Getting There

A Sustainable Transport Vision for Scotland

Sustainable Development Commission Scotland

Contents

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Abbreviations

AWPR	Aberdeen Western Peripheral Route
CCTV	Close Circuit Television
CO_2	Carbon Dioxide
CoSLA	Confederation of Scottish Local Authorities
DfT	Department for Transport (UK Government)
GDP	Gross Domestic Product
ICT	Information and Communication Technology
mph	Miles per Hour
MTCCI	Mitigating Transport's Climate Change Impact in Scotland (report to the Scottish Government)
$MtCO_2e$	Metric Tonne Carbon Dioxide Equivalent
NPF2	National Planning Framework 2
NTS	National Transport Strategy
OECD	Organisation for Economic Cooperation and Development
RTP	Regional Transport Partnership
SDC	Sustainable Development Commission
SDI	Social and Distributional Impact
SEABS	Scottish Environmental Attitudes and Behaviours Survey
SHS	Scottish Household Survey
SPP	Scottish Planning Policy
SSCI	Scottish Sustainable Communities Initiative
SSE	Spot Speed Enforcement
STAG	Scottish Transport Appraisal Guidance
STPR	Scottish Transport Projects Review

Executive Summary

Transport policy in Scotland is not delivering against sustainable development criteria. This has been the common message when the Sustainable Development Commission Scotland (SDC) has engaged with the Scottish Government on policy review and development based on sustainable development principles. We have contributed to discussions with the previous Government on the current National Transport Strategy (NTS) (published in December 2006), have assessed progress in each of our three annual assessments and have met regularly with Scottish Government to discuss and advise on transport issues.

As the Government's official advisor we remain very concerned that transport policy has been the area of most consistent concern. We welcomed the current NTS and are encouraged by the fact that the Scottish Government recognises transport as one of the most difficult areas to address. However, while Government is taking action to reduce emissions, improve quality, accessibility and affordability, improving journey times and connections, transport indicators are showing a negative trend.

Both emissions and the volume of road traffic continue to increase. They are symptoms of an unsustainable transport system. A shift to more use of public transport and active travel like walking and cycling has yet to take place. Rail use is up but bus use remains in decline. In short, how we use transport in Scotland is a long way from the Government's stated aims of improving journey times and connections, reducing emissions and improving quality, accessibility and affordability.

Most significant is the impact of transport on climate change. Failure to get to grips on this will undermine Government delivery on its emission reduction targets. In 2009 the Scottish Government introduced what it deservedly describes as the strongest climate legislation in the world. The Climate Change (Scotland) Act 2009 commits Scotland to reducing its emissions by 42% in 2020, rising to 80% by 2050.[1]

The Scottish Government's Climate Change Delivery Plan makes clear that meeting the targets will require a cut from 14.5MtCO_2e (2006 levels) to 9.9MtCO_2e, followed by "almost complete decarbonisation of road transport by 2050 with significant progress by 2030".[2]

Scottish Government research makes clear that delivering on the 2020 target will require a wide range of actions. Critically, these options include politically difficult actions such as road speed reductions and increasing parking charges. This must be implemented alongside options like investing in cycling infrastructure and public transport and supporting electric car technology.

These are crucial elements for the "refresh" of the National Transport Strategy due by the end of the year.

The Scottish Government needs to adopt a new perspective to assess the many transport policy challenges it faces. Otherwise the small incremental changes we have witnessed since the launch of the last strategy will prevent change at the scale and pace which is obviously required.

Our view is that to be effective any refreshed transport strategy must be framed around the five principles of sustainable development. It must respect environmental limits, support a strong, healthy and just society, while achieving a sustainable economy.

The SDC believes that the complex but potentially very beneficial relationship between transport policy and health, social justice and community is not fully understood. The impact of transport policy on sustainable development should be assessed by widening the scope of what we measure. Until now emissions have been considered the most important of a relatively narrow range of sustainability measures.

Integrated policymaking is the best way to ensure that policy interactions are taken into account and that co-benefits are achieved. Scotland has the policy framework and tools to make this possible but it does require a shift in focus by both the Scottish Government and local authorities. We also hope that the recent merging of the Government's Transport Directorate into Transport Scotland will help in making this shift.

In this paper we discuss the different ways in which good transport systems and infrastructure can underpin a productive and flourishing society. We analyse how emission cuts can be achieved whilst simultaneously meeting the transport needs of our households, businesses and communities.

Our priority recommendation is for Government to ensure all its transport policy considerations and decisions are based on sustainable principles. **In particular we want Government to shift its attention**

from mobility to accessibility. This means that instead of judging success on how we manage congestion and journey times **Government must focus its attention on destinations and how transport policy makes them easy and attractive places to travel to**.

The evidence is clearly telling us that action to improve journey times simply leads to commuters choosing to commute from further away, while increasing the drawbacks to wider society. In short, transport policy needs to get better at avoiding the perverse effects that stem from targets expressed in terms of distance travelled and time saved.

Government needs to adopt **a sustainable investment and decision making hierarchy**. This first and foremost aims to **reduce demand** for powered transport; then considers **modal shift** to more sustainable and space efficient modes; then considers **efficiency improvements** to existing modes; and only as a final resort examines **capacity increases** for motorised transport.

To deliver decisions based on this hierarchy Government must adopt assessment mechanisms that recognise and quantify all the impacts of transport policy, including issues such as health, social justice and community cohesion.

The final challenge is how to manage and deliver transport policy at the national, regional and local scales. National planning policy is clear on its goal of delivering sustainable development but work is needed to ensure a consistent approach across Scotland. Only then can the cumulative impact of local planning decisions and choices on local transport investment better deliver sustainable communities *and* tackle transport emissions.

There is currently a focus on the peripheral areas of Scotland's cities where it is hard to offer a viable alternative to the private car. Instead, we would like to see action targeted at the urban cores or around transport hubs and on building the self-sufficiency of Scotland's towns and other settlements that sit beyond city boundaries.

Through programmes such as **Smarter Places, Smarter Choices** and the **Scottish Sustainable Communities Initiative**, the Scottish Government has clearly demonstrated it understands how to incentivise more sustainable planning and transport outcomes on the ground. However, these initiatives need to become the norm rather than the exception if we are to see a sustainable transport system in Scotland.

There are concerns about how Government will fund strategic transport projects given constraints on public spending. Emerging evidence shows that for every £1 invested in sustainable travel an estimated £9 is saved either through generated economic growth, or avoided expenditure on carbon reduction or tackling poor health. This level of efficiency and return on a wide set of outcomes ought to strengthen the resolve of Government to prioritise investment on transport choices that help make better places while improving the life of our communities and the health of our people.

The principles and recommendations in this paper add up to a **vision of a transport system in which the most desirable way of getting somewhere is also the one with the most benefits to our health, environment, community, economy and society.**

1. Background & Methodology

1.1 Introduction

The Sustainable Development Commission holds Government to account to ensure the needs of society, the economy and the environment are properly balanced in the policy decisions it makes and the way it runs itself.

We work with the UK's four Governments to ensure they have the evidence and the skills they need to deliver a better quality of life for everyone today, without endangering the chances of future generations.

Our starting point is the five principles of sustainable Development agreed by the four UK Governments:

SDC Scotland reports directly to the First Minister and we prepare an annual report on the Scottish Government's progress toward sustainable development. Our Third Assessment of progress was published in December 2009.

As part of this Assessment we examined the sustainability of transport policy and concluded that travel is the policy area where there is the least alignment between current action and long term sustainability. Because of this we committed to explore this issue in more detail and to report back to the Scottish Government with further policy advice.

Evidence shows that there will have to be a radical rethinking of transport priorities and funding if we are to cut transport emissions in line with the 2020 carbon target and to meet wider sustainable development goals. This will require bold leadership from Government. It has already shown such leadership through the passing of the Climate Change (Scotland) Act and must now ensure that this commitment tracks through to policy.

Our aim in producing this paper is to help Government and local authorities in developing more sustainable transport policies. We believe that a more sustainable transport policy can contribute positively to the Scottish Government's central purpose '*to create a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth*'. A fresh perspective can also help transport policy impact positively on a wider range of outcomes and indicators of the National Performance Framework (NPF). This paper includes a series of case studies, from Scotland and elsewhere that demonstrate what can be achieved.

1.2 The National Transport Strategy

The Scottish Government will refresh the National Transport Strategy (NTS) by the end of 2010, and is being advised in this by its NTS Steering Group, of which the SDC is a member. This paper is designed to inform that discussion, the refresh of the strategy and wider policy discussions that affect transport and related policy in Scotland.

Scotland's current National Transport Strategy[3] was published in December 2006. It set out three key strategic outcomes which are:

- **Improve journey times and connections** between our cities and towns and our global markets to tackle congestion and provide access to key markets (linking to **wealthier and fairer, safer and stronger)**
- **Reduce emissions** to tackle climate change (linking to **safer and stronger, wealthier and fairer)**
- **Improve quality, accessibility and affordability** of transport, to give people the choice of public transport and real alternatives to the car (linking to **greener, healthier, smarter**).

