European Best Practice 2006 Update (2)

Phase 1 – Final Report (Updated October 2006)

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Executive Summary

This report is a revision of the European Best Practice 2006 Update Final Report which was submitted to the Commission for Integrated Transport in April 2006. The revision was requested in light of a new release of data (2005) from one of the main sources used in the study, Eurostat's *EU Energy & Transport in Figures*. CfIT requested Atkins to update a number of key figures and tables presented in the April 2006 report, using the newly released data. The results of this update, together with a commentary on findings, have been integrated within this report. Table 1.1 in the Introduction shows where changes have been made to the April version of the report to produce the current version.

The UK government's 1998 White Paper marked a new commitment to integrated and sustainable transport in the UK. Government spend on transport increased from approximately £5 billion in 1997/98 to £7 billion by 2001/02 and rose to nearly £9 billion by 2002/03.

This update of the Commission for Integrated Transport's 2001 report on European Best Practice provides an opportunity to understand what progress was made in the early years following the 1998 White Paper. New data sets make it possible to examine changes at a national level typically for the period to 2002. For cities, the data is available up to 2001 only. However, a shift to a more integrated approach to transport at a local level was emerging in many of our cities during the latter part of the 1990s and hence this update provides some indication of the progress of a selection of UK cities relative to other cities elsewhere in Europe.

Inevitably difficulties with obtaining reliable data and reconciling unexplained differences require the data analysis to be treated with caution. Five years on it is disappointing that data sets for benchmarking of transport outcomes both in the UK and across Europe are not more advanced and more readily available to policy makers.

INCREASED CAR OWNERSHIP AND MOBILITY

Continued economic growth across Europe has seen increases in car ownership and the amount people travel. Car ownership (cars per thousand population) has increased by 9 percent across the EU15 and by 11 percent in the UK over the period 1998 to 2002. Whilst this increase in the UK is higher than countries such as Germany, France and Italy, the overall level of car ownership in the UK remains below these countries.

Walking and cycling in the UK is still low compared to most other countries in the EU15. A one percent increase in walking levels per capita over the period 1995 to 2000 is notably lower than in France (a 4 percent increase). Cycling per capita has decreased in all countries over the same period with the 2 percent decrease in the UK typical of that seen in many countries across Europe.

ECONOMIC AND TRANSPORT CONVERGENCE

Policies aimed at reducing the disparity between member states have contributed to the greatest increases in economic growth, car ownership and travel occurring in those countries below the EU average in terms of gross domestic product.

These countries have also seen the greatest increase in new transport infrastructure investment.

Similarly the New Member States have experienced above average increases in car ownership, investment in roads and, in most cases, car use, with a decline in their dependence on public transport.

REDUCING CAR DEPENDENCE

The UK continues to have the greatest reliance on car relative to public transport use with a car mode share of 85 percent. This reflects a level of travel by car broadly equivalent to the European average but a lower use of public transport.

Despite a continued increase in car ownership, public transport use has increased faster than car use due to an increase in rail travel. There is therefore the prospect that we are starting to see greater genuine choice of mode being exercised in the UK.

Only four other countries are showing a similar pattern of public transport use increasing faster than car use. Other countries, particularly those with faster rates of economic development are showing much higher rates of growth in car compared to public transport use.

In 2001 about half of all trips in London were by car with about 20 percent by public transport and just under 30 percent by walk and cycle. Car and powered two wheeler mode shares in Barcelona, Paris and Berlin remain slightly lower. In Manchester and Glasgow, however, car mode share in 2001 is over 65 percent and higher than in comparable cities such as Lyon, Copenhagen, Munich and Vienna.

There is some evidence that we are starting to decouple the growth in travel demand from economic growth. In the EU15 only the UK, Ireland, Netherlands and Luxembourg have achieved a rate of growth in car travel less than GDP growth over the period 1998 to 2002.

THE RELATIVE COST OF PUBLIC TRANSPORT USE

The UK continues to capture a much greater proportion of public transport operating costs from users than other European countries and cities.

Partly as a consequence, the cost of public transport use remains higher in the UK. A monthly public transport pass in London is twice that in Paris, Barcelona and Madrid. The cost of making a trip by car compared to public transport is typically double in UK cities whilst for other European cities, lower public transport user costs means the costs of travelling by car is typically over three times and potentially ten times the cost of using public transport.

The cost of motoring in the UK is higher with fuel prices higher in the UK than in all other EU15 countries other than Portugal. Furthermore, in the 7 years to 2002 fuel prices in the UK have increased by more than any other EU15 country. Parking costs in London are typically two to three times that in other comparable cities. Manchester and Newcastle tend to be higher than average and Glasgow broadly in line with comparable cities.

Overall using a car compared to public transport remains relatively cheap in the UK cities when compared to cities elsewhere in Europe.

PROGRESS ON PRIORITY OUTCOMES

Congestion

There remains little useful data on which to compare congestion levels at both a city and national level. Whilst some cities (e.g. Copenhagen, Berlin and Paris) achieve higher road speeds at similar or greater levels of traffic density (traffic flow per kilometre of road) compared to UK cities, this in itself is not a reliable guide to congestion levels.

Demand management through parking charges (as noted above) appears to be more advanced in UK cities, although further work will be necessary to determine how this correlates with congestion levels and traffic densities.

Road Safety

The UK continues (along with Sweden) to have the lowest exposure to fatalities. Over the last four years the UK has reduced the fatality risk and exposure by 1 percent compared to 13 percent across Europe.

The greatest national reductions in fatalities tend to be in those countries with higher than average rates of fatality, suggesting that other countries are being effective in introducing best practice from other countries such as the UK. Exposure to road traffic fatalities in the New Member States is nearly three times that for the EU15. Exposure to injury is also higher.

The UK's exposure to injury accidents is above the European average and over the last four years we have achieved only an 8 percent reduction compared with an average 14 percent reduction across Europe.

Pedestrian fatalities in the UK, despite reducing by 11 percent between 1996 and 2003, are now slightly above the EU15 average. Sweden and Denmark have made more progress than the UK over recent years despite having lower levels to start with. Hence, there is considerable merit in the UK looking to these countries for best practice.

Emissions

Over the period 1996 to 2003 the UK has seen a reduction NOx and NMVOC emissions. This reduction has, in both cases, been greater than that achieved across Europe as a whole.

However, CO2 is still rising in most countries including the UK. Whilst the UK increase is less than the European average, Germany experienced a reduction.

Polluting emissions per capita from transport in London are lower than in all other comparable cities included in the survey and nearly a third the level in Paris. Manchester and Glasgow have lower levels than Lyons and Copenhagen but are higher than Vienna and Budapest. Newcastle has lower levels than all other comparable cities surveyed including Nantes, Marseilles and Stuttgart.

Accessibility and social inclusion

There is little comparative data available that enables the UK and cities to be compared with other European countries and cities in terms of accessibility and social inclusion. All cities appear to be making progress towards fully accessible public transport and free or concessionary fares for the young, elderly and disabled.

IN PURSUIT OF BEST PRACTICE

The analysis of the latest data provides an update to the earlier European Best practice research in terms of the comparison between transport determinants, outputs and outcomes.

The comparisons, in themselves do not however, provide evidence as to why countries and cities are performing better or worse than others. The 2001 study, therefore, undertook case studies in those cities showing the greatest promise in terms of delivery of integrated transport. A similar exercise is necessary to explain some of the key differences exposed by this latest research. Indeed the Commission has already undertaken research on world cities through a case study approach and in parallel with this update is exploring areas of interest.

The analysis undertaken in this latest research indicates that the UK and some of its major cities are performing relatively well on safety and emissions. There is some evidence to suggest that the UK has made some progress on halting an increasing dependence on car use and decoupling traffic growth from economic productivity growth. It is unclear as to how much this can be attributed to integrated transport policies, a general increase in funding (note London has invested more in transport per capita in 2001 than other comparable cities, whilst Manchester and Glasgow invested far less in public transport than comparable cities) or indeed lessons learned from the earlier European Best Practice research.

Inevitably there are areas where the UK can still make ground on and/or learn from its European counterparts:

- Continued reduced reliance on car use – learning from Sweden and the cities of Berlin, Barcelona, Munich and Vienna;
- Increased reliance on walking and cycling – learning from Denmark and cities of Berlin, Munich, Copenhagen and Graz;
- Funding of public transport – ascertaining to what extent the much greater level of revenue support provided for urban public transport in cities such as Paris, Rome, Stockholm, Vienna, Lyons, Nantes, Stuttgart and Brussels is as a result of stronger regional and city-wide co-ordination and revenue raising powers;
- Reducing road traffic injuries as well as fatalities – learning from Netherlands, Ireland, France and Denmark;
- Reducing pedestrian fatalities from road traffic accidents at a faster rate – learning from Sweden, Denmark, Germany and France;
- Further investigation on comparative investment levels.

A separate commission is currently exploring these lines of research.

1. Introduction

UPDATE

1.1 This report is a revision of the European Best Practice 2006 Update Final Report which issued in April 2006. The revision was requested in light of a new release of data (2005) from one of the main sources used in the study, Eurostat's *EU Energy & Transport in Figures* .The results of the update, together with a commentary on findings, have been integrated within this report. Table 1.1 shows where changes have been made to the April version of the report to produce the current version.

BACKGROUND

1.2 The Commission for Integrated Transport (CfIT) is an independent organisation that advises the UK Government on integrated transport issues. CfIT's remit, as set out in the Integrated Transport White Paper and following an independent review of CfIT in 2003, includes:

- Refreshing the transport debate; and
- Providing policy advice via evidence based reports including comparisons with European/International policy initiatives and dissemination of best practice.

1.3 In 2001, CfIT published reports on the findings of its European Best Practice research. This research, undertaken by Atkins, was aimed at benchmarking the UK's approach to all modes of transport with that of the rest of Europe. Five years on the report remains one of CfIT's most popular pieces of research with transport readers.

1.4 By updating the study, CfIT aims to provide a valuable source of data to support the main workstreams in the current CfIT work programme, policy advice to DfT and the wider research community.

STUDY AIMS AND OBJECTIVES

1.5 The broad aim of the project is to provide a refreshed benchmark of the UK's approach to transport in comparison with other EU states. The following objectives have been identified:

a) To update the performance indicators across the 15 EU states studied in CfIT's 2001 research "European Best Practice in the Delivery of Integrated Transport", drawing out the key trends and issues.

b) To examine the level of data available from the New Member States and whether adequate data exists for comparable performance measures.

c) To provide a source of reference for DfT and other industry stakeholders, as well as informing CfIT's own work programme.

1.6 In addition to providing a comparison between the UK's performance and other European states, the research inevitably requires consideration to be given to the availability, quality and reliability of the data. This necessarily includes identification of inconsistencies between different data sets.

Table 1.1 – Overview of Updates Required

Reference in European Best Practice 2006 Update Final Report (Phase 1)	Figure/Table Title
Table 2.1	National Demographic & Socio-Economic Indicators, 1997/8 and 2003/4 (EU-25)
Figure 2.1	Change in Population (%), 1997-2004 (EU-25)
Figure 2.2	Change in Density, 1997-2003 (EU-25)
Figure 2.3	Change in GDP per capita in PPS, 1997-2003 (EU-25)
Figure 2.4	Change in Unemployment Rate (%), 1998-2003 (EU-25)
Figure 2.5	Car ownership, 1980-2002 (EU-25)
Figure 2.6	Change in car ownership, 1998-2002 (EU-25)
Figure 2.7	Powered Two Wheeler Ownership, 1998 and 2002 (EU-15)
Table 2.2	Change in Powered Two Wheeler Ownership (%), 1998-2002 (EU-15)
Figure 2.8	Bus & Coach Supply, 2002 (EU-25)
Table 2.3	Change in Bus & Coach Supply (%), 1998-2002 (EU-25)
Figure 2.9	Rail Supply, 1998 and 2002 (EU-15)
Table 2.4	Change in Rail Supply, 1998-2002 (EU-15)
Figure 2.11	Motorway Provision, 2001 (EU 15)
Table 2.6	Motorway Provision, 2001, (New Member States)
Table 2.7	Change in Motorway Provision, 2001, (EU 15)
Figure 3.1	Motorised Travel, 2002
Figure 3.2	Change in Motorised Travel, 1998-2002, (EU 15)
Figure 3.3	Change in Motorised Travel, 1998-2002, (Selected NMS)
Figure 3.4	Public Transport Mobility, 2002
Figure 3.5	Change in Public Transport Mobility, 1998-2002, (EU 15)
Figure 3.13	Motorised Travel and GDP, (PPP adjusted at current values) for 2002
Figure 3.15	Travel Intensity for Recorded EU Countries, (1995-2002)

PURPOSE OF THIS REPORT

1.7 This report compares UK performance against other EU countries using a selection of indicators at the national and city levels to assess, where possible, relative progress in achieving the desired **outcomes** of integrated transport policies and changes in transport outputs.

1.8 As noted in the 2001 Report, sensible comparison of outcomes requires benchmarking against various **inputs** or determinants of travel behaviour such as demographic and socio-economic characteristics, the supply of transport, and levels of investment in provision which can help to explain some of the differing levels of success in policy delivery. Where no clear indicators of policy outcomes exist, it has been necessary to define proxy measures such as modal shares. These **outputs** represent necessary conditions for achieving desired outcomes.

COMPARING LIKE WITH LIKE

1.9 Inevitably, the research has faced some challenges in simply updating the previous research. The European Union has expanded from 15 to 25 Member States as of May 2004.

1.10 Available data sets do not always enable comparative analysis (see below). In particular, time-trend analysis for cities is severely constrained by the lack of consistency between the primary data sets used for the 2001 report (Millennium Cities) and the more recent Mobility in Cities database used for this study (see below).

LIMITATIONS OF AVAILABLE EUROPEAN DATA

1.11 The 2001 report drew attention to the limitations of the data and concluded that "benchmarking integrated transport is still in its infancy". Limitations on the completeness accuracy, continuity, timelines and transparency of the data sets were identified.

1.12 Since then it is evident that some progress has been made to develop standard data sets and to monitor trends over time. However, many of the concerns raised in the 2001 Report remain valid today.

National Data

1.13 At a national level the prime source of data is **Eurostat**. Eurostat is the Statistical Office of the European Communities, situated in Luxembourg. Its task is to provide the European Union with statistics at European level that enable comparisons between countries and regions. Eurostat produces statistics on a number of different topics. The main source of reference for this study has been *EU Energy and Transport in Figures 2004, European Commission, Directorate-General for Energy and Transport,* produced in co-operation with Eurostat. The main data source for those figures which have been updated has been the 2005 version of this publication. The pocketbook is based on a range of sources, including Eurostat, international organisations, national statistics, and where no data is available, its own estimates.

This publication follows a similar format to the *EU Transport in Figures 2000* publication which was the main source of national data in the 2001 study.

1.14 However, it should be noted that the format of the publication has changed, and as it now reports on energy and transport statistics, rather than just transport indicators, there has been some rationalisation of the information provided. In some cases, where no data is provided in the 2004/05 publication, we have referred to the *EU Energy and Transport in Figures 2003* publication, which has some additional content. Furthermore, Eurostat also provides a searchable database with statistics for a range of indicators, which has been used as a source of some data not available from the *EU Energy and Transport in Figures* pocketbooks (http://.epp.eurostat.cec.eu.int).

1.15 The Eurostat *EU Energy and Transport* publications are published annually by the European Commission Directorate-General for Energy and Transport (DGTREN). For many indicators, data for a number of years are provided, allowing the analysis of trends over time. However, during the course of this study, it has emerged that there are significant limitations in the data, including:

- Discrepancies in the values for the same indicator in the same year between different annual publications of EU Energy and Transport in Figures. Many of these discrepancies are minor (less than 1 percent change) and are attributed to refinement of data sets to ensure year-on-year consistency. There are, however, more marked discrepancies between different publications of seemingly the same indicator. For example, there is a 12 percent difference in the 1998 value for total car passenger kilometres in the Netherlands between the 2000 and 2004 Eurostat publications.
- Changes in the scope of published Eurostat data from one year to another. Hence, it is impossible to look at trends over time for some indicators or to report on indicators used in the 2001 Report but for which there is no more recent published data. For example, the 2000 EU Transport in Figures provided data on investment in transport infrastructure but no comparable information is available in subsequent publications.

1.16 To enable comparisons to be made with the 'EU average', most charts show an EU-15 or EU-25 average. However, it should be noted that these averages are not necessarily based on all 15 or 25 constituent countries if no data exists for some of those countries.

City Data

1.17 At a city level, the primary data source is the Mobility in Cities (MCD) Database. This database follows on from the *Millennium Cities Database for Sustainable Transport*, which provided data on 200 indicators, including population, the economy and urban structure, the number of road vehicles, taxis, the road network, parking, public transport networks (offer, usage and cost), individual mobility and choice of transport mode, transport system efficiency and environmental impact (duration and cost of transport, energy consumption, accidents, pollution, etc.), for 100 cities for the year 1995. The update for the year 2001 was released in January 2006 and contains a set of 120 indicators collected in 50 cities worldwide, for the year 2001. However, it should be noted that data for 40 cities was made available at the end of January

2006. The database is produced by the International Association of Public Transport (UITP); a worldwide network of public transport professionals, representing over 2700 urban, local, regional and national mobility actors from more than 90 countries.

1.18 The indicators available in the *Mobility in Cities* database are not entirely the same as those included in the *Millennium Cities Database*. For example, emissions from transport are now recorded differently. Similarly, while the cities included in both databases are largely similar, there are some additions in and omissions from *Mobility in Cities,* e.g. Budapest, Prague, Bilbao, Geneva, Ghent, Warsaw, Valencia are now included, but Ruhr and Düsseldorf are not.

OTHER DATA SOURCES

1.19 In addition to the Eurostat data sources and the MCD database, we have drawn on several additional sources to supplement our analyses. These include:

National Data

- Additional publications from Eurostat (e.g. EC Economic Data Pocket Book, Eurostat database, http://.epp.eurostat.cec.eu.int);
- Jane's Urban Transport Systems 2005-06 (24th edition);
- Organisation for Economic Co-operation and Development (OECD) (e.g. Statistics Portal, http://www.oecd.org; OECD in Figures 2005);
- International Road and Traffic Accidents Database (IRTAD), 2005;
- European Foundation for the improvement of Living and Working Conditions (Eurofound) - European Community Household Panel (ECHP) 1994-2000; Eurobarometer, 1999; Second European Survey on Working Conditions, 1996 and Third European Survey on Working Conditions, 2000.

City Data

- Citizen's Network;
- European Metropolitan Transport Authorities (EMTA) Barometer;
- Regional data from Eurostat.

OVERALL APPROACH

1.20 Within the timescales available for the project, the overall approach has been to draw largely on Eurostat (for national data) and the Mobility in Cities database (for city data) thereby ensuring use of internally consistent data sets. Information has been drawn from the sources referred to above to supplement the analysis.

1.21 We have used the latest data sets to provide the most up-to-date picture as possible and then, at the national level, to use the latest time trend data to report on changes since the time period covered in the 2001 report. Typically, the 2001 Report covered data up to 1998 but in some cases earlier than this.

1.22 In most of the national level analysis we have been able to report on the situation in, and changes up to, 2002. This is important to note as this represents only the first four years following the UK's introduction of its Integrated Transport White Paper in

1998, only two years following introduction of the UK Government's Ten Year Plan for Transport and only one year of implementation of Local Transport Plans.

1.23 Therefore, as the findings are based largely on data for 2002, they are unable to provide a complete picture of how the UK has performed since the first five years of implementation of its integrated transport policy.

DEALING WITH NEW MEMBER STATES

1.24 For comparison purposes, at national level, we have sought to distinguish the performance of the 15 Member States (EU-15) that belonged to the European Union at the time of the 2001 research and the performance of the New Member States (NMS) that joined in 2004 (Figure 1.1). Where possible, comparisons are drawn between New Member States and the EU-15 but, for many indicators, the data for the New Member States is lacking and/or raises questions as to its reliability.

Figure 1.1 – EU-15 and New Member States

Source: www.ezilon.com/ eu_map_europe.jpg

STRUCTURE OF THIS DOCUMENT

1.25 Following this introductory chapter, this report is divided into two parts; Part 1 contains national level comparisons, and Part 2 contains local level comparisons.

1.26 Within Part 1:

- Chapter 2 considers transport inputs by presenting comparisons of key determinants of integrated transport outputs and outcomes, such as demographic and socio-economic indicators, supply of transport and investment levels;

- Chapters 3-6 cover outputs and outcomes covering the key policy themes of mobility and modal choice, road safety, congestion and environmental impact, and accessibility and social inclusion.

1.27 Within Part 2, cities have been classified as world cities, large cities/metropolitan areas and other cities, consistent with the 2001 report, as shown in Table 1.2.

Table 1.2 – Sample of Cities

World Cities	Large Cities/ Metropolitan Areas	Other Cities
Athens, Greece	Copenhagen, Denmark	Brussels, Belgium
Barcelona, Spain	**Glasgow, UK**	Graz, Austria
Berlin, Germany	**Manchester, UK**	Helsinki, Finland
London, UK	Munich, Germany	Marseille, France
Madrid, Spain	Stockholm, Sweden	Nantes, France
Paris (Ile de France), France	Vienna, Austria	**Newcastle-upon-Tyne, UK**
Rome, Italy	Lisbon, Portugal	Stuttgart, Germany
	Lyon, France	
	Budapest, Hungary	
	Prague, Czech Republic	

1.28 The classification of 'world cities' studied is unchanged from the 2001 report.

1.29 The **'larger cities'** previously included Milan. This city is not included in the *Mobility in Cities* database and has, therefore, been excluded. We have, however, included two new cities, Lisbon and Lyon. Lisbon is a capital city, and Lyon, whilst not a capital city, was included in CfIT's 2005 research on world cities[1]. We have also included two new cities representing capital cities in New Member States.

1.30 The number of 'other cities' studied has been considerably reduced compared to the earlier work (from 23 to 7 cities). Whilst data is now available only for a smaller number of cities it is more complete than the data used in the 2001 Report.

1.31 The locations of these cities and towns are shown in Figure 1.2 below.

1.32 Chapter 7 reports on the world cities, chapter 8 on the larger cities and chapter 9 on the other cities. Chapter 10 seeks to draw some overall conclusions from the analysis together with identifying areas for further research.

[1] World Cities Research, Final Report on World Cities, CfIT, 2005.

Figure 1.2 – Locations of Cities & Towns Studied

2. Key National Determinants

INTRODUCTION

2.1 This chapter considers transport inputs at the national level under the following headings:

- Demographic and socio-economic characteristics – which can have significant implications for the demand for transport, modal shares and expenditure and investment levels.
- Transport Networks – the supply of transport infrastructure and services can be an important influence in modal choice and a key determinant of integrated transport policy outputs such as reducing car dependency, improving accessibility to alternative modes and promoting social inclusion.
- Price of Travel – fuel prices and fares can impact on how frequently and how far people travel. Relative user costs can also influence modal choice and public perceptions of the value for money offered by a service.

DEMOGRAPHIC AND SOCIO-ECONOMIC DATA

2.2 Table 2.1 summarises updated values for the demographic and socio-economic indicators presented in the 2001 Report.

Table 2.1 – National Demographic & Socio-Economic Indicators, 1997/9 & 2003/4

Country	Population (mil)		Density (persons per sq km)		GDP per capita, PPS adjusted		Unemployment Rate (%)	
	1997	2004	1997	2003	1997	2003	1999	2003
Germany	82.0	82.5	230	231	106	100	8.4	9.9
UK	**58.9**	**59.7**	**242**	**244**	**102**	**107**	**6.0**	**5.0**
France	58.1	60.2	107	110	104	103		9.3
Italy	57.5	57.9	193	195	103	97	11.4	8.7
Spain	39.5	42.3		83	80	90	15.7	11.5
Netherlands	15.6	16.3	461	480	108	115	3.6	3.7
Greece	10.7	11.0	82	84	65	74	12.1	9.7
Belgium	10.2	10.4	334	340	107	109	8.6	8.2
Portugal	10.1	10.5	110	114	70	67	4.5	6.3
Sweden	8.8	9.0	22	22	105	107	7.6	5.7
Austria	8.0	8.1	97	99	113	111	3.7	4.2
Denmark	5.3	5.4	123	125	114	111	5.6	5.4

Country	Population (mil)		Density (persons per sq km)		GDP per capita, PPS adjusted		Unemployment Rate (%)	
	1997	2004	1997	2003	1997	2003	1999	2003
Finland	5.1	5.2	17	17	100	102	10.2	9.0
Ireland	3.7	4.0	54	58	102	123	5.8	4.7
Luxembourg	0.4	0.5	162	174	165	201	2.4	3.7
Poland	38.6	38.2		122	40	43		19.6
Czech Republic	10.3	10.2	133	132	62	62	8.8	7.8
Hungary	10.3	10.1	109	109	45	55	7.0	5.9
Slovak Republic	5.4	5.4	110	110	42	47	16.4	17.6
Lithuania	3.6	3.4	55	53	33	42	13.4	12.4
Latvia	2.4	2.3	39	37	29	38	13.8	10.5
Slovenia	2.0	2.0	99	99	65	70	7.4	6.7
Estonia	1.4	1.4	32	31	35	44	11.6	10.0
Cyprus	0.7	0.7	118	127	72	74		4.1
Malta	0.4	0.4	1189	1263		66		7.6
EU-25	448.9	457.2		118	91	92		9.2
EU-15	373.8	383.0			100	100		8.2

Source for population: EU Energy & Transport in Figures, 2005 (data for 1997 and 2004), Eurostat.

Source for population density: Eurostat database (data for 1997 and 2003), http://epp.eurostat.cee.eu.int Note that 1997 data for Spain and Poland is not available.

Source for GDP (PPS)[2]: EC Economic Data Pocket Book (Q4), 2005 (data for 1997 and 2003), Eurostat. Note that all 2003 GDP data are the forecast results of the European Commission and 1997 GDP data for NMS are estimations. No 1997 data for Malta is available.

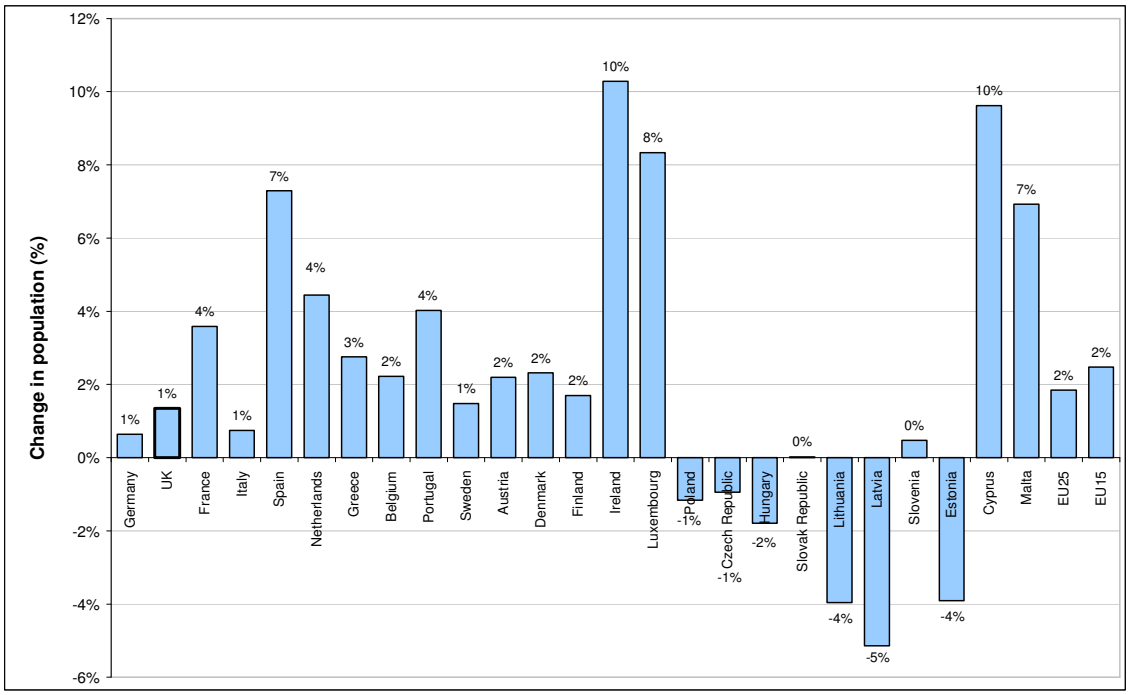
Source for unemployment rate: Eurostat database (data for 1999 and 2004), http://epp.eurostat.cee.eu.int Note that the figures shown are for 1999 and 2003 as 1998 data, as previously shown, was no longer available from the revised data source. Note that no 1999 data is available for France, Poland, Cyprus and Malta.

[2] Gross Domestic Product (GDP) is a measure for economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. GDP at constant prices (base year 1995) is used to measure the volume growth of GDP. Purchasing Power Parities (PPP) are currency conversion rates that convert national currencies to a common currency called Purchasing Power Standards (PPS), eliminating the differences in price levels between countries.

Population

2.3 Population across the EU as a whole has increased between 1997 and 2004 (Figure 2.1). Several New Member States have experienced reductions in population, notably Latvia (a 5 percent reduction), Lithuania and Estonia (both by 4 percent), though Cyprus and Malta have experienced increases in total population (by 10 percent and 7 percent, respectively). EU-15 countries have seen increases in total population, in particular Ireland (by 10 percent), Luxembourg (an 8 percent increase) and Spain (by 7 percent).

Figure 2.1 –Change in Population (%), 1997-2004 (EU-25)

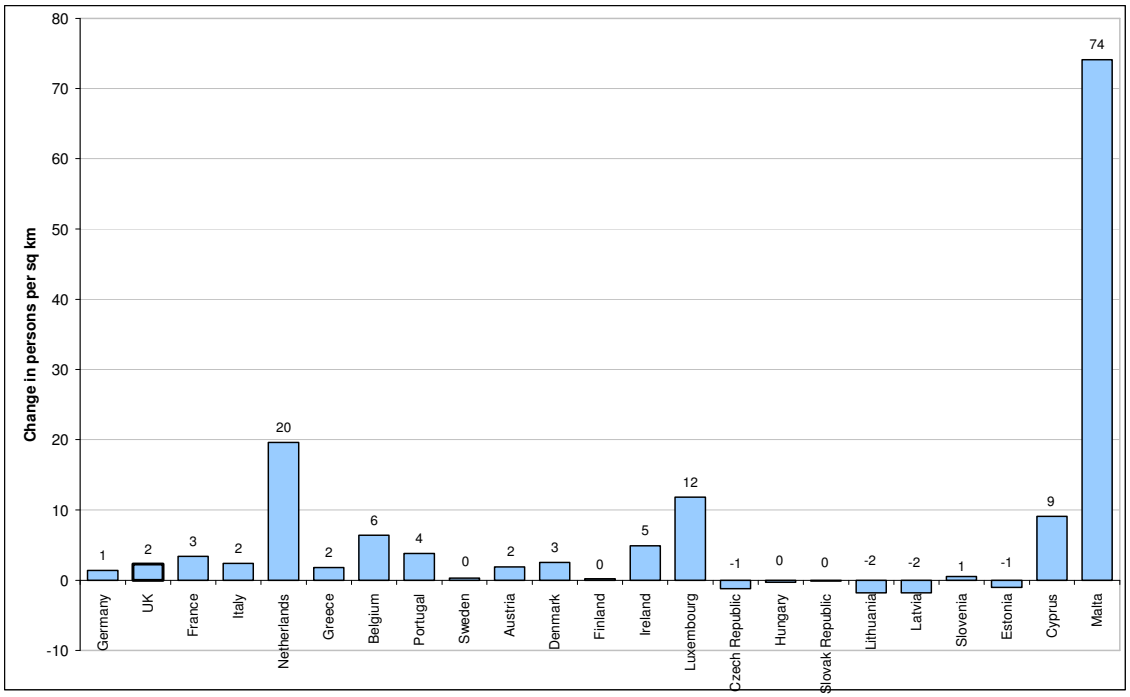


Source: EU Energy & Transport in Figures, 2005 (data for 1997 and 2004), Eurostat.

Population Density

2.4 Population density has increased in most European countries, notably in Malta (by 74 persons per square kilometre), the Netherlands (20 persons per square kilometre) and Luxembourg (12 persons per square kilometre). The UK has experienced an increase in population density of 2 persons per square kilometre between 1997 and 2003 (Figure 2.2).

Figure 2.2 – Change in Density, 1997-2003 (EU-25)

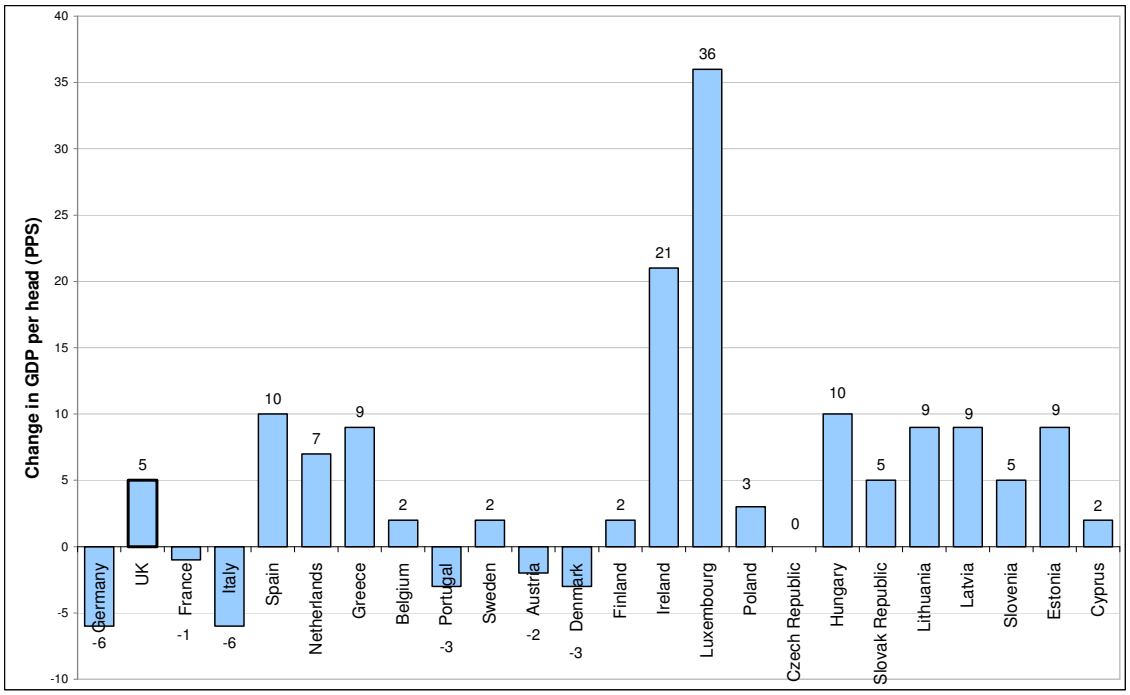


Source: Eurostat database (data for 1997 and 2003), http://epp.eurostat.cec.eu.int. Note that 1997 data for Spain and Poland is not available.

GDP per capita

2.5 GDP per capita (PPP adjusted) has increased in most European countries between 1997 and 2003, notably in Luxembourg and Ireland (Figure 2.3). However, Germany, Italy, Portugal, Denmark, Austria and France have experienced reductions in GDP per capita. The UK's GDP per capita ratio has increased from 102 in 1997 to 107 in 2003.

Figure 2.3 – Change in GDP per capita in PPS, 1997-2003 (EU-25)

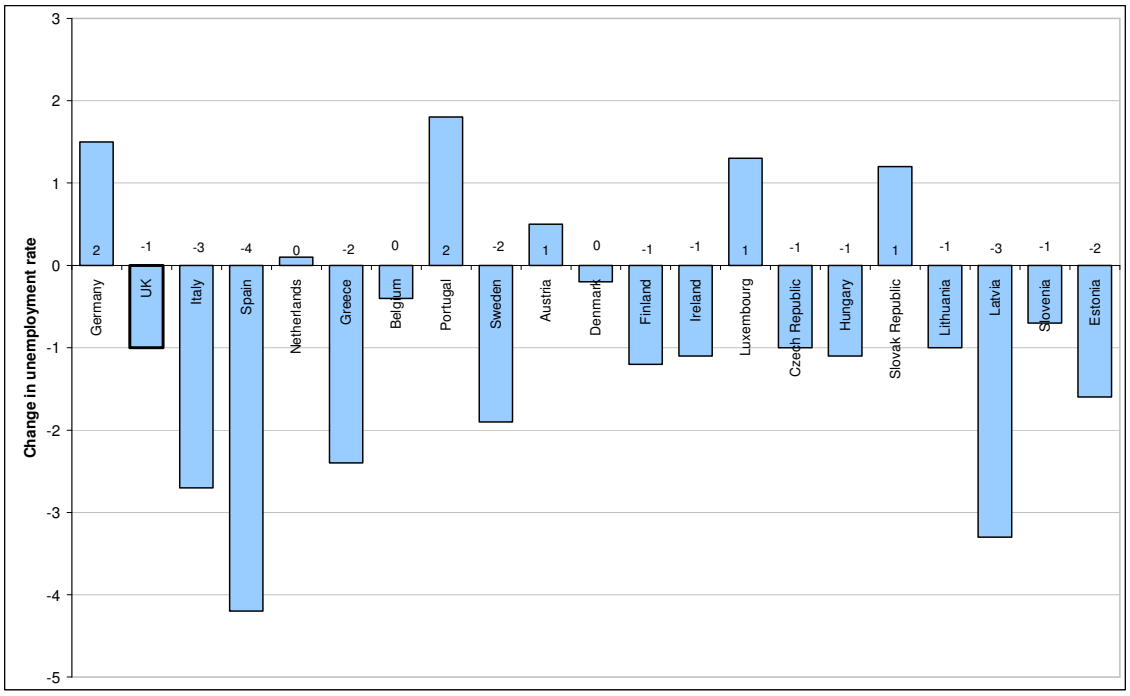


Source: EC Economic Data Pocket Book, 2005 (Q4) (data for 1997 and 2003), Eurostat. Note that all 2003 GDP data are the forecast results of the European Commission and 1997 GDP data for NMS are estimations. No 1997 data for Malta is available.

