

**ASSESSMENT INTO THE SUSTAINABILITY OF EDINBURGH'S TRANSPORT
STRATEGY**

**Charlene Curran
081410051**

A dissertation submitted in partial fulfilment of the requirements for the degree of

MSc Urban and Regional Planning

Dissertation supervisor: Angela Hull

**Heriot-Watt University
School of the Built Environment**

14 August 2009

Declaration:

I hereby confirm that this dissertation is my own work.

Signature

Date

Abstract

With climate change affecting all aspects of our quality of life, sustainable development is an important factor in today's society. With the over-use of the private car being one of the most common sources of harmful emissions contributing to climate change, it is vital that sustainable forms of transport (i.e. walking, cycling and public transport) are utilised to their full potential. This research determines what a sustainable transport network should consist of, examines public opinion surveys and identifies the travel needs of our modern society. An assessment of the City of Edinburgh Council's current and future transport plans will determine whether enough is being done to promote sustainable transport in order to reap the physical health and environmental benefits. Examples of sustainable transport plans in cities in the UK and information obtained from several research interviews will determine the issues and limitations Edinburgh faces in achieving a highly sustainable transport network. As a result of this research and the review of several case studies, possible and feasible recommendations are made to improve the sustainability of Edinburgh's transport network.

Acknowledgements

Firstly, I would like to acknowledge my dissertation supervisor, Ms. Angela Hull. I am most grateful for the diligence and commitment shown to me throughout the research period. I appreciated the time taken to attend many meetings with me for feedback and for keeping in regular contact via e-mail for guidance and advice in order to gain the utmost potential from my research. I would also like to acknowledge the following for their time in providing me with an interview and further guidance in my research: Mr. Dave du Feu and Mr. Euan Renton (Spokes), Ms. Lisa Black (SEStrans) and Mr. Clive Brown (the City of Edinburgh Council).

Contents

INTRODUCTION.....	8
METHODOLOGY.....	9
Interviews.....	9
Review of Statistics and Public Attitude Surveys.....	9
Document Reviews.....	9
Computer Software Packages.....	9
Statement Relating to my Study Route.....	9
CHAPTER 1.....	10
Sustainable Transport and Health.....	10
Sustainable Transport and the Environment.....	10
UK Emission levels.....	10
Scotland's Emission Levels.....	11
Defining a Sustainable Transport System.....	12
CHAPTER 2.....	14
Car Ownership.....	14
Car Ownership in Edinburgh.....	14
Commercial Vehicles.....	14
Car Occupancy Levels and Distance Travelled.....	15
Travel to Work Using Different Transport Modes.....	15
Access to the Public Bus Service.....	15
Public Transport Accessibility in Edinburgh.....	16
Public Attitude Survey Findings.....	17
Scottish Environmental Attitudes and Behaviours Survey (SEABS).....	17
Travel Choices.....	17
Congestion Charging.....	18
Health and Lifestyle.....	18
Scottish Government National Transport Strategy: User Consultation Survey.....	18
Traffic Calming Strategies.....	18
Attitudes to Public Transport.....	18
Infrastructure.....	19
Reasons for Car Use.....	19
Formulation of a Strategy That Meets Public Needs.....	19
CHAPTER 3.....	20
City of Edinburgh Council's Current Local Transport Strategy.....	20

Streets.....	20
Individual Travel.....	20
Transport for All.....	20
Smarter Travel Choices.....	20
Transport and the Economy.....	20
Planning and Growth.....	20
Current Initiatives in Adopting Sustainable Transport in Edinburgh.....	22
SWOT Analysis of LTS.....	23
CHAPTER 4.....	24
Sustainable Travel Demonstration Towns in the United Kingdom (UK).....	24
Darlington.....	24
Peterborough.....	24
Worcester.....	26
Comparison of Sustainable UK Demonstration Towns with Edinburgh.....	27
CHAPTER 5.....	29
Reviewing Edinburgh’s Implementation of Transport Plans.....	29
Is There A Lack of Funding Towards Active Travel and Marketing Due to Vast Amounts of Trunk Road Investment?.....	29
A Limited Lack of Competition for Lothian Buses and the Issues as a Result.....	29
The Effects of Having Segmented Walk, Cycle and Bus Lanes City Wide.....	29
New Developments and Sustainable Transport.....	30
Monitoring of New Plans and Policies to Ensure They Are Adhered To.....	30
Marketing and Advertising Behaviour Change.....	30
Co-operation between Transport and Land Use Planners in CEC.....	30
Critical Analysis of Interview Topics.....	30
Future Plans Set in Place to Promote Sustainable Transport in Edinburgh.....	31
A Critical Analysis of Edinburgh’s Future Transport Plans.....	32
Limitations.....	33
CHAPTER 6.....	34
Conclusion.....	34
An Assessment as to Whether Edinburgh’s Current Transport Strategy is Sustainable.....	34
Recommendations.....	35
REFERENCES.....	36
APPENDIX 1.....	40
APPENDIX 2.....	45

List of Figures

Figure 1: Obesity Levels in Scotland.....	5
Figure 2: Anxiety and Stress Levels in Scotland 2005.....	6
Figure 3: UK Emission Levels in Tonnes (2006)	8
Figure 4: Demographic of Car Ownership in Scotland (2008)	12
Figure 5: Car Ownership Levels in Scotland (2007) by Number Owned.....	13
Figure 6: Reasons for Car Use in Scotland (2005-06).....	14
Figure 7: Car Occupancy Levels in Scotland 2005/6.....	15
Figure 8: Travel to Work Modes (2007).....	15
Figure 9: Access to Nearest Bus Stop (2007).....	16
Figure 10: Frequency of Bus Service (2007).....	17
Figure 11: Issues of Global Concern.....	18
Figure 12: Travel to Work (2008).....	19
Figure 13: Daily Modes of Transport Used.....	20
Figure 14: Congestion Charging.....	20
Figure 15: Lifestyle Aspirations.....	21
Figure 16: Travel Changes in Darlington.....	31
Figure 17: Travel Changes in Peterborough.....	33
Figure 18: Travel Changes in Worcester.....	35
Figure 19: Association Between Bus Patronage and Bus Lane Length.....	38

List of Tables

Table 1: List of Measures Adopted in Darlington.....	29/30
Table 2: List of Measures Adopted in Peterborough.....	32/33
Table 3: List of Measures Adopted in Worcester.....	34

Glossary of Abbreviations

CEC	The City of Edinburgh Council
CECr	The City of Edinburgh Council representative
CO ₂	Carbon Dioxide
DfT	Department for Transport
ECCMC	Edinburgh City Centre Management Company
EU	European Union
ITM	Individualised Travel Marketing
LTS	Local Transport Strategy
NH ₃	Ammonia
NO _x	Nitrous Oxide
NO ₂	Nitrogen Dioxide
NTS	National Transport Strategy
PAN	Planning Advice Notice
QBP	Quality Bus Partnership
SEABS	Scottish Environmental and Attitudes Behaviours Survey
SEStrans	South East of Scotland Transport Partnership
SO _x	Sulphur Dioxide (predominantly)
STAG	Scottish Transport Appraisal Guidance
SPP	Scottish Planning Policy
TP	Travel Plan
UK	United Kingdom

Introduction

Edinburgh is a high density region with a population of 468,070 people and an estimated 1,775 persons per square kilometre (Edinburgh Guide; July 2008). Population is on the increase and is expected to be 497,000 by 2022 and with this an increase in commuting and pressure on the transport system (Transport Scotland; December 2008).

This dissertation aims to examine the sustainability of Edinburgh's transport strategy. To begin, it will be necessary to identify what a sustainable transport strategy is and the reasons for its importance. A review of the sustainable transport plans currently in place will be undertaken and an examination of the travel statistics in Edinburgh and Scotland, prior to and post plan introduction. The attempts of Edinburgh and other UK cities will determine some of the successful methods at reducing car use in modern society.

The Climate Change (Scotland) Bill was introduced in December 2008. This requires Scotland's greenhouse gas emissions to be 80% lower in 2050 in comparison to the year 1990. The Bill requires harmful emissions to be 34% lower in 2020 compared to the levels of 1990 and a reduction in greenhouse gases on an annual basis between 2010 and 2050 (Scottish Government; June 2009a). Overuse of the car is one of the major contributors to harmful emissions and this dissertation will explore the City of Edinburgh Council's (CEC's) attempts to promote the more sustainable alternatives of walking, cycling and public transport.

The increase in car use in recent decades has mirrored the increase in noise and air pollution, traffic congestion and obesity levels in the UK. Through this research, the extent of the problem is closely examined specific to Edinburgh. Both the SEABS and the Scottish Government National Transport Strategy: User Consultation Survey will be reviewed to determine whether Edinburgh's transport strategy adequately addresses public needs and if not; why not. Examples of successful projects to limit car use in other cities will be explored in order to determine the potential for Edinburgh to reduce its current levels of car use.

In a critical assessment of Edinburgh's transport strategy, analysis of the CEC's attempts at promoting sustainable transport will be examined and the potential for Edinburgh to move forward. Future plans and recognition of the limitations that Edinburgh faces will lead to a determination of the true sustainability of Edinburgh's transport strategy. Recommendations to improve the sustainability of Edinburgh's transport strategy will conclude this study.

Methodology

The research for this MSc dissertation relies mainly on in depth document reviews, published surveys and interviews and consultations with relevant bodies and organisations. The use of the Internet to access information has provided the most up to date and relevant literature and statistics in the subject area.

Interviews

Interviews adopted for this research take a qualitative approach as they aim to gain an insight into the research topic. Interview questions take an open form in order to give the interviewees “more room to relate their views, ideas, values, feelings, attitudes, motives and so on” (Allison et al; 2001; p 103). Responses are less factual and more optimistic leaving all realms of possibility for improvement. It was important to seek qualitative information from a reliable source. With this in mind the Professional Officer, Transport Policy of the CEC was chosen as an interviewee to gain first hand opinions on the implementation of policies, funding, idea generation and specific positive and negative aspects uncovered in the research. Additionally, informal interviews were held with ‘Spokes’ voluntary cycling lobby group and SEStrans. Many members of the public are aware of the problems encountered when walking and using public transport around the region but may not have experienced or be aware of the positive and negative aspects of getting around by bicycle. Representatives from ‘Spokes’ would be ideal candidates from whom to gain this information as they have in depth knowledge of issues associated with cycling in Edinburgh through experience and involvement with the organisation over many years. As the daily commute by car accounts for a large part of environmental and health concerns it was important to obtain first-hand knowledge into what strides are being made at grass roots regional levels today. Consequently, a meeting with the SEStrans Travel Plan Officer, to provide an insight into Travel Plan implementation and schemes in work places would prove beneficial. Time constraints limit the sample of interviewees in this instance and it is important to select the most appropriate subjects to provide quality information.

The research interviews will be less formal in their approach. Whilst interview questions will be prepared in advance, questions will have the potential to be adapted on the day in order to elaborate on answers given by the interviewees (Allison et al; 2001). In presenting the questions by asking “in your opinion” this ensures answers given are not bias and interviewees are not persuaded to give a certain type of answer through the wording of the questions put forward (Birley and Moreland; 1998).

Review of Statistics and Public Attitude Surveys

Given the time constraints, costs involved and the fact that two relevant national surveys had recently been carried out, it proved to be a more effective use of the time allocated to use these findings as the basis of the research for Edinburgh instead of conducting a new survey. As the surveys are based on the national population, it is justifiable to assume the findings would be similar had the sample group been selected within Edinburgh, taking regional variations into account.

A review of a recent national public attitude survey and a National User Consultation Survey provides the most relevant public opinions on transport and the environment. Findings from

these surveys has enabled identification of the transport needs of the modern society and a basis to recommend changes to provide a sustainable yet adequate transport network in Edinburgh.

Document Reviews

A variety of document reviews come in a mixture of primary, secondary and statistical sources. Primary sources used which have been written at the time of the event include official communication (i.e. interviews), journals, and minutes of meetings, reports, commentaries and announcements on-line. Secondary approaches used have been written some time after the event including analytical academic literature which has been published some time after the event has taken place (Birley and Moreland; 1998). Statistical sources from public attitude surveys, household surveys and government studies are relevant to measure the successful implementation of Edinburgh's transport strategy.

An evaluation of the successful sustainable UK demonstration towns proves useful. It will determine Edinburgh's potential to adopt the successful schemes and initiatives of such towns in order to maximise and utilise walking, cycling and public transport to its full potential to achieve a healthier environment and population.

Computer Software Packages

The computer software which has been utilised to conduct this research includes the browser, Internet Explorer which was used to gain access to the Internet to research many government, university and various organisations' websites. This aided in locating the most up to date and relevant information on which the findings of this dissertation have been based. The word processing program, Microsoft Word was used not only to transcribe this dissertation but also to view research documents such as government documents downloaded from websites. Acrobat Reader was also used to view pdf documents, government reports and surveys. The spreadsheet program, Microsoft Excel was used to input travel statistics for creating charts and graphs so that the data could be analysed more clearly and concisely.

Statement Relating to my Study Route

As part of my MSc in Urban and Regional Planning, the area I have chosen to specialise in is that of the Transport and the Environment option (semester one) incorporating some elements and theories from my Urban Regeneration option (semester two). As part of Transport and the Environment, I gathered information and an interest in the area of active travel and public transport and its infrastructure requirements. As active travel is an up and coming issue in transport planning I feel this is a strong point of focus in providing a sustainable public transport network.

The Urban Regeneration option compliments the Transport and the Environment module as the transformation of neighbourhoods and the transport system in order to meet travel needs requires an element of change and positive regeneration in communities and neighbourhoods.

Chapter 1

In order to determine the success of sustainable transport it is necessary to investigate the contributing factors. The effectiveness of a transport strategy will be determined by transport behaviour and attitudes and efforts being made to modify these. Climate change will be affected by the success of the transport strategy to meet targets set. The successful implementation of this strategy will affect the health of the public which in turn has an economic impact. Current health issues, alternative fuels and vehicles available at present, environmental concerns and how the strategy plans to combat these will be examined.

The concept of sustainability has been a prominent one in the last two decades. In 1987, The World Commission on Environment and Development defined a sustainable society “as one that meets the needs of the present without compromising the ability of future generations to meet their own needs” (cited in Whitelegg; 1993; p 5).

