Preparation of a Green Paper on Urban Transport: Report on urban transport in Europe

Prepared for the European Commission, Directorate-General for Energy and Transport

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LIST OF ABREVIATIONS

B2B	Business to business
B2C	Business to consumer
CO_2	Carbon dioxide
CNG	Compressed Natural Gas
DME	Di-Methyl-Ether
EEA	European Environment Agency
EU-15	EU Members that joined the EU before 2004
EU-25	EU Members that joined the EU before 2007
EU-27	Current EU Members (2007)
GDP	Gross Domestic Product
GHG	Green House Gas
GTL	Gas-To-Liquids
ICE	Internal Combustion Engine
LPG	Liquefied Petroleum Gases
N_2O	Nitrous oxide
NH_3	Ammonia
NMVOC	Non-Methane Volatile Organic Compound
NO_2	Nitrogen dioxide
NOx	Nitrogen Oxide
P2W	Powered Two-Wheelers
PISI	An ICE using the Port Injection Spark Ignition technology
PM	Particulate matter
PRM	People with Reduced Mobility
PT	Public Transport
SOx	Sulphur Oxide
toe	tonne of oil equivalent
VOC	Volatile Organic Compound
WTT	Well-To-Tank
WTW	Well-To-Wheels

FOREWORD

A large amount of data and information has been collected by the consultant from various sources in order to prepare the present report. The following sources have been used:

- European Commission documents;
- Data provided by stakeholders;
- Presentations and statements made during the conferences and workshops that were organised to help prepare the Green paper on urban transport;
- Position papers prepared by stakeholders;
- Documentary research that covered studies, publications, scientific literature, research reports, databases, etc.

The consultant has not been able to verify the quality of all the data and information that has been collected. The consultant therefore cannot endorse any responsibility related to this data and information and its further use.

The consultant assumes that the data and information that has been collected is not confidential and that it is available for public use. Any entity or person that feels that its rights were not respected is invited to contact the consultant.

The proposals for solutions and actions presented in Chapter 4 of the report are the consultants' interpretation of the spoken and written contributions made during the consultation process.

Concerning the data supplied by the International Association of Public Transport (UITP), any use, computation or interpretation by the consultant of these data is the sole responsibility of the consultant. It does not represent the views of, nor has it been endorsed by, UITP.

The use of data and information included in the present report is allowed as long as the source is mentioned and the content of this foreword is acknowledged.

1. INTRODUCTION

1.1 CONTENT OF THE GREEN PAPER ON URBAN TRANSPORT

In its mid-term review of the 2001 Transport White Paper[1] the Commission announced the publication of a Green Paper on Urban Transport in 2007 to identify potential European added value to action that is taken at the local level.

The Green Paper will examine whether obstacles to successful urban transport policies exist at the EU level. In addition, it will examine where, whilst fully respecting the subsidiarity principle, there is a consensus among stakeholders to develop and implement joint solutions. The Green Paper will form the basis for the development of a European policy on urban transport as part of European transport policy.

The Green Paper on urban transport will address all transport modes, including walking, cycling, motor cycles and motor vehicles, and will cover both urban freight (and logistics) and passenger transport. The functioning of the private car in cities will be addressed. In addition, the paper will emphasise the need for an integrated policy approach. The paper will have a strong technology component and may also address issues related to the Commission's proposals on public service obligations in public transport and clean vehicle procurement.

The present report on urban transport in Europe constitutes the support document for the preparation of the Green Paper on Urban Transport. It contains the following main elements:

- Overview of data and trends
- Results of the stakeholders consultations
- Preliminary proposals for urban transport policy options.

1.2 THE LINK BETWEEN EU POLICY AND LOCAL, REGIONAL AND NATIONAL POLICIES

Around 80% of European citizens live in an urban environment. They share in their daily life the same space, and for their mobility the same infrastructure. Their mobility accounts for 40% of all CO_2 emissions of road transport and up to 70% of other pollutants from transport.

European cities increasingly face problems caused by transport and traffic. The question of how to enhance mobility while at the same time reducing congestion, accidents and pollution is a common challenge to all major cities in Europe. Cities themselves are usually in the best position to find the right answer to this question that takes into account their specific circumstances.

But at the same time, urban transport policy is of increasing importance for the EU. Efficient and effective urban transport can significantly contribute to achieving objectives in a wide range of policy domains for which the EU has an established competence. The success of policies and policy objectives that have been agreed at EU level, for example on

efficiency of the EU transport system, socio-economic objectives, energy dependency, or climate change, partly depends on actions taken by national, regional and local authorities.

Existing EU legislation, for example on public service obligations in public transport, air quality and noise and vehicles standards, does have a direct impact on the transport policies of Europe's cities. EU policy and financial programmes for regional development and research provide significant resources for the renewal and innovation of urban transport infrastructures, technologies and services in many European cities.

National, regional and local authorities, besides being able to receive EU financial benefits, have responsibilities for implementing EU policies and legislation. They have enforcement and compliance responsibilities. **Every level of governance in the EU has an important and own role to play in the formulation and implementation of transport policy in general and urban transport policy in particular. It is important that these policies match each other and strengthen each other**.

1.3 RECOGNISING AND BENEFITING FROM DIFFERENT APPROACHES

The preparations of the Green Paper, and the stages that will follow, are undertaken in an open and interactive process. The complex structure of policies, objectives and legislation, combined with the wide range of different responsibilities, administrative structures and interactions, can only be taken into account if all levels of governance and all stakeholders accept a “shared responsibility”.

An EU approach on urban transport policy should recognise and respect national differences. Urban transport is organised differently in every Member State, with different allocations of policy responsibility, administrative structures and financial responsibilities. The interactions between these levels of governance and with stakeholders are also organised differently in every Member State.

Effective urban transport policies also depend on successful interactions with other policies. Examples are the interaction between transport and land use policy, the frameworks for local and regional co-operation, and the co-ordination and the allocation of financial responsibilities for urban transport between the national, regional and local level. Responsibilities, administrative structures and interactions again differ per Member State.

Local, regional and national authorities, when implementing EU policy or legislation, need to base themselves on the good practices that exist elsewhere. Practices that have been, and that are being developed in a wide variety of contexts. **Policy makers at all levels need to base themselves on knowledge and feedback from the local and regional level, in this wide variety of contexts. This requires an interactive combination of 'top-down’ and ‘bottom-up’ policy making**.

1.4 MAXIMISING THE ADDED VALUE OF A EUROPEAN POLICY ON URBAN TRANSPORT

So far, European policies which have effect on Urban Transport, be it transport, regional, environmental, internal market or research policy, and legislative initiatives have often been developed independently from each other. Therefore, an integrated European approach on issues linked to urban transport and adding value to individual policies, is lacking. In

addition, so far no reflection has taken place on how such an integrated European approach might feed back on these individual policies and legislative initiatives – and their future development. The Green Paper on urban transport will have this aim and will take the objectives of the EU's sustainable transport policy as a starting point.

The Green Paper on urban transport will sketch a possible general EU policy framework for urban transport. The paper will look at the main trends and the resulting problems and challenges. It will reflect on the barriers, identify options and will pay particular attention to those solutions that have already been successfully tested. The added value of possible policy and actions at EU level will be examined and the adequate instruments identified. The need for early actions will be assessed.

But the Green Paper will certainly not be able to give an answer to all questions and to offer all solutions. It should recognise the fact that it is usually the cities that are in the driving seat, and that they are moving forward. Advanced solutions are under continuous development or are already in place in a number of European cities. Developments at the local, regional and national level should be encouraged and not hindered.

Nevertheless, at the same time, **a possible EU policy framework for urban transport should ensure minimum levels of coherence in policy and actions at all levels and help to maintain the integrity of the Single Market.** It should offer legal certainty or could facilitate decisions which are not always easy to take at the national, regional or local level. It should help to generalise joint solutions across the EU.

This generalisation can be based upon the knowledge on measures that have been successfully tested by Europe's advanced cities.

1.5 TAKING SUBSIDIARITY SERIOUSLY

The principle of subsidiarity is incorporated in the Treaty of Maastricht in Article 3b. It is intended to ensure that decisions are taken as closely as possible to the citizen, and that constant checks are made as to whether action at EU level is justified in the light of the possibilities available at national, regional or local level. It is closely linked to the principles of proportionality and necessity, which require that any action by the EU should not go beyond what is necessary to achieve the objectives of the Treaty.

The Green Paper on urban transport should also indicate and explain cases where no action is envisaged. Protocol 30 to the Treaty of Amsterdam states, that Member States are required to take all appropriate measures when the application of the subsidiarity principle leads to no action being taken at Community level. This requires monitoring and the collection of data and information.

Apart from the decision whether to take an action at EU level, the subsidiarity principle also influences the type of action that the EU may take in a given area. For example, reasons of efficiency, coherence, equity and standardisation may necessitate initiatives at EU level. It may e.g. be necessary to integrate networks or services such as ticketing or traveller information. This can happen within a Member State or between Member States, i.e. across national borders.

Complementary action can be a powerful instrument to achieve common objectives. The Green Paper should help to define those objectives.

1.6 EU INSTRUMENTS

Urban transport is a domain where the expectations from the EU are high but at the same time the competences of the EU are limited.

The EU can add value by:

- providing legal and financial frameworks as appropriate, to encourage decision-makers
- setting standards and ensure interoperability;
- promoting research and the spread of best practice across borders;
- integrating urban transport concerns into and removing barriers from sectorial EU policies;
- playing the role of catalyst;
- providing financial support.

The EU can use different legislative and non-legislative tools. Within one single tool the focus can change over time. For example, legislation can be tightened. The use of one tool may also be followed by another instrument. For example a recommendation or voluntary agreement may be followed by legislation. The use of combinations of tools is also possible.

1.7 THE PROCESS AND PLANNING OF THE GREEN PAPER PREPARATIONS

The preparation of the new Green Paper does not start without history. The Commission has presented its Citizen's Network Green Paper and its 'Implementation' Communication in the mid-1990-ties. **A number of recent Commission documents[2], proposals and initiatives have substantially touched upon urban transport issues and helped to build up the momentum for the new Green Paper on urban transport.** The responses by Parliament and Council to these recent initiatives will be analysed and incorporated.

To support the preparations of the Green Paper, a number of key events and meetings have been organised. An interservice group inside the Commission has been established.

There is a clear gap in the collection and availability of official urban transport statistics at local, regional, national and European level. There was a need for the Commission to collect existing information and data during the preparations of the Green Paper in order to get a good picture of the situation and the trends. Stakeholders were invited to share their data.

The Green Paper on urban transport is foreseen for adoption by the Commission in the autumn of 2007. The preparation of the Green Paper has taken place in partnership with the stakeholders concerned. An Internet consultation has taken place during the preparatory phase. The Green Paper includes a series of questions that were the basis for a large debate to which all stakeholders were invited to participate.

2. DIAGNOSTIC

A diagnostic of urban transport at the EU level, presenting relevant data and trends in this field, was the first step in the preparation of a report on urban transport in Europe.

Extensive documentary research has been carried out in order to collect available data at the European level, relative to indicators such as demography, energy consumption, environment, safety, congestion, modal split, employment, social aspects, etc.

The diagnostic is based on the currently available data. It must be noted that the set of relevant statistical data available for urban areas at the EU level is limited, as statistical data are usually compiled globally at the national levels and not for urban areas, or are available for a sample of cities, usually without common definitions of concepts and without harmonisation at the European level, thus raising the issue of aggregation and comparison.

Within such context, this chapter presents a short diagnostic of urban transport in Europe, based on statistical data at the European level whenever available, and a set of relevant indicators.

2.1 DEMOGRAPHY

2.1.1 Proportion of urban population vs. total population in the European Union

The United Nations[3] provide the following demographic statistics[4] and forecasts concerning urban and rural areas in the European Union.

Years	2005			2030		
	Urban population (thousands)	Rural population (thousands)	Total population (thousands)	Urban population (thousands)	Rural population (thousands)	Total population (thousands)
EU-25	341 875	117 510	459 385	373 741	90 485	464 226
% of total	74.4%	25.6%	100.0%	80.5%	19.5%	100.0%
EU-27	358 933	129 889	488 822	390 775	98 979	489 754
% of total	73.4%	26.6%	100.0%	79.8%	20.2%	100.0%

- 341.9 million persons lived in urban areas in the EU-25 in 2005. This figure represents 74.4% of the total EU-25 population.
- Considering the current 27 Member States (EU-27), 358.9 million persons lived in urban areas in 2005. This figure represents 73.4% of the total EU-27 population.
- Total population forecast in the EU-27 in 2030 will be similar to the population of 2005 (+ 0.01% average growth rate per year) according to the United Nations forecasts, while urban population will grow on average by 0.34% per year between 2005 and 2030.

- The urban population is expected to reach 390.8 million persons in the EU-27 in 2030, which will represent 79.8% of the total population in Europe's 27 Member States.

The "National policy frameworks for urban transport" project[5] provides the following analysis on population.

"As an indication of urbanisation, an average of 80.1% of the EU-15's population in the year 2000 was classified as urban (an increase from 76.8% in 1980), although this is based on each country's own definition of "urban", which can range from a population threshold of 200 to 10 000. In 2000, Belgium has the greatest percentage of its population classified as "urban" (at 97%, with urban being defined as communes of 5 000 people or more), followed by Luxembourg, the UK, the Netherlands and Germany. The percentage of total populations living in towns or cities has increased gradually in most countries (the greatest increases being in Portugal, Luxembourg, Germany and Ireland), while in Austria, Italy and Sweden, the urban/rural split of the population has remained broadly constant since 1980 (less than 1% change).

Of more interest to urban transport policy frameworks is the percentage of countries' populations that live in cities and conurbations, as these larger urban areas are those where most urban transport problems (e.g. congestion) occur and where most of the public transport investment is made."

The following figure "shows for each Member State of the EU-15, the percentage of national population living in urban areas of various sizes (200 000 to half a million, half a million to a million, and over a million), as well as the remaining "urban" population (i.e. living in settlements with a population above the national threshold for "urban" but below 200 000) and the "rural" population (living in settlements below the national threshold)."

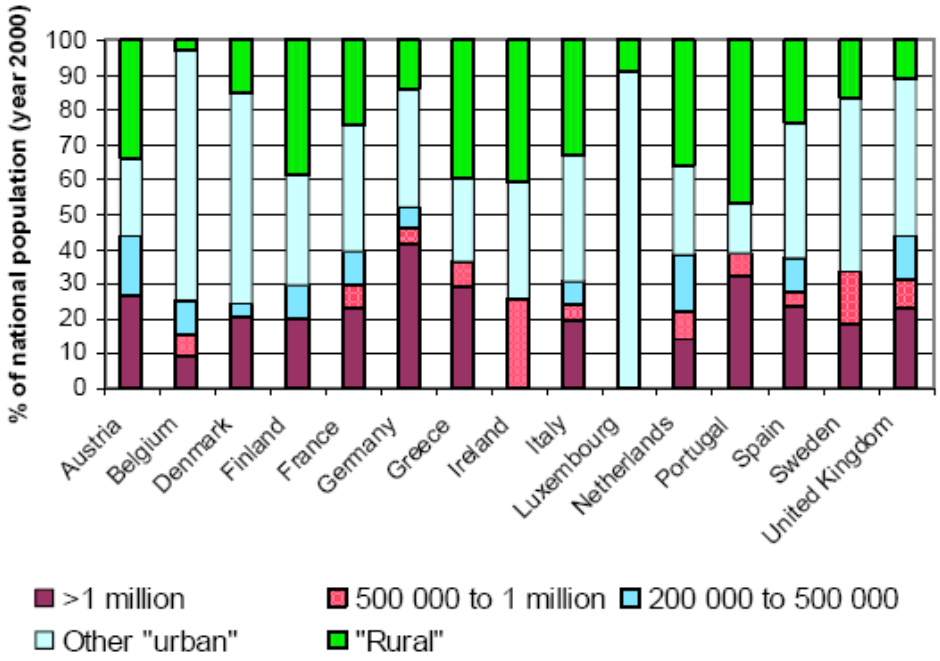


Figure 2: Proportion of Population of each Member State which is Urban (by different sized urban areas)[6]

Note to Figure 2: The limits between "Other urban" and "Rural" are affected by the threshold population for each Member State for an area to be defined as "urban". These are as follows:

- 200 - Denmark, Sweden
- 1 000 - UK
- 1 500 - Ireland
- 2 000 - France, Germany, Luxembourg, Netherlands
- 5 000 - Belgium
- 10 000 - Greece, Italy, Portugal, Spain

Population thresholds are not used in Austria and Finland. Also in some of the other countries other factors as well as population are considered, e.g. minimum land area or maximum distances between houses (density indicator).

2.1.2 Demographic changes in Europe- quantitative analysis

In the impact assessment of the Thematic strategy on the urban environment[6], the following analysis is presented.

"Population will increase until around 2020 and then it will stabilise and then decline. Numbers of working-age population will decline earlier and there will be a sharp increase in the numbers of older people (65 and over) who have special needs as regards housing and transport. In addition, changes in the pattern of population mean that some European regions will experience considerable growth (e.g. south east England) and others are experiencing decline (e.g. eastern Germany). Managing changes in urban population whilst maintaining a high environmental quality will be a key challenge for many urban areas. Prague lost 2% of its population and Katowice 7% during the 1990s."

2.1.3 Demographic changes in Europe- qualitative analysis

In a research project[7], the Council of European Municipalities and Regions presents the following analysis.

"Europeans are becoming older, fewer and more heterogeneous. Demographic changes are apparent in all European countries. They mean shrinkage and ageing of population as well as regional and international migration resulting in heterogeneity. These trends interact in different ways, shrinkage contributes to ageing, suburbanisation (migration) explains some degree of population decline in core cities."

"The population structure will also be affected. The ratio of elderly and very elderly people will grow as well as the ratio of immigrants. In the EU25 the proportion of elderly people (aged 65 and more) will increase from 16.4% in 2004 to 29.9% in 2050, or from 75.3 million in 2004 to 134.5 million in 2050."

The demographic change will in particular have an impact on urban transport and spatial planning. "Demographic change will influence traffic volume and performance, trip purpose and modal choice, as well as the spatial distribution of traffic volume. Owing to building and maintenance costs and long-term inelasticity, transport infrastructure is strongly impacted by demographic change and evolving demand." "For public transport a decreasing population means fewer passengers. Traditional modes of public transport, such as timetabled bus services using large vehicles, depend on certain population densities. In shrinking areas, especially in rural regions, shrinking population leads to thinned-out timetables and thus less attractive public transport."

In a contribution to the Green paper on urban transport[8], the Senate Department for Urban Development of Germany provides the following analysis on the impact of demographic and economic changes on urban transport.

Effects of demographic change on demand for and supply of means of public transport

"The societal shift that demographic change will bring about in most countries is likely to affect all spheres of public life, among which urban transport is an exceedingly relevant one. It can be attributed to the dual role transport is playing in the process of demographic change: First, mobility patterns and demands in cities will considerably be transformed due to ageing and further social diversification. Second, mobility and, moreover transportation, can also contribute to give rise to attractive urban centres in favour of a cohesive urban society thus enabling all of the citizens to have an equal share in social, economic, political, and cultural life.

Depending on general conditions prevailing in urban areas, i.e. the population structure, economic sectors, employment rates amongst others, the actual population trends might differ considerably. In this regard, it is an essential question of whether or not a city is going to sustain a decrease in population. On the evidence of recent developments it is mainly small towns and cities with weak economies and already high unemployment rates that will suffer a decline in population as a result not only from demographic developments as such, but moreover from migration flows. Large cities as well as conurbations and metropolitan regions will not stand to see a decrease in population in the short or even medium term.

However, the increasing proportion of older age groups gives rise to a number of challenges, in particular as regards urban transport."

Safeguarding mobility for seniors

"The elders have different activity patterns, and consequently different needs of mobility than those still belonging to the work force. For them, leisure, healthcare and recreational activities replace work as their main travel purpose. Travel distances tend to get shorter as the elderly follow their activities in the immediate surroundings of their place of residence. At the same time, a decline in physical abilities that comes along with old age requires special provisions to be made in vehicles, along roads and at stops in order to allow free and unrestricted travel in a barrier-free environment."

"Better health, longevity, diversified ways of living, and probably even the need to earn extra money in order to increase potentially decreasing retirement pensions, i.e. old-age poverty, may all generate mobility patterns that bear more resemblance to those of 'active travellers' than to those of 'traditional retirees'. It concerns residential areas, places of activity as well as preferred modes of travel. Whether or not a generalised possession of a driving licence among seniors will entail an increasing use of their cars remains to be discussed. Bearing in mind identified economic challenges to the elderly's households accompanied by an anticipated increase in costs of individual transport as a result of rising crude oil prices, not all of the seniors will be able to satisfy their needs of mobility by car."

More diverse population means more diverse transportation

"Urban agglomerations are economic centres, which have been and will be centres of attraction for migrants. This is particular phenomenon, since for economic and demographic reasons migration will gain in importance, and the proportion of people from a migratory background will rise. However, the needs of mobility felt by people from a different cultural background are usually not taken into consideration. Even more so, they are often not even known. Language abilities, norms of behaviour grounded in culture, varying activity patterns, driving skills and the ability to drive in large streams of traffic might lead to different attitudes towards and the use of transport."

The city for all people

"Despite an increasing proportion of the elderly, all younger age groups ranging from infants to pupils, from students to the work force, from junior to senior professionals, will continue to form large proportions of the urban population. There is need to anticipate potential conflicts of interests and demands with the aim of acting on them at the earliest possible stage so as to make the city a place worth living in for all of the generations. As regards transport, this means paying regard also to the activity patterns of youngsters. For example, school children and seniors have the frequent use of the bicycle and a focus on activities in the immediate vicinity of their homes in common. However, where they cycle to, and notably the way in which they cycle (as regards speed, observance of traffic rules, behaviour) might be totally conflicting. Similarly, an appropriate public transport network available at night time might not be of importance to elderly people, but to younger age groups. Clearly, transport is not the only factor that makes a city or an area attractive to young people and families, but an important factor nevertheless."

Demographic trends and resultant spatial patterns

"As a result of urban sprawl, a process that has set in during the 1990s and is partly still ongoing, a great number of the elderly will reside in suburban and peripheral areas, which are not well connected to public transport. Therefore, their access to urban facilities might

be restricted. Furthermore, concerns have been raised about probable age-related segregation, i.e. the splitting-up of urban areas into districts for young and old. Apart from social implications, this aspect too is of relevance to the transport sector for different demands in various districts require a supply of means of transport that calls for even greater diversification. Equally, migrants, and especially foreign nationals tend to live together in defined areas of the city. In conjunction with the foregoing, a varying mobility culture in the city, if not handled adequately, might render the system inefficient and inappropriate."

Economic viability of urban transport at stake

"At this stage, planners and providers of urban transport are confronted with the need to ease the burden of transport costs on the budget. However, decreasing tax revenues due to the decline in the work force, and more expenditure for provisions induced by demography, health care, pensions, among others, will add to the pressure of cutting public spending. New forms of financing, mechanisms to increase efficiency, and more resourceful transport supply are all urgently needed. In the same way, the focus on transport grounded in the infrastructure should be replaced by one that centres around utilisation thereby taking into account the lifecycle of existing roads and railways. New infrastructure is not only expensive to build, but, in addition, requires continuous capital expenditure for maintenance, which might be better used for carrying out measures other than those of infrastructure. The construction of roads and tracks in excess of required capacity today might turn out to be an expensive legacy for future generations to deal with."

Appropriate actions for the transport sector must be defined now

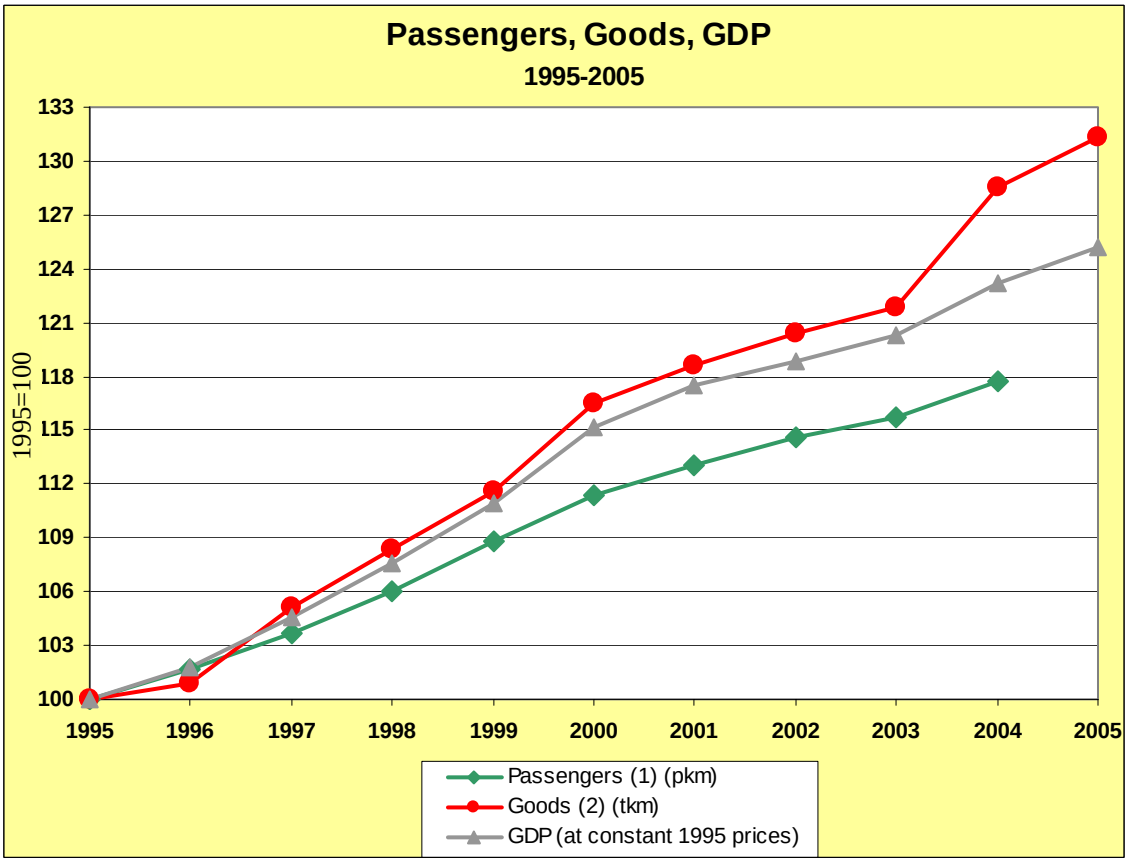
"In conurbations special features of the population structure, notably the continuing gains from migration, both national and international, interact in such a way that demographic transition is sowed down when compared to rural areas and smaller settlements. This opens up an opportunity for official bodies to develop strategies to tackle the phenomenon of ageing and of ever more heterogeneous inhabitants as well as possible population losses in the long term."

2.2 TRANSPORT GROWTH IN THE EU-25

2.2.1 Global evolution of passengers and goods transport compared with GDP growth

The following figure[9] shows the global evolution of passengers and goods transport compared with GDP growth in the EU-25, represented over the 1995-2005 period as indices, with 1995= 100.

- Passengers transport includes the following modes: passenger cars, powered two-wheelers, buses & coaches, tram & metro, railways, air, sea. The index corresponds to the growth in passengers-km.
- Goods transport includes the following modes: road, sea, rail, inland waterways, pipelines, air. The index corresponds to the growth in tonnes-km.
- GDP: at constant 1995 prices and exchange rates



Passengers transport globally followed a trend slightly lower than the evolution of the GDP over the 1995-2004 period. In 2004, the index for passengers transport was equal to 117.7, whereas the GDP index was equal to 123.1 (base 100 in 1995).

Goods transport globally followed a trend slightly higher than the evolution of the GDP over the 1996-2003 period, then the trend was significantly higher than the GDP trend over

the 2003-2005 period. In 2005, the index for goods transport was equal to 131.3, whereas the GDP index was equal to 125.2 (base 100 in 1995).

2.2.2 Performance of passengers transport by mode

The following table[10] shows the performance of passenger transport by mode in the EU-25, expressed in 1000 million passenger-kilometres.

	Pass - enger Cars	P2W	Bus & Coach	Rail -way	Tram & Metro	Air	Sea	Total
2004	*4 458*	*143*	*502*	352	*75*	*482*	*49*	***6 061***
2003	*4 399*	*140*	*493*	347	*73*	*454*	*49*	***5 956***
2002	*4 370*	*136*	*489*	351	*72*	*435*	*50*	***5 903***
2001	*4 277*	*135*	*493*	355	*71*	*441*	*50*	***5 823***
2000	*4 196*	*132*	*492*	353	*71*	*440*	*49*	***5 734***
1999	*4 119*	*130*	*485*	339	*69*	*408*	*50*	***5 600***
1998	*4 021*	*126*	*484*	329	*67*	*381*	*52*	***5 461***
1997	*3 927*	*124*	*478*	326	*66*	*363*	*53*	***5 337***
1996	*3 852*	*121*	*479*	322	65	*341*	*55*	***5 235***
1995	*3 787*	*120*	*474*	324	65	*324*	*55*	***5 149***
1995 - 2004	17,7%	19,7%	5,8%	8,6%	16,4%	48,8%	-11,1%	**17,7%**
per year	1,8%	2,0%	0,6%	0,9%	1,7%	4,5%	-1,3%	**1,8%**
2003 - 2004	1,3%	2,2%	1,8%	1,2%	2,9%	6,3%	-0,8%	**1,8%**

Tram and metro is the only urban transport mode explicitly identified. The statistics for the other modes do not specifically identify urban or interurban transport performances.

Growth trend for Tram and Metro over the 1995-2004 period is of the same order of magnitude as the growth trend for passenger cars and powered two-wheelers, and higher than the growth trend of bus and coach and of railway transport.

Modal split among these modes is presented in the next table.

	Pass - enger Cars	P2W	Bus & Coach	Rail -way	Tram & Metro	Air	Sea
2004	*73,5*	*2,4*	*8,3*	*5,8*	*1,2*	*8,0*	*0,8*
2003	*73,9*	*2,4*	*8,3*	*5,8*	*1,2*	*7,6*	*0,8*
2002	*74,0*	*2,3*	*8,3*	*5,9*	*1,2*	*7,4*	*0,8*
2001	*73,4*	*2,3*	*8,5*	*6,1*	*1,2*	*7,6*	*0,9*
2000	*73,2*	*2,3*	*8,6*	*6,2*	*1,2*	*7,7*	*0,9*
1999	*73,5*	*2,3*	*8,7*	*6,1*	*1,2*	*7,3*	*0,9*
1998	*73,6*	*2,3*	*8,9*	*6,0*	*1,2*	*7,0*	*0,9*
1997	*73,6*	*2,3*	*9,0*	*6,1*	*1,2*	*6,8*	*1,0*
1996	*73,6*	*2,3*	*9,1*	*6,2*	*1,3*	*6,5*	*1,0*
1995	*73,6*	*2,3*	*9,2*	*6,3*	*1,3*	*6,3*	*1,1*

2.2.3 Performance of goods transport by mode

The following table[11] shows the performance of goods transport by mode in the EU-25, expressed in 1000 million tonnes-kilometres.

The statistics for the different modes of transport do not specifically identify urban or interurban transport performances.

	Road	Rail	Inland Water-ways	Pipe-lines	Sea	Air	Total
2005	*1 724*	392	129	*131*	*1 525*	*2,5*	***3 903***
2004	*1 683*	392	129	*129*	*1 484*	*2,5*	***3 819***
2003	*1 573*	364	119	*128*	*1 435*	*2,4*	***3 621***
2002	*1 560*	358	128	*126*	*1 404*	*2,1*	***3 578***
2001	*1 518*	359	*129*	*130*	*1 388*	*2,2*	***3 526***
2000	*1 487*	374	*130*	*124*	*1 345*	*2,1*	***3 462***
1999	*1 439*	358	*124*	*122*	*1 270*	*2,0*	***3 315***
1998	*1 382*	370	*125*	*123*	*1 220*	*2,0*	***3 221***
1997	*1 314*	380	*121*	*116*	*1 193*	*1,9*	***3 126***
1996	*1 268*	360	*114*	*116*	*1 140*	*1,9*	***2 999***
1995	*1 250*	358	*117*	*112*	*1 133*	*1,9*	***2 972***
1995 - 2005	37,9%	9,2%	10,2%	17,5%	34,6%	31,1%	**31,3%**
per year	3,3%	0,9%	1,0%	1,6%	3,0%	2,7%	**2,8%**
2004 - 2005	2,5%	-0,2%	0,3%	1,5%	2,8%	-0,4%	**2,2%**

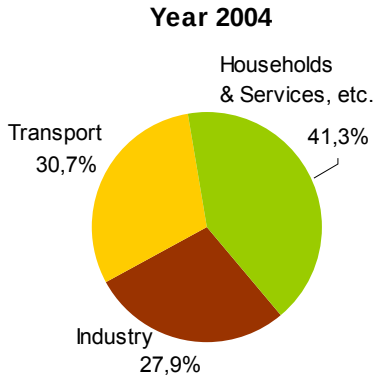
2.3 ENERGY

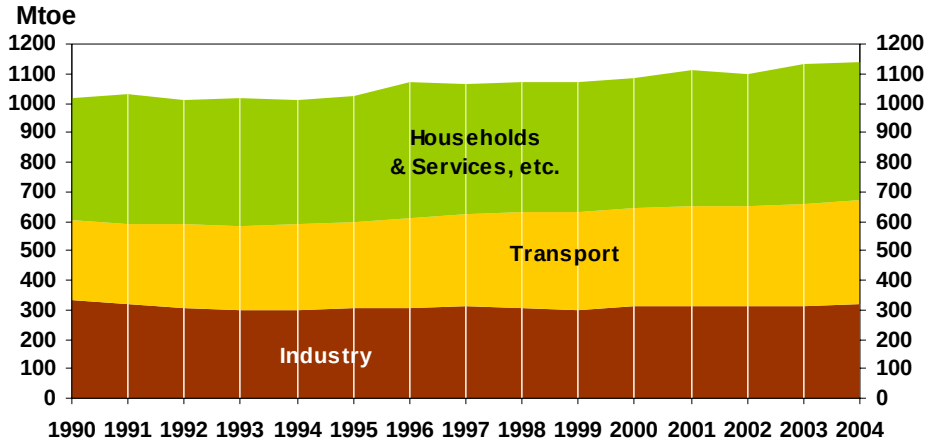
2.3.1 Energy consumption of the transport sector

Total energy consumption in the EU-25[12] amounted to 1,141 million toe in 2004.

Out of this consumption, transport used 350 million toe in 2004. The share of transport in the total energy consumption in the EU-25 has grown from 26.8% in 1990 to 30.7% in 2004.

These figures are represented in the following charts.





2.3.2 Energy consumption by mode of transport

In 2004, final energy consumption by mode of transport was distributed as follows[13]:

	Final energy consumption (Mtoe)	% of total
Road	289.7	82.7%
Railways	8.6	2.5%
Air	47.0	13.4%
Inland navigation	5.0	1.4%
Total transport	350.3	100.0%

Globally, road transport energy consumption represents almost 83% of the total energy used by transport. A figure for urban transport is not available from this source.

The average annual growth rate of energy consumption by mode of transport from 1993 to 2004 was the following[14]:

	Average annual growth rates
Road	+1.7%
Railways	-0.4%
Air	+3.6%
Inland navigation	-1.6%

Road transport energy consumption has been growing on average by 1.7% per year over the 1993-2004 period, while the energy consumption of railways has been decreasing by 0.4% over the same period.

2.3.3 Energy consumption by type of fuel

In 2002, final energy consumption in the transport sector by type of fuel was distributed as follows[15] in the EU-25:

Final energy consumption in terajoules (Net calorific value)			Fuel shares in final energy consumption (%)		
Motor spirit (gasoline)	Gas / diesel oil	Biofuels	Motor spirit (gasoline)	Gas / diesel oil	Biofuels
5 242 160	6 635 686	40 052	44.0%	55.7%	0.3%

Fossil energy (gasoline, gas / diesel oil) represented 99.7% of the total energy consumption in 2002, with biofuels accounting for 0.3% of the total.

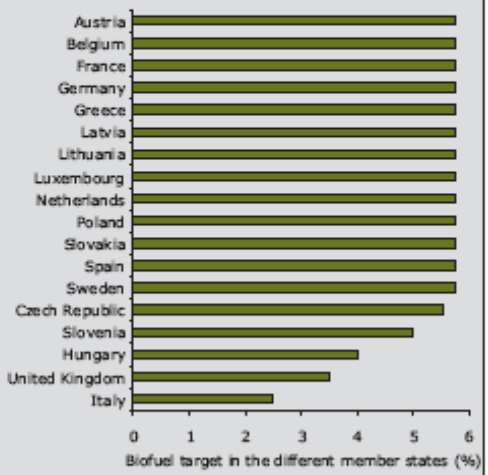
Renewable energy sources may be used to provide transport fuels, as well as electricity and heating (or cooling) for buildings. Currently, the European Commission[16] has set a target of 21% of renewable electricity and a target of a 5.75% share of biofuels in transport by 2010. A higher use of renewable energy sources in heating and cooling and in the supply of electricity will lead to lower emissions in urban areas, improving the urban environment and people's health as well as the possibility of creating local employment.

2.3.4 Developments in transport fuels

The EEA mentions in its TERM 2006 report[17]: "After a century of fossil fuel dominance in the transport sector, biofuels are beginning to be more and more common on the market. However, they still remain on a small scale. This is happening as a result of government policies that were implemented in response to the EU Biofuels Directive 2003/30/EC. Most Member States have implemented targets equal to the EU indicative target for 2010 (see Figure 6.1). This has created a market for biofuels and promoted the development of a biofuels industry in the EU. Both biodiesel and bioethanol production volumes increase annually (see Figure 6.2). Furthermore, biofuels are becoming an integral part of the various sectors involved: the agricultural sector, the oil industry and the car industry."

Figure 6.1 Indicative biofuel targets in the member states

Many EU Member States have implemented biofuels targets corresponding to the indicative EU target for 2010 (Directive 2003/30/EC, 5.75 %). However, some Member States have lower targets. Targets for Cyprus, Denmark, Estonia, Finland, Ireland, Malta, and Portugal have not yet been fixed, and are not required until 2007.

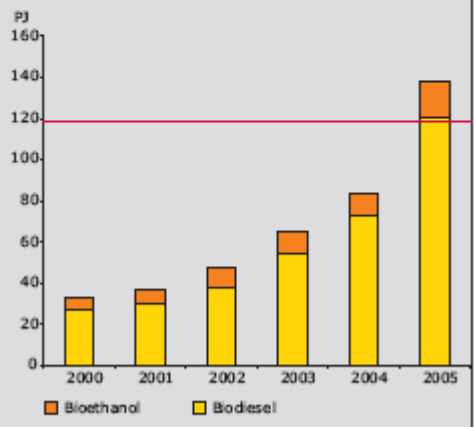


Source: Submissions by Member States to DG TREN, and information received directly.

Figure 6.2 Biofuels production data

Today biofuels are mainly produced as biodiesel and bioethanol. Overall 3.9 million tons of biofuels were produced in the European Union in 2005, marking a 65.8 % growth in production from the year before. Biodiesel accounted for 81.5 % of the total production.

The red line (119 PJ) represents 1 % of the road transport energy consumption in 2005. It thus represents half of the indicative target of 2 % proposed by the Commission.



Source: EurObersv'ER, Biofuels Barometer.

2.3.5 Trends of energy consumption to 2030

In a recent document regarding the trends of energy consumption to 2030[18], the European Commission presents the following analysis and forecasts.

"Transport energy demand in 2030 is projected to be 21% higher than in 2000. After having seen very high growth rates in the 1990s, the increase of energy use for transportation decelerates. In the projection period, transport energy demand growth rates decline over time reaching the lowest value in the decade to 2030. This reflects the declining growth rates over time of both passenger and freight transport activity. In addition, there are important fuel efficiency improvements in particular in passenger transport (e.g. private cars). Therefore, energy demand in transport grows less than transport activity (in passenger- and tonne-km).

Contrary to the past, the projection period has some significant fuel switching in the transport sector as a result of the implementation of the biofuels Directive. Under baseline conditions the biofuels share in 2010 rises strongly to almost 4% - however, falling somewhat short of the indicative target of 5.75. Nevertheless, this target would be nearly met in 2015 (5.5%) and the share continues increasing up to 2030 to reach 8.3%. No other alternative fuels are penetrating in this scenario reflecting current policies and the cost development in the modelling of "nonconventional" fuels relative to petrol and diesel. As a consequence, CO_2 emissions from transport are expected to grow less than energy use (13% versus 21% from 2000 to 2030)."

2.3.6 Energy consumption of urban transport

2.3.6.1 Introduction

Data on the energy consumption of urban passenger transport has been computed by the UITP. No data on the energy consumption of urban freight transport or on total energy consumption of urban transport have been identified during the data collection. Therefore the following paragraphs present the analysis of the energy consumption of urban passenger transport only.

2.3.6.2 Definitions

The source of data on the energy consumption of urban passenger transport is the UITP "Mobility in cities" database[19], which presents relevant figures for a large sample of European cities for the year 2001.

The following concepts have been defined by the UITP: Annual energy consumption for passenger transport for the total population (at vehicle)/ (at source), which is the sum of:

- the annual energy consumption for private motorized passenger transport within the metropolitan area. Private passenger transport refers to passenger cars, motorcycles, taxis and collective taxis. The consumption of each type of fuel (petrol, diesel and LPG) was converted into a single unit, namely Megajoules (Mj) in accordance with the following conversion factors:

  - one litre of petrol= 34.7 megajoules
  - one litre of diesel= 38.3 megajoules
  - one litre of LPG= 26.3 megajoules

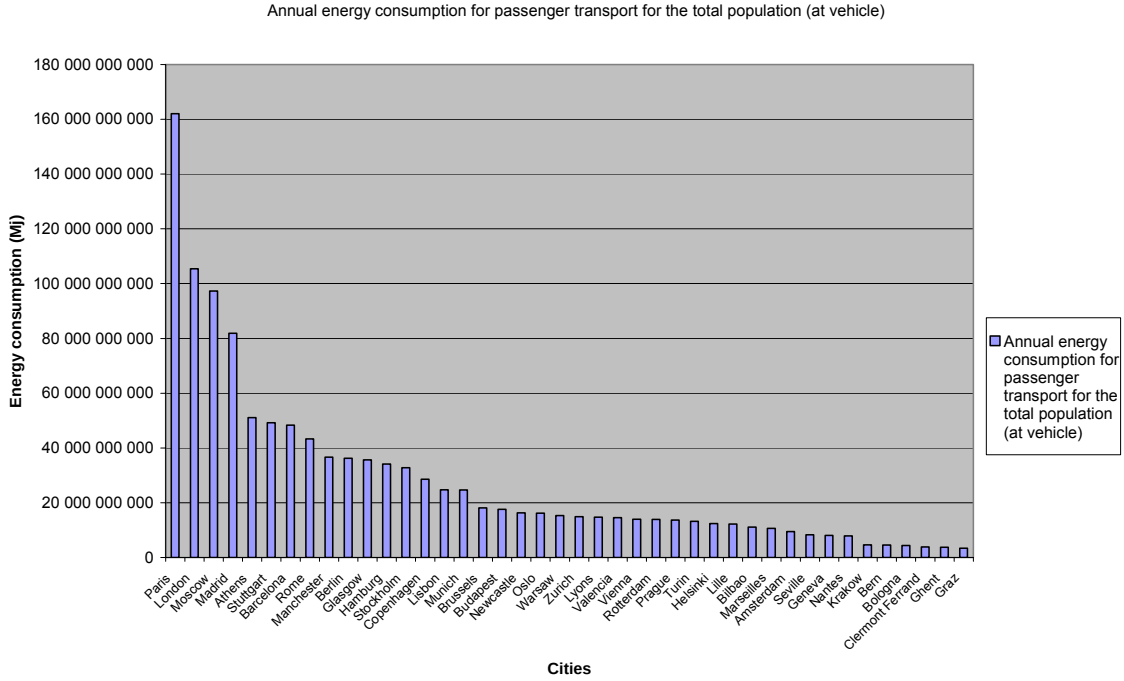
- the annual energy consumption for public transport (at vehicle), which is computed on the basis of consumption of fuel (litres of petrol, diesel and LPG) and electricity (kWh) for the operation of public transport within the metropolitan area. Electricity consumption concerns both vehicle traction and the power supply of equipment at stations and stops (ventilation, pumps, escalators, lighting, etc.) The consumption of each type of fuel (petrol, diesel and LPG) and electricity was converted into a single unit, namely Megajoules (Mj) in accordance with the following conversion factors:
  - one litre of petrol= 34.7 megajoules
  - one litre of diesel= 38.3 megajoules
  - one litre of LPG= 26.3 megajoules
  - one kWh= 3.6 megajoules.

    The annual energy consumption for public transport (at source) is computed in a similar way as the consumption of energy for public transport (at vehicle). The difference resides in the assumption guiding the conversion of electricity consumption from kWh to megajoules. In this case, the efficiency of power stations is taken into account, and it is assumed that electricity is produced from fossil fuel burnt by power stations with an average efficiency of 0.40. In this case, the conversion factor is: one kWh= 9.0 megajoules.

2.3.6.3 Annual energy consumption for passenger transport (at vehicle)

A For the sample of cities selected by the UITP

The following chart presents the annual energy consumption for passenger transport for the total population of the selected sample of cities (at vehicle), according to the definition previously mentioned. The cities of the sample are ranged in decreasing order of annual energy consumption.



The cities which had the highest annual energy consumption for passenger transport (at vehicle) in 2001 are respectively: Paris (162.1 Pj[20]), London (105.4 Pj) and Moscow (97.2 Pj).

B Estimation for the total EU-27 urban population

A rough estimation of the total annual energy consumption for passenger transport (at vehicle) for the total EU-27 urban population in 2001 has been made by the consultant on the basis of the following hypotheses and calculations.

Considering that:

- the total EU-27 urban population in 2001 is estimated at 354.1 million inhabitants[21],
- the total population of the cities of the sample selected by the UITP amounts 91 million inhabitants in 2001, which represents 25.7% of the total EU-27 urban population in 2001,
- the hypothesis is made that the energy consumption for passenger transport in all the EU-27 urban areas is similar to that of the sample of cities considered by the UITP.

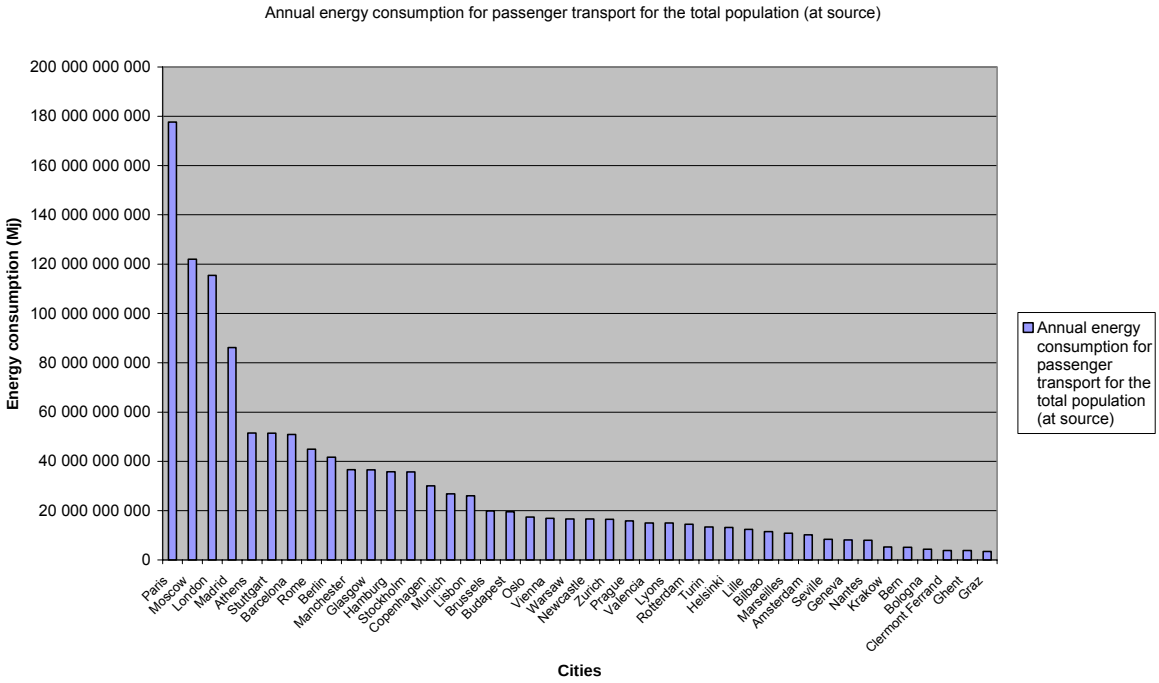
Therefore, the total annual energy consumption for passenger transport (at vehicle) for the total EU-27 urban population in 2001 is estimated to be 6 255 Pj[20].