The NTS was welcomed by the SDC upon publication, in particular for the emphasis it placed on using a carbon balance sheet, as well as commitments on active travel and demand management.

There was substantial discussion prior to the NTS being finalised around the merits of a traffic stabilisation target, which the NTS kept as an aspirational target. However, the SDC supported the Government's move towards carbon budgeting as a better approach. By this we understood that a carbon balance sheet[4] would be used to manage transport in Scotland and ensure that it did not exceed any carbon budget set for it. Furthermore, we expected that the carbon budget would fall over time.

The 2006 NTS was adopted by the new Government following the May 2007 elections. They highlighted that the three key strategic outcomes supported the purpose of Government[5] and the five strategic objectives[6] contained in the Government's Economic Strategy.

Figure 1: How the National Transport Strategy relates to the National Performance Framework

The Government's Purpose	Strategic Objectives	NTS Strategic Outcomes	National Outcomes	Current Situation	SDC's Vision
To focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth	Wealthier & Fairer	Improved Journey Times & Connections	We live in a Scotland that is the most attractive place to do business	Congestion affects our major cities and towns. Lack of car alternatives affects smaller urban and rural areas	Providing attractive and viable cities that are well served by public transport; less congestion; more and safer alternatives to car use; more active commuting delivering employee health benefits for businesses.
			We realise our full economic potential with more and better employment opportunities for our people	Non car owners can have limited employment options, particularly in rural areas.	'Green jobs' potential, especially in transport planning and ICT; greater accessibility to employment benefit all, particularly the socially excluded; extending labour and skills markets
	Safer & Stronger	Improves Quality, Affordability and Accessibility	We live in well-designed, sustainable places where we are able to access the amenities and services we need	Congestion and lack of car alternatives mean amenities and services are not as accessible as they could be	A renewed focus on accessibility and better local implementation of planning policies will improve access, particularly for the socially excluded
			We have tackled the significant inequalities in Scottish society	Areas of multiple social deprivation tend to be the least accessible, least healthy, with few opportunities for active travel.	Improved community cohesion, safer and more welcoming neighbourhoods, better accessibility and more health opportunities
	Smarter		We live our lives safe from crime, disorder and danger	Road safety statistics are showing positive trends. However, there is low and inconsistent provision of safe active travel routes.	Smarter choices initiatives and more active travel infrastructure investment will improve safety records and tackle perceptions
			Our public services are high quality, continually improving, efficient and responsive to local people's needs	Scotland's public transport is generally well provided, at least in more populated areas. Sustainable options often more expensive.	The application of Smarter Choices and use of ICT will help services be more inclusive and customer responsive e.g. travel planning for health service users
	Healthier		We live longer healthier lives	Smarter Choices and cycle to school initiatives are having a positive effect on active travel. Obesity levels are rising and health indicators are poor.	Enhancing cycling and walking provision will encourage a more active and healthy society.
	Greener	Reduce Emissions	We value and enjoy our built and natural environment and protect it and enhance it for future generations	Current national planning guidance is broadly compatible with sustainability, but not always implemented well at the local level.	Greater connection between national, regional and local objectives and the alignment of policy at all levels around sustainability will make neighbourhoods more attractive
			We reduce the local and global environmental impact of our consumption and production	Current emissions trends are unsustainable and rising	There is significant potential to reduce emissions whilst also positively impacting on other sustainability indicators

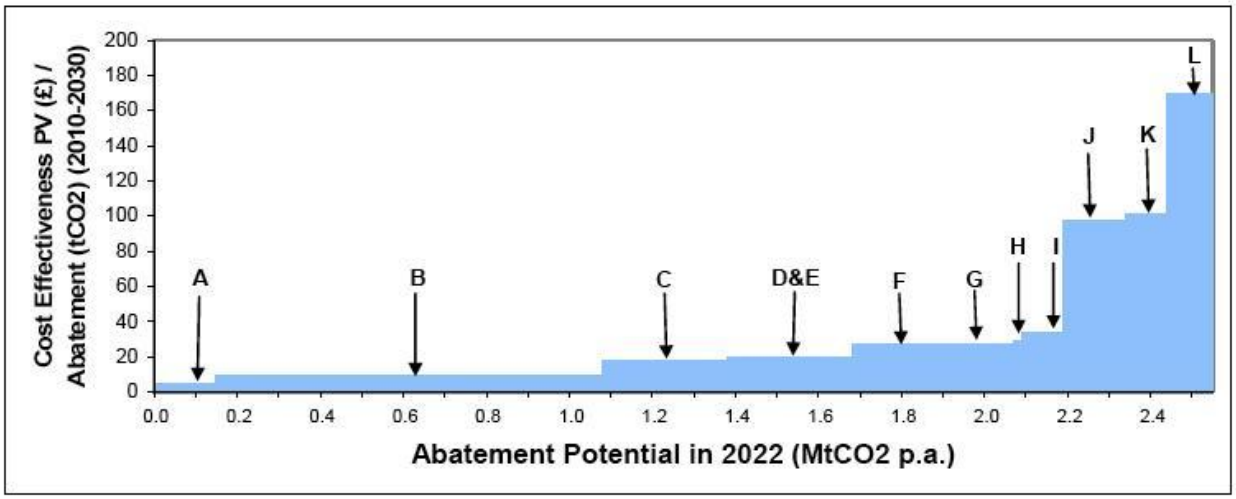
Source: Scottish Government, with additional analysis from the SDC

1.3 The context for this Report

Current Scottish transport policy is not sustainable. Our emissions of greenhouse gases are high and continue to rise; local air quality is above safe limits in some areas; too many communities suffer from noise, congestion and road traffic accidents; and levels of cycling and walking are low even for short journeys. While there are many examples of good practice across Scotland - high bus use and walking levels in Edinburgh, Dundee's innovation in smart cards and Glasgow bus routing being a few – these remain examples that are not being implemented at the scale needed to reverse worrying trends in our transport system. A particular challenge is to cut our greenhouse gas emissions. Transport is responsible for 26% of emissions in Scotland and is the only major sector where emissions continue to rise. The Climate Change (Scotland) Act 2009 commits the Scottish Government to reducing Scotland's emissions of greenhouse gases by 80% by 2050 and by 42% by 2020. The Scottish Government set out in its Climate Change Delivery Plan that the contribution it expects from transport (excluding aviation) means reductions of 4.6 $MtCO_2e$ (42% Scottish target) by 2020 (against 2006 levels of 14.5$MtCO_2e$).[7]

However, the research report commissioned by the Scottish Government, *Mitigating Transport's Climate Change Impact in Scotland: Assessment of Policy Options* ("the MTCCI report")[8] shows that for transport to contribute significantly to the Scottish climate change targets it will be important to implement **all** (positive) policy options highlighted in the report. However in its assessment, it also acknowledges that this would still achieve less than half the reductions needed to achieve 42% transport emissions cuts by 2020. Below is the Marginal Abatement Cost Curve of the MTCCI report showing the twelve most cost effective policy options.

Figure 2: Cost effectiveness of different transport policies in cutting carbon emissions



This segment of the MTCCI report's Cost Effectiveness and Marginal Abatement Cost Curve illustrates **the most cost effective policies** - the cost in Present Value terms of each tonne of abatement achieved in total over the 20 year period by each policy option. The x-axis shows emission reduction potential, while the y-axis shows cost-effectiveness.

Key:

A: Provide community hubs
B: Widespread implementation of travel plans
C: Speed reduction on trunk roads
D: Introduction or increase in public parking charges
E: National motoring package
F: Workplace parking levy
G: Bus quality contracts / statutory partnerships
H: Urban density increases
I: Freight best practice
J: Electric car technology & network development
K: National network of car clubs
L: Cycle infrastructure investment

1.4 A positive vision

This report considers how transport policy can contribute more to the reduction of greenhouse gas emissions in Scotland and also contribute much more positively to a range of sustainable outcomes. For example, the MTCCI report suggests investing in cycle infrastructure is poor value in comparison with other options; however, if the health benefits and consequent healthcare cost reductions are taken into account (for instance, the impact on the 85,000 UK deaths a year due to diseases related to physical inactivity[9]) then it is likely that investment in cycle infrastructure would be seen as a more cost-effective option.

The complex but potentially very beneficial relationship between transport policy and health, social justice and community cohesion must be brought to the fore. While this viewpoint is understood within the Scottish Government, in practice it has been difficult to put this into practice in policy making and delivery. Making these links will mean more effective action to cut transport emissions than by simply focusing on transport interventions.

In Chapter 2 we set the scene for the report with a brief overview of current transport outcomes, trends and statistics in Scotland.