According to Banister (1994) the last forty years has seen a major shift from a society where the main modes of transport were walking, cycling and public transport with cars as luxury items to a society where the car is considered the main mode of transport. The reason for this shift is due to the decentralisation of employment, services and facilities requiring greater travel distances. Planning decisions to locate retail and leisure parks, business parks and suburban developments where land is cheaper has resulted in the need for greater car use due to poor direct public transport links. Attitudes to public transport use such as safety, cleanliness, cost, convenience, frequency, physical mobility access and available information have also contributed to increased car usage. (Scottish Government; February 2009, and Scottish Executive Social Research; October 2006)

Road transport is imposing costs our society far greater than any income from car taxation (Whitelegg; 1997; p 30). With car ownership steadily increasing, demands for energy, raw materials and space will rise. In addition, air and noise pollution and climatic change will become more dramatic (Whitelegg; 1993). “For at least two generations, planning and transport practice in the UK have been focussed on the car” (Sustrans; 2008) which has contributed towards the decline in walking and cycling and increasing obesity and mental health illness in the UK today.

The Climate Change Delivery Plan identifies key sectors producing the highest levels of greenhouse gas emissions, interim targets and outcomes before the 2050 deadline, barriers and risks associated with the implementation of the plan and identification of where the policy levers sit (i.e. EU, UK or Scotland). The greenhouse gas emission targets will be measured according to the levels of emissions from the production of goods and services in each country (Scottish Government; June 2009a).

Key aspects in successfully reducing car use are by reducing the number of trips people make, reducing the distances of journeys and reducing the number of vehicles involved in journeys made i.e. from car pooling to high occupancy public transport (Banister and Marshall; 2000). Transport and land use planners have a key role in deciding the placement of infrastructure and land uses. If a wide variety of mixed use developments and services are readily available within a short distance of households, this limits the need for travel, particularly private vehicle use. It is essential that transport and land use planners work in conjunction with one another in order to achieve a healthy balance of services available locally and cater for accessible, sustainable transport options.

Sustainable Transport and Health

It has been proven that as little as thirty minutes of daily exercise can have a positive effect on physical and mental health. An active lifestyle can help reduce the risk of several cancers, diabetes, depression and stress as well as aid towards weight management and energy levels (Paths for All Partnership; spring 2009).

The obesity epidemic has tripled in the UK over the last twenty years (Townshend and Lake; 2007). The main reasons for this are due to increased car use for short distances and lifestyles requiring little or no activity. Jacobs (1961) views the private car as a “simple scapegoat” for the “failures of urban planning” with a narrow focus on solving these problems (cited in Patton; 2007; p928). Many planners believe if they solve the problem of traffic congestion they will be solving the major problem of many cities, however, as we have learned, increasing road capacity results in an increase in car volumes (The Buchanan Report cited in Banister; 1994).

As illustrated in Figure 1 obesity is on the rise. From 1995 to 2003, 7% more males and 10% more females were found to be obese. From 1998 to 2003, 4.8% more boys were found to be obese and a marginal increase for girls. Only 2 out of 10 people surveyed cited that they would like to increase their levels of physical activity while only 4 in 10 people were already attempting to do so. With car use being a contributing factor to increasing obesity levels it is necessary to raise awareness of the benefits of walking and cycling and provide the infrastructure to lower obesity. In 2005, approximately 26% of respondents had reported large amounts of stress while 39% had reported harmful stress (NHS Health Scotland; May 2006).



Figure 1

(Adapted from Scottish Government; May 2009a)



Figure 2

(Adapted from NHS Health Scotland; May 2006)

For many, safety on the streets has become an issue as many pedestrians and cyclists feel intimidated by the fast pace of the roads. Filion and McSpurren believe there is a need to provide “environments that are conducive to walking, cycling and public transit use, while fostering a sense of community” (2007; pg 502). According to Barton, Grant and Guise the key solution for this is by “reclaiming the streets for people” for activities such as “walking, cycling, idling, playing, sitting, drinking, talking, selling” and traffic has to be tamed so as to avoid any threat to street users (2003; pg 117). Poorly planned neighbourhoods and unwelcoming features such as graffiti and litter discourage people from walking (Townshend and Lake; 2007). These considerations need to be put first by transport and land use planners respectively within the Edinburgh region.

Sustainable Transport and the Environment

Air pollution is the main negative impact of transport with 98% of transport modes dependent on oil (European Commission; 2006). Recent target statistics state that in order to remain on track in making an improvement to climate change, greenhouse gas emissions must be reduced by 8% between 2008-2012 and by 20% by 2020 (European Commission; 2008).

UK Emission levels

Currently, dependence on fossil fuels is emitting harmful greenhouse gases which cause climate change, resulting in increases in the earth's temperature. As a result, unpredictable weather ranging from extreme heat and drought to extreme cold and flooding results in damage to livestock and crops and the melting of ice sheets causing rising sea levels. Such catastrophes have the power to displace whole populations (Faculty of Public Health; 2008).

In 2006, the UK emitted 74.3 tonnes of acidifying substances (SO_x, NO_x and NH₃) which can cause acid rain. This ranks fourth in the EU behind Spain, France and Germany. High levels of economic activity producing fossil fuels result in these acidifying substances which are damaging to soil, forestation, aquatic systems and human health. 20% of these emissions alone are from the transport sector (European Commission; 2008). In 2006, the UK ranked thirteenth in the EU emitting 10.8 tonnes of greenhouse gas emissions per capita, mainly from the use of coal, oil and gas (European Commission; 2008).

With the global population set to rise to over 9 billion by 2050, climate change has the potential to threaten our access to water, food production, land use and health and well being. It is essential that our current lifestyles protect natural resources and do not compromise the lifestyles of future generations. In the UK specifically an increase in deaths, disabilities and injuries can be expected from extreme hot and cold weather, floods and storms, health hazards from pollution, food poisoning, respiratory problems, skin cancer, cataracts and insect borne diseases (Faculty of Public Health; 2008).

Rising oil prices and energy supply concerns could potentially affect the way in which we travel, therefore, transport planning must implement a change in travel modes and behaviour (Sustrans; 2008). A shift towards the promotion, planning and provision of active travel infrastructure will contribute towards solving such issues as they emit little or no harmful substances.

In conjunction with increasing demand, realignments or new routes are often placed in areas "where opposition is perceived to be less likely or less effective" i.e. areas that are politically weak. More often than not, these changes occur in those under privileged housing areas where land is at a lower cost (Feitelson; 2002; pg 103).

While substitutes such as solar energy, hybrid vehicles and alternatives fuels seem the obvious choice in reducing emissions, these are not without their drawbacks. Biomass fuels such as ethanol and methanol can be supplied by Africa and South America. However, "it would do little for the source countries denied adequate land for food crops and forced back into the kind of survival behaviour which currently destroys fragile environments" (Whitelegg; 1993; p 11). With the potential of such knock on affects, the mass introduction of electric vehicles appears to be the only sustainable option, benefitting both the environment and society. The implementation and enforcement of government policies have the power to enforce a strategy of car manufacturers 'phasing out' current dependable and conventional sources to adopt the new and sustainable electric modes.



Figure 3

(Adapted from European Commission; 2008)

Scotland's Emission Levels

Up to 40% of transport emissions arise from individuals' daily transport choices (Transport Planning Society; 2007). Emissions have seen a 2% rise annually between 1990 and 2006. The Climate Change Delivery Plan makes several suggestions as to how Scotland can reduce the emission levels from the most dominant sector. These measures include improving the energy efficiency of petrol and diesel vehicles, increasing the uptake of hybrid and electric cars, modal shift to walking, cycling and public transport, road space reallocation, changes to land use development, efficient driving and bio fuels (Scottish Government; June 2009a). However, earlier analysis has highlighted that electrical powered vehicles and modal shift and behaviour change appear to be the only truly sustainable alternatives, both in terms of the environment and society.

A sustainable carbon footprint per person per year is approximately 2 tonnes maximum. Private car use alone accounts for 1.2 tonnes per person annually while public transport consumes only 0.5 tonnes per person on an annual basis. Between 1990 and 2004, transport emissions increased by 9% in the UK. CO₂ emissions from cars accounts for 13% of the UK total. Without a change in behaviour and a reduction in car travel, an increase in CO₂ emissions would be expected to rise by 35% between 1990 and 2030 (Faculty of Public Health; 2008).

Knowledge is power and heightened awareness results in heightened adoption. According to Whitelegg (1997), the attraction and positive advertisement of cars is a perception which must be addressed. He believes that images of "speed, power, open roads, attractive scenery and sexuality" are purposefully adopted in an effort to portray an image of "freedom and mastery over nature" (p 17). In reality, cars do not live up to their advertised image. They are subject to traffic congestion, pollute the environment, are prone to attack and crime and cost a lot of money to maintain. (Whitelegg; 1997; p 36). Recent figures indicate that 60% of annual car journeys are unaccompanied (Scottish Government: May 2009d) and it is estimated that it costs approximately £4,500 annually to run a small family car (Automobile Association; 2008). Given that an annual Ridacard for the unlimited use of all Lothian buses in Edinburgh costs just £540 for one adult (Lothian Buses; 2009), heavier advertising is required to inform the public and change their perception as the annual cost of taking the bus is 12% of that to run a car in single occupancy cases.

Defining a Sustainable Transport System

Sustrans is the UK's leading sustainable transport charity encouraging a transport system that benefits our health and the environment. Their main aims in achieving such a transport system are to:

1. "reduce the environmental and resource impacts of transport".
2. "enable people to choose active travel more often".
3. "provide car-free access to essential local services".
4. "create streets and public spaces into places for people to enjoy".

(Sustrans; 2009)

The Scottish Government's definition of sustainable transport is:

1. "Improving local environment and facilities so that amenities can be reached by more sustainable and active means thus reducing the need to travel".
2. "Promoting the use of more sustainable modes like walking, cycling, bus and trains to reduce the number of single occupancy car journeys".
3. "Making more efficient use of vehicles through car sharing, eco-driving and using the most appropriate vehicle for the particular journey".
4. "Identifying future and more sustainable vehicles and fuels and planning for their use".

(Scottish Government; June 2009b)

The Department for Transport (DfT) aims to provide a transport network that works for everyone balancing the needs of the economy, the environment and society, i.e. a sustainable transport strategy. Their five strategic objectives in achieving a sustainable transport strategy are:

1. "To support national economic competitiveness and growth, by delivering reliable and efficient transport networks".
2. "To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of avoiding dangerous climate change".
3. "To contribute to better safety, security and health and longer life-expectancy through reducing the risk of death, injury or illness arising from transport, and promoting travel modes that are beneficial to health".
4. "To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society".
5. "To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment".

(DfT; 2009)

It can be argued that economic competitiveness will be a natural outcome if all other factors in the strategy are achieved. For example:

- Climate change has caused flooding in many areas resulting in heavy costs and pollution which is a financial burden on our health system.

- With respect to road safety, a plan that will decrease road traffic accidents will result in a reduction of serious injury which limits the employable workforce and places additional costs to the government due to social supports required.
- Achieving equality of opportunity to all would mean improved access to widen employment opportunities and greater use of services and facilities.
- Not only does a better quality of life place less of a financial burden on society as the population would be healthier, but the creation of a healthy natural environment also encourages tourism to benefit the economy.

All three definitions of a sustainable transport network place emphasis on the need to increase active travel modes and public transport infrastructure. It is recognised that the public need to be given the choice in transport modes in order to promote behavioural change and improve quality of life which also benefits health and the environment.

However, the Sustran's definition has a narrower view which focuses on active travel and environmental concerns and lacks consideration of economic factors. This could be because of their history which focussed on cycling and other energy reducing means of transport. It fails to address the physical mobility needs of the elderly, disabled, parents with pushchairs and the need for transporting heavy loads, for example, shopping bags.

Likewise, the Scottish Government's definition focuses primarily on the environment with little emphasis on safety, security and quality of life which would have a social as well as an economic impact. Equality of opportunity to public transport is another important factor that has not been addressed.

The DfT's definition identifies transport's contribution to the environment and health as well as the economy. It recognises that Edinburgh's current transport strategy should deliver:

- A transport network that encourages healthy competition, economic competitiveness and growth by providing a reliable, affordable and flexible public transport network.
- A transport network that promotes the use of healthier and alternative environmentally and society friendly modes.
- A system that promotes environmentally friendly alternatives in order to reduce harmful emissions from fuel.
- A safe transport network that meets the needs of all members of the public.
- The provision of attractive open space to improve the quality of life of the public.

From the analysis above, this chosen definition (DfT's) is broader, making it the most suited to determine the sustainability of Edinburgh's transport strategy.

Thus, current transport choices, infrastructure, overuse of vehicles powered by fossil fuels and the influence of advertising contribute greatly to problems such as obesity and health concerns, climate change and air pollution. The extent to which a successful transport strategy can be implemented requires an examination of current statistics on the public's travel behaviour and their reasons for these choices, public awareness on transport, health and

the environment and the needs of the public with respect to the delivery of a successful transport system.

Chapter 2

There has been an ever increasing government awareness of sustainability in recent years. At the same time travel behaviour has caused a detrimental impact on health, the environment and society with little or no significant travel behaviour changes taking place at either a national or local level. Therefore, if the government want to make significant changes, an assessment of current behaviours will be the catalyst for a successful transport strategy. From this analysis, it will be possible to determine the sustainability of Edinburgh's transport plans and whether the problems are being addressed.

Car Ownership

From the Borders, through Perth and Dundee, stretching North East to Aberdeen and the surrounding area an estimated 4.6 million inter-zonal person trips per weekday were made in 2005. Of these, 3.9 million were made by car and 20% were within Edinburgh and the Lothians alone (Scottish Government; December 2008a).

A 2008 survey found that approximately 66% of Scottish households had access to at least one car. 63% of households in urban areas had access to at least one car compared to 79% of households in rural areas (Scottish Government: May 2009e). Depending on the frequency of car use, this could suggest that current public transport may not be meeting the needs of the demographic illustrated in Figure 4.



Figure 4

(Adapted from Scottish Government: May 2009e)

Since 1999 the percentage of households with access to one private car has risen from 63% to 70% and households with two or more cars have risen from 18% to 25% (Scottish Government: May 2009e). Multiple car ownership in particular, might suggest a high level of single occupancy trips which are a major contributor to congestion and emissions.