On the basis of the conversion factor of 1 toe (tonne of oil equivalent) being equivalent to 41.86 GJ (Gigajoule), **the total annual energy consumption for passenger transport (at vehicle) for the total EU-27 urban population in 2001 is estimated to be 109.6 million toe.**

2.3.6.4 Annual energy consumption for passenger transport (at source)

A For the sample of cities selected by the UITP

The following chart presents the annual energy consumption for passenger transport for the total population of the selected sample of cities (at source), according to the definition previously mentioned. The cities of the sample are ranged in decreasing order of annual energy consumption.



The cities which had the highest annual energy consumption for passenger transport (at source) in 2001 are respectively: Paris (177.6 Pj), Moscow (122.0 Pj) and London (115.4 Pj).

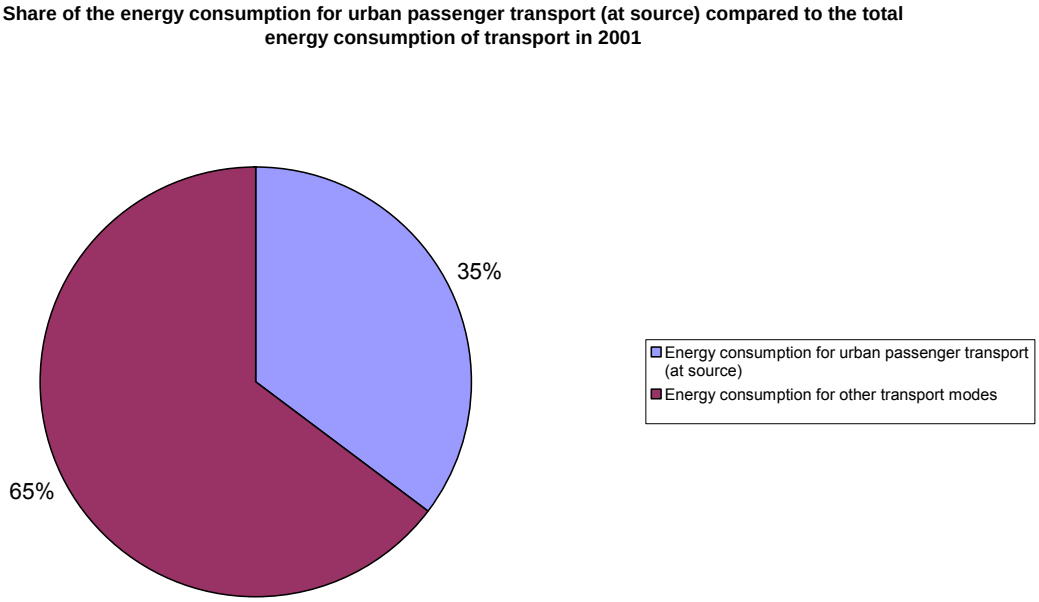
B Estimation for the total EU-27 population

A rough estimation of the total annual energy consumption for passenger transport (at source) for the total EU-27 urban population in 2001 has been made by the consultant on the same basis as the evaluation of the energy consumption at vehicle.

Accordingly, **the total annual energy consumption for passenger transport (at source) for the total EU-27 urban population in 2001 is estimated to be 118.5 million toe**.

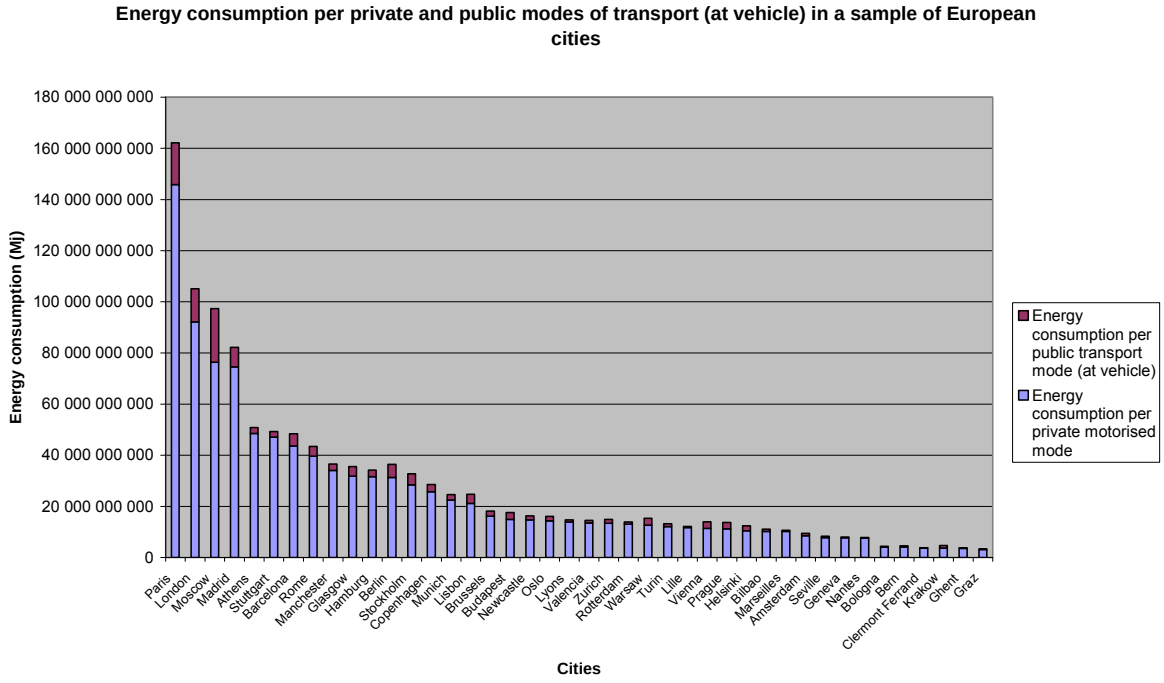
2.3.6.5 Share of the energy consumption for urban passenger transport (at source) compared to the total energy consumption of transport

On the basis of the above-mentioned estimations, **the share of the energy consumption for urban passenger transport (at source) represented 35% of the total energy consumption of transport in 2001** (336 million toe).

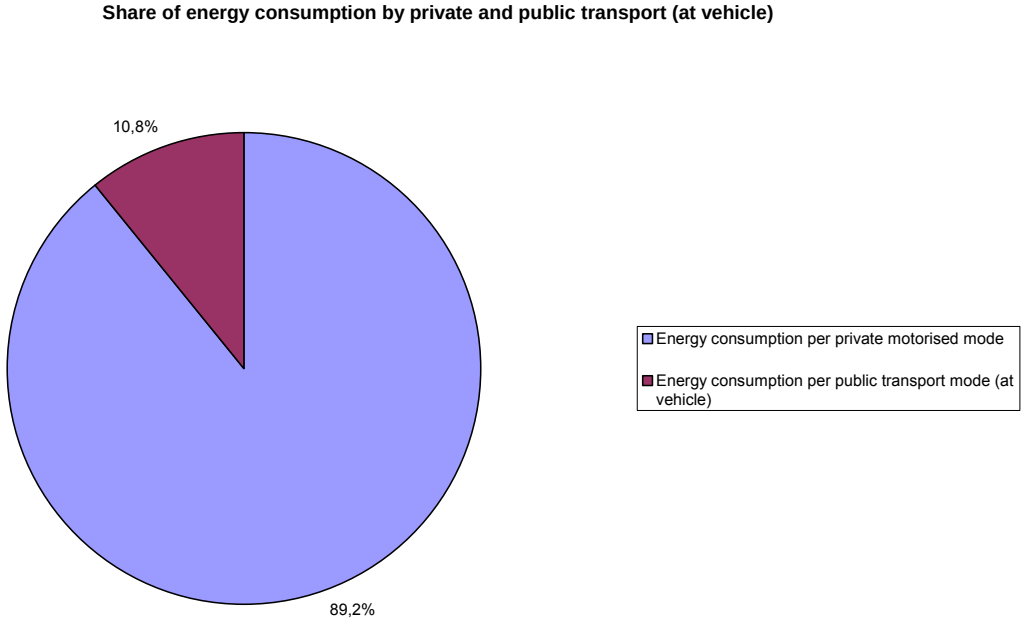


2.3.6.6 Annual energy consumption for passenger transport by mode of transport (at vehicle)

The following chart presents the annual energy consumption for passenger transport by mode of transport -private and public- (at vehicle for public transport), according to the definition previously mentioned. The cities of the selected sample are ranged in decreasing order of annual energy consumption by private transport.



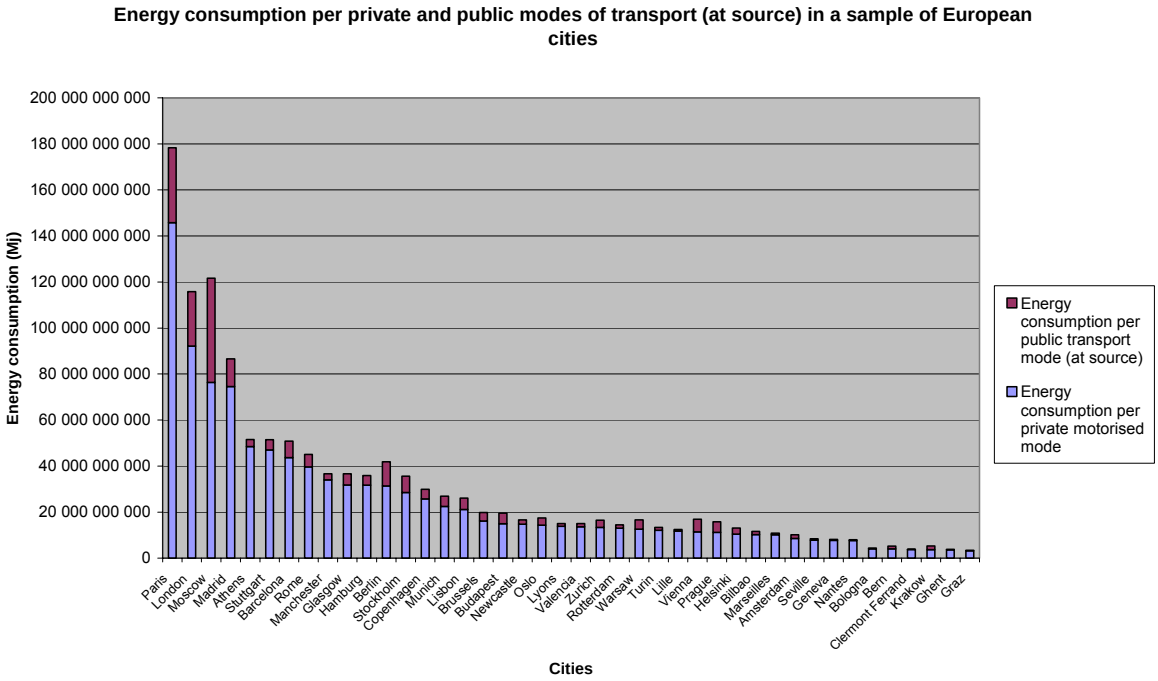
Globally, for all the cities of the sample, the average distribution of energy consumption by mode of transport is the following:



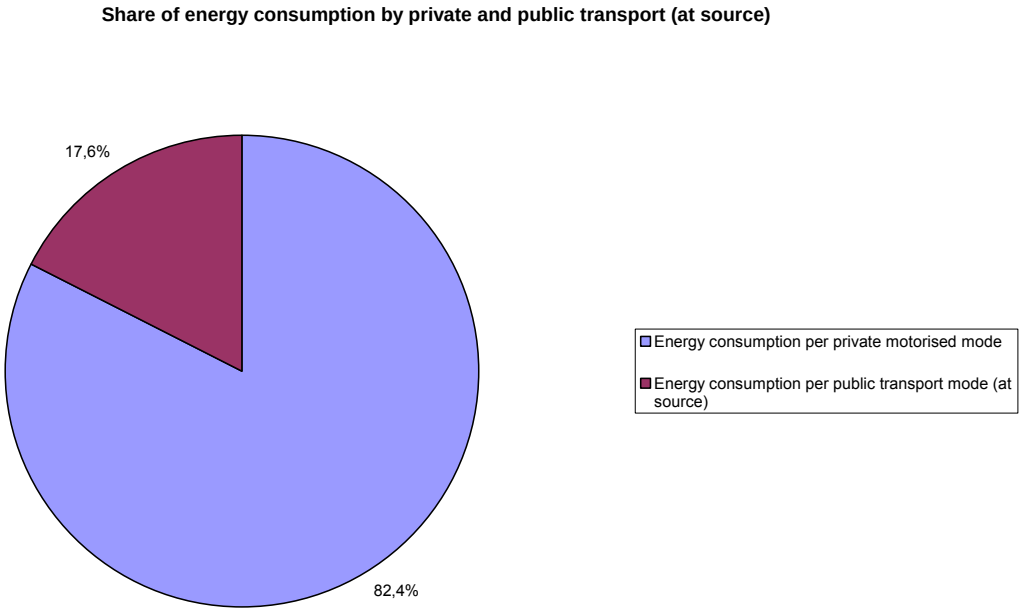
2.3.6.7 Annual energy consumption for passenger transport by mode of transport (at source)

The following chart presents the annual energy consumption for passenger transport by mode of transport –private and public- (at source for public transport), according to the

definition previously mentioned. The cities of the sample are ranged in decreasing order of annual energy consumption by private transport.



Globally, for all the cities of the sample, the average distribution of energy consumption by mode of transport is the following:



2.4 ENVIRONMENT

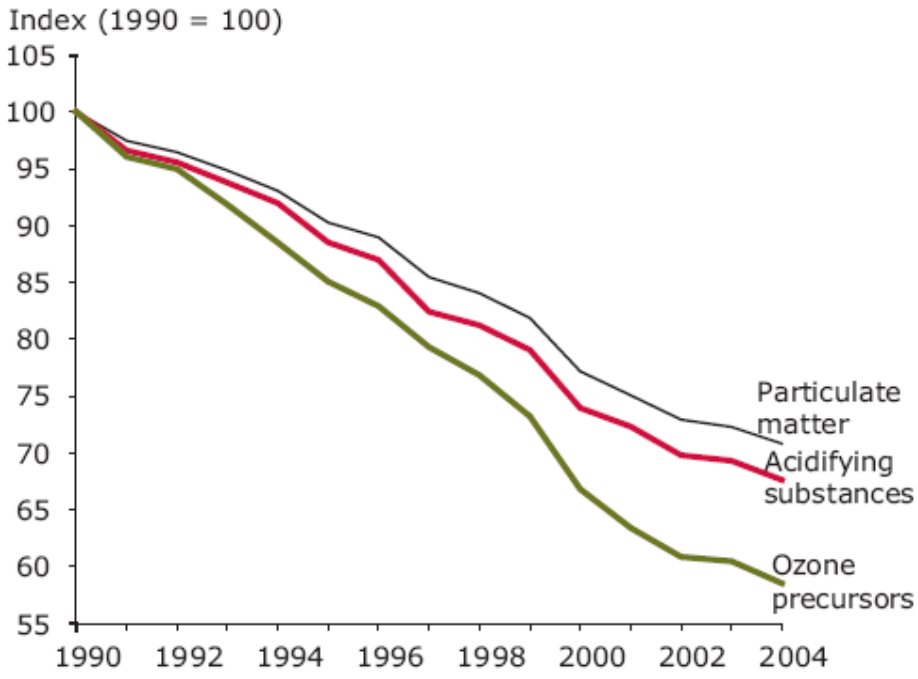
Most of the statistics on the environmental aspects are available at the countries level or at the EU level and usually not at urban areas levels. When available, data referring to urban areas are provided hereafter, otherwise the information and data that are provided in the present chapter refer to the whole European Union.

2.4.1 Pollutant emissions

2.4.1.1 Transport emissions of air pollutants in EEA member countries[22]

"Emissions of air pollutants from transport (excluding international aviation and maritime) have decreased significantly since 1990 in EEA member countries: particulate matter by 29%, acidifying substances by 32% and ozone precursors by 41%. This is mainly due to innovations in exhaust gas treatment in road vehicles and improved fuel quality. The introduction of EU standards for automotive emissions and fuel quality (especially reduced sulphur concentration) has had a significant impact. Further reductions will take place as even stricter limits enter into force and older vehicles are replaced by new models."

Transport emissions of air pollutants in EEA member countries



Note: Data cover all 32 EEA member countries. International aviation and maritime transport are not included in this figure.

Particulate matter= PM_{10}

Acidifying substances= NO_x, NMVOCs

Ozone precursors= SO_x, NO_x, NH_3

2.4.1.2 Air quality in cities[23]

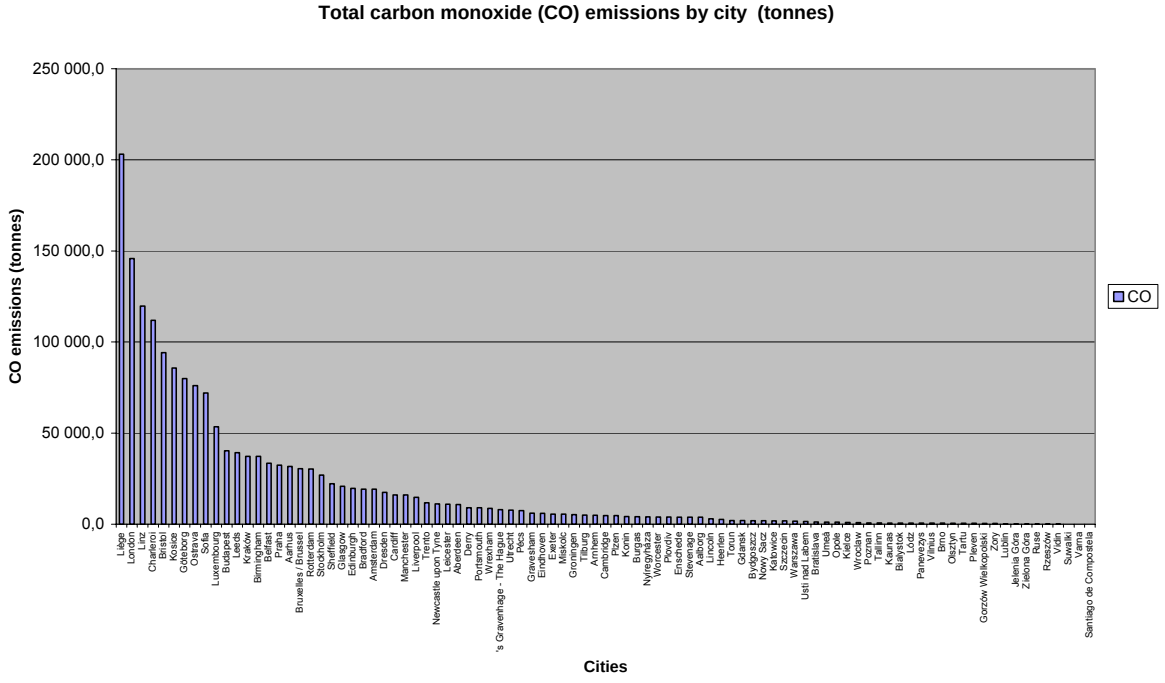
A EEA data

"Continued attention to air quality in cities is needed. Approximately 9% of the EU-25 population live closer than 200 metres from a road with more than 3 million vehicles per year, and as many as 25% live within 500 metres (ENTEC, 2006). Consequently, approximately 4 million life-years are lost each year due to high pollution levels (EC, 2005). In the past, emission standards have been the most powerful tool for reducing transport emissions. A fast introduction of tighter emissions standards for cars, vans and trucks (Euro 5/6) may have great health benefits and help Member States to meet the EU Directives on air quality and national emission ceilings (NEC)."

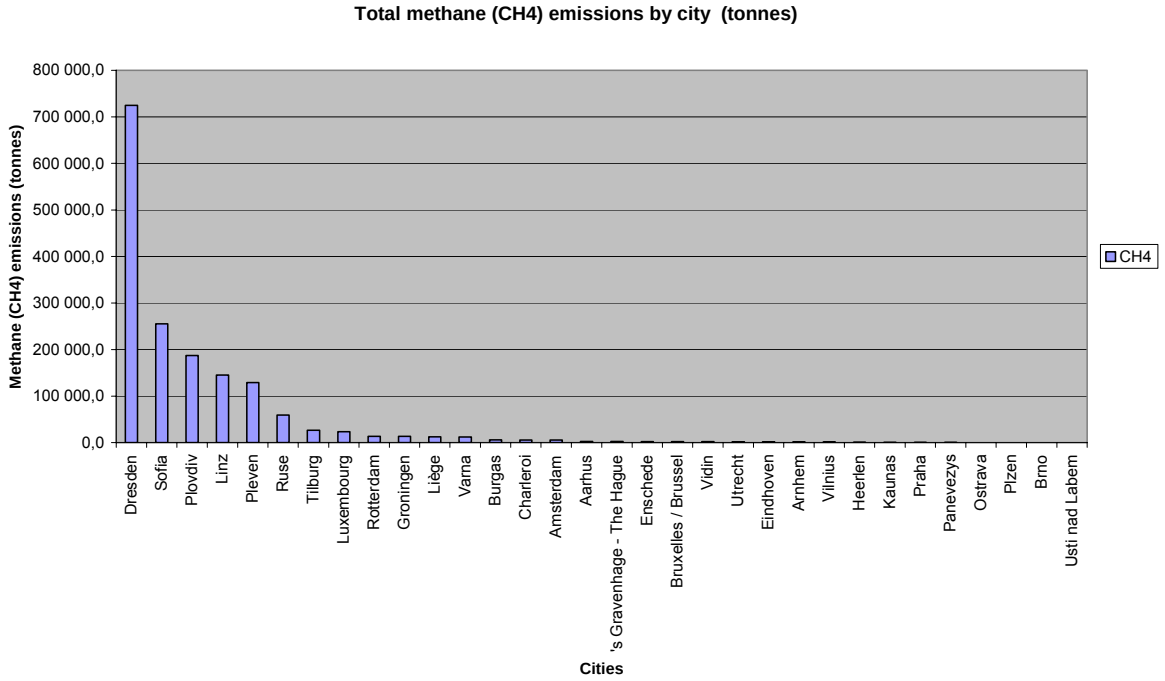
B Data for a sample of European cities (Urban audit)

The database from the Urban Audit contains indicators on polluting emissions for a sample of European cities. The next charts present the available figures[24] for the following pollutant emissions:

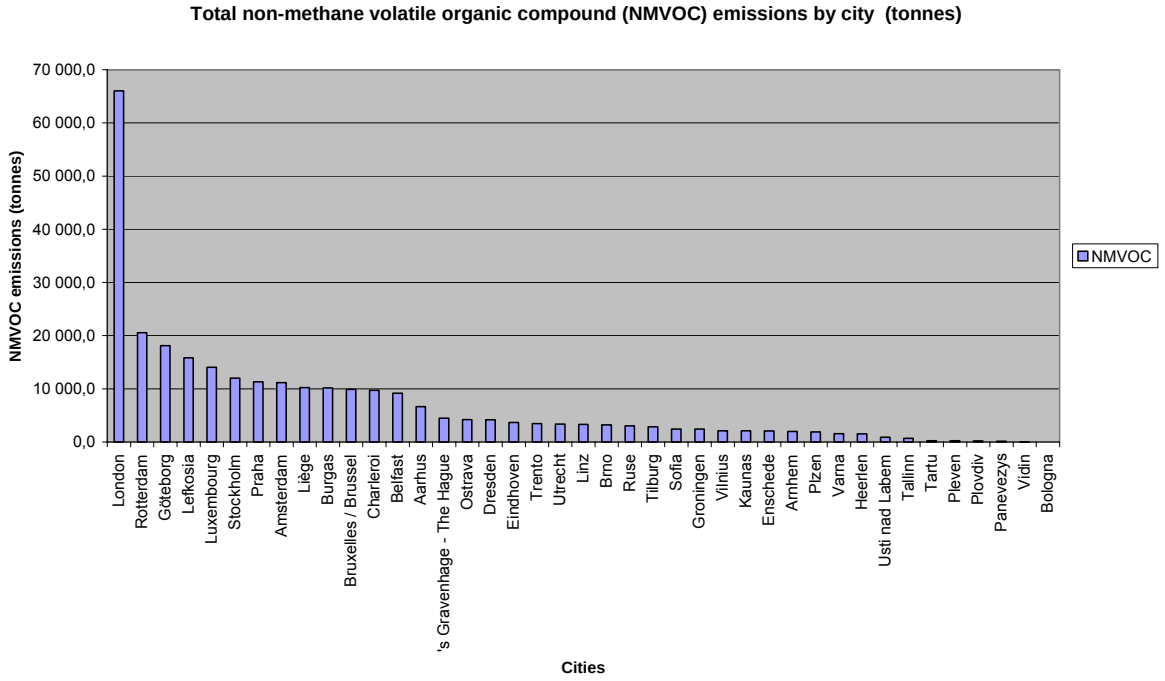
- carbon monoxide (CO)
- methane (CH4)
- non-methane volatile organic compounds (NVOC)
- sulphur dioxide (SO2)
- nitrogen dioxide (NO2)



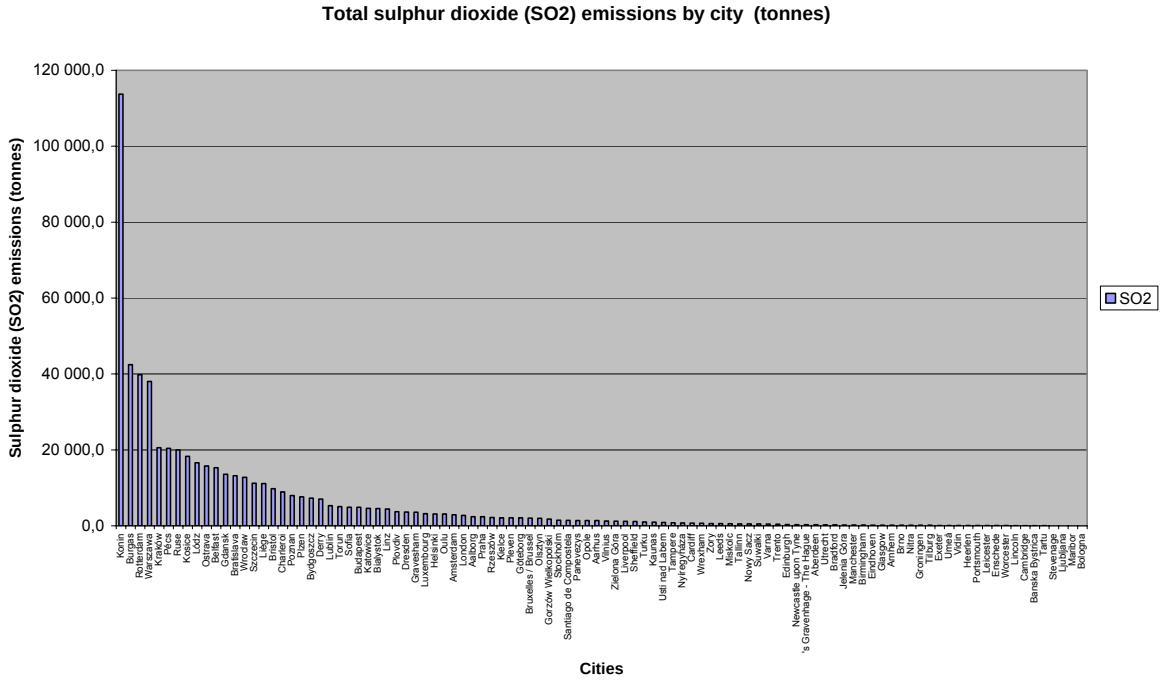
The cities which had the highest annual carbon monoxide emissions in 2001 are respectively: Liège, London and Linz.



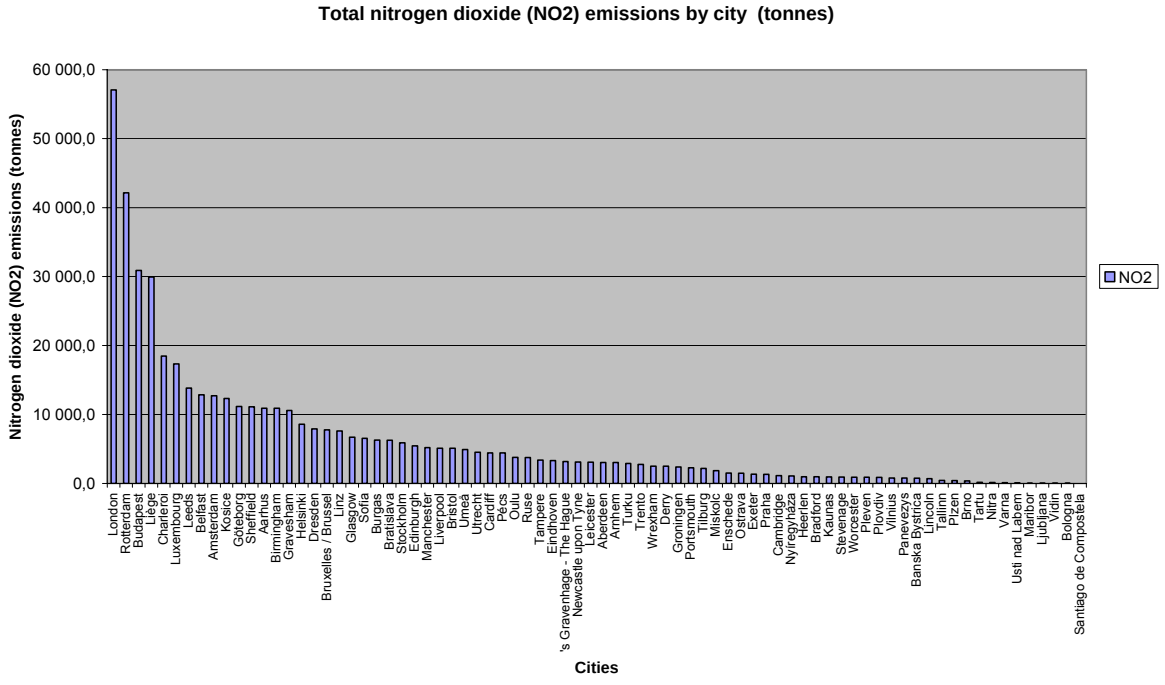
The cities which had the highest annual methane emissions in 2001 are respectively: Dresden, Sofia and Plovdiv.



The cities which had the highest annual non-methane volatile organic compound emissions in 2001 are respectively: London, Rotterdam and Goteborg.



The cities which had the highest annual sulphur dioxide emissions in 2001 are respectively: Konin, Burgas, Rotterdam and Warsaw.



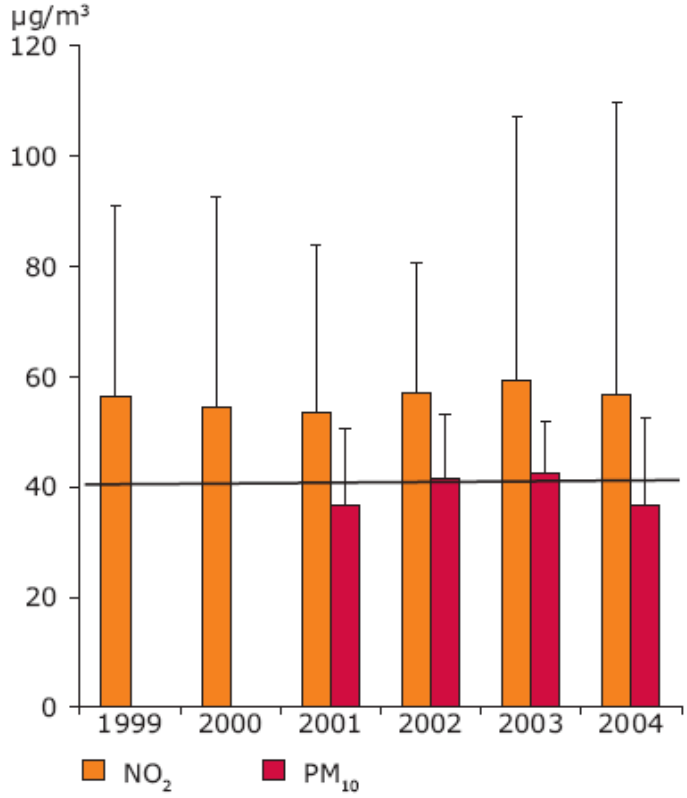
The cities which had the highest annual nitrogen dioxide emissions in 2001 are respectively: London, Rotterdam, Budapest and Liège.

C Average annual concentrations of NO_2 and PM_{10} in urban areas[25]

"Data from selected measuring stations in urban agglomerations close to major traffic arteries indicate that the concentrations of NO_2 (2010 limit) and PM_{10} (2005 limit) are at or above the European air quality limits at these sites."

"Air quality is affected by a combination of emission and meteorological factors. It is therefore too early to offer solid conclusions on the impact of transport on air quality development in urban areas. However, two elements may help to explain why the improvement still fails to appear: the increased use of diesel in urban areas and an increase of the fraction of NO_x emitted as NO_2 since 2000. Oxidation catalysts and regenerative traps in modern diesel vehicles have been found to cause the increase (AQEG, 2006)"

Average annual concentrations of NO_2 and PM_{10} in urban areas[26]



Note: Bars represent average annual concentrations over a limited number of monitoring stations along busy roads in major European cities (Vienna, Brussels, Prague, Helsinki, Paris, Berlin, Athens, Krakow, Bratislava, Stockholm and London); error bars represent highest annual concentration measured at one single monitoring station. The dotted lines represent the EU limit set for PM_{10} (2005) and NO_x (2010).

2.4.1.3 Structural Indicator on urban air quality[27]

A Statistical concept[28]

The Structural Indicator on urban air quality comprises two sub elements based on concentration levels of **ozone** and **particulate matter** in ambient air in urban areas.

Ozone is a strong photochemical oxidant, which causes serious health problems and damage to ecosystem, agricultural crops and materials. Human exposure to elevated ozone concentrations can give rise to inflammatory responses and decreases in lung function. Formation of ozone by photochemical reactions of precursor substances (non-methane volatile organic compounds, nitrogen oxides, carbon monoxide and methane in the atmosphere) takes place at various spatial and time scales.

Particulate Matter can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases. Particulate matter which passes through a size-selective inlet with a 50 % efficiency cut-off at 10 μm aerodynamic diameter (PM10, aerodynamic diameter is a diameter of a spherical particle having a density of 1 gm/cm3 that has the same inertial properties in the gas as the particle of interest). Primary PM10 refers to particulate matter emitted directly into the atmosphere. PM10 precursors are sulphur dioxide (SO2), nitrogen oxides (NOx) and ammonia (NH3) that are partly transformed into particles by photo-chemical reactions in the atmosphere (secondary PM10). The total PM10 forming potential refers to the sum of primary PM10 and the weighted emissions of secondary PM10 precursors. There are no specific EU emission targets for primary PM10. However, emissions of the PM10 precursors NOx, SOx and NH3 are covered by the EU National Emission Ceilings Directive (Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants). Measured PM10 concentrations do not distinguish between primary and secondary sources.

The high emission density of reactive precursors in urban areas might lead to high ozone and PM10 levels. The indicator is subject to strong year-to-year fluctuations as it is determined by relatively rare episodic conditions, and these depend on particular meteorological conditions.

B Definition of indicators

These indicators show measurements of ozone and particulate matters reported under Air Quality Framework Directive 96/62/EC and its daughter directives. For ozone the annual sum of daily maximum 8-hour mean measured ozone concentration above 70 μg per m^3 is calculated. For PM10 the annual mean concentration is derived. The indicators show national and EU aggregates using the population weighted annual values at the urban background stations in agglomerations.

C Urban population exposure to air pollution by ozone

The indicator shows the population weighted yearly sum of maximum daily 8-hour mean ozone concentrations above a threshold (70 microgram Ozone per m3) at the urban background stations in agglomerations [in (mg/m^3).day]. Ozone is a strong photochemical

oxidant, which causes serious health problems and damage to the ecosystem, agricultural crops and materials. Human exposure to elevated ozone concentrations can give rise to inflammatory responses and decreases in lung function.

Population weighted yearly sum of maximum daily 8-hour mean ozone concentrations above a threshold[29]

	1999	2000	2001	2002	2003	2004
EU (25 countries)	3752.0	3065.8	3636.2	3442.9	5685.9	3497.9

D Urban population exposure to air pollution by particulate matter

The indicator shows the population weighted annual mean concentration of particulate matter at urban background stations in agglomerations [in mg/m³]. Fine particulates (PM10), i.e. particulates whose diameter is less than 10 micrometers, can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases.

Population weighted annual mean concentration of particulate matter[30]

	2001	2002	2003	2004
EU (25 countries)	26.9	28.4	30.2	26.6

2.4.2 CO_2 emissions

2.4.2.1 CO_2 emissions levels by sector in 2004

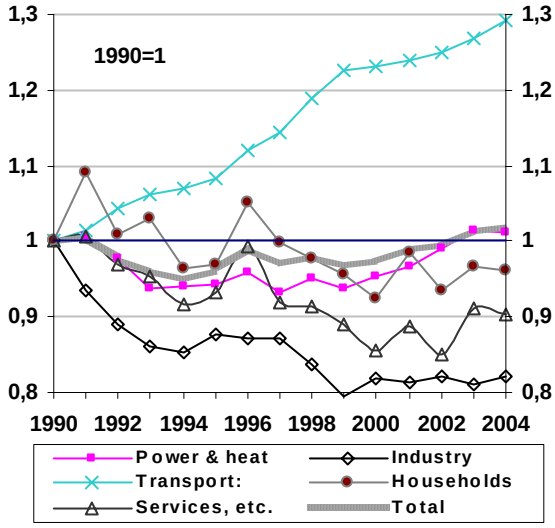
In 2004, CO_2 emissions by sector were distributed as follows[12] in the EU 25, expressed in million tonnes of CO_2

Total	Power & Heat Generation	Industry	Households	Services, etc.	Transport	of which:			
						Road	Air	Inland Navigation	Rail
3 863	1,512	599	470	262	1,021	859	139	15	8

Transport accounted for 26.4% of the total CO_2 emissions in the EU 25 in 2004. Road transport represented 84.1% of the total emissions of the transport sector and 22.2% of the total CO_2 emissions in the EU 25 in 2004.

2.4.2.2 Past trends

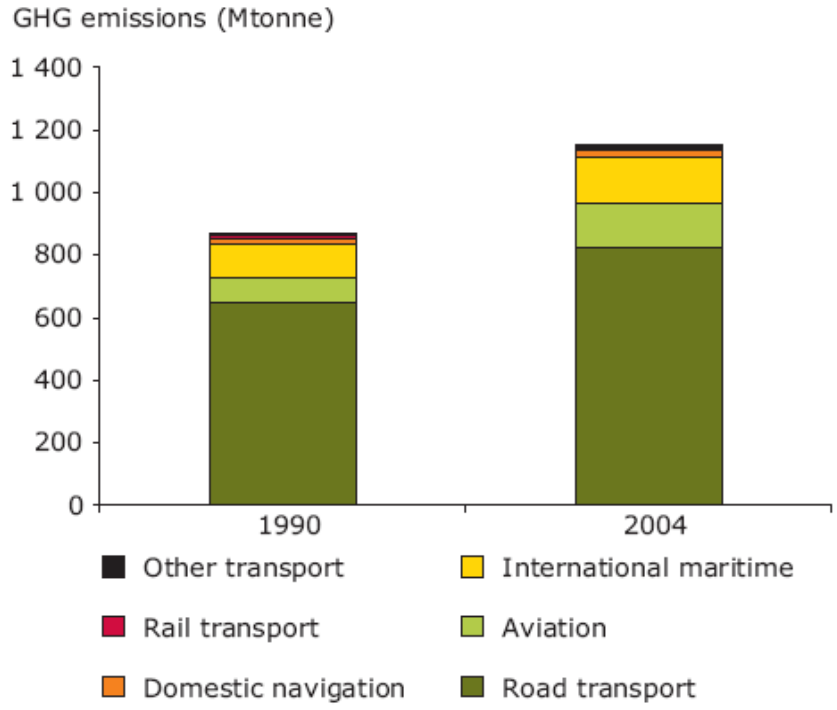
The growth trends by sector are represented in the following graph[12].



CO_2 emissions from the transport sector have been steadily growing since 1990 and represented in 2004 1.3 times the level of emissions reached in 1990. The emissions from the other sectors showed a global decreasing trend over the 1990-2004 period.

"Greenhouse gas emissions from transport increased in EEA member countries by more than 32% between 1990 and 2004. The EU-15 is responsible for 83% of the total GHG emissions from transport in all EEA member countries (international aviation and maritime transport are not included). This growth can be explained by the increased volumes of road transport (e.g. private cars, vans, and trucks), aviation and international maritime shipping."[31]

Greenhouse gas emissions from transport



Note: Data cover all 32 EEA member countries. Figure includes all international transport.

"The growth in GHG emissions and energy use in the transport sector is the result of increased transport volumes. Road transport is by far the biggest transport emission source (93% share). Emissions have increased continuously both for passenger transport (increase of 27% between 1990 and 2004) and for freight transport (increase of 51% between 1990 and 2003)."[32]

2.4.2.3 Trends of CO_2 emissions to 2030

In a recent document regarding the trends of energy consumption to 2030[33], the European Commission presents the following analysis and forecasts.

"The evolution of the EU-25 energy system in the last decade has been characterised by a strong decoupling of energy demand from economic growth and, in addition, by a decoupling between energy demand and CO_2 emissions growth. While primary energy needs increased by 6.3% in 1990-2000, CO_2 emissions declined in the same period by -2.7%."

"CO_2 emissions, under Baseline assumptions, are projected to grow over the outlook period (+0.2% pa in 2000-2030; see Table 1-16). The growth is more pronounced in the NMS (+0.5% pa) than in the EU-15 (+0.2% pa). However, even in 2030, CO_2 emissions in NMS remain at levels significantly below those observed in 1990 (-9.0% lower) while emissions in the EU-15 are projected to rise by +7.9% from 1990 levels."

Table 1-16: CO_2 emissions by sector in EU-25

	Mt CO_2				
	1990	**2000**	**2010**	**2020**	**2030**
Power generation	1264.3	1250.0	1328.0	1303.7	1392.5
District heating	96.3	44.9	33.9	29.6	31.5
New fuels (hydrogen etc.) prod.	0.0	0.0	0.2	1.2	2.2
Energy Branch	141.5	144.9	123.7	112.7	97.5
Industry	698.9	567.7	577.0	595.2	569.8
Residential	506.1	452.1	482.7	494.9	486.7
Tertiary	274.2	244.6	261.8	275.8	281.9
Transport	792.7	969.9	1074.6	1115.5	1092.9
Total	**3776.1**	**3674.1**	**3881.9**	**3928.6**	**3955.0**
EU-15	3068.4	3127.0	3290.9	3301.0	3311.0
NMS	707.7	547.1	591.0	627.5	644.0
	Annual Growth Rate (%)				
	90/00	**00/10**	**10/20**	**20/30**	**00/30**
Power generation	-0.1	0.6	-0.2	0.7	0.4
District heating	-7.5	-2.8	-1.3	0.6	-1.2
New fuels (hydrogen etc.) prod.	-	-	20.4	5.8	-
Energy Branch	0.2	-1.6	-0.9	-1.4	-1.3
Industry	-2.1	0.2	0.3	-0.4	0.0
Residential	-1.1	0.7	0.3	-0.2	0.2
Tertiary	-1.1	0.7	0.5	0.2	0.5
Transport	2.0	1.0	0.4	-0.2	0.4
Total	**-0.3**	**0.6**	**0.1**	**0.1**	**0.2**
EU-15	0.4	0.5	0.0	0.0	0.2
NMS	-5.0	0.8	0.6	0.3	0.5

Source: PRIMES.

"In the period 2000-2010, CO_2 emissions for EU-25 are projected to grow by 5.7%, exceeding the 1990 level by +2.8%. The strong short term increase to 2010 is due to high price increases for oil and particularly gas that encourage coal use in power stations, as well as the limited investment in energy efficient equipment, both in the demand and the supply side, caused by the slowdown of economic growth in the EU-25 that occurred in the recent past. Beyond 2010, CO_2 emissions are projected to rise at a much slower pace (+1.2 in 2010-2020, +0.7% in 2020-2030), with the demand side being the main driver for emissions growth in 2010-2020 and the power generation sector becoming the main driver for this

increase in 2020-2030 due to the massive decommissioning of nuclear power plants and increasing competitiveness of coal in the power sector."

"The growth of CO_2 emissions in the transport sector decelerates over the projection period and even becomes negative in the long run. This slowdown in transport emissions growth takes place in spite of modal shifts towards less energy efficient modes. Technological progress, the projected decoupling of transport activity from economic growth and the increasing penetration of biofuels blended in gasoline and diesel oil allowing for carbon intensity gains explain the above trend. In 2030 CO_2 emissions in the transport sector are projected to be 12.7% higher than in 2000 (with carbon intensity in the sector improving by 0.2% pa) accounting for 27.6% of total CO_2 emissions, up from 26.4% in 2000."

2.4.2.4 CO_2 emissions produced by urban transport

A Global evaluation

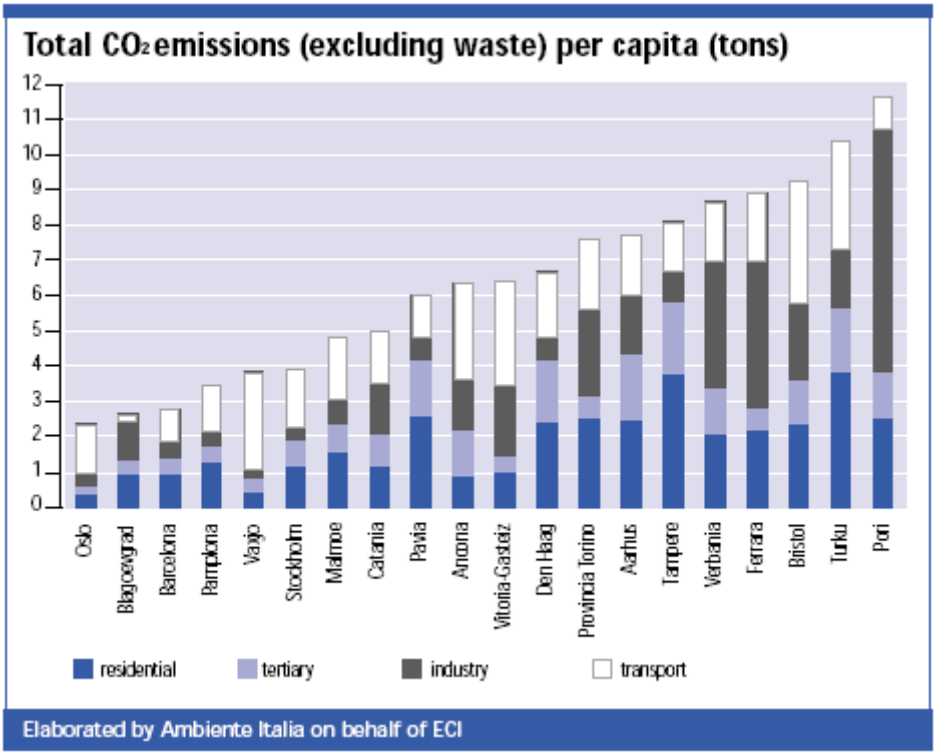
In the impact assessment of the communication from the Commission to the Council and the European Parliament on the thematic strategy on the urban environment[34], the following estimation is provided.

"Up to 40% of all energy used is consumed in the built environment (heating, cooling, hot water, use of electrical appliances and equipment). **Urban transport accounts for around 40% of all road transport related greenhouse gas emissions**. A city of 1 million people is estimated to generate 25,000 tonnes of CO_2 per day, but there is considerable variation between cities depending on the fuel used to generate electricity."

On the basis of the above-mentioned ratio, **the CO_2 emissions produced by urban transport are estimated at 344 million tonnes of CO_2 in the EU-25 in 2004, i.e. 9% of the total CO_2 emissions in the EU 25 in 2004.**

B CO_2 emissions produced by urban transport for a sample of cities

A study on "European common indicators"[35] provides the sectoral CO2 emissions per capita for a sample of European cities.



In **Berlin**, total $C0_2$ emissions have decreased by 14% between 1990 and 2002. $C0_2$ emissions from urban transport remained stable between 1995 and 2002. Compared to 1990, these emissions in 2002 have increased by 14%.