In Chapter 3 we explore some possible ways of reducing emissions from the transport sector whilst also contributing positively to other policy outcomes. We consider what principles should underpin sustainable transport strategies and look at some examples of effective interventions for the future. We then describe what a sustainable transport strategy for Scotland might look like and address some of the complexities surrounding behaviour change. Case studies are used to illustrate best practice.

In **Chapter 4** we summarise our recommendations.

2. Transport in Scotland: Overview

2.1 Introduction

2.1.1 Key Transport Statistics

In 2007 **transport accounted for 25.9% of Scotland's greenhouse gas emissions**. Transport's share of total emissions has shown a strong upward trend, having been 18.9% in 1990.

The total **volume of road traffic has increased by 14%** between 1998 and 2008. The volume of traffic is at its second highest ever level. The estimates show increases in every one of the past ten years apart from 2000, when levels fell due to the impact of the fuel protests.

In 2008 local bus journeys in Scotland showed a decrease of 0.4 percent on the previous year. Over the longer term, **bus use has declined significantly**. There were almost 1,700 million passenger journeys on local bus services in 1960. This number had nearly halved by 1975. Since then it has reduced again from 891 million in 1975 to 513 million in 2007-08.

Rail use on the other hand has been **rising**. There were 3% more ScotRail passenger journeys recorded in 2008-09 than in the previous year. This is 44% more than 10 years earlier.

The Scottish Household Survey (SHS) shows that in 2008 70% of households had at least one car available for private use. This means that **30% of households do not have access to a car**.[10]

Commuter modal shift shows no significant changes in trends in 2008. There have been year-to-year fluctuations, but cars and vans remain the dominant mode. The average distance travelled per person per year for commuting purposes has remained steady for recent years; around 1,300-1,400 miles with an average trip length of around 8.5 miles. Since the previous year, the percentage driving to work has risen 5% whereas passengers fell by 6%.

Compared to other North European countries (see Figure 5 below), our travel habits are less healthy, more unsustainable and present a huge opportunity to increase active travel rates.

Between 1998 and 2008 the number of **air terminal passengers increased by 60% for Scotland** and 48% for the UK as a whole. Over the past ten years the number of passengers per head of population has been higher for Scotland than for the UK.[11]

While the proportion of journeys to work made by public or active transport has been broadly static over time, and shows signs of falling very slightly,[12] data from the Scottish Government and other national bodies shows that total vehicle kilometres are still increasing, active travel is in relative decline and carbon emissions from the transport sector continue to rise. Despite work on active travel over many years, Scotland still has some of the lowest levels in Europe. The SDC believes these statistics reflect the fact that the current approach is not effective enough.

2.1.2 Smarter Choices

The Scottish Government is already funding Smarter Choices initiatives in Scotland through seven demonstration projects. These look at measures such as better public transport services and residential improvements, upgrades in walking and cycling infrastructures, studies into travel patterns and access, intensive marketing and awareness campaigns, and workshops and information packs. Communities involved range from between approximately 10,000 in Kirkwall to 37,000 in Dumfries.

The SDC is highly supportive of Smarter Choices initiatives, which the MTCCI has found to be most effective. We believe there is significant evidence that such measures lead to positive outcomes (see box below on the evaluation of the English Smarter Choice Programmes; the monitoring and evaluation of Scotland's Smarter Choices Smarter Places programme is ongoing).

The Scottish Government recently announced an additional investment of £10million in 2010-11[13] for sustainable transport initiatives. The SDC welcomes this announcement and hopes this report can feed into considerations on how this money will be spent.

Figure 3: Emissions of greenhouse gases by type of transport allocated to Scotland[14]

	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
							Thousand tonnes of Carbon Dioxide equivalent			
Transport										
Road transportation	9,243	9,283	9,499	9,450	9,722	9,738	9,848	9,912	10,034	10,249
Buses & coaches	376	381	279	266	293	293	277	306	309	333
Passenger cars	5,839	5,977	6,260	6,219	6,414	6,307	6,351	6,276	6,274	6,296
HGVs	2,116	1,906	1,975	1,997	1,970	2,082	2,110	2,095	2,193	2,303
Light duty vehicles	863	975	933	905	971	973	1,025	1,150	1,176	1,235
Mopeds & motorcycles	27	23	27	28	30	34	32	32	30	33
Other	21	21	24	34	44	50	52	52	53	50
Railways	217	206	237	231	209	225	241	245	251	259
National navigation & international shipping	2,516	2,421	2,035	1,986	1,661	1,781	1,886	1,885	2,161	2,093
Aviation	720	829	1,244	1,297	1,296	1,367	1,559	1,747	1,800	1,770
Other transport	515	398	302	303	314	295	301	293	292	355
Total transport	13,212	13,137	13,317	13,265	13,201	13,406	13,805	14,082	14,537	14,726
Non-transport net emissions	56,678	54,564	52,101	51,558	47,678	46,964	44.554	43,304	46,496	42,179
Net emissions of all sources	69,890	67,701	65,418	64,824	60,879	60,370	58,359	57,385	61,033	56,905
										percentage
Transport % of Total net emissions	**18.9**	**19.4**	**20.4**	**20.5**	**21.7**	**22.2**	**23.7**	**24.5**	**23.8**	**25.9**

Source: Scottish Government – Not National Statistics

Figure 4: kilometres travelled in Scotland since 1975[15]

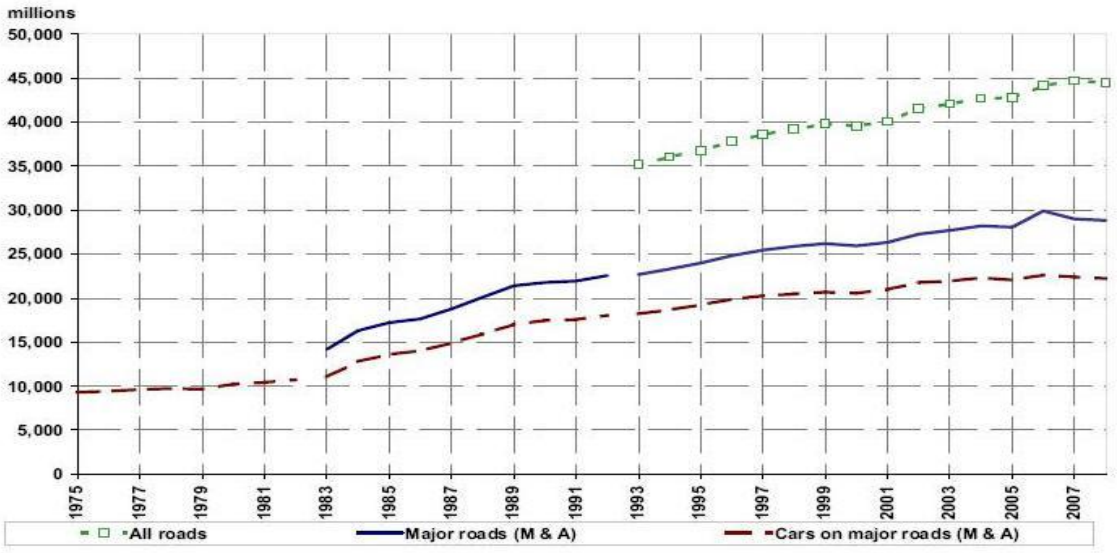


Figure 5: A comparison between Scottish and Dutch travel habits based on number of trips taken per person, per year

	Scotland all trips (2008)[16]	Netherlands all trips (2007)[17]
Car or Van	62%	48%
Walking	24%	16%
Bus	8%	4% (incl. metro)
Train	2%	3%
Cycle	0.8%	26%

Evidence from England: The Effects of Smarter Choices Sustainable Travel Towns

The summary report analysing the evidence from the English Smarter Choices programmes in Sustainable Travel Towns gave the following key results:[18]

Car use: Car driver trips by residents fell by 9% per person and car driver distance by 5% to 7% according to aggregated household survey results for the three towns. This compares with a fall of about 1% in medium-sized urban areas over the same period based on NTS data.

Prior to the economic downturn the volume of traffic observed on-street in all three towns in the programme reduced by approximately 2% across the whole urban areas. There was a 7 to 8% reduction in the inner areas. Once the economic downturn began, there is evidence of further town-wide traffic reductions in the order of 0.5 to 1%. This was broadly in line with national trends.

Bus use: Bus trips per person grew substantially, by 10% to 22% compared with a national fall of 0.5% in medium-sized towns.

Cycling: The number of cycle trips per head grew by a substantial 26% to 30% in all three towns. Darlington (which was also a Cycling Demonstration Town) showed the greatest growth. Meanwhile, cycle trips declined in medium-sized towns elsewhere.

Walking: The number of walking trips per head grew by 10% to 13% compared to a national decline in similar towns.

Assessment of Success

Overall the Smarter Choice Programmes in the towns contributed positively to objectives of supporting economic growth, reducing carbon emissions, increasing health, promoting equality of opportunity and improving quality of life.

