmental decision-making: A comparison between cost-benefit analysis and multicriteria decision aid	12	No framework but may be useful to quote in theoretical discussion re CBA/MCA. Essentially argues for MCA as superior in environment to CBA but no clear guidance on use of MCA

Author(s)	Year	Source	Title	Reason	Comments
Nord et al.	2003	<i>Health Economics</i>	The value of life: individual preferences and social choice. A comment to Magnus Johannesson	11	Specific to QALYs and DALYs
O'Brien	2003	<i>Forestry</i>	Human values and their importance to the development of forestry policy in Britain: a literature review	12	Useful background especially on positivism and interpretivism & WTP
Olu-Tima	2003	<i>AACE International Transactions</i>	Acceptable project investment criteria	13	Ranking of non-financial investment criteria
Oxley & Richards	1995	<i>Transport Policy</i>	Disability and transport. A review of the personal costs of disability in relation to transport	4	Costs to individual disabled people
Pearce	1998	<i>Oxford Review of Economic Policy</i>	Cost benefit analysis and environmental policy	12	Description of use, not framework
Pearce	1998	<i>Environmental and Resource Economics</i>	Environmental Appraisal and Environmental Policy in the European Union	12	Description of issues, no framework
Pelletier et al.	2000	<i>Agriculture and Human Values</i>	Values, public policy and community food security	12	Exploring background to values and policy – might be useful for establishing values around access.

Author(s)	Year	Source	Title	Reason	Comments
Philip & Shucksmith	2003	<i>European Planning Studies</i>	Conceptualizing Social Exclusion in Rural Britain	12	Describes and explains exclusion but doesn't propose framework for addressing
Pollard & Brookes	2001	<i>Journal of Environmental Assessment Policy and Management</i>	Development of a policy appraisal checklist for the Environment Agency of England and Wales	12	Describes issues but does not propose a framework
Prakash & Kollman	2004	<i>Business Strategy and the Environment</i>	Policy modes, firms and the natural environment	10	But may have useful insights for Project 2
Rahman & Edwards	2004	<i>European Journal of Law and Economics</i>	Economics of Polluter Pays Principle for mitigating social costs of electricity: A search for an optimal liability share	6	Seeks to allocate liability for pollution
Ravetz	2000	(Google)	Integrated economic evaluation for sustainable development	12	Discussion - no framework
Ravetz et al.	2004	<i>Journal of Environmental Assessment</i>	Evaluation of regional sustainable development – transitions and prospects	12	Description of evaluation processes and features – no framework
Reilly & Rabe	1997	<i>Health Care Management Review</i>	The valuation of health care intangible assets	5	Valuing health care assets of medical practices effectively as corporates

Author(s)	Year	Source	Title	Reason	Comments
Rhodes	2002	<i>International Journal of Public Administration</i>	Using data envelopment analysis (DEA) to evaluate environmental quality and justice: A different way of looking at the same old numbers	12	No framework – DEA is answering a different question - about relative impacts on particular groups
Romero	1997	<i>European Journal of Operational Research</i>	Multicriteria decision analysis and environmental economics: An approximation	Not 2	Not readily transferable to disabled access in transport
Sable & Kling	2001	<i>Journal of Cultural Economics</i>	The double public good: A conceptual framework for “shared experience” values associated with heritage conservation	Not 2	‘Double public good’ concept not transferable to disabled access
Salvage & Zarb	1995	(Leeds Disability Archive)	Disabled People and Public Transport	12	Useful as background
Schoenwetter et al.	2004	<i>Current Medical Research & Opinion</i>	Economic impact and quality-of-life burden of allergic rhinitis	4	Focus on costs imposed by hay fever - not benefits/framework
Schopper et al.	2000	<i>Journal of Epidemiology & Community Health</i>	Setting health priorities in a Swiss canton: what do different methods tell us	11	Specific survey for Geneva, focusing on WTP, health benefits and Delphi survey - if more info on Delphi surveying required could be useful
Schramm & Berger	2002	<i>Haemophilia</i>	Linking medicine and economics: health economics and quality of life in haemophilia care	11	Focus on benefits of specific interventions for haemophilia

