UNIVERSITY OF SOUTHAMPTON

FACULTY OF ENGINEERING, SCIENCE AND MATHEMATICS

School of Geography

Road Pricing: Barriers to Successful Implementation and Influences on Business Responses

Case studies of Singapore, the Netherlands and Southampton

by

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ABSTRACT

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ROAD PRICING: BARRIERS TO SUCCESSFUL IMPLEMENTATION AND INFLUENCES ON BUSINESS RESPONSES
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This thesis examines the controversial policy of road pricing, using a qualitative approach based on a series of case studies. Two related issues are explored; first the barriers to implementation, which help account for the lack of road pricing schemes to date, and second how businesses are likely to respond to a road pricing scheme. As the effects of road pricing are not fully understood, policy makers are often reluctant to implement schemes. This amplifies the problem that there are a lack of operational schemes to learn from, and in turn means the impacts of road pricing remain poorly understood.

The first part of the analysis explores the institutional, attitudinal, practical and technological factors that influence the success and failure of road pricing policy, through case studies of Singapore and the Netherlands. In particular, the dominance of the automobile in society, and the history of policy controls on its ownership and use are shown to play a key role in affecting both the acceptance, and the ultimate success, of road pricing. A series of potential barriers to implementation are outlined, key lessons are identified, and recommendations are made for future road pricing proposals, both in Southampton and beyond.

The second part of this thesis moves on to consider the potential economic impacts of road pricing, focusing on how businesses in Southampton would respond to a hypothetical road pricing scheme. A wide range of ways that businesses could respond to road pricing are identified, which are categorised as locational, organisational, transport and financial. This thesis shows that a number of businesses in Southampton are locally embedded, both through territorial embeddedness, high sunk costs and ties to Southampton because of its unique characteristics as a deep water port and cruising centre. This embeddedness means many firms are less likely to relocate in response to road pricing than policy makers often fear. Firms' non-locational responses are affected by a number of factors, including their level of behavioural and cognitive 'lock in' to their working and transport practices, and their willingness and ability to pass on any extra costs that they may incur if road pricing is introduced. Although Southampton is in many ways unique, this research has focused on understanding and explaining the reasons for particular responses, rather than simply identifying them; and as such the results can be applied to other cities considering implementing road pricing.

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DECLARATION OF AUTHORSHIP

I, ELEANOR PRYCE, declare that the thesis entitled:

'Road Pricing: Barriers to Successful Implementation and Influences on Business Responses – Case Studies of Singapore, the Netherlands and Southampton'

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- none of this work has been published before submission

Signed: .....

Date: 25/04/2008.....

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Disclaimer

All views expressed in this thesis can either be attributed to individual interviewees, or to the author. They should not be taken to represent the views of particular organizations, or of Southampton City Council.

Key to Abbreviations

AA	Automobile Association
ABP	Associated British Ports
ABVM	Anders Betallen Voor Mobiliteit (Dutch policy, which translates as Paying Differently for Mobility)
ALS	Area Licensing Scheme
ANWB	Dutch equivalent of the UK's Automobile Association
BAT	Bus and Toll (Lane)
BSA	British Small Arms
DfT	Department for Transport
CfIT	Commission for Integrated Transport
CILT	Chartered Institute of Logistics and Transport
CoE	Certificate of Entitlement
ERP	Electronic Road Pricing
FSB	Federation of Small Businesses
HCC	Hampshire County Council
IPPR	Institute of Public Policy Research
IU	In-vehicle Unit
LTA	Land Transport Authority (In Singapore)
LTT	Local Transport Today (Trade publication)
LTP	Local Transport Plan
NHS	National Health Service
IMPRINT-EUROPE	Implementing Reform in Transport, Effective Use of Road Pricing in Europe
IPPR	Institute of Public Policy Research
NMD	Network Management Duty
OMV	Open Market Value
PAP	People's Action Party (In Singapore)
PPG13	Planning Policy Guideline 13
RAC	Royal Automobile Club
SCC	Southampton City Council
SCOT	Social Construction of Technology

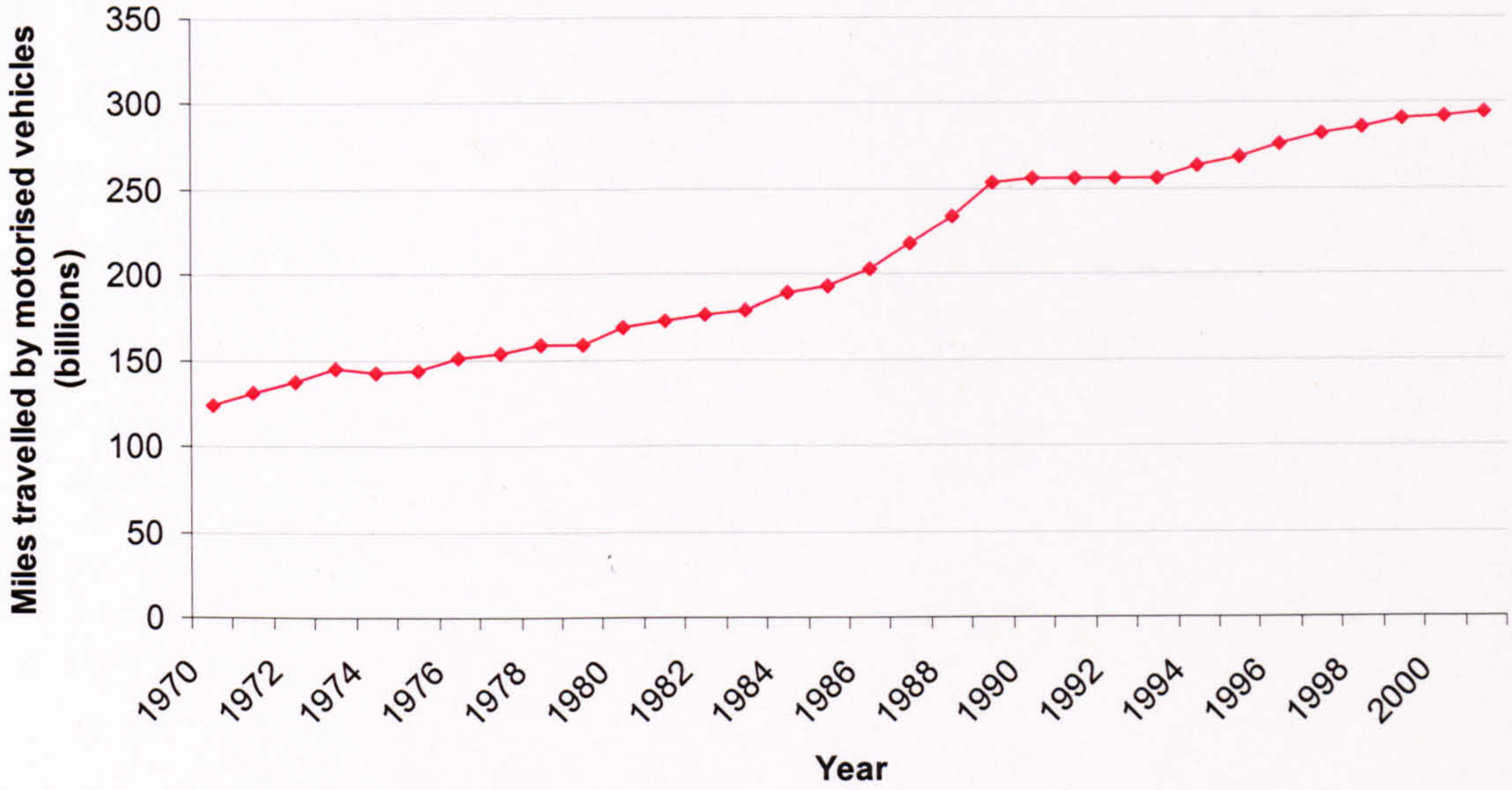
SGH	Southampton General Hospital
SRA	Singapore Retailer's Association
TDM	Travel Demand Management
TfL	Transport for London
TIF	Transport Innovation Fund
TMA	Traffic Management Act
VQS	Vehicle Quota System
WTP	Willingness to Pay

Chapter 1 - Introduction

1.1 Introduction

Travelling is an essential part of daily life for the vast majority of the population in modern British society. While some people live, work, and undertake leisure activities within a relatively local area, many others regularly travel large distances. Automobile ownership levels have been increasing for many years and this growth has facilitated the geographical separation of peoples' homes and places of work, and has made it quicker and more convenient to travel increasing distances by car than it is by public transport. However, instead of benefiting from the travel time savings that the car can offer, the 'theory of constant travel time' suggests that people, in fact, use these time savings to travel increasingly further, a trend which is not sustainable (see Rodrigue *et. al.* 2006). Although telecommunications and *"electronic mobility"* are increasing (Adams, 1996), car usage levels are increasing. Car ownership in the UK has increased from 17.9 million in 1989, to 24 million in 1998 (www.statistics.gov.uk), and 27.5 million in 2005 (www.dft.gov.uk). Alongside this increase, there has also been a corresponding increase in the distances travelled by car, which is illustrated in Figure 1.1 overleaf, and a decline in the real costs of using the car (Bannister *et. al.* 2000,58). The increase in the distance travelled by car is made up both of people travelling further, but also an increasing number of short trips.

Figure 1.1 Distance travelled by car in the UK 1971 to 2001



Source: (www.statistics.gov.uk)

Environmental issues such as sustainability are currently coming to the fore in UK politics, particularly with respect to concerns over climate change. There is an increasing recognition, at least amongst politicians and policy makers (if not the general public), that this trend of increasing car use is not sustainable, either in terms of fossil fuel consumption or land take. The growing numbers of cars on the roads is increasing congestion and making journey times both longer and less reliable. In the light of these issues, transport policy in the UK is beginning to encourage the use of smaller, less polluting vehicles, through decreasing taxation on them, but there is also an increasing emphasis on managing car use more broadly. Measures that do this are referred to as Travel Demand Management (TDM) and can be categorised as soft and hard. Soft "carrot" measures pull people towards public transport through incentives such as reduced fares and increased frequencies of service. In contrast, removing car parking spaces is an example of a hard "stick" measure that attempts to push people away from the automobile. Although the carrot measures are more popular, the less popular stick measurers are actually more effective at promoting modal shift (Gatersleben and Uzzall, 2003). A stick measure that is extremely controversial is road pricing, sometimes referred to as congestion charging.

Road pricing is not just controversial in the UK, but also in many other countries around the world, and as a result there are very few schemes in operation around the globe. Consequently, knowledge about the actual impacts of such schemes is limited, and policy makers are reluctant to implement the policy as they do not fully understand what its effects are likely to be. Southampton City Council (SCC) recognise that road pricing may be a policy tool they wish to consider in the future, but before implementing it they would like to know more about how it is likely to affect the city, particularly its economy. This research is designed to investigate the reasons why road pricing schemes often fail, and to look more specifically at the potential impacts on businesses of implementing such a scheme in Southampton.

This chapter will begin by outlining the research questions that will be explored in this thesis, and clarify what is meant by the terms congestion and road pricing. As the main body of research in this thesis is based in Southampton, the chapter will then go on to outline some context about the city in terms of demography, economic trends and planned future developments. Having introduced both road pricing and the city of Southampton, the chapter will then discuss some of the issues associated with the notion of road pricing in Southampton. Finally, it will end by outlining the structure of this thesis, and the issues discussed in each of the remaining eight chapters.

1.2 Research objectives and questions

The objectives of this thesis are twofold. Firstly, it will try to uncover some of the reasons why implementation of road pricing schemes around the world is often problematic, and identify some factors that are important for its successful introduction. By examining this issue, lessons can be learnt to improve the success rate of future road pricing proposals. The lack of operational road pricing schemes around the world means very little is known about its potential impacts, so the second objective is to begin to address this gap in existing knowledge by exploring the potential responses of businesses in Southampton to road pricing. This will influence the economic impacts of the policy, and also help to inform the decisions of the city's policy makers about road pricing. The findings can also be applied more broadly to other UK cities considering road pricing. These objectives will be explored through two research questions:

1. What factors have contributed to the success or failure of road pricing schemes around the globe; and therefore what lessons can be learnt for Southampton, and other UK cities?

2. How would businesses in Southampton respond to a road pricing scheme in the city, and how can these responses be explained?

Question one will be explored through case studies of the success of road pricing in Singapore, and its failure in the Netherlands, in Chapters 5 and 6 respectively. A number of barriers are identified to the implementation of road pricing in the Netherlands, which were not present in Singapore. This contrast will help explain the lack of schemes in the world to date, and suggest lessons for the implementation of road pricing in Southampton. Examining two case studies together will help highlight the key issues better than focusing on either success or failure alone, as common themes can be identified. Although there has been research conducted on road pricing in Singapore before, it is easy to dismiss the country a 'special case', rather than looking at the lessons which it can provide. The case studies identify a number of reasons why road pricing is likely to be problematic in the UK, and help begin to explain the lack of schemes to date. This helps set the scene for addressing the next research question, which attempts to fill the gap in existing knowledge about the effects of road pricing schemes.

In addressing question two the research will draw upon a variety of concepts including local embeddedness, lock-in and the constraints on firms' working practices. These will be discussed in detail in Chapter 3, and used to analyse businesses locational and non-locational responses to road pricing in Chapters 7 and 8 respectively. More details on the methods which will be used to address these research questions are outlined in Chapter 4. This thesis will focus on business responses to road pricing, rather than the overall economic effects of road pricing, for a number of reasons. Firstly, research is being conducted elsewhere on the social effects of road pricing in Southampton (Lucas, N, forthcoming), and after discussions with Southampton City Council it was decided that this research should broadly focus on economic issues so that the two studies were complementary. Secondly, time constraints meant that it was necessary to focus in

detail on key issues. The decision about what to focus on was heavily influenced by the fact that there are no road pricing proposals for Southampton, and without these it is only realistic to examine general trends, rather than to predict exact monetary effects, which would be largely based on speculation over scheme design. After some background research it became clear that firms are unlikely to passively accept the impacts of road pricing upon them, but will make responses in order to try and minimise any negative effects. These responses will have an impact both on the impact of road pricing on Southampton's' economy, but also on the overall effectiveness of the policy in reducing congestion. Southampton City Council were particularly interested in the locational responses of firms, but as these are closely linked to firms ability to make other kinds of response, this research will examine all of these types of response.

It is important to understand the reasons for business responses to road pricing, rather than simply identifying the ultimate effects. This understanding will lead to more robust findings (see Chapter 4), and can be built upon with further research to examine the overall impacts on the city's economy. Although there has been some research on the effects of road pricing on businesses in London, there is not really a large volume of work in this area. It will be beneficial to conduct research outside of London, as it is often viewed as "special". Being the capital city of the UK it does not face the same issues as other UK cities, such as economic competition from surrounding cities, and poor public transport provision.

1.3 Congestion and road pricing

Section 1.1 identified congestion as an increasing problem in the UK, but exactly how to define congestion is a subject of debate, and there are a number of different possible measures that can be used. The current measure used by the Department for Transport (DfT) in the UK is to compare journey times by car against a baseline of journey times at night in free-flow conditions, referred to as *"excess delay"* (LTT 13/07/2006). Another measure involves classifying traffic conditions according to the *"level of service"* being provided, which ranges from A, the best, to F, the worst. Condition A generally occurs late at night and in rural areas where there is very little traffic, and condition F refers to a complete breakdown in flow. This scale is outlined fully in the

Highway Capacity Manual (www.trb.org). Stopher (2004) distinguishes two kinds of congestion; recurring and non-recurring. Non-recurring congestion involves a random element, and usually occurs due to incidents such as accidents on the road network. Recurring congestion is more predictable, and is the result of demand for road space outstripping supply at particular times and places. A certain amount of congestion in cities is often seen as inevitable, as *"if you live in an urban environment that's what you get"* (Business U, see Chapter 4), but there is a growing consensus that congestion is getting worse in the UK, and measures need to be taken to address it. One such measure is road pricing, which is aimed at reducing recurring congestion. However, it is important to recognise that it is not desirable to eliminate congestion completely, as this would mean that the road capacity is being under-used most of the time, and would not be efficient (Santos 2004).

It is important to make clear exactly what is meant by 'road pricing' in this thesis, as the term can be used to refer to a variety of different types of charging, including toll roads. In this thesis the term 'road pricing' will be used to refer to schemes with an explicit demand management component, such as the London congestion charge. It is important to recognise that tolls on motorways, bridges and tunnels are *"essentially different from urban road pricing"* (Santos and Fraser 2006,267), as they often involve recouping infrastructure costs, rather than demand management (i.e. M6 Toll Road, the Itchen bridge in Southampton). This thesis will not discuss tolled transport facilities, as they generally do not have the same purpose as urban road pricing schemes, and the problems and issues associated with them are different. Instead, road pricing refers to schemes like the London congestion charge where vehicles have to pay £8 per day between 7am and 6pm to drive within the most congested area of the city centre. The economic principles of road pricing and the various different schemes that have been proposed or are in operation around the world are discussed in Chapter 2.

It is worth noting here that road pricing is a controversial policy, both in the UK and beyond, and as a result there are few schemes in operation, and not much is known about its economic impacts. In many countries people have become used to and even dependent on the freedoms and flexibilities that the automobile offers, and as such are resistant to the idea of road pricing, since it will affect their lifestyles (see Chapter 3). Although Local Authorities in the UK have the power to implement road pricing

schemes, the only scheme to date outside London is a small one in Durham. The key developments and current situation of road pricing policy in the UK will be explored further in Chapter 2. This chapter will now outline some background on Southampton, before discussing the prospects for road pricing in the city.

1.4 The City of Southampton

As the majority of the empirical research in this thesis is set in the City of Southampton, it is important to outline some contextual information about the city, particularly the key aspects of its economy. This section will then go on to explore the city's planned future growth and the effect this is likely to have on transport issues.

1.4.1 Background information

Southampton has a population of around 221,200 (Southampton City Council, 2006), and is located in South Hampshire on the South Coast of the UK (see Figure 1.2 overleaf). The city can be considered as part of the Solent sub-region in South Hampshire; which extends from Hythe and Southampton in the West; to Portsmouth and Havant in the East, and Romsey and Eastleigh at the Northern extent (see Figure 1.2). A more detailed schematic map is given in Figure 1.3. To manage the development of the transport network in the Solent sub-region an organization called Solent Transport was established in March 2003, and published its own Local Transport Plan (LTP) in 2006. Members of Solent Transport include Southampton City Council, Portsmouth City Council, Hampshire County Council, the Highway Authority, regional authorities such as SEERA and SEEDA, and private bus and train operators in the area, enabling co-ordination between the stakeholders. The Solent Transport LTP was developed with Southampton City Council, Portsmouth City Council and Hampshire County Council, and as such can act as a good basis for integrated transport planning across the sub-region.

Figure 1.2 The Solent sub-region (Map reproduced with permission of Southampton City Council)

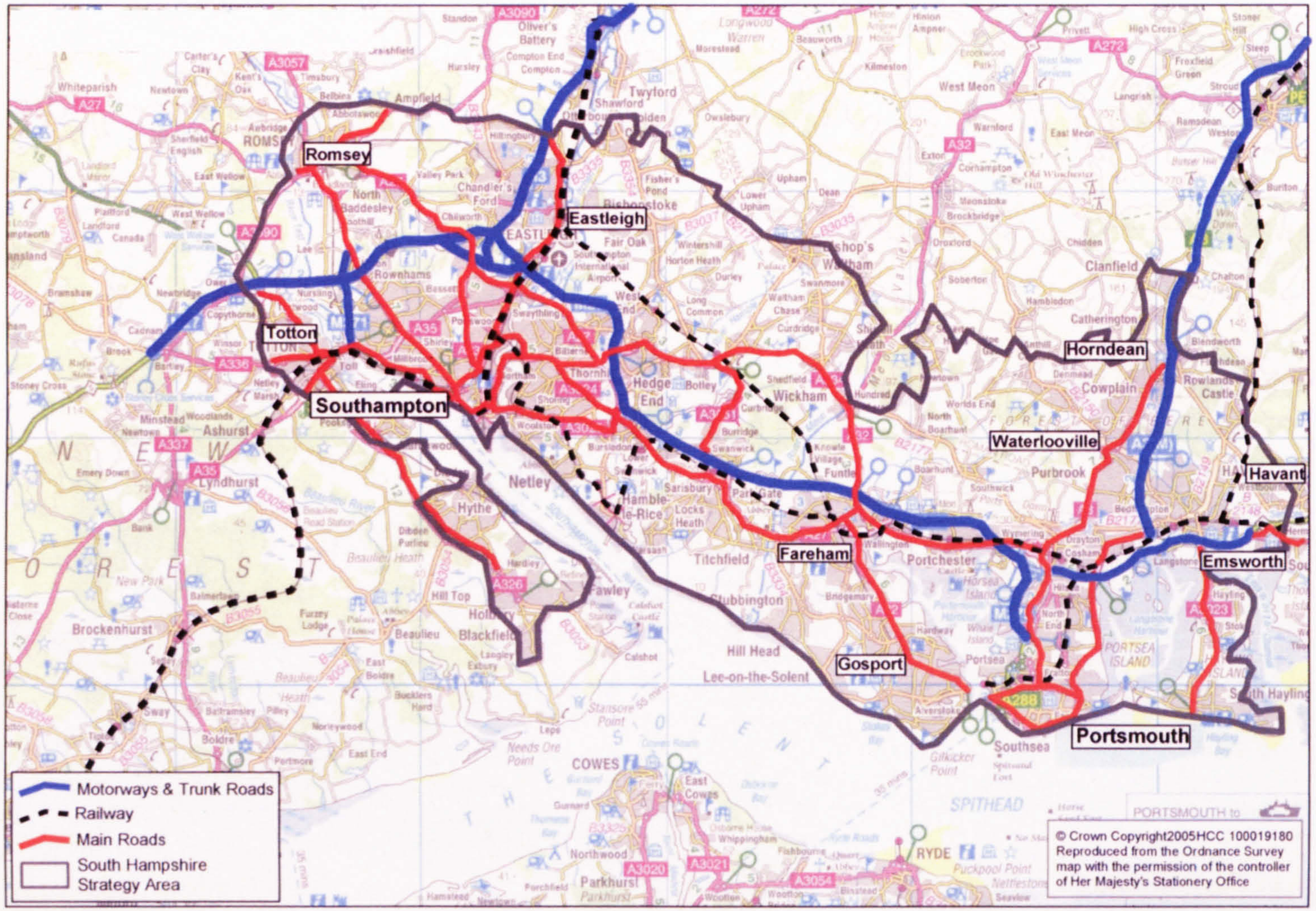
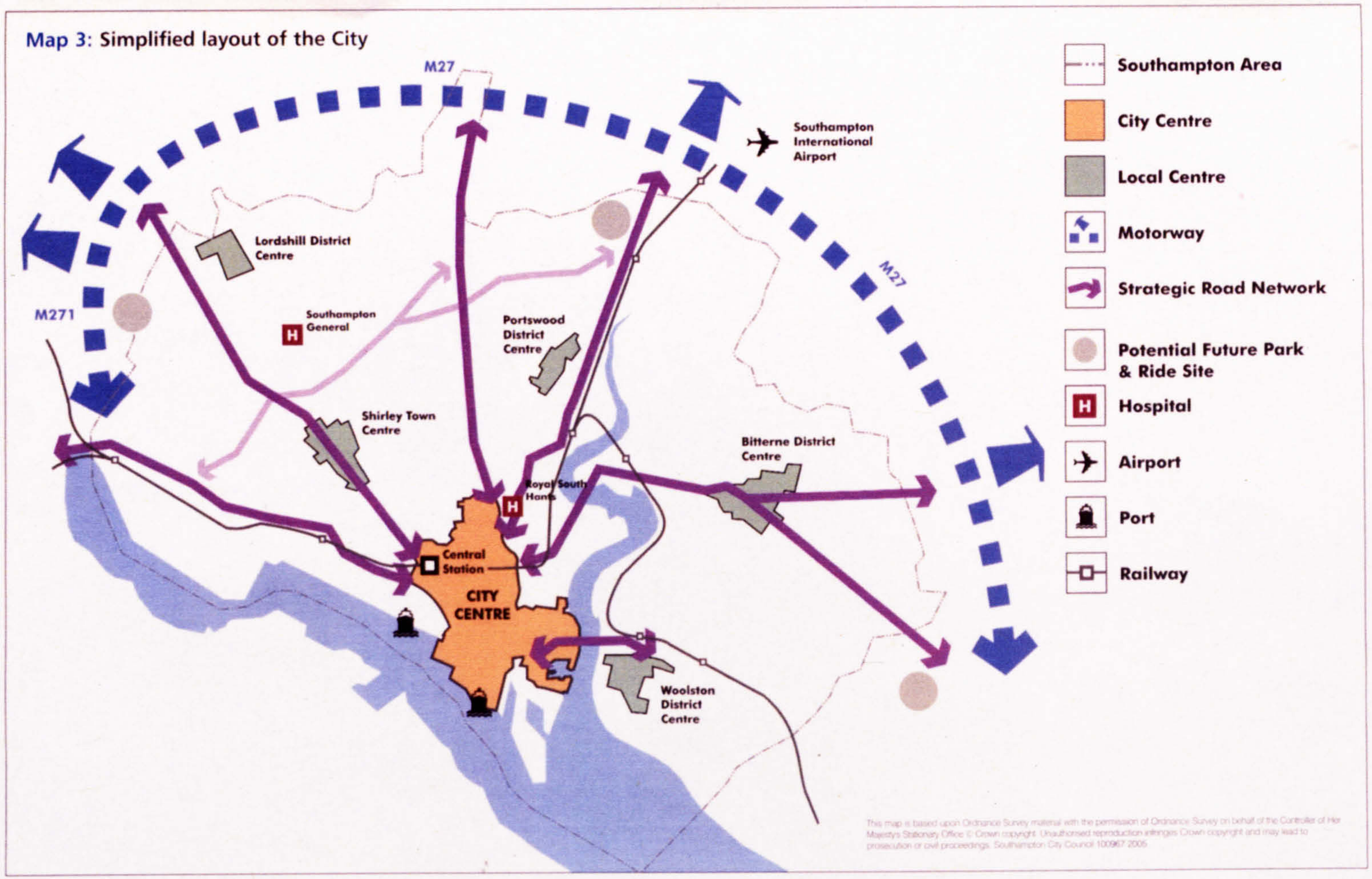


Figure 1.3 – The City of Southampton (Map reproduced with permission of Southampton City Council)



Southampton is perhaps best known historically as passenger shipping port. Today, Southampton is a booming container port, run by Associated British Ports (ABP), which covers an area of 78 hectares (see Pinch 2002 for a history of the city and its port). The port processes over one million tonnes of grain and agricultural products each year[1], and processes 44% of the materials traded between the UK and the Far East[2]. In 2005 the port handled 38 million tonnes of cargo and 750,000 vehicles, making it the UK's largest vehicle handling port. Ensuring the free movement of all of these goods into and away from the city is crucial. At present freight is transported to and from the city by both road and rail, but the shift towards larger 9.5 foot containers will cause problems for rail transport as there are two bridges on the route out of the city which are too low for these containers to pass under. Although there are long-term plans to alter the rail gauge scheme to address this problem, funding for this has yet to be secured, so in the mean time ensuring efficient transport of freight by road is even more important.

Southampton is also the UK's principal cruise port. It had 62% of the UK market share in 2005 (with 237 ship calls), and is home to both the prestigious Queen Elizabeth 2 and the Queen Mary 2. In 2004 over half a million passengers sailed to or from the city (www.abp.co.uk, accessed 07/11/2005). These embarkations and disembarkations can add an extra 1,500 to 2,000 people to the city's roads at a given time, and need to be carefully managed. Southampton is also home to a fast growing regional airport, located on the north-eastern outskirts of the city. Both the port and the cruise industry are important for employment and the economic vitality of the city, so the impact of road pricing upon them needs to be carefully considered.

Retailing also makes an important contribution to Southampton's economy. The large West Quay shopping centre opened in September 2000, and moved the city up to 7th in the rankings of the most important urban retail centres in the UK (http://archive.thisisyork.co.uk/2004/3/3/251071.html). West Quay has helped Southampton compete for retail customers not only with out of town locations, but also with surrounding cities. It has also played a key role in the regeneration of the city, and has been seen as *"vital to the survival of Southampton as the south coasts leading*

[1] (http://www.solentforum.hants.org.uk/portship/sinportship.htm).
[2] (www.abports.co.uk)

regional centre" (Lowe 2005,450). Road pricing could potentially deter shoppers to other city locations, especially if they do not have similar charges. As such, it is important to carefully consider the scale of any road pricing charge, and investigate the impacts on retailing in more detail if any proposals are made.

Broadly speaking, Southampton's economy reflects national trends of slow but steady growth, and is now growing faster than the surrounding areas (SCC, 2006). In particular it experienced above average growth of population and employment compared to other UK cities between 1996 and 2004 (IPPR, July 2007). However, the average annual income of a Southampton resident is lower than the regional averages at £22,200, compared to a national average of £25,000 and a regional one of £27,900. 117,000 people were employed by firms in Southampton in 2004. Although employment in the manufacturing sector has halved in the last 20 years, this has been replaced by a growth in the service sector, particularly retail, restaurants, hotels and sporting facilities (SCC, 2006). The city also has a lower rate of business growth than its surroundings, with 5.6% growth in VAT registered businesses between 1994 and 2004, compared to 25% in Portsmouth, and 18.6% in the South East as a whole (SCC, 2006). One of the possible reasons for this is the shortage of high quality vacant office premises in the city, which is leading to high rents, and making out of town locations more attractive (SCC, 2006). Road pricing could potentially increase the cost difference further between city centre and out of town premises, and further encourage existing relocation trends. This issue will be explored in more detail in Chapter 7.

1.4.2 Regional planning

There are a number of development pressures that the City of Southampton will face in the future, including both natural population growth and planned development, which will make effective transport planning crucial. Southampton's population is forecast to grow approximately 3% by 2010, taking it to over a quarter of a million people (SCC, 2006). This growth will not be uniform, but will occur primarily in specific age groups of society, and in specific areas of the city. The largest growth will be a 30% increase in the 60 to 65 age group, and a 20% increase in the over 85's. Spatially, the Bargate ward covering most of the city centre is forecast for the most growth at 55%, which equates to approximately 5,400 people (SCC, 2006). These trends have important implications

for transport in the city. The 2001 census showed that just under 30% of the population of Southampton do not have *"access to a car"*[3], including many elderly people and those with *"economic or health problems"*. These car-less people are also largely concentrated in the more deprived *"priority neighbourhoods"* of the city, which includes the Bargate ward (SCC, 2006). Given the future predicted trends for population increases in the city, there is likely to be a significant increase in the number of car-less people living in Southampton, and it is vital to improve public transport services to cater for their needs.

On top of this 'natural' population growth, the South-East Plan (2006) contains proposals for the development of up to 80,000 new residential units in South Hampshire by 2026. This growth will come from a variety of sources, including 16,300 units from increased density within Southampton, and a further 30,000 on green field sites within the Solent Transport region (SCC 2006,32). In the past, a number of large brown-field sites in the city have been redeveloped for housing, and it has been noted that many of the inhabitants of these developments have jobs outside of Southampton (SCC 2006,34). This intensifies morning peak flows out of the city, and evening peak flows into the city, a trend which is likely to continue when extra housing is created in the city, unless there is a simultaneous expansion of employment opportunities within Southampton. The increase in the population living in green-field areas surrounding the city will also create extra transport demand, including some into Southampton. The South-East Plan (2006) proposes to reinforce the roles of Southampton and Portsmouth as the key cities in the region, so it is important to concentrate on making transport improvements in these cities to alleviate potential congestion (SCC, 2006). The 2002 Regional Economic Strategy (RES) for South East England also identifies South Hampshire as *an "area of economic opportunity"*, but argues that the *"link between economic growth and traffic growth must be weakened"*, to create a more *"sustainable transport network"* (SEEDA 2002).

All of these trends have implications for the future of transport planning in both Southampton and the Solent region more broadly. Although there is likely to be an increase in travel by automobile, there is also expected to be an increase in the sector of

[3] A number of these people without access to a car are likely to be people who choose not to have a car (SCC, 2006).

the population without access to a car, and it is vital that the needs of both of these groups are met. Although road pricing is not popular as a policy tool it does offer a way to manage demand, and simultaneously raise revenue which by law has to be invested in transport improvements for ten years (see section 2.3.1). Having outlined some background to both road pricing and the city of Southampton, this chapter will now discuss both of these issues together and outline a number of issues related to road pricing in Southampton.

1.5 Road pricing in Southampton?

Under the Traffic Management Act (2004), Southampton City Council, as the Transport Authority for Southampton, has a Network Management Duty to *"secure the expeditious movement of traffic on the city's road network"*[4]. The city's LTP sets out a three pronged strategy to *"Reduce-Manage-Invest"* (SCC 2006,6), which includes both reducing the demand for travel, and also managing the use of the existing road network more effectively. Road pricing can help achieve both of these aims, but could also potentially help address some of the city's other transport objectives. For example, road pricing could help reduce congestion and the damage that it causes to the local economy, improve accessibility (SCC, 2006,49) and help to address the falling levels of bus patronage in the city, which stood at 20.7m in 2001, but fell to 18.5m in 2005 (SCC, 2006). However, it is also important that road pricing also fits the wider objective of promoting economic development, and does not harm the vitality of the city (LTP, 59). Although there are no plans for road pricing in Southampton at present, the SCC recognise that it could become an important policy option in the future, and commissioned this research to examine its potential economic impacts.

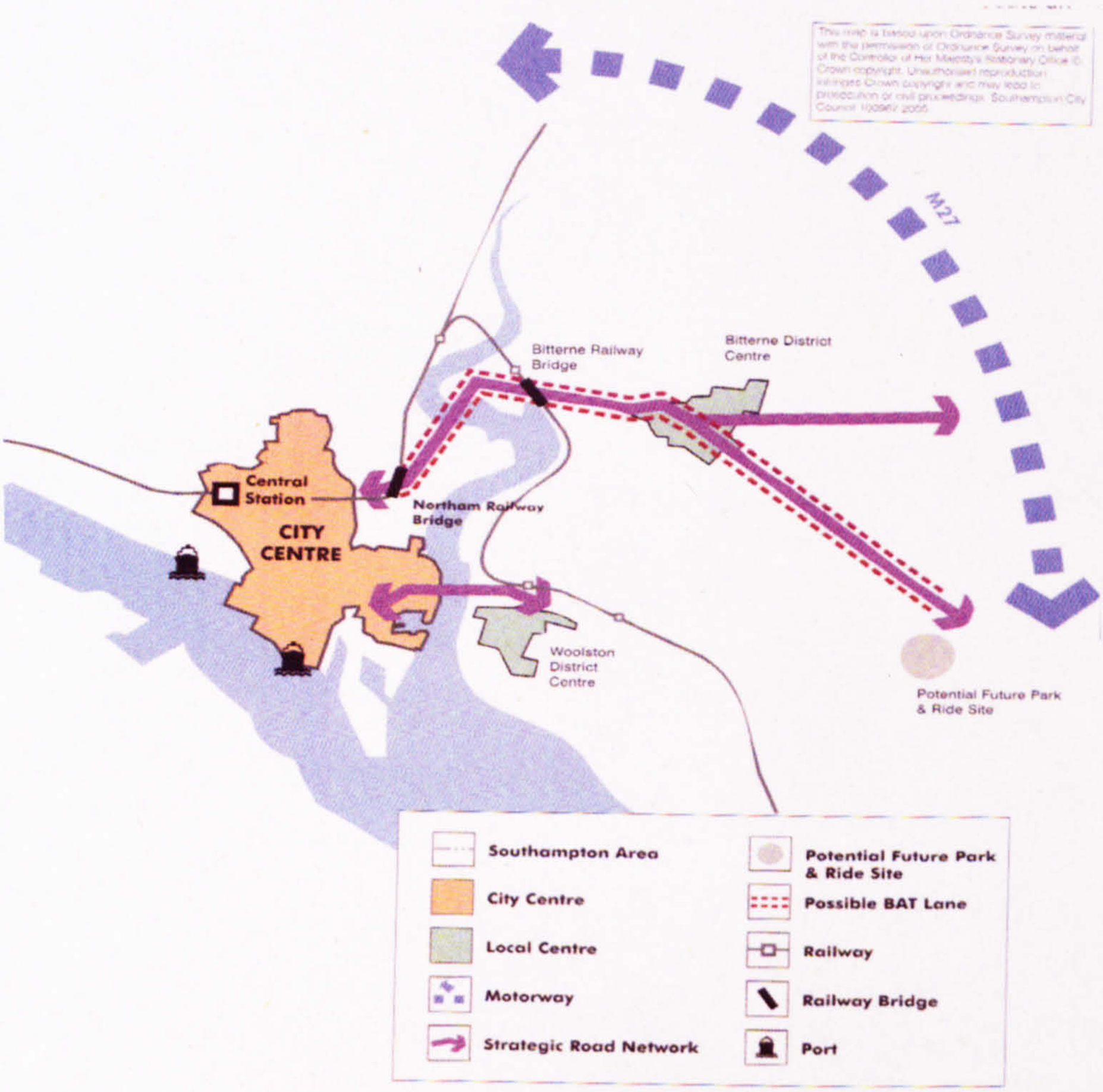
Although the 2000 Transport Act gave Local Authorities the powers to implement road pricing, so far the only existing scheme outside of London is a very small scale one covering two roads in Durham. Central Government is trying to encourage more schemes through the Transport Innovation Fund (TIF) which was established in July 2004 to fund schemes *"that deliver innovative solutions to the problems of congestion and accessibility"*, particularly those *"that contain a significant element of road user*

[4] http://www.dft.gov.uk/pgr/roads/tpm/tma2004/trafficmanagementact2004netw4143

charging as a demand management measure, and which promote modal shift and better bus services" (SCC 2006,99) (see section 2.3.3). Although SCC has not currently applied to the TIF it may in future develop some schemes that are *"suitable for consideration"* (SCC 2006,47). Any bids for TIF pump priming funding to develop projects are likely to be made by Solent Transport, as road user charging would be considered as part of an integrated approach to demand management at the sub-regional level (SCC 2006,61). In terms of the need for road pricing, Southampton is not thought to suffer from the *"levels of congestion that are encountered in many other built-up areas"* at present, and although there is *"inevitably some level of congestion at peak periods"* this is for a relatively short period of time (SCC 2006,62). However, national traffic levels are steadily increasing, and with the growth pressures that the city faces, congestion is likely to get worse if nothing is done. As such, it is important to consider preventative measures in the near future, rather than waiting until congestion is more of a problem before beginning to address it.

One scheme which may be suitable for consideration for TIF funding is the Bus and Toll (BAT) lane (SCC 2006,76). The BAT lane would be a combined bus and toll lane, which *would "function as a normal lane giving priority to buses, but it would also be available to car and light vehicle drivers who were prepared to pay a premium to use it"* (SCC 2006,76). The road for which this scheme is proposed is the A3024 which runs from the city centre, East, towards an area which is forecast to be one of the centres of growth in the South East plan (see Figure 1.4). However, this idea is currently at the concept stage, and is likely to face a number of technical, public (and therefore political) acceptability obstacles if it is pursued. The potential impacts of this scheme on individuals are explored by Lucas, N (forthcoming).

Figure 1.4 Map showing the possible BAT lane in Southampton



(Map reproduced with permission of Southampton City Council)

1.6 Thesis structure

This thesis is comprised of nine chapters, in four broad sections. The first four chapters set up the thesis with this introduction, two chapters reviewing policy related and academic literature, and finally an outline of the research design. Chapters 5 and 6 are the first two empirical chapters, examining the factors influencing the success and failure of road pricing schemes, to address the first research question. This empirical research continues in Chapters 7 and 8 which examine business locational and non-locational responses to road pricing in Southampton to address the second research

question. Finally, the conclusions of the research are drawn in Chapter 9. Each of these will now briefly be outlined in more detail.

Chapter 2 reviews current literature on transport policy in the UK, and road pricing specifically. After discussing a number of relevant trends in transport policy, it explains the economic rationale for road pricing, and outlines the current status of road pricing policy around the world. Following on from this, the history of road pricing policy developments in the UK is explained, before reviewing literature on barriers to the implementation of road pricing, to help explain the lack of schemes to date. Finally, the chapter ends by reviewing literature on both the measured and the predicted effects of road pricing schemes, and highlights a number of potential problems with research predicting the effects of road pricing.

Chapter 3 reviews a number of bodies of work from the broader social science literature, and evaluates their relevance in the context of this thesis. There is no single body of research alone which is closely related to this work, so this chapter draws on a range of literatures. It begins by discussing literature on automobility and the dominance of the automobile, and highlights that in the UK high levels of societal and individual dependence on the automobile are likely to create resistance to road pricing. The chapter then reviews notions of local dependency and local embeddedness, which can be used to explain business location decisions. It highlights the differences between these two concepts, and explains why local embeddedness is the most relevant concept in the context of this thesis. Finally the chapter explores the notion of 'lock-in'. Although 'lock-in' was originally applied to the development of technologies, this chapter will show how the notion has been adapted over time, and can be used to explain businesses' non-locational responses to road pricing.

Chapter 4 outlines the research design used in this thesis, and discusses the methodologies which were used to answer the research questions set out in section 1.2. This research adopts an intensive approach, examining a relatively small number of cases in detail, rather than conducting a large scale representative survey. Chapter 4 explains why this was the most appropriate method given the focus of this research, and outlines its advantages. The chapter also outlines the research scope, and explains the practical issues involved in each of the case studies of the Netherlands, Singapore and

Southampton; including in-depth interviews with businesses in Southampton, and more detailed research with three firms in the city. The analysis of the data collected is also discussed, along with broader issues such as positionality and power relations.

The long standing, successful road pricing scheme in Singapore is explored in Chapter 5, and the institutional, societal and practical issues which contributed to its success are discussed. This chapter highlights that although in some countries institutional, acceptance and practical barriers can hamper the introduction of road pricing, in Singapore there were a number of different issues in each category which actually helped facilitate the introduction of road pricing. As such, the term issues rather than barriers is used in this chapter. Following on from Chapter 5, Chapter 6 examines the reasons for the repeated failure of attempts to introduce road pricing in the Netherlands, and identifies a number of institutional, societal and practical barriers to various different road pricing proposals. Chapter 6 ends by discussing the findings from both the Singaporean and Dutch case studies, and identifies a series of lessons for cities considering implementing road pricing.

The lack of road pricing schemes around the world means that very little is known about its possible impacts, and this often makes policy makers reluctant to implement schemes. However, Southampton City Council were keen to find out more about the potential impacts of a road pricing scheme in the city, and this issue is addressed in Chapters 7 and 8. Chapter 7 begins the analysis of firms' responses to road pricing in Southampton by examining how their propensity to relocate is affected by their levels of local embeddedness.

A range of less-extreme non-locational responses to road pricing are explored in Chapter 8. This chapter identifies a wide range of ways which firms can adapt around road pricing to minimise its impact upon them, which are divided into transport related, financial and organizational changes. However, some firms are locked into their current practices, and others are constrained in how they can respond, given the nature of their firms. Despite these constraints the range of possible non-locational responses to road pricing means that most firms will be able to do something to minimise the impact of charging on themselves, and therefore are less likely to consider a measure as extreme as relocation.

Finally, Chapter 9 concludes the thesis, by summarising its main findings. The chapter ends by outlining the limitations of my research, along with its contribution to theory and the road pricing debate, and areas which warrant further investigation.

Chapter 2 - Transport policy and road pricing

2.1 Introduction

This chapter will discuss issues related to transport policy and road pricing, and can be considered in two main parts. The first part concentrates on background issues in transport planning, and the current situation concerning road pricing in the UK and around the rest of the world, and the second section moves on to consider some more general literature related to road pricing policy. The chapter begins by reviewing current and past trends in transport policy in the UK, and highlights a number of issues relevant for road pricing policy. It then explains the economic rationale for road pricing policy, and outlines the current state of implementation schemes in the world, together with the history of road pricing policy related developments in the UK. The second part goes on to discuss some broader literature which is relevant to answering the two research questions (see Chapter 1). The notion of barriers to road pricing policy is discussed, which will be used in Chapters 5 and 6 to examine the success and failure of road pricing in Singapore and the Netherlands, and helps explain the lack of schemes in the world to date. The absence of schemes means that not much is known about the effects on road pricing policy, so the chapter ends by reviewing existing literature on this topic, particularly the effects of road pricing on businesses, and discusses some common problems associated with research in this field.

2.2 UK transport policy

To understand the policy context of road pricing it is important to be aware of some background issues in UK transport policy. This section will outline the historical shift in UK transport policy away from a 'predict and provide' approach based on road building, towards an emphasis on demand management and promoting sustainability. The changing role of markets in transport provision will also be explored, with reference to the effects of privatisation on public transport services and its implications for road pricing. Finally, the current trends in UK transport policy which are relevant to road pricing will be summarised, before going on to discuss road pricing policy in more detail in section 2.3.

2.2.1 From "Predict and Provide" to Travel Demand Management

In the past, traditionalist transport planners adopted an approach to road building referred to as 'predict-and-provide'. Under this philosophy congestion was viewed as a symptom of a lack of road space, and it was thought that *"cities had to adapt to the car"* by building more roads (Bannister 2002,251). Loosely speaking, predict-and-provide involved modelling the current movement of people and goods in a study area, and then predicting how much traffic would use the road in 20 to 25 years time (Bannister 2002,25). This growth in traffic was viewed as *"inevitable"*, so planners sought to *"provide the road capacity necessary"* to cater for this increase in car use and avoid congestion (Goodwin 1999,657). Predict-and-provide did not question whether automatically catering for increases in automobile use was appropriate or sustainable, but gradually this issue began to come to the fore. Over time, predict-and-provide has been replaced with an emphasis on Travel Demand Management (TDM), which attempts to influence trends in the demand for transport, rather than catering for them automatically. Owens (1995) refers to this shift towards TDM as the *"new realism"* in transport policy, which involves the recognition that transport trends can be managed and influenced rather than simply predicted and then provided for. There was not a single point when a switch from one philology to the other occurred, but rather Goodwin (1999) suggests that they have actually been used in parallel for around 60 years. This transition between them will now be explored in more detail.

The gradual shift away from predict and provide can be illustrated through a number of policy documents, the first of which is the 1963 report *"Traffic in Towns"* (Buchanan, 1963). This report made two important contributions to transport planning. Firstly, it suggested that large increases in road capacity actually tended to exacerbate rather than solve congestion, a point that remained controversial for many years. Secondly, the report highlighted the significant environmental problems caused by traffic (Bannister 2002,26), and questioned whether automatically meeting demand was the most appropriate option. At an international level, this issue was explored further in the Brundtland Report (1987), which identified the importance of sustainability.

Although these reports were beginning to question the philosophy of predict-and-provide, the Conservative White Paper *"Roads to Prosperity"* (1989), set out over 500 road building schemes. This report was based on the notion that investment in infrastructure would attract inward investment into cities and improve their economic competitiveness, whilst also creating fast and efficient road access to a range of other areas (Vigar 2002,148). However, in 1994 the SACTRA Report argued road building may actually increase rather than solve congestion, due to a phenomena it referred to as 'induced traffic'. Induced traffic can be defined as *"all the traffic that would be present if an expansion of road capacity occurred, which would not be there without the expansion"* (Goodwin and Noland 2003,1451). The implication of accepting this idea is that it is futile to provide road space to cater for the predicted increases in demand, as demand would simply rise to match the amount of road space available. This idea is controversial, and is still subject to debate today. In the late 1980's there was increasing criticism of road building to meet forecast demand on both economic and environmental grounds, and concerns grew about the effects of human activity on global warming and the environment (Goodwin 1999,660).

These arguments against predict and provide were consolidated in 1997 when the new Labour Government came to power and published a White Paper entitled *"A New Deal for Transport"* (1998). This paper recognised that existing transport trends were unsustainable in many ways, and that it was not feasible to provide increases in road capacity to match the expected growth (see Goodwin 1999). Many of the Conservative Party's road building schemes were abandoned, and following the 1998 White Paper there was an increased emphasis on Travel Demand Management (TDM). These measures seek to *"control, moderate or tailor car use so that it is kept within bounds defined by broader objectives of traffic or social efficiency"* (Goodwin 1999,657), although these measures are often unpopular with the motoring public.

There are two different distinctions between TDM measures; 'soft' and 'hard' measures, and 'carrots' and 'sticks'. Soft measures are generally policy driven, and can include encouraging home working and workplace and personal travel plans. In contrast, hard measures generally involve engineering solutions such as limiting car parking availability or introducing road pricing. Road pricing can also be categorised as a stick (push) measure, because it uses price to discourage drivers rather than providing an

incentive through a carrot (pull) measure. The substantial public transport improvements that are likely to accompany road pricing are an example of a carrot measure. These carrot measures are generally more popular with motorists, but unfortunately it is the less popular stick measures (such as road pricing) that are actually more effective at promoting modal shift (Gatersleben and Uzzell 2003). The public resistance to stick measures can cause acceptability barriers to the introduction of road pricing, an idea which will be explored further in Chapters 5 and 6.

An important policy concept related to TDM is modal shift. Policies which promote modal shift generally try and encourage people away from the car, towards public transport, walking and cycling. This will increase the sustainability of travel patterns, and is a key policy in many Local Authorities' Local Transport Plans (LTP's). Road pricing could be one policy which helps to achieve this modal shift, although it would also encourage some drivers to alter the time of their trip, or their destination rather than their mode.

The shift towards TDM also broadly coincided with the (1997) Kyoto Summit, where many countries agreed to reduce their CO_2 emissions levels, including the UK which pledged to reduce 1990 greenhouse gas emissions levels by 12.5% by 2010. In the UK the transport sector makes up a large proportion of these emissions, and action is needed if the Kyoto targets are to be met (Bannister 2005,21). A *"technological fix"* alone will not provide the necessary cut in emissions, so the amount of miles travelled by car will also have to be carefully managed. Broadly speaking, as income increases in a country, so does demand for mobility; so one of the important ways that the sustainability of transport can be increased is to decouple increasing transport volumes from economic growth (Bannister et al 2000,130). This decoupling could be encouraged through institutional (policy) changes (i.e. integrating transport and land use, promoting modal shift), and changing in societal attitudes to travel by encouraging people to undertake leisure activities closer to their homes, and purchase locally produced products. These technological, institutional and societal approaches to increasing the sustainability of travel mirror the three types of barriers to road pricing which are discussed in section 2.4 and Chapters 5 and 6.

2.2.2 Integrated land use planning

It is important to recognise that the transport sector does not operate in isolation, but is linked to land use, employment patterns and other broader economic trends. Transport planning is increasingly being integrated with other planning policies such as land use planning, taking a holistic approach and promoting more sustainable living and working arrangements. This integrated approach is apparent in Singapore, and its implications for the success of road pricing will be discussed in Chapter 5. A direct link between land use and the traffic which it generates has been identified (White and Senior 1983), sometimes referred to as the *"land use-transport connection"* (Newman and Kenworthy 1996). This is recognised by the UK Government through Planning Policy Guideline 13 (PPG13), which promotes the integration of land use and transport planning in order to reduce the need to travel (Pharoh 1996), and states that new developments should be *"highly accessible"* by modes other than the car (Curtis 1996). Instead of promoting mobility for its own sake, there is now more focus on ensuring accessibility to destinations, particularly as a way to combat social exclusion.

A particularly important aspect of land use which affects levels of car use and the viability of public transport is density. In low density, sprawling cities, use of the car is encouraged, but in high density compact cities public transport systems and walking are more effective (Bovy 2001). There are already pressures for space in some UK cities, so building at higher densities will not only address this issue, but will also help to promote modal shift away from the car. There are plans to increase the density of development in and around the Southampton area in future (see Chapter 1). Road pricing could potentially cause changes in land use patterns by influencing business location decisions, an issue which will be discussed in Chapter 7.

2.2.3 The legacy of privatisation

It is important to be aware of the history of privatisation of public transport in the UK, as it has important implications for road pricing, particularly how the revenues from a pricing scheme can be spent. One of the main aims of the Conservative Government in the 1980s' and 1990s' was to reduce public expenditure on transport, and this was achieved through privatisation of public transport services (Banister 2001,79). Transport

policy at this time was influenced by neo-liberal economic values that maximised the role of market mechanisms in service provision and price setting (Docherty *et. al.* 2004), with services being operated by the private sector to maximise competitiveness. The 1980 Transport Act deregulated long distance bus services, and was applied to all bus services in 1985, except for those in Greater London. As long as the routes were being operated as registered, Local Authorities had no control over them. Private companies invested in lucrative routes rather than marginal ones, and many routes which were not profitable enough were cut, often those in rural areas (Graham and Marvin 2002,96). This did not benefit the public as a whole, and the Government had to intervene to subsidise some of these routes to prevent social exclusion caused by market failure (Docherty *et. al.* 2004).

The deregulation of public transport in the UK makes it different from other counties in Europe (Bonnel 1995,85), and means Local Authorities have very little control over services. This has implications for road pricing policy. There is a general consensus that public transport services in an area should be improved before road pricing is introduced, but the privatisation of services makes it difficult for Local Authorities to guarantee improvements (see section 2.3.3.2). The principles of road pricing, and issues for its implementation in the UK will now be explored in more detail.

2.3 Road pricing background

This section will explore road pricing in more detail, beginning by explaining the principles behind it, before going on to outline the current situation of road pricing around the world, and then discussing both historic developments and the current situation concerning road pricing in the UK context.

2.3.1 Principles of road pricing

When discussing road pricing it is important to be clear exactly what is meant by the term, and have an understanding of the principles on which the policy is based, so this will be discussed in this section. The term road pricing can be used to refer to a variety of different types of charging, but it will be used in this thesis to refer to schemes with

an explicit demand management component. It is important to recognise that tolls on motorways, bridges and tunnels are different from urban road pricing, as they often involve recouping infrastructure costs, and "locking in" the benefits of any additional capacity, rather than pure demand management (i.e. the M6 Toll Road, the Itchen Bridge in Southampton). As tolling will not be discussed in this thesis, it is not covered in this policy review.

The full economic rationale for using road pricing as a way to allocate scarce road space was outlined by Pigou (1920). It will be briefly summarised here, and a more detailed explanation can be found in Appendix A. Each extra person driving on the road causes a cost to other drivers, by adding to traffic and extending the journey time of others. This type of cost imposed on others is referred to as an externality (see Johnston *et. al.* 2000,251). Other externalities caused by travelling by car include the cost of pollution, accidents and wear and tear on the road surface (see Button and Verhoef 1998,4), and these are not currently accounted for in the cost of driving. Road pricing is based on the idea that individuals do not correctly perceive the costs that their travel imposes on others, do not have to pay them, and that therefore they travel more than is socially desirable. As well as these external costs, people also miscalculate their own costs of travel by car, as they often overlook the high fixed costs like taxation, insurance and maintenance of the vehicle, and focus instead on the fuel-consumption based price per mile, which is comparatively low; especially in relation to the up-front cost of a trip by public transport. Road pricing uses charging to increase peoples' awareness of the true cost of travel, and therefore reduce their travel to a level where the social benefit outweighs the social cost. This is sometimes referred to as internalising the external costs (Gonzales 2005,3). As the general public are not usually aware of this rationale, and the associated arguments in favour of road pricing, it remains controversial. As roads have previously been perceived as free at the point of use, they are viewed as a public good, and people are reluctant to begin paying as they use them (see section 2.4.2).

Once a charge is introduced, road pricing theory suggests people will respond in a number of different ways, as individuals will value their journeys differently depending on their purpose. Travellers with a high value of time (such as people on work related or other urgent trips) are likely to be willing to pay for a faster and more reliable journey.

If the value of their time saved is greater than the amount of the charge then they will be 'winners' under the scheme (Gonzales 2005,5). People making less important trips are likely to be more price sensitive, and are therefore likely to make a range of other responses, including; switching mode, changing their route or destination, re-timing their trip or simply not travelling (Larsen 1995,193). This leads to a reduction in congestion, so that those who do pay have a quicker and more reliable journey. In order to encourage people on to public transport, improvements to services are usually made before road pricing beings. By law the revenue from the scheme has to be re-invested in transport in the area for at least ten years, which is referred to as hypothecation, although cities have argued they should be able to retain the revenue to invest for at least thirty years (IPPR 21/05/07). The theory of road pricing suggests that as congestion is eased, bus journey times fall, and services become more reliable, leading to a *"virtuous circle"* (Small 2005,5), with increased patronage and further improvements in service quality. Although there is a theory and rationale behind the principles of road pricing, many motorists feel it is unfair that pricing should be used to ration their car use (see section 2.4.2), and are often vocal in their opposition to it, which contributes to the current lack of schemes.

2.3.2 Road pricing around the world

As road pricing is a controversial policy which often faces barriers to implementation, there are not many operational schemes around the world. The longest running road pricing scheme in the world is in Singapore. The Area Licensing Scheme (ALS) began as a paper based system in 1975, and was upgraded to a more sophisticated system of Electronic Road Pricing (ERP) in 1998. The second significant scheme is the 'Congestion Charge' in London which has been operational since 17th February 2003. There have also been a number of other pricing trials, such as in Hong Kong along with failed attempts to implement policies, such as in Edinburgh. The most notable of these trials and policy failures are outlined in Table 2.1, in chronological order.

Singapore was the first country in the world to introduce pricing in 1975, but its semi-democratic political system means that it is rarely held up as an example for the rest of the world (see Chapter 5). The only other operational schemes to date which aim to manage demand are in Durham, London, and Stockholm. This lack of schemes is an

indication of the controversial nature of road pricing policy, and the many barriers it faces which are explored further in Chapters 5 and 6.

Table 2.1 Notable road pricing schemes / proposals around the world

Scheme	Status	Description
Singapore	Operational road pricing since 1975, upgraded to electronic system in 1998	The first road pricing scheme in the world. In 1975 drivers had to buy a paper permit to gain access to the city centre. Now the system is based on transponders, gantries and in-vehicle units, and is part of a wider range of measures which restrict the ownership and use of the automobile. The charge can be varied throughout the day. See Chapter 5.
Norway	Toll cordons, beginning in Bergen in 1986, followed by Oslo in 1990 and Trondheim in 1991	The tolls around the main cities are used to fund infrastructure, as the Norwegian landscape of fjords and mountains necessitates a large number of bridges and tunnels. Although the purpose of these toll cordons is not demand management, it is interesting to note that acceptance of the schemes increased after they were implemented, as people became aware of the benefits they conveyed (see Odeck and Brathen 2002).
The Netherlands	A series of road pricing proposals have not been implemented	Since 1991 various road pricing proposals in the Netherlands have met with public and political resistance, and no scheme has been implemented to date. The reasons for this are explored in Chapter 6.
Cambridge	Failed road pricing trial, 1993	This was the first trial of road pricing in the UK. Vehicles were fitted with electronic metering devices which measured congestion based on a combination of speed and distance travelled, and charged drivers accordingly using a smart card (Ison 1998). Ison (1998,139) suggests the scheme was *"a concept in the right place but essentially at the wrong time"* as congestion was not perceived as a problem, and the idea was ahead of its time in the UK.
Hong Kong	Trials from July 1983 to March 1985 (Ison and Rye 2005) and 1997 to 1999	A sophisticated system involving electronic number plates, and charges which varied according to the vehicle type, location and time of day (May 1992,319). Trials were abandoned despite high levels of accuracy, because of privacy concerns. More recent technological developments are able to ensure privacy, and so Hong Kong conducted another major feasibility study between 1997 and 1999, and more technological trials, but these were abandoned in 2001 (Ayland 2005)
Durham	Operational road pricing since October 2002	The first road pricing scheme in the UK. The Durham scheme is small, and only covers two roads. Since 1st October 2002, all vehicles using Sadler Street and the Market Place between 10am and 4pm have had to pay £2 to raise an exit barrier (Santos and Fraser 2006,269). This has reduced traffic in the historic city centre by 50-80%, depending on the baseline used.