Table 5-3: Time series of carbon dioxide emissions in Berlin according to polluter (in 1,000 t)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Industry	5.087	4.374	4.058	3.411	2.939	3.410	3.084	2.819	2.952	2.580	2.825	2.674	2.774
Traffic	5.037	5.694	4.837	5.340	5.152	5.690	5.664	5.624	5.651	5.768	5.764	5.763	5.737
Households/minor consumers	19.195	19.587	18.099	19.678	19.355	17.643	18.369	17.384	16.996	17.178	16.631	16.945	16.777
Total	**29.319**	**29.655**	**26.994**	**28.429**	**27.446**	**26.743**	**27.117**	**25.827**	**25.599**	**25.526**	**25.220**	**25.382**	**25.288**

Source: Senate Department of Economic Affairs, Employment and Women, 2001/2002 Energy balance

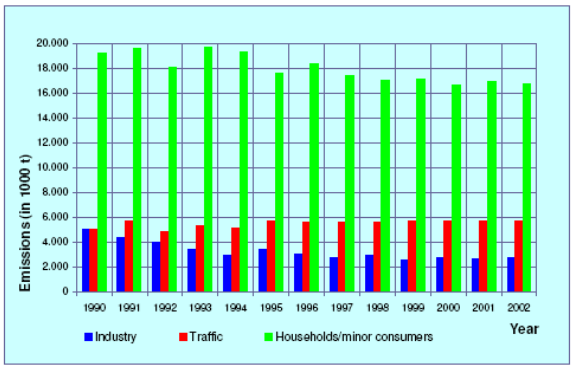


Figure 5-5: Carbon dioxide emissions in Berlin by polluter

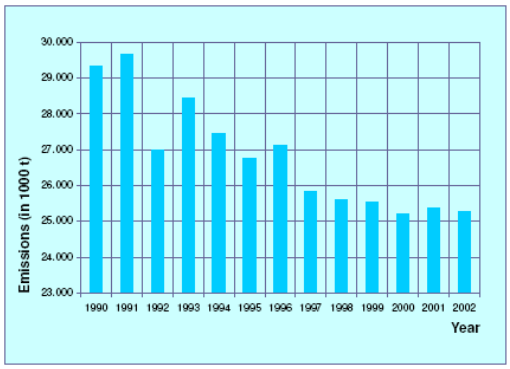


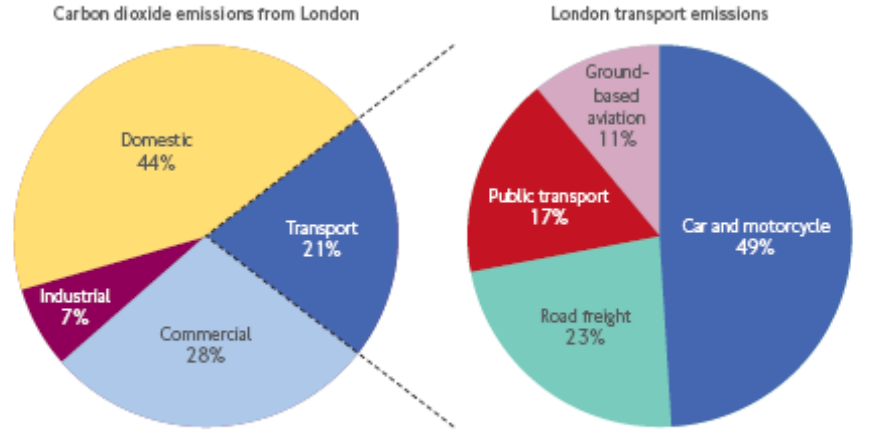
Figure 5-6: Overall carbon dioxide emissions in Berlin

In **London**, the "Transport 2025 - Transport vision for a growing world city"[36] report provides the following data.

"Transport is a significant contributor to CO_2 emissions, responsible for about nine million tonnes (21 per cent) of London's CO_2 emissions. This includes ground-based aviation

activities only (for example, landing and takeoff cycles) but excludes emissions from flights. Road transport is the largest emitter, generating about 80 per cent of the total, of which private vehicles and road freight account for around 50 per cent and 23 per cent of total emissions respectively. Reducing traffic demand and congestion is central to cutting CO_2 emissions in London. Without intervention, surface transport emissions are projected to rise as London's population continues to grow."

Figure 7 – Sources of London's CO_2 emissions



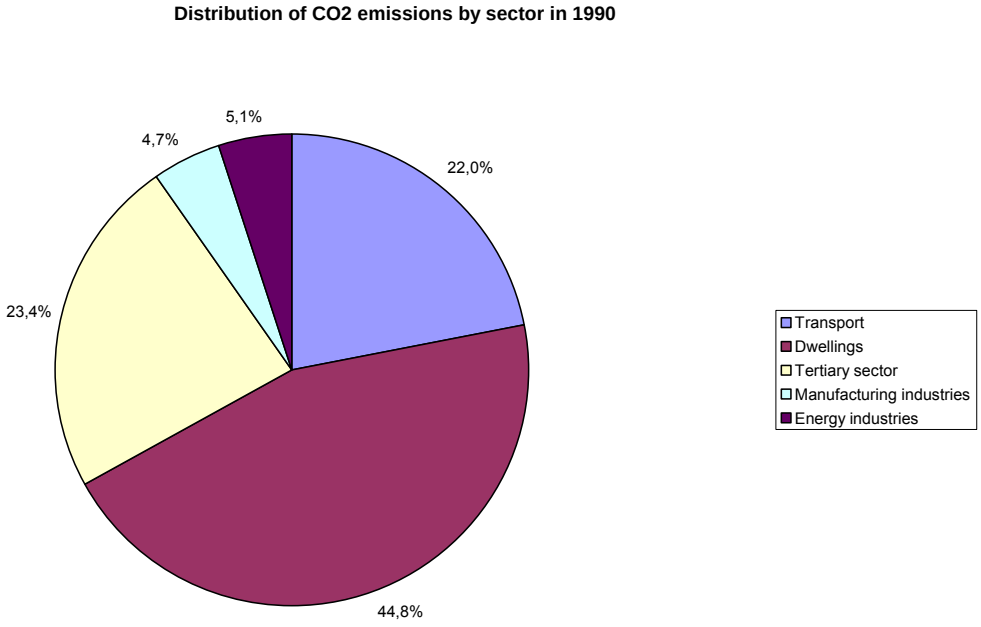
Transport 2025 - Transport vision for a growing world city

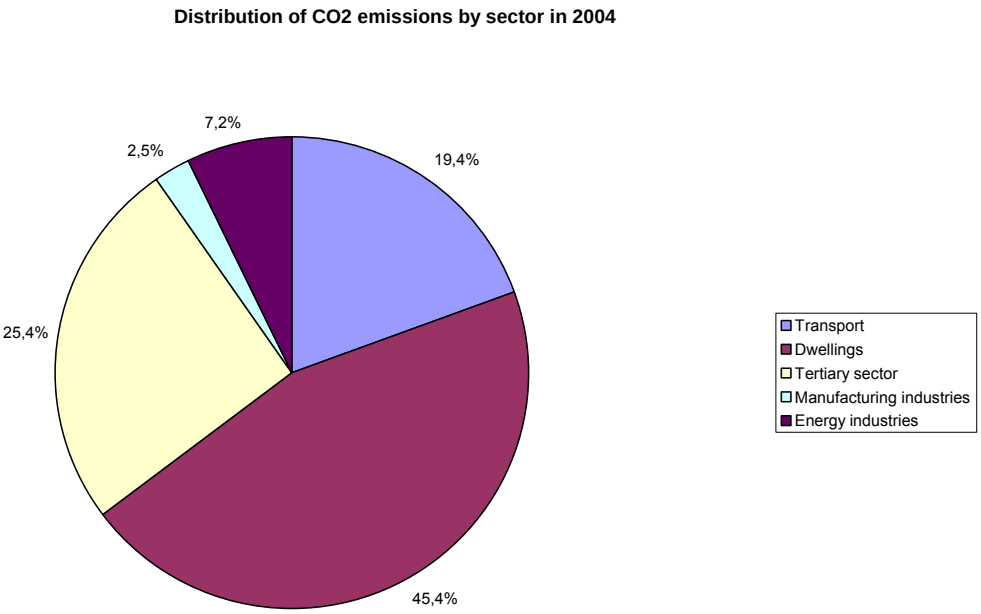
In **Brussels**, the following statistical data are provided by the IBGE [37].

The CO_2 emissions by urban transport have evolved from 835 ktons in 1990 to 795 ktons in 2004, i.e. a decrease of 4.8% over the period.

Total CO_2 emissions in the Brussels Capital Region have grown from 3 795 ktons in 1990 to 4 105 ktons in 2004, i.e. a growth of 8%.

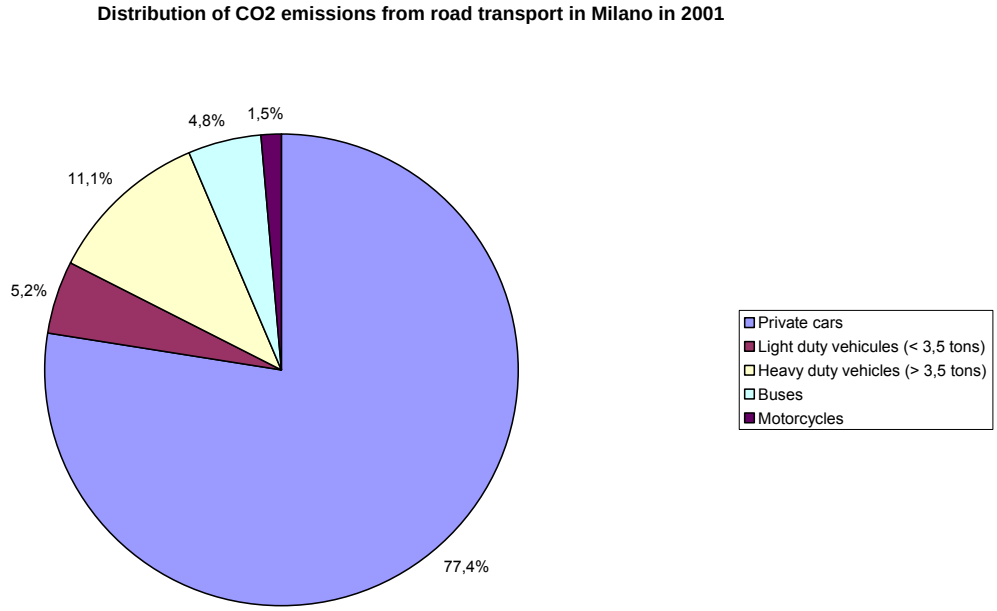
CO_2 emissions by urban transport represented 22% of the total CO_2 emissions in Brussels in 1990 and 19% in 2004, as shown in the following charts.





In **Milan**, total CO_2 emissions amounted to 4,498 tons in 1998[38], of which 1,599 tons from road transport, i.e. 35.6%.

CO_2 emissions from road transport amounted to 1,579.5 tons in 2001[38]. They were distributed as follows:

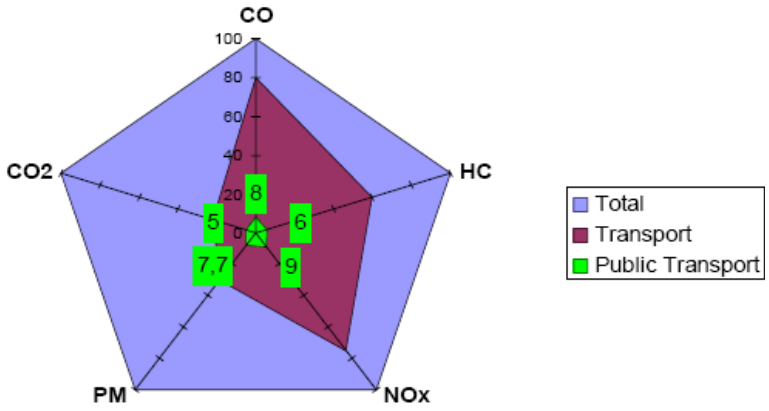


2.4.2.5 CO_2 emissions from new passenger cars

CO_2 emissions from new passenger cars sold in the EU-15 are declining. Emissions from diesel cars were reduced by 12.3 % between 1995 and 2003 and emissions from petrol cars have been reduced by 9.5 %. In 2003, the average specific CO_2 emissions of the total fleet was 164 g/km, compared with 186 g of CO_2/km in 1995[39]

2.4.2.6 Relative responsibilities for emissions in urban areas

Unit : %



This picture, presented by the UITP[40] with the following comment, shows the share of public transport emissions in urban areas, in proportion of the emissions from transport and from other sources.

"Buses are responsible for 8% of carbon monoxide emissions (CO), 6% of hydrocarbons (HC), 9% of nitrogen oxide emissions (NOx), 7.7% of particulates (PM) and 5% of carbon dioxide (CO_2)".

"Experts concur that the number one issue to be resolved this century is that of carbon dioxide (CO_2). The release of CO_2 into the atmosphere occurs whenever fossil fuel is burned and contributes to the greenhouse effect and global warming. **Thus thermal engine vehicles are responsible for 22% of all CO_2 emissions in the 15 EU member states, with only 5% generated by buses and coaches.** This transport mode is thus clearly not a priority target in strategies to combat greenhouse gas."

2.4.3 Noise

2.4.3.1 General data on noise in urban areas

In the Guidelines for Community noise elaborated by the World Health Organization[41], the following definitions and data are provided.

"Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic; industries; construction and public work; and the neighbourhood. The main indoor noise sources are ventilation systems, office machines, home appliances and neighbours.

In the European Union about 40% of the population is exposed to road traffic noise with an equivalent sound pressure level exceeding 55 dB(A) daytime, and 20% are exposed to levels exceeding 65 dB(A). When all transportation noise is considered, more than half of all European Union citizens is estimated to live in zones that do not ensure acoustical comfort to residents. At night, more than 30% are exposed to equivalent sound pressure levels exceeding 55 dB(A), which are disturbing to sleep. Noise pollution is also severe in cities of developing countries. It is caused mainly by traffic and alongside densely-travelled roads equivalent sound pressure levels for 24 hours can reach 75–80 dB(A).

In contrast to many other environmental problems, noise pollution continues to grow and it is accompanied by an increasing number of complaints from people exposed to the noise. The growth in noise pollution is unsustainable because it involves direct, as well as cumulative, adverse health effects. It also adversely affects future generations, and has socio-cultural, esthetic and economic effects."

The Green Paper on Future Noise Policy (COM(96) 540) adopted and published by the Commission in November 1996 was the first step in the development of a noise policy with the aim that no person should be exposed to noise levels which endanger health and quality of life (Fifth Environmental Action Programme).

The following diagnostic was made by the DG Environment concerning the noise situation in the European Union.

"The data available on noise exposure is generally poor in comparison to that collected to measure other environmental problems and often difficult to compare due to the different measurement and assessment methods. However it has been estimated that around 20 percent of the Union's population or close on 80 million people suffer from noise levels that

scientists and health experts consider to be unacceptable, where most people become annoyed, where sleep is disturbed and where adverse health effects are to be feared. An additional 170 million citizens are living in so-called "grey areas" where the noise levels are such to cause serious annoyance during the daytime.

For more than twenty years Community environmental noise policy has essentially consisted of legislation fixing maximum sound levels for vehicles, aeroplanes and machines with a single market aim, or to implement international agreements in the case of aircraft, linked to certification procedures to ensure that new vehicles and equipment are, at the time of manufacture complying with the noise limits laid down in the directives.

Thanks to this legislation and technological progress significant reductions of noise from individual sources have been achieved. For example the noise from individual cars has been reduced by 85% since 1970 and the noise from lorries by 90%. Likewise for aircraft footprint around an airport made by a modern jet has been reduced by a factor of 9 compared to an aircraft with 1970s technology.

However data covering the past 15 years do not show significant improvements in exposure to environmental noise especially road traffic noise. The growth and spread of traffic of traffic in space and time and the development of leisure activities and tourism have partly offset the technological improvements. Forecast road and air traffic growth and the expansion of high speed rail risk exacerbating the noise problem. In the case of motor vehicles other factors are also important such as the dominance of tyre noise above quite low speeds (50km/h) and the absence of regular noise inspection and maintenance procedures.

For some sources such as railways and a wide range of noisy equipment used outdoors there are no Community or international standards setting emission limits. A number of Member States are planning national legislation for these products, which could cause problems for the functioning of the single market.

Most Member States have adopted legislation or recommendations setting emission limits for noise exposure in sensitive areas. These are often integrated into national abatement laws and used in land use plans especially for new infrastructure developments. A survey done for the Commission has shown a considerable degree of convergence between Member States in the establishment of such quality criteria for road, rail and industrial noise. The situation for aircraft noise indices and exposure levels is more divergent."

2.4.3.2 Data on noise for a sample of urban areas

A Data for a sample of European cities (National policy frameworks for urban transport)

The "National policy frameworks for urban transport" study[42] provides the following analysis and data.

"Data is available mainly at individual city level for various years, however for France, Germany and Italy, the respective percentage is given at a national level. Consequently, the comparison between countries or even cities is not accurate. The following table presents the percentages of urban populations exposed to noise >65 db(A) indicating the name of city and the year of reference. Population exposure to other levels of noise (<50 db(A), 50-65 db(A)) is not available for any countries or cities."

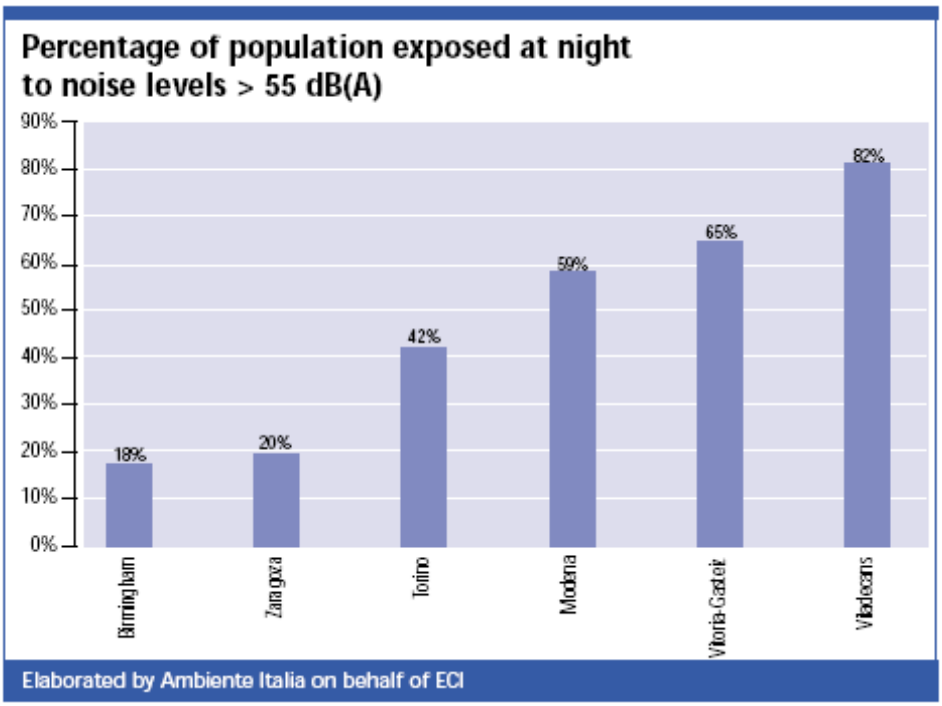
Table 13: Transport noise in European cities

	City	Year of reference	% of urban population exposed to >65db(A)
BE	Brussels	1998	30.5 %
DK	Copenhagen	1998	25.2 %
FI	Helsinki	1990	2.7 %
FR	-	2000	16.4 %
DE	-	2000	30.9 %
IE	Dublin	2000	0.04 %
IT	-	1996-1999	40.7 %
NL	Amsterdam - Rotterdam	1993	16 %
PT	Lisbon - Porto	2000	2 %

Note that dB(A) can be measured in L_{eq} (generally on the Continent) or in L_{10} (generally in the UK and Ireland) – this explains the very low figure for Dublin.

B European common indicators

A study on "European common indicators"[43] provides data on noise pollution for a sample of European cities. The following chart presents the share of the population exposed to night noise levels higher than 55 dB(A) for a sample of cities.



C Berlin

The following data concern noise pollution in **Berlin** in 2004, during the day and during the night.

Noise pollution in Berlin in 2004[1)]

Table 5-4: Potential number of people in roadside housing affected during the day

db(A) scale	Roadside (km)	People affected	%
0 - 50	14,5	1.974	0,6%
50 - 55	41,4	9.318	2,6%
55 - 60	141,1	41.558	11,8%
60 - 65	373,6	80.974	23,0%
65 - 70	602,6	128.903	36,6%
70 - 75	293,0	84.807	24,1%
75 - 80	17,3	4.371	1,2%
> 80	0,0	0	0,0%
Total	**1.483,4**	**351.905**	**100%**

[1)] Basis data from 1998

Table 5-5: Potential number of people in roadside housing affected at night-time

db(A) scale	Roadside (km)	People affected	%
0 - 50	80,1	15.847	4,5%
50 - 55	185,7	54.675	15,5%
55 - 60	450,3	92.476	26,3%
60 - 65	573,3	131.677	37,4%
65 - 70	186,7	55.549	15,8%
70 - 75	7,4	1.681	0,5%
75 - 80	0,0	0	0,0%
> 80	0,0	0	0,0%
Total	**1.483,4**	**351.905**	**100%**

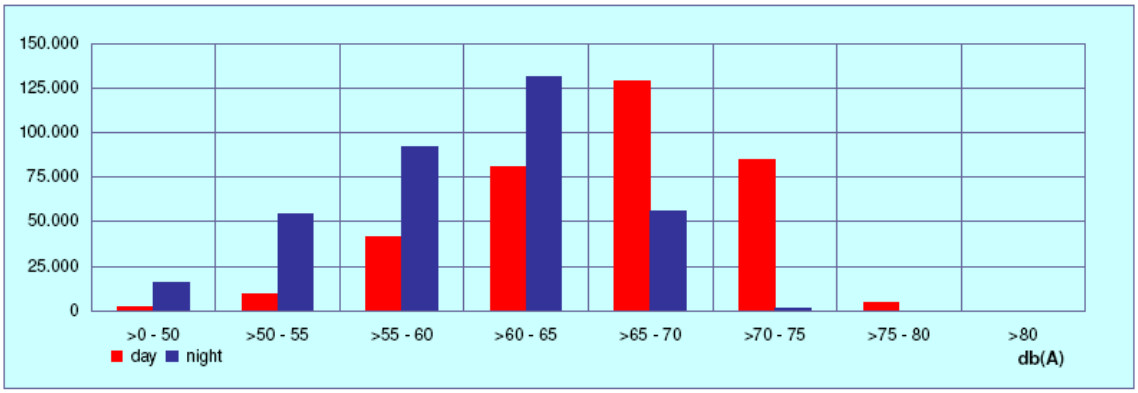


Figure 5-7: Number of people affected

Source: Senate Department for Urban Development

2.5 SAFETY

2.5.1 Definitions

The reference source of data on road safety in Europe is the CARE database, which is presented as follows.

"CARE is a Community database on road accidents resulting in death or injury (no statistics on damage-only accidents). The major difference between CARE and most other existing international databases is the high level of disaggregation, i.e. CARE comprises detailed data on individual accidents as collected by the Member States. This structure allows for maximum flexibility and potential with regard to analysing the information contained in the system and opens up a whole set of new possibilities in the field of accident analysis".

"National data sets should be integrated into the CARE database in their original national structure and definitions, with confidential data blanked out. The Commission provides a framework of transformation rules allowing CARE to provide compatible data."

The CARE database enables to evaluate urban road safety through several indicators:

- Traffic **injuries**, inside or outside an urban zone: number of injuries on the road network, per annum and per mode of transport. The definition of an injury does not imply that there is a hospitalization or medical treatment. It is the opinion of the police[44].
- Traffic **fatalities**, inside or outside an urban zone, for all categories of road users (pedestrian, pedal cycle, moped, motorcycle, car or taxi, lorry under 3.5 tonnes, heavy goods vehicle, bus or coach (>8 seats), agricultural tractor, other), and by user class (driver, passenger, pedestrian): number of deaths on the road network, per annum and per mode of transport. The definition of a fatality implies that the death has occurred within 30 days of the road accident. The suicide and natural deaths are not included[44].

The following figures are based on CARE reports[45]. The CARE database defines three areas of study:

- **Inside urban areas**: Area inside urban area boundary signs (except GB, IE, NI). Includes dual carriageways and national roads. Can include motorways (except DK, DK, GR, IT). Opinion of the police (DK, SE). Data approximated from speed limit of 40 mph or less (GB, IE, NI).
- **Outside urban areas**: Area outside urban area boundary signs. Opinion of the police (DK, SE). Includes motorways. Data approximated from speed limit over 40 mph (GB, IE, NI).
- **Motorways** : Public road with dual carriageways, and at least two lanes each way. Entrance and exit signposted. Road with grade separated interchanges. Road with a central barrier or central reservation. No crossing permitted. No stopping permitted unless in an emergency. Entry prohibited for pedestrians, animals, pedal cycles, mopeds, agricultural vehicles; learner drivers (BE, GB, GR, IE, NI, PT). Access restricted to motor vehicles (AT, DK, FI). Minimum speed between 50 km/h and 80 km/h (except FR, GB, NI). Maximum speed between 100 km/h and 130 km/h (except DK recommended 130 km/h).

2.5.2 Traffic injuries and fatalities in the three areas defined by CARE

In 2004[46], EU-15 countries suffered almost **1.2 million road traffic accidents**; **67%** occurred **inside urban areas**, 27.4% outside urban areas and 5.6% on motorways.

These traffic accidents caused more than 1.6 million severities (injured or killed people).

The injuries occurred for a bigger proportion (64%) inside urban areas, against 30% outside urban areas and 6% on motorways, while the fatalities occurred mostly outside urban areas (60%). 31 % of the deaths occurred inside urban areas, and 9% on motorways.

More precisely, in 2004, traffic accidents caused **32 951 deaths** and **1 570 884 injuries. Inside urban areas**, **10 252** persons were **killed** and about **1 million**[47] persons were **injured** by traffic accidents.

On average, in the EU-15, one traffic accident (with at least one person injured or killed) causes severities to 1.37 people (1.34 people injured and 0.03 person killed).

2.5.3 Traffic fatalities by mode of transport (in which the fatality was travelling) in the EU-14 (EU-15 without Germany)[48]

Inside urban areas, the **car** or **taxi** is the first cause (**34.2%**) of fatality by traffic accident, causing 3 328 deaths. The non motorized people are also vulnerable, with more than one third of the traffic fatalities (**36.2%**); 2 813 **pedestrians** have died (28.9) by traffic accident in 2003 and 712 **pedal cycles** (7.3%). **Motorcycles** (1 360 deaths) and **mopeds** (1 054 deaths) are responsible for one quarter (**24.8%**) of the road fatalities. The last part (**2.6%**) of the traffic fatalities is made **of heavy vehicles**: 135 deaths in lorries under 3.5 tonnes (1.4%), 43 in heavy goods vehicles (0.4%), 41 in agricultural tractors (0.4%) and 31 in bus or coach (0.3%). The remaining **2.2%** fatalities (209 deaths) are caused by others or unknown modes of transport.

Outside urban areas, the **car** or **taxi,** causing **13 095 deaths,** is responsible for **65.6%** of the deaths on roads outside urban areas; mopeds and motorcycles are responsible for 2 876 deaths (14.4%), pedestrians and pedal cycles for 2 035 deaths (10.2%), heavy vehicles for 1 540 deaths (7.7%), other or unknown for 430 (2.1%).

The proportion of deaths by each mode of transport which occurs inside urban areas is given as follow: pedestrian (66.6%), pedal cycle (53.4%), moped (53.9%), motorcycle (40.8%), car or taxi (20%), lorry under 3.5 tonnes (14.2%), heavy goods vehicle (8.1%), bus or coach (20.9%), agricultural tractor (26.1%).

2.5.4 Traffic fatalities by user class[49]

Inside urban areas, the **driver** is killed in **58%** of the road fatalities, a **pedestrian** in **28.6%** and a **passenger** in **13.4%**.

Outside urban areas, the driver is killed in 70% of the road fatalities, a passenger in 23% and a pedestrian in 7%.

On motorways, the driver is killed in 61% of the road fatalities, a passenger in 32% and a pedestrian in 7%.

2.5.5 Evolution (1998-2004)[50]

In the EU-14[51]; the number of traffic fatalities was reduced by 21% over the 1998-2004 period, while the number of all traffic accidents (injury and fatal) decreased by 9.5% over the same period.

2.6 CONGESTION

2.6.1 Introduction

Congestion arises when one vehicle on the road delays another one. Congestion induces additional journey time, additional fuel consumption, additional polluting and GHG emissions, additional accidents. In other words, beyond the annoyances which are suffered by the users and the roadside residents, congestion has a cost: value of time of the users, short term environmental and accident costs for the local community and long term climate change for the entire world.

2.6.2 Cost of congestion

As mentioned in the "Mid-term review of the European Commission's 2001 Transport White Paper" report[52], total "Road congestion has increased and is costing the EU about 1% of GDP".

In the impact assessment of the Thematic strategy on the urban environment[53], the following data is presented: "Private car ownership, private car use and the length of car journeys have all increased significantly. The resulting traffic congestion, most of which occurs in urban areas, is estimated to cost more than 0.5% of Community GDP." (…) "The number of kilometres travelled in urban areas by road transport is predicted to rise by 40% between 1995 and 2030. Levels of car ownership in EU10 are still not at the same levels as for EU15 suggesting further growth. If nothing is done, road congestion is expected to increase significantly by 2010 and the costs attributable to congestion will increase to approximately 1% of Community GDP."

2.6.3 Public transport congestion

To the extent the traffic of the public transport vehicles is mixed with the general road traffic it is also affected by the congestion. In addition to this, public transport passengers might also suffer from in-vehicle congestion or crowding effects when the number of passenger exceeds the public transport vehicles capacity. In addition to the congestion costs evoked apropos the private road transport, the public transport operator has to support the cost of additional vehicles on the road to keep service headways at acceptable levels (if not mandatory levels to comply with its public service obligations).

In a position paper[54], the UITP provides the following analysis.

"Congestion slows down surface public transport and makes it more irregular. It causes longer journeys and waiting times for users and increases operational expenditure by operators.

A study carried out in Brussels in 1999 evaluated the annual cost of traffic jams for operators at 17.5 million euros, or 18% of total service production costs.

The construction of new urban road infrastructures does not provide any sustainable solutions to the problem of congestion. It is incompatible with growing environmental protection demands and public budget constraints.

Rather than carry on developing expressway networks, the use of existing infrastructures needs to be optimised in terms of passenger transport capacity (and not vehicle capacity, as is still too often the case). In this respect, it is worth noting that buses (or tramways) use space far more efficiently than cars.

Moreover, surface public transport seldom needs to park whereas the space needed to park one car is equivalent to the space used for an employee's office."

2.6.4 Scarcity

Another form of congestion arises when one vehicle prevents another one from gaining access to the network: it is called scarcity and it essentially applies to scheduled public transport using an infrastructure with strictly limited access. In an urban or metropolitan context scarcity would affect rail transport: railway and metro services, and possibly tramway services to the extent these are strictly separated from the general road traffic, which is generally not the case all along the tramway routes. In this case, in contrast to road traffic, where individual users demand for a particular infrastructure capacity without taking into consideration the effects they impose on the other users, the effect of extended traffic in rail transport is known (and anticipated) by the operator. Therefore there are arguments to say that in scheduled public transport with own infrastructure congestion cannot exist. However it is obvious that in public transport also high demand levels are leading to capacity problems and delays which are not anticipated in the timetables defined by the operator and/or the infrastructure manager. Like road traffic congestion, scarcity also has a cost, notably comprising the disutility of the additional journey time for the end users and the cost of the additional driving time for the operator(s) which would either reschedule their journeys and/or change their mode of transport or would even not travel at all because of infrastructure capacity shortage at the right time.

With regard to congestion and scarcity there should thus be a distinction between:

- Congestion in individual transport;
- Congestion in scheduled public transport systems which share the road infrastructure with the "general" road traffic, such as buses and tramways systems;
- Congestion and scarcity in scheduled public transport systems operated on their own infrastructure.

2.6.5 Data for a sample of European cities

Data on traffic congestion was collected on specific opportunities, notably:

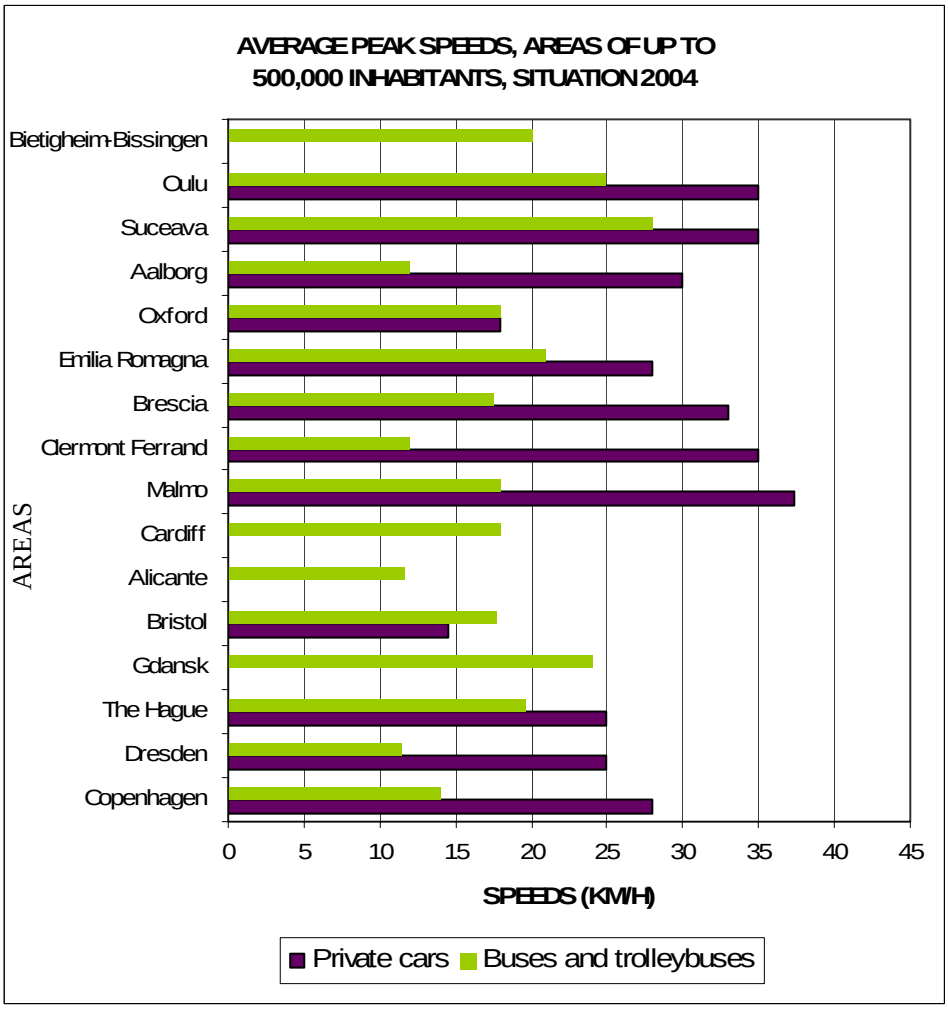
- for the Urban Transport Benchmarking Initiative,
- for the EMTA Barometer of Public Transport in the European Metropolitan Areas,
- for the "National policy frameworks for urban transport" study
- for the Urban audit.

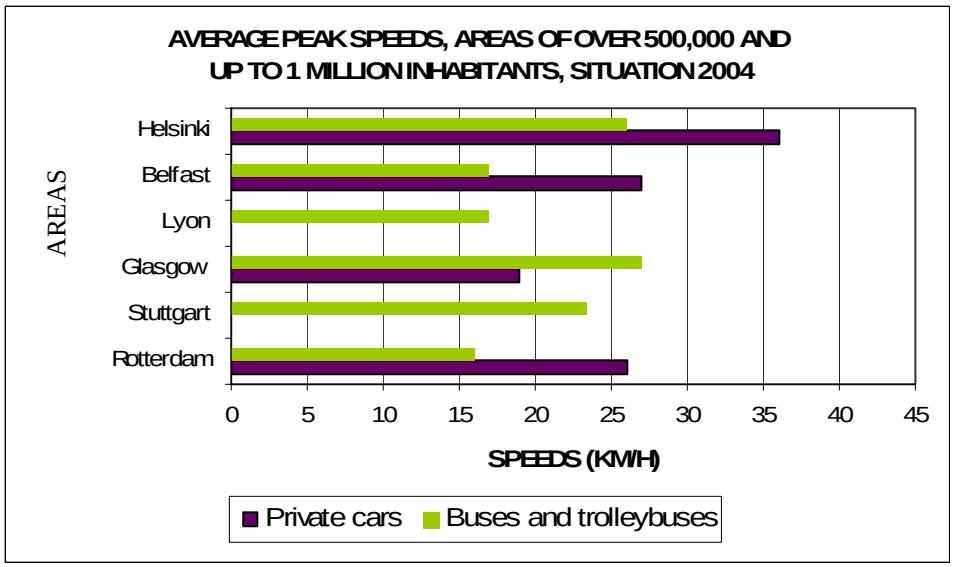
2.6.5.1 Data for a sample of European cities (Urban Transport Benchmarking Initiative)

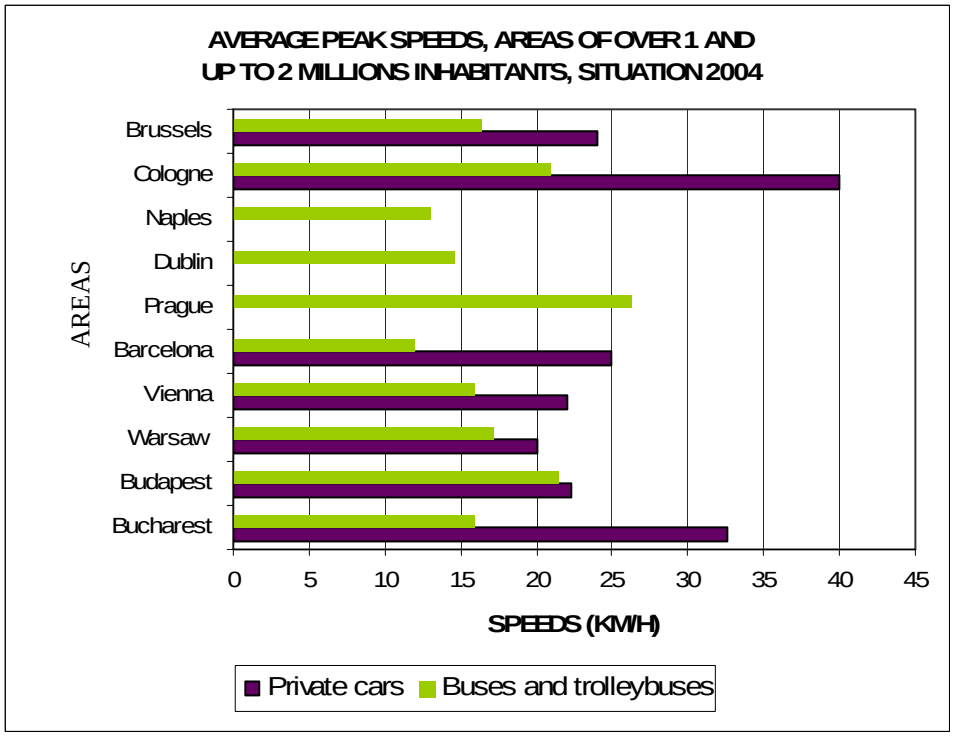
Average peak speeds data derived from the work undertaken in the framework of the Urban Transport Benchmarking Initiative are shown in the following figures for four groups of cities based on their population level[55]: up to 500,000 inhabitants, over 500,000 up to 1 million inhabitants, over 1 million up to 2 millions inhabitants and over 2 millions inhabitants.

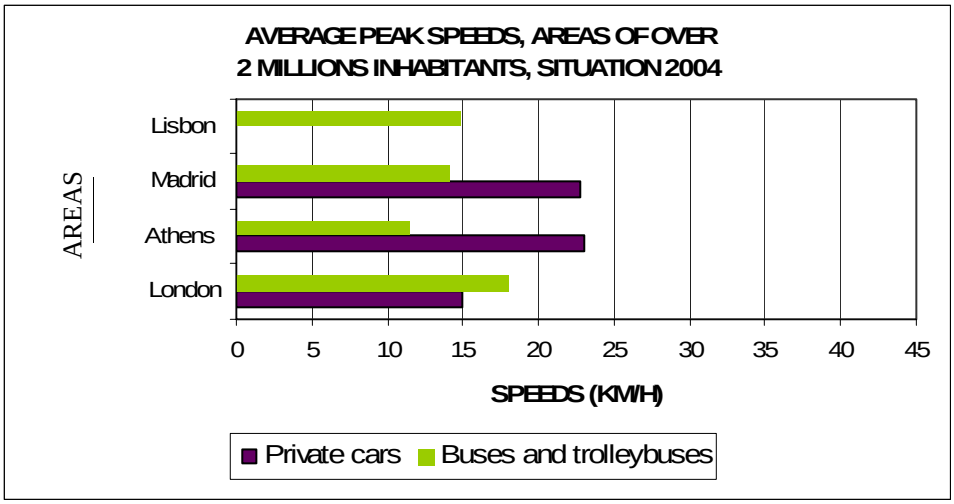
These figures show a high variability of observed speeds, not only between groups of cities but also inside of these groups, for private cars as well as for public transport vehicles, which means that congestion levels are not uniform all over Europe. Generally speaking, private car speeds are higher in small and medium size cities than in large and very large cities, and this confirms what is commonly recognised, i.e. that large and very large cities suffer more from road traffic congestion than small and medium size cities.

As far as buses and trolleybuses are concerned, even in small and medium size cities, average peak speeds are often lower than 20km/h or even lower than 15km/h. Road network configuration as well as small average distances between stops might explain this as well as possible road traffic congestion.



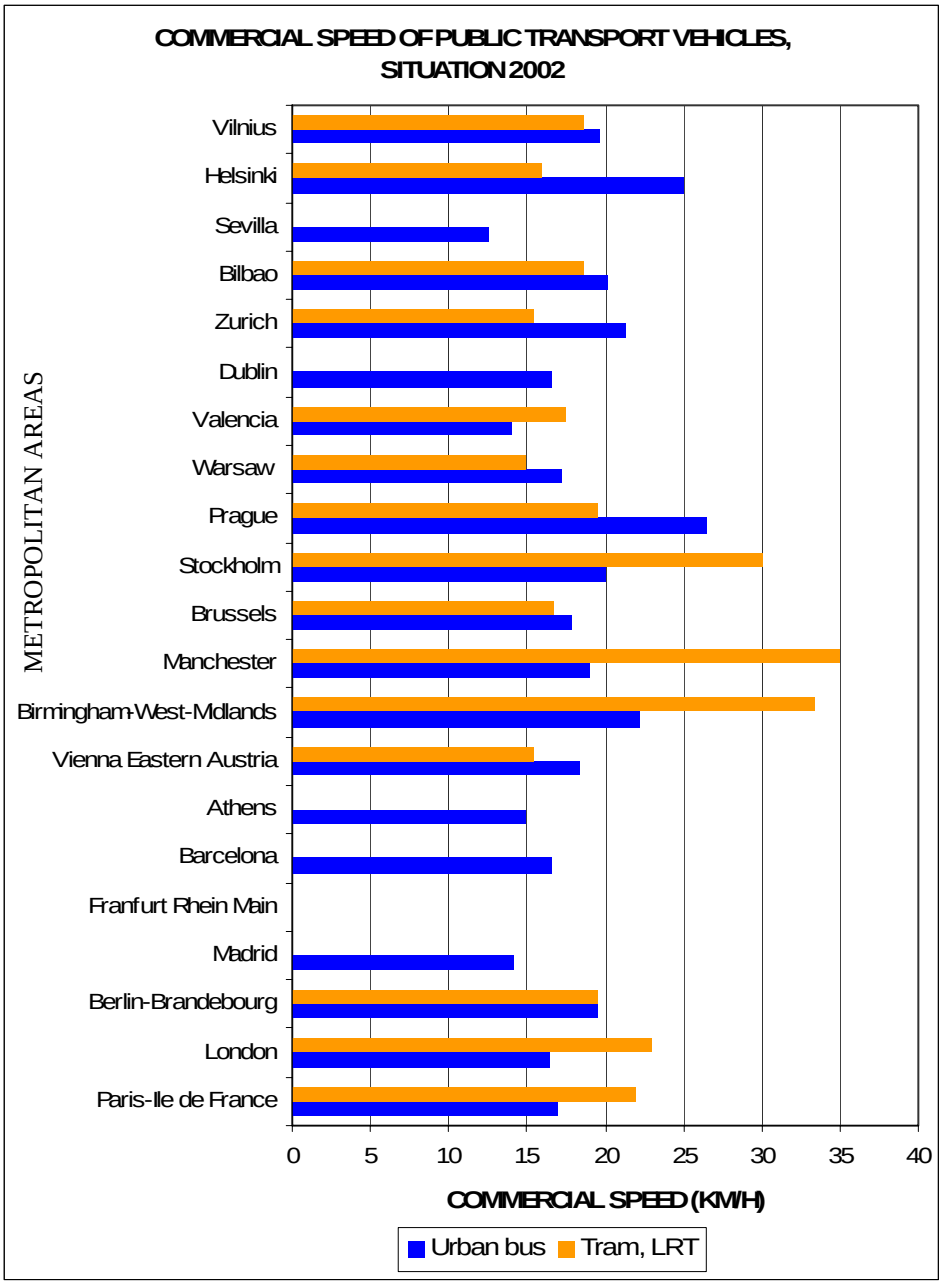

AVERAGE PEAK SPEEDS, AREAS OF OVER 500,000 AND UP TO 1 MILLION INHABITANTS, SITUATION 2004
AREAS
Helsinki
Belfast
Lyon
Glasgow
Stuttgart
Rotterdam
0 5 10 15 20 25 30 35 40 45
SPEEDS (KM/H)
Private cars
Buses and trolleybuses


AVERAGE PEAK SPEEDS, AREAS OF OVER 1 AND UP TO 2 MILLIONS INHABITANTS, SITUATION 2004
AREAS
Brussels
Cologne
Naples
Dublin
Prague
Barcelona
Vienna
Warsaw
Budapest
Bucharest
0 5 10 15 20 25 30 35 40 45
SPEEDS (KM/H)
Private cars
Buses and trolleybuses



2.6.5.2 Data for a sample of European cities (EMTA Barometer)

Commercial speeds of public transport vehicles obtained from the EMTA Barometer are shown on the diagram of the following figure. Urban bus speeds do not differ significantly from those shown on the Urban Transport Benchmarking Initiative diagrams. As far as tramway speeds are concerned, they are of the same order of magnitude as those of the bus speeds, except in case of recently developed infrastructures, such as Manchester, Birmingham, London and Paris: for which tramway commercial speed is significantly higher than bus services speeds.



2.6.5.3 Data for a sample of European cities (National policy frameworks for urban transport)

The "National policy frameworks for urban transport" study[56] provides the following analysis and data.

"Average speed of surface public transport and average traffic speeds are the focus of this indicator. Measurements can be in city centres or in suburbs, and can take place in weekday peak periods or off-peak free-flow conditions (e.g. late evening or on Sundays).

One possible measurement is seconds per kilometre in travel time above free flow (night time) speed, which measures how severe traffic congestion at various times of the day are compared to situations without any congestion.

Limited data for average speeds is available, however this generally means calculating speeds from bus timetables. Taking such a sample would require considerable effort in terms of data collection (several bus routes in several cities) to be representative. It is not available on a time series basis.

Surprisingly, average traffic speeds are unavailable in most cases, following searches of studies, transport plans and reports of urban authorities in several countries, etc. However, a number of cities have limited data (although this risks being unrepresentative and difficult to compare).

Examples of average urban speeds (between 2000 and 2004) are:

- Greece (all traffic): city centres: 15 km/h, suburban areas: 40 km/h.
- Ireland (Dublin metropolitan area): all traffic: 18.7 km/h, buses: 14.6 km/h.
- Italy (surface public transport, Rome): 15 km/h.
- The Netherlands (The Hague):
  - city centre, peak periods: all traffic: 8 km/h, surface public transport: 18 km/h
  - city centre, evenings/Sundays: all traffic: 30 km/h; surface public transport: 20 km/h
  - suburbs: all traffic: 40 km/h, surface public transport: 23 km/h.
- Portugal (surface public transport, peak periods): Lisbon: 14.4 km/h, Porto: 14.9 km/h.
- Sweden (surface public transport, Stockholm area):
  - city centre, peak periods: all traffic: 17 km/h, surface public transport: 13 km/h
  - city centre, evenings/Sundays: all traffic: 25 km/h; surface public transport: 15 km/h
  - suburbs: all traffic: 43 km/h, surface public transport: 21.5 km/h.
- UK (all traffic, London): city centre, peak periods: 15.8 km/h, suburbs: 27 km/h.