Author(s)	Year	Source	Title	Reason	Comments
Schur	2002	<i>Journal of Economic Issues</i>	The difference a job makes: The effects of employment among people with disabilities	12	Considers reasons for and effects of disabled people's exclusion from employment
Sculpher	2001	<i>Pharmacoeconomics</i>	Using Economic Evaluations to Reduce the Burden of Asthma and Chronic Obstructive Pulmonary Disease	12	No framework and relates specifically to medical issues
Sen	1972	<i>Economic Journal</i>	Control areas and accounting prices: an approach to economic evaluation	4	About the use of e.g. global labour costs and assumptions made
Sen	1999	Book	Commodities and Capabilities	12	No transferable framework – useful in theoretical background
Sheate	1995	<i>World Transport Policy & Practice</i>	Transport policy: a critical role for strategic environmental assessment	12	Pure' policy - no detail on evaluation
Short	1995	<i>World Transport Policy & Practice</i>	Freight transport as an environmental problem	12/Not 2	No models or frameworks proposed or used
Singh et al.	2001	<i>Australian and New Zealand Journal of Psychiatry</i>	The role of economic evaluation in mental health care	13	Explanation of economic evaluation/types of in (mental) health care

Author(s)	Year	Source	Title	Reason	Comments
Smith & Osborne	1996	<i>Journal of Environmental Economics and Management</i>	Do contingent valuation estimates pass a 'scope' test? A meta-analysis	Not 2	Advocates the use of past empirical (CV) studies of an issue to validate evidence for or against hypothesis. Requires the existence of past studies using similar approach (comparable) – not applicable to disabled access in transport
Smith & Sheate	2001	<i>Journal of Environmental Planning and Management</i>	Sustainability Appraisals of Regional Planning Guidance and Regional Economic Strategies in England: An Assessment	12	Not applicable to economic appraisal - description of sustainability appraisal
Stanton & Stanton	1998	<i>Accounting, Auditing & Accountability Journal</i>	The questionable economics of governmental accounting	12	Largely repeat of Stanton & Stanton 1997
Stanton & Stanton	1997	<i>International Journal of Social Economics</i>	Governmental accounting for heritage assets: economic, social implications	12	Interesting philosophical discussion of neo-classical economics as applied to heritage assets
Strijker et al.	2000	<i>Environmental and Resource Economics</i>	Evaluation of Nature Conservation	Not 2	Combines MCA and CBA but very specific to nature conservation

Author(s)	Year	Source	Title	Reason	Comments
Temu & Due	2000	<i>Journal of African Economies</i>	Participatory appraisal approaches versus sample survey data collection: a case of smallholder farmers well-being ranking in Njombe District, Tanzania	Not 2	PRA applies where funding is already available
UK Department for Transport	2004	(Google Scholar)	Social exclusion and the provision of public transport – Main report	12	Describes the relationship between transport of social exclusion but provided no framework
Van den Berg & Ferrer-i-Carbonell	2004	(Google Scholar)	The well-being of informal caregivers: A monetary valuation of informal care	Not 2	Applies well-being method i.e. different but not transferable to disabled access in transport
Van den Berg et al.	2005	<i>Health Economics</i>	The economic value of informal care: a study of informal caregivers' and patients' willingness-to-pay and willingness to accept for informal care	11	Tests model of informal care giving with CV. No comment on CV. Not transferable
Van Wee et al.	2003	<i>Transportation Research</i>	Environmental impacts of high-speed rail links in cost-benefit analyses: a case study of the Dutch Zuider Zee line	11	Focus on specific environmental issues in order to enhance CBA for ZZL
Vollebergh	1997	<i>Energy Policy</i>	Environmental externalities and social optimality in biomass markets: waste-to-energy in The Netherlands and biofuels in France	11	Specific to biomass markets – no transferable framework