Unemployment

2.6 The unemployment rate has fallen in all the EU-15 countries other than Germany, the Netherlands, Portugal, Austria and Luxembourg, as shown in Figure 2.4. In The UK, the unemployment rate has fallen by 1 percent (from 6 percent in 1999 to 5 percent in 2003). Similarly, all New Member States but Slovak Republic have experienced decreases in unemployment.

Figure 2.4 – Change in Unemployment Rate, 1999-2003 (EU-25)



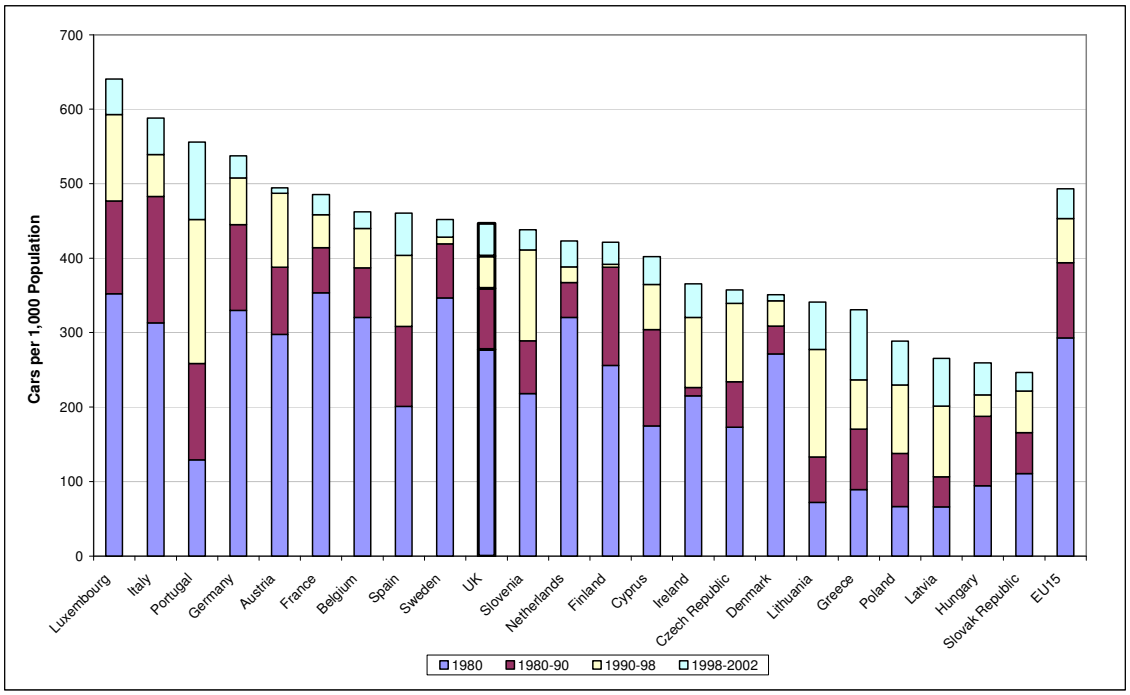
Source: Eurostat database (data for 1999 and 2003), http://epp.eurostat.cec.eu.int. Note that 1999 unemployment data for France, Poland, Cyprus and Malta is not available.

VEHICLE OWNERSHIP

Cars

2.7 The UK has a lower level of car ownership than nine other EU-15 countries (Figure 2.5). Most of New Member States show levels of car ownership as much as half of those in countries such as Luxembourg, Italy and Germany.

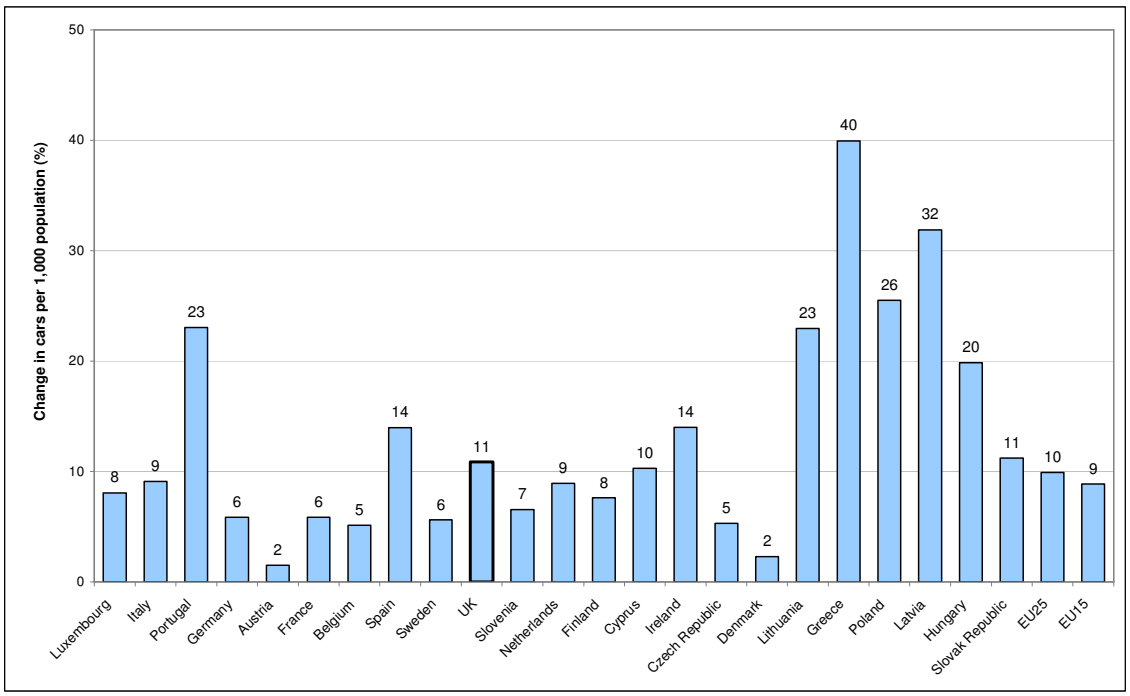
Figure 2.5 – Car Ownership, 1980-2002 (EU-25)



Source: EU Energy & Transport in Figures, 2005 (data for 1980-2002), Eurostat. Note: Estonia data unreliable and thus excluded. No data available for Malta for 1980-98.

2.8 Figure 2.6 shows that car ownership continues to increase in all countries across Europe, with the largest increases being in Greece and Portugal and the New Member States. An 11 percent increase in the UK is similar to the EU-15 and EU-25 averages of 9 percent and 10 percent respectively over the period 1998-2002.

Figure 2.6 – Change in Car Ownership (%), 1998-2002 (EU-25)



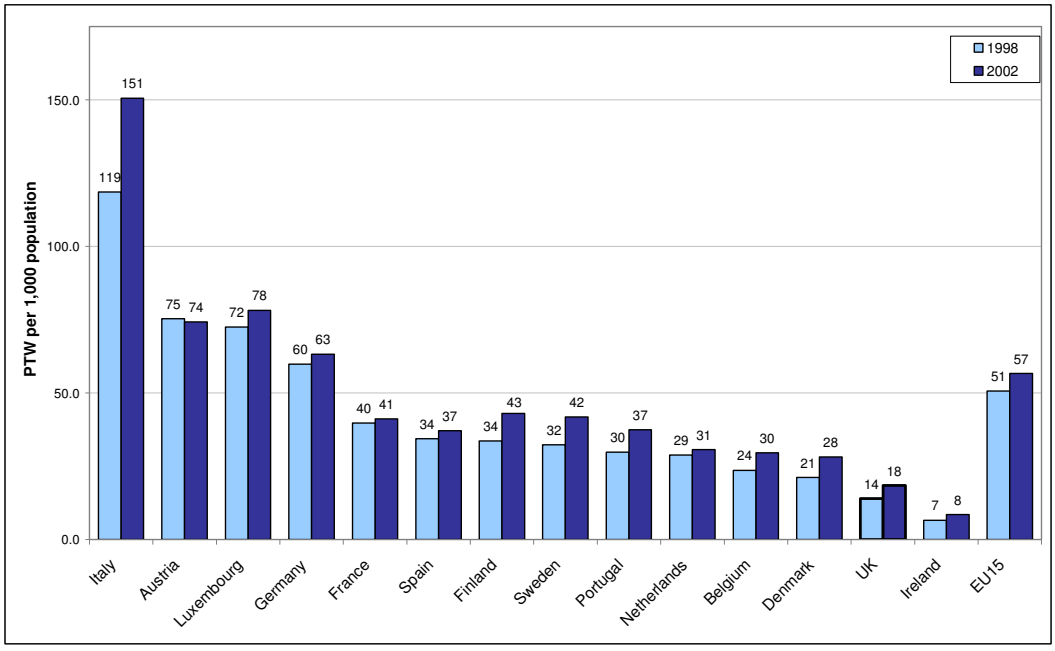
Source: EU Energy & Transport in Figures, 2005 (data for 1998-2002), Eurostat. Note: Estonia data unreliable and thus excluded. No data available for Malta.

Powered Two-Wheelers

2.9 The UK has the second lowest level of ownership of powered two wheeler vehicles of the EU-15 countries (excluding Greece for which no data exists) – see Figure 2.7. However, this has increased by 4 per 1000 population (equivalent to 32 percentage points) in the last four years. Denmark, Sweden, Finland and Ireland have also seen large percentage increases (Table 2.2).

2.10 Italy has by far the highest level of powered two wheeler ownership at 151 vehicles per 1000 population. Note that the data used in Figure 2.7 is not comparable to the 1998 data shown in the 2001 report. This is down to errors in the reporting of the 1998 data.

Figure 2.7 – Powered Two Wheeler Ownership, 1998 & 2002 (EU-15)



Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat. Note that no data is available for Greece.

Table 2.2 – Change in Powered Two-Wheeler Ownership, 1998-2002 (EU-15)

Country	PTW per 1,000 population		% Change 1998-2002
	1998	2002	
Italy	118.5	150.5	+27.0
Austria	75.4	74.2	-1.5
Luxembourg	72.5	78.1	+7.8
Germany	59.8	63.2	+5.7
France	39.8	41.1	+3.3
Spain	34.4	37.1	+8.0
Finland	33.7	43.0	+27.8
Sweden	32.3	41.8	+29.3
Portugal	29.8	37.5	+25.8
Netherlands	28.8	30.7	+6.5
Belgium	23.7	29.6	+25.3
Denmark	21.2	28.2	+33.1
UK	**14.0**	**18.4**	**+31.5**
Ireland	6.6	8.5	+28.7
EU-15	50.7	56.7	11.7

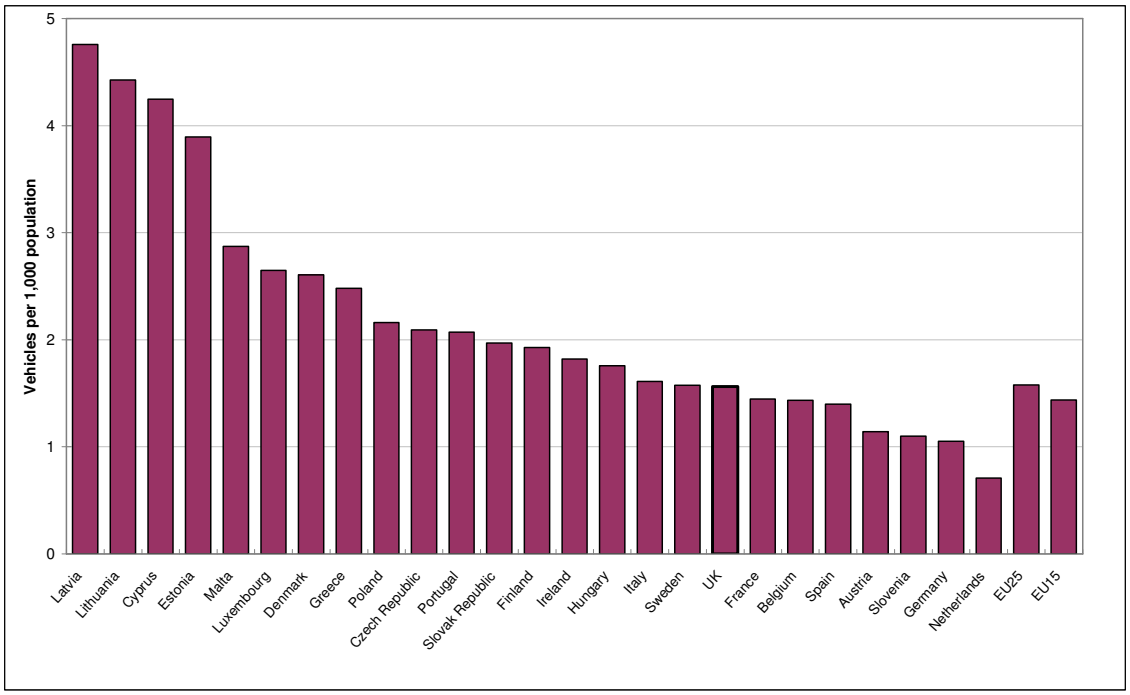
Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat. No data is available for Greece.

PUBLIC TRANSPORT PROVISION

Bus and Coach

2.11 Compared with the EU-15 many of the New Member States have a large supply of road based public transport in relation to their population levels (Figure 2.8). The UK's supply of buses and coaches (1.6 per thousand population) is close to the EU-25 average of 1.6.

Figure 2.8 – Bus and Coach Supply, 2002 (EU-25)



Source: EU Energy & Transport in Figures, 2005 (data for 2002), Eurostat.

2.12 The UK has experienced a 15 percent increase in the supply of buses and coaches per thousand population during the period 1998-2002 (Table 2.3).

Table 2.3 – Change in Bus and Coach Supply, 1998-2002 (EU-25)

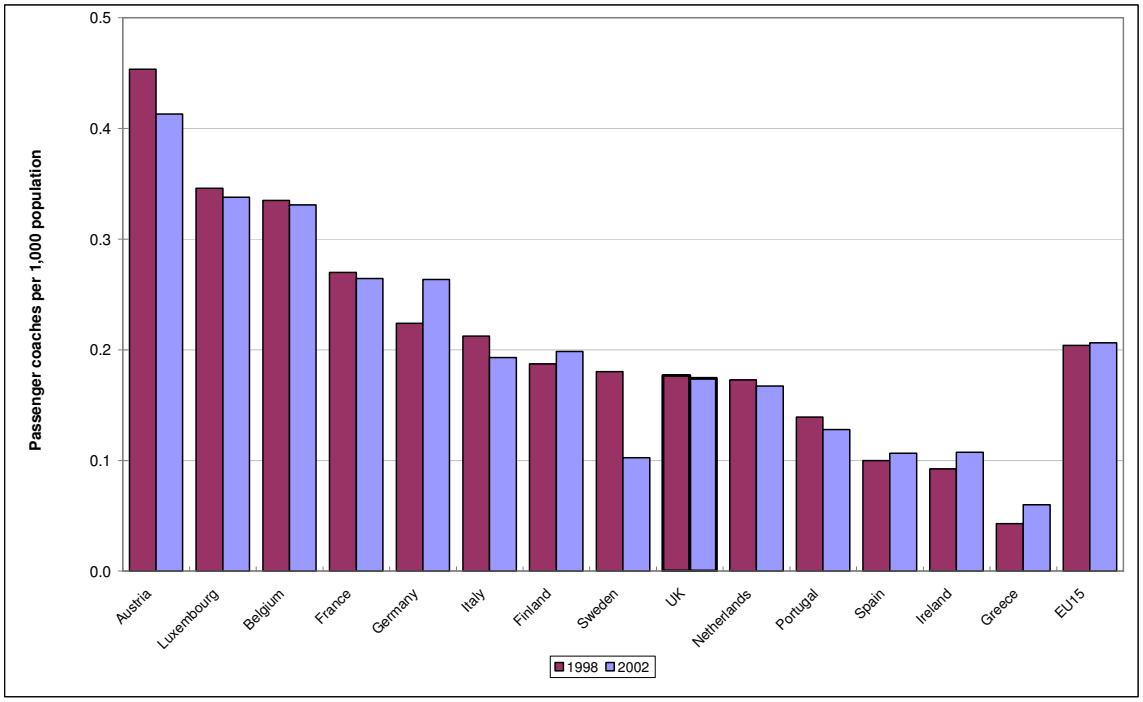
Country	Vehicles per 1,000 population		
	1998	2002	% Change 1998-2002
Latvia	4.8	4.8	+0.1
Lithuania	4.3	4.4	+4.0
Cyprus	4.1	4.2	+4.1
Estonia	4.5	3.9	-13.9
Malta	3.0	2.9	-3.2
Luxembourg	2.2	2.6	+18.3
Denmark	2.6	2.6	-0.8
Greece	2.4	2.5	+1.8
Poland	2.1	2.2	+3.5
Czech Republic	1.9	2.1	+7.9
Portugal	1.7	2.1	+19.5
Slovak Republic	2.1	2.0	-6.1
Finland	1.8	1.9	+9.7
Ireland	1.7	1.8	+10.2
Hungary	1.8	1.8	-3.9
Italy	1.5	1.6	+9.2
Sweden	1.7	1.6	-6.6
UK	**1.4**	**1.6**	**+15.1**
France	1.5	1.4	-0.7
Belgium	1.4	1.4	+0.1
Spain	1.3	1.4	+6.6
Austria	1.2	1.1	-5.9
Slovenia	1.2	1.1	-6.4
Germany	1.0	1.0	+2.8
Netherlands	0.7	0.7	+0.5
EU-15	1.5	1.6	+4.5
EU-25	1.4	1.4	+2.6

Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat.

Rail

2.13 The UK's supply of rail passenger transport, in terms of the number of rail coaches per thousand population (0.17), is slightly below the EU-15 average of 0.21 (Figure 2.9).

Figure 2.9 – Rail Supply, 1998 and 2002 (EU-15)



Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat.
Note that the 2002 value for the UK is judged to be unreliable. Therefore the 2001 value has been used in its place.
As no 2002 data is available for Portugal, the 2001 value has been used instead.
The data for Denmark is inconsistent between pocketbooks depending on the year of publication. As a reliable value cannot be provided, none have been included.

2.14 Germany, Sweden and Greece have experienced large changes in rail supply per thousand population over the period 1998-2002 (Table 2.4).

Table 2.4 – Change in Rail Supply, 1998-2002 (EU-15)

Country	Passenger Coaches Per 1,000 Population		
	1998	2002	% Change 1998-2002
Austria	0.5	0.4	-9.0
Luxembourg	0.3	0.3	-2.4
Belgium	0.3	0.3	-1.2
France	0.3	0.3	-2.1
Germany	0.2	0.3	+17.8
Italy	0.2	0.2	-9.0

Country	Passenger Coaches Per 1,000 Population		
	1998	2002	% Change 1998-2002
Finland	0.2	0.2	+5.9
Sweden	0.2	0.1	-43.2
UK	0.2	0.2	-1.5
Netherlands	0.2	0.2	-3.2
Portugal	0.1	0.1	-8.0
Spain	0.1	0.1	+6.6
Ireland	0.1	0.1	+16.4
Greece	0.0	0.1	+40.5
EU-15	*0.2*	*0.2*	*+1.1*

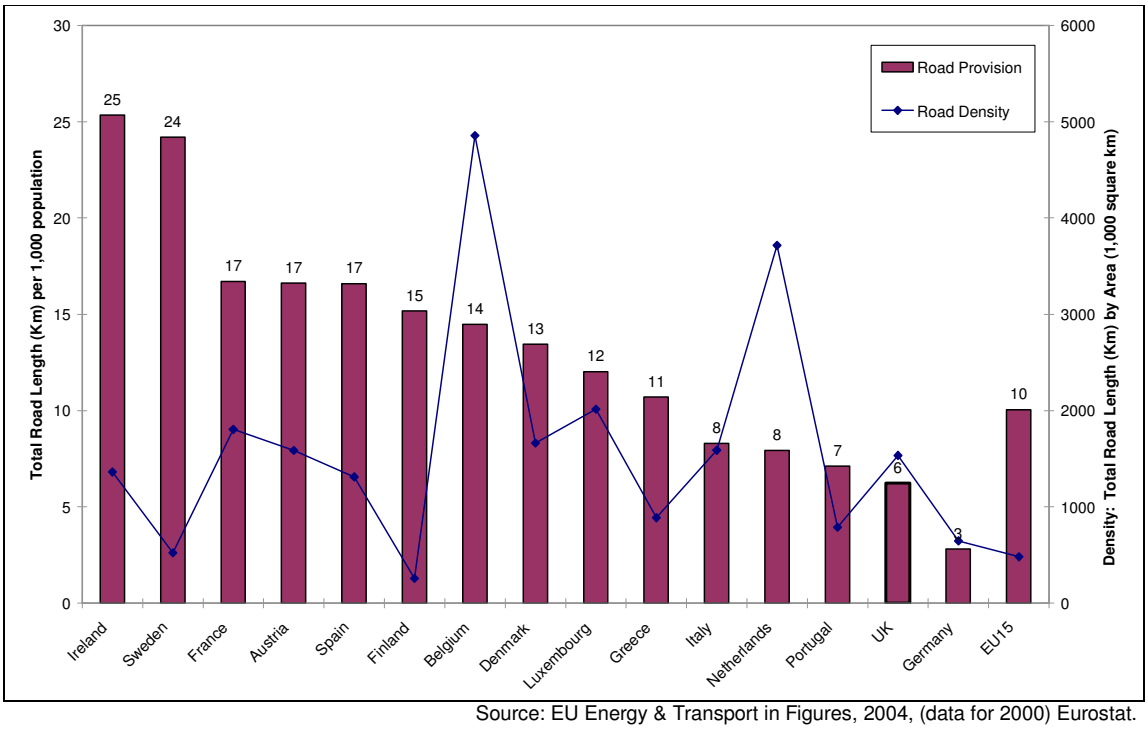
Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat.
Note that the 2002 value for the UK is judged to be unreliable. Therefore the 2001 value has been used in its place.
As no 2002 data is available for Portugal, the 2001 value has been used instead.
The data for Denmark is inconsistent between pocketbooks depending on the year of publication. As a reliable value cannot be provided, none have been included.

TRANSPORT NETWORKS

Supply of Road Space

2.15 The UK has a lower road provision of road length relative to population and land area than all other EU-15 countries except Germany (Figure 2.10).

Figure 2.10 – Road Provision, 2000 (EU-15)



Source: EU Energy & Transport in Figures, 2004, (data for 2000) Eurostat.

2.16 Table 2.5 shows a wide variation in the provision of road length per thousand population for the New Member States, with the Baltic States well above the EU-15 average of 10 km per 1,000 inhabitants. Other New Member States such as Slovak Republic and Malta have a lower figure.

Table 2.5 – Road Provision, 2000 (New Member States)

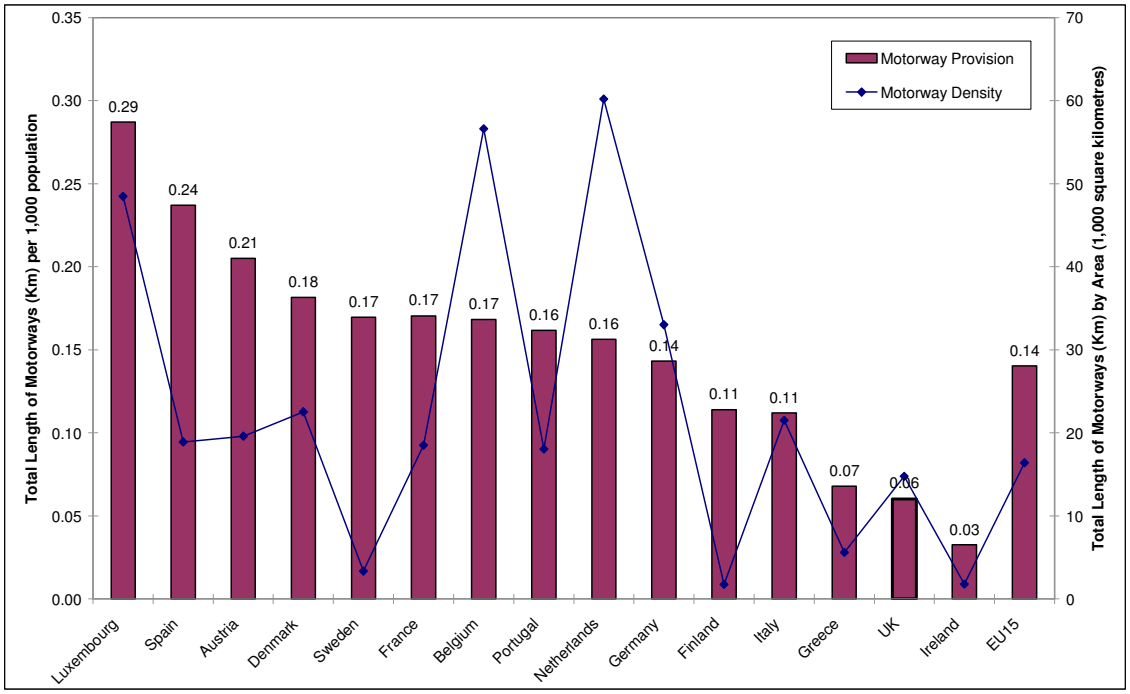
Country	Road Provision (km per 1,000 population)
Estonia	38
Latvia	29
Lithuania	22
Cyprus	17
Hungary	16
Czech Republic	12
Slovenia	10
Poland	9
Slovak Republic	8
Malta	6

Source: EU Energy & Transport in Figures, 2004, (data for 2000) Eurostat.

Motorway Provision

2.17 Figure 2.11 shows the UK's motorway provision per thousand population (0.06) to be lower than the EU-15 average of 0.14 km per thousand population. Table 2.6 shows wide variation in motorway provision amongst New Member States.

Figure 2.11 – Motorway Provision, 2001 (EU-15)



Source: EU Energy & Transport in Figures, 2005, (data for 2001), Eurostat.

Table 2.6 – Motorway Provision, 2001 (New Member States)

Country	Motorway Provision (km per 1,000 population)
Cyprus	0.37
Slovenia	0.22
Lithuania	0.12
Estonia	0.07
Slovak Republic	0.06
Czech Republic	0.05
Hungary	0.04
Poland	0.01

Source: EU Energy & Transport in Figures, 2005, (data for 2001), Eurostat. Note that no data is available for Malta or Latvia

Table 2.7 – Change in Motorway Provision, 1998-2001 (EU-15)

Country	% Change in Motorway Provision (km per 1,000 population) 1998-2001	% Change in Motorway Density (km per 1,000 sq kms) 1998-2001
Luxembourg	+5	+10
Spain	+13	+16
Austria	+1	+2
Denmark	+10	+11
Sweden	+4	+5
France	+7	+8
Belgium	+2	+3
Portugal	+31	+33
Netherlands	+10	+12
Germany	+3	+3
Finland	+24	+25
Italy	+0	+0
Greece	+47	+48
UK	**+0**	**+2**
Ireland	+17	+21
EU-15	*+7*	*+8*

Source: EU Energy & Transport in Figures, 2005, (data for 1998 and 2001), Eurostat.

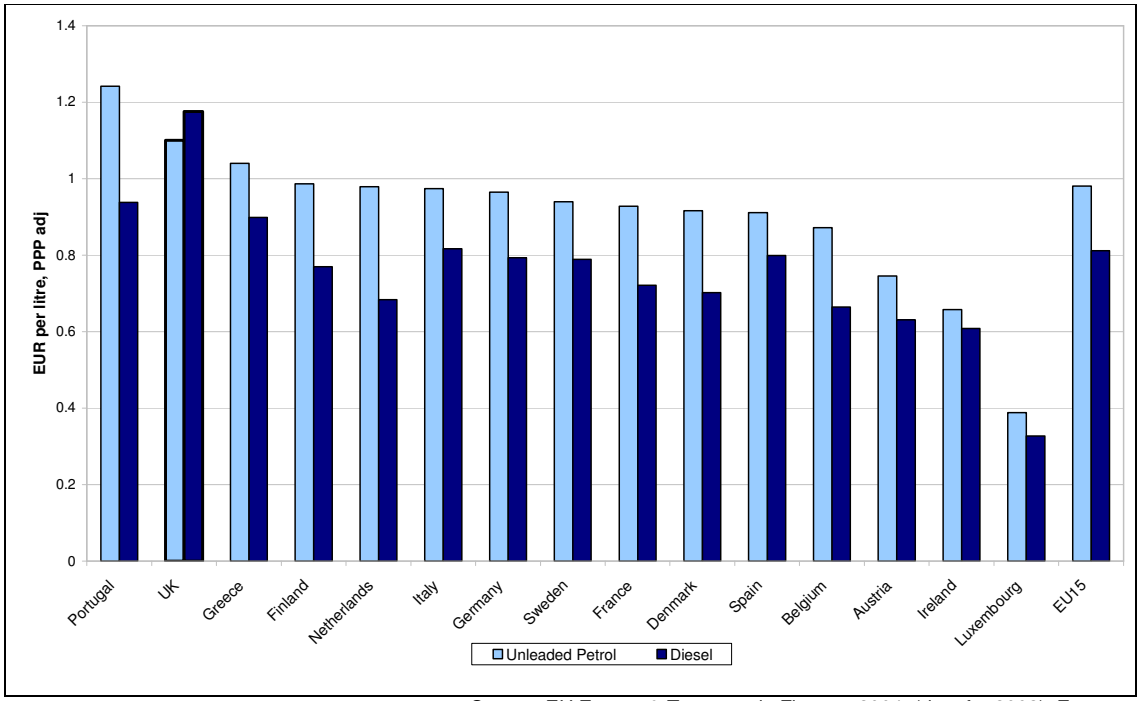
2.18 The UK has not increased its motorway provision per thousand population between 1998-2001, similar to Italy and Austria (Table 2.7). Finland, Spain, the Netherlands and Denmark have seen much larger increases (by at least 10 percent). The peripheral EU-15 countries, presumably assisted through the cohesion funding, have increased motorway provision by 15 percent or more (and over 40 percent in Greece). Greece and Portugal have also experienced the greatest increases in motorway density.

PRICE OF TRAVEL

Fuel Prices

2.19 Figure 2.12 shows that PPP adjusted diesel prices in the UK are the highest in the EU, while the price of unleaded fuel is greater than all countries other than Portugal.

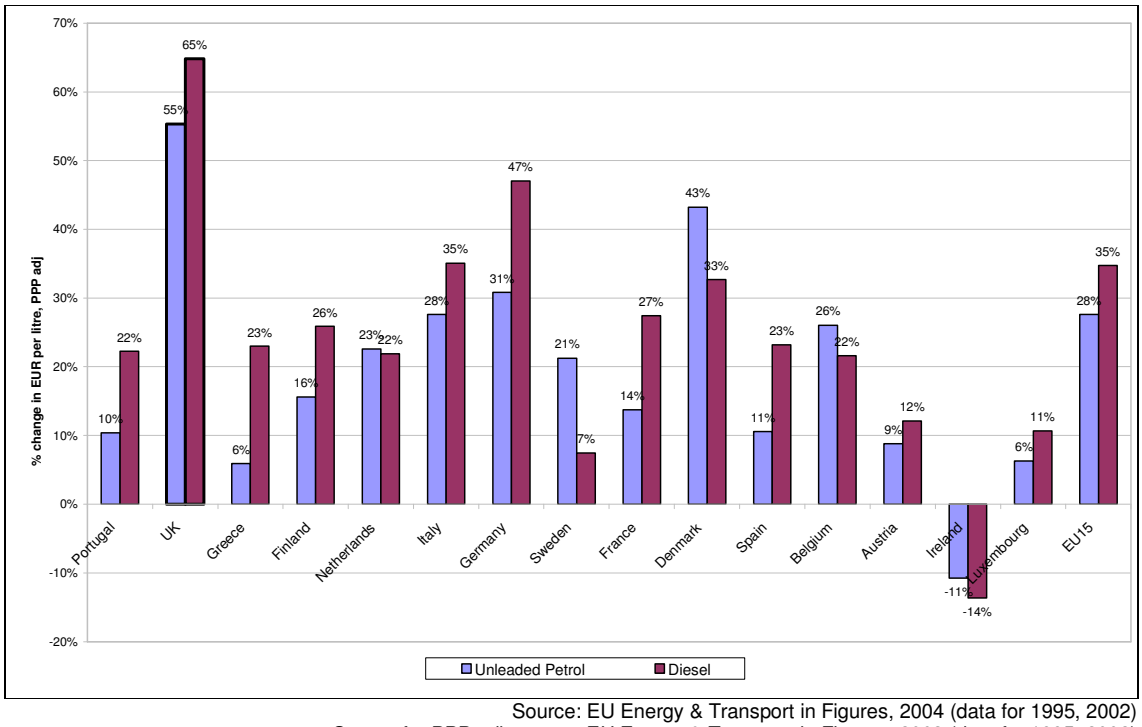
Figure 2.12 – Sales Price of Fuel (PPP adjusted), 2004 (EU-15)



Source: EU Energy & Transport in Figures, 2004, (data for 2002), Eurostat.
Source for PPP adjustment: EU Energy & Transport in Figures, 2003, (data for 2002), Eurostat.

2.20 Figure 2.13 demonstrates that the UK has also experienced the greatest increases in fuel prices between 1995 and 2002 – 55 percent for petrol and 65 percent for diesel. Diesel prices have increased by more than unleaded petrol in all countries except the Netherlands, Sweden and Luxembourg (where petrol and diesel prices have fallen).

Figure 2.13 – Change in Sales Price of Fuel (PPP adjusted), 1995-2002 (EU-15)



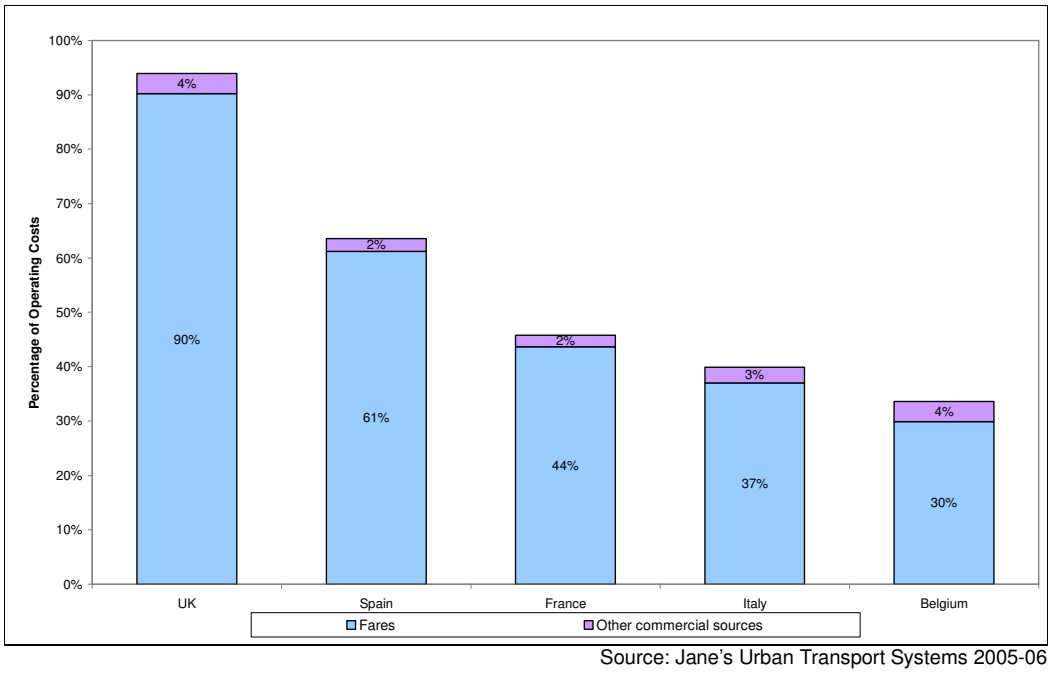
Source: EU Energy & Transport in Figures, 2004 (data for 1995, 2002)
Source for PPP adjustment: EU Energy & Transport in Figures, 2003 (data for 1995, 2002)

REVENUE SUPPORT

2.21 Analysis of revenue sources for bus systems (Figure 2.14) and all public transport modes (Figure 2.15) in several European cities[3] shows that buses in the UK receive the greatest proportion of their revenues from fares and other commercial sources. This is discussed in more detail in Part 2.

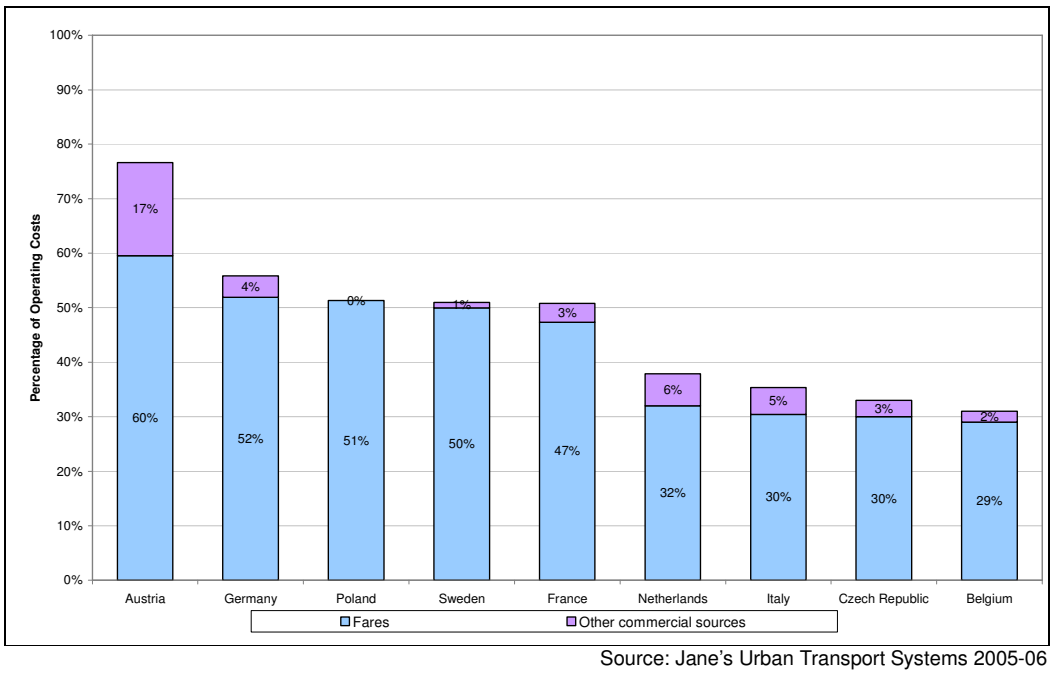
[3] These are average figures calculated for all cities for which data is available. Figure 2.14: data for UK based on 11 cities, France – 7, Spain – 5, Italy – 4, Belgium – 2. Figure 2.15: data for Austria based on 3 cities, Germany – 9, Poland – 5, Sweden – 2, France – 6, Netherlands – 3, Italy – 3, Czech Republic – 2, Belgium – 2.