Table 2.1 (continued): Notable road pricing schemes / proposals around the world

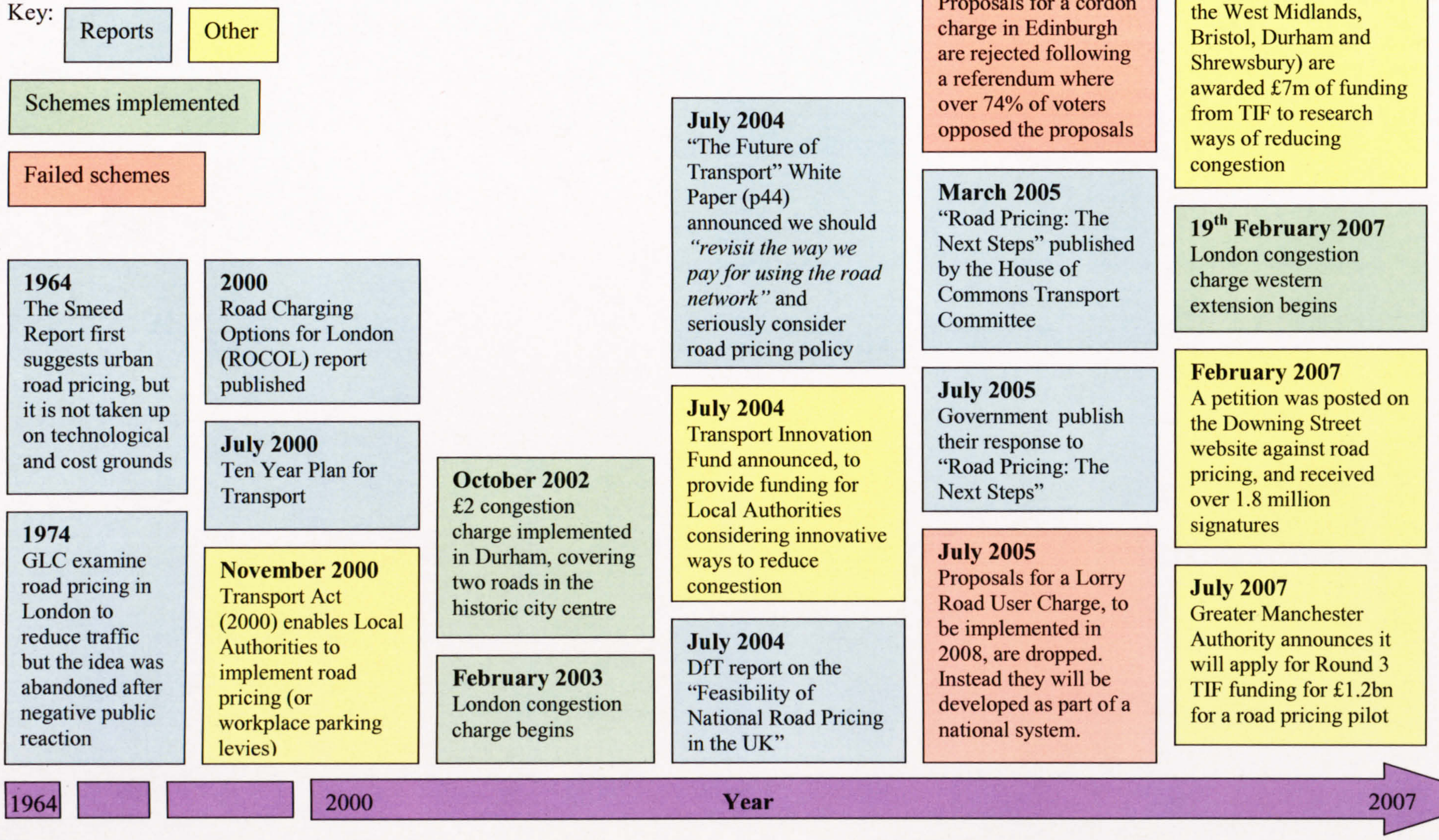
Scheme	Status	Description
London	Operational area licensing scheme since 2003	The London 'Congestion charge' was the first large scale road pricing scheme in the UK, and began on 17th February 2003 and covered an area of 22km^2. The charge was initially set at £5, and increased to £8 per day in April 2005, and applies from 7am to 6pm, for all travel within the zone, not just for crossing the cordon line. The scheme is enforced by number plate recognition cameras (ANPR). The size of the zone was doubled to the West on 19th February 2007, and residents of both the original and the extended zone receive the 90% discount . The scheme was accompanied by extensive public transport improvements, and has cut congestion 26% since its introduction (TfL June 2006).
Edinburgh	Failed proposal in 2005 for a double cordon around the city centre and suburbs	The proposal was for a double cordon. The inner cordon covered the city centre, and would have applied Monday to Friday, from 7am to 6.30pm. The outer cordon covered much of the city, but would only have applied 7am to 10am, Monday to Friday A £2 charge was suggested, payable once per day no matter how many times a cordon was crossed, and the scheme would have been enforced using ANPR cameras, similar to those used in London. The Scottish Executive agreed not to implement the scheme without a public referendum, which was conducted in February 2005. 74% of the public voted against the scheme (Ryley and Gjersoe 2006,66), so it is not going ahead. Even though there was extensive consultation, public support for the scheme fell as the referendum approached (Ryley and Gjersoe 2006,66), and there was a lot of negative comment in the media. See www.tieedinburgh.co.uk/congest.html
Stockholm	Road pricing trial began 3rd January 2006, and will be implemented in full in 2007	Following a trial and a referendum on 17th September 2006 it was decided to implement road pricing in Stockholm. The scheme began in August 2007, and was accompanied by improved park and ride and public transport facilities. The trial used free transponders and ANPR cameras at 18 control stations, with a daily cap on charges of 60skr. The revenue from the scheme will be used to part-finance a new city by-pass. See http://www.stockholmsforsoket.se

2.3.3 Road pricing policy in the UK

2.3.3.1 UK Road pricing policy history

This section will examine the current situation of road pricing policy in the UK, and highlight a number of the key issues. It is important to be aware of the history of the road pricing debate in the UK to understand both the issues facing the policy today, and how it is likely to progress in the future. An overview of road pricing policy in the UK is given in Figure 2.1, which shows the publication of key policy documents, the implementation of schemes and other important milestones. Road pricing in the UK was first suggested over forty years ago in the Smeed Report (1964), which argued people should pay for the amount of congestion that they cause. The report set out a series of important requirements for the introduction of road pricing, which included varying the charges according to the amount travelled, the time of day and class of vehicle; and that the system should be fair, simple to understand and reliable (see Richards 2006, 28). However, at the time road pricing was considered by policy makers to be too technically complex and costly, so it was not taken up (Bannister 2002,26). The next important step for road pricing in the UK did not occur until 2000, when the Transport Act (2000) was passed. This gave Local Authorities the power to implement road pricing schemes (or workplace parking levies), with the approval of the Secretary of State, and essentially shifted the responsibility of implementation from national Government to smaller Local Authorities. The Transport Act also stated that those Local Authorities which implement schemes by 2010 can retain all of the revenue for ten years, but they must be hypothecated for *"local transport improvements"* (DfT 19/07/2004). The Ten Year Plan for Transport (2000) suggested that there would be eight operational road pricing schemes in the UK by 2010, with the earliest being around 2003 to 2005. However, despite the success of the London scheme in cutting congestion, the only other road pricing scheme in the UK was introduced in Durham in October 2002 (see Table 2.1).

Figure 2.1 Timeline of road pricing in the UK



One of the most important developments to date in road pricing policy in the UK, and indeed the world, has been the introduction of the congestion charge in London in 2003. Before London, the only large scale road pricing scheme in the world was in Singapore, and this is often considered 'unique' because of the country's political, social and geographic nature. The implementation of the London change now means road pricing is *"perceived as a realistic policy to be able to be imposed in democratically elected governments"* (ESRC, 2005). As road pricing is such a sensitive topic that rarely wins votes, the London scheme can be considered a major political success (Hensher and Puckett 2005,378). Not only was Mayor Livingstone initially elected in 2000 with road pricing as part of his election manifesto, he also managed to successfully implement the scheme, and was then re-elected in 2004, once the scheme was operational. This should be re-assuring to local authorities considering road pricing. Debell (2003) argues that because the London scheme was a success, other pricing schemes are now more likely in the rest of the UK. However, how likely it is other cities will follow on from London's success is open to debate, as it is different from other UK cities in a number of ways. For example, London's status as the capital city of the UK, the presence of an elected Mayor, a comprehensive publicly run public transport system and the perception that congestion was a problem that needed addressing (ESRC, 2005), all raise questions about the transferability of its success to other UK cities.

In July 2004 the Department for Transport (DfT) published the *"Feasibility Study for Road Pricing in the UK"*, which concluded that although national road pricing is *"not currently technologically feasible"*, it is becoming so[1]. They estimated that a scheme could be implemented in ten to fifteen years, meaning the *"earliest date on which a national road pricing scheme could begin to go live would be about 2014"*[2]. The report also suggested a well-targeted national road pricing scheme had the potential to make £12 billion worth of benefits to the economy in time savings and increased reliability. However, it concluded that road pricing could not proceed without a *"greater degree of public consensus"* on the need for road pricing, and stated the Government would promote 'debate' on this issue[1]. In July 2004, the *"Future of Transport"* White Paper

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1 http://www.dft.gov.uk/pgr/roads/roadpricing/feasibilitystudy/studyreport/feasibilitystudyofroadpricin4002?page=8#1043

2 http://www.dft.gov.uk/pgr/roads/roadpricing/feasibilitystudy/studyreport/feasibilitystudyofroadpricin4002?page=5#1019

announced plans for a Transport Innovation Fund, which Local Authorities could bid into for funding for "*innovative schemes to address specific local congestion problems*" (Alexander, D 08/02/2007 DfT website). This fund acted as incentive to encourage cities to consider road pricing, as although they had been able to implement road pricing since 2000, the only schemes to emerge were in London and Durham. Pump priming funding was available from 2005/6, and is forecast to rise from £290 million when the main TIF fund becomes available in 2008/09 to around £2.5 billion by 2014/15 (DfT July 2005,10). £18m is available up to 2007/8 to support preliminary scheme development by local authorities, and DfT is committed to ensuring that up to £200m per year is available to support such local pilots (ibid). Although the fund will give priority to *"packages that include road pricing as the demand management element"* (LTT 09/02/2006,9) there is also funding available for *"productivity schemes"* which contribute to national productivity objectives (LTT 09/02/2006). Southampton has bid into this productivity fund for money to help fund a £53m project to upgrade the rail line from the city to the West Midlands to allow more freight to be moved from the city by rail (LTT 15/09/2005,3).

Most of the interest in the TIF to date has been in the congestion charging element of the fund. In November 2005 seven areas were awarded the first round of pump priming money to fund studies which were match funded by the authorities in question, including the West Midlands which was awarded the largest amount; £2.6m (LTT 08/12/2005,5). These seven areas, and other authorities, were eligible to bid for the second round of pump priming funding in early 2006, worth £11m. In November 2006 9 areas were awarded funding: Cambridgeshire; Durham County Council (for Durham City); Greater Manchester; Shropshire County Council (for Shrewsbury); Tyne & Wear; West Midlands conurbation; Nottingham, Derby and Leicester and the surrounding counties; Reading and Norfolk (for Norwich)[3]. All of these areas will develop packages which combine hard demand management measures, such as road pricing, with improvements in public transport. The Department for Transport anticipates that after

3 http://www.dft.gov.uk/press/speechesstatements/statements/transportinnovationfundpumpp1038?version=1

further rounds of funding pilot schemes would be developed, which could involve technology trials and inform the discussion on national road pricing. The establishment of the TIF, and the awards from it were portrayed in much of the national media as *"the next step towards the inevitable implementation of a nationwide road pricing scheme"* (LTT 08/12/2005,5), however, it remains to be seen how many of these will progress as far as implementation. At the moment Southampton City Council has not applied for any congestion charging TIF funding, but they are developing the concept of a Bus and Toll lane, where drivers can pay to gain access to a bus lane (SCC LTP 2006), which may be a candidate for TIF funding in the future (see section 1.4).

Following on from the Government's Road Pricing Feasibility Study in 2004, the House of Commons Transport Committee conduced a review of road pricing in the UK, and published a report called 'Road Pricing: the Next Steps' in March 2005. Amongst other things, the report argued that as congestion is already a problem in many urban areas, *"we cannot afford to wait 10 to 15 years for the technology for a national system to arrive before testing the effectiveness of road pricing"* (House of Commons March 2007, 30). The committee highlighted that the London congestion charge has already shown that a lack of technology is not *"a show stopper"*, and local schemes should be encouraged to proceed using relatively *"low-tech"* solutions, rather than using the lack of technology as an excuse for doing nothing (ibid). The Government issued its response to each of the recommendations contained in this report in July 2005, and stated they are *"committed to undertaking the work needed in order to make choices about whether [national] road pricing would be beneficial, and in what form"*. The Government believes *"it would not be feasible to introduce national road pricing scheme in one go"* (DfT July 2005,4), and will *"consider how the transition from localised charging systems to a potential national road pricing scheme"* could happen (ibid). In July 2005 plans for a separate Lorry Road User Charging (LRUC), which was due to be introduced in 2008, were abandoned. This scheme would have replaced fuel duty for hauliers with a distance-based charge, in an attempt to increase the amount that foreign hauliers have to pay for their use of the UK road network, and offset the advantage they gain from lower fuel prices on the continent. However, the proposals became overly complex (McKinnon 2006), and in July 2005 the Government

announced the scheme would not proceed by itself, but would be *"taken forward as part of the wider work on national road pricing"* (DfT July 2005, 10).

In May 2006 there was a reshuffle in the Labour cabinet following local elections. Douglas Alexander replaced Alistair Darling as Transport Secretary, but emphasised *"a national road pricing scheme remains central to Government transport policy"* (LTT 18/05/2006,1). In November 2006 the draft Road Transport Bill was announced, which will be finalised in late 2007, and is expected to give Local Authorities increased powers to *"tackle congestion"*, and more flexibility over introducing demand management. The exact contents and wording of this bill remain to be seen. In June 2007 there were further changes to the cabinet when Tony Blair resigned as Prime Minister, and Ruth Kelly was appointed as the Minister for Transport, and the effect of this on road pricing policy remains unclear.

On 27th July 2007 Manchester announced that it would be bidding for £1.2bn from round 3 of the TIF to implement a double cordon scheme, which would charge motorists going into the city centre in the morning peak, and leaving during the evening peak on weekdays. The bid includes public transport improvements, 80% of which would be in place before charging began, which is anticipated to be in 2012; and the other 20% over the following two years[4]. A decision on the bid is expected in December 2007. Having outlined the history and the key policy documents relating to road pricing in the UK, the next section will go on to highlight a number of the key issues associated with road pricing in the UK.

2.3.3.2 Issues for road pricing in the UK

Within the UK Government there is now *a "broad consensus that some form of demand management will be necessary"* as part of a package to address traffic problems (House of Commons 16/03/2005,3). However, exactly what form this demand management will take, and whether it will involve road pricing is still the subject of debate. Local authorities are also able to implement Workplace Parking Levies (WPL's), but to date only Nottingham is seriously considering this (www.nottinghamwpl.com), and a more

4 http://www.manchestereveningnews.co.uk/news/s/1012/1012297_ccharge_bid_goes_in_on_tuesday.html

detailed examination of their impacts is beyond the scope of this thesis. If road pricing is adopted in the UK there are a wide range of possible options, and *"difficult decisions"* are needed about issues like when to charge, which roads to price, how much to charge, whether and how prices should vary throughout the day, what those prices should be, what technology to use and so on (House of Commons 16/03/2005,3). These decisions have yet to be made, and as such the future of road pricing in the UK is unclear at present.

A crucial issue which will not only influence public acceptance of road pricing, but also its effectiveness at tackling congestion is whether such a scheme should raise revenue, or be revenue neutral compared to the current charges paid by motorists. Blythe (2005,571) commented that the Government are *"actively looking"* at the feasibility of national road pricing to *"fully or partially replace fixed car-tax [Vehicle Excise Duty] and fuel-duty"*, suggesting a revenue neutral scheme. Although revenue neutral road pricing is likely to be more publicly acceptable, it may not be as effective at cutting congestion as a revenue raising scheme. Glastier and Graham (2005) found that at today's prices the cost of driving in the city is lower than the marginal social cost, but in contrast driving in rural areas is over-priced. As a result, if a national revenue neutral charging scheme is introduced it would *"make it cheaper to drive in rural areas, which could potentially lead to an increase in congestion and damage to the environment"* (Glastier and Graham 2005), and could actually lead to an increase in overall traffic levels. A revenue neutral scheme would not raise funds for investment in public transport improvements which will be an important accompaniment to any road pricing scheme, and is also less likely to help meet the transport sectors' emission reduction targets (House of Commons 16/03/2005,12).

Another key issue for the future of road pricing in the UK is the tension between a local bottom-up and a national top-down approach. It will remain to be seen whether city-based schemes will take off, and if these will act as a precursor to a national system of charging. The Department for Transport (DfT) had originally intended for this to be the case, as national road pricing presents a *"major delivery challenge"*, and would benefit

from a *"period of transition"* rather than 'Big Bang' style implementation[5]. The only city-based scheme outside London to date is Durham, but it is hoped that the Transport Innovation Fund will encourage more authorities to consider road pricing. In a speech in mid-2005 Alastair Darling commented:

> *"Whatever we decide about national road pricing, there are problems that cannot wait for a national solution. We need to get on with these local schemes now. And I'm clear we won't get to national pricing all in one go. Nor should we. We will need tests and trials of parts of the system. And we will need a pilot somewhere in the UK – probably in a major conurbation or region of the country. To do that we'll need to work with one or more local authorities. No decisions have been made about where they might be. But we need to be making those decisions in the next two years, with a pilot up and running in five to six years" (A. Darling Speech, 9th June 2005).*

Although a number of authorities have received TIF funding (i.e. West Midlands, Shrewsbury), no major pilot has yet been confirmed. The House of Commons report (16/03/2005,21) suggested that one of the reasons for the lack local schemes is because authorities perceive implementing road pricing as a *"high political risk"*. There is also concern that road pricing could harm economic competitiveness, particularly if it results in *"trade diverting to other neighbouring cities that do not have a congestion charge"*, or to out of-town shopping centres and business parks, which are already competing with many city centres (House of Commons 16/03/2005,22). As there are so few road pricing schemes in operation it is not clear how likely it is these fears would be realised if road pricing is introduced in stand alone cities rather than regions, and this issue will be explored further in Chapter 7.

Another problem facing the implementation of local road pricing schemes is that outside London, Local Authorities do not have the same level of control over public transport services as they do in the capital (see section 2.2.3). London was exempt from

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5 http://www.dft.gov.uk/pgr/roads/roadpricing/feasibilitystudy/studyreport/feasibilitystudyofroadpricin4002?page=5#1019

the (1980) Transport Act which deregulated bus services, so its public transport operations are planned and run by Transport for London (TfL), a civil service organization. This made it relatively straightforward to invest in public transport improvements prior to introducing road pricing, and also to allocate the revenue raised by the scheme to further service improvements. Outside the capital where services are operated by private companies, both of these issues are likely to prove problematic, and Local Authorities will need to work closely with the public transport operators. The 2000 Transport Act did give Local Authorities powers to make Bus Quality Contract Schemes, under which they can specify services, fares and performance targets and operators bid for the exclusive rights to run services on these routes. This could potentially simplify the process of investing revenue from road pricing into public transport, but these contract schemes have been criticised, and the powers have not yet been adopted on a wide scale (House of Commons 16/03/2005).

The Institute of Public Policy Research (IPPR) recommended in 2004 that road pricing in the UK should begin with tolling for widened sections of motorway, as an interim step to a national charge. However, distance-based charging systems are currently not popular with the UK public. In February 2007 a petition against road pricing was launched in the Downing Street Website, and was signed by over 1.8 million people (http://petitions.pm.gov.uk/list/closed, accessed 17/04/2007). Road pricing often faces public acceptability problems, an issue which is explored further in section 2.4.2. During the time this petition was live, and for a relatively short time period afterwards, road pricing received a great deal of media attention, but more recently the debate has subsided. One of the ways that public support for road pricing can be increased is if it is implemented as part of a package of measures (Jones 1991). The House of Commons Transport Committee (16/03/2005,4) stressed that *"road pricing schemes must not be undertaken in isolation"*, but should include complementary measures like improvements in public transport services, which should be in place before charging is introduced. Road pricing could also be accompanied by 'soft' measures such as school and workplace travel plans, teleworking and car clubs in cutting congestion. A number of these measures are set out in the report *"Smarter choices: changing the way we travel"* (DfT 2004), which suggests they could reduce peak hour urban traffic by as much as 21%. The House of Commons Transport Committee (16/03/2005,18) recommended these should be *"adopted without delay"*.

Having outlined the current situation, and issues surrounding road pricing policy around the world and in the UK, this chapter will now move on to discuss some of the broader bodies of literature on road pricing. In the context of this thesis there are two main bodies of work that are relevant, which relate to the first and second research questions respectively. Firstly, section 2.4 will discuss literature on the barriers faced by road pricing, which helps explain the lack of the schemes to date. Secondly literature on the likely effects of schemes, particularly on businesses, will be explored in section 2.5.

2.4 Barriers to road pricing

This chapter has already mentioned a number of reasons why road pricing is a controversial policy, and it can face a number of barriers to implementation, which have been categorised differently by different researchers. Ubbels and Verhoef (2003, 3) identify a number of barriers to the success of road pricing, which they divide into three categories; institutional, acceptability and practical barriers, which includes technological barriers (see also Boot *et. al.* (1993) on feasibility). In contrast, Herry (2001) separates the barriers into more categories, and distinguishes between legal, institutional, technical, information, communication and behavioural barriers. In this thesis the metaphor of barriers to road pricing is used to interpret the success and failure of road pricing in Singapore and the Netherlands respectively in Chapters 5 and 6. With this in mind, this thesis adopts the relatively simple interpretative framework of the three types of barrier outlined by Ubbels and Verhoef (2003), in order to facilitate comparison, and to clearly highlight contrasts between the two case studies. This framework was adopted as it was very similar to the one which emerged from the interviews, and there was little benefit to be gained from reworking existing it.

Each of the three types of barriers (institutional, acceptance and practical / technological) will be discussed here, and then used to structure the case studies of road pricing schemes in Chapters 5 and 6. Chapter 5 will show that rather than facing barriers in each of the three categories, the introduction of road pricing in Singapore was actually facilitated by a series of enabling factors. As such, the barriers metaphor is not appropriate, and instead the term issues will be used, to help highlight a range of

different circumstances which helped, rather than hindered, the introduction of road pricing in Singapore. In contrast, Chapter 6 will show how the three types of barriers all contributed to the failure to implement road pricing in the Netherlands.

Although this thesis will be referring to three different types of barriers to road pricing, it is important to recognise that there is overlap between these, and that they can interact and influence each other (as will be shown in Chapters 5 and 6). This thesis will adopt a dynamic approach, recognising that barriers can change in their magnitude and importance over time, as political parties shift their positions, technology develops, more road pricing schemes are implemented around the world, and so on. Although a number of technical barriers to road pricing are now being overcome, institutional and acceptability barriers are still important, and each of these types will now be discussed in more detail.

2.4.1 Institutional barriers to road pricing

There are a number of institutional barriers that can affect the success of road pricing policy. Many of these relate to politics and the political system, such as the number of powerful political parties in a country, the structure of its political system, and the level of democracy. There has not been much written about these issues to date, but they will be discussed further in Chapters 5 and 6. The structure of the political system itself plays an important role in the implementation of road pricing, as Chapters 5 and 6 will show, using contrasting examples from Singapore and the Netherlands. Essentially, Singapore can be considered as a dominant party system, as although there are a number of different political parties, the political system has been dominated by the People's Action Party (PAP) for over forty years. The opposition parties can be considered essentially *"weak and ineffective"* (Heywood 2002,263), a key characteristic of dominant party systems. The lack of effective political opposition makes it relatively straightforward to implement controversial policies like road pricing without being challenged, as Chapter 5 will show. In contrast, the Netherlands has a multi-party system which results in the formation of coalitions, where parties from different political backgrounds govern together. This can create problems for the introduction of controversial policies like road pricing as coalitions often focus on *"debate, conciliation and compromise"* (Heywood 2002,264), and become dominated by the political centre.

These two examples of contrasting political structures will help examine the effects of different political systems on the implementation of road pricing in detail, and can provide more insights than looking at just a single country. The UK is essentially a three-party system, and sits between the political extremes of Singapore and the Netherlands. The implications of this for the implementation of road pricing will be discussed further in section 6.9

In political systems where a number of parties compete for power, road pricing is often unpopular with politicians. The 'Next Steps' report commented that the *"lack of political will is the biggest impediment to the introduction of a road pricing scheme"* outside London (House of Commons Transport Committee, 19th Jan 2005, Q239). There are a number of reasons why road pricing is often not popular with politicians, including the fact that it generally unpopular with the public, and politicians want to adopt policies which are likely to win them votes, not lose them. An associated reason for road pricings' lack of popularity is because its costs are easy to see, especially if they vary in space and time, but the benefits of reduced congestion and shorter journey times can be very difficult to see (Oberholzer-Gee and Hannemann 2002,367), and therefore as a policy it is difficult to sell to the public. Even if politicians do support road pricing, members of different parties are likely to have different motives for doing so. Johansson *et. al.* (2003) highlight that Left-wing and Green parties favoured pricing for reducing car use and promoting environmental goals, whereas Conservatives, Liberals and Christian Democrats tended to support economic and fairness reasons for the policy.

The controversial nature of road pricing policy means that if one party does choose to support it, it could easily become a political issue. To avoid this it is important to achieve a cross party agreement that it is in fact a *"necessary evil"* (Larsen and Ostmoe 2001,463[6]). However, this agreement may be difficult to achieve, and can be sensitive, especially as elections approach, and political parties adopt certain positions in order to win votes (see Ison 1998, on Cambridge). The electoral cycle can have an important influence on policies like road pricing, as *"the various presidential, national, federal and local electoral cycles mean that there may not be a neutral period in which such*

[6] This reference actually relates to road tolls, but is equally applicable to road pricing to reduce congestion.

[road pricing] schemes can be developed and implemented away from the political spotlight" (Baker 2002, 13). The same is also true in the UK with national and local elections, and political stability is identified by Rye *et. al.* (2003) as an important factor in the successful implementation of road pricing, an issue which will be explored further in the contrasting cases of Singapore in Chapter 5 and the Netherlands in Chapter 6.

Support for individual road pricing schemes can be increased if they are *"championed"* by charismatic and dedicated leaders (Rye *et. al.* 2003), as happened in London with Ken Livingstone (Ison, 1998). However, a report by the ESRC (2005) argues that local councillors are not often brave enough to take on policies which are unpopular with the electorate, and as they face re-election every three years they are *"very reluctant to take on even minor issues relating to restricting the universal access and use of the motor car"*. Baker argues that to overcome this problem, road pricing should be *"promoted by a single layer of government, on the basis of an electoral mandate which offers a realistic period for scheme development"* (Baker 2002,13), an approach which is not being taken in the UK at present.

As well as issues associated with the electoral cycle, local councils in the UK also face problems because they may not have the authority to plan for the whole of their travel-to-work area. In order to ensure integrated policies they would have to work in partnership with other authorities, which could be problematic if they are of a different political orientation. Ideally there should be a single implementing agency responsible for road pricing in the UK (Rye *et. al.* 2003), but this is not currently the case, and could result in interoperability problems if different types of schemes are developed in different cities. Another important institutional factor is the role of lobby groups, such as motoring organizations and employers groups, who can have a strong affect on public support for policies such as road pricing, particularly if they oppose them (see Chapter 6).

2.4.2 Acceptance barriers to road pricing

Acceptability is extremely important in ensuring the successful implementation of policies, and its absence can be an *"external crippling constraint"* (Gunn 1978). Road

pricing currently has low levels of public acceptability, which in turn leads to low levels of political support in democratic countries, as politicians are reluctant to introduce policies that may cause them to lose votes (see Oberholzer-Gee and Hannemann, 2002). Along with public and political acceptability, the acceptance of businesses and lobby groups also plays an important role. Although there is no common theory about how to make urban road pricing acceptable (Whittles 2003), there have been a number of studies looking at factors affecting acceptance and ways that it can be increased. Some of this literature will now be reviewed, including some of the common arguments that are used against road pricing.

Road pricing is an example of a 'stick' (push) measure, which are generally less popular than 'carrot' (pull) measures, but are often more effective at achieving their aims (Gatersleben and Uzzell 2003, Stradling 2002). However, Jones (1991) shows that support for road pricing does increase when it is used as part of a package that also involves carrot measures, and this also increases its effectiveness (see also Schade and Schlag 2003,21). Research by the IPPR (2006) suggests support for road pricing also increases if it is clearly targeted at congestion hotspots and urban areas, rather than being applied as a blanket policy. This is linked to the fact that people are unlikely to support road pricing if congestion is not perceived as a problem (Rye et al, 2003). It is also important to acknowledge the role played by the media, who can have an important effect on perception of transport issues (Raje 2003, 336), and can potentially increase or decrease acceptance through their coverage of road pricing and congestion issues (see also Rowlands (2004)).

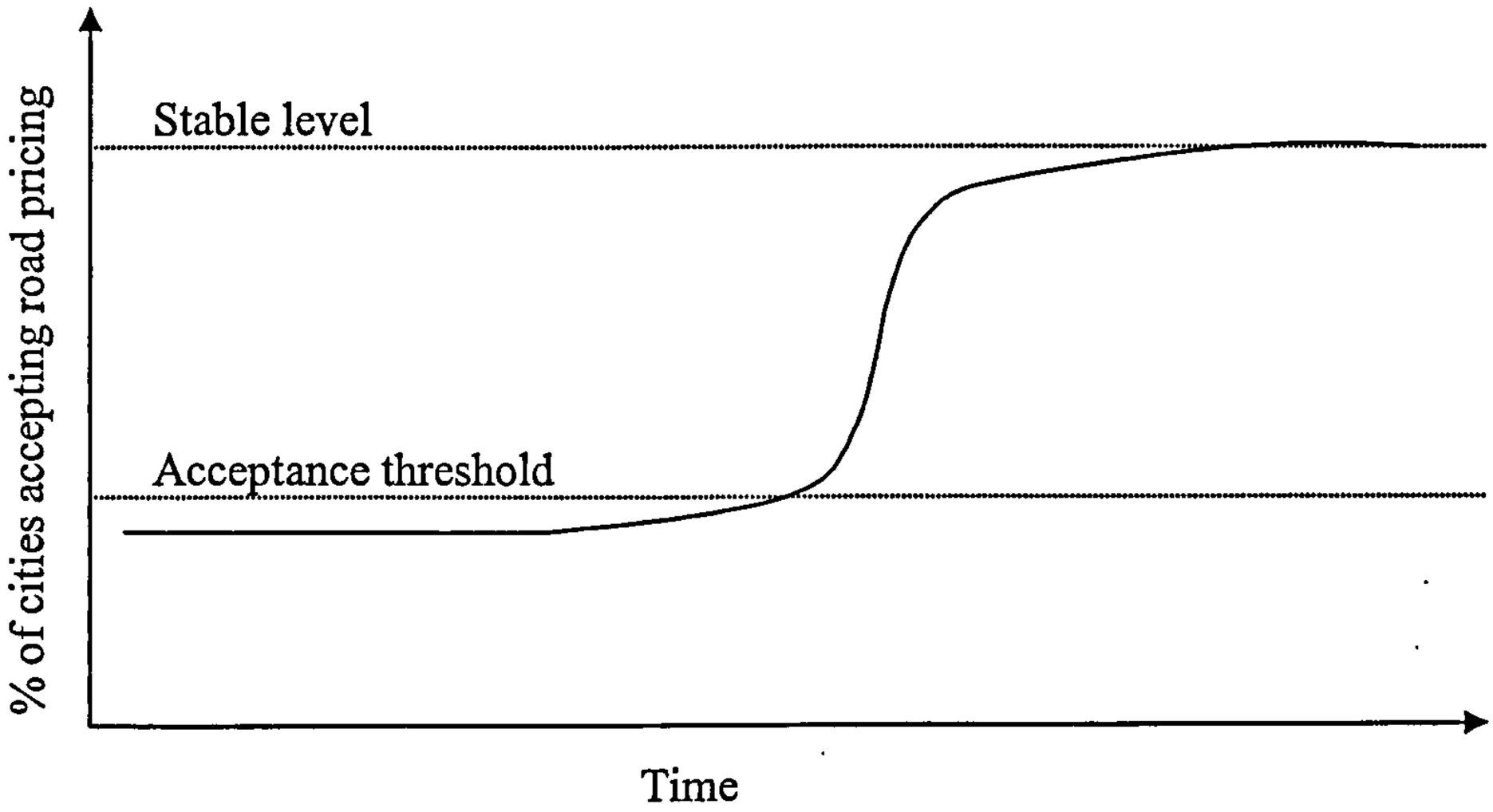
Road pricing effectively introduces market principles into the allocation of road space. Although this might lead to efficiency gains, Ogilvy (2002,32) argues there are a group of *"absolute values"* (such as the right to life, liberty and happiness), which should not be priced and allocated by market mechanisms (see also Heywood 1992,46). Whether road space is one of these absolute values can be debated. Urry (1999,13) comments one of the reasons people oppose road pricing is because it impinges on their *"crucially significant right"* to own and be able to drive automobiles. Many motorists argue that once they have paid their flat rate of road tax they *"entitled to unlimited use of the roads"* (Green and Stone 2004,iii), and have a *"right to drive"* (see also Schade and Schalg 2003). Roads are often seen as a public good, and as they have been free at the

point of use to date, drivers are resistant to the idea of paying for them (IPPR 2006,24), and many feel that road pricing would impinge on their current freedom of choice (Jakobbson and Garling 2000,153). Generally drivers are less resistant to the idea of paying for a new road than an existing one, as it is clear they are getting something for their money (Green and Stone 2004).

One of the common arguments made by opponents of road pricing is that it is simply another tax on the motorist, and it is unfair because they have *"little choice but to continue driving"* (Harrington et al 2001,103). Although under most types of pricing schemes motorists would be able to time their trips to minimise road pricing charges, or switch mode, it can be seen as a consumption tax, as if they adopt certain transport patterns they would incur charges. Another common argument is that drivers pay more in taxes than is re-invested directly in road infrastructure. DfT (16/07/2004) used the National Transport Model to show that although this is true, the overall costs that driving creates are actually two to three times larger than the amount of tax paid (see section 2.3.1 on externalities).

Odeck and Brathen (2002) suggest that some of the resistance to pricing comes from a lack of information, and therefore misunderstanding about the rationale behind charging (see also Gunn 1978). Although support for road pricing is often low in advance of schemes being implemented, Jones (2003, 36) argues the acceptance curve is actually "U" shape, and once a scheme is implemented and people realise the benefits it can have for them then support may increase (see Odeck and Brathen 2002). The lack of existing road pricing schemes means that public awareness of the issues surrounding road pricing is low at present, but Schade and Schlag (2003,143) suggest that once a certain number of cities have road pricing schemes, acceptance will rapidly increase as people get a better understanding of the issues involved. This is illustrated graphically in Figure 2.2 (see also Goodwin, LTT 01/06/2006,17)

Figure 2.2 Acceptance of road pricing (Schade and Schlag 2003,14)



If people were more informed about the economic principles of road pricing (outlined in Appendix A), and scheme aims were clearly set out at an early stage, then acceptance may increase. However, public distrust in the Government is an issue in many countries, and even if the advantages of the schemes are set out in advance, people may simply not believe what they are told until they see it for themselves (see Link 2003, 312 in Schade and Schalg 2003).

A number of different studies have shown that one of the key ways to increase acceptance of road pricing is to hypothecate the revenue from the scheme to fund public transport and other improvements (Thorpe et al, Ison 2000). Goodwin's (1989) *"rule of three"* suggests three possible uses of road pricing revenue; investment in building or upgrading road infrastructure, improving alternatives to the car and reducing existing taxes (see also IPPR 2006). Different groups are likely to support different uses of the revenue, so the individual schemes should be tailored to local needs. Rowlands (2004) reviewed the views of several organizations to road pricing (RAC, CfIT, IPPR) and concluded *"the majority of organizations accept congestion charging in principle"*, and are more favourable towards schemes if the money is ring-fenced and used to reduce existing taxes. However the revenue is allocated, transparency will help to increase public confidence in the scheme (Afford 2002,111).

Scheme designs can also be tailored to increase acceptance. In London a number of trade-offs were made in the scheme design to increase acceptance, rather than basing the scheme purely on first-best economic principles. The Mayor recognised that what looked best on paper was not likely to be publicly and politically acceptable in reality, and a number of compromises were made on issues like the level of the charge for HGV's, the times and limits of the zone, and the exemptions given (Santos and Fraser 2006,296). Ultimately the scheme design was based around *"political issues much more than economic questions"* (Ubbels and Verhoef 2003, 5), and this helped to increase its acceptance. Gonzales (2005,11) suggests that for the benefits of road pricing to outweigh its social costs it is best implemented in areas with a large number of non-drivers. In London *"the density and cost of driving mean that most citizens use public transit to travel in the inner city anyway"* (Gonzales 2005,11), suggesting it is an ideal location for road pricing. If most people already use public transport then acceptance of road pricing is likely to be less of a problem, but this could also mean the scheme is less effective in promoting modal shift.

2.4.3 Practical barriers to road pricing

The final type of barrier to road pricing is the practical barrier, which also includes technological barriers (Ubbels and Verhoef, 2003). The lack of technology for road pricing is less of an issue today than it has been in the past, and *"if the market is found for technology then the technology will be developed for it, particularly something like road user charging which has any number of applications"* (House of Commons Transport Committee, 19th Jan 2005, Q356). However, there are still a number of issues surrounding the use of GPS technology that is likely to be needed for a national road pricing scheme. There are also issues associated with the costs of road pricing technology, which could prove to be prohibitively expensive in the short term. If any in-vehicle equipment is required there is also likely to be debate over the extent to which this should be subsidised by the Government, and how much the individual driver should have to contribute.

There are a wide range of different practical barriers to road pricing, including the lack of existing schemes at present. This can cause problems for the design of new schemes, as there is only a limited amount of experience to draw upon (Ison, 1998), although it is

gradually becoming less of a problem. Timing is an important practical factor for politicians to consider. Rye *et. al.* (2003) build on the work of Gunn (1978) on the perfect implementation of policies, and suggest that congestion needs to be severe enough that it is perceived as a problem, before road pricing will be accepted as a solution (see Chapter 5). The ability to ensure users' privacy is also a key practical issue (Ison and Rye 2005), and can have knock on effects on public acceptability of the scheme if it is not assured. Clear agreement and understanding of the objectives of road pricing is needed, amongst all the parties affected, or there could be an adverse effect on acceptance of the scheme (Ison and Rye 2005). This is linked to the fact that good co-ordination and communication are vital for a scheme's success (Gunn 1978). If the public do not understand the rationale behind road pricing then they may develop misconceptions and oppose the scheme. This means consultation and stakeholder involvement are important in helping ensure the success of any road pricing scheme, an issues which will be illustrated by the Dutch case study in Chapter 5.

2.5 The effects of road pricing

The various barriers to road pricing mean that there are not many existing schemes around the world, and as a result there is not much literature on its actual effects. This makes policy makers even more reluctant to implement schemes, and so knowledge about the actual effects of road pricing does not increase much, but instead is largely based around research into hypothetical proposals. This section will review what is known about the effects of road pricing on businesses and the economy, particularly the locational decisions of firms. Chapters 7 and 8 will build on this literature to explore the potential responses of businesses in Southampton to a hypothetical road pricing scheme in the city. Finally, this section will end by discussing the problems associated with measuring or predicting the effects of road pricing, especially given the lack of schemes to date.

2.5.1 Economic effects of road pricing

The link between road pricing and economic vitality is a key issue for this thesis, but as there are so few pricing schemes in operation there has not been much previous work on

this issue. Despite the fact there has been considerable investment in transport infrastructure around the world, there is still a debate over whether it leads to economic growth (see Banister and Berechman (2001), Black (2000)); so it is perhaps not surprising that given the lack of road pricing schemes to learn from, there is debate about its economic impacts.

The impact of the London congestion charge on John Lewis on Oxford Street was studied by Bell *et. al.* (2004). They compared sales figures to stores outside of the congestion charge zone, and used an econometric model to isolate the effects of the congestion charge from other trends like the closure of the central line, Christmas and the state of the economy. Bell *et. al.* (2004) found that the congestion charge caused a 5.52% drop in sales at John Lewis on Oxford Street, a result they are 98% certain of. Schmocker *et. al.* (2006) also found that a *"significant number"* of customers had reduced the frequency of their shopping trips to central London, as a result of the congestion charge and associated issues like not knowing how to pay. The issue of shoppers diverting from Southampton to other cities can only be explored in detail once some proposals have been made, and there is more certainly over the scale of a scheme; as whether or not road pricing is introduced in adjacent competing cities will have an important influence on the policies effects.

Other studies have examined the attitudes of businesses towards road pricing more generally. Gerrard *et. al.* (2001) surveyed 152 businesses, who gave a mixed reaction to the principle of road pricing. Half of the businesses surveyed expected road pricing to result in non-economic benefits such as reduced traffic noise and air pollution, less traffic congestion and decreased parking problems, which could make the city more attractive to visitors and tourists. However, in the same survey, 71% of businesses felt pricing would have a negative impact on their city's economic prosperity, and 64% thought it would decrease their profitability and harm their performance, particularly their ability to recruit and retain staff (Gerrard *et. al.* 2001). This potential negative impact is often influenced by scepticism about how long it would take for the Government to make improvements in public transport, and when the benefits of these would be realised (Whitehead 2002). Although these surveys are helpful, their broad scale can mask smaller scale variation according to the characteristics of the firms, and the results should therefore be treated with a degree of caution.

As well as businesses, there has been research looking at the impact on cities as a whole. Docherty (2001,326) points out that road pricing is likely to result in some *"diversion of economic activity"*, and although the London economy was strong enough to withstand this, the same may not be true in other UK cites. For cities outside London *"the potential benefits of road user charging must be weighed against the risk of losing higher value activities to nearby competitors, such as New Towns, which lie outside practical tolling cordons and often have better access to the motorway network"* (Docherty 2001, 326). In contrast, Whitehead (2005) suggests that the economic effects of pricing may be *"modest and relatively benign overall, except perhaps for some businesses that operate at the margins of profitability"*. Potentially, therefore, road pricing could lead to a downward spiral in cities that are already struggling economically, whereas for those that are relatively prosperous it may have little effect. Stopher (2004,117) concludes that *"the potential for serious impacts on the economy become large if the charges are made sufficiently high or the area covered is made sufficiently large"*. However, more research is needed to determine what should be classed as "sufficient". A number of studies have suggested that the impacts of road pricing will be *"town specific"* and vary according to factors such as *"where people live, where people work, and what mode of transport they use to go to work"* (see ESRC 2005), and also regional competitiveness (Whitehead 2005,452). This highlights the importance of city-specific research like that conducted in this thesis.

Whitehead (2003) conducted 38 in depth interviews with a range of businesses, academics and government officials around the UK, to explore how road pricing may affect the economic performance of city centres. The research examines a number of different sectors including retail, office functions, tourism and manufacturing, and identifies how these may be affected by road pricing over time. For example, the freight and logistics sector was expected to benefit from road pricing because of *"time savings from reduced congestion"*, and many types of firm may respond by passing their costs on down their supply chains, an issue which is discussed further in Chapter 8. Whitehead (2005) explores the impact of road pricing on economic activity in cities, and suggests that its impacts are likely to be *"modest"*, although some businesses which are currently operating at the margins may be adversely affected. This research builds on some of the areas identified by Whitehead (2005) as worthy of further investigations,

and broadly supports his findings that the impacts of road pricing on the economy are not likely to be as severe as policy makers often fear.

Holguin-Veras *et. al.* (2006) examine the responses of freight operators to tolled bridge and tunnel facilities in New York, where the prices vary according to the time of day, vehicle type and method of payment used. Very little previous research has been conducted on the responses of freight carriers to road pricing, but it is of relevance for Southampton as freight makes an important contribution to the city's economy (see Chapter 1). Holguin-Veras *et. al.* (2006) found that about 20% of the carriers surveyed changed their operations in response to the charge, including changing their payment method, altering their time of travel or route. However, many said they could not change their transport patterns, either because they were tied by their customers requirements, or because they felt the charge was not significant enough to warrant it. The potential impact of road pricing on the freight sector in Southampton will be explored in more detail in Chapters 7 and 8.

The economic effects of road pricing can also be considered in terms of literature on the rise of the 'Creative Class' (Florida 2002). Florida (2002) argues that the creative class is becoming increasingly important for cities' economic competitiveness, and that *"places that succeed in attracting and retaining creative class people prosper; those that fail don't"*. This creative class includes scientists, engineers, artists, architects and many more, who value diversity, and *"higher levels of quality of place"* than the quality of life attributes considered by most people (Florida 2002). While some regions are becoming centres of the creative class, others remain composed of larger shares of working-class or service-class people. Road pricing could potentially help encourage the creative class into cities which introduce it, for a number of reasons. Reducing car use will improve the quality of the urban environment by reducing air and noise pollution, and help make city centres more pedestrian-friendly, particularly when teamed with public transport improvements. In turn, this will help promote the *"indigenous street-level culture"* of city life that the creative class value (Florida 2002). Road pricing could also improve cities' images as concerned about the environment, an issue which is becoming increasingly important. If road pricing can successfully transform urban centres from car dominated environments, to pedestrian friendly,

bustling and diverse areas which attract the creative class, it could have a positive effect on their economic competitiveness.

2.5.2 Road pricing and business location decisions

It is not possible in the scope of this thesis to look at the economic effects of road pricing in Southampton in their entirety, so this thesis will focus on one element, the responses of businesses to road pricing, as outlined in research question two in Chapter 1. Whitehead (2002,238) divides responses to road pricing into three orders of responses. First order responses are defined as *"initial reactions, such as changing route, travel time or mode"*, and are essentially non-locational (see Chapter 8). Second order responses involve relocation, including businesses which leave a city that introduced road pricing in order to avoid the charge. This is perhaps the most extreme response that firms could make to road pricing, and potentially the most economically damaging. Southampton City Council were particularly concerned about the effects of road pricing on the locational decisions of firms in the city, so this issue will be explored in detail in Chapter 7. Previous research on this issue presents a mixed picture.

Different business types will be affected differently by pricing, and have different propensities to relocate in response to it. This issue is discussed further in Chapter 3 using the concept of local embeddedness, but there is some research specifically related to road pricing that it is worth mentioning here. Firstly, it is important to recognise that there is a debate in the literature about whether road pricing would even affect business location decisions. Gerrard *et. al.* (2001) found that even if businesses perceived acute transport problems, this did not have a statistically significant effect on their intention to relocate, and instead this decision was driven by broader factors such as expansion, leases ending, and consolidation of multiple sites onto one. Once the decision to move has been made, transport issues like staff parking and proximity to main routes were considerations, but they did not drive the initial decision itself. Tillema *et. al.* (2003,7) found a similar effect specifically related to road pricing, and commented that *"spatial effects for most firms are considered to be small, because transport costs only form a minor part of the total operational costs"*. Although road pricing may not be a sufficient factor in promoting businesses to relocate, by itself, if they are considering moving for

other reasons, it could influence their decision about where to go. This issue will be explored further in Chapter 7.

Harsman (2001,4) suggests that for some businesses the high costs associated with charging may make their location *"non-optimal"*, and prompt them to consider relocation, particularly if the reductions in congestion do not benefit them. In a survey of 152 businesses around the UK Gerrard *et. al.* (2001) found that headquarters and businesses with fewer employees were more likely to relocate in response to road pricing, whereas those engaged in *"customer-based activities such as retail and distribution"* were less likely to move. This would be welcome news for Southampton City Council, as the city is an important retailing centre. However, research by Whitehead (2002) concluded that retail was likely to be the most sensitive sector, as it is already under pressure from out of town outlets in a number of cities. Although road pricing may not impose significant extra costs on the retail sector, there is a risk that customers would be deterred to locations without charging.

As well as causing existing businesses in the city to leave, road pricing could also affect the decisions of businesses considering coming to the city. Docherty (2001,326) suggests that *"the introduction of road user charging by city authorities could prompt their neighbouring local councils to enter into a bidding war for the location of new developments"*. This will not be explicitly examined in this thesis, as it is beyond the remit agreed with Southampton City Council (see Chapter 4), but it is important to be aware of this potential effect.

2.5.3 Measuring effects / bias and problems

It is worth noting at this stage some potential sources of bias in studies of the effects of road pricing, as these can affect the reliability of findings. Firstly, as road pricing policy results in a redistribution of welfare, Ubbels and Verhoef (2005,16) suggest that before schemes are implemented *"institutions have an incentive to exaggerate expected losses or neglect possible gains, in order to try and realise a share in the revenue allocation as large as possible, should implementation materialise"*. This means that businesses may exaggerate the expected negative effects of pricing, in order to enhance their lobbying position and shape the scheme in their best interests. It is important to keep this in mind

when researching the potential impacts of road pricing schemes. This research attempts to overcome this potential source of bias by conducting qualitative in-depth research that helps understand the reasons for businesses' responses and the effects of road pricing, rather than using a more straightforward method like a questionnaire which would be more open to response bias. This methodology is discussed further in Chapter 4.

Willis and Power (1998) identified another potential source of bias in responses. They found there was a divergence between people's hypothetical willingness to pay (WTP), as stated in surveys, and the actual WTP when schemes come in (Willis and Power 1998,313). This response bias is a common problem on road pricing research, because the lack of operational schemes means that many studies are based on predicting the possible effects of hypothetical schemes, rather than measuring what actually occurred. This bias occurs partly because it is difficult for people to know how they would actually respond to a policy before it is introduced, and could apply to other areas of responses to road pricing aside from WTP. As such it is important to be aware of this effect when researching the possible effects of future road pricing schemes.

2.6 Conclusion

This chapter has reviewed the traditional approaches to understanding transport policy and road pricing, as background to a number of the issues explored in this thesis. Some key trends in UK transport policy were discussed, before explaining the economic rationale for road pricing, and outlining the current status of the policy around the world. The chapter then discussed the history of road pricing in the UK, and explored some of the issues related to its implementation, including the tension between a top down 'big bang' approach led by central Government, and a bottom up approach based on local schemes in a number of different cities. It is currently unclear how road pricing policy in the UK will progress, and as such this thesis focuses on exploring general trends and patterns, so that the findings can be applied to a variety of charging options (see Chapter 4).

Having outlined the current situation with road pricing policy, the chapter then reviewed two relevant bodies of literature related to road pricing. There are few road pricing

schemes in operation around the world, partly because of the large numbers of barriers that these schemes face. These barriers were reviewed, and divided into institutional, acceptance and practical / technological issues. Today the technical barriers to road pricing are decreasing, and institutional and acceptance issues are more of a concern for policy makers. These barriers will be returned to in Chapters 5 and 6 to provide an analytical framework through which to understand the success and failure of road pricing in Singapore and the Netherlands respectively. They will also be used in Chapter 6 to discuss the transferability of the findings of the two case studies to the UK, and to identify a number of lessons to increase the chances of successful implementation of road pricing in the future.

Finally, the chapter reviewed literature on the effects of road pricing, particularly related to businesses and their location decisions. The lack of operational road pricing schemes means there is a gap in knowledge about the actual effects of road pricing, and policy makers often fear the worst. Much of the research into the effects of road pricing, like this, relies on hypothetical proposals. Some limitations with this type of research were outlined, and a qualitative in-depth approach was advocated to help overcome some of these problems (see Chapter 4). Chapters 7 and 8 will build on and add to this literature by examining the potential responses of businesses in Southampton to a hypothetical road pricing proposal.

Chapter 3 – Literature Review

3.1 Introduction

Chapter 2 reviewed the 'traditional' approaches to understanding transport policy and road pricing. It highlighted a range of barriers to road pricing, and showed that as a result of these, there are few operational schemes, which means that little is known about the likely effects of road pricing policy. This chapter will move on to consider a number of bodies of work from the broader social sciences, and evaluate their relevance within the context of this thesis. It will begin by examining research on the automobile, particularly how it has become dominant in many societies and created a series of dependencies at both a societal and an individual level. These dependencies on the automobile contribute to the barriers to road pricing outlined in Chapter 2, particularly acceptability barriers. The chapter will then turn to some bodies of literature that can be used to understand the responses of businesses to a road pricing scheme in Southampton. Firstly, the concepts of local dependence and local embeddedness will be discussed, and the chapter will outline why local embeddedness in particular is a helpful concept through which to understand businesses' locational responses to road pricing (see Chapter 7). The chapter will then end by examining the concept of 'lock-in', which will be used in Chapter 8 to help explain some of the constraints affecting businesses' non-locational responses to road pricing.

3.2 Understanding automobile dominance

3.2.1 Introduction to automobility

The dominance of the automobile in many societies, and people's increasing dependencies on it, can cause acceptability barriers to the introduction of sustainable transport policies, particularly the controversial measure of road pricing (Dupuy 1999). One of the reasons for the lack of many operational road pricing schemes around the world is because of the motoring publics' resistance to it, which is fuelled by their attachment to, and perceived dependence on the automobile. This section will examine literature on how the automobile became so dominant in many societies, explore how it

maintained this dominance, discuss the effects this has at both an individual and a societal level, and comment on the possibilities of moving towards a different system of mobility. The implications of the automobile's dominance for road pricing policy will be discussed throughout, finishing with an evaluation of the relevance of this body of work for this thesis at the end of the section.

3.2.2 The rise of the automobile

In the early 1900's Fordist systems of mass production fuelled a growth in the manufacture of automobiles, and also made them more affordable for the general population. Gradually the growth and expansion of the automobile system became a self-perpetuating cycle, which was referred to in the 1970s' by the American oil and engineering industry as a *"magic circle"* (Dupuy 1999). Essentially, as levels of automobile ownership increased, the 'predict and provide' philosophy led to an expansion of the road network (see Chapter 2), which in turn induced more traffic and triggered the further expansion of the road network. This cycle continued for decades, not just in America, but around much of the world, creating automobile dependence at both a societal and an individual level. This dependence on the automobile creates public opposition to policies such as road pricing which are thought to impinge on peoples' 'right to drive' (see section 2.4.2).

Although millions of people around the world use automobiles, this does not necessarily mean that it is the most desirable mode of mobility possible. Literature on the Social Construction of Technology (SCOT) (Bijker *et. al.* 1990) rejects previous technological determinist views that the intrinsically 'best' technology will become dominant at a given time (MacKenzie and Wajscman 2003,19). Instead SCOT literature argues that the development of technology is influenced by broader social and historical factors, so that the dominant technology is not necessarily the most socially desirable (see also Barnes 1992). The notion of path dependence can help explain why the automobile became dominant, even though there may have been potentially superior technologies in existence. Foxon (2002) suggests that history of adoption of a technology is important for its current and future uptake, and Liebowitz (1995,205) adds that minor or seemingly inconsequential market leads can be amplified, so that ultimately one technology becomes irreversibly dominant (see also Arthur 1989). These initial

variations can occur for many reasons, including policy and institutional frameworks. MacKenzie and Wajscman (2003) argue that once the car began to become dominant, it was able to *"freeze out"* alternatives, even though they were potentially superior; creating *"undesirable lock in"* (Leibowitz 1995,214) (see section 3.3). The sunk costs that have been invested in developing automobiles eventually became large enough that it was not financially viable to peruse other alternatives (see Foxon (2002) drawing on Arthur (1994))[1].

Despite its dominance there are a number of problems with the current system of automobility, such as the congestion and pollution that it creates. Adopting a SCOT viewpoint allows an acknowledgement that there may actually be more socially desirable and sustainable systems of mobility; and just because the automobile is dominant it may not necessarily be the best possible system of mobility. Although road pricing is not popular with the public, restraining the use of the automobile and promoting a shift in current patterns of mobility could actually be in society's best interests in the longer term (see section 3.1.5). Although automobility may not be the 'best' system of mobility, the car has achieved remarkable levels of dominance, both at societal and individual levels. This can be partially explained by some of its unique characteristics, which will now be explored.

3.2.3 Automobility

One of the important groups researching the dominance of the automobile is the 'Lancaster School'. Although their work has addressed a range of mobility issues, including arguing for a "mobile sociology", there is one particular strand which is relevant in the context of this thesis; *automobility*. Literature on automobility helps explain the dominance of and dependencies on the automobile, and therefore some of the barriers to the introduction of road pricing. In contrast to the positive connotations of the "magic circle", Urry (2000,4) has conceptualised the rise of the automobile in a more negative light, suggesting its spread has been *"viral"*, beginning in North America

[1] The picture is not this simple in reality. In America in the early 1890's petrol and steam cars were actually competing with each other for dominance (Arthur, 1989). Arthur argues that petrol cars were initially seen as the inferior option because they were "*explosive, noisy, hard to obtain in the right grade, and it required complicated new parts*". However, petrol cars benefited from a "*series of trivial circumstances*" which increased their market share, and caused them to become dominant.

and spreading around the globe, enhancing its dominance over time. Urry (2000) argues that a unique combination of characteristics of the automobile have helped to build and maintain its dominance, and these are summarised in Table 3.1. These six aspects of automobility highlight that the automobile is part of a broader industrial system, rather than an isolated object. It is not just the automobile itself which creates and perpetuates dependencies, but it is linked to broader patterns of land use, employment and service provision, which are often based around the dominance of the automobile (i.e. out of town shopping centres and business parks).

Table 3.1 – The six aspects of automobility (Urry 2000)

Aspect of automobility	**Description**
Manufactured Object	Produced by iconic 20th century capitalist (Fordist) firms
Item of individual consumption	Status symbol conferring power and identity to its owners
Agent of culture	Determines discourses of normal social practice, such as where people travel to and how often
Instrument of quasi-private mobility	Subordinates other modes of public transport due to its high levels of convenience and flexibility
Use of environmental resources	Creates emissions, visual and noise pollution, and the associated infrastructure and industries require a large amount of land
Complex linked to other industries	Technical and social linkages to other industries exist i.e. road building and car accessories

The fact that the automobile has become an integral part of modern society for many people has important implications for the success of road pricing policy. With this in mind, three of the six points outlined in Table 3.1 are worth briefly expanding upon here; the automobile as an agent of culture, as an instrument of quasi-private mobility and as an unsustainable use of environmental resources. The dominance of the automobile in many societies means that people come to perceive it as a 'normal' mode of transport, take for granted that it is available, and in many cases actually feel they have a 'right to drive'. Societal dependence on the automobile will be explored further in section 3.2.4.4, but essentially it means that the use of the automobile has become

normalised, and any measures which restrict its use, or are perceived to impinge on an individuals' right to drive, such as road pricing, are met with resistance. This is closely linked to the notion of the car as an instrument of quasi-private mobility. Drivers value the levels of flexibility, convenience, reliability and relatively short journey times that the automobile offers compared to public transport. The opportunities that the automobile offers to participate in *"spatially disjoined activities"* (Bertolini and le Clerq 2003,575) are not always available by other modes. Once people have experienced the advantages offered by the automobile they are reluctant to return to other modes (see section 3.2.4.2 and Appendix B on the hysteresis effect), and again this makes road pricing an unpopular policy. All these factors contribute to the barriers to the introduction of road pricing, particularly public acceptance barriers. Chapter 5 will highlight that in Singapore, which has relatively low levels of automobile ownership for a developed country, public acceptability was not a barrier to the introduction of road pricing[2]; but in contrast, Chapter 6 will show that in the Netherlands where dependency on the car is higher, there was much more public resistance to road pricing.

Despite the freedoms the automobile offers, there are increasing concerns over sustainability, and the need to reduce greenhouse gas emissions. As the car is a major consumer of both land and fossil fuels, measures to manage its use are gaining increasing media and political attention, which could lead to a more serious consideration of road pricing in the future. However, there are high levels of automobile dependence, at both a societal and an individual level, and these make it difficult to implement policies such as road pricing which restrict the use of the automobile. These dependencies and their implications for transport policy, particularly road pricing, will now be explored.

3.2.4 Automobile dependence

In many societies the dominance of the automobile has led to a range of dependencies on it, which makes introducing policies like road pricing controversial and problematic. This section will briefly outline the different types of dependency, before looking in

[2] Other societal factors also played a role to the acceptance of road pricing in Singapore, which are explored further in Chapter 5.

more detail at societal and individual dependences. Stradling (2002) draws on various strands of work on automobile dependence, and suggests that there are three kinds of dependency; dependent places, people and trips. The latter two of these are of most interest in this thesis. Dependent people can be divided into two categories; those with structural dependence on the car, for whom there is no other viable alternative, and those with conscious dependence, who could realistically make their trip by another mode (Farrington *et. al.* 1998). This latter group often perceive themselves to be dependent, but are often actually just reluctant to use other modes because of emotional attachments to their cars (see section 3.2.4.2), or because of behavioural lock in (see section 3.4). Policies like road pricing could actually encourage this group to consider other transport options, although they are likely to be resistant to the idea initially.

A number of business journeys are likely to be dependent on the car, as many supply chains that involve transporting goods are orientated around motorised transport. (see section 3.4). Automobile dependence may also be present in the supply chains of large companies, which have been operating for many years, and are therefore resistant to change. However, other trips may simply be perceived to be dependent; and again, road pricing may be a sufficient enough factor to encourage the businesses to review their travel patterns. Dependent trips will be examined in the context of lock-in to work related travel patterns, which are discussed in Chapter 8 (see also section 3.4). Societal and individual dependencies on the automobile will now be explored in more detail, to help explain why road pricing often faces acceptability barriers (see section 2.4.2).

3.2.4.1 Societal automobile dependence

Urry (2000) argues that the car is an agent of culture which determines normal social practice, and this often goes hand in hand with societal dependence on the automobile. The automobile is not a passive mode of transport, but rather it actually *"reconfigures civil society"*, creating new patterns of living, working, travelling and socialising (Urry 2000a,59). For example, the growth of the automobile initially facilitated the separation of home and work, allowing people to move out of the cities into more pleasant suburbs, and travel to where they got paid more for their labour (White and Senior 1983). Beckmann (2001,598) argues that other types of land use are also becoming increasingly fragmented in the modern city, including shopping and leisure facilities.

This separation further increases the need to travel, which many people do by car (see Beckmann 2004,83). As car ownership levels increase, the cycle continues, with increasing urban sprawl and suburbanisation further necessitating the use of the car (Urry 2003a,5).

Although daily life has become orientated around the availability of the automobile in many countries, this dependence is by no means inevitable, as the case of Singapore shows (see Goh 2002 and Chapter 5). However, in the UK the car has become pervasive, and does influence what is seen as normal practice, as its use becomes taken for granted over time. Castells (1985,295) uses the example of the school run, where walking used to be the norm, but now it is increasingly common that parents drive their children to school. As what is seen as normal practice in a society becomes increasingly built around the automobile, being able to have access to and use a car becomes increasingly seen as a right. This means policies such as road pricing which seek to manage the use of the automobile are seen as impinging on peoples' freedoms and restricting their current lifestyles, and hence they are often unpopular.