Figure 5

(Adapted from Scottish Government: May 2009e)

Car Ownership in Edinburgh

Despite a heightened awareness of the negative impacts of car use, car ownership at both a national level and local level (Edinburgh) remains significantly high with an increase within

the last decade alone. With such high ownership levels, one can assume the car is being used for a vast amount of the travel needs in each household.

Commercial Vehicles

The Edinburgh Household Survey, conducted in spring 2007, showed that 42% of Edinburgh households owned at least one car or light van. By the 31st December 2007, Edinburgh had a total of approximately 180,200 vehicles registered, third after Glasgow and Fife. Of this, 151,900 were classified under private or light goods vehicles and 9,300 classified as company cars and only 1,000 of these were public transport vehicles (Scottish Government; December 2008b).

Research by the Scottish Government has shown that the most frequent journeys made were shopping trips with an average of 216 outings per person per year in 2005/6. These trips were closely followed by commutes (159), visiting relatives/friends (119) and other errands (107) and escorting trips (100). Over the last decade, there has been little change in the average number of trips per person per year, however, the modes and distances travelled have, with the private vehicle increasingly dominating (Scottish Government: May 2009c).



Figure 6

(Adapted from Scottish Government: May 2009c)

With the high levels of car use as part of the daily commute and to run errands, it can be assumed from our knowledge that this is due to the displacement of employment and services in out of town centres with poor transport links. The constantly increasing capacity of motorways and bypass roads to and from these locations encourages the use of the car. The lack of direct public routes and the inability to walk and cycle such distances leaves residents no other alternatives but the car.

Car Occupancy Levels and Distance Travelled

In 2007, 69% of the Scottish population used a private car or van to travel to the workplace. The numbers of driver journeys increased while the number of passenger journeys decreased (Scottish Government: May 2009b), therefore, indicating a rise in the level of single occupancy trips.

Figure 7 illustrates that 60% of trips were unaccompanied. Additionally, 82% of car journeys for business purposes were made unaccompanied. In this same 2005/6 period, 80% of unaccompanied car journeys were made before 7a.m. and 73% of such journeys between 7a.m. and 9.30a.m. (Scottish Government: May 2009d), most likely being the commute to the workplace. There is an opportunity for public transport to meet the needs of employees which could potentially reduce unaccompanied journeys.



Figure 7

(Adapted from Scottish Government: May 2009d)

With the large majority of car occupancy being driver only, most likely on the commute to work, this behaviour will contribute to an excess in the recommended sustainable carbon footprint of 2 tonnes per person per year given that the private car alone accounts for 1.2 tonnes of such levels (Faculty of Public Health; 2008).

Travel to Work Using Different Transport Modes

In 2007, it was shown that in Scotland, walking and bus use accounted for the most common forms of transport to the workplace after the car.



Figure 8

(Adapted from Scottish Government; August 2008)

Although the bus is a more sustainable alternative to the car, accounting for 0.5 tonnes of harmful emissions per person per year (Faculty of Public Health; 2008), this mode is preferable to car use where walking or cycling are not possible. However, harmful emissions remain an issue. With the emergence of out of town centres, it can be assumed that bus travel to work is necessary as those centres are hard to reach otherwise.

Access to the Public Bus Service

With regard to the usability of public transport in Scotland, 77% of adults who had recently used the local bus service felt that finding the routes and times was easy. Likewise, 85% of rail users felt finding the routes and times needed was easy also (Scottish Government; May 2009g).

With regard to public transport in Scotland, inequalities were found between those who lived in rural areas compared to those living in urban areas, with rural residents having a longer walk to their closest bus stop (Scottish Government: May 2009f).



Figure 9

(Adapted from Scottish Government; May 2009f).

In terms of the frequency of local buses, 29% of those surveyed did not know how often their nearest bus service operated and only 23% said there was a bus at least every 13 minutes. Bus services in general were less frequent in rural areas (Scottish Government; May 2009f).



Figure 10

(Adapted from Scottish Government: May 2009f)

Poor access to the local bus is a major factor in discouraging the public from its use. Public attitude surveys have shown that if people are expected to walk any more than a few minutes to their nearest stop, then many residents will find it easier and more convenient to use their car to travel directly from their home to their destination.

Public Transport Accessibility in Edinburgh

When asked how accessible the city centre was via public transport, only 79% of those surveyed were satisfied, 1% less than the previous year. 82% of Edinburgh's residents were satisfied with the quality of streets, buildings and public spaces in the city centre, 7% more than the previous year. Only 19% felt more parking was required in the city centre (CEC; spring 2007). This might suggest, that the remaining 81% of Edinburgh residents are willing to travel to the city centre by walking, cycling or public transport as they do not believe additional car parking in the city centre to be necessary. However, a remaining 21% believe accessibility of Edinburgh city centre by public transport is poor which supports the views of those residents in favour of additional car parking space.

Public Attitude Survey Findings

In order for Edinburgh's public transport system to be a successful one, it must meet the needs and requirements of the public and alleviate the transport problems they encounter on a regular basis. These wishes and concerns can be determined by examining public attitude survey findings. For the purposes of this research, two national surveys (including the opinions of Edinburgh residents) have been reviewed in order to determine the requirements of Edinburgh's transport strategy.

Scottish Environmental Attitudes and Behaviours Survey (SEABS)

SEABS survey of 3,054 Scottish adults conducted between August and November 2008 focussed on attitudes towards the environment, patterns of behaviour and behavioural barriers. It was conducted in order to analyse what drives environmental attitudes and behaviours. The main aims and objectives of this survey were to:

“produce dedicated, sound and up-to-date robust social survey data on environmental attitudes and behaviours, supporting the development and delivery of environmental policy, relating specifically to climate change, sustainable development and wellbeing, but also of relevance to other policy areas.”
(Scottish Government Social Research; 2009; p 3)

As outlined in Figure 11, a combination of global warming, climate change and environmental impacts are cited as being the greatest issues of global concern. When asked to consider the most important environmental issue, 15% of respondents cited CO₂ emissions, the most common of transport emissions (Scottish Government; February 2009).



Figure 11

(Adapted from Scottish Government; February 2009)

When asked of their awareness of climate change, 1% of Scottish adults knew nothing about it, 40% admitted to not knowing very much about it and 43% believed to know a satisfactory amount. Despite government efforts in recent years, almost half of Scottish adults lack any solid awareness of climate change. Should they know of the damage everyday actions can cause to the environment, this alone may help ignite and promote behavioural change. Of those aware of climate change, emissions from cars and road transport were cited as the most common cause. Over half of respondents (57%) believe that climate change is a problem which needs to be addressed immediately; therefore, the desire for behaviour change exists. 48% of respondents believe that their behaviour and everyday decisions are contributing towards negative environmental impacts (Scottish Government; February 2009).

With regard to making changes towards helping the environment, using a more fuel efficient car and cutting down on car journeys accounted for, 32% and 28% of responses respectively (Scottish Government; February 2009).

Travel Choices

Figure 12 highlights the dependence on the car to travel to work and the poor levels of adoption of other sustainable modes. When asked for their reasons for travelling to work by car, 50% cited the car is quicker and more convenient than alternative modes while only 20% believe they need their car for work. 18% feel there is a lack of, or problems with the public transport, mainly the lack of direct routes and 13% cited that public transport takes too long (Scottish Government; February 2009). This is clearly an issue that Edinburgh's transport strategy must address in order to provide an effective sustainable transport system.



Figure 12

(Adapted from Scottish Government; February 2009)

This survey also highlighted that people use their cars to go grocery shopping because it is more convenient and that the shopping is too heavy, whilst walking or taking the bus (Scottish Government; February 2009). The strategy must address this issue because people have found that shopping locally is more expensive and there is a lack of availability of popular brands. This will also have an economic impact. Whilst home delivery from the popular, large supermarkets could help solve these problems, it could negatively impact on the financial success of small, local grocery stores.

Figure 13 illustrates the overdependence on the car over other more sustainable modes of transport and most worryingly, 27% never use the bus.



Figure 13

(Adapted from Scottish Government; February 2009)

Congestion Charging

Figure 14 illustrates that the majority of respondents oppose congestion charging which confirms the public's desire to take their cars into the city.



Figure 14

(Adapted from Scottish Government; February 2009)

Health and Lifestyle

As outlined in Figure 1, over half of adults in Scotland are obese, yet Figure 15 shows that only 12% of the population aspire to lose weight and become more physically active. This

demonstrates that the government will need innovative initiatives to motivate people to tackle the obesity issue and change their travel behaviour and way of thinking.



Figure 15

(Adapted from Scottish Government; February 2009)

Scottish Government National Transport Strategy: User Consultation Survey

In October 2006, the Scottish Government conducted a National Transport Strategy: User Consultation Survey with an aim of “understanding the views of ‘hard to reach’ audiences who are transport users, to ensure their views are taken account of in the development of the NTS”. In particular it aimed to “identify the type and nature of unmet mobility needs of different groups” (Scottish Executive Social Research; October 2006; p 2). This survey consulted with eleven focus groups across all age spectrums, race, sex, disabled and sexuality groups. In-depth interviews were conducted with forty respondents to obtain their views on transport in Scotland and identify the potential areas for improvement (Scottish Executive Social Research; October 2006).

Traffic Calming Strategies

In terms of traffic calming strategies, many respondents were in favour of the introduction of 20 mph zones and speed cameras and the Park and Ride schemes. Negative views were expressed regarding the use of speed humps and intimidation walking alongside roads with large vehicles passing at speed (Scottish Executive Social Research; October 2006).

Attitudes to Public Transport

Many respondents felt that the bus service in Scotland was generally irregular and infrequent, with urban areas provided for better than rural areas. This was thought to be due to competition between private bus companies serving lucrative routes, hence, other areas being poorly served. The general consensus was that there must be better subsidies paid to such bus companies or else a return to regulation and nationalisation to target this transport inequality. The underutilisation of the train service is generally due to the cost implications, with young mothers on a low income worst affected (Scottish Executive Social Research; October 2006).

The lack of information and accurate timetables was one of concern, with many noting that it can be difficult to obtain timetables at bus stops. Those from Ethnic Minority groups suggested that information provision in a variety of languages would also be beneficial to tourists. Real Time Information systems are considered an essential element in using public transport (Scottish Executive Social Research; October 2006).

Respondents cited that the lack of cleanliness, disabled and pushchair facilities and the poor attitude of drivers on buses were uninviting (Scottish Executive Social Research; October 2006).

Infrastructure

Basic bicycle lane infrastructure and a poor range of bus lanes are believed to be underdeveloped in both urban and rural areas across Scotland (Scottish Executive Social Research; October 2006).

Reasons for Car Use

Respondents cited that the main reasons for the increase in car use was due to out of town retail parks and supermarkets, out of town hospitals and the lack of local facilities and amenities. Many individuals expressed an inability to work from home due to unfavourable employers and social interaction issues (Scottish Executive Social Research; October 2006).

For many years, the public have been provided with the information regarding the negative effects of car use; however, there remains to be an increase in car use in the same period. Through examination of public attitude surveys and questionnaires, it is now known that contributions to this increase are issues regarding safety, frequency and discomfort (Scottish Executive Social Research; October 2006).

Formulation of a Strategy That Meets Public Needs

As outlined in Chapter 1, the chosen definition of a sustainable transport strategy stresses that a balance must be struck to provide an efficient, effective network within Edinburgh and between major cities that also supports economic growth. In order for this strategy to be realised, car use must be discouraged and public transport must meet the needs of the public.

Chapter 3

With the knowledge of the negative effects of the over use of the car, the current travel statistics in Scotland and Edinburgh and the concerns and desires of the public with regard to the public transport system, it is necessary to critically examine the schemes and initiatives included in Edinburgh's current transport strategy in order to determine its sustainability. These will be determined by comparing Edinburgh's transport strategy to the chosen definition of a sustainable transport strategy (Chapter 1), the changes in travel behaviour in recent years and whether Edinburgh's transport plans address the needs of the public.

City of Edinburgh Council's Current Local Transport Strategy

The CEC's Local Transport Strategy (LTS) 2007-2012 outlines the Council's aims and objectives in improving the transport network in Edinburgh. They aim to provide an integrated and effective transport network which compliments economic growth throughout the entire region and improves the quality of life and travelling experience for all transport users. The strategy recognises the value of consulting with communities to achieve an effective transport system that will be used by the public (March 2007).

The main policies and plans include:

Streets

The LTS aims to maintain better street management by ensuring the safest, direct routes for pedestrians, vehicles and cyclists as well as maintaining the character of this historical city, including its bridges. Access to premises to those with mobility impairments has also been prioritised. Since 17% of greenhouse gas emissions come from the transport sector, a figure that is on the increase annually, close monitoring of NO₂ levels have been maintained and aim to reduce pollution by traffic management measures. These include improving traffic flow, encouraging the use of low emission vehicles, switching off engines when parked, information and awareness programmes and potential roadside emission testing. Whilst traffic is on the increase (currently 1.25% per annum), the goal is to stabilise traffic at 2001 levels by 2021 (CEC; March 2007).

Analysis: It is questionable however, whether or not in these recessionary times if funding will permit priority of access measures. Also, the 2021 emissions target will be a challenge as it takes time for attitudes to change sufficiently to have an effect.

Individual Travel

Individual travel choices place an emphasis on safety and health by aiming to reduce casualties of road traffic accidents. Their road safety policy 'Vision Zero' aims to be achieved by good road design, adherence to rules of the road, speed reduction, education, enforcement, Safer Routes to School and behavioural changes from cars to walking, cycling and public transport use. Other useful initiatives are Controlled Parking Zones, improvement of pedestrian crossings, improved street lighting and security measures such as CCTV to make the city a safer place. An increase in cycle lanes and the use of mopeds and motorcycles aims to reduce emissions and single occupier vehicle figures. In an effort to reduce car use, the Council have introduced the 'City Car Club' where car sharing is

encouraged and Car Free Residential areas where more space can be allocated to green and community activity space. Development of more Park and Ride facilities in addition to those in existence are planned to reduce congestion in the city (CEC; March 2007).

Analysis: Whilst these measures could work in theory, changing people's attitudes away from car use to walking, cycling, mopeds, motorbikes and car sharing will be a major challenge. Park and Ride services are only sustainable for the city-bound part of the journey but will go some way to reducing city centre congestion and emissions.