Figure 2.14 – Revenue Sources for Buses, 2005



Source: Jane's Urban Transport Systems 2005-06

Figure 2.15 – Revenue Sources for All Public Transport Modes, 2005



Source: Jane's Urban Transport Systems 2005-06

3. National Mobility and Modal Choice

INTRODUCTION

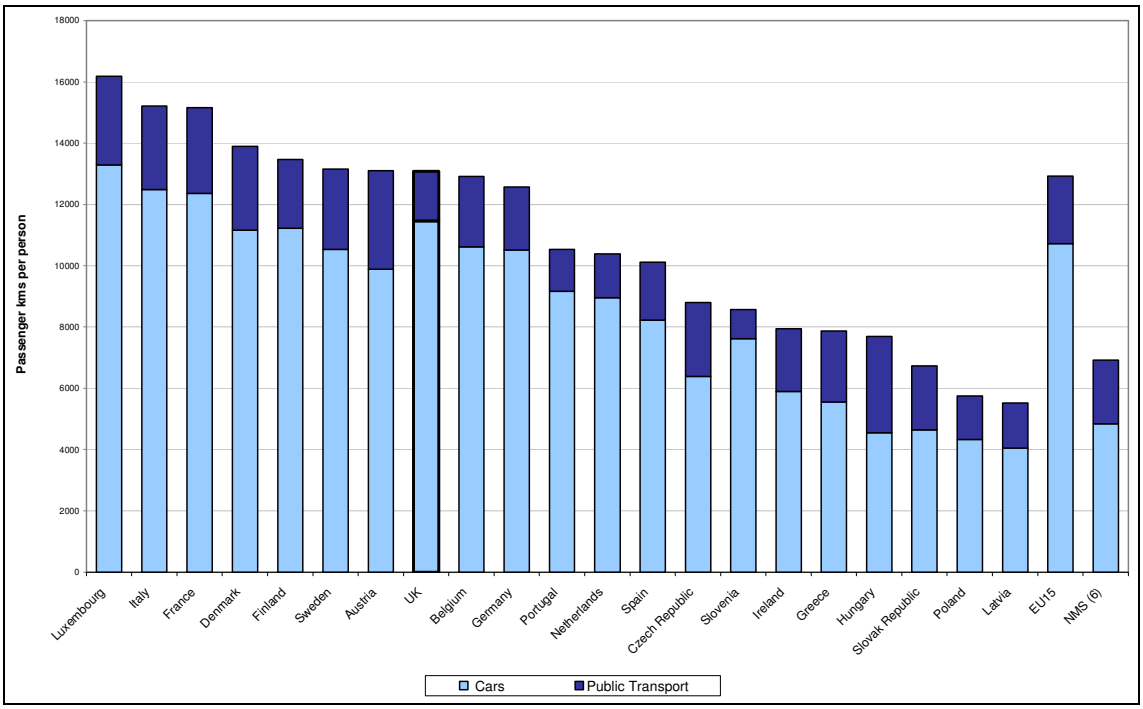
3.1 This chapter looks at levels of mobility and national performance against the desired integrated transport policy outcome of reducing the volume of travel, particularly by private car and encouraging alternative modes.

HOW MUCH DO PEOPLE TRAVEL?

3.2 Travel distance per capita by motorised mode in the UK remains close to the EU-15 average with Luxembourg having the highest level (24 percent above the UK figure) and Spain the lowest level in the EU-15 (23 percent below the UK figure) – see Figure 3.1

3.3 The New Member States, for which data is available, all have lower levels of motorised travel per capita.

Figure 3.1 – Motorised Travel, 2002



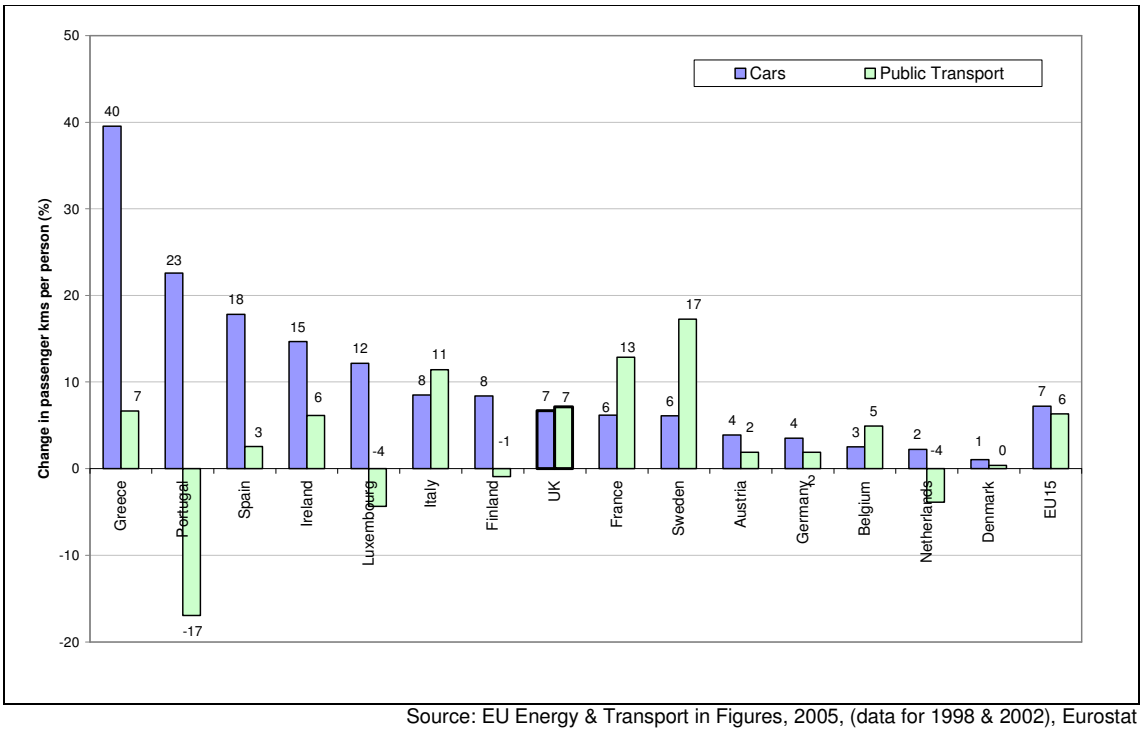
Source: EU Energy & Transport in Figures, 2005, (data for 2002), Eurostat.
Note that 'public transport' is defined as buses and coaches, high speed rail, interurban rail and urban rail (tram & metro).

3.4 The UK's growth in the amount of car travel per capita between 1998 and 2002 is in line with the EU-15 average (Figure 3.2). The highest levels of growth in car travel have been in Greece, Portugal, Spain and Ireland, reflecting above average growth (from a relatively low base) in GDP over the last two decades.

3.5 Countries such as France and Finland with levels of long-term growth similar to those in the UK have seen comparable levels of growth in car travel (between 6 and 8 percent) between 1998 and 2002 (Figure 3.2). Belgium, Denmark and the Netherlands have experienced negligible growth of between 1 and 3 percent.

3.6 In the UK, public transport use (+7 percent) has increased at a similar rate to car use (+7 percent) between 1998 and 2002. This increase is broadly in line with the EU-15 average (+6 percent). However, in Sweden, Italy, France and Belgium there has been a greater increase in public transport use compared to car use, with the greatest increase in public transport travel being in Sweden (+17 percent). Portugal has experienced a significant decrease in public transport use (-17 percent).

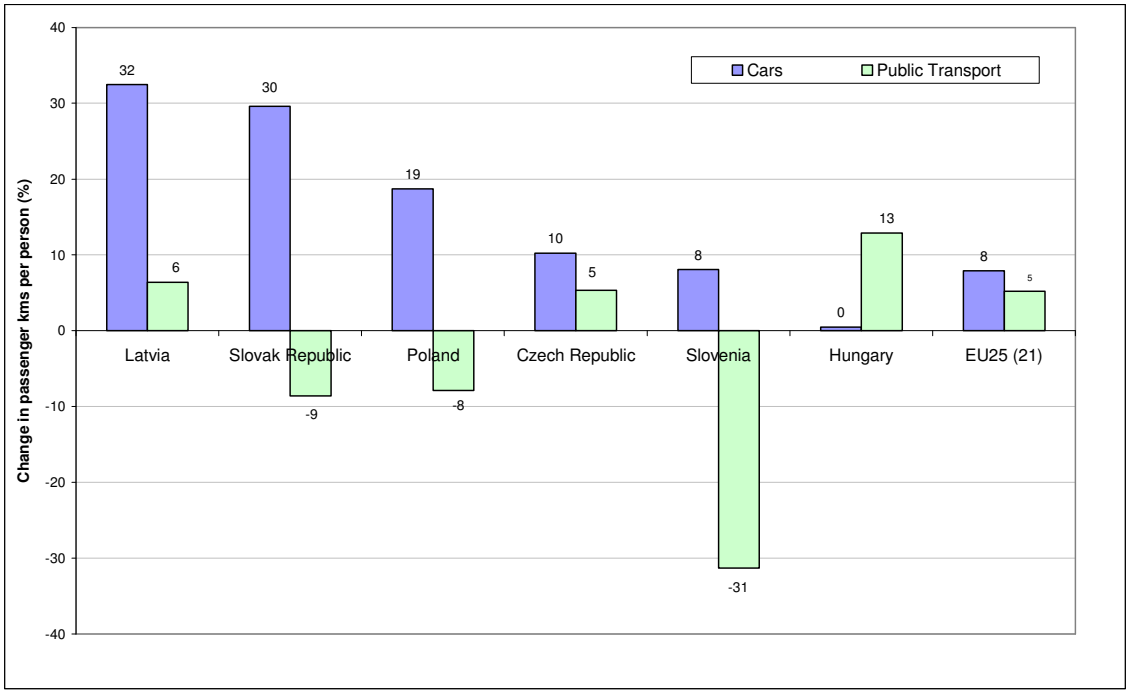
Figure 3.2 – Change in Motorised Travel (%), 1998-2002 (EU-15)



Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat
Note that 'public transport' is defined as buses and coaches, high speed rail, interurban rail and urban rail (tram & metro)

3.7 Analysis of the change in motorised travel by car for some of the New Member States (Figure 3.3) shows that in Latvia, the Slovak Republic and Poland there has been an increase in car travel substantially higher than across the EU as a whole. At the same time, public transport use has declined in three of the New Member States, reflecting an increased dependency on car travel.

Figure 3.3 – Change in Motorised Travel (%), 1998-2002 (Selected NMS)

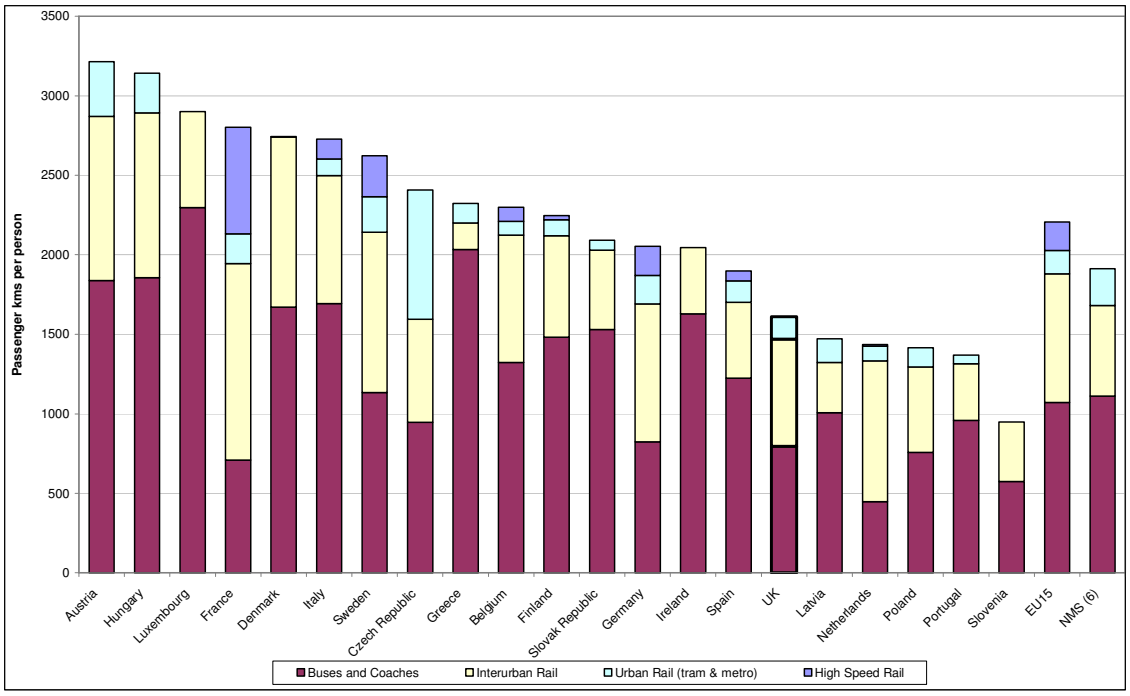


Source: EU Energy & Transport in Figures, 2005, (data for 1998 & 2002), Eurostat.
Note that 'public transport' is defined as buses and coaches, high speed rail, interurban rail and urban rail (tram & metro)

3.8 Travel by public transport varies considerably as shown in Figure 3.4. Passenger kilometres per capita by public transport modes in Austria, Hungary and Luxembourg are twice that in Latvia, Netherlands, Poland, Portugal and Slovenia. The UK level of public transport use is 27 percent below the EU average and is lower than all of the EU-15 countries other than the Netherlands and Portugal.

3.9 The mode of public transport use also varies considerably with bus use being greatest in Greece and Luxembourg. Rail use is greatest in France, Sweden, Czech Republic, , Hungary, Germany and Austria. Rail use in the UK is 28 percent below the EU-15 average.

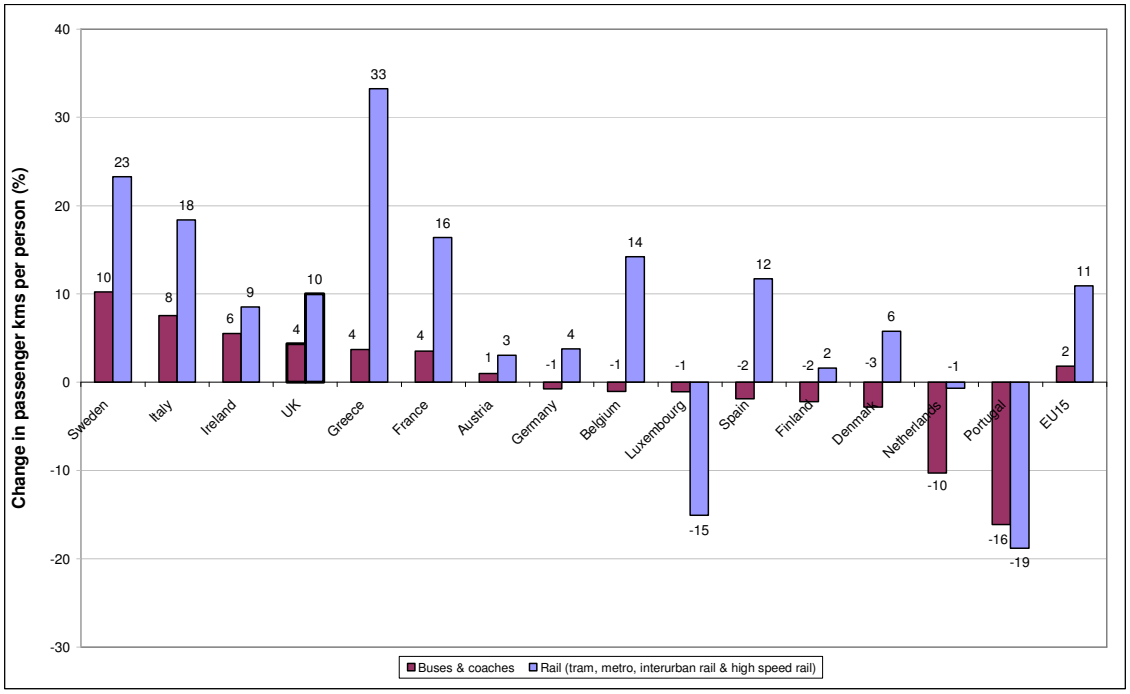
Figure 3.4 – Public Transport Mobility, 2002



Source: EU Energy & Transport in Figures, 2005, (data for 2002), Eurostat.

3.10 Changes in public transport mobility vary widely across the EU-15 countries (Figure 3.5) with Greece experiencing a large (33 percent) growth in rail travel while there is a 19 percent reduction in Portugal and a 15 percent reduction in Luxembourg. Rail travel in the UK has grown significantly faster than bus travel between 1998 and 2002.

Figure 3.5 – Change in Public Transport Mobility (%), 1998 – 2002 (EU-15)



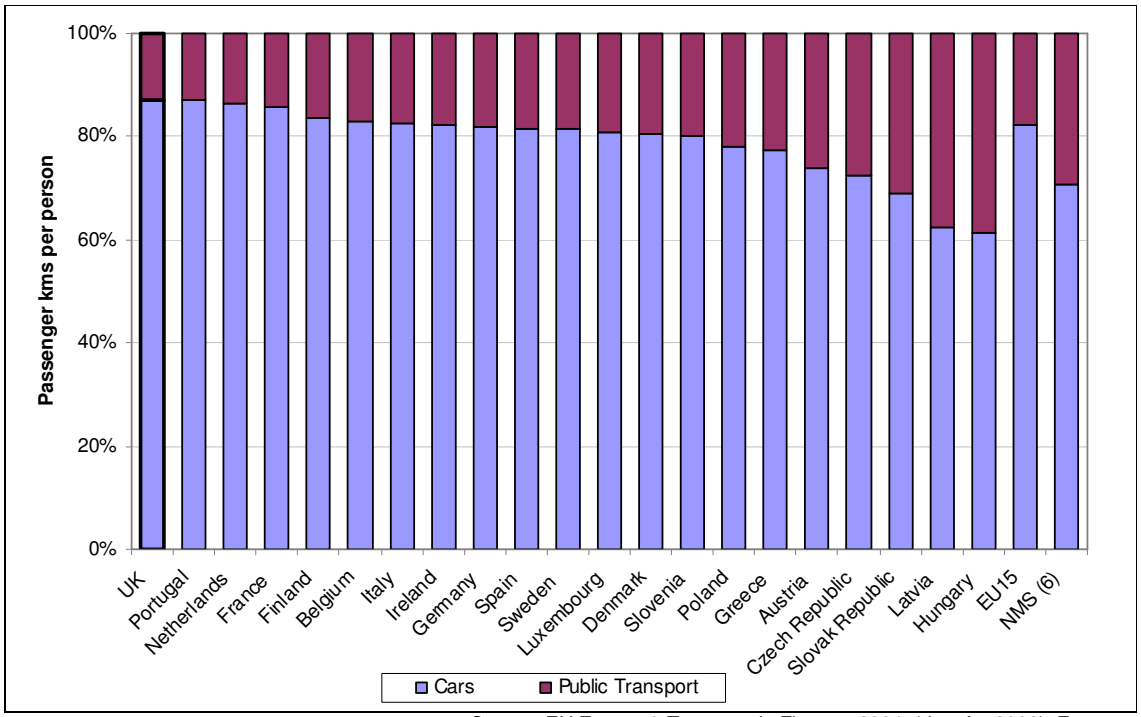
Source: EU Energy & Transport in Figures, 2005, (data for 1998 and 2002), Eurostat.

BY WHAT MOTORISED MODE DO PEOPLE TRAVEL?

3.11 Figure 3.6 shows that the UK has the highest car dependency and lowest public transport mode share, within the EU. Taking account of powered two-wheeler travel (Figure 3.7) reveals the same story with the UK having a car mode share of 85 percent - higher than all other EU countries.

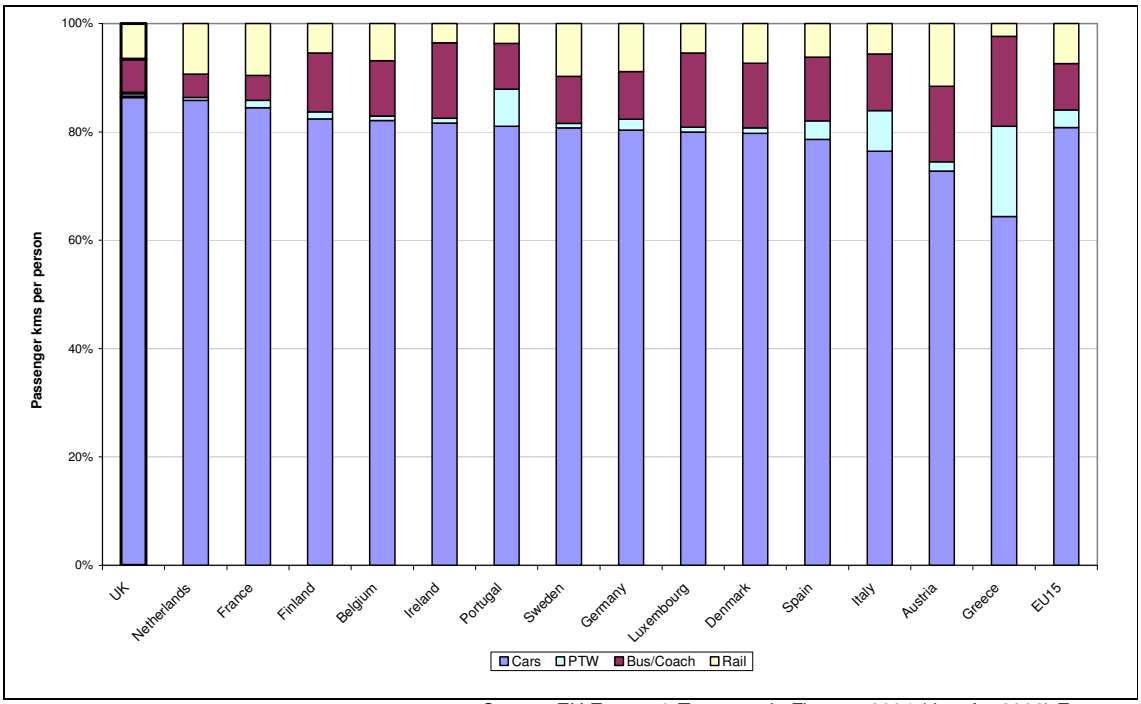
3.12 Figure 3.6 also shows, notwithstanding a rapid growth in car use over recent years, the relatively low level of car dependency in New Member States.

Figure 3.6 – Modal Shares for Cars and Public Transport, 2002



Source: EU Energy & Transport in Figures, 2004, (data for 2002), Eurostat.

Figure 3.7 – Modal Shares for All Motorised Transport, 2002 (EU-15)

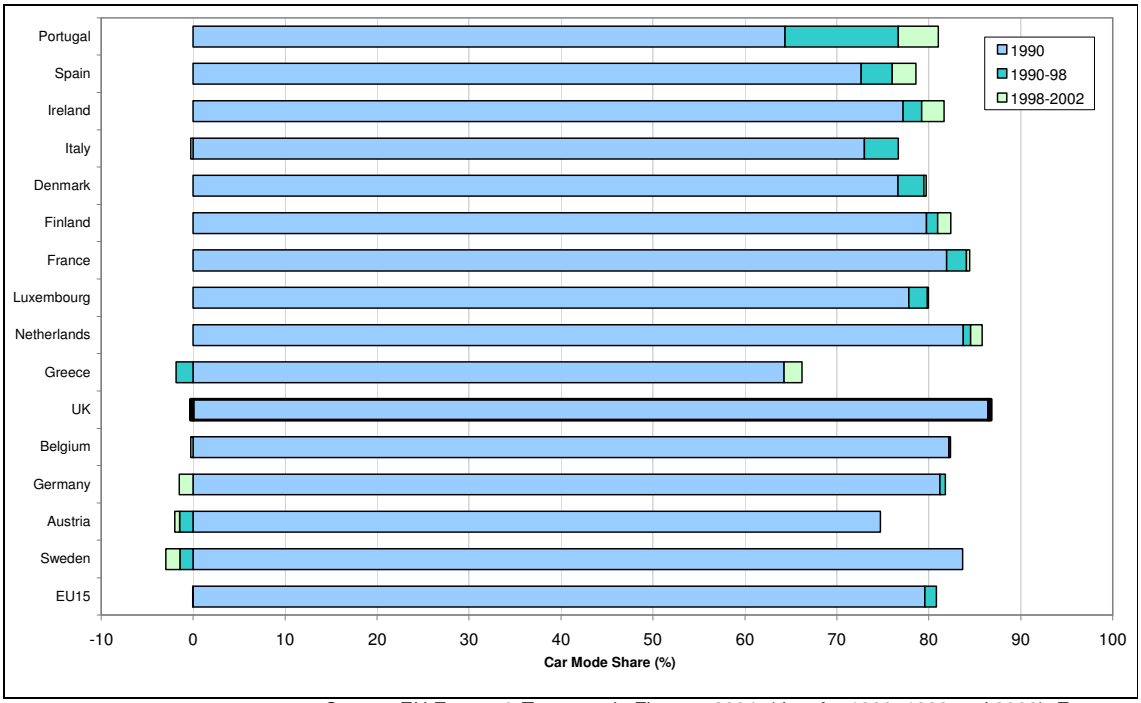


Source: EU Energy & Transport in Figures, 2004 (data for 2002) Eurostat.

3.13 Figure 3.8 shows that since 1990 car mode share in the UK has changed very little and in the period 1998 to 2002, has fallen very marginally (-0.3 percent). This

contrasts with countries such as Portugal, Spain and Ireland where car mode shares have continued to increase. Many of the EU-15 countries, however, demonstrate little or no growth in car mode share with Germany, Sweden and Belgium all experiencing a decline between 1998 and 2002.

Figure 3.8 – Car Modal Share 1990-2002 (EU-15)



Source: EU Energy & Transport in Figures, 2004, (data for 1990, 1998 and 2002), Eurostat.

3.14 Table 3.1 reveals that in eight of the EU-15 countries, and all those experiencing a decline in car mode share other than Germany, the mode share for rail has increased marginally. In contrast bus mode share has declined in all the EU-15 countries apart from Sweden, Germany, Italy and Austria.

Table 3.1 – Change in Modal Shares for Motorised Transport (1998-2002)

Country	Change			
	Cars (%)	PTW (%)	Bus/Coach (%)	Rail (%)
UK	**-0.3**	**+0.1**	**-0.1**	**+0.4**
Netherlands	+1.3	-0.1	-0.5	-0.7
France	+0.3	-0.1	-0.7	+0.5
Finland	+1.4	-0.1	-1.0	-0.4
Belgium	-0.3	0.0	-0.4	+0.7
Ireland	+2.4	-0.1	-1.9	-0.4
Portugal	+4.4	+0.4	-3.2	-1.6
Sweden	-1.5	+0.2	+0.2	+1.2

Country	Change			
	Cars (%)	PTW (%)	Bus/Coach (%)	Rail (%)
Germany	-1.5	+0.4	+1.2	-0.1
Luxembourg	+0.1	0.0	-0.7	+0.6
Denmark	+0.2	+0.2	-0.4	0.0
Spain	+2.6	-0.4	-1.9	-0.3
Italy	-0.3	+0.1	0.0	+0.2
Austria	-0.5	0.0	+0.4	+0.2
Greece	+2.0	+0.7	-2.8	+0.2
EU-15	*0.0*	*+0.2*	*-0.2*	*+0.1*

Source: EU Energy & Transport in Figures, 2004 (data for 1998 & 2002) Eurostat.

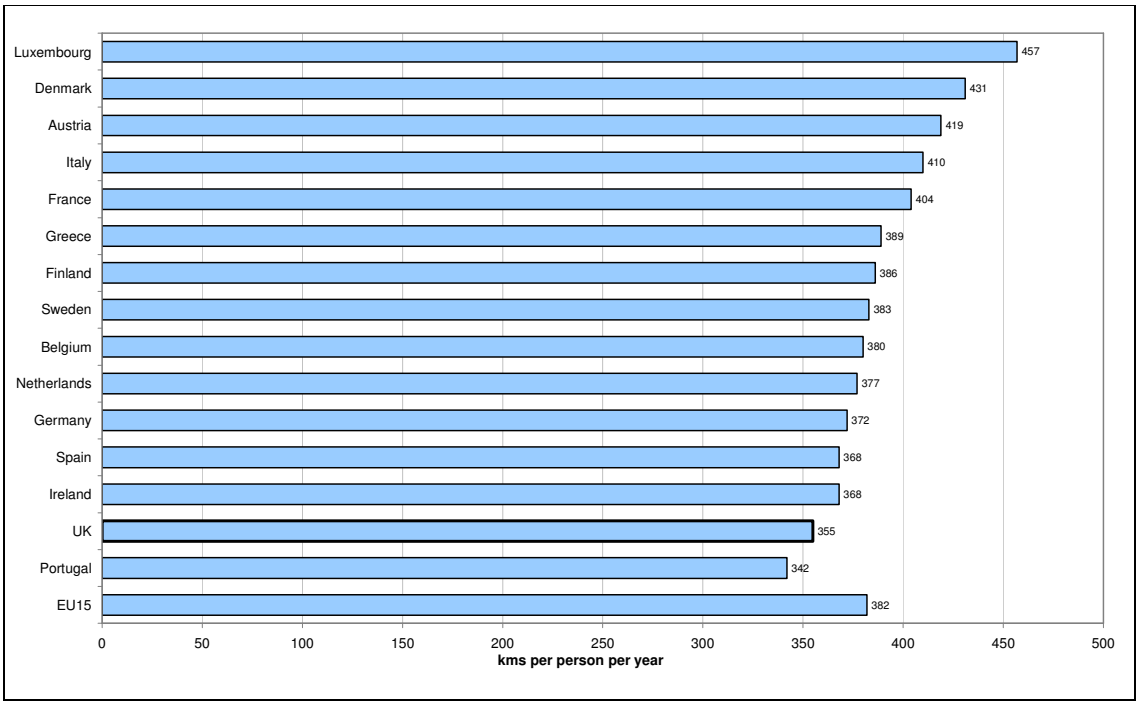
HOW MUCH DO PEOPLE WALK AND CYCLE?

3.15 As with the earlier reports the UK is shown as having the second lowest level of walking compared to the EU-15 countries (Figure 3.9) [4]. The number of kilometres walked per capita in the UK is 23 percent below that in Luxembourg and 18 percent below that in Denmark.

3.16 There is still a significant variation in cycle use between countries: Denmark and the Netherlands have the highest levels of cycling per capita (936 and 848 kilometres, respectively), as shown in Figure 3.10. The UK has the fourth lowest level of cycling, with only 75 kilometres per capita per annum.

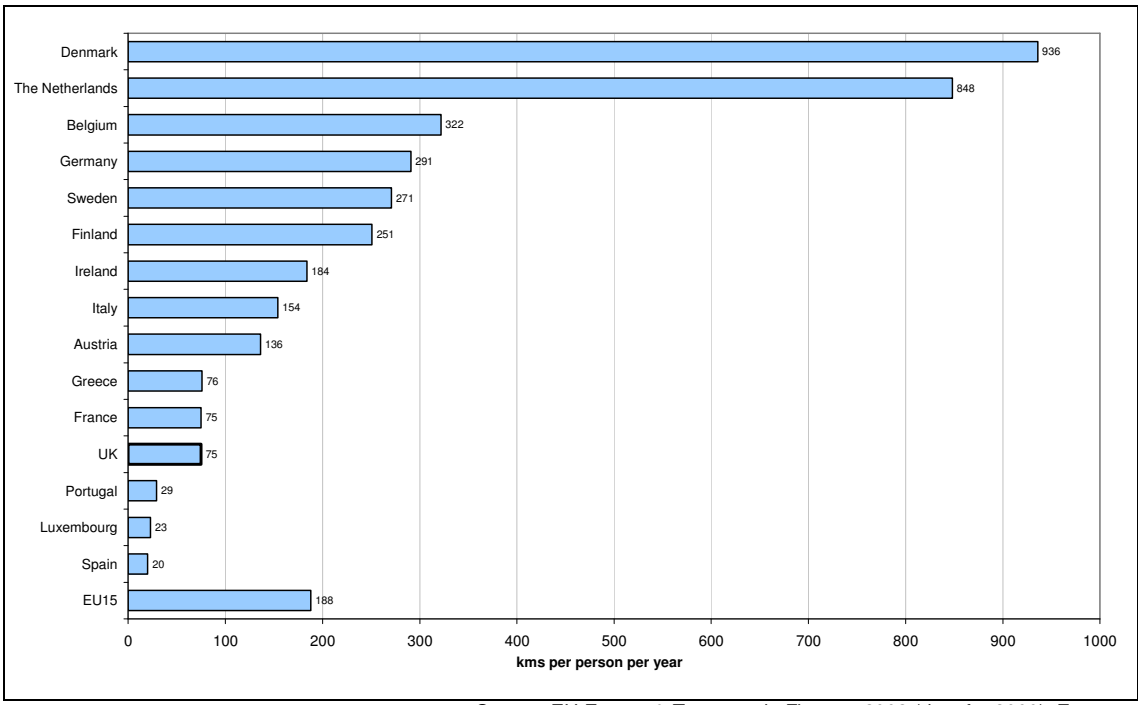
[4] *EU Energy & Transport in Figures 2004* does not include information on walking and cycling. We have, therefore, relied on the latest data – *EU Energy & Transport in Figures 2003*.

Figure 3.9 – Walking Levels per annum, 2000 (EU-15)



Source: EU Energy & Transport in Figures, 2003 (data for 2000), Eurostat.

Figure 3.10 – Cycling Levels per annum, 2000 (EU-15)

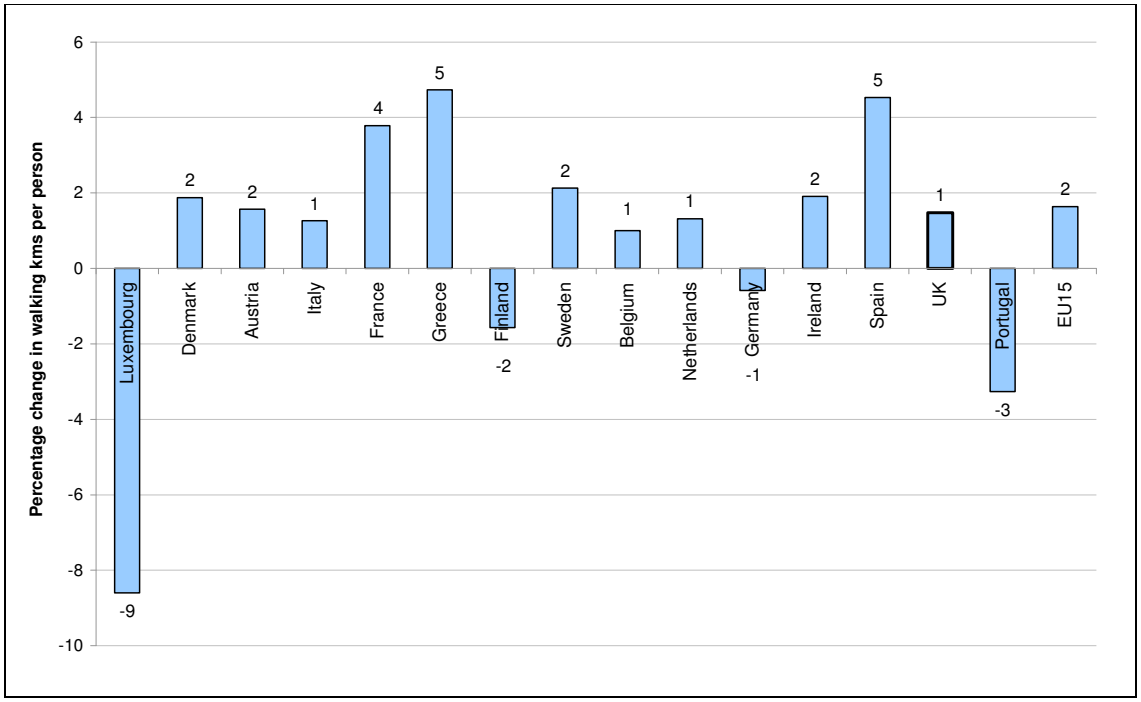


Source: EU Energy & Transport in Figures, 2003 (data for 2000), Eurostat.

3.17 Figure 3.11 shows that in all countries other than Germany, Luxembourg, Finland and Portugal, walking levels per capita have increased. In the UK the increase is

1 percent, similar to that in countries such as Netherlands and Belgium. In France, Greece and Spain walking has increased by at least 4 percent.