Author(s)	Year	Source	Title	Reason	Comments
Wixey & Lake	1998	<i>World Transport Policy & Practice</i>	Transport Policy in the EU: A strategy for development	12	No framework
Yeo & Moore	2003	<i>World Development</i>	Including disabled people in poverty reduction work: "Nothing about us, without us"	12	Discusses issues including causes of poverty but no framework – disabled people's involvement in research favoured
Zarb	1997	(Leeds Disability Archive)	Researching Disabling Barriers	12	Exclude but useful background. No framework

Table 80: Systematic review: exclusion table

Appendix E Discrete choice experiment additional information

I.1. Advisory group members

Stephen Golden:	Transport for London, Equality & Inclusion
Carol Smales:	Transport for London, London Rail
John Towriss:	Cranfield University, School of Management
Sarah Wardle/Chris Smith:	Department for Transport, Integrated Transport Economics & Appraisal

1.2. Sample choice set sequence

Project 1555: Exercise 1, Set 2

1	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 28 minutes • <i>Journey cost: £3.40</i> • To reach the platform you are travelling from you can use a long ramp, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 20 minutes • <i>Journey cost: £3.40</i> • To reach the platform you are travelling from you can use stairs or a long ramp, as shown in the picture 	A	B
2	<p>OPTION A</p> <ul style="list-style-type: none"> • <i>Journey time: 28 minutes</i> • Journey cost: £4 • To reach the platform you are travelling from you can use stairs or a long ramp, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • <i>Journey time: 28 minutes</i> • Journey cost: £3 • To reach the platform you are travelling from you can use stairs or a lift, as shown in the picture 	A	B
3	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 20 minutes • <i>Journey cost: £3</i> • <i>To reach the platform you are travelling from you can use a long ramp, as shown in the picture</i> 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 28 minutes • <i>Journey cost: £3</i> • <i>To reach the platform you are travelling from you can use a long ramp, as shown in the picture</i> 	A	B
4	<p>OPTION A</p> <ul style="list-style-type: none"> • <i>Journey time: 28 minutes</i> • Journey cost: £3 • To reach the platform you are travelling from you can use stairs, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • <i>Journey time: 28 minutes</i> • Journey cost: £4 • To reach the platform you are travelling from you can use stairs or a lift, as shown in the picture 	A	B

5	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 24 minutes • Journey cost: £4 • To reach the platform you are travelling from you can use a long ramp, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 28 minutes • Journey cost: £3.40 • To reach the platform you are travelling from you can use stairs, as shown in the picture 	A	B
6	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 28 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs or a long ramp, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 24 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs, as shown in the picture 	A	B
7	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 20 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs or a lift, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 24 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs or a long ramp, as shown in the picture 	A	B
8	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 20 minutes • Journey cost: £4 • To reach the platform you are travelling from you can use stairs, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 24 minutes • Journey cost: £3.40 • To reach the platform you are travelling from you can use stairs or a lift, as shown in the picture 	A	B
9	<p>OPTION A</p> <ul style="list-style-type: none"> • Journey time: 28 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs or a lift, as shown in the picture 	or	<p>OPTION B</p> <ul style="list-style-type: none"> • Journey time: 20 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use a long ramp, as shown in the picture 	A	B

10	OPTION A	<i>or</i>	OPTION B	A B
	<ul style="list-style-type: none"> • Journey time: 20 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs or a lift, as shown in the picture 		<ul style="list-style-type: none"> • Journey time: 28 minutes • <i>Journey cost: £3</i> • To reach the platform you are travelling from you can use stairs, as shown in the picture 	

Italics indicate that the attribute level is the same for both alternatives in the choice set.

Source: Accent Marketing & Research

1.3. Photographs used



Figure 9: Stated preference experiment: picture of stairs



Figure 10: Stated preference experiment: picture of long ramp



Figure 11: Stated preference experiment: picture of long ramp and stairs



Figure 12: Stated preference experiment: picture of lift

1.4. Research questionnaire



1555 Barrier Free Access To Heavy-rail Stations Recruitment Questionnaire

Interviewer RQ number:

Interviewer name:

Interviewer no:

Date:

Time:

Introduction

Good morning/afternoon/evening. My name is and I am from Accent. We are an independent market research company carrying out research sponsored by Transport for London. The research is looking at improvements to railway stations. If you are eligible to take part in this research we can offer you a £5 Boots voucher as a 'Thank you' for your time.