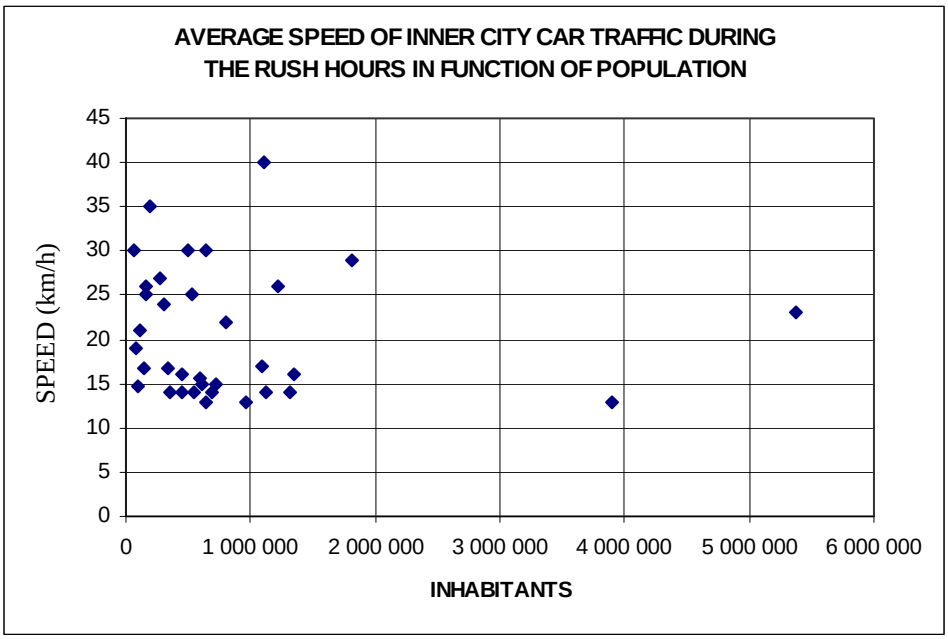
The use of speed per se as an indicator does not necessarily tell us whether a city is performing well or not. On the one hand, higher average speeds can be positive, indicating a low level of congestion. On the other hand, many cities implement traffic calming and reduced speed zones (e.g. 30 km/h) in order to improve safety, encourage walking and cycling, etc, therefore low speeds can also be seen as positive. What is not known is the extent to which low speeds are by design (traffic calming, enforcement, etc) or not (e.g. due to congestion). For this reason, the most appropriate indicator is perhaps the number of seconds per kilometre in travel time above free flow speed (comparing peak periods and other daytime periods with speeds as an uncongested time, e.g. at night). However, this is not available except for London.

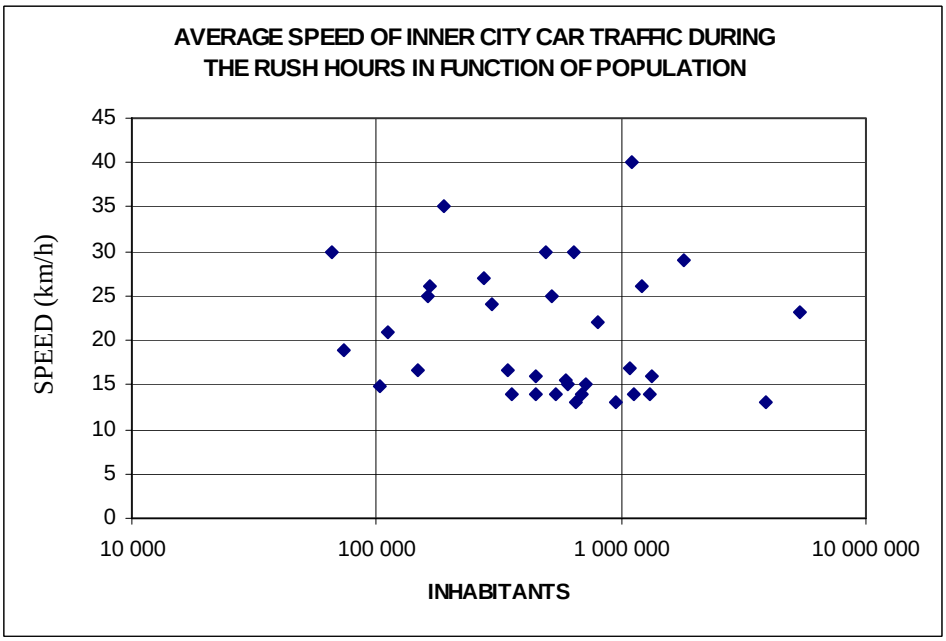
The development of a standard unit for measuring congestion index for cities, similar to the mobility monitoring programme used in the US to assess congestion conditions and trends for a large sample of urban areas, would provide a consistent and reliable measure of mobility performance in European cities."

2.6.5.4 Data for a sample of European cities (Urban audit)

The database from the Urban Audit contains indicators on traffic conditions: average speed of cars during rush hour(s), average bus waiting time during rush hour(s), for a sample of European cities.

A possible relationship between average speed in the inner city during rush hours and population has been examined. Exploited data were the ones concerning the 34 cities for which rush hours speeds data were actually available for the 1999-2003 period. The following graphs drawn on the base of the 34 cities sample, with two different scales, do not show a relationship between average speed in the inner city during rush hours and population.





2.6.6 Which are the key congestion drivers?

Congestion and scarcity levels are not always and everywhere the same. Therefore attention has to be paid to the main possible drivers of congestion and scarcity situations.

2.6.6.1 Congestion drivers in individual and commercial road transport

On the transport supply side, the main congestion drivers are the overall road infrastructure capacity, the traffic control efficiency and the development of traffic conditions when capacity limits are approached.

Lack of capacity may result of permanent network features, i.e. physical bottlenecks linked to the physical layout of the infrastructure and/or to the traffic control inefficiency, and events with a more or less random character: traffic incidents, road works or works affecting public spaces which are normally assigned to road traffic, weather, special events (for example demonstrations during which some roads would be closed to traffic or such events which cause surges in traffic demand) and also the day to day fluctuations of normal traffic.

In the USA, at the country wide level, roadway data show the following relative importance of the congestion sources:

- Bottlenecks: 40%
- Traffic incidents: 25%
- Work zones: 10%
- Bad weather: 15%
- Poor signal timings: 5%
- Special events, other: 5%

Congestion induced by the physical bottlenecks is of recurrent nature while the other causes give rise to additional congestion of random nature, which forces us to introduce a concept of reliability that is linked to the variability of the traffic conditions. In this respect, one must be aware that where and when the recurrent traffic conditions are close to the capacity limits, any other congestion cause might provoke a sharp increase of the congestion level.

On the demand side the elasticity is a main congestion driver concerning the reaction of the demand to changing traffic conditions, transport alternatives, user charges as a determiner of the choices regarding route, travel time and mode of transport.

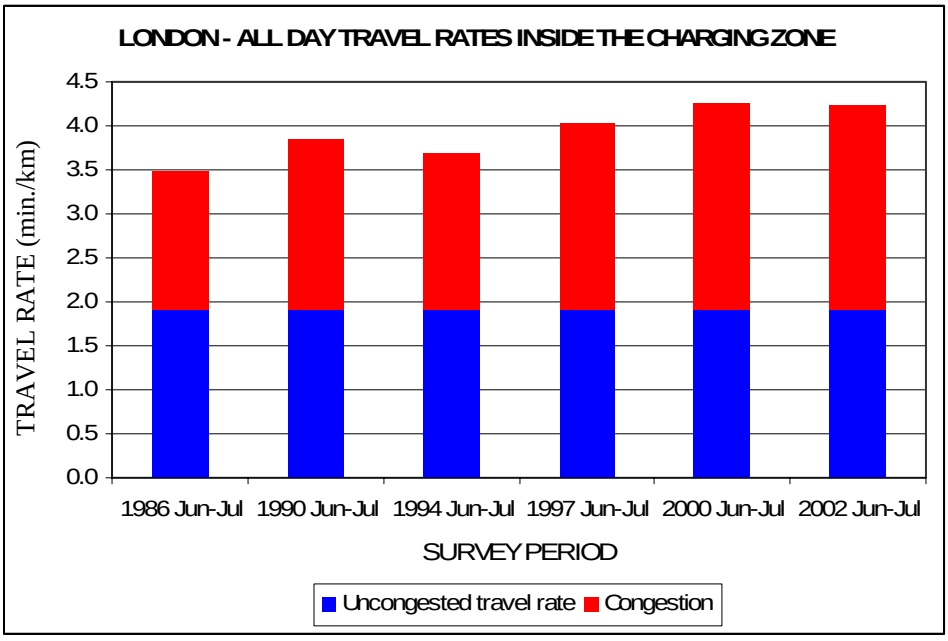
The road administrations which monitor the congestion have gathered evidences that congestion is worsening, simply because transportation demand is growing faster than the road network capacity. In the urban context, the Texas Transportation Institute tracks congestion and congestion trends in 85 US urban areas: its Urban Mobility Report shows that if the large and very large conurbations are mostly suffering from the road traffic congestion, medium and small size urban areas are affected as well. Between the years 1993 and 2003:

- Peak period trips take an average of 7% longer: in most metropolitan areas the concept of rush hours is obsolete as congestion happens for multiple hours on both morning and evening weekdays;

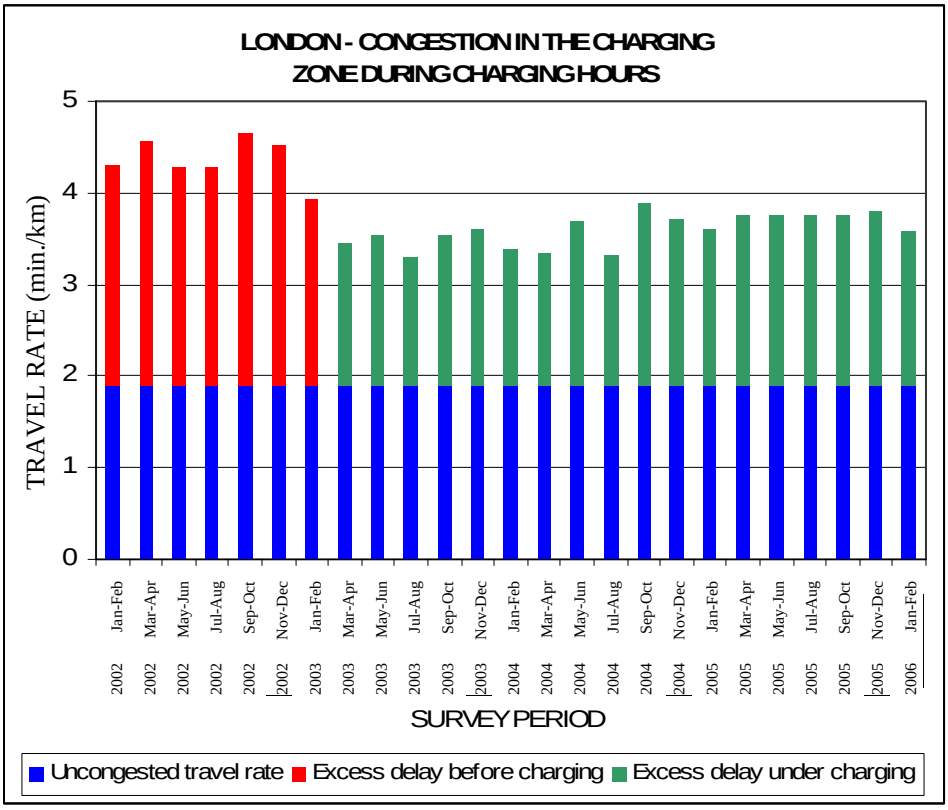
- Travellers spend 47 extra hours per year in travel as compared to 40 hours in 1993;
- The percentage of urban freeway mileage that is congested has grown from 51% to 60%.

Census and surveys also tell us that behind the increasing congestion the travel behaviour has changed as well as a result of changing family structure and growing car ownership, not forgetting urban sprawl: increasing congestion is a result of the combination of increasing distances being travelled, decreasing private cars speed and increasing travel time.

Congestion can be expressed in terms of delay or "excess travel rate" over that which would have been experienced under uncongested conditions, which is considered to be the travel rate applying during the early hours of the morning. In the case of the London charging zone, the uncongested average network speed had been measured at 31.6 km in 2001, which correspond to a travel rate of 1.9 min/km. The following graph shows the evolution of the congestion level, as expressed in travel rate, inside that zone from 1986 to 2002: starting in 1990, travel rate was at least twice as much as that in uncongested conditions[57].



It is interesting to see how the travel rate indicator enables to highlight the extent to which congestion in the London centre has been reduced through implementation of the Congestion Charging Scheme: this is shown in the following graph. During the whole survey period (from March 2003 to February 2006), average delays are 1.7 min/km giving a reduction of 26% over pre-charging conditions in 2002. During the year 2005, the average delay is 1.8 min/km, giving a reduction of 22% against pre-charging values[58].



The review of the COMPETE[59] project shows that urban congestion in Europe is in line with urban congestion in the United States, in terms of magnitude and growth, as illustrated by the following table extracted from the final report.

Travel time index in EU and US cities 2003

Area	Travel time index		
	1993	2004	1993-2004
Paris, Ile de France		1.34	
Greater Copenhagen area		1.40	
Greater London		1.84	
Average of other English cities	1.24	1.32	0.08
US 85 areas average	1.28	1.37	0.09
US very large areas average (13 areas)	1.38	1.48	0.10
US large areas average (26 areas)	1.19	1.28	0.09
US medium areas average (30 areas)	1.11	1.18	0.07
US small areas average (16 areas)	1.06	1.10	0.04

The COMPETE country reviews brought to the conclusions that in Europe:

- "The most congested urban areas are located in the UK, in Central and in Southern Europe, the most affected agglomerations being Paris, London, Prague, Athens and the large Spanish and Italian urban areas. In some cases (e.g. Prague) peak traffic has spread out in the previously off-peak periods, such that off-peak is only visible during night time;

- For other large and medium size capitals, such as Berlin, Zurich, Vienna, Stockholm, Helsinki or Copenhagen, usual peak hour or only mild congestion is reported. In most of these cases, congestion is rather a problem of access links. However it needs to be stated that the reduction of urban congestion is partly due to the increasing sprawl of urban areas, which also considerably impacts daily travel and commuting times."

2.6.6.2 Congestion and scarcity drivers in scheduled public transport

For **scheduled road public transport**, congestion drivers are the same as for individual and commercial road transport: road infrastructure capacity, traffic control efficiency, general road traffic conditions and possibly here alighting/boarding times at major stops and stations[60]. Demand elasticity to quality of service as a result of changing traffic conditions can also indirectly exert influence on related congestion level, but to a lesser extent than for individual road transport.

For **scheduled public transport operated on their own infrastructure**, i.e. rail transport, congestion develops under the form of delays generated in a cascade –type effect due to various initial causes: technical breakdown of vehicles or fixed equipments, long boarding/alighting times, passenger uneasiness, etc, are among the most common ones. Key congestion/scarcity drivers are, as well as for 'traditional' congestion of the road individual transport, the infrastructure capacity and configuration, possible infrastructure works, the infrastructure use, the current level of traffic, in terms of temporal density and geographical pattern of scheduled services on given infrastructures, the operation efficiency, notably in terms of traffic control, and demand elasticity. Theoretically appropriate time schedules of the services have been defined by the operator(s) in accordance with the network configuration and capacity, the vehicles capacity and geographical and temporal patterns of the demand for transport. However for railway services interactions can be such that the delay of a single train can impact the progression of a more or less important number of trains during the highly trafficked periods.

A typical example for this is the case of the Belgian railway network wherein many train services (at least 75% of them) are radial services across the whole Belgium through the so called North-South Link in Brussels. During the daily morning and evening peak periods trains are following each other on this link in a kind of continuous flow, and any single service irregularity that results in loss of compliance vis-à-vis a service time schedule can trigger disturbances to the progression of many other trains of several of the services being concerned. As far as these services are operated under the form of daylong shuttles, these disturbances can be brought around the country for long periods.

2.7 URBAN SPRAWL

2.7.1 What is urban sprawl?

"Urban sprawl is commonly used to describe physically expanding urban areas. The European Environmental Agency (EEA) has described sprawl as the physical pattern of low-density expansion of large urban areas, under market conditions, mainly into the surrounding agricultural areas. Sprawl is the leading edge of urban growth and implies little planning control of land subdivision. Development is patchy, scattered and strung out, with a tendency for discontinuity. It leap-frogs over areas, leaving agricultural enclaves. Sprawling cities are the opposite of compact cities – full of empty spaces that indicate the inefficiencies in development and highlight the consequences of uncontrolled growth[61]."

Urban sprawl was initially a US phenomenon under the form of the rapid low-density outward expansion of US cities that started during the early part of the 20th century. It was driven by the rapid growth of car ownership and the preference for detached houses with gardens.

If European cities are still more compact than US cities, they are however less compact and more sprawled today than they were in the mid 1950s: urban sprawl is now a common phenomenon throughout Europe and there isn't any sign that the trend is slowing.

Sprawl matters because it brings about negative environmental, social and economic impacts and it seriously undermines efforts to meet the global challenge of climate change. It matters because of its major adverse impacts in terms of increased consumption of land, energy and soil threatening both the natural and rural environment, raising GHG emissions and elevating air and noise pollution levels which often exceed the agreed human safety limits. It has direct effects on the quality of life for the city residents.

2.7.2 Why are cities sprawling?

If historically the increasing population has driven the growth of cities, today, even where there is little or no population pressure, sprawl is still driven by the desire to realise new lifestyles in suburban or rural environments outside the inner cities.

Sprawl is driven by a mix of forces including both macro and micro socio-economic trends such as improved means of transportation, price of land, individual housing preferences, demographic trends, cultural traditions and constraints, the attractiveness of existing urban areas, and the application of land use planning policies at both local and regional scales.

Improved transportation links have made it possible to live increasingly farther away from city centres while keeping all the advantages of a city location, or even live in one city and work in another one.

Evidence suggests that sprawl will occur in a mechanistic way when unplanned decentralised development dominates, while if growth around the periphery of the city is coordinated by a strong urban development policy, more compact forms of urban extension can be secured.

2.7.3 The European Picture

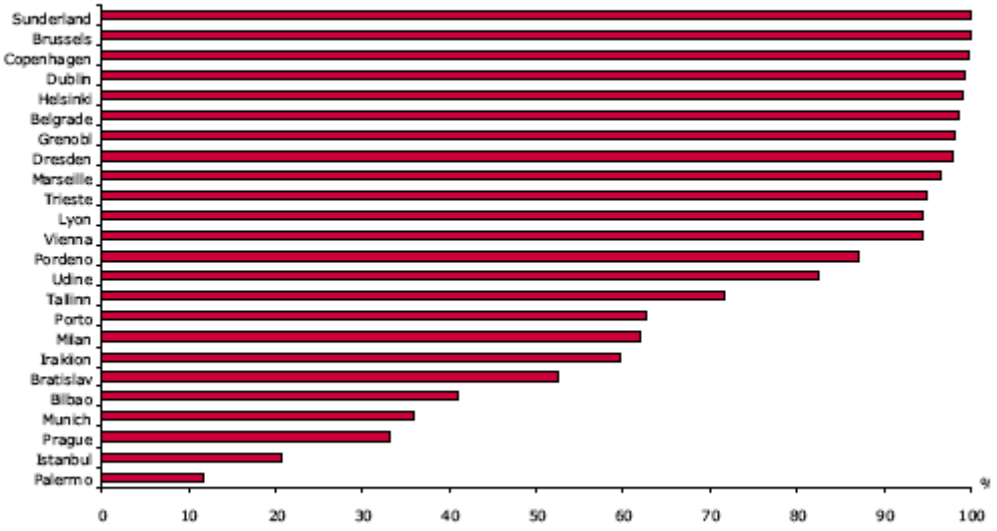
Urban sprawl has accompanied the growth of urban areas across Europe over the past 50 years. The most visible impacts of urban sprawl are visible in countries or regions with high population density and economic activity (Belgium, the Netherlands, Southern and Western Germany, Northern Italy, the Paris region) and/or rapid economic growth (Ireland, Portugal, Eastern Germany, the Madrid region).

Development are also to be observed around smaller towns in the countryside, along transportation corridors and along many parts of the coast usually connected to river valleys, such as along the Rhone valley down to the Mediterranean coast.

Urban sprawl is also common along already highly populated coastal strips, like in Spain where artificial areas can cover up to 50% of the total land area. Considering the known vulnerability of coastal ecosystems and because the Mediterranean region is one of the biodiversity hot spot in the world, this is highly worrying.

Since the mid-1950s historical trends show that European cities have expanded on average by 78%while population has grown by only 33%. In subsequent decades the main wave of urban growth has moved farther away from the city centres allowing urban sprawl to extend the urban footprint into the adjacent countryside. The dense enclosed quarters of the compact city have been substituted by free standing apartment blocks, semi-detached or detached houses. In half of the urban areas studied by the Moland project, more than 90% of all residential areas built after the mid-1950s were low density areas. Only in 5 of the 24 cities, all in southern or central parts of Europe were more than 50%¨of new housing areas densely built up.

Figure 2 Low density residential areas as a proportion of all residential areas built after the mid-1950s, selected European cities



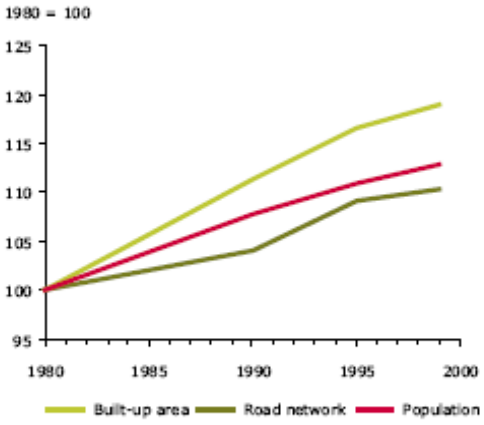
Source: MOLAND (JRC) and Kasanko *et al.*, 2006.

Figure 2 from "Urban sprawl in Europe" The ignored challenge, EEA, page 12.

Trends towards low density environment are also evident in the space consumed per person in the European cities during the past 50 years which has more than doubled. Over the last 20 years the extent of built up areas in many western and eastern European countries has

increased by 20% while population has grown by 6% only. Palermo with 50% growth of population generated more than 200% growth of its built up areas.

Figure 3 Built-up area, road network and population increases, selected EEA countries



Note: Countries covered are: Belgium, Czech Republic, Denmark, France, Germany, Latvia, Lithuania, the Netherlands, Poland, Slovakia and Spain.

Source: EEA, 2002.

Figure 3 from "Urban sprawl in Europe" The ignored challenge, page 13.

Residential densities tend to fall towards the north and west of Europe and the five urban cities with densities of at least 10,000 inhabitants /km2 are all located in southern or south-eastern Europe. There is however no tendency for urban sprawl to vary with the city densities: sprawl is equally evident in the vast majority of cities examined.

Southern European cities have a long urban tradition in which the urbanisation process has been slower, with fewer periods of rapid growth, and the cities have been very compact. Urban sprawl has however started to develop at unprecedented rates in recent decades and unless planning and zoning restrictions are more rigorously applied. In this context the case of Bilbao must be highlighted as it lies in a class of its own in respect of density and compactness: much of it can be attributed to its location bordered on two sides by mountains but credit must also be given to the active planning regime and its well developed transport system.

Cluster of compact cities are also evident in the former socialist countries of Central and Eastern Europe. Compact urban forms and high densities mainly reflected the strong centralised planning regimes and substantial reliance on public transport that prevailed during the communist era. Today those cities are facing the same threats of rapid urban sprawl: the land market is liberated, housing preference evolves, improving economic prospect induces new pressures for low density urban expansion and les restrictive planning controls prevail.

In smaller cities, in general, densities are lower as the population pressure is lower and in many cases the planning regulations are more permissive allowing more low density buildings than in large cities

In general also cities in northern and western Europe have been more strongly influenced by traditions in which the planning ideal has supported less compact, garden suburbs, which has resulted in much lower densities and more suburban development, particularly as individual housing preferences have also favoured semi detached and detached houses.

To sum up this section, it is demonstrated that throughout Europe urban areas have expanded considerably more rapidly than the growth of population during the post-war decades and there is no apparent slowing down in this trend. Urban areas in southern, central and eastern parts of Europe whose urban structure has historically been very compact are now at risk as they have started to grow rapidly outwards during the last few decades.

2.7.4 The impacts of urban sprawl

2.7.4.1 Environmental impacts

Urban sprawl engenders the following impacts:

- Rapid consumption of scarce land resources: expansion of urban areas in many European countries has increased by over three times the population growth;
- Dramatic transformation of the soil properties: compaction of soil, loss of water permeability, loss of soil biodiversity, pollution of rain water falling on sealed soils (tire abrasion, dust and concentration of heavy metals), modification of surface and groundwater interaction inducing desertification process in southern part of Europe;
- Greater consumption of water and over-exploitation of groundwater resources;
- Growing consumption of energy;
- Degradation of adjacent natural and protected areas, fragmentation by transport corridors, etc, which clearly undermines nature conservation efforts such as Natura 2000; many sensitive ecosystems are threatened by urban sprawl linked to the extension of tourism activities, notably along the Mediterranean coast and in mountain ranges.

As far as transport is concerned, urban sprawl engenders a significant increase of travel related energy consumption in cities where density is falling: transport related energy consumption in cities depends on a variety of factors i.e. the nature and type of road and rail networks, the extent of the development of mass transportation systems and the modal split between public and private transport. Hereafter figures show the sprawling city being dominated by relatively inefficient car use as it is frequently the only practical alternative to more energy efficient, but typically inadequate and increasingly expensive public transportation systems.

Population and employment density, energy consumption and cost of transport

Density (population + jobs per hectare)	Annual energy consumption for travel (mega joules per inhabitant)	Cost of transport (% of GDP)
< 25	55,000	12.4
25 to 50	20,200	11.1
50 to 100	13,700	8.6
> 100	12,200	5.7

From "Urban sprawl in Europe" The ignored challenge, EEA, page 30: adopted from Newman, P. and Kenworthy, J., 1999.

Increased transport related energy consumption in turn engenders an increase of CO2 emissions in the atmosphere that will have major implications in terms of global warming and climate change, with increasingly severe weather events in the coming years and increased incidences of river and coastal flooding. The more general permanent flooding of the coastal regions of Europe due to rising sea level and climate change is particularly worrying: many European countries are vulnerable to coastal flooding: Belgium, the Netherlands, Germany, Romania, Poland, Denmark, France, the United Kingdom, Estonia. These are not specific issues generated by urban sprawl, but if it is not controlled the management of those risks will be made more complicated.

2.7.4.2 Socio-economic impacts

Urban sprawl generates greater segregation of residential development according to income. In some cities it has become so apparent that the concept of “divided” or “dual” city has been used to describe the division between the inner city core and the suburban outskirts. In the inner city poor quality neighbourhoods often house a mix of unemployed people, the elderly poor, single young people and minority ethnic groups, often suffering from the impacts of the selective nature of migration and employment loss.

From the economic point of view urban sprawl is at the very least a more costly form of urban development due to:

- Increased household expenses on commuting to work over longer and longer distances;
- The cost to business of the congestion in sprawled urban areas with inefficient transportation systems;
- The additional costs of the extension of urban infrastructures including utilities and related services across the urban region.

The development of public transport and solutions based on mass transportation systems and the provision of alternative choices of transportation that are essential to ensure the efficient working of urban environment are inhibited by urban sprawl because in sprawled areas appropriate and attractive quality of service cannot be provided at reasonable costs. On the other hand experiences from both Stockholm and Munich have confirmed these conclusions: efficient control of urban sprawl has resulted in increased population densities that in turn fostered the use of public transport and reduced the growth of car use.

Economic inefficiency is also a result of market oriented planning regimes that frequently generate urban sprawl, as it often result in the abandonment of former industrial areas. There are now many derelict or underused former industrial zones throughout Europe. In Spain, 50% of sites contaminated from past industrial activities are located in urban areas (1999), and in Austria abandoned industrial sites are estimated to cover about 2% of all urban areas (2004).

Generally, the efficiency savings of more compact city development as compared with market driven suburbanisation can be as high as 7 to 54% in land resources, 5 to 20% in the construction of local roads and 5 to 8% savings in the provision of water and sewage facilities (Burchell *et all*, 2000)

The failure to control urban sprawl at local level despite the policies and tools that are available makes it necessary to develop new initiatives to address these policy failures. Reasons for this are that without any such initiative the impacts of urban sprawl might seriously undermine the achievement of EU commitments to the Kyoto protocol on GHG

emissions, and that some problems of urban sprawl arise from European intervention in other policy domains.

2.8 MODAL SPLIT

2.8.1 Introduction

For decades attempts have been made to curb the continuous growth of road traffic in urban areas and the related negative impacts. Quite often, in the Member States, it has been under the form of investments in the public transport sector, but not all these investments have actually brought the expected improvements in terms of modal shift from the private car use to the public transport services. Consequently there is a need to assess the present situation and trends, notably to identify possible good practices.

2.8.2 Data for a sample of European cities (Urban audit)

To derive relevant conclusions, the necessary information regarding modal split should be homogenous so that data describing situations in different urban areas at different time periods could be compared.

The Urban Audit was a response to a growing demand for an assessment of the quality of life in European towns / cities, where a significant proportion of European Union citizens live. The Urban Audit is a joint effort by the Directorate-General for Regional Policy (DG REGIO) and Eurostat to provide reliable and comparative information on selected urban areas in Member States of the European Union.

The Urban Audit aims to provide information at three spatial levels:

- the Core City (administrative definition), as the basic level (Label “A”),
- the Larger Urban Zone (Label “LUZ”), which is an approximation of the functional urban zone centred around the town/ city, and
- the Sub-City District (Label “SCD”), which is a subdivision of the city according to strict criteria (5 000 – 40 000 inhabitants in each sub-town / city district).

The selection of participating towns / cities and the definition of the composition of the LUZ and the SCD in terms of spatial units need to respect certain criteria set by DG REGIO and statistical quality in general:

- the participating towns / cities in each country should represent about 20 % of the population in that country
- the participating towns / cities should reflect a good geographic distribution within the country (peripheral, central)
- coverage should reflect more medium-sized towns / cities than was the case in the UAPP (medium-sized towns / cities having a population of between 50 000 – 250 000 inhabitants, large towns / cities with >250 000)
- there should be comparability of data to enable comparative analysis between towns / cities
- data should be available.

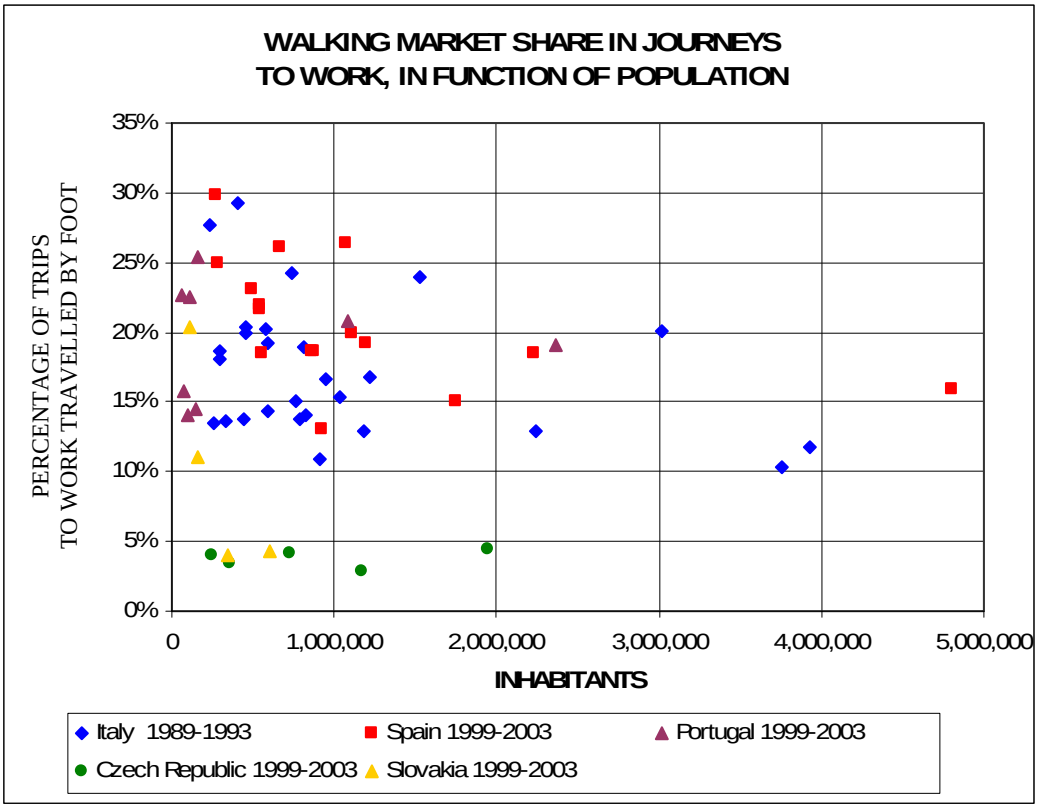
This “sampling” procedure for the Urban Audit project was closely and specifically designed by Eurostat, DG REGIO, the National statistical offices and the towns / cities in the countries. The final selection of participating towns / cities in the Urban Audit has been a compromise between all aspects.

The concept and the definition of the town / city are important and, in future, should also be worked out in close co-operation with the individual towns / cities. In striving for comparable urban indicators, there is a need for two geographical units: the administrative town / city and the functional urban region of the town / city (FUR).

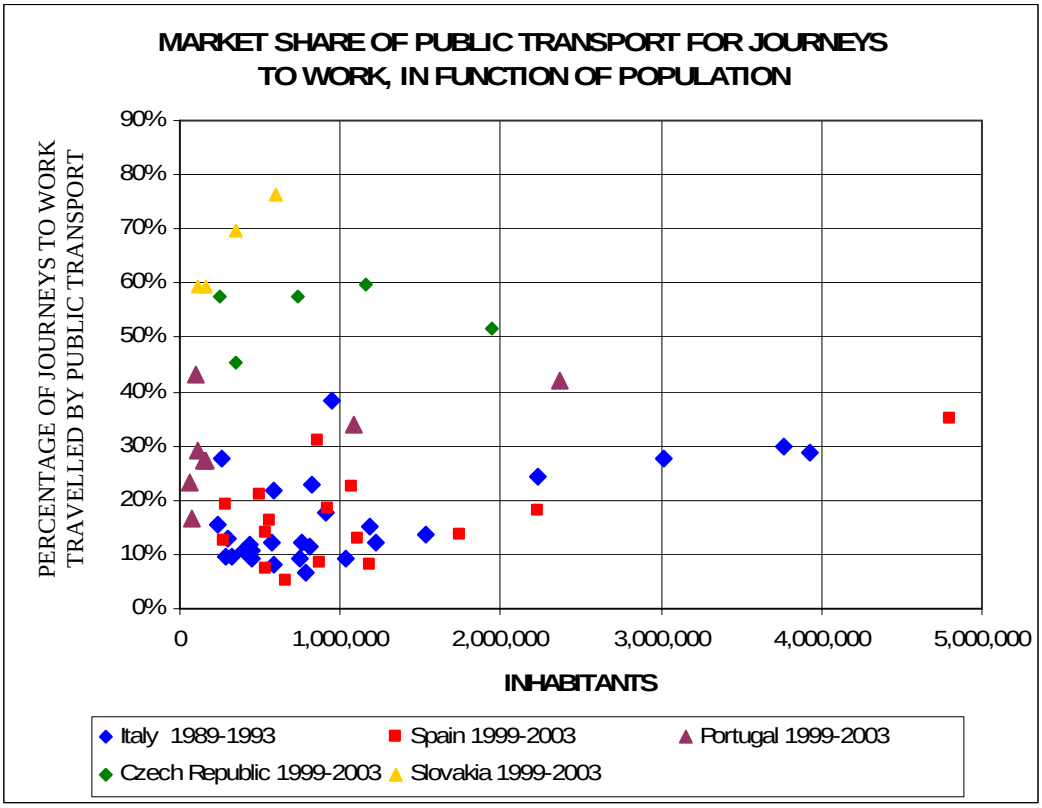
The data base which Eurostat developed in the framework of the Urban Audit contains data concerning the mode of transport used for the journeys to work, for a sample of European cities.

The data that have been exploited are referring to the large urban zones (LUZ) so as to consider functionally coherent urban entities.

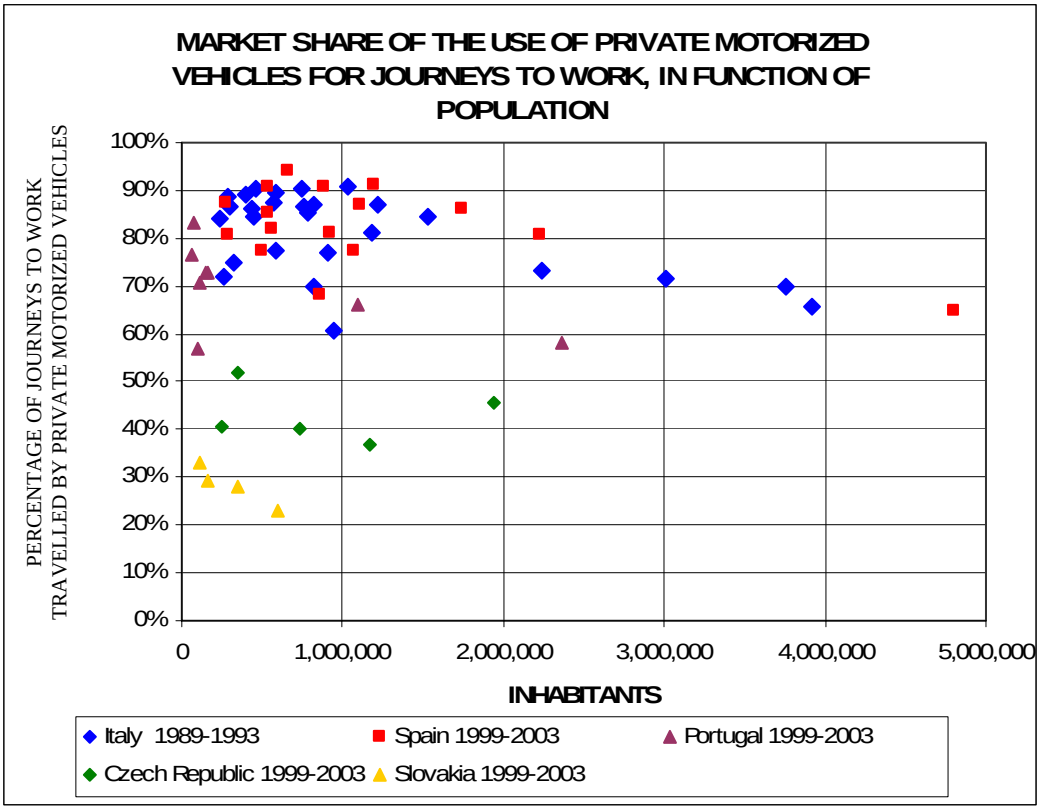
The next figure shows the walking market share in function of total population for several groups of cities of which cities from some new Member States. Their walking market share is well below the ones observed in Italy, Spain and Portugal. Besides that no clear trend emerges from this figure.



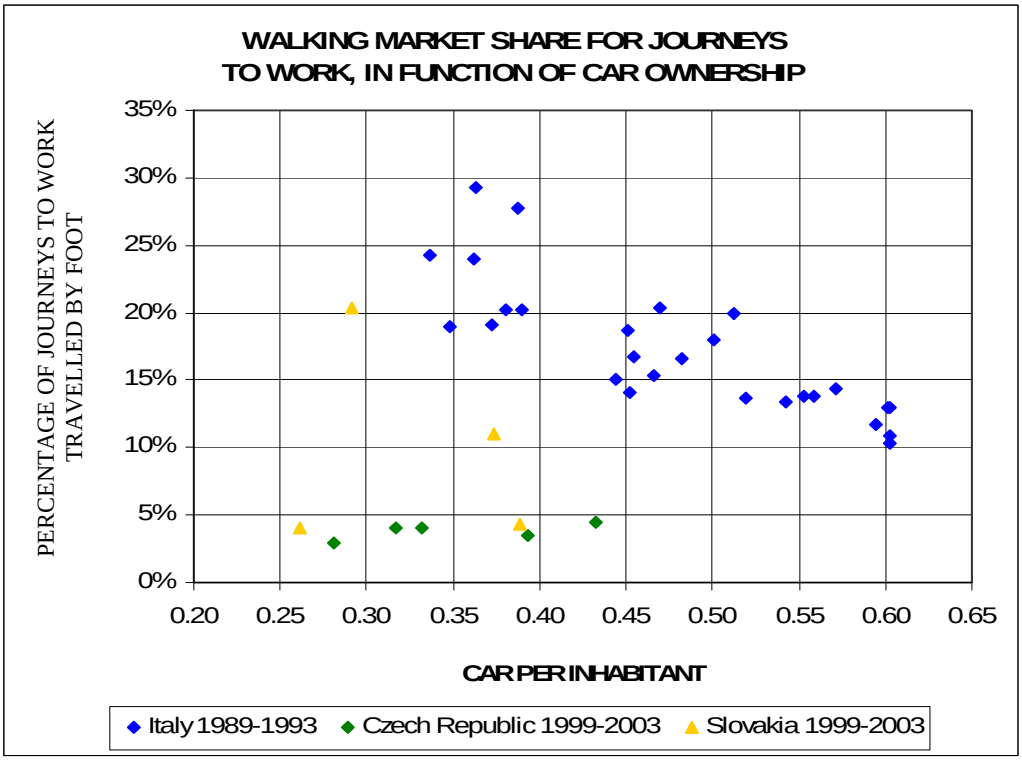
The next figure shows the variations of the public transport market share in function of the total population. A slightly increasing trend can be detected for the dots representing situations from Italy, Spain and Portugal. Market shares observed in new Member States are clearly above those observed in the above countries and do not show any specific trend.



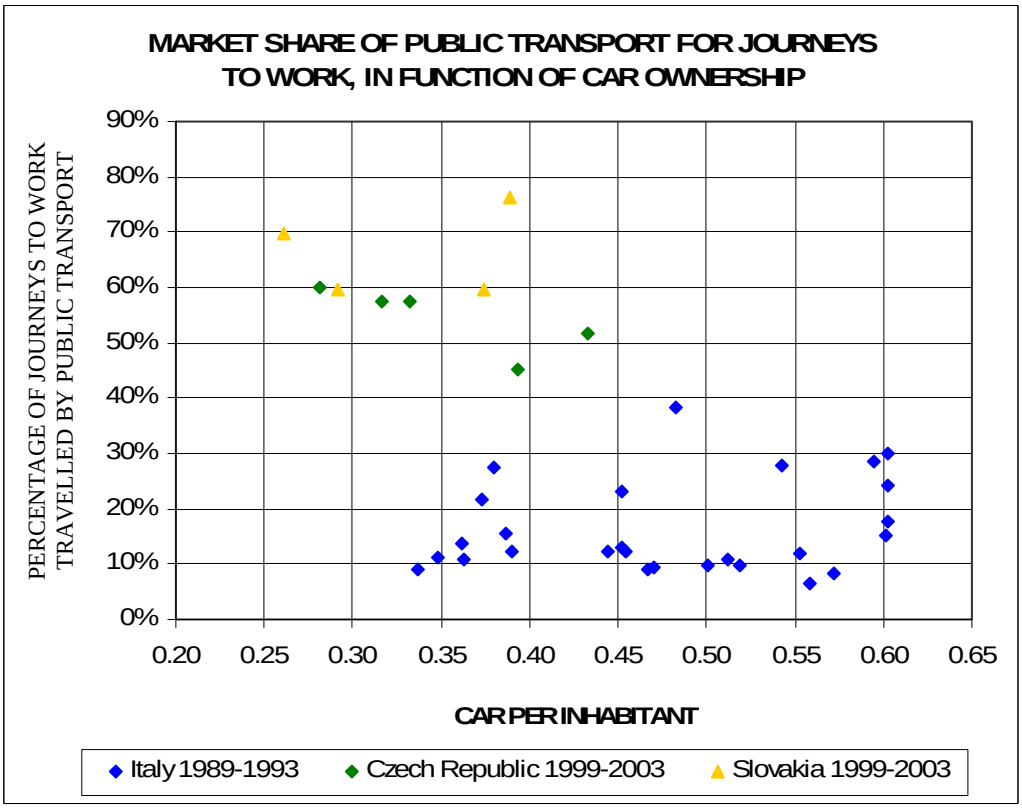
The graph of the next figure shows the variation of the market share of the use of private motorized vehicles in function of total population. It is strictly symmetric to the previous graph: slight decrease for the cities in Italy, Spain and Portugal, and new Member States showing much lower market shares.



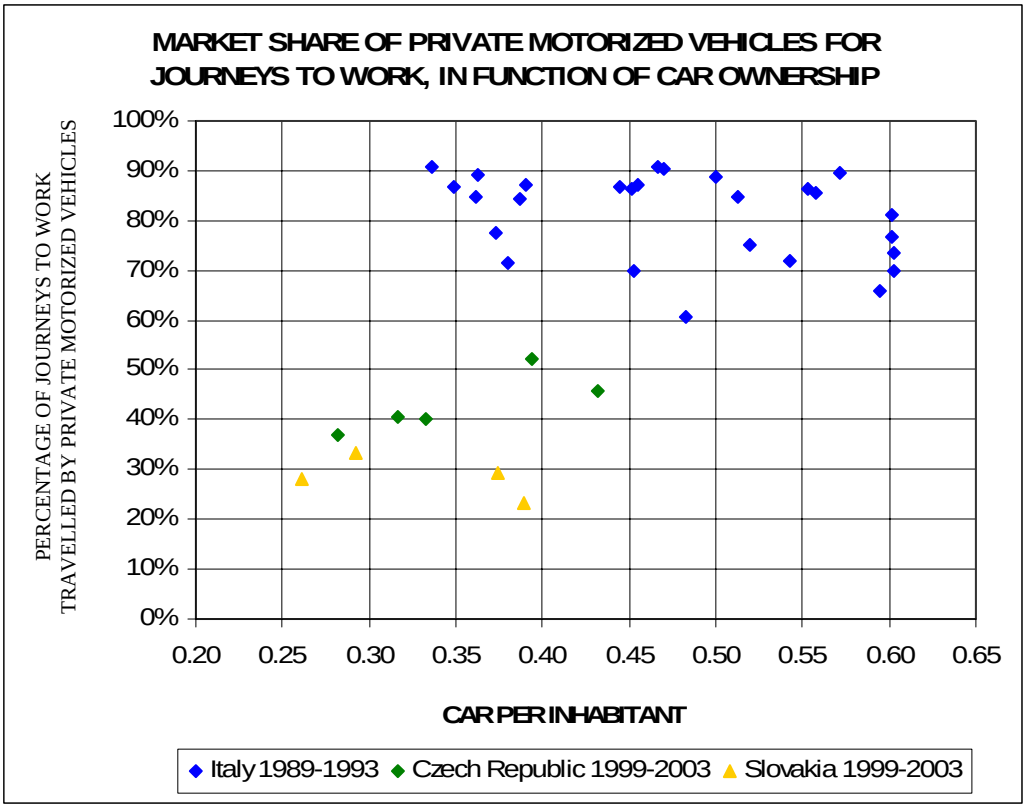
The next figure shows variation of the walking market share in function of car ownership. For the Italian cities there is clearly a decreasing trend. For the new Member States walking market shares are well below those observed in Italy.



The next figure is about public transport market share in function of car ownership. There isn't any specific trend emerging neither from market shares observed in Italy nor from those observed in new Member States. These are again well above those recorded in Italy.