3.2.4.2 Individual automobile dependence

As well as societal dependence on the automobile, many individuals also exhibit automobile dependence at a personal level. This is often in the form of emotional and subjective attachments to their vehicles, and again this leads to resistance to the idea of road pricing. The car was initially a luxury item that was the preserve of the wealthy, but over time relative income levels increased, and manufacturing costs decreased with mass production. The car first became a household item, progressed to an individual item and finally a specialist individual item, with people owning multiple vehicles (Gilbert 1998 in Stradling 2002). Automobile ownership patterns show hysteresis, which means that although car ownership levels rise as income increases, they do not fall by the corresponding amount if these incomes then fall (see Appendix B for more details). There may be a number of reasons for this, but broadly speaking, once people own a car they become attached to it, and are reluctant to give it up. This means it is more straightforward to use policy controls to prevent the automobile becoming dominant than it is to reverse its dominance once it has occurred; a point which is well illustrated by the case of Singapore explored in Chapter 5.

The freedom and flexibility that the automobile offers is one of its major advantages, and often leads to dependencies on it. Drivers can make any stops or detours that they desire, at very little notice (see Brottman 2001). Journey times by automobile are often much shorter than by public transport, and this is a particular advantage for business travellers. Compared to public transport, travel by automobile is relatively *"seamless"*, as there is no need to incur delays waiting for connections, which are often seen as *"wasted time"* (Dowling 2000). It has been argued that the automobile also acts as a time management tool (ibid), allowing people to do more and more varied tasks in a single day (see Shove 2002, Urry 2000a). Again, this is a particular advantage for businesses, where time is money.

For many people the car is much more than just a form of transport (Hagman and Tengstrom 1991,3), but it also acts as a status symbol and a way to express identity, something which cannot really be said of the bus. Alongside the convenience and sense of freedom that the automobile offers, the actual act of driving increases people's emotional attachments to their vehicles (Thrift 2002). These emotional attachments can be very strong, but as they are difficult to quantify they are often overlooked in policy documents (Sheller 2003). This could mean road pricing may not reduce automobile travel as much as predicted, a phenomena sometimes referred to as the 'policy-behaviour gap' (Salomon and Mokhtarian 1999). To avoid this problem it is important to be aware of people's dependence on the automobile, be realistic about the modal shift that policies like road pricing can achieve and look at a package of measures which includes public transport improvements.

3.2.5 Moving beyond the current automobile system?

Although many people and societies are dependent on the automobile, this does not mean that there is not potential to move towards a system of mobility where the automobile plays less of a role. Adopting the SCOT viewpoint discussed in section 3.1.2, and recognising that the automobile may not be the best system of mobility for society, has important implications for future transport policy. Some research will now be reviewed which has critically assessed whether other systems of mobility may be better, and examined how we could move towards these.

Sheller (2003, 21) argues that despite incremental change and experimentation with new transport policies (like road pricing) there has not been a radical transformation of the car and road system. However, there is potential for this to happen, if a *"tipping point"* occurs (Gladwell 2000). Automobility literature has explored the notion of tipping points, in which contagious behaviour can cause a dramatic change to occur in a system in a very short space of time[3]. For example, once a critical mass number of people purchased mobile phones in the UK, suddenly the majority of the population wanted them. Urry (2004) argues that the automobile system is non-linear, so small changes can lead to large and unpredictable effects, which could result in a complete break with the current system (see also Featherstone 2004, on complexity theory from mathematics). Urry (2003) identifies a number of possible ways that such a tipping point could occur, which are outlined in Figure 3.1.

Figure 3.1 – Potential tipping points for the system of automobility (Urry, 2003a)

- New fuel systems such as hybrid or hydrogen cars
- New lighter materials to make car bodies, and reduce engine sizes
- Improvements in smart card technology
- De-privatisation of cars through car clubs
- A focus on demand reduction in transport policy (including road pricing)
- Developments in communications technology and the internet

Increasing concerns over sustainability and the introduction of road pricing could lead to a tipping point, but if and when such a move towards a *"post car system"* (Urry 2003a) would occur is highly unpredictable. Urry argues that for such a shift to occur most of the changes outlined above would be needed, and in a certain order, adding to its unpredictability. In contrast, Foxon (2002) argues that many industrial economies exhibit "carbon lock-in" to carbon intensive fossil fuel based systems, including the car, and that this could impede any potential tipping points.

[3] A parallel concept to the idea of tipping points can also be found in the analysis of political change. The *"punctuated equilibrium"* view adopts a *"discontinuous conception of political time"* (Hay 2002,161), in which periods of gradual evolutionary change can be punctured by rapid and intense revolutionary changes. These can be infrequent and as such unpredictable, similar to the notion of a tipping point.

A tipping point in transport would impact on broader sectors such as land use, business working practices and locational decision-making. Although it is very difficult to predict the form a future system of mobility may take, it is important to keep in mind that such a shift is possible, and although the automobile has created high levels of individual and societal dependencies, these may not persist forever. Road pricing could be involved in such a tipping point in two ways. Firstly, the introduction of a number of road pricing schemes could help contribute to a tipping point, by beginning to adjust societal attitudes to the use of the automobile. Alternatively, factors like the rising prominence of green issues and sustainability in politics, and the increasing price of oil could contribute towards a tipping point which adjusts attitudes to mobility, and increases the acceptability of road pricing.

3.2.6 Automobility and road pricing

There is a wide range of literature looking at the reasons for the dominance of the automobile, the societal and individual dependencies it creates, and the potential to move beyond it. This work is important in the context of this thesis in helping to explain why road pricing is such a controversial policy, but also highlights that although it is unpopular, it could have an overall benefit to society. The dominance of the automobile in the UK, and the systems which have evolved around it, means it determines normal social practice for many people, who are dependent on it to maintain their current lifestyles at a societal level. The automobile also offers highly flexible patterns of mobility and creates a series of emotional and subjective attachments that mean people are often dependent on their automobiles at an individual level. These attachments and dependencies create acceptability barriers to road pricing, as it is seen as impinging on peoples' freedom, and would force many to adapt their lifestyles. However, the current growth in the use of the automobile and the associated consumption of resources and the pollution produced is unsustainable. The increasing emphasis on sustainability, combined with the recognition that the automobile system does have many disadvantages at a societal level may make road pricing more important as a policy option in the future.

Automobility literature is helpful in explaining some of the reasons road pricing is a controversial policy which faces acceptance barriers (see section 2.4.2). The concepts discussed here will be drawn upon in Chapters 5 and 6 to help explain some of the reasons for the success and failure of road pricing in Singapore and the Netherlands respectively, and answer my first research question. The notion of dependent trips will be helpful in explaining businesses transport responses to road pricing in Chapter 8, but beyond that, automobility literature does not help address the second research question of this thesis, about the responses of businesses to road pricing. To address this question it is necessary to explore some further concepts; local dependency, local embeddedness and lock-in.

3.3 Local dependency and local embeddedness

So far this chapter has focussed on notions relating to the dominance of the automobile to help explain why road pricing is often a controversial policy, but another important element of this thesis is to examine the effects of road pricing on businesses, and their possible responses. Hensher and Puckett (2005,382) argue that road pricing in a city centre may lead to the relocation of offices. There is concern amongst Southampton City Council that if they were to implement road pricing then a range of firms (not just offices) may relocate out of the city in order to avoid the charge. There are several bodies of research that are useful when considering the potential impact of road pricing on the locational decisions of firms. This chapter will now review the potentially most relevant; local dependency and local embeddedness, and explain how local embeddedness will be used in Chapter 7 to explore businesses' potential locational responses to road pricing in Southampton. Local dependency and local embeddedness can be easily confused, so it is important to outline their meanings here to avoid *"fuzzy terminology"* (Markusen 1999,870). Section 3.4 will then go on to discuss the concept of lock-in which can be used to explain businesses non-locational responses to road pricing.

3.3.1 Regime theory and local dependency

The concept of local dependency originated from regime theory, which is an area of urban politics that evolved from the Marxian concepts of the 1970s'. Regime theory developed during the 1980s', based on the idea that within all advanced capitalist societies co-operation and *"blending"* of activities between the Government and non-government organizations (such as businesses) is necessary, in order to facilitate urban change (see Stoker, 1995).

The notion of local dependency is intuitive, and suggests that firms can be tied to a particular location - locally dependent - for a variety of reasons, including investments in the built environment. There are degrees of local dependency, and some firms in each location may be more dependent than others (Cox and Mair 1991,203). As a result of their dependency the success of these firms is partially dependent on the health of the economy in that area (Cox and Mair 1988,308). As locally dependent firms have a vested interest in the prosperity of their area, one of their primary interests is *"defending or enhancing the flow of value through a specific locality"* (Cox and Mair 1988,310). In order to do this, groups of firms may form regimes, to give them a stronger voice for lobbying policy makers for local economic developments that benefit them (Cox and Mair 1988,307 and Imrie *et. al.* 1995). A regime can be defined as *"an informal yet relatively stable group* with access to institutional recourses, *that enables it to have a sustained role in making Government decisions"* (Stoker 1995,58, original emphasis). Regime theory explores the conditions under which relationships between Governments and businesses are formed and maintained, and how the actors within the regime will try to influence local policy-making to their advantage[4] (Ward 1996). Although locally dependent firms will have an interest in ensuring the prosperity of the local area, local dependence does not guarantee political engagement[5]. Much of the work to date has been done in an American context, so further research is needed into how it applies in the UK context (Wood, 2004).

[4] A similar literature is that on urban growth coalitions (see Stoker and Mossberger, 1994), but this emphasises the role of *"rentiers"* (land owning businesses) in local economic development. This is overly restrictive in the context of this thesis, as it is not only land owning businesses that will be affected by road pricing, but those which rent too.

[5] It is possible for businesses to *"jump scales"*, so businesses do not necessarily have to engage with politics at the same scale as their local dependency (Wood 2004,2111).

There are a wide range of reasons why firms may be locally dependent. Investment in infrastructure and communications is often essential for production to occur in particular locations (Cox and Mair 1991), and this investment then ties the firm to that location as a sunk cost (see section 3.3.2). Other less tangible factors may also lead to local dependence, including trust, reputations, established working relationships with other businesses, relationships with suppliers, and a unique relationship with a particular place that could not be replicated elsewhere (see Imrie *et. al.* 1995,33). As individual workers may have valuable skills and knowledge, firms can also be dependent on their pool of labour (Stoker and Mossberger 1994, 202). These employees themselves can also be locally dependent (Cox and Mair 1999,191). Everyday lives are situated in places, and this can lead to dependency if people have brought their homes, established friendships, become affiliated to local institutions such as clubs and churches, or have children attending local schools (Cox and Mair 1988,312). The local dependency of these individuals can have a knock on effect on their employers, particularly if they have highly specialist skills.

The term *local* dependency can be slightly misleading, as the extent of what is considered 'local' can vary, and should be considered a relative rather than an absolute concept (Duncan and Savage 1989,186). At one extreme, firms can be locally dependent at the micro-scale of their individual specialist sites, as illustrated by Imrie *et. al.* (1995) who studied a group of firms in Cardiff Bay. Equally, firms can also be locally dependent at the regional scale. This can happen if they do not have large sunk costs in their particular sites, but are restricted in how far they could relocate because of the need to retain skilled staff, and or the need to serve an established customer base. It is also possible for firms to adopt strategies to reduce their levels of local dependency, and their levels can change over time without their intervention. Ways that this can be done include the de-skilling of labour, and renting rather than purchasing premises (Cox and Mair 1988,309). Firms can also reduce their dependence on a single location by having multiple sites, although this could just increase the scale of dependence, rather than totally removing it (see Cox and Mair 1993,440). Although local dependence does involve these complexities, it is sometimes used in an overly simplistic way. For example, Wood (2004) categorises firms as having either high or low levels of local dependence and political engagement; binary distinctions which do not capture the complexities of many real life examples.

Despite being potentially helpful for this research, the concept of local dependence has not been widely applied since it was first established in the early 1990's. Local dependency literature has particularly focused on the effect of dependency on the political engagement of firms, and this is not a key concern for my work. A study of road pricing and local dependence would examine the potential effect of a scheme on Southampton's economy, including on businesses in the city, and explore how, in light of the anticipated effects, they would lobby the City Council about the scheme. As there are currently no proposals for road pricing in Southampton, it is not possible for firms to engage with the City Council about these, and as such this relationship cannot be readily studied. Further research into the broader economic effects of road pricing would be needed to investigate these issues, and that is beyond the scope of this thesis. Although firms can take measures to reduce dependence, the term does imply a state rather than a process, so it is helpful to look at a further concept; local embeddedness.

3.3.2 Local embeddedness

The notion of local embeddedness is similar to that of local dependence, but there are also some important differences. Previous studies have resulted in a *"plethora of meanings linked with embeddedness"* (Hess 2004,166), so it is important to clarify its meaning here, and explain how the concept will be used in this thesis. The notion of embeddedness was first explored in detail in the 1980's by the sociologist Granovetter (1973, 1985), after early work by Polanyi (1944). Granovetter (1985) argued that traditional economics research often excludes socio-cultural factors as they are not thought to affect economic transactions (see also Uzzi 1997,35). He highlighted that business relations are actually mixed up with social ones, and that although these are often overlooked in much market related literature, they are actually important in all economic transactions.[6] (See also Amin and Thrift (1995) on 'institutional thickness', which emphasises the importance of social and cultural factors on the economic success of regions). Since the early literature by Granovetter, the notion of embeddedness has evolved, and many different meanings and definitions have now emerged (Hess

[6] That said, Granovetter (1985) also argued it was equally important to avoid over-socialised accounts of markets as well as under-socialised ones.

2004,167). Some of these interpretations are very different from the original use of the term, and can be *"complex and often confusing"* (Hess 2004,172).

Within the notion of embeddedness, a range of different sub-types can be identified, some of which overlap and involve different terms for the same phenomenon. Hess (2004) argues that geographers have adapted and specialised the original idea of embeddedness to explain the success of regions and clusters, but that essentially the term is based on the idea that *"economic action is grounded in 'societal' structures"* (Hess 2004, 176). Within this Hess (2004,178) identifies three *"closely knitted"* types of embeddedness; societal, network and territorial embeddedness. It is even possible to break these different types down further into sub-types (see Halinen and Tornros (1998) on network embeddedness), but this is not necessary for the purposes of this thesis.

Of the three types of embeddedness, societal (social) embeddedness is the most similar to Granovetter's original concept. The term refers to the importance of an actors' societal background, and the fact that their cultural and historical origins will affect their economic behaviour[7] (Hess 2004,176). Social embeddedness recognises that economic activity does not occur in a *"social vacuum"* (Dacin *et. al.* 1999,326), but is influenced by social relationships and ties between actors, including working relationships and established trust (see Agnes (2001) on the importance of face-to-face contact in custodial banking). Societal embeddedness is not the key form of embeddedness discussed in this thesis, but it is mentioned briefly in Chapter 7, as it was clearly displayed by one of the firms in Southampton, and influenced their location decisions.

Network embeddedness focuses on the network of actors and organizations a person or business is involved in, and how the stability of these relationships contributes to their embeddedness in a location (see also Storper (1995) on untraded interdependencies). Wood *et. al.* (2004) examine the network embeddedness of a cluster of metalworking firms in Sheffield, exploring the relationships between firms and whether their growth orientated nature links to their levels of embeddedness in the cluster. Chapter 7 identifies a number of businesses in Southampton which display network

[7] In this case actors can be firms, but also individuals.

embeddedness, not only because of their working relationships with other firms in the city, but also because of their skilled employees and established customer bases.

Finally, the most relevant form of embeddedness for this thesis is territorial embeddedness, which *"considers the extent to which an actor is 'anchored' in particular territories or places"*, often as a result of the economic and social conditions in that place (Hess 2004,177). This is sometimes referred to as *'spatial lock in'* (see section 3.4). As with notions of local dependence, the spatial scale at which an actor is territorially embedded may range from the nation state down to individual sites, and may not necessarily be local (Wrigley *et. al.* 2005, 441). Wrigley *et. al.* (2005,440) highlight that retail TNC's display high levels of territorial embeddedness, which occurs in a number of different ways, and is also linked to societal embeddedness. Not only are these TNC's embedded through investment in physical assets, which leads to sunk costs (see section 3.3.2.1), but also by sourcing products from within the country in which they are located, and tailoring these to local variations in cultural norms and preferences (Wrigley 2005,441). It is not just retail firms which can be territorially embedded, but as will be shown in Chapter 7, it can be applied to a range of types of businesses in Southampton. Businesses which show this embeddedness, particularly at the site scale, will be constrained in how likely they are to relocate in response to road pricing. How the different types of embeddedness will be applied in Chapter 7 is discussed further in section 3.3.3.

A notion related to embeddedness is "sticky places". Markusen (1996,191) highlights that although many *"corporations [that] are increasingly mobile internationally"*, certain places are *"able to sustain their attractiveness to both capital and labour"*, and examines why this is the case. Markusen (1996,191) argues that although many production spaces are becoming *"slippery"* as firms are able to relocate more easily; there are also at least three types of New Industrial Districts (NID's) which are *"sticky places"* with the *"ability to attract as well as to keep"* firms, despite the increasing mobility of capital. These places can be sticky for a range of reasons, including local politics and policies (Markusen, 1996,200), so road pricing could potentially have an effect on the stickyness of places. Southampton does not clearly fit into any of the NID types, but it is important to consider that it may still have some of the attributes of a 'sticky place'. Chapter 7 will examine this issue at the firm scale rather than the city

scale, and identify a series of locally embedded firms which can be considered 'stuck' to the city, and therefore unlikely to relocate in response to a road pricing charge.

There are a number of complexities surrounding the concept of local embeddedness which are worth outlining. Firstly, not only can firms be embedded at changing amounts and scales over time, Irmie *et. al.* (1995,41) highlight that firms can also be embedded for a number of different reasons simultaneously. The different types of embeddedness (i.e. territorial and network) are not mutually exclusive, and it is possible for firms to exhibit more than one type. However, very little is known about the interaction between different types of embeddedness, such as whether they have an additive or a multiplicative effect (Dacin *et. al.* 1999,343), and further research is needed in this area.

The second point to recognise is that local embeddedness should not be seen as a dichotomous state, but rather it is a continuous variable, which can occur in nested levels and vary in strength over time (Dacin *et. al.* 1999,343). As with local dependency, the term local can be misleading, as embeddedness can also occur at a range of scales (see section 3.3.1). Levels of embeddedness of both firms and individuals can increase or decease through processes of both embedding and dis-embedding (Hess 2004,180). For businesses, Government policies of training programmes and tax breaks, along with specific infrastructure projects or business initiatives may embed firms in locations (see Phelps *et. al.* (1998)), whereas events such as changes in company structure, retirement of executives, falling sales, take-overs and so on may lead to dis-embedding (Hess 2004,177). For individuals, life events such as marriage and having children can result in embedding, whereas divorce or the death of a family member is likely to lead to dis-embedding (Cox 1993). Road pricing could also potentially lead to dis-embedding, as if it significantly harms the profitability of firms then they may decide to relocate away from a charging area, which would then harm the economy. However, very little is known about the effects of road pricing on business, and it is also possible that the impact may simply not be large enough to lead to dis-embedding. This issue will be explored further in Chapters 7 with reference to businesses in Southampton.

3.3.2.1 Sunk costs

Within territorial embeddedness, Wrigley *et. al.* (1997) identify that sunk costs play a particularly important role in shaping businesses' location decisions, and therefore they merit discussion here[8], and are discussed further in Chapter 7. Tan and Yates (2005, 311) define sunk cost effects as *"instances in which a decision makers' choices are affected by prior investments in the available options"*. They argue that sunk costs mean *"decision makers are reluctant to abandon options in which they have made prior investments"* (ibid). For example, if businesses have invested heavily in their sites, established customer bases, spent money training staff and so on, they are likely to be unwilling to relocate unless there is a very good reason to do so. Clark and Wrigley (1997) identify three types of sunk cost; entry, accumulation and exit, the latter two of which are the most relevant in the context of this thesis. Accumulation costs are those costs incurred during normal business operations such as training staff, maintaining sites and equipment and so on. Exit sunk costs are the costs not recovered upon leaving a location, for example, if a loss would be made on selling the site, or if there would be costs associated with de-commissioning or relocating staff. Clark and Wrigley (1997) argue that there is a close relationship between sunk costs and the logic of firms' exit decisions, and this is likely to be particularly true for accumulated and exit costs. These accumulated sunk costs are likely to embed firms more in locations over time, as they will get larger.

It could be argued firms with larger sunk costs will be less likely to relocate in response to road pricing, although other factors will also play a role. Chapter 7 will highlight that some firms in Southampton, particularly the port related firms, do have large sunk costs, particularly exit sunk costs, and therefore would be reluctant to relocate in response to road pricing. However; for the port related firms the lack of availability of alternative sites also contributes to the likelihood they would stay in Southampton if road pricing were introduced.

3.3.2.1 Footloose firms

[8] It is worth noting that the *"spatial immobility of built environment investments"* also contributes to local dependence (Cox and Mair 1988,308), not just local embeddedness.

In contrast to the notion of locally embedded firms, economic geography literature highlights that there are a growing number of 'footloose' firms, a concept which will be discussed in this section. It is possible that both locally embedded and footloose firms are present in Southampton, an idea which will be explored further in Chapter 7. The chapter will illustrate the different types of firm present in the city, and explore the impact which this has on their locational responses to road pricing.

Economic geography recognises there has been a shift from Fordist methods of standardised mass production, to post-Fordist era where smaller firms specialise in specialised flexible production, and economic structures, processes and institutions are also becoming more flexible (Bryson 1999, 12). This flexibility of capital means that *"firms readily disinvest in one locality to seek out cost, market and knowledge advantages in another"* (Bryson 1999,12), and as such they can be considered increasingly footloose. As a result of the increase in footloose firms, competition between different localities increases as they make a *"desperate attempt to hold onto to attract mobile firms and jobs"* (ibid), and both firms and places face increasing insecurity and uncertainty. Policy makers are often concerned that road pricing could potentially be seen as an extra financial burden on firms, and could both hamper their ability to attract new firms, and cause existing footloose firms in the city to relocate, particularly if they are not affected adversely by congestion. However, the converse may be true, and reduced congestion, improved public transport and an enhanced city environment could actually be seen as a benefit and attract new firms. The lack of existing road pricing schemes means there is considerable uncertainty about the effects of road pricing means policy makers tend to err on the side of caution, and assume firms are generally footloose rather than embedded.

Existing literature suggests a number of different factors which influence the location decisions of footloose firms. Watts (1991) distinguished between 'plant-related' and 'area-related' reasons for firm closure, but the principle can also be applied to footloose firms considering relocation. Plant-related factors include issues like productivity of the site's employees, whereas area related factors include the local policy environment and accessibility to markets. Road pricing could potentially be an area-related factor which may influence business location decisions, an issue which will be explored further in

Chapter 7. Brouwer *et. al.* (2003) analysed over 5,500 firms in 21 countries from 1997 to 1999, and identified the size of the firm as having an important affect on its propensity to relocate. Behavioural theory suggests that *"moving costs and the organizational problems associated with relocation are considerable for large firms"* (Brouwer *et. al.*, 2005, 5), whereas small firms have *"they have less demanding premises requirements and less capital investment to write off"* (ibid) (see also sunk costs, section 3.3.2.1). They used a logit model to test this notion, and found that firms with under 100 employees are more likely to relocate, and firms with more than 1500 employees are most immobile, probably due to *"high costs in site relocation and high costs in engaging large numbers of new employees"* (Brower *et. al.* 2005,9). Chapter 7 will use the concept of footloose firms alongside that of embeddedness to explore firm's locational responses to road pricing, and highlight that many firms are not as footloose as policy makers often assume.

3.3.3 Local embeddedness and road pricing

Following the review so far, two main differences have emerged which mean that the concept of local embeddedness is more appropriate for exploring firm's locational responses to road pricing than local dependency. Firstly, the notion of local dependency is most commonly applied to understanding how firms ensure their economic success by engaging politically to defend their interests. This concept cannot be readily applied in this thesis as there are no road-pricing proposals for firms to lobby for or against. Whilst levels of local dependency may affect firms' broader responses to road pricing, this is a step away from the conventional use of the local dependency concept, and it may not be the most appropriate notion in this case. Secondly, the notion of local embeddedness is advantageous for this research as it captures the processual and temporally dynamic nature of firms' relationship with the locations they are in more effectively than the notion of local dependence.

Embeddedness can have practical implications for businesses, imposing limits on what they are able to do (Dacin et al 1999,322), and Chapter 7 will apply the concept to understanding how embeddedness influences businesses locational responses to road pricing. This thesis will adopt a qualitative approach to examining embeddedness, (see Uzzi 1997), rather than attempting to quantify it. Given that this research is focusing on

qualitatively identifying trends rather than quantifying the economic impacts of road pricing, because there are no proposals for road pricing in Southampton, it is not necessary to attempt to quantify levels of embeddedness or footloose-ness. Issues concerning how to measure local embeddedness are discussed further in section 4.3. Generally local embeddedness literature does not seek to quantify the term, and although Wood *et. al.* (2004) attempted to do so, they were concerned solely with network embeddedness, rather than territorial embeddedness which is a key issue in Chapter 7. Although it would be possible to attempt to quantify the sunk costs associated with investment in sites, equipment and staff training, finances can be a sensitive issue for businesses. Although some firms commented on the size of their investments, I did not directly ask for this information.

Chapter 7 considers three elements of embeddedness; network embeddedness, territorial embeddedness (including sunk costs), and how businesses are embedded by unique local characteristics. It also recognises that some firms may be footloose. Network embeddedness is identified in a number of firms which display local embeddedness, including one which is not embedded itself, but is tied to Southampton because of its close working relationship with a firm which is embedded. A range of territorially embedded firms are identified, particularly as a result of investments which would result in large exit sunk costs. Southampton is unique in the UK as a deep water port, as well as being a major cruising centre, and these characteristics embed a number of firms in the city. A diagrammatic representation will be used to show that local embeddedness is not a binary, but that firms can be embedded to different degrees, and can also display more than one type of embeddedness simultaneously. Extracts from the interview transcripts will also be used to highlight both embedded and footloose characteristics of different firms.

Having identified firms which are embedded, and those which are not, the implications of this on their responses to road pricing will be analysed; taking into account whether they would actually be affected by such a scheme. Businesses which may relocate if road pricing is introduced are discussed in two groups; those which are considering relocating already and for whom road pricing is the "final-straw", and those which would be so severely affected by road pricing that they would be forced to relocate. Those businesses that are unable to relocate in response to road pricing may look at

making other responses, such as altering their transport and working patterns, which are discussed in Chapter 8. These non-locational approaches are affected by the firms' levels of lock in, a notion that is outlined in section 3.4.

3.4 Lock-in

Section 3.3 highlighted that businesses' locational responses to road pricing can be affected by their levels of local embeddedness, and in a similar way their non-locational responses will be influenced by their levels of "lock-in" to certain practices. This idea is used in Chapter 8 to explore businesses' non-locational responses to road pricing. The notion of lock-in was originally developed in the context of *"technological lock in"*, and applied by David (1985) to the dominance of the QWERTY typewriter format. Although the *"ideal keyboard"* with a "DHAITENSOR" key layout allowed much faster typing, a series of factors meant that by 1905 the QWERTY keyboard had become locked in as the *"universal standard"*. Arthur (1989) built on the work of David (1985), and uses a model to illustrate how variations in initial market shares of technologies affects their final uptake, particularly for technologies where there are increasing returns with rising uptake (see section 3.2.2 on automobility). Arthur (1989, 116) highlighted that if two technologies with increasing returns compete in a market;

> *"insignificant events may by chance give one of them an initial advantage in adoption. This technology may then improve more than the others, so it may appeal to a wider proportion of potential adopters. It may therefore become further adopted and further improved. Thus a technology that by chance gains an early lead in adoption may eventually 'corner the market' of potential adopters, with the other technologies becoming locked out."*

The dominant technology is referred to as "locked in". Initial *"random historical events"* may mean that inferior technologies actually come to dominate the market because *"insignificant circumstances become magnified by positive feedbacks to "tip" the system"* in favour of their uptake (ibid). The idea of lock-in is closely related to path dependence which was discussed in section 3.2.2.

Although lock-in was initially applied to the adoption of technologies, more recently the concept has been used more widely. Grabher (1993) identifies three different types of lock-in; cognitive, functional and political. Of these, cognitive lock-in is the most relevant in the context of this thesis, and is related to technological lock-in. Cognitive lock-in stems from the close working relationships between firms, which results in them adopting a particular world-view that determines what is important and what is not. This can cause firms to become *"locked in to existing technological trajectories"* (Grabher 1993, 263) as they fail to perceive innovation opportunities, and continue to use existing methods rather than trying new technologies and approaches. Potentially more beneficial options may be overlooked in favour of sticking with the norm, as if the current system is thought to work then there is little impetus to change it. This cognitive lock-in could constrain businesses' non-locational responses to road pricing, as they will simply not realise the adaptations that they could make, and the benefits these could offer. In contrast, it is possible the effects of road pricing could be so extreme for particular firms that it gives them sufficient incentive to question their current practices and overcome their cognitive lock-in. The findings in Chapter 8 suggest most firms could make some non-locational responses to road pricing, but some did display behavioural lock-in particularly to their use of private modes of transport.

Another related form of lock in which can be more readily applied to business practices, and is therefore relevant in the context of this thesis, is behavioural lock in. Barnes et al (2004) argue behavioural lock-in occurs because people (or businesses) become accustomed to acting in particular ways out of habit, once they have done so for a reasonable length of time, and therefore are *"less likely to try a rival process, even if over time it proves superior"* (Barnes *et. al.* 2004,372). Habit means that over time people (and businesses) can become locked in to a particular mindset, and simply may not see other options which are available. Over time a "*strong status quo inertia may discourage other behaviour"*, as a lot of effort is likely to be required to change (Barnes *et. al.* 2004,373), and this is likely to be particularly true for large organizations. It is possible that if road pricing is expected to have a large enough impact on a firm it would be sufficient for them to overcome their behavioural lock-in to certain established practices. How lock-in affects business responses to road pricing is explored in Chapter 8, with reference to financial responses, organizational responses and also transport responses.

In addition to being locked-in, some firms may be constrained in how they respond to road pricing because of the nature of their operations. Lock-in applies when businesses either cannot see a change that they could make, or are not prepared to make it, but in some cases some responses simply will not be appropriate for certain businesses. For example, builders or retailers could not work from home, port-related firms could not move all of their operations in-land and freight transporters could not move goods by bus, although it may be possible to move more freight by rail in some cases. Many businesses are actually dependent on the automobile or other private modes of transport, and often public transport is genuinely not a suitable option. It is important to distinguish between lock-in and the fact that some responses are simply not appropriate for particular types of firm. Lock-in will be applied to practices which *could* be changed, whereas there are also a series of other constraints which mean in the first instance certain responses are simply not possible for particular firms. This concept of certain responses not being appropriate is developed further in Chapter 8, and is based on common sense rather than relating to a particular body of literature. If firms that are affected by road pricing feel that they genuinely cannot adapt any of their operations to minimise its impact on them, they are likely to see it as an unfair policy, and be resistant.

3.5 Conclusion

This chapter has examined a number of bodies of literature from the broad social science literature, which are helpful in the context of this thesis. These cover a wide range of areas, but can broadly be divided into three categories; automobility, local embeddedness and lock-in.

Literature examining the dominance of the automobile and societal dependency upon it begins to explain why road pricing is such a controversial and unpopular policy. Where automobile ownership levels are high, people quickly become dependent on their vehicles, and public acceptability barriers to road pricing increase. The notion of automobility will be drawn upon in Chapters 5 and 6 to explore the success and failure of road pricing in countries with very different levels of motorisation. In Singapore,

where automobile ownership was restricted from an early stage, public acceptance of road pricing was much higher than in the Netherlands, where people had become more dependent on their vehicles.

The related concepts of local dependency and local embeddedness were explored, and it was shown that local embeddedness was more appropriate in the context of this thesis for two reasons. Firstly local dependency literature generally examines firms' levels of political engagement over issues which could affect their profitability, and as road pricing is not currently on the policy agenda in Southampton this engagement cannot occur. Secondly, the concept of embeddedness helps capture the dynamic process involved in embedding, and can be applied to investigate if road pricing is likely to cause disembedding and the relocation of firms away from the city. The notion of local embeddedness will be used in Chapter 7 to highlight that rather than being footloose, many businesses in Southampton display a range of levels and types of tie to the city, and to explore how this affects their locational responses to a charge.

The constraints on businesses' non-locational responses to road pricing were explored though the notion of "lock-in", particularly behavioural lock-in, where businesses become habitualised into certain practices, and are therefore unlikely to change them, even if it may be beneficial to do so. Behavioural lock-in will be discussed in Chapter 8 to help understand a range of financial, organizational and transport responses that businesses may make to road pricing. These responses will also be shown to be influenced by a series of practical constraints, as certain responses are simply not possible or appropriate given the nature of a firms' operations.

Having outlined these bodies of literature, and the policy and road pricing related literature in Chapter 2, Chapter 4 will now discuss the research design that was used to apply this literature to answering the research questions set out in Chapter 1.

Chapter Four – Research Design

4.1 Introduction

In any research it is important that the research design process is outlined as explicitly as possible, to help ensure that the data is both valid and reliable (Yin 1994,98), and that is the purpose of this chapter. The chapter will begin by re-stating the research questions which this thesis addresses, and outlining the benefits of the intensive qualitative approach used to address them, rather than a more quantitative one. The empirical research in this thesis all comes under the umbrella of case study research, but within this there are three distinct strands. The first is the case studies of successful and failed road pricing schemes, the second is interviews with Southampton based businesses about their responses to road pricing, and finally this issue is explored in more detail with three selected businesses using multiple interviews and secondary sources within the same firm. This chapter will outline the theoretical basis for case study research, including in depth interviews, and will then go on to outline how these approaches were applied to the three research strands. The analysis process used will be outlined, and the chapter will then end by discussing some broad methodological issues, including whether it is really possible to capture the view of a business, and positionality.

4.2 Research questions

Before outlining the methodological approach, it is worth briefly reiterating the research questions outlined in Chapter 1. These questions are:

1. What factors have contributed to the success or failure of road pricing schemes around the globe, and therefore what lessons can be learnt for Southampton?

2. How would businesses in Southampton respond to a road pricing scheme in the city, and how can these responses be explained?

Question one will be addressed through two case studies; one of the successful road pricing scheme which has been operating in Singapore since 1975, and one of the series of failed road pricing proposals in the Netherlands which first took off from the early 1990's. Question two will be addressed through a case study of Southampton, based on two streams of data collection. The first is based on a series of in-depth interviews with senior representatives from businesses in Southampton, and the second involves more detailed case study research with three selected firms in the city. The details of these methods and their scope will be discussed in this chapter, after setting the context by outlining the overall research approach.

4.3 Research approach

To answer the research questions outlined above, this thesis uses case studies based in three different locations; Singapore, the Netherlands and Southampton, looking at a relatively small number of cases in detail. This type of approach is referred to by Sayer (1992) as intensive, and can be considered part of the "interpretative social science" (ISS) paradigm, which emerged in the last decade as a response to the limitations of positivist approaches (Groningen 2004). Intensive research is generally seen as the opposite of extensive research, which is based on a very different philosophy (see Patton 1987,165). Whereas intensive research involves methods such as in-depth interviews and participant observation, extensive research generally involves methods such as large scale 'representative' surveys, hypothesis testing and statistical analysis to identify trends. Although intensive (qualitative) research approaches are not as common within transport geography as other sub-disciplines such as cultural geography (Roe, 2000), they can offer many advantages, particularly given the nature of this research. This is especially true for the business responses to road pricing, as this is an area where very little is known already. Although these responses were interpreted using notions of local embeddedness and lock-in, the details of the actual responses that firms would consider emerged from the interviews (see Glaser and Strauss (1967) and Gibbs (2004) on grounded theory). Extensive (positivist) methods are generally considered to be scientific, but they are not appropriate for answering either of the research questions. This section will outline the reasons why, and highlight the advantages of an intensive approach given the nature of this research.

There are a number of reasons why an extensive methodology would not be appropriate for the case studies of successful and failed road pricing schemes. Firstly, in this part of the research an understanding of local context and how this contributed to the success and failure of schemes is crucial, but extensive research often divorces phenomena from their context (Groningen 2004). Secondly, the extensive approach of taking a representative sample from which to generalise is not appropriate, as there are so few road pricing schemes around the world. The importance of local context means it would not be possible to make straightforward generalisations, but rather the transferability of aspects of each case study should be considered individually. Finally, a key element of intensive research is its recognition that there is not necessarily a single correct 'answer' but rather multiple perspectives and truths are possible (Patton, 1987,166). This is particularly relevant in the research on the success and failure of road pricing, as there is unlikely to be just one reason alone why road pricing succeeds or fails in a country. Rather, there is likely to be a series of related issues, and different interviewees are likely to attribute different levels of importance to these depending on their perspective. An intensive approach can account for this, rather than searching for 'the truth'.

There are also a series of reasons why an extensive research approach is also not appropriate for the Southampton based case study, and an intensive approach is advantageous. It was not possible to model the spatial effects of road pricing in this case as there are no proposals to base a model upon, so instead Chapters 7 and 8 focus on theoretical aspects of businesses responses to road pricing (see Tillema *et. al.*, 2003). Similarly, the economic effects could not have been quantified without details of the times, amounts and extent of any charges to be levied. Given road pricing is a relatively new policy in the UK, and is often a controversial and emotive topic, an extensive survey of businesses could lead to knee-jerk responses, influenced by their misconceptions about road pricing. A method like a structured formal questionnaire would not encourage respondents to really think through the issues involved in detail, and could lead to biased results if respondents have misconceptions about how a road pricing scheme would actually work. The in-depth interviews adopted here gave respondents a chance to consider the issues involved in detail, and in some cases their views did evolve throughout the interviews, as they fully considered the potential impacts of road pricing upon them. A further advantage of the in-depth interviews was

that they did not constrain the issues which could emerge as important like a closed questionnaire may have done. Even with some open questions, a questionnaire would not have been able to pick up the detail and range of responses captured in the in-depth interviews.

Conducting in-depth interviews with businesses in Southampton was advantageous as it helped me to gain a good understanding of the firms in question, and how the nature of their operations affected their potential responses to road pricing, rather than reducing their answers to ticks in boxes. This meant I was able to appreciate the reasons *why* they would make particular responses, rather than just identifying *what* these responses were. A number of studies into the acceptability of road pricing have used extensive approaches, based on opinion polls and questionnaires (i.e AFFORD, 1998, Jakobsson *et. al.* 2000). Although this research did produce detailed results, these were predominantly based on reporting percentages, and did not really get at the more detailed reasons *why* certain patterns exist (see Oppenheim 1992,12). The ability to understand causal processes is an important advantage of intensive methods (Sayer 1992), and is more appropriate for this research than measuring how frequently a particular outcome occurs, as is more common in extensive research (Johnston *et. al.* 2000,673). By getting a better understanding of why some road pricing schemes succeed and others fail, lessons can be learnt to improve the chances of future proposals being implemented. Similarly, by understanding why businesses may respond to road pricing in a particular way, the schemes can be designed more sensitively to avoid potential negative effects.

One of the major advantages of intensive methods for this research as a whole is their flexibility. As this work is exploratory, not much was known in advance about the factors that were likely to be important, but I was able *to "adapt preconceived questions and ideas"* that I had, and modify interview questions according to issues raised by the respondents (Sayer 1992,245). As well as the content of the interviews themselves, I was also able to adjust my research sample as necessary to ensure all the issues were captured, rather than defining a representative sample in advance.

One of the methodological issues specifically associated with local embeddedness research is how to measure embeddedness (Dacin *et. al.* 1999,343). A number of

different methods have been used in embeddedness research to date, both qualitative to quantitative. Turok (1993) used quantitative statistical measures of local sourcing to examine the embeddedness of firms in the Scottish electronics industry, whereas Uzzi (1997) conducted qualitative ethnographic fieldwork with 23 firms to explore how embeddedness influences organizational and economic outcomes. Other studies, such as that by Wood *et. al.* (2004), use a combination of both quantitative and qualitative approaches. Their study was based on 70 in-depth semi-structured interviews with owner-managers from a cluster of metal-working firms in Sheffield. From these interviews the firms' network embeddedness was determined according to how much they buy from and sell to other firms in the cluster. The interviews were also used to classify the firms according to five variables of growth orientation, and this was tested statistically against their embeddedness using the Chi-squared test. Given the qualitative research approach of this thesis, it will adopt an approach most aligned to that of Uzzi (1997), and will focus on using interview extracts to illustrate how embeddedness influences businesses' responses to road pricing, rather than attempting to quantify it. How exactly this will be done was outlined in section 3.5.

4.4 Research methodologies

Having outlined the rationale for the research approach adopted in this thesis, this section will now discuss the actual methodologies involved and the advantages they offer. This research draws on a number of different theoretical approaches, which were outlined in Chapter 3, but none of these place a strong emphasis on empiricism. Although many studies of local embeddedness use interviews (i.e. Wood 2004), they do not often discuss methodology. This section and the remainder of this chapter will help avoid this problem, by explicitly outlining the research process.

The research in this thesis can be divided into two parts, addressing each of the research questions outlined in section 4.2 by using case studies. The first strand involves case studies of successful and failed road pricing schemes in Singapore and the Netherlands respectively, and the second examines business responses to road pricing in Southampton. This second strand included interviews with 44 representatives of

businesses and local authorities, and a further more detailed aspect where fifteen interviews were conducted with three selected firms. Both of these main parts can be classified as detailed case study research, and involved semi-structured in-depth interviews, secondary data collection and direct observation. The theoretical background to case studies and interviewing will be discussed in this section, before going on to explore the scope of the research and some of the practicalities involved in section 4.5.

4.4.1 Case study research

As a methodology, case studies are helpful for exploratory studies addressing how and why questions. As such they were well suited to answering the two research questions posed in this thesis, essentially; *why* did road pricing succeed in Singapore and fail in the Netherlands, and *how* would businesses in Southampton respond to a road pricing scheme? Case studies generally examine data from a wide range of sources, including interviews, direct observation, written documents and physical artefacts (Yin 1994,8). This section will focus on the direct observation and secondary data aspects, and in depth interviews will be discussed in section 4.4.2.

Looking at real life schemes and proposals means it is possible to account for the complexities involved in real life situations, and uncover large amounts of detail. However, it is important to take into account the local context of the places in question. I had lived and driven in Southampton for a number of years before conducting this research, so was already familiar with the city and some of the issues outlined in Chapter 1. During the research I travelled to both Singapore and the Netherlands, not only to conduct in-depth interviews with key stakeholders first hand (see section 4.4.2 and 4.5.1), but also to familiarise myself with the different cultural contexts, in order to better understand how these affect the success and failure of road pricing. In both countries I was able to experience public transport systems, and in Singapore I was able to observe road pricing in operation.

Travelling to the Netherlands and Singapore also helped facilitate secondary data collection, and meant more documents were available to me than I could obtain in the UK. Most of these secondary sources were policy documents, or information about the

businesses or groups being interviewed. One of the most helpful documents I obtained was a book called "The Journey, Singapore's Land Transport Story" (Sharp 2005), which summarises Singapore's transport policy history, and was given to me by their Land Transport Authority. I also obtained a document in the Netherlands which summarised the current road pricing advice referred to as "Anders Betalen Voor Mobiliteit" (2005), which translates as "alternative ways of paying for mobility". Many of the Dutch policy documents were available with summaries in English, and in some cases interviewees would translate key aspects of the document for me, providing me with information I was unlikely to be able to access from the UK. All of these secondary documents provided helpful background information, and have been cited, and referenced where appropriate. The ability to collect data from a range of different sources, and triangulate it to improve reliability is an important benefit of case study research. A large part of the case study data was based on in-depth interviews, and this method will now be discussed.

4.4.2 In-depth interviews

Semi-structured in-depth interviews were used in all aspects of the empirical research in this thesis. Given the qualitative research approach outlined in section 4.3, and its exploratory nature, semi-structured interviews were more appropriate than structured ones. Very little research has been conducted previously on businesses' responses to road pricing, so it was important to be able to take account of the range of issues raised by the respondents. Semi-structured interviewing also has the advantage of allowing respondents to express ideas in their own words, without terms being imposed on them by the researcher. There is no single *"correct"* interview technique (Patton 1987,141), but rather its adaptability is an important benefit, and the questions could be tailored to the individual circumstances (see Valentine 1997, 111). Throughout the interviews I often adapted my language in light of terms the respondents' used (see Schoenberger 1991,184), which helped increase respondents understanding of the research questions, and also built rapport.

Interviews have been used previously in local embeddedness research, but there is often very little mentioned specifically about them (see Wood 2004,2113). I did consider using a focus group methodology for the Southampton based research, and piloted this

with members of the public in Southampton, comparing the type and level of data obtained from the two approaches. While the focus groups covered a range of topics in little depth, the interviews generated a large amount of depth on a smaller number of topics, including details about the individual interviewee, and the reasoning behind their opinions. As a result of the pilot project I decided that interviews would be the most appropriate method for the Southampton based business research, as I wanted to obtain firm specific information. Morgan (1998,32) argues that even a short interview can generate much more data on individuals than a focus group, and I also found this to be the case. Confidentiality issues also meant that interviews were more appropriate for the business research, as interviewees were unlikely to talk about potentially sensitive issues like finances and relocation in front of people from other businesses.

I judged that I managed to establish a good rapport during most of my interviews which helped me to probe and elicit views that may not have otherwise been expressed, as they lie below a *"social barrier"* (Groningen 2004). For example, over the course of the interviews many interviewees happily discussed potentially sensitive strategic information about finances and relocation, which they are unlikely to have revealed 'cold' in response to a questionnaire. In the more detailed research with 3 firms in Southampton I interviewed multiple people about the same topic, and this meant that the findings could be triangulated to increase reliability (see section 4.7.3). Details of the people interviewed, the questions and materials used and other practical issues relating to the interviews are discussed further in section 4.5.

4.5 Research scope and practicalities

Having reviewed the theoretical aspects of case study research, including in-depth interviews, this section will outline the scope of the empirical research in this thesis, and discuss some of the practical issues involved in conducting it. The empirical research will be discussed in three parts, as there are slightly different issues relating to each. Firstly, the section will begin by explaining how the case studies of successful and failed road pricing were chosen, and what the research involved. Secondly, the interviews with businesses in Southampton will be discussed, including the sampling and recruitment process, and the structure and content of the interviews themselves.

Finally, the in-depth studies of three firms in Southampton will be outlined separately, explaining how these firms were selected and what the research with them involved.

4.5.1 Research in Singapore and the Netherlands

The first issue to arise with the case studies of the success and failure of road pricing was defining what exactly should count as a "case" (see Yin 1994,213). I chose to conduct two case studies due to the time constraints, one of a failed and one of a successful road pricing scheme, so that they could be compared and contrasted. These were selected using purposive sampling to highlight a range of issues. The key factor that I took into account when selecting schemes was their purpose, as not all road pricing schemes have the same objectives. In Southampton the primary purpose of road pricing is likely to be to cut congestion, so a case study of the Norwegian cordon schemes would not be appropriate, as their main aim is to raise revenue to invest in infrastructure improvements (see Table 2.1). There are numerous toll roads around the world, but these were also discounted as they generally exist only on isolated highways, are often introduced to raise revenue for infrastructure improvements rather than to reduce congestion, and are significantly different from a wider scale road pricing scheme (Santos and Fraser 2006,267). After these examples have been ruled out, the number of remaining road pricing schemes, both successful and failed was limited. The three main candidates which remained are outlined in Table 4.1.

Table 4.1: Possible road pricing case studies

Location	Details	Rationale
The Netherlands	Various attempts at cordon and distance pricing, beginning in the mid 1970's	Not just one, but multiple failed schemes, which were complicated by the system of coalition government
Singapore	A history of restrictions on the automobile since the 1970s, with road pricing since 1975	The world's first and longest running road pricing scheme, which evolved from a paper based system to one based on advanced infra-red technology
London	Introduced area wide road pricing in 2003, under the Mayoral power of Ken Livingstone	The only UK congestion charging scheme to date. Highlights the importance of a powerful Mayor

The Netherlands was the best example of a series of failed road pricing schemes, as there were actually a number of detailed plans, rather than just a single proposal or a general debate about road pricing. It is important that each case study adds something new (Yin 1984), so although the London example is interesting because of its UK context, research is already being conducted on it within the UK. As the scheme is relatively new its full impacts are still unclear, and I wanted to avoid replicating any work which is already looking into these. I chose to examine Singapore as an example of a successful road-pricing scheme, and although there are cultural differences with the UK, its long established history of road pricing can still provide valuable insights into what made the scheme successful.

In July 2004 I spent a month in the Netherlands, funded by a scholarship from the World University Network (WUN). During this time I interviewed eighteen people, including academics, policy makers in local and national Government and members of environmental and automobile lobby groups. A full list is given in Table 6.1. In Singapore I conducted six interviews over two weeks in April 2006. These interviews were with four academics, one of which used to work for the Singapore Land Transport Authority (LTA), a current member of the Singapore LTA, and a representative from

the Singapore Retailers Association lobby group (see Table 5.1). All of the interviewees names have been removed to ensure anonymity.

The main problem which I encountered during this strand of the research was actually arranging the interviews. It was difficult to do this prior to my arrival in the Netherlands and Singapore, as the response rate via email was low. However, once in the Netherlands and Singapore I was able to make phone calls to improve recruitment. I also used snowballing methods where possible, asking each interviewee if they could recommend any other people that I could speak to. This worked more successfully in the Netherlands as I was able to spend a longer period of time there, and could therefore fit in better with the availability of the interviewees. The potential language barrier in the Netherlands did not pose problems, as fortunately all of the interviewees were fluent enough in English for the interviews to work well.

4.5.2 In-depth interviews in Southampton

The second major strand of this research involved interviewing firms in Southampton about their potential responses to road pricing. This section will first outline the sampling and recruitment process, before explaining how the interview schedule was developed, and the materials which were used during the interviews.

4.5.2.1 Sampling and recruitment

The interviews with businesses in Southampton were based on purposive (theory-based) sampling, to highlight a range of issues to address the second research question (see Patton, 1987). The sample was not intended to be representative of the broader business community in Southampton, but rather I ensured the businesses included displayed a range of characteristics that may influence the effect of, and their responses to, road pricing. The sample deliberately covered factors that I anticipated would affect the level of a firm's embeddedness, and their ability to adapt to road pricing. These included:

- A range of business *sectors*, including; retail, leisure, financial and professional services and manufacturing firms

- A variety of *sizes* of businesses, according to both the number of employees, annual turnover, and whether they function at a local, regional, national or international level
- Businesses from *locations* both within the city centre, and in secondary centres such as Portswood, Shirley, Bitterne and Eastleigh

The details of firms in Southampton were obtained from the 2004 Hampshire Business Directory, and the FAME online database of national firms, which was searched by postcode. This gave firm's addresses and often some background information about their size, turnover and type of operations. The database listed a senior manager for each firm, so I began recruitment by writing to this contact, and followed up the letters with a phone call after about two weeks. I deliberately contacted people as senior as possible within the organization so that we could discuss strategic level decisions about finance and location, and to ensure they could represent the views of the company (see EuroPrice 2002,iii, and section 4.7.1). After a low response rate from the first round of letters, I began writing to a larger number of firms, and interviewed all the people who agreed. As the research progressed I focused the recruitment more on certain types of firms that were missing from the sample.

Ideally I would have continued interviewing businesses until I reached theoretical saturation, to ensure that no ideas contrary to the "hypothesis" are missed (Gibbs 2004, 9). As there were so many different aspects of each business to take into account, each raised slightly different issues. A number of points did overlap, suggesting some saturation, but there were also very specific differences between different types and sizes of firm. Total saturation would have probably required well in excess of a hundred interviews, but time constraints and recruitment issues meant this was simply not possible.

Overall I conducted in-depth interviews with forty-one different businesses in Southampton, a further two with city and regional Local Authorities, and one with the Federation of Small Businesses (FSB), a business representative group. These were held between February and June 2005. The business case studies of three firms involved a further fifteen interviews between December 2005 and February 2006 (see section

4.5.3), giving fifty nine interviews in total for the Southampton based fieldwork. The forty one firms interviewed initially are shown in Table 4.2 overleaf, with the names removed to ensure anonymity, and in Chapters 6 and 7 the names of the individual interviewees have also been removed[1]. Details about the type of firm have been included as they have an important effect on the responses to road pricing, and it is not possible to identify the firms based on this. Information was collected about the firms' turnover and employee numbers, but this has not been included in Table 4.2 as it would make it possible to identify some of the firms. Assuring the firms anonymity meant that no potentially sensitive information could be revealed to their competitors; either concerning their current operations, or their potential responses to a road pricing policy. Removing the names of businesses and interviewees also helped to ensure that the research was ethical, as comments cannot be attributed to particular individuals. As road pricing is a controversial topic, people may have felt uncomfortable expressing certain views if they knew they could receive negative feedback as a result of these.

[1] Apart from with the case studies of firms in Southampton, where interviewees names were removed, but the firms are named.

Table 4.2: Interviews conducted with businesses in Southampton[2]

Business	Type of Business	Location
A	Office	City centre
AA	General industrial	City centre
AB	Financial services	Edge of city centre
B	Financial services	City centre
BA	General office	City centre
BB	Restaurant	City centre
C	Business park	Outskirts
CA	Retail	City centre
D	Leisure and tourism	City centre
E	Retail	City centre
F	Manufacture and retail	Secondary centre
FA	Transport provider	Secondary centre
G	Professional services	City centre
GA	Public House	City centre
H	Design and manufacture	Secondary centre
HA	General industrial	City centre
J	Retail	City centre
JA	Manufacture	City centre
JB	Building contractor	Secondary centre
K	General industrial	Secondary centre
KA	Professional services	City centre
L	Storage and distribution	City centre
M	Retail	City centre
MA	Assembly and leisure	City centre
N	General office	Secondary centre
NA	Professional services	City centre
NB	Professional services	City outskirts
O	Storage and distribution	City centre
P	Financial services	Secondary centre
PA	Manufacture	Secondary centre
Q	Storage and distribution	City centre
R	Transportation provider	City centre
RA	Manufacture and sale	City centre
S	General industrial	City centre
SA	Manufacture / professional services	Edge of city centre
T	Retail (food)	City centre
TA	Manufacturing and sales	City outskirts
U	Leisure / travel	City centre
V	General office	City centre
W	Retail	City centre
Y	Professional services	City centre

[2] The firm types used in this thesis are loosely based on the classes set out in the 1987 Town and Country Planning Order. See http://www.planningportal.gov.uk/england/genpub/en/1011888237913.html

To help structure the research process the interviews with businesses in Southampton were carried out in rounds. Although these were reasonably flexible, they followed the structure outlined in Table 4.3. I deliberately started by interviewing smaller firms to improve my understanding of the issues involved and refine my interview technique, so that I was well prepared for interviewing the more powerful individuals from the larger firms.

Table 4.3 Interview rounds with Southampton businesses

Round	Focus
1	Small and medium sized companies in and around the city centre
2	Businesses outside the city centre, and non-profit groups / services
3	Large firms across the entire city
4	In-depth study of three firms

4.5.2.2 Interview structure and content

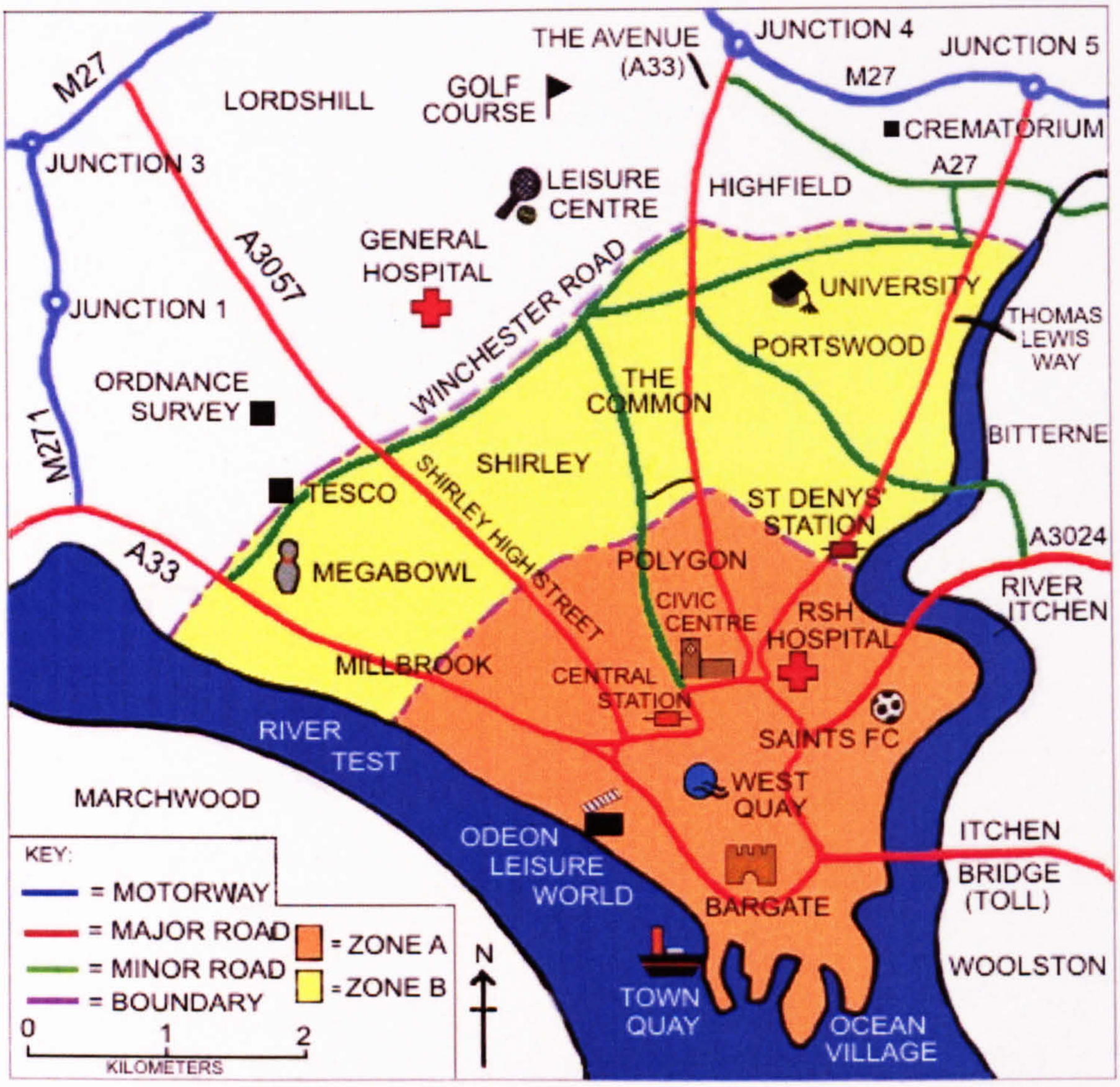
As there are no actual proposals for road pricing in Southampton, the interview schedule was developed to cover the general trends and responses which were likely to occur as a result of road pricing, rather than focusing on highly specific quantifiable impacts. As the research with businesses was largely exploratory, the interview schedule was designed to be flexible, and I did not prescribe all of the questions in advance (see section 4.4.2). Instead, I developed an outline interview schedule, but added in more questions and altered their order as necessary, and probed the questions in different levels of depth depending on the comments of the individual interviewees. There is no single "correct" interview technique (Patton 1987,141), but rather its adaptability is an important benefit. An example of an interview schedule used near the end of my fieldwork is given in Appendix C. The interview schedule was adapted as the research progressed, with questions being added and removed to reflect the issues raised by the interviewees. For example, under the 'responses' section I initially had a few broad questions about responses, but as the interviews progressed the categories of transport, organizational, financial and locational responses emerged. The questions were numbered and divided into categories for my own reference, but were not always

asked in the order on the interview schedule, and in some cases not all of them were asked, as they were not appropriate to the firm in question.

When developing the interview schedule it became clear that I would need to produce some accompanying information to inform the interviewees about road pricing and to facilitate discussion of its potential impacts. At the time the interviews began, road pricing was not very high on the political agenda in the UK, and the London scheme had only been operating for about one year. I decided to develop a background sheet on road pricing and a summary sheet of its possible advantages and disadvantages, and was careful not to be biased. These materials were sent to interviewees once they had agreed to participate in the research, in case they wanted to find out more about road pricing. These materials were sent with an accompanying letter, which stressed that it was not necessary to read this information before the interview, but that they could do so if they wished. I was conscious of not including too much material in case the interviewees were put off. The document which was sent to interviewees is given in Appendices E.

When developing the interview materials I felt it would be helpful to show interviewees a hypothetical road pricing scheme. This meant they could think through their responses, rather than talking in the abstract (see Whittles 2003,60), and meant the findings were likely to be more reliable. I developed two maps of possible pricing scenarios for Southampton, one for a cordon scheme and one for distance-based pricing, as well as some accompanying materials on the background principles of road pricing. After some initial interviews it became clear that only one hypothetical scheme was needed, so I chose to use the cordon (area) based scheme as this is easier to understand, and more straightforward to implement in practical terms. The map only is shown in Figure 4.1 below, and the full sheets for both the area and distance-based pricing examples can be found in Appendices F and G.

Figure 4.1 A map of a hypothetical cordon scheme for Southampton



I stressed to all interviewees that the diagrams represented hypothetical schemes to be used as a discussion tool, and were not a real proposal. To avoid any misunderstanding these materials were presented during the interview, and not sent out in advance. All the materials mentioned in this section were tested with members of the public during the pilot study, so that they could be refined before being presented to the business community.