This is a *bona fide* market research exercise. It is being conducted under the Market Research Society Code of Conduct which means that any answers you give will be treated in confidence. Can you spare a few minutes to run through a few questions to check that you are eligible to take part in this research?

Q1. What is the first part of your home postcode? **INTERVIEWER:
PLEASE REFER TO THE MAP IE SHOW CARD A.**

1. HA9
2. HA0
3. NW10
4. Other **THANK AND CLOSE**

Q2. Do you **ever** travel into central London (by any mode of travel)?

1. Yes
2. No **THANK AND CLOSE**

Q3. For what purpose do these journeys tend to be? **CODE ALL THAT
APPLY. TO CONTINUE, RESPONDENTS MUST ANSWER CODE
1 OR 2.**

1. Commuting **CHECK QUOTAS IE min 40%**..... |
2. Leisure **CHECK QUOTAS IE min 40%** |
3. Employers business **IF ONLY THIS CODE, THANK AND CLOSE**..... |

Q4. Have you made a journey by rail at all in the past 5 years?

1. Yes check quotas – min 25% - max 90%
2. No CHECK QUOTAS - min 10%

Q5. Do you receive free or subsidised travel on public transport as part of an employment package? **INTERVIEWER NOTE:** Respondents who are in receipt of an employers' travel loan eg for the cost of a season ticket, should be coded as 2.

1. Yes **THANK AND CLOSE**
2. No, travel package not included in employment package
3. Do not know

Q6. Which of the following age groups do you fall into? **READ OUT TICK ONE ONLY. IF 'REFUSED' MAKE BEST GUESS**

- 0 Under 18 **THANK AND CLOSE**
1. 18-34 – **CHECK QUOTA MIN 25%**
2. 35-54 – **CHECK QUOTA MIN 25%**
- 3 55 or older – **CHECK QUOTA MIN 25% - MAX 50%**

Q7. **INTERVIEWER: CODE RESPONDENT GENDER**

1. Male **CHECK QUOTAS MIN 33%**
2. Female **CHECK QUOTAS MIN 33%**

Q8. Would you like to take part in an interview now about improving railway stations which will last about 15 to 20 minutes, for which we can offer you a £5 Boots voucher?

1. Yes **CONDUCT INTERVIEW**
2. No **THANK AND CLOSE**

I confirm that this interview was conducted under the terms of the MRS Code of Conduct and is completely confidential

Interviewer's signature:.....

THANK RESPONDENT FOR THEIR HELP IN THIS RESEARCH

I.5. Main questionnaire



1555
FINAL BARRIER FREE ACCESS TO HEAVY-RAIL

RQ no: **Computer no:**

Interviewer name: **Interviewer no:** **Date:** **Time:**

MAIN QUESTIONNAIRE

- Q1. **INTERVIEWER:** record Location of interview
1. Kensal Green
 2. Stonebridge Park
 3. South Kenton
 4. Headstone Lane
-

- Q2. **INTERVIEWER:** Was the respondent selected for their commuting or leisure journey (**SEE Q3 OF RQ**)? **CODE ONE ONLY**
1. Commuting
 2. Leisure
-

- Q3. Thank you very much for agreeing to take part in this survey. The interview will take about 10-15 minutes to complete. You do not have to answer any questions you do not wish to and you can stop the interview at any point. It will not be possible to identify you from the information you give.
-

This survey is designed to find out what value people put on different ways of getting from one rail platform to another.

Transport for London has helped to pay for this research, which is being undertaken on behalf of a student studying for a post-graduate degree. In autumn 2007 Transport for London will take responsibility for managing the North London Railway, which includes local services between Watford Junction and Euston.

I am going to show you several choices and I would like you to tell me which you prefer.

The choices that I will show you include information on:

- how you get from one platform to the other at the station
- the cost of a single rail ticket
- the time taken to travel into London by train.

For each pair of options I am going to show you I would like you to say which one you would prefer: A or B. You might not like either option, but we are only looking for a preference between the two.