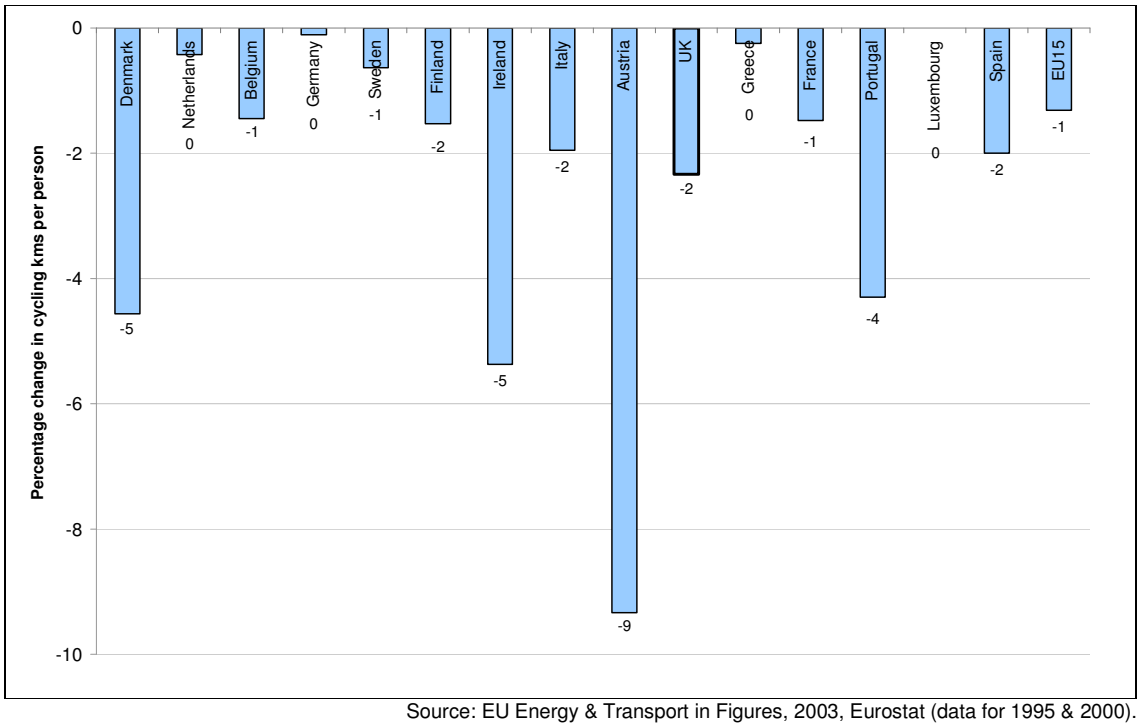
Figure 3.11 – Percentage Change in Per Capita Walking Volumes, 1995-2000 (EU-15)



Source: EU Energy & Transport in Figures, 2003 (data for 1995 and 2000), Eurostat

3.18 Figure 3.12 shows that in contrast to an overall increase in walking, cycling has declined in all counties. The greatest percentage reductions in cycling levels have been in Austria (by 9 percent), Denmark and Ireland (both by 5 percent) and Portugal (by 4 percent). Cycling levels in the UK have fallen by 2 percent.

Figure 3.12 – Percentage Change in Per Capita Cycling Volumes, 1995-2000 (EU-15)



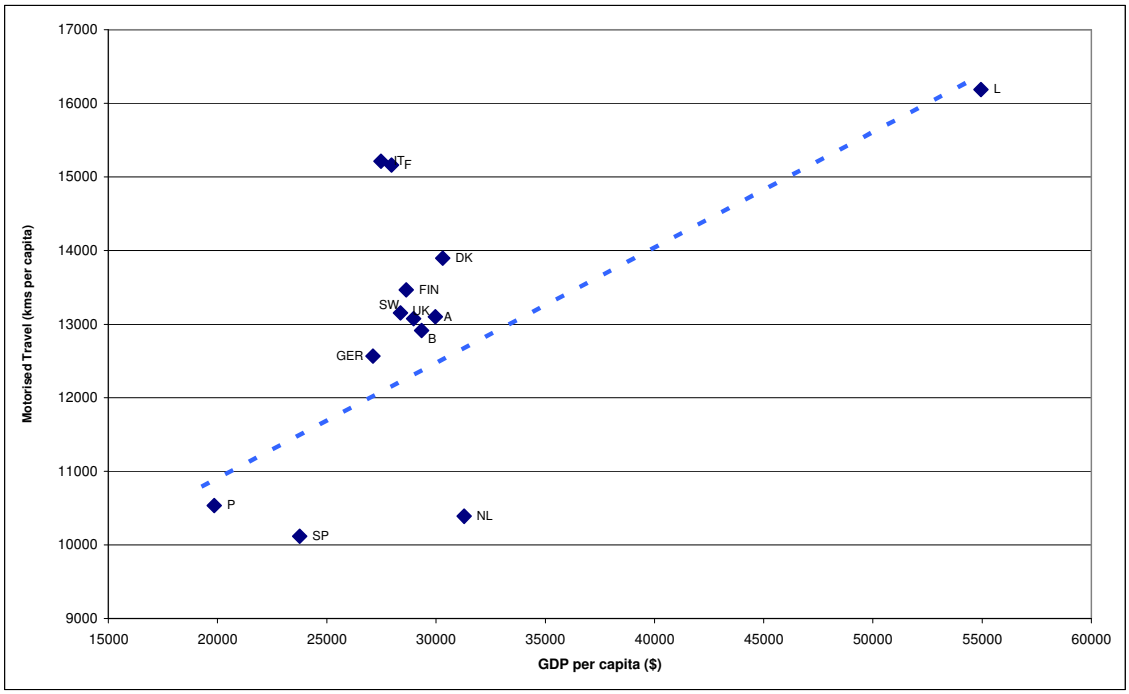
Source: EU Energy & Transport in Figures, 2003, Eurostat (data for 1995 & 2000).

IS THERE A RELATIONSHIP BETWEEN THE AMOUNT TRAVELLED AND ECONOMIC GROWTH?

3.19 The 2001 Report provided analysis to illustrate the link between the amount people travel (excluding air travel) and economic productivity, with people in wealthier countries tending to travel more. We have now updated this analysis using 2002 data.

3.20 This analysis across countries presents a rather different picture to the 2001 report, with the PPP-adjusted GDP per capita for many countries now being at similar levels (as shown in Figure 3.13). This may reflect a narrowing of the disparities between individual nations' economic performance across Europe. As there has been less change in the motorised travel volumes, the overall correlation between per capita GDP (adjusted for PPP) and motorised travel is much weaker.

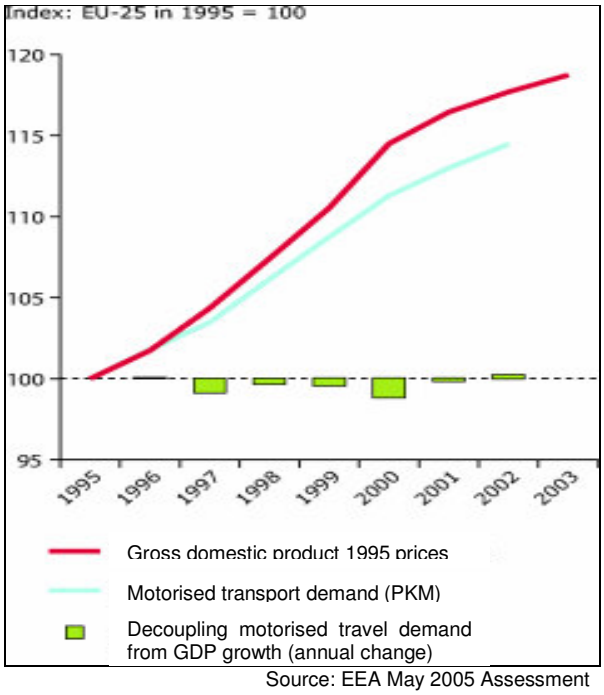
Figure 3.13 – Motorised Travel and GDP (PPP adjusted at current values) for 2002



Source: car passenger kilometres: EU Transport in Figures, 2005 (data for 1998 and 2002), Eurostat.
Source: GDP growth: OECD Statistics Portal database (data for 1998 and 2002).
Note that 'motorised travel' is defined as cars, buses and coaches, high speed rail, interurban rail and urban rail (tram & metro)

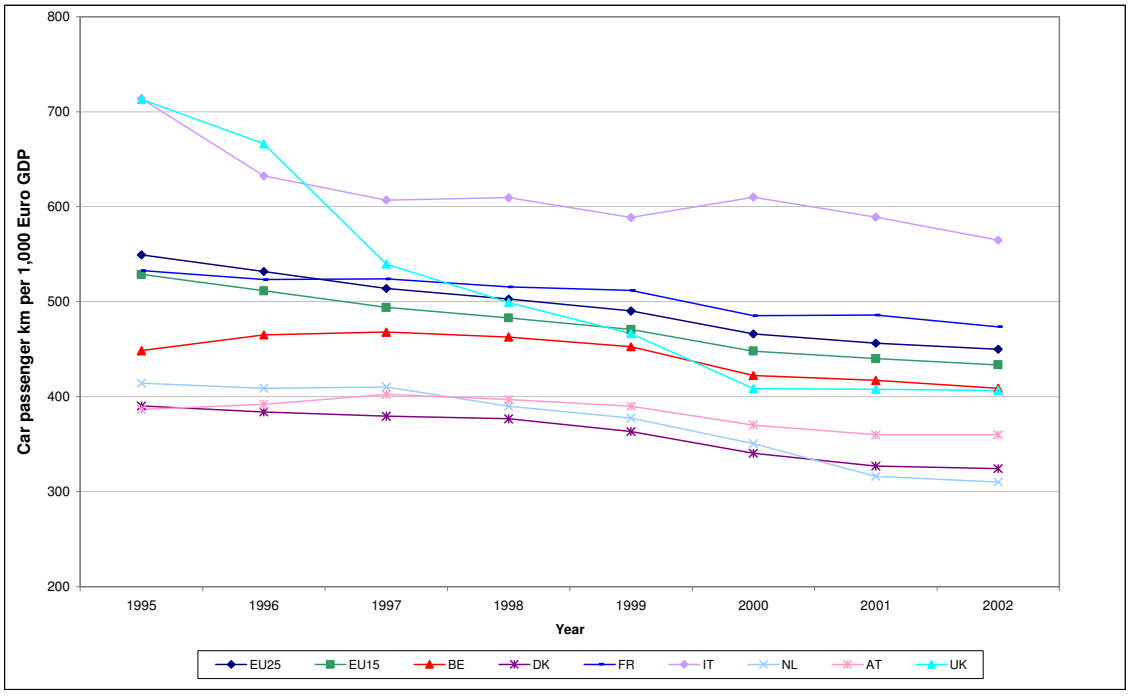
3.21 Time series data for the EU as a whole (Figure 3.14) shows a slightly slower rate of growth in overall transport demand (**all** motorised transport) than growth in GDP. Analysis in the 2001 report showed how car passenger kilometres and GDP had been fairly strongly correlated for most of the EU15 countries over the last three decades. An update of this analysis for 2002 (Figure 3.15) shows a similar pattern, although over the period 1995 to 2002 there has been a downward trend in travel intensity in some countries, meaning that per capita GDP has been growing faster than car travel in those countries.

Figure 3.14 – Relationship between GDP and Motorised Transport Demand



Source: EEA May 2005 Assessment

Figure 3.15 – Travel Intensity for Recorded EU Countries (1995-2002)



Source for car passenger kilometres: EU Energy & Transport in Figures, 2005, Eurostat.
Source for GDP: EC Economic Data Pocket Book, Q4 2005, Eurostat

3.22 The UK ratio of growth in car travel relative to growth in GDP over the period 1998 to 2002 (Table 3.2) is lower than in many other EU-15 countries, suggesting some

success (relative to other EU-15 countries) in de-coupling economic growth and the growth in travel demand.

Table 3.2 – Change in Growth of Car Travel Relative to GDP (GDP at current prices & current exchange rates in billions of US$), 1998-2002

Country	A: % Change in car passenger kms	B: % Change in GDP	Ratio of A to B
Germany	-5.1	-7.6	0.7
Austria	1.8	-2.9	-0.6
Sweden	6.8	-2.6	-2.7
Belgium	3.7	-1.3	-2.9
France	9.1	-1.0	-8.8
Italy	7.4	-0.9	-8.6
Denmark	2.4	-0.6	-4.0
Finland	9.4	1.5	6.2
Netherlands	5.2	6.7	0.8
Portugal	25.3	7.6	3.3
Slovak Republic	29.4	9.3	3.2
Greece	27.3	9.9	2.8
UK	**3.8**	**10.3**	**0.4**
Poland	18.6	12.9	1.4
Luxembourg	5.0	13.6	0.4
Spain	21.6	14.2	1.5
Czech Republic	9.2	21.3	0.4
Hungary	1.2	38.0	0.0
Ireland	30.6	39.2	0.8

Source: car passenger kilometres: EU Transport in Figures, 2004 (data for 1998 and 2002), Eurostat.
Source: GDP growth: OECD Statistics Portal database (data for 1998 and 2002).

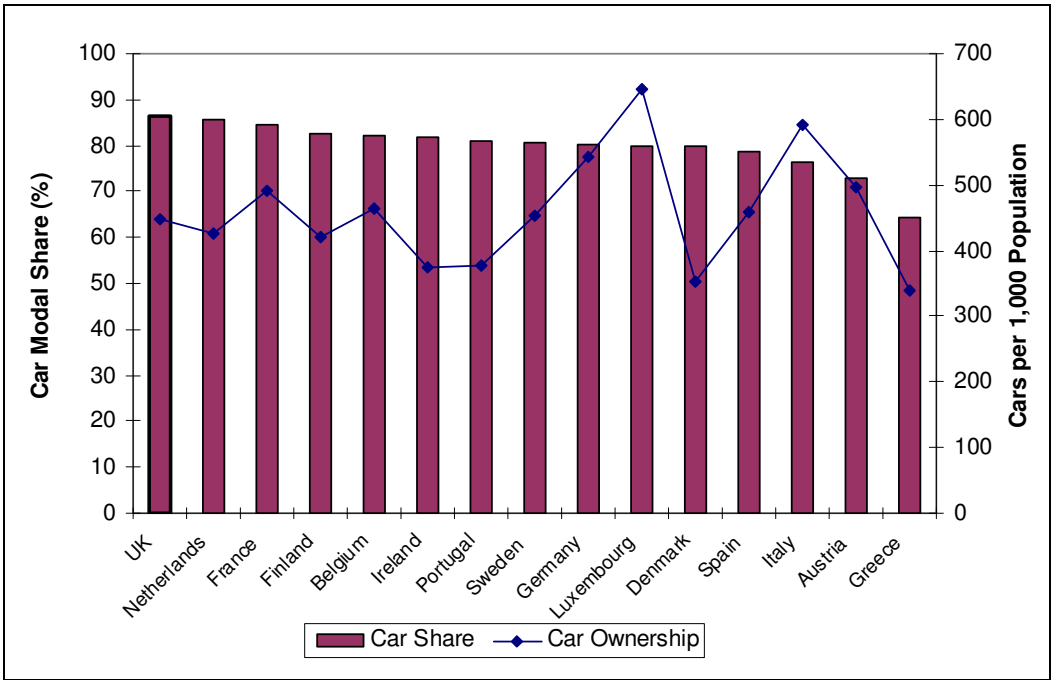
DOES HIGHER CAR OWNERSHIP MEAN HIGHER CAR DEPENDENCE?

3.23 The 2001 Study Report demonstrated that whilst the UK had the highest car dependency of all the EU-15 countries, several countries, notably, Austria, Italy, Germany, Luxembourg and France, had higher car ownership and hence high levels of car ownership did not automatically lead to high car dependence.

3.24 Figure 3.16 updates this analysis using 2002 data and confirms the findings of the earlier work. Table 3.3 shows that over the period 1998-2002, car mode share in the UK has fallen slightly despite a 10 percent increase in cars per thousand population.

In comparison with other EU-15 countries the UK is one of only five countries to experience a fall in car mode share, and this has occurred despite the UK experiencing an increase in car ownership which is greater than all countries other than Ireland, Portugal, Spain and Greece.

Figure 3.16 – Car Ownership and Use in EU-15 (2002)



Source: EU Energy & Transport in Figures, 2004, Eurostat (data for 2002).

Table 3.3 – Change in Car Ownership and Use (1998-2002)

Country	Change in car mode share 1998-2002 (Percent)	Change in Car Ownership (*cars per 1,000 population*) 1998-2002	
		Absolute	Percentage
UK	**-0.3**	**+42.6**	**+10.5**
Netherlands	+1.3	+34.4	+8.8
France	+0.3	+31.5	+6.9
Finland	+1.4	+29.1	+7.4
Belgium	-0.3	+23.6	+5.4
Ireland	+2.4	+50.3	+15.5
Portugal	+4.4	+65.9	+21.2
Sweden	-1.5	+25.4	+5.9
Germany	-1.5	+33.9	+6.7
Luxembourg	+0.1	+45.9	+7.6
Denmark	+0.2	+7.6	+2.2

Country	Change in car mode share 1998-2002 (Percent)	Change in Car Ownership (*cars per 1,000 population*) 1998-2002	
		Absolute	Percentage
Spain	+2.6	+52.9	+13.0
Italy	-0.3	+51.9	+9.6
Austria	-0.5	+8.3	+1.7
Greece	+2.0	+101.9	+42.9

Source: EU Energy & Transport in Figures, 2004, Eurostat (data for 1998 and 2002).

4. Road Safety

INTRODUCTION

4.1 The 2001 Report identified the UK as performing comparatively well on overall road safety but performing less well at reducing the exposure to accidents of pedestrians, cyclists and powered two wheeler users.

4.2 Actual incidence of fatalities and injury accidents[5] varies significantly between countries due to differences in population, car use and other factors. Therefore, as with the 2001 report, this chapter benchmarks accidents in terms of:

- Exposure – calculated as casualties per billion vehicle kilometres to give some indication of the risk of travelling. This does not, however, reflect the risk per journey;
- Risk – calculated as casualties per 100,000 population to indicate the danger associated with living in different countries; and
- Risk by participation – to indicate the relative risk of travelling by different modes; and
- Risk by age cohort – to illustrate the risks faced by children and young people.

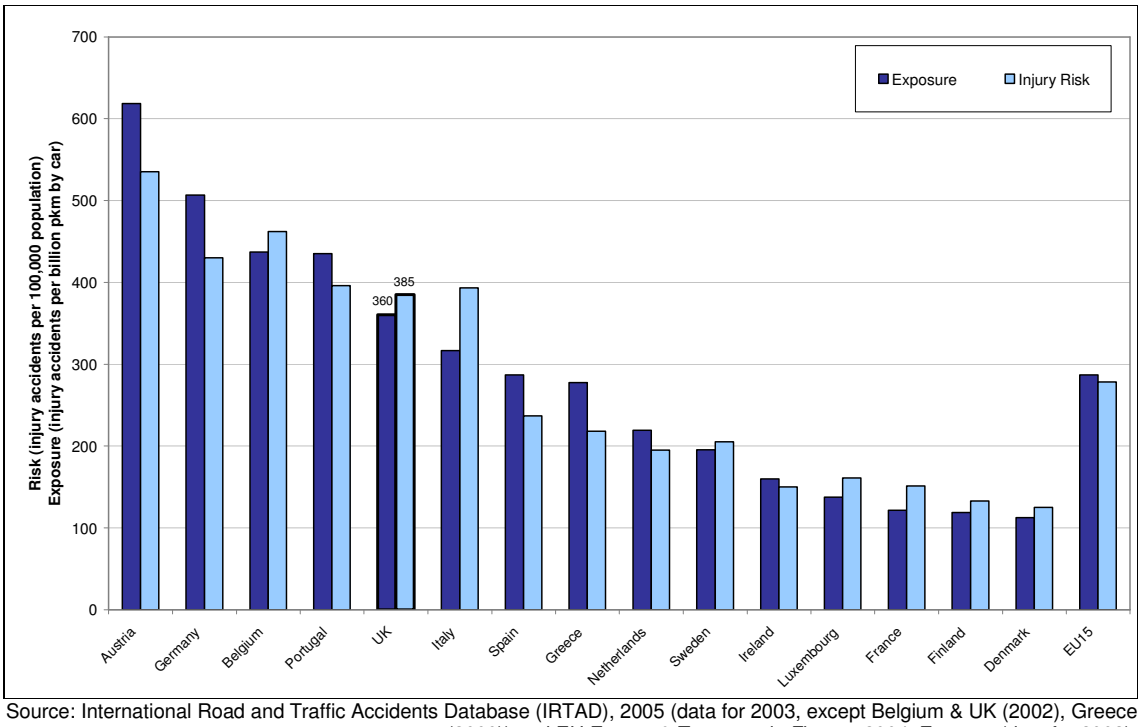
4.3 To overcome the variations in definitions of 'fatality', adjustments devised by OECD have been applied to accident indicators throughout this chapter such that a fatality is a death within 30 days of an accident.

WHAT IS THE RISK OF INJURY FROM ROAD TRAFFIC?

4.4 The UK has the sixth highest level of injury risk in the EU-15 (385 injury accidents per 100,000 population), considerably higher than Scandinavian countries, France and Ireland (Figure 4.1). Denmark has the lowest injury exposure and risk rates in the EU-15.

[5] Road accidents involving personal injury, either fatal or non-fatal

Figure 4.1 – Injury Accident Exposure & Risk, 2003 (EU-15)



Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003, except Belgium & UK (2002), Greece (2000)) and EU Energy & Transport in Figures 2004, Eurostat (data for 2003).

4.5 Table 4.1 shows that injury exposure levels in the New Member States as a whole are more than double those for the EU-15. However, whilst, Slovenia has significantly higher levels of injury exposure and risk than the EU-15 average, injury risk levels in the Czech Republic, Hungary and Poland are in-line with those in the rest of Europe, and are in indeed lower than the injury risk in the UK.

Table 4.1 – Injury Accident Exposure & Risk, 2003 (Selected NMS)

Country	Injury Exposure	Injury Risk
Slovenia	1,230	597
Czech Republic	419	268
Hungary	416	193
Poland	306	134
EU-15	*287*	*278*
NMS (4)	*624*	*298*

Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003, except Belgium & UK (2002), Greece (2000)) and EU Energy & Transport in Figures 2004, Eurostat (data for 2003).

4.6 Most EU-15 countries have seen reductions in injury exposure and risk between 1998 and 2003 (Table 4.2). In the UK, levels of both injury exposure (injury accidents per billion car passenger kilometres) and injury risk (injuries per 100,000 inhabitants) have fallen by 8 percent.

4.7 The greatest reductions in injury accident exposure and risk have been in Luxembourg, Ireland, France, Netherlands and Portugal while levels of risk and exposure have increased in Austria and Sweden.

Table 4.2 – Change in Injury Accident Exposure and Risk, 1998-2003 (EU-15)

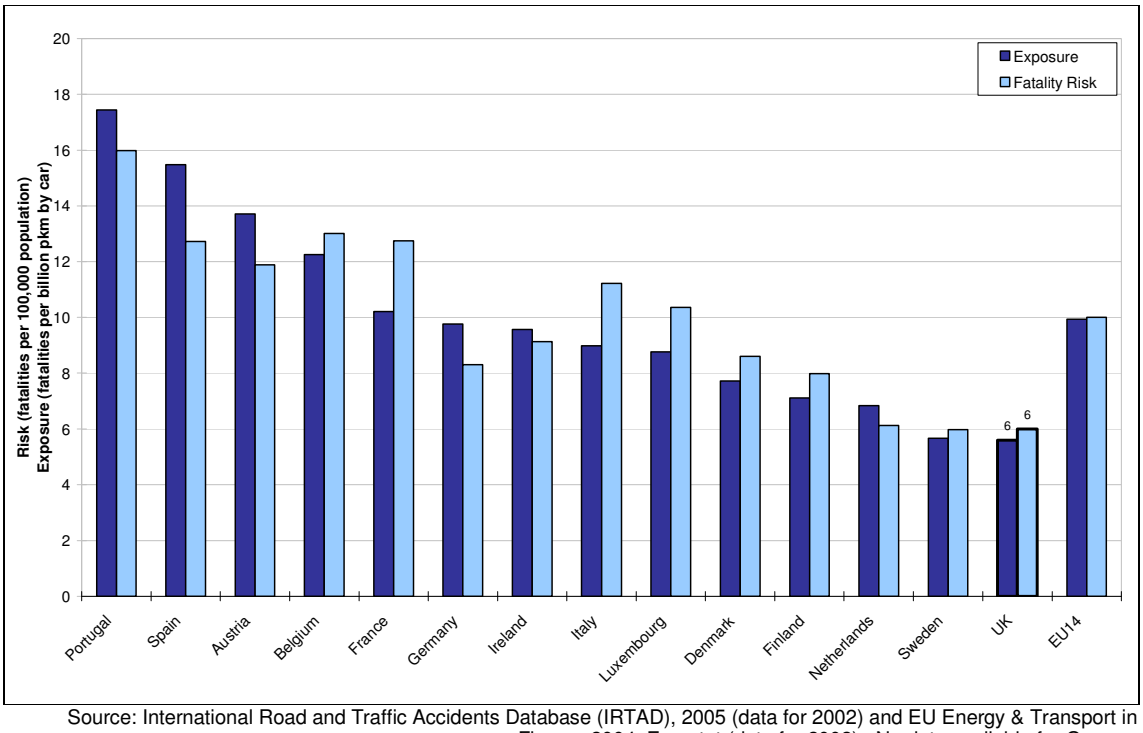
Country	Injury Exposure % change (1998-2003)	Injury Risk % change (1998-2003)
Austria	+8	+10
Germany	-1	-7
Belgium	-18	-8
Portugal	-33	-20
UK	**-8**	**-8**
Italy	0	+11
Spain	+4	-4
Greece	-24	-8
Netherlands	-20	-26
Sweden	+20	+18
Ireland	-45	-33
Luxembourg	-35	-35
France	-31	-29
Finland	-8	0
Denmark	-13	-12
EU-15	*-14*	*-9*

Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003, except Belgium & UK [2002], Greece [2000]) and 2000 (data for 1998); EU Energy & Transport in Figures 2004 (data for 2003) and EU Transport in Figures 2000 (data for 1998), Eurostat

WHAT IS THE FATALITY RISK FROM ROAD TRAFFIC?

4.8 The UK has retained its position (alongside Sweden) as the European country with the lowest exposure to fatality, with six deaths per billion passenger kilometres by car, and also the lowest fatality risk, with six deaths per 100,000 population (Figure 4.2). Portugal has the highest exposure to and risk of fatalities.

Figure 4.2 – Fatality Exposure & Risk (EU-14), 2002



Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2002) and EU Energy & Transport in Figures 2004, Eurostat (data for 2002). No data available for Greece.

4.9 Where available, data for New Member States shows much higher levels of exposure to accidents resulting in fatalities; of these, Czech Republic has the lowest exposure, but is still well above the EU-15 average (Table 4.3). Though fatality risk in all four New Member States shown is higher than the EU average, they are lower than in Portugal (16 deaths per 100,000 population).

Table 4.3 – Fatality Exposure & Risk (Selected New Member States), 2002

Country	Fatality Exposure	Fatality Risk
Poland	35	15
Hungary	30	14
Slovenia	28	13
Czech Republic	22	14
EU-15 (14)	*10*	*10*
NMS (4)	*29*	*14*

Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003, except Belgium & UK [2002], Greece [2000]) and EU Energy & Transport in Figures 2004, Eurostat (data for 2003). Note that EU average excludes Greece.

4.10 On the whole, there has been a reduction in fatality risk between 1998 and 2002 across Europe, with the greatest improvements having taken place in Ireland, Portugal and Luxembourg (Table 4.4). The greatest reduction in fatality exposure – 40 percent – has occurred in Ireland.

Table 4.4 – Change in Fatality Exposure and Risk, 1998-2002 (EU-15)

Country	Fatality Exposure % change (1998-2002)	Fatality Risk % change (1998-2002)
Portugal	-7	-25
Spain	-9	-16
Austria	-3	0
Belgium	-22	-12
France	-19	-16
Germany	-7	-13
Ireland	-40	-26
Italy	-8	2
Luxembourg	-23	-22
Denmark	-10	-9
Finland	-5	4
Netherlands	-3	-10
Sweden	1	0
UK	**-1**	**-1**
EU-15 (14)	*-13*	*-13*

Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2002) and 2000 (data for 1998); EU Energy & Transport in Figures 2004 (data for 2002) and EU Transport in Figures 2000 (data for 1998), Eurostat. No 2002 data available for Greece.

4.11 The reduction in fatality exposure and risk in the UK over the period 1998-2002 is only 1 percent compared to 13 percent for the EU-15 as a whole. Hence, whilst UK has comparatively low levels of fatality exposure and risk, other countries are making progress towards closing the gap.

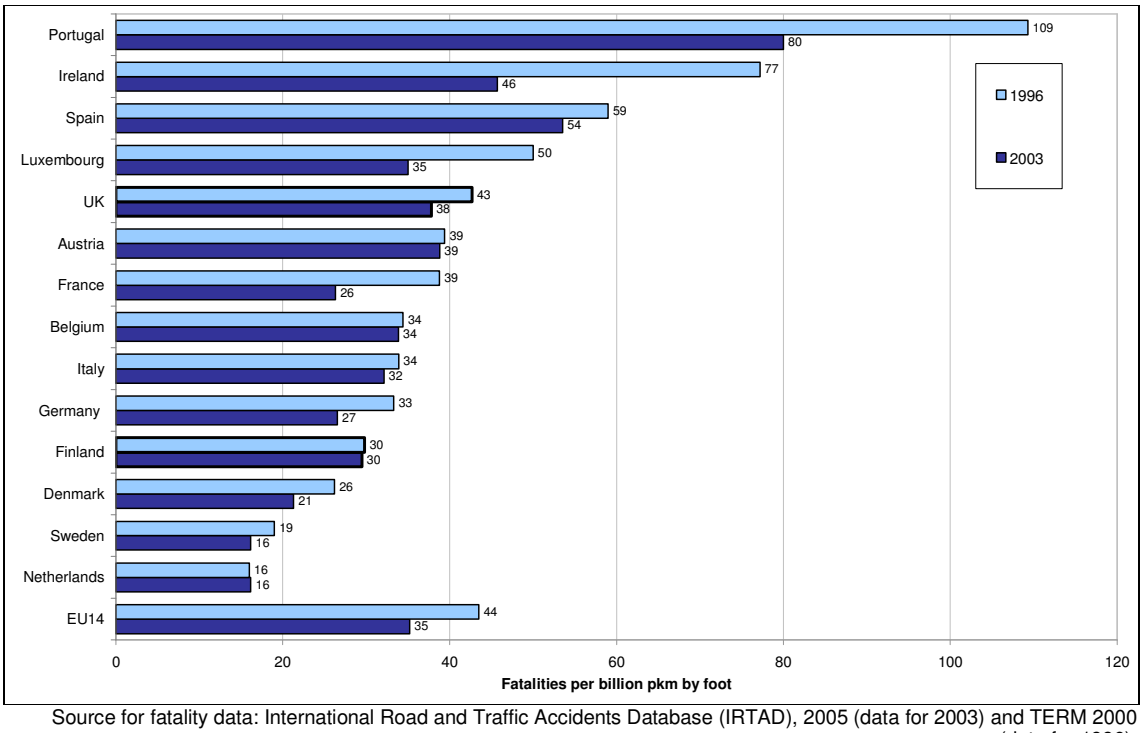
WHAT ARE THE EXPOSURE AND RISKS FOR DIFFERENT TYPES OF ROAD USER?

Pedestrians

4.12 The 2001 Report identified pedestrians in the UK as having the fifth highest exposure to fatalities, based on 1996 data.

4.13 It is evident in Figure 4.3 that UK pedestrians remain exposed to higher fatality levels than pedestrians in many other EU countries – the UK has the fifth highest level of pedestrian fatalities per distance walked. Pedestrian exposure to fatalities is greatest in Portugal (80 fatalities per billion passenger kilometres on foot) and lowest in Sweden and the Netherlands (16 fatalities).

Figure 4.3 – Pedestrians' exposure to fatalities (EU-15), 1996 & 2003



Source for fatality data: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003) and TERM 2000 (data for 1996).
Source for trip volume data: EU Energy & Transport in Figures 2003 (data for 2000) and 2000 (data for 1996), Eurostat. Note that most recent data available for kilometres by foot is 2000; hence this has formed the basis of the 2003 calculations.
No data available for Greece.

4.14 Levels of pedestrian exposure to fatalities have decreased all over Europe between 1996 and 2003, notably in Ireland (by 41 percent), France and Luxembourg (Table 4.5). The UK has seen an 11 percent reduction compared to an EU-15 average of 19 percent.

Table 4.5 – Change in pedestrian exposure to fatalities (EU-15), 1996-2003

Country	Change in fatalities per billion pkm by foot (1996-2003)
Portugal	-27%
Ireland	-41%
Spain	-9%
Luxembourg	-30%
UK	**-11%**
Austria	-1%
France	-32%
Belgium	-2%
Italy	-5%
Germany	-20%

Country	Change in fatalities per billion pkm by foot (1996-2003)
Finland	-1%
Denmark	-19%
Sweden	-15%
Netherlands	+1%
EU-15 (14)	*-19%*

Source for fatality data: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003) and TERM 2000 (data for 1996).
Source for trip volume data: EU Energy & Transport in Figures 2003 (data for 2000) and 2000 (data for 1996), Eurostat. Note that most recent data available for kilometres by foot is 2000; hence this has formed the basis of the 2003 calculations.
No data available for Greece.

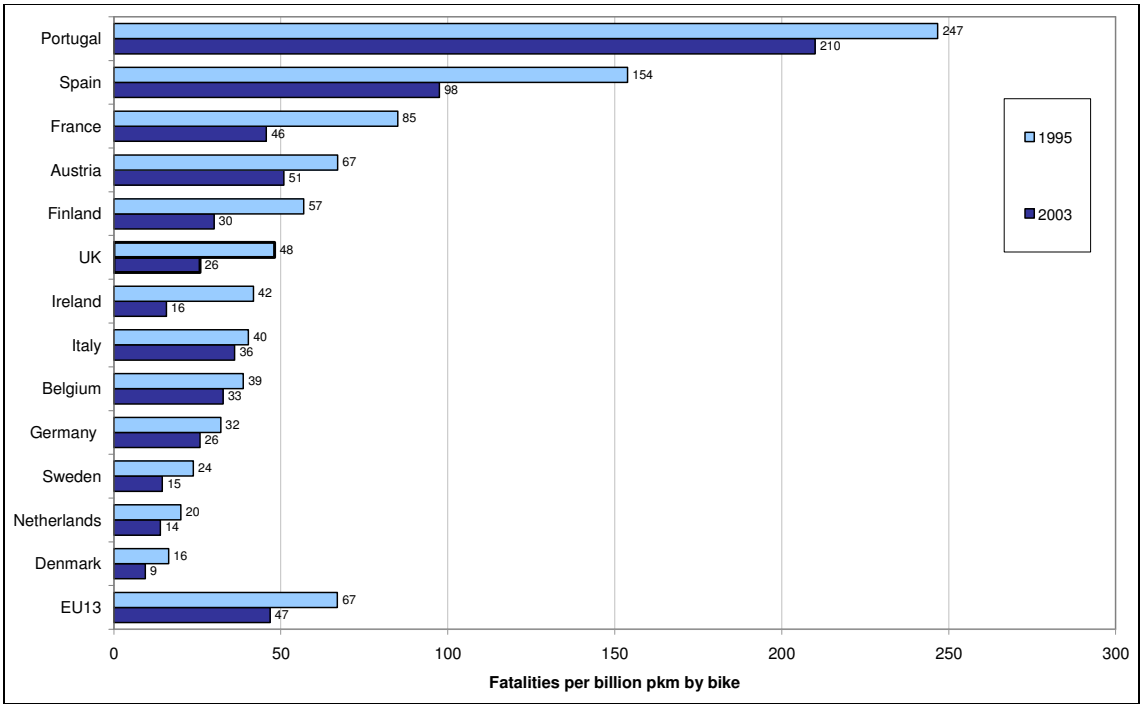
Cyclists

4.15 The 2001 Report identified UK cyclists as having an exposure to fatalities similar to the EU-15 average but twice as high as in Denmark, the Netherlands and Sweden (based on 1996 data).

4.16 There is considerable variation in levels of cyclists' fatalities across Europe (Figure 4.4). Cyclists remain considerably more exposed to fatalities on UK roads than in Denmark, Netherlands and Sweden – cyclists in the UK are nearly three times as likely to be killed in road accidents as those in Denmark.

4.17 Cyclists' exposure to fatalities is greatest in Portugal (210 per billion passenger kilometres by bike).

Figure 4.4 – Cyclist's exposure to fatalities, 1995 & 2003 (EU-15)



Source for fatality data: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003) and TERM 2000 (data for 1995).
Source for trip volume data: EU Energy & Transport in Figures 2003 (data for 2000) and 2000 (data for 1995), Eurostat. Note that most recent data available for kilometres by cycle is 2000; hence this has formed the basis of the 2003 calculations. No data available for Greece or Luxembourg.

4.18 Cyclist fatality levels have decreased all over Europe between 1995 and 2003, notably in Ireland (by 62 percent) – see Table 4.6. The decrease in the UK is the second highest at 47 percent and similar to the decrease in France, Finland and Belgium.