All respondents were asked if they agreed to the interviews being recorded, and nobody refused. Respondents were assured that their comments would remain anonymous, and be used only for the purposes of my research. The recordings were subsequently transcribed to ensure that the words of the participants are not altered in any way, misinterpreted or taken out of context. Sometimes interviewees would make comments that they wanted to be *"off the record"*, and these have not been included in the thesis. I

did make notes during the interviews, but as the interview was also being recorded I could concentrate on what was being said, and think about follow-up questions. There was only one case where the recording failed, and I had to write up a summary of the interview based on my notes.

4.5.3 Case studies of businesses in Southampton

The final strand of the empirical research in this thesis is in-depth case studies of the responses of three firms in Southampton to road pricing. This involved multiple interviews with employees of the firms, and the collection of secondary data to supplement their accounts. It was possible to explore the issues raised in the initial interviews in more detail, and also to assess the validity of the findings by comparing different accounts. The case study candidates were chosen using purposive sampling to highlight a range of responses to pricing, and also to represent three different types of firm. Two of the firms selected (the Mayflower Theatre and BSA Regal) had been contacted during the initial fieldwork, and indicated then that they would be willing to participate in further research. For the third case study I decided to include the public sector, and selected Southampton General Hospital, one of the largest public sector employers in the city aside from the City Council. I conducted five interviews with employees of the Mayflower Theatre employees, four at BSA, and six with Southampton General Hospital, giving a total of 15. Background information about these firms is given in Appendix D.

It was difficult to use extracts from the business case study interviews without using the firm names, or providing information that would make it possible to identify the firms. To overcome this problem I asked permission to keep the names of their firms in this thesis, and they all agreed verbally. However, the names of the individual interviewees have been removed so that comments cannot be attributed to a particular person. As road pricing is a controversial political issue, naming interviewees would not be ethical, and it is unlikely so many people would have participated in the research if they thought their comments could be attributed back to them. I have not included a summary table of the roles of each interviewee here, as this would make it possible to identify individuals. In Chapters 7 and 8 the interviewees are identified by the name of the firm and a number.

As well as covering some general issues, the questions were tailored to reflect the nature of the individual's job, which included questions on finance, transport and human resources. As in the other interviews, I tried to access senior figures with decision-making capabilities and also used a semi-structured approach to remain open to issues which emerged as important. The case studies helped overcome the problem of taking the view of one person to represent the position of a whole firm by speaking to a number of people (see section 4.7.1). It was possible to get more detail on the firms in question, and also to check the reliability of the accounts by interviewing more than one person and triangulating the findings. Some interviewees did provide slightly different information depending on their position, as different issues and responses were important to them depending on their role within the company. This range of insights was helpful, and theoretical saturation was reached on some more general issues as interviewees generally agreed with each other, suggesting their accounts were reliable.

The location of interviews can have an important effect on their outcome. In both the interviews with one employee per business and the more detailed case studies I travelled to the interviewees places of work to conduct the interviews, and this helped recruitment. Although this did emphasise the individuals' position of power in their company, it was helpful as it allowed me to get a better understanding of the business, and its *"microgeography"* (Elwood and Martin, 2000). I could see the size of their site, its levels of parking provision, how accessible it was and so on. Travelling to the site was also beneficial because if interviewees mentioned certain documents I was often able to obtain copies of them at the end of the interview, rather than having to chase them up later on. I did conduct one interview in a participants' home. In this case I did find it more difficult to get a feel for how the nature of their business operations, but I compensated for this by asking more questions.

4.6 Analysis

In qualitative research the analysis process is ongoing, and often overlaps with data collection (Gibbs 2004, 2). This was true in my case, as the analysis began when ideas about the important issues emerged from the interviews. For example, during the interviews in the Netherlands the notion of barriers to road pricing emerged, and I originally began to classify these in my own mind into political, societal and organizational barriers. However, I later developed this with reference to some related literature, most notably that by Ubbels and Verhoef (2003) (see Chapter 2), who distinguish between institutional, acceptability and practical / technological barriers to road pricing. As their categorisation was very similar to the one I had developed independently, there was little need to reinvent their basic concept. Rather, I used my findings to build upon their work, add more detail within the categories, and ultimately to evaluate the appropriateness of the barriers metaphor (see section 6.7).

The analysis of qualitative data is much more creative and interpretive than the statistical methods which can be used on quantitative material (Walker 1985, 3), but it can still be systematic. As the interviews generated large volumes of textual data, I used a programme called Nvivo, which is a Computer Assisted Qualitative Data Analysis Software (CAQDAS) tool to assist in the data analysis. This helped to organise the transcripts electronically, and made it easier to search them than it would be with only paper copies.

The formal part of the analysis began with coding the interview transcripts (see Strauss and Corbin (1990) and Whittles (2003, 77)). I transcribed all bar twelve of the total of eighty eight interviews myself, and this gave me a good feel for the issues which had arisen before I began the coding. As I conducted my Dutch research first I began with coding these transcripts, followed by the interviews with Southampton businesses, and finally the interviews in Singapore. It was helpful to code the Dutch transcripts first, as there were fewer of these than for the Southampton research, and it gave me a chance to familiarise myself with Nvivo and the coding process. I began with open coding, assigning codes to sections of text, and creating 'free nodes'. Gradually, as themes emerged axial coding began, which involved arranging the free nodes into hierarchical

'tree nodes' to structure the codes, and adding more codes as appropriate. As the analysis progressed categories were often revised and adjusted, certain codes were removed or re-named, and in some cases similar codes were merged together. As the codes evolved during the analysis process, a number of codes were created that did not exist when the analysis began. To ensure consistency the entire coding process was repeated, and every transcript re-coded, drawing upon the full set of codes that had been developed. This helped ensure that potentially important passages did not go un-coded. The type of coding I used was 'non-serial', meaning the length of text coded could vary from a single letter to many paragraphs. The coding was also *"inclusive"* which means that the same section of text can be assigned to more than one code (Gibbs 2004,130). A number of sections had multiple codes attached to them, as respondents would often move quickly between ideas, or talk about two issues at the same time.

The final set of codes for Dutch work were structured around the barriers to the different road pricing proposals, and the Singaporean codes were based around the different categories of issues influencing the success of the scheme. These were used in conjunction with the barriers metaphors outlined in Chapter 2 to help structure Chapters 5 and 6. As the Singapore scheme dates back the furthest this is discussed first. The Southampton based codes focused on the different types of responses to road pricing, and also the reasons for these. As the coding progressed I categorised the wide range of responses as locational and non-locational, the former category being broken down into transport responses, organizational responses and financial responses. These categories partly became evident during the interview process as my approach was sufficiently flexible that interviewees could bring up the issues important to them (see section 4.5.2.2), and were refined during coding.

A significant amount of material emerged from the transcripts, so it was necessary to write separate chapters on the locational and non locational responses. As locational responses are the most extreme, and potentially the most threatening to the economy, these are tackled first in Chapter 7, and the concepts used to explain these are different from those used in Chapter 8, to examine the non-locational responses. Southampton City Council were specifically interested in the locational responses to road pricing, but non-locational responses are also shown to play an important role, so these are discussed in Chapter 8. As the main source of data in this thesis is from the

interviewees, direct quotes are included in the analysis chapters. These are referenced by citing the altered name of the interviewee, and the number of the paragraph in the transcript in which the quote is made, which is given automatically by the programme NVivo, i.e. (Interviewee X, 372).

4.7 Broader issues

So far this chapter has focused on outlining the research approach used, the theory behind the different methodologies adopted, and explaining how these were applied in practice during this research. There are also a number of broader issues which merit consideration, and will now be discussed, including how to capture the view of an organization, positionality and reliability.

4.7.1 What is the view of a business?

One of the issues that arose when planning the Southampton research was how to define and capture the view of a business. I accept that there is no single true 'business view', and recognise that the comments made by individual members of a firm will be affected by their position within the company and their personality. Some of the 'facts' presented by interviewees may be generally accepted truths (i.e. the number of full-time employees the firm has), but many of their other comments will be influenced by their personal views. That said, the personal views of a self employed individual working alone, or in charge of a small company, are likely to be close to some sort of 'business view'. These individuals are likely to have quite a clear idea about how they would respond to road pricing. In contrast, in a multi-national company, the managers of individual stores or branches may have different interpretations of company policy, and less of a clear idea how the company as a whole would respond to road pricing. I took these issues into account during the interviews, and spoke to as senior a figure as possible within each company, ideally someone with the capacity to make the kind of strategic decisions that were being discussed. Although these individuals are not likely to decide how to respond to road pricing in isolation, they would have a better idea of how the firm would respond than more junior employees.

Although comments made by interviewees are presented as data in the following chapters, they should not and cannot always be treated as 'facts', or as providing definite and absolute 'answers' to the research questions. The same also applies to the case studies of successful and failed road pricing schemes. Rather than being a single reason why particular schemes either succeeded or failed there are many different explanations, people will attribute different levels of importance to these, and no one should be considered to be entirely correct.

4.7.2 Positionality

Positionality is an important issue that has long been recognised in feminist research, and is gradually moving into other areas of the social sciences (McDowell 1992, England 1994). I feel a number of my personal characteristics had an impact on the research process and findings, so I will now briefly outline these. The fact that my research was funded Southampton City Council (SCC) did influence my Southampton based research in a number of ways, primarily in terms of its scope. Members of the council specified a number of businesses which they wished to be deliberately excluded from the research. Generally these were large firms who may be considering relocation in the short term, and could potentially be deterred if the idea of road pricing in Southampton was mentioned. Although this list only included five firms, it did restrict the number of large firms within the city that I could speak to.

Secondly, in some cases my funding also influenced the interview process. When I wrote to businesses inviting them to take part in the research I mentioned my funding to add credibility, and to inform them their responses would be used as an input to future policy making. I feel my links to SCC did help recruitment, as many participants welcomed the chance to express their views on road pricing when they knew it would be passed on to policy makers. However, some interviewees did assume that I was directly employed by SCC, rather than an independent researcher, which made them cautious when answering my questions. Others saw my link to SCC as an opportunity to tell me about their dissatisfaction with various aspects of the Council, in the hope that I would be able to address them. If it became obvious that interviewees had misunderstood my position I would clearly explain it to them. Generally this issue arose near the start of the interviews, so I was able to clarify any misunderstandings, and go

on to built up a good rapport with the interviewees. After this issue occurred a number of times I changed the wording of my recruitment letter slightly, and decided to explain my position at the start of each interview to avoid any confusion. I found that deliberately distancing myself from the Council helped establish a good rapport with the interviewees. Many interviewees revealed an element of distrust in the Council, so I feel that I was able to get more information from participants as an independent researcher than an official council employee would have been able to.

It is also worth noting that most of my interviews were with men, who were generally white, older than me, and held senior positions within their firms (this is similar to some of the research of England, 1994). I feel this helped to build rapport during the interviews, as I did not come across as threatening (see McDowell, 1992 for more on femininity in research), and it did not result in me losing control of any of the interviews (see Schonenberger (1992) on power relations).

The final element of positionality which is worth discussing are my personal views on road pricing. Throughout the research process I have tried to remain open minded about road pricing, and was careful not to express my own views during the interviews, as they could have biased the interviewees. I was also careful how I responded when the interviewees expressed their own opinions about road pricing. Although I corrected them if they expressed a view which was wrong (like the times or days the London charge applies), I was careful to remain neutral about their views on road pricing, and not express any disagreement or approval. This could bias respondents, and cause them to suppress or exaggerate future comments (Patton 1987,127). As road pricing is such a controversial topic, many people were interested in my own views on it, and I was generally happy to discuss it with them after the interviews were over. When doing this I was careful not to inadvertently criticise any views that the interviewees had expressed, and made sure that I had already established their unbiased views on pricing before expressing my own.

4.7.3 Reliability

I am confident that my findings from Singapore and the Netherlands are reliable, as the accounts given by different interviewees about the same topics are broadly similar.

Multiple interviews were also conducted with three firms in Southampton, and these suggested that people within firms did indeed give similar information. Unfortunately in the other Southampton based interviews there was not time to ensure the reliability of accounts by interviewing more than one person in every firm (see Schoenberger 1991,187). Having found in the more detailed case studies that the accounts of different members of the businesses were generally similar, I am confident the interviewees were generally answering my questions truthfully. It was usually clear during the interviews which comments were based more on personal views, rather than those of the organization, and I was able to analyse these accordingly. Sometimes a helpful way to verify findings is to present the final documents back to the respondents for them to comment upon. I did this with the Dutch case study, received some helpful feedback, and was reassured when people generally supported my conclusions.

One issue which could potentially jeopardise the reliability of the findings is recollection problems. This was not an issue in the Southampton based research as it focused on current issues, but the case studies in Singapore and the Netherlands often involved asking interviewees to recall events which happened over ten years ago. The Area Licensing Scheme (ALS) was first introduced in Singapore in 1975, and the first detailed road pricing proposals in the Netherlands date back to the early 1990s. The interviewees who were not involved with road pricing at this time generally did not discuss it in as much detail, and focused instead on the more recent developments such as the Electronic Road Pricing (ERP) system in Singapore. One of the Singaporean interviewees was involved in setting up the ALS in the 1970's, and seemed to have a good recollection of events at the time. When Dutch respondents had worked on road pricing in the early 1990s, there were some recollection issues. Many people only recalled vague details of the schemes, and often did not remember the exact dates involved. The accounts of these early phases were broadly similar, and were triangulated with secondary sources such as journal articles. It is important to recognise that recollection issues are not just relevant for these early road pricing phases, but interviewees can also make mistakes when recalling aspects of any of the schemes, even the most current ones.

4.8 Conclusion

This chapter has outlined the two research questions addressed in this thesis, and the intensive qualitative approach which will be used to explore them. The advantages of this over a more extensive approach where outlined, including the attention qualitative methods pay to context, and the ability to explore the reasons why certain patterns and responses occur, rather than simply identifying trends.

The research is composed of three strands; case studies of successful and failed attempts to implement road pricing, semi-structured interviews with businesses in Southampton about their responses to road pricing, and more detailed research with three firms in Southampton to examine their responses further. These three elements can all be classed as case study research, and all involved in-depth interviews. This chapter outlined the theoretical background to case study research, including secondary data sources and in-depth interviews. The scope and practicalities of the three strands of research where then outlined. This included issues such as how interviewees were selected, the types of questions asked, the materials used and the subsequent coding and analysis of the interview transcripts. A number of important broader issues were also discussed, notably what constitutes a 'business view', and how to try to capture it. Chapter 5 will begin the empirical analysis, examining the lack of barriers which contributed to the successful introduction of road pricing in Singapore.

Chapter 5 – The success of road pricing in Singapore

5.1 Introduction

The first example of road pricing in the world began in Singapore in 1975. As the scheme has now been operational for over thirty years it provides a useful case study of the issues associated with road pricing, particularly the factors which contributed to the scheme's success. Rather than encountering any barriers to implementation (see section 2.4), in fact a number of issues in the Singapore context worked in favour of the introduction of road pricing, as this chapter will show. Singapore's experience with road pricing can be considered a success, as it was introduced smoothly with very few 'teething problems', met with little public or political resistance and has been operating effectively ever since. This chapter will examine the reasons for the success of road pricing in Singapore, based on a series of six interviews which were conducted in Singapore in March 2006. Summaries of the interviewees' background can be found in Table 5.1 below.

Table 5.1 Interviews conducted in Singapore

Interviewee	Position
Interviewee A	Assistant Professor, Department of Public Policy, National University of Singapore (NUS)
Interviewee B	Professor, Civil Engineering, NUS
Interviewee C	Former senior member of the Land Transport Authority (LTA), now a Professor at NUS
Interviewee D	Professor, Nanyang Technologucal University (NTU), Singapore
Interviewee E	Current senior member of the LTA
Interviewee F	Member of the Singapore Retailers Association (SRA)

This research will build on the existing literature on road pricing in Singapore in a number of ways. Much of the existing literature on road pricing in Singapore is based on describing how the ALS and ERP systems operate, and discussing the effects of the

schemes on traffic; rather than examining the factors that contributed to the success of the schemes. For example, Olszewski and Xie (2005) modelled the effects of the charges and examine how effective they are at controlling congestion. Other work, such as that by Chin (2002) explains how both the ALS and ERP operate, discusses the technology involved, the operating hours, charges, vehicles covered, publicity campaigns and so on; but focuses on description rather than analysis of the effects, lessons or reasons for the schemes' success. Although some of the existing work often alludes to reasons for the success of road pricing in Singapore, it has not been an explicit focus of much research to date, and this chapter will begin to address this gap in understanding. Holland and Watson (1977) did examine the reasons for the success of the ALS, but this work is dated, and does not apply to the more recent ERP system. Similarly, there has not been a great deal of work specifically looking at lessons that can be learnt from the scheme's success. Menon and Chin (2004) explored the lessons learnt from the ERP system, but their paper focuses on technical and operational issues, rather than looking at the broader political and acceptability issues associated with the scheme (see also Menon (2000) and Chin (2005)). This chapter will use a structured framework to interpret the reasons for the success of road pricing, ensuring a comprehensive analysis (see section 2.4). By comparing Singapore's success with the failure of road pricing in the Netherlands a more informed picture can be presented about both the important factors in the implementation of road pricing, and the subsequent lessons for other authorities considering road pricing schemes.

The structure of this chapter is based on the framework of barriers to road pricing outlined by Ubbels and Verhoef (2003) in Chapter 3, although it has been adapted for the Singapore context. This chapter will show that the potential barriers identified by Ubbels and Verhoef (2003) did not occur in Singapore, but rather there were a series of factors in each category which actually enabled the success of road pricing. As such, this chapter will refer to a series of issues (in the positive sense), rather than barriers. Institutional and acceptance issues proved to be particularly important to the success of road pricing in Singapore, so these will be explored in turn, followed by the practical (and technical) issues associated with road pricing. These three categories of barriers or issues will also be used in Chapter 6 to facilitate comparison between the success of road pricing in Singapore and its failure in the Netherlands. Finally, the transferability of the results will be discussed, with particular reference to my research on Southampton.

5.2 Road pricing in Singapore

Road pricing in Singapore began in 1975 with a relatively straightforward paper-based system called the Area Licensing Scheme (ALS) which was upgraded to an electronic system in 1998. Both of these schemes were part of a wider package of measures to both control the automobile and improve public transport, and meant that the automobile did not become as dominant in Singapore as it has in many other developed countries. This section will give an overview of the two road pricing schemes, before going on to begin exploring the reasons for their success in section 5.3.

The ALS began in 1975 and covered a 610 hectare area of the city centre referred to as the Restricted Zone (RZ), and in order to drive into it drivers had to buy a paper permit and display it in their vehicles. Permits could be brought at a range of shops and booths, and cost $3SGD per day, or $60 per month. (Today $1SGD = £0.33[1]). The scheme was enforced manually, with police officers standing at the entry points into the zone recording the number plates of vehicles without permits (Goh 2002,31). Over time the ALS scheme evolved, and was expanded to cover an area of 725 hectares in 1998 (Kian Keong, 2002). The charging hours were originally 7.30am to 10.15am every day, apart from Sundays and Bank Holidays. However, during the 1980's traffic levels increased, so the scheme was expanded to include a charge from 4.30pm to 7pm on weekdays. In 1994 the charging period was extended to cover the inter-peak period, but full day and half day permits were also introduced to make the system more flexible. However, Interviewee D (313) suggested this meant the system was *"just too complicated. Because you had...12 different types of licences. Because they were monthly and daily, and there were whole day and part day. So you have four combinations already; and then different types of vehicles; cars motorcycles, taxis"*. As well as the complexities of the number of combinations of permits, the manual enforcement of the system was not ideal as it required large amounts of manpower. Over time technological improvements meant it was possible to consider upgrading the system.

[1] www.xe.com/ucc

In 1998 the ALS was upgraded to a system of Electronic Road Pricing (ERP), which replaced the paper permits with roadside gantries and In-Vehicle Units (IU's). This system is still in place today, and allows charges to more accurately reflect mileage than the ALS (Santos 2004). Charges apply from 7.30am to 7pm (Goh 2002), and range from 50 cents to $3 per half-hour, and vary for different types of vehicles (Menon and Kian-Keong 2004, 64). The gantries cover all the entrances to the RZ, and show 'in operation' when charging hours apply. Originally there were 33 gantries, but the area was gradually expanded and by 2005 there were 49 gantries, some of which have accompanying signs showing the charges for different types of vehicle. A photo of a gantry is shown in Figure 5.1. Each gantry is actually composed of three metal arches, containing a series of IU detectors and cameras.

Figure 5.1: A roadside ERP gantry in Singapore



Drivers insert a rechargeable cash card into the IU in their vehicle, which beeps and displays the amount charged and the remaining balance each time a charge is made. Initially these IU's were distributed for free during a ten month fitting period to encourage drivers to get them, and after this there was a cost of $150 (Kian Keong 2002). It is not compulsory to have an IU, but 99% of vehicles in Singapore do, and new vehicles are automatically fitted with them (Menon and Kian-Keong 2004,63). The gantries are also fitted with cameras which enforce the scheme. Dedicated Short Range

Communication (DRSR) transmitters detect the IU's in the vehicles and charge them. If an IU is not detected the cameras photograph the vehicles number plate, and using the comprehensive and accurate vehicle database a letter is sent to the driver to request payment within 28 days, or a fine is issued. Vehicle speeds in the zone are monitored, and the charges can be adjusted every 3 months to reflect levels of congestion (Menon and Kian-Keong 2004,64). It is also possible to have different charges for different times of day, at thirty minute intervals; and this enables shoulder pricing to avoid surges of vehicles into the zone before charging begins or after it ends. Having outlined what road pricing in Singapore involves, this chapter will now discuss the reasons for its successful implementation, when there are so few schemes elsewhere in the world. It will begin with institutional issues, followed by acceptance issues, and finally practical and technological issues.

5.3 Institutional issues

Ubbels and Verhoef (2003) identify three types of barriers to road pricing, the first of which is institutional barriers such as political systems and organizational structures. In the Singapore context these institutional factors actually played a very important role in facilitating the introduction of road pricing. In particular, Singapore's political structure, history of restraints on the automobile and the integration of transport and land use planning helped enable the successful introduction of road pricing. Each of these issues will now be explored in turn, to explain how they contributed to the success of road pricing in Singapore.

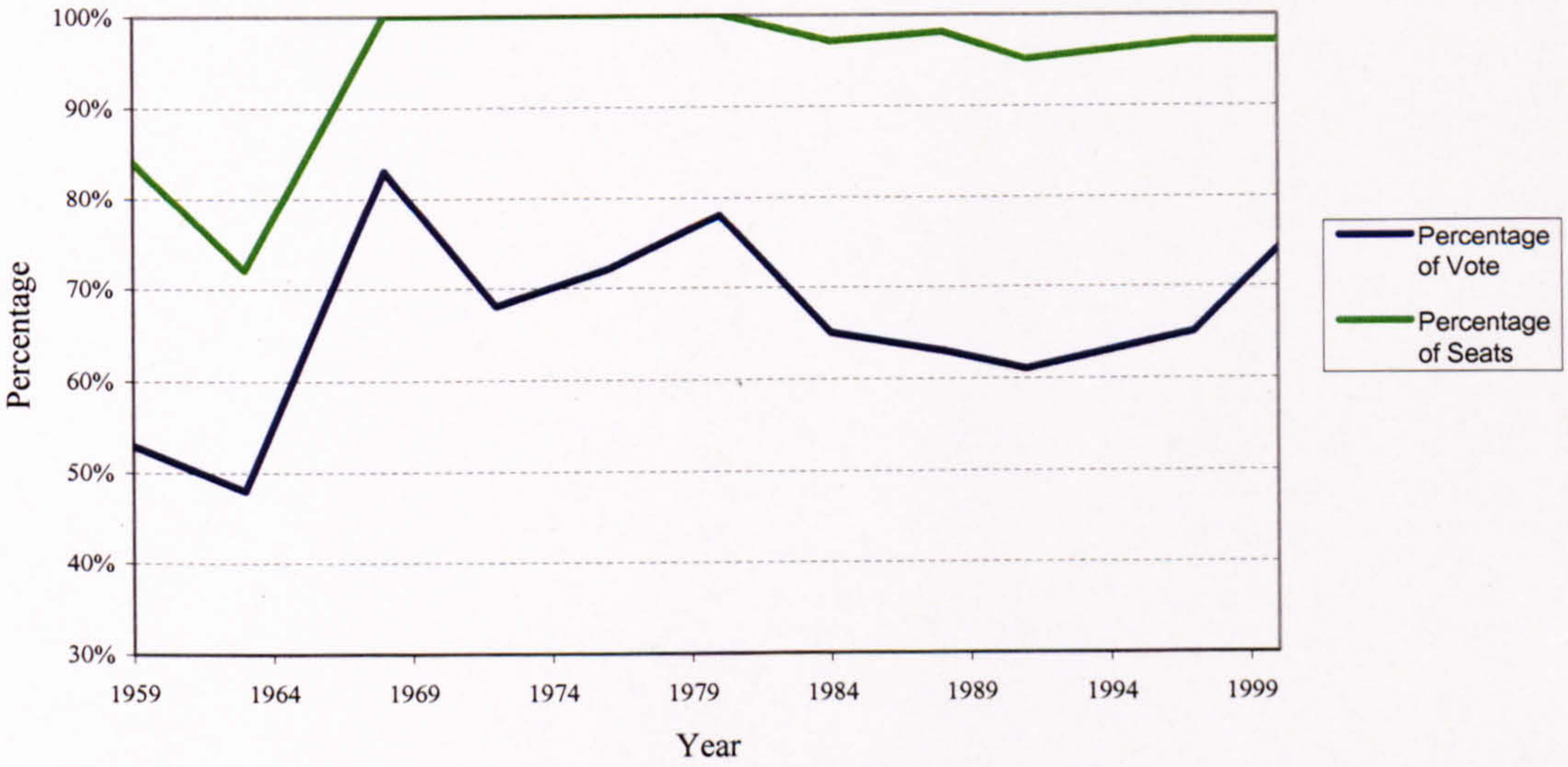
5.3.1 Politics in Singapore

Singapore's political structure is different to many Western countries, and as a result it was more straightforward to introduce road pricing there than it would be in many other places, including the UK. This section will begin to outline the impact of Singapore's political structure on its ability to introduce road pricing, before exploring the related topic of its transport and land use policy history in more detail in section 5.3.2.

Heywood (1992,287) suggests 'third world' democracies are *"often dominated by a single party, typically headed by a charismatic leader"*, and this is true of Singapore. Singapore's political system has historically been dominated by the People's Action Party (PAP) and Prime Minster Lee Kuan Yew. Kuan Yew was elected as the country's first Prime Minister in 1959, and led the PAP to electoral victory in 1968 when they won *all* of the seats in parliament. The PAP completely dominated Singapore's politics until 1981, when a small number of opposition members were elected. Although there are currently eighteen registered minor parties in Singapore, none of them are realistically likely to win power in an open election, as they cannot compete on an equal basis with the powerful and resource-rich PAP (Li and Eliklit 1999,208). The electoral dominance of the PAP is shown in Figure 5.2 below.

Figure 5.2: The PAP's dominance in Singapore's elections 1959 to 2000

(Source: www.wikipedia.org)



The dominance of the PAP in Singapore has led to questions about how democratic the country is (see Beng Haut (1994), Lazar (2001) Li and Elkli (1999) and Quah (1987)). One interviewee suggested it could be considered an *"illiberal democracy"*, or *"soft authoritarian"* (Interviewee A, 1439). Heywood (1992,277) identifies competitive elections as one of the key factors that defines a democracy, to allow voters a choice, so on this basis Singapore cannot be considered truly democratic. However, it is not the purpose of this chapter to specifically debate this issue. Rather, the implications of the

PAP's dominance for the country's policy making are important. When road pricing was first introduced in 1975 the PAP had complete control of parliament, and faced no political opposition. As such, they could implement road pricing without the need for political debate on the issue. The PAP not only dominated parliament at one point in time, but have maintained the majority of the seats in parliament for decades. This meant opposition parties were not able to take power and reverse the PAP's policy decisions, and allowed time for the principle of road pricing to become well established and accepted. Amongst the public in Asia there is typically *"broad support for strong government"* (Heywood 2002,37), so public opposition to road pricing was also low (see section 5.4). In the UK, the three party system means it is very unlikely one party would have a sufficient majority to be able to push through a controversial policy like road pricing without opposition (see section 5.6).

Along with the dominance of the PAP, policy making in Singapore was simplified further by the fact that the country is a city-state with only a single tier of Government, and a single chamber (Holland and Watson 1978,22). This meant that when the PAP won all the seats in parliament in 1968 they had total control of the whole country, putting them in an exceptionally strong position. As Singapore is a city-state, there is no tension between national and regional politics, as *"100% of the country/city is planned by one authority"* (Olds and Yeung 2004, 512), so decisions only needed to be made once, at a single scale. This makes it much quicker and easier to bring in legislation and apply uniform policies across the country than it would be in the UK. This single tier of Government also helps to ensure integrated transport and land use planning, which is discussed further in section 5.3.2.1.

Both the dominance of the PAP, and Singapore's political structure, helped facilitate the introduction of road pricing. The PAP had sufficient political power at a national level (and all other scales) that they could implement controversial policies without political opposition, and the lack of regional government considerably simplified the policy making process. Having outlined the dominance of the PAP and the implications for policy making, the specific policies which they implemented that helped enable the introduction of road pricing will now be discussed.

5.3.2 Policy history

Ubbels and Verhof (2003) identify that the regulatory framework of a country's transport system can act as an institutional barrier to road pricing, but they do not specifically mention the effect of policy history. This is an important subset of institutional issues to consider, particularly in Singapore where there is a long history of restraints on the automobile, which meant it did not become as dominant a mode of transport as it has in many other developed countries (see section 3.2). This section will explore the reasons the Singapore Government introduced policies to restrain the automobile from an early stage, outline what some of these involved, and illustrate how this policy history helped facilitate the introduction of road pricing.

Road pricing in Singapore was not used in isolation, but was part of a broader range of measures which restricted the use of the automobile. One of the reasons for this restriction is that the country is small, and the Government wanted to ensure the available land was used in the best way possible. The Land Transport Authority (LTA) recognised that it simply wasn't feasible to *"keep on building roads"* (Interviewee C, 826, former LTA member), and instead demand management measures were implemented from an early stage to ensure that the existing network was used as efficiently as possible. The Singapore Government also framed the need to minimise congestion in terms of keeping the country attractive to the foreign businesses which make a large contribution to the country's economy. Interviewee A (1547) commented; *"It'll be said that the stakes are very high for the economy. If we allow ourselves to become congested foreign investors won't come, all of the headquarters for companies will leave, and Singapore will go down the drain"*. The measures to restrain the automobile in Singapore began in the late 1940's, and the shift away from a predict and provide approach to demand management occurred earlier in Singapore than it did in the UK (see section 2.2.1). As well as road pricing, there have been a series of other measures which restrained both the ownership and the usage of automobiles. Initially many of these measures restricted the ownership of automobiles in order to prevent congestion, but more recently there has been a shift towards lowering ownership costs, and increasing the costs of using cars through measures like ERP (Interviewee E, 131). An overview of the key restraint measures is given in Table 5.2.

Table 5.2: Automobile restraint measures in Singapore (1949 – 1998)

Year	Measure	Ownership or usage control	Description
1949	Registration Fee	Ownership control	Introduced to cover administrative costs for processing licences, based on a percentage of the vehicles' open market value (OMV)
1956	Additional Registration Fee	Ownership control	Between 1974 and 1978 the fee jumped from 25% to 125% of the cars OMV. Recently this has been reduced and stood at 100% in 2004 (Sharpe 2005,151)
1972	Import Duty	Ownership control	Raised from 10% of the vehicles OMV in 1968, to 45% from 1972
1975	Area Licensing Scheme (ALS)	Usage control	The earliest road pricing scheme in the world. See section 5.2 for details
1975	Preferential Additional Registration Fee (PARF)	Ownership control	This is a bonus scheme which encourages motorists to take their cars off the road before they reach ten years old. This bonus can be offset against the cost of a new car (Sharpe 2005,151)
1990 (Goh 2002)	Vehicle Quota System (VQS)	Ownership control	People wanting to buy a car have to bid for a ten year Certificate of Entitlement (CoE) in a monthly auction. Quotas were set by the Government at around 3% growth each year. This system was unprecedented and directly marketised people's ability to own a car
1994	Off Peak Car Scheme	Usage control	New and existing car owners could pay lower car registration fees and taxes if they had low levels of car use
1994/1997	Road Pricing Scheme on roads	Usage control	Manual road pricing was introduced for linear passage vehicle flow on three major expressways to ease congestion (Goh 2002). This is essentially tolling.
1998	Electronic Road Pricing (ERP)	Usage control	Essentially a technological upgrade to the manual ALS system to an electronic one. See section 5.2 for details.

The long history of restrictions on the automobile from an early stage meant that it never became as pervasive in Singapore as it is in many other developed countries, and ownership levels did not grow in line with GDP. There were low levels of automobile dependence both at an individual and a societal level (see section 3.2). As a result of these low levels of motorisation it was easier to introduce road pricing in Singapore in 1975 than it would be in the UK today, for a number of reasons. Firstly, the various policy controls in Singapore mean that the car is viewed as a luxury item for the wealthy, rather than a necessary part of mobility. In 1975 car ownership levels had only reached about 50 per 1000 people (Interviewee A, 630), so the automobile had not become pervasive enough to determine *"normal social practice"*, or *"reconfigure civil society"* (see automobility, section 3.2). As the majority of the population has not become used to, and dependent on, the freedoms and flexibility that the automobile offers, they did not resist the controls on it. Secondly, the ALS was not an isolated measure. Rather, Interviewee C (138), a former senior member of the LTA suggested, *"it was sold as a package... we will improve public transport, we will improve the roads"*. Many people were already using the public transport system, so they supported the improvements that came as part of this package, and were not affected by the ALS. Finally, the people who did own cars were already used to a range of other financial measures controlling its ownership and use, so against this background road pricing seemed like a less radical measure. All of these issues meant that there were no public acceptability barriers to the introduction of road pricing in Singapore, an issue which is discussed further in section 5.4.

5.3.2.1 Land use planning

It is not only transport policy history which facilitated the introduction of road pricing in Singapore, but the close links between transport and land use planning also played an important role. Land use planning in Singapore is closely controlled by the Government, rather than being left to market forces, and is based on long-term Concept and Master plans for the whole country. The integration of land use, town and transport planning is illustrated by the two main elements of the 1991 Concept Plan; decentralising commercial and other activities by developing fringe centres at MRT stations and reducing the need to travel by locating employment centres near residential

areas (May 2004,88)[2]. These integrated plans aim to promote sustainable development and reduce both the need to travel and dependence on the automobile. The decentralised towns were connected to the city centre by an efficient system of roads, expressways and public transport (White paper 1996,14), meaning there was no need for people to become dependent on the car. As Interviewee F from the Singapore Retail Association suggested, *"the car hasn't ever really associated with shopping to a big extent in Singapore. You don't get the same sort of out of town, use the car as a shopping basket mentality as you do back in Europe"* (Interviewee F, 850). Integrated planning therefore means people do not need to use cars to access retail facilities, and did not become dependent upon them. This integration of transport and land use planning was assisted by the PAP's ongoing parliamentary dominance, highlighting that many of the issues discussed in this chapter are linked. This dominance meant the PAP could follow through on long-term plans for both transport and land use without being diverted by policy changes implemented by opposition parties.

5.4 Acceptance of road pricing

Acceptability is often a major stumbling block for road pricing schemes (see Schade and Schalg 2003 and Chapter 6), and is the second major barrier type outlined by Ubbels and Verhoef (2003). This section will show that in the Singapore case, rather than being a barrier, the public, politicians and business groups alike all had favourable attitudes towards road pricing. In a similar way that the institutional arrangements in Singapore actually facilitated the introduction of road pricing rather than created barriers to it; the attitudes towards road pricing, particularly from the public and politicians, increased acceptance of the scheme rather than created opposition to it.

5.4.1 Public acceptance of road pricing

There are a number of related reasons why there was public acceptance of road pricing in Singapore, the first of which is to do with the general attitudes of the public.
It has been suggested that Singaporean society is based on a distinct set of 'Asian values', which include putting the interests of the community and the stability of society

[2] See Sim *et. al.* (2001) for a case study of how this strategy affected the Tampines Regional Centre.

before the interests and rights of the individual (Inoguchi and Newman 1997). Although it can be debated whether these distinct 'Asian values' exist and what they involve, it is important to be aware that there are differences between Asian and more Western cultures, and these can influence both people's attitudes towards the automobile and the acceptance of policies such as road pricing. Khong (1997) suggests that Asian values also involve a belief in authoritarian control and respect for bureaucracy, which supports Interviewee B's comment that the Singaporean public generally *"embrace Government policy"* rather than challenging it, as they believe the Government act in the interests of the population as a whole. This is referred to by Holland and Watson (1977, 22) as *"cultural-social attitudes favourable to compliance"*, or more simply, a 'culture of compliance'. Heywood (1992,288) also highlights that Asian countries often adopt a collectivist outlook, rather than the emphasis on individualism which is more common in the UK and many other Western countries. Arguments against road pricing used in the UK about impinging on an individuals' right to drive are simply not used in the Singapore context (Interviewee A, 1535), but rather, the improvements in public transport are seen to benefit society as a whole. Interviewee A (413) suggested that although people may resist the Government on some issues, road pricing is *"not important enough"* to make a stand on. One explanation for this is because there are many other reasons why the public accept road pricing in Singapore, and these will now be explored.

The principle of road pricing in Singapore was established in 1975 when the ALS was introduced, and this enabled the ERP to build on its success. One interviewee suggested that *"in 1975 the issue was pricing, whether we should price people. In 1998 the issue was that the technology would work"* (Interviewee C, 339). As there was no political or public opposition to road pricing when it was first introduced, the principle of charging to drive on the country's roads was seemingly accepted. Interviewee E, a current member of the LTA, suggested the fact that the ALS was there for the ERP system to be built upon *"made it much easier for our implementation, because the pioneers they had already done most of the work!"* (Interviewee E, 340). By 1998 the principle of road pricing was well established, as "*a whole new generation of drivers have grown up with ALS"* (Interviewee E, 1137) and *"very few people today remember what it was like without ALS"* (Interviewee E, 1216). Road pricing and the other charges associated with automobiles simply became *"a fact of life in Singapore"* (Interviewee E, 341), which

people accepted, as the majority of the population never became dependent on the car. When ERP was introduced it was seen as an *"improvement in technology"* for road pricing rather than the introduction of a new scheme (Interviewee F, 239), so its principle did not raise any acceptance barriers.

In Singapore both the ALS and ERP were seen against a background of other restraints on the automobile, which made them seem less radical in comparison. In contrast, in the UK, where the automobile has had a relatively free reign to date, measures which seek to restrict its use meet much more resistance. The specific level of the charges in comparison to other charges also played an important role in gaining acceptance in two respects. Firstly, the ERP charge was actually relatively small compared to the existing costs of car ownership. For example, Interviewee F (1413) suggested *if you can afford a car, and afford the COE on a car...by comparison a couple of cents a day or a couple of bucks a day on an ERP charge is nothing"*. Secondly, the ERP was part of a move away from ownership charges and towards usage charges, and as a result the ERP charges were lower than the previous ALS ones. Interviewee E summarised the Government's view by saying; *"we believe that it is only though the usage of cars that you cause congestion. If people buy the cars and keep them in the garage we should not be too bothered about it, but use is a separate issue"* (Interviewee E, 123). This move away from ownership charges towards charges which encourage vehicles to be used efficiently is supported by the public, as it allows more people to fulfil their ambitions to own cars (Interviewee A). The overall attitude of Singaporeans towards road pricing was summarised by Interviewee B who suggested it was seen as a *"necessary nuisance"*. Although the public may not be completely happy about it, they do accept the Government's arguments that it is needed for the good of the country, and therefore there were no significant acceptance barriers to the introduction of road pricing.

5.4.1.1 Surprising results?

Although there was public acceptance for road pricing in Singapore, there are two reasons why this could be considered surprising. Literature on the acceptability of road pricing suggests a number of important criteria for its acceptance (see section 2.4.2), two of which were lacking in Singapore. Firstly, there should be a good public transport service to provide an alternative to the car, which should be operating at a high standard

before road pricing begins (Jones (2003,51) in Scade and Schalg). Secondly, public acceptance of road pricing has been shown to improve if the revenue from the scheme is hypothecated for further improvements to both public transport and the roads (see AFFORD 2004[3]). Paradoxically, the Singapore scheme gained public acceptance without either of these things, so the possible reasons why will now be briefly discussed.

During the 1960's the Singaporean Government focused on policy areas related to housing and employment, rather than public transport (Willoughby 2001,126), and Interviewee C (936) suggested that when the ALS was introduced in 1975 public transport was in fact *"really bad"*. An important aspect of road pricing was that it was sold as one element of a five pronged approach, which also included integrated land use planning, traffic management, and supply side measures of improving the road network and public transport services. The Government stressed *"of these five, no one alone will work, so it is a package"* (Interviewee C, 1029, former LTA member), which needs road pricing and traffic management to balance the demand side. The public transport improvements were made alongside the introduction of the ALS rather than before it, but this was not a problem as the Singapore public trusted the Government to deliver on their promises (unlike in the UK, see section 5.4.1). The Government feels they have delivered, and Interviewee C (145) who used to work at the LTA commented; *"We improved the trains, we improved the buses, built roads...it has been backed up with actions"*, including the new MRT system which was opened in 1987. Although the public transport system was not ideal to begin with, the clear framing of road pricing as part of a package, trust in the Government and their track record of delivering on their promises all contributed to public acceptance of the ALS.

The second surprising result is that road pricing in Singapore was accepted despite the fact that the revenue from the schemes was not hypothecated for transport improvements. The interviewees suggested there were a number of reasons for this, aside from the general lack of public opposition to Government policy. Interviewee E from the LTA explained that the Government's view is that they *"should not ear mark*

[3] See: http://ec.europa.eu/transport/extra/web/downloadfunction.cfm?docname=200310%2Fafford%2Epdf&apptype=application/pdf

revenue. It should go into the general pool so that there is more flexibility for the ministry of finance, so they can channel funds to where it is needed" (Interviewee E, 51). All revenue, including that from road pricing goes into the general treasury, and the flexibility of this system is supported by the public as they trust the Government's decisions about how to spend the money. The revenue generated by road pricing is actually far less than from the other motoring taxes and charges, and as Interviewee F (1644) commented; *"there is no way the money from ERP would pay for the new MRT lines."* Public transport in Singapore is well funded, so spending of additional Government revenue on improving services is not considered a priority. This is in contrast to countries like the UK, where public transport is generally regarded as suffering from under-investment, and so opportunities for further investment in it are normally met with approval from users. As the principle of road pricing is already accepted in Singapore, Interviewee A (717) suggested the Governments view towards hypothecation is *"it is politically acceptable already, why should we do that?"* Although hypothecation increases acceptance of road pricing in the UK, the Singapore example shows it is not always necessary in other countries with different funding arrangements.

5.4.2 Political acceptance of road pricing

Not only was public acceptance of road pricing a key factor in its success in Singapore, but so was political acceptance of the scheme, which was heavily influenced by the dominance of the PAP. When the ALS was proposed in 1973, and implemented in 1975, the PAP faced no opposition in parliament, so there was no overt political opposition to the scheme. Although there were some opposition politicians in parliament by the time the ERP system was developed, the principle of road pricing had already been established for over twenty years. Interviewee E (341) suggested it had become *"part of life in Singapore"*, which was accepted by politicians and the public alike. The PAP's dominance meant they were able to present the 'facts' about the scheme and allay any concerns that the public might have, without any challenges or scare stories from opposition parties. Interviewee D (649) suggested that where road pricing does turn into a political issue a lot of the arguments used involve *"playing on the sentiments of the population for political advantages"*, rather than being genuine reasons against pricing. The lack of opposition in Singapore in 1975 meant this was

avoided, and road pricing did not face political acceptability barriers. However, in countries like the UK with a more even distribution of political power, road pricing is likely to be a much more publicly and politically controversial issue.

5.4.3. Business acceptance of road pricing

Like public and political acceptance, business acceptance did not cause problems for road pricing in Singapore, although some groups were not very supportive of the scheme at first. There are no effective lobbying organizations in Singapore, as it does not fit in with the 'culture of compliance', and there are no national automobile manufacturers, which are likely to be one of the key groups opposed to the policy (Interviewee E). As the history of restrictions on the automobile meant a large motoring public never developed, there was no need for a political party or group to represent their interests. Although Singapore does have an Automobile Association (AA), they focus on providing motoring advice and a breakdown service, rather than taking on any sort of lobbying role (Interviewee E, 918). Despite the AA being opposed to the ALS in preference of more road building, they did not actively vocalise this view (Interviewee C).

Not all businesses were in favour of the road pricing when it was first intorduced, but they did not vocalise their views strongly. Interviewee F from the Singapore Retailers Association (SRA) commented that, initially, road pricing was "*seen as a burden on the [retail] industry*", but once the scheme was introduced the effects were not substantial and they *"got used to it very quickly*" (Interviewee F, 110). The Government consulted the SRA about the possibility of extending ERP to Saturdays. Although the SRA were not in favour, the Government decided to go ahead with it anyway as they felt it would be a *"long term benefit to the industry"* (Interviewee F, 330) in creating a better environment for customers. However, they were not very vocal in their opposition.

Even though there was some opposition to the initial principle of road pricing and the later details of the scheme, the Government did not let it deter them from their proposals. However, they were very mindful of business costs, and offset the ERP charges with reductions and rebates in other business taxes, which helped minimise any negative feelings about the scheme. The Government approach was summarised by Interviewee F (217) as "*we are going to increase the cost on you in one area, but we'll*

give you a benefit in another area". This helped to introduce the scheme smoothly without resistance from businesses, and also meant that they did not suffer many adverse effects.

In other countries it is likely that business opposition to road pricing will play more of a role in creating barriers to its introduction than it did in Singapore, for two reasons. Firstly, businesses may vocalise their concerns more strongly, rather than in Singapore where the public and businesses alike generally embrace rather than challenge Government policy (see section 5.4.1). Secondly, the dominance of the PAP in Singapore gave them the confidence to pursue controversial policies despite some opposition, and this is not likely to be the case in countries where there is more electoral competition between political parties.

5.5 Practical and technological issues

Practical barriers are the final type identified by Ubbels and Verhoef (2003), which includes technological barriers. Practical issues did not really emerge from the interviews as important in the Singapore case, so this section will focus on the technological issues. Although a lack of available technology in the 1970's did present a barrier to road pricing, the PAP did not let this deter them from implementing a scheme. Rather, they started with a simple system, which they later upgraded when the technology to do so became available.

The ALS was not the desired system of the PAP, as they always aspired to *"move towards a more usage- based regime"* (Interviewee E, 118). By the early 1990's the ALS was *"using a lot of manpower...and it was getting very inflexible"* because of the many different types of paper licence available (Interviewee C, 319), so in the early 1990's the PAP decided they should upgrade to an electronic system (Interviewee C, 322). Technology trials in Hong Kong in the mid 1980's had shown this would be possible, but as Singapore was the first country to implement such a scheme, they undertook extensive tests of the system. The PAP set *"a very high standard for accuracy"* (Interviewee D, 339), and tested the system by "*block[ing] an un-open expressway for 6 months, and we had about 200 vehicles going round and round,*

generating 5 million transactions" (Interviewee C, 328). In addition to these tests, the scheme actually went live three months before the official start date with zero charging so *"people could go in and test the equipment"* (Interviewee C, 347). This further ensured any problems were identified in advance of people being charged and that *"everybody knew how it worked"*, so when charging began it really was a *"non –event"* (Interviewee C, 414).

Although there could have been technological barriers with being the first in the world, the extensive testing and the *"technocratic"* (Interviewee A, 1442) approach of the PAP meant all the problems were ironed out at an early stage. Rather than let technological concerns put them off road pricing the PAP saw it as a chance to *"showcase"* themselves to the rest of the world and be praised as *"cutting edge"* (Interviewee F, 245).

5.6 Transferability of findings

Although Singapore's experience with the first and longest running road pricing scheme in the world could provide important lessons for other countries considering similar schemes, it is important to be aware that contextual differences can lead to problems of transferability. The three main differences between Singapore and the UK that have implications for the success of road pricing are the fact Singapore is a city-state, the differing levels of dependence on the automobile and the dominance of different parties within the political system. Firstly, as Singapore is a city state it only has only a single tier of Government, and therefore there is no tension between national and regional or local politics. When road pricing was introduced in Singapore the policy covered the whole country, but in the UK it is more likely that the route to national road pricing will begin with schemes in individual cities, and be led from the bottom up rather than the top down (see Chapter 2). 'Big bang' implementation will be harder in the UK as it is a larger country, but schemes in individual cities raises issues of technological interoperability and public understanding of different systems.

Secondly, in the UK many people are more dependent on the automobile than they were in Singapore when road pricing was introduced. There has not been a history of

restraints on the automobile in the UK, and as it is more difficult to reverse automobile dependence than to prevent it (see Appendix B and section 3.2), public acceptance of road pricing is likely to be a much larger problem. This is likely to be compounded by the fact the UK public often have less trust in the Government than Singaporeans. In Singapore the lack of significant political opposition and a motoring lobby in Singapore meant political acceptance of road pricing was not a problem, and the ongoing parliamentary dominance of the PAP meant they were able to pursue integrated long-term policies without challenges from the opposition. In the UK, a three-party system and regular elections mean political acceptance of road pricing is likely to be more of a problem, and there would have to be a cross-party consensus to ensure continuity in pricing policy if there were a change in government.

Holland and Watson (1977) studied the ALS in Singapore, and divided the factors influencing the scheme's success into those which are essential and those that merely contributed to it. The factors which set Singapore apart from the UK, such as the low levels of car use, 'cultural-social attitudes favourable to compliance' and the *"relative ease of planning and decision making at just one level of government in one geographical area"* were regarded as contributing to the schemes success, rather than being essential. The analysis in this chapter supports this view, and although Singapore is different from the UK in a number of ways, this does not mean the UK cannot successfully implement road pricing policies. The factors which Holland and Watson (1977, 22) class as necessary for the success of road pricing are quite general and therefore transferable, and include *"competent management"*, *"good scheme design"* and *"advance education of the public on the reasons for the scheme"*. These are not closely related to the social, cultural, political or geographical differences between Singapore and the UK, and could therefore be applied to increase the chances of road pricing being successful in the UK.

Despite there being issues about the transferability of Singapore's experience to the UK context, some of the issues concerning the economic effects of road pricing in Singapore can provide useful insights. It is difficult to be sure of the exact economic effects of road pricing in Singapore, because many other economic developments have occurred since the introduction of the ALS. However, in-depth interviews with leaders of the business community showed that the ALS generally did not have an adverse

effect on them (Holland and Watson 1978,16); suggesting some of the concerns that people have about the economic effects of road pricing may be unfounded. Similarly, the ERP system was not found to have had a large impact on businesses, as *"they got used to it very quickly"* and *"it actually hasn't been as much of a drag as they thought it would be"* (Interviewee F, SRA, 129). One of the responses that businesses in Singapore made to road pricing was to pass on the extra costs along their supply chains in order to maintain their profitability. One interviewee suggested; *"It's basically the standard way. If you get a higher cost along your supply chain then you look for a discount somewhere else"* (Interviewee F, SRA, 719). The ERP charges were used as a negotiating tool to gain discounts from suppliers, effectively passing the charge on up the supply chain. The Southampton based research in this thesis found that firms in the city would also respond in a similar way, an idea which is explored in more detail in Chapter 8. Singapore firms also made a number of organizational responses to road pricing, including scheduling morning meetings for after 10am, so that employees could be flexible in their working hours and avoid the charge (Interviewee C, 628). This trend is also likely to emerge in some firms in Southampton if road pricing was introduced, and will be explored further in Chapter 8.

5.7 Conclusion

The framework of institutional, acceptance and practical barriers to road pricing outlined by Ubbels and Verhoef (2003) has been helpful in examining road pricing in Singapore. However, rather than there being barriers, in each of the three categories there were issues which contributed to the successful introduction of road pricing. Many of these factors which contributed to the schemes' success are closely linked. For example, the political dominance of the PAP allowed them to introduce controversial policies without being challenged politically, and meant they could plan for the long term without their policies being diverted when opposition parties took power. The history of restraints on the automobile and integrated land use planning meant the already favourable public attitudes towards most Government policies were enhanced, because people were not as dependent on the automobile as they are in the UK.

Despite Singapore's success in introducing road pricing, it has not been taken up in many other countries, as in many cases it does face barriers to implementation. The next chapter will examine a number of failed attempts to introduce road pricing in the Netherlands, and show that in contrast to Singapore, all three categories of barriers were present, and hindered the introduction of road pricing. Chapter 6 will end by drawing on the case studies of both Singapore and the Netherlands to summarise the main factors which can contribute to the successful implementation of road pricing, and will use the case study findings to identify some lessons for road pricing in the UK.

Chapter 6 – Barriers to road pricing in the Netherlands

6.1 Introduction

Despite the successful implementation of road pricing in Singapore, it has not been widely adopted as a demand management measure elsewhere around the world. Currently the only other full scale road pricing schemes in the world are in London and Stockholm[1], although some cities have made proposals which were rejected, including Edinburgh (see Table 2.1). This lack of road pricing schemes is not purely the result of a lack of proposals, but is also symptomatic of its controversial nature as a policy, and the number of barriers it can face (see Chapter 2). In contrast to the various political, social and practical issues that aided the introduction of road pricing in Singapore, in the Netherlands there have been a series of different proposals which have faced a range of barriers. These schemes faced barriers in all of the three categories outlined by Ubbels and Verhoef (2003); institutional, acceptance and practical (including technological) (see Chapter 2).

During the fieldwork in the Netherlands a number of different interpretations emerged across the range of interviews, about the reasons why road pricing has not been implemented there to date. Whereas some of these variations are due to recollection issues (see section 4.7.3), others reflect different interviewees insights into different areas, and also differences in personal opinions. Clearly staff from the Ministry of Transport would have more inside knowledge about the political issues surrounding road pricing, those from lobby groups would know more about the issues related to their campaigns, and so on. I interviewed a wide range of individuals to highlight as wide a range of perspectives and insights as possible, and recognise that the range of views of different interviewees is perfectly valid, and reflect their different positions. This chapter will not reveal a single underlying reason that road pricing has failed to be implemented in the Netherlands to date, and it is unlikely such a reason actually exists (see Chapter 4). Rather, there are multiple factors that influenced the failure of road pricing, and individuals may have different views over the relative importance of these.

[1] Norway has cordon schemes around three of its major cities, but these are aimed at raising revenue rather than reducing congestion.

There is no single universal truth or 'correct answer' that can be reached, and the multiple viewpoints help to reaffirm this. As such, this chapter will highlight that a range of issues which all contributed to the failure of different road pricing schemes in the Netherlands, but will not identify any one of these as the most important.

The Dutch road pricing proposals have been the subject of both academic and policy related research, particularly the Rekeningrijden proposal. This chapter will draw on some of this research, using the barriers metaphor developed by Ubbels and Verhoef (2003) as a framework to interpret the failure of road pricing, and compare the issues involved to successful implementation in Singapore. This chapter will add more detail to this and other previous work, based on in-depth interviews with eighteen key stakeholders, which are outlined in Table 6.1 overleaf. Their names have been removed to ensure anonymity.

Table 6.1 Interviews conducted in the Netherlands

Interviewee	**Position**
Interviewee A	Lecturer, School of Geography, University of Utrecht (UU)
Interviewee B	Member of Amsterdam City Council
Interviewee C	Member of Directorate of Passenger Transport, Dutch Ministry of Transport
Interviewee D	Member of Dutch Ministry of Transport
Interviewee E	Professor, Delft Technical University
Interviewee F	Senior member of the Dutch Automobile Association, the ANWB
Interviewee G	Transport Planner in the Gelderland Province
Interviewee H	PhD Student, School of Geography, University of Utrecht
Interviewee J	Senior member of the group Stichting Natuur en Milieu, an environmental research and lobbying organization
Interviewee K	Member of Economic Research Institute and the Dutch Ministry of Transport
Interviewee L	Senior Economic Advisor, Dutch Ministry of Transport
Interviewee M	Senior member of the employers organization VNO-NCB
Interviewee N	Former senior member of the ANWB and senior member of the current "platform" looking into road pricing
Interviewee O	Member of Directorate of Transport and Aviation at the Dutch Ministry of Transport, and member of the current "platform" looking into road pricing
Interviewee P	Professor, Spatial Economics, Free University of Amsterdam
Interviewee Q	PhD Student, Free University of Amsterdam
Interviewee R	Professor, Free University of Amsterdam
Interviewee S	Member of Directorate of Passenger Transport Dutch Ministry of Transport

This chapter will examine institutional, acceptance and technological barriers to road pricing, before discussing the appropriateness of the barriers metaphor for understanding the success and failure of road pricing. Although these barriers will be discussed separately in this chapter, it is essential to recognise that they are not discrete, but rather they overlap and can interact with each other. At the end of the chapter the findings will be drawn together with those from Chapter 5 about the success of road

pricing in Singapore, and the transferability of the findings to road pricing in the UK and Southampton will be discussed. Having a case study of both successful and failed attempts to introduce road pricing helps to highlight a range of issues, and provides more insights than just looking at a single example.

6.2 Road pricing proposals in the Netherlands

This section will give a short background to the key characteristics of the Netherlands as a country, and then outline the details of the various failed road pricing proposals. The Netherlands is the most densely populated country in Europe, and a large proportion of its population is concentrated within the poly-centric Randstad region in the West (see Figure 6.1). These demographic patterns cause congestion on the road network at particular times and places, particularly because of cross commuting between the four large cities of the Randstad (The Hague, Amsterdam, Rotterdam and Utrecht) (Bovy 2001,92).

Figure 6.1: Map of the Netherlands showing the Randstad region

(source: www.technology.amis.nl, accessed 26/10/06)



Although there are a range of reasons why it can be beneficial to reduce congestion on the road network at certain times and places, there are two that are particularly important in the Dutch context. Firstly, the Netherlands is often described as the *"Gateway to Europe"* for freight (Verhoef and Ubbels 2004, 12), and the freight industry is one of the most important contributors to the Dutch economy. As such, minimising congestion to ensure the efficient movement of goods will have a direct and large economic benefit for the country. Secondly, the Netherlands is a small country, which already has one of the densest road networks in the world (Bovy 2001, 91). As there is only a limited amount of space available for expanding the current road network, it is increasingly important to use the existing capacity in the most efficient

way possible, and road pricing is one of the measures the Dutch Government tried to use to do this. These two reasons are very similar to those which were used in Singapore to justify the introduction of road pricing (see section 5.2), and are likely to hold true in many other countries which want to maintain a strong economy and use their land efficiently. However, as the Dutch case study will show, these arguments alone are not enough to successfully introduce road pricing.

The Netherlands has a long history of road pricing proposals, the first of which dates back to 1977. Since 1970's there have been a series of different types of road pricing proposals, but none of these have been implemented. An overview of these different proposals is shown in Table 6.2 overleaf. This includes the abbreviation of the political party who made the proposals, and a key to their full names is given in Table 6.3. Road pricing was first mentioned as a concept in the 1977 National Transport Plan, and again in 1988. The first concrete proposal was developed in 1991, and involved roadside toll plazas similar to those now used in Singapore. The most controversial suggestion was the 1994 Rekeningrijden cordon scheme, which was eventually replaced with the proposal for a national distance-based pricing system in 2000, which was eventually abandoned when there was a change in Government in 2002.

Table 6.2 – Overview of road pricing proposals in the Netherlands[1]

Date	Proposal	Description	Political Party
1977	Structuurschema Verkeer en Vervoer (SVV)[2]	A mention of the idea to have road pricing in the 1977 National Transport Plan	VVD
1988	SVVII - Rekeningrijden I	A second mention of the idea to have road pricing in the 1988 National Transport Plan	VVD
1991	Tollpleinen	The first specific proposals for road pricing, in the form of roadside toll plazas	CDA
1993	Spitsvignet	A proposal for drivers to pay a fixed amount per year for a permit that enabled them to drive during peak times (Boot *et. al.* 1999, 6). This scheme was fairly straightforward technologically, but once people had purchased an annual permit there was no longer any incentive not to drive.	CDA
1994	Rekeningrijden (Literally translates as ("Bill driving", Interviewee K))	Drivers entering the four large Randstad cities between 7 to 9am on weekdays would have to pay a toll, either at an electronic toll cordon, or by a bill sent to them later (Boot *et. al.* 1999, 7). The boundaries of the cordons were up to 15km from the city centres (Interviewee R, 362).	VVD, then PvdA

[1] Adapted from Van der Saar (2005)
[2] This is the term of the Dutch equivalent of a 20 year Transport Plan

Table 6.2 (continued) – Overview of road pricing proposals in the Netherlands

Date	Proposal	Description	Political Party*
2000	Kilometerheffing (Translates as Kilometer Pricing)	Based on a report by entrepreneur Roel Pieper, this proposal involved reforming the entire motoring taxes system, so that payment was directly related to how much individuals drove. Fees would be calculated using GPS and wireless technology	PvdA
2002 to 2003	No proposals	The coalition in power at this time was opposed to the idea of road pricing, so they abolished the Kilometerheffing proposals and did not suggest an alternative scheme	LPF
2005	Anders Betallen Voor Mobiliteit (ABVM)	The current proposal translates as "Paying Differently for Mobility"; and again involves a national reform of the entire motoring taxation system, referred to as variabalisation. Under this system the average drivers will pay *differently* rather than more, as fixed taxes will gradually be phased out	CDA

Table 6.3 Dutch Political Parties

Party	Dutch Name	English Translation	Political alignment
CDA	Christen Democratisch Appel	Christian Democrats	Centre-Right
LPF	Lijst Pim Fortuyn	List Pim Fortuyn	Right wing
PVDA	Partij van de Arbeid	Party of the Workers	Central-Left (Social Democrats)
VVD	Volkspartij voor Vrijheid en Democratie	Party of Freedom and Democracy	Central-Right (Liberal)

A distance based pricing scheme is currently being considered again in the Netherlands, but the proposals have been developed by a 'platform' of stakeholders appointed by the Government, rather than by the Government itself. This platform included local authorities, environmental groups and employers organizations, and the Chairman is actually the former head of the ANWB (the Dutch equivalent of the Automobile Association) who led the 'Stop Rekeningrijden' campaign! The platform has developed a proposal called "*Anders Betallen Voor Mobiliteit*" which translates as *"Paying Differently for Mobility"*, and this was presented to the Dutch Government in May 2005. The proposal involves a national reform of the entire motoring taxation system, referred to as 'variabalisation'. Under this system the average drivers will pay a price per kilometre, which would vary according to time of day, place and the environmental characteristics of the vehicle. Significant infrastructure improvements would be made before charging began. Overall, the scheme would be revenue neutral, and the current ownership taxes (the BPM and MRB) would be gradually phased out (ABVM summary, 2005). The scheme would represent a shift from ownership to usage-based taxes, but overall drivers would pay differently for running their cars, not more (ABVM summary, 2005).