Can you assume that if you have a Freedom Pass or Railcard you are unable to use it and have to pay full price for your ticket on this service.

The options include pictures of stairs, a 'long' ramp and a lift.

Here 'long' means that they are about 90-100 metres on each platform, with a gentle gradient of 1 in 20 and flat landings every 10 metres.

The lift is big enough for two pushchairs and a couple of people standing and is enclosed. The lift buttons are large and lit up and the numbers on them are raised.

RESPONSES TO STATED PREFERENCE CHOICES

For each choice offered, of the random choice set selected:

- Q4. Which option do you prefer?
- Q5. Which option do you prefer?
- Q6. Which option do you prefer?
- Q7. Which option do you prefer?
- Q8. Which option do you prefer?
- Q9. Which option do you prefer?
- Q10. Which option do you prefer?

BARRIERS QUESTIONS

Q11. **READ OUT:** Now I am going to ask you some questions about your experiences and views of travelling by public transport.

What, if any, are the main difficulties you have using public transport? **INTERVIEWER: READ OUT AND CODE ALL THAT APPLY**

1. Difficulties due to steps and stairs, lack of seating, long walking distances and other physical barriers
2. Difficulties hearing or understanding things like PA announcements, conversations, and warning sounds
3. Difficulties seeing or reading things like train departure boards, timetable posters, and numbers on buses
4. Difficulties finding your way because of poor or difficult to read signs or directions
5. Stressful situations such as overcrowding, late changes of platform, or disruption
- 6 Other difficulties (**DESCRIBE**)
- 7 None of the above / Not known (e.g. not a public transport user)

ATTITUDINAL QUESTIONS

Q12. Could you please tell me how strongly you agree or disagree with the following statements. Do you agree or disagree with the statement that .. (INTERVIEWER: READ OUT AND CODE ONE ANSWER FOR EACH):

- | | Strongly
Disagree | Dis-
agree | Neutral | Agree | Strongly
Agree |
|---|----------------------|---------------|---------|-------|-------------------|
| 1. Difficulties with public transport stop disabled people being useful members of society..... | 1 | 2 | 3 | 4 | 5 |
| 2. Disabled people shouldn't complain about public transport because a lot has already been done to make it easy for them..... | 1 | 2 | 3 | 4 | 5 |
| 3. Accessible public transport for disabled people benefits the whole community..... | 1 | 2 | 3 | 4 | 5 |
| 4. People who spend taxpayers' money making public transport easier for disabled people to use are just doing it to look good..... | 1 | 2 | 3 | 4 | 5 |
| 5. It would be better to provide a separate transport service for disabled people that meets their needs than spend money making public transport accessible..... | 1 | 2 | 3 | 4 | 5 |
| 6. A civilised society provides for people who have different needs even when it costs more..... | 1 | 2 | 3 | 4 | 5 |

RESPONDENT DETAILS

Finally I am going to ask you a number of questions about yourself and your household. This will help us to interpret your choices more effectively.

Q13. **INTERVIEWER:** Please record whether respondent is male or female?

1. Male

2. Female

Q14. How would you describe your ethnic origin? **SHOW CARD**

WHITE

1. White British
2. Any other white background

MIXED

3. White and Black Caribbean
4. White and Black African
5. White and Asian
6. Any other Mixed background

ASIAN OR ASIAN BRITISH

7. Indian
8. Pakistani
9. Bangladeshi
10. Any other Asian Background

BLACK OR BLACK BRITISH

11. Caribbean
12. African
13. Any other Black background

CHINESE

14. Chinese

ANY OTHER ETHNIC GROUP

15. Any other ethnic group
16. Refused

INTERVIEWER: CODE FROM RQ

Q22. THE FIRST PART OF RESPONDENT'S HOME POSTCODE

1. HA9
 2. HA0
 3. NW10
-

Q23. HAS RESPONDENT MADE A JOURNEY BY RAIL AT ALL IN THE PAST 5 YEARS?