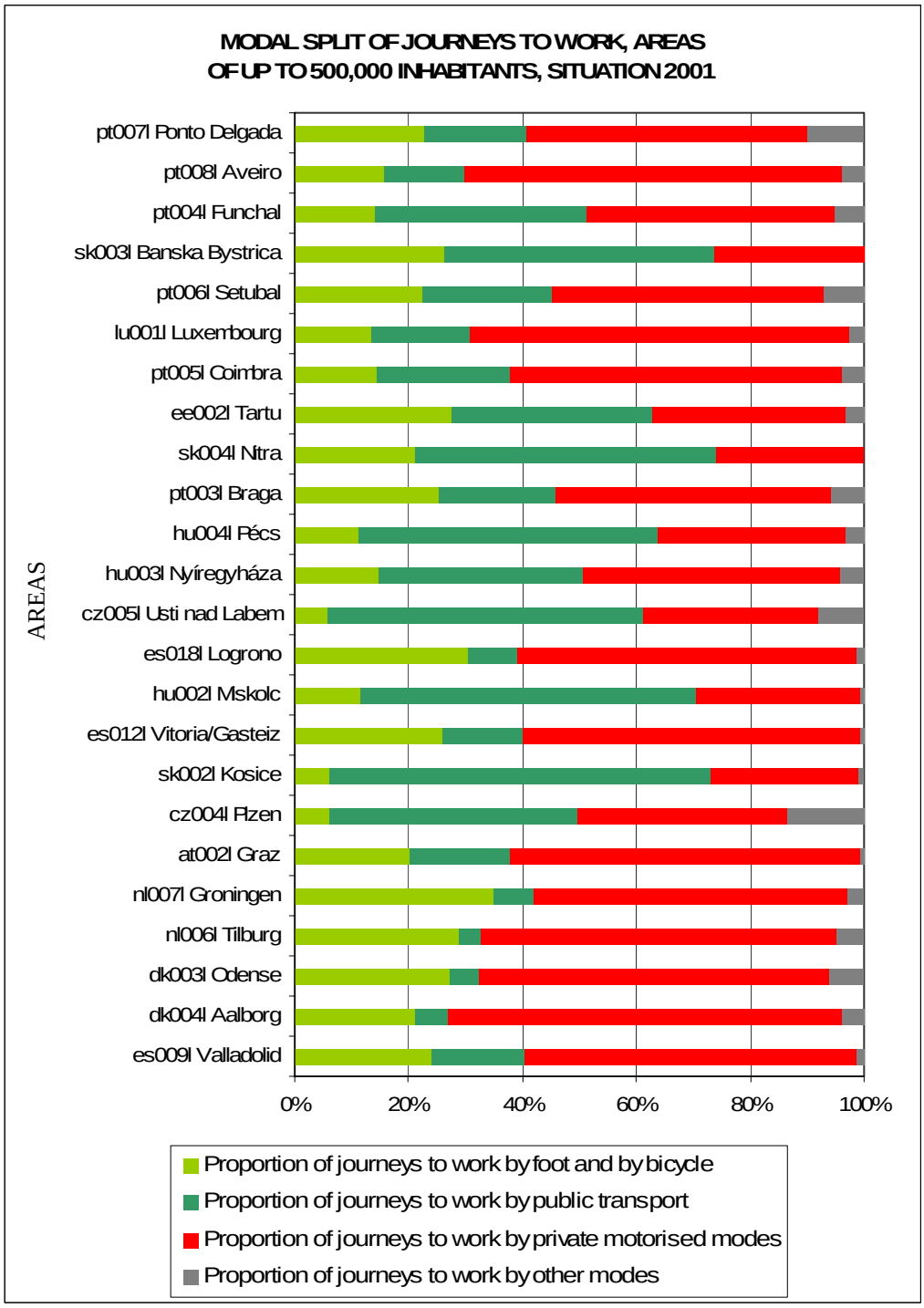
The next figure shows the variation of the market share of the use of private motorized vehicles in function of car ownership. It strictly reflects the previous figure.

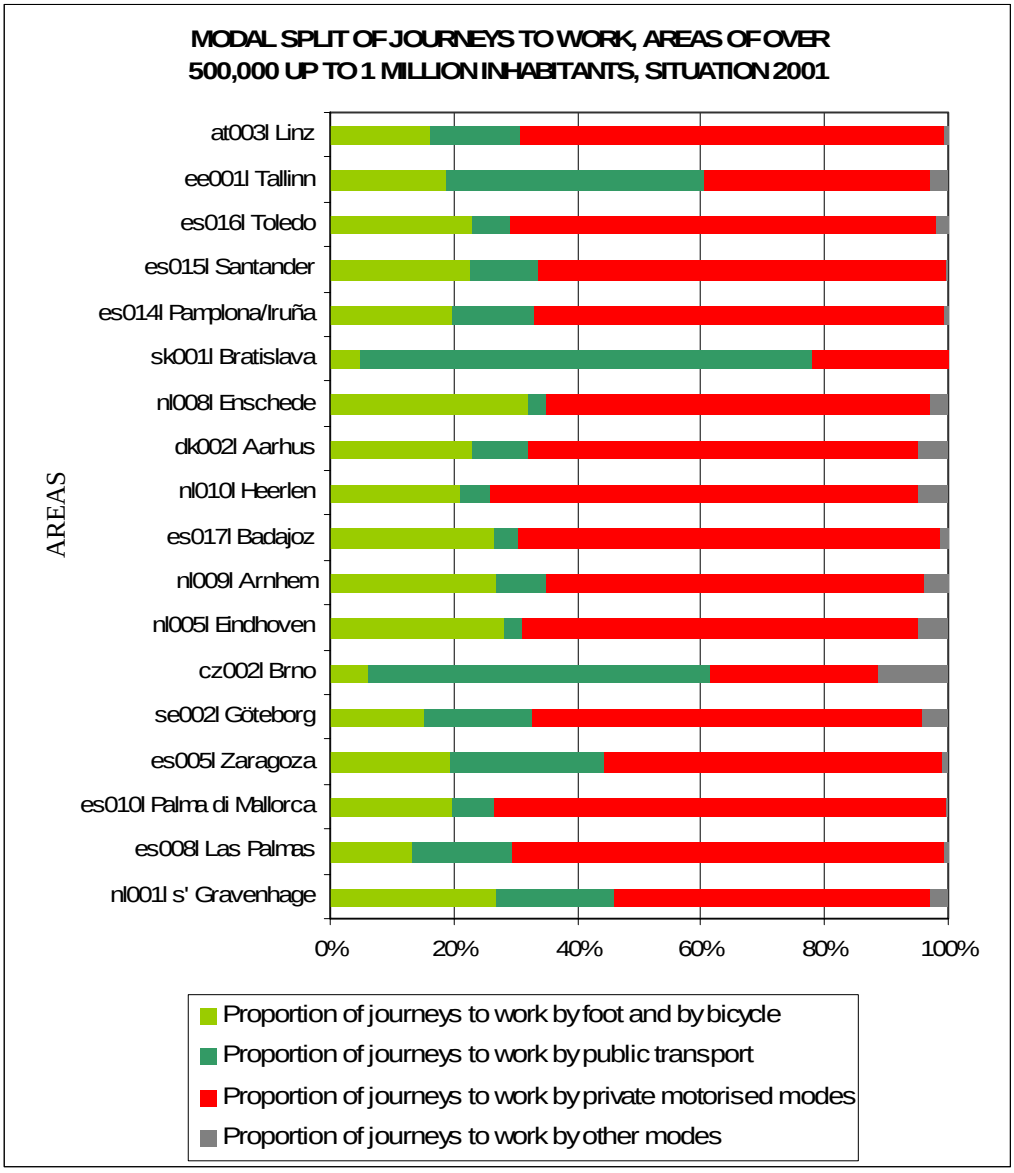


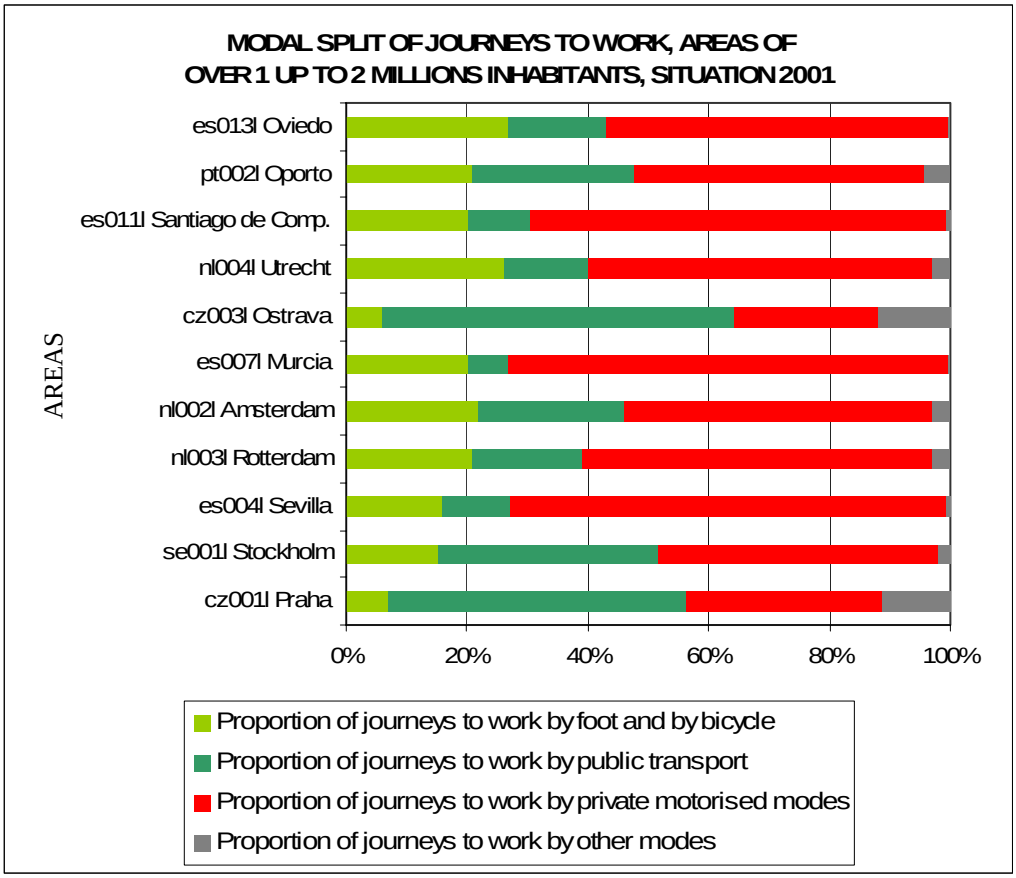
Data from the Urban Audit have also been represented hereafter under the form of histograms of the modal split for journeys to work and for four groups of cities: with population of up to 500,000 inhabitants, with population over 500,000 and up to 1 million inhabitants, with population over 1 million and up to 2 millions inhabitants and with population over 2 millions inhabitants.

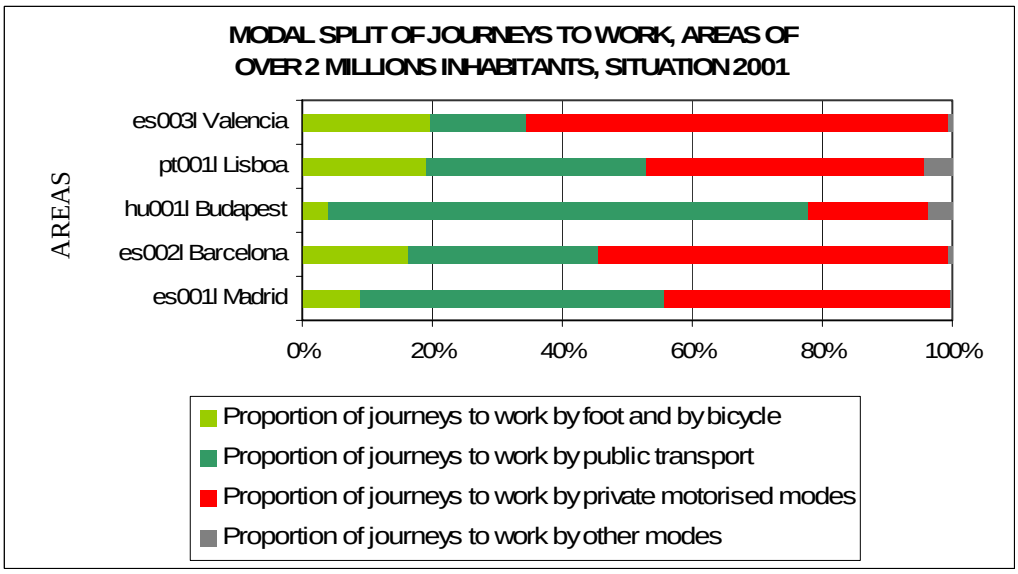
The main conclusions from this data analysis are as follows:

- For the small-medium size cities (first group), there is a wide variability of the market shares of the various modes; this variability is less important in the other groups of cities;
- Public transport market share is very low for the first group of cities and increases to some extent with the city size, merely for the last group of cities (over 2 millions inhabitants);
- In the new Member States cities, the public transport market share is significantly higher than in the other Member States of the EU, while walking and bicycling are less frequent. It must however be expected that rapid car ownership growth in the new Member States would bring about a diminution of the public transport market share.


MODAL SPLIT OF JOURNEYS TO WORK, AREAS OF UP TO 500,000 INHABITANTS, SITUATION 2001
AREAS
pt007l Ponto Delgada
pt008l Aveiro
pt004l Funchal
sk003l Banska Bystrica
pt006l Setubal
lu001l Luxembourg
pt005l Coimbra
ee002l Tartu
sk004l Nitra
pt003l Braga
hu004l Pécs
hu003l Nyíregyháza
cz005l Usti nad Labem
es018l Logrono
hu002l Mskolc
es012l Vitoria/Gasteiz
sk002l Kosice
cz004l Plzen
at002l Graz
nl007l Groningen
nl006l Tilburg
dk003l Odense
dk004l Aalborg
es009l Valladolid
0%
20%
40%
60%
80%
100%
Proportion of journeys to work by foot and by bicycle
Proportion of journeys to work by public transport
Proportion of journeys to work by private motorised modes
Proportion of journeys to work by other modes


MODAL SPLIT OF JOURNEYS TO WORK, AREAS OF OVER 500,000 UP TO 1 MILLION INHABITANTS, SITUATION 2001
AREAS
at003l Linz
ee001l Tallinn
es016l Toledo
es015l Santander
es014l Pamplona/Iruña
sk001l Bratislava
nl008l Enschede
dk002l Aarhus
nl010l Heerlen
es017l Badajoz
nl009l Arnhem
nl005l Eindhoven
cz002l Brno
se002l Göteborg
es005l Zaragoza
es010l Palma di Mallorca
es008l Las Palmas
nl001l s' Gravenhage
0%
20%
40%
60%
80%
100%
Proportion of journeys to work by foot and by bicycle
Proportion of journeys to work by public transport
Proportion of journeys to work by private motorised modes
Proportion of journeys to work by other modes

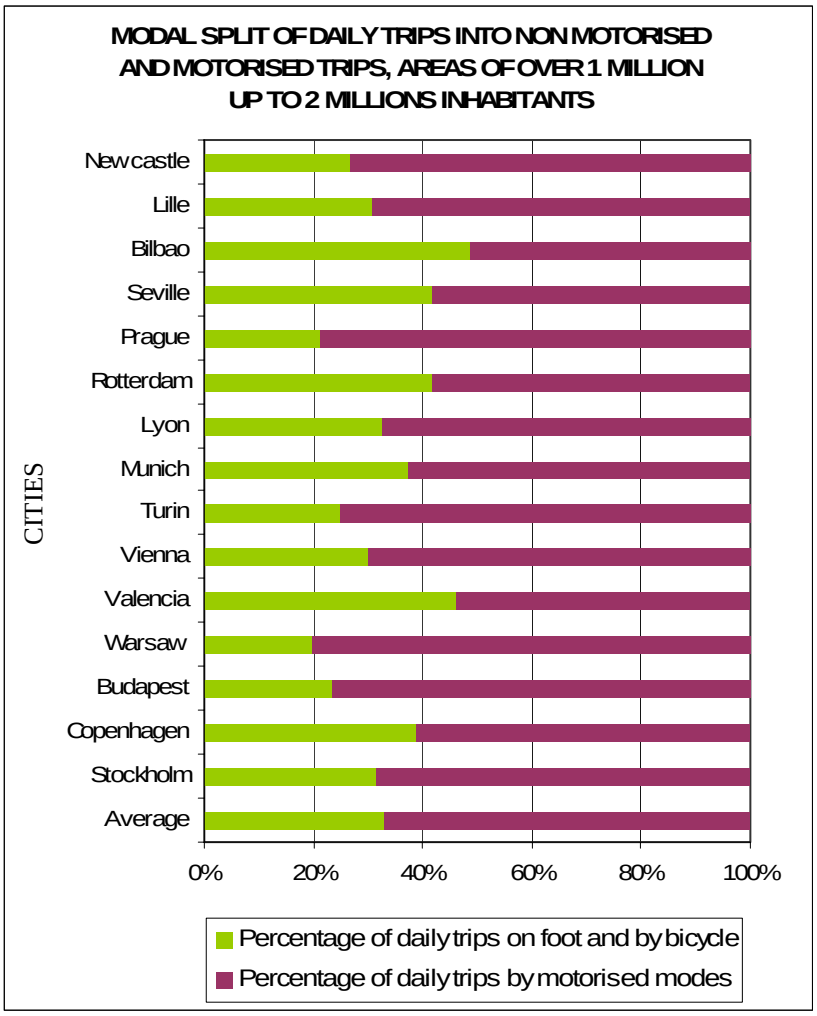

MODAL SPLIT OF JOURNEYS TO WORK, AREAS OF OVER 1 UP TO 2 MILLIONS INHABITANTS, SITUATION 2001
AREAS
es013l Oviedo
pt002l Oporto
es011l Santiago de Comp.
nl004l Utrecht
cz003l Ostrava
es007l Murcia
nl002l Amsterdam
nl003l Rotterdam
es004l Sevilla
se001l Stockholm
cz001l Praha
0%
20%
40%
60%
80%
100%
Proportion of journeys to work by foot and by bicycle
Proportion of journeys to work by public transport
Proportion of journeys to work by private motorised modes
Proportion of journeys to work by other modes


MODAL SPLIT OF JOURNEYS TO WORK, AREAS OF OVER 2 MILLIONS INHABITANTS, SITUATION 2001
AREAS
es003l Valencia
pt001l Lisboa
hu001l Budapest
es002l Barcelona
es001l Madrid
0%
20%
40%
60%
80%
100%
Proportion of journeys to work by foot and by bicycle
Proportion of journeys to work by public transport
Proportion of journeys to work by private motorised modes
Proportion of journeys to work by other modes

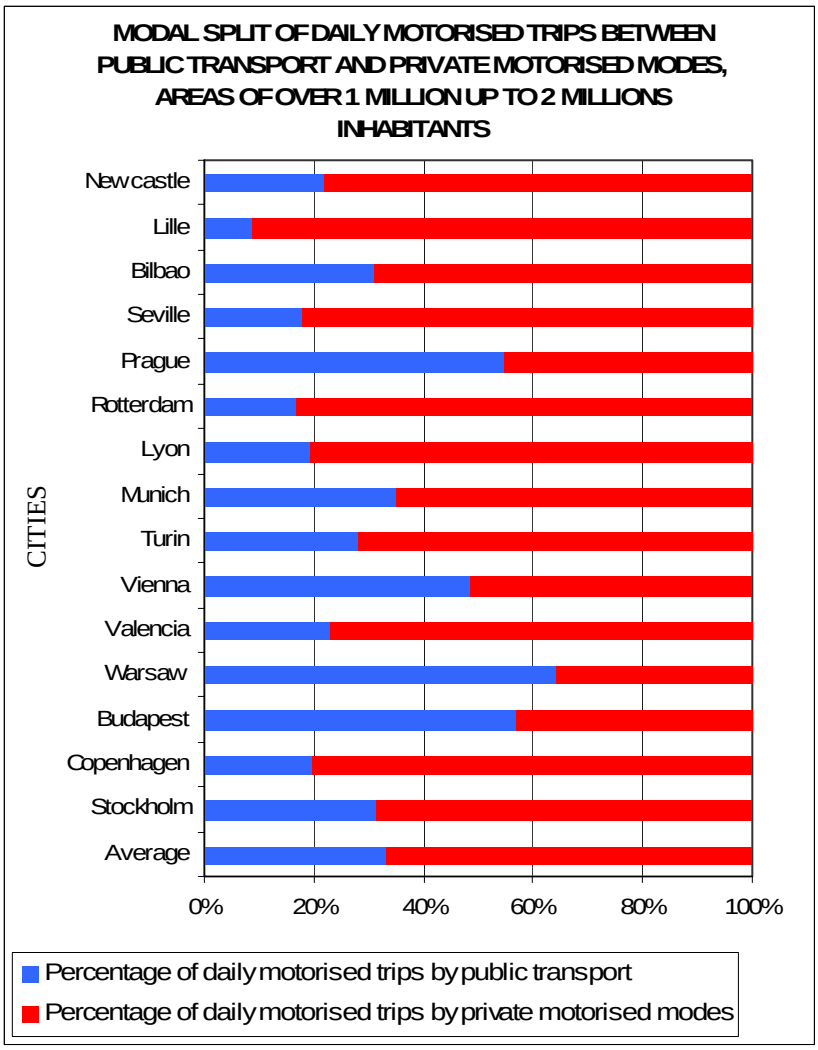
2.8.3 Data for a sample of European cities (UITP)

The UITP "Mobility in Cities" database[62] also provides with modal split data, concerning all purposes trips. An example is provided hereafter for urban areas with a population of over 1 million up to 2 millions inhabitants.

The first diagram shows that walking and cycling remain important in most cities, with an average proportion of 33% of the journeys and highest values sometimes exceeding 40%, while this proportion is however smaller in the new Member States urban areas

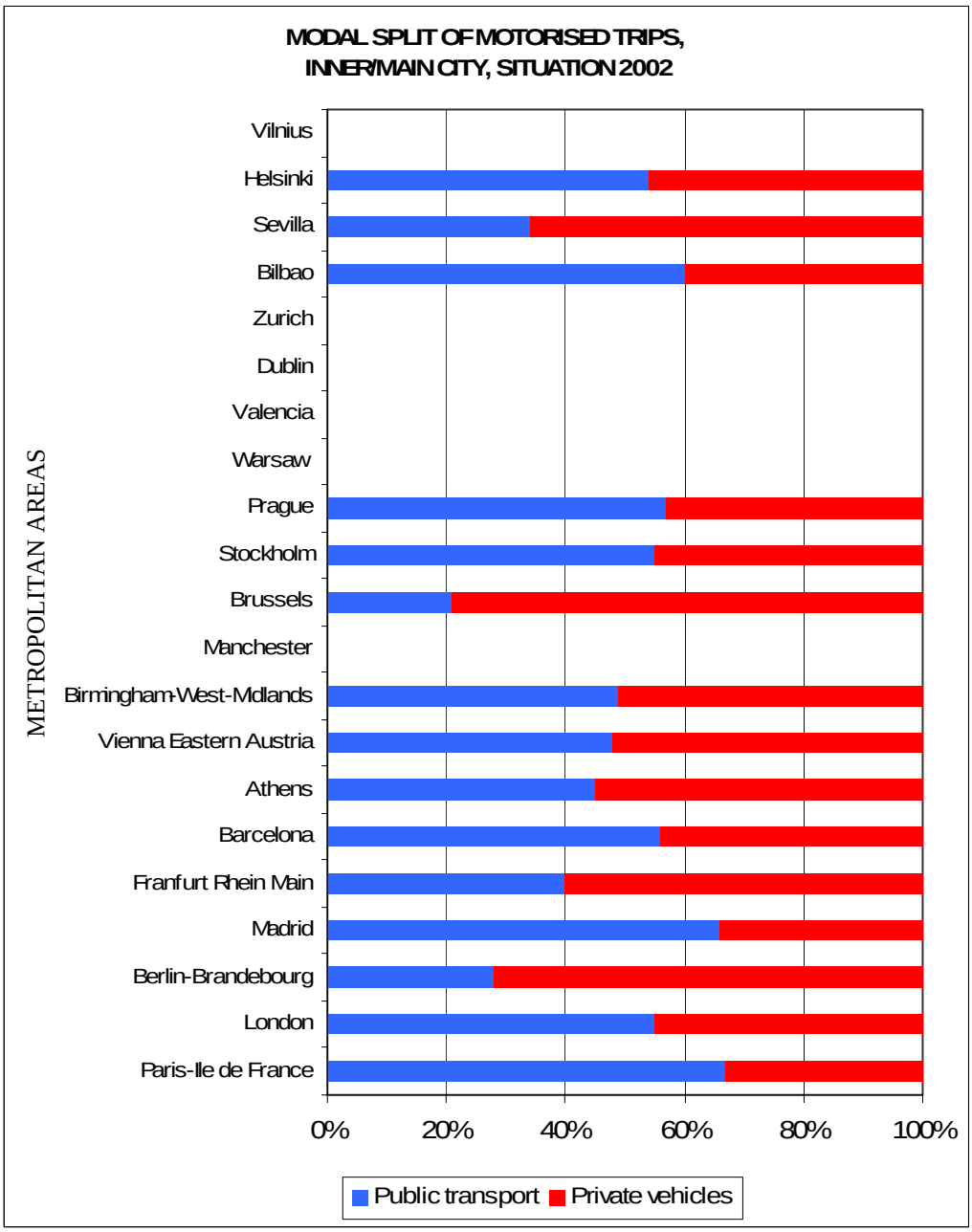


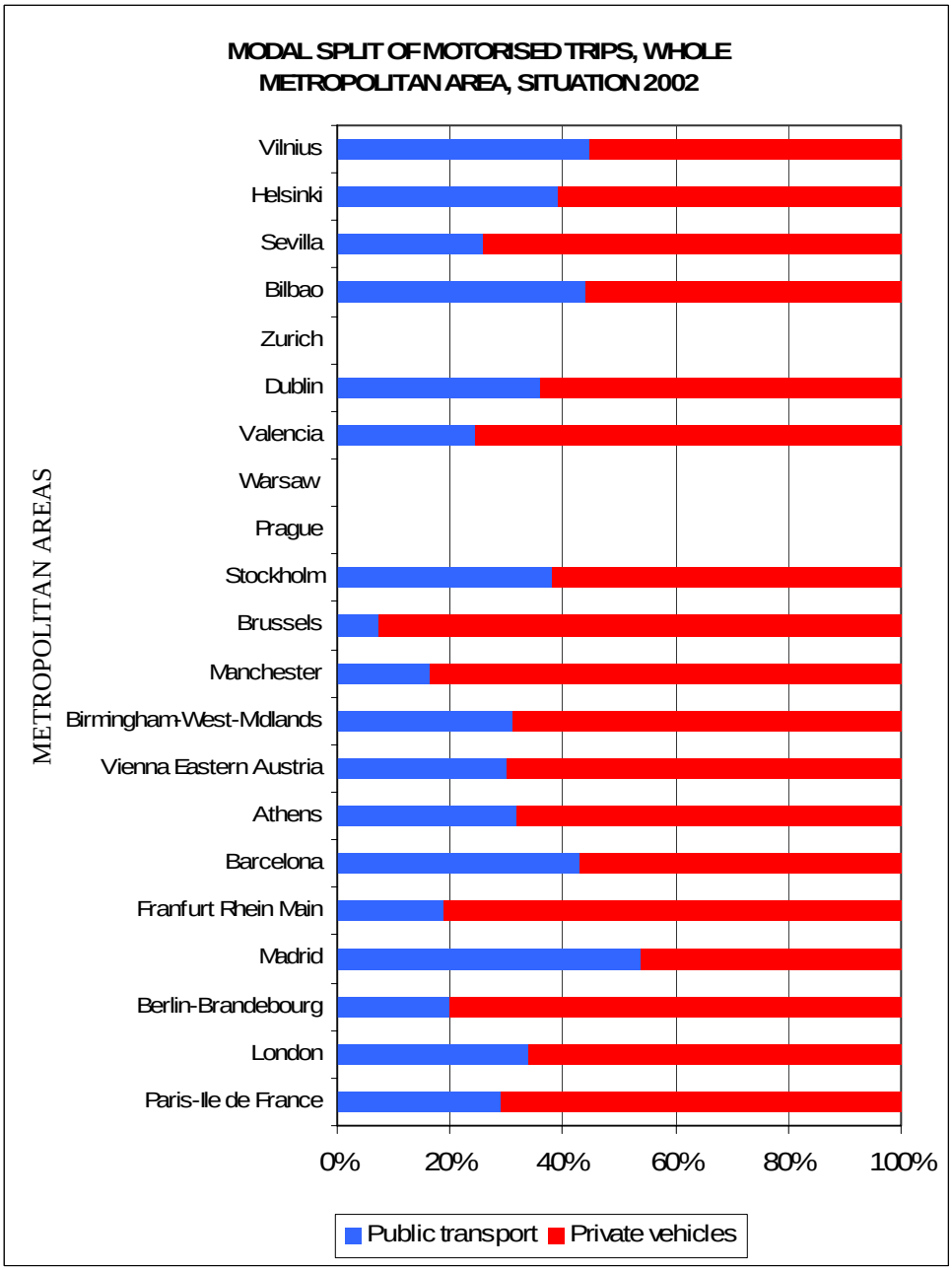
The diagram of the modal split of the motorised trips between public transport and private motorised modes shows similar situations as those identified with the Urban Audit data: if the average market share of this group of urban areas reaches 33%, actual values are significantly higher in the new Member States than in other EU Member States.



2.8.4 Data for a sample of European cities (EMTA Barometer)

It is also interesting to analyse the EMTA Barometer data regarding modal split, as these are presented separately for the inner/main city of the metropolitan areas being reviewed and for the whole metropolitan areas: the following diagrams show that public transport market share is significantly higher in the inner/main cities than in the other parts of the metropolitan areas.


MODAL SPLIT OF MOTORISED TRIPS,
INNER/MAIN CITY, SITUATION 2002
METROPOLITAN AREAS
Vilnius
Helsinki
Sevilla
Bilbao
Zurich
Dublin
Valencia
Warsaw
Prague
Stockholm
Brussels
Manchester
Birmingham-West-Mdlands
Vienna Eastern Austria
Athens
Barcelona
Franfurt Rhein Main
Madrid
Berlin-Brandebourg
London
Paris-Ile de France
0%
20%
40%
60%
80%
100%
Public transport
Private vehicles


MODAL SPLIT OF MOTORISED TRIPS, WHOLE METROPOLITAN AREA, SITUATION 2002
METROPOLITAN AREAS
Vilnius
Helsinki
Sevilla
Bilbao
Zurich
Dublin
Valencia
Warsaw
Prague
Stockholm
Brussels
Manchester
Birmingham-West-Mdlands
Vienna Eastern Austria
Athens
Barcelona
Franfurt Rhein Main
Madrid
Berlin-Brandebourg
London
Paris-Ile de France
0%
20%
40%
60%
80%
100%
Public transport
Private vehicles

2.8.5 Data for a sample of European cities (National policy frameworks for urban transport)

The "National policy frameworks for urban transport" study[63] provides the following analysis and data.

The indicator looks at the number of passenger-km within or partly within urban areas, per capita, by mode of transport.

The only country for which urban data was disaggregated was for the UK. Modal split per size of urban area is shown in the figure below. The increased public transport mode share (at the top of the columns) can be seen for the larger urban areas, in particular Greater London.

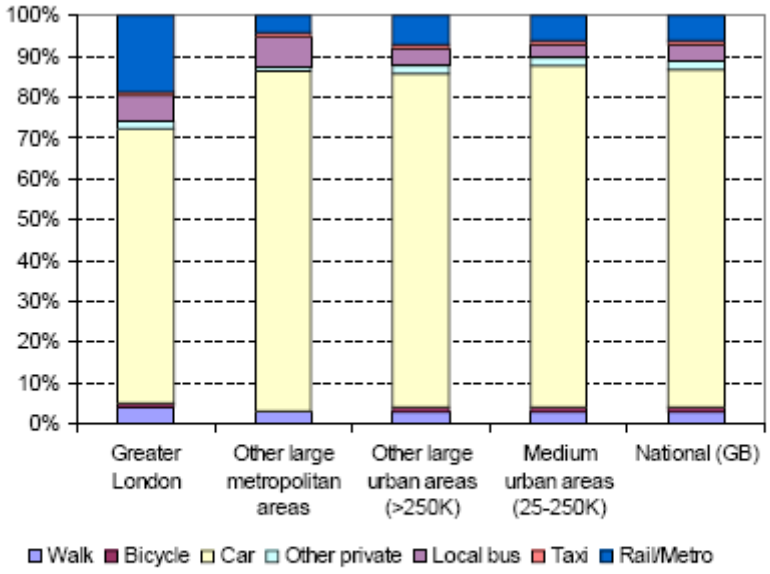


Figure 27: Modal split (percentage of distance travelled) in Great Britain, 1999/2001, by size of urban area[60]

2.8.6 Data for a sample of European cities (Urban Transport Benchmarking Initiative)

The "Urban Transport Benchmarking Initiative"[64] study provides the following analysis and data.

"The following figures[65] show the modal split in each city/region which is usually measured through travel survey data and public transport ticket sale data."

The first two figures illustrate the percentage of trips made using motorised transport, discounting the figures for cycling and walking (which have not been provided by all cities) and which are often based upon estimates. The full modal split is displayed in the next two figures.

Figure 4.5a: Modal Share of motorised trips in the urban administrative area on a weekday
(continued in Figure 4.5b)

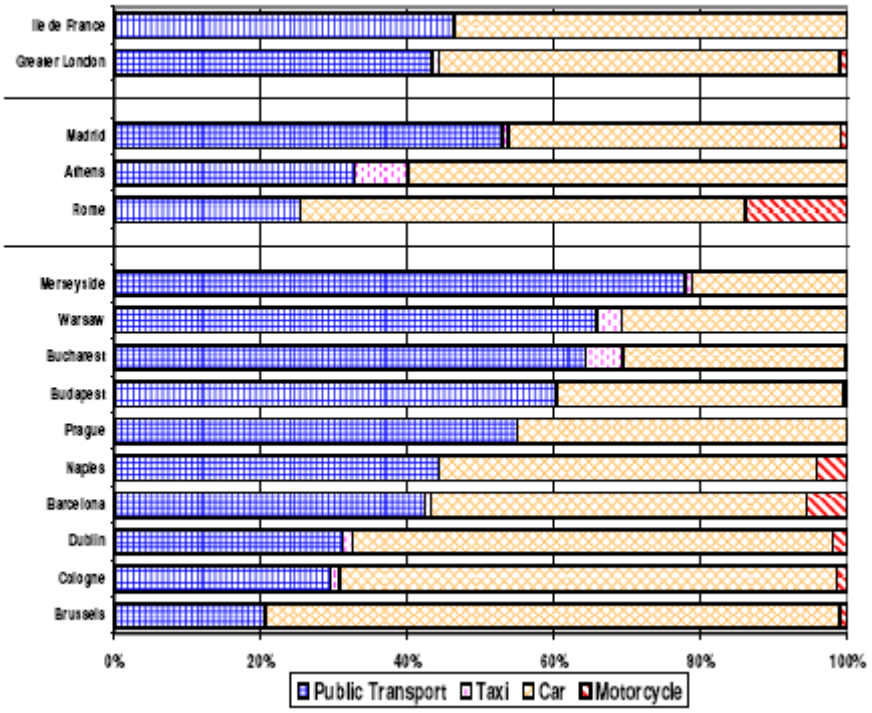


Figure 4.5b: Modal Share of motorised trips in the urban administrative area on a weekday
(continued)

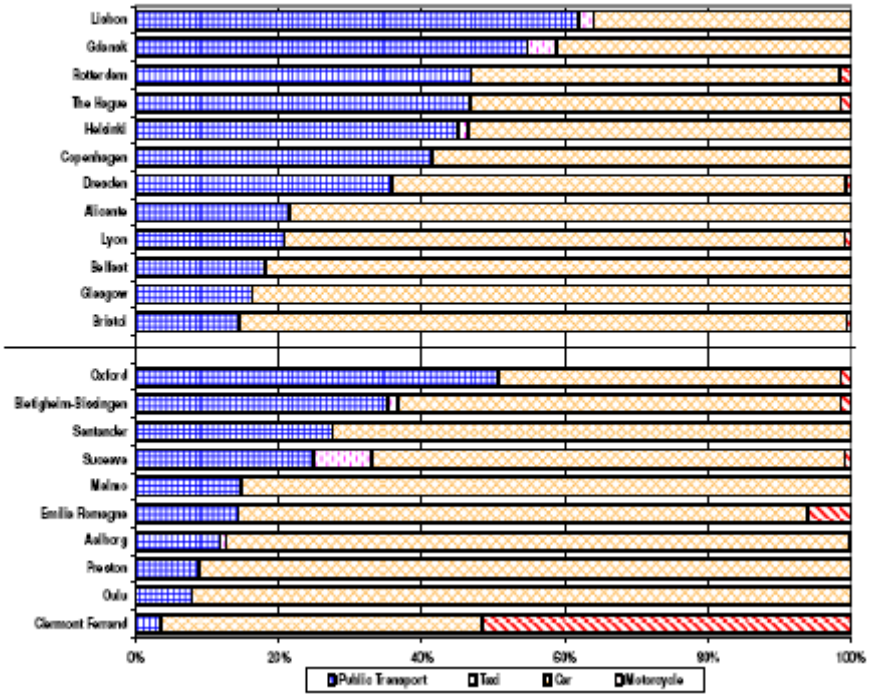


Figure 4.6a: Modal Share of trips by all modes in the urban administrative area (continued in Figure 4.6b)

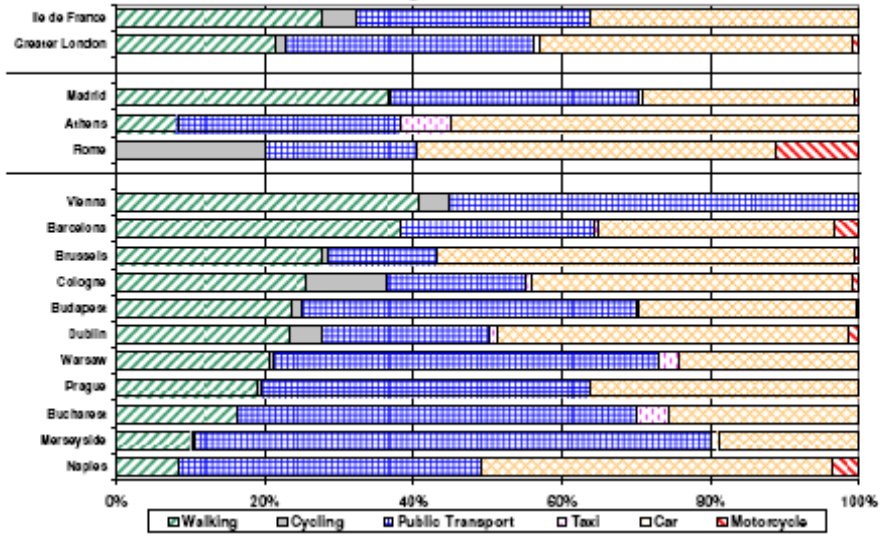
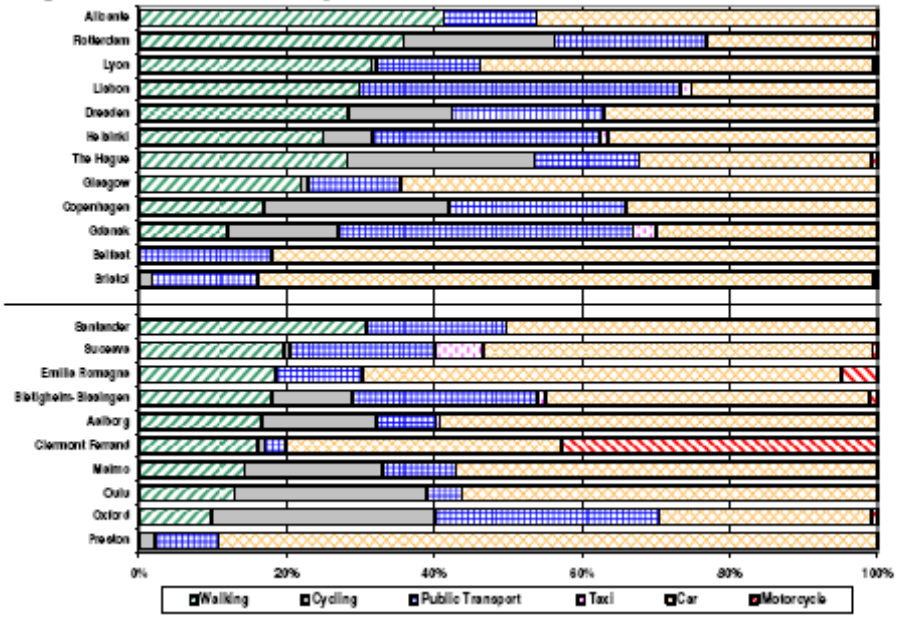


Figure 4.6b: Modal Share of trips by all modes in the urban administrative area (continued)



2.9 INVESTMENT AND MAINTENANCE IN URBAN TRANSPORT INFRASTRUCTURE, PUBLIC TRANSPORT INFRASTRUCTURE AND PUBLIC TRANSPORT FLEETS

2.9.1 Data for a sample of European cities (UITP)

The investment and maintenance expenses in urban transport infrastructure have been estimated as follows. The source of data is the UITP "Mobility in cities" database[66], which presents relevant figures for a large sample of European cities. The data refer to the year 2001.

2.9.1.1 Road network investment, operation and maintenance expenditure in % of GDP

Expenditures which are taken into account concern investment, operation and maintenance of the road network. More precisely, they cover:

- all categories of roads open to public traffic (only residential roads whose use is reserved exclusively for property owners are excluded),
- public car parks (with the exception of P+R facilities),
- pavements and public parking areas,
- toll booths and parking meters,
- noise barriers and landscaping tied in with road infrastructures,
- signposts, traffic lights and traffic management and road-user information systems.

Investment is understood as all creations of infrastructures or new systems and all extensions or substantial improvements to infrastructures or existing systems.

Maintenance is understood as all work to restore and repair the infrastructures and systems listed earlier. Operation is understood to refer mainly to traffic police costs.

All types of expenditure are taken into account, including expenditure on expropriation and financial costs linked to borrowing contracted by investors.

All fund providers are concerned, be they public (State, region, province, district, groups of public authorities, etc.) or private.

The expenditure being compiled is that which is effectively being consumed (not programme authorisations).

Given the variations that are likely to affect investment, provision was made here for this indicator to be collected year on year over a five-year period: 1997, 1998, 1999, 2000 and 2001. Annual average expenditure was calculated by summing the total expenditure for the years 1997 to 2001, expressed in 2001 prices (that is, adjusted for inflation), and dividing it by 5.

2.9.1.2 Public transport investment expenditure in % of GDP

The expenditure taken into account refers to investment by public transport networks operated within the confines of the reference area, all modes combined.

Investment is understood as all creations of infrastructures or new systems and any purchase of rolling stock or waterborne craft. More specifically, investment may involve:

- construction of new infrastructures (new lines, reserved routes (e.g. exclusive rights-of -way), stations, stops, bus shelters, P+R facilities, workshops, depots, maintenance and storage facilities, administrative buildings of public transport companies, etc.),
- implementation of equipment and new systems for existing lines and networks,
- rolling stock purchases,
- certain maintenance expenditure whenever this is not incorporated within operating expenditure. This might be the case with certain heavy expenditure involving modernisation or renovation.

All types of expenditure are taken into account, including expenditure on expropriation and financial costs linked to borrowing contracted by investors.

All fund providers are concerned, be they public (State, region, province, local district, groupings of public authorities, transport organising authorities, public transport operators, etc.) or private (private operators).

Each year's investment expenditure is the sum without duplication of each operator's investment expenditure within the reference area for that year.

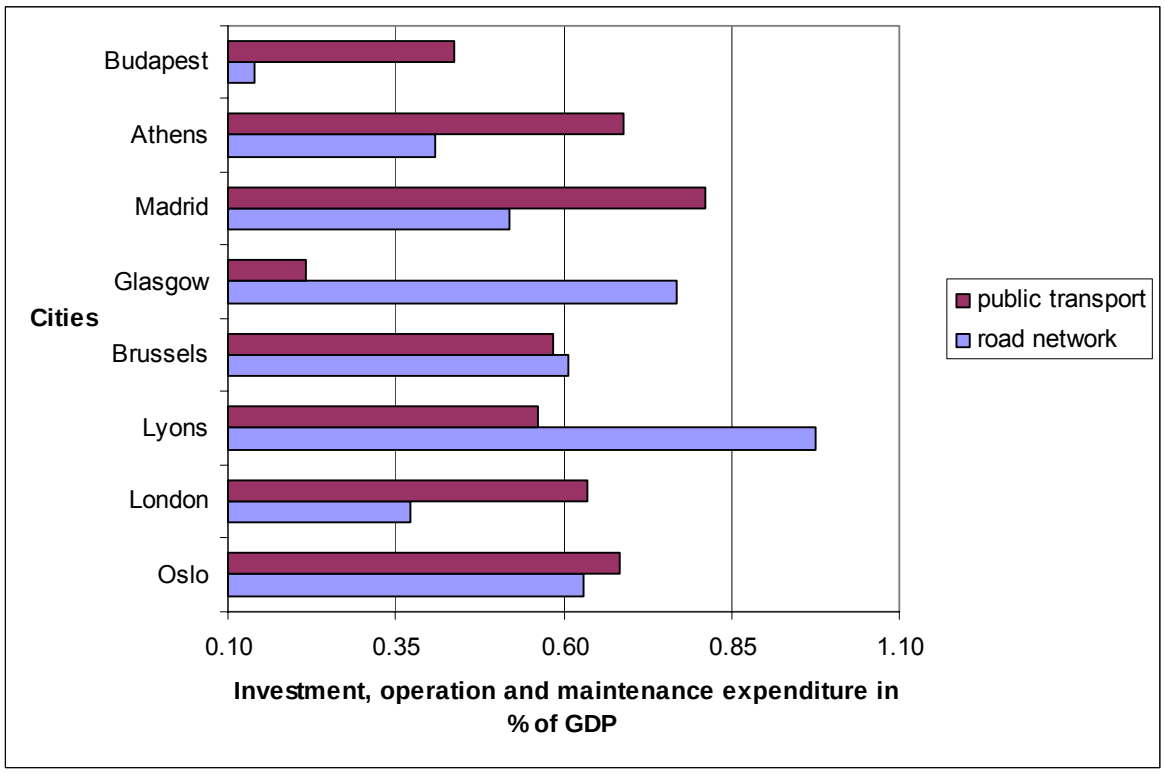
The expenditure being compiled is that which is effectively being consumed (not programme authorisations).

Given the variations that are likely to affect investment, provision was made here for this indicator to be collected year on year over a five-year period: 1997, 1998, 1999, 2000 and 2001. Annual average expenditure was calculated by summing the total expenditure for the years 1997 to 2001, expressed in 2001 prices (that is, adjusted for inflation), and dividing it by 5.

2.9.1.3 Analysis of the road network and the public transport investment

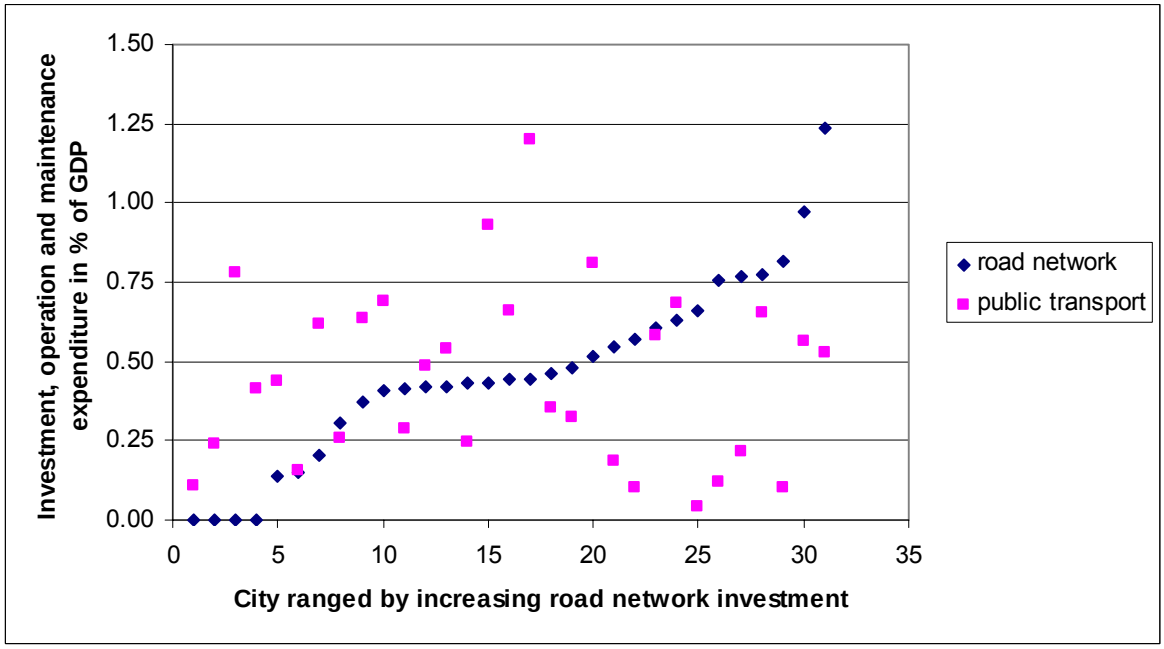
A Investments in proportion of GDP

The following figure presents for a sample of European cities the percentages of GDP assigned for the investment, operation and maintenance of the road networks and of the public transport over the 1997-2001 period.