The platform recommended that the revenues from the scheme should not be paid to the Government, but rather to an independent organization to alleviate trust issues. This organization would then be responsible for reinvesting the revenues in the construction and maintenance of the road network (ABVM summary, 2005). This point is controversial with the Government, but the platform clearly stated that their advice is a

package, and in order to maintain public acceptability the Government cannot simply pick and choose which parts it wants to follow. The platform's advice develops the principles for a charging scheme, but does not specify the exact details, and the coalition in power at the time decided to leave the decision on these until after the 2007 elections. The governing coalition has now changed, but they still have an *"appetite for road pricing"* (LTT 18/05/06, p9), and have vowed to implement a kilometre charge, beginning with an interim version which can be introduced before the next election in 2012. After the various failed road pricing proposals in the past, the future of Anders Betallen Voor Mobiliteit is currently uncertain. The barriers faced by the previous road pricing proposals will now be explored, beginning with institutional barriers, and going on to discuss acceptance and practical ones. The chapter will end by drawing together the experience from both Singapore and the Netherlands so that lessons can be learnt both for the current proposals in the Netherlands and any future proposals elsewhere.

6.3 Institutional barriers

Whereas the institutional arrangements in Singapore assisted the introduction of road pricing, in the Netherlands the political system, policy history and the presence of some powerful lobbying groups all created barriers to its introduction. These factors will be explored in turn, highlighting the combination of institutional barriers faced by road pricing proposals in the Netherlands. The different political context between Singapore and the Netherlands can be seen as one of the key factors influencing the respective success and failure of road pricing.

6.3.1 Politics in the Netherlands

In contrast to the dominant party model in Singapore, politics in the Netherlands is based on a system of coalition governance, where two or more parties govern together in a coalition, often from quite different political backgrounds (see Heywood 2002, 263). A consensus between these parties is needed to implement policies, which means decision-making can be a slow and complicated process, particularly if the policy is radical or controversial.

In theory it would be possible to have a single party rule in the Netherlands, but as the Dutch parliament is made up of 150 seats, and there are over 20 different political parties this *"almost never happens"*, as it is unlikely any one party would ever win a such a large majority (Interviewee A, 200). Coalition governance is the opposite political extreme to the single dominant party model of Singapore, and whereas the Singaporean political system facilitated the introduction of road pricing (see section 5.3), the Dutch system of coalition Governance acted as a barrier. Even if one party in the Netherlands is strongly committed to road pricing they are unlikely to have sufficient power to implement it without support from other members of the coalition. Heywood (2002,265) highlights that coalition systems are often *"negotiation and conciliation, a search for common ground, rather than by conviction and the politics of principle"*, and this can cause problems for implementing controversial policies like road pricing, as it is unlikely all of the parties in a coalition will support it. Rather, compromises and trade offs are made, which tend to result in more radical policies being abandoned. The Christian Democrat party (CDA) were always opposed to road pricing, and as they have often been part of the governing coalition this has created obstacles to road pricing (Interviewee E, 99). Interviewee Q suggested that during the Rekeningrijden proposals, in light of growing public resistance *"one political party [in the coalition] said no, these proposals are not acceptable any more"* (Interviewee Q, 29), and so the scheme had to be abandoned as there was no longer sufficient political support for it.

As well as the system of coalition governance, the "Big Politics" (Latour 1998, 128) of the four year electoral cycle created further problems for the implementation of road pricing in the Netherlands. Road pricing proposals often face declining political support in the run up to elections (see section 6.4.2), but even if they survive these events, there are two more potential barriers to implementing the schemes. Firstly, if different parties form the Governing coalition after the election they may decide to abandon the pricing policies of their predecessors. This is exactly what happened to the Kilometerheffing proposals in 2003, when the newly formed LPF party were voted into the coalition. As they were under no obligation to continue with the Kilometerheffing scheme they decided to *"postpone it to the next election period"* (Interviewee Q, 63). Secondly, Interviewee C from the Ministry of Transport pointed out that even if the cabinet remains the same, and there is continuing support for road pricing, the four-year term

between elections is generally considered *"too short"* to design and implement a road pricing scheme, which typically takes around 8 years (Interviewee C, 484). Interviewee K, also from the Ministry of Transport, commented this means that *"you always have to pass 1 or 2 elections before the scheme is fully implemented"*, during which time public and political support may fall, and newly elected parties may abandon the schemes (Interviewee K, 343). These barriers could potentially be avoided if there is strong cross-party agreement on the necessity of road pricing policy (Harsman 2003, 138) at the local the national level, but this has not been the case in either the Netherlands or the UK to date.

6.3.2 Policy history

Three aspects of automobile-related policy history in the Netherlands created barriers to road pricing; the lack of restraints on the growth of the automobile, the absence of any policy which established the principle of allocating road space using pricing, and the timing of the various proposals in quick succession after each other. Whereas the growth in automobile ownership and usage in Singapore was restrained from an early stage, in the Netherlands, as in the UK, it was allowed a relatively free reign. This meant the automobile became a normalised part of daily life for many people, they became dependent on it as a mode of transport (see section 3.2 on automobility). As a result the public opposed the idea of road pricing which was seen as a restraint on their current freedoms to drive when and where they wished (see section 6.4.1). This links into the issue that the principle of paying for the use of the roads and allocating space using market forces is not established in the Netherlands (see section 2.4.2). In Singapore this was established in 1975, but as no such policy exists in the Netherlands it is difficult to convince the public of its merits. This is especially problematic against a background where *"the public feels that they already have to pay a lot for car use"* (Interviewee R, 35), as they resisted measures which they felt would result in them paying more. The history of land use planning in the Netherlands also makes road pricing more difficult, as there is a lot of cross commuting between the Randstad cities and *"working and living is very separated"* (Interviewee F, 37). This is again in contrast to Singapore, where land use and transport planning have been integrated for many years to reduce the need to travel.

The timing of a number of the road pricing proposals in quick succession created a further barrier, as people did not understand the differences between them, and the negative feeling which had built up towards one scheme was transferred onto the next. Although the kilometre charge proposal involved pricing by distance rather than using cordons, many of the pubic thought *"well that's Rekeningrijden again"* (Interviewee F, 238), and therefore were strongly opposed to it. The Kilometerheffing proposals were viewed as *"too much too fast after Rekeninrijden"* (Interviewee F, 236), and Interviewee F from the ANWB suggested a *"cooling off period"* between the two proposals would have helped decrease public resistance to the scheme.

6.3.3 Lobby groups

The final institutional barrier faced by road pricing proposals in the Netherlands was created by the presence and activities of lobby groups. Lobbying is not really part of the culture in Singapore (see section 5.3.3), but in the Netherlands there is more of a tradition of political pluralism, and the Automobile Association (ANWB) played a key role in fostering opposition to the Rekeningrijden proposal. This barrier is closely linked to business acceptance which will be explored further in section 6.4.

Pluralist notions of politics suggest that individuals can actually exert more political influence as members of organizations and pressure groups than as voters, particularly members of very organised groups (Heywood 1992,283). These lobbying groups are able to adopt very distinct and clearly defined positions (Heywood 2002, 270), and attract members with shared goals to pursue a common interest. In the Netherlands, the ANWB was not only a large organization, it was also a vocal lobby group, which successfully mobilised both its own members and the general public to oppose the Rekeningrijden proposals. The ANWB did this by launching a campaign called "Stop Rekeningrijden" which helped generate public opposition to the scheme (see section 6.4.1), and as *"almost half of the Netherlands is a member of the ANWB"* (Interviewee S, 157) the campaign generated a great deal of media attention. This was further enhanced through an association with the *Telegraaf* newspaper, one of the largest in the Netherlands (Interviewee L, 81) which ran many stories opposing the scheme (Interviewee P). The ANWB also distributed car stickers to its members to raise the profile of the campaign (Interviewee S). The campaign was based on the argument that

the scheme simply would not work to reduce congestion, so motorists would have to *"pay to stand still in a traffic jam"* (Interviewee N, 57)[5]. As the only other similar pricing scheme in operation was in Singapore, the Dutch Ministry of Transport had little evidence with which to refute these claims.

It is generally accepted that the ANWB campaign played a very important role in the abandonment of the Rekeningrijden proposal. Interviewee G commented *"...they said "No Rekeningrijden", and when they say it you just stop"* (Interviewee G, 100) because they are such an influential lobby group. The campaign effectively decreased both public and political acceptance for the scheme (Interviewee P, 289), and these acceptability barriers will now be explored in more detail.

6.4 Acceptance of road pricing

The Dutch road pricing proposals faced acceptability barriers in all of the three areas outlined by Ubbels and Verhoef (2003); public, political and business acceptance. It is worth noting that these acceptance barriers are linked to other barriers. For example, public acceptance was influenced by the ANWB campaign, political acceptance was affected by both public acceptance and the system of coalition governance, and business acceptance was influenced by the role of lobby groups. The acceptability barriers and their links to other issues will now be explored.

6.4.1 Public acceptance of road pricing

The lack of public acceptance of the Dutch road pricing proposals was perhaps one of the most significant barriers that the road pricing schemes faced. Interviewee D, from the Ministry of Transport, commented *"there was no public support. No public support"* (Interviewee D, 21) particularly for the Rekeningrijden proposal. This was not only a problem in itself, but it also had the knock on effect of decreasing political support for the proposals (see section 6.4.2). The interview findings suggest the reasons

[5] The position of the ANWB was actually more complex than their media campaign would allow them to effectively convey (Interviewee N, 78). In order for the campaign to be successful they had to adopt a clear message against road pricing. In fact, the ANWB were in favour of a system of distance based charging, but they could not admit this at the time as it would have weakened their campaign.

for this public opposition can be divided into two categories; opposition to the principles of road pricing, and opposition to the specific details of the individual proposals.

Objections to the principle of road pricing are more difficult to overcome than objections to the details of specific schemes, as it is possible to modify scheme design to increase acceptance. However, by examining the reasons why people oppose the principle of road pricing it is possible to begin to consider ways that their objections can be overcome. During the research three reasons for public opposition to the principle of road pricing were identified, which are not specific to the Netherlands, but have been found in other countries (see section 2.4.2), including my own research in Southampton (see Chapter 7). The first argument is that *"motorists pay enough already"* in taxes (Interviewee D, 41), and are unwilling to pay any more. Interviewee N from the current Platform investigating road pricing commented that this feeling is exacerbated by the perception that the Government is not using this existing revenue to fund improvements in the road infrastructure (Interviewee N, 77), and that motorists *"pay more than they get"* (Interviewee K). This argument can potentially be mitigated by proposing a road pricing system that involves reforming the entire motoring taxation system so motorists pay *differently* for the use of the roads, and not more overall. The latest Dutch proposal (ABVM) is based on this principle, but as high mileage motorists will be paying more, they are likely to remain opposed to the idea.

The second common argument against the principle of road pricing is that public transport is not a viable alternative to the car, so people have no choice but to use their cars. Some of the common reasons cited include public transport not serving particular locations, many of the services which do run are perceived to be *"full already"* (Interviewee D, 41), they are not frequent enough and it is too costly. However, these arguments are unlikely to be totally objective, but rather are linked to peoples' attachment to, and dependence on, the automobile (see section 3.2).

Finally, many people oppose the principle of road pricing because they do not believe that congestion is bad enough to warrant a scheme. Although the Dutch policy makers were forward thinking in proposing road pricing before congestion became a crippling problem, the public view was that *"congestion is not severe enough"* to warrant it, and

a survey of ANWB members found *"people don't perceive it really as a problem"* (Interviewee Q, 141). However, congestion is increasing in many countries, and so people are gradually beginning to accept that it needs to be addressed. A number of interviewees suggested a consensus is emerging in the Netherlands that *"congestion has been getting worse"* (Interviewee P, 233), and some even went as far as suggesting road pricing is *"inevitable"* (Interviewee J, 267), as *"there is not really an alternative"* (Interviewee P, 233). These changing attitudes suggest the barrier of people opposing the principle for road pricing may decrease with time. A representative from Amsterdam City Council suggested they *"cannot wait until 2014"* for the current proposals to be implemented (Interviewee B, 126), but there is not the same sense of urgency and inevitability about road pricing in the rest of the Netherlands yet.

The (1994) Rekeningrijden cordon system was the most detailed of all the Dutch pricing proposals. Consequently, as well as objections from people who opposed the principle of road pricing, it also met with resistance because of the specific details of the proposals. There was specific opposition to the Rekeningrijden design because the *"average distance...between the charging points and the centre of the city would usually be something like 15km"* (Interviewee R, 362), so people using they ring-roads but not travelling to the city centres would still have to pay the charge. Interviewee M from the employers organization thought that was unfair (Interviewee M, 131), and increased public opposition to the scheme. Public opposition to the Rekeningrijden scheme was also increased by the "Stop Rekeningrijden" campaign launched by the ANWB (see section 6.3.3), which was high profile and had a *"very big impact"* on the public debate (Interviewee A, 130).

Public acceptance of road pricing proposals in the Netherlands was also affected by the person making the proposals. It is not uncommon for policy measures to become strongly associated with a political figure, such as London's congestion charge and the city's Mayor, Ken Livingstone (see also Gray and Hary 1990, 155 on Margaret Thatcher and the Poll Tax). In London the Mayor became a 'champion' for the congestion charge, and was able to gather the support of the general public, but also of a wide range of other stakeholders (see Chapter 2). However, the Dutch case study illustrates that if the figure associated with the scheme is not popular, then there can be negative repercussions for the policy. The main proponent of the Rekeningrijden and

Kilometerheffing proposals was the Dutch Minister for Transport Ms. Netelenbos, but because of her *"personal style"* (Interviewee K, 190) she was *"not a very popular person"* (Interviewee D, 39) with either the public or politicians[6]. This dislike of Minister Netelenbos is thought to have contributed to the failure of both of the proposals she tried to introduce (Interviewee P, 201). Indeed, Interviewee C from the Ministry of Transport suggested that, had the schemes been led by a more charismatic person, they may have got further and had more support from both the public and politicians (Interviewee C, 208).

Public acceptance of road pricing in the Netherlands was also low because of peoples' distrust in the Government, a phenomena which is also found in the UK. Many people simply did not believe the details that the Ministry of Transport issued about the road pricing schemes, as they had already experienced broken promises from the Government over fuel tax increases which were *"meant to be temporary, but [it] never disappeared"* (Interviewee A, 182). In particular, *"the sentiment that the government is not trusted with the tax payers money is so dominant"* that people did not believe the Government would spend the revenues from the scheme as they stated they would (Interviewee M, 171). As this distrust has built up over a long period of time, in relation to a range of policy issues, it is difficult to overcome completely.

6.4.2 Political acceptance of road pricing

The low public acceptability of road pricing in the Netherlands is closely linked to low levels of political support for the schemes. In the Netherlands politicians saw that public support for road pricing was low, and recognised that implementing a scheme may lose them a significant number of votes in the next election. As such the public acceptability barrier to road pricing influenced the political acceptability barrier. Road pricing has been described as a *"political hot potato"* at the best of times (Interviewee D, 253), and this is especially true in the run up to elections. In Singapore the ongoing electoral dominance of the PAP and the lack of effective opposition parties meant there was not the same concern about re-election. However, in the Netherlands political support for road pricing was closely linked to the four year electoral cycle, with the already low

[6] She earned the nickname "Tieneke Tollport" (Interviewee L). Tieneke was her first name, and Tollport means toll-booth!

levels of support falling in the run up to elections. The 4 million car drivers in the Netherlands form a substantial part of the electorate, and Interviewee M suggested politicians were *"afraid of electoral misfortune"* (Interviewee M, 155) if they supported road pricing. Interviewee S from the Ministry of Transport suggested *"the lack of social consensus was influencing the political consensus"* to abandon the road pricing proposals (Interviewee S,160), implying if public support for pricing was higher then the politicians may have been more willing to proceed with it.

6.4.3 Business acceptance of road pricing

It was not only public opposition to road pricing which decreased political support for the policy in the Netherlands, but it was also influenced by opposition from a number of powerful stakeholder groups such as Chambers of Commerce of the Randstad cities, and the employers organization VNO-NCB (Interviewee L, 43). These groups were much more vocal than the opponents of the Singapore scheme. The Randsad Chambers of Commerce argued the Rekeningrijden cordons would mean *"businesses will go elsewhere"* (Interviewee D, 526), and weaken not only the competitiveness of the individual cities, but also the competitiveness of the whole region within Europe (Harsman 2003, 147). A number of employers were concerned that road pricing would damage their competitiveness (Interviewee P, 241), both through direct increases in running costs, and with employees saying *"if you want me to work with you, well you have to pay my kilometre fee"* (Interviewee F, 118). This issue is explored with reference to the Southampton based firms in Chapter 7. Interviewee P, a Professor of Economics commented that modelling studies actually showed that many businesses would have benefited from the scheme (Interviewee P, 241), especially those with high values of time (Interviewee K, 282). However, as many of these businesses distrusted the Government, they did not believe the results of these studies.

6.5 Practical and technological barriers

The final set of barriers outlined by Ubbels and Verhoef (2003) are practical ones, which include technological barriers, and a number of both practical and technological problems were confronted by the Dutch road pricing schemes. The first practical barrier

occurred because of the timing of the Dutch proposals relative to international road pricing developments. When the majority of the Dutch schemes were proposed the only other road pricing scheme in the world (with the aim of managing demand) was in Singapore. This lack of road pricing schemes meant *"everybody perceived it as theory"* (Interviewee J, 295), and there was very little existing knowledge to draw upon when designing the Dutch proposals. In particular, very little was known about the likely effects of the proposals, meaning the media scare stories that road pricing would lead to increases in both the cost of driving and increasing congestion could not be refuted. One interviewee commented *"I think you need more courage to introduce it as the first, compared to if you want to introduce it when many others already preceded"* (Interviewee E, 143), as people tend to perceive the idea as radical, and not believe it will work. After the introduction of congestion charging in London in 2003, and more recently in Stockholm, there is now more confidence that road pricing can work, and one interviewee suggested the introduction of the London scheme put road pricing *"back again on the Dutch agenda"* (Interviewee R, 291). This increase in the profile of road pricing around the world means the lack of schemes is less of a problem today than it was in the past, although many of the public still find it controversial.

The other two practical barriers to road pricing which emerged from the interviews, a lack of consultation and poor communication, were actually created by the approach of the Dutch Government. Stakeholder consultation is important in new policy formation, as it helps ensure that policies are effective, and have the support of the majority of the groups affected. However, the Dutch Ministry of Transport did not consult about any of their road pricing proposals, and *"there was no amendment possible on the proposal"* (Interviewee N, 94). Stakeholders either had to accept the proposals as they were, or not at all, so many were opposed to it, even though they may have supported the principle of road pricing. The Dutch Ministry of Transport have since adapted their approach to consultation and actually put together a *"platform"* of seventeen stakeholders to advise them on developing the most recent proposals. The platform includes transport groups, employers, environmental groups, local authorities, the ANWB and so on (Interviewee N); and as they have helped develop the proposals they will be more accepting of them than they were in the past.

Related to the lack of consultation are the barriers created by poor communication from the Ministry of Transport about the proposals to the public. This was actually a deliberate move by the ministry, and the Project Manager of the Rekeningrijden scheme was actually told *"he was not expected to discuss details of this scheme in public"* (Interviewee M). Interviewee C, a civil servant, commented *"we were not allowed to communicate"* [about Rekeningrijden] because the Minister *"wanted to get political deals"* before going to the public with a campaign for the scheme (Interviewee C). As it was thought to be *"very risky"* (Interviewee E) to communicate about the road pricing proposals at an early stage they were *"developed in the ministry, and then went out to the public once it was very detailed"* (Interviewee O). However, this did not work and details of the schemes were leaked to the public via the media, and often misinterpreted (Interviewee K, 178). This led to increasing opposition to the proposals, and information which could correct the misconceptions and increase public support could not be divulged (i.e. that people driving under 16,000 km per year would be better off, Interviewee E). Interviewee K from the Economics Research Institute suggested that *"many people would change their view if they really knew and understood that congestion would fall quite sharply after the introduction of such a measure"* (Interviewee K, 177), although public distrust in the Government may have meant people did not believe what they were told.

As well as these practical barriers, there were also a number of specific technological barriers to road pricing in the past. The limited technology available in 1991 was a problem for the Tollpleinen Scheme, which was designed to be enforced by roadside gantries. As the road network was already very dense there was not enough space available to erect these gantries at the sides of the roads (Interviewee P, 53). A lack of available technology was also a barrier that influenced the Rekeningrijden proposals. The Ministry of Transport knew Rekeningrijden was not ideal, and always aspired to have a distance-based charge, *"because it is more equitable, fair"* (Interviewee L). However, *"because it was technically not feasible, we thought we said well for the short term...we need something else, so we had Rekeningrijden"* (Interviewee L, 31). Even though it was simpler than a distance based scheme there were concerns about the technology that would be used for the Rekeningrijden scheme because although it would work in theory, there had not been large-scale tests elsewhere to prove that it would. It is generally agreed that there are no significant technological barriers to the

implementation of time and location differentiated road pricing today (Raux and Souche 2003, 153), and if there was demand for the technology it could be developed. In the Dutch case, and also the UK, the institutional and acceptability barriers are likely to be more significant in preventing the uptake of road pricing schemes.

6.6 Transferability of results

Having examined the reasons for the failure to implement road pricing in the Netherlands, it is worth briefly considering how transferable these are to the UK and Southampton. Overall, many of the barriers faced by the Dutch road pricing proposals are general and likely to be found in other countries considering road pricing, although they may play out differently because of the local circumstances. For example, a lack of political acceptance of road pricing could be a problem in many countries, but it was exacerbated in the Netherlands because of the system of coalition governance. A number of the other barriers which could apply in the UK include; declining political support in the run up to elections; there is no established principle of road pricing besides in central London; people are dependent on the automobile; there are strong lobby groups; congestion is not perceived as a bad enough problem to warrant charging; people do not trust the government, especially over the use of revenues from the scheme; and motorists feel they pay a lot of taxes already. The extent which each of these barriers applies will depend on the details of any scheme, and how they are presented by the Government. The Singapore and Netherlands case studies show that the barriers can play out differently and be more or less of a problem in different contexts. The transferability of each of the barriers and sub-barriers are explored in more detail in Tables 6.7, 6.8 and 6.9 with reference to Singapore as well as the Netherlands.

6.7 How useful is the barriers metaphor?

Having used the metaphor of barriers to road pricing in this chapter and loosely in Chapter 5 to examine the success and failure of road pricing, it is worth reviewing how helpful it has been, and noting its limitations. The notion of barriers first emerged

during my fieldwork in the Netherlands, which was conducted before the case study of Singapore. As the barriers metaphor had been used by Ubbels and Verhoef (2003) it was decided to map the findings onto their framework of three kinds of barrier, adding more detail to their work, rather than revising it and 'reinventing the wheel'.

The metaphor of barriers to road pricing is helpful because of its negative connotations, which helps stress the many difficulties faced when attempting to implement road pricing policy. This emphasises the possibility that a single large barrier could be enough to cause a proposal to fail, but to be a success many different barriers must be overcome (Hall 1980), a situation that favours maintenance of the status quo. However, this did mean the metaphor was less appropriate in the Singapore context for looking at the reasons why road pricing was successful, as this was more to do with a series of enabling factors than a lack of barriers. Although the barriers metaphor is a good starting point, there are a number of issues that it does not capture very well. For example, it is not implicit that barriers are dynamic and can be erected over time, and that they interact with each other rather than being discrete. That said, it is possible to work these elements into the barriers metaphor, and there is no other concept which could really capture them any more effectively. The notion of barriers could also be developed further to emphasise that while some barriers can be anticipated in advance, whereas others are more like 'hidden pitfalls'. Ubbels and Verhoef (2003) did not explicitly mention the role of policy history (both transport and land use related), which this research has shown is particularly important in the success of road pricing proposals.

This chapter and Chapter 5 have shown that two key differences between Singapore and the Netherlands made an important difference to the success of road pricing were the different political arrangements and the levels of automobility, which are influenced by the history of policy restraints. Although the barriers metaphor did capture these institutional issues, the importance of the level of automobility in a country does not fit neatly into either of the three barrier types, and could potentially be overlooked. In this chapter automobility has been discussed as a policy history issue under institutional barriers, and as a public acceptability barrier. Future research should be sure to consider automobility as an important factor in the success of road pricing schemes, as it is not implicit in the three current barrier types. Although the barriers metaphor is a helpful

starting point for looking at the failure, and to some extent the success of road pricing schemes, it is important to be aware it does oversimplify, as barriers are not static or discrete, and could benefit from further development.

6.8 Conclusion

This chapter should be considered alongside Chapter 5, which looks at the contrasting example of the success of road pricing in Singapore, and as such this conclusion will also refer to some of the key findings of that chapter. This chapter has shown that road pricing in the Netherlands faced a wide range of barriers, which have been categorised as institutional, acceptability and practical. Whereas in Singapore many enabling factors meant there were few barriers to the introduction of road pricing, over time the Dutch proposals faced barriers in all three of these areas. Not all of these barriers occurred for each proposal, and this chapter has concentrated on pulling out the overall issues, rather than looking at each proposal in turn. The different types of barriers have been shown to overlap and interact with each other in a number of cases, which resulted in the barriers becoming larger. For example, the practical barrier of poor communication and a lack of consultation, decreased the public and business acceptance of the schemes, which in turn led to declining political support for the proposals. The Dutch political context meant the political acceptance of road pricing was closely related to its public acceptability, as politicians feared losing votes in elections and therefore losing their seats in parliament.

There are two notable differences between the Netherlands and Singapore which added to the difficulties implementing road pricing in the Netherlands. Firstly, the lack of a history of policy controls on the automobile in the Netherlands meant that it became a dominant mode of transport for many of the population, who became dependent on it, and emotionally attached to the freedoms and flexibility that it provides compared to public transport. As a result, public acceptance of road pricing was low. In contrast, in Singapore the automobile did not become as pervasive, and therefore measures which restricted its use impacted upon less people. Secondly, the Dutch political structure of coalition governance made it difficult to get wide enough agreement about the need for road pricing to implement it, and the regular changes in the composition of the coalition

led to policy changes. In contrast, the dominance of the PAP in Singapore meant they were able to push through policies without political support, and their ongoing electoral success ensured policy continuity and improved their ability to integrate transport and land use planning. The UK's levels of automobile ownership are more similar to those in the Netherlands, and its political system is somewhere in between that of Singapore and the Netherlands, with neither one long-standing dominant party, nor a coalition. As a result, the UK is likely to face some of the public acceptability issues to implementing road pricing that were seen in the Netherlands, and probably also a number of the political issues. The final part of this chapter will now bring together the findings from the two case studies in more detail, discuss their relevance for the UK, and identify some lessons for future road pricing schemes.

6.9 Case study conclusions

The two case study chapters have identified a range of issues and barriers that influenced both the success of road pricing in Singapore, and its failure in the Netherlands. These barriers will be drawn together here, before examining their transferability to the UK and the lessons that can be learnt for future schemes. Tables 6.4 to 6.6 summarise the three different types of barriers identified by Ubbels and Verhoef (2003), and how they contributed to the success of road pricing in Singapore, and its failure in the Netherlands. The barriers worked in very different ways in each of the countries, and really did facilitate rather than hamper the introduction of road pricing in Singapore. It has been helpful to look at two contrasting case studies, as it has been possible to examine how barriers can present problems for road pricing, but also to show how in different circumstances enabling factors can facilitate its introduction. This helped present a balanced picture, and ensure the lessons and recommendations were well informed. It also enabled some of the limitations of previous research to be overcome, much of which only discussed one example of road pricing, and therefore tends to have more of a one sided view about the reasons for either the success or failure of schemes.

Table 6.4: Summary of the institutional barriers contributing to the success and failure of road pricing in Singapore and the Netherlands

Sub - barrier	Contribution to the success of road pricing success in Singapore	Contribution to the failure of road pricing in the Netherlands
Political system	o The dominance of the PAP meant they could implement radical policies without concerns over being challenged or getting re-elected o The ongoing electoral success of the PAP ensured policy continuity o A single tier of Government simplified both policy making and implementation	o The system of coalition governance meant it was very difficult to achieve political consensus on the need for road pricing o Any political consensus which did emerge broke down as elections approached every 4 years, as politicians distanced themselves from road pricing to win more votes
Policy history	o As the ownership and use of automobiles was controlled from an early stage, people did not become dependent on them. The car is viewed as a luxury item rather than a necessity, and not part of everyday life o The principle of road pricing was established in the 1970's, and over time people accepted it as a 'natural' part of driving in Singapore o Top down integrated transport and land use policies reduced the need to travel and therefore dependence on the automobile	o The growth of automobile ownership and use was not restricted, and many people's lifestyles became dependent on it. As people viewed their cars as necessities they opposed the idea of road pricing o As the principle of using market principles to allocate road space is not established to date, it is difficult to introduce it, especially against a background of automobile dependence o The ongoing debate about various road pricing proposals increased public resistance to them, and people did not understand the differences between the various proposals
Lobby groups	o There were no lobby groups, and no culture of lobbying so this did not present a problem for road pricing	o The powerful and vocal lobby groups (i.e. the ANWB) launched a high profile campaign against the Rekeningrijeden scheme which successfully mobilised both political and public opposition against it

Table 6.5: Summary of the acceptability barriers contributing to the success and failure of road pricing in Singapore and the Netherlands

Sub-barrier	Contribution to the success of road pricing in Singapore	Contribution to the failure of road pricing in the Netherlands
Public acceptance	o The Singaporean public are generally accepting of Government policies, and believe they are acting in societies best interests o The Singaporean public generally put the interests of society as a whole before their own. o The notion of the 'right to drive' does not apply, and was therefore not used as an argument against road pricing	o Congestion was not seen as bad enough to warrant road pricing o Public opposition was increased by the ANWB's high profile campaign against the Rekeningrijden scheme o There was public distrust in the Government, particularly over the use of the revenues from the schemes
Political acceptance	o There were no opposition political parties with enough power to challenge the policies of the PAP	o Not all political parties within the various coalitions supported road pricing, which made it very difficult to implement o Political acceptance of road pricing was heavily influenced by public acceptability of the proposals, because of parties desire to win votes and be re-elected
Business acceptance	o There was some opposition initially, but businesses did not vocalise these strongly o The PAP increased business acceptance by offering rebates in other business taxes to offset the costs of ERP o The PAP were confident and dominant enough to implement road pricing and make changes to the scheme despite the concerns of businesses	o Employers organisations and Chambers of Commerce of the major cities vocally opposed the schemes, particularly Rekeningrijden

Table 6.6: Summary of the practical and technical barriers contributing to the success and failure of road pricing in Singapore and the Netherlands

Barrier	Contribution to the success of road pricing in Singapore	Contribution to the failure of road pricing in the Netherlands
Practical	o The PAP were not afraid to be the first in the world to implement a scheme, but saw it as an opportunity to showcase their technology	o At the time road pricing was first proposed in the Netherlands there were no other schemes in the world to learn from, besides Singapore o Poor communication and a lack of consultation increased public and other stakeholder opposition to the schemes, and caused misunderstandings
Technological	o Extensive testing ensured there were no problems with the equipment before charging began o The scheme technology became operational before charging began so people could become familiar with it and any final problems were identified and resolved	o There was physically not enough space at the roadsides for the toll plazas proposed by the Tollpleinen scheme, and the technology was not available for a more advanced scheme in 1991 o There were doubts over whether the Rekeningrijden and Kilometerheffing proposals would be technologically possible, and who would pay for it

Singapore and the Netherlands represent different political extremes, from single party dominance to a coalition of multiple parties, and this undoubtedly had an important influence on the implementation of the road pricing proposals. It was significantly easier to implement road pricing in Singapore where there was a lack of effective opposition parties, compared to in the Netherlands where the coalition system of parties from different backgrounds meant consensus on the need to introduce road pricing was unlikely to be achieved, particularly in light of the regular elections. However, there were also a wide range of other factors influencing the success of road pricing such as policy history, public acceptance and the role of lobby groups. Having examined the reasons for the success and failure of the road pricing case studies, it is worth considering how their experience can be translated into other contexts, and the lessons which can be learnt from them. Tables 6.7 to 6.9 examine the transferability of the three types of barrier and enabling factors for road pricing, the implications of this for the UK and the lessons that can be learnt from past experience (see also Schade and Schlag, 2003, and Richards, 2006).

Table 6.7 Transferability of political issues to the UK / Southampton and lessons for the future

Sub - barrier	Transferability	Application to the UK / Southampton	Lessons for the future
Political System	o The difficulty obtaining agreement about road pricing is a general problem, which played out in specific ways in Singapore and the Netherlands because of their Governance structures o The lack of policy continuity after a change in government is likely to apply in many countries	o The UK fits between the two political extremes of Singapore and the Netherlands. Although there are likely to be problems getting consensus on the need for road pricing in the UK, it is likely to be easier than under the three party system in the Netherlands o Unless there is political consensus on the need for road pricing in the UK at both a national and a local level it is likely to be vulnerable to changes in Government	• The more power any one political party has, the easier it will be for them to implement road pricing. • As political support for road pricing is likely to fall in the run up to elections, politicians should ideally begin implementing schemes as soon as possible after they are elected. • Having a single tier of Government, or national Government taking the lead through a top down approach will simplify the introduction of road pricing. Individual cities are concerned road pricing may damage their economic competitiveness, and are therefore often reluctant to implement schemes.
Policy History	o Countries with high levels of automobile dependence are likely to find it much harder to implement road pricing then where use of the automobile has been restrained more in the past o If countries do not have a precedent for the principle of road pricing it will be difficult to introduce it	o The UK has similar levels of automobile dependence to the Netherlands, so could encounter similar resistance to road pricing o The principle of using market mechanisms to allocate road space is not established in the UK. As people have been relatively free to drive as and when they wish to date road pricing is likely to meet with resistance	• How the automobile has been treated in the past, and how dependent people have become on it has an important impact on public acceptance of road pricing. If growth of automobile ownership and use have been restricted for a long time this will become the norm, and road pricing will meet with less resistance. • Transport and land use planning should be integrated to reduce both the need to travel and dependence on the car
Lobby Groups	o Many countries have lobby groups which are likely to be vocal if they oppose road pricing proposals, particularly if they are not consulted	o Groups in the UK such as the AA, RAC, Chambers of Commerce and other business groups could potentially oppose road pricing	• Lobby groups should be consulted and engaged in road pricing proposals from an early stage to minimise their opposition to the scheme.

Table 6.8 Transferability of acceptability issues to the UK / Southampton and lessons for the future

Barrier	Transferability	Application to the UK / Southampton	Lessons for the future
Public Acceptance	o Congestion not being perceived as bad enough to warrant road pricing is a general problem that could occur in many countries	o This argument has been used in the UK against road pricing, and was also made by interviewees during the Southampton based interviewees. However, people did often acknowledge that the situation could become worse in the future and road pricing may become necessary	• People must perceive there to be a congestion problem which needs to be addressed before they will support road pricing • Public transport should be perceived as good and a viable alternative to the car
	o Low public acceptance of road pricing is a general problem, but can influenced positively or negatively by other factors, such as campaigns for or against road pricing	o Low public acceptance is likely to be a problem in the UK until the public mood towards road pricing becomes more favourable. As the automobile has had a relatively free reign to date people have become dependent on the freedoms and flexibility that it offers, and see public transport as a poor alternative	• Policy makers should be flexible about the details of road pricing proposals. Trade offs in perfect scheme design can be made to increase public acceptance. • The history of the road pricing debate plays a role in acceptance, as strong negative feelings can build up, so this needs to be carefully managed
	o Opposition to the details of road pricing proposals could occur in many counties, particularly if stakeholders are not consulted during scheme design	o This could occur in the UK and Southampton. The debate in the UK to date has shown people have particular concerns over privacy issues associated with GPS technology	• A strong popular figure can help increase public support for proposals by "championing" the schemes, but an unpopular one can have the opposite effect
	o Distrust in the Government, particularly over the use of the revenues from road pricing applies in many countries	o People in the UK are often sceptical about how the Government would use the revenues from road pricing, and perceive it as "another tax"	

Table 6.8 (continued) Transferability of acceptability issues to the UK / Southampton and lessons for the future

Barrier	Transferability	Application to the UK / Southampton	Lessons for the future
Public acceptance (continued)	o Arguments are made in many countries that motorists pay enough already, and that they should not have to pay more because existing taxes are not reinvested into public transport and the roads o The unpopular transport minister was specific to the Dutch context, but illustrates the more general point about the importance of people to champion schemes	o This argument has been used in the UK road pricing debate, and needs to be tackled by the Government at a national level. Public transport improvements should be made in advance of road pricing. o Champions for schemes in the UK may help to increase their acceptability, but it remains to be seen if there are suitable candidates	• See previous page
Political acceptance	o Declining political support for road pricing as elections approach is likely to be a problem in democratic countries with regular open elections	o This could occur in the UK at both a national and a regional / city level. Currently national Government is encouraging Local Authorities to implement schemes rather than taking a top down national approach, so it is most likely to be a problem at the regional / city level.	• Politicians wishing to implement road pricing should do so as soon after elections as possible • The UK example has shown that cities have been reluctant to take the bottom up approach and implement schemes without strong encouragement from national government.
Business acceptance	o Business stakeholder opposition is a general problem, and was made worse in the Netherlands by the ANWB campaign	o This barrier could well occur in the UK. The interviews with businesses in Southampton did reveal some opposition to the principle of road pricing, although whether and how this would be articulated needs further research.	• As with other lobby groups, businesses should be engaged in the proposals from an early stage to minimise their opposition.

Table 6.9 Transferability of practical / technological issues to the UK / Southampton and lessons for the future

Sub-barrier	Transferability	Application to the UK / Southampton	Lessons for the future
Practical	o The lack of other road pricing schemes at the time of the Dutch proposals was quite a specific barrier. There are now more schemes such as London and Stockholm, and the profile of road pricing around the world is gradually increasing o Poor communication and a lack of consultation was a specific problem in the Netherlands, but could potentially also occur elsewhere	o This is still likely to be a problem as road pricing is not a common policy, and there will be arguments about the transferability of the results from other countries. However, the success of the London congestion charge is likely to help the case for road pricing in the UK o There is already confusion about the Government's intentions for road pricing in the UK. The situation should be clarified as soon as possible to avoid misunderstandings and correct incorrect assumptions	• It is likely to be easier to implement a scheme that is similar to an existing one than to do something new as people will see that it can work • Good communication is vital to avoid misunderstandings and therefore increase acceptance • Stakeholder consultation is important to get stakeholder "buy in" to the proposals
Technolog-ical	o The lack of available technology is generally accepted to be less of a problem today than it was in the past, although some doubts remain about the level of sophistication that could be achieved	o There is some uncertainly over the development of a national GPS based system, and particular concerns over privacy	• It is likely to be easier to implement a scheme based on existing technology than something new. People are likely to be more accepting if they can see that it will work • Extensive testing will help increase confidence in the system, especially if part of it can be conducted by the scheme users • The technological requirements of local and national schemes should be developed in parallel to ensure interoperability

Given the factors that have been highlighted as important in the successful introduction of road pricing, and the lessons emerging from these, a number of potential barriers to its introduction in the UK (and therefore Southampton) can be identified. These include political barriers, but also acceptance and practical ones. The barriers which are potentially the largest are outlined in Table 6.10, along with a brief comment on their potential to be overcome. Although there are obstacles to the implementation of road pricing in the UK, identifying them is one of the first steps in beginning to address them, both at a national level and specifically in cities which are thinking about introducing charging.

Table 6.10: Potential obstacles to the implementation of road pricing in the UK

Potential problem	**Potential to be Overcome**
The automobile system is well established, and many people are dependent on the car and view it as a "necessity"	Although it is more difficult to decrease levels of automobile dependence than to prevent them occurring, it is possible, and significant modal shift towards public transport has been achieved since the introduction of the London Congestion Charge.
Public transport is seen as poor, especially compared to the convenience of the automobile	Road pricing revenues could be used to fund public transport improvements, although to maximise support these improvements should be substantial, and be made prior to charging beginning.
The three-party system and regular competitve elections means politicians are likely to be reluctant about supporting controversial policies like road pricing	There may be national political agreement on the need for road pricing as issues like sustainability and worsening congestion come to the fore. It could emerge as a topic at the next general election, so time will tell!
The UK public could potentially be vocal in their opposition to road pricing, and there has already been a high profile petition against national road pricing on the Downing Street website which received over one million signatures	Public opposition to road pricing may decrease over time as the debate gets more media attention, congestion becomes worse and people start to understand more about the principles of road pricing. Good communication and information from the Government could help to increase acceptance

It is important for authorities considering implementing road pricing to be aware of the barriers that their proposals are likely to face, and the two case studies have explored these issues, and outlined ways which they can be overcome. The barriers to road pricing identified in this chapter and Chapter 5 have not only occurred in the Netherlands, but also to an extent in other countries that have considered road pricing. In particular, concerns over public acceptability and low numbers of schemes from which to learn lessons has led to a general reluctance to implement road pricing. This is a cyclical problem as the lack of schemes fuels policy makers' reluctance to adopt road pricing, which means no more schemes are implemented for others to learn from! This practical barrier to road pricing means that not much is known about the effects of road pricing policy, and this has made many authorities, including Southampton City Council cautious about it. Southampton City Council were particularly interested in the economic effects of road pricing on the city, and that is the issue which the next two chapters will explore. In the absence of many operational road pricing schemes, research into its potential effects of road pricing should begin to help overcome the barrier of a lack of existing knowledge about the policy.

Chapter 7 – Locational responses of businesses to road pricing in Southampton

7.1 Introduction

One of the issues which often concerns policy makers about urban road pricing is its potential negative economic effects, particularly if the charge causes businesses to relocate out of a city. As there are still so few operational pricing schemes around the world, relatively little is known about these economic effects, and this uncertainty makes policy makers reluctant to implement schemes. Examining the full economic impacts of a road pricing scheme is a large task, which would need to include not only the effects of a charge on shoppers, tourists and other visitors to the city, but also its effect on employment patterns, the demographics of the city, leisure trends and a range of other issues. This chapter (and Chapter 8) will begin to explore the potential economic impacts of road pricing in Southampton, in order to answer the second research question posed in Chapter 1. It will focus on the specific issue of business responses to such a charge, an area where there has been little research to date. This chapter will draw on findings from a total of fifty-nine interviews with businesses in Southampton, including three detailed case studies with selected firms. A list of firms interviewed, and their type, was given in Table 4.2. Some basic background information about the three case study firms can be found in Appendix C, and contextual information about Southampton was discussed in Chapter 1.

Perhaps the most drastic response that a business could make to a road-pricing scheme is to relocate out of the city that introduces it. This could potentially harm the city's economic competitiveness, especially if new businesses are not attracted in to replace the firms which have relocated. Growing concerns over the increasing footloose nature of firms (Bryson 1999, 12), along with the migration of manufacturing firms to low cost locations in developing countries, make local authorities reluctant to implement policies like road pricing which they fear could deter firms from locating in their cities, or cause existing firms to relocate. This was not a concern in London as it is the capital city of the UK, offers considerable advantages to businesses, and therefore does not face the same levels of competition from surrounding cities as Southampton and other provincial

cities in the UK. Singapore also lacked concerns about businesses relocating in response to road pricing because the island is a city-state, so the single layer of Government would receive taxation income from the firms no matter where on the island they were located.

This chapter will begin the analysis of possible responses of businesses to road pricing in Southampton by examining firms' potential locational responses. This will be understood through the concepts of local embeddedness, and sunk costs, which were discussed in Chapter 3, along with the related notions of footloose firms and "sticky places" (Markusen 1996). Chapter 8 will then go on to examine the less drastic non-locational responses. These two chapters are based on forty-four in-depth interviews with firms in Southampton, and three more in-depth case studies with selected firms (which involved fifteen interviews), giving fifty-nine interviews in total. The three case studies involved interviewing a number of people within one firm, which allowed the comments of interviewees to be verified (see Chapter 4), and were deliberately chosen to illustrate the issues arising in a range of different sectors.

This chapter will begin by exploring the level and type of local embeddedness of businesses in Southampton in three dimensions; territorial embeddedness, network embeddedness, and ties due to specific local characteristics of Southampton. It will then go on to examine how this local embeddedness affects firms' locational responses to a road pricing scheme in the city, by dividing firms into five categories, as follows:

- Businesses that would not relocate:
    1. Unaffected firms
    2. Locally embedded firms who cannot relocate
- Businesses that could potentially relocate (and are not locally embedded):
    3. Firms which are not affected enough
    4. Firms already considering relocation, for whom road pricing may be the 'final straw'
    5. Firms which would relocate because of road pricing alone

Each of these types of firm will be discussed in turn, highlighting that, for various reasons, relatively few businesses would relocate because of road pricing alone; so the effect on the economy will not be as extreme as policy makers sometimes fear.

Locational responses to road pricing could in fact have a positive effect on the cities economy, if more businesses were attracted to the city. This could arise because the charge created an environmentally friendly image for the city, and helped to solve its transport and congestion problems. Overall road pricing could result in an increased quality of life in cities, and make them more attractive to the "creative class" which are becoming an increasingly important part of modern economies (see Florida 2002, section 2.5.1). It is not certain how likely this is, and the issue has not been explored in this thesis because of concerns amongst Southampton City Council about interviewing businesses who were considering locating in the city. However, this could be an area for further research in the future.

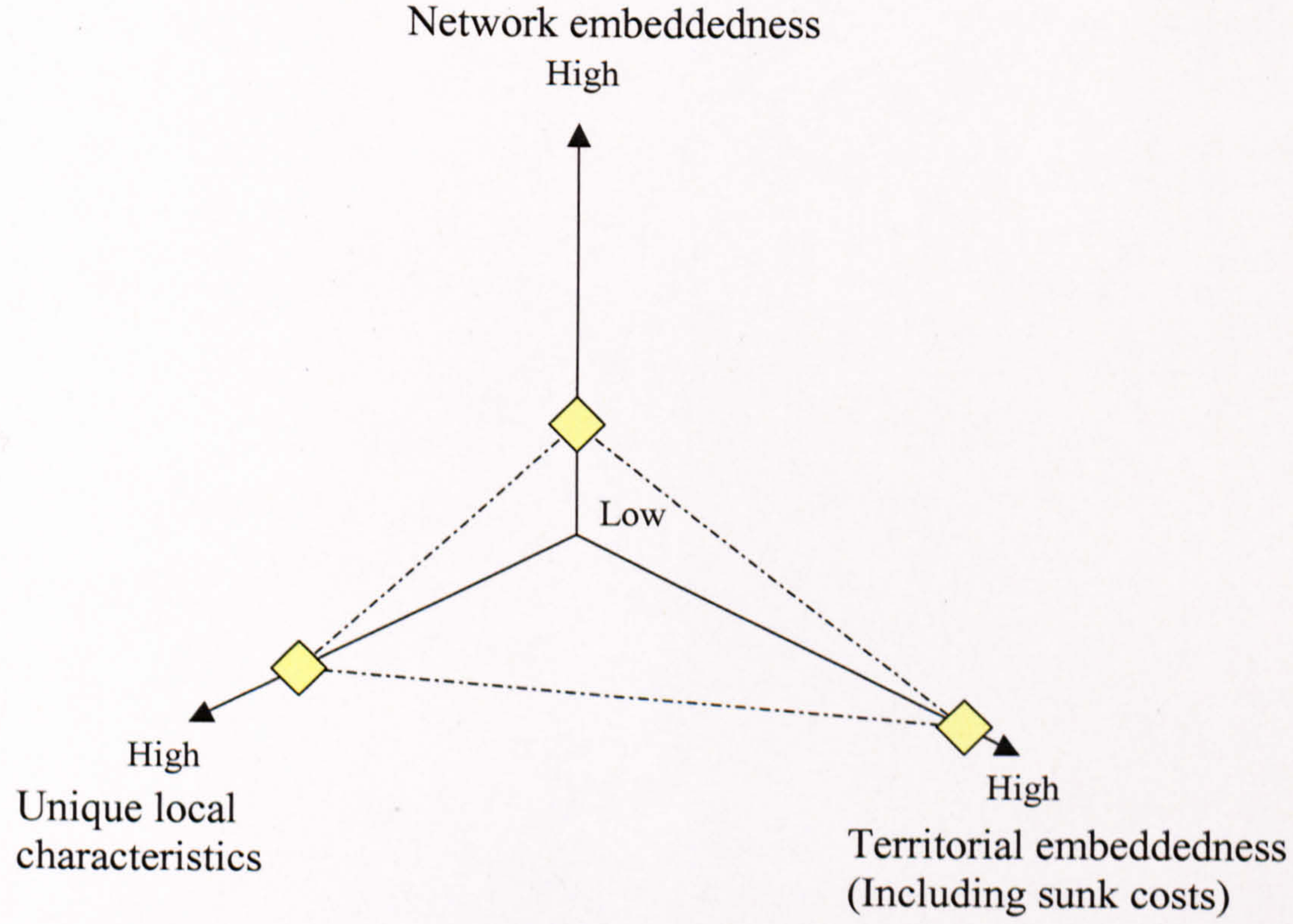
7.2 Local embeddedness

Many businesses are actually not as 'footloose' as is often assumed (see Bryson 1999), and there are a number of different reasons why they may not relocate as a response to road pricing. These reasons will be explored in this chapter through the notions of local embeddedness (see Chapter 3), particularly territorial and network embeddedness (Hess 2004). Territorial embeddedness explores how factors such as sunk costs in physical assets tie firms to a particular location. Sunk costs have historically been used as a factor explaining business location decisions (see Clark and Wrigley 1997), but the notion of territorial embeddedness goes beyond this to look at a range of other factors, including the local sourcing of products and tailoring of end products to specific local markets (see Wrigley *et. al.* 2005 and also Irmie *et. al.* 1995). Network embeddedness looks more broadly at how firms can be tied to a location through their established working relationships with other firms (Grabher 1993), an idea that can be applied to the cluster of port-related businesses in Southampton (see section 7.3.1). Firms can also be embedded because their location offers some sort of unique characteristic or combination of characteristics which are not found in many other places, for example the presence of a deep water port with a double tide. This type of embeddedness

overlaps with the concept of local dependency (see Cox and Mair 1988), which was also discussed in Chapter 3.

This research has identified all of these types of embeddedness in firms in Southampton, which affects their responses to a road pricing scheme in the city, and means that certain firms are unlikely to relocate in response to a scheme. The three dimensions of embeddedness which are relevant for this chapter are illustrated diagrammatically in Figure 7.1 as an 'embeddedness triangle', and firms can be plotted on each of the three axes. In the example given the firm displays high territorial embeddedness, relatively high embeddedness because of unique local characteristics, and low network embeddedness.

Figure 7.1 The 'embeddedness triangle'



Although Figure 7.1 may over-simply firms ties, it is a helpful way to visualise the different types of embeddedness, and the details will be explored later in the chapter. A

3-D graph would provide a better representation, but this is not graphically possible in this thesis. Ties due to local characteristics are really a sub-set of territorial embeddedness, but they will be considered separately here as they are relevant for a number of different firms in Southampton. They can be considered as contributing to the "stickiness" of Southampton (see Markusen 1996), and increasing its ability to retain existing firms. In this thesis network embeddedness includes links with other firms, but also encompasses the societal embeddedness of firms and their employees. The triangle helps to illustrate that firms' can be embedded for more than one reason, and can also be embedded to different degrees. For example, a firm with high sunk costs *and* also a dependence on local characteristics will be even less likely to relocate than one which just has high sunk costs. It is not the intention to quantify the levels of embeddedness, but rather to provide an indicative illustration that some firms display different amounts of different types of embeddedness. This chapter will discuss the nature and extent of the embeddedness of a number of different firms, as this will affect their responses to a road pricing scheme.

Although the term 'local' embeddedness will be used in this chapter, it is important to clarify that embeddedness can actually occur at many different scales, which may not necessarily be local. Businesses can be embedded at the micro-scale of their particular sites, but also at the city, sub-regional or regional scale and possibly even at a larger scale. It is also important to be aware that embeddedness is not always a permanent state, but the processes of both embedding and disembedding can mean that firms levels (and type) of embeddedness change over time. Potentially, road pricing could harm the competitiveness of firms, and lead to disembedding if the firms consider relocating to an area without a charging scheme. If they are not replaced by other firms then ultimately this could lead to an economic decline in the area. The issue of whether road pricing is likely to lead to disembedding will be explored further in this chapter.

7.3 The embeddedness of Southampton's firms

Before exploring how local embeddedness affects firms' responses to road pricing in Southampton, it is necessary to outline the characteristics of the embedded and non-embedded businesses in the city.

7.3.1 Locally embedded businesses

During interviews with firms in Southampton, a range of different types of tie were uncovered, which are summarised in Table 7.1[1]. These ties are clearly more complex than can be portrayed in the table, and are not intended to be representative of the broader community of firms in the city. Rather, the table highlights a range of different types of tie, which will be explored further in section 7.4.

It is not appropriate to generalise about the types of firm which are embedded in Southampton, but they do broadly fit into the three types of embeddedness outlined in Figure 7.1 overleaf. Three of the businesses listed in table 7.1 have annual turnovers of £120m, £28m and £10m, and as such their levels of investment and sunk costs are also large. They can be considered as territorially embedded. For example, Business R, a transport provider, have *"got millions of pounds worth of infrastructure in place"* (Business R, 398) and have invested in bespoke equipment which would be costly to move. The interviewee from Business JA, a chemical manufacturing company, commented; *"We have invested too much into this site... In the equipment, the clean rooms...it is not a simple case of us just getting up and moving to another site...the expenses associated with moving would be astronomical"* (Business JA, 367). Both of these firms would have large exit sunk costs (Clark and Wrigley 1997), and as such would need a very good financial imperative to consider relocation.

[1] As this thesis is not based on a representative sample of firms in Southampton, this table is unlikely to cover all the forms of embeddedness which occur in Southampton.

Table 7.1 – Locally embedded businesses in Southampton

Business	Type	Type of Tie
AA	General industrial	Unique local characteristics – the port
C	Business park	Specific site requirements
F	Manufacture and retail	Specific site requirements
FA	Transport provider	Contract with Local Authority
GA	Public house	Location is integral to the business
JA	Manufacture (Chemicals)	Sunk costs in equipment
M	Retail (Clothing)	Strategic location in national chain
MA	Assembly and leisure	Location is integral to the business
NA	Professional services	Sunk costs and established customer base
O	Storage and distribution	Network embeddedness - closely linked to a firm with high sunk costs and reliance on local characteristics
P	Financial services	Customer base
Q	Storage and distribution	Unique local characteristics – the port
R	Transportation provider	Sunk costs in equipment and infrastructure, location specific requirements (the port)
RA	Manufacturing	Unique local characteristics (the port) and sunk costs
S	General industrial	Unique local characteristics – the port
SGH	Public sector organization	Sunk costs and customer base
W	Retail	Location is integral to the business

As well as being territorially embedded, a number of the firms are tied to Southampton because of factors related to the city's unique characteristics as a deep water port and a major cruising centre, which is home to both the QE2 and QM2. Southampton's naturally deep water and rare double-tide has helped it become a booming port, particularly for ships with large draughts. Five of the businesses in Table 7.1 are embedded because of their need to be near the port[2], and the nature of their work means they often have large sunk costs. Some of these firms are embedded by the lack of other

alternative sites, for example one interviewee from a port-related firm said; *"we need the deep water, and the distance, when you look at it from our [product sourcing] area... there isn't any alternative"* (Business S, 300). Business S, and many of the other port-related firms can be considered as 'stuck' in Southampton, because of the deep water port facilities which are not available elsewhere in the UK. For businesses associated with the cruise industry, proximity to the port can be an important benefit which enhances their competitiveness. For example, Business AA (37), does work on cruise ships, and is able to 'nip on' to the liners the same day that they arrive, and Business L (33) felt their location gave them a *"distinct advantage"* because they are able to provide a more *"comprehensive service"* than their competitors further from the port. Other cities in the UK may also have city-specific factors which embed businesses, acting alongside more general reasons for embeddedness like sunk costs, embeddedness of staff and availability of labour. Research into this should be conducted on a city-by-city basis.

The final element of embeddedness displayed by businesses in Southampton is network embeddedness, which occurs when businesses in an area have close working relationships with other firms in the area (Grabher 1993). Business O is not territorially embedded itself, but it has a working partnership with Business X (not listed) which is tied to Southampton because of high sunk costs, and the need to be near the deep water container port. Business O, a storage and distribution firm, would not relocate because it works closely with Business X and gains many advantages from being in close proximity to it. As such, Business O can be said to display network embeddedness. Network embeddedness can also include the relations between firms and their staff. Some of the firms listed have several hundred members of staff in Southampton alone[3], and this leads to embeddedness as firms do not want to lose skilled workers. Business HA (239) said they would only move locally because, *"our staff, highly skilled staff, specialist staff; it would be very difficult to get them to move from here to another part of the country."* Recruiting and training new staff will take time and money, so businesses with skilled or large numbers of staff are likely to think carefully about relocating further than the distance their staff would be willing to travel.

[3] This information is based on the questionnaire which was sent to firms prior to the interviews

Although the firms outlined in this section do display embeddedness, it should not be considered as a simple dichotomous state, and the businesses can be embedded by different degrees depending on the nature of their tie (compare to Wood, 2004). For example, Businesses R, RA and NA are highly embedded as they have both large sunk costs and location specific requirements. Business JA, a manufacturing firm, can be considered less embedded, as although it has high sunk costs, its location is not important to the business, so in extreme circumstances it could relocate and operate from elsewhere. It is also possible for firms to be locally embedded at a range of different nested, scales simultaneously (see Dacin et al 1993). An example of this is Southampton General Hospital. Firstly, the Hospital has large sunk costs in its current site, and to rebuild elsewhere would be *"financially unviable"* (Interviewee 5, SGH), because the current site would need to remain open to treat patients. For this reason the hospital can be considered as territorially embedded on its site. Secondly, Southampton General Hospital is part of the Southampton Primary Care Trust (PCT), one of over 200 PCT's across the country. The hospital receives its funding from the PCT for treating its resident population, so it has to be located in a position where it can do this, *"close to our end user"* (Interviewee 6, SGH). Thirdly, at the micro-scale, the majority of staff are embedded on the site, because their job is to provide care to the patients who are at the site, and they could not do this from any other location. Finally, despite the embeddedness of the clinical staff, the hospital performs a wide range of functions, and some of these are not embedded on the site at all, but are relatively footloose. For example, many of the administrative roles are located on the site for historical reasons, and *"don't physically actually have to be here"* (Interviewee 3, SGH). It is important to be aware that local embeddedness is not a dichotomous state, and as well as varying between different firms, there can also be different levels within businesses. These levels will be discussed in more detail in section 7.4 when exploring how embeddedness affects locational responses to road pricing.

7.3.2 Non-locally embedded businesses - *"We could be anywhere" (Business H, 61)*

Although sixteen businesses displayed some type of local embeddedness, the majority of the firms interviewed (twenty six out of forty one) were not actually embedded, and these are outlined in Table 7.2

Table 7.2 – Non-locally embedded businesses in Southampton

Business	Type of Business	Business	Type of Business
A	Office	K	General Industrial
AB	Financial Services	KA	Professional Services (IT)
B	Financial services	L	Storage and distribution
BA	Engineering	N	General office
BB	Restaurant	NA	Professional services
CA	Retail	PA	Manufacture
D	Leisure	SA	Manufacture / Professional Services
E	Retail	T	Retail (Food)
G	Professional Services	TA	Manufacturing and sales
H	Design and manufacture	U	Leisure / Travel
HA	General Industrial	V	General office
J	Retail (Clothing)	Y	Professional Services
JB	Manufacturing		

Whereas the locally embedded businesses included a number of primary and secondary industries, the non-locally embedded businesses are more predominantly (but not exclusively) 'tertiary' firms, such as office and administration functions, professional and financial services. A number of characteristics typical of these firms can be identified, although it is important to note that not all of the non-locally embedded firms display all of these characteristics. These will now be discussed with reference to the three embeddedness dimensions outlined in Figure 7.1.