Transport for All

The LTS aims to provide a modern, well integrated public transport network to meet all travel needs to, from and within the city. Emphasis is on mobility access, access to travel information, comfortable and safe stops, convenient mode integration and easy use tickets. The Council will seek a maximum number of days per year where changes to bus services can come into effect, disability awareness training for all bus drivers, a fully accessible and environmentally friendly bus fleet, marketing of bus services aimed at car users and ticket incentives for family use of bus services. Provision of less conventional services such as the 'taxi-bus' plan to facilitate the public where demand for a regular bus service is low are also under consideration. The objective of CEC is to improve reliability and journey times of buses by enforcing effective bus lane operation, improving markings and signs, monitoring the bus lanes by camera and the integration of bus lanes with the tram network. CEC also plan to improve rail services to and within the city but recognises the financial restraints it faces in constructing new lines and opening new routes. They also recognise the dilemma faced in limiting journey times and the number of stops necessary to provide an adequate service as well as the provision of a new high-speed rail route between Scotland and England. The strategy for Community and Accessible Transport aims to support those who have physical and mobility needs through the 'Taxicard' scheme, 'Dial-a-Bus' and 'Dial-a-Ride' services but these are subject to budgetary constraints (CEC; March 2007).

Analysis: The focus of the strategy in the area of providing transport for all is well placed but, by the Council's own admission, much of the initiatives are dependent on adequate financial support. Should all of these measures be fully implemented they would certainly be effective in meeting their objectives.

Smarter Travel Choices

The strategy aims to change the public's travel behaviour by encouraging alternatives to the car. By providing facilities, information and marketing it has already seen some success in a pilot scheme where it saw a reduction in participants' mode share for car trips to work by 6% and the mode share for bus travel to work saw an increase of 17%. Events such as 'In town without my car' day and intensive marketing under the 'Travelwise' banner have gone some way to informing travellers but CEC recognises the importance of high quality public transport information. Almost a quarter of all travel is from commuting and business, which is concentrated at peak times, and disproportionately contributes to congestion and air pollution. The Council is keen to have employees travel to work in other ways than driving alone. Consequently, the Council is encouraging employers to introduce Travel Plans (TPs) which help reduce parking, congestion and the recruitment of employees with no car access. Whilst the Council does not have the power to enforce TPs it does provide support and advice to businesses. TPs have also been encouraged in schools to promote safe and sustainable travel and one initiative has been the reduction in speed limits to 20 mph in the vicinity of

schools. Also under examination is the potential introduction of dedicated school bus services to reduce car travel to school. Home delivery services for the weekly shop and teleworking are other ways in which car use can be reduced which the Council also encourages (CEC; March 2007).

Analysis: The Council recognises the importance of changing attitudes and behaviour and has seen some positive results when a focused marketing campaign is implemented. For this to work in the long term it will be necessary to keep up this intensive marketing.

Transport and the Economy

The establishment of the Regional Transport Partnerships and emerging city-region planning processes aim to ensure efficient and effective infrastructure within the city and connectivity at a regional level to promote competitiveness. The Council also recognises that to have an economically strong city it is necessary to provide excellent accessibility and a high quality environment. The ECCMC Action Plan aims to improve pedestrian facilities, bus services and perhaps an underground car park. External connectivity is a major consideration in strengthening the economy. Whilst the Council has little control over the motorway and trunk road network, or long distance rail, coach, air and sea services it aims to promote the quality and capacity of the major gateways through SEStran. They will have a key role in tackling the issues of improving cross border travel, better public transport within Scotland and maintaining the integrity of key regional connections, particularly across the Forth. CEC are also examining the issues of city centre logistics with respect to the movement of goods within and through the city to reduce congestion and pollution as well as encourage movement of goods via rail and sea freight (CEC; March 2007).

Analysis: Since the Council has little control over the routes into and out of the city, seizing control over the logistics within the city to ensure high efficiency will help alleviate congestion and prevent gridlock. A move to transporting more goods via rail and sea is a step in the right direction but not without their contribution to harmful emissions.

Planning and Growth

The strategy recognises that in the long term, it is essential that land use planning and infrastructure is well managed so that the distribution of amenities, employment and housing has a positive effect on travel patterns. This will ensure greater opportunities to utilise more sustainable modes of transport reducing the need to travel long distances (CEC; March 2007).

Analysis: Existing infrastructure presents a major barrier to future land use planning as well as the preservation of the historical nature of the city. It will be dependent on the co-operation between relevant decision makers such as planners and engineers.

Major projects completed between 2001 and autumn 2006 include:

- CrossRail including new stations at Brunstane and Newcraighall, and Park and Ride at Newcraighall
- Edinburgh Park Rail Station
- Park and Ride at Ingliston and Hermiston
- Straiton - Leith quality bus corridor
- Edinburgh Fastlink guided bus corridor
- A90 bus priority and queue management linked to Ferrytoll Park and Ride in Fife

- Real Time Information/Bustracker at 120 bus stops
- An extensive programme of Safer Routes to Schools Projects
- Widespread provision of 20 mph zones to improve safety in residential areas and around all Edinburgh schools
- £40 million spent on road maintenance

(CEC; March 2007; p 11)

Real Time Information (BusTracker system)

Current Initiatives in Adopting Sustainable Transport in Edinburgh

Edinburgh is very much a highly residential and centralised city with 40% of all jobs and services located in the city centre (Banister and Marshall; 2000). For this reason, easy access to and from the city centre is a vital necessity, however car use must be discouraged in order to minimise harmful emissions and environmental effects caused by dense traffic presence. In order to combat this, the CEC introduced the bus priority scheme, i.e. Greenways, providing routes to and from the city centre. Priority lanes are painted green for use by buses, taxis and cyclists and other sustainable transport modes. There are strict parking restrictions on these Greenways which are in operation during the day and peak hours. Also located on these Greenways are red lines which replace yellow lines which strictly control parking and loading and forbid vehicles from stopping (Royal Academy of Engineering; 2004). Despite these efforts, bus lanes are segmented flowing in and out of other traffic and private vehicles are not forbidden along these red lines, therefore, they are not solely dedicated for bus use. Bus priority lanes are key to achieving the public's desired quick, direct routes to persuade current car users to change their travel modes. For this reason, an extension and increase in Greenways along all routes to and from the city centre is essential.

Greenway System

Greenway locations:

- A8 Glasgow Road – Maybury to Princes Street
- A900 Leith Walk – Leith to Princes Street
- A702 Lothian Road – Leven Street to Princes Street
- A70 Slateford Road – Inglis Green Road to Haymarket
- A71 Calder Road – City Bypass to Ardmillan

(CEC; 2009)

It has been shown that over 70% of residents believe that the bus service is good but only 30% of the Edinburgh population regularly take the bus to work (CEC; November 2007). Current benefits of the bus service are that priority bus lanes aid in a faster, more reliable journey to that of the car. Bus fares are also set and affordable unlike the variable fuel prices. In July 1997, Lothian Buses, First Buses and the CEC signed the Quality Bus Partnership (QBP) in an effort to improve the public bus service in the city. This partnership included citywide agreements to work together and with others in order to fund, deliver and implement and enforce this improvement to the bus service. This agreement brought about bus priority measures, Park and Ride facilities, improvements to the Edinburgh bus station and ticketing, customer care, accident reduction measures, low emissions, low floor buses, improved information, access and passenger facilities at stops. In addition, the QBP provided improvements on the Greenways and other bus priority schemes, Park and Ride, Real Time Information, redevelopment of the Edinburgh bus station, introduction of the SmartCard and off-bus ticketing, schemes to reduce road accidents, better shelters and information, low floor buses and efforts to reduce emissions (Association of Transport Coordinating Officers; April 2004). Newest developments to the service include travel shops, a national travel phone line and route maps on timetables. Despite these efforts, there is still a 70% Edinburgh population remaining to be convinced in using this service regularly.

Although the public bus service in Edinburgh is a relatively effective and successful one, there is room for improvement. Analysis of the most recent public attitude surveys regarding transport has shown that the Scottish public require various amendments to their local bus service in order to encourage them to change their travel modes. Instigators for change include quicker, more direct routes via an increase in bus lanes, a more frequent and regular service, an increase in services in rural areas, more timetables at bus stops, an increase in Real Time Information at bus stops, cleaner buses and more disabled and pushchair access (see Chapter 3).

SWOT Analysis of LTS

Strengths	Weaknesses
<ul style="list-style-type: none">• Improved buses and information.• Increase in bus lanes.• Introduction of car pooling/car-sharing schemes.• CCTV for increasing safety and security.	<ul style="list-style-type: none">• Priority bus lanes are not exclusively for buses.• Segmented pedestrian paths, bus and cycle lanes.• Lack of provision of pedestrian and cycle lanes.

- Major successful projects completed to support the strategy.
- Successful commencement of the tram project.

- Lack of control of private bus companies.
- Infrastructure is difficult and expensive to change because of the historical nature of the city.
- Emission targets are most likely unachievable in the long term.
- Financial constraints in provision of an effective rail system.
- QBP has resulted in limited competition for Lothian Buses.
- Lack of control over traffic on major routes to and from Edinburgh.
- Plans for growth could be inhibited by existing developments.
- Focus on marketing is weak as it has been limited to bus services and attitudes but there is no specific department deployed in this area.

Opportunities

- Increase consultation and surveys with Edinburgh residents to ensure their specific needs are met rather than on a national basis of opinion.
- The current recession has created an opportunity for completing projects cost effectively through the tendering process.

Threats

- Deepening recession may seriously affect the quality and/or implementation of the number of initiatives in the planned strategy.
- Climate change forecasts may be underestimated putting greater pressure on the Council to deliver targets at a faster rate than previously expected.
- Political and national government intervention thwarting the implementation of plans.

Chapter 4

Sustainable Travel Demonstration Towns in the United Kingdom (UK)

In 2004, a 5 year demonstration project of three UK towns was undertaken in order to exhibit the use of smarter travel choices and improvements to infrastructure. These towns were Darlington, Worcester and Peterborough chosen from fifty local authority towns that had expressed interest in becoming a demonstration town. The three towns shared funding of £10 million with building and infrastructure improvements funded by the Local Transport Partnership capital funding (DfT; October 2005).

Darlington

The Darlington ‘Local Motion’ campaign and subsequent research was conducted between 2004 and 2008. In March 2009, a report of the findings was produced highlighting the travel behaviour changes before and after project implementation.

The main aims of the project were to increase active travel at a local level, to increase the use of public transport, to improve safety across all transport modes, to improve access to employment and local services, to improve air quality and reduce the amount of short local trips by private car (>2 miles). Performance indicators for 2010/11 were to achieve a 10% reduction in car-as-driver trips (i.e. unaccompanied), a 2% increase in the mode share of walking and cycling respectively for all trips and a halt in the decline of bus passenger trips (Darlington Borough Council; March 2009).

Type of Measure	Specific Measure
Travel Information	<ul style="list-style-type: none">• Timetables at all bus stops specific to that bus stop• Walking, cycling and bus guides• Local journey planning website• Individualised Travel Marketing (ITM) (a personal travel plan for each household)
Marketing and Promotions	<ul style="list-style-type: none">• Portray a transport link without being mode specific• A ‘doing’ adjective in the brand logo to encourage a call to action• The ‘Local Motion’ Club to keep in touch with the community• Members of the club received a free jute bag, regular information leaflets, newsletters of local activities, case studies on local people and organisations, competitions and challenges• Advertising in local publications, billboards, buses, bus stops, bus and car parking tickets, posters and local radio

Travel Planning

- Full-time Travel Plan Officer (September 2004)
- 38 schools were involved, 5 of which produced Travel Plans
- March 2008 – 30 schools had devised a Travel Plan, 20 had installed secure cycle parking and all of the local primary schools had taken part in an active travel campaign promotion
- ‘Bike It’ programmes and walking programmes have also been popular with secondary schools
- By summer 2008, 23 local businesses had or were in the middle of composing Travel Plans (a workforce of 11,000 people - 30% of the local workforce)

Other Measures

- Traffic free areas in the town centre
- Re-routing of all bus services to and from the town centre
- Cycle and pedestrian space along the A66 trunk road
- New toucan crossings
- An extension of 20 mph zones in residential areas
- Improvements to information and facilities at all bus stops in the area
- A complete re-structuring of the local bus service
- A free bus pass for eligible passengers
- New residential parking around the edge of the town
- Charging for parking in the town centre

Table 1

(Adapted from Darlington Borough Council; March 2009)

Figure 16: Positive changes in mode choice, car usage, active travel time and CO₂ emissions from cars as a result of the measures outlined in Table 1.

(Darlington Borough Council; March 2009).

Peterborough

In March 2009, the final report for the ‘Travelchoice’ programme published the findings from the sustainable transport scheme adopted in Peterborough between 2004 and 2008. The City Council was awarded £3.24 million to undertake the project and fund workplace and school travel planning, ITM and other sustainable transport methods (Peterborough City Council; March 2009).

Summary of measures adopted:

Type of Measure	Specific Measure
Travel Information	<ul style="list-style-type: none"> • Cycle journey planner, cycle promotions and updated Peterborough cycle map • Integrated sustainable transport guide (used in the ITM project) • Interactive kiosks • Interactive mapping system • Passenger information screens • Real-time passenger information • Sustainable transport interchange information • ‘Text & Go’ (public transport information) • Transportation interactive website • Travel information centre
Marketing and Promotions	<ul style="list-style-type: none"> • Car share scheme promotion • Good Going (reward and travel awareness campaign, also promoted by the ITM) • Route branding scheme • Sustainable Travel Co-ordinator and overall marketing and promotion scheme • Travelchoice Week (annual promotion to coincide with European Mobility Week)
Travel Planning	<ul style="list-style-type: none"> • My Travelchoice ITM programme • Business travel planning scheme • Residential Travel Plans through the planning process • School travel planning • Workplace Travel Plans through the planning process as well as voluntarily
Other Measures	<ul style="list-style-type: none"> • Adult cycle training • PLUSBUS (bus/train ticket discounts)

Table 2

(Peterborough City Council; March 2009; pg 7)

Figure 17: Positive changes in mode choice, car usage, active travel time and CO₂ emissions from cars as a result of the measures outlined in Table 2.