Table 4.6 – Change in Cyclists' exposure to fatalities (1995-2003)

Country	Change in fatalities per billion pkm by cycle (1995-2003)
Portugal	-15%
Spain	-37%
France	-46%
Austria	-24%
Finland	-47%
UK	**-47%**
Ireland	-62%
Italy	-10%
Belgium	-39%
Germany	-19%

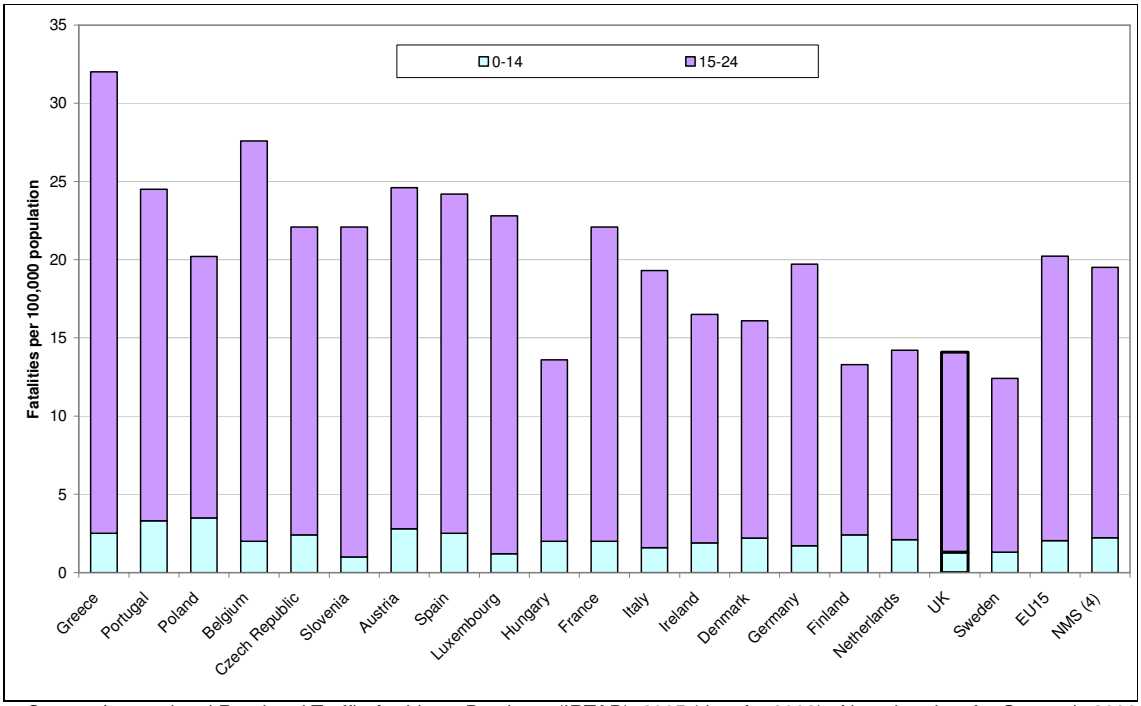
Country	Change in fatalities per billion pkm by cycle (1995-2003)
Sweden	-39%
Netherlands	-31%
Denmark	-43%
EU13	*-30%*

Source for fatality data: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003) and TERM 2000 (data for 1995).
Source for trip volume data: EU Energy & Transport in Figures 2003 (data for 2000) and 2000 (data for 1995), Eurostat. Note that most recent data available for kilometres by cycle is 2000; hence this has formed the basis of the 2003 calculations.
No data available for Greece or Luxembourg.

HOW DO FATALITY RISKS VARY BY AGE COHORT?

4.19 The UK has one of the lowest child fatality rates, with 1 fatality per 100,000 children (aged 0-14) and one of the lowest young persons fatality rates: 13 fatalities per 100,000 young adults (15-24 years) – see Figure 4.5. These rates are considerably lower than the EU-15 averages. Compared to the UK, only Slovenia and Luxembourg have slightly lower fatality rates amongst children (aged 0-14).

Figure 4.5 – Young Persons Fatalities, 2003



Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003). Note that data for Greece is 2000 and for Belgium and Poland is 2002).

4.20 The fatality records for children and young people have generally improved across Europe over the last five years (Table 4.7). The UK improvements are all lower than the EU average reflecting the relatively low base levels of fatalities in the UK.

Table 4.7 – Change in Fatalities of Young People, 1998-2003 (EU-15)

Country	Change in fatalities per 100,000 population	
	0-14	15-24
Greece	-38%	-16%
Portugal	-61%	-48%
Belgium	-58%	-7%
Austria	-10%	1%
Spain	-24%	-6%
Luxembourg	-54%	-38%
France	-43%	-31%
Italy	-6%	2%
Ireland	-54%	-34%
Denmark	5%	-10%
Germany	-26%	-22%
Finland	41%	-12%
Netherlands	40%	-12%
UK	**-24%**	**12%**
Sweden	-13%	28%
EU-15	*-34%*	*-19%*

Source: International Road and Traffic Accidents Database (IRTAD), 2005 (data for 2003, except Greece [2000], Belgium and Poland [2002]) and IRTAD 2000 (data for 1998).

4.21 However, there have been several increases[6]:

- In Denmark, Finland and the Netherlands, there have been small absolute increases in the child fatality rates; and
- In the UK and Sweden, the fatality rates amongst 15-24 year olds have increased.

[6] Note that percentages may seem overly high because of small absolute numbers

5. Congestion and Environmental Outcomes

CONGESTION

5.1 There are few standard criteria for gauging congestion and comparisons tend to rely on individual perceptions which lack consistency, or proxy indicators such as traffic speeds which depend on other variables such as speed limits and junction delays.

5.2 The 2001 research relied on data on road utilisation, time spent commuting and perceptions on the severity of congestion. However, it has not been possible to update many of these measures.

TRANSPORT EMISSIONS

5.3 Exhaust fumes contain a number of harmful substances, including

- Carbon Dioxide (CO_2) – the main source of greenhouse gases;
- Nitrogen oxides (NO_x) – affect immune system responses and contribute to acid rain; and
- Non-methane Volatile Organic Compounds (NMVOCs) – cause numerous health problems.

5.4 The UK is the twelfth highest producer, per thousand population, of CO_2 from transport within the EU. The UK's figure of 2,123 tonnes per 1,000 people is broadly in line with the EU average. According to the figures shown in Table 5.1, Luxembourg produces the most CO_2 per thousand population, but these figures may well be over-estimated given the magnitude of difference compared to all other EU countries.

Table 5.1 – Transport Emissions 2003 (tonnes per 1,000 population)

Country	CO_2 Emissions - All Transport		NO_x Emissions - Road Transport		NMVOCs - Road Transport	
	t per 1,000 pop	*Rank*	t per 1,000 pop	*Rank*	t per 1,000 pop	*Rank*
Luxembourg	13,426	*1*	16	*2*	10	*4*
Ireland	2,874	*2*	11	*9*	6	*9*
Austria	2,813	*3*	16	*1*	3	*22*
Cyprus	2,535	*4*	15	*4*	13	*2*
Finland	2,510	*5*	13	*7*	8	*6*
Belgium	2,443	*6*	14	*5*	4	*21*
Denmark	2,375	*7*	12	*8*	6	*12*
France	2,371	*8*	10	*16*	6	*13*
Spain	2,347	*9*	13	*6*	5	*14*

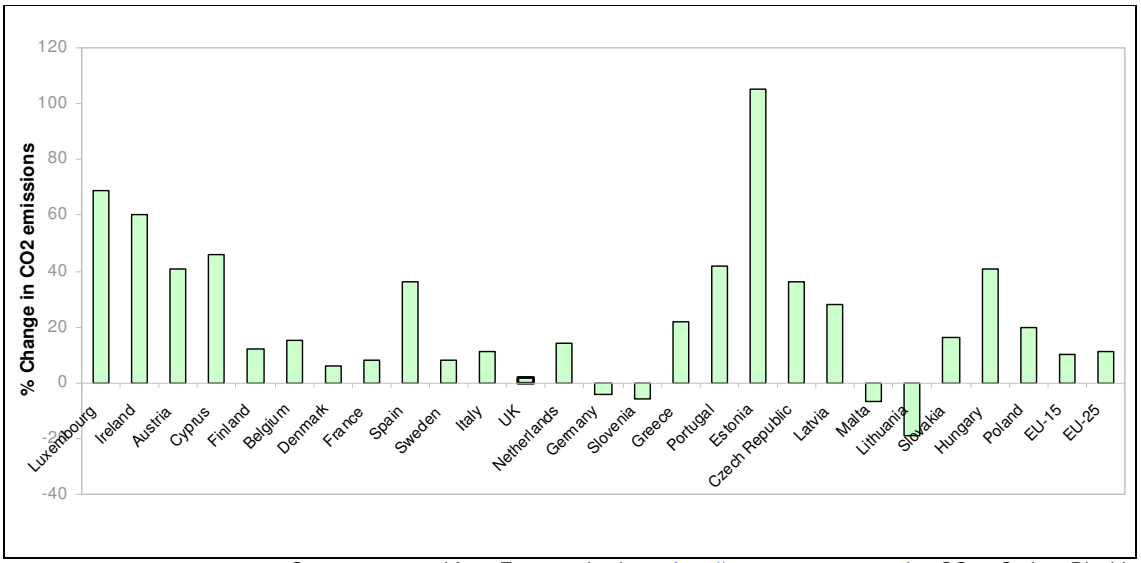
Country	CO_2 Emissions - All Transport		NO_x Emissions - Road Transport		NMVOCs - Road Transport	
	t per 1,000 pop	*Rank*	t per 1,000 pop	*Rank*	t per 1,000 pop	*Rank*
Sweden	2,243	*10*	10	*13*	7	*7*
Italy	2,198	*11*	11	*10*	8	*5*
UK	**2,123**	***12***	**11**	***11***	**3**	***23***
Netherlands	2,109	*13*	10	*14*	5	*16*
Germany	2,062	*14*	7	*22*	2	*24*
Slovenia	1,975	*15*	16	*3*	7	*8*
Greece	1,927	*16*	9	*19*	14	*1*
Portugal	1,882	*17*	10	*15*	6	*11*
Estonia	1,583	*18*	10	*17*	5	*15*
Czech Republic	1,316	*19*	9	*18*	4	*20*
Latvia	1,111	*20*	8	*21*	5	*18*
Malta	1,086	*21*				
Lithuania	1,025	*22*	9	*20*	5	*19*
Slovakia	956	*23*	6	*23*	5	*17*
Hungary	945	*24*	10	*12*	6	*10*
Poland	883	*25*	6	*24*	11	*3*
EU-15	*2,228*		*10*		*5*	
EU-25	*2,032*		*10*		*6*	

Source: extracted from Eurostat database: http://epp.eurostat.cec.eu.int: Note: CO_2 = Carbon Dioxide, NO_x = Nitrogen Oxide, NMVOCs = non methane volatile organic compounds. Note that CO_2 emissions are only available for all transport modes whereas NO_x and NMVOCs emissions are only available for road transport.

5.5 Austria has the greatest per thousand population production of NO_x from road transport, with around 16 tonnes per thousand population. The UK is ranked as the eleventh highest producer. The UK however produces the second lowest amount (per thousand population) of NMVOCs in the EU-25, with only Germany having a lower level.

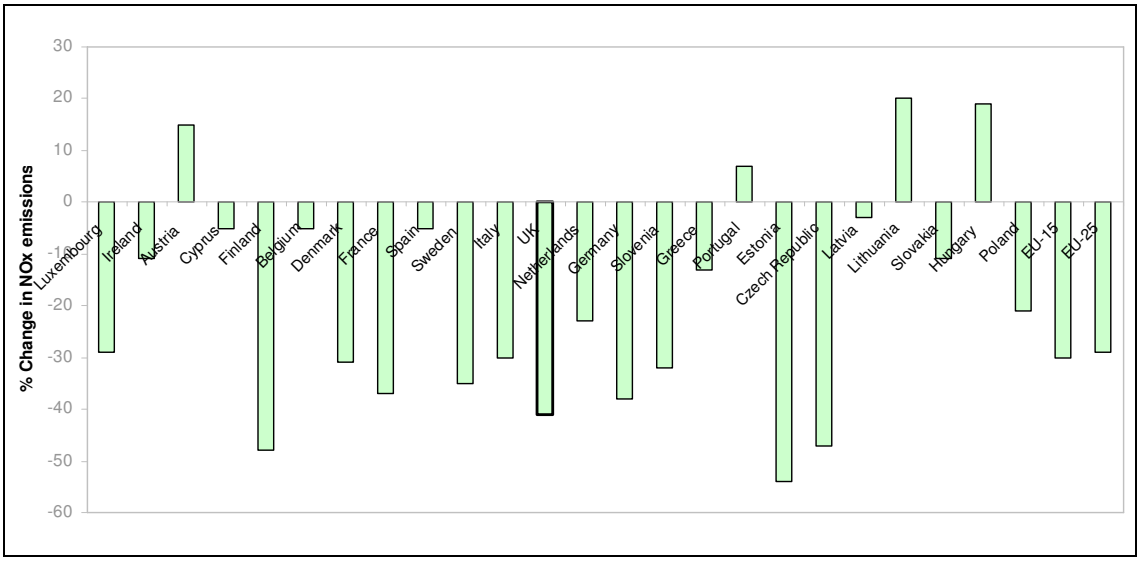
5.6 The general trend of rising CO_2 and falling NO_x and NMVOCs across Europe noted in the 2001 report has continued (as shown in Figure 5.1, Figure 5.2, Figure 5.3and Table 5.2), with several anomalies particularly in the New Member States. Smaller countries, such as Luxembourg, those with lower base levels of traffic and hence emissions, such as the New Member States, and those with high volumes of transit traffic can experience large changes in emission levels.

Figure 5.1 – Change in CO_2 Emissions from All Transport, 1996-2003 (EU-25)



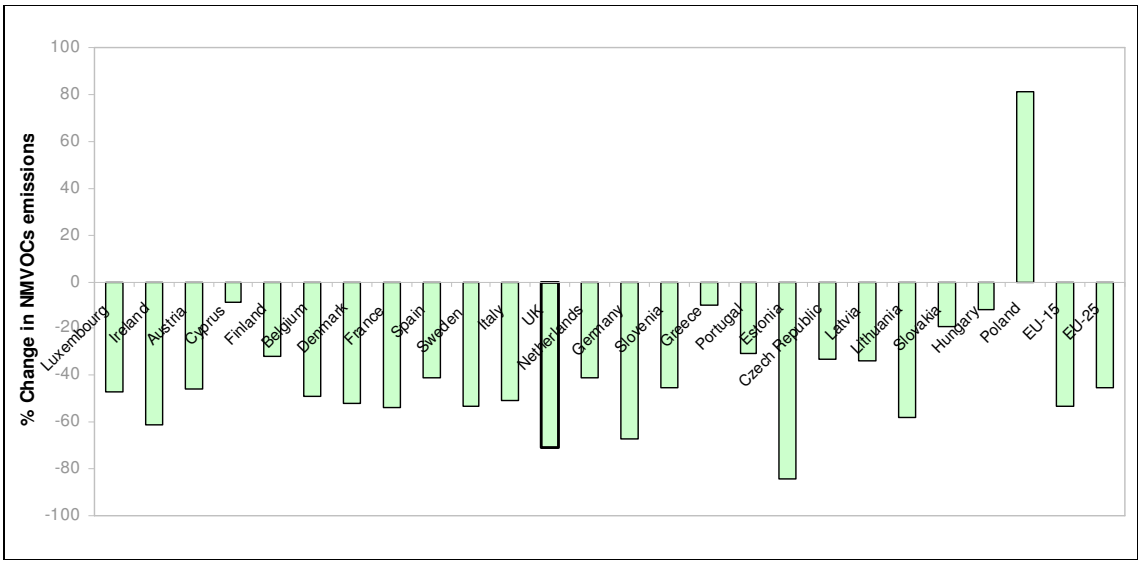
Source: extracted from Eurostat database: http://epp.eurostat.cec.eu.int: CO_2 = Carbon Dioxide

Figure 5.2 – Change in NO_x Emissions from Road Transport, 1996-2003 (EU-25)



Source: extracted from Eurostat database: http://epp.eurostat.cec.eu.int: Note: Note: NO_x = Nitrogen Oxide

Figure 5.3 – Change in NMVOC Emissions from Road Transport, 1996-2003 (EU-25)



Source: extracted from Eurostat database: http://epp.eurostat.cec.eu.int NMVOCs = non methane volatile organic compounds. Note that no data for Malta is available.

Table 5.2 – Percentage Change in Road Transport Emissions (1996-2003)

Country	CO_2 Emissions - All Transport (% change)	NO_x Emissions - Road Transport (% change)	NMVOCs - Road Transport (% change)
Luxembourg	+69	-29	-47
Ireland	+60	-11	-61
Austria	+41	+15	-46
Cyprus	+46	-5	-9
Finland	+12	-48	-32
Belgium	+15	-5	-49
Denmark	+6	-31	-52
France	+8	-37	-54
Spain	+36	-5	-41
Sweden	+8	-35	-53
Italy	+11	-30	-51
UK	**+2**	**-41**	**-71**
Netherlands	+14	-23	-41
Germany	-4	-38	-67
Slovenia	-6	-32	-45
Greece	+22	-13	-10

Country	CO_2 Emissions - All Transport (% change)	NO_x Emissions - Road Transport (% change)	NMVOCs - Road Transport (% change)
Portugal	+42	+7	-31
Estonia	+105	-54	-84
Czech Republic	+36	-47	-33
Latvia	+28	-3	-34
Malta	-7		
Lithuania	-19	+20	-58
Slovakia	+16	-11	-19
Hungary	+41	+19	-12
Poland	+20	-21	+81
EU-25	*+11*	*-29*	*-45*
EU-15	*+10*	*-30*	*-53*

Source: Eurostat database http://epp.eurostat.cec.eu.int. Note: CO_2 = Carbon Dioxide, NO_x = Nitrogen Oxide, NMVOCs = non methane volatile organic compounds. Note that CO_2 emissions are only available for all transport modes whereas NO_x and NMVOCs emissions are only available for road transport.

5.7 There has been a significant turnaround in some countries, such as the Czech Republic, which reported increases in NO_x and NMVOCs between 1990 and 1996, yet has seen a significant percentage reduction in these emissions between 1996 and 2003.

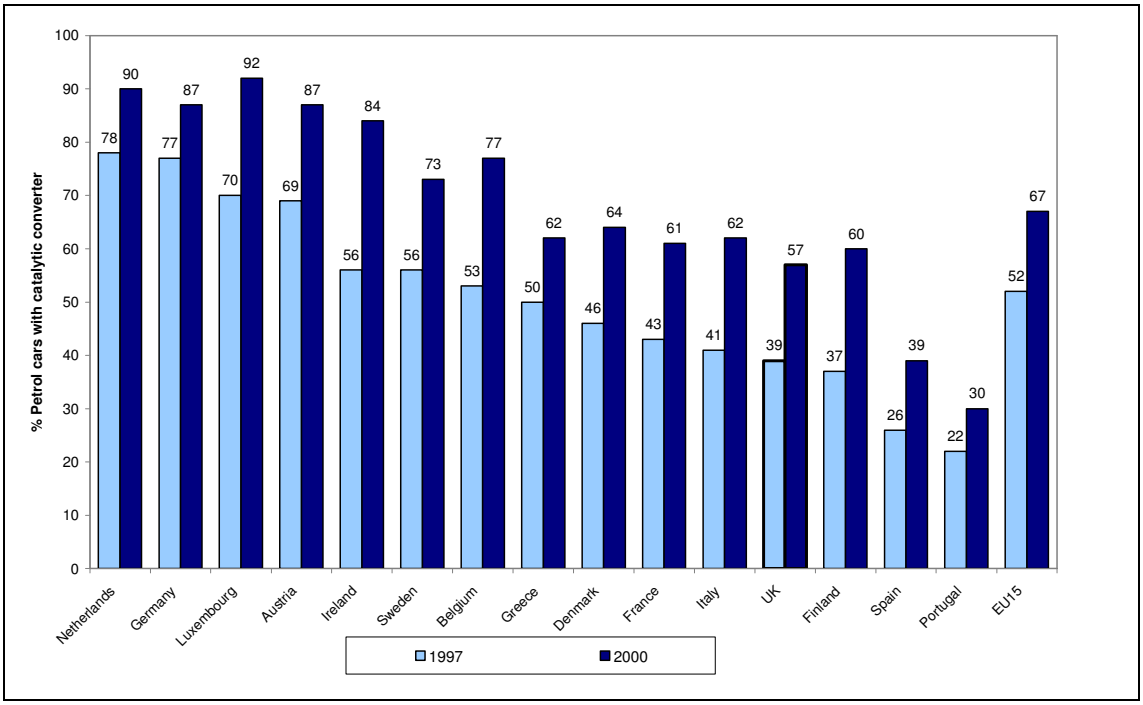
5.8 The UK has achieved an above average reduction in NO_x and NMVOCs emissions and a slower rate of growth in CO_2 emissions between 1996 and 2003. However, Germany has managed to achieve a reduction in CO_2 emissions (as have Lithuania, Slovenia and Malta) during this period. Czech Republic, Finland and Estonia have seen larger percentage reductions in NO_x emissions from road transport than the UK. The UK has had the second largest percentage reduction in NMVOCs from road transport.

5.9 Note that CO_2 emissions are only available for **all transport modes** whereas NO_x and NMVOCs emissions are only available for **road transport**[7]**.**

5.10 The UK had the third lowest proportion of cars with catalytic converters in 2000, with only Spain and Portugal lower (Figure 5.4). The share of cars fitted with catalytic converters in the UK is 10 percentage points lower than the EU-15 average (67 percent).

[7] It is not clear whether the Eurostat databases are composed of data from the TERM database and additional sources, but it should be noted that this data is not directly comparable to that used in the 2001 report.

Figure 5.4 – Proportion of Petrol-engine Cars Fitted with Catalytic Converter, 1997& 2000



5.11 However, Table 5.3 shows that the UK's share of cars fitted with catalytic converters has increased in-line with the EU average.

Table 5.3 – Change in Proportion (%) of Petrol-engine Cars Fitted with Catalytic Converter, 1990-2000

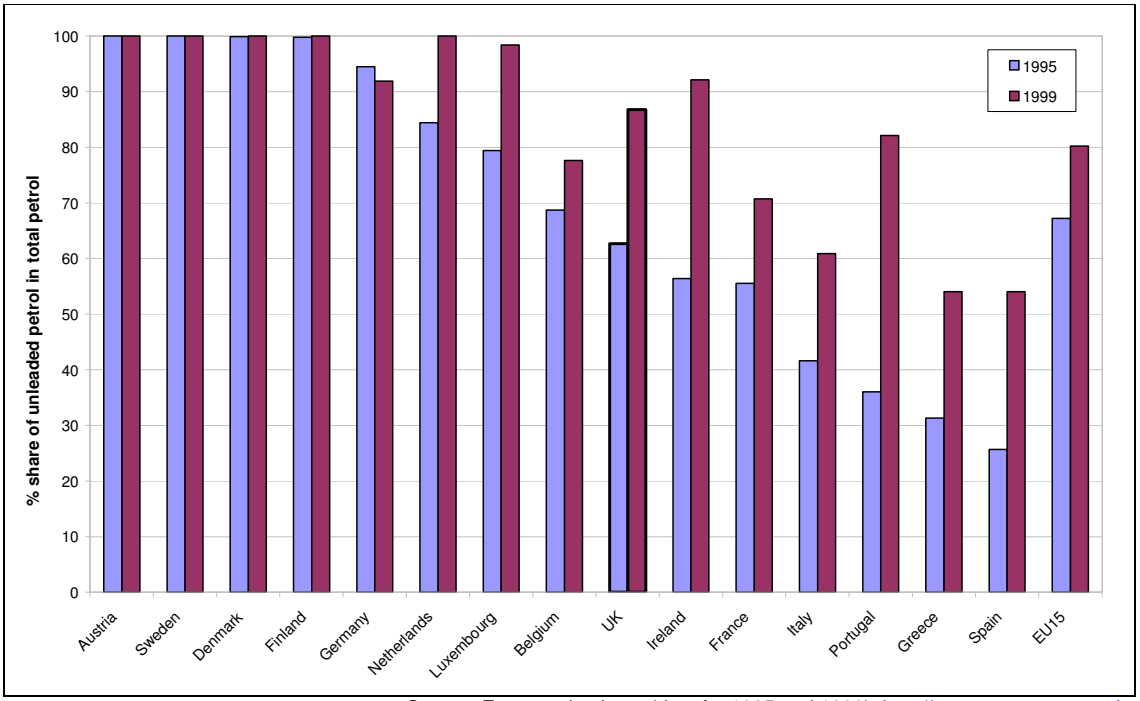
Country	Change	
	1990-1997	1997-2000
Luxembourg	+65	+22
Ireland	+51	+28
Belgium	+50	+24
Netherlands	+46	+12
Austria	+45	+18
Denmark	+44	+18
Greece	+41	+12
France	+40	+18
Germany	+39	+10
Italy	+38	+21
UK	**+36**	**+18**

Country	Change	
	1990-1997	1997-2000
Finland	+35	+23
Sweden	+30	+17
Spain	+22	+13
Portugal	+21	+8
EU15	*+39*	*+15*

Source: Eurostat database (data for 1990, 1997 and 2000).

5.12 The UK's uptake of cleaner fuels (87 percent) is ahead of the EU-15 average (80 percent), but still behind the 100 percent share of unleaded petrol in some European countries (Figure 5.5 and Table 5.4).

Figure 5.5 – Share of Unleaded Petrol in Total Petrol, 1995 & 1999 (EU-15)



Source: Eurostat database (data for 1995 and 1999), http://epp.eurostat.cee.eu.int

Table 5.4 – Change in Share (%) of Unleaded Petrol in Total Petrol, 1995 – 1999 (EU-15)

Country	Change (1995-99)
Austria	0.0
Sweden	0.0
Denmark	+0.1

Country	Change (1995-99)
Finland	+0.2
Germany	-2.6
The Netherlands	+15.6
Luxembourg	+19
Belgium	+8.9
UK	**+24.1**
Ireland	+35.7
France	+15.2
Italy	+19.3
Portugal	+46.1
Greece	+22.7
Spain	+28.3
EU15	*+13*

Source: Eurostat database (data for 1995 and 1999), http://epp.eurostat.cee.eu.int

6. Accessibility and Social Exclusion

INTRODUCTION

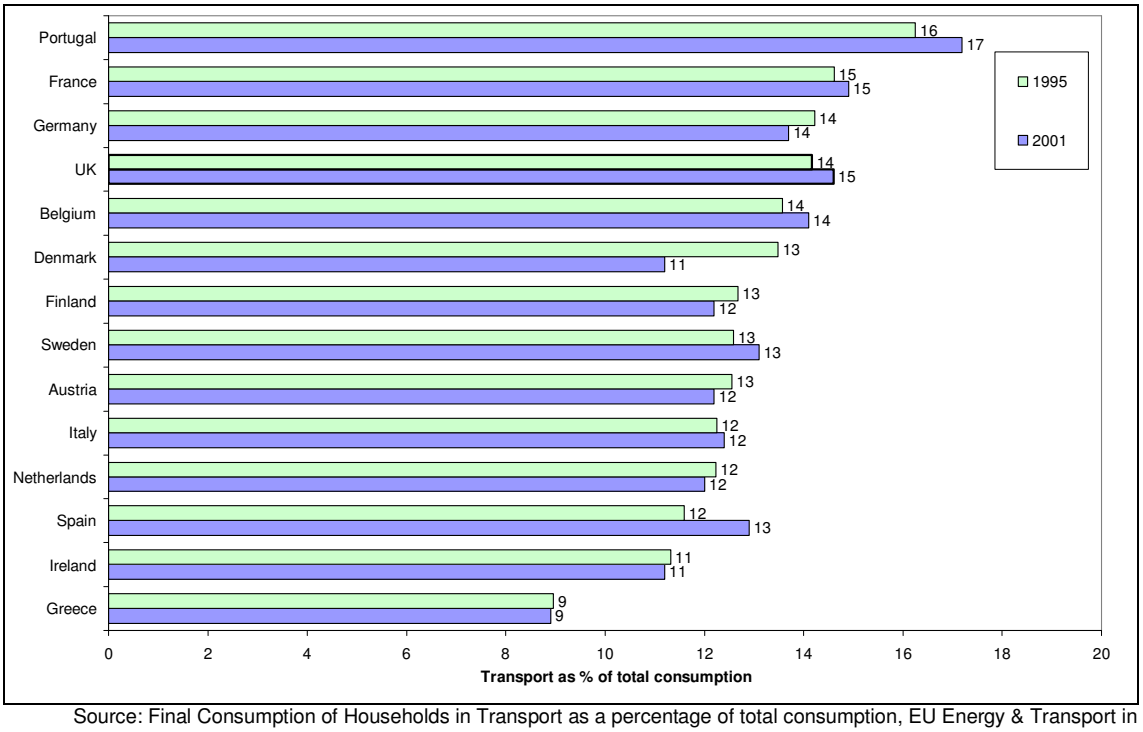
6.1 Improving access to transport systems is an important aspect of increasing participation in society that can lead to a higher quality of life; however there are few relevant measures of transport outputs or outcomes. Consideration was given to statistics relating to time spent commuting and access to cars and public transport. However, inconsistencies with the data and inadequately defined indicators prevented their inclusion within this report.

6.2 Therefore, this chapter only considers household expenditure on transport.

HOUSEHOLD EXPENDITURE ON TRANSPORT

6.3 Households in the UK spend 15 percent of their total expenditure on transport. This is the third highest in the EU after Portugal and France as shown in Figure 6.1. Greece has the lowest expenditure on transport (9 percent).

Figure 6.1 – Household Expenditure on Transport, 1995 & 2001 (EU-15)



Source: Final Consumption of Households in Transport as a percentage of total consumption, EU Energy & Transport in Figures 2004, Eurostat. No data for Luxembourg available. Limited data available for some countries.

6.4 Table 6.1 shows that, in the New Member States, household expenditure on transport is between 8 percent of total consumption in Estonia and 15 percent in Slovenia and Hungary.

Table 6.1 – Household Expenditure on Transport, 1995-2002 (New Member States)

Country	1995	2000	2001	2002
Slovenia	16.9	16.1	15.2	
Cyprus	14.6	14.6	14.4	
Hungary	12.6	15.3	15.0	
Poland	11.1	13.0	12.8	
Czech Republic	10.5	9.9		
Estonia	8.0	7.8	8.4	9.1
Malta		14.4	13.7	13.1
Slovak Republic		9.1	10.6	10.3

Source: Final Consumption of Households in Transport as a % of total consumption, EU Energy & Transport in Figures 2004, Eurostat. Limited data available for some countries.

6.5 Table 6.2 indicates that the UK has seen a 0.4 percent rise in the proportion of household expenditure on transport between 1995 and 2001. Amongst the EU-15, Spain and Portugal have seen the greatest increases in the proportion of household expenditure on transport, while the largest reduction has been in Denmark. Looking at the New Member States, Hungary and Poland have seen increases greater than all the EU 15 countries whilst Slovenia has decreased second only to that in Denmark.

Table 6.2 – Change in Household Expenditure on Transport, 1995-2001

Country	Change 1995-2001
EU-15	
Portugal	+0.9
France	+0.3
Germany	-0.5
UK	**+0.4**
Belgium	+0.5
Denmark	-2.3
Finland	-0.5
Sweden	+0.5
Austria	-0.4
Italy	+0.1
Netherlands	-0.2
Spain	+1.3

Country	Change 1995-2001
Ireland	-0.1
Greece	-0.1
New Member States	
Slovenia	-1.7
Cyprus	-0.2
Hungary	+2.5
Poland	+1.7
Czech Republic	-0.6
Estonia	+0.4

Source: Final Consumption of Households in Transport as a percentage of total consumption, EU Energy & Transport in Figures 2004, Eurostat. Limited data available for some countries. Note that figures shown for Czech Republic are based on 1995-2000 as no 2001 data available. Malta and Slovak Republic have not been included as no data available for 1995 base year. 2001 has been used as a base year, instead of 2002, due to the availability of a more complete data set.

7. World Cities

7.1 Cities included in this section are:

- Athens, Greece;
- Barcelona, Spain;
- Berlin, Germany;
- **London, UK;**
- Madrid, Spain;
- Paris (Ile de France), France;
- Rome, Italy.

7.2 All of these cities have a population in excess of 2.75 million.

KEY LOCAL DETERMINANTS

Demographic and Social Indicators

7.3 London is the second largest city in the sample and also has the second highest GDP per inhabitant – more than twice the figure for Athens (Table 7.1). The proportion of jobs within the Central Business District (CBD) is also higher than all the other sampled cities except Madrid.

Table 7.1 – Demographic and Socio-Economic Indicators

City	Population (000s)	Urban population per hectare	Urban population + jobs / hectare	GDP per inhabitant (PPP adj)*	Proportion of jobs in CBD (%)
Paris	11,100	40.5	59.3	67,564	14
London	**7,170**	**54.9**	**89.6**	**40,068**	**21.8**
Madrid	5,420	55.7	78.9	26,822	34.6
Barcelona	4,390	74.7	106	23,541	12.5
Athens	3,900	65.7	92.4	17,420	17.4
Berlin	3,383	54.7	79.9	20,454	-
Rome	2,808	56.6	81	28,782	22.6

Source: Mobility in Cities, 2006 (data for 2001), except * Eurostat (GDP market prices at NUTS level 3, data for 2002)
Note: No Proportion of Jobs in CBD data for Berlin available.

Car & Powered Two-Wheeler Ownership

7.4 There is much variation in levels of car ownership between world cities (Table 7.2). Rome has the highest level of car ownership (761 cars per thousand population) – more than twice the London level.

Table 7.2 – Car & Powered Two-Wheeler Ownership

City	Cars per 1,000 population		PTW per 1,000 population	
	Number	Rank	Number	Rank
Rome	761	1	89.5	1
Madrid	478	2	29.5	5
Paris	439	3	58.6	4
Barcelona	424	4	65.5	2
Athens	385	5	64.1	3
London	**343**	**6**	**14.3**	**7**
Berlin	328	7	23.5	6

Source: Mobility in Cities, 2006 (data for 2001)

7.5 Powered two-wheeler (PTW) ownership is considerably lower in London than the other world cities (14 per thousand population), while Rome again has the highest level of ownership.

Supply of Roads and Parking

7.6 London has a lower supply of road kilometreage per thousand population than Madrid, Rome, Athens and Barcelona (Table 7.3). As well as having a high level of car ownership, Madrid and Rome also have the highest provision of roads. However, Paris has the third highest level of car ownership but is only ranked sixth in terms of its road supply.

7.7 Motorway supply per thousand population in London is the lowest of the world cities. This highlights the difficulties in making such comparisons between cities – the figure of 9.9m of motorway per thousand population for London indicates that the definition of 'London' (Greater London) used by Mobility in Cities excludes the M25.

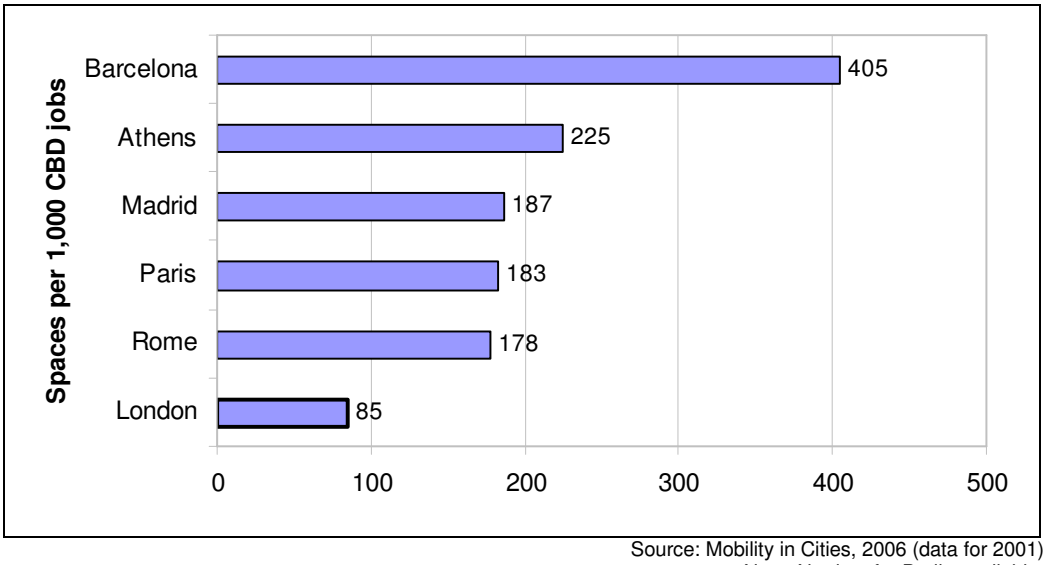
Table 7.3 – Supply of Roads

City	Length of Road (metres / 1,000 population)	Rank	Motorways (metres / per 1,000 population)	Rank
Madrid	4,870	1	98.3	2
Rome	3,100	2	123.0	1
Athens	2,310	3	39.0	5
Barcelona	2,100	4	89.7	3
London	**2,030**	**5**	**9.9**	**7**
Paris	1,980	6	69.5	4
Berlin	1,570	7	20.2	6

Source: Mobility in Cities, 2006 (data for 2001)

7.8 London also has the lowest supply of parking, with just 85 spaces per thousand jobs in the Central Business District, while Barcelona's parking supply is nearly five times greater (405 spaces) – see Figure 7.1.

Figure 7.1 – Supply of Parking



Source: Mobility in Cities, 2006 (data for 2001)
Note: No data for Berlin available.

Supply of Public Transport

7.9 London has the greatest supply of public transport[8], in terms of vehicle kilometres per capita (Table 7.4). London's length of reserved routes (defined as segregated tracks and busways, excluding bus lanes demarked only by painted lines) is second only to Barcelona.

7.10 London has a much greater supply of buses than all other world cities except Rome.

[8] 'Public transport' consists of scheduled services on: buses; minibuses; tramways & LRT; metros; commuter and suburban railways

Table 7.4 – Supply of Public Transport

City	Supply of public transport		Density of public transport*		Reserved public transport		Buses per 1,000 pop
	Veh. Km per capita	Rank	Route km per sq km	Rank	Metres / urban ha	Rank	
London	**157.0**	**1**			**9.7**	**2**	**0.9**
Berlin	127.0	2	2.4	2	8.1	3	0.4
Madrid	85.0	3	2.5	1	5.1	6	0.6
Paris	84.1	4	1.6	6	6.1	5	0.7
Rome	78.3	5	1.9	3.5	6.7	4	1.1
Barcelona	54.0	6	1.9	3.5	10.8	1	0.4
Athens	36.9	7	1.8	5	3.5	7	0.6

Source: Mobility in Cities, 2006 (data for 2001) and *Citizen's Network, 2002 (data for 2000).
Note: no Density data for London is available from Citizen's Network

Investment

7.11 Of the world cities shown, London currently invests the most in public transport (231 Euros per capita) while Paris invests the most in roads (Table 7.5).