1. Yes
 2. No
-

Q24. AGE GROUP OF RESPONDENT

1. 18-34
 2. 35-54
 3. 55 or older
-

Thank you for your help in this research. This research was conducted under the terms of the MRS code of conduct and is completely confidential. If you would like to confirm my credentials or those of Accent please call the MRS free on 0500 396999.
HAND OVER THE THANK YOU SLIP.

Please can I take a note of your name and where we can contact you for quality control purposes?

Respondent name:

Telephone: home:work:

Thank you. I confirm that this interview was conducted under the terms of the MRS code of conduct and is completely confidential

Interviewer's signature:

1.6. Documents relating to attitudinal questions

Behavioural hypothesis

People who believe that disabled access is socially desirable (e.g. morally right, civilised, improves social inclusion) will be prepared to pay for it.

Indicator question	Origin
1. Problems with public transport stop disabled people being useful members of society	The Times (1998)
2. Accessible public transport for disabled people benefits the whole community	The Guardian (1998)
3. A civilised society is one where we provide for people who have different needs even when it costs more	Disability Action (1999)
4. It would be better to provide a separate service for disabled people that meets their needs than spend money making public transport accessible	Rickert (1999)
5. Disabled people shouldn't complain about public transport because a lot has already been done to make it easy for them	The Times (1998)
6. Spending money on making the public transport accessible is just political correctness	The Times (2005)

1.7. 'Before-and-after' questions

Barriers questions

Pilot questions:

1. Physical barriers (e.g. steps and stairs, lack of seating, too far to walk)
2. Barriers in accessing audible information (e.g. PA announcements, conversations, warning sounds)
3. Barriers in accessing visual information (e.g. train departure boards, timetable posters, numbers on buses)
4. Barriers in wayfinding (e.g. signage, directions)
5. Stressful situations (e.g. overcrowding, late changes of platform, disruption)
6. Other barriers (DESCRIBE)

Final questions:

1. Difficulties due to steps and stairs, lack of seating, long walking distances and other physical barriers
2. Difficulties hearing or understanding things like PA announcements, conversations, and warning sounds
3. Difficulties seeing or reading things like train departure boards, timetable posters, and numbers on buses
4. Difficulties finding your way because of poor or difficult to read signs or directions
5. Stressful situations such as overcrowding, late changes of platform, or disruption
6. Other difficulties (DESCRIBE)

Attitudinal questions

Pilot questions:

4. Spending money on making public transport accessible for disabled people is just political correctness
6. A civilised society is one where we provide for people who have different needs even when it costs more

Final questions:

4. People who spend taxpayers' money making public transport easier for disabled people to use are just doing it to look good
6. A civilised society provides for people who have different needs even when it costs more

All other questions remained unchanged.


```

OPT_B_JC = (OPT_B_JC_PP )
OPT_A_STAIRS      = OPT_A_AM_NO == 1
OPT_A_RAMP        = OPT_A_AM_NO == 2
OPT_A_RAMPSTAIRS = OPT_A_AM_NO == 3
OPT_A_LIFTSTAIRS = OPT_A_AM_NO == 4
OPT_B_STAIRS      = OPT_B_AM_NO == 1
OPT_B_RAMP        = OPT_B_AM_NO == 2
OPT_B_RAMPSTAIRS = OPT_B_AM_NO == 3
OPT_B_LIFTSTAIRS = OPT_B_AM_NO == 4
HASIMPAIRMENT    = (IMPAIRMENT == 1 )
ISDISABLED       = (DISABLED == 1 )
PHYSBARR         = (PHYSICAL_BARRIERS == 1 )
AUDBARR          = (AUDITORY_BARRIERS == 1 )
VISBARR          = (VISUAL_BARRIERS == 1 )
WAYBARR          = (WAYFINDING_BARRIERS == 1 )
STRESSBARR       = (STRESS_BARRIERS == 1 )
OTHERBARR        = (OTHER_BARRIERS == 1 )
BARRIERS         = (PHYSBARR || AUDBARR || VISBARR || WAYBARR
|| STRESSBARR || OTHERBARR )
SMDISABLED       = (HASIMPAIRMENT && ISDISABLED && BARRIERS )
NOTSMDISABLED    = (SMDISABLED == 0 )

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