The estimated outturn costs of the programme were £10 per person per year. This included both capital and revenue expenditure. On conservative assumptions, the implied benefit-cost ratio of the achieved outcome in the three towns, allowing only for congestion effects, is 4.5:1.

Based on recent Department for Transport modelling, the inclusion of environmental, consumer-benefit and health effects could broadly double the congestion-only figure. A full benefit-cost ratio for forward projection, comparable with other transport investments, including a longer term assessment of both costs and effects on demand, is more likely to increase the figure than reduce it.

The report makes recommendations to assist local authorities in planning and delivering a successful large-scale Smarter Choice Programme. It covers issues such as staffing requirements, engagement of stakeholders, the need for complementary measures and important elements of the overall programme. It recommends giving more attention to measures aimed at work travel, and to capturing changes in travel over time at an individual level.

The report concludes that the current evidence base is sufficient to justify a substantial expansion of implementation of Smarter Choice Programmes.

3. A Sustainable Transport Policy

3.1 Principles of a Sustainable Transport Policy

The European Union Council of Ministers of Transport defines a sustainable transportation system as one that:

- allows the **basic access** and development needs of individuals, companies and society to be met safely and in a manner consistent with human and ecosystem health and promotes equity within and between successive generations
- is **affordable**, operates fairly and efficiently, offers a choice of transport mode, and supports a competitive economy as well as balanced regional development
- **limits emissions** and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes while minimising the impact on the use of land and the generation of noise.

The SDC believes that an effective transport policy is not only reactive to needs but has an important role to play in enabling and encouraging more sustainable choices whilst helping to meet wider policy objectives. Building on the European Union definition we believe that Scotland's refreshed Transport Strategy should be based on a clear sustainable investment hierarchy. It should also adhere to clear principles that should be applied to all transport decisions. We set out our suggested hierarchy and principles below. We recognise that the Scottish Government does consider these issues but believe that they should be more clearly stated in any updated Strategy.

3.1.1 A sustainable investment and decision making hierarchy

The SDC believes that transport policy, like policy for energy and waste, should be based on a hierarchy of options (see box below). The focus should be on demand reduction, then modal shift and efficiency, with capacity increases only being a last resort. This hierarchy should also be used to prioritise improvements to existing infrastructure. We suggest that all current transport related spending plans are reviewed within the context of this hierarchy.

Demand reduction must be at the top of any sustainable transport policy. We already know that current transport trends are unsustainable in terms of resource use and reliance on oil. The Government's National Planning Framework acknowledges that "growing imbalance between supply and demand for oil and gas products has profound implications for the future of transport and the global economy.... These factors together with economic security considerations point to a strategy of reducing dependency on fossil fuels over time." [19]

The MTCCI report highlights that switching to cleaner fuels or greater engine efficiency will not itself be sufficient to deliver the required cuts in emissions. Further, we know that focusing on supply-side policies, by providing more road space to keep pace with traffic, is not an effective long-term answer as increasing provision stimulates demand. To slow down and eventually reverse current trends we need to manage demand by offering positive alternative solutions. This also encourages more efficient use of existing infrastructure.

The MTCCI report suggests that smart measures such as car demand management have the greatest potential within devolved measures to reduce CO_2 emissions. But curbing emissions is not the only concern of a sustainable transport policy. The World Health Organisation has stated that current patterns of transport, which are dominated by motorised road transport, have substantial adverse impacts on health.[20] A focus on demand reduction can therefore contribute to wider sustainable outcomes.

SDC's Sustainable Transport Hierarchy

Our sustainable transport hierarchy is one that has four levels, and actions to improve transport should focus on each of these priorities in turn. The hierarchy is as follows:

1. Demand Reduction
2. Modal shift to more sustainable and space efficient modes
3. Efficiency Improvements to existing modes
4. Capacity increases for motorised transport

Using this hierarchy in decision making and delivery will assist the Scottish Government in delivering a more sustainable transport system in Scotland. More details on each of these steps are set out below.

1: Demand Reduction

The primary aim of a sustainable transport hierarchy is to reduce demand for ***powered*** transport. Increased demand for 'active travel' (cycling and walking) should be viewed positively. Demand reduction should be achieved through the widest possible application of spatial planning, fiscal interventions, behavioural change and technological measures.

Examples:

Spatial planning: ensuring all new planning decisions are designed to create an overall reduction in the need for motorised transport through mixed use developments and promoting development in city centres and at transport hubs

- Home or teleworking: promoting ways of avoiding or reducing commuting journeys, including the use of 'work-hubs'
- Video and audio conferencing: avoiding travel for meetings
- Home / internet shopping: reducing travel for shopping
- Travel planning: all schools and large employers should be encouraged to implement, monitor and continuously improve their own travel plans
- Congestion charging, road pricing, workplace parking levy and/or fiscal policies which discourage travel.

2: Modal shift to more sustainable and space efficient modes

Modal shift has a focus on four areas:

- Shifting away from motorised modes to cycling and walking
- Shifting from private motor vehicles to public transport
- Measures to shift freight from road to more sustainable modes such as rail
- Measures to shift away from unsustainable air travel.

Examples:

- Providing first class information and facilities for walking and cycling including safe, attractive and direct routes, particularly linking with health authorities to maximise benefits
- Reducing speed limits: making walking and cycling safer and more attractive, motorised travel less attractive. Area-wide 20mph speed limits are the most effective way of achieving this and help engage the community and raise awareness of transport issues (see case study on Page 28 on the introduction of 20mph speed limits in Portsmouth).
- Improving public transport options: ensuring price, comfort, convenience, safety etc. are competitive with private motoring
- Improving integration of public transport with cycling and walking to enable convenient door to door journeys
- Shifting freight from road to rail.

3: Efficiency Improvements to existing modes:

The aim of making efficiency improvements is to optimise the utilisation of existing provision. This covers a range of possible options including: legislation to mandate vehicle efficiency improvements; encouraging higher vehicle occupancy rates; promotion of car clubs; eco-driving; measures to spread demand peaks on public transport.

It also includes improvements to existing infrastructure to maintain assets and ensure longevity, as well as efficient usability for all modes of transport. Opportunities to achieve revenue spend should be pursued, which in turn can be invested back into, for instance, improving infrastructure through road maintenance.

Examples:

- Encouraging higher occupancy rates on all forms of transport (without inducing increased travel) e.g. promotion of car sharing and car clubs
- Ensuring that driver behaviour is as efficient as possible, e.g. providing eco-driver training for all public transport operators and private vehicle users
- Ensuring that public transport vehicles consistently use the most efficient and least polluting whole lifecycle technologies available
- Ensuring that private vehicles are the most efficient available, e.g. legislation to mandate vehicle efficiency improvements; fiscal incentives to ensure vehicle efficiency is prioritised in purchasing decisions
- Focusing on measures to spread demand peaks on public transport
- Implementing measures to promote more efficient use of existing transport networks.

4: Capacity increases for motorised transport:

Capacity increases should only be considered once the full potential impacts of 1-3 have been appraised, an explicit delivery programme determined and the full effects of that programme included in assessing the residual role for capacity increases. Any capacity increases that are required should be prioritised to the most efficient modes.

The current Scottish Transport Appraisal Guidance (STAG) is objective-led and can therefore be used in conjunction with this hierarchy.

The SDC recognises that the Scottish Government followed a similar investment hierarchy when evaluating options for its Strategic Transport Projects Review: firstly, to maintain and safely operate existing assets; secondly to make better use of existing capacity with targeted infrastructure improvements as a last resort. We support the order of this hierarchy but strongly recommend that demand reduction should added into this hierarchy as the first consideration.

3.1.2 Measure Everything that Matters

Decisions on transport actions must be based on an effective appraisal of all impacts the project or approach will have. A sustainable approach to transport can offer significant economic, social and environmental benefits as shown in Figure 6. For example the Transform Scotland Trust set out in its 2008 report *Towards a Healthier Economy* its analysis of the potential economic benefits of more sustainable transport investment- presented in the figure below.[21]

Figure 6: economic impacts for several different transport-related measures

Measure	Economic Impact
Achieve Scottish cycle mode-share of 13%[22]	£1–£2 billion/year savings
Achieve Scottish cycle mode-share of 27%[23]	£2–£4 billion/year savings
Switch 20% of Scottish car commutes to walking or cycling[24] [25]	£2.8–£11.6 million/year savings
Switch 40% of Scottish car commutes to walking or cycling[26]	£5.6–£23.1 million/year savings
Economic benefit/cost per additional user	**Economic Impact**
Each extra new cyclist	£540-640 per year benefit
Each extra car driver[27] [28]	£172–£250/year cost
Each extra car passenger[29]	£100–£145/year cost

Note: In *Towards a Healthier Economy*, Transform Scotland has calculated the economic impacts for several different transport-related measures or goals.