Table 7.5 – Annual Investment in Transport Infrastructure

City	Investment in Public Transport		Investment in Roads	
	Euros per capita	Rank	Euros per capita	Rank
London	**231.0**	**1**	**135.0**	**2**
Berlin	189.0	2	87.7	4
Madrid	162.0	3	104.0	3
Paris	121.0	4	178.0	1
Athens	79.7	5	47.3	5
Rome	61.5	6		
Barcelona	40.2	7		

Source: Mobility in Cities, 2006 (data for 2001)
Note: no Road Investment data for Rome and Barcelona is available.
Investment includes public and private fund providers.
Public transport investment includes construction of new infrastructure, implementation of equipment, modernisation and rolling stock purchases.
Road investment includes all roads and footways open to the public, public car parks and parking meters, signposts and traffic management, and noise barriers.

Relative Costs of Transport

7.12 As shown in Table 7.6, the cost of using public transport in London is considerably higher than in any other world city sampled. Average monthly fares are twice as high as in Barcelona and Madrid. However, it should be noted that the fares shown relate to networks of different sizes and qualities.

Table 7.6 – Cost of Monthly Public Transport Pass

City	Monthly Pass (Euro, PPP adj)
London	**78.9**
Berlin-Brendenburg	50.9
Athens	47.3
Paris (Ile de France)	40.1
Barcelona	39.5
Madrid	35.1

Source: EMTA Barometer (2004), data for 2002. Data is for cost of monthly integrated transport ticket (main city).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2002), Eurostat.
Note no data for Rome available.

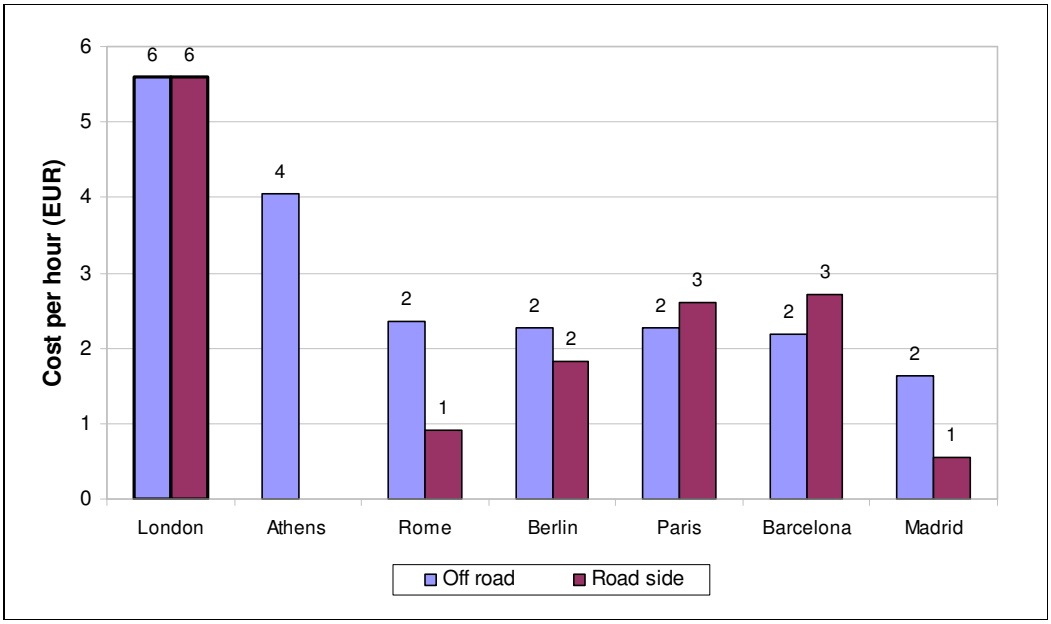
7.13 London has the most expensive off-road and road side parking – more than double the charges in Rome, Berlin, Paris and Barcelona (Table 7.7 and Figure 7.2). In London the cost of off-road parking is similar to road side; in the other cities the cost varies between the two parking types.

Table 7.7 – Maximum cost of one hour of parking in the CBD

City	Maximum cost of one hour of parking in the CBD (EUR), PPP adjusted			
	Off-road parking	Rank	Road side parking	Rank
London	**5.6**	**1**	**5.6**	**1**
Athens	4.1	2	0.0	7
Rome	2.4	3	0.9	5
Berlin	2.3	4	1.8	4
Paris	2.3	5	2.6	3
Barcelona	2.2	6	2.7	2

Source: Mobility in Cities, 2006 (data for 2001)
Note: Roadside parking costs data for Athens not available.

Figure 7.2 – Maximum cost of one hour of parking in the CBD (PPP adjusted)

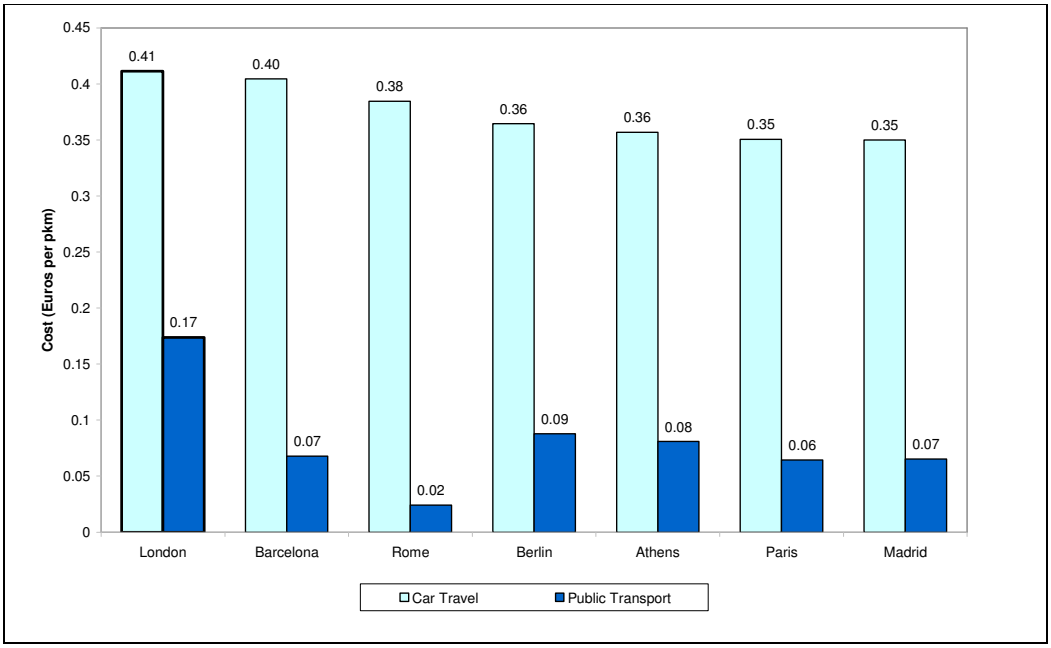


Source: Mobility in Cities, 2006 (data for 2001)
Note: Roadside parking costs data for Athens not available.

7.14 Figure 7.3 illustrates that travel by both car and public transport in London is comparatively more expensive[9] than in the other world cities sampled. However, Table 7.8 shows that the differential in the cost of travel by car and public transport is lower in London than the other cities.

[9] Car costs include the full cost of ownership and use i.e. fuel, maintenance, insurance, tax, parking, tolls and vehicle depreciation.

Figure 7.3 – Comparison of Public and Private Transport Costs to the User



Source: Mobility in Cities, 2006 (data 2001).
Note: PPP adjusted Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2001), Eurostat.

Table 7.8 – Ratio of Public and Private Transport Costs

City	Ratio of Car Travel costs to PT costs	Rank
London	**2.4**	**7**
Barcelona	6.0	2
Rome	15.8	1
Berlin	4.2	6
Athens	4.4	5
Paris	5.4	3
Madrid	5.4	4

Source: Mobility in Cities, 2006 (data 2001).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2001), Eurostat.

MOBILITY AND MODAL CHOICE

Distance Travelled

7.15 Table 7.9 shows that while the distance travelled per person by private vehicle in London is lower than all of the other cities apart from Barcelona and Berlin, London ranks forth in terms of overall distance travelled. Only Rome has a greater distance travelled by public transport.

Table 7.9 – Distance Travelled per Annum

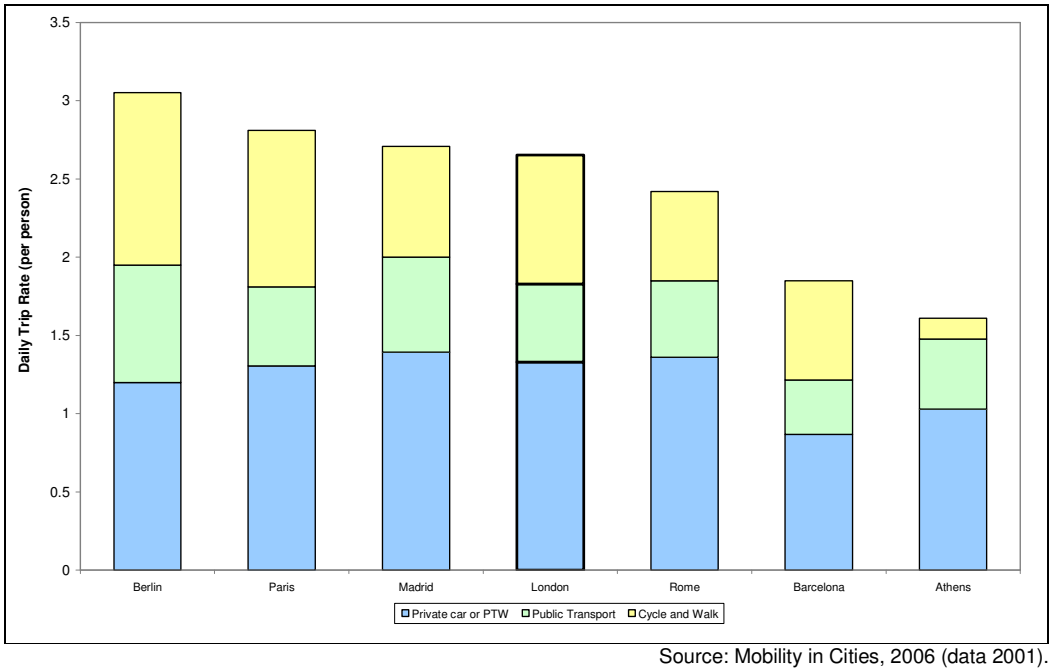
City	Passenger km / Person				Private vehicle proportion
	Private Vehicle	Public Transport	Total	Rank	
Rome	6,140	2,880	9,020	1	68%
Madrid	5,590	2,330	7,920	2	71%
Paris	4,900	2,170	7,070	3	69%
Athens	4,620	890	5,510	6	84%
London	**4,400**	**2,520**	**6,920**	**4**	**64%**
Barcelona	4,290	1,400	5,690	5	75%
Berlin	3,540	1,840	5,380	7	66%

Source: Mobility in Cities, 2006 (data 2001).

Trip Rates and Journey Lengths

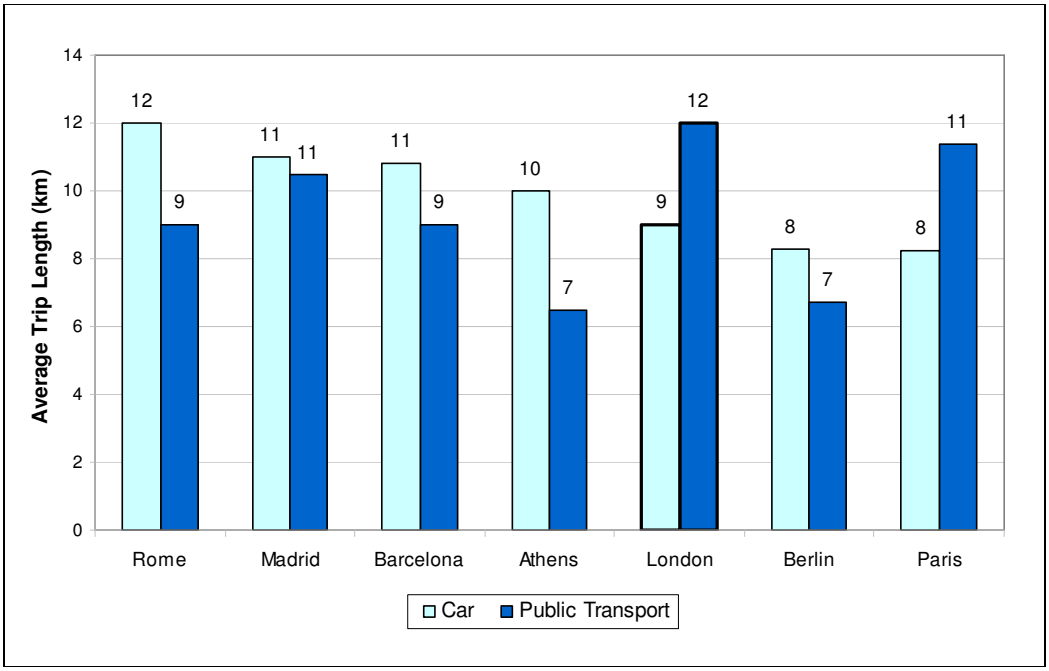
7.16 Figure 7.4 shows that in London around 2.5 times more trips per capita are made by car than by public transport. Berlin has the greatest overall trip rate per capita, but the lowest average trip length (Figure 7.5). Trip lengths by public transport are highest in London. Athens has the lowest overall level of trip making, with a particularly low number of trips made on foot or by cycle.

Figure 7.4 – Trip Rates by Mode



Source: Mobility in Cities, 2006 (data 2001).

Figure 7.5 – Average Trip Length

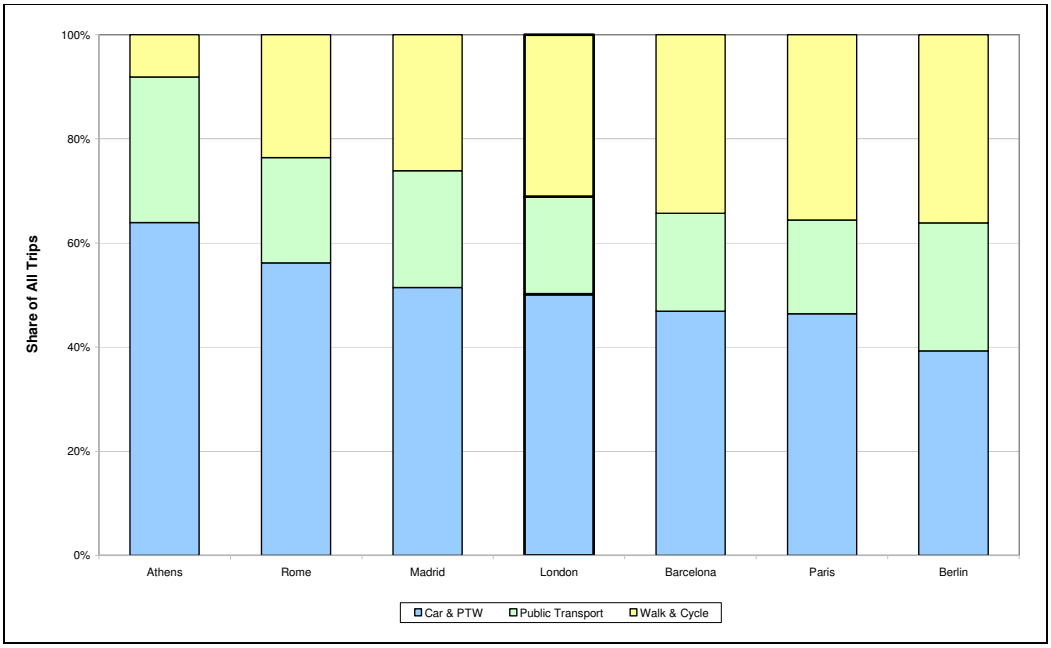


Source: Mobility in Cities, 2006 (data 2001).

Modal Split

7.17 London has the fourth highest share of private motorised vehicle transport trips – around 50 percent – (Figure 7.6), despite its low car ownership (Table 7.2). Barcelona, Paris and London all have equally low shares of public transport trips. Athens has a very low share of walk and cycling trips and the highest car mode share.

Figure 7.6 – Modal Share for World Cities



Source: Mobility in Cities, 2006 (data 2001).

ROAD SAFETY

7.18 Madrid has the lowest fatality record (2 fatalities per 100,000 population), while Barcelona has the greatest number of fatalities (Table 7.10). No data for London was available from the comparative data sources.

Table 7.10 – Traffic Fatalities

City	Traffic Fatalities per 100,000 inhabitants 2000
Madrid	2.0
Berlin	3.0
London	3.8
Rome	4.4
Athens	7.7
Paris	8.6
Barcelona	9.1

Source: Citizen's Network (2002), data for 2000.
Source for London: Fatalities figures from TfL website, data for 2003; Population figures from EU Transport in Figures, data for 2003.

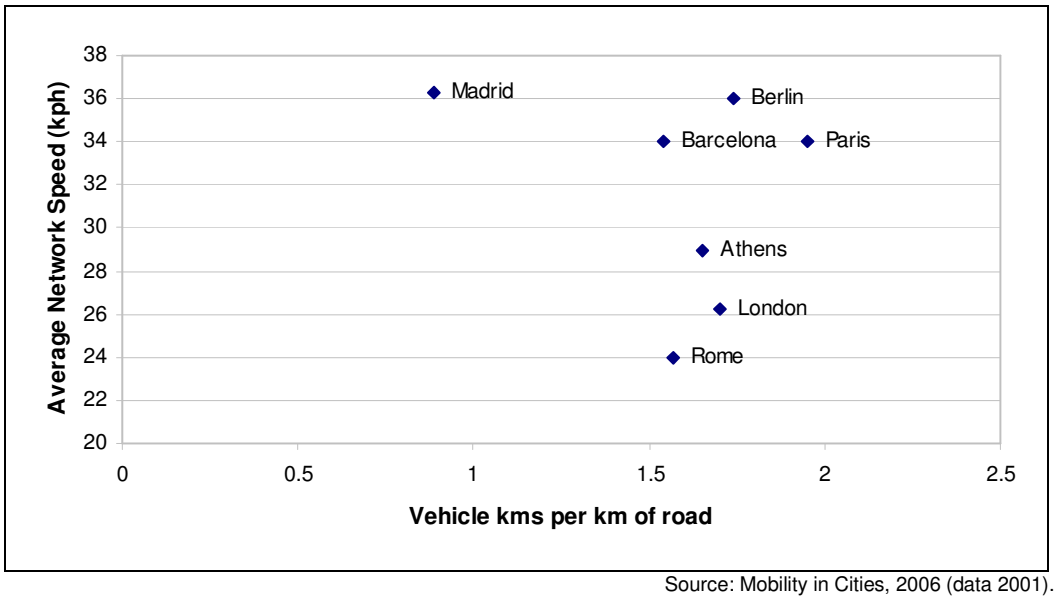
CONGESTION AND THE ENVIRONMENT

Congestion

7.19 As no formal measure of congestion exists, this report analyses average network speeds and compares them with vehicle kilometres per kilometre of road.

7.20 Figure 7.7 compares average road speed with average traffic density and shows that London and Rome experience lower speeds than the other cities despite having similar levels of traffic density as Berlin, Barcelona and Athens. Paris has a higher level of traffic density but has speeds around 8 kph higher than London.

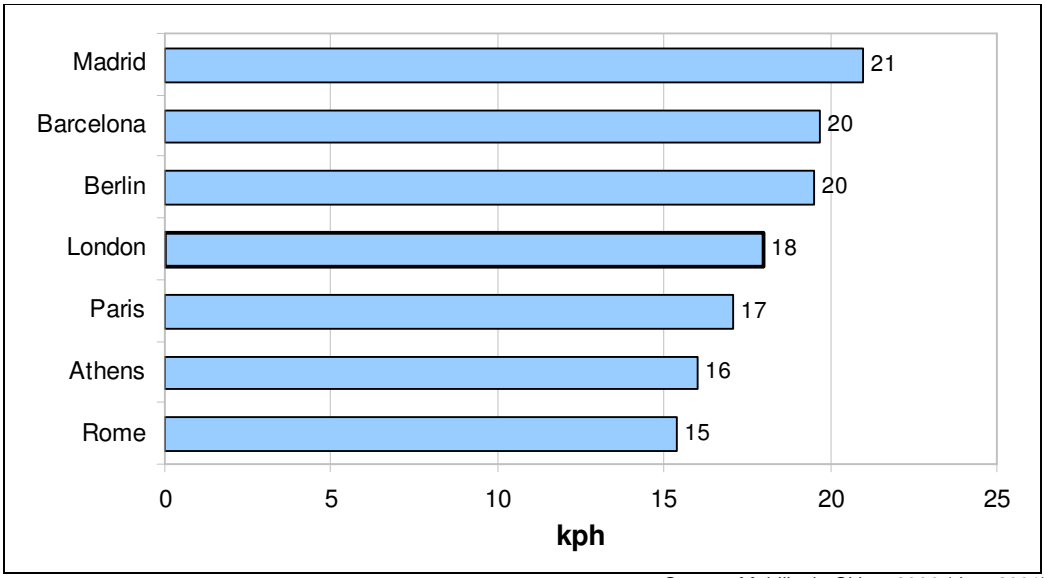
Figure 7.7 – Network speeds and traffic densities



Source: Mobility in Cities, 2006 (data 2001).

7.21 Rome also experiences the lowest average speeds for road-based public transport (Figure 7.8). In London public transport speeds are around average for the cities sampled.

Figure 7.8 – Average Public Transport Speed (road-based modes)



Source: Mobility in Cities, 2006 (data 2001).

Emissions

7.22 Annual polluting emissions per capita are lower in London than any of the other sampled cities (note: no data was available for Barcelona). Transport in Athens produces around three times as many polluting emissions as London (Table 7.11).

Table 7.11 – Passenger Transport Emissions of CO_2, VOC[10] & NO_X

City	Polluting Emissions (kg per capita per annum)
London	**29.3**
Berlin	37.2
Madrid	52.6
Rome	53.5
Paris	76.7
Athens	95.7

Source: Mobility in Cities, 2006 (data 2001).
Note: No data for Barcelona available.

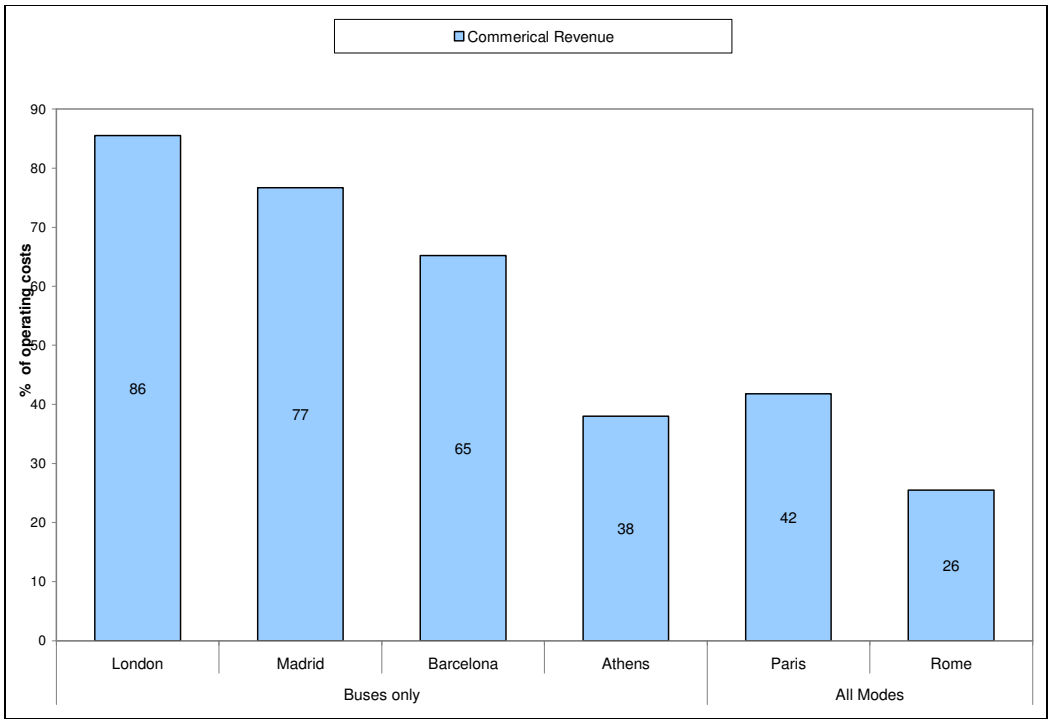
ACCESSIBILITY AND SOCIAL INCLUSION

Support for Public Transport

7.23 In London, commercial revenue accounts for 86 percent of bus operating costs while in Rome and Athens commercial revenue supplies less than 40 percent of bus/public transport operating costs (Figure 7.9).

[10] VOC: Volatile organic compounds

Figure 7.9 – Revenue Sources for Buses (and other public transport modes)



Source: Jane's Urban Transport Systems, 2005-06.
No data is available for Berlin.

Concessionary Fares

7.24 Discounts for over 65s/pensioners exist in all the sampled cities where data was available (Table 7.12). London's free travel for both the young and the elderly appears to be the most generous concessionary arrangement.

Table 7.12 – Summary of Concessionary Fare Availability

City	Concessionary Fares Summary
Barcelona	Bus & Metro: Reduced rate or free travel for over 65s according to pension levels
Berlin	Bus: Senior citizen passes; Free daily travel for disabled.
London	London transport network: Free travel for the elderly (aged 60 and above) and disabled who live in a London borough – excludes travel in the morning peak. Buses and trams: Free travel for under 16s.
Madrid	Bus: Heavily discounted passes for students and the elderly

Source: Jane's Urban Transport System 2005-06
Note: Data for Athens, Paris and Rome not available.

7.25 A summary of facilities for elderly and disabled has been provided (Table 7.13) as data on concessionary fares was not available for a number of the world cities being compared. Many bus facilities exist for the elderly and disabled in London; Athens has a fully accessible rail and metro system.

Table 7.13 – Facilities for the Elderly and Disabled

City	Facilities for Elderly and Disabled
Athens	Rail & Metro: All stations are accessible to disabled and elderly passengers
Barcelona	Bus: 301 low-floor buses in service. Metro: Line 2 fully accessible by street to platform lifts
Berlin	Bus: Accessible buses in operation on 103 routes; Separate 'Telebus' network of low-floor wheelchair-accessible midi buses operated by special agency. Tram: Trams on lines 20 and 24 are accessible.
London	TfL: LT's Unit for Disabled Passengers funds locally administered dial-a-ride minibus services as well as working to improve accessibility of all transport; Network of lift-equipped Mobility Bus routes, while fully accessible low-floor buses are operating on conventional routes.
Madrid	Bus: Low-floor buses used on routes with high proportion of elderly passengers.
Rome	Bus: Experimental operation of 4-lift-equipped minibuses

Source: Jane's Urban Transport System 2005-06
Note: Data for Paris not available.

8. Large Cities & Metropolitan Areas

8.1 Cities included in this section are:

- Budapest, Hungary;
- Copenhagen, Denmark;
- **Glasgow, UK;**
- Lisbon, Portugal;
- Lyon, France;
- **Manchester, UK;**
- Munich, Germany;
- Prague, Czech Republic;
- Stockholm, Sweden; and
- Vienna, Austria.

8.2 All have population in excess of one million and less than 2.75 million.

KEY LOCAL DETERMINANTS

Demographic and Social Indicators

8.3 Manchester has the second highest and Glasgow the third highest population of the cities investigated (Table 8.1). While population density, job density and GDP per inhabitant are all close to the average within the cities studied, the proportion of jobs within the CBD is low.

8.4 Glasgow is also one of the largest cities investigated but population and job densities are lower than average. The GDP per inhabitant and the proportion of jobs in the CBD are higher than in Manchester and some of the other sampled cities.

Table 8.1 – Demographic and Socio-Economic Indicators

City	Population (000s)	Urban population per hectare	Urban population + jobs / hectare	GDP per inhabitant (PPP adj)*	Proportion of jobs in CBD (%)
Lisbon	2,680	27.9	39	23,665	46.3
Manchester	**2,510**	**40.4**	**58.6**	**23,059**	**10.4**
Glasgow	**2,100**	**29.5**	**42.3**	**32,898**	**16.7**
Stockholm	1,840	18.1	27.5	33,488	13.7
Copenhagen	1,810	23.5	36.6	33,848	10.2
Budapest	1,760	46.3	71.5	26,296	10.2
Vienna	1,550	66.9	103	36,603	12.1
Munich	1,250	52.2	91.3	47,660	33

City	Population (000s)	Urban population per hectare	Urban population + jobs / hectare	GDP per inhabitant (PPP adj)*	Proportion of jobs in CBD (%)
Lyon	1,180	40	59.1	18,402	15.5
Prague	1,160	44	73.5	32,357	37.2

Source: Mobility in Cities, 2006 (data for 2001), except * Eurostat (GDP market prices at NUTS level 3, data for 2002)

Car & Powered Two-Wheeler Ownership

8.5 Car ownership levels in Glasgow are low while powered two-wheeler (PTW) ownership levels in both Glasgow and Manchester are lower than in most of the other cities (Table 8.2).

Table 8.2 – Car & Powered Two-Wheeler Ownership

City	Cars per 1,000 population		PTW per 1,000 population	
	Number	Rank	Number	Rank
Munich	542	1	42.1	3
Prague	536	2	45.2	1
Lyon	489	3	25.5	4=
Manchester	**434**	**4**	**10.1**	**8**
Lisbon	432	5	25.5	4=
Vienna	414	6	42.2	2
Stockholm	397	7	13.0	7
Glasgow	**345**	**8**	**5.42**	**10**
Budapest	329	9	7.0	9
Copenhagen	315	10	18.9	6

Source: Mobility in Cities, 2006 (data for 2001)

Supply of Roads and Parking

8.6 Glasgow has the highest proportion of road length per thousand population and the second highest proportion of motorway length per thousand population (Table 8.3). Manchester also ranks highly in terms of motorway and overall road length per thousand population.

Table 8.3 – Supply of Roads

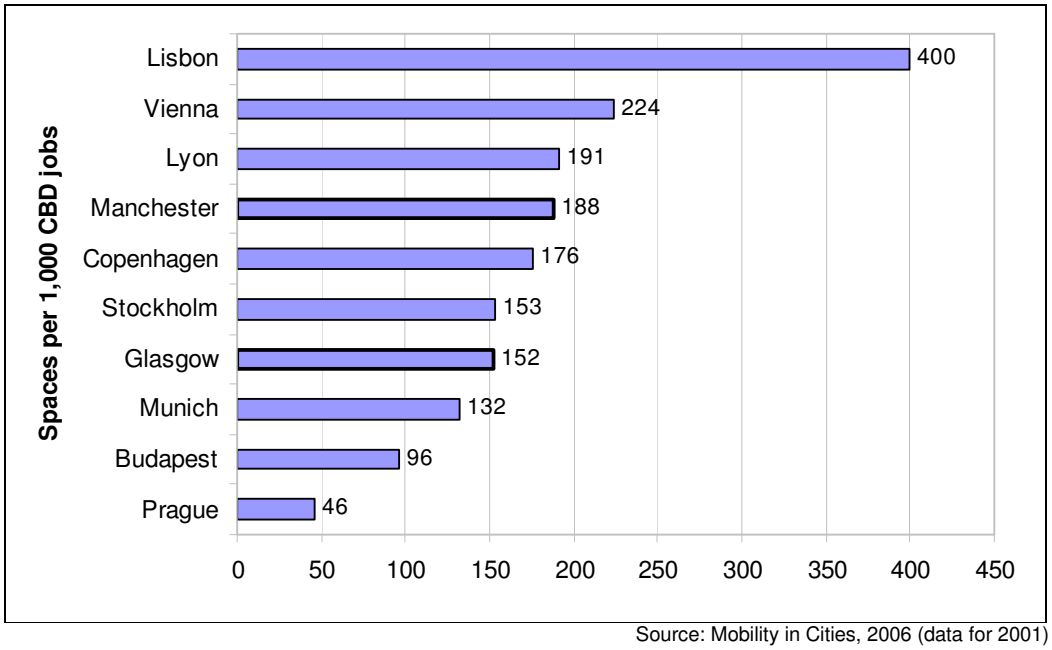
City	Length of Road (metres / 1,000 population)	Rank	Motorways (metres / 1,000 population)	Rank
Glasgow	**5,800**	**1**	**111.0**	**2**
Copenhagen	3,850	2	125.0	1
Manchester	**3,700**	**3**	**70.9**	**4**

City	Length of Road (metres / 1,000 population)	Rank	Motorways (metres / 1,000 population)	Rank
Prague	2,910	4	64.4	6
Lyon	2,470	5	68.1	5
Budapest	2,430	6	13.6	10
Munich	1,830	7	47.8	7
Vienna	1,810	8	28.7	9
Lisbon	889	9	86.8	3
Stockholm			45.0	8

Source: Mobility in Cities, 2006 (data for 2001)
Note: No Road length data for Stockholm available

8.7 The supply of parking (per thousands jobs in the CBD) in Manchester and Glasgow is typical for the cities investigated at 188 spaces and 152 spaces respectively (Figure 8.1). As with the proportion of jobs in the CBD (Table 8.1), the supply of parking in Lisbon's CBD is very high.

Figure 8.1 – Supply of Parking



Source: Mobility in Cities, 2006 (data for 2001)

Supply of Public Transport

8.8 Public transport vehicle kilometres per capita in both Glasgow and Manchester are comparatively low (Table 8.4) – Manchester's figure of 58.5 is less than half that recorded for Stockholm, Prague and Munich. The number of buses per thousand population is high in both Glasgow and Manchester, however.

Table 8.4 – Supply of Public Transport

City	Supply of public transport		Density of public transport*		Reserved public transport		Buses per 1,000 pop
	Veh. km per capita	Rank	Route km per sq km	Rank	Metres / urban ha	Rank	
Stockholm	147.0	1	-		4.2	9	0.9
Prague	135.0	2	1.8	3	10.3	3	1.2
Munich	121.0	3	2.7	1	12.0	2	0.5
Budapest	109.0	4	2.1	2	9.1	4	0.8
Copenhagen	109.0	5	-		6.0	7	0.6
Vienna	107.0	6	-		12.3	1	0.3
Glasgow	**99.7**	**7**	**-**		**7.7**	**5**	**1.9**
Lisbon	64.7	8	0.6	4	2.2	10	1.0
Manchester	**58.5**	**9**	**-**		**4.3**	**8**	**1.4**
Lyon	45.8	10	-		6.3	6	0.9

Source: Mobility in Cities, 2006 (data for 2001) and *Citizen's Network, 2002 (data for 2000).
Note: no density data for Stockholm, Copenhagen, Vienna, Glasgow, Manchester or Lyon is available from Citizen's Network

Investment

8.9 Manchester and Glasgow have lower public transport investment levels per capita than all other studied cities except Budapest – Glasgow's investment level is only 20 percent that of Copenhagen (Table 8.5). However, road investment in the UK cities is higher with Glasgow ranked second.

Table 8.5 – Annual Investment in Transport Infrastructure

City	Investment in Public Transport		Investment in Roads	
	Euros per capita	Rank	Euros per capita	Rank
Copenhagen	226.0	1	152.0	3
Munich	215.0	2		
Vienna	213.0	3	69.7	7
Stockholm	193.0	4	138.0	4
Lyon	152.0	5	264.0	1
Lisbon	133.0	6		
Prague	98.6	7	117.0	5
Manchester	**64.9**	**8**	**93.0**	**6**
Glasgow	**44.4**	**9**	**159.0**	**2**

City	Investment in Public Transport		Investment in Roads	
	Euros per capita	Rank	Euros per capita	Rank
Budapest	43.0	10	13.8	8

Source: Mobility in Cities, 2006 (data for 2001)
Note: no Road Investment data for Munich and Lisbon is available.
Investment includes public and private fund providers.
Public transport investment includes construction of new infrastructure, implementation of equipment, modernisation and rolling stock purchases.
Road investment includes all roads and footways open to the public, public car parks and parking meters, signposts and traffic management, and noise barriers.

Relative Costs of Transport

8.10 A comparison of monthly integrated transport ticket prices is only possible for those cities where such a public transport fare exists – see Table 8.6. Parking price data is available for more cities, however, and this indicates that Manchester has the highest rate of off-road parking charge while Glasgow has the highest on road parking charge (Table 8.7 and Figure 8.2).

Table 8.6 – Cost of Monthly Public Transport Pass

City	Monthly Pass
Stockholm	47.8
Vienna	40.9
Prague	20.2

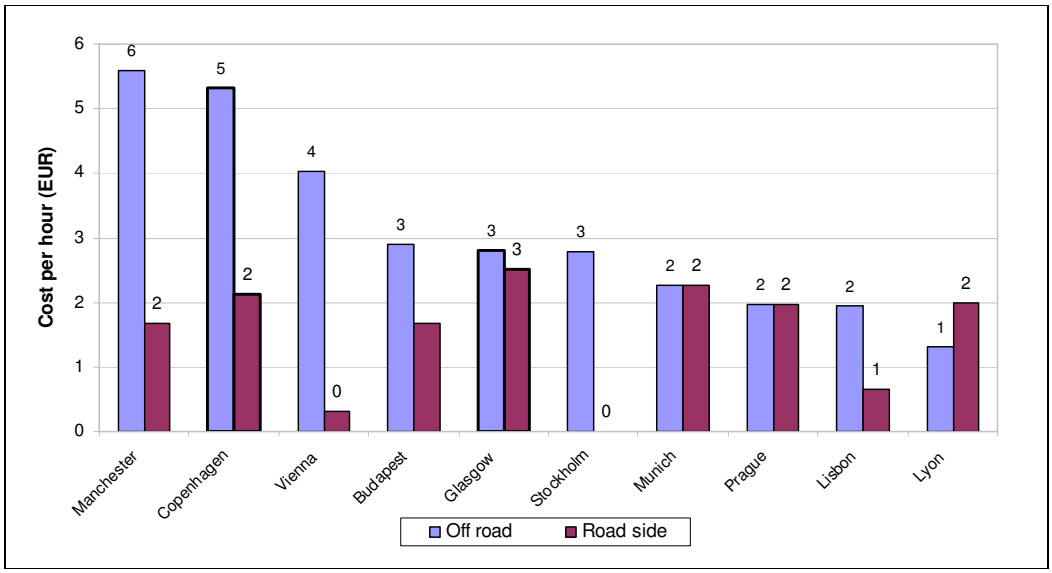
Source: EMTA Barometer (2004), data for 2002. Data is for cost of monthly integrated transport ticket (main city).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2002), Eurostat.