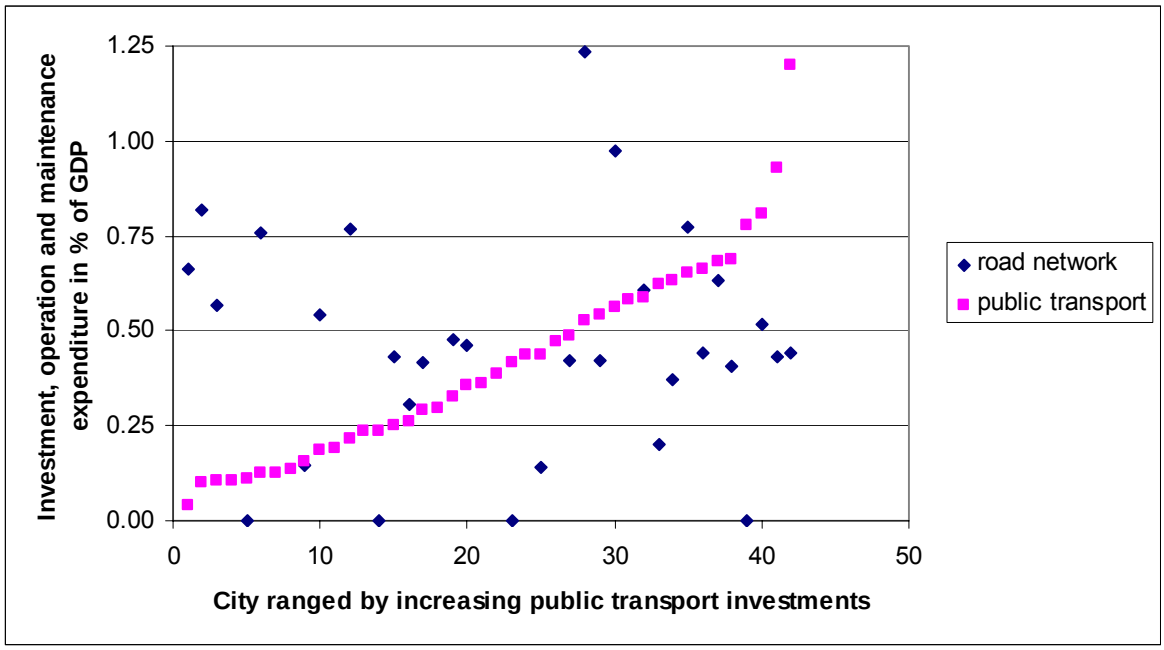


The next figures cover a larger sample of European cities. They also compare the investment, operation and maintenance of the road networks and of the public transport over the 1997-2001 period.

Road network and public transport investment, operation and maintenance expenditure in % of GDP for 31 European cities ranged by increasing road network investments[67]



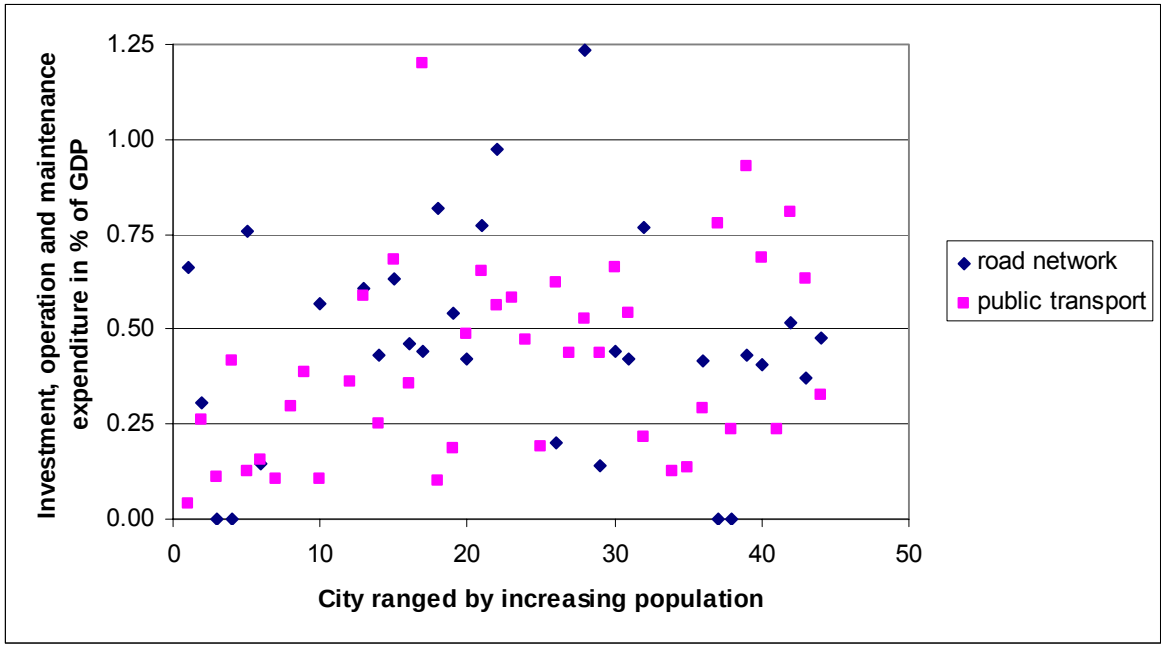
Road network and public transport investment, operation and maintenance expenditure in % of GDP for 42 European cities ranged by increasing public transport investments[68]



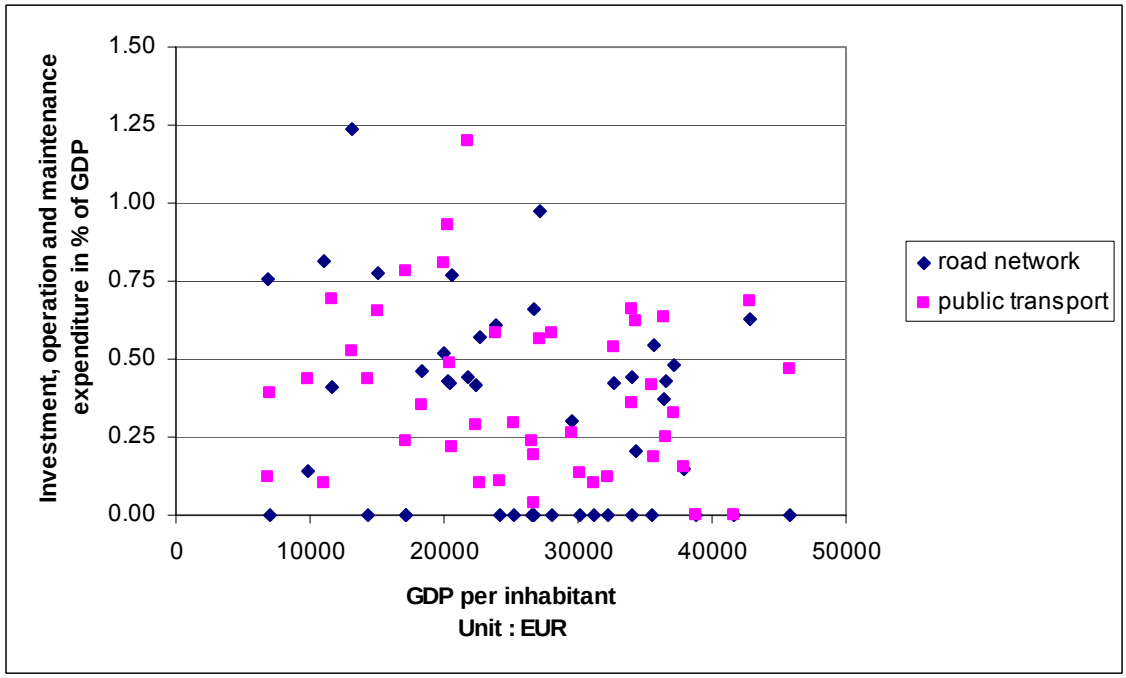
The two figures presented above show that investments in road networks and public transport networks for the selected sample of European cities represent percentages up to 1.25% of GDP.

Moreover, they show that there is no correlation between investment expenditure in % of GDP for road networks and for public transport networks.

Road network and public transport investment, operation and maintenance expenditure in % of GDP for 44 European cities ranged by increasing population[69]



Road network and public transport investment, operation and maintenance expenditure in % of GDP for 42 European cities ranged by increasing GDP per inhabitants[70]



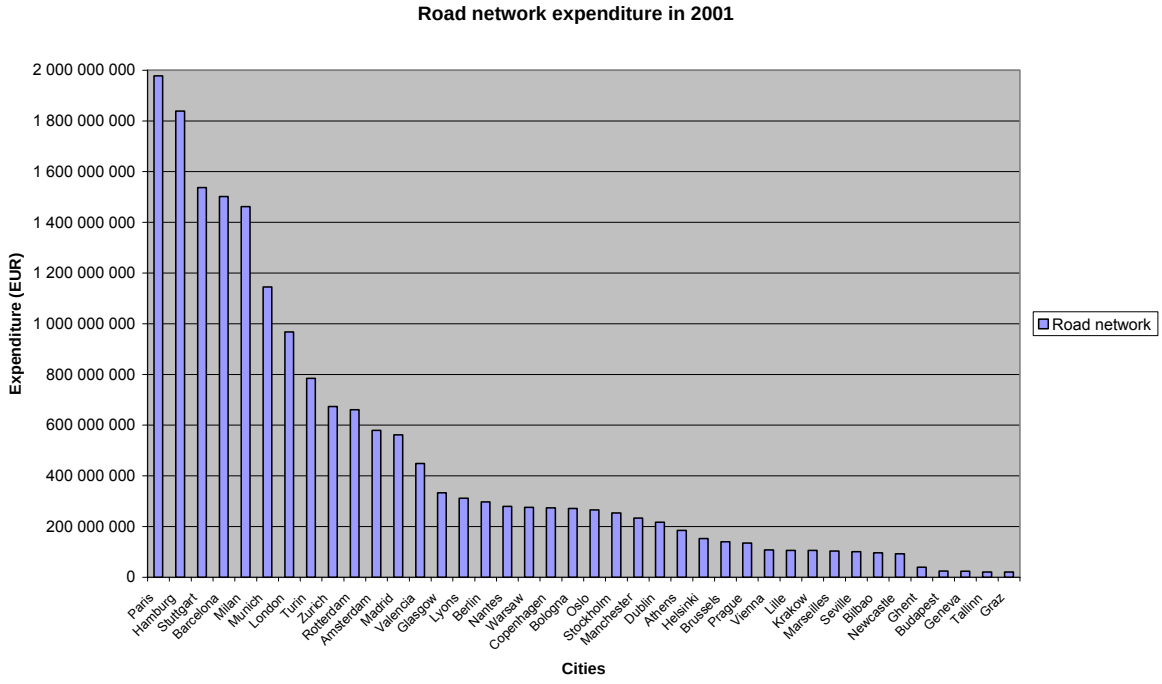
The two figures presented above also show that there is no correlation between investment expenditure in % of GDP for road networks and for public transport networks compared to the population of the cities or to the GDP per inhabitant.

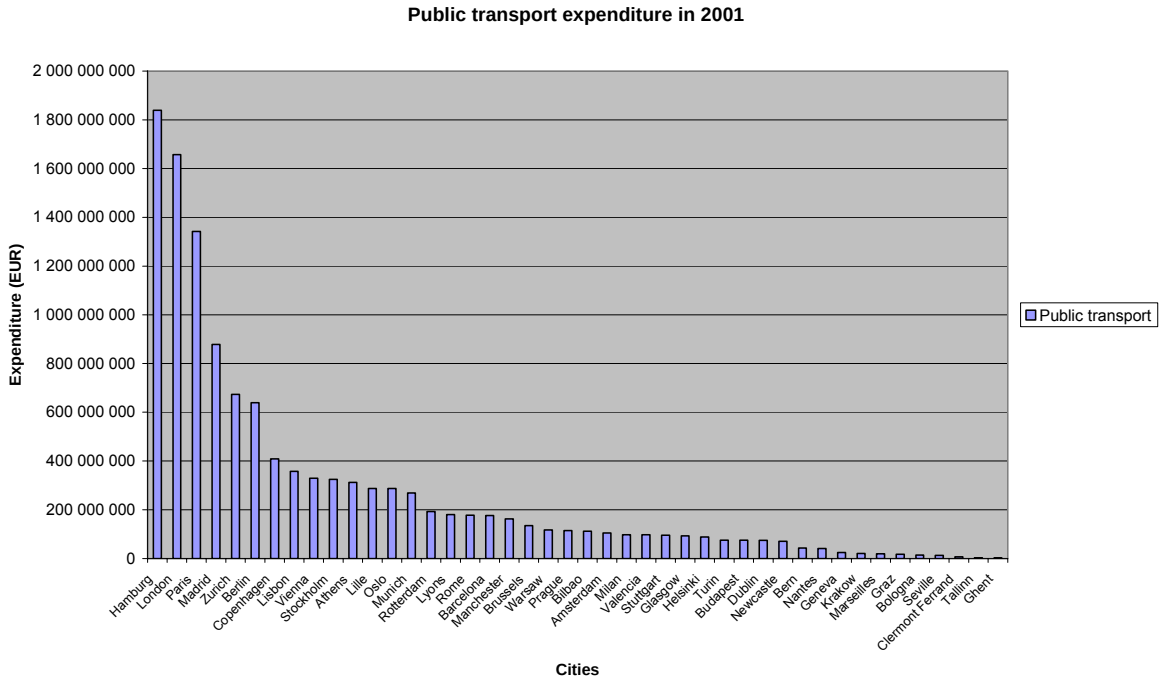
B Investments in absolute values

The following charts present respectively the expenditure for the road networks and for public transport, with the cities ranged in decreasing order.

Concerning the road networks, the cities of Paris and Hamburg invested the highest amounts in absolute terms among the cities of the sample in 2001.

Regarding public transport networks, the cities of Hamburg, London and Paris invested the highest amounts in absolute terms among the cities of the sample in 2001.





2.9.2 Data for a sample of European cities (National policy frameworks for urban transport)

The "National policy frameworks for urban transport" study[71] provides the following analysis and data.

The aims of the project were:

- to collect information on urban transport performance at national level in the 15 “old” EU Member States;
- to provide comparative analyses between countries and on a temporal basis; and
- to draw conclusions in relation to national urban policy frameworks and data collection issues.

Two indicators related to investment were used. These are:

- Expenditure on Transport Infrastructure / Network Development
- Expenditure on Public Transport Service Provision.

2.9.2.1 Expenditure on Transport Infrastructure / Network Development

"This indicator is designed to measure investment in transport infrastructure and network development in urban areas. This comprises construction and maintenance of roads, car parks, pedestrian and cycle facilities, urban railways, and local public transport infrastructure (tramways, dedicated busways, bus and tram stations/stops, interchanges, etc). Expenditure on public transport operations is not included (this is part of the following indicator, covering public transport service provision)."

Table 3: Expenditure on transport infrastructure or network development (per head of population of country, region or city mentioned)

Country	Roads (construction and maintenance)	Local public transport infrastructure (construction and maintenance)
AT[17]	National investment in roads in 2000 (including non-urban) per head of national population: €442 (including asset depreciation), of which 47% is for motorways, expressways and national roads (Bundesstraße) and 53% for regional and municipal roads. Expenditure for maintenance only (in 2000) is €68 per head of national population, of which 45% is for motorways, expressways and national roads and 55% for regional and municipal roads.	Vienna region (2002): €186
FI[18]	3-year average (2000-2002) of €170 per head of national population for Finnra roads (urban and non-urban, except municipal streets)	
FR[19]		4 year annual average investment in local PT works (1998-2001, excluding suburban rail) per inhabitant for selected large urban areas: Lyon: €142.58; Marseille: €8.19; Nantes: €4.76; Strasbourg: €18.95; Toulouse: €59.56 Medium urban areas: Chambéry: €0.56; Clermont Ferrand: €9.43; Metz: €1.82; Mulhouse: €0.57; Quimper: €0.85; Rouen: €82.60
DE[20]	Estimate of between €65 and €75 per head of urban population for urban roads (based on nation-wide spending of €113 per head on all roads)	Estimate of between €30 and €40 per head of urban population for urban/suburban railways: this is based on about 50% of total national rail investment being for urban/suburban (i.e. national urban estimate of €1677 billion in 1991, €2354.5 bn in 1995 and €2229 bn in 2000)
GR[21]	Annual average for Athens (from 2001 to 2004): €30.82 per head	Annual average for Athens for all modes (including vehicle purchase, which is not given separately): €10.8 million (€3.14 per person) in 1990 €134.2 million (€38.55 per person) in 2000 €115 million (€33.04 per person) in 2003. Note that in Athens investment rose very significantly since the end of the 1990s due to preparation for the Olympic Games.
IE[22]	Annual average for Dublin City Council (from 2000 to 2003): €84.89 per head Annual average for Galway City Council (from 2000 to 2003): €113.64 per head Waterford City (2000 only): €168.89 per head	Suburban rail enhancement programme in Dublin area: €176.2 million over 3 years = average annual spending of €56 per head of Dublin County population (however rail network extends beyond County Dublin and only serves limited corridors).
IT[23]	Expenditure per head in urban areas (expenditure by municipalities only with over 10 000 inhabitants): €48.29 in 1991 €30.76 in 1995 €50.26 in 1997 €32.18 in 1999 €42.41 in 2000.	€11 per head in urban areas (2000).
NL[24]	National investment in roads (including non-urban) per head of national population: €88.72 (1990-1992 annual average) €103.32 (2002-2004 annual average)	€32.10 per head for local public transport nationwide (not just urban), excluding rail (average annual for 2002-2004)
PT[25]	National investment in roads (including non-urban) (2000): €56.51 per head of national population	National investment in suburban railway infrastructure and maintenance (2003): €53.03 per head of urban population

Country	Roads (construction and maintenance)	Local public transport infrastructure (construction and maintenance)
ES[26]		Madrid: annual average (for metro extension only) (1995-99): €303 million, or €8 per inhabitant (for region), or €9 per inh. for the city and suburbs (extent of the metro network).
SE[27]	National investment in roads (including non-urban) (2000): €134 per head of population	€54 per head in Stockholm (2000) €13 per head in Gothenburg region (Västra Götaland) (2000)
UK[28]	National spending by all English local authorities (including non-urban but not trunk roads and motorways) per head of population in England: €74.61 in 2001; €67.84 in 2002 Expenditure by authorities in Greater London per head: €118.93 in 2001; €87.25 in 2002 Expenditure in Edinburgh (by city council only) per head of city population: €47 (average for 2000-2002)	Strathclyde: €151 million (annual average for 2000-2002), or €72 per head of urban population

"The following figures summarise the road investment data and public transport investment data as far as possible, although these should be read in conjunction with the table above as the comparisons are generally not consistent."

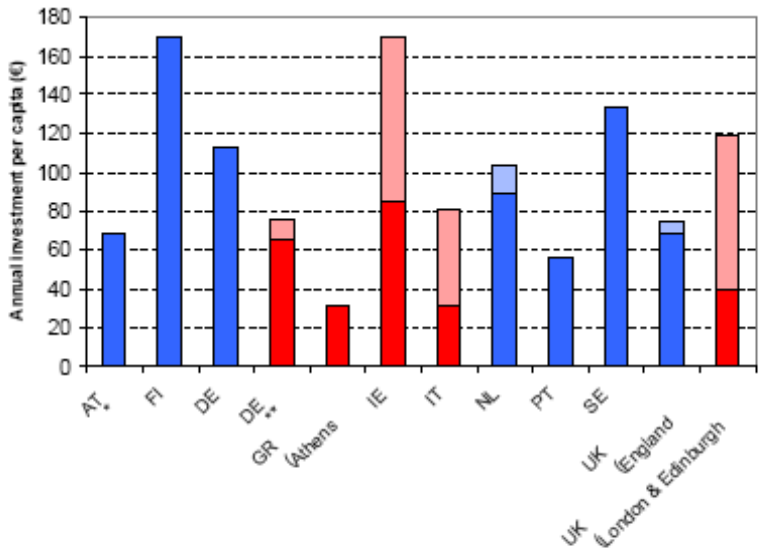


Figure 17: Expenditure on road transport infrastructure (construction and maintenance)[28]

Key:

* - maintenance costs only

** - estimate

National expenditure on roads (urban and non-urban)

Expenditure on urban roads

Difference between lowest and highest (in cases where there are different figures for different years or cities)

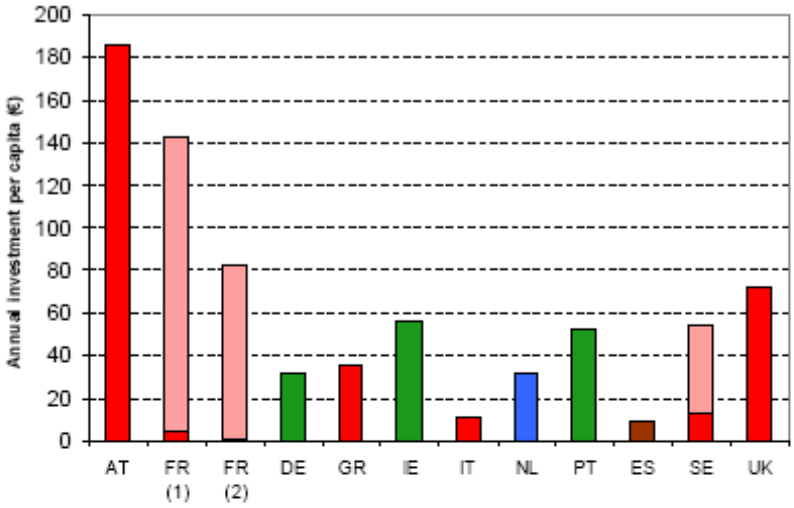


Figure 18: Expenditure on public transport infrastructure[30]

Key:

* Lyon, Marseille, Toulouse, Strasbourg, Nantes. Average for 4 years (1998-2001)

** estimate

- National expenditure on PT infrastructure (urban and non-urban)
- Expenditure on urban PT infrastructure
- Metro only (ES)
- Suburban rail only (DE, IE, PT)
- Metro and suburban rail only (GR)
- Difference between lowest and highest (in cases where there are different figures for different years or cities)

Notes to Figure 18:

AT: Vienna, 2002
FR (1) 4-year annual average (1998-2001) for 5 big cities: Lyon(highest), Toulouse, Strasbourg, Marseille and Nantes (lowest)
FR (2) 4-year annual average (1998-2001) for 6 medium/small cities: Rouen(highest), Clermont-Ferrand, Metz, Quimper, Mulhouse and Chambéry (lowest)
DE: national urban estimate for rail only, based on national data annual average over 3 years 1998-2000
GR: Athens, average for 2000 and 2003, including vehicle purchase
IE: Dublin area, rail only, annual average for a 3-year programme (2003-2005)
IT: Urban expenditure by municipalities of over 10 000 inhabitants (annual average for 1999 & 2000)
NL: National local public transport, 3-year annual average (2002-2004)
PT: Suburban rail only (Lisbon/Porto), 2003
ES: Madrid metro only (5-year annual average, 1995-1999)
SE: Stockholm (high) and Gothenburg (low) (2000)
UK: Strathclyde (Greater Glasgow), bus, rail and underground (3-year annual average, 2000-2002)

2.9.2.2 Expenditure on Public Transport Service Provision

This indicator is designed to measure expenditure on urban public transport, excluding public transport infrastructure. It includes operational subsidies and new vehicles.

Where possible, data is given by mode (bus, tram, metro, suburban rail, etc).

Examples of city data are given in the following table.

Table 4: Expenditure on public transport provision (per head of population of country, region or city mentioned)

	Vehicle purchase	Operating costs and subsidies
DK[32]	DSB suburban rail: average €46 per urban inhabitant in suburban rolling stock investment in 2002.	
FR[33]	4 year annual average investment in PT vehicles/rolling stock (1998-2001, excluding suburban rail) per inhabitant for selected large urban areas: Lyon: €17.09; Marseilles: €13.16; Nantes: €6.96; Toulouse: €8.35 Medium urban areas: Chambéry: €6.42; Clermont Ferrand: €11.17; Metz: €12.76; Mulhouse: €5.74; Quimper: €13.60; Rouen: €23.62	Urban public transport subsidy per head of population: Large urban areas (>300 000 inhabitants): Average €70.28 in 1997; €98.11 in 2002 Medium urban areas (100 000 to 300 000 inhabitants): Average €47.56 in 1997; €66.22 in 2002
DE[34]	Annual vehicle investment by operators within VDV (PT operators' association): €567.2m (average of 1999-2001). VDV covers most but not all urban PT operations, and the population covered by VDV operators is not known. Estimated vehicle investment per head between €8 and €11.	Annual operating costs by operators within VDV (PT operators' association): €6579.4m (average of 1999-2001), of which 32% is public subsidy. VDV covers most but not all urban PT operations, and the population covered by VDV operators is not known. Estimated operating costs per head between €80 and €100.

	Vehicle purchase	Operating costs and subsidies
GR[35]	Investment in buses & trolleybuses in Athens €17 per head of metropolitan area population in 2003	Operating costs for all public transport (bus, trolleybus, metro and suburban rail) in Athens: €128 per head of metropolitan area population (annual average of costs from 2000 to 2003)
IE[36]	Investment in buses for Dublin: €14 per head of Dublin metropolitan (county) population in 2003	Bus operating costs for Dublin: €222 per head of Dublin metropolitan (county) population in 2002. Suburban rail operating costs €60 per person Total PT operating costs in Dublin area: €282 per year per inhabitant (2002).
IT[37]	Average investment per head for buses, trams and metro in all urban areas: €4.33 (2002)	
NL[38]	Investment in buses nationwide: €14 per head of national population (annual average of costs from 2000 to 2002)	
PT[39]	Investment in buses for Lisbon: €3 per head of Lisbon metropolitan population per year (4 year average 1998-2001). Investment in metro rolling stock in Lisbon: €12 per head (3 year average 2000-2002). Investment in suburban rail rolling stock in Lisbon: €10 per head (3 year average 1999, 2001 & 2002). Total PT vehicle investment per year in Lisbon area: €25 per head.	Bus operating costs for Lisbon: €95 per head of Lisbon metropolitan population per year Metro operating costs €77 per person (6 year average 1997-2002) Total PT operating costs in Lisbon area: €171 per year per inhabitant.
ES[40]	Madrid: annual average of €44.6m on metro rolling stock (1995-99) = €8 per inhabitant (for region), or €9 per inh. for the city and suburbs (extent of the metro network). For 1999-2003, the annual investment in metro rolling stock is €83.8m, an 88% increase.	Madrid Region: €490.3m in 2002 (operation and fare subsidies) = €90 per inhabitant, for all modes (urban bus, suburban bus, metro, suburban rail)

	Vehicle purchase	Operating costs and subsidies
SE	Total investment in land public transport vehicles in 2000 (bus, train, metro, tram) nationwide: €62 per head	Swedish county councils subsidise PT operations by about €1.62bn per year (local public transport, nationwide), equating to €182 per head of population. Operations in Stockholm (SL) amount to €183 per head of local population
UK[41]		Greater Manchester (public subsidy to operators 2002): bus: €6.69 per head; tram: €0.46 per head, suburban rail: €42.04 per head. Total public expenditure on PT operation subsidies in Greater Manchester: €49 per head (not including concessionary fares: if these are included, total public transport subsidy rises to €73 per head). At national level (for England only), local authority expenditure on public transport (urban and non-urban) was €53.74 in 2001 and €66.79 in 2002. This includes investment, operation subsidies to bus and rail operators, strategic planning and concessionary fares. The equivalent figures for Greater London are €113.35 in 2001 and €196.86 in 2002. Total bus operating costs in Great Britain in 2002/03 were approximately €113 per head of national population, of which 62% was covered by passenger fares and the remainder by various subsidies. Central government support to local authorities for local transport in England (annual average 1999-2004) approx. €49 per head of English population (urban and rural).

"The following figures summarise this data graphically as far as possible, although these should be read in conjunction with the table above as the comparisons are not necessarily like with like."

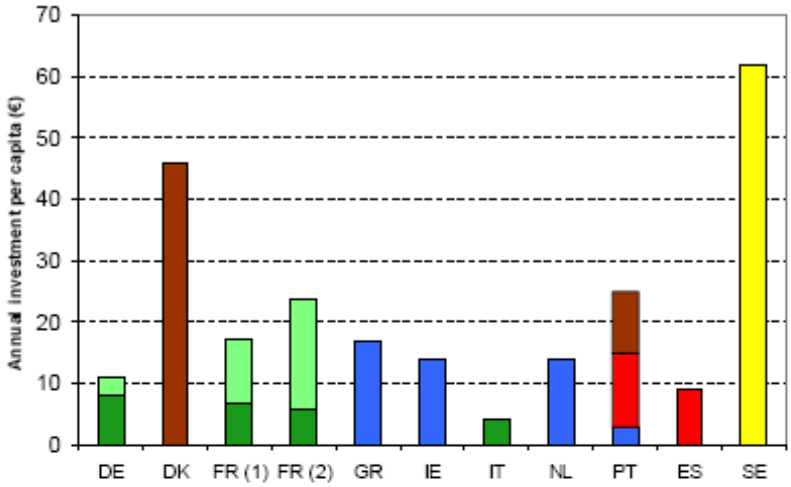


Figure 20: Expenditure on vehicle/rolling stock purchase for public transport[42]

Key:

- Bus
- Metro
- Urban/suburban trains
- All except trains
- All
- Difference between lowest and highest (in cases where there are different figures for different years or cities)

Notes to Figure 20:

DE: Operators within the VDV association only (national estimate based on VDV data), annual average 1999-2001

DK: DSB suburban rail stock, 2002

FR (1) 4-year annual average (1998-2001) for 4 big cities: Lyon(highest), Marseille, Toulouse and Nantes (lowest)

FR (2) 4-year annual average (1998-2001) for 6 medium/small cities: Rouen(highest), Quimper, Metz, Clermont-Ferrand, Chambéry and Mulhouse (lowest)

GR: Athens, buses & trolleybuses only, 2003

IE: Dublin area, buses only, 2003

IT: Urban expenditure on buses in municipalities of over 10 000 inhabitants (2002)

NL: National bus investment, 3-year annual average (2000-2002)

PT: Lisbon, 4 year average 1999-2002

ES: Madrid metro only (5-year annual average, 1995-1999)

SE: Total land public transport (urban and non-urban, including rail)

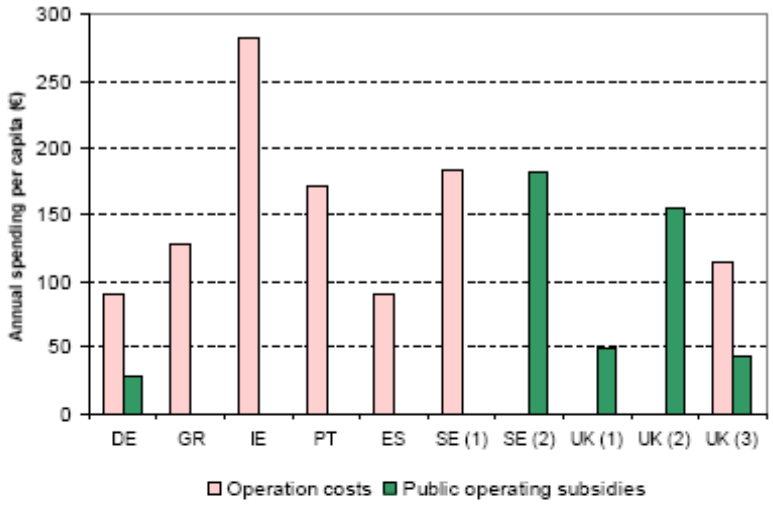


Figure 21: Operating costs of public transport[43]

Notes to Figure 21:

DE: Estimate based on operating costs for VDV association (national estimate, annual average 1999-2001)
GR: Athens, all public transport, annual average for 2000-2003
IE: Dublin area, bus and rail, 2002
PT: Lisbon, bus and metro, 6 year average 1997-2002
ES: Madrid, all public transport, 2002
SE (1): Stockholm (SL), 2003
SE (2): National subsidy for public transport from all Swedish counties (urban and rural)
UK (1): Greater Manchester (2002)
UK (2): Greater London (average of 2001 & 2002)
UK (3): National (Great Britain), for buses only, 2002-2003

Comparability is difficult as subsidies come from different sources and cover different modes. The UK examples illustrate differences within a single country, where subsidy levels for public transport are far higher in London than for other urban areas.

Data on revenue support for local bus services are available for some countries. The following examples illustrate the percentage of bus operating costs accounted for by subsidies and grants in 1998[44]:

- Austria and Belgium: 65-70% of bus operating costs;
- The Netherlands: 60%
- Denmark and France: 48%
- Greece and Sweden: 45%
- Germany: 41%
- Spain: 33%
- UK: 19% (Although according to the UK Department of Transport, public support for bus services, including concessionary fare reimbursement, was 31% of operating costs in 1998 and 38% in 2003. Excluding concessionary fare reimbursement, the figures were 17% and 27% respectively).

2.9.3 Current market and perspectives for light rail and metro systems in Europe

A study published in 2004, carried out by the UITP for the ERRAC[72] on light rail and metro systems in Europe, provides the following data.

2.9.3.1 Tram and light rail systems

Existing tram and light rail systems in Europe represent track lengths of a total of 8 060 km of which 4 793km in the EU-15, 2 240 km in the EU-10 (New Member States which joined the EU in May 2004) and 1 027 km in the other countries considered in the study, called "Beyond EU-25", (Norway, Switzerland, Bulgaria, Romania, Turkey, Western Balkan countries).

The current total tram and light rail fleet in Europe amounts to about 25,000 vehicles. 42% of the EU-15 fleet, 67% of the new Member States fleet and 48% of the Beyond EU-25 fleet is over 20 years old and should be replaced before 2020.

"In terms of **infrastructure** expressed in track*km, a 40% growth is confirmed. In terms of number of European cities equipped with LRT, the growth has reached 55%. 739 km of double track are being built, and 1473 km are in planning stages. If an average construction cost of 15 million EUR/km (without rolling stock) is assumed, the monetary evaluation of the market is in the range of **EUR30 billion over the next 20 years** (EUR9.5 billion for lines in construction and EUR22 billion for planned lines). These figures do not include expenditures on infrastructure refurbishment and/or segregation, which is expected to boom in the new Member States. On the infrastructure side, we can estimate research into civil engineering activities is rather moderate and could be range between 1 and 2 %, i.e. between 300 and 600 million euros.

As far as **rolling stock** is concerned, the forecast both for the replacement and the new markets ranges between 7500 (conservative figure) and 9300 (maximalistic figure) for the period 2000-2020. If we take two average cost hypothesis of 1.2 and 1.5 million EUR/vehicle, we find a turnover ranging **between EUR9 and 14 billion** (7500 * 1.2 and 9300 * 1.5). Research and development (R&D) expenditures dedicated to rolling stock can be estimated at 1.5% of this value (EUR170 million) and should be increased to 3% (as encouraged by European Commission). It is thought that this increase in R&D to EUR340 million could generate return on investment between EUR450 and 1400 million through a decrease in cost between 5 and 10 %."

2.9.3.2 Metro systems

Existing metro systems in Europe represent track*km of a total of 2346 km of which 2072 km in the EU-15, 93 km in the EU-10 (New Member States which joined the EU in May 2004) and 181 km in the "Beyond EU-25" countries.

"The total fleet in Europe amounts to about 19,200 vehicles. The current EU-15 member states account for slightly below 90% of the rolling stock, new Member States for nearly 6% and countries Beyond EU-25 for about 4%."

"In terms of **infrastructure** expressed in track*km, the growth is more moderate than for LRT, but still rather substantial with a 21% increase (135 km in construction and 503 km in planning). If we assume average construction cost of 150 million EUR/km (without rolling stock), the monetary evaluation of the market is in the range of **EUR95 billion over the next 20 years** (20 billion for lines in construction and 75 billion for planned lines). These figures do not include expenditures on infrastructure refurbishment and line automation. Refurbishment is expected to boom in the new Member States and automation in EU-15 countries. Automation of conventional lines should be a major research area in the coming years. On the infrastructure side, we can estimate that research into civil engineering

activities is rather moderate and could range between 1 and 2 %, i.e. between EUR950 and EUR1900 million.

As far as **rolling stock** is concerned, the forecast both for the replacement and the new markets is assessed at around 14,000 units (cars) for the period 2000-2020. If we take an average cost hypotheses of EUR1.5 million/car (average between motorized car and trailer), we find a turnover of **about EUR 21 billion**. R&D expenditures dedicated to rolling stock can be estimated at 1.5% of this value (EUR315 million) and should be increased to 3% (as encouraged by the European Commission). It is thought that this increase in R&D to EUR630 million could generate return on investment between EUR1.05 and EUR2.1 billion through a decrease in cost between 5 and 10%."

2.10 PERFORMANCE OF URBAN TRANSPORT

2.10.1 Performance of public and private urban transport

Within the framework of the "Urban Transport Benchmarking Initiative"[73], the average peak hour speeds of public transport and private motorized modes in the benchmarking cities have been recorded[74].

The results are presented in the following figures.

Figure 5.10a: Average peak-hour speeds of public transport and private motorised modes in the benchmarking cities (continued in Figure 5.10b)

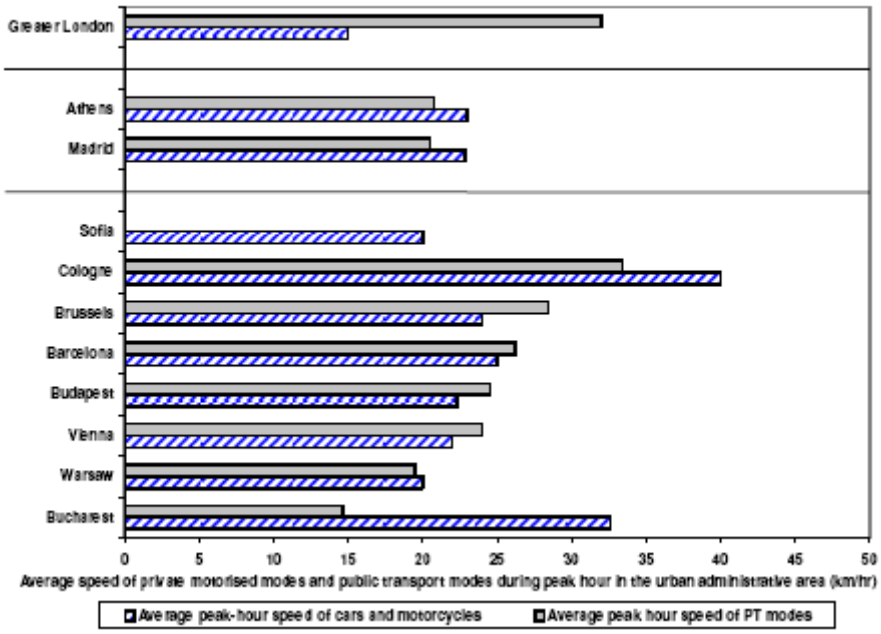
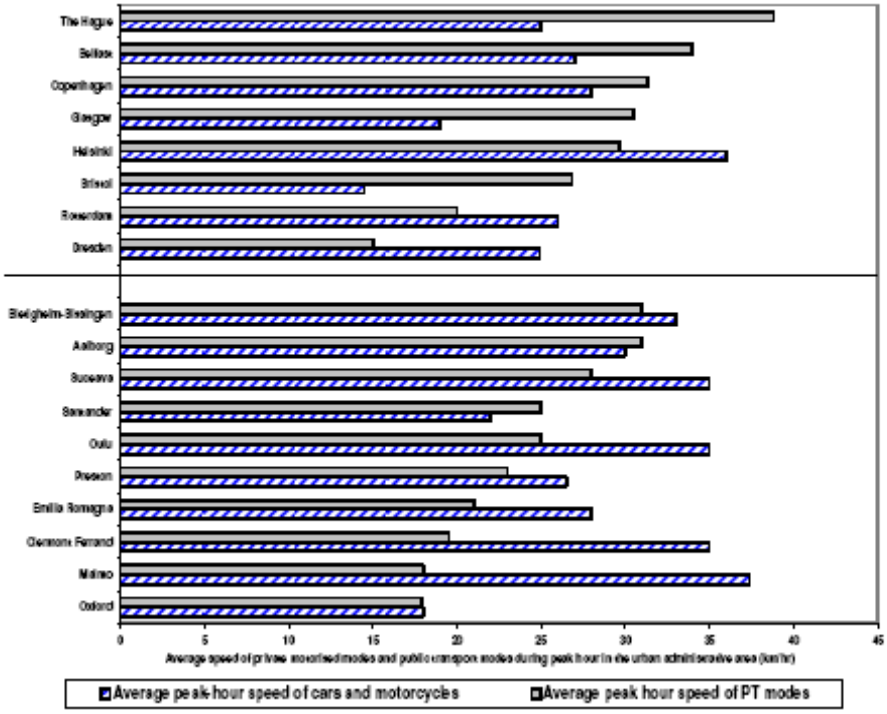


Figure 5.10b: Average peak-hour speeds of public transport and private motorised modes in the benchmarking cities (continued)



The following comments are reproduced from the "Urban Transport Benchmarking Initiative" report.[73]

"The two figures above indicate that no clear trend exists for the average speeds of public and private transport modes. The key observations from the graphs are;

- In Aalborg, Bristol, Copenhagen, Belfast, Glasgow, The Hague, Vienna, Preston, Santander, Budapest, Barcelona, Brussels and Greater London the average speed of public transport modes exceeds that of private motorised transport.
- London, Preston and The Hague are the two cities where there is the largest difference between the peak-hour speed of public transport modes and the peak hour-speed of private motorized modes.
- In 7 of the 10 cities with populations of less than 300,000 inhabitants it is quicker to travel by car or motorcycle than by public transport during peak hour. This is likely to be related to the fact that smaller cities often rely upon bus services which, due to the need to stop regularly, tend to circulate at a slower rate than private cars can.
- Bucharest and Dresden displayed the slowest peak-hour public transport speeds of all of the cities (15km/h) while Bristol and London had the slowest peak-hour private motorised speeds (also 15km/h).
- Cologne demonstrated the fastest peak-hour private motorised speed (40km/h) and The Hague has the fastest peak hour public transport speed (38km/h)."

2.10.2 Cost of private and public transport

2.10.2.1 Data for a sample of European cities (UITP)

The UITP "Mobility in cities" database[66] provides the following figures for evaluating and comparing the respective costs of private and public transport in urban areas.

A Cost of one private motorised passenger kilometre for the traveller

The cost being sought is the full cost (all taxes included) borne by the motorist. This cost is computed for an "average" car, which varies depending on the city being studied, and includes:

- fuel expenditure (based on fuel consumption and fuel price – including all taxes),
- vehicle maintenance expenditure,
- insurance and vehicle ownership taxes,
- expenditure on parking and tolls,
- vehicle depreciation (based on the purchase cost of the average car, divided by 6, 8, 10 or 12 when the average annual distance travelled by private car is respectively >15 000km, between 10 000 and 15 000 km, between 6 000 and 10 000km, or <6 000km).

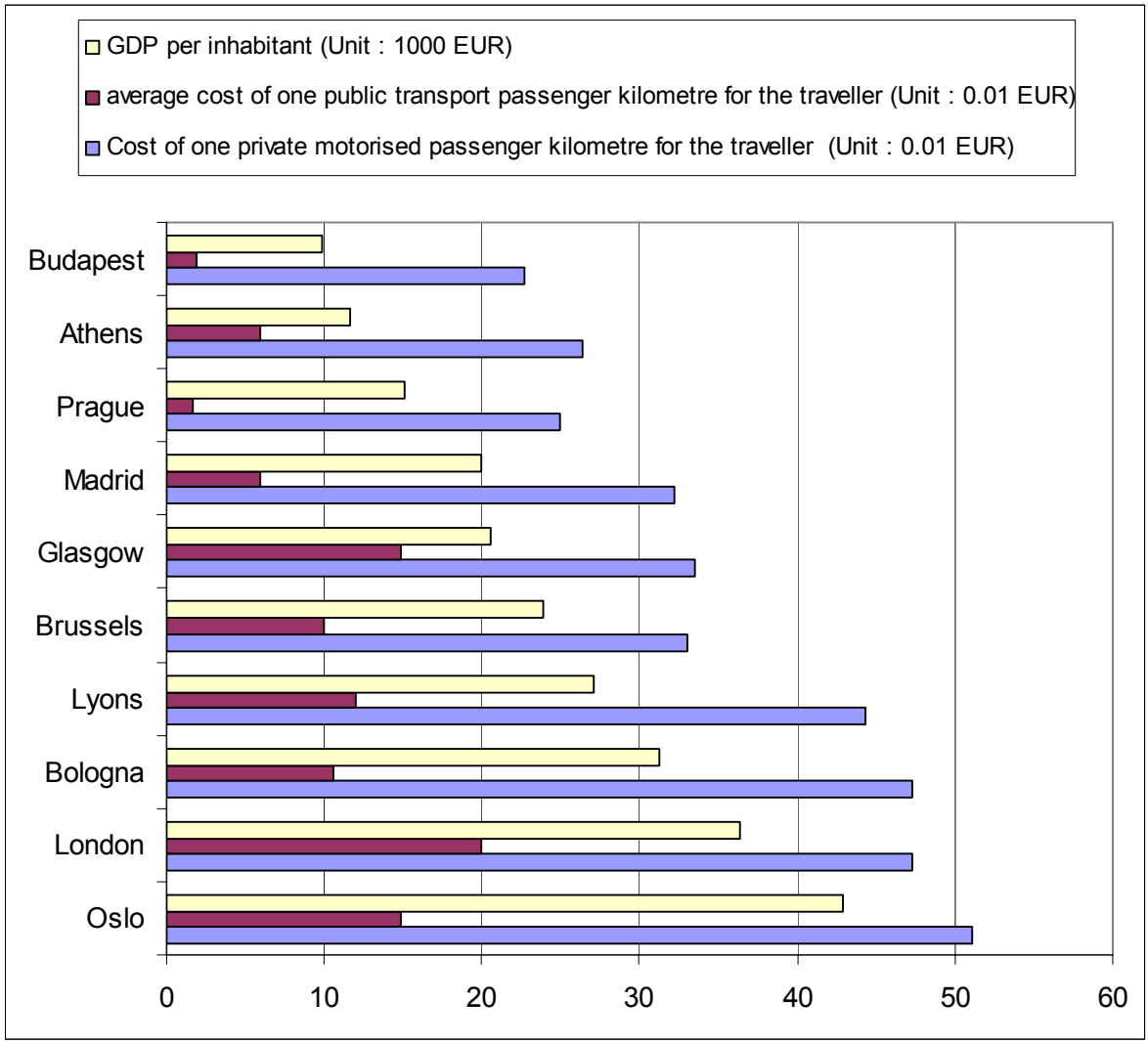
The above information is collected separately for petrol and diesel cars. The average cost is a weighted average (based on the proportion of traffic respectively due to petrol and diesel cars). If motorcycles play a significant role, the cost of using a motorcycle is also integrated in the average cost. Unit: 0.01 EUR.

B Average cost of one public transport passenger kilometre for the traveller

This indicator is the ratio between public transport farebox revenue, excluding reimbursements for concessionary fares, and the annual public transport passenger-kilometres. Unit: 0.01 EUR.