The SDC recently published a UK wide report *Sustainable development: The key to tackling health inequalities*.[30] This report examines in detail the links between transport policy, health and social inequality and concludes that many of transport's health risks are strongly linked to socioeconomic status. Road traffic injuries have one of the strongest correlations in relation to poverty and unemployment, and many of the environmental impacts, including air pollution and community dislocation,[31] tend to be borne disproportionately by poorer populations. Because of this, national or city-wide initiatives must be designed to benefit the whole population, but prioritise those from lower socioeconomic groups.

Government has made progress in developing more balanced appraisals of transport options. In particular, we now have a Carbon Account for Transport and modelling of many economic, social and environmental impacts is undertaken. However, we also need mechanisms for adequately costing the impact on other areas such as health and community cohesion. The SDC recognises that current appraisal methods do currently include guidance on the monetary impact of improved health. However, it is less explicit on how changes in travel demand for walking and cycling should be measured. Therefore we recommend that where appropriate mechanisms do not exist or are lacking, **the Scottish Government should commission original research to find appropriate ways of costing and evaluating all relevant impacts of its transport policies.**

The SDC is aware that the UK Department for Transport has commissioned a programme of work to inform the improvement of the assessment of Social and Distributional Impacts (SDIs) in transport appraisal. This includes health and community cohesion impacts. The Scottish Government is considering the outputs of this work and its implications for transport appraisal in Scotland.

3.1.3 Aim for Accessibility rather than mobility

We highlighted in our Third Annual Assessment the tension that exists between *mobility* and *accessibility*. Mobility in this context means the physical movement between places, which is improved by addressing issues such as congestion and journey times.

Accessibility focuses on destinations. It is measured by the number of places that can be reached in a given period of time. Accessibility is about removing barriers to travelling to such places, making them both easy and attractive to go to. Cities and other economic activity centres tend to have relatively poor internal mobility (due to congestion), but are economically successful due to excellent accessibility (activities that are clustered together with various travel options available). This indicates that when it comes to economic competitiveness, accessibility matters more than mobility.[32]

Greater mobility is not necessarily sustainable; for instance, improving journey times also enlarges commuter catchment areas, and can lead to a net rise in emissions and travel (depending on mode share and changes to it). However, an imbalanced emphasis on mobility still remains in many nations, including Scotland. This is partly because mobility indicators are a lot easier to measure. Yet there is growing evidence that living in a 'hypermobile' culture can have detrimental social effects as well as contributing to carbon emissions.

In a hypermobile society traditional geographical communities are replaced by 'communities of interest' which are not tied to a particular geographic location. From the viewpoint of sustainable development, a hypermobile society has severe drawbacks. Not only is it likely to be highly polluting but there are also adverse social implications as society may become more anonymous and less sociable. A hypermobile society risks losing social benefits such as the effect of community involvement on vulnerable and excluded groups (e.g. older people's wellbeing and life expectation).[33] There are also a significant number of deaths and injuries associated with hypermobility. Road accidents are the most common cause of death of five to 35 year olds in Britain.[34]

The ultimate goal of most transport activity is however accessibility (the ability to obtain the goods, services and activities that are needed for a healthy and fulfilling life), not mobility. The fact that mobility can be measured more easily (e.g. average commuting times) means that it is often taken as a proxy for accessibility when the two are different and achievement of one may sometimes be to the detriment of the other. For instance, measures to reduce the journey time from point A to a service at point B, may mean people from further afield will find it worthwhile to travel to service B because of the reduced journey times, thus increasing congestion and reducing journey time savings. Instead, providing another service B closer to A, or providing better access to public transport on that journey, is more likely to lead to long-term traffic volume reduction and therefore journey time savings. A focus on mobility targets can have perverse effects on transport systems and does not aid sustainability. **Therefore a sustainable transport policy should aim to provide accessibility.**

This does not mean that mobility should be ignored or discounted. It means that its primary function - as a means of access - is not lost in any pursuit to improve mobility. Accessibility targets are often defined as the distance or time to access services by different modes of transport including walking, cycling and public transport. They have a particular focus on disadvantaged groups and areas. The SDC believes a focus on accessibility will lead to a more holistic, sustainable transport system. One way to do this is to support cities – particularly city centres and transport hubs – as they are easier to serve by public transport and active transport and behaviour change is therefore easier to achieve.

Business as Usual versus Environmentally Sustainable Transport:

The OECD has undertaken research looking at Scenarios for Environmentally Sustainable Transport and Business-as-Usual Trend Projections, which concludes that compared to countries pursuing Environmentally Sustainable Transport policies, those countries in which the Business-as-Usual scenario is achieved will be richer (measured by GDP), but poorer measured by most other social and environmental indicators.

Business-as-Usual countries will be:

- More polarised (greater disparity between rich and poor)
- More dispersed (more suburban sprawl)
- More anonymous and less convivial (fewer people will know their neighbours)
- Less child-friendly (children's freedoms will be further curtailed by parental fears)
- Less culturally distinctive
- More dangerous for those not in cars (more metal in motion)
- Fatter and less fit (less exercise built into daily routines)
- More crime ridden (less social cohesion and more fear of crime)
- Subject to more policing (more CCTV surveillance)
- Less democratic (the majority will have less influence over the decisions that govern their lives).

The main winners under Business-as-Usual will be the mobility providers and the principal users of their services:

- Those who build the infrastructure and equipment - road and airport builders, car manufacturers and airplane makers, energy companies, manufacturers of computer and telecommunications equipment, and all those who sell and service their products
- The tourist industry, airlines, freight hauliers, software developers and their customers, and all those who do business on the Internet
- Participants in the process of globalisation - especially those with the freedom to cross international boundaries.

The main winners under Environmentally Sustainable Transport will be:

- The many who get left behind by Business-as-Usual. About one third of the population are prevented from participating as fully as they could in the social and economic life of a country mainly dependent on the private car to meet its transport needs. Their disadvantage increases as society's dependence on the car increases
- Those who travel little - physically and/or electronically; under Business-as-Usual their lives are increasingly buffeted by forces beyond their ability to influence
- All who value a cleaner, safer, healthier, more peaceful, more convivial, sustainable society in which people know their neighbours and it is safe for children to play in the street.[35]

3.1.4 Co-ordinated action between the national, regional and local level

The most effective and sustainable transport strategy is integrated, with a combination of policies that address mode switching, fuel switching, demand reduction and network and vehicle efficiency in order to promote low carbon fuels, low carbon vehicles and low carbon journeys and lifestyles.

Co-ordinated action means not only a package of policy measures, but also that these measures are joined up at the national, regional and local level, by devolving significant policy formulation and implementation powers to an appropriate scale of governance. In many cases this will be the city-region.[36]

Successful city-region focused planning requires the right governance structures. There should be mechanisms for joint planning between city-regions, local authorities and the national level, as well as inter-authority.

The SDC is concerned by how delivery of transport policy is currently integrated across Scotland.

Through the Local Government Concordat local authorities have been granted greater flexibility over how they use their funds, with the seven Regional Transport Partnerships (RTPs) now being controlled directly by local authorities. Recent years have seen cuts in the funding for the RTPs and a reduction in their influence, with fewer powers and resources. Delivery of transport at the local level is down to local authorities working to their own Single Outcome Agreements.

The SDC believes that current arrangements are not delivering an effective alignment between national, regional and local actions. It is not clear that the Strategic Development Plans for the city-regions are likely to deliver the scale of carbon cuts required to meet the 42% target for 2020 (see section on Land Use Planning).

In their paper, *The Governance of Transport and Climate Change*, Marsden and Rye conclude that the UK's main policy approaches, including those favoured in Scotland, currently appear constrained by a desire to divide accountability by formal institutional structures, thus failing to tackle the dispersed nature of travel and the national and international nature of businesses.

This analysis chimes with the SDC's experience of advising the Scottish Government on transport. While there is clear understanding within Government of the need to reduce greenhouse gas emissions, this is often accompanied by a viewpoint that action that Government takes is often resisted, undermined or negated by decisions of local authorities, businesses or individuals.

There is currently a lack of clarity about the tiers of responsibilities between national, regional and local government and there is therefore a comparative lack of commitment to the potential for demand management and travel reduction strategies to contribute to carbon reduction. Carbon reduction policies are also influenced by strong industry lobbies whose goals may not be fully aligned with carbon reduction strategies. The profusion of actors engaged in climate change policy seems to dilute rather than promote effective policy making.[37]

The SDC **recommends that the Scottish Government** Governance structures **must** be improved to **give greater clarity about which part of government is responsible for making emission cuts and what their respective contributions are.**

The Scottish Government will need to work with CoSLA, local authorities, agencies and other stakeholders to ensure they can deliver more sustainable transport policies at all levels.