(Peterborough City Council; March 2009)

Worcester

The ‘Choose How You Move’ scheme was set up in Worcester in order to target the problems of traffic congestion and reduce car use through walking, cycling, and car sharing and public transport. Like Darlington and Peterborough, Worcester also adopted this project between 2004 and 2008. The table below summarises the measures adopted in order to promote walking, cycling, public transport and car sharing throughout the 5 year period in the Worcester area (Worcestershire County Council; March 2009).

Type of Measure	Specific Measure
Travel Information	<ul style="list-style-type: none"> • Information on the Choose how you move section of Worcestershire County Council’s website • New public transport maps and timetables (also used in the ITM programme)
Marketing and Promotions	<ul style="list-style-type: none"> • Individualised Travel Marketing • Public transport marketing campaigns • Car sharing marketing campaign • Cycling marketing campaign
Travel Planning	<ul style="list-style-type: none"> • Workplace Travel Plans • School Travel Plans
Public Transport	<ul style="list-style-type: none"> • Service improvements • Regular timetable change dates • Improved infrastructure and information at bus stops
Cycling	<ul style="list-style-type: none"> • New ticketing initiatives • Cycle loan scheme • Tour of Britain, Pedal in the Park and Dr Bike events • Adult and child cycling training • Development of new maps and leisure route information (also used in the ITM programme)
Walking	<ul style="list-style-type: none"> • Walk to school week • Walking buses

Other Measures	<ul style="list-style-type: none"> • Walk to work events • Car club • Car sharing database for employers
----------------	---

Table 3

(Worcestershire County Council; March 2009; pg 2)

Figure 18: Positive changes in mode choice, car usage, active travel time and CO₂ emissions from cars as a result of the measures outlined in Table 3.

(Worcestershire County Council; March 2009)

Comparison of Sustainable UK Demonstration Towns with Edinburgh

As a result of the schemes and initiatives in all three towns (outlined above), significant positive changes were seen in terms of mode choice, changes in active travel time, the levels of car usage and harmful emissions.

On observing the successful schemes and initiatives piloted in the sustainable UK demonstration towns, Edinburgh's current LTS has several weaknesses. Edinburgh's current LTS lacks clear focus on:

- Individualised Travel Marketing
- Strong emphasis on marketing and promotion campaigns for walking, cycling and public transport
- Targeting behaviour change in schools, i.e. promoting a generational change
- Increased travel planning for businesses and workplaces in order to combat the traffic congestion from the daily commute
- Pedestrian and cycle paths along trunk roads
- Re-structuring of the local bus service
- Introduction of a congestion charging scheme
- In depth travel surveys and interviews specific to the Edinburgh region

Should such schemes and initiatives be adopted this would address the issues of:

- Poor awareness of the benefits of physical activity
- Education and instigation of physical activity from a young age, i.e. targeting current childhood obesity concerns

- Promotion of the use of the more sustainable modes of walking, cycling and public transport where possible to help lower emissions
- Encouragement of alternatives to car use in order to travel to work, i.e. the most prominent traffic generator
- Provision of safe pedestrian and cycle routes along roads where fast traffic is intimidating
- Introduction of a more flexible and dependable bus service in order to increase bus patronage
- Congestion charging in Edinburgh city centre in order to refrain car drivers from entering
- A heightened awareness of local walk/cycle routes in order to provide the public with a choice to walk or cycle as an alternative to the car
- Sustainable individual Travel Plans suited to one's specific travel requirements

Successful adoption of the above suggestions would potentially result in a sustainable, safe, efficient and flexible transport system which in turn will ensure economic success due to successful and quick traffic flow to and from Edinburgh.

Chapter 5

Reviewing Edinburgh's Implementation of Transport Plans

From the review of travel statistics, documents and public attitude surveys, several issues and inequalities with Edinburgh's transport strategy were identified. In order to obtain answers as to why Edinburgh's current transport strategy lacks significant focus on a number of matters, several bodies were approached in order to uncover the reasons behind such issues i.e.:

- Marketing and awareness programmes
- Funding allocation
- Behaviour change policies
- A congestion charging scheme
- The potential to make changes to the bus service and ticketing system
- Travel planning initiatives

As a result, the CEC Professional Officer for Transport Policy was interviewed on 15th July 2009.

Declaration: For the purposes of this analysis and the use of information retrieved from an interview conducted with the chosen CEC representative, the abbreviation CECr will be used to refer to the individual and their responses. Additional cited information retrieved from an interview conducted with two members of the voluntary cycle organisation 'Spokes' will be referred to as 'Spokes' representatives one and two (see Appendix 1).

Responses cited below are in the professional opinion of the interviewee/s and not those of the organisation as a whole.

Is There A Lack of Funding Towards Active Travel and Marketing Due to Vast Amounts of Trunk Road Investment?

According to the 'Spokes', a £40 million shift from trunk road investment would triple the current cycle investment still leaving trunk road expenditure £100 million higher than the previous year (Spokes; 2009). CECr suggests that funding towards trunk road construction is still high as many people still have an "inherent affection" for road construction in our society. Although car ownership in Scotland is increasing by 2% per annum, this percentage may not be an increase per se but a variable in the balance between new car owners (i.e. those entering the car ownership market and those coming out of the car ownership market). Speculation is that almost 60% of advertising in the media comes from the automobile industry. Therefore one could assume advertising is still very much in favour of the car, having an influence on society (CECr).

A Limited Lack of Competition for Lothian Buses and the Issues as a Result

Edinburgh has had competition between bus companies in the past, the last being 3 years ago when First Buses launched their low fares campaign and dramatically extended their routes. In response to this, Lothian Buses extended their routes into what were originally First Buses areas. This competition then settled down leaving the situation today with Lothian Buses dominating Edinburgh's bus service. CECr believes there seems to be stability in the bus service in Edinburgh. While bus operators do have their territories, they also share routes but they no longer appear to be willing to compete. This current situation of domination has allowed Lothian Buses to invest in more comfortable buses, increasing bus patronage over all. With competition between bus companies you increase the number in the fleet which results in a decrease in waiting time. The journey time is a combination of waiting time and travelling, therefore, the generalised cost of bus travel declines making them more attractive, perhaps being a benefit (CECr).

It is also believed that a stable settled bus market may be beneficial as this allows bus operators to plan ahead their regulatory bus services and this lack of change to the service gives certain stability to users. Competition may only provide a sudden outburst of good bus services which will then settle down and depart over time (CECr).

The Effects of Having Segmented Walk, Cycle and Bus Lanes City Wide

On observing this graph, there is an obvious association between bus patronage and bus lane length. There are a number of variables at play and it cannot be proven that the length of bus lanes has led to that amount of bus patronage compared with other factors, for example, Real Time Information systems at bus stops (CECr).

Figure 19: Association Between Bus Patronage and Bus Lane Length.

'Spokes' representatives one and two highlight that as cyclists, it is important that safe cycle lanes and infrastructure are located in busy areas as residents will see the facilities available and this itself may spark an interest in cycling ('Spokes' representatives one and two).

New Developments and Sustainable Transport

Admittedly there is confusion with regard to the responsibility of provision of sustainable transport in new developments. The confusion being whether it is the developers or those that purchase the property from developers that contribute towards sustainable travel.

There have been wonderful examples of section 75 agreements located at Edinburgh Park and Ocean Terminal where developers contributed towards sustainable transport activities, for example a bike pool for employees and firms (CECr).

CECr recognises that increasing housing supply will put pressure on infrastructure being financed as an increase in the number of residents will inevitably result in an increase in the number of car journeys. For this reason, it necessary that something is done in terms of road infrastructure and public transport provision (CECr).

Monitoring of New Plans and Policies to Ensure They Are Adhered To

Each year, the CEC produces a Transport Policy Annual Review document. Within this, new plans and policies are reviewed under the following headings: action, achievement measure, funding, officer/section, percentage completed, on/off target and the date completed and closed (CEC; November 2008).

Marketing and Advertising Behaviour Change

CEC does have a communications team to keep the transport message alive. In terms of advertising this is the responsibility of the public transport operators themselves. As with the sustainable demonstration towns in the UK, most of the behaviour change approaches which have been successful have involved direct conversation with households backed up by subtle forms of marketing (e.g. shopping bags). In Edinburgh, there is no form of advertising per se but instead more subtle approaches such as Travel Plans for schools and developers. CECr agrees that many Edinburgh residents will not be made aware of such Travel Plans, however, there tends to be measures within the Travel Plan that gets advertised (CECr).

Co-operation between Transport and Land Use Planners in CEC

When asked about the co-operation between transport and land use planners, admittedly there is not a lot of interaction with the land use planning department. Although there is an exchange of documents when consultations plans are going to Council, the transport team discuss with the land use planners as the plans emerge and co-inside with them on various matters. In addition, letters are sent out regarding consultation and discussions take place between both departments. Apart from these actions, there is no formal structure of interaction or co-operation between transport and land use planners in the CEC (CECr).

In 2006, the Scottish Government published an evaluation of the attitudes of the Edinburgh residents towards a congestion charging system. Of the 1,002 surveyed, 57% of Edinburgh residents were not in favour of a congestion charging scheme in the city (June 2006). Despite government attempts to spearhead the congestion charging scheme, those plans have since been ignored. The national government have admitted that they are no longer intending on introducing congestion charging in the next government at a national level although technically, economically and environmentally a congestion charging scheme will be necessary in Edinburgh to alleviate both traffic congestion and CO₂ emissions. This fee also increases the costs associated with car use unlike walking, cycling and public transport, however, the initiative has been “politically shunned” and, for this reason only, the CEC are no longer actively pursuing the initiative (CECr).

Critical Analysis of Interview Topics

It is evident from the interviews conducted that there are in discrepancies in the funding allocation with respect to investment in road infrastructure to accommodate the private car, compared to the necessary investment required to support sustainable modes. With such a high percentage of advertising towards car ownership, achieving such a change in mindset away from car ownership would require a strong counter offensive marketing campaign by the CEC for which it has not planned.

Travel initiatives that have been set up to make public transport use more effective are already in place. ‘Traveline’ is an online journey planning information system operating across the UK. Information regarding timetables, a journey planner, Real Time Information

bus times, and travel by bicycle and bus times sent via mobile phone is all accessible through this service (Traveline; 2009). In an effort to provide an integrated ticketing system within Edinburgh, the 'One-Ticket' system has been introduced to integrate bus and rail travel. These tickets are available on a weekly (£20.20), monthly (£60.50) or an annual basis for use between participating bus and rail operators. While this system is convenient, 'One-Ticket' prices amount to a higher price than the same equivalent of tickets for one operator (One-Ticket; 2009).

A weak approach to communications with the community to persuade behaviour change may be the weakest link in the transport strategy as behaviour is a key aspect to its success.

Greater focus on formal co-operation between transport and land use planners in the CEC is vital. Land use mixture and careful transport planning can ensure a minimised need for travel and distances suitable for walking and cycling and affordable public transport which can have a positive effect on the economy, health and income growth.

With the majority of the public against congestion charging and national political intervention discarding its planned introduction, the CEC will have lost out on a major source of revenue. Now that the country is in recession, this could have gone a long way to implementing some of the more sustainable initiatives in the LTS.

Future Plans Set in Place to Promote Sustainable Transport in Edinburgh

CEC's future plans for the next five years and beyond are to continue to support and improve sustainable, safe public transport options and promote health and well being.

Specific objectives for the Edinburgh transport system over the next five years and beyond are to:

- A. To facilitate reliable and convenient access to the city and movement within it, in particular by reducing congestion;
- B. To increase the proportion of journeys made on foot, by cycle and by public transport;
- C. To implement the tram project;
- D. To reduce the need to travel, especially by car;
- E. To reduce the adverse impacts of travel, including road accidents and environmental damage;
- F. To recognise the many roles that streets have for the community – as places that people live and work, as areas that people meet, shop and relax, as a setting for the city's built heritage, as well as routes for movement whether by car, bus, bicycle or on foot
- G. To improve the ability of people with low incomes and people with mobility impairments to use the transport system; and
- H. To ensure that the road, footway and cycle network are of a standard suitable for safe and comfortable movement

(CEC; March 2007; p 19)

5 year initiatives in achieving such goals are in place and include:

- To upgrade the computer control of traffic lights
- To introduce Real Time Information signs on parking availability
- Introduce more Real Time Information signs at bus stops
- A bus only road from the Royal Infirmary to Greendykes
- A new electric rail link from Glasgow via Airdrie and Bathgate
- Introduction of a rail line at The Borders
- Further upgrades to Waverly and Haymarket stations
- The construction of a new motorway link between Forth Bridge and the M9
- More 20 mph zones and Safer Routes to Schools
- Improvements to aid active travel and other road users
- Provision of funding for an orbital bus service
- Continuation of high levels of spending on road, pavement and cycleway maintenance

(CEC; March 2007)

The CEC has also commissioned a feasibility study to be carried out in Haymarket in an effort to improve the traffic congestion in the area over the next thirty years. Haymarket is a very busy location containing Scotland's fourth busiest train station generating four million passengers through the area. With new rail services proposed in the future and new developments in the area, the Haymarket Interchange Feasibility Study investigates the re-development of the Haymarket Station and the surrounding area. This study aims to create a contemporary, multi-modal transport hub within Edinburgh city centre. The study is funded by Transport Scotland and will involve organisations such as Network Rail, First ScotRail and the public bus operators of Edinburgh. If successful, this will provide a safe and efficient transport network for public transport users and pedestrians (Haymarket Interchange; 2009).

With Edinburgh Airport attracting nine million passengers each year, plans are in place to invest £40 million in a new terminal extension with state of the art security facilities, a wider choice of bars, shops and restaurants and more relaxation space. It is hoped that this new development will be open to passengers by 2011 (British Airport Authority; 2009).

The CEC has made several suggestions for improvement to the current public bus service. These include:

- Improvements to online information
- Audible Real Time Information at bus stops
- Buses to be fitted with 'next stop' displays
- Increased promotion of 'Traveline'
- More information in foreign languages
- More information on accessible and disabled buses

In addition, information will be provided on connections and travel concessions at bus stops and any service changes will be advertised three weeks in advance. There will also be increased information on interchange points (CEC; November 2007).