C Analysis of the average cost of private and public transport by passenger-km

Average cost of one public transport and private motorised passenger-kilometre for the traveller and GDP per inhabitant for ten European cities ranged by increasing GDP per inhabitant

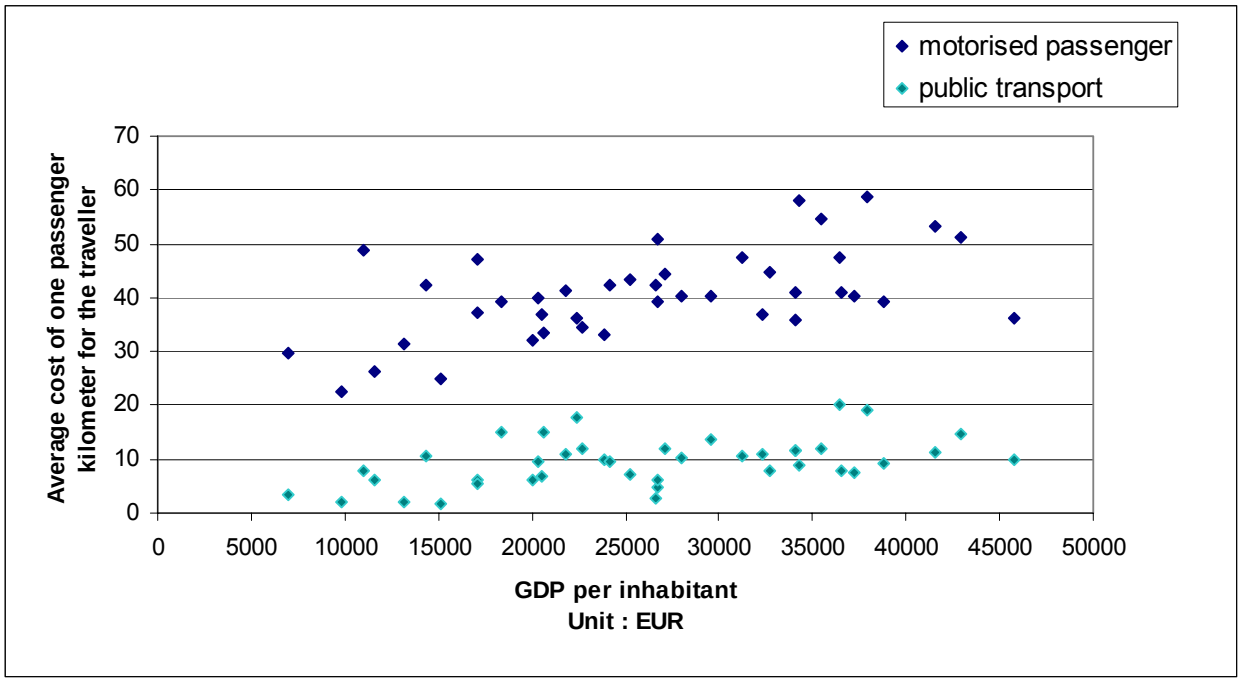


For the cities selected in the sample, the average cost of public transport per passenger-km is systematically lower than the average cost of private motorised transport.

The cities are ranged by order of GDP per inhabitant. The figure shows an almost parallel trend for the average cost of private motorised transport and GDP per inhabitant, whereas there is no such trend for public transport average costs.

The following figure presents the average cost of one passenger-km for the traveller, compared to the GDP per inhabitant for a larger sample of European cities[75].

Average cost of one public transport and private motorised passenger-kilometre for the traveller as a function of the GDP per inhabitant

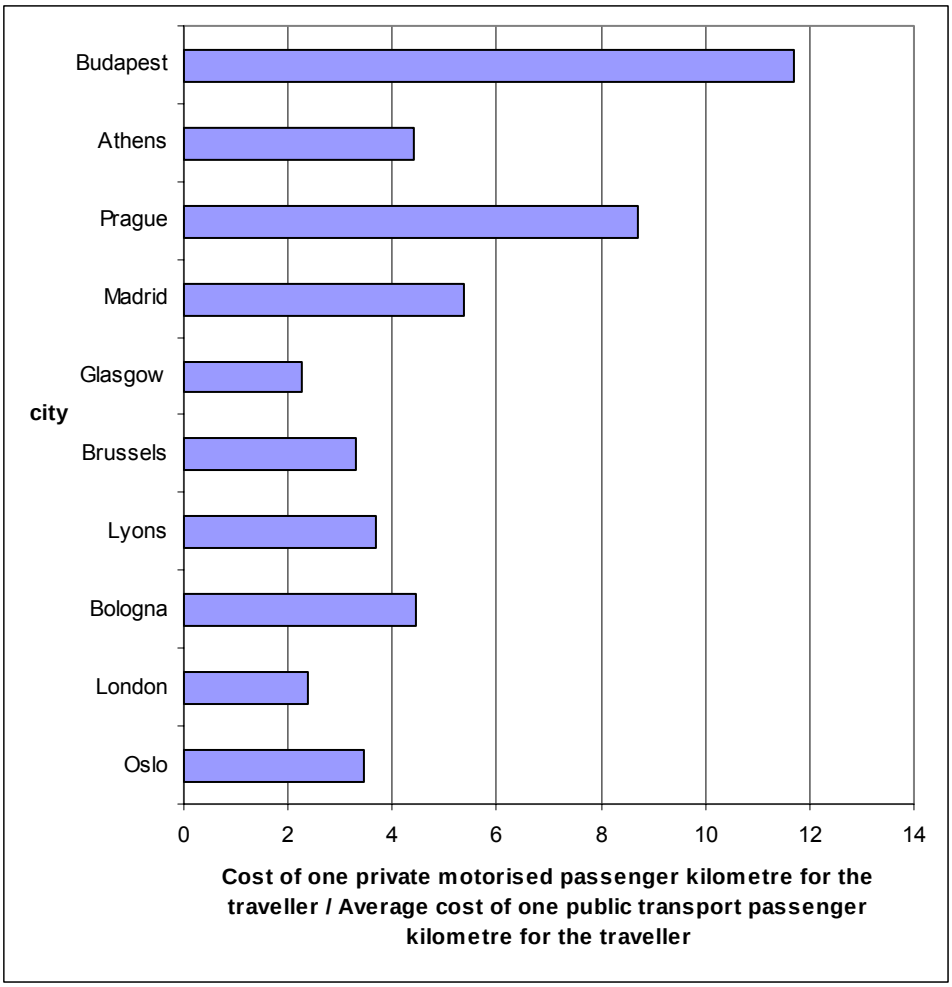


The figure shows that, globally, the average cost of public transport per passenger-km (ranging from 0.02EUR to 0.20 EUR) is systematically lower than the equivalent for private transport (ranging from 0.23 EUR to 0.59 EUR per passenger-km).

The following figure presents the ratio of the cost of one private motorised passenger kilometre for the traveller divided by the average cost of one public transport passenger kilometre for the traveller for a sample of cities.

This indicator is the ratio of the cost of one private motorised passenger-kilometre for the traveller (as defined above) and the cost of one public transport passenger-kilometre for the traveller (as defined above).

Cost of one private motorised passenger kilometre for the traveller / Average cost of one public transport passenger kilometre for the traveller, for 10 European cities ranged by increasing GDP per inhabitant



The ratio for the sample of cities ranges from 2.25 for Glasgow and 2.37 for London, to 11.7 for Budapest.

2.10.2.2 Data for a sample of European cities (National policy frameworks for urban transport)

The "National policy frameworks for urban transport" study[76] provides the following analysis and data.

The "Cost of transport use" indicator looks at two trip lengths into a major city centre, by car and by public transport:

- an urban return journey of 5km each way; and
- a return journey from the suburbs to the city centre of 15km each way.

For each one, a peak hour commuting journey is first analysed, in which the traveller spends eight hours in the city (reflecting a typical working day). In the case of public transport use, it is assumed that the user has a season ticket. Secondly, costs to the user for a one-off off-peak trip are analysed, for a shopping/leisure trip on a Saturday, spending two hours in the city centre. In this case, for public transport users, it is assumed that the user does not have a

season ticket and single tickets (or an off-peak return ticket if available) are used. This explains why in several cases the off-peak trip appears to cost more than the peak hour trip.

The aim is to compare the prices for these two journeys by car and by public transport.

Costs by car are shown in two forms:

- Fuel costs and any urban tolls that may exist (at present this only applies to the London Congestion Charge– tolled infrastructure in other cities exists, but this is mainly on arterial routes and can usually be avoided by making a different route choice, whereas the London charge is compulsory for all entering the city).
- As above, with the addition parking charges in the city centre (taken from the input indicator data described in Sub-chapter 3.2.7), for eight hours (peak) or two hours (off-peak).

A Peak Out-of-pocket Urban Travel Costs

Costs by public transport assume the use of a monthly season ticket with the daily cost assumed to be 1/20th of the monthly cost. If a monthly ticket is not available, the price of a weekly ticket is used, with daily cost assumed to be 1/5th of the weekly ticket price.

By public transport, the shorter (5km) journey assumes using just one mode (bus, tram or metro), covering the least number of zones possible (where fares are arranged zonally). The 15km trip assumes use of metro or suburban rail plus a connecting journey in the city centre by bus or tram. Therefore, where multimodal or multi-operator tickets are available, these are assumed to be used for this journey.

This data is available for all countries, although only at individual city level. In some countries, parking costs and public transport fares vary considerably between cities. Samples were taken from a few representative cities per country and they are presented in the following table.

Table 10: Peak out of pocket urban travel costs in 2004 in euro

	Cities	5km each way			15km each way		
		by car		by PT (season ticket)	by car		by PT (season ticket)
		Including parking	Not including parking		Including parking	Not including parking	
AT	Graz, Salzburg, Innsbruck	21.47	0.68	1.38	22.28	1.54	1.53
	Vienna	40.62	0.68	2.25	41.73	1.54	2.25
BE	average	10.64	0.77	1.40	11.79	1.73	2.35
DK	Copenhagen	11.54 to 38.30	0.91	1.94	12.90 to 39.66	2.04	4.36
	average outside Copenhagen	11.50	0.91	1.68	12.86	2.04	3.71
FI	Helsinki	24.62	0.83	1.92	25.72	1.87	3.40
FR	Paris	24.68	0.78	2.43	25.90	1.75	3.98
	average outside Paris	7.88	0.78	1.55	9.10	1.75	2.79
DE	average	14.72	0.85	1.74	16.02	1.91	2.70
GR	Athens	10.55	0.65	0.88	11.55	1.46	1.75
	Thessaloniki	9.55	0.65	1.10	10.55	1.46	2.50
IE	Dublin	11.66	0.71	3.50	12.86	1.60	4.90
	Cork	6.66	0.71	2.30	7.86	1.60	4.70
IT	average	12.70	0.84	1.49	13.95	1.89	1.98
LU	Luxembourg	6.27	0.67	1.03	7.48	1.51	2.05
NL	Amsterdam	20.20	0.93	2.77	21.70	2.08	5.48
PT	Lisbon	5.67	0.75	0.60	6.69	1.68	2.46
ES	Barcelona and Madrid	11.38	0.65	1.75	12.41	1.46	2.50

	Cities	5km each way			15km each way		
		by car		by PT (season ticket)	by car		by PT (season ticket)
		Including parking	Not including parking		Including parking	Not including parking	
SE	Stockholm	7.20	0.85	3.25	8.48	1.91	3.25
UK	London[59]	34.50	8.37	4.82	36.21	10.08	6.78
	Edinburgh	20.25	0.93	2.67	21.96	2.10	3.45

Clearly public transport is considerably cheaper in every case, assuming that car users pay full car parking fees in the city centre. However, in reality, most do not, and many have a private parking space that is not charged at all. A project such as this cannot analyse how much car users actually pay to park in cities, as this would require very extensive surveys, so the analysis is largely meant to show the differences in full parking prices between countries and differences in public transport fares. The following figure shows the data for a 5km trip, with the car costs including parking being omitted for clarity (as these are on a different scale, from around €5 to over €40 for an eight hour day).

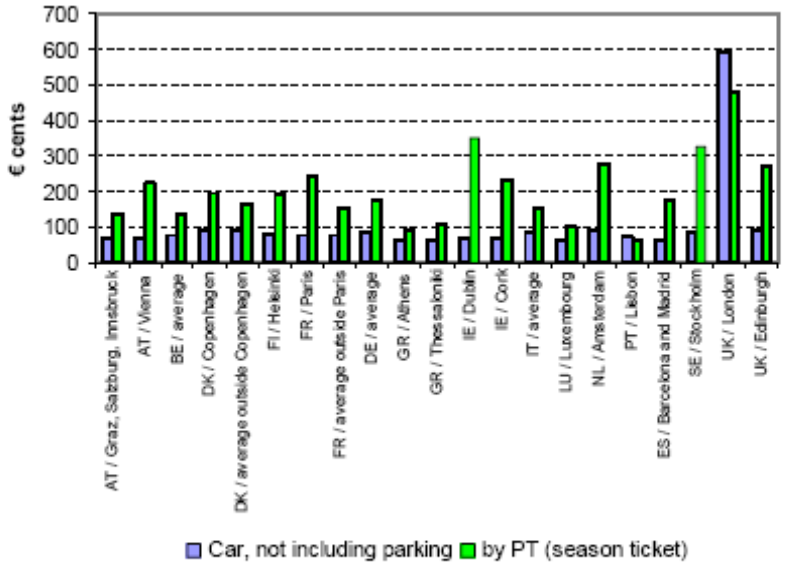


Figure 25: Peak out of pocket urban travel costs for a 5km return trip in 2004 (car, excluding parking, vs. public transport)

Looking at car costs excluding parking, most are significantly less than the public transport fare, with the notable exception of London, where the Congestion Charge makes public transport cheaper (despite it being the most expensive public transport in Europe). Longer distance public transport commuting in many Austrian and Italian cities is however relatively attractive, being only marginally more expensive than car fuel costs for a 15km return trip.

The cheapest public transport is in Greece, Portugal, Luxembourg and Austria (outside Vienna), at under €1.40 for a 5km return trip. The most expensive is in London, Dublin and Stockholm (all over €3 for a 5km return trip).

For the longer (15km) journey, the cheapest public transport is in Austria (outside Vienna), Greece and Italy (all under €2 for a return trip based on a season ticket). The most expensive cities were London, Amsterdam (over €5), Ireland (Dublin and Cork) and Copenhagen (over €4).

The ratio of public transport fare to the cost of using a car (with full parking fees being paid) is also of interest: in Copenhagen, Helsinki, all Austrian cities, Athens and Paris, the cost of

car use and parking is over ten times the price of a return public transport trip (5km each way). At the other end of the scale, Stockholm, Luxembourg, France (outside Paris) and Spain have the lowest ratio, with car between two and seven times more expensive than public transport.

Figure 26 shows the data for the longer 15km trip, again with car parking being excluded from the motoring costs. Again, London has the most expensive public transport fares, but taking into account the Congestion Charge, public transport into the city centre is still cheaper than by car.

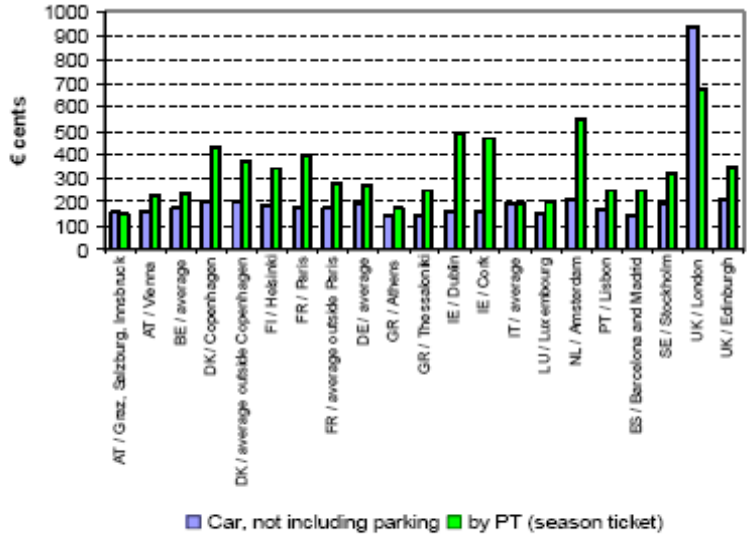


Figure 26: Peak out of pocket urban travel costs for a 15km return trip in 2004 (car, excluding parking, vs. public transport)

B Off-peak Out-of-pocket Urban Travel Costs

This indicator is identical that above except that the trip type (again 5 and 15km return trips) is assumed to be a shopping/leisure trip on a Saturday, spending two hours in the city centre.

For the trip by car, fuel and two hours parking is assumed. By public transport, the price of a day return ticket (if available), or two singles, or a day rover type pass is used, whichever is the cheapest.

Given that single or day return fares often are more expensive than 1/20th of a season ticket, these "off-peak" public transport fares mostly appear to be more expensive than the "peak" ones: however, this analysis is based on an occasional traveller to the city centre who is faced with either paying the normal public transport fare or driving (regular commuters who have a season ticket clearly have an incentive to use public transport for their off-peak leisure journeys if their pass is valid, and in this indicator it is looked at users who do not have this incentive).

Table 11 shows the results. The columns for car costs excluding parking are not shown because, firstly the prices are equivalent to those in Table 10 (except that in London the Congestion Charge does not apply at weekends), and secondly, because occasional Saturday visitors are more likely to have to pay for parking than commuters who may have a free parking space.

The greatest price advantage for public transport over the car is in Austria (particularly Vienna), Greece, Helsinki, Copenhagen and London. For certain journeys in Sweden, the

UK, Ireland, Germany and France, the fuel and parking for a car can be slightly cheaper than the public transport fare, particularly for the longer 15km trip.

Table 11: Off-peak out of pocket travel costs in 2004 in euro

	Cities	5km each way by car	5km each way by PT (return ticket)	15km each way by car	15km each way by PT (return ticket)
AT	Graz, Salzburg, Innsbruck	5.45	1.53	6.56	2.25
	Vienna	20.62	1.50	21.73	1.50
BE	Average	4.14	2.40	5.29	4.20
DK	Copenhagen	3.45 to 7.46	1.88	4.81 to 8.82	3.82
	average outside Copenhagen	4.12	1.41	5.48	1.88
FI	Helsinki	8.62	1.40	9.72	3.00
FR	Paris	6.68	2.60	7.90	7.00
	average outside Paris	3.68	1.92	4.90	6.40
DE	Average	4.22	3.60	5.52	5.95
GR	Athens	7.55	1.40	8.55	2.60
	Thessaloniki	5.05	0.90	6.05	1.50
IE	Dublin	4.66	3.00	5.86	7.00
	Cork	3.66	2.40	4.86	5.00
IT	Average	3.70	1.90	4.95	2.45
LU	Luxembourg	2.07	1.84	3.28	3.70
NL	Amsterdam	7.40	3.20	9.20	4.50
PT	Lisbon	1.67	1.30	2.69	1.65
ES	Barcelona and Madrid	2.78	2.30	3.81	4.60
SE	Stockholm	3.34 to 5.04	4.33	4.61 to 6.31	8.23
	London	11.64	3.71	13.35	7.57

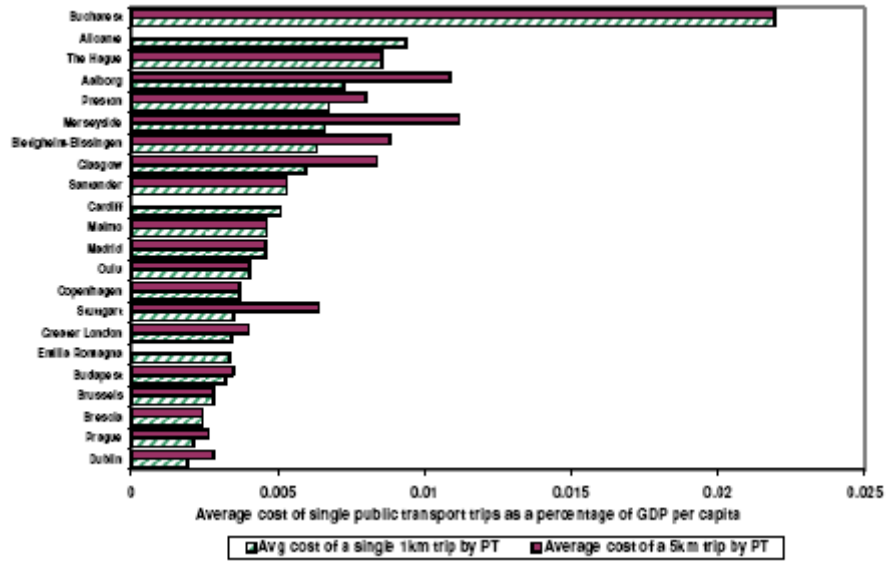
	Cities	5km each way by car	5km each way by PT (return ticket)	15km each way by car	15km each way by PT (return ticket)
UK	London	11.64	3.71	13.35	7.57
	Edinburgh	2.73	2.97	4.44	5.34

2.10.2.3 Data for a sample of European cities (Urban Transport Benchmarking Initiative)

The "Urban Transport Benchmarking Initiative"[77], provides the following analysis and data.

"The following figure compares the average cost (cost averaged across all modes) of public transport as a proportion of GDP per capita for 1km and 5km trips. The data presented in the figure indicates that the average cost of single public transport trips is significantly higher in Bucharest than in any other city (more than twice the proportion of the second most expensive, Alicante). For most of the benchmarking cities the average cost is between 0.0025% and 0.0075% of GDP per capita, but in Bucharest it is greater than 0.02%."

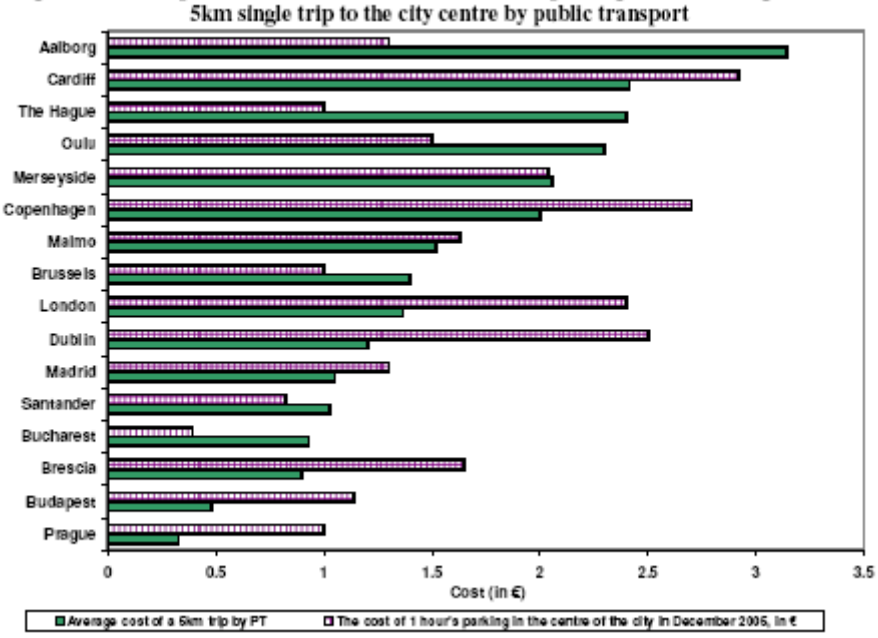
Figure 5.27: The cost in real terms of single public transport trips over a distance of 1km and 5km in 2003.



"In the next figure, the data for the cost of an hour's parking in the city centre has been displayed and contrasted against the average cost of a 5km trip by public transport.

Of the sixteen cities which were able to provide data for these indicators a total of seven (Cardiff, London, Dublin, Madrid, Brescia, Budapest and Prague) showed that one hour's parking in the city centre was more expensive than a 5 km trip to the city centre."

Figure 5.29: Comparison between the cost of one hour's parking and the average cost of a 5km single trip to the city centre by public transport



2.11 EMPLOYMENT IN THE URBAN PUBLIC TRANSPORT SECTOR

2.11.1 Quantitative analysis

2.11.1.1 Eurostat

In 2004, in the EU-25, **1 700 991 persons**[78] were **employed in the road passenger transport sector (bus, coach and taxi operations)**.

A total of 8.2 million persons were employed in the transport sector (road: freight and passenger transport, sea transport, air transport, railways, inland water transport, pipelines, travel agencies and tour operators, other auxiliary transport activities).

The employment in the road passenger transport sector represented therefore 20.7% of the total employment in the transport sector in the EU-25.

Employment by mode of transport in the EU-25 in 2004

Total	Road		Sea transport	Air transport	Railways	Inland water transport	Pipelines	Travel agencies and tour operators	Other auxiliary transport activities
	Freight transport	Passenger transport							
8 224 582	2 600 659	1 700 991	163 325	396 649	911 848	36 746	10 134	478 680	1 925 550

A study[79] published by Eurostat in 2000 provides the following information.

"The passenger land transport sector consists of buses and urban railways, taxis and coach charter services. Passenger transport by interurban railways is excluded."

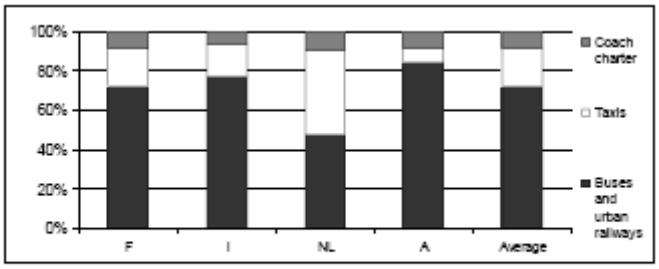


Figure 1: Distribution of persons employed in passenger land transport (various reference years, see table 2 for details)

Table 1: Enterprises population in passenger land transport

		Number of enterprises			
	Year	Pass-enger land transport	Buses and urban railways	Taxis	Coach charter
EU 15	:	:	:	:	:
B	:	:	:	:	:
DK	1996	:	262	:	:
D	:	:	:	:	:
EL	:	:	:	:	:
E (1)	1997	66911	3679	63107	3672
F (2)	1997	33648	1842	23624	1190
IRL	:	:	:	:	:
I	1996	22659	2406	17464	2989
L	1996	176	:	:	:
NL (3)	1997	3085	66	3295	245
A (4)	1998	4187	516	2881	561
P	:	:	:	:	:
FIN	1998	9022	:	:	:
S (2)	1996	9594	988	7850	445
UK (5)	1997	8471	2401	4332	1679

(1) Data for 60.22 and 60.23: 1996 (for 60.21: 1994)
(2) Data for 60.21, 60.22 and 60.23: 1994
(3) Data for 60.21, 60.22 and 60.23: 1993
(4) Data for 60.21, 60.22 and 60.23: 1991
(5) Data for 60.21, 60.22 and 60.23: 1996

Table 2: Employment in passenger land transport

		Number of persons employed			
	Year	Pass-enger land transport	Buses and urban railways	Taxis	Coach charter
EU 15	:	:	:	:	:
B	1997	27974	:	:	:
DK	1996	:	13784	:	:
D	:	:	:	:	:
EL	:	:	:	:	:
E (1)	1996	:	65265	:	38180
F (2)	1996	173305	118295	31012	13662
IRL	:	:	:	:	:
I	1996	136011	105384	22379	8248
L	1996	1867	:	:	:
NL	1993	58295	27805	24935	5555
A (3)	1998	37710	67966	5907	6962
P	:	:	:	:	:
FIN	1998	24076	:	:	:
S	:	:	:	:	:
UK	:	:	:	:	:

(1) Data for 60.21: 1994
(2) Data for 60.21, 60.22 and 60.23: 1994
(3) Data for 60.21, 60.22 and 60.23: 1991

Table 3: Self-employment rate (%)

		Self-employment rate			
	Year	Pass-enger land transport	Buses and urban railways	Taxis	Coach charter
EU 15	:	:	:	:	:
B	1997	8	:	:	:
DK	1996	:	1	:	:
D	:	:	:	:	:
EL	:	:	:	:	:
E (1)	1996	:	4	:	7
F (2)	1996	16	1	77	6
IRL	:	:	:	:	:
I	1996	18	3	81	43
L	1996	10	:	:	:
NL	1993	6	0	13	1
A (3)	1998	11	:	0	:
P	:	:	:	:	:
FIN	1998	42	:	:	:
S	:	:	:	:	:
UK	:	:	:	:	:

(1) Data for 60.23: 1994
(2) Data for 60.21, 60.22 and 60.23: 1994
(3) Data for 60.22: 1991

"The concentration (few and large enterprises) in buses and urban railways is confirmed by the low self-employment and may be due to the high infrastructure investments required in this business. The taxis sector shows the opposite tendency, with a high self-employment rate due to the low costs of entry."

2.11.1.2 CTUE project

The CTUE is a European project devoted to the evolution of competencies within urban transport and drivers' qualifications in six European countries: France, Italy, Germany, Poland, the Netherlands and the United Kingdom. It provides the following analysis on the labour market situation of the urban transport drivers in these countries.

Gender

"Woman employment within the drivers is an issue for the companies. Especially those which suffer difficulty in recruiting. For example, in the north of Italy, companies made specific effort toward women to attract thon as they suffer a higher rate of unemployment."

Woman proportion within the drivers

	Italy Approximation for 2001	Germany 2001[7]	Poland 2002[8]	Great Britain 2002[9]	France* 2003[10]
Number of Women drivers	939	4,421	870**	12,000	2,987
Proportion of Women drivers	2%	7,4%***	3,3%	8,8%	10,9%

* Data from the UTP's survey on 103 enterprises representing 97% of the urban transport undertakings (excluding RATP et SNCF Ile de France).
** Among these 870 Women drivers, 777 are tramways drivers, 74 are trolley bus drivers and only 19 bus drivers.
*** The Women proportion rise to 18,2% in the rail transportation enterprises members of the VDV.

As the table shows it, the women proportion is still rather low. Italy and Poland, maybe for cultural reasons, are the two countries the less open to women drivers. France is leading the way for women employment.

Age structure

"The drivers, as the rest of the staff employed in the urban transport sector and the overall European working population, is ageing."

"In Germany, the driver age structure in both passenger and goods transport shows a clear rise of the average age in the period of 1996 to 2001. In 1996 a third (32.3%) of all drivers were less than 35 years of age. By 2001 only a quarter (25.9%) were left benefiting to the 35 to 50 years of age category which rose from 43.6% of drivers in 1996 to 48.8% in 2001.

In Poland, 62% of the 133 companies surveyed by the GKM declared having an ageing staff."

Staff and Drivers distribution per age in France in 2004

	Overall staff		Drivers
	percentage	Trend since 2001	percentage
Under 25 years	1,7	→	1,4
25-40 years	37,7	↘	39,8
41-50 years	35	↘	34,2
51-54 years	14,2	↘	13,9
55-59 years	10,8	↗	10,2
60 years and more	0,6	→	0,5

Source: UTP

Seniority

Along with the ageing population, the average seniority seems to be increasing.

Staff and drivers seniority in France in 2004

	Overall staff		Drivers
	percentage	Trend since 2001	percentage
Less than 1 year	4.7	↘	5.1
From 1 year to less than 3 years	10	↘	11.4
From 3 years to less than 5 years	12.2	↗	13.9
From 5 years to less than 10 years	19.5	↗	21.2
From 10 years to less than 15 years	14.2	↗	14.4
From 15 years to less than 20 years	8.1	↘	7.7
From 20 years to less than 25 years	14.1	→	12.1
More than 25 years	17.2	↗	14.2

The trends are calculated from the year 2001 - Source: UTP

Contract situation

Contracts in urban transport are full time and long term ones, whatever the country considered. Following the development of part time and short term contract in other sectors of the services industry, the transport increase its use of these types on contracts. The development of short terms and part time contracts are seen as a way to attract new population to the driver job. Following the same idea of attraction for more free time, Women are supposed to be favourable to part time job, considering their specific arbitration between family and professional life. Consequently, the possibility to work part time is often part of the recruitment process targeting women. But these contracts are also flexibility tools. They allow to absorb seasonal changes in the activity without having to hire

new drivers. Though, it is less used than in other sectors of the economy because the transport activity level is rather easy to plan.

Distribution in Europe of the contracts by type: full or part time

Contract type	Italy 2001[11]	Poland* 2002[12]	Great Britain 2002[13]	France 2002[14]
Part time	3.9	7.1*	12.8	11
Full Time	96.1	92.3*	87.2	89

* the remaining 0.8% corresponds to self employment and tasks contracts

2.11.1.3 UITP

In the document[80] "Public Transport, the Lisbon Strategy and Sustainable Development", the UITP provides the following analysis concerning jobs creation.

"There are no comprehensive statistics available for numbers employed in public transport for the EU as a whole. National statistics for some Member States suggest that direct employment in public transport ranges from 1% to 2%. **For the EU 25, UITP estimates that around 900,000 people are employed in urban public transport.** In many medium and small urban areas the local bus operator is often the largest employer in the area. Rail product suppliers claim that urban, suburban and regional rail systems account for about 50% of their total turnover, estimated at EUR 36 billion annually (world-wide "accessible" market including all rail supplies, but excluding infrastructure).

Studies in Europe and the USA show that around 30 jobs are created for every EUR 1 million invested in public transport infrastructure and around 57 jobs for a similar investment in public transport operations.

In Switzerland every direct job in public transport is linked to 4.1 jobs in other sectors of the economy."

2.11.2 Qualitative analysis

The Joint statement[81] by the UITP European Union Committee and the European Transport Workers' Federation on the proposed Green Paper on Urban Mobility, mentions the following, relative to employment in the urban areas.

"Employees are key to the success of public transport operations. The quality of the working environment is an essential element for assuring quality services to the customers. It is therefore important to promote the availability of occupational training to improve quality and service.

It is important that it enables learning and development of the employees within the companies. Remuneration, benefits, working conditions and conditions of employment should attract, retain, motivate and reward employees. The social partners at all relevant levels have an important role in this regard.

Policies aiming at modal shift from private car over to public transport put in place by authorities, as well as commercial policies instigated by operators to win over new clients, will generate new activities and imply continual growth in the quality of services produced. This will cause employment in the public transport sector to rise both in terms of quantity and quality.

The role of public transport in achieving sustainable urban transport systems will result in greater numbers of employees in both the planning and operation of services in a large sense, and it is important that there is appropriate investment. This may create serious challenges, particularly where staff shortages and high turnover are experienced. It is therefore important that employers, employees and trade unions consider together how best to retain and attract people with appropriate skills and aptitudes. Will for example training facilities be adequate and are recruitment policies sufficiently diverse to attract the required numbers?

The Green Paper should address these issues, particularly with regard to identifying best practices and emphasise the importance of social dialogue."

2.12 SOCIAL TRENDS (INCLUDING CONSUMER ISSUES, PASSENGER RIGHTS, SOCIAL EXCLUSION AND ACCESSIBILITY)

2.12.1 Consumer issues, passenger rights

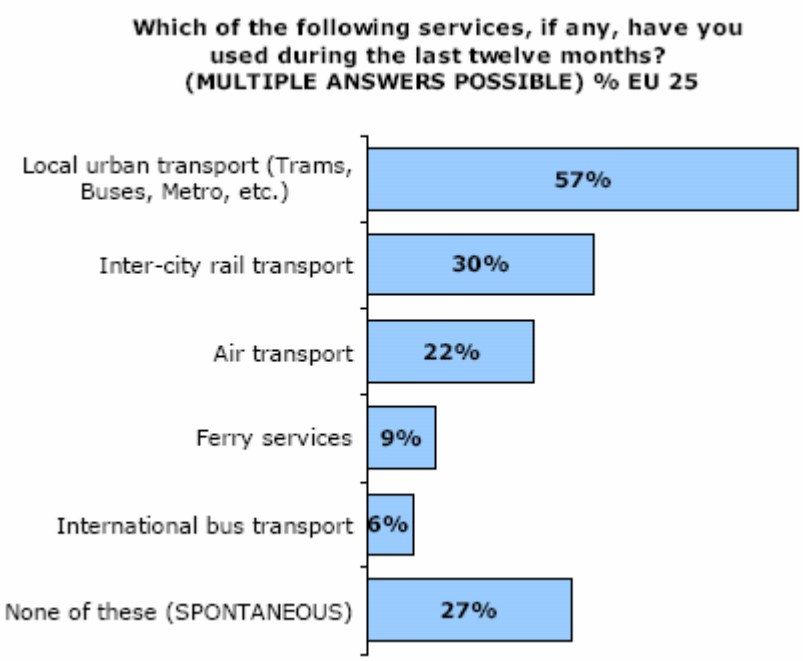
2.12.1.1 Eurobarometer: Passengers' rights[82]

Along with punctuality and safety, protection of passenger's rights is a key factor determining a passenger's choice of a particular mode of transport.

How Europeans rate the different transport services and how they view travelling across borders in the European Union in general are also aspects the Commission wished to study through the Eurobarometer.

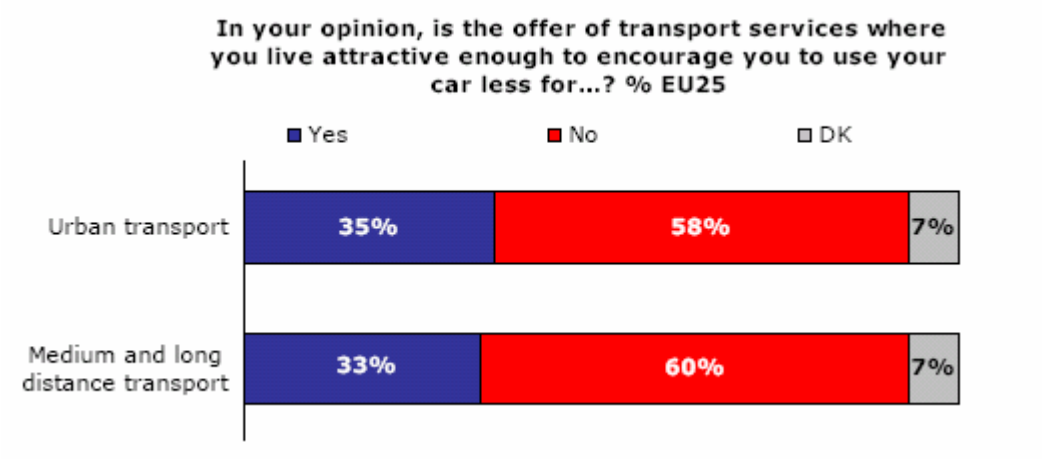
A European citizens and transport services

Results show that over one in two citizens (57%) has used local urban transport during the last year. This is by far the transport service which has been the most commonly used by Europeans.



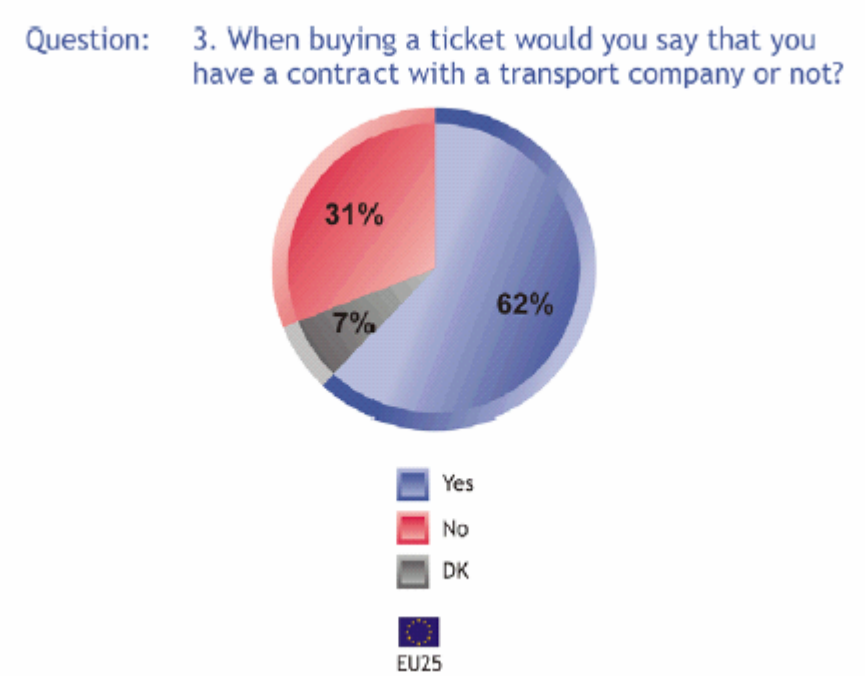
Results for the average of the 25 European Union countries show us that a majority of European citizens do not feel encouraged to use their car less thanks to the offer of transport service where they live. This is both the case for urban transport (58%) and for medium and long distance transport (60%) for which Europeans make almost no distinction. The car

remains an essential means of transportation for Europeans. Transport services need therefore to make important efforts in order to become more attractive in the eyes of European citizens so as to encourage them to use their cars less for their transport needs.

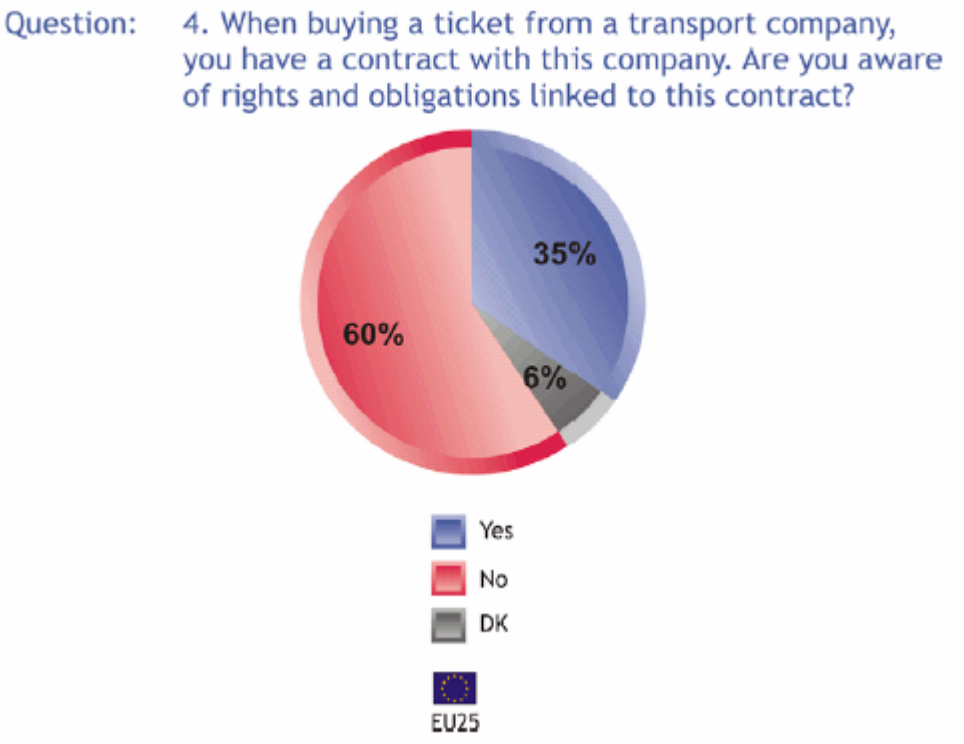


B Awareness of passengers' rights

Almost two thirds of citizens of the European Union (62%) are aware that they have a contract with a transport company when they buy a ticket from them.



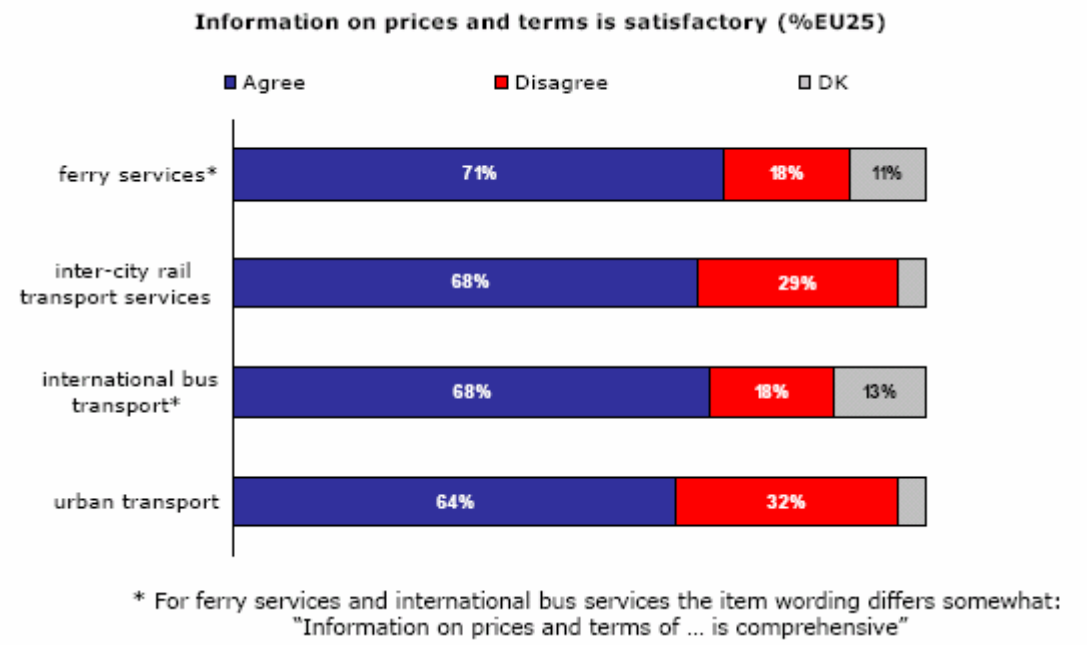
Although a majority of European citizens is aware of the existence of a contract between them and a transport company when they purchase a ticket, only a minority of them (35%) knows what rights and obligations are actually linked to this contract; 60% indicate that they are not aware of the contractual rights and obligations linked to this contract.



C Overview of the perception and satisfaction of transport services

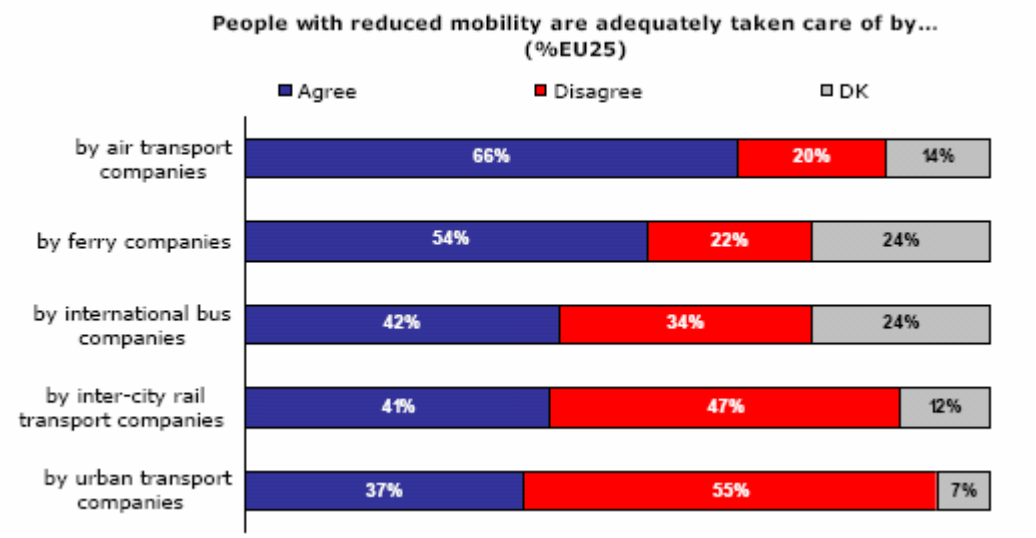
A rate of satisfaction of 64% concerning information on prices and terms is reached for urban transport. One third (32%) of citizens does not find this information satisfactory.

The rate of satisfaction for urban transport is lower than for the other modes considered in the survey: ferry services, inter-city rail services, international bus transport.



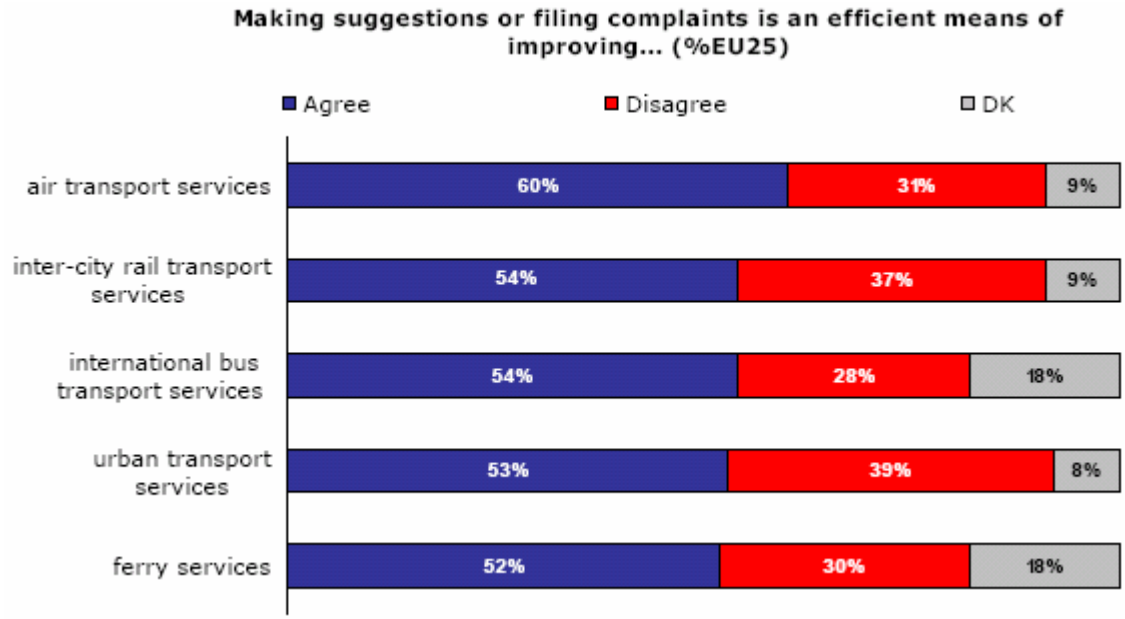
For the statement that people with reduced mobility are adequately taken care of, the results for urban transport companies show that only a minority of 37% agrees with this statement against 55% who disagree that people with reduced mobility are adequately taken care of by these companies.