In the meantime, authorities need to encourage and enable small-scale initiatives, as their impacts are not always adequately reflected through most appraisal methodologies. Research has shown that small scale measures, especially when combined, can make a big impact on transport problems. Professor of Transport Policy Phil Goodwin recommends routine and widespread use of methods which:

- include both walking and cycling, as two separate (not combined) modes of transport whose data and modelling is treated as seriously as is done for vehicles
- allow for a wider range of travel behaviour changes, not just the traditional four responses of trip generation, distribution, mode choice and assignment, but also recognise the importance of psychological factors such as driving style and household behaviour
- distinguish the timescale of implementation and response in order to identify those initiatives able to produce results very swiftly
- do not treat 'time-saving' as the most important of all indicators, especially where it is unlikely to

be delivered, or is indeed not the objective of an initiative

- allow for the synergetic combination of various different small initiatives to produce a total effect which is greater than the sum of its parts. [38]

3.2 Tools for a Sustainable Transport Policy

3.2.1 Land use and planning

Effective land use planning is fundamental to a sustainable transport system. Through effective planning the need to travel can be drastically reduced and public transport, walking and cycling made far more attractive.

New developments should always be of appropriate density, mixed use, socially diverse, linked to or integrated with existing communities and provided with accessible public transport and safe walking and cycling routes. These principles have been understood by central and local planners for many years and are now better integrated than before. However there is still not a consistency of approach, which means that the cumulative impact of many local planning decisions will not deliver sustainable communities or decreasing transport emissions.

The national vision for planning – as set out in the National Planning Framework (NPF2) and the consolidated Scottish Planning Policy (SPP) - provides a clearer vision for sustainable and low carbon communities. However this has yet to be translated into a consistent approach at a local level with many developments poorly provided with public transport and walking/cycling facilities and not integrated with existing settlements. Much development seems to be focussed on the peripheral areas of Scotland's cities where it is hard to offer viable alternatives to the private car. Action should instead be concentrated on the urban cores or around transport hubs, and also on building the self-sufficiency of Scotland's towns and other settlements that sit beyond city boundaries.

The development of Strategic Development plans for the city-regions of Scotland offers the possibility of more strategic planning that could reduce transport demand and promote mode shift, but only if carbon is a core consideration as the plan is being developed.

Examples from elsewhere could be usefully applied in Scotland. In Wales the SDC and Welsh Assembly Government have jointly developed the **Low Carbon Wales** report. At the regional level in Wales this has been used to develop an overview of low carbon activity within regions to guide and co-ordinate projects, identify gaps, opportunities, synergies and potential for collaborative working. The SDC has engaged with the Scottish Government on this work and would **recommend a similar approach as the Low Carbon Wales initiative is adopted for Strategic Development plan areas here.**

Some local initiatives in Scotland are showing the way towards more sustainable planning and transport. The **Scottish Sustainable Communities Initiative (SSCI)** has been working in eleven communities across the country, showing how an integrated approach to the provision of housing, facilities and economic development can be taken. As noted earlier, the **Smarter Places, Smarter Choices** initiative is working in seven communities, demonstrating how a combination of infrastructure investment, joint working and public engagement can enhance the use of more sustainable transport measure.

These approaches remain the exception rather than the rule. The challenge for planning authorities and the Government is to standardise this approach for all community-level planning across Scotland.

3.2.2 Infrastructure investment and costing benefits

The Scottish Government has undertaken detailed work on the potential to cut greenhouse gas emissions from transport and the relative costs and benefits of different options. The MTCCI report shows some surprising results – for example some active travel investment, such as on cycling, does not appear to provide the best value for money in reducing carbon. However, if one factors in other outcomes, such as health, social cohesion and inequalities, such investment becomes much more desirable. It is relatively cheap compared to other policies with these aims, so represents good value for money. Active travel can be made more cost effective than it already is, by measuring impacts beyond the reduction of emissions. For instance, it is one of the cheapest ways of helping economically disadvantaged people become more active.[39]

There is already evidence and good practice around the benefits of using different budgets to invest in policies with co-benefits, e.g. health budget spending on active

travel. Again, in considering investment priorities, policies must ensure that small schemes and initiatives are considered and evaluated appropriately, so that they can play their full part (as discussed earlier in this chapter).[40]

The Scottish Government has also committed itself to several high profile projects aimed at increasing capacity (the last option in our hierarchy). Its Strategic Transport Projects Review (STPR)[41] recommends and outlines 29 projects for improving Scotland's rail and trunk road networks, to be implemented over the next 20 years. It is difficult to quantify the implications of the proposals in detail, as the STPR does not contain fully developed costings and no indication of the priority attached to most of the projects. For instance, the A9 upgrade is estimated to cost between £1.5 billion and £3 billion.

The most high profile project within the STPR, the Forth Replacement Crossing, was judged to be a priority and its go-ahead has already been announced by the Scottish Government. As a rough comparison, Scotland's Smarter Choices initiative cost of £27 per person, per year, means the replacement crossing's current projected £2bn cost could fund 15 years' worth of investment into Smarter Choices across the whole of Scotland.[42]

Cross-country comparative research shows that investment in infrastructure is the number one determinant when it comes to increasing active travel rates.[43] Cycle spending per head in Amsterdam is estimated at approx £20 per year and £17.50 per year in Copenhagen (see case study below). The equivalent investment here is an estimated £3.70 for Scotland and £3.60 for Edinburgh.[44]

To encourage active travel as an alternative to the private car, Transport Scotland is supporting the development of the National Cycle Network on key parts of the trunk road network. In its draft Cycling Action Plan for Scotland,[45] the Government has expressed the ambition that by 2020, 10% of all journeys should be made by bike compared to just 2% of work journeys and 1% of school journeys now. This is welcome but will require significant investment in creating high quality, safe and attractive cycling routes and reducing the danger posed to cyclists by motor transport.

Sufficient investment is not yet forthcoming. The Scottish Parliament's Transport, Infrastructure and Climate Change Committee recently undertook an inquiry into active travel. It makes several recommendations to increase participation in active travel, which the SDC supports. It concludes the 10% cycling target "will be meaningless if the Scottish Government fails to match its stated ambition with a realistic level of funding. The Committee therefore recommends ambitious increases in resources with robust mechanisms established to ensure that these are carefully targeted and effective. Stronger, more effective and sustained leadership is required from the Scottish Government in order to implement improvements to walking and cycling policies in Scotland."[46]

3.2.3 Costing Road Travel

The Department for Transport (DfT) calculated that, in England and Wales "the evidence shows that the measurable costs of urban transport of congestion, road accidents and poor air quality are each in the region of about £10 billion per annum. Transport policy can also make a positive impact to reducing the £10 billion cost of physical inactivity and obesity."[47]

The DfT report made no attempt to quantify the costs of the social impacts of current urban transport. The dominance of private motorised travel results in impacts such as the restrictions on children's independent travel and the associated 'escort trips' that have to be made as a result; loss of independence for the elderly; and reductions in numbers of friends and acquaintances.[48]

Social impacts such as these are very difficult to quantify in financial terms, but may represent the largest external cost to society of our current transport policies. We therefore **recommend that the Scottish Government broaden its evidence base to quantify the financial implications of social costs and benefits of Scotland's transport systems**, which then informs both future policy making and a re-evaluation of current policies.

Case study: Copenhagen – Cycling Infrastructure Investment

Denmark has one of the highest proportions of commuters cycling to work and education, currently accounting for 18% of all commuter journeys. Over the past 15 years the general trend in Denmark has seen a reduction of 23% in cycling figures. On the other hand Copenhagen has seen an increase of 26% between 1996 and 2008 accounting for 37% of commuter journeys. This rise in cycling has been due to the investments made in cycling infrastructure in the city, whilst also increasing cycling corridors between Copenhagen city boundaries and neighbouring communities.

Copenhagen currently has 350 km of cycle track, 40 km of marked cycle lanes and 41 km of green cycle routes, with Copenhagen cyclists travelling 1.2 million km a day. In Copenhagen studies show that the introduction of a cycle track on any given road will result in a 10% reduction of cars and a 20% increase in cyclists.[49]

Transport mode for going to work or education in Copenhagen in 2008:

- Train and Bus: 28%
- Walking: 4%
- Cycling: 37%
- Car: 31%.

The City of Copenhagen aims to achieve its target of 50% of journeys to work and education to be made by bicycle by 2015. To achieve this further infrastructural work is required including the widening of busy cycle tracks, improvement of busy junctions, new bridges for cyclists, increased car free routes, improved bicycle parking facilities and the introduction of 'green waves' for cyclists.[50]

The key to fully reflecting all these different costs and benefits lies in the way we appraise options. Transport Scotland's own transport appraisal guidance (STAG) is based around five categories of criteria: economy, safety, environment, accessibility and integration. It attempts to quantify many of the wider costs of transport in monetary terms, which is perhaps both its strength and its weakness. A recent report on the wider costs of transport in urban areas noted that "Most impacts within the first three objectives can be monetised although with varying degrees of robustness." This suggests that the goals of **accessibility** (*to promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society*) and **integration** (*to improve quality of life for transport users and non-transport users, and to promote a healthy natural environment*) are **not** adequately measured and accounted for, despite the progressive thinking behind STAG.