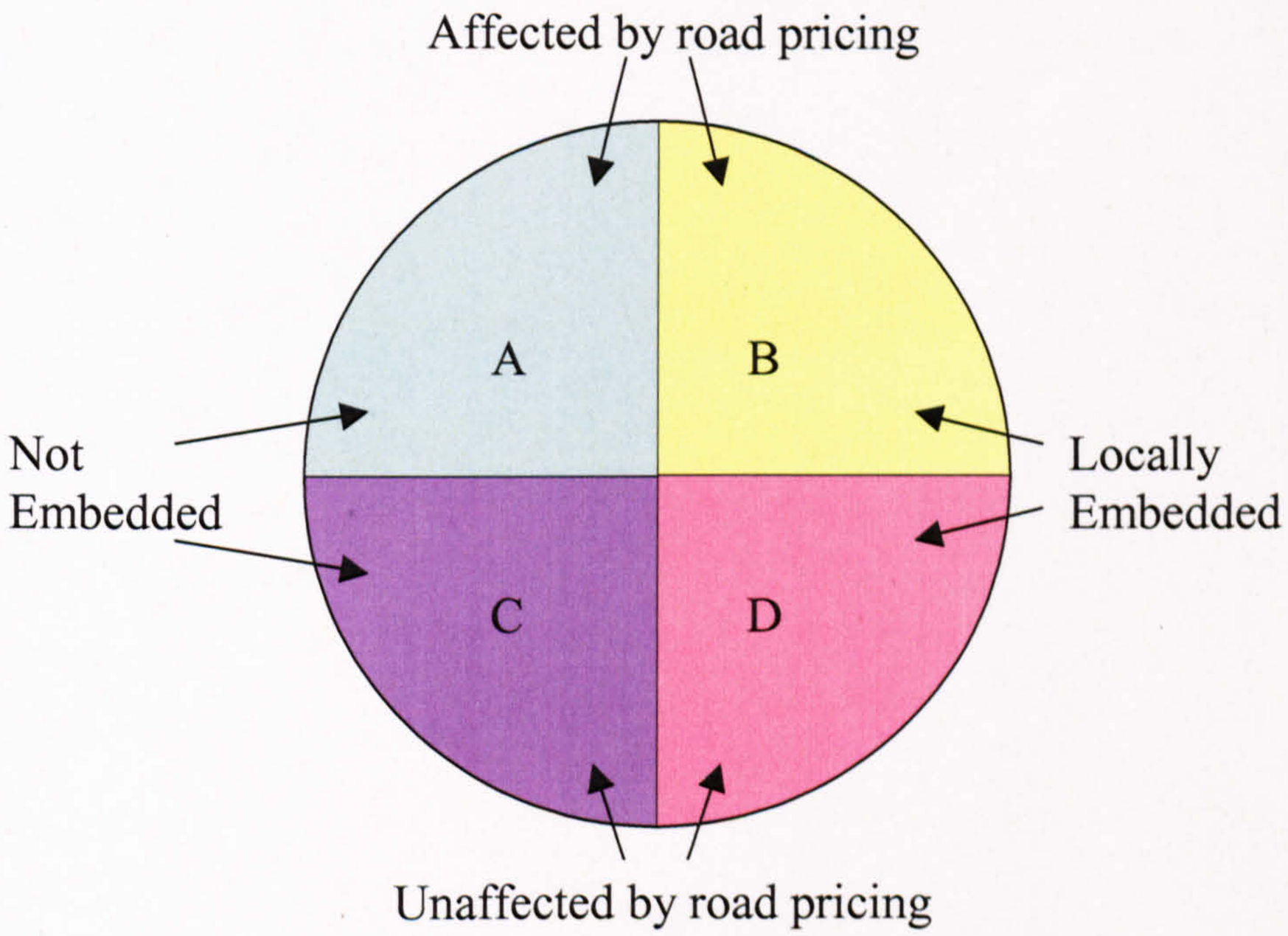
Firstly, these non-locally embedded firms do not generally have the same degree of sunk costs in infrastructure and equipment as the locally embedded businesses.

Although they are likely to have invested in equipment, this is generally less bespoke and more portable than that of the embedded firms. Secondly, these firms generally do not rely on a particular resource that is unique to Southampton, such as the port, and therefore their business could function in other locations. They often do not have direct interactions with customers at their sites, but communicate with them electronically or on the telephone, meaning they do not necessarily even have to be located near their customer base. Business D, from the leisure and tourism industry commented; *"we are not a public office, we don't get consumers coming in here. So it doesn't really matter where we are"* (Business D, 37). As a number of these business offer services over a large area, rather than selling goods to customers which come to them from the local area, proximity to customers is not an issue. Finally, these businesses generally do not display network embeddedness as they do not work with other businesses in the same city. Although representatives from these businesses commented that they *"could move anywhere"* (Business K, 258), the need for certain facilities, the ability to recruit and retain staff and other problems associated with relocation may mean that this is not likely to be absolutely correct. However, these firms do have the ability to relocate (they are footloose), and therefore may consider leaving Southampton if road pricing is introduced. Although these firms have the potential to move, the links between embeddedness and relocation as a response to road pricing are complex, and just because businesses could theoretically relocate they may not actually do so. The links between embeddedness and relocation in response to road pricing will now be explored in more detail in the following section, and the different locational responses discussed.

7.4 Local embeddedness and locational responses to road pricing

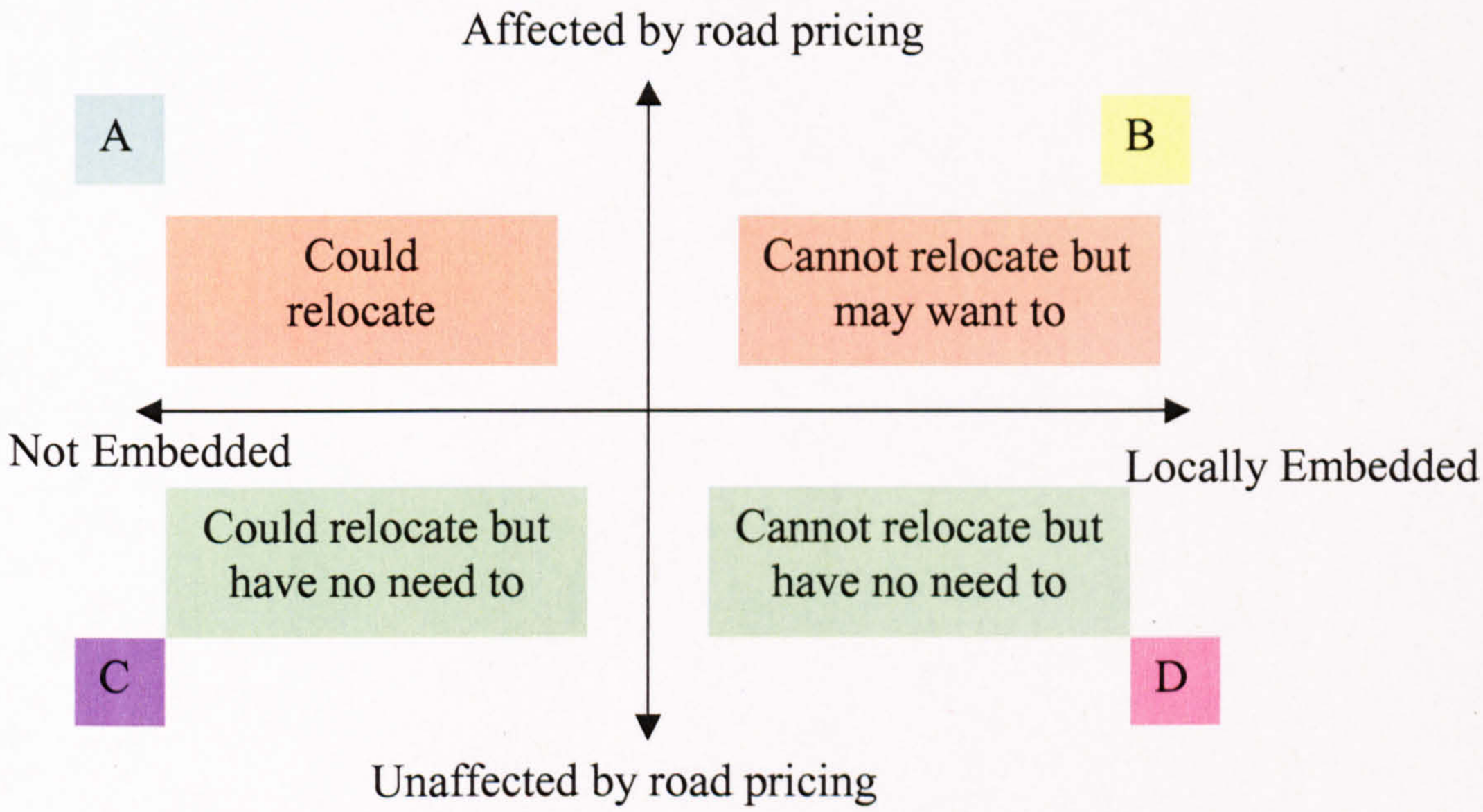
This section will examine the effect of local embeddedness on businesses' locational responses to road pricing. Four types of relationship between embeddedness and the effect of road pricing on firms can be identified, and this will affect their response to the charge. These four categories are outlined in Figure 7.2 overleaf.

Figure 7.2 Road pricing and local embeddedness



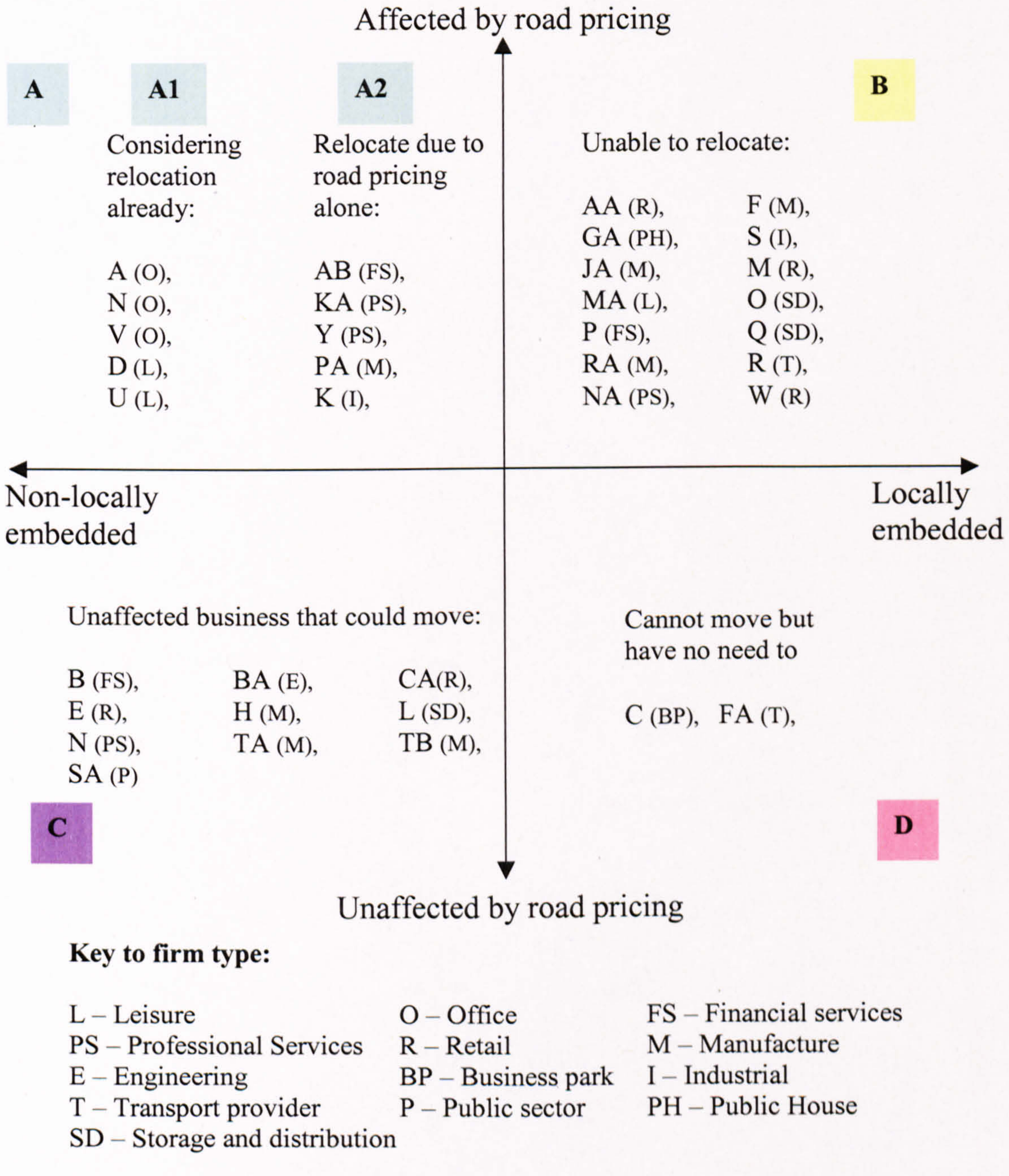
Although the boundaries between each of the categories may be fuzzy, essentially firms can either be locally embedded in some way or not, and either affected by road pricing to some degree, or not at all. Where they fall in each of these categories will affect their locational responses to a road pricing scheme. These possible responses are outlined in Figure 7.3.

Figure 7.3 Businesses' possible responses to road pricing



Businesses in the bottom half of the diagram (quadrants C and D) would have no need to relocate as they would not be affected by road pricing. However, both sets of firms in the top half of the diagram (quadrants A and B) are potentially concerning as their responses could damage the economy of the city. The businesses in quadrant A are relatively footloose, and therefore could relocate if they are affected sufficiently by road pricing to warrant it. Within this group there will be some firms which were already considering relocation for other reasons, and some for whom the impact of road pricing would be severe enough to prompt a move by itself. The businesses in quadrant B would also be affected by road pricing, but because they are locally embedded they would not be able to relocate as a response, and would have to adopt other measures instead. These non-locational responses are explored in more detail in Chapter 8, but it is important to note here that if firms cannot relocate and are unable to make any other responses to minimise the impact of charging, they could face financial difficulties and potentially be forced to close. The firms which fall into each category are outlined in Figure 7.4 overleaf, although the number in each category should not be taken to be statistically representative of the broader business community in Southampton.

Figure 7.4 Businesses' response to road pricing



Key to firm type:

L – Leisure
PS – Professional Services
E – Engineering
T – Transport provider
SD – Storage and distribution
O – Office
R – Retail
BP – Business park
P – Public sector
FS – Financial services
M – Manufacture
I – Industrial
PH – Public House

It is worth noting that Figure 7.4 concentrates on negative rather than the positive effects of road pricing, as very few positive outcomes of a pricing scheme were mentioned during the interviews. It is apparent from Figure 7.4 that the proportion of businesses that would consider relocation in response to road pricing is relatively small

(10 of 41), and half of these were already considering relocating for other reasons. This section will now explore the five different locational responses to road pricing in turn, beginning with businesses which would not relocate, and then exploring three different options for business which *could* relocate; those which would *not be affected enough* to do so, those which *are considering it anyway*, and those *which would relocate because of road pricing alone.*

7.4.1 Businesses that would not relocate

From Figure 7.4 it is clear that the majority of businesses would not relocate out of Southampton as a response to road pricing (those in quadrants B, C and D). There are two main reasons for this; either because they would not be affected by the scheme (quadrants C and D), or because they are locally embedded and therefore unable to move (quadrant B). This section will discuss both of these options and their impact on the economy of the city.

7.4.1.1 Unaffected businesses

Twelve of the businesses interviewed would simply not be affected enough by road pricing to consider relocation as a response (in quadrants C and D)[4]. As this research was based on a hypothetical cordon scheme, many of the businesses thought they would be unaffected because of their location and travel patterns. If they were located outside of a possible cordon and had no reason to travel into it during charging hours then the direct effect on them would be minimal, if anything. For these reasons, even under a more sophisticated pricing system with varying charges based on location and time of day, there are likely to be a group of businesses that are still relatively unaffected. The exact numbers of firms that are unaffected will vary according to the details of the scheme, and which firms are involved in lobbying during the scheme design phase to try and ensure that it does not disadvantage them.

[4] Two of these unaffected businesses are actually locally embedded, so if they were affected by road pricing they would not be able to move. The issue of locally embedded and affected firms is discussed in Section 6.5.1 b.

Even if a business is located in an area with road pricing, there are still three reasons why it could be unaffected. Firstly, the travel patterns of the business and its staff may be such that they will not incur the charges. This could be because they use public transport, or travel at times of day when charging does not apply. Secondly, some businesses are likely to qualify for exemptions or discounts, for example Southampton General Hospital. Although this would minimise the direct cost of the charge on them, they could still suffer indirectly if patients are deterred and travel to hospitals in cities which do not have road pricing (see Chapter 8). Finally, some businesses that do incur the charges would be able to pass them on down their supply chains to their customers, especially if the charges involved are small (see Chapter 8).

The businesses that are relatively unaffected by road pricing are unlikely to make any response to it, especially one as extreme as relocation. Many interviewees from firms that would not be affected felt *"it would be too much to move"* in response to a charge of a few pounds (Business SA, 409). As the interview sample is based on theoretical rather than representative sampling, it is important to be cautious when generalising to the broader business community of Southampton. However, it is clear that under any scheme design some businesses would simply not be affected enough to need to consider relocation. It should be taken as an encouraging sign for policy makers considering road pricing, although more research is needed into this area, particularly into the potential impacts on customers.

7.4.1.2 Locally embedded businesses

The group of businesses in quadrant B of Figure 7.4 would be affected by road pricing, but are locally embedded and therefore unable to relocate in response to it. As relocation is not an option for these firms, they are likely to try and make a range of non-locational responses to minimise the impact of the charge upon them, which are discussed in more detail in Chapter 8. Although there are a wide range of possible responses, some businesses may be locked-in to their current practices and not able to make any of these responses; and as a result their profitability is likely to suffer, and ultimately they may have to close. This could have an adverse knock on effect on the economy of Southampton, even though the affected firms do not leave the city. This

section will examine how the three different dimensions of embeddedness (network embeddedness, territorial embeddedness including sunk costs and local characteristics) and how the scale of this embeddedness affects firms' responses to road pricing.

Businesses generally do not operate in isolation, but are linked to other firms through working relationships and supply chains, which can lead to network embeddedness. Section 6.3.1 identified network embeddedness in Business O, a storage and distribution firm, because of its close working relationship with Business X, which is itself locally embedded for two reasons. Firstly, Business X has sunk costs of *"tens of millions, if not hundreds of millions"* of pounds (Business O, 201) in its specific site. Secondly, it is 'stuck' to Southampton because the location of its site at the port is crucial for the operation of the business, and it would be problematic to find anything else suitable in the UK. Although Business O could operate from elsewhere in the UK, if it moved far away from Business X, their working relationship would become more difficult, and therefore Business O's profitability would suffer. This example highlights that, even if one firm does not display local embeddedness, it might become embedded because of a close relationship with an embedded firm. As such, it is important to consider businesses' relationships with other firms, rather than examining them in isolation.

Network embeddedness not only includes businesses' relationships with other firms, but can also include the relationship between a firm and its employees. If these employees are locally embedded it can have an effect on the embeddedness of the firm, particularly if local skilled labour is in short supply. Recruiting and retaining new staff involves time and money, so firms are generally likely to want to retain their current employees, especially if they are highly skilled. As such, their decision about if and where to relocate to is likely to be influenced by what proportion of their staff would also be prepared to relocate. Staff issues are especially important for certain types of business, because of the pool of particular kinds of labour that is available in Southampton. For example, Business RA a boat manufacturing firm, said that *"because of its history there are more skilled boat builders around Southampton. For our business, if we need to source new staff, you know, if we were in the middle of Wiltshire or something then we wouldn't be able to get a single boat builder"* (Business RA, 37). This availability of skilled labour which is not found elsewhere is an important tie for certain firms,

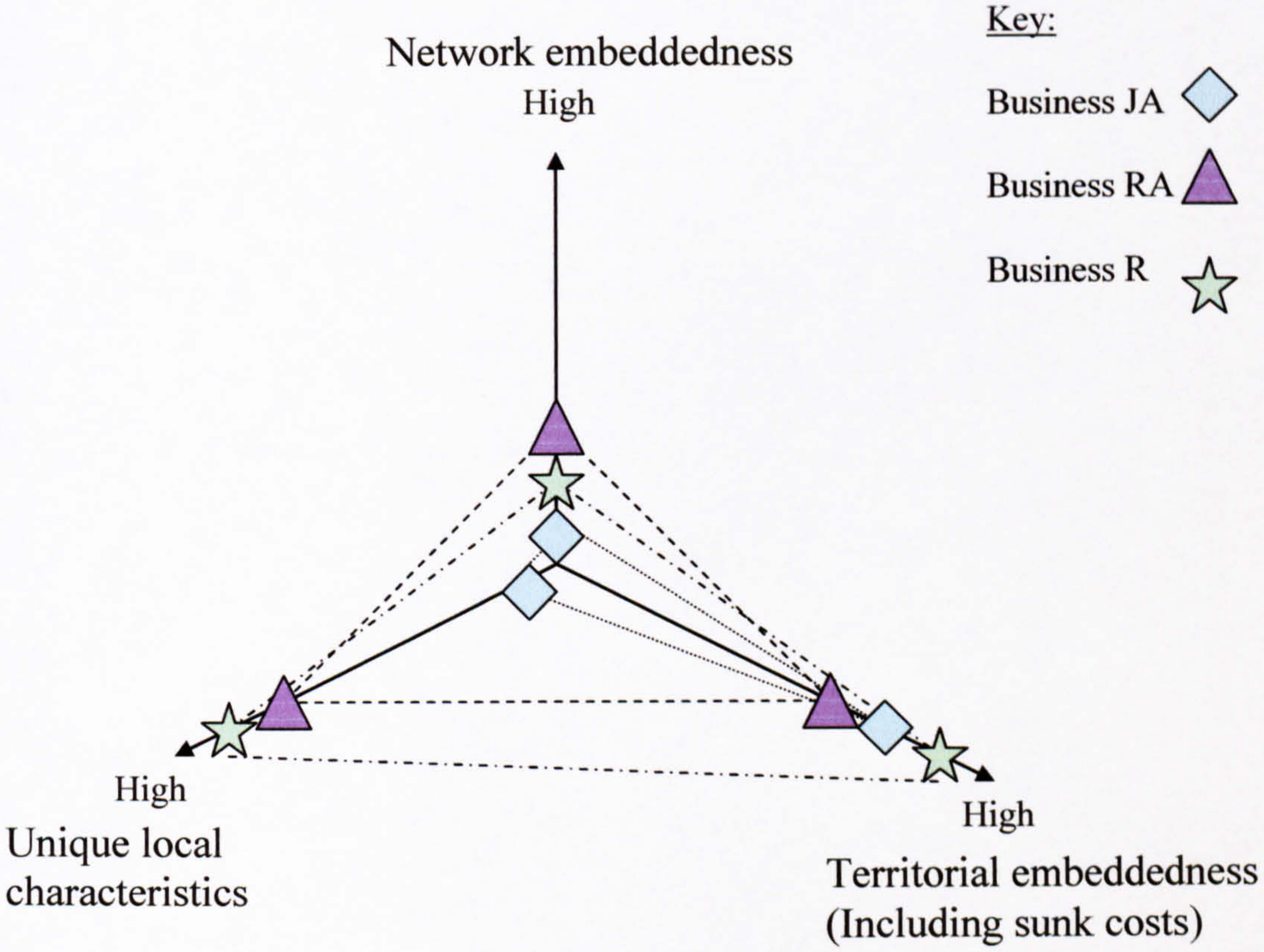
alongside the more general desire to retain skilled staff. Staffing issues may not embed firms completely, as highly skilled individuals may be prepared to move in order to keep their jobs. However, there would be costs and time involved in relocating employees, so it is likely to be an important consideration.

Embeddedness caused by local characteristics also has an important influence on firms' locational responses to road pricing. As noted in section 7.2, even if a firm is locally embedded it may not necessarily be embedded in the "local" area, and there are different scales of embeddedness. At the most extreme, firms like the public house Business GA are tied to their specific sites, because it is an integral part of their business; whereas other firms may be embedded at the city or regional scale. Firms that are dependent on a particular resource in an area will be restricted in the extent that they will be able to relocate, depending on the availability of that resource. Many of the port-related businesses are essentially tied to being near the waterfront (territorial embeddedness) and other port related businesses (network embeddedness), but in theory they could move sites within the port area. However, accumulated and exit sunk costs, such as investment in equipment which is likely to be difficult to move, or in upgrading their sites, often means they are unlikely to leave their specific premises (see Clark and Wrigley 1997). Due to its location, a cordon charge is likely to apply to the whole area covered by the port, so there would be no advantage in moving within this area anyway.

Businesses can create the circumstances for their own embeddedness in an area. For example, Business P, a financial services firm, relies on a great deal of repeat custom, and has established a customer base in and around the city of Southampton. They can be considered as embedded at the city scale, because they are unlikely to move far from their customer base, but could relocate to another site in or around the city if they wished. The scale of Business P's embeddedness means that, although broadly speaking they are tied to the city, they do have some scope to relocate in response to road pricing. For the purposes of maintaining the economic competitiveness of Southampton, this may cause a problem if they locate just outside of the city boundary. Further research in this area should be conducted if road pricing is proposed for the city, once the scale of the scheme is known, as some locally embedded firms may still be able to relocate within the region.

Sunk costs are part of territorial embeddedness, and can present a considerable barrier to a firm's relocation. Clark and Wrigley (1997) distinguish between entry, accumulation and exit sunk costs (see section 3.3.2.1), the latter two of which are the most relevant in this case. Generally, relocating bespoke equipment can be seen as an exit sunk cost, and although it is possible, it can be costly. Money which has been invested in a site is an accumulated sunk cost, and may not be recouped when the site is sold, especially if it has been highly customised to the needs of a particular business. Five of the locally embedded businesses in Figure 7.4 are embedded at least partially because of sunk costs, but the effect of this on their propensity to relocate varies; partly because of the type of the costs, but also because of the other ways in which they are embedded. For example, Business JA is purely embedded because of its large investment in manufacturing equipment, and has no other tie to its site. This means that if they were impacted severely by road pricing, in extreme cases they would be able to relocate, although it would be costly. Business RA, the boat manufacturer, also has high sunk costs in equipment, but it is also embedded on its site because of its characteristics. The sunk costs, combined with the difficulty of finding another site make them very unlikely to relocate in response to road pricing, and they can be thought of as "stuck". They can also be considered to show a small level of network embeddedness as they gain advantages being on the waterfront near other similar firms. At the most extreme, Business R, a transportation provider, has very high sunk costs in equipment *and* its site, which it is also locally embedded in because of its specific characteristics. This combination of factors would make it virtually impossible for them to relocate, so they would be under the most pressure to find alternative responses to road pricing. These different scenarios are plotted in Figure 7.5 overleaf.

Figure 7.5 Local embeddedness triangle – examples



Businesses which are embedded due to sunk costs alone may still relocate in response to road pricing, although their decision is likely to be affected by the relative size of these costs compared to their turnover. Businesses with high sunk costs, which are also locally embedded because of ties to the local area, are less likely to relocate than those with sunk costs alone. The cumulative effects of different combinations of types of local embeddedness on locational responses to road pricing is an area which would benefit from further research.

This section has already highlighted a number of firms which are embedded at different scales, but there can also be variation in the levels of embeddedness within individual firms. For example, the Mayflower Theatre (Business MA) can be considered territorially embedded at the site level because the (theatre) building itself is an integral part of the functioning of the business, and "y*ou couldn't pick it up and move it elsewhere"*, or rebuild it (Interviewee 1, Mayflower Theatre). However, the staff of the Mayflower can be divided into three groups; office staff, front of house and backstage

staff; and their different roles mean that they are embedded different amounts. These roles are summarised in Table 7.3 below (see also Appendix C).

Table 7.3 Different groups of staff at the Mayflower Theatre

Type of Staff	Location	Working Hours	Roles
Office Staff	Offices next to the theatre	8.30am to 5pm, Monday to Friday	Finance, Marketing, HR, IT and other administration tasks
Front of House	Front of Theatre	4 hour shifts with shows, around 7pm to 11pm or 2pm to 6pm for matinees	Box Office sales, Users, Bar Staff, Cashiers
Backstage	Backstage	Four hour shifts with shows as above. Also, through the night on Sunday / Monday for "get in" and "get out" nights when shows arrive and leave.	Stage door, electricians, technical staff, dressers

The roles of the front of house and backstage staff are directly linked to the shows performed in the theatre, so they are more embedded than the office staff, who have *"very little need to be in the theatre itself"* (Interviewee 4, Mayflower Theatre). In theory, the office staff could be relocated to another office within the city but away from the theatre, to minimise the effect of road pricing on them. However, these office staff are socially embedded, and established social and working relationships, and emotional ties mean they are unlikely to relocate away from the rest of the theatre's employees (see Agnes 2001). It is important for the office staff to *"feel part of the theatre"* (Interviewee 6, Mayflower Theatre), because even though *"you can do accounts anywhere for a company, it is knowing that you are part of a theatre that makes the job"* (Interviewee 6, Mayflower Theatre). Being located near the theatre increases the job satisfaction of the office employees, and the management feel that if the two were separated it would have a *"de-motivating effect"* (Interviewee 5, Mayflower Theatre). The theatre itself is territorially embedded at the site level, and although it would be

possible for some of its functions to move, social embeddedness means that this would not happen. There can also be variation within firms in the likely uptake of home working, and this issue is explored further in Chapter 8.

This section has highlighted a range of different scales of embeddedness and also shown that businesses can be embedded different amounts. These varying scales and magnitudes of embeddedness will affect firms' responses to road pricing, and although some firms may not be able to move from their sites at all, others may exhibit some characteristics of embeddedness, but still be able to move relatively small distances in extreme enough circumstances. The exact responses can be examined in more detail if a specific pricing proposal is made.

7.4.2 Businesses that could relocate

Having looked at the businesses which could not relocate in response to road pricing, it is also important to consider those which are more footloose and would be able to relocate. Figures 7.3 and 7.4 illustrated that there are three types of business which could relocate in response to road pricing; those which are affected and were considering relocation anyway (quadrant A1), those which are affected and would be prompted to consider relocation just because of the impact of road pricing alone (quadrant A2), and those which are not affected (quadrants C and D). If these firms were to leave the city it would have an adverse affect on the economy, so it is important to understand if they are likely to do so, and for what reasons. This section will show that although there is a large pool of footloose businesses that could potentially relocate in response to road pricing, not many of them actually would do so.

7.4.2.1. Not affected enough

A large number of the non-locally embedded businesses would not be affected enough by road pricing to warrant relocation (see Figure 7.4, quadrants C and D), although the exact number will depend on the nature of any scheme that is introduced. The costs and other issues associated with relocating means that firms are not likely to consider it if the affect of road pricing on them is only small. For example, Southampton General

Hospital could potentially relocate, but is unlikely to be affected enough to do so, partly because many of their vehicles are likely to be exempt. The Hospital may suffer if patients are deterred to other nearby hospitals in locations without road pricing, but they could make a range of non-locational responses to combat this, (which are outlined in Chapter 8). The hospital site has a turnover of over a million pounds a day (Interviewee 2, SGH), so in comparison road pricing charges would be relatively insignificant.

7.4.2.2. Road pricing is the 'Final Straw'

Some of the businesses that might consider relocation in response to road pricing would have been considering it anyway, to seek out cost, market or other advantages (quadrant A1 in Figure 7.7) (see Bryson 1999,12). Other reasons for relocation include outgrowing premises, wanting a more accessible location, or adjusting to a new customer base (i.e. Business KA, 157). The ending of a lease is a natural time to consider relocation, and the majority of businesses interviewed did lease rather than own their premises. For example, Business N, an office based firm, have been considering relocating to a newer building for some time, and the fact their current lease is ending is *"driving the process"* (Business N, 515).

For businesses already considering relocation, the announcement of a road pricing scheme is likely to influence their decision about whether to relocate, and where to relocate to; but as a contributing factor rather than the only one. None of the businesses who were already contemplating moving suggested road pricing would be a reason for them to remain in the area; and in fact the scheme would have the opposite effect. Interviewees suggested it would be the *"icing on the cake"* (Business D, 230), providing *"another reason really for us to move our business out of Southampton"* (Business A, 279), along with the ones they already have. Business KA, a professional services firm, have no need to be in Southampton, and suggested that if road pricing was announced it would be a *"major factor"* in their next location decision, but only when they were *"at the point of being able to move"* with a break in their lease. It would not be sufficient in itself to drive a move, because its effect on them is not likely to be large enough.

The problems and costs associated with relocation (see section 7.7) mean that even relatively footloose companies need good reasons to consider it as an option. For the firms in this category, road pricing would not be sufficient to drive a move by itself, but it could contribute to other factors to tip the balance away from Southampton. It is important to be aware that although road pricing may not initially lead to a large number of firms leaving the city, this could happen over a longer period of time as their leases are due for renewal. Currently, road pricing is viewed as a negative factor which would cause businesses to consider leaving a city, but as more is known about its impacts this perception may alter, and further research will be needed in the future, particularly into the location decisions of firms considering coming into the city.

7.4.2.3. Relocation due to road pricing

The group of firms which local authorities should be most concerned about in terms of potential damage to the economy are those that are not currently considering relocation, but would be prompted to do so if road pricing were introduced (quadrant A2 in Figure 7.4). Five of the firms interviewed fell into this category, four of which were tertiary office based and financial businesses, which often operate remotely from their customers. Business Y, a professional services firm, commented *"if this comes in, we'd have to move. After 17 years, we'd have to think about moving"* (Business Y, 248). Some firms felt that it would be relatively straightforward to relocate, especially if they were on short leases, suggesting; *"we're only a Sales & Marketing office, we could up sticks and shift out fairly simply"* (Business PA, 331). These firms felt that they would incur large charges under road pricing, because there were not many other changes that they could make to work around the charge (see Chapter 8).

Although this group of businesses would consider relocating if road pricing was introduced, it is important to consider where they would move to; as if they stay within the city boundary then it would do less harm to the economy than if they moved outside, as the city would still receive taxation income from them. Generally the businesses would not actually locate very far from their current locations, with possible destinations mentioned including Chandlers' Ford, Romsey and Winchester. Business Y (252) said; *"We'd go outside. But somewhere just outside"*. This suggests that although

these businesses are not locally embedded in Southampton, they may be embedded at a regional scale, due to factors like proximity to customers, and a desire to retain staff who may be locally embedded. Business AB, a financial services firm, is tied to the area to an extent because *"a big proportion of the clients are in this area"* (Business AB, 448), and the need for face-to-face meetings means that proximity is a benefit. In another example, Business PA (448) commented; *" I want to keep the staff that we've got, and they're all locally based. Most of the jobs are not, the office based ones are not senior enough for people to drive halfway across the country for."* As discussed earlier, retaining staff is an important consideration for businesses, and there is likely to be a limit to how far most staff will move. Road pricing could actually be counter-productive if it encourages firms to relocate to out-of-town sites, as these often have poor public transport provision compared to the city centre, and so this trend may result in an increase in car use (see Hensher and Puckett 2005,382). Schemes do need to be designed and packaged appropriately to prevent this, possibly as part of a broader regional strategy.

These findings suggest that Southampton City Council should consider tailoring a road pricing scheme and its accompanying policies so that even if business do relocate, they are encouraged to stay within the city boundaries so that they continue to contribute to the economy. The number of businesses that choose to relocate in the light of road pricing, and where they move to will be affected by the details of the scheme, but also how many other cities choose to implement similar schemes. If a regional strategy is introduced, then the negative economic effects are likely to be smaller as it will create more of a *"level playing field"* (Business AB, 538), as there would be little advantage for firms leaving Southampton, only to go to another city with a similar scheme. Further research is needed into the effect of road pricing on encouraging new businesses to locate in cities. This could help ameliorate any negative effects of firms leaving, and may result in a change in the nature of firms that are found in the city, for example, there may be an increase in firms which have low travel costs.

Just as local embeddedness is not a binary state, but can occur at a range of different degrees and scales, there are also a range of different types of locational response to road pricing. It is not always necessary for whole firms to move, but there can be

variation within businesses where some functions can be moved or outsourced, but not others (see section 7.4.1 on the Mayflower Theatre). The complexity of possible responses to road pricing can be illustrated by Southampton General Hospital, which could make a number of different locational changes to minimise the impacts of road pricing on both patients and staff. Firstly, there is a move within the NHS to carry out more routine procedures at GP surgeries and community hospitals[5]. This could reduce the number of patients having to pay for road pricing, or at least the amount they would have to pay if they are travelling a shorter distance to a closer hospital. There is also a parallel policy encouraging more outpatient clinics at community hospitals outside of cities, which would have a similar effect of reducing the cost of road pricing for patients. The second national policy worth noting is the drive to relocate patients to community hospitals (i.e. Lymington) sooner after their operations, which would help minimise the cost of road pricing for visitors. For staff, Southampton General Hospital is currently looking at outsourcing some work such as clinical typing to South Africa, but it is unclear if this will proceed as it would result in a loss of jobs locally. Other functions such as diagnostic tests and the sterilization of instruments could potentially be decentralised (Interviewee 3, SGH), although this would work against the NHS's current move towards centralisation and a *"one stop shop"* approach (Interviewee 4, SGH). However, it is possible that road pricing could influence these outsourcing and decentralisation trends, and although the hospital has very high sunk costs in its site, it would not be impossible to relocate certain functions.

Although the interview sample used is not intended to be representative of the broader business community in Southampton, it is encouraging that the majority of businesses interviewed would not consider relocation because of road pricing alone. Many of those that could relocate would not do so, and some of those which would relocate were already considering this action for other reasons. As well as embeddedness, there are a range of other costs and issues which make relocation problematic, which will now be discussed.

[5] These would include minor surgeries like hernia repairs, x-rays and some diagnostic tests (Interviewee 4).

7.6 Barriers to relocation

Relocation is problematic for businesses for a number of reasons, and this chapter has already highlighted a range of reasons why businesses which could relocate are often unlikely to do so. The different types of embeddedness can be considered as barriers to relocation, using the same metaphor of barriers applied in Chapter 5 and 6 to explore the success and failure of road pricing schemes. However, as well as embeddedness there are also a range of other barriers to relocation, which mean businesses may not be as likely to relocate in response to road pricing as local authorities often fear. These will be briefly outlined now.

Relocation involves both a wide range of costs, and a great deal of time. Business RA, a boat manufacturing firm, commented; *"the cost of relocating would be massive... we have got a lot of bespoke equipment, and to be honest, we would either have to pay a lot of money to get it moved, or you would have to buy new; in which case you just couldn't afford to do it"* (Business RA, 354). Businesses with long lease periods (i.e. Business B is ten years, 251) may incur large penalty costs if they terminate these early, so the costs of road pricing would have to outweigh these to make relocation a viable option. There may also be *"relocation of staff costs"* (Business Y, 272), as businesses would not want (or be able) to simply dismiss skilled staff. There are also other expenses associated with moving such as lost working time, and *"the silly things like the headed paper"* (Business A, 343). All these costs are likely to be larger for larger firms, with more staff and equipment to move. This may mean these large firms are less likely to relocate (see Brouwer *et.al.* 2003), although it is important to consider relocation costs as a proportion of their turnover,which may be larger than that of smaller firms.

Relocation can be a time consuming process for many reasons, including the time needed to find a suitable new site, and go through all the necessary paperwork and processes to acquire it. The actual act of moving and adjusting to the new environment will also take time, and possibly lead to a temporary decline in productivity. Whilst relocation can be costly and time consuming, if the business perceives the cost of road pricing to be even greater than the potential cost of moving, then they are likely to give

it serious consideration. Although moving is costly, in some cases, such as for Business AB, a financial services firm, "*it would be more costly to stay*" (Business AB, 374).

This chapter has focused on businesses already in Southampton, and whether they would stay in the city, or be encouraged to relocate if road pricing was introduced. As noted in the introduction, this thesis does not address the issue of businesses that could be attracted to come to Southampton if road pricing successfully reduces congestion, improves public transport services, enhances the quality of life of residents and creates a better environment in the city. At the moment some businesses may see congestion as a barrier to locating in Southampton, and road pricing could remove this. This issue deserves further research in the future, particularly when the scale of any possible road pricing scheme becomes clearer.

7.7 Conclusion

This chapter has highlighted that businesses' propensity to relocate in response to a road-pricing scheme is affected by their levels and scale of local embeddedness. Businesses can be embedded for a wide range of reasons, and while some could relocate within the city, others are tied to their sites by sunk costs and specific local requirements. In particular, port-related firms, including those in the cruise industry, showed a high degree of local embeddedness for these reasons, and could be considered "stuck" in Southampton. This embeddedness, and other problems with relocation mean that only a small number of businesses are likely to consider relocation in response to road pricing, which should be welcome news for local authorities considering implementing such a scheme. Road pricing is not likely to be significant enough for many firms to lead to disembedding, as most interviewees suggested the costs involved with road pricing were unlikely to outweigh the costs associated with relocation, and the benefits they gain from being based in a city centre. That said, road pricing will be an important factor for firms to take into account when they come to renew their leases, so over time it may contribute towards firms leaving the city, although it might not be the primary cause of their departure. These findings help explain why city centres have maintained their growth and economic vitality in recent years, despite fears over their decline. Not only do some businesses have large accumulated and exit sunk costs, or

rely on particular resources available uniquely in their locations, there are a variety of other reasons they are unlikely to relocate in response to road pricing, including; access to skilled pools of labour, network embeddedness due to established customer bases and working relationships, as well as lost working time planning and carrying out the move.

The exact number of businesses that are likely to relocate in response to road pricing will be influenced by the characteristics of the scheme, and the scale on which it is implemented. If a scheme is implemented in Southampton alone, then the economic impact could potentially be worse than if it was part of a regional or broader national strategy. A larger scale strategy would reduce the likelihood of businesses relocating, because they would not gain anything from doing so. Relocation is difficult for businesses for a number of reasons, and rather than resorting to this they are likely to make a number of other responses first, including the financial, organizational and transport changes which will now be discussed in Chapter 8.

Chapter 8 – Non-locational responses of businesses to road pricing in Southampton

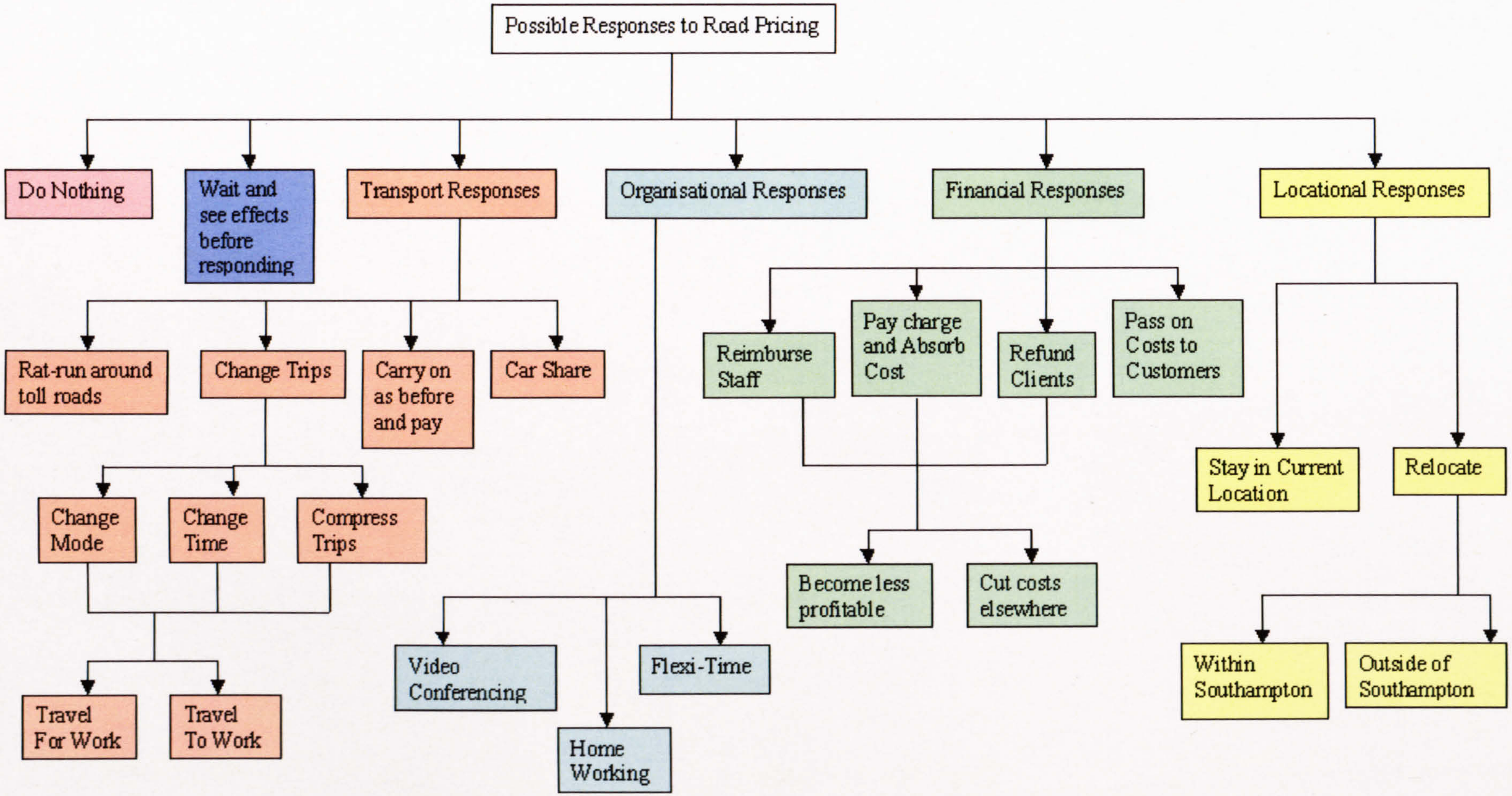
8.1 Introduction

8.1.1 Introduction

Chapter 7 showed that there are a range of reasons why businesses are generally unlikely to respond to urban road pricing by doing something as extreme as relocating out of a city that introduces such a scheme. Part of the reason for this locational inertia is because firms are embedded in the local area, but they are also unlikely to relocate as an immediate response to road pricing because there are a range of other, less drastic, responses which they can make first in order to minimise the impact of the charge upon themselves. If road pricing is introduced, firms are not likely to simply continue operating as before and pay any charges that they incur in the process; but rather this research suggests most of them will find ways to adjust their operations to minimise the amount that they would have to pay. The aim of this chapter is to examine these non-locational responses to road pricing in more detail, to further answer research question 2 (see Chapter 1). The different possible responses are summarised in Figure 8.1 (overleaf), and range from the extremes of doing nothing, to relocation. These responses are not generally mutually exclusive, and it is possible for firms to make multiple responses to road pricing.

The categories of transport, organizational and locational responses were included in the initial interview schedule (see Appendix C), but the financial responses and the full details of the possible responses emerged during the interview process. Apart from relocation, the responses outlined in Figure 8.1 can be made regardless of whether a business is locally embedded or not, and depend instead on the characteristics of the firm in question. Although there are a wide range of possible responses to road pricing, some firms are more adaptable than others, and there are a series of constraints which affect how they can respond.

Figure 8.1: Possible business responses to road pricing



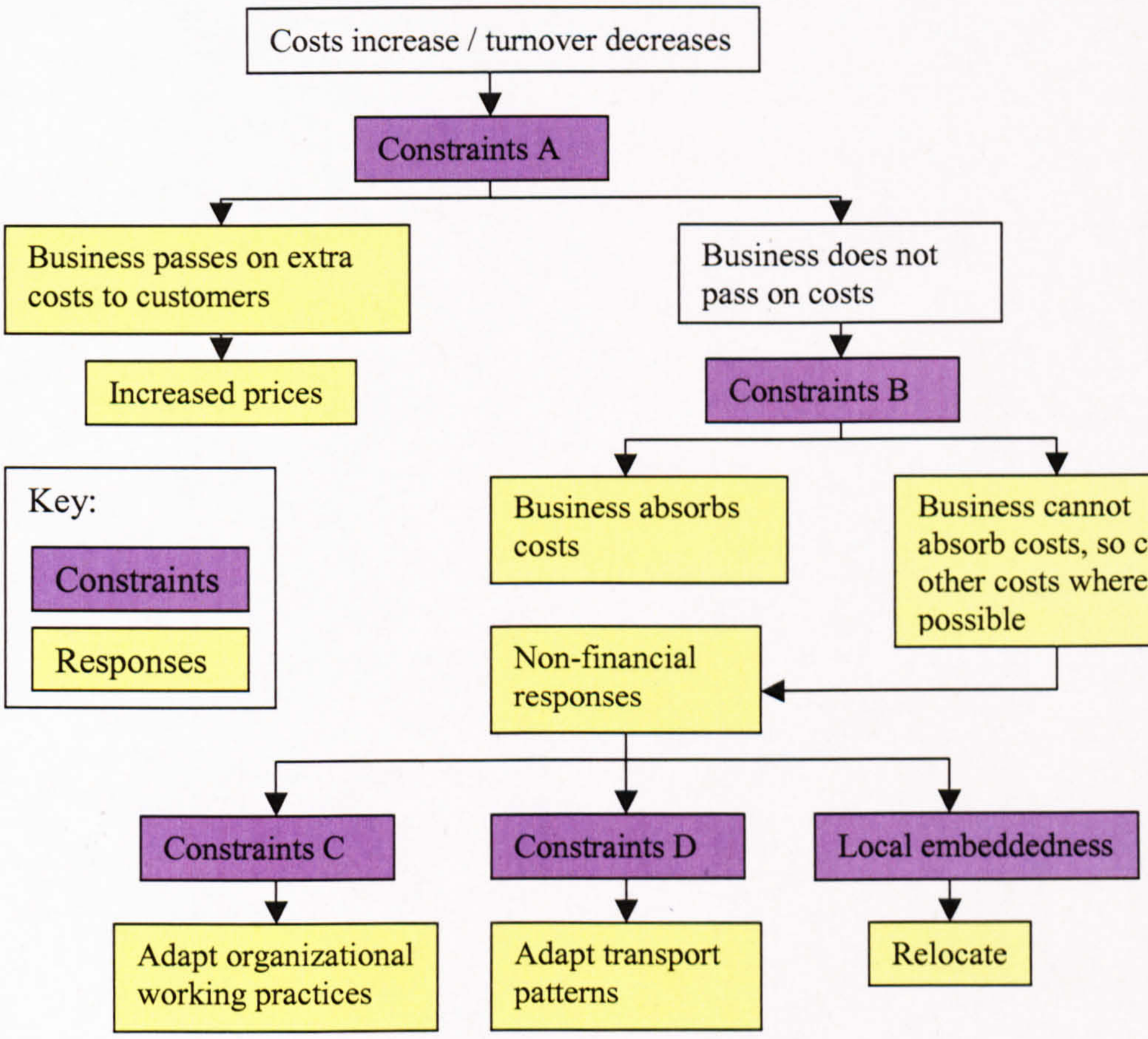
8.1.1 Lock-in and constraints on businesses' responses to road pricing

Businesses cannot respond to road pricing however they wish, but are limited by a number of constraints, including 'lock-in' (see section 3.4). Chapter 3 discussed the notions of cognitive lock-in and behavioural lock-in, which are relevant for this chapter. Cognitive lock in could affect businesses responses to road pricing if they have become so entrenched in their current working practices that they simply do not perceive changes that they could make which would decrease the financial cost of road pricing to them (see Grabher 1993). This is likely to apply to more radical 'blue sky' responses, as people may consider some relatively simple changes to their business practices, but not think of or investigate more extreme options. Behavioural lock in can occur when businesses behave in a certain way for so long that it becomes habit and routine, and they prefer to stick with the *"status quo"* rather than change their practices, even though there may be more effective ways of operating (see Barnes *et. al.* 2004). Road pricing charges may provide sufficient incentive for some firms to overcome their behavioural lock in, although those which show cognitive lock-in may not even realise that they could change. Like embeddedness, 'lock-in' is a complicated concept, and this chapter will show that it can occur in varying levels amongst different employees and practices within individual businesses.

Although lock-in is important, it is not the only factor governing firms' responses to road pricing, and for some firms certain responses will simply be inappropriate. This does not mean that they are locked in, but rather the nature of the firm constrains how they can respond, and precludes certain changes. For example, it would not be possible for builders or nurses to work from home, or for freight distributors to shift entirely to public transport. They are constrained in how they can respond because of the nature of their firm. Both lock in and practical constraints to responding to road pricing will be identified in this chapter. Generally more firms are constrained in how they can respond, rather than being truly locked in; as lock in implies they *could* respond in a particular way, but there are reasons why they will not do so. The four types of responses (locational, financial, transport and organizational), the constraints on them and the possible outcomes of these are illustrated in Figure 8.2 below, for businesses which are affected by road pricing. In some cases the businesses will be constrained by

genuine lock-in, but in others particular responses will be constrained by more general factors (i.e the ability to pass on costs will be constrained by the amount of competition the business faces), or will simply not be possible.

Figure 8.2 Potential responses to road pricing and associated constraints



As one of the fundamental aims of businesses is to make a profit, many interviewees commented that one of their first responses to road pricing is likely to be to try and pass on the extra costs which they incur. These financial responses will be explored first, showing that issues of competition, profitability, the price sensitivity of customers and the level of control over pricing structures all play a role in whether businesses can successfully pass on costs. Aside from financial responses, there are also a series of organizational and transport responses that firms can make to road pricing, which will be discussed in sections 8.3 and 8.4. A series of constraints on altering working hours.

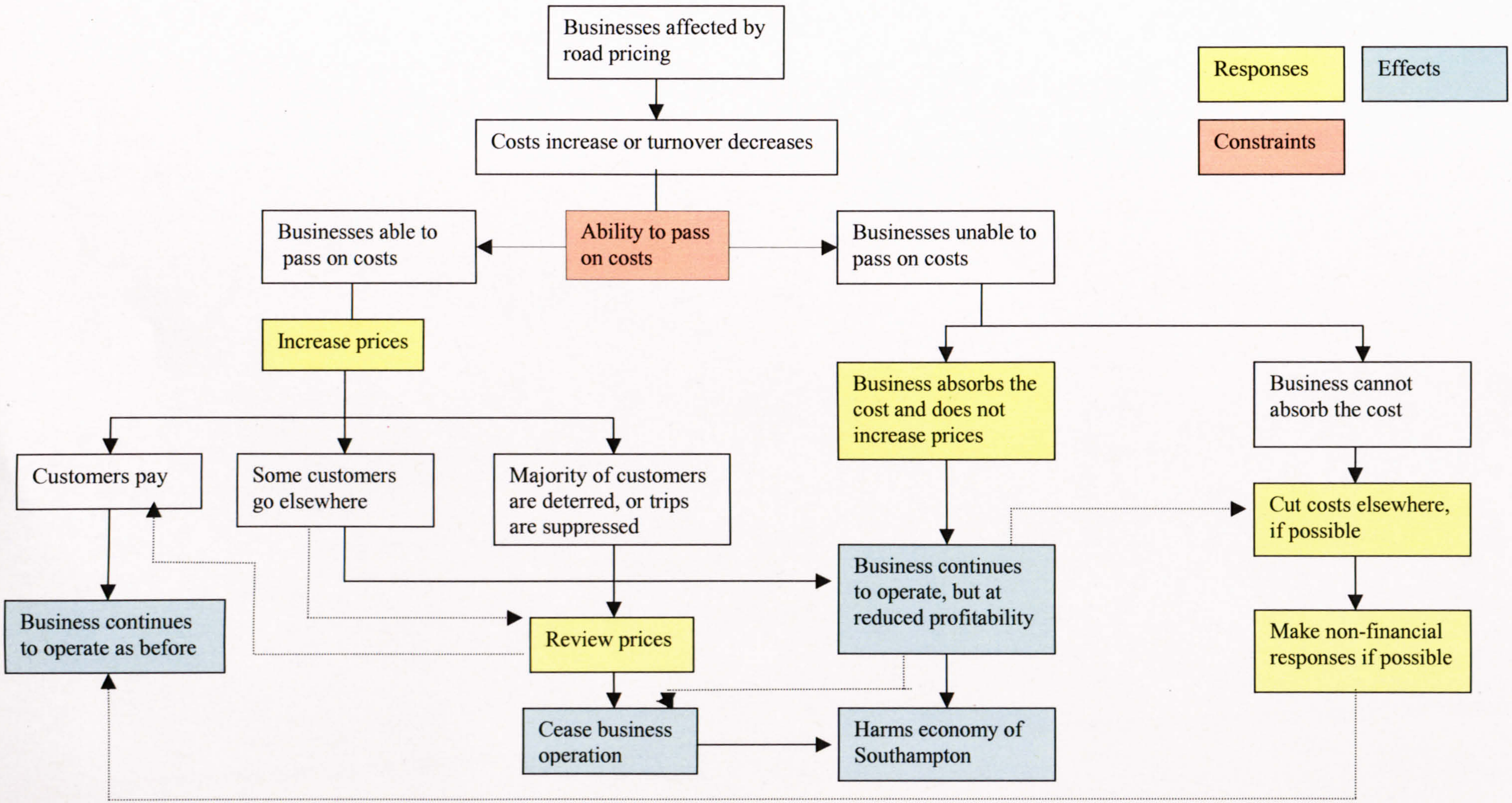
and home working will be identified, before going on to explore the reasons firms can be locked in to both their modes and times of travel, for journeys both to, and for, work. The chapter will then finish by examining a number of broad possible economic impacts which could arise from road pricing, and discuss the applicability of the findings for cities beyond Southampton. As well as the interviews, this chapter will draw on findings from the three case study firms. Relevant background information about these firms can be found in Appendix C.

8.2 Financial responses to road pricing

The potentially negative effects of road pricing on firms' finances can be divided into two categories; increased costs and loss of turnover. Extra costs may be incurred directly as a result of the firms' transport practices, or indirectly from inflated prices from suppliers, reimbursing staff and so on. Many firms said they would refund employees for their extra travel-to-work costs, as they were concerned about potential recruitment and retention problems. Staff like plumbers, electricians and engineers are already in short supply (Interviewee 1, BSA), and it was also considered unfair to *"expect people, whatever salary they are on to suddenly take a 5% or whatever percentage it works out at pay cut"* (Interviewee 4, BSA). The problem of road pricing leading to a loss of turnover is likely to be most applicable to firms whose customers travel to them during charging hours. As these customers would have to pay the charge they may be deterred, especially if they are travelling for discretionary rather than essential purposes (see section 7.2.3). If competition allows, one of the natural responses for businesses is to try to pass on these extra costs along their supply chain, in order to maintain their profit margins. This effect was seen in Singapore when road pricing was introduced[1] (see Chapter 4). The financial responses of firms to road pricing, along with the constraints and effects of these are summarised in Figure 7.3 below, based on the interview findings.

[1] Although in this case businesses looked for discounts from their suppliers, so the costs were passed up the supply chain, rather than down it.

Figure 8.3 – Financial responses to road pricing



Road pricing could potentially have a positive financial effect on firms, if the cost of the charge is smaller than the value of the travel time savings that they gain from paying it. However, only one of the firms interviewed felt that this would be the case. Generally congestion in Southampton is seen as a *"minor irritation rather than a major problem"* (Business O, 281), and so most businesses did not see the benefits to them of reducing it, and felt road pricing was unnecessary at this point in time. However, if congestion gets worse in the future this view could change, and road pricing could become more acceptable as a way to tackle congestion (see Chapter 2).

The businesses affected financially by road pricing can be split into two groups; those that can pass on the increased costs associated with road pricing, and those that cannot. Which category firms fall into will be affected by a number of factors, including the actual costs that the firm incurs (depending on the nature of the charge), the levels of competition that they face, and how flexible their pricing structure is. These are generally practical constraints, rather than examples of lock-in. For strategic reasons, businesses that are in a highly competitive environment are less likely to increase their prices than those that are not. However, if the extra costs associated with pricing are minimal, then it may be easier to absorb these, rather than alter their pricing structure to pass them on. Exactly how large the cost has to be to warrant passing on will vary between firms. The financial responses to road pricing are actually more complex than this, and will now be explored in more depth, beginning with firms which could pass on costs, and going on to discuss those which cannot.

8.2.1 Passing on costs

Many of the firms interviewed felt that *"ultimately the first law of business is you must make a profit"* (FSB, 251). If costs increase substantially, then business will try to recover them elsewhere, in order to maintain or increase their profit margins. Fifteen of the forty-one businesses interviewed said that if road pricing resulted in any extra costs for them they would pass these on to their customers, and generally felt they would be successful in doing this. A further three businesses said they would absorb a proportion of the cost and pass on the rest, and eight felt the costs would not be large enough to warrant passing on. For many of the businesses passing on extra costs was an automatic response, and something they would 'have to' do in response to any kind of increased

cost, not just those associated with road pricing (i.e. Business K, 322, an industrial firm). This is especially true for businesses operating with tight profit margins. For example, Business Q, a storage and distribution firm commented; "*we're not out to make a loss... we are quite to the bone to get business. So anything else [costs] has got to be passed on*" (Business Q, 226).

Although many firms saw passing on their extra costs as a natural response, there can be constraints on their ability to do this. The level of constraints on businesses ability to pass on costs can vary, so that they could potentially pass on all, some or none of the extra costs. If the costs are large it may not be possible to pass them all on, so some would have to be absorbed, recovered another way, or minimised through other responses. The ease with which firms can pass on the extra costs associated with road pricing will also depend on how much competition they face. The more competition there is, the more sensitive customers are likely to be to price increases, and so the more cautious firms are likely to be about increasing their prices. Within the holding company BSA Regal Group there are actually ten subsidiary firms (see Appendix D) which face different levels of competition. For example, the motorcycle products produced by Andover Norton in the BSA Group are unique, and so *"if people are going to buy it [Norton motorcycle parts] anywhere, it will be here, so there will be no loss of turnover"* (BSA, Interviewee 4). This absence of competition means that as long as there is demand for their products, it should be relatively straightforward for BSA to recover any extra costs. On the other hand, the building services part of the BSA Group face more competition, so they *"wouldn't be able to pass it all on...because we have got to be competitive like everybody else"* (Interviewee 2, BSA). Firms that are constrained so much that they cannot pass on costs are explored further in section 8.2.2.