A Critical Analysis of Edinburgh's Future Transport Plans

The CEC proposes some promising changes in improving and promoting public transport infrastructure and services within the region. Plans to improve the Real Time Information facilities, increase rail links to and from Edinburgh and to reduce congestion in the Haymarket area are all attempts which, if fully implemented, will be welcomed by the public considering the responses from both public attitude surveys (see Chapter 2).

In these times of economic uncertainty, it is vital that government expenditure is put to good use and directed in the correct area. The largest allocation of the transport budget is directed towards the construction of the Forth Road Bridge costing between £3.2bn and £4.2bn (BBC News; December 2007), and a new terminal at Edinburgh airport. Although the new Forth Road Bridge will aid in improving rail and bus links to and from Edinburgh city centre, this will primarily benefit the daily car commuter. For this reason, it is questionable whether it is the most effective allocation of an already limited transport budget. With 21% of Edinburgh residents still unsatisfied with the public bus service, it is essential that their requirements are met, i.e. a quicker, more direct service through the increase in bus lanes, better services in rural areas, more timetables and Real Time Information at bus stops, cleaner vehicles and

more disabled and pushchair access (see Chapter 2). With such mammoth investment planned to be directed elsewhere before such relatively small scale issues are alleviated, this is considered irresponsible. With relatively low cost and small scale amendments to the current transport network having a potentially dramatic influence on transport behaviour, such large scale projects and expenditure should be adopted after essential and effective amendments are made to the current network.

With only 1% of Scottish residents getting their shopping delivered to the home (Scottish Government Social Research; 2009), this is a facility which could be intensely promoted and utilised further at a local level requiring only one vehicle to deliver to several households daily and benefitting small, local businesses.

Only 1 in 10 car users in Scotland feel that they have no alternative to the private car, journey time and convenience being cited as the main benefits (Scottish Government; March 2004). If CEC's plans to improve the bus and rail services are successfully implemented this would result in vast improvements in terms of the levels of harmful emissions, both environmentally and health wise. With a relatively weak focus in promoting and providing infrastructure for walking and cycling throughout Edinburgh, the health implications related to a lack of physical activity will persist.

Limitations

A variety of limitations were encountered during this research. On evaluation of the statistics, problems were encountered in retrieving recent figures specific to Edinburgh in the case of:

- The reasons for car ownership
- Car occupancy levels
- Travel to work
- Public health
- Harmful emissions

Similarly, the most recent public attitude survey applied to Scotland as a whole. In all instances, however, it can be and has been assumed that these opinions are reflective of the Edinburgh population also.

In terms of limitations for future development, CEC has a relatively small capacity compared with other UK cities, e.g. London. With an estimated workforce of 20,000 and a gross revenue budget of approximately £1 billion, the CEC is limited on funding and resources, therefore, potentially making it more difficult to adopt methods or schemes trialled by larger bodies (Aegon Breakfast Club: 2007).

The short time period allocated to conduct this research required limiting the study to a specific area so that it could be explored in sufficient depth to be of value. While the Edinburgh tram and rail network as well as air and sea travel to and from the city are appropriate in examining sustainable transport indicators, a conscious decision was made to primarily focus this study on walking, cycling and the public bus service as these are the most flexible forms of public transport and many improvements can be relatively immediate. The

utilisation of walking and cycling also has the added benefits towards health and the environment with little or no emissions from their use.

Chapter 6

Conclusion

An Assessment as to Whether Edinburgh's Current Transport Strategy is Sustainable

As outlined in Chapter 1, the sustainability of Edinburgh's transport strategy will be determined by evaluating whether the LTS meets the five strategic objectives of the sustainable transport strategy as defined by the DfT.

1. "To support national economic competitiveness and growth, by delivering reliable and efficient transport networks".

In August 2005, Scotland introduced the 'Planning for Transport' policies SPP 17 and PAN 75 highlighting the issue and need for sustainable transport (see Appendix 2). On review of the statistics (Chapter 2), it is evident that despite the introduction of such guidance, car ownership and car use has continued to increase in Scotland and Edinburgh. As recently as 2005, over half of the entire Scottish population were not meeting the recommended quota for physical exercise (Chapter 1). In addition, patronage on Edinburgh's public transport network has been wavering across this same time frame. Increased support towards trunk road investment (eg. Forth Road Bridge) and unpredictable budgets towards walking and cycling is the result of a society still largely dependent and in favour of the private motor vehicle. Bus and rail networks have a vital role to play in the integration of public transport. It is also important that the alternative to the car for long distance journeys, i.e. the bus and rail service is made as attractive as possible in order to encourage behaviour change and reduce car use. With the operation of the Edinburgh tram pending, this is regarded the only significant contribution towards promoting sustainable transport in Edinburgh. The lack of an efficient and effective transport system will hinder economic competitiveness and growth which will be detrimental to recovery from the current recession.

2. "To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of avoiding dangerous climate change".

With Scotland's emissions increasing by 2% each year and levels of car ownership in Scotland seeing marginal changes, it is proof that past and current efforts at reducing car use and alleviating emissions from motor vehicles are currently unsuccessful. Limited funding and staff dedication towards sustainable transport marketing and awareness programmes are detrimental in encouraging Edinburgh's population to adopt alternative modes to the car, therefore, a shift in focus and investment is imperative.

3. "To contribute to better safety, security and health and longer life-expectancy through reducing the risk of death, injury or illness arising from transport, and promoting travel modes that are beneficial to health".

Currently, reducing the need for travel through strategic land use and transport planning depends on informal discussions among the separate departments; therefore, this is an issue which must be addressed. In addition, health officials and engineers have a major role in ensuring plans and strategies are in place to provide safe, adequate and welcoming infrastructure for walking and cycling in order to encourage and provide the healthier, more sustainable travel choices to and from local services. This role however is not being fulfilled.

Land use sites must take the transport opportunities into account and identify any impacts in order to ensure environmentally friendly developments and transport. Priority on roads for walking, cycling and public transport may discourage others from car use as such sustainable options will provide a faster, more direct route than that of the private car. Ultimately, funds for prioritising these sustainable modes are inadequate.

4. "To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society".

In order to address some of the recognised inequalities such as access to travel information and journey planning and a convenient integrated ticketing system, the initiatives of 'Traveline' and 'One-Ticket' are in place. While this is a move in the right direction, these systems have the potential to alienate those who do not have the use of the Internet, or do not have the funds to pay the premium for the convenience of an integrated ticket, therefore this does not promote equality. With many survey respondents citing additional disabled and pushchair access on buses as being important (see Chapter 2), Edinburgh's current LTS suggests heightened information awareness but not the provision of mobility access facilities specifically.

5. "To improve quality of life for transport users and non-transport users and to promote a healthy natural environment".

The changing of travel behaviour to walking, cycling and public transport is paramount in achieving a healthier population and environment in Edinburgh. However, these changes can and will only take place when attitudes change and infrastructure is provided. With a limited, unpredictable budget and policy adherence towards sustainable modes and awareness programmes, this will result in a continuation of current car dependent travel behaviour.

Consequently, with Edinburgh's transport strategy failing to fully meet the requirements of each of the five criteria; it is not considered a sustainable transport strategy.

Recommendations

The recommendations below are a result of this research taking into account the requirements of the public as stated in the public attitude surveys and successful initiatives implemented in the sustainable UK demonstration towns and interviews with relevant parties. Such changes are feasible and possible for Edinburgh to further utilise or adopt. These recommendations will support a sustainable transport strategy as defined by the DfT:

Recommendations:	Specific Measure
Travel Information/Changes	<ul style="list-style-type: none">• Timetables at all bus stops (specific to that bus stop)• A local journey planning website (specific to Edinburgh)• Multi-lingual travel information• Interactive travel kiosks• Interactive mapping• Increased interchange information• Alternative methods to achieving Real Time Information, e.g. Teletext or 'Text & Go' (mobile phone public transport information)
Marketing and Advertising	<ul style="list-style-type: none">• ITM aimed at households, schools and businesses• An increase in walking and cycling promotional events• A full-time travel planner in CEC• Ignite more public awareness of the effects of climate change and the benefits of walking, cycling and public transport through intense advertising campaigns
Additional Measures	<ul style="list-style-type: none">• An increase in safe walk/cycle lanes and services city wide• Safer cycling/pedestrian routes and crossings along roads of high speed• A more cost effective rail network• An increase in traffic free zones• An increase in Greenways• Re-routing/re-structuring of bus services in urban and rural areas• Further ticket discounting measures• Improvements to out of town parking• Congestion charging and higher parking fees in the city centre• Cycle training programmes• A cycle loan scheme• Further utilisation of home delivery and shopping at a local level to limit the need for the car• Formal and regular consultations between transport and land use planners• Establish more realistic/achievable emission targets• A reduction in car lanes to make car travel less appealing• A reduction in trunk road investment• More incentives for developers to promote and provide walking, cycling and public transport facilities• An increase in open space• An increase in traffic calming measures, e.g. 20 mph zones and Park and Ride facilities

- Research into successful international sustainability projects and alternative fuels/vehicles

Word count for main report: 14,986

References

- Aegon Breakfast Club: 2007. The City of Edinburgh Council [Online] Available at: <http://www.aegonbreakfastclub.org/edinburgh.html> [Last Accessed; 19th July 2009]gt
- Allison et al; 2001. *Research Skills for Students*. De Montfort University: Kogan Page; London.
- Association of Transport Coordinating Officers (Scotland); April 2004. *A Review of Current Practices and Future Aspirations*. Image and Print Group; Glasgow.
- Automobile Association; 2008; *AA Fuel for Thought Campaign* [Online] Available at: http://www.theaa.com/public_affairs/news/fuel-for-thought-cost-of-motoring-up-11-percent.html [Last Accessed: 13th June 2009]
- Banister, D.; 1994. *Transport Planning: In the UK, USA and Europe*. E & FN Spon; London.
- Banister, D. and Marshall, S. ;2000. *Encouraging Transport Alternatives: Good Practice in Reducing Travel*. The Stationary Office: London.
- Barton, H., Grant, M and Guise, R.; 2003. *Shaping Neighbourhoods: A Guide for Health, Sustainability and Vitality*. Spon Press: London.
- BBC News; December 2007. *New Bridge to be Built Over Forth* [Online] Available at: http://news.bbc.co.uk/2/hi/uk_news/scotland/edinburgh_and_east/7152186.stm [Last Accessed: 7th August 2009]
- Birley, G and Moreland; N; 1998. *A Practical Guide to Academic Research*. Kogan Page: London.
- British Airports Authority; 2009. *Edinburgh Airport* [Online] Available at: [http://www.edinburghairport.com/portal/page/Edinburgh%5EGeneral%5EAbout+Edinburgh+Airport%5EEdinburgh+lowdown%5EEdinburgh's+new+departure+lounge/f17b7f38dfb4f110VgnVCM20000039821c0a_____/448c6a4c7f1b0010VgnVCM200000357e120a_____/](http://www.edinburghairport.com/portal/page/Edinburgh%5EGeneral%5EAbout+Edinburgh+Airport%5EEdinburgh+lowdown%5EEdinburgh's+new+departure+lounge/f17b7f38dfb4f110VgnVCM20000039821c0a_____/448c6a4c7f1b0010VgnVCM200000357e120a____/) [Last Accessed: 6th June 2009]
- Darlington Borough Council; March 2009. *Final Evaluation Report for Darlington Borough Council*. Socialdata.
- Department for Transport; 2009. *Department for Transport; Aims and Objectives* [Online] Available at: (<http://www.dft.gov.uk/about/aimandobjectives>) [Last Accessed; 7th July 2009]
- Department for Transport; October 2005. *Sustainable Travel Demonstration Towns* [Online] Available at: <http://www.dft.gov.uk/pgr/sustainable/demonstrationtowns/sustainabletraveldemonstrati5772> [Last Accessed; 26th July 2009]
- Edinburgh Guide; July 2008. [Online] Available at: <http://www.edinburghguide.com/story/edinburghcitycouncil/2090> [Last Accessed; 5th August 2009]

- European Commission; 2008. *Eurostat Pocketbook 2008 edition; Energy, Transport and Environment Indicators*. European Commission Publications Office.
- European Commission; 2006. *Keep Europe moving. Sustainable Mobility for Our Continent. Mid-Term Review of the European Commission's 2001 White Paper*. European Communities; Luxembourg.
- Faculty of Public Health; 2008. *Sustaining a Healthy Future; Taking Action on Climate Change* [Online] Available at: http://www.fphm.org.uk/resources/AtoZ/r_sustaining_a_healthy_future.pdf [Last Accessed; 12th July 2009].
- Feitelson, E.; 2002. *Introducing Environmental Equity Dimensions into the Sustainable Transport Discourse: Issues and Pitfalls* (in Transportation and Research D, volume 7, Issue 2).
- Filion, P. and McSpurren, K.; 2007. *Smart Growth and Development Reality: The Difficult Co-ordination of Land Use and Transport Objectives* (in Urban Studies, Volume 44, Issue 3).
- Haymarket Interchange; 2009 [Online] Available at: <http://www.haymarketinterchange.com/> [Last Accessed: 3rd June 2009]
- Lothian Buses; 2009. *Ridacard* [Online] Available at: <http://lothianbuses.com/downloads/timetables/RIDACARD090118.pdf> [Last Accessed; 22nd July 2009]
- National Health Service (NHS) Health Scotland; May 2006. *Health Education Population Survey; Update from 2005 Survey*. NHS Health Scotland; Glasgow.
- One-Ticket; 2009. *Why One-Ticket?* [Online] Available at: <http://www.one-ticket.co.uk/bus/whyoneticket.html> [Last Accessed; 17th July 2009]
- Paths for All Partnership; spring 2009. *Paths to Health (Issue 22)*. Paths for All Partnership; Edinburgh.
- Patton, J. W.; 2007. *A Pedestrian World: Competing Rationalities and the Calculation of Transportation Change* (in Environment and Planning A, Volume 39, Issue 4).
- Peterborough City Council; March 2009. *Final Evaluation Report for Peterborough City Council*. Socialdata.
- Royal Academy of Engineering; 2004. *Edinburgh Greenways* [Online] Available at: <http://www.hw.ac.U.K./sistech/rae/documents/Greenway-EDINBURGH%20GREENWAYS.pdf> [Last Accessed; 16th June 2009]
- Scottish Executive Development Department; August 2005. *Planning Advice Notice (PAN) 75*. The Scottish Government Publications.
- Scottish Executive Social Research; October 2006. *Scottish National Transport Strategy 2006: User Consultation Survey*. The Scottish Government.
- Scottish Government; March 2004. *Attitudes to Car Use and Modal Shift in Scotland*; [Online] Available at: <http://www.scotland.gov.uk/Publications/2004/03/19062/34290> [Last Accessed; 23rd May 2009]