Table 8.7 – Maximum cost of one hour of parking in the CBD

City	Maximum cost of one hour of parking in the CBD (EUR), PPP adjusted			
	Off-road parking	Rank	Road side parking	Rank
Manchester	**5.6**	**1**	**1.7**	**6**
Copenhagen	5.3	2	2.1	3
Vienna	4.0	3	0.3	9
Budapest	2.9	4	1.7	7
Glasgow	**2.8**	**5**	**2.5**	**1**
Stockholm	2.8	6		
Munich	2.3	7	2.3	2
Prague	2.0	8	2.0	5
Lisbon	1.9	9	0.6	8

Source: Mobility in Cities, 2006 (data for 2001)
Note: Roadside parking costs data for Stockholm not available.

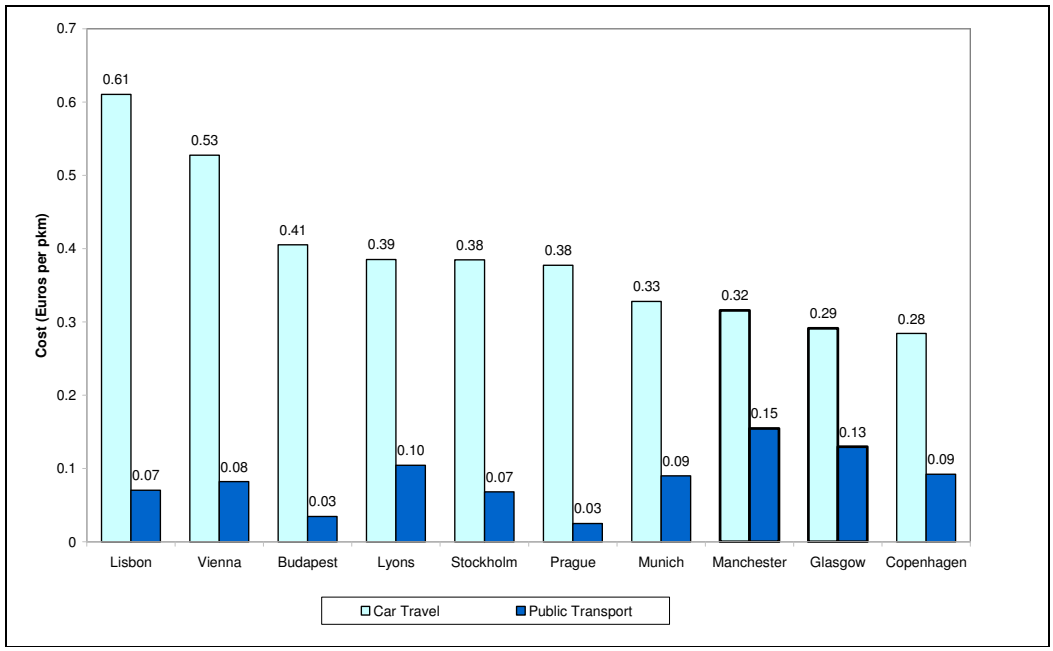
Figure 8.2 – Maximum cost of one hour of parking in the CBD (PPP adjusted)



Source: Mobility in Cities, 2006 (data for 2001)
Note: Roadside parking costs data for Stockholm not available.

8.11 A comparison of the cost of car travel (based on the full cost of car ownership and use) and public transport (based on fare revenue) indicates that car travel costs more per passenger kilometre than the equivalent rate for public transport, in all the cities studied (Figure 8.3). Car travel costs around double that of public transport in Manchester and Glasgow, whereas in Prague and Budapest the ratio is greater than 11 (Table 8.8) and in all other cities at least three.

Figure 8.3 – Comparison of Public and Private Transport Costs to the User



Source: Mobility in Cities, 2006 (data 2001).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2001), Eurostat.

Table 8.8 – Ratio of Public and Private Transport Costs

City	Ratio of Car Travel costs to PT costs	Rank
Lisbon	8.7	3
Vienna	6.4	4
Budapest	11.7	2
Lyon	3.7	6
Stockholm	5.6	5
Prague	15.1	1
Munich	3.6	7
Manchester	**2.0**	**10**
Glasgow	**2.2**	**9**
Copenhagen	3.1	8

Source: Mobility in Cities, 2006 (data 2001).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2001), Eurostat.

MOBILITY AND MODAL CHOICE

Distance Travelled

8.12 Munich has the highest passenger kilometres per person of the cities investigated with Manchester one of the lowest at around 6,300 km per capita in 2001 (Table 8.9). Public transport trip kilometres are lowest in Manchester, Glasgow and Lyon, with Manchester and Glasgow recording the highest proportion of car trip kilometres at 91 percent and 87 percent respectively.

Table 8.9 – Distance Travelled per Annum

City	Passenger km / Person				Private vehicle proportion
	Private Vehicle	Public Transport	Total	Rank	
Copenhagen	7,140	1,630	8,770	2	81%
Munich	6,750	2,910	9,660	1	70%
Glasgow	**6,330**	**978**	**7,308**	**4**	**87%**
Manchester	**5,700**	**561**	**6,261**	**7**	**91%**
Stockholm	4,760	2,450	7,210	5	66%
Lyon	4,350	776	5,126	9	85%
Prague	3,920	4,460	8,380	3	47%
Budapest	3,010	3,640	6,650	6	45%
Vienna	2,950	2,350	5,300	8	56%

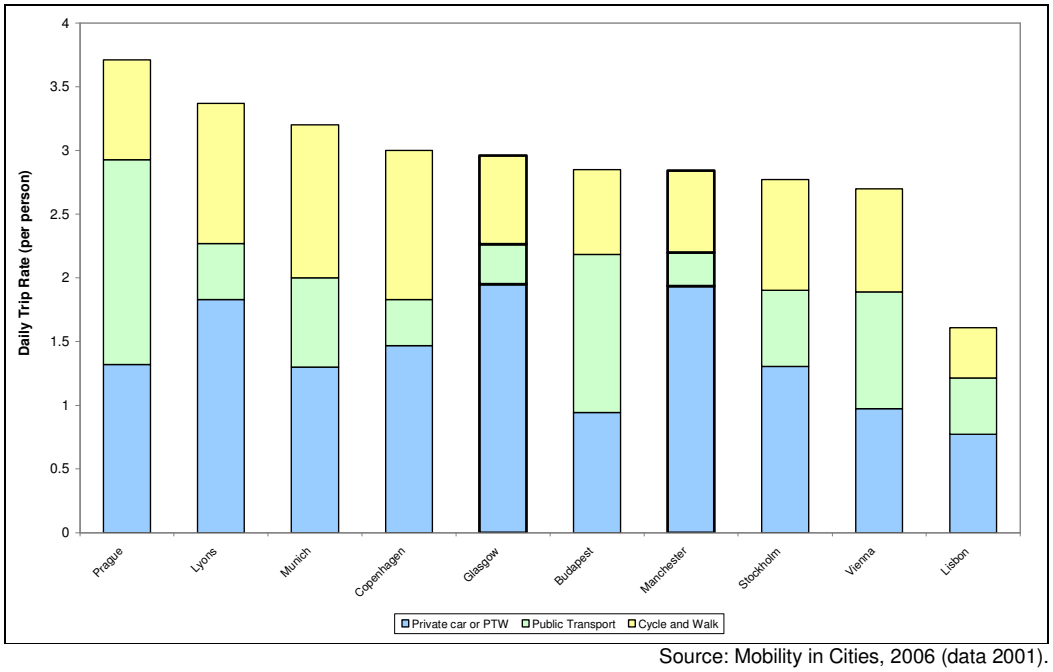
City	Passenger km / Person				Private vehicle proportion
	Private Vehicle	Public Transport	Total	Rank	
Lisbon	2,780	2,030	4,810	10	58%

Source: Mobility in Cities, 2006 (data 2001).

Trip Rates and Journey Lengths

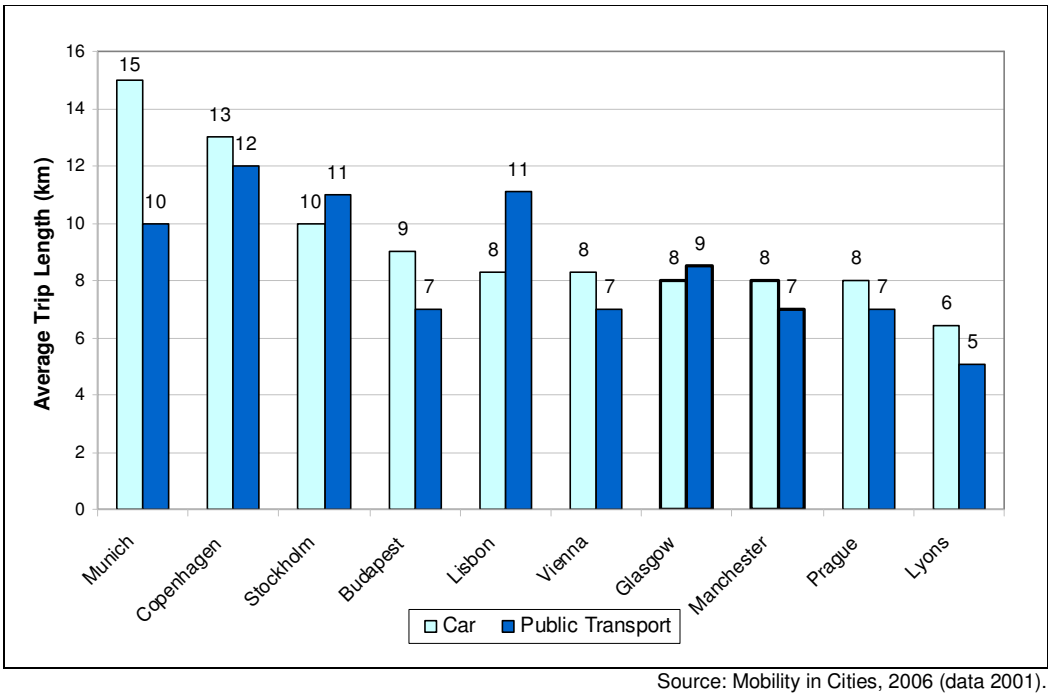
8.13 While average trip rates per capita in Glasgow and Manchester are typical within the group of cities investigated, the proportions of these trips made by private motorised vehicle are well above average with comparatively low trip rates per capita by public transport (Figure 8.4). Average trip lengths by car and public transport in Manchester and Glasgow are lower than in Munich, Copenhagen and Stockholm (Figure 8.5). Public transport trip lengths in Lisbon are also higher than in Manchester and Glasgow.

Figure 8.4 – Trip Rates by Mode



Source: Mobility in Cities, 2006 (data 2001).

Figure 8.5 – Average Trip Length

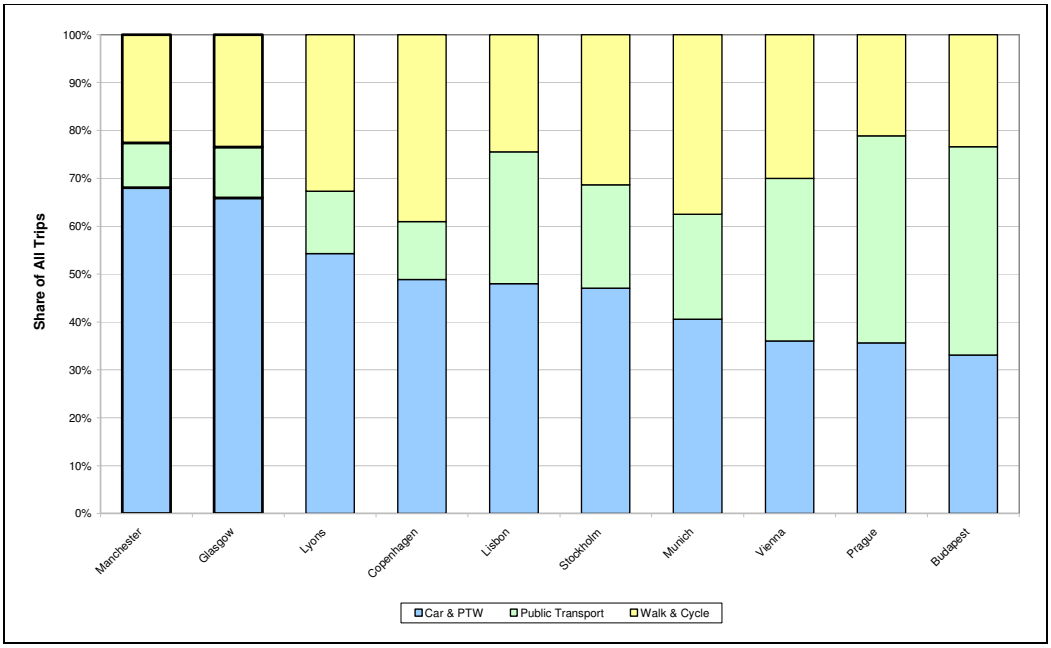


Source: Mobility in Cities, 2006 (data 2001).

Modal Split

8.14 Manchester and Glasgow have the highest private motorised vehicle mode share of the cities studied at around 67 percent (Figure 8.6). Vienna, Prague and Budapest have less than 40 percent car mode share.

Figure 8.6 – Modal Share for Large Cities



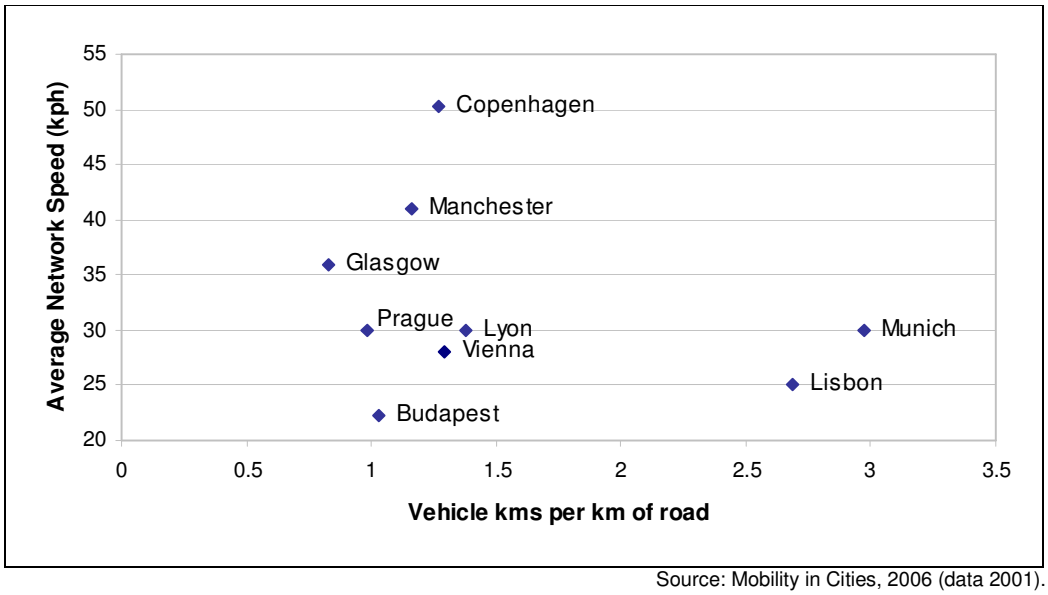
Source: Mobility in Cities, 2006 (data 2001).

CONGESTION AND THE ENVIRONMENT

Congestion

8.15 Average traffic speeds in Manchester and Glasgow are among the highest for the cities studied – only Copenhagen achieves higher average network speeds (Figure 8.7). While network speeds are lower in Munich and Lisbon, these are achieved with traffic densities more than double those experienced in the other cities.

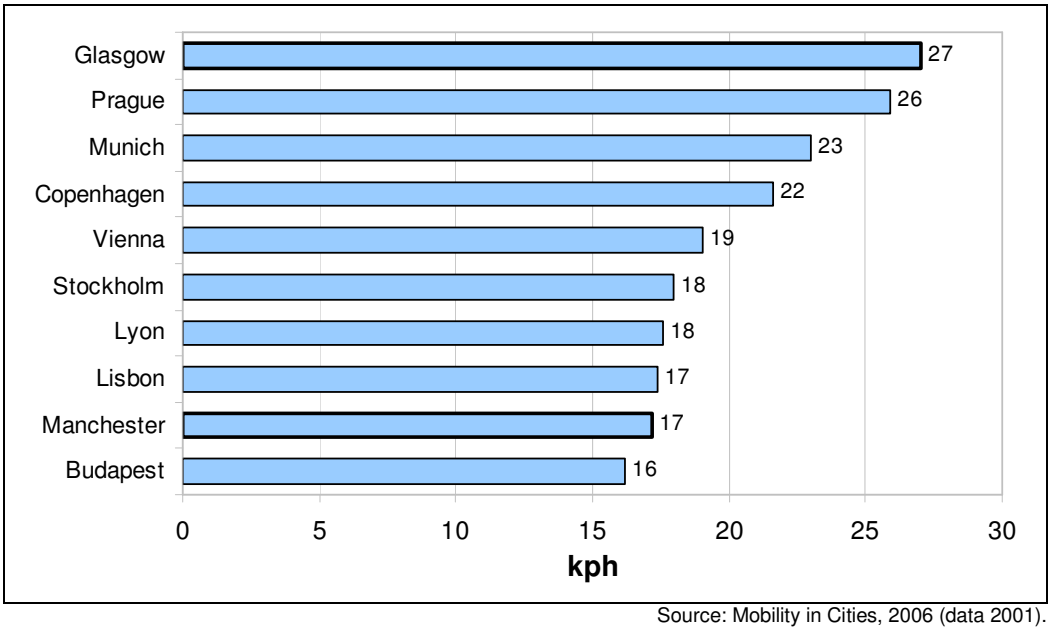
Figure 8.7 – Network speeds and traffic densities



Source: Mobility in Cities, 2006 (data 2001).

8.16 Average speeds for road based public transport modes are highest in Glasgow while Manchester records the second slowest speeds amongst the cities investigated (Figure 8.8). Despite the high density of traffic in Munich, noted above, public transport speeds in this city are relatively high.

Figure 8.8 – Average Public Transport Speed (road-based modes)



Source: Mobility in Cities, 2006 (data 2001).

Emissions

8.17 There is a wide variation in the passenger transport emissions per capita between the studied cities (Table 8.10). The data indicates that per capita emissions in

Copenhagen are around eight times those in Vienna. Emissions per capita in Manchester and Glasgow are average within this group of cities.

Table 8.10 – Passenger Transport Emissions of CO_2, VOC & NO_X

Large Cities	Polluting Emissions (kg per capita per annum)
Vienna	10.8
Budapest	14
Manchester	**39.2**
Glasgow	**39.6**
Stockholm	42.3
Lyon	67.4
Copenhagen	86

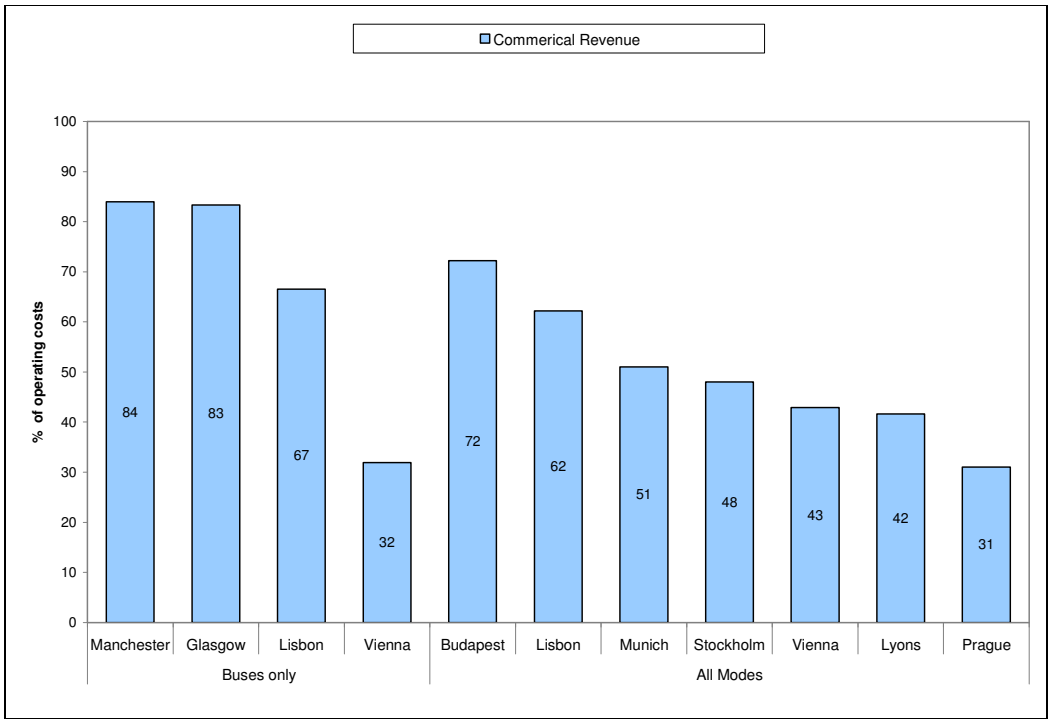
Source: Mobility in Cities, 2006 (data 2001).
Note: No data for Lisbon, Munich and Prague available.

ACCESSIBILITY AND SOCIAL INCLUSION

Support for Public Transport

8.18 In Manchester and Glasgow commercial revenue covers around 80 percent of bus operating costs (Figure 8.9). Of the cites studied this is the highest proportion of commercial revenue funding; in Vienna and Prague commercial revenue accounts for only around 30 percent of bus/public transport operating costs.

Figure 8.9 – Revenue Sources for Buses (and other public transport modes)



Source: Jane's Urban Transport Systems, 2005-06
Note that no comparable data is available for Copenhagen

Concessionary Fares

8.19 For all of the cities for which data is available some form of concessionary fare for the young and/or elderly is available (Table 8.11). In Budapest, Copenhagen and Lyon concessions are available on season tickets only, while in Glasgow, Manchester, Prague and Vienna concessions are available on a wider variety of ticket types.

Table 8.11 – Summary of Concessionary Fare Availability

City	Concessionary Fares Summary
Budapest	Bus: Reduced fares for monthly and annual passes for the elderly/disabled
Copenhagen	Bus: 3-month off-peak season tickets at one-tenth normal adult price for elderly/disabled but no special finance provided.
Glasgow	Bus: Nominal fare for concessionary passengers.
Lyon	Bus: Reduced price or free monthly pass for over 65s who pay no income tax and invalids
Manchester	Bus: On ordinary services low flat fare charged for elderly and disabled; Bus & Light Rail: The Great Manchester Passenger Transport Executive administers the concessionary fares scheme which allows pensioners children and disabled people to free or reduced rate travel.
Prague	Bus: Concessions for children, students, elderly and military

City	Concessionary Fares Summary
Vienna	Bus: Free travel for children up to 19 on Sunday and holidays.

Source: Jane's Urban Transport System 2005-06
Note: Data for Lisbon, Munich and Stockholm not available.

8.20 The data on specific facilities for the elderly and disabled on public transport indicates a wide variation in levels of provision (Table 8.12). While in Lisbon only 4 specifically adapted bus services for the elderly and disabled are noted, in Manchester the LRT system is fully accessible while all new buses on standard scheduled routes are low floor type.

Table 8.12 – Facilities for the Elderly and Disabled

City	Facilities for Elderly/Disabled
Budapest	Bus: Accessible buses on 17 routes
Glasgow	Bus: Dial-a-bus network.
Lisbon	Bus: 4 Mercedes-Benz 412D vehicles are specially arranged for elderly/disabled
Lyon	Bus: 'Optibus' pre-reserved door-to-door on-demand service operated by a private company, Interhone, contracted by Sytral, using 20 minibuses plus taxis
Manchester	Bus: Some single-decks have wheelchair ramps; all new buses are low-floor type; Light rail: Fully accessible to wheelchairs by ramps to raised platforms.
Munich	Bus: 85 stations are wheelchair accessible.
Prague	Bus: Some special bus services; one sixth of the bus fleet is low-floor; electronic information system for blind persons
Stockholm	Train to Arlanda Airport: All of the stations are accessible and one of the middle carriages of each four-car train has special spaces for wheelchairs.

Source: Jane's Urban Transport System 2005-06
Note: Data for Copenhagen and Vienna not available.

9. Other Cities

9.1 Cities included in this section are:

- Brussels, Belgium;
- Graz, Austria;
- Helsinki, Finland;
- Marseille, France;
- Nantes, France;
- **Newcastle-upon-Tyne, UK;**
- Stuttgart, Germany.

9.2 All these cities have populations of one million or less.

KEY LOCAL DETERMINANTS

Demographic and Social Indicators

9.3 While the sample of 'other cities' demonstrate a wide variation in total population – Stuttgart is around ten times the size of Graz – population densities are more comparable at between 31 and 74 persons per hectare (Table 9.1). Newcastle has the lowest GDP per capita – less than half that of Brussels.

Table 9.1 – Demographic and Socio-Economic Indicators 2001

City	Population (000s)	Urban population per hectare	Urban population + jobs / hectare	GDP per inhabitant (PPP adj)*	Proportion of jobs in CBD (%)
Stuttgart	2,380	35.3	54.7	29,032	7.85
Newcastle-upon-Tyne	**1,080**	**42.5**	**60.6**	**22,603**	**18.4**
Helsinki	969	44	70.9	33,420	16.1
Brussels	964	73.6	124	49,645	26.3
Marseille	800	58.8	80.9	23,876	23.4
Nantes	555	34.7	50.6	23,777	19.6
Graz	226	31	52.5	30,442	19.4

Source: Mobility in Cities, 2006 (data for 2001), except * Eurostat (GDP market prices at NUTS level 3, data for 2002)

Car & Powered Two-Wheeler Ownership

9.4 Of the cities investigated, Newcastle has the lowest car and powered two-wheeler ownership per thousand population (Table 9.2).

Table 9.2 – Car & Powered Two-Wheeler Ownership

City	Cars per 1,000 population		PTW per 1,000 population	
	Number	Rank	Number	Rank
Stuttgart	566	1	43.8	2
Nantes	546	2	28.9	3
Brussels	497	3	17.9	5
Graz	468	4	48.6	1
Marseille	406	5	19.4	4
Helsinki	361	6	15.5	6
Newcastle	**320**	**7**	**8.52**	**7**

Source: Mobility in Cities, 2006 (data for 2001)

Supply of Roads and Parking

9.5 Road densities (per thousand population) in Stuttgart, Marseille and Brussels are significantly lower than in the other cities sampled (Table 9.3). Motorway density in Newcastle is typical at around 130 metres per thousand population, while in Stuttgart it is high (around 270 metres per thousand population) and Brussels and Marseille low (around 40 metres per thousand population).

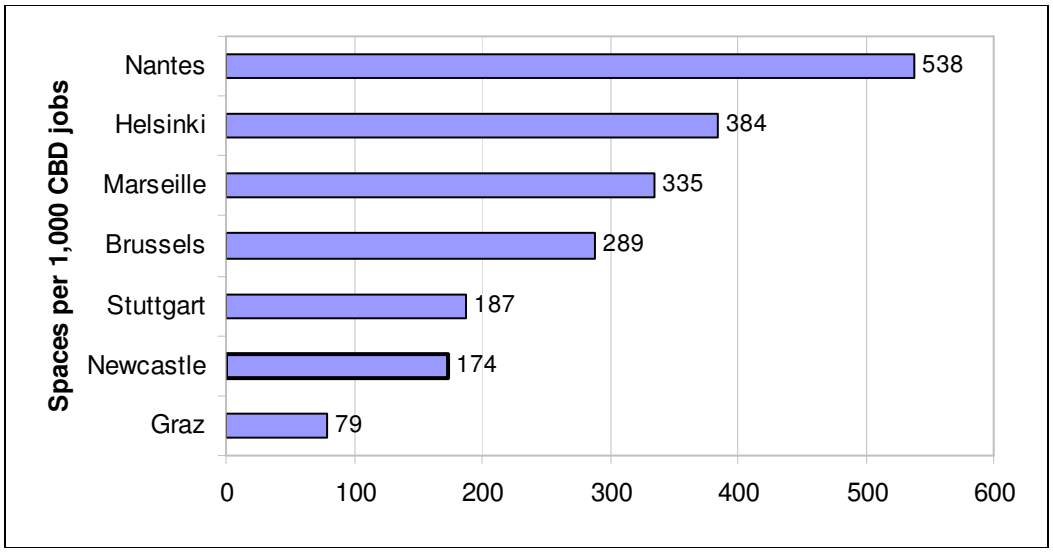
Table 9.3 – Supply of Roads

City	Length of Road (metres per 1,000 population)	Rank	Motorways (metres per 1,000 population)	Rank
Nantes	5,410	1	123	3
Graz	4,400	2	79.6	5
Newcastle	**4,120**	**3**	**129**	**2**
Helsinki	3,610	4	90.8	4
Brussels	1,940	5	36.3	7
Marseille	1,630	6	41.3	6
Stuttgart	1,190	7	269	1

Source: Mobility in Cities, 2006 (data for 2001)

9.6 Parking space density (per thousand CBD jobs) is low in Newcastle – only one third that of Nantes (Figure 9.1). However, Graz – which has the lowest parking density of the cities sampled – has a parking density less than half that recorded in Newcastle.

Figure 9.1 – Supply of Parking



Source: Mobility in Cities, 2006 (data for 2001)

Supply of Public Transport

9.7 The supply of public transport in Newcastle is above average in terms of both vehicle kilometres per capita and buses per thousand population (Table 9.4). However, Brussels, Stuttgart and Helsinki have a higher proportion of reserved routes for public transport.

Table 9.4 – Supply of Public Transport

City	Supply of public transport		Reserved public transport		Buses per 1,000 pop
	Vehicle km per capita	Rank	Metres / urban ha	Rank	
Helsinki	119.0	1	4.5	3	1.3
Brussels	91.1	2	13.6	1	0.9
Newcastle	**84.0**	**3**	**3.1**	**4**	**1.1**
Stuttgart	69.6	4	8.0	2	0.5
Graz	50.0	5	1.0	7	0.6
Marseille	37.9	6	1.5	6	0.8
Nantes	37.2	7	2.4	5	0.6

Source: Mobility in Cities, 2006 (data for 2001)

Investment

9.8 Reflecting the high level of supply of public transport, reported above, investment levels in public transport are high in both Brussels and Helsinki (Table 9.5). Public transport investment per capita in Newcastle is less than half that of Brussels.

Table 9.5 – Annual Investment in Transport Infrastructure

City	Investment in Public Transport		Investment in Roads	
	Euros per capita	Rank	Euros per capita	Rank
Brussels	140.0	1	145.0	2
Helsinki	90.9	2	157.0	1
Graz	77.1	3	89.9	4
Nantes	74.5	4		
Newcastle	**65.0**	**5**	**85.3**	**5**
Stuttgart	40.0	6		
Marseille	23.6	7	129.0	3

Source: Mobility in Cities, 2006 (data for 2001)
Note: no Road Investment data for Nantes and Stuttgart is available.
Investment includes public and private fund providers.
Public transport investment includes construction of new infrastructure, implementation of equipment, modernisation and rolling stock purchases.
Road investment includes all roads and footways open to the public, public car parks and parking meters, signposts and traffic management, and noise barriers.

9.9 The data for highway investment is less complete, but of those cities where numbers are available, Newcastle invests the least.

Relative Costs of Transport

9.10 Data on the cost of monthly integrated public transport tickets was extremely limited – potentially reflecting the unavailability of such tickets in some cities (Table 9.6).

Table 9.6 – Cost of Monthly Public Transport Pass

City	Monthly Pass (€)
Brussels	30.8
Helsinki	29.8

Source: EMTA Barometer (2004), data for 2002. Data is for cost of monthly integrated transport ticket (main city).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2002), Eurostat.
Note: no data for other cities available.

Newcastle has the second highest off road parking costs of all the cities studied – eclipsed only by Marseille which costs more than twice as much as Newcastle (Table 9.7 and Source: Mobility in Cities, 2006 (data for 2001)

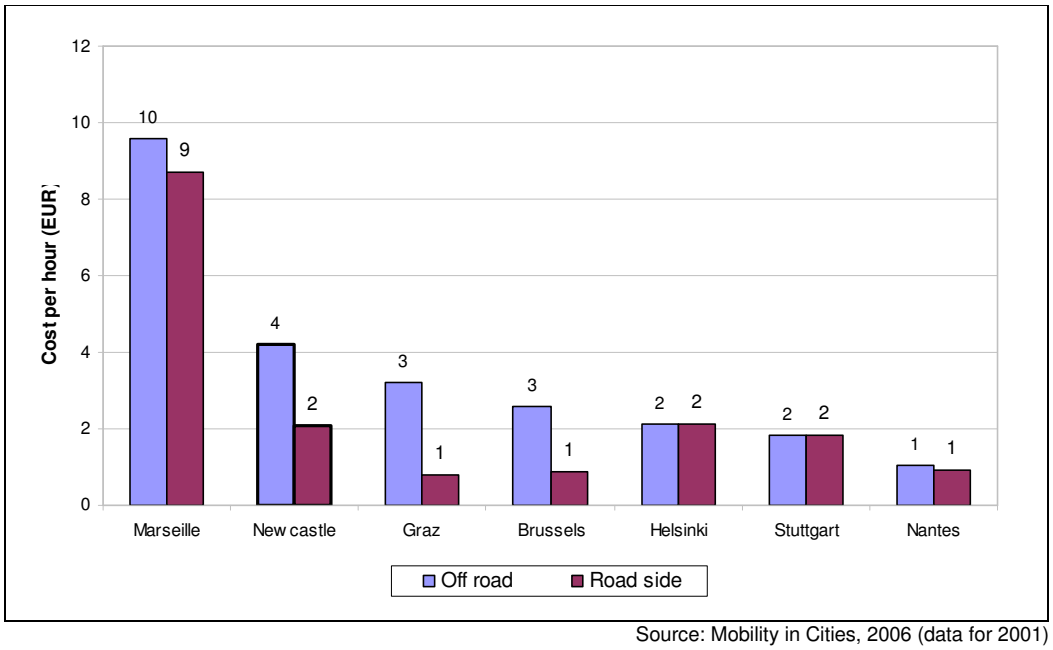
9.11 Figure 9.2). Road side parking costs in Newcastle are comparable to Helsinki and Stuttgart, with Marseille again the most expensive at 8.7 euros (PPP adjusted).

Table 9.7 – Maximum cost of one hour of parking in the CBD

City	Maximum cost of one hour of parking in the CBD (EUR), PPP adjusted			
	Off-road parking	Rank	Road side parking	Rank
Marseille	9.6	1	8.7	1
Newcastle	**4.2**	**2**	**2.1**	**3**
Graz	3.2	3	0.8	7
Brussels	2.6	4	0.9	6
Helsinki	2.1	5	2.1	2
Stuttgart	1.8	6	1.8	4

Source: Mobility in Cities, 2006 (data for 2001)

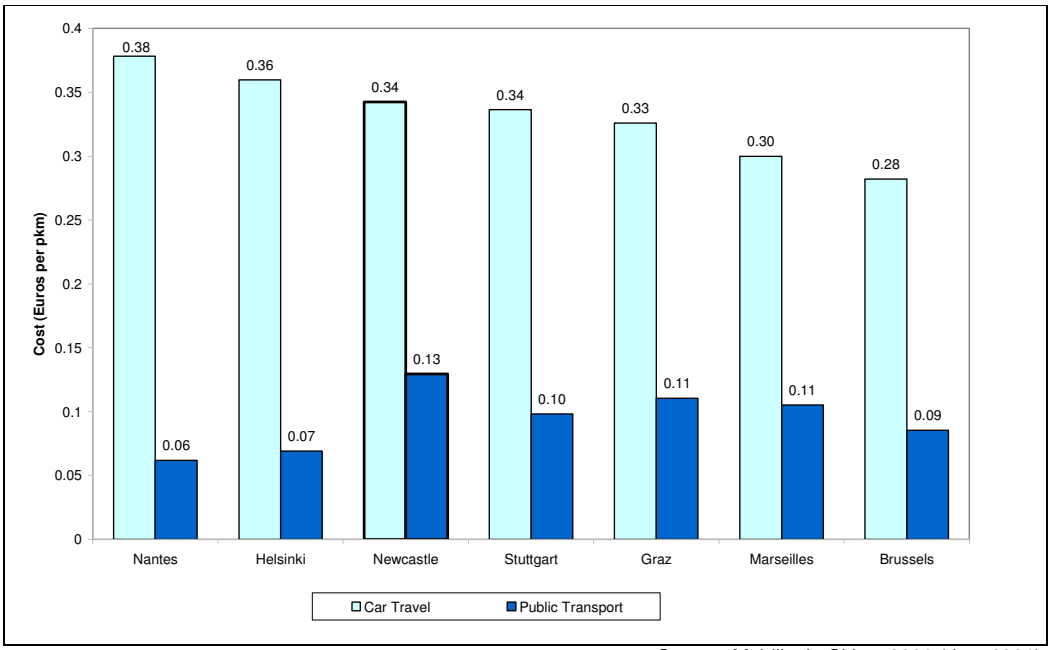
Figure 9.2 – Maximum cost of one hour of parking in the CBD



Source: Mobility in Cities, 2006 (data for 2001)

9.12 A comparison of the full costs of car ownership with the cost to the individual of using public transport indicates that car travel costs more per kilometre than public transport in all of the cities analysed (Figure 9.3). Newcastle has the lowest ratio of car cost to public transport cost 2.6 compared with 6.1 in Nantes (Table 9.8).

Figure 9.3 – Comparison of Public and Private Transport Costs to the User



Source: Mobility in Cities, 2006 (data 2001).
Note: PPP adjusted Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2001), Eurostat.