Within Scotland, several high profile and costly road building projects have recently been given financial priority over more sustainable investment options. These include the Forth Road Replacement Crossing and the Aberdeen Bypass. We are concerned that these are likely to absorb all or almost all the budget that is currently available between 2011 and 2016 for other schemes, particularly given the financial constraints facing Government in coming years. This puts a question mark over the deliverability of any other major policies during that period. In our view these are significant lost opportunities that are likely to lead to some unsustainable outcomes, such as a rise in emissions, car use, and growing commuter catchment areas. Our sustainable investment hierarchy would suggest that there are more sustainable ways of investing the money from these projects.

The Aberdeen Western Peripheral Route

The Aberdeen Western Peripheral Route (AWPR) is the planned 28 mile long bypass for the city. The scheme will reduce journey times across or around the city, at least in the early years of operation, and is seen to be of benefit to the local economy. It will have a far more limited impact on journey times within the city and only a negligible impact on reducing public transport journey times along key arterial routes. The scheme will lead to an increase in carbon dioxide emissions.

The scheme proved contentious, with 9,000 objections related to the impact of the road in terms of its impact on climate change, the green belt and on local settlements, particularly the Camphill village. This led to a Public Local Inquiry on the road being held.

The Inquiry provided broad support for the scheme with some mitigation measures and an announcement was made by the Scottish Government in January 2010 that approval for the AWPR had been granted.

The proposal and the Inquiry did not look at alternative means of meeting the same objectives – for example through investment in rail, bus, walking and cycling. Approval for the road was also granted despite it leading to a 8% increase in local transport greenhouse gas emissions. There is therefore a disconnect between such schemes and the Government's overall aims of cutting emissions by 42% by 2020. Approval for schemes such as the AWPR requires even more challenging action to be taken in other policy areas if carbon targets are to be met.

3.2.4 Road Freight

The external costs associated with road freight are still large, highlighting the need to commit significant resources to moving freight transport off the roads and onto rail/water. By far the greatest increase in lorry mileage that has taken place in recent decades is due to longer hauls as opposed to increased tonnage, and faster road speeds have encouraged more journeys by road which would have otherwise gone by rail.[51]

Many analysts believe that road freight does not pay for its direct costs (let alone indirect externalities such as damage to roads). Keith Buchan's *A Low Carbon Transport Policy for the UK* includes detailed assessment and comparison of attempts to calculate costs of HGVs.[52] The SDC acknowledges that the Scottish Government is already pursuing ways to ensure that goods move by the most environmentally sustainable option (whether road, rail, inland waterways, or short sea shipping).

Further to this, the SDC **recommends that the Scottish Government investigates the establishment of consolidation centres in Scotland.** Such centres provide a logistics facility that is situated in relatively close proximity to the geographic area that it serves, be that a city centre, an entire town or a specific site (e.g. shopping centre), from which consolidated deliveries are carried out within that area. A range of other value-added logistics and retail services can also be provided at a consolidation centre.[53] They have been successfully introduced in Bristol and Norwich. The aim of these centres is to reduce the number of lorries in town and city centres, reducing congestion, emissions, road danger and illegal parking.

3.2.5 Behaviour change

Efficiency and technology measures – for example new minimum standards for emissions from new cars - implemented without associated action to influence individual choices, will not bring about the full necessary reductions in emissions. This is of particular concern when potential rebound effects are taken into account (e.g. more fuel efficient cars are cheaper to run so people may use them more).

Behaviour change is therefore crucial to any sustainable transport strategy - this is regardless of whether the 'ask' is for more active travel or adoption of new technology. Changing behaviour is brought about by a combination of personal attitudes, infrastructure and social acceptability and should not simply be viewed as being about the provision of more information to individual citizens. This is borne out by the recent SEABS[54] study which shows that people's attitude to environmental issues do not have a significant influence on their travel behaviour.

Governments across the UK have been implementing initiatives very similar to Smarter Choices. As discussed, *Smarter Choices* has the potential to reduce the demand for car travel while facilitating the take up of

travel choices that better satisfy users' needs. **The Committee on Climate Change recommends that there is a phased roll out of such programmes across the UK's towns and cities.[55] The SDC supports this recommendation** and has previously recommended a nationwide roll-out of Smarter Choices in our Sustainable New Deal report to the UK Government.[56]

There are many other possible actions to address behaviour, such as car clubs, bike pooling and incentives to use public transport. Focusing on places where people congregate, such as work, can lead to significant changes. For instance, encouraging flexible working patterns and community work hubs offer several benefits. Aside from reducing the need for travel, they could potentially utilise space that would otherwise be empty during the day (e.g. public buildings). There are potential business advantages arising from such arrangements, as well as community benefits from increased interaction. Finally flexible working patterns offer people the chance to reduce their commute times, resulting in a better work/life balance.

Case study: A Scottish case study: Dundee Travel Active

Dundee Travel Active is one of seven projects selected under the Smarter Choices Smarter Places travel partnership set up by CoSLA and the Scottish Government. The aim of the Dundee Travel Active is to 'encourage active travel, to promote healthy lifestyles for residents of and visitors to central Dundee'. Dundee Travel Active and other local initiatives are aimed at improving the health of the residents and visitors through active travel, increase the use of more sustainable transport modes, improve accessibility to local facilities, promote social inclusion, improve community safety and reduce the dependency on car use.

As part of the project, Personalised Journey Plans will be provided to residents and visitors through the following pathways:

- **NHS/GPs** – Patients
- **Local Residents** – House hold communities
- **Universities** – Staff and students
- **Businesses** – Employers and employees
- **Schools** – Children and parents
- **Visitors** – Retailers and key trip attractors

At the same time the following infrastructure improvements will be carried out:

- Improved active travel networks
- Public realm and open space enhancements
- Resident bicycle loan scheme
- Network condition rangers.

Work commenced in May 2009, and between 2009 and 2010 33% of the households in the project area received visits from travel advisors. During 2010 and 2011 contact will be made with the remaining 67% of the households in the area. As this project is still ongoing, a clear picture of improvements on health and the shift to active and sustainable travel is not complete. There are some positive interim results available. Following home visits from the travel advisors, a follow up survey confirms that approximately 35% of those contacted have increased their physical activity by 20 minutes per day. The biggest improvements have been seen in those people that considered themselves to be in poor health before the project commenced. On completion of this demonstration project, Dundee City Council and their partners will be better placed to see whether the projects aims have been achieved.[57]

3.2.5 Speed Management

Lowering the 70mph speed limits on all trunk roads to 60mph is the third most cost effective policy analysed in the MTCCI report. In addition to reduced fuel consumption, speed management through the use of variable speed limiters and lower speed limits would have several benefits.[58]

Cameras which measure average speed over a distance (known as average speed cameras) are becoming widely used on motorways. These have the advantage that it is not possible to slow down briefly to avoid detection, and also reduce the incidence of sudden braking as can happen with traditional speed cameras. There is also evidence that they reduce the number of fines issued, thus representing a cost saving for motorists as well as lower administrative costs for enforcement due to a strong reduction in violations. The SDC believes they are a cost effective measure that should be implemented more widely. They not only increase safety records, but also lead to fuel efficiency improvements through much improved speed limit compliance.

Average speed cameras: the evidence

Evidence from Speed Check Services, an Average Speed Camera provider, shows that driver behaviour is noticeably better with average speed cameras, with compliance maintained throughout the speed restriction zone.

At the M8 Junction 28, January – April 2007, comparison with spot speed cameras was possible as identical works were carried out in 2006. This comparison found that there were no delays on M8 at morning peak (as compared to an average of 15 minutes delay); traffic volumes were greater; compliance with the 40mph speed limit is 99.7% and average speeds are 38mph through the scheme. The number of offenders fell from 1083 to 97.

	Non-enforced 70mph Limit	SPECS Enforced 70mph limit	SPECS Enforced 50mph limit
Average Fuel Consumption (MPG)	38.48	43.35	54.40
Fuel saved annually (gallons per mile)	0.00	79,190	206,302
CO_2 Emissions (Kg/M)	0.279	0.248	0.197
Annual CO_2 Emissions (Tonnes per mile)	7,484.21	6,636	5,276
Annual CO_2 Reduction (Tonnes per mile)	0.00	847	2,207
Saving	**0%**	**11%**	**29%**

Source: All information received from *Speed Check Services Limited*[59]

The Highway Agency's *Safety Camera Technologies at Roadworks*[60] acknowledges that average speed cameras have been found to cause some braking and accelerating behaviour. However, it occurs less than with traditional cameras and reduces over time as noted:

"The 'surfing' effect, where drivers brake on approaching a camera and then accelerate after passing it, (which is normally associated with SSE*) has been found to occur with both systems, although to a far greater extent and with greater magnitude under Spot Speed Enforcement (i.e. traditional speed check camera) than under Time Over Distance (i.e. average speed camera)"

Better enforcement of the existing 70 mph speed limit would reduce traffic volume on motorways by 4%-5%, thereby reducing inefficient fuel consumption associated with 'stop and start' driving.[61] This would allow for more efficient use of the existing road network by reducing congestion and increasing capacity. Reducing the limit to 55mph could reduce traffic volume by up to 20%. The risk of collision, emissions and other negative health impacts associated with high volume traffic would also be reduced; however, it is likely to have low public acceptability. It looks likely that the Scottish Government will soon be in a position to consider this option as the new UK Government has committed to implement the Calman Commission recommendations, which include giving responsibility on speed limits to the Scottish Government.