The exact ways firms will pass on their extra costs will vary according to the nature of their operations. Some service providing firms could increase their hourly rate (i.e. BSA Engineers), while manufacturing and sales-based companies like retailers may increase the margins on products which they sell. Other businesses, such as the Mayflower Theatre, have a range of ways that they could recoup costs, including; increases in ticket prices, an additional booking fee, and increases in the price of ancillary items such as ice creams. These options have different merits, and it is beneficial to have a choice as the theatre are able to select the option (or combination of

options) which is least likely to deter customers. The theatre introduced a 7% booking fee in 2003 which did not affect sales, *"because once people have decided to come and see a show and buy their ticket they will just pay the price, it's built in"* (Interviewee 5, Mayflower). This is the most likely way which the Theatre would recover any extra costs associated with road pricing, as ancillary items only generate a relatively small amount of income, and a proportion of the revenue from the ticket sales goes to the production company. Not all businesses will have this choice, so if their method of passing on costs deters customers they will have to look at making non-financial responses (see section 8.3 and 8.4).

Figure 8.3 shows that if businesses try to pass on their costs to their customers then there are three possible outcomes. Firstly, the best outcome for the firm is that the customers pay the increased prices. If these customers are other businesses then the costs could be passed on further down the supply chain, possibly as far as the end consumer. In this case, the business maintains their profit margins, and continues to operate as before, relatively unaffected by road pricing. Secondly, the business could be less successful in passing on their extra costs, and a proportion of their customers may decide to go elsewhere. If this happens the firm may review its price increase, look for cost savings elsewhere, or adapt in other ways to reduce the costs it has to pass on. Ultimately the firm will either become slightly less profitable, or make other responses to maintain its margins. The final and worst case scenario would be if customers are deterred by the price increase, but the business is locked in to its working practices so that it is unable to make any non-financial responses. If this is the case, and the firms' profitability suffers significantly, then they may be forced to consider relocation (see Chapter 7). In the most extreme cases this would not be a viable option, and the firm may forced to close. This situation was not encountered in any of the firms interviewed, as they were all either unaffected, able to pass costs on, or make some non-financial responses.

It is worth noting that most of the businesses which were able to pass on some or all of their costs had customers which were other businesses, rather than individuals. These businesses could also potentially pass on the costs further, ultimately meaning the end consumer could end up paying twice for road pricing, directly if they incur the charge, and also indirectly through inflated prices. However, as individuals are unable to pass

costs on to anybody, they are more likely to respond to inflated prices by going elsewhere to seek cheaper alternatives. Further research could be conducted into this area, to examine whether individuals are actually more sensitive to pricing increases, and the implications of this for responses to road pricing.

8.2.2 Businesses that cannot pass on costs

Although some businesses could pass on the costs of road pricing, others would not be able to do so, because of a range of constraints. Many of the businesses that could not pass on costs served individuals rather than other businesses, and faced pressure from competitors. Unless they can offer something special, these firms are unlikely to increase their prices for fear of losing customers to their competitors, especially if they are "*competing with people that don't have those [road pricing] charges*" (Business HA, 233). One retailer commented they would have to absorb the costs of road pricing, because *"people will just use another store if we put 50p more on a sandwich or something, they will just go somewhere else"* (Business M, 373). The insurance industry is similar, and if premiums increased because of road pricing one firm thought "*the clients would simply find another broker*" (Business P, 301).

A number of businesses felt they were constrained by the *"market rate"* for goods and services. Even if road pricing did inflate their costs, they may not be able to increase their prices to recoup this, because "*the market will only accept a certain price*" (Business HA, 233). If firms are already close to that price, then there will be very little scope for them to increase their costs, although in some cases this could be an example of cognitive lock-in, as businesses perceive the amount customers are willing to pay incorrectly. A leisure and travel firm commented, "*people are not going to pay more for one [holiday] than another simply because the staff of that [type of] company are paying congestion charges*" (Business U, 399). Even if businesses face no immediate competition they are still unlikely to increase their prices above what they perceive to be this market rate, it could result in them losing custom. This is particularly true in the leisure sector, where customers' spending is discretionary (see section 8.2.3).

A third reason why firms may not be able to increase their prices is because their pricing structure is inflexible. Some firms that are part of national or international companies

may have their prices fixed by their head offices, or standardised around the globe. For example, Business D, a leisure firm, (250) commented they *"have a pricing structure that is global, and it is internet based and we convert it to stirling. And we sell at a global rate...we can't increase that price."* This is a good example of a practical constraint. If a business cannot pass on or the cost of road pricing, or adapt around it then they are likely to suffer from reduced profitability. This may mean they invest less money in the area, pay fewer taxes and minimise increases in employee wages; all of which could have a negative effect on the economy of Southampton. However, this is an extreme situation, as many firms would be able to make some non-financial responses to work around the charge (see section 8.3 and 8.4).

8.2.3 Discretionary travel and choice

As well as increasing costs, road pricing could cause a loss of turnover for firms if their customers are deterred by the charge. This issue was raised during the interviews as a particular concern for the retail and the leisure industry, for two reasons. Firstly, these firms generally have customers who travel to them (i.e. restaurants, theatres, cinemas and sports centres), and therefore these people would be liable to pay road pricing charges if they travel at certain times. This is in contrast to many manufacturing, IT and other businesses where goods and services are sent out to customers at the expense of the firm. Retailing plays an important role in Southampton's economy, and many interviewees were concerned that road pricing could lead to a decline in trade for small businesses as *"people will go to out of town shopping centres rather than go to the city centre"* (Business U, 331), and that ultimately it could *"kill off the town centre"* (Business G, 281). Secondly, travel for leisure purposes is discretionary rather than essential, like a journey to hospital or a solicitor. As road pricing is designed to minimise unnecessary trips, leisure trips may be one of the first type of journey to be reduced, as people have a range of other options available. They could potentially engage in activities closer to their homes, travel at different times, or reduce their leisure spend all together, although the picture is likely to be more complex than this. This section will now look at the issues related to loss of turnover in more detail, with reference to case studies of both the Mayflower Theatre and Southampton General Hospital.

The Mayflower Theatre displays both the characteristics outlined above; its customers travel to its site and therefore could incur road pricing charges, and they are discretionary. However, this does not necessarily mean the theatre will suffer if road pricing is introduced, as the theatre is often considered more 'special' than other leisure venues, and generally does not suffer unduly when the economy is performing poorly (Interviewee 2, Mayflower Theatre). Although people on the margins of being able to afford the trip may be deterred, the theatre may not be affected much, as *"although everyone tightens their belts they will allow themselves the occasional treat, and those treats will be really special...a night at the theatre is a special night out"* (Interviewee 1, SGH). It was also suggested that the effect of road pricing may only be small, because of similarities between the likely charge level and the price of many of the ancillary items which people buy on a trip to the theatre. One interviewee commented, *"if it is a £3 congestion charge, you know, they are paying £2 for their ice cream. £3 is a pint of beer, or a glass of wine. It's not necessarily going to impact greatly"* (Mayflower, Interviewee 5). Rather than the actual cost, the 'hassle factor' of paying the charge may have more of an effect, or confusion over the details of the scheme. It is possible that people could *"hear that Southampton has a congestion charge, they might not look into or realise that there is free period"* (Business U, 255), so they could be deterred even though they would not have had to pay the charge. The example of the Mayflower Theatre shows that it is difficult to generalise about the effects of road pricing, and highlights the importance of looking at each business in turn. Although city centre retailing could suffer, if shops can offer special or unique attracting factors, their customers may not necessarily be deterred by road pricing.

Although accessing healthcare is often essential (rather than discretionary), a case study of Southampton General Hospital is also relevant here, as patients do actually have a degree of choice over the location where they receive their treatment. The NHS has recently launched a Patient Choice Initiative, which introduced more of a market into the provision of healthcare. Instead of referring patients to a single hospital, GPs' now give patients a choice of three, meaning that hospitals need to become more competitive in the quality of their service in order to win patients. The hospital receives a set amount of money from the Government for each procedure that it performs, referred to as the tariff. Therefore, if road pricing deterred patients from using the hospital, it would lead to a loss of turnover, because effectively *"patients equals points equals money"*

(Interviewee 6, SGH). As the tariff is fixed nationally, the hospital could not pass on costs, or recover any losses by increasing its prices. This could lead to financial difficulties, and is a bigger concern for the hospital than the direct costs of road pricing, as they are likely to have a strong case for exemptions, particularly for emergency vehicles. In order to retain patients it would not be advisable for the hospital to 'scrimp' in certain areas to cut costs, as this would lead to a *"lower quality of service"*, and a *"vicious cycle"* of losing more patients (Interviewee 5, SGH). Instead, they would respond with a number of non-financial responses to help retain patients. The Patient Choice Initiative is relatively new, so at the moment it is unclear if road pricing is likely to be one of the factors that influences patients' choice of hospital. Southampton General Hospital is a specialist hospital for a number of procedures, and this could make it sufficiently unique in the region that it is able to retain the patients that require these services.

The most extreme financial effect of road pricing would occur if businesses have extra costs associated with road pricing, but also suffer from a loss of turnover, and are in a highly competitive environment where passing on costs is problematic. This could be the case for some city centre retailers or leisure providers, but it is likely that these firms would be able to make some non-financial responses to minimise the direct cost of the charge to them. These organizational and transport responses will be explored in the next two sections.

8.3 Organizational responses to road pricing

The working practices of firms, including their transport patterns, will influence how affected they are by the direct costs of road pricing. In some firms these working practices are flexible, so they could potentially adapt them to minimise the impact of road pricing upon them. As a road pricing scheme in Southampton is unlikely to apply all day, changes to working hours, or allowing or increasing home working could all help to minimise the impact of road pricing. However, some firms are constrained in their ability to change their working practices, and are therefore unable to adapt to road pricing in certain ways. Changes to working hours and home working will now be discussed in turn, highlighting that rather than being genuinely locked in, certain

responses are simply not appropriate for some firms. Transport related responses will be discussed separately in the next section.

There are a number of reasons why firms can be tied to their working hours, including as a result of their working relationships with other firms (network embeddedness) (see Chapter 3). If staff from the different companies regularly work closely with each other, it is important that they are all available at the same times, or productivity would decrease. For example, Business D, a leisure firm, has a close working relationship with other similar firms in its industry who operate from 9am until 5pm, so they *"have got to respond to their opening times"* (Business D, 314). At a broader scale, Business Q, a storage and distribution firm, has aligned its working hours with clients in Europe to increase the level of service that they offer, and as such they have little scope to alter these without their relationship with their clients suffering. Firms within a national company with standardised hours also face similar issues. For example, Business B, a financial services firm commented; *"it is very unlikely that we would introduce local variation to the standard policy, because it is just too cumbersome and difficult to deal with"* (Business B, 203). These are all examples of constraints on working practices, but an element of behavioural lock-in could also contribute in some cases. Because people get used to particular hours, firms are sometimes reluctant to try altering them or introducing flexibility.

The research findings indicate that there are a number of other reasons why firms may be constrained in their working hours, including external factors over which they have little control. For example, the poor availability of public transport services after 11pm means that the Mayflower Theatre would not be able to start its shows much later in the evening to avoid road pricing. A later start, and therefore a later finish, to the shows could mean audience members and staff alike faced problems getting home. The desire to avoid congestion can also influence firms working hours. For example, Business S opens at 7am to receive deliveries from lorries, to deliberately try and *"get them away from Southampton before the congestion"* (Business S, 295). This is a decision made by the business to increase their efficiency, rather than an example of lock-in. As such, if road pricing solved the congestion problem then Business S could potentially return to its previous hours.

Although some firms are constrained in their working hours, there are many others who could adjust their working days slightly. Some businesses mentioned they were already *"reasonably flexible"* with their hours, allowing people to come in early and leave early (Business HA,319), and Hampshire County Council *"have got a group of people that do nine day fortnights"* (HCC, 134). Business AB, a financial services firm, mentioned that if charging applied at peak periods they could *"see [their] clients outside of those times"* (Business AB, 366). Southampton General Hospital would be able to adjust the times of its' outpatient appointments so that they ran later into the evenings, to help patients avoid paying road-pricing charges (Interviewee 4, SGH), and could also be flexible about shift patterns within individual departments. Although these firms are not locked in to their working hours, if the charging periods are very long, then the ability of firms to work around them will be lower, as there is a limit to how early people will be prepared to start work, and how late they would be prepared to stay. As conventional working hours are often 9am to 5pm, large deviations from these would not be practical in many cases.

The second major change that businesses could make to work around road pricing is to begin or increase home working. Staff working at home one or two days a week would incur less road pricing charges, and therefore the firm would have to compensate them less through increases in pay. However, levels of home working have not risen as dramatically as predicted so far (Handy and Mokhtarian, 1996), and there are a number of reasons why it is not likely to be widely adopted as a response to road pricing. Most of these relate to practical constraints given the nature of firms. For firms such as builders, electricians, couriers and those requiring highly specialised, expensive, equipment, it is simply not possible to work from home. For example, some employees at BSA use large pieces of specialist precision engineering equipment, which are located on their site, and would be unable to work from home as *"you can't take a lathe home to go and turn a piece of material"* (Interviewee 2,BSA). Even where home working is possible, social ties often prevent it because employees value interaction with their co-workers (see Urry, 2003). One firm commented, *"most people like working with people, they don't like being at home"* (Business HA, 311), so even if home working is adopted it is not likely to be for the majority of an employees time. As employees could still be in the office the majority of the time then the costs of installing any necessary equipment in their homes would not be *"particularly economic"*

(Business P, 165), as it would not be used to its full potential. For some firms there are genuine practical reasons that they could not introduce home working, but for others like Business HA behavioural lock-in does seem to play a role, as their arguments against it could be questioned.

Although few firms are likely to take up home working on a large scale, there is variation within firms, and it is more appropriate for some types of employee than others. For example, Business J (314), a retailer, commented that although *"you can't do it for the people who work front of house"* on the shop floor, the head office staff do work at home sometimes. Similarly, the Mayflower Theatre office staff could potentially adopt home working, but the staff who work in the theatre itself selling tickets, ushering, serving at the bar and so on would not be able to (see Appendix C). Approximately 1,000 of the 8,000 staff connected with Southampton City Primary Care Trust are involved in administration and could potentially work from home some of the time. The hospital is already considering running some departments in a *"call centre"* approach, with people logged on to computers in their homes (Interviewee 3, SGH), a trend which road pricing could potentially accelerate.

This section has shown that although there are a range of constraints affecting businesses ability to alter their working practices, many firms do have a degree of flexibility to make some changes. Some firms did display behavioural lock in, and came up with reasons that they could not change which were open to challenge. Although home working is not likely to ever completely replace site-based working, road pricing could provide an incentive for firms to increase it, and assuming the charging period is not too long then working hours could also become more flexible. Working practices include travel patterns, and these will now be examined, as they are particularly important in the context of road pricing.

8.4 Transport responses to road pricing

Businesses' working practices are closely linked to their transport practices, and as road pricing aims to create more sustainable travel patterns, it is important to consider the constraints on businesses' transport patterns. If businesses cannot change their travel

patterns to adapt around road pricing, then the policy may not be as effective as policy makers anticipate. This section will look at two types of business travel; travel *for* work related purposes, and travel *to* work. Within these categories two potential responses will be explored; changes to the mode of travel, and to the time of the trip. In some cases there were genuine constraints on responses, and others displayed behavioural lock in to their mode of travel.

8.4.1 Travel to work

Although employers are not generally responsible for their employees travel to work, these trips are likely to be affected by road pricing, so it is important to consider them. Employees can be constrained in their mode of travel for a number of reasons, and are generally reluctant to change from the car and other forms of private transport, rather than to stop taking public transport. There are a number of reasons that public transport is often not a viable mode for many people to use when travelling to work. Some workers may be based in locations with poor public transport links. Some shift patterns or working hours can make using public transport problematic, particularly if these require travel late at night or very early in the morning, when bus and train services can be limited. These can both be seen as genuine examples of constraints on mode choice, although in other cases people may display behavioural lock-in to using their cars, because of their dependence on them. This is discussed further for travel for work purposes in section 8.4.2.

Other employees may feel the need to drive *to* work because they need to travel during the day *for* their work. One interviewee from office based Business A commented *"I am a sales guy, even if I wanted to get the bus into work I couldn't, I couldn't. I need my car here. So it's not even an option, its not even an option, I need to drive"* (Business A, 157). Although this may be true, this type of view may also reflect peoples' subjective and emotional ties to their vehicles, rather than a real need for them, and is an example of behavioural lock in (see Chapter 3.3). It may actually be possible for some of these people to leave company vehicles at their place of work overnight, if they really wanted to walk or cycle to and from work. This issue should be borne in mind when consulting

about road pricing schemes, as more firms are likely to say that they are unable to change their travel patterns than it truly applies to.

Employees are often not so constrained in their time of travel to work as their mode, unless they work shifts or have non-work commitments such as taking children to and from school. Many of the businesses interviewed had a degree of flexibility in their working hours, so *"people do tend to come early to miss the worst of the traffic, and they tend to go home late to miss the traffic, or leave early"* (Business H, 221). That said, there are limits to this flexibility, and most firms are likely to have core hours which employees need to be present for.

Although travel to work patterns are largely individual decisions, a number of firms mentioned that they would refund employees the additional costs associated with road pricing in order to avoid retention problems. Business HA, an industrial firm, summed it up as, *"either we pay more, or we lose staff"* (Business HA, 205). This would mean that employees no longer had any incentive to adapt their travel patters around road pricing, and could reduce the effectiveness of the policy. Further research is needed into this effect, and any road pricing policy should be designed with this in mind.

8.4.2 Travel for work

Employees and businesses can also display a range of constraints on the modes and times of their travel patterns for work, and while some are fixed, others are more flexible. Like the travel to work, attachment to a particular mode generally relates to the car or other forms of private transport, which offers a number of different advantages over public transport. Some people need to make a number of different trips on the same day, and although some of these may be possible by public transport, it is not as quick or convenient as travelling by car. In business, time is money, so the speed of the car is a considerable advantage (Business AA, 197). Some of these trips may involve locations which are *"way off of the beaten track"* (Business JA, 53), which are not actually accessible by public transport.

For some firms public transport would be genuinely impractical because they have to transport bulky goods. BSA Engineers use vans to carry large numbers of tools and

other pieces of equipment with them on a daily basis, and argue they *"can't use any other form of transport"* (BSA, Interviewee 1), as this equipment is too large and heavy to take on public transport. This is a genuine constraint, rather than an example of behavioural lock in. The Mayflower Theatre operates a publicity van, which travels around many different areas in a single day, distributing large amounts of promotional material. Public transport would be an impractical option because of both the volume of material involved, and the need to travel around many different destinations in a single day; some of which are rural and not served by regular public transport routes. Although some firms do have genuine reasons for using private transport, others display elements of behavioural lock-in, and each case should be examined separately. This behavioural lock-in and attachment to the automobile and private transport shows that levels of automobility are not only important in affecting the successful implementation of road pricing schemes, but that it also has an effect on responses to road pricing (see Chapter 3).

If road pricing was introduced, some businesses may be able to time their appointments to avoid the charging periods, as many of them already avoid travelling at peak periods. One interviewee commented; *"I avoid the periods from let's say 8am to 9.30, and I avoid going down after 4 o clock in the afternoon...Deliberately, yes, to avoid the traffic"* (Business C, 119). The need to travel for meetings could potentially be reduced by increased video-conferencing, although this has not yet taken off on a large scale, and for many negotiations face-to-face contact is still important. Generally speaking, businesses have more flexibility in the times of their trips that in its mode. In some cases certain modes are genuinely not appropriate given the nature of the firm, and in others cases firms display behavioural lock-in to using private transport, because of the advantages over public transport. These modal constraints and lock-in may reduce the effectiveness of road pricing policies, particularly if the firms in question are also unable to change the time of their travel.

8.5 The effects of road pricing – selected case studies

Having examined the three types of non-locational responses to road pricing some of the broader effects of road pricing will now be discussed. This section will begin by using two of the case studies to show that there can be variation in the effects of road pricing within firms, and as such they should not necessarily be treated as the smallest unit of analysis. It will then discuss the specific effects on three important sectors in Southampton; the port, the cruise industry and retailing. Finally this section will highlight that the number of firms that would be so severely affected by road pricing that they would be forced to relocate or close is relatively small.

The Mayflower Theatre hosts a range of different types of shows at different times of day. As these attract slightly different types of audience, the effect of pricing is likely to vary between them. The larger *"big event shows"* such as *Les Miserables* and *Phantom of the Opera* tend to draw audiences from a larger catchment area (up to a 70 minute drive time), and take more advance bookings than the smaller shows. This could mean the larger shows are less price sensitive, and therefore less likely to suffer from a drop in audience numbers if road pricing was introduced. There could also be variation in the effects of evening shows compared to afternoon matinees, as the matinee performances finish around the time road pricing is likely to begin in the afternoon. These matinee shows attract a large number of more elderly audience members, who are generally more price sensitive than other audience members, and spend noticeably less on ancillary items (Interviewee 5, Mayflower Theatre). This suggests they are likely to be particularly sensitive to road pricing, as; *"even if it wasn't a really large charge, it would be something that they would be very conscious of"* (Interviewee 5, Mayflower Theatre). If road pricing charging periods do coincide with matinee performances then they could potentially be more adversely affected than the evening shows, because of the nature of their audience. These two effects combined could mean the worst hit shows are the matinees of the smaller productions.

At Southampton General Hospital (SGH) there are two potential sources of variation in the effects of road pricing on patients. Although the differential effect of road pricing on patients (customers) is not the focus of my research, it is important to briefly consider

this, as patients generate the hospital's main income, and the variation in effect also raises equity issues. Firstly, there could be variation in the effect of road pricing by the type of patient. Emergency patients are less likely to be affected than elective patients, as they are typically brought in by emergency services, or out of core hours, rather than using their own transport (Interviewee 2, SGH). Patients receiving ongoing treatments such as chemotherapy are also likely to be more affected than those receiving one off treatment, although the hospital may consider ways to schedule appointments around road pricing for these regular outpatients. There is also a potential variation depending on where patients like in relation to both the hospital and the charging zone.

The second source of variation in the effects of road pricing on SGH relates to the fact that it is a regional specialist hospital for many procedures, so there could also be variation in the effects on patients depending on the type of their medical problem. If patients who need specialist treatment are choosing which hospital to attend based on clinical outcomes, then they are likely to still come to Southampton because *"they are getting a specialist service"* (Interviewee 4, SGH). One interviewee suggested that the more serious the treatment required then the less likely road pricing is to be a factor in deciding which hospital to go to, as people will focus more on clinical outcomes. Essentially, "*if it's going to see your GP, you probably wouldn't pay 3 quid for 20 minutes to park. But if its going to see the cancer specialist who is going to tell you if they can treat your cancer or not, you don't give a monkeys about your three quid*" (Interviewee 6, SGH). For seriously ill patients factors like parking, the quality of the food and getting a single room *"becomes irrelevant, and all you care about is whether you have got a chance of getting better"* (Interviewee 5, SGH). However, patients requiring less specialist or serious treatment, living on the edge of the city may be deterred by road pricing; and go to other nearby hospitals such as Winchester, which may promote the fact they have *"free parking, and no toll charges"* (Interviewee 3, SGH). Further research should be conducted on these issues in cities wishing to go ahead with road pricing, to make sure the scheme is as equitable as possible.

Chapter 1 identified a number of sectors that are important to the economy of Southampton, including the port, the cruise industry and retailing. With this in mind, the possible impacts of road pricing on each of these industries, and their likely responses will be briefly discussed. Chapter 7 showed that a number of port-related firms have

high levels of sunk costs due to investment in sites and equipment, and are also often locally embedded because of their need to be near the deep water facilities of the port, which are not found in many other locations in the UK. As such, the port related firms are unlikely to relocate in response to road pricing, but are more likely to make the types of financial, organizational and transport responses outlined in this chapter. The exact responses will vary according to the firms in question.

The cruise industry and retailing are both potentially vulnerable to the effects of road pricing because they are leisure industries, with discretionary customers who could be deterred by a road pricing charge, or have their trips suppressed. The impact on the cruise industry was not anticipated to be large, as *"anyone who is paying £1,500 for a cruise isn't going to be bothered about paying £5 to come into Southampton"* (Business U, 257), although it would be important to give passengers information about the charge. In contrast, there was concern amongst retailers and other interviewees that road pricing could *"kill off the town centre"* (Business G, 281) as customers who were already driving to the city would just *"go another ten miles down the road where its free"* (Business B, 295). There were concerns from retailers that customers are not *"loyal enough to come to Southampton regardless"* (Business M, 333), as it does not have many unique features in the same way that London does, and already competes with some out-of-town shopping locations where parking is free. These views reflect the concerns of businesses, and more research is needed with customers themselves to explore these issues in more detail. The findings of this research suggest that the effects will vary between different types of firm. For example, people who are buying large and bulky goods will want to come by car, so *"if we [Southampton] are more expensive than the neighbouring town they will go to the neighbouring town"* (Business J, 121). However, if the charge does not apply all day, customers may simply *"choose the time to come in more carefully"* (Business F, 247), if they are able to be flexible. The effect of people being deterred from Southampton and going to nearby cities, such as Portsmouth, could be minimised with an integrated demand management policy which does not apply in Southampton alone.

Although there is variation between and within firms in the effects of road pricing, this chapter has helped to highlight that the proportion of firms that would be extremely negatively affected by road pricing is relatively small; as there are many non-locational

responses that they can make to minimise the impact of the charge. The firms that would be affected severely enough that they may close are those which meet five conditions simultaneously, which are summarised below:

- The firms' working and travel patterns mean that they are likely to have to pay the road pricing charge, either directly or indirectly though increased costs
- They are in a competitive environment, or have a fixed pricing structure which means that they are unable to pass on these additional costs
- They are sufficiently locked-in to or constrained in their working and transport practices that they cannot adapt around the charge by altering their mode, time or destination of travel
- They are not profitable enough to absorb the costs and accept reduced profit margins
- They are locally embedded, and therefore cannot relocate as a last resort (see Chapter 7)

Firms which meet all these criteria could potentially be forced to close if road pricing was introduced. However, there are a wide range of possible responses available to most firms, and all of the firms interviewed would be able to do make some response to minimise the impact of the charge upon them. The details of any pricing scheme should be considered with these five issues in mind, to ensure that road pricing does not damage businesses in the area.

8.6 Wider issues

This section will draw out a number of broad issues about the economic impacts of road pricing in Southampton which have been touched upon in the chapter so far. Firstly, it is important to recognise that the exact effect of a road-pricing scheme in Southampton will be largely influenced by the characteristics of the scheme. This scheme design will be important in ensuring that road pricing can secure *"significant economic, social and environmental benefits"* (IPPR, 2004). This research has begun to examine the potential economic impacts, but further work is needed to examine social and environmental issues. As there are no proposals for road pricing in Southampton it is not possible to

begin to quantify the economic impact in monetary terms, and even if there were this would be a very complicated task. The impacts of a scheme will vary according to many factors including the charging level and times, whether it is a cordon or distance-based system, and the scale at which the scheme is implemented. If a scheme is introduced in Southampton alone, then the economic impact could potentially be worse than if it was part of a regional or national strategy. However, the advantages which businesses often gain from locating in city centres may provide a strong incentive not to move out of town. National road pricing is increasingly moving up the policy agenda, and if implemented would reduce the likelihood of businesses relocating between cities, because they would not gain anything from doing so.

All of the case study firms, and many of the other interviewees mentioned that road pricing may lead to staff recruitment and retention issues. Sometimes this was a general comment, and in other cases it related to particular groups of staff, because of their working hours or low rates of pay. People who have to drive to work and cross into a charging zone to do so are the most likely to be affected, as public transport users should benefit from improved services. In the medium to long term it is possible that road pricing could actually change the geography of employment of firms, as people may move nearer to their place of work, or nearer the associated public transport routes. This would ultimately be a beneficial move towards more sustainable land use patterns, and further research could be conducted in this area.

One of the possible negative economic impacts of road pricing is that shoppers and other customers could be deterred from coming into the city, and would go to the surrounding cities or out of town centres instead. This is likely to be worst if Southampton implements charges without anywhere else in the region doing the same. One retailer argued their visitors need to come by car; because "*we're not just a clothing retailer, it's a lot of heavy consumer durables. And they don't want to lug them home on the bus, they want to be able to come in, park their car*", so if the cost of driving into Southampton went up they would "*go to the neighbouring town*" instead (Business J, 121). Even if a charge only applied at peak times, customers may not understand or know this, or may not take the time to find out about the scheme, and avoid Southampton instead because it becomes "*labelled*" as a city you have to pay to visit (Business R, 400). One of the reasons for this was because Southampton was

thought to lack many unique qualities that would attract customers despite road pricing. One interviewee observed; *"London has many unique things to offer. Whereas if you took Southampton, someone who lives half way between Southampton and Portsmouth, might well say, oh I'll go to Portsmouth"* (Mayflower, Interviewee 1, 467). People who live near Southampton city centre may not be deterred, but people in the suburbs or out of town may be tempted travel to a different city such as Portsmouth, Bournemouth or Winchester. This does not mean road pricing should be avoided altogether, but that it should be integrated with other policies on a regional basis, to help minimise these problems.

As well as these negative impacts, there could also be a number of economic benefits from road pricing. These could involve businesses saving money because of reduced journey times, and improvements in the city's environment and general image, making it a more attractive location in which to invest. It is easy to overlook these potential benefits, and they were not generally mentioned by the interviewees. However, for businesses with high values of time, who do suffer from congestion, road pricing could offer considerable benefits, and further research should be conducted into this.

The idea that responses to road pricing are affected by a firms' ability to pass on extra costs and its ability to adapt its working and transport practices (and its level of local embeddedness) is not unique to Southampton, but can be applied to businesses in other cities considering road pricing. The importance of each of these factors will vary according to the characteristics of the businesses in the different locations, as some may have more locally embedding factors than others. The scale of a road pricing scheme will also be an important issue wherever it is considered, as local authorities are likely to be concerned about deterring customers and businesses, who would then go to surrounding competing areas.

The future of road pricing in the UK is uncertain, but the Government has already conducted research into the feasibility of a national road pricing scheme (DfT, 2003), and is continuing to look into this further. Such a system may have varying prices according to the type of road, the levels of congestion in particular places and time of day, and as such it is likely to cost more to drive into Southampton city centre than the outskirts of the city. Although this research has not looked explicitly at the idea of

national road pricing, the findings are still applicable, as they are based on the principle that it would cost more to drive into the city centre than it would to out-of-town locations. If a national system of road pricing is introduced which covers all congested city centres, then is it even less likely that firms would relocate from Southampton to neighbouring cities. Similarly, the effects on deterring customers are also likely to be smaller under a national system, although some people may still be drawn to out of town locations, depending on the level of the charges. Further research is needed on the effects of national pricing specifically on the country's ports, as one study has suggested it may increase the attractiveness of ports in the north, rather than sending goods to ports in the south and then moving them large distances across the country by road (LTT 29/06/2006). This would have important implications for Southampton, and should be investigated further.

8.7 Conclusion

This chapter has highlighted that there are three types of non-locational responses that businesses can make to road pricing (aside from doing nothing); financial responses, changes to working practices and changes to transport practices. Each of these are affected by constraints, including how much competition the business faces, and their levels of behavioural and cognitive lock-in to working and transport practices. In some cases certain responses are simply not possible for particular types of firms, others are affected by a series of practical constraints and some display behavioural, and to a lesser extent cognitive, lock-in. The range of possible responses means that most businesses can minimise the costs of road pricing in some way, although there are a small number which could potentially be affected so severely that they are forced to either relocate (see Chapter 7), or close. Behavioural lock in was found to apply predominantly to the use of automobiles, as dependency on them meant people and firms did not perceive they could travel by alternative modes.

The firms interviewed were deliberately selected so that they varied in terms of their locations, number of employees, turnover, travel patterns, working hours, ties to the area, type of customer and many other factors; all of which influence how they are affected by and respond to road pricing (see Chapter 4). Although no single model

emerged to suggest how the business community as a whole would respond to road pricing, this chapter has been able to outline the possible responses, and highlight the factors which influence them. All of these responses will involve effort on the part of businesses, will take time, and possibly require funding, so the extent to which they are made is likely to vary depending on the effects of road pricing on particular organizations.

The potentially damaging economic effects of road pricing on firms would occur if firms were forced to close, or to relocate out of the city (see Chapter 7). This chapter has shown that as there are a wide range of potential responses, the number of firms which would be forced to close because of road pricing is relatively small, as most would be able to work around it somehow. The exact number of businesses in this category will depend on the details of the charge, but it should be possible to minimise the numbers by using careful scheme design.

Chapter Nine – Conclusion and Recommendations

This chapter will review the answers to the research questions outlined in Chapter 1, summarise the main conclusions of this thesis, identify some key lessons and recommendations, and point out the limitations of this research. It will then go on to outline the relevance of this research for theory and the broader road pricing policy debate, and identify some areas which warrant further research.

9.1 Summary of research findings

It is not the intention of this chapter to repeat the conclusions of the previous chapters in detail. Rather, this section will briefly summarise the findings of this thesis to address the research questions posed in Chapter 1, and link these findings to a number of broader theoretical and policy issues.

9.1.1 The success and failure of road pricing

Research question one was:

> *What factors have contributed to the success or failure of road pricing schemes around the globe; and therefore what lessons can be learnt for Southampton, and other UK cities?*

The case studies of the success of road pricing in Singapore, and its failure in the Netherlands, highlight a range of issues that affect the implementation of road pricing schemes. The enabling factors and barriers to road pricing were divided into three categories based on the work of Ubbels and Verhoef (2003), which are; institutional, acceptance and practical / technological barriers. In Singapore a series of issues in all of these categories worked in favour of road pricing, but the Netherlands was the opposite extreme, and road pricing faced barriers in all of these areas.

There was not one single factor which solely contributed to either the success of road pricing in Singapore, or its failure in the Netherlands, but rather a wide range of contextual factors played a role. In short, some of the key issues which enabled road

pricing to be successfully introduced in Singapore were; its long history of restraints on both the ownership and use of automobiles, its semi-democratic political status, the continuing dominance of the PAP, the culture of compliance amongst members of the public and the lack of a motoring lobby or any other kinds of lobby group. In contrast, the Dutch proposals faced a range of barriers, including; the system of coalition governance, which made it difficult to achieve political consensus, a strong lobbying campaign against the proposals and low public acceptance of both the principles of road pricing and the details of the actual proposals.

The two contrasting case studies illustrate that local circumstances play an important role in the success or failure of road pricing policies. In particular, there are two notable differences which are worth considering; the structure of the political systems in the two countries, and levels of automobile dependence amongst their citizens. The two countries represent different political extremes, from single party dominance in Singapore to a coalition of multiple parties in the Netherlands. These different institutional arrangements helped facilitate and hamper the introduction of road pricing in Singapore and the Netherlands respectively. The UK's three party system places it between these two different political extremes, and although it will not be as politically straightforward to introduce it as it was in Singapore, there should be less problems than in the Netherlands, as the need for a cross-party consensus is not as great.

The dominance of the automobile is also a key difference between Singapore and the Netherlands. In Singapore the use of the car has been restricted by numerous policies since as early as the 1940s, and as such it is perceived as a luxury item for the wealthy, rather than a necessity for day to day life. In contrast, many people in the Netherlands have lifestyles which necessitate the use of the car, and are not accustomed to demand management measures which restrict its use. As a result, there was strong public resistance to road pricing in the Netherlands. The same is likely to occur in the UK, as here many people are dependent on, or emotionally attached to, the freedoms and flexibility that the automobile offers. It is already clear from previous material in the media that this public opposition does exist, but having identified this it should be possible to learn other lessons from the two case studies to help overcome both this public opposition and other potential barriers. These lessons are summarised in section 9.1.2 along with a series of recommendations for future road pricing proposals.

9.1.2 Lessons and recommendations for future road pricing schemes

Chapter 6 outlined a series of lessons about the success and failure of road pricing schemes, based on the findings from the case studies. These can be built upon to make a series of recommendations for Local Authorities considering implementing road pricing schemes. A shortened version of the lessons identified in Chapter 6, and the associated recommendations are outlined in Figure 9.1 overleaf.

Having identified the lessons from these case studies, it should be easier to anticipate the problems associated with future road pricing schemes further in advance, and take action to minimise them. Ongoing technological advances mean that technology is less of a barrier to road pricing than it was in the past (Raux and Souche, 2003,153), although as technology improves there is an increasing expectation that schemes will be more sophisticated. Many practical barriers to road pricing can be overcome without too much difficulty, meaning the most likely barriers to future road pricing schemes are institutional and acceptance ones. One of the key institutional issues facing future road pricing schemes in the UK is the historic lack of policy controls restricting the growth of the automobile. In many countries the population have become dependent on the car, and once this dependence has occurred it is difficult to reverse (see Appendix B). Automobile dependence is closely linked to the issue of public and other stakeholder acceptance of road pricing, meaning it is important to design schemes carefully and sell them to the public appropriately to ensure successful implementation. One way in which road pricing could be introduced in the UK is through a reform of the entire system of motoring taxation. The public may be more accepting of a system where fixed costs such as VED and other charges like fuel duty are partially or wholly replaced by a road pricing charge per mile, which could vary according to a number of factors like time of day and type of road. However, high mileage drivers are not likely to be in favour of this system as they are likely to have to pay more than at present. Further research could be conducted in this area (see section 9.4). Aside from these general recommendations, a number of specific recommendations for Southampton can also be made, which are outlined in section 9.1.4, based on the findings of the Southampton based research.

Figure 9.1 Lessons and recommendations for Local Authorities considering implementing road pricing

Barrier category	Key lessons from case studies	Recommendations for future road pricing schemes
Political system	• The more power any one political party has, the easier it will be for them to implement road pricing • Political support for road pricing is likely to fall in the run up to elections • Policy making is simpler if implemented by a single tier of Government, particularly if national Government takes the lead using a top down approach	o Ideally politicians should begin implementing schemes as soon as possible after they are elected o The UK Government should take a stronger lead on the future of road pricing policy, and clarify the way forward. TIF is a good step forward, but clearer guidance about national road pricing would be beneficial.
Policy history	• The way that the automobile has been treated by policy in the past, and how dependent people have become on it will affect how much resistance there is to road pricing	o Integrate transport and land use planning as far as possible, as soon as possible, to reduce both the need to travel and dependence on the car
Lobby groups	• Lobby groups can have an important effect on the success of road pricing schemes, particularly if they vocally oppose the proposals	o Consult and engage with lobby groups from an early stage, to minimise their opposition to the scheme
Public acceptance	• People must perceive there to be a congestion problem which needs to be addressed before they will support road pricing • If public transport is not perceived to be a viable alternative to the car people will be reluctant to use it, and see road pricing as unfair • A strong popular figure can help increase public support for proposals by "championing" them, but an unpopular person can have the opposite effect	o Do not suggest road pricing if congestion is not perceived to be a problem o Ensure public transport services are perceived as good o Consult about the proposals o Policy makers should be flexible about the details of road pricing proposals, and make trade offs in ideal scheme design to increase public acceptance o If possible, appoint a popular and charismatic figurehead to "champion" the proposals o Persevere even if support declines as implementation approaches, as research suggests support will increase again after the scheme is implemented (Odeck and Brathen 2002)

Figure 9.1 (continued) Lessons and recommendations for Local Authorities considering implementing road pricing

Barrier category	Lessons from case studies	Recommendations for future road pricing schemes
Political acceptance	• See political system	o See political system
Business acceptance	• Businesses can form lobby groups and have an important effect on the overall success of road pricing	o As with other lobby groups, businesses should be engaged in the proposals from an early stage to minimise their opposition
Practical	• It is easier to implement road pricing if there are other schemes to learn from • Good communication is vital to avoid misunderstandings which will decrease public acceptance • Stakeholder consultation is important to get their "buy in" to the proposals	o Communicate clearly from an early stage o Actively consult stakeholders and take their comments on board, rather than just providing "lip service" o Be brave! The effects of road pricing are not likely to be as bad as is often feared o Try and work with other Local Authorities and bodies so that road pricing is introduced as part of a broader regional package of measures o Make sure the scheme design is tailored to the nature of the congestion problem in the area in question
Technological	• It is likely to be easier to implement a scheme based on existing technology rather than something new, and people are likely to be more accepting of the proposals if they can see the technology already works elsewhere • Extensive testing will help increase confidence in the system, especially if part of it can be conducted by the scheme users. • The technological requirements of local and national schemes should be developed in parallel to ensure interoperability	o Base the scheme on tried and tested technology if possible o Conduct extensive testing to ensure the technology for the scheme works o Plan ahead to ensure interoperability and consistency in scheme design across a wider area

9.1.3 Business responses to road pricing in Southampton

As road pricing often faces a number of barriers to implementation, it is not a common policy around the world and very little is known about its potential impacts. Many policy makers are aware of the barriers road-pricing faces, particularly in terms of public acceptability, and are therefore reluctant to propose such a scheme. The lack of knowledge about the potential impact of road pricing increases this reluctance, and further compounds the problem, because no schemes are implemented to learn from. To attempt to begin to address this problem the second research question asked:

> *How would businesses in Southampton respond to a road pricing scheme in the city, and how can these responses be explained?*

This second research question was answered by drawing on a range of concepts which are discussed in Chapter 3, including; local embeddedness, footloose firms, sunk costs, lock-in and other constraints on business responses. A wide range of ways which businesses could respond to road pricing where identified, which were categorised as locational, transport, organizational and financial responses. Many firms could potentially make a number of different responses, but others were restricted by local embeddedness, lock-in and the fact that some responses are simply not appropriate for their type of firm due to certain constraints.

The most extreme response firms could possibly make in response to road pricing is to relocate out of the area covered by the charge. However, Chapter 7 found that a number of firms interviewed displayed characteristics of local embeddedness, meaning they are less likely to relocate in response to road pricing than local authorities often fear. There were two main reasons for this local embeddedness. The first was a tie to a unique local characteristic or resource in Southampton, which meant there were a lack of alternative sites that the firm could relocate to. In Southampton's case the deep water port service to "stick" many firms to the city, including cruise providers, freight operators and those which import and export goods. The second major reason why some firms were embedded in Southampton was high levels of investment in a site or large bespoke

equipment which can act as both an accumulated and exit sunk cost. This was found in two of the three large manufacturing firms (See Table 7,1, section 7.3.1).

Although a number of firms were locally embedded, twenty six of the forty one firms interviewed stated that they were footloose enough to consider relocation in response to road pricing. Generally speaking these are firms which do not have high levels of sunk costs, do no rely on a unique resource in Southampton, have no strong working relationships with other firms in the area and do not interact directly with their customers on their site. This included financial and professional service providers and a number of other office based firms. Some firms may not be prompted to relocate because of road pricing alone, but are likely to take it into account as a factor when they next consider relocating for another reason. This could apply to many different types of firm, who have leases which are expiring, or are outgrowing their existing premises.

Many of the firms interviewed would not be sufficiently affected by road pricing to consider relocation as a response, either because of their location, or because their travel patterns mean they are not likely to incur any charges. The exact firms which this applies to will vary according to the scheme design, but they will generally be those without a large transportation element to their operations.

Before responding with as extreme a measure as relocation, many firms would be able to make a non-locational response to minimise the impact of the charge upon them. This can include transport responses like re-timing their trips, organisational responses such as allowing flexi-time or home working or financial responses such as passing on any additional costs incurred. However, many firms were found to be 'locked-in' to one of more aspects of their current working and transport practices, and therefore unable to adjust them in response to road pricing. There are also a number of more intuitive constraints on firm's responses which mean that certain responses are simply not possible for certain types of firm. For example, nurses are not able to work from home, and construction workers who have to carry large amounts of tools and equipment to different sites are unlikely to be able to use public transport.

The firms which cannot adapt their transport or working practices around road pricing are likely to incur extra costs, and which many interviewees suggested they would deal

with these by passing them on to their customers. This is almost an automatic response for many businesses, whose main purpose is to make money. Whether this will be possible or not will be affected by a number of factors, including the competition within the industry concerned, the firm's profitability, its control over its pricing structure, the size of the cost incurred and the price sensitivity of the firm's customers.

The proportion of businesses that can work around road pricing compared to those which are "locked in" will vary according to the design of the scheme. However, this is a very important issue to take into account when designing a road pricing proposal. Ideally, the scheme should be designed so that firms will either willingly pay because they benefit from the reduction in congestion, or they can adapt their working and transport practices around the scheme. If a large number of firms are so locked in that they have to pay the charge, and simply pass the costs on, this will ultimately lead to inflation, and the scheme is unlikely to have the desired effect on transport patterns. The scheme should be designed so that it does influence travel behaviour of a large number of firms, or it will simply be viewed as an unfair tax. Similarly, if the cost is largely borne by employees, they are likely to lobby for compensating wage increases, which may lead to wage inflation across a wider area.

Businesses offering leisure facilities and retailers services could be particularly affected by road pricing as their customers are discretionary and could potentially be deterred to out of town sites where they do not have to pay a charge, or look for alternative leisure options. Interviewees generally felt that the impact of road pricing would be smaller if it was introduced on a broader scale than just in Southampton alone, as this was thought to create a level playing field, and there would be little benefit in relocating to another city.

Although the research with businesses in Southampton was based on a theoretical rather than a representative sample (see section 4.5.2.1), and no single model of businesses responses to road pricing was developed, this research has highlighted the wide range of influences and constraints on these responses for a wide range of sectors. Future research could potentially concentrate on particular sectors or responses in more detail (see section 9.5).

9.1.4 Recommendations for road pricing in Southampton

Based on the findings of this research, including the pilot project, and taking into account some broader policy issues, this thesis has highlighted a number of specific recommendations for the future of road pricing in Southampton. The decision about whether road pricing is either necessary or desirable in Southampton, either now or at some point in the future, is likely to have substantial political ramifications. It is not my intention to comment on whether road pricing is the correct policy for Southampton or not, but if Southampton City Council do decide to develop a proposal, then the issues in this section should be given due consideration.

Firstly, as highlighted in Figure 9.1, it is very difficult to introduce road pricing policy if congestion is not perceived as a problem. This research found that although some businesses in Southampton do minimise the amount they travel in the rush hour *"to avoid the traffic."* (Business C), generally congestion is viewed as a "*minor irritation rather than a major problem"* (Business O,281). It is not seen as a problem *"compared to other cities"* (Business CA), especially London which makes driving in Southampton seem like *"a breeze"* (Business J). Only four of the interviewees mentioned problems caused by congestion, mainly related to time spent "wasted" in queues. When road pricing was suggested as a solution a number of interviewees made comments like *"I don't think there is enough of a problem to warrant charging at the moment"* (Business GA), although a number of people did recognise it may become necessary in the future. The perception of congestion in Southampton in the future should be monitored and taken into account when considering road pricing. Schemes are more likely to be accepted if there is a perceived need for them, or an acknowledgement that congestion will get sufficiently worse in the future so that preventative action is necessary.

Secondly, it is important to consider the scale at which road pricing and any associated measures are introduced. Road pricing in Southampton should not be considered in isolation from the surrounding region, nor in isolation from other complementary policy measures. As Southampton is within the area covered by Solent Transport, this could be a good basis at which to begin planning, to ensure an integrated approach. More research is needed on the effect of scale on the effects of road pricing policy, but the findings of this thesis suggest that the larger the scale road pricing is implemented over,

the less drastic the effects will be on business relocation as there is more of an 'even playing field', and businesses would have less of an incentive to relocate. Road pricing should not be used as an isolated policy instrument (House of Commons 16/03/2005), but needs to be integrated with improved public transport services and where appropriate soft measures such as workplace travel plans.

At present Southampton City Council is 'hung', and no single party has a strong majority. There are 16 Conservative councillors, 16 from the Labour Party, 15 from the Liberal Democrats and 1 vacancy (www.southampton.gov.uk accessed 16/04/2007). This situation has parallels with the system of coalition governance in the Netherlands which caused problems for the implementation of road pricing, as it was very difficult to achieve political consensus on the need for such a policy. If road pricing were to be implemented in Southampton, a strong cross-party consensus on its necessity would be needed, and this is especially crucial in light of the current composition of the City Council. Experience from the Netherlands shows this consensus can break down as elections approach, so any proposals should be put forward as soon after an election as possible to minimise this problem.

9.2 Limitations of this thesis

All research has its limitations, and it is important to acknowledge these. I feel there are three main limitations with the research in this thesis, the first of which is that time constraints meant I was only able to interview one person within each organization in Southampton, with the exception of the more detailed research with 3 firms in Southampton. Ideally I would have interviewed more than one person from each firm to verify their comments. However, I feel that the three business case studies did show that accounts from different members of the same firm were usually broadly consistent, although the exact views did vary depending on the position of the person within the company. I was able to interview senior members of all the firms, who were likely to give informed accounts based on their businesses strategy and priorities. It would never be possible to get a true "business view" (see Chapter 4.6.2), and I feel my findings are more than acceptable considering the time constraints.

The second limitation is that this research could become quickly out of date as the policy agenda moves on, a problem that applies to much policy related research. The road pricing debate has advanced considerably since I began this thesis, but I feel my research has maintained its relevance. Although a cordon road pricing scheme may not be implemented in Southampton, the responses I have identified would also apply under a national pricing scheme, where Southampton city centre was more expensive to travel into than the surrounding areas. I have concentrated on the general concept of road pricing rather than looking at specific scheme designs, and because of this the conclusions remain relevant to a national pricing scheme. It is possible that the policy agenda could move on again, or the idea of road pricing in the UK could be abandoned altogether in favour of other measures. If this were to happen then my findings could still be applied to other countries, or in time if road pricing were to come back on the political agenda in the UK.

The final limitation of this research is that I was encouraged not to interview businesses that were considering locating in Southampton, so I have not been able to explore how road pricing would affect the locational decisions of these firms. The findings from the interviews with Southampton-based firms suggest that they would be put off of locating in a city with road pricing, but this is only anecdotal, and further research would be needed to explore this area in more detail. Although I would have liked to have researched this issue for completeness, it would have required a substantial amount of time, and I did not feel it would have been possible within my timeframe.

9.3 Contribution to Theory

Theoretical knowledge is an important aspect of research, as it provides an interpretative framework through which to further understanding of particular phenomena and issues, and adds analytical depth to existing thinking. Traditionally the policy relevant nature of much of the research on road pricing has meant is has generally been an area of applied research, grounded in real world examples, rather than making use of many academic theories (i.e. Ison 1998, Gerrard *et. al.* 2001). This is true of both the literature on the success and failure of road pricing, which is generally discussed in order to learn lessons from specific schemes, rather than in the abstract;

and the literature on business responses to road pricing, which is often based on questionnaire type surveys similar to those used in the field of market research.

The applied nature of much of the previous research on road pricing means that there is no single over-arching theoretical position or theory through which the various concepts and issues explored in this thesis could be drawn together coherently. Rather, this research has drawn on a wide range of notions from the social sciences, which meant that particular theories (such as local embeddedness) were used in very specific ways to address different issues throughout the thesis, and no single over-arching concept runs throughout. Many of these concepts were used in order to try to better understand the determinants of decision-making both by policy-makers and firms. It is important to recognise this, and reflect upon how the notions used in this thesis could be developed further in future, to move to a more integrated and coherent theoretical basis from which to understand both the success and failure of road pricing, and business responses to it.

This section will begin by reflecting on the theories and concepts used in this thesis, and critically evaluate their relevance in helping to understand and explain both the success and failure of road pricing, and businesses responses to such policies. This will involve considering the theoretical basis for understanding business responses to road pricing, including notions of embeddedness, lock in, constraints, structure and agency. The limitations of the notions used in this thesis will be discussed, and how they could be developed in future, in conjunction with other relevant concepts, to further advance our understanding of the issues associated with road pricing policy.

9.3.1 Understanding the success and failure of road pricing

A number of theoretical concepts were used in this thesis to help explain the success and failure of road pricing schemes, including notions of automobility, (which examines both individual and societal dependence upon the car), and the metaphor or barriers. This section will begin by evaluating their usefulness and limitations in this context, in an area of research which has previously been primarily grounded in real life situations, rather than based on abstract theorising. It will then consider how these ideas can be

developed in future, to help understand possible changes in the acceptability of road pricing schemes over time, and therefore in the success of implementation.

9.3.1.1 Critique of existing approach

The notion of automobility was used in Chapters 5 and 6 to help explain both individual and societal attachments to the automobiles, and therefore the currently low levels of acceptability of road pricing schemes. These two chapters highlighted the importance of automobility in practical policy terms, and applied concepts that have so far been largely theoretical to empirical case studies of Singapore and the Netherlands.

Despite the usefulness of automobility in helping to explain some of the reasons that road pricing is controversial at present, it is primarily concerned with explaining people's attachments to their vehicles at an individual and societal level, but does not further our understanding of how this may change in future. For example, it is important to recognise that issues like the increasing emphasis being given to tackling climate change and promoting sustainable transport may lead to a broad shift in societal attitudes, which could potentially increase the acceptability of measures such as road pricing. Concepts of automobility are largely theoretical, and to date have not been widely applied to practical issues such as examining people's propensity to shift from using the car to more sustainable modes, or the potential for increases in the acceptability of road pricing if attitudes towards the automobile and the notion of the "right to drive" change in the future. This is an area which would benefit from further research. In addition, not much is known at present about peoples' willingness to pay for the benefits of automobility; how much will the dominance of the automobile be weakened or changed if the cost of driving is increased?

The second important concept developed and applied to understanding the success and failure of road pricing was the metaphor of barriers, which was based on the original notion of Ubbels and Verhoef (2003) (see Chapter 2). The barriers metaphor has the advantage of being able to incorporate and move beyond concepts of automobility, to include an examination of the political, acceptability, technical and practical issues surrounding the introduction of road pricing. This thesis has shown how the metaphor

can be reversed and applied to factors that enable, rather than inhibit, the success of road pricing schemes.

The barriers metaphor does provide a helpful framework through which to understand the success and failure of road pricing schemes, and to identify a series of lessons for future schemes, which were outlined in section 6.9. However, it would be developed in a number of ways to provide a more sophisticated analytical framework through which to understand the success or failure of road pricing. A series of ways this could be done were discussed in section 6.7, including highlighting the importance of automobility and policy history in the successful implementation of road pricing, as well as accounting for the fact that barriers to road pricing are actually dynamic, and can interact with each other and change over time. The barriers metaphor is essentially a framework for interpretation, and needs to be used in conjunction with concepts such as automobility and the functioning of different systems of governance, rather than offering a large level of explanatory capacity in itself. As I argue below, the barriers approach also tends to merge and blur questions of structure and agency.

9.3.1.2 Future theoretical development

Given the limitations of automobility and the barriers metaphor outlined so far, it is worth considering how, in future, the success and failure of road pricing schemes can best be theorised; taking into account possible changes in both its public and political acceptability over time.

Over time, as technology improves, the major barriers to road pricing which are likely to remain are those based on public acceptability, and the political issues associated with implementation, such as structure of governance in the country or area considering a scheme, and the desire to win the support of the electorate in order to maintain political power. The close links between public and political acceptance of road pricing are likely to remain in future (see Chapters 5 and 6). There has been an increasing amount of work on the acceptability of road pricing (Schade and Schalg, 2003), but it is important that future work gives due consideration to not only the current levels of public and political acceptability, but the potential for these levels of change over time as societal attitudes to the car and the transport policy context evolve. There has already

been a shift in transport policy from "predict and provide" to an approach towards travel demand management (See Chapter 2). Future trends in transport policy, particularly road pricing, need to be seen in this context, and against the background of increasing emphasis on promoting sustainable transport.

As well as having an awareness of the changing policy context, future work on the success of road pricing schemes needs to be able to account for the related potential for broad shifts in societal attitudes towards transport, including the car. In the past practices such as drink-driving or driving without a seatbelt were relatively common in the UK, but gradually attitudes have changed, and they have become unacceptable. Similarly, there may be potential for a shift in attitudes towards paying for road transport, if people can understand the rationale behind it, and feel that it is fair (see also section 3.2.5 on tipping points). Marketing and awareness campaigns could potentially play a role in encouraging this shift in attitudes and therefore in travel behaviour, but these would only be introduced if there was sufficient support from politicians to encourage such a shift in attitudes towards transport. Given the controversial nature of road pricing policy this may not be realistic at present, but if and when road pricing becomes more popular around the world such measures could play a role in paving the way to re-open the debate on road pricing in the UK.

9.3.2 Understanding business responses to road pricing

A number of theoretical concepts were used throughout this thesis to help understand businesses' responses to road pricing, building on previous research which has also been largely applied and based on empirical survey methodologies rather than abstract theorising (i.e. Gerrard *et.al.* (2001), Whitehead (2003)). This section will review the utility of these largely discrete ideas of local embeddedness, lock in and constraints on responses, and move on to consider how the diverse influences on business responses to road pricing can be drawn together and understood in a more coherent and integrated manner in future.

9.3.2.1 Critique of existing approach

The notion of local embeddedness has been used in many different ways by a range of different authors in the past (see section 3.3.2) which has led to some problems over its actual meaning (see Hess 2004). Hess (2004) examines the three main types of embeddedness; social, network and territorial (the latter two of which are the most relevant in the context of this thesis); and highlights that although they are closely knitted to one another, they are from different academic and theoretical backgrounds. It is important to be aware that the original use of societal embeddedness by Polyani (1944), and later by Granovetter (1972, 1985) was non-spatial, and focussed on the role of economic and non-economic institutions in the functioning of the economy, the embeddedness of individual actors and networks of relations between firms. The explicitly spatial notion of territorial embeddedness was only developed by economic geographers in the 1990's, and applied to understanding the embeddedness of firms in networks and institutional settings at the local and regional scale, and to explain the economic success of particular regions.

In this thesis, concepts of territorial embeddedness (including sunk costs), network embeddedness, and embeddedness due to the unique characteristics of a place were used to help understand businesses' different responses to road pricing. It is important to be aware that these different types of embeddedness do originate from different theoretical traditions, and that as such caution should be applied when applying them together in this thesis. Territorial embeddedness (linked to the new economic geography) largely focuses on firms' embeddedness in networks and institutional settings at the local and regional scale. However, network embeddedness (more aligned with the New Economic Sociology), is more concerned with the embeddedness of the economic behaviour of firms as well as individuals, in networks of ongoing social relations, at any scale (Hess 2004). Whereas territorial embeddedness has a clear geographical element concerned with firms fixedness in a place, network embeddedness has traditionally focussed more on the relations between firms and how these social relations affect economic action. Although using these two concepts together helped to understand the range of influences on business responses to road pricing, their different theoretical backgrounds mean that in the past they have been used in isolation, rather than applied together to understand a single issue (see Chapter 3.3.2). It is important to be aware of this, and

understand that traditionally the notion of network embeddedness was not developed to be applied to understanding spatial phenomena such as firms' ties to Southampton.

Hess (2004) suggests embeddedness should be reconceptualised using the metaphor of the rhizome, which he illustrates can capture aspects of social, network and territorial embeddedness, as well as accounting for changes in embeddedness over both space and time. He argues; *"It is the simultaneity of societal, network and territorial embeddedness that shapes networks and the spatial-temporal structures of economic action"* (Hess 2004,181), suggesting that different types of embeddedness can be successfully applied to understanding a single phenomena. However, caution, and appreciation of the different origins of these concepts is needed when doing so. An alternative method for understanding business responses to road pricing in Southampton, which helps begin to overcome the limitation of applying network embeddedness in a spatial manner, is discussed in section 9.3.2.2.

A further limitation of the concept of local embeddedness is that it primarily helps explain firms' locational responses to road pricing, but does not account for the range of other non-locational responses which they make, such as adapting their working and transport patterns (see Chapter 8). A possible approach which could be used to overcome this drawback, and consider business responses to road pricing holistically is outlined in section 9.3.2.2.

The concepts of lock-in and constraints on responses were used to help understand why certain businesses would not or could not act in particular (non-locational) ways in response to road pricing. Although lock-in was particularly helpful in understanding why firms' adopt and continue with certain transport and working practices, Chapter 8 showed that aside from behavioural and cognitive lock-in, there are also a series of other more practical constraints influencing business responses to road pricing; highlighting the need to go beyond using the concept of lock-in alone. This includes embeddedness due to high levels of investment which act as sunk costs, and costs of relocation, which are effectively forms of financial lock in.

Another limitation of the concept of lock-in arose because the road pricing proposals for Southampton are only hypothetical. As such, it was difficult to distinguish whether

firms were genuinely locked-in and constrained, or whether they simply believed this to be the case due to cognitive lock in. As lock-in can have a variety of causes it can be difficult to identify. In addition, although the notion of lock-in is helpful in highlighting that firms are likely to make small incremental changes rather than large drastic ones in response to road pricing, it does not readily assist in identifying what these might be, when they might occur or how they might be influenced by the agency of the people involved (see section 9.3.2.2).

The idea of constraints on business responses to road pricing is relatively straightforward and intuitive, but could be developed in future though an approach which accounts for the effects of structure and agency in influencing how businesses respond to road pricing. This possible future approach will now be outlined in section 9.3.2.2.