Table 9.8 – Ratio of Public and Private Transport Costs

City	Ratio of Car Travel costs to PT costs	Rank
Nantes	6.1	1
Helsinki	5.2	2
Newcastle	**2.6**	**7**
Stuttgart	3.4	3
Graz	2.9	5
Marseille	2.9	6
Brussels	3.3	4

Source: Mobility in Cities, 2006 (data 2001).
Note: PPP adjusted. Source for GDP in PPP: EU Transport in Figures, 2004 (data for 2001), Eurostat.

MOBILITY AND MODAL CHOICE

Distance Travelled

9.13 Stuttgart is recorded as having the highest combined private and public transport passenger kilometre per capita figure Table 9.9. The proportion of car journeys is low in Helsinki and Graz, while at 85 percent Newcastle is slightly above average.

Table 9.9 – Distance Travelled per Annum

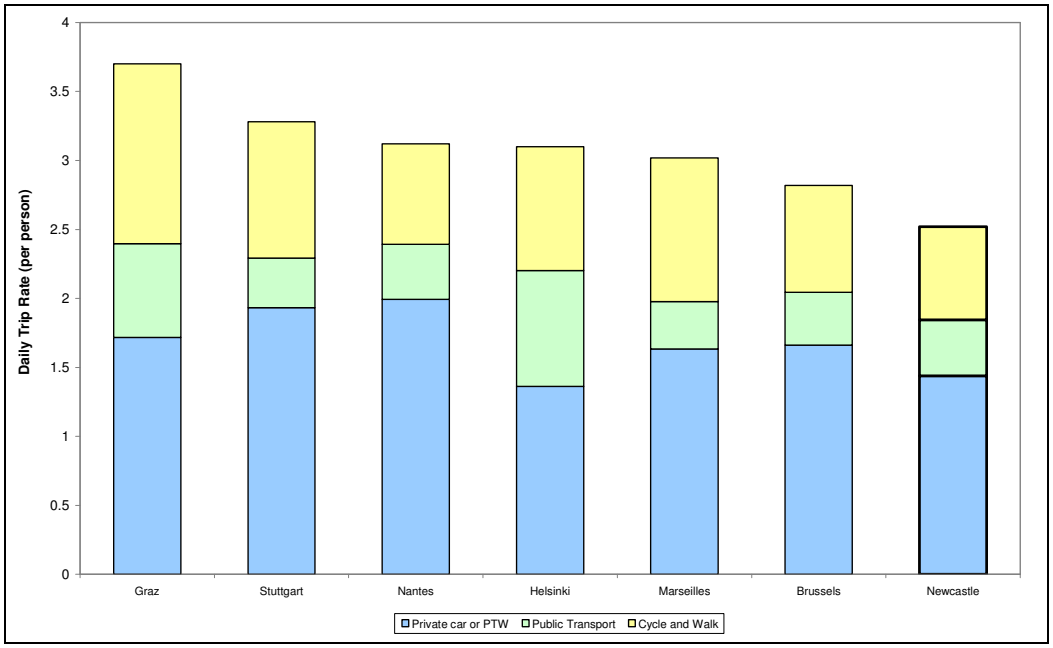
City	Passenger km / Person				Private vehicle proportion
	Private Vehicle	Public Transport	Total	Rank	
Stuttgart	7,630	1,070	8,700	1	88%
Brussels	6,140	1,400	7,540	2	81%
Newcastle	**5,630**	**976**	**6,606**	**4**	**85%**
Graz	5,410	1,580	6,990	3	77%
Marseille	5,130	581	5,711	6	90%
Nantes	5,010	642	5,652	7	89%
Helsinki	4,250	2,200	6,450	5	66%

Source: Mobility in Cities, 2006 (data 2001).

Trip Rates and Journey Lengths

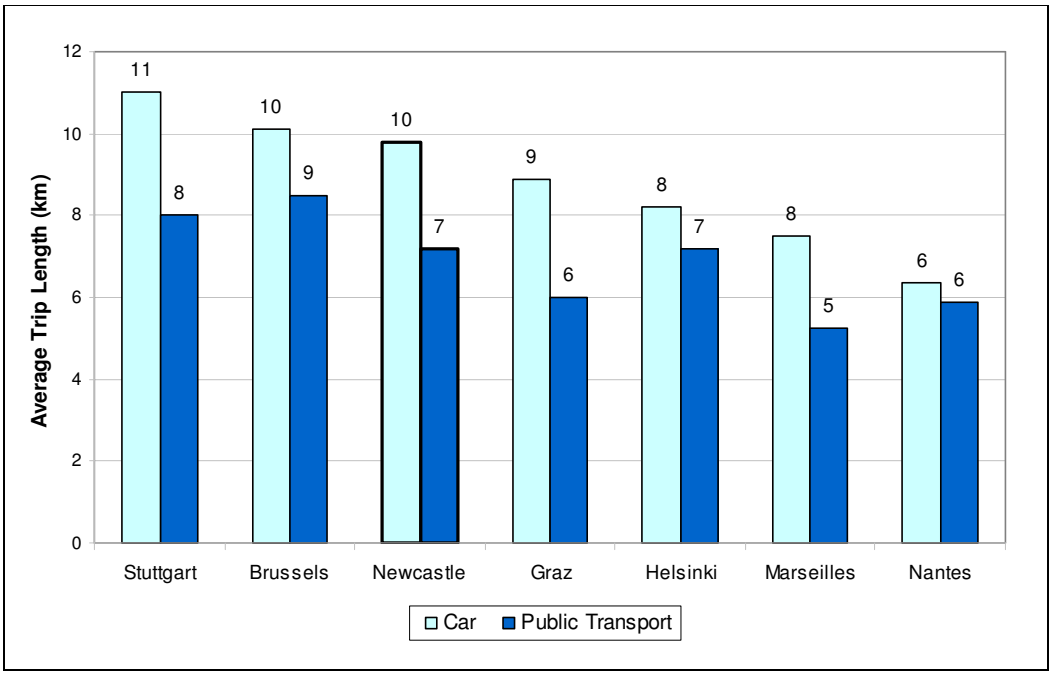
9.14 The lowest recorded trip rates per capita are in Newcastle (Figure 9.4). Graz, which shows the highest overall trip rates per capita, has particularly high numbers of trips by walk/cycle. Average trip lengths by car in Newcastle are towards the upper end of the examples shown in Figure 9.5, while trips lengths by public transport are close to the average. Although public transport trip rates in Graz are high, trip lengths are below average.

Figure 9.4 – Trip Rates by Mode



Source: Mobility in Cities, 2006 (data 2001).

Figure 9.5 – Average Trip Length

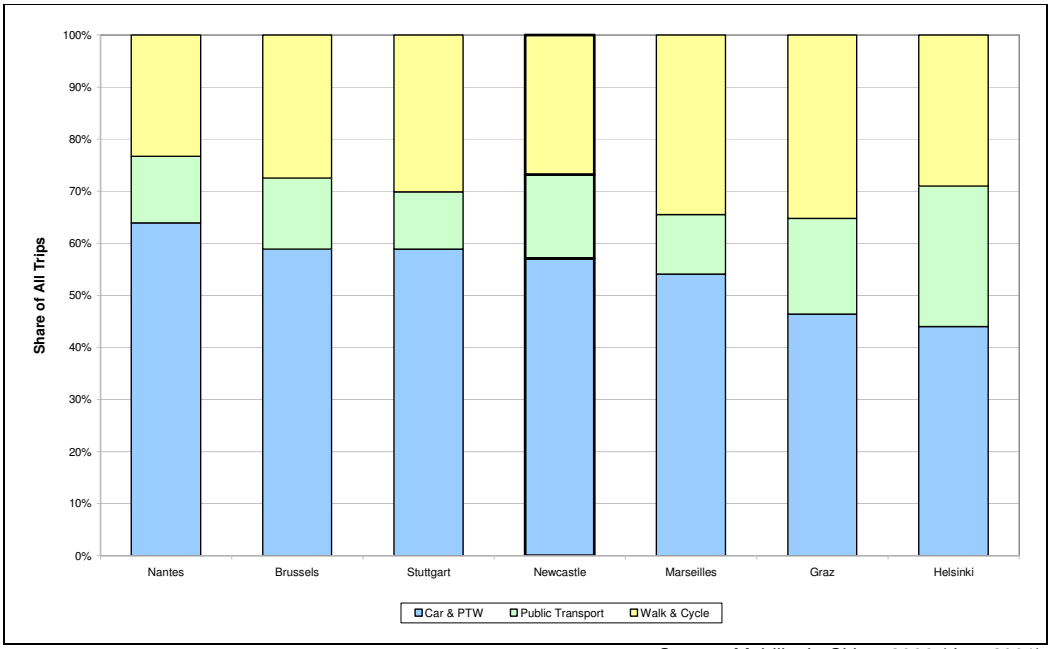


Source: Mobility in Cities, 2006 (data 2001).

Modal Split

9.15 A comparison of overall mode shares indicates that car and powered two-wheeler use in Newcastle is typical, with high rates recorded in Nantes and low rates in Helsinki (Figure 9.6). While Stuttgart has a similar car and powered two-wheeler mode share to Newcastle, the walk/cycle mode share is greater in Stuttgart – in Newcastle residents show a greater preference for public transport modes.

Figure 9.6 – Modal Share for Other Cities



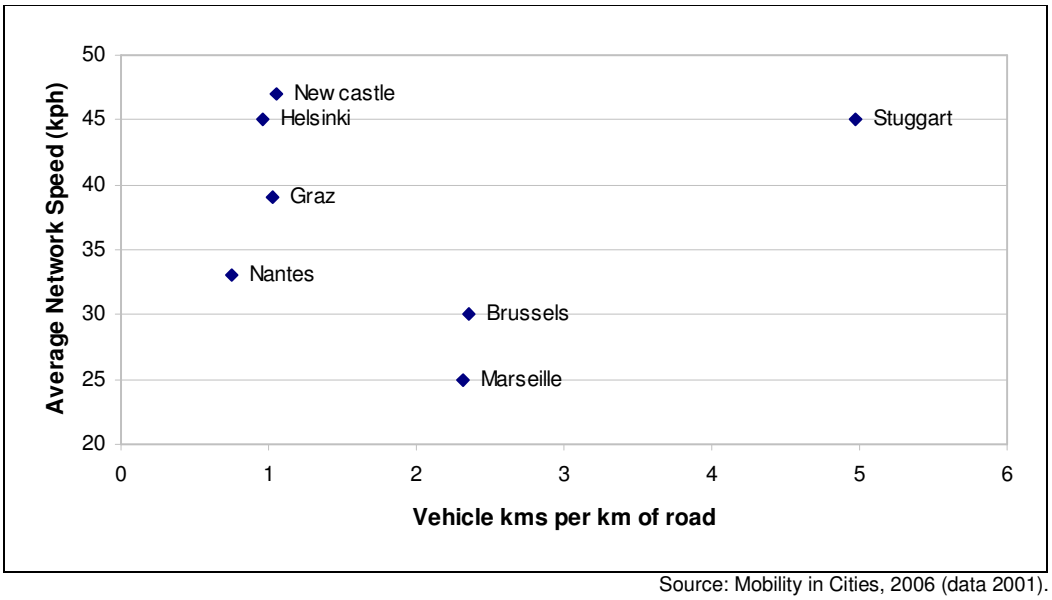
Source: Mobility in Cities, 2006 (data 2001).

CONGESTION AND THE ENVIRONMENT

Congestion

9.16 Average network speeds in Stuttgart are among the highest, at 45 kph, even though the proportion of vehicle kilometres per kilometre of road (5) is considerably higher than the other cities investigated (Figure 9.7). Newcastle records the highest network speed (47 kph), though the proportion of vehicle kilometres per kilometre of road is only around one fifth that in Stuttgart.

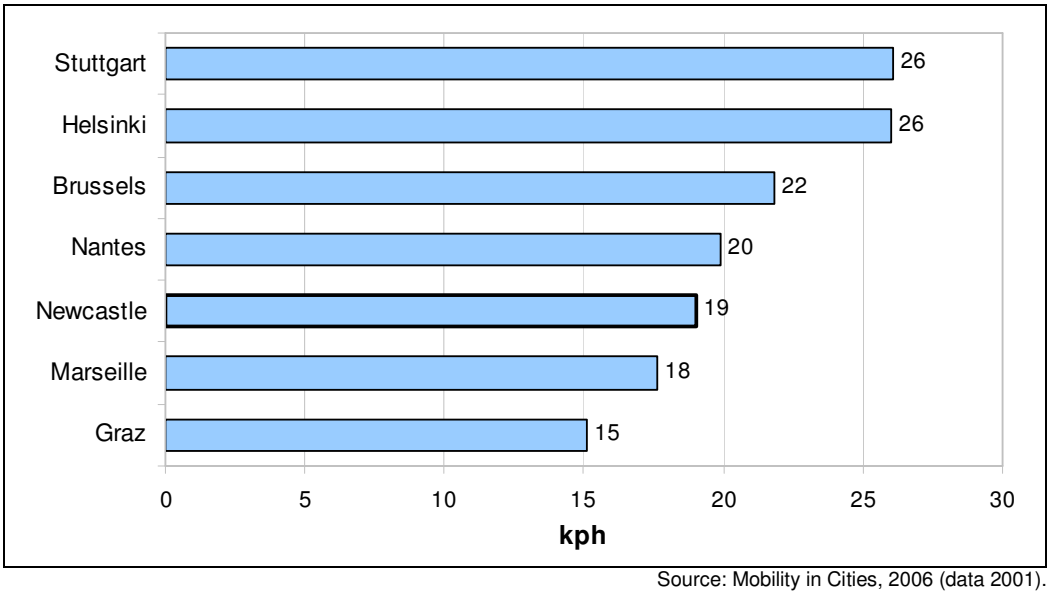
Figure 9.7 – Network speeds and traffic densities



Source: Mobility in Cities, 2006 (data 2001).

9.17 Average public transport speeds in Stuttgart, Helsinki and Brussels are above average for the cities studied (Figure 9.8), potentially reflecting the above average proportion of reserved public transport routes (Table 9.4).

Figure 9.8 – Average Public Transport Speed (road-based modes)



Source: Mobility in Cities, 2006 (data 2001).

Emissions

9.18 Of the cities analysed, Newcastle is recorded as having the lowest emissions of carbon dioxide, volatile organic compounds, and nitrogen oxide per capita (Table 9.10). In Nantes the combined measure of these emissions in kilograms per capita is more than double the figure recorded in Newcastle.

Table 9.10 – Passenger Transport Emissions of CO_2, VOC & NO_X

City	Polluting Emissions (kg per capita per annum)
Newcastle	**35.3**
Graz	36.2
Helsinki	40.9
Stuttgart	52.9
Brussels	68.9
Marseille	74.4
Nantes	80.4

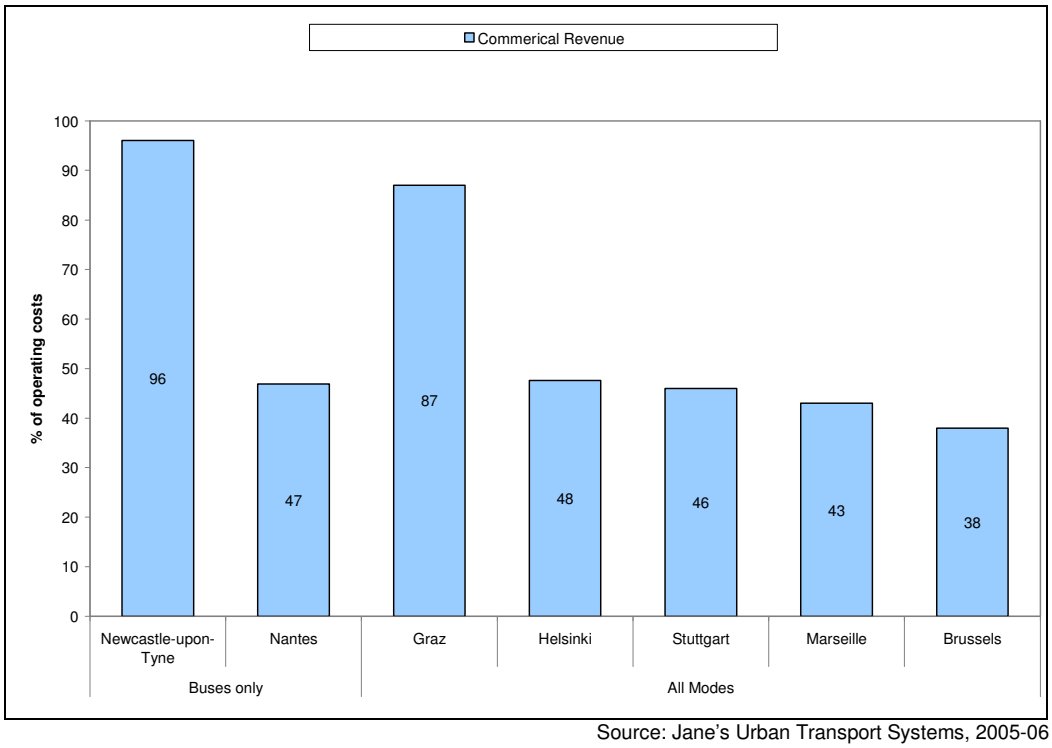
Source: Mobility in Cities, 2006 (data 2001).

ACCESSIBILITY AND SOCIAL INCLUSION

Support for Public Transport

9.19 While commercial revenue accounts for the overwhelming proportion of total bus/public transport operating costs in Newcastle (96 percent) and Graz (87 percent), in the other cities commercial revenue accounts for less than 50 percent of operating costs (Figure 9.9).

Figure 9.9 – Revenue Sources for Buses (and other public transport modes)



Source: Jane's Urban Transport Systems, 2005-06

Concessionary Fares

9.20 For all the cities where data is available, concessionary fares exist for the elderly but only Newcastle is recorded as offering concessions to the young (Table 9.11). In Helsinki all buses are to be low floor by 2006 while in Stuttgart the majority of the stations on the tram network are accessible by ramp or lift (Table 9.12).

Table 9.11 – Summary of Concessionary Fare Availability

City	Concessionary Fares Summary
Graz	Bus: Reduced rate monthly and annual passes for unrestricted travel on weekdays after 0815 and at weekends for elderly and disabled
Marseille	Bus: Reduced fares or free travel for over 65s and invalids
Nantes	Bus: Free travel for blind people and escorts, free/reduced for persons over 65 provided by communities in SEMITAN
Newcastle*	Bus: Concessionary fare for elderly, disabled, young person (aged 5-16) and students(16-18); Elderly and disabled persons can travel at half fare up to a maximum of 30p per journey or at the operator's half fare if this is a lesser amount.

Source: Jane's Urban Transport System 2005-06
* Source: Tyne and Wear Passenger Transport Authority website, www.twpta.gov.uk
Note: Data for Brussels, Helsinki and Stuttgart not available.

Table 9.12 – Facilities for the Elderly and Disabled

City	Facilities for Elderly/Disabled
Brussels	Bus: Special minibus service provided; 15 vehicles lift-equipped
Helsinki	Bus: All buses will be low-floor by 2006; Trams: New trams are low-floor versions.
Nantes	Bus: Minibuses adapted to take wheelchairs; System administered for SEMITAN (bus services provider) by a local disablement research body.
Stuttgart	Tram: 137 of the 151 high-platform stations are accessible by ramp or lift

Source: Jane's Urban Transport System 2005-06
Note: Data for Graz, Marseille and Newcastle not available.

10. Summary and Conclusions

10.1 The UK government's 1998 White Paper marked a new commitment to integrated and sustainable transport in the UK. This update of the Commission for Integrated Transport's 2001 report on European Best Practice provides an opportunity to understand what progress was made in the early years following the 1998 White Paper. Changes at a national level have been examined using new data-sets, typically for the period to 2002. For cities, the data (available up to 2001 only) has provided some indication of the progress of a selection of UK cities relative to other cities elsewhere in Europe.

10.2 Inevitably difficulties with obtaining reliable data and reconciling unexplained differences require the data analysis to be treated with caution.

INCREASED CAR OWNERSHIP AND MOBILITY

10.3 Analysis in relationship to car ownership shows:

- Growth in car ownership across Europe, but the rate of growth in the UK is greater than the average for the EU15 (11 percent compared to 9 percent);
- Faster rates of growth in the UK than in Germany, France and Italy, although overall car ownership rates remain lower;

10.4 Analysis of walking and cycling indicates that:

- Levels of walking and cycling in the UK are still low compared to most other countries in the EU15 – the UK has the second lowest level of walking in the EU15, and the fourth lowest level of cycling;
- There has been a one percent increase in walking over the period 1995 to 2000 compared to an EU average of 2 percent;
- Cycling per capita has decreased in all countries over the same period with the 2 percent decrease in the UK typical of that seen in many countries across Europe.

ECONOMIC AND TRANSPORT CONVERGENCE

10.5 EU Member states with lower than average gross domestic product (such as Greece and Spain) have experienced the greatest increases in economic growth, reflecting policies aimed at reducing the disparity between member states.

10.6 Amongst these states, Greece, Portugal and Spain (together with Ireland) feature the highest increases from 1998 to 2002 amongst EU-15 countries in both car ownership (40 percent, 23 percent and 14 percent respectively) and car travel per capita (40 percent, 23 percent, 18 percent respectively).

10.7 These countries have also seen the greatest increase in new transport infrastructure investment.

10.8 Similarly the New Member States have experienced above average increases in car ownership, investment in roads and, in most cases, car use, with a decline in their dependence on public transport.

REDUCING CAR DEPENDENCE

10.9 While Greece, Spain, Portugal and Ireland have seen the largest increases in car mode share between 1998 and 2002, UK continues to have the highest overall car mode share at 2002 (85 percent) within the EU-15. Levels of travel by car in the UK are broadly equivalent to the European average but there is a lower use of public transport, and the UK therefore has the highest reliance in the EU-15 on car relative to public transport use.

10.10 However, the increase in public transport use in the UK between 1998 and 2002 (7 percent) is broadly similar to the increase in car use (7 percent). The UK is one of only five countries where this has occurred (with Sweden, for instance, showing an increase in car use of 6 percent and in public transport use of 17 percent). Other countries, especially those with faster growing economies have seen much higher rates of growth in car use than public transport use. For instance, in Ireland car travel has increased by 15 percent between 1998 and 2002, compared to a 6 percent increase in public transport use.

10.11 Analysis of car dependence at the city level indicates:

- In 2001 about half of all trips in London were by car or powered two wheeler with about 20 percent by public transport and just under 30 percent by walk and cycle;
- Car mode shares in Barcelona, Paris and Berlin remain slightly lower. In Berlin car trips are around 40 percent, with around 35 percent walk and cycle, and 25 percent public transport;
- In Manchester and Glasgow, however, car mode share in 2001 is over 65 percent and higher than in comparable cities such as Lyons, Copenhagen, Munich and Vienna.

10.12 In the EU15 only the UK, Ireland, Netherlands and Luxembourg have achieved a rate of growth in car travel less than GDP growth over the period 1998 to 2002.

THE RELATIVE COST OF PUBLIC TRANSPORT USE

10.13 The cost of using public transport in the UK is higher than in other EU countries. The cost of a monthly travel pass in London is around twice that in Paris, Barcelona and Madrid. The UK continues to capture a much greater proportion of public transport operating costs from users than other European countries and cities. Eighty-six percent of bus revenue in London comes from commercial revenue, compared to 42 percent in Paris and 26 percent in Rome.

10.14 The cost of making a trip by car compared to public transport in London, Manchester and Glasgow is higher by factors of 2.4, 2.0 and 2.2 respectively. In other European cities car trip costs are higher than public transport by a factors of 3.6 (Munich), 6.4 (Vienna) 8.7 (Lisbon) and 15.8 (Rome). This largely reflects the lower public

transport user costs in these cities. Rome, for instance, has public transport user costs per kilometre which are around a tenth of those in London.

10.15 The cost of motoring in the UK is higher than in most other EU15 countries. In addition, in the seven years to 2002, fuel prices in the UK have increased by more than the EU15 average. Parking costs in London are typically two to three times that in other comparable cities. Manchester and Newcastle tend to be higher than average and Glasgow broadly in line with comparable cities.

10.16 Overall using a car compared to public transport remains relatively cheap in the UK cities when compared to cities elsewhere in Europe.

PROGRESS ON PRIORITY OUTCOMES

10.17 Our analysis with respect to progress on priority outcomes may be summarised as follows:

Congestion

- Although not in itself a reliable guide to congestion levels, some cities (e.g. Copenhagen, Berlin and Paris) achieve higher road speeds at similar or greater levels of traffic density (traffic flow per km of road) compared to UK cities;
- Demand management through parking charges (as noted above) appears to be more advanced in UK cities, although further work will be necessary to determine how this correlates with congestion levels and traffic densities.

Road Safety

- The UK continues (along with Sweden) to have the lowest exposure to fatalities. Over the last four years the UK has reduced the fatality rate by 1 percent compared to 13 percent across Europe;
- The greatest national reductions in fatality risk tend to be in those countries with higher than average rates; for instance, Portugal and Spain have experienced reductions in fatality risk of 25 and 16 percent respectively;
- Exposure to road traffic fatalities in the New Member States is nearly three times that for the EU15. Exposure to injury is also higher;
- The UK's exposure to injury accidents is above the European average and over the last four years we have achieved an 8 percent reduction compared with an average 14 percent reduction across Europe;
- Pedestrian fatalities in the UK, despite reducing by 11 percent between 1996 and 2003, are now slightly above the EU15 average. Sweden and Denmark have made more progress than the UK over recent years despite having lower levels to start with.

Emissions

- Over the period 1996 to 2003 the UK has seen a reduction in NOx and NMVOC emissions. This reduction has, in both cases, been greater than that achieved across Europe as a whole;
- However, CO2 is still rising in most countries including the UK. Whilst the UK increase is less than the European average, Germany experienced a reduction;

- Polluting emissions per capita from transport in London are lower than in all other comparable cities included in the survey and nearly a third the level in Paris. Manchester and Glasgow have lower levels than Lyons and Copenhagen but are higher than Vienna and Budapest. Newcastle has lower levels than all other comparable cities surveyed including Nantes, Marseilles and Stuttgart.

Accessibility and social inclusion

- All cities appear to be making progress towards fully accessible public transport and free or concessionary fares for the young, elderly and disabled.

APPENDIX A

Table A1 - Comparison between 2004 and 2005 data

Reference in European Best Practice 2006 Update Final Report (Phase 1)	Figure/Table Title	Comparison between 2004 and 2005 data
Table 2.1 Figure 2.1	National Demographic & Socio-Economic Indicators, 1997/8 and 2003/4 (EU-25) Change in Population (%), 1997-2004 (EU-25)	In the 2005 data source, population data for 2004 have been amended slightly for most countries, though 1997 figures remain unchanged. This has given rise to several slight adjustments in the population change figures presented in Figure 2.1. The most notable difference is Spain, for which a rise of 4 percent was reported using the 2004 data, and 7 percent with the revised 2005 data.
Figure 2.2	Change in Density, 1997-2003 (EU-25)	Population density data for 1997 and 2003 are similar in both 2004 and 2005 data sources. The greatest variations are for Italy and Spain. However, the amendments are not sufficiently significant to have impacted on the 'change in density' figures.
Figure 2.3	Change in GDP per capita in PPS, 1997-2003 (EU-25)	GDP per capita data for 1997 have remained similar in the 2004 and 2005 publications, apart from the figures for Italy (101 to 103) and Cyprus (76 to 72). There have been some slight fluctuations in the data presented for 2003, notably for Portugal (71 to 67), Sweden (105 to 107) and Luxembourg (194 to 201). These amendments have impacted slightly on the calculation of change in GDP per capita, as presented in Figure 2.3. There are notable differences in the data presented for Luxembourg (change in per capita GDP presented as +28 using 2004 data source, and as +36 with 2005 data source), Portugal (+1 to -3), Italy (-4 to -6), Sweden (0 to +2), Cyprus (-1 to +2).
Figure 2.4	Change in Unemployment Rate (%), 1998-2003 (EU-25)	It should be noted that unemployment data in the earlier 2006 European Best Practice Update was presented for 1998 and 2003. However, the data source (Eurostat database) no longer provides unemployment data for 1998, so the figures presented here are for 1999 and 2003. There have been some minor changes to the 2003 data. Calculations of the change in unemployment rate between 1999 and 2003, using the 2005 data source, present slightly, but not significant, different figures to those illustrated in the earlier report for 1998-2003. The most notable difference is for Estonia (previous calculations showed a change of +1; 2005 data shows a change of -2) and Czech Republic (2004 data showed a change of +2; 2005 data shows a change of -1).
Figure 2.5 Figure 2.6	Car ownership, 1980-2002 (EU-25) Change in car ownership, 1998-2002 (EU-25)	There are some variations in the car ownership data taken from the 2004 and 2005 sources. The most notable differences are in the data for Portugal – the 2004 data demonstrates that between 1998 and 2002, car ownership has increased by +66 vehicles per thousand population, though the 2005 data source presents an increase of +104 vehicles. As there are some differences in the car ownership data presented in the 2004 and 2005 sources, there have been some alterations to the percentage change figures, which are shown in Figure 2.6. The main discrepancies are for Slovenia (an increase of +12 percent was presented using the 2004 source, though the 2005 source shows a 7 percent increase), and Hungary (2004 source: 15 percent increase; 2005 source: 20 percent increase), with slight variations (+/- up to 3 percent) for Greece, Poland, Portugal and Ireland.

Figure 2.7 Table 2.2	Powered Two Wheeler Ownership, 1998 and 2002 (EU-15) Change in Powered Two Wheeler Ownership (%), 1998-2002 (EU-15)	There are a number of variations in the data for powered two wheeler ownership in 1998 and 2002 between the 2004 and 2005 sources. Notably, the variations between the two datasets are greatest for Denmark, Germany, Spain, the Netherlands, Italy, Portugal and the UK. For example, the 2004 source states that in 1998 and 2002 the stock of vehicles in the UK is 1016 thousand and 1457 thousand vehicles, respectively, while the 2005 source states the figures as 828 thousand and 1090 thousand, respectively. Due to the large variations in the relevant data in the 2004 and 2005 data sources, figures showing the change in powered-two-wheeler ownership between 1998 and 2002 also vary. For example, in the earlier report, using the 2004 data source, the UK was shown to have experienced a 43% increase in ownership, while the 2005 data source shows this increase to be 32%. Several countries have experienced a sign reversal: Germany (the 2004 source reported a 21% decrease in ownership; the 2005 source shows an increase of 6%); Spain (-5% to +8%); Portugal (-21% to +26%); and the Netherlands (-7% to +7%). The EU average increase in ownership has changed from +3% using the 2004 source, to +12% using the 2005 data.
Figure 2.8 Table 2.3	Bus & Coach Supply, 2002 (EU-25) Change in Bus & Coach Supply (%), 1998-2002 (EU-25)	There are also some variations in the bus and coach supply data presented in the 2004 and 2005 sources. The most notable differences are for the UK; the 2004 data source presents the UK's vehicle stock to be 87 thousand vehicles in 1998 and 95 thousand in 2002, while the 2005 dataset shows the respective figures to be 80 thousand and 92 thousand vehicles. There are also significant variations in the 2002 data for Greece (2004 source: 31 thousand; 2005 source: 27 thousand vehicles). The variations in bus and coach vehicle stock data between the 2004 and 2005 data sources carry through into the calculations of change in bus and coach supply between 1998 and 2002. The most noticeable difference is for Ireland: the earlier report, using the 2004 data, reported a 21% increase in vehicles per thousand population, while Table 2.3, using the 2005 data, shows a 10% increase. With regards to the UK, the 2004 data source shows an increase in vehicles per thousand population of 9%, compared to an increase of 15% using 2005 data. There are also differences in the data for Greece (2004 source shows a 17% increase; 2005 source shows a 2% increase). The EU-25 average rate of change has been amended from +5% to +3%.
Figure 2.9 Table 2.4	Rail Supply, 1998 and 2002 (EU-15) Change in Rail Supply, 1998-2002 (EU-15)	There are no significant variations in the rail supply data quoted in the 2004 and 2005 data sources. Generally, the figures showing the percentage change in rail supply between 1998 and 2002, using both the 2004 and 2005 sources, are very similar for most countries. The greatest variations in the data are for the UK and Portugal, though in both cases, the 2001 values have been used in place of the 2002 values, as explained above.

Figure 2.11 Table 2.6 Table 2.7	Motorway Provision, 2001 (EU 15) Motorway Provision, 2001, (New Member States) Change in Motorway Provision, 2001, (EU 15)	On the whole, the values for the length of motorways in both the 2004 and 2005 data sources are very similar. The greatest variations in data are for Sweden and the Netherlands. The 2004 source shows that Sweden has 1529 km of motorways and the Netherlands 2291 km, while the 2005 source shows figures of 1507 km and 2499 km, respectively. Slight differences in the source data have impacted on the calculations for the change in motorway provision and density between 1998 and 2001. The earlier report, using the 2004 source, demonstrated a 1% increase in motorway provision and 3% increase in motorway density in the Netherlands, while Table 2.6 shows the respective increases to be +10% and +12%. Slight differences are also evident in the data for the UK (2004 source shows no increase in motorway provision and 2% increase motorway density between 1998 and 2001; 2005 source shows increases of 2% and 4%, respectively) and Sweden (2004 source: +6% increase in motorway provision; 2005 source: +4%).
Figure 3.1 Figure 3.2 Figure 3.3 Figure 3.4 Figure 3.5	Motorised Travel, 2002 Public Transport Mobility, 2002 Change in Public Transport Mobility, 1998-2002, (EU 15) Change in Motorised Travel, 1998-2002, (EU 15) Change in Motorised Travel, 1998-2002, (Selected NMS)	There are a number of variations in the data presented in Figures 3.1-3.5 and the comparable 2004 data used in the earlier report. These are outlined below: Car passenger kilometres: there are variations in both the 1998 and 2002 data reported in the 2004 and 2005 data sources, notably for Austria, Germany, Greece, Ireland and the UK (e.g. UK - 2004 source: 1998 - 611 billion passenger kilometres, 2002 – 634 billion pkm; 2005 source: 1998 – 635 billion pkm; 2002 – 678 billion pkm). These adjustments have impacted on the level of the change in motorised travel reported, shown in Figure 3.2. For example, the earlier report using the 2004 source reported a 25 percent increase in car passenger kilometres per person in Greece between 1998 and 2002, while the 2005 data shows the increase to be 40 percent. The rate of increase reported for Ireland has shifted from + 24 percent to +15 percent, and for Luxembourg, from +12 percent to 0 percent. The values quoted for Germany have changed from -6 percent to +4 percent, and for Slovenia, from -4 percent to +8 percent. There have been minor adjustments in the data for the UK, Austria and the EU-15. Bus and coach passenger kilometres: overall, few significant changes, but notable variations between the 2004 and 2005 data sources for the 1998 value for France (2004 source: 43; 2005 source: 40) and the 2002 value for Germany (2004 source: 77; 2005 source: 68). The adjustments in passenger kilometre data have altered the level of change in bus passenger kilometres reported for several countries. In particular, while the earlier report based on the 2004 data source demonstrated a change of -7 percent in France, the 2005 data source shows the rate to be +4 percent. Similarly, 2004 data shows that bus passenger kilometres in Germany increased by +12 percent between 1998 and 2002; but using 2005 data, the rate decreased by -1 percent. Small amendments in the rate of change are also evident for the UK and Austria. Rail passenger kilometres: unlike the recently released data source, the 2004 source did not provide any values for high speed rail, making it difficult to make overall comparisons for rail. Looking more specifically at interurban rail, the most significant amendments have been made to the 2002 values for Germany (2004 source: 69 billion passenger km; 2005 source: 71) and Poland (2004 source: 17 billion passenger km; 2005 source: 21). With regards to urban rail, again, the greatest variations between the 2004 and 2005 sources are for Germany and Poland. Looking at rail mobility overall, the inclusion of high speed rail, and the above variations in data have led to variations in the values shown for the rate of change in rail mobility between the earlier report and this version. Notably, the earlier report, using the 2004 data source, shows Germany to experience a decline in total rail passenger kilometres per person between 1998 and 2002 (-4 percent), while the 2005 source, as shown in Figure 3.5 demonstrates a 4 percent increase. The value for Luxembourg was shown to be -5 percent in the earlier report, while it is now -15 percent; the rate for the Netherlands has changed from -6 percent to -1 percent; for Italy, from +13 percent to +18 percent and for Denmark, from +1 percent to +6 percent. The EU-15 average rate of change has increased from +6 percent to +11 percent.

Figure 3.13	Motorised Travel and GDP, (PPP adjusted at current values) for 2002	Notably, the 2004 and 2005 data sources report contrasting GDP values for Denmark, Finland, Italy, Luxembourg and Portugal. As already noted, motorised travel values have changed for most of the countries shown, particularly Austria, Germany, Greece, Ireland and the UK (e.g UK - 2004 source: 12,313 passenger kilometres per head; 2005 source: 13,075 pkms per head). These variations in data between 2004 and 2005 sources have affected some shifts in the distribution shown in Fig. 3.6. For example, in the earlier report, using the 2004 source, the UK was located on the regression line while Austria and Germany were below the line. Now, using the 2005 data source, the values for these three countries are located above the line. Analysis in the 2001 report showed how car passenger kilometres and GDP had been fairly strongly correlated for most of the EU-15 countries over the last three decades. An update of this analysis for 2002 (Fig 3.7) shows a similar pattern, although over the period 1995 to 2002 there has been a downward trend in travel intensity in some countries, meaning that per capita GDP has been growing faster than car travel in those countries.
Figure 3.15	Travel Intensity for Recorded EU Countries, (1995-2002)	Generally, analysis using the 2004 and 2005 data shows a similar decreasing trend in travel intensity for most of the EU-15 countries, though a few minor changes have occurred due to changes in the source data for Italy, Austria and the UK (e.g. UK - 2004 source: 2002 – 380 car pkms per 1,000 Euro GDP; 2005 source: 2002 – 407 car pkms per 1,000 Euro GDP).