While motorway speeding by lorries is no longer a problem thanks to their being fitted with top-speed limiters, a survey undertaken by the DfT in 2006 showed that in normal traffic conditions, 76% of articulated lorries were breaking the 40mph limit and 83% were breaking the 50mph limit at any given time in the survey locations.[62]

Lower speeds in built-up areas and particularly on residential roads would also reduce car traffic, but for different reasons. Lower speeds would make walking and cycling much safer and so bring about a shift to these modes. For short journeys where a car is still necessary, reducing speed limits will have little or no impact on journey times as these are primarily determined by the number of junctions encountered and congestion levels (which would be eased by modal shift to walking and cycling). The Scottish Government recognises the benefits of low speed limits, and its road safety framework contains a commitment to encourage local authorities to consider 20 mph speed limits in all residential areas, which we are highly supportive of.

Case study: Portsmouth City Council – Britain's first 20 mph city

In 2008 Portsmouth was the first city in Britain to introduce city-wide 20mph speed limit on 94% of the length of its roads.[63] The council introduced the 20mph speed restriction to increase safety for both pedestrians and cyclists, and therefore make both modes of active travel more attractive to its residents, especially young children, the elderly and cyclists. In Portsmouth the residents' reaction to the implementation of this scheme has generally been favourable.

In September 2009, an Interim report was published, exploring the achievements of the scheme after the first year of implementation. The study indicates that the scheme has been successful in reducing speed by 7 mph along the faster roads; however the overall average speed reduction achieved was of 0.9 mph. According to the report this reduction is considered statistically inconclusive, and a final report after three years of operation is expected to provide conclusive results. The interim report also indicates that accidents dropped by 13% and the number of casualties by 15%. Again statistically stronger results are expected after three years of operation; however the Portsmouth City Council views these results positively. In its view this scheme requires a long term vision and depends on behavioural change over time.

While cutting speed limits on urban roads has safety benefits there has been a debate about whether it can also help cut emissions. There is now evidence that in real driving conditions 20mph zones can also help cut fuel use. [64] [65]In addition, research also shows that driver behaviour has a more significant impact on fuel consumption than speed.[66]

Following the successful trial in Portsmouth, the Department for Transport plans to allow 20mph limits to be implemented by local authorities on streets where traffic speeds are already low without the need for additional traffic calming measures.

3.2.6 Technology and efficiency

There are several ways in which technology and efficiency can contribute to sustainable transport policy:

- Designing improvements for motorised transport including fuel efficient and electric vehicles
- Managing the existing road network through monitoring, traffic lights, providing information and restricting or allowing access
- Encouraging mode shift, for example through web-based travel planning, electronic bus time tables, discounts and incentives, and
- Reducing demand through Information and Communication Technology (ICT) such as videoconferencing.

Such technologies have an important role to play and support for investment must continue in this area. However, the MTCCI report illustrates that 50% of the needed reductions in transport emissions will need to come from elsewhere, emphasising the need for alternative measures in the short term especially as new vehicle technologies can require many years to achieve sufficient market penetration to make large contributions to reductions.

The Scottish Government recognises the potential application of ICT and one of the projects of the STPR focuses on this specifically.[68] Transport Scotland has already invested over £28m in Intelligent Transport Systems. We support this initiative, which aims to deliver the operational efficiencies that would prevent the "stop start" traffic conditions and fits well within the 'efficiency Improvements to existing modes' tier of our hierarchy.

Nevertheless, transport policy and practice tends to primarily focus on the need to provide transport services and infrastructure to meet projected demand. For a more balanced approach, equal consideration should be given to the demand side of the equation. Using technology to manage transport networks to make them more efficient is now commonplace, but technology can also be harnessed to record personal preferences and habits in order to make transport much more responsive to demand. For more information on the role of ICT in managing emission reductions see our 2010 Report *Smarter Moves.*[69]

Getting there? Conclusions and Summary of Recommendations

4.1 Introduction

It is a huge challenge to meet emission targets and deliver a more sustainable transport. This challenge can be made easier by recognising our transport systems' great potential to achieve significant emissions cuts whilst simultaneously achieving better outcomes in terms of health and social cohesion.

Transport in Scotland will be much better placed to meet its Climate Change Act targets if transport policy is developed from a fresh perspective based on a holistic vision. It would also contribute positively to wider sustainability with a healthier, happier, more inclusive society.

4.2 Priority Recommendations

The principles that currently underpin Scottish transport policy, such as improving journey times and cutting congestion, are in many ways not sustainable. The way we assess land use and transport planning options does not adequately reflect the full range of potential outcomes of some policies. The assessments can even favour the more unsustainable options.

We recommend that the Scottish Government adopts the following **guiding principles in transport policy investment and decision making**, which all future policies should be evaluated against:

- **A focus on accessibility rather than mobility** in measures and targets. In particular the refreshed National Transport Strategy should acknowledge and address potential perverse effects that can result from increasing distance travelled and ensure targets are expressed in terms of accessibility
- **A sustainable transport investment hierarchy** that first and foremost aims to **reduce demand** for powered transport; then considers **modal shift** to more sustainable and space efficient modes; then considers **efficiency improvements** to existing modes; and only as a final resort examines **capacity increases** for motorised transport. This should also apply to local decision making
- Transport policy options must be assessed against criteria relating to a wider range of outcomes on health, wellbeing and social cohesion. New tools and mechanisms need to be developed to do this accurately and effectively
- **Governance structures must be improved to give greater clarity about which part of government is responsible for making emission cuts and what they respective contributions are.** The Scottish Government will need to work with CoSLA, local authorities, agencies and other stakeholders to ensure they can deliver more sustainable transport policies at all levels.

We recommend that current and future transport related spending plans are reviewed within the context of our recommended hierarchy for transport investment priorities. These principles widen the focus beyond emissions and economic growth as isolated objectives.

In addition, we have made specific recommendations in areas where there is potential for a change in policy that can have significant sustainability impacts. Many of these are relatively low cost, though will require political leadership and will.

4.3 Other Recommendations

The Scottish Government has produced the **Carbon Account for Transport** to help assess the impact transport policy options will have on emissions. This is a significant step forward. However, it is not yet a fully effective tool for decision making and should be revised to work more effectively alongside emissions reductions budgets that will be drawn up under the powers from the Climate Change Act.

We recommend that the Scottish Government **broadens its evidence base** to quantify the full social costs and benefits of Scotland's transport systems. This evidence base should together with the accounting for carbon inform both future policy making and a re-evaluation of current policies.

Effective **land use planning** is essential for sustainable transport. While the National Planning Framework and the consolidated SPP do adopt a sustainable approach to planning guidance, there is not a consistent application of these principles through Strategic Development Plans and other local plans. To complement and underpin the principles of a sustainable transport policy the Scottish Government should work with CoSLA and local authorities to ensure that its planning guidance is implemented at the local level. This can only be done by **identifying and addressing current barriers to its effective implementation**.

Significant funding has been made available for the **Smarter Choices** initiatives through demonstration projects. However, we believe the evidence base is already strong enough to warrant that Smarter Choices initiatives are rolled out across the country with an appropriate level of funding for those who apply. At a time of constrained public budgets, Government and local authorities should ensure that small scale initiatives have access to funding and appropriate evaluation tools. This will help smaller budgets go further.

Behaviour Change is also crucial to more sustainable outcomes. In the Climate Change Delivery Plan the Scottish Government has recognised that behaviour change in transport is central to meeting carbon targets; it must work with experts to develop an effective approach to changing behaviours. Computer technology can play an important role in achieving behaviour change and emissions reductions, whilst contributing to wider issues such as safety and social inclusion.[70] The forthcoming refresh of the National Transport Strategy is an opportunity to look at these aspects from a new perspective.

Finally, as part of wider work to cut congestion, emissions, road danger and illegal parking by reducing the number of lorries in town and city centres, we recommend that the Scottish Government investigates **consolidation centres,** which are logistics facilities that are situated in relatively close proximity to the geographic area that it serves, from which consolidated deliveries are carried out within that area. A range of other value-added logistics and retail services can also be provided at a consolidation centre. This has been done in Bristol and Norwich.

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