Scottish Government; June 2006. *Evaluation of Edinburgh Residents' Attitudes to the Proposed Road User Charging Scheme*; [Online] Available at: <http://www.scotland.gov.uk/Publications/2006/06/26125431/0> [Last Accessed; 17th July 2009]

Scottish Government; December 2008a. *Scottish Transport Statistics: No 27 - 2008 Edition (Chapter 12)* [Online] Available at: <http://www.scotland.gov.uk/Publications/2008/12/22091243/165> [Last Accessed; 13th July 2007]

Scottish Government; December 2008b. *Scottish Transport Statistics: No 27 - 2008 Edition (Part 19)* [Online] Available at: <http://www.scotland.gov.uk/Publications/2008/12/22091243/19> [Last Accessed; 13th July 2007]

Scottish Government; May 2009a. *Health of Scotland's Population; Healthy Weight* [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Health/TrendObesity> [Last Accessed; 10th August 2009]

Scottish Government; May 2009b. *Personal Travel Statistics: Travel to Work*; [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendTraveltoWork> [Last Accessed; 25th May 2009]

Scottish Government; May 2009c. *Personal Travel Statistics: Reasons for Travel*; [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendReasonsforTravel> [Last Accessed; 25th May 2009]

Scottish Government; May 2009d. *Private Transport: Car Occupancy*; [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendCarOccupancy> [Last Accessed; 24th May 2009]

Scottish Government; May 2009e. *Private Transport: Household Car Availability*; [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendHouseholdCar> [Last Accessed; 24th May 2009]

Scottish Government; May 2009f. *Public Transport: Availability of Bus Service*; [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendBusServices> [Last Accessed; 23rd May 2009]

Scottish Government; May 2009g. *Public Transport - Travel Information and Concessionary Fare* [Online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendTravelInformation> [Last Accessed; 10th August 2009]

Scottish Government; August 2008. *Scottish Household Survey 2007* [Online] Available at: <http://www.scotland.gov.uk/Publications/2008/08/07100738/0> [Last Accessed; 25th July 2009]

Scottish Government; February; 2009. *Scottish Environment Attitudes and Behaviour Survey 2008*. The Scottish Government; Edinburgh.

Scottish Government; June 2009a. *Climate Change Delivery Plan*. The Scottish Government.

Scottish Government; June 2009b. *Sustainable Transport* [Online] Available at: <http://www.scotland.gov.uk/Topics/Transport/sustainable-transport> [Last Accessed; 23rd July 2009]

Scottish Government Social Research; 2009. *Scottish Environmental and Attitudes Behaviours Survey 2008*. Scottish Government.

Scottish Government; August 2005. *Scottish Planning Policy (SPP) 17; Planning for Transport*. The Scottish Government.

Spokes, du Feu, D. (Editor); 2009. *Spokes Bulletin (Issue 104; Summer 2009)*. Barr Printers.

Sustrans; 2008. *Take Action on Active Travel*. Sustrans; Bristol.

Sustrans; 2009. *About Sustrans* [Online] Available at: <http://www.sustrans.org.uk/about-sustrans> [Last Accessed; 23rd July 2009]

The City of Edinburgh Council; November 2007. *Bus Information Strategy*. The City of Edinburgh Council.

The City of Edinburgh Council; spring 2007. *Edinburgh Household Survey*. The City of Edinburgh Council.

The City of Edinburgh Council; March 2007. *Transport in Edinburgh: the Next Five Years: Edinburgh's Local Transport Strategy: 2007 – 2012*. The City of Edinburgh Council.

The City of Edinburgh Council; 2009. *Transport; Greenways and Bus Lanes*. The City of Edinburgh Council.

The City of Edinburgh Council; November 2008. *Transport Policy Annual Review*. The City of Edinburgh Council.

Transport Planning Society; 2007. *Transport and Climate Change – Facing the Carbon Emissions Challenge* [Online] Available at: http://www.tps.org.uk/files/Main/Library/2007/transport_and_climate_change_160507.pdf [Last Accessed: 13th June 2009]

Transport Scotland; December 2008. *Strategic Transport Projects Review Report 1: Review of Current and Future Network Performance* [Online] Available at: <http://www.transportscotland.gov.uk/reports/publications-and-guidance/road/j9853a-08.htm> [Last Accessed; 9th August 2009]

Traveline; 2009. *Traveline Scotland* [Online] Available at: <http://www.travelinescotland.com/welcome.do> [Last Accessed; 5th August 2009].

Townshend, T. and Lake, A.; 2007. *Warning Sloburbia!* (in *Town and Country Planning*, February 2007).

Whitelegg, J.; 1997. *Critical Mass; Transport, Environment and Society in the Twenty-first Century*. Pluto Press; London.

Whitelegg, J.; 1993. *Transport For a Sustainable Future: The Case For Europe*. Belhaven Press; London.

Worcestershire County Council; March 2009. *Final Evaluation Report for Worcestershire County Council*. Socialdata.

APPENDIX 1

Declaration: Issues discussed below are the main points expressed from answers given. Responses to the questions are in the professional opinions of those interviewed and not representative of the organisation.

Summary of Interview with ‘Spokes’

Present: Charlene Curran, Dave du Feu, Euan Renton.

Elephant House: 2nd July 2009.

A summary of the main points of discussion:

Many non-cyclists have the perception that weather is permitting in the uptake of cycling as a main mode of transport. However, many European cities such as Holland also have strong winds and this is not an issue. A survey conducted found that there was a slight drop in cycling levels in Edinburgh in November, however February was the highest level. Daylight is probably the most permitting issue. It is a matter of battling people’s perceptions and views.

Advertising often portrays cycling as a dangerous activity with messages of “always have your helmet on” and beware of traffic at full speed. This is not the case. While first cycling around Edinburgh can be intimidating, it is suggested cyclists use “L” plates so drivers and buses are aware that the cyclist lacks experience and to give caution.

It is also important that safe cycle lanes and infrastructure are located in busy areas for everyone to see and spark an interest in cycling. If such facilities are located in off road areas where only experienced cyclists are aware of their existence this will not have an effect.

While Britain has remained static in cycle levels over the last decade, Edinburgh and London has seen a rise (Edinburgh rose from 1% to 4%), most likely due to visible signs of cycling (lanes and people) sparking an interest and making roads look cycle friendly.

David Begg was a spearhead in enforcing sustainable transport measures in CEC. The red and green line lanes in Edinburgh were originally for buses, however, this was then enforced to include bikes and taxis. He was also enthusiastic and hard backing for the congestion charging referenda.

Economics is playing a major role in decisions. Funding has also resulted in fewer grants for sustainable development projects.

The new St. James Centre was originally granted 600 parking spaces; however, the developer then added 1800 spaces. When it came to approval the developer/s received permission or else they would walk away from the project.

£10 million went towards Quality Bus Corridor under the Scottish National Party.

Personality and enthusiasm of decision makers is a major factor in pushing for sustainable transport projects. Andrew Holmes and a new cycle officer look promising for the future.

Provision of city car club spaces.

Secure cycle parking for flats/tenements is still an issue in Edinburgh.

Summary of interview with SEStrans (Lisa Black: Travel Plan Officer).

Present: Lisa Black and Charlene Curran.

SEStrans Office: 8th July 2009.

A summary of the main topics of discussion:

To date, the 'Lifeshare' scheme has attracted 5,100 members. Advertising had a major role to play in raising awareness and making people aware of the schemes purpose. Advertising methods involved the use of a website, links from other sites (NHS, Local Authorities) and information leaflets. Some of the major Edinburgh institutions involved are Scottish Water, the Big Tent Festival, Heriot-Watt University, Napier University, Edinburgh University and the Borders College.

Another successful initiative aimed at reducing car use has been the season bus ticket ('Bus-to-Work'). This method, adopted by employers, takes the cost of the season bus ticket directly from an employee's wages. However, as this is not taxed, it is thought that some employers use this as a loophole.

Some of the main barriers associated with the use of bus network in Edinburgh today are the cost of tickets and the quality of the buses in operation. With EU funding granted, SEStrans hope to implement and install the Real Time Information ('Bus Tracker') system across the entire Edinburgh region.

The SEStrans bike week has been running for the last 3 years. The most recent event this year attracted approximately 250 people. The local radio and Lord Provost were present. Cyclists of all age ranges took part in this friendly race and prizes were given to those who won.

The current Travel Plan budget is not obligated or dedicated a certain degree of funds to particular projects or initiatives.

Funding towards cycling has included cycle parking facilities, try-a-bike and an information DVD.

One of the primary issues which must be targeted is that of behaviour change and the perception of public transport. Although nothing may ever beat the convenience of the private car, it is vital that behaviour change begins in small local areas where the car is almost second to none. The privilege and authority associated with having a dedicated parking space at the workplace must also be addressed. Those of high authority in an organisation must set an example in promoting our transport behaviour change.

In most cases, the Travel Plan Co-ordinator in the workplace adopts the duty as a second role, i.e. they generally have other priorities with Travel Plans getting pushed aside. It is essential that Travel Plan Officers are appointed having a sole purpose to promote sustainable transport to and from the workplace.

Upcoming/Existing schemes or initiatives:

Strategic Projects Review (Transport Scotland)

Sustainable Transport Group (cycle data)

Energy Savings Trust (free Travel Plan advice)

Tripshare Edinburgh ('Hands-Up' Survey)

Cycle Action Plan (CAPs)

Urban Cycle Network (SEStrans in association with Colin Buchanan)

SESplan

European Mobility Week (prize given to most sustainable city)

Summary of interview with Clive Brown, Edinburgh City Council (Professional Officer, Transport Policy)

Present: Clive Brown and Charlene Curran

Edinburgh City Chambers, 15th July 2009.

Declaration: Answers below are the main points (not all) expressed from answers given. Responses to the questions are in the professional opinion of Mr. Clive Brown and *not* those of The City of Edinburgh Council.

- 1) Once plans and policies are introduced, what kind of monitoring takes place to ensure they are adhered too?

Each year there is a transport policy annual review, it lists the actions in the Local Transport strategy and what progress has been made (or not).

- 2) Is there any form of appraisal for small schemes?

That's a good question. I'm not directly involved with that sort of thing. On the policy side we just produce the policies. There are our roads and transport design section, infrastructure and other such sections for appraisal. Things just get into the policy document as a policy idea and then get done.

- 3) Do you think segmented walk, cycle and bus lanes are issues in peoples travel choice?

The Local Transport Strategy has a diagram which tracks the growth in the lane lengths or our bus lanes. Graphed with it is the curve of the number of passengers carried by Lothian Buses and the curves form each other. Now if you ask me to say there's obviously an association between bus lane lengths there is, but is there a connection. I would apotheosise there is as over the years the bus operators introduce new buses, Park and Ride sites. There might be other thoughts in people's heads for using vehicles for environmental reasons we don't know about so there does seem to be a connection between the two or an association at the very least, the length of bus lanes. I'm not sure I can prove the length of bus lanes led to that amount of patronage compared with other factors like Real Time Information systems at bus stops. There are a number of variables at play on demand. I have to confess we have difficulty sorting one from the other.

- 4) When coming up with ideas to make changes to the transport network, where do they come from? How is the expenditure breakdown decided upon?

Ideas they tend to come from a variety of sources. There's the ideas that float around the transport planning community developed by academics like Bill Goodwin. Depending on your view point you tend to agree or disagree with them. Some of the ideas are generated by politicians and can last for many years. I would guess one of the most interesting and isolated examples and ideas developing into a policy at a national level rather than a local level was that of deregulating bus services. I used to work in the bus industry and I have a transport qualification before that and nobody really discussed academically, industrially or politically deregulating the bus services except for one professor, John Hibbs (University of

Birmingham). He had this idea that bus services are best deregulated and that large bus services are not the best way. He was the only one saying this but the then conservative government which of course wanted a more free market economy sort of liked his ideas and developed them. Policy development is one of the few very sharply designed examples of idea developing from an individual to a national level, liked it or not. Politicians liked this idea and they put it into effect. It can come from the academic sector or politicians liked Councillor David Begg, now still lurking around as a Professor. His ideas were there and I think he was the one behind the original impetus Road User Charging in Edinburgh. Even then you can say the policy impetus for that goes back hundreds of years to the turnpike roads (estuary crossings) that we have. The policy for road user charging has been around. It is sometimes officer level ideas, ideas picked up in circulation and you're not quite sure where they arise. You pick them up in network groups you are part of as a professional. ACT Travel Wise, one association for the commuter transport at a national level with conferences and meetings and you can pick up ideas. For example residential Travel Plans, I came back and reported to a group internally who suggested looking at residential Travel Plans. Interestingly, initially I was laughed out of court thinking it was silly but we had to work on a document called the North of Edinburgh Transport Plan in an attempt to ameliorate the transport impacts of the development of brownfield sites in northern Edinburgh. The Leith Dock area was there to meet the manufacturing needs of central Scotland. The demand for transport in central Edinburgh has tended to decline somewhat so we've got plenty of free space and brownfield sites which will then be developed for housing. We developed that in an attempt to ameliorate the impact of what will eventually be a population greater than that of Clackmanackshire attached onto the northern edge of Edinburgh. We had a plan which was the north Edinburgh transport plan and interestingly was the idea of residential Travel Plans for the new developments so it's interesting how that particular policy idea developed. There are ideas that seem to develop from a commercial level. Classic ones being registered trademarks like travel blending, an attempt to change people's travel behaviour by keeping a travel diary, having conversations with them, discussing what their transport needs are and looking at potential solutions and the travel blending technique has spread. It all seems to be at the pilot stage. Pilots are enormous like the one on Sutton in South West London, its involved 70,000 households. Also things like the English sustainable travel demonstration towns (Darlington, Peterborough and Worcester). Darlington applied it with great affect apparently. So these ideas are picked up in a professional life and we try and use those if possible.