9.3.2.2 Future theoretical development

Having reflected on the limitations and issues that arose from the concepts used in this thesis to understand business responses to road pricing, it is possible to suggest an alternative approach which could be developed in future. I feel it would be beneficial to examine business responses to road pricing using an approach which is sensitive to issues of structure and agency, and also the recursive nature of the relationship between them, such as the strategic relational approach (See Jessop 2001 and Valler and Wood, 2004). This section will outline how such an approach can be applied to develop a more integrated understanding of businesses responses to road pricing, as well as potentially help further our understanding of the issues associated with the success and failure of road pricing which were discussed in section 9.3.1.

In simple terms, the structure of firms, and the associated nature of their operations, can have an important influence on the responses which it is practical and affordable for them to make to road pricing. However, agency is also an important factor in firms' responses. Businesses are made up of individual people, and decisions about how to respond to road pricing are often made by senior managers who will have particular views about its likely impacts on their firm which will influence their decision making. The agency of firms' employees can also play a role, as they may lobby for refunds of

the charge, adaptations to working practices, or raise other issues which will influence managerial decisions about how to respond to road pricing. So, a firm's response to a road pricing scheme can be seen as a product of not only the structure of its operations, which govern how it is practical for it to respond, but also the agency of both the key decision makers and the firm's employees which are likely to be affected by the charge.

A firm's structure can influence its responses to road pricing in a number of different ways, including territorial embeddedness if it needs to be located near a particular resource such as the port in Southampton, as well as impassion a number of practical constrains on the responses it can make because of the nature of its operations. Exit sunk costs due to high levels of investment in requirement or a site, and lease periods can also be considered structural influences on responses.

There are a number of examples of how agency can influence firm's responses to road pricing. The views of key decision makers within firms on how severe congestion is, their sympathy with environmental goals, their opinions about road pricing and levels of network embeddedness due to established working relations with other firms are all likely to influence how they respond to a scheme. The effects of automobility and individual emotional and subjective attachments to vehicles could also be considered an aspect of how human agency influences responses to road pricing, and may mean people do not make rational decisions about the best possible transport responses to a road pricing scheme. The example of the Mayflower Theatre used in section 7.4.1.2 is a good example of how agency and subjective issues can influence responses to road pricing. Although it would be possible to relocate some of the theatre staff to avoid the charge, senior managers did not wish to do this because it would could mean staff to longer *"feel part of the theatre"*, lose job satisfaction and become de-motivated. Clearly, decision makers take into account more than simply the financial aspects of a scheme when choosing their responses. Other examples of the effects of agency include the desire to retain existing skilled staff who may be locally embedded in an area because of established housing, education and social patterns (see section 3.3.1), and therefore reluctant to relocate with a firm.

It is important to recognise that the effects of structure and agency are not mutually exclusive dualistic categories, but rather they have a recursive relationship. Recently,

the need to overcome the structure-agency dualism has been advocated through the strategic relational approach (SRA). This highlights that structures are constituted only by their impacts on agents, agency takes place only within a structured context, and that some structures privilege certain forms of agency (Jessop, 2001). Therefore, in the context of this research it is important to appreciate that business responses to a road pricing scheme are a display of agency resulting from decisions taken by key actors, but that these are made within the context of a number of structural influences such as the nature of the firm, its organisational structure and the details of the proposed road pricing scheme. An example of how both structure and agency can influence business responses to road pricing is highlighted by the response of passing on any additional costs incurred because of road pricing. This will not only be influenced by how it makes money (its structure), but agency effects such as the loyalty of its customers and the presence of competition in the market will determine how successfully these costs are actually passed on (see section 8.2.1).

Using this approach which is sensitive to both structure and agency can help draw together and integrate the wide range of influences on business responses to road pricing that were identified in this thesis. It can provide a broad framework for interpreting these responses, and applies to both locational and non-locational responses, encompassing issues of embeddedness, lock-in and other constraints. An appreciation of the effects of human agency can help explain why two firms which seem similar structurally and in other ways may respond differently to road pricing, as the individual views of the decision makers will play an important role. However, this also necessitates an appreciation that firms are often unique, and therefore it is difficult to generalise about how particular types will respond to road pricing. An appreciation of the effects of structure and agency could also potentially be applied to understanding the success and failure of road pricing schemes. Political and institutional structures and the agency effects of public and political opinions in affecting acceptability could all be considered through this framework.

9.3.3 Conclusions

This section has reflected upon the advantages and limitations of the theoretical concepts used in this thesis to examine the success and failure of road pricing schemes,

and businesses responses to these schemes. Suggestions were made to help overcome these limitations, and develop a more integrated and coherent theoretical basis from which to understand these issues in future. Firstly, this included refining the barriers metaphor to account more clearly for the roles of automobility, policy history, and potential future changes in policy context and societal attitudes to the car and transport. It also advocated adopting an approach more sensitive to the combined influences of structure and agency on business decision-making. Having done this, this Chapter will now examine the contribution which this thesis has made to the more applied area of the road pricing policy debate.

9.4 Contribution to the road pricing policy debate

As well as contributing to theoretical understanding, this research has also made a number of contributions to the road pricing debate. Firstly, it has added more depth and detail to previous research on the reasons for the success and failure of road pricing schemes, the possible effects of the policy, and in particular business responses to road pricing (i.e. Whitehead 2005). The qualitative approach has allowed me to pay attention to details (such as *why* firms would make certain responses to road pricing), rather than simply using survey data to identify broader trends. I hope that these findings will help to allay some of the common fears that policy makers have about implementing road pricing schemes, especially in terms of the locational responses of firms, and allow more informed policy decisions to be made.

Based on the research findings I have been able to identify a number of lessons and recommendations for authorities considering implementing road pricing schemes. These are not just relevant for Southampton City Council, who wanted a better understanding of the issues involved with road pricing policies, but also to a wider audience. Although it is important to exercise caution when transferring the results, I do feel many of these can be applied beyond Southampton, and to the wider debate about the effects of road pricing policy.

Some of the findings about businesses responses to road pricing, in particular their financial responses, suggest that the policy may not necessarily have the desired effect

on reducing business-related traffic. Many firms suggested they would pass on any extra costs associated with road pricing to their customers, but if this happens it could simply lead to inflation in prices, rather than a reduction in traffic. Further research could be conducted into this area, to investigate further which types of firms are likely to pass on their costs and whether there are ways that scheme designs can be tailored to minimise this effect.

9.5 Areas for further research

This thesis has focused on some relatively narrow issues of the road pricing debate, and there are many different areas which are worthy of further research. A number of these have been mentioned already in this and other chapters (e.g. more research into businesses' financial responses to road pricing), but this section will briefly outline a number of key areas which I feel deserve further examination.

This research has mainly concentrated on the private sector, and so more research on the impacts of pricing on the public sector could be of interest. My initial findings suggest the types of responses will be broadly similar, but will vary with the specific nature of the institutions concerned. Further research in this area would be interesting, particularly examining whether public sector institutions are more susceptible to local embeddedness than the private sector, and how this affects their subsequent responses. This research also focused on the economic impacts of road pricing, so another way to build on this would be to examine its potential social and environmental impacts. There is some research currently being done on issues of social exclusion (Lucas, N forthcoming), but future studies could be conducted on broader social and environmental issues.

Whitehead (2005) highlighted that the effects of road pricing schemes are likely to vary on a city by city basis, and with this in mind it may be useful to conduct further research about the likely effects of road pricing in other cities. Southampton has a number of unique characteristics as a port, as an important city for the cruise industry and a large retail centre. It would be interesting to compare my findings about the likely effects of road pricing on businesses in Southampton with studies conducted in other cities, both

in the UK and abroad. Southampton's port does lead to local embeddedness for a number of firms, and so future research could look at how these levels of embeddedness vary in other cities, and affect locational responses to road pricing. There may be different factors which embed firms in other cities, or Southampton could be unique in having a number of firms which are not as footloose as is often assumed.

As there are currently no road pricing proposals for Southampton, this research is based on the principle of a scheme, not actual details about the type of charging scheme such as the amount of the charge, times it applied, types of vehicles charged and exempt, or the area covered. As such my results are based on trends, not figures. If any specific road pricing proposals are developed for Southampton or the region, then the impact of these should be researched in more detail. This research could further clarify the possible trends in business responses, social impacts and environmental consequences, but may also be able to estimate figures for the economic impacts. More detailed modelling work should also be carried out to look at the transport effects of any scheme. It is important that all research on the potential impacts of road pricing remains open to its positive effects as well as the negative ones. For example, the policy could potentially enhance the city's image as 'green' and may attract businesses that would benefit from lower levels of congestion. It would also be beneficial to conduct research with consumers. Many of the business interviewed in this research expressed concerns that their customers would be deterred to other charge-free areas by a road pricing scheme, so further research to investigate whether these concerns are warranted would be worthwhile.

The future of road pricing in the UK is currently unclear. Although a number of cities have received funding from the Transport Innovation Fund to research options for road pricing, it is not a given that these will progress into implemented road pricing schemes; and the future of road pricing in Manchester will not be decided until at least December 2007. Research has been conducted on the impacts of various national road pricing schemes (see Glastier and Graham 2003), and more should be conducted as the policy agenda moves on, and it becomes clearer how road pricing in the UK is likely to be implemented, if at all. In particular the effects of different scales of schemes should be investigated, as the impacts of charging are likely to be different if it is introduced in a single city compared to on a regional basis. Specifically for Southampton, the effects

of a scheme in the city could be compared to one in the Solent Transport sub-region, or across Hampshire as a whole.

9.6 The Next Steps?

This thesis has shown that road pricing is a controversial policy which faces a number of barriers to implementation, and as a result there are not many operational schemes around the world today. However, lessons can be learnt for future schemes from road pricing in Singapore, and even from failed attempts to introduce pricing in countries like the Netherlands. Given the lack of current schemes, there is a gap in current knowledge about the potential effects of road pricing policy, and this thesis has attempted to fill this gap. It has focussed on how businesses would respond to road pricing in the city of Southampton, and highlighted that there are a range of different possible responses, and that most firms would be able to do something even if it is passing on their extra costs. It found that a number of firms are "locally embedded" in the city, and therefore unlikely to relocate out of the city if road pricing is introduced, particularly if the scheme is introduced at a scale larger than just Southampton, and is part of an integrated package. Many other firms which are not embedded are still unlikely to relocate because they can respond in other, less drastic, ways to the policy; and its effects are not likely to be severe enough to warrant a response as extreme as relocation for most firms.

The House of Commons report (16/03/2005) suggested there is a sense that *"some form of road pricing would probably be introduced at some point in the future"*. However, after the recent vocal public opposition to a national pricing scheme in the UK, its future is now more unclear. The TIF is encouraging research into road pricing schemes in a number of cities across the UK, and Manchester's bid for a pilot scheme is encouraging for road pricing supporters. However, two of the ten councils in the Association of Greater Manchester Authorities (AGMA) do not support the current proposals, so they are likely to face both acceptability and institutional barriers to implementation. As time goes on, concerns over the environment are getting ever greater, and traffic levels are likely to continue to increasing. However, many people are highly attached to their cars, so whether road pricing will ever become widely publicly

and politically acceptable, and be adopted as a method of reducing congestion and funding transport improvements will remain to be seen.

Appendices

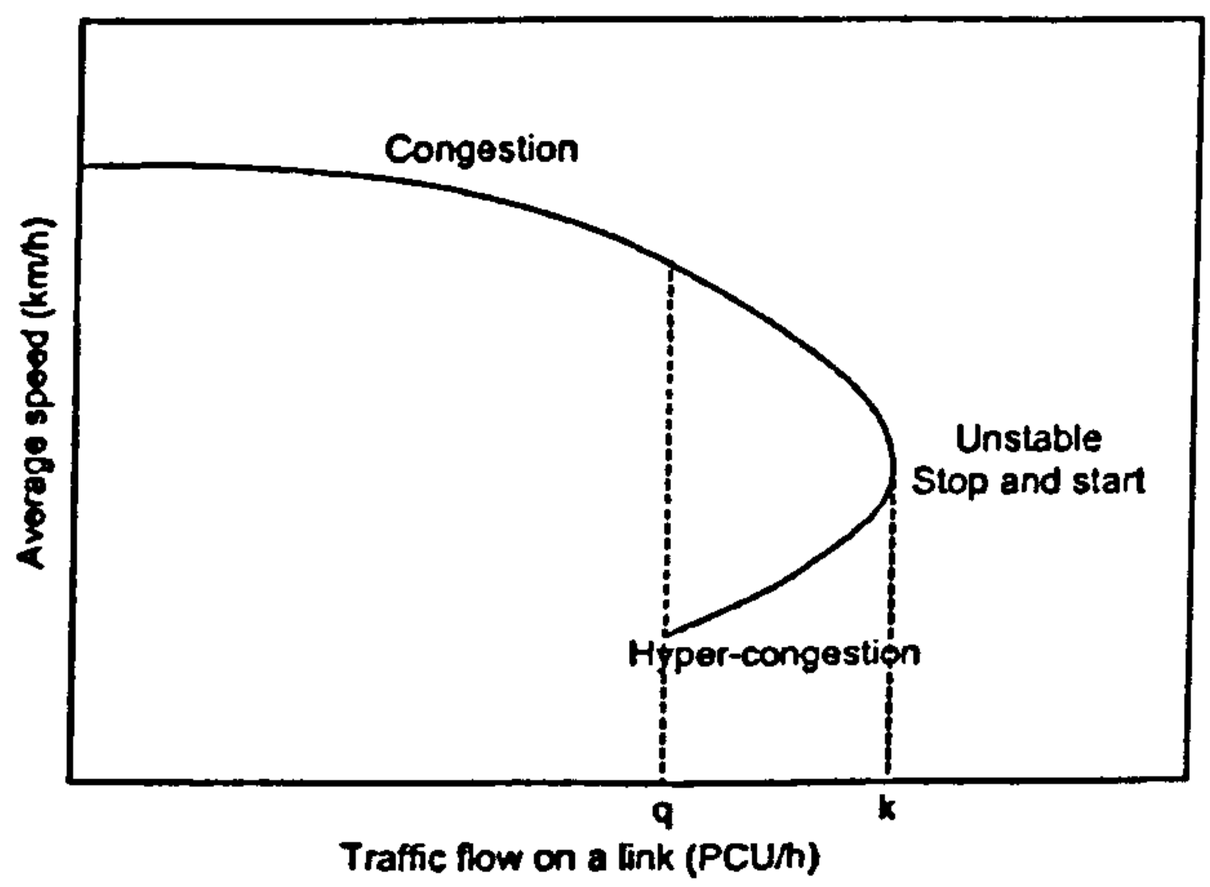
Appendix A – The economic rationale for road pricing (Pigou 1920)

Appendix A – The economic rationale for road pricing (Pigou 1920)

It is important to be aware of the economic rationale for road pricing, and to bear it in mind when discussing the political and social arguments often made against pricing. The theoretical basis for road pricing was explained by Pigou in 1920 in his book the Economics of Welfare, and can be illustrated by a series of diagrams. The economic rationale for road pricing is well established, although recently the arguments have developed to include social and environmental aspects.

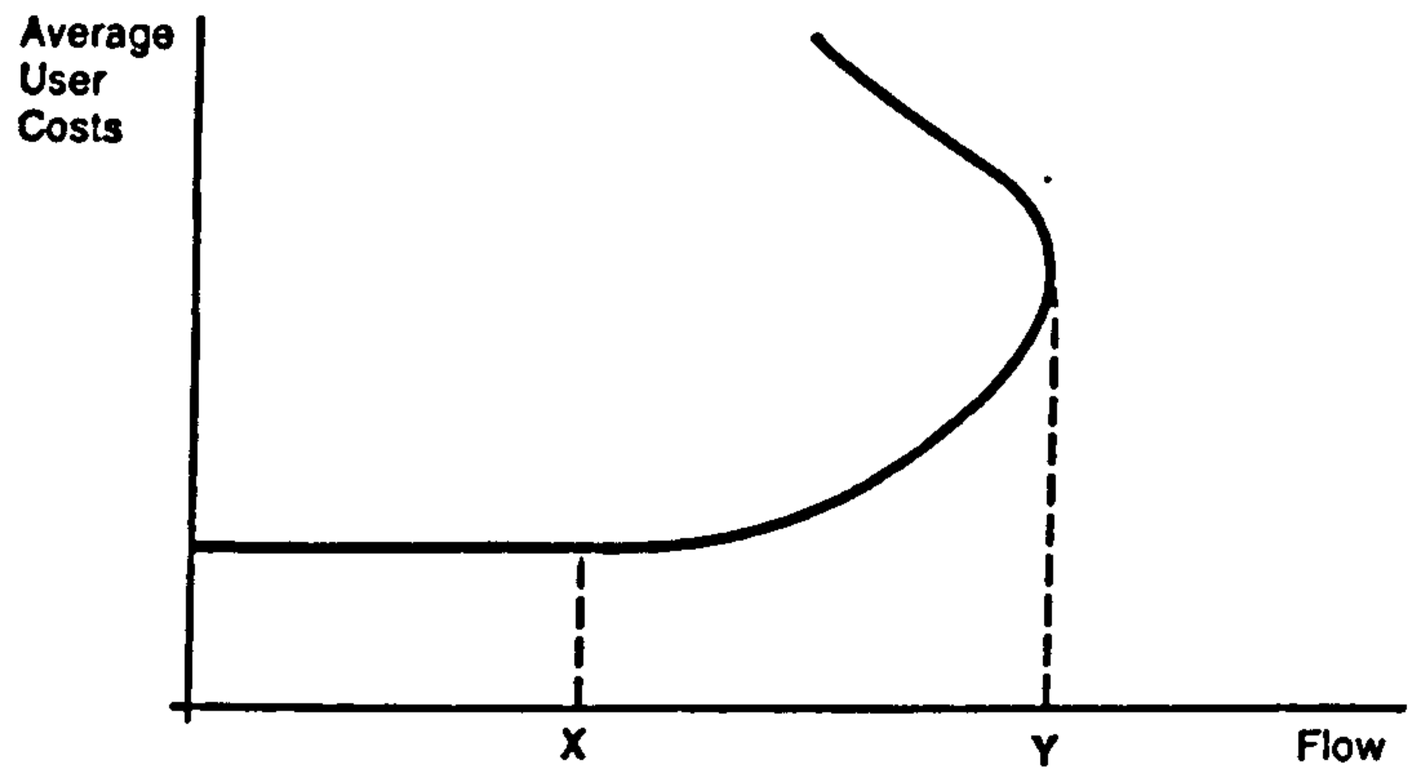
The argument for road pricing begins with the speed-flow curve; a concept from economics which can be used to illustrate the movement of traffic. Figure 10.1 depicts the relationship for a simple one-way street. At low levels of traffic flow the speed of vehicles is restricted only by the legal speed limit, and the capabilities of the vehicles. As the traffic flow increases vehicles begin to affect each others speeds, as slow vehicles hold up the faster ones; meaning overall average speeds decline. Past point q the flow begins to become unstable, leading to stop and start conditions. At point k the capacity of the road is reached, so flow cannot increase any further. If vehicles continue to enter the road then hyper-congestion will occur, where flow and speed both decrease; sometimes referred to as gridlock.

Figure 10.1 – Speed-flow relationship graph (Button 2004,5)



The speed curve can be translated into a cost function, which was first done by Walters (1961) (Button 2004, 5), and is shown in Figure 10.2. The direct costs of driving include fuel costs, wear and tear, time to make the trip and so on. Up to flow X the cost for each vehicle is constant, but as flow levels increase past this the cost for each vehicle increases, gradually at first and then more steeply as congestion gets worse, as each card delays the others. Congestion means that not all vehicles can travel at their desired speed, so trip times increase, and therefore costs go up. Past point Y flow becomes unstable and the flow of traffic decreases, but the costs carry on going up as people's journeys get much longer, fuel costs and the time of the trip increases.

Figure 10.2 – Cost-flow diagram (Richards 2006,11)



As the cost of a journey goes up, less people are likely to make it; meaning demand will go down. This is illustrated in Figure 10.3, where the cost curve is drawn alongside the demand curve. As the user costs go up, the demand to travel falls according to line A-B; so at a high cost of travel there is lower demand, and at low cost demand and flow are both high. Demand can be thought of as equal to the marginal private (and social) benefit.

Figure 10.3 – Demand-cost diagram (Richards 2006,13)

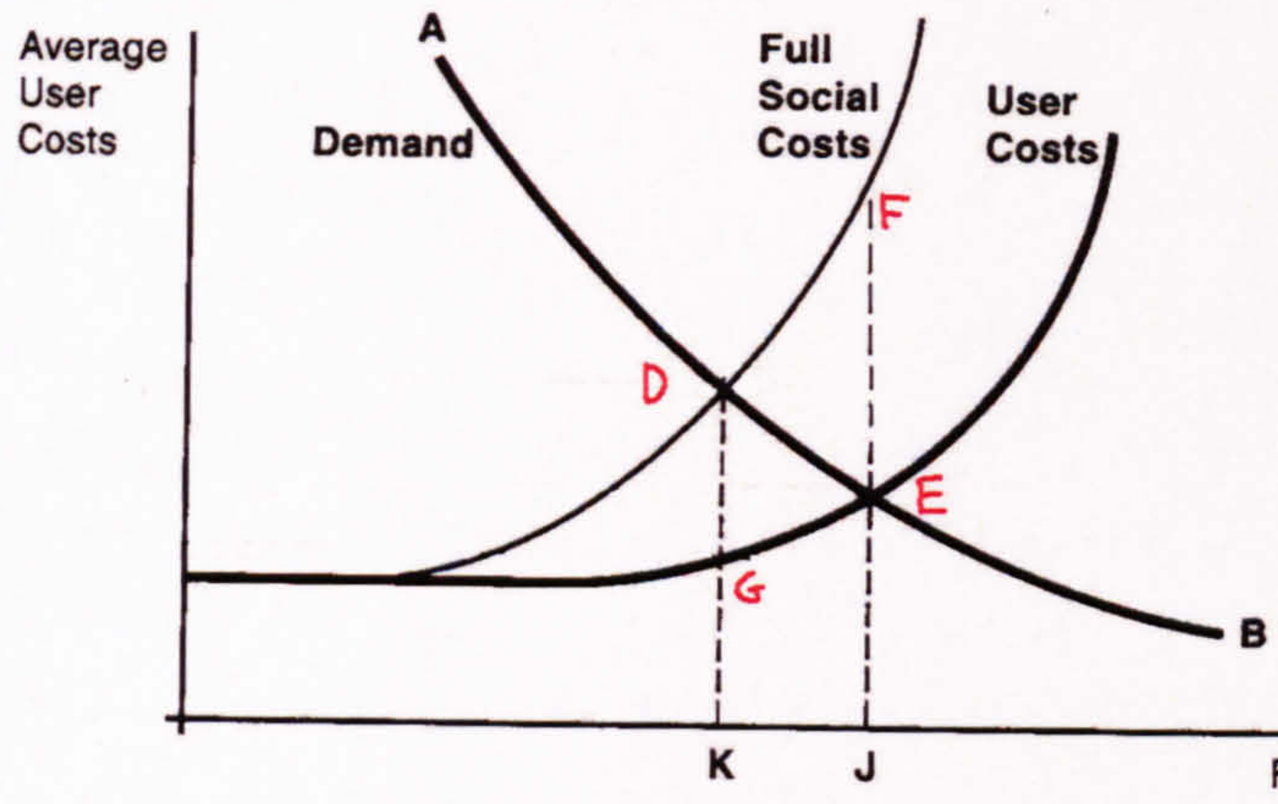


Figure 10.2 only showed the direct costs of travel, and does not take into account the costs imposed on others, which can include pollution, delays and noise. Similarly, when individuals decide how to travel they generally only think of their personal costs, and rarely take into account the full (marginal) social cost, which they impose on others. Figure 3 illustrates that for a given flow the full social cost is actually higher than the average user cost, and the gap between these increases as the flow increases.

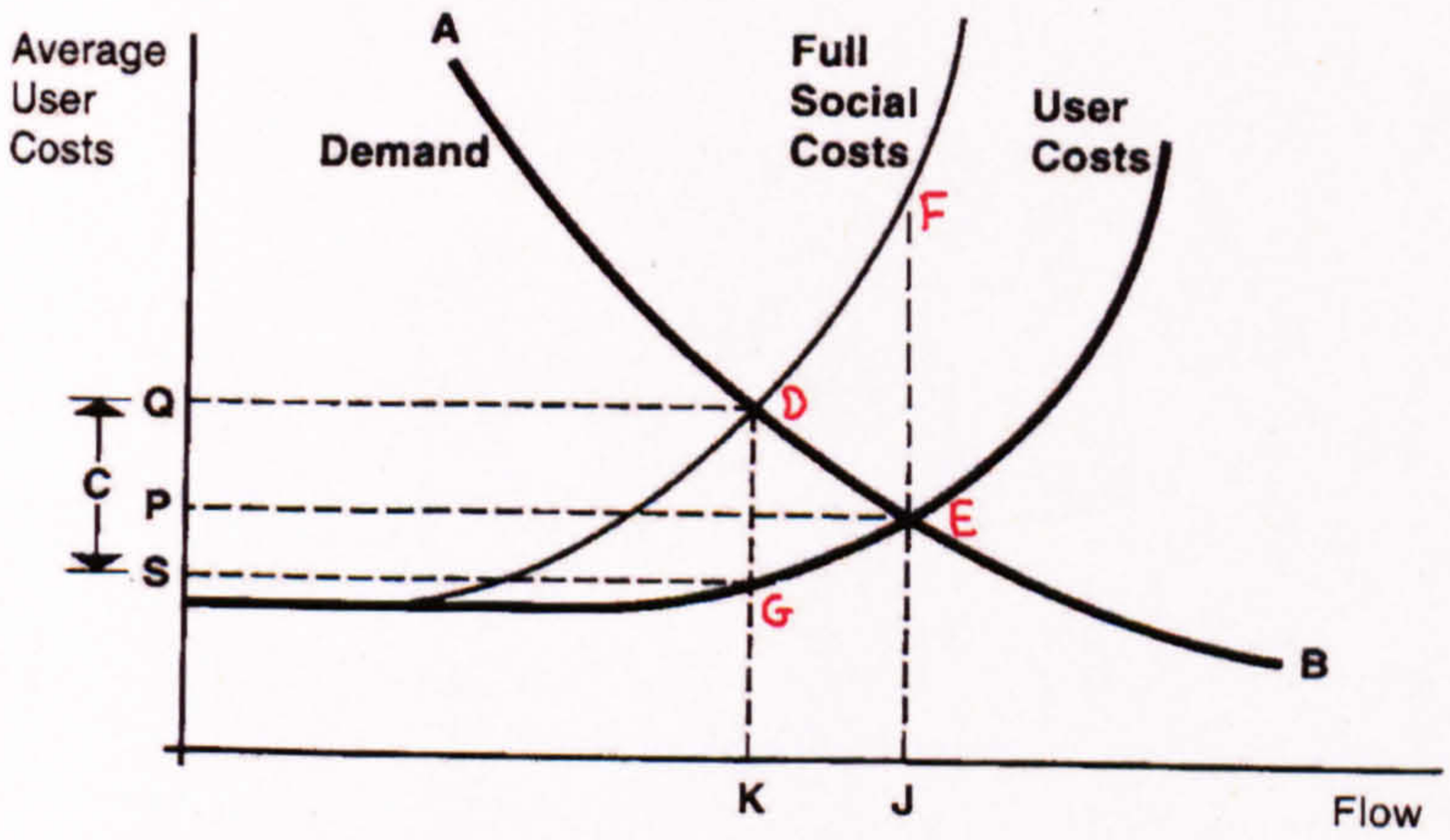
Economic theory suggests that traffic flow stabilises at point J in Figure 10.3, where the user cost and demand curves cross; as the cost of using the road is seen to match the benefits of using it. However, the *full* social cost curve crosses the demand curve at a lower level, meaning that if all users of the road were aware of the full costs they imposed on others then demand (and flow) would drop to level K. K is actually the optimal flow level, as the marginal (full) social cost is equal to the marginal social benefit (which is the same as demand), so the roads are used in the most efficient was possible. However, because people generally only take account of the direct costs to themselves, then flow is higher than the optimum, at J.

Road pricing is based on the rationale that if people were aware of, and had to pay, the full social costs of their travel then demand would drop to the optimal level, K. This is because the demand for road space is elastic, and will vary in relation to its price (see Rodrigue *et. al.* 2006, 58). Figure 10.3 illustrates it is socially desirable to reduce traffic flow to level K, because at flow J the average motorist is getting a benefit of E, but is

imposing a cost of F, which leads to what in transport economics is called the social cost of congestion, or *"deadweight welfare loss"*, given by the triangle DEF (Button 2004, 7). At point K the full social cost and benefit of travel are equal, so there is no net loss or gain.

In order to make drivers aware of the full social costs of their travel, an additional road pricing charge is needed. At a desirable flow of K the direct cost to each vehicle would be S, although the true full social cost would in fact be Q (see Figure 10.4). As motorists do not take this cost into account, road pricing would force them to do so, by imposing a charge per trip of C; the difference between Q and S. Because the demand for road space is elastic this extra cost will result in some people changing the time or mode of their trip, or abandoning it completely. Elasticities can be quantified and used in modelling the effects of road pricing, although it is important to realise that different trips can have different elasticities. For example, people flying on holiday are likely to be more price sensitive than commuters who may have little choice over the time and destination of their trips. Implementing a charge of C per trip would be a "first-best" pricing scheme, but in reality technological and political issues mean this is not likely to be possible, so most road pricing schemes are examples of "second-best" charging, and involve various compromises.

Figure 10.4: Congestion charging diagram (Richards 2006,13)

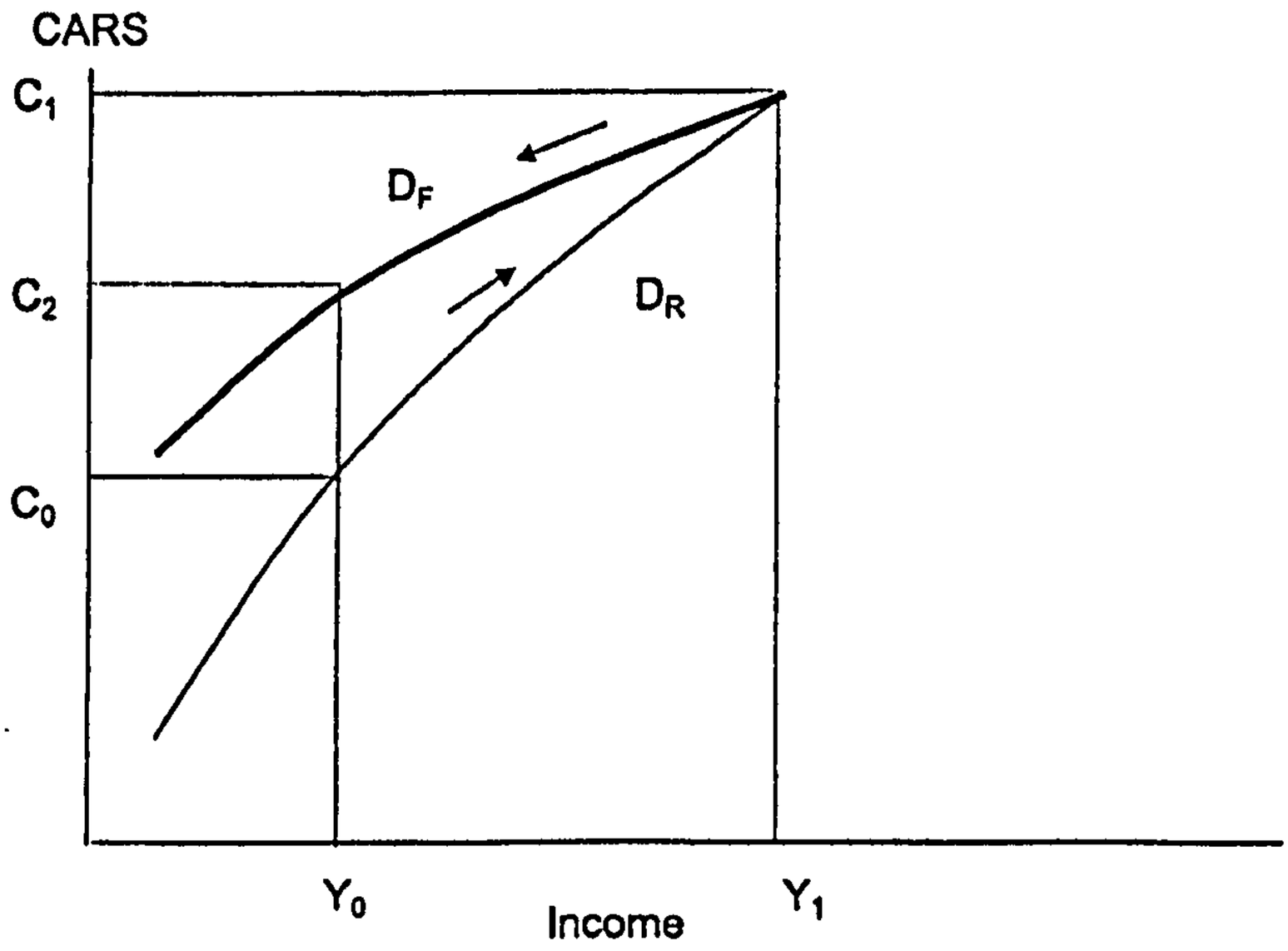


Appendix B – The hysteresis effect

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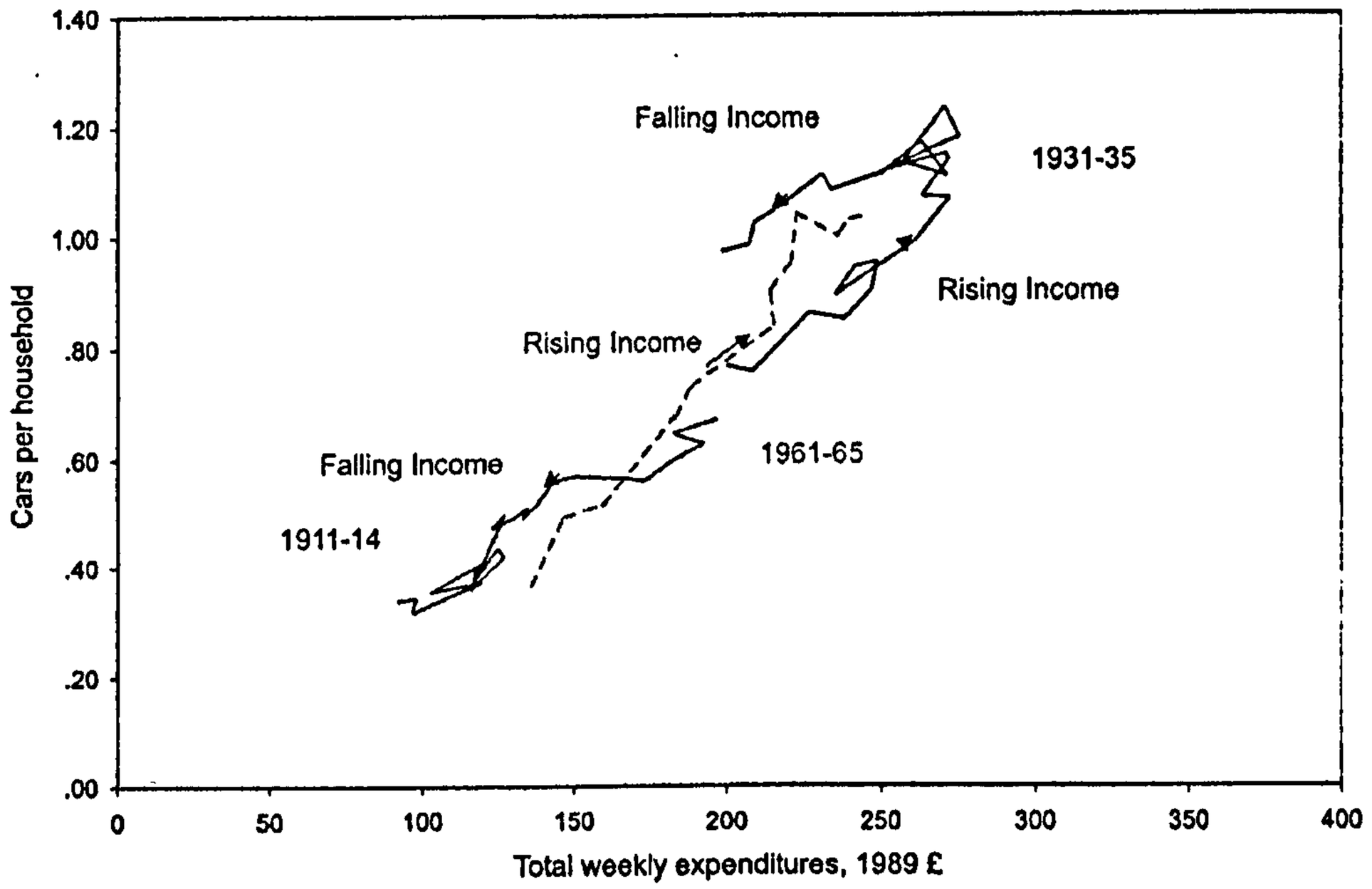
Automobile dependency at the individual level can illustrated by the hysteresis effect (Daragay 2001). The hysteresis effect refers to the asymmetrical effect of rising and falling income on levels of car ownership, and means it is very difficult to alter patterns of individual and business car ownership. Although rising incomes lead to increases in car ownership, these patterns do not exactly reverse when income falls. This relationship has been statistically proven, using data from the family expenditure survey (Daragay 2001). Hysteresis means that once people acquire vehicles they are unlikely to give them up if their income falls, producing a significant barrier to policies which aim to reduce car dependence. The hysteresis effect is illustrated graphically in Figure 10.5.

Figure 10.5 – Demand function showing hysteresis (Daragay 2001,811)



As income rises from Y_0 to Y_1 (demand curve D_R), car ownership increases from C_0 to C_1. However, when income falls back to Y_0 (curve D_F), car ownership does not return to C_0, but instead falls to C_2, and remains higher than the initial level of car ownership at income Y_0 . There is greater elasticity in car ownership for rising income, than there is for falling income. A real example of this effect is illustrated in Figure 10.6, using data from the Family Expenditure survey.

Figure 10.6 – Relationship between household car ownership and income (Daragay 2001)



Each line represents an age group cohort. The hysteresis effect is most clearly demonstrated by the 1931-1935 cohort, where there is a clear asymmetrical loop effect between rising and falling income levels. As income rises, car ownership is seen to increase steeply, but once income begins to decline car ownership falls by a lesser amount than the original rise. This highlights that car ownership does respond more strongly to rising rather than falling income levels, and as *such "it is much easier to prevent growth in car ownership and use in the first place, than it is to reduce it once it has happened"* (Cullinane 2003,33). This presents problems for the UK, as car ownership has already increased dramatically over the last fifty years, so promoting modal shift will be a considerable challenge, and people are likely to be reluctant to accept road pricing as it will restrict their automobile use.

Daragay (2001) offers a possible explanation for this effect, suggesting that households become accustomed to owning cars, and the convenience that they provide. As such

there is a strong tendency to maintain car ownership, even when income falls, although people may change the type of car that they have, for ones that are cheaper to run. Goodwin (1977) applies the hysteresis concept to modal split, but also argues mode choices are influenced by habit, as people do not *"carefully and deliberately calculate anew each morning whether to go to work by car or bus"* (Goodwin 1977,95). The implications of the hysteresis effect in modal split is that *"the fare subsidies, speed changes etc. necessary to attract a given number of people back from car to public transport will be greater than the charges which recently caused them to shift from public transport to car"* (Goodwin 1977,98).

Appendix C

Example of a semi-structured interview schedule used with businesses in Southampton

Interview schedule

Preamble

Thank you. Results will be anonymous.
Permission to record?
Interview on behalf of your company
Some general questions about your company and transport first
Move on to look at road pricing and how you would respond to it

Background

1. Background
    How long has the company been in existence?
        Check company structure / site status
    What attracted them to Southampton?
    How important is location for your business?
        Do they have a specific reason for being here, or could they operate anywhere?

2. Roughly what proportion of your customers / clients come from within the Southampton area, compared to from outside the city?

3. Transport...
    What transport facilities do you have? (parking, vehicles, bike storage)
    How do most of your employees travel to work?
    How big a priority are transport links / provision?

Transport Costs

4. What is the largest component of your companies transport costs?
    Other amounts? (Relative)

5. Which transport costs can you pass on to your customers?
    How much?
    How is this done?

Congestion

6. Does your company perceive a congestion problem in Southampton?
    If so, where and when?
    What effect does it have on your business?

7. Do you think congestion in Southampton is bad enough to warrant measures to address it?
    If so, is it bad enough to need road pricing?

8. What is your view on the PRINCIPLE of congestion charging in cities, as a way to cut congestion and improve public transport?
(Principle, not necessarily for Southampton)
    Transferability of London result

Scheme Impacts

In the next set of the questions I would like to focus on pricing to minimise congestion. It is important to mention:

- *Public transport services would be improved before charging began*
- *By law the revenue raised has to be hypothecated for transport improvements*
- *The scheme is NOT likely to apply all day, only in peak periods*
- *The charge is likely to be less than £5*

9. *An area change would most likely apply around the hours of 7 to 9am, and 4.30 to 6.30pm.* What do you think the effect on your business would be? *(i.e London)*
   Advantages
   Disadvantages
   Suggested changes or caveats? *(i.e. exemptions)*
   Effects on the supply chain (Employees, suppliers, partners, customers)

Costs

10. What is the extra cost of road pricing likely to be to your business? (Who would pass costs on to you?)

   Deliveries in
   Making deliveries
   Staff reimbursement
   Travel for work (and to work)

11. How much of these costs would you pass on to your customers?
   Would prices rise across the board, or selectively on certain lines / deliveries?
   What is the likely customer response?

12. How often do you review your costs / pricing structure?

Responses

13. What would your businesses likely organizational responses to a road user charge be?
i.e. Refunding charges, extend opening hours, teleworking, change modes
   Why these responses?

14. What would your businesses likely logistical responses to a road user charge be?
i.e. Retime deliveries, combine deliveries…
   Why these responses?

15. Does your company currently have any plans to relocate / expand / invest in other locations?

16. How likely would it be that you would consider relocating if some form of road pricing was introduced?
   What are your ties to this area? *(Business links or contacts)*
   What are the [potential] barriers to relocating?
   When? (Immediately, or after some time to see impacts)
   Where to? (Why there? Close v far?)

Wider effects

17. Do you think the effects you have mentioned would be similar for other businesses similar to yours? (i.e. your competitors).

How might it be different? (Is your business unique in some way?)

18. What do you think the effects of these kinds of charges would be on the wider Southampton economy?

How do you think the competitiveness of Southampton might be affected, in relation to surrounding areas?

19. Would the effect on your business vary according to the scale of the scheme?

- *i.e. If Southampton went alone compared to a regional or national scheme?*

Closing questions

20. Are there any measures you feel would be more appropriate / acceptable for tackling congestion and transport problems than road pricing?

i.e. Improved PT, WPL, increase parking charges, car-free zones

- Effect or response to that?

Appendix D

Background information on the Southampton case study firms

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Background information on the Southampton case study firms

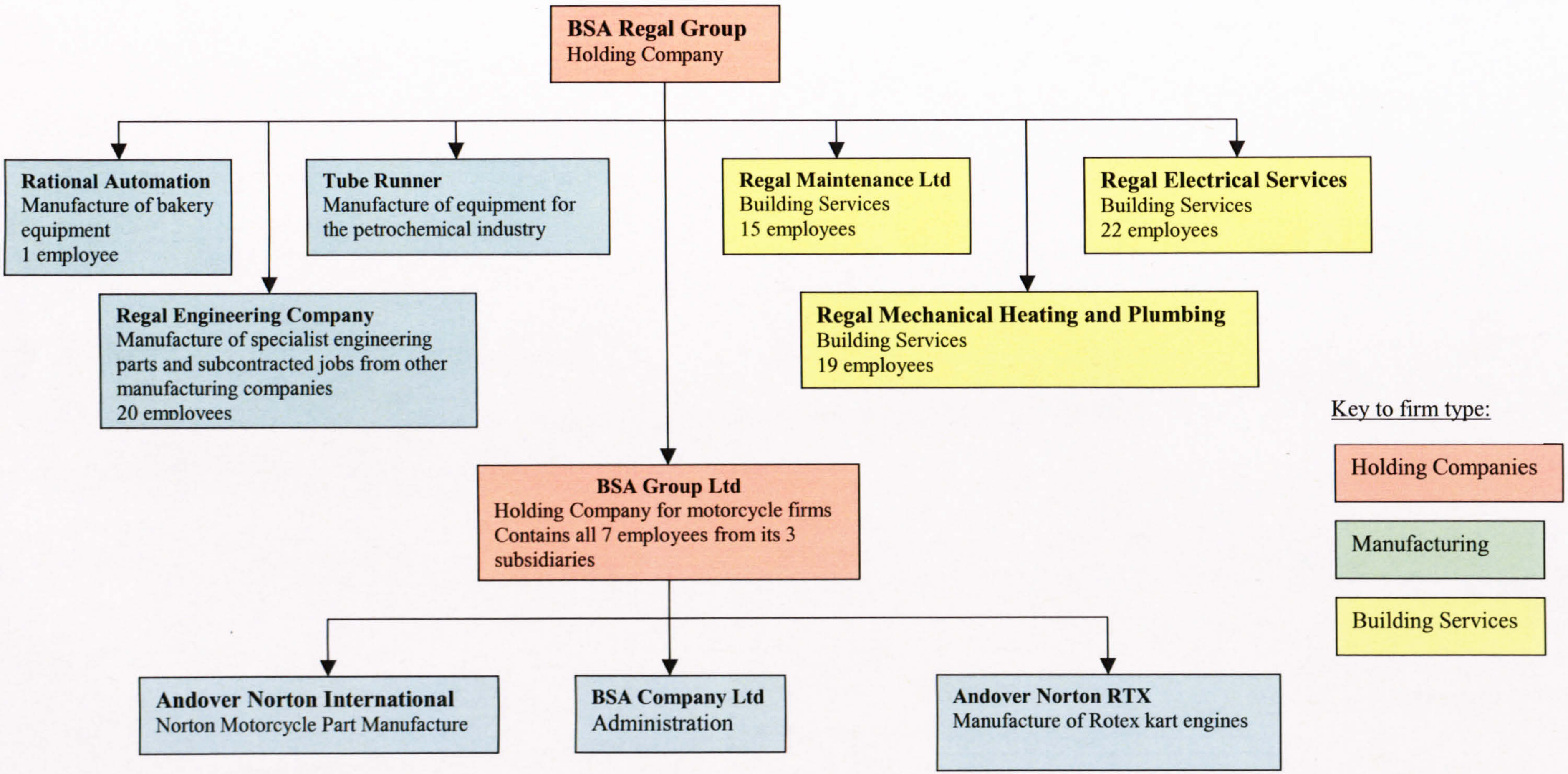
This Appendix will provide some background information on the three case study firms in Southampton (see Chapter 4). In-depth interviews were conducted with between four and six senior members of each of these organizations, to discuss how road pricing would affect them, their likely responses to it and to obtain any relevant secondary information.

a. BSA Regal Group

The first case study is actually of a group of firms, called the BSA Regal Group. BSA Regal itself is a holding company, with ten subsidiary firms, all located on a single site in Southampton city centre. The firms are engaged in a variety of manufacturing and engineering activities, ranging from electrical and plumbing contracting, to the manufacture of specialist motorcycle parts, karting engines, and bakery equipment. These firms can broadly be divided into three groups; the holding companies that deal with the administration, the manufacturing firms, and the 'building services', which includes the electrical, plumbing, heating and building maintenance engineers. These are illustrated in Figure 10.7 in orange, blue and yellow respectively.

The two holding companies within the BSA Group deal specifically with *"taxes, compliance issues, employment issues, VAT customs and PAYE issues"* (Interviewee 3) on behalf of all the other companies, so that they can concentrate on their industrial specific jobs without being responsible for much of the accompanying administration. While many of the manufacturing companies serve international markets, the building services are mainly based within Hampshire. The combined annual turnover of the group of firms is around £10 million.

Figure 10.7: Organisational structure of the BSA Regal Group



b. The Mayflower Theatre

The Mayflower Theatre is the second case study firm, used to illustrate some of the possible issues which road pricing could raise for the leisure sector. It is the largest theatre on the South Coast, attracting over 500,000 visitors each year, to a range of musicals, ballets and operas. The Mayflower Theatre is located near the train station in the city centre, and attracts audience members from around a 40 minute drive time, which can rise to up to 70 minutes for the larger shows. The theatre employs around 70 permanent staff and about 80 casual staff, although the numbers do fluctuate throughout the year. There are high levels of loyalty amongst the permanent staff, with a number of people having worked there for 25 and even 40 years (Interviewee 1). As well as hosting performances, the theatre also provides pre-show meals on a regular basis, and has a corporate suite that is hired out for business training and stage school auditions.

The theatre staff can be divided into three different types, with different working patterns (office staff, front of house and backstage staff). These are outlined in Figure 10.8 below.

Figure 10.8 – Types of staff at the Mayflower Theatre

Type of Staff	Location	Working Hours	Roles
Office Staff	Offices next to the theatre	8.30am to 5pm, Monday to Friday	Finance, Marketing, HR, IT and other administration tasks
Front of House	Front of Theatre	4 hour shifts with shows, around 7pm to 11pm or 2pm to 6pm for matinees	Box Office sales, Users, Bar Staff, Cashiers
Backstage	Backstage	Four hour shifts with shows as above. Also, through the night on Sunday / Monday for "get in" and "get out" nights when shows arrive and leave.	Stage door, electricians, technical staff, dressers

The different roles and working patterns of these staff mean they are will be affected differently by road pricing, and the ways which they can respond to it will vary. This issue is explored in Chapters 7 and 8.

c. Southampton General Hospital

The final case study is of Southampton General Hospital (SGH), one of the largest public sector institutions in the city. The rest of the Southampton based research focuses on the private sector, but it is also important to consider the effect of road pricing on the public sector. Although the hospital is not driven as much by the drive for profitability as the private sector, it actually has a number of similarities with the private sector, and is under increasing pressure to commercialise, reduce costs, and minimise its losses.

Southampton General Hospital is part of the Southampton City Primary Care Trust (PCT), which is one of the largest employers in Southampton. It employs around 8,000 members of staff, ranging from doctors and nurses, to administrative staff, managers, porters and cleaners. The Trust is responsible for a number of sites around the city, most notably the Royal South Hampshire (RSH) Hospital in the city centre, and the Southampton General Hospital (SGH) site in Lordshill (see Chapter 1, Figure 1.2 and Appendices F and G). The SGH is the largest site, and as such will be the focus of this case study. It has an accident and emergency department, and all the other clinical and surgical departments associated with a major hospital, whereas the RSH deals with the less acute outpatient services.

Appendix E

Background information on road pricing, sent out to interviewees from businesses in Southampton prior to the interviews

[See over]

Road User Charging Background Information

1. Aim

RUC is a method of reducing congestion that uses **pricing** to reduce demand for private car use

Road users are charged to enter the congested **city centre**, at times of day when congestion occurs.

By **law**, money raised by RUC has to be used to **improve transport** in the area for at least 10 years after the scheme starts. This is referred to as **hypothecation.** Most of this money is likely to be used for public transport improvements.

RUC can be used because improved public transport by itself does not encourage people to drive less.

Schemes vary according to the **time and days** of charge, the **level** of charge, the **size** of the charging zone, and the **exemptions** allowed. There is also a choice between a single of double zone scheme.

2. Example

In **London** a £5 charge per day applies on weekdays between 7am and 6.30pm Monday to Friday, to park or travel within the zone in the map. (See Overleaf)

This has successfully cut congestion by up to **32%** since the Mayor Ken Livingstone introduced it in February 2003

Dramatic bus improvements were made in London BEFORE the scheme began to provide alternatives to the car. This would also happen in Southampton

More improvements have been made since the introduction of the London scheme, using the money raised by the scheme

In Southampton an **all day charge is unlikely,** as the city does not suffer from an all day congestion problem.

People could therefore travel at different times of day where possible

Figure 1: The London Congestion Charging Zone



3. Enforcement

Various methods can be used to enforce a congestion charge

London uses a **pre-pay** scheme, policed by Number Plate Recognition **Cameras** (NPRC) inside the zone

Another common method is to use **toll-booths** where people stop and pay, or buying **permits** in advance. In future some sort of smart-card may be possible, which can also be used on public transport.

4. How it works

Some people will choose not to pay the charge; by re-timing their trips or using alternative modes, and so those that do pay to drive have **clearer roads**

RUC is always part of a **PACKAGE** of transport measures, and would not be used by itself as a way to reduce congestion

Good public transport would be in place before any scheme began, so that people who stop driving can travel easily another way

The money raised from congestion charging can be used to improve public transport, so people who use it get a **better service.**

Many of these people would be non-car owners, who would previously have been forced to rely on a poor service previously.

With less congestion and delays, all road trips, especially **buses**, become **quicker and more reliable**

Certain kinds of vehicles can be **exempt** from the charge, or receive a discount. This can include emergency service vehicles, gas powered vehicles, public transport vehicles, and those of disabled people. This varies between cities. The more exemptions there are, the less effective the scheme becomes.

5. General Points

At present there are no plans for RUC in Southampton. The Council simply recognises that RUC is an important issue, because many people are concerned about congestion and air pollution. As such, the Council are carrying out research. RUC is one of a range of measures being considered to reduce congestion and improve air quality.

If there were a firm proposal there would be extensive public consultation, and public transport improvements prior to the scheme beginning.

As such, any form of Road User Charging is unlikely to occur in Southampton before 2010 at the very earliest.

6. Congestion Related Websites

http://www.cclondon.com/ http://www.bbc.co.uk/london/congestion/

http://www.london.gov.uk/mayor/congest/index.jsp

http://www.cfit.gov.uk/congestioncharging/

http://www.tiedinburgh.co.uk/congest.html

Possible Advantages and Disadvantages of Road User Charging

Possible Advantages:

Public transport improvements can be made, which would be very difficult to fund otherwise.

These improvements can include:

- Increased frequency of services
- Services to new areas
- Services earlier in the morning and later at night
- Reduced fares

Non-car users get a better public transport service

Buses become more reliable, as congestion is reduced

Those who choose to pay the charge get clearer roads, with less congestion, and quicker journey times

Reduced congestion would create a more pleasant city environment, with less noise and air pollution from cars

This may increase the attractiveness of Southampton to new businesses and consumers.

Possible Disadvantages:

A group of people will be priced off of the road, and on to public transport. Although public transport services will be dramatically improved, it may not meet the needs of people living in certain areas.

Some businesses may be tempted to relocate out of the city to other areas [although there is little evidence for or against this at present].

If the charge applies all day: Consumers may travel to other destinations, harming the economy of Southampton

If the charge is too high: Too many people will stop driving, and so not as much money will be raised to improve public transport

If the charge is too low: Too many people will keep driving, and so congestion will not be reduced as much as wanted.

Appendix F

Information sheet on area based road pricing used during interviews with businesses in Southampton

[See over]

Area-based congestion charge

Rationale:

Area based charging (often referred to as a "cordon")

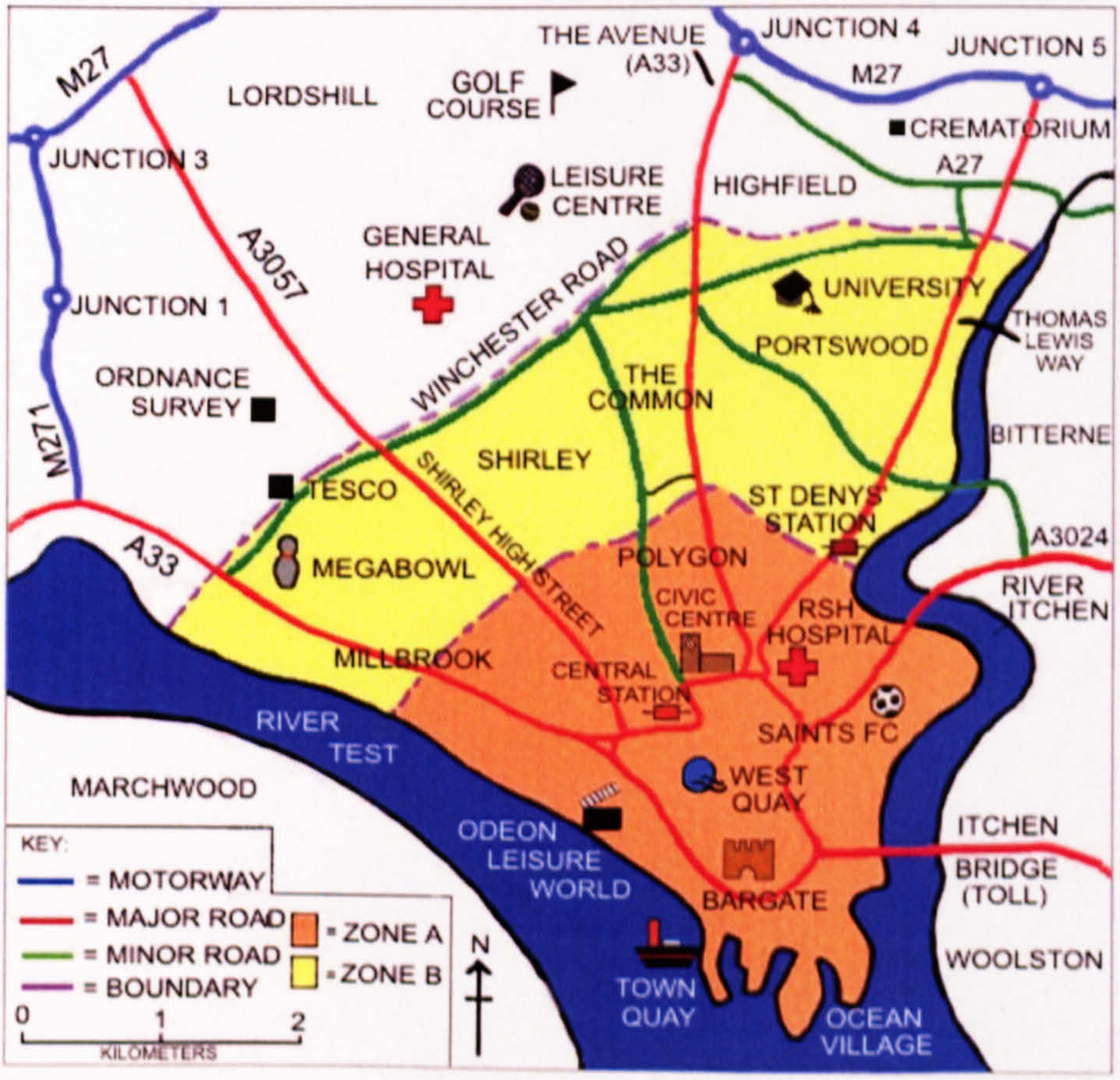
Principle:

Vehicles are charged a fixed amount to either be in, or cross into a particular area, which is known to suffer from congestion. The charge can apply for most of the day, or peak times only. The charge is **not** linked to the distance travelled, simply the area travelled in.

Example:

Congestion charge in London, England. A £5 charge applies to be in a 21km^2 area of the city centre, between 7am and 6.30pm.

Diagram:



Scheme Options:

- Charge at peak times only, or all day
- A single cordon (as in London), or double cordon (proposed in Edinburgh)
- The size of the area covered by the charge
- Whether payment is required upon crossing in to the zone, or from all vehicles moving within the zone (i.e. residents)

Possible Advantages:

- By law, all revenue raised by the scheme has to be hypothecated, and used to fund public transport improvements in and around the charged area.
- Public-transport users experience a better and more reliable service
- Those who choose to pay the charge experience clearer roads, less congestion, quicker and more reliable journey times

Possible Disadvantages:

- The amount of the charge is only relatively crudely linked to the level of congestion experienced in the area.
- A group of people will be priced off of the road, and on to public transport. Although public transport services will be dramatically improved, it may not meet the needs of people living in certain areas.
- The scheme should be fair to residents of the charged area. However, the more discounts and exemptions are allowed then the less effective the scheme becomes.

Appendix G

Background information on distance based road pricing used during interviews with businesses in Southampton

[See over]

Toll Lanes

Rationale:

Charging based on distance travelled, and the level of congestion whilst doing so.

Principle:

Vehicles are charged based on the distance they travel along a particular road. The further they travel the higher the charge. The charge can be increased in times of high congestion, and is very low at off-peak times. Toll free lanes can exist alongside the tolled lanes, in order to offer a choice about whether to pay.

Example:

M6 toll road, Midlands, UK. The road was opened in December 2003, as an alternative to the section of the M6 running through Birmingham.

Diagram:



Scheme Options:

- Possible exemptions for High Occupancy Vehicles
- Whether to implement a toll-free lanes, to provide motorists with a choice of whether to pay
- How many roads the toll should apply on
- Whether the toll only applies inbound to the city, or also on outbound routes

Possible Advantages:

- A toll-free lane offers a choice for people who do not want to pay to avoid congestion.
- The premium tolled service would be in addition to current road provision, so no space is being taken away from motorists who do not wish to pay.
- The tolled lane could also act as a bus lane, referred to as a Bus and Toll [BAT] lane.
- The price can be adjusted throughout the day to guarantee a stable and reliable journey time.

Possible Disadvantages:

- Rat-running is possible, as people may use minor roads in an attempt to avoid the charge (although this will be minimised if there is a toll-free lane)
- There could be insufficient width for a toll-free lane on some routes. If too many vehicles share the bus lane, the reliability of the buses could be adversely affected.
- If the toll is variable it may not be possible to predict the price of a given trip in advance; although the likely range will be known.

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