- 5) According to Spokes a £40m shift from trunk road investment would treble the current cycle investment still leaving trunk expenditure £100million higher than the previous year. What is your opinion on this?

To be honest I don't know the figures. At a personal level than a professional level it would be lovely to see a switch in investment away from that sort of highways type beloved project that everybody has towards more sustainable modes, particularly active travel. Again the theoretical approach developed by Phil Goodwin was the concept of journey in times of economic growth we always seem to see a growth in car ownership or car use of around 2% per annum. You get journey effect because although you get people old enough to drive and then entering the employment market and being able to afford cars, you also get people who are coming out of the car owning market because of the age infirmatory or choice and what you've got is a balance. Although 2% seems like an unstoppable rate all you have to do is get people coming of the market and you've got zero growth or sometimes negative growth. Most people tend to be relapsing to the 'predict and provide' approach and you have endless missing links like the missing link in the motorway system. It's amazing how so many

people have the missing links in their area. There still seems to be that inherent affection for road construction in society. It's interesting to speculate how much of the public opinion is influenced by the papers and the media to be in a pro-car position. It has been said that the media get 60% of their income from advertising by the automobile industry so they might just take their views in things.

- 6) Currently, Lothian Buses is second to none. What is the reason for this lack of competition? Do you believe this results in high fares and only the most lucrative routes being serviced? Do you believe there are any issues with that lack of competition?

This gets us back to John Hibbs, in practice deregulation gets both sides wrong. Those against it said it would lead to crazy on-road competition and unsafe practices. Others said it would cater for a huge market and generate. In the end it proved to be neither, there was no massacring of bus passengers, no huge descent into chaos or anarchy. In Edinburgh, there have been bus wars, the last one was 3 years ago when First launched a low fares campaign and extended routes quite dramatically, so Lothian did react by extending routes into what was originally the First Bus areas but then that all settled down and we have the situation today. If you look at the situation today it appears there is no competition but, historically yes there has been. Today there seems to be a strange sense to stability, a return to territoriality. Of course bus operators have their territories, they share routes but they don't seem to be terribly into competing, not directly or aggressively. There is that interesting co-existence. Whether that's good or bad is a good point. You can see the current situation has allowed Lothian Buses to invest in more comfortable buses, the number of passengers has over the long-run increased. The only difficulties at the moment are with the business cycle which you would expect. Few people in work means fewer people travelling in the commuter traffic and there's less money to spend on shopping so the demand for public transport will decline. There's difficulties in having to withdraw bus services but over-all a very good fleet they've got - low floor buses, and I have a feeling the fares are reasonable. With competition you increase the number of buses and decrease waiting time. The journey time is a combination of waiting time and travelling so the generalised cost of bus travel declines making them more attractive so perhaps there is that benefit there. The situation as I see it is a reflection very largely of the UK, I'm not aware of any huge competition elsewhere in the UK, it's not as if Edinburgh is anomalous. It's as if the bus market (mini-buses and coach operators trying their hand at bus operating went back or went out of business). There seems to be a maturing of the market and a settling down. I think a stable settled bus market might be good because it allows bus operators to plan ahead regulatory bus services. The lack of change gives a certain stability to users as well. It's ok to have competition where there is a sudden outburst of good bus services, for example West Lothian, back in the 1980's benefitted dramatically from competition between Lothian Buses and SMT (now First) because Lothian Buses used an urban fare stage, you can travel the whole way into city from West Lothian at a hugely cheap cost compared to conventional costs used by SMT which had operated for decades before that. There was a real sense of loss when Lothian (Buses) left West Lothian as a result of the competition settling out and things settling down again. This wonderful joyous bus service departed.

- 7) Will the tram affect the bus routes? Is this an opportunity to re-route and create more public transport linkages? What about the introduction of an integrated ticketing system?

It is a chance. The problem with buses (particularly Lothian Buses), you get to a point where there is very reasonable fares, a reasonable level of service in terms of geographical penetration and times. Sadly the night services are now unravelling (26th July, night services are declining in terms of time departs). You get to that point and say where can we go from here. Tom Rye has been doing research on how good things like Travel Plans and smart measures (control parking and travel behaviour change, information marketing campaigns), how good are they compared to European approaches which is putting the money into public transport unlike UK type approaches. They do get just as good if not better levels of modal share (public transport and active travel) because they have policies in their countries which deals with that and the tram is our chance to emulate a bit of that and go beyond the bus service. People like tram transport, particularly the target audience that you are aiming at. Metro was developed in the days of Lothian Regional Council which has re-emerged as a tram proposal in Edinburgh (a step change). Dependability on the route of the bus service is important, especially if you are in a strange city. The London underground gives you this level of dependability.

- 8) How effective has the Quality Bus Partnership been? What more would you like to do?

I was not involved much with that, it was before I was on the public transport side. It's a nice thing to have, we are working with public transport operators on voluntary agreements having a look at the issue of air quality because buses converge on Edinburgh city centre and they are a source of nitrous oxide which then converts to dioxide which we are above the advised concentration levels. We know this comes mainly from compression emission engines, i.e. diesels. We know the largest number of diesels passing through Edinburgh in terms of size and output is of course buses. So we will have to and are working with them but we know the next round of Lothian's 75 new buses will be up to standard. The routes are not bad, the Quality Bus Partnership helped put in Greenways which were complicated because they had side entry treatment on the side roads. We also had bus lanes and bus borders.

- 9) Do you believe we are doing enough to maximise the current network to deliver a more sustainable transport system in Edinburgh?

We're not doing badly, although a bit slower than other UK cities. Southampton had a Real Time Information system in the 1980's. There is an attempt to improve the physical infrastructure for buses with the Leith bus corridor project to improve the situation for buses, cyclists and pedestrians. We are working on the provision on the infrastructure side. Maybe there should be a condition on bus operators doing better but that's past the post now. The infrastructure is there, the bus lanes are there and the Real Time Information signs are in. We're doing our bit to support the bus services in Edinburgh.

- 10) What kind of co-operation is there between transport and land use planners to reduce the need for travel?

There already is recognition of that with the planners. I personally do not have a lot to do with them. There is certainly an exchange of documents (like consultations for Local Plans). Our team go and discuss with the planners as the plans emerge and work with them on various things. Letters are sent out regarding consultation on this side of the consultation

(parking standards). We have discussions with them. There is no real formal structure, but we do interact with each other. They are told which relevant department to contact.

11) Do you believe a more formalised co-operation system between planners would make a difference?

There are dangers, we are not a huge local authority. We have around 400-500 formal strategies and policies which is quite stunning. There is a formal process when consultation plans are gone to council. If we had to read through all of those policy documents to see how they affect us we would never get any work done. We bump into, we meet, we discuss with planners on various issues related to transport. The only formal interaction would be at the time of consultation.

12) Is transport a big factor in planning decisions? Is there any incentive for developers to cater for sustainable transport first?

This is a big issue. Is it the developers or the people who buy the property from developers that contribute to sustainable travel? There was a plan for £45 million to be collected from developers towards the development of the tram system, particularly around the waterfront area, but of course the recession and loss of development companies. There was a lack of interest in the development and a lack of money which damaged that approach. We got contribution from Princes Street developers but at much reduced rates and planning committee have accepted that presumably because it is better to have development rather than nothing. On the other hand there have been wonderful examples of section 75 agreements like at Edinburgh Park and Ocean Terminal where developers contributed towards sustainable transport activities (bike pool for employees and firms). There have been problems recently with contributions towards sustainable transport (i.e. trams).

There is recognition that increasing housing supply will put pressure on infrastructure being financed. If you are increasing the number of residents, the number of car journeys will go up, you have to do something in terms of roads and public transport provision. There is a Community Infrastructure Fund and roof tax (Milton Keynes) collected from residents which go towards infrastructure.

13) Where does Edinburgh stand on a congestion charging scheme? A large portion of the population is not in favour of this, how much of an effect will this have?

It just has not been mentioned anymore. The national government have said they are not intending to introduce congestion charging in the next government at a national level. It is being pushed aside for political reasons but technically, economically and environmentally some kind of congestion charging will be necessary, not just in terms of congestion but carbon dioxide emissions. This increases the costs associated with car use unlike walking, cycling and public transport, however you also generate funds to go towards the other modes and the increasing capacity required and to get access to what they need. You get demand management by increasing the cost of motoring and funding for sustainable transport. You have to have a different charging scheme for emissions unlike one geared at congestion. That is where a national scheme would be of most benefit but they are backing away because it is politically shunned. It is still feasible.

14) As they play a major role in behaviour change, is there a dedicated budget towards marketing and advertising campaigns to promote walking, cycling and public transport? Is there a dedicated marketing team in promoting behaviour change?

We have a communications team which keeps the transport message going. In terms of advertising no that is up to public transport operators to do advertising there. The Scottish Government tried it with their 'Learn to Let Go' adverts but they were ridiculed on television as they were seen to be anti-car. Most of the behaviour change approaches which have been successful (demonstration towns) have involved direct conversation with households backed up by subtle forms of marketing (e.g. shop bags). The 'Local Motion' Darlington campaign was a brand with no mention of the Council on any of the documentation. Subtle public relations rather than huge advertising got the message across.

In Edinburgh we don't do things like advertising for that, again more subtle like Travel Plans for schools, developers, our own Travel Plan. However, you would never see a sign advertising our Travel Plan.

15) Do you think that is an issue for awareness? Many people are not going to come across Travel Plans and therefore will not be informed of how to change.

True, absolutely. Within the Council there was a leaflet produced for the first Travel Plan. The 'one-in-five' suggested an alternative, more sustainable mode to take the place of the car one day per week. Otherwise, there tends to be measures within the Travel Plan that gets advertised (bike lone scheme, season tickets for public transport). What other firms do I'm not sure, there is firms with Travel Plans.

16) I believe the issue with that is travel planning within a firm is often a second duty for one employee, leaving it pushed aside a lot of the time.

Yes, true. Some organisations do have dedicated Travel Plan Officers as they are big enough (Queen Margaret and Edinburgh University hire in a consultant), but you are right. We have Euan Renton as our Travel Plan consultant so he is dedicated to it but you are right, most places it is probably forced upon someone who are embarrassed and do not like to ask people to not use their cars.

17) Is there any behaviour change policies set in place?

Yes, our Local Transport Policy states that we will be happy to accept any attempts by SEStrans to promote behaviour change. We did try some behaviour change work (optimum 2) where we looked at applying mobility management measures to areas of large employment outside of Edinburgh city centre. The trouble was we applied a variety of measures at the same time (cycling leaflet, walking challenges, personalised travel planning and assistance to staff). We managed to change the mode share numbers by a reduction in car travel (1%) and managed to reduce the number of public transport users by 5% as the rest had been picked up by walking and cycling. Edinburgh Park had a pool of bikes for staff and the use of the bike went down, however, there was an improvement in attitude towards buses (times, cleanliness etc.) but they used it less.

Edinburgh went wrong by targeting commuters who already had a lot of controlled parking anyway. You are better off applying this to a wide spectrum rather than just commuters as we did.

18) Do you think the current Edinburgh transport strategy is ambitious enough to aid our carbon emission targets by 2050 (80% lower than 1990; 34% lower in 2020)?

That's a good question, it also arises because of the charter of Brussels who set a very ambitious target for cycling. We have targets set in the Local Transport Strategy for bi-mode

share. I will be honest and say at a personal level I like the psychology of high achievers. At an individual level, high achievers set small objectives. Small and gradual targets give an adrenaline rush to continue achieving. Ambitious targets are hard to achieve and can give a sense of failure if not achieved. We need reasonable targets and meet them. I would hope that we do meet our targets but I am not a fan of huge targets.

Initiatives that have been adopted by sustainable UK towns that could potentially be adopted in Edinburgh:

- Local journey planner site/interactive mapping/transport interchange and travel info.

We already have 'Traveline' and 'Transport Direct' available in Scotland. Something related specific to Edinburgh would be nice but these are conditional (i.e. limitations of budget) but there is an issue of the number of people already connected to the Internet.

- A mobile phone system of checking bus times.

We are working on that for the bus tracker system at the moment.

- Individual travel marketing advisor.

The question arises, who is our market? We have school Travel Plan Co-ordinators in place for a couple of years (100 schools) setting up school Travel Plans. We are working towards coverage there we have Euan Renton for our own plan. Optimum 2 project has come to an end. Some local authorities have a full-time dedicated Travel Plan Officer who works with schools and companies.

- Ticket discounts

There is already the Ridacard (Lothian) system and First have a 10 for 9 ticket booklet for any journey. The more important issue is multi-operator, multi-journey tickets. SEStran operate the 'One-Ticket' system however, this works out more expensive in the long run for the sake of convenience.

APPENDIX 2

Planning for Transport Policies

Policy name

Planning Advice Notice (PAN) 75, 'Planning for Transport'.

(Scottish Executive Development Department; August 2005)

Policy initiatives

To establish a more sustainable, environmentally friendly transport system in Scotland.

Policy aims and objectives

Any new developments in Scotland should be designed for the safety and convenience of all users, e.g. entrances are as close as possible to pedestrian and cycle zones and bus stops with secure bicycle parking at the main entrance.

All new planning applications that meet the threshold for a transport assessment should require a Transport Plan, contributing to sustainable travel.

All transport related projects that are required to have Scottish Executive approval or funding will be appraised in accordance with the Scottish Transport Appraisal Guidance (STAG).

Walking and cycling infrastructure and facilities with designated zones and lanes are also of utmost priority.

Public transport must be affordable, integrated, with top quality infrastructure and service provided.

Transport infrastructure and facilities must be accessible for those physically impaired and/or with mobility difficulties.

(Scottish Executive Development Department; August 2005).

Policy name

Scottish Planning Policy (SPP) 17, 'Planning for Transport'.

(Scottish Government; August 2005)

Policy initiatives

If land use can be controlled, providing all the required services within the immediate residential area, this limits the need for lengthy journeys

Policy aims and objectives

In Scotland, land use sites must take the transport opportunities into account and

identify any impacts in order to ensure environmentally friendly developments and transport networks.

Development plans need to be co-ordinated with Regional Local Transport Strategies to identify areas requiring new transport infrastructure and development patterns in order to limit the need for travelling long distances.

Transport Assessments should have maximum parking space guidelines per development in an effort to reduce car dependence.