Also, the rate of satisfaction is lower for urban transport companies than for the other modes considered in the survey: air transport, ferry, international bus, inter-city rail companies.



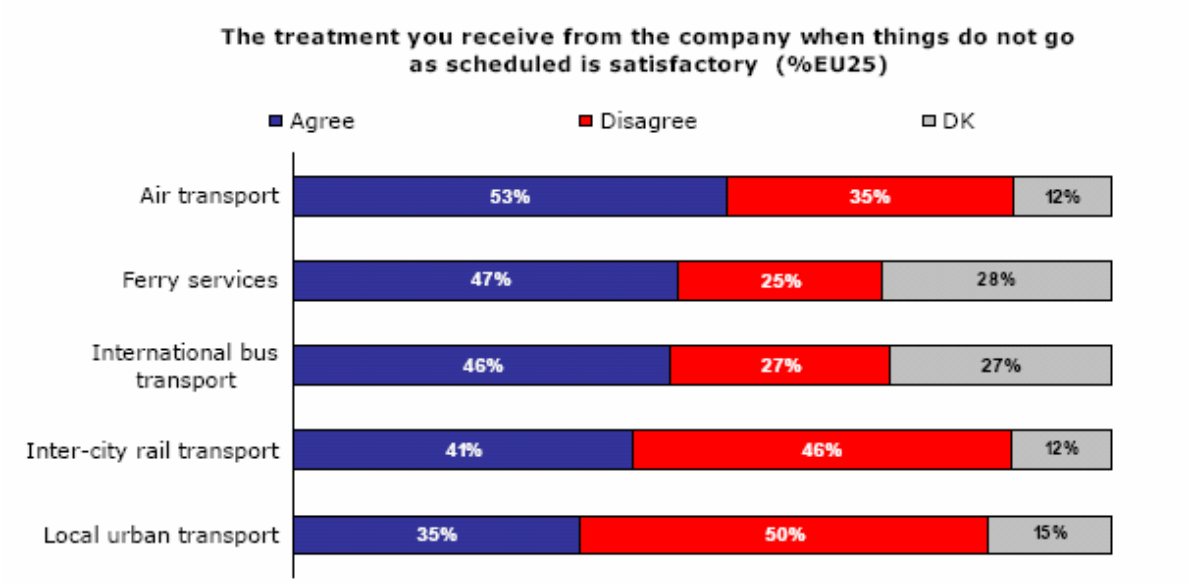
Making suggestions or filing complaints is seen as an efficient means of improving urban transport services by 53% of the respondents. This is one of the lowest percentages compared with the other modes.

The highest percentage of people disagreeing with the statement (39%) is observed within the urban transport users.



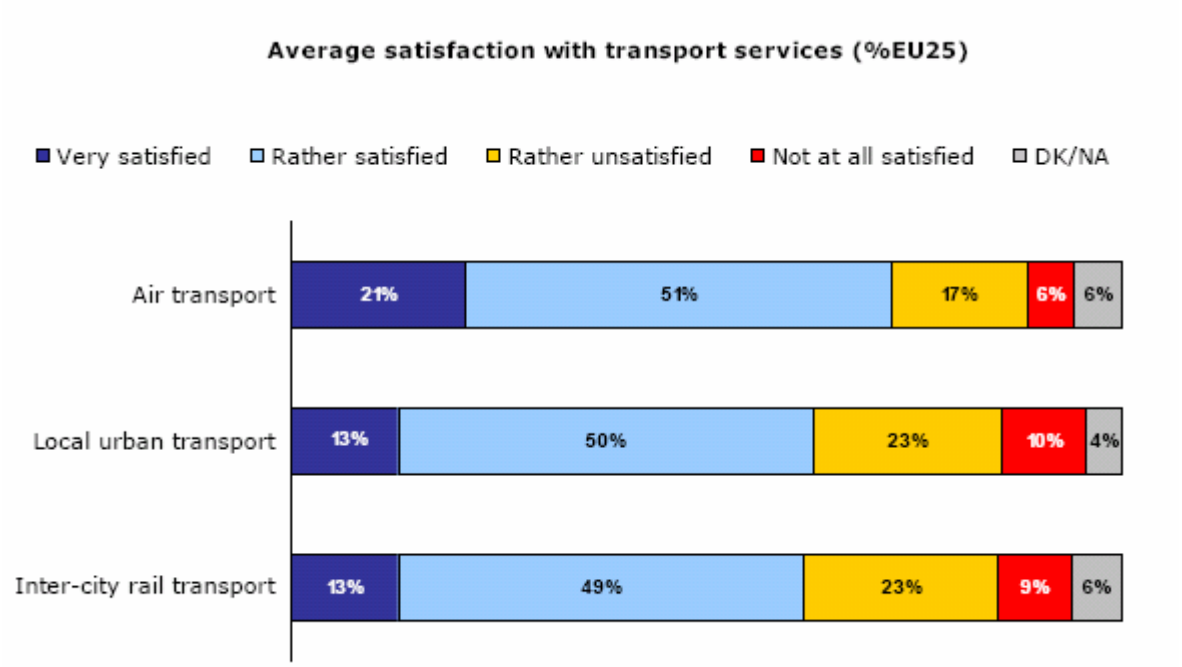
A real dissatisfaction of local urban transport is observed concerning the treatment that its users receive from the company when things do not go as scheduled. Indeed, only 35% are satisfied with the treatment received and 50% are not satisfied.

Local urban transport has the worse scores for this topic compared with the other transport modes considered in the survey.



Concerning the average satisfaction with transport services, local urban transport counts 63% of respondents who are globally satisfied, of which 13% are "very satisfied" and 50% are "rather satisfied".

The rate of persons unsatisfied with local urban transport, with 33% showing this opinion, is significantly higher than for air transport (23%) and close to inter-city rail transport (32%).



2.12.2 Social exclusion and accessibility

2.12.2.1 Special edition of the Eurobarometer on social aspects

Since 1973, Eurobarometers have regularly surveyed Europeans on their satisfaction with different aspects of life. In 2006, a special edition of the Eurobarometer has provided indicators on social aspects[83].

A sample of the European population, consisting in 24 815 people from the 25 EU Member States, was questioned. Among them, 33% state to live in rural areas or villages, the other 67% live in small, middle sized or large towns.

Question: Would you say you live in a...?

	UE25 EU25
TOTAL	24815
Dans une commune rurale Rural area or village	8212 *33%*
Dans une ville petite ou moyenne Small or middle sized town	10759 *43%*
Dans une grande ville Large town	5815 *23%*
NSP DK	29 *0%*

The results of the specific questions regarding urban transport are summarized below.

- 80% of the questioned persons state to have an easy (physical) access to the local transport networks (bus, tram, underground, etc.) and 13% consider that such access is difficult.

  Question: In general, would you say that access to the local transport networks (bus, tram, underground, etc.) is easy or difficult for you? By that, I do not mean "affordability".

	UE25 EU25
TOTAL	24815
Accès facile Easy access	19898 *80%*
Accès difficile Difficult access	3332 *13%*
Pas d'accès (SPONTANE) No access (SPONTANEOUS)	1006 *4%*
NSP DK	579 *2%*

- 65% of the questioned persons state to use transport services within towns \ cities (bus, tram, underground, etc.).

  Question: Could you tell me which of the following services do you use? (Transport services within towns\ cities (bus, tram, underground, etc.))

	UE25 EU25
TOTAL	23229
Les services de transports locaux (bus, tram, métro, etc.) Transport services within towns\ cities (bus, tram, underground, etc.)	15193 *65%*

- 78% of the questioned persons agree to say that the price of transport services within town\cities is affordable. 10% state not to be able to afford the service they need and 10% expressed that the price is excessive.

  Question: In general, would you say that the price of transport services within towns\ cities (bus, tram, underground, etc.) is affordable or not? By that, I mean that I would like to know if you are able to afford the services you need.

	UE25 EU25
TOTAL	15193
Abordables Affordable	11890 *78%*
Pas abordables Not affordable	1536 *10%*
Excessifs (SPONTANE) Excessive (SPONTANE)	1497 *10%*
NSP DK	270 *2%*

- In 2004-2005, 4% of the questioned persons have personally made a complaint about an aspect of transport services within town \ cities:
  - 3% to the service provider,
  - 0.6% (rounded to 1% in the next table) to a complaint handling body (consumer organisation, European Consumer Centre, ombudsman, regulator),
  - 0.4% (rounded to 0% in the next table) to another party.

Question: In the last two years, have you personally made a complaint about any aspect of transport services within towns\ cities?

	UE25 EU25
TOTAL	15193
Oui, au fournisseur de service Yes, to the service provider	476 *3%*
Oui, à un organisme de traitement de plaintes (organisation de consommateurs, Centre européen des consommateurs, médiateur, organisme de contrôle) Yes, to a complaint handling body (consumer organisation, European Consumer Centre, ombudsman, regulator)	96 *1%*
Oui, à une autre organisation (p. ex. organisation professionnelle) Yes, to another party (e.g. industry body)	55 *0%*
Non No	14476 *95%*
NSP DK	94 *1%*
Oui Yes	624 *4%*

- 60% of the questioned persons think that the consumers' interests are well protected in respect of transport services within town \ cities, of which 9% think they are very well protected.
  21% of the respondents consider that they are badly protected, of which 5% think they are very badly protected.

Question: In general, how well do you think consumers' interests are protected in respect of the following services? Transport services within towns\ cities

	UE25 EU25
TOTAL	24815
Très bien Very well	2353 *9%*
Plutôt bien Fairly well	12507 *50%*
Plutôt mal Fairly badly	4019 *16%*
Très mal Very badly	1236 *5%*
NSP DK	4700 *19%*
Bien Well	14860 *60%*
Mal Badly	5255 *21%*

2.12.2.2 People with reduced mobility

People with reduced mobility (PRM) represent an important proportion of the EU population (about 35-40%). They are principally disabled people, elderly people but also people with a large amount of luggage or shopping bags, people with children in buggies, people with temporary injuries. The Commission has carried out and is currently promoting a series of initiatives aiming to facilitate and improve the accessibility to public transport for these citizens[84].

For social concerns, four common indicators were identified:

- The proportion of public transport vehicles which are wheelchair accessible, by mode. This indicator is expressed in % [85];
- The proportion (%) of public transport infrastructure (stops/stations) which are wheelchair accessible[85];
- Perception of public transport accessibility: attitude survey of perception of physical accessibility of the public transport network (distance to nearest public transport stops): percentage of the population living within less than 300 metres of a stop served every 30 minutes on normal working days [86].
- Satisfaction of people using the public transports.

A Proportion of public transport vehicles which are wheelchair accessible

"It is important to note that the data collected has used the term "wheelchair accessible" as a means of ensuring comparability across the benchmarking cities. While it is acknowledged that wheelchair users only represent one group of disabled travellers in cities, this distinction was essential in order to make use of available and comparable data."

The following figures[87] show the proportion of bus fleets which are wheelchair accessible in each of the benchmarking cities.

Figure 5.12a: Accessibility of bus vehicles operating in the benchmarking cities (continued in Figure 5.12b)

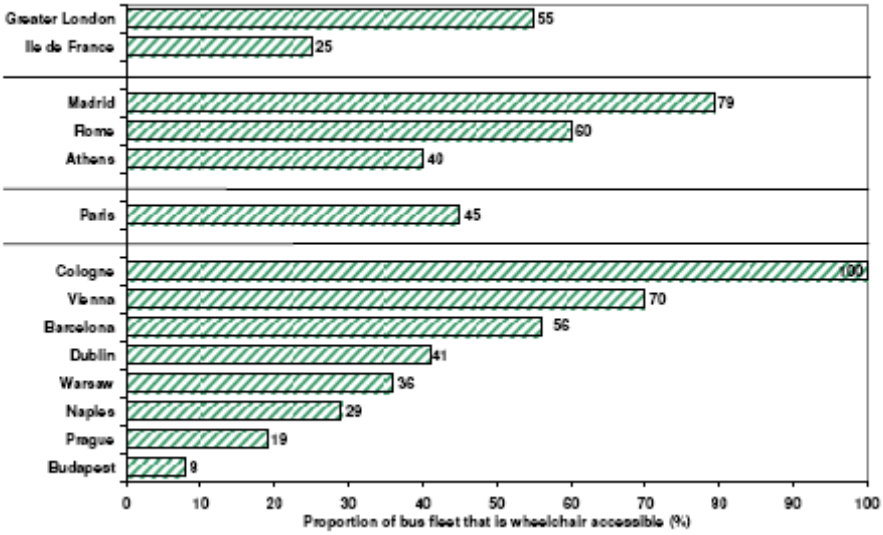
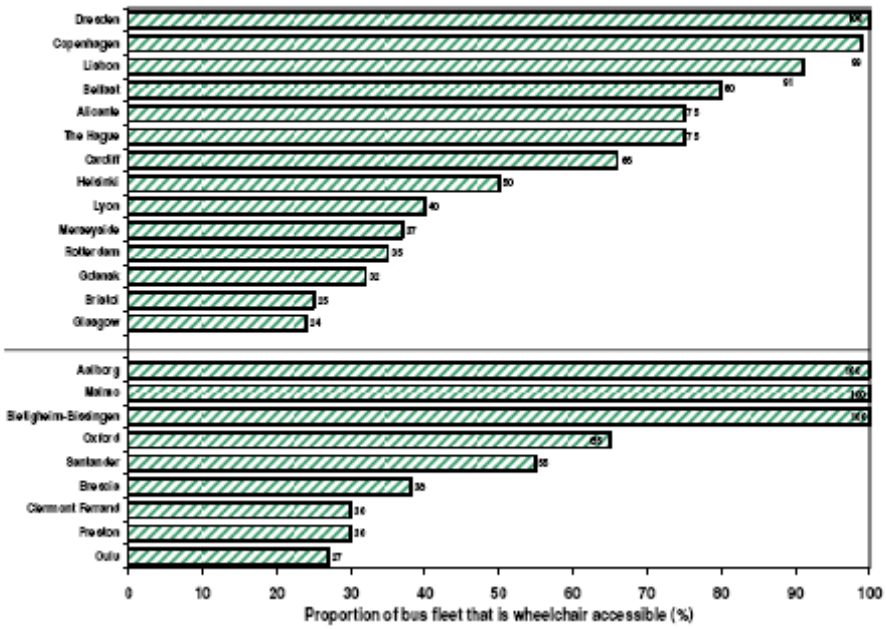
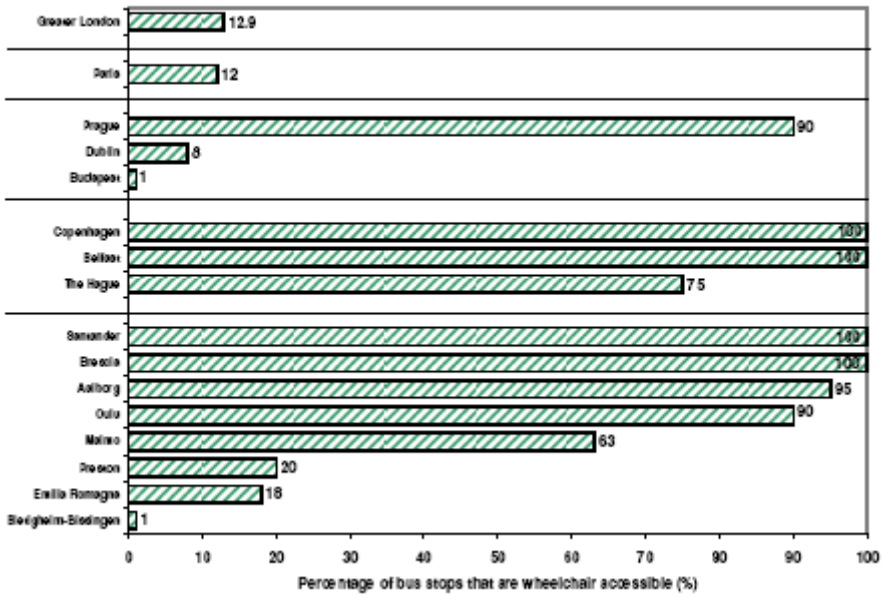


Figure 5.12b: Accessibility of bus vehicles operating in the benchmarking cities (continued)



The next figure[88] focuses on the accessibility of bus infrastructure in the cities.

Figure 5.13: Accessibility of bus infrastructure in the benchmarking cities



The following figures[89] illustrate the accessibility of train, tram and metro fleets, and infrastructure, in the benchmarking cities.

Figure 5.14: Accessibility of train vehicles in the benchmarking cities

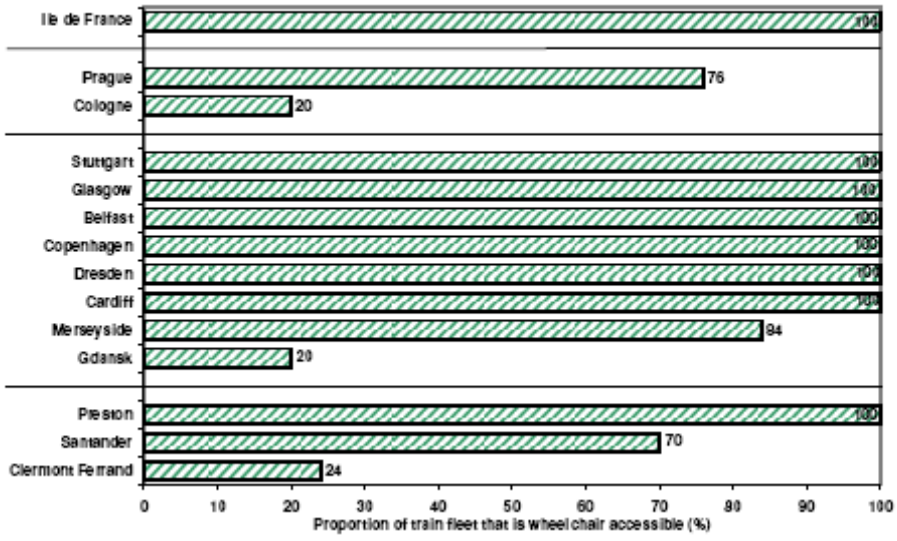


Figure 5.15: Accessibility of train infrastructure in the benchmarking cities

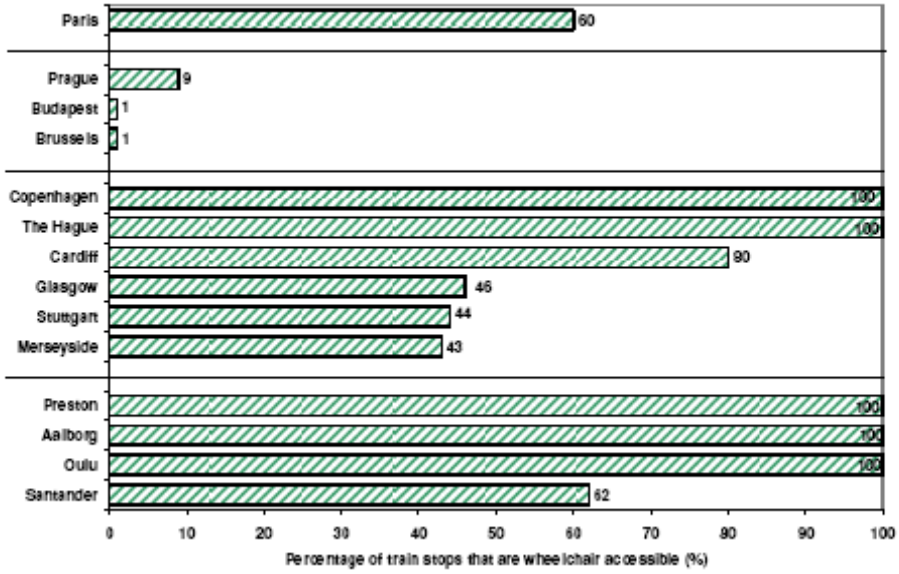


Figure 5.16: Accessibility of tram vehicles in the benchmarking cities

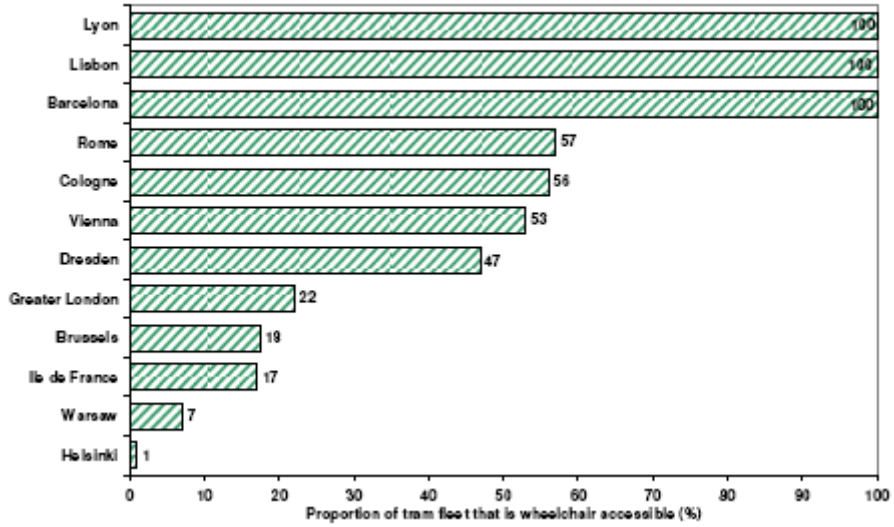


Figure 5.17: Accessibility of tram infrastructure in the benchmarking cities

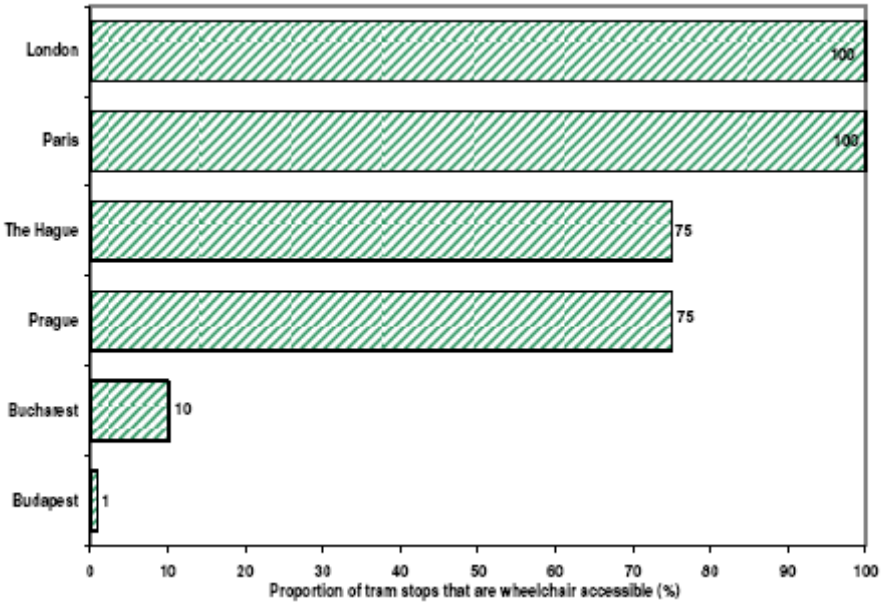


Figure 5.18: Accessibility of metro vehicles in the benchmarking cities

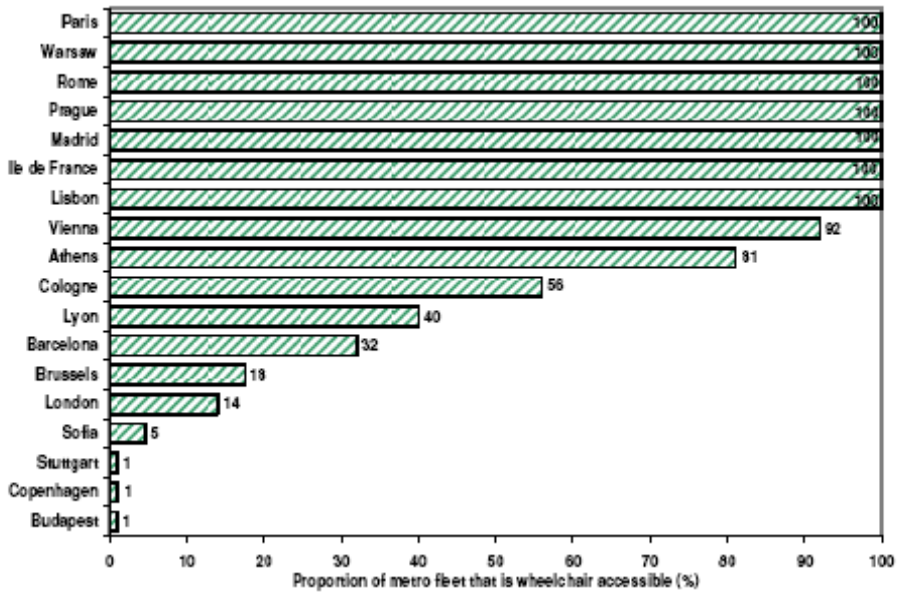
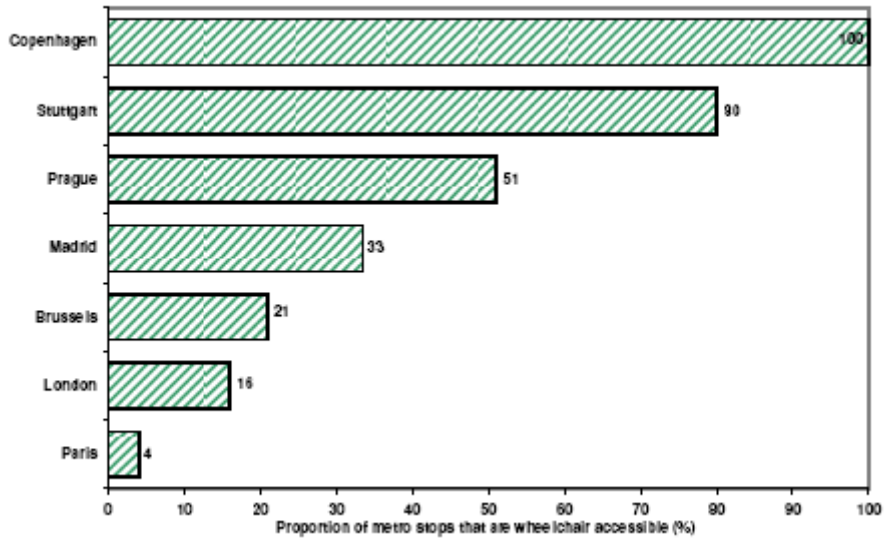


Figure 5.19: Accessibility of metro infrastructure in the benchmarking cities



A statistical analysis of the data collected in the "Urban Transport Benchmarking Initiative" gives, for the benchmarking cities[90] :

- An average accessibility of public transport by mode (proportion of public **transport vehicles** which are wheelchair accessible):
  - Bus: 55%
  - train: 78%
  - tram: 48%
  - metro: 58%

- an average accessibility of public transport infrastructure by mode (proportion (%) of public **transport infrastructure** (stops/stations) which are wheelchair accessible**)** :
  - bus: 55%
  - train: 60%
  - tram: 60%
  - metro: 45%

2.12.2.3 Social aspects and inclusion

In a presentation on "Urban transport, social aspects and inclusion"[91], Ms Ann Frye highlighted the following elements:

- "The population balance is shifting. To take the UK as an example of a common trend across Europe, it is observed:
  - Increasing longevity – average life expectancy in the UK will rise from 76 years now to 81 by 2030;

  - Baby boomers – the population boom of the post war years is reaching middle age;
  - Lower birth rates – the average number of children per family unit in the UK is now 1.7 (2.1 is needed to maintain a stable population).
  - This means that:
    - The centre of gravity of the population is shifting upwards significantly;
    - The number of people aged 50 and over in the UK is expected to rise from 20 million today to 25 million in 20 years' time;
    - By 2020, people of 50 and over will comprise half the adult population;
    - The numbers in younger age groups are projected to be static or to decline.
- What do the demographic trends mean for transport and mobility?
  - The growing imbalance between working age and older people will have profound economic as well as social implications;
  - the working age population will be too small to support an older population who are not self sufficient;
  - transport and mobility are key to maintaining self sufficiency and independence.
- And the link between age and disability:
  - There is a strong correlation between age and disability;
  - Two thirds of disabled people are elderly;
  - Over half the population aged over 75 has a disability.
- Facts and Figures:
  - There are some 50 million disabled people in the 27 countries of the European Union;
  - About 20% of adults have some form of long term disability;
    - 70% of them have difficulty walking and/or climbing stairs;
    - 41% have a hearing loss;
    - 24% have a vision loss;
    - One in four households has a disabled resident.
- Key issues:
  - Personal mobility is the key to independence. Without it, disabled people cannot:
    - Be self sufficient in daily living;
    - Find or keep employment;
    - Access health, education and other facilities.
  - The high cost of dependence falls on the individual but also on local and national health and welfare services which provide services in the home."

2.13 TECHNOLOGICAL TRENDS

2.13.1 Introduction

The growth of transport in and around urban areas in Europe generates significant negative effects such as congestion, emissions and accidents.

The need for more sustainable urban transport is putting more emphasis on R&D activities that address these issues. The current main areas of technological breakthrough regarding urban transport are the alternative sources of energy and the transport management systems. These aspects are developed hereafter.

2.13.2 Alternative sources of energy

2.13.2.1 Current situation

A recent study[92] provides the following analysis, which is applicable to public and private urban road transport.

"A wide range of non oil-based options for road and air transport has been developed in the last decade, and some technologies are already commercialised. However, it is currently impossible to predict which technologies will emerge as the front-runners for Europe. Five technological mainstreams are discussed today, mainly in relation to passenger transport[93]:

- Hydrogen and fuel cells
- Hybrids
- Battery Electric Vehicles
- Biofuels
- Natural Gas and LPG

In the long run, **hydrogen combined with fuel cells** seems to be a promising technology whereby serious technological problems remain unsolved, amongst them for instance questions concerning the performance of fuel cells, or from where large amounts of "clean" hydrogen may be taken. Different routes are being discussed including the generation of hydrogen from natural gas, from renewable sources, from coal and from nuclear power. Recently, the only affordable way of large-scale hydrogen production is via steam-reformation from natural gas. From a mid-term perspective, this route might support the market penetration of hydrogen and of fuel cells. The crucial point is that, in this case, hydrogen is derived from a fossil source. Hydrogen production from renewable sources (wind, photovoltaic, solarthermal, water) via electrolyses is often regarded as a kind of silver bullet since it enables close to zero emissions of greenhouse gases (GHG). But it is not clear if, at which time, and in which regions the production of hydrogen from renewable sources will be feasible at larger scales and at reasonable costs. A "clean" production of hydrogen from nuclear power is feasible as well. Controversies are related to nuclear power itself and to the finiteness of uranium resources. In terms of climate security the coal-route will be only suitable if it is combined with CO_2 sequestration and storing (CSS) – a technology that is still in the stage of basic research.

Hybrid technology is currently high on the agenda and extends its market shares. It offers a possibility to save energy and emissions by using established technologies and infrastructures. Whatever fuel and propulsion technology will be dominant in 20-30 years, it seems to be highly likely that hybrid technology will be part of the propulsion system. It is an important component of most fuel cell concepts and there seems to be a high potential to further improve the efficiency of conventional fuels. This "hybridisation" at the same time means an "electrification" of the drive train technology and, thus, supports a more dominant role of the electric engine in general.

The commercialisation of **pure electric cars** (Battery Electric Vehicles) strongly depends on the development of suitable batteries. In spite of decades of research and development activities, decisive technological breakthroughs regarding batteries are not in sight. Yet, a surprising breakthrough in battery technology is not completely impossible and would surely entail radical changes to both the transport and the energy sector.

Biofuels can be derived from a wide range of biomass and might serve as a relatively clean "bridging" or "additional" technology. So-called first generation fuels, mainly biodiesel and bioethanol, are the only renewable transport fuel option that is commercially deployed today. The production process is comparatively uncomplicated. Second generation biofuels are produced by synthesis, in most cases from synthesis gas, which is then treated in a so-called "biomass-to-liquid" process (BTL). A decisive benefit of BTL is the opportunity to define the properties of such "designer fuels" by setting the synthesis parameters; engine and fuel can be very well adjusted to each other. For second generation biofuels the whole plant or other forms of biomass can be used to produce fuel, in contrast to the production of "first generation" biofuels where only parts of the plants (oil, sugar, starch) are used. Biogas as well has the potential to contribute to climate and energy security. Blends with natural gas are imaginable. It is estimated that roughly between 20% and 30% of EU27 road transport fuels in 2030 could be covered by biofuels derived from European biomass (e.g. energy crops, agricultural and forestry residues, organic fraction of municipal solid waste). Imports of biomass are critically discussed since they might go at the expense of ecologically sensitive areas.

Natural gas technology (CNG) is feasible in the transport sector and has the potential to bring at least mid term improvements in terms of energy security and GHG emissions – whereby it is crucial that real "gas-engines" are being developed. But in particular its possible contribution to energy security strongly depends on the overall demand on natural gas. It is likely, that CNG vehicles will become at least established for niche applications (e.g. in larger fleets, in inner cities). Autogas (**LPG**) is a relatively uncomplicated technology. It offers environmental benefits at relatively low costs. It is becoming rather popular in several European countries. Since both CNG and LPG are based on fossil feedstock they must be considered as bridging technologies. They might help to pave the way for "cleaner" gaseous fuels such as hydrogen, bio-methane or DME.

Hybrids and Battery Electric Vehicles are not suitable for freight transport on roads. The potential of hybrids can only be fully tapped in urban transport and not in long-distance transport. For long-distance trucking biofuels, CNG, LPG or blends of those fuels in combination with improved conventional engines (ICE's) appears to be the most suitable solution at least from a short and mid-term perspective. The situation in 2047 might be different. However, one suitable solution might be to use the restricted potential of domestic biomass mainly for long-distance trucking and other options for urban transport.

The technologies mentioned above are all promising but all have clearly weak points and bottlenecks. Each single technological pathway faces difficulties in terms of serving the

complete future fuel demand of the EU27. Innovations will be needed in order to tackle the three central challenges in this field: climate change, energy security and competitive challenges. However, in the long run the predicted phase-out of oil would make business-as-usual impossible for all oil-based technological contexts. A phase-out of oil would, at the same time, exert pressure on European innovation regimes – "something new" has to come. Policy strategies should remain flexible and open enough to support ground-breaking innovations."

The Background Paper on the Promotion of Clean and Energy Efficient Vehicles[94], elaborated by the DG Tren, provides the following analysis.

"Alternative fuels have been given high weight in a Communication of the European Commission of 2001[95], which identified biofuels, natural gas, and hydrogen as the main candidates and proposed an indicative target of 20% market share overall by 2020.

Biofuels as the most mature and most promising alternative fuels with a perspective for fast market broadening have been supported by legislative actions adopted in 2003. A Directive on the promotion of the use of biofuels or other renewable fuels for transport[96] set reference targets for the market share of biofuels of 2% in 2005, increasing by three quarter of a per cent annually to 5.75% in 2010. A Directive on the taxation of energy products[97] allows Member States to reduce taxes on biofuels or completely exempt them from taxes.

Following up, the Alternative Fuels Contact Group called by the Commission from experts from the main stakeholders in Europe, assessed the technical and economical basis for future developments of alternative fuels and confirmed in its report on the "Market Development of Alternative Fuels" of December 2003 a considerable market potential for alternative fuels, consistent with the 20% substitution target for 2020.

These actions have resulted in important progress. The market share of biofuels has strongly increased, but it remains nevertheless still below the level required by the directive.

The sale of the natural gas vehicles and the number of natural gas filling stations have increased appreciably in some Member States where the use of natural gas or of biogas as motor fuel is supported by economic incentives or legislative obligations."

The recent "Well-to-wheels analysis of future automotive fuels and powertrains in the European context" study[98] carried out by EUCAR, CONCAWE and JRC has come to the following main conclusions.

"GENERAL OBSERVATIONS

- A Well-to-Wheels analysis is the essential basis to assess the impact of future fuel and powertrain options.
  - Both fuel production pathway and powertrain efficiency are key to GHG emissions and energy use.
  - A common methodology and data-set has been developed which provides a basis for the evaluation of pathways. It can be updated as technologies evolve.

- A shift to renewable/low fossil carbon routes may offer a significant GHG reduction potential but generally requires more energy. The specific pathway is critical.
- Results must further be evaluated in the context of volume potential, feasibility, practicability, costs and customer acceptance of the pathways investigated.
- *A shift to renewable/low carbon sources is currently expensive.*
  - *GHG emission reductions always entail costs but high cost does not always result in large GHG reductions*
- *No single fuel pathway offers a short term route to high volumes of "low carbon" fuel*
  - *Contributions from a number of technologies/routes will be needed*
  - *A wider variety of fuels may be expected in the market*
  - *Blends with conventional fuels and niche applications should be considered if they can produce significant GHG reductions at reasonable cost.*
- Large scale production of synthetic fuels or hydrogen from coal or gas offers the potential for GHG emissions reduction via CO2 capture and storage and this merits further study.
- *Advanced biofuels and hydrogen have a higher potential for substituting fossil fuels than conventional biofuels.*
- *High costs and the complexities around material collection, plant size, efficiency and costs, are likely to be major hurdles for the large scale development of these processes.*
- *Transport applications may not maximize the GHG reduction potential of renewable energies*
- *Optimum use of renewable energy sources such as biomass and wind requires consideration of the overall energy demand including stationary applications.*

CONVENTIONAL FUELS / VEHICLE TECHNOLOGIES

- Developments in engine and vehicle technologies will continue to contribute to the reduction of energy use and GHG emissions:
  - Within the timeframe considered in this study, higher energy efficiency improvements are predicted for the gasoline and CNG engine technology (PISI) than for the Diesel engine technology.
  - Hybridization of the conventional engine technologies can provide further energy and GHG emission benefits.
- *Hybrid technologies would, however, increase the complexity and cost of the vehicles.*

COMPRESSED NATURAL GAS, BIOGAS, LPG

- Today the WTW GHG emissions for CNG lie between gasoline and diesel, approaching diesel in the best case.
- Beyond 2010, greater engine efficiency gains are predicted for CNG vehicles, especially with hybridization.
  - WTW GHG emissions become lower than those of diesel.
  - WTW energy use remains higher than for gasoline except for hybrids for which it becomes lower than diesel.
- The origin of the natural gas and the supply pathway are critical to the overall WTW energy and GHG balance.
- LPG provides a small WTW GHG emissions saving compared to gasoline and diesel.

- *Limited CO2 saving potential coupled with refuelling infrastructure and vehicle costs lead to a fairly high cost per tonne of CO2 avoided for CNG and LPG.*
- *While natural gas supply is unlikely to be a serious issue at least in the medium term, infrastructure and market barriers are likely to be the main factors constraining the development of CNG.*
- *When made from waste material biogas provides high and relatively low cost GHG savings.*

ALTERNATIVE LIQUID FUELS

- A number of routes are available to produce alternative liquid fuels that can be used in blends with conventional fuels and, in some cases, neat, in the existing infrastructure and vehicles.
- The fossil energy and GHG savings of conventionally produced bio-fuels such as ethanol and bio-diesel are critically dependent on manufacturing processes and the fate of by-products.
  - The GHG balance is particularly uncertain because of nitrous oxide emissions from agriculture.
- ETBE can provide an option to use ethanol in gasoline as an alternative to direct ethanol blending. Fossil energy and GHG gains are commensurate with the amount of ethanol used.
- Processes converting the cellulose of woody biomass or straw into ethanol are being developed. They have an attractive fossil energy and GHG footprint.
- *Potential volumes of ethanol and bio-diesel are limited. The cost/benefit, including cost of CO2 avoidance and cost of fossil fuel substitution crucially depend on the specific pathway, by-product usage and N2O emissions. Ethanol from cellulose could significantly increase the production potential at a cost comparable with more traditional options or lower when using low value feedstocks such as straw.*
- High quality diesel fuel can be produced from natural gas (GTL) and coal (CTL). GHG emissions from GTL diesel are slightly higher than those of conventional diesel, CTL diesel produces considerably more GHG
- *In the medium term, GTL (and CTL) diesel will be available in limited quantities for use either in niche applications or as a high quality diesel fuel blending component.*
- New processes are being developed to produce synthetic diesel from biomass (BTL), offering lower overall GHG emissions, though still high energy use. Such advanced processes have the potential to save substantially more GHG emissions than current bio-fuel options.
- *BTL processes have the potential to save substantially more GHG emissions than current bio-fuel options at comparable cost and merit further study.*
  - *Issues such as land and biomass resources, material collection, plant size, efficiency and costs, may limit the application of these processes.*

DME

- DME can be produced from natural gas or biomass with better energy and GHG results than other GTL or BTL fuels. DME being the sole product, the yield of fuel for use for Diesel engines is high.
- *Use of DME as automotive fuel would require modified vehicles and infrastructure similar to LPG.*

- *The "black liquor" route which is being developed offers higher wood conversion efficiency compared to direct gasification and is particularly favourable in the case of DME.*

HYDROGEN

- Many potential production routes exist and the results are critically dependent on the pathway selected.
- If hydrogen is produced from natural gas:
  - WTW GHG emissions savings can only be achieved if hydrogen is used in fuel cell vehicles.
  - The WTW energy use / GHG emissions are higher for hydrogen ICE vehicles than for conventional and CNG vehicles.
- *In the short term, natural gas is the only viable and cheapest source of large scale hydrogen. WTW GHG emissions savings can only be achieved if hydrogen is used in fuel cell vehicles albeit at high costs.*
- *Hydrogen ICE vehicles will be available in the near-term at a lower cost than fuel cells. Their use would increase GHG emissions as long as hydrogen is produced from natural gas.*
- Electrolysis using EU-mix electricity results in higher GHG emissions than producing hydrogen directly from NG.
- Hydrogen from non-fossil sources (biomass, wind, nuclear) offers low overall GHG emissions.
- *Renewable sources of hydrogen have a limited potential and are at present expensive.*
- *More efficient use of renewables may be achieved through direct use as electricity rather than road fuels applications.*
- Indirect hydrogen through on-board autothermal reformers offers little GHG benefit compared to advanced conventional powertrains or hybrids.
- *On-board reformers could offer the opportunity to establish fuel cell vehicle technology with the existing fuel distribution infrastructure.*
- *The technical challenges in distribution, storage and use of hydrogen lead to high costs. Also the cost, availability, complexity and customer acceptance of vehicle technology utilizing hydrogen technology should not be underestimated.*
- For hydrogen as a transportation fuel virtually all GHG emissions occur in the WTT portion, making it particularly attractive for CO2 Capture & Storage."

2.13.2.2 Long term development

The conclusions of a study[99] carried out by the European Commission Joint Research Centre are the following.

"The scenarios described in this report investigated some issues of policy relevance concerning the introduction of alternative technologies in passenger cars. The analysis that was carried out identified a number of uncertainty factors that influence the potential of the various technologies in the sector and quantified their impact in the year 2020 horizon. Apart from the outlook of each technology in terms of market share, the scenarios also

provided estimates concerning the development of certain policy relevant indicators, such as fuel consumption and CO_2 emissions in the EU and each member state.

The main conclusion from the scenario analysis is that although alternative technologies are promising from the technical point of view, their market potential is questionable if no measures to support them are taken. Most scenarios describe a situation of the market being dominated by conventional internal combustion engines at least until 2010. The gradual shift from gasoline to diesel is expected to continue in the meanwhile and, under certain conditions, an evolution from conventional ICEs to hybrid vehicles (probably ICE- electric) can be expected afterwards. Electric vehicles can be expected to capture a limited market only, while the share of fuel cells can become significant in the longer term.

It is rather questionable, however, whether the optimistic path of technological development can be followed for each alternative. The high degree of uncertainty concerning their future costs, the intense competition with conventional technologies, and the large long-term investments normally necessary in order to realise the technological breakthroughs needed may prevent car manufacturers from committing themselves into bringing the alternative technologies to the market. On the other hand, the potential benefits in terms of fuel consumption and emissions may make it worthwhile for policy makers to provide stimuli for technological development or to implement suitable measures that would reduce the degree of uncertainty.

The scenarios analysed in this report can give some indication of the elements of a suitable policy mix that would support the introduction of alternative technologies in the passenger car sector. There are numerous financial or regulatory measures that could accelerate the introduction of alternative technologies, but the co-operation of car manufacturers is necessary in all cases. The main question, therefore, is to identify the policy measures that would decrease the uncertainty that car manufacturers face concerning the long term prospects of alternative vehicle technologies."

The long term conclusions of a study[100] carried out by the UITP concerning urban bus operations are the following.

"Having evaluated all the evidence, the authors believe that the long term source of energy for transport will be electricity. In urban areas the economics offered by shared transport rather than individual transport will support the widespread use of public transport, and reinforce the need for governmental control on individual transport modes.

Demands for flexibility of operation will mean that a majority of public transport will need an on-board energy supply rather than an external feed.

To this end, it is predicted that commercial and public pressure will accelerate the development of high quality batteries and fuel cells to the point where they become a technically feasible and cost effective source of electrical energy.

Meanwhile, it is necessary to give thought to the most appropriate means of bridging the gap between current operations and our predictions for the future. (…) All changes have a cost, but it would be sensible to use the investments in technology between now and achieving full electric drive in the most targeted and least wasteful manner possible. Thus heavy investment in compressors, storage tanks and costly fuelling installations such as those needed for CNG and some other fuels, may not be entirely appropriate for universal application. It would be better to use development money to produce highly sophisticated and efficient electric final drives, such as hub motors, to further invest in research into on-

board energy stores such as batteries and flywheels, and then, until fuel cells are developed, to feed these energy stores by on-board diesel, petrol turbine or internal combustion engines.

Such a course of action gives maximum flexibility with the lowest investment wastage but retains the ability to offer zero emissions in sensitive areas, and much reduced emissions in the rest of the environment."

2.13.2.3 Demonstration projects in European cities

The Background Paper on the Promotion of Clean and Energy Efficient Vehicles[101], elaborated by the DG Tren, provides the following analysis.

"Research and technological development programmes in transport and energy, funded by the Framework Programmes of the European Union, have had a strong focus on clean and energy efficient technologies.

Major demonstration projects have been supported by Community funds to accelerate the development of alternative fuels and the technologies necessary for their use in vehicles. Biofuel production and their use in captive fleets have been supported in several projects in the framework of "Biofuels Cities". The BEST project supports biofuels with a strategic introduction of more than 10 000 vehicles and more than 140 fuelling stations in 10 towns and regions. The BIOGASMAX project supports production, distribution, and use of biogas as transport fuel. Hydrogen and fuel cells have been supported with 300 M€ from the Sixth Framework Programme (2002-2006) of the European Union. Particularly successful was the CUTE project, which has put into operation buses running on hydrogen, has established a solid basis for the development of the market of this clean and innovative technology. In October 2006 half a dozen of cities signed a "Memorandum of understanding" for the purchase of several hundred hydrogen buses.

A European Technology Platform on hydrogen and fuel cells has been initiated by the European Commission in 2004 to accelerate the development of hydrogen as a fuel. This Technology Platform has drawn up, in 2005, strategies for research and deployment of hydrogen and fuel cell technologies over the next 15-25 years were drawn up and presented an implementation plan to align research and development work over the next 10 years.

The search for integrated solutions for clean urban transport has also been supported within the framework of the CIVITAS initiative. The European Commission has invested around 100 M€ in 36 cities throughout Europe. It will continue supporting this type of initiative in the future."

In the final report from the European project Trendsetter[102], the following information is provided.

"Alternative fuels work perfectly for city bus and car fleets. This is shown in three Trendsetter cities, where clean vehicles have been promoted. The public bus fleets in Graz, Lille and central Stockholm run on renewable fuels. In addition, a whole taxi fleet in Graz and more than 3,000 private vehicles in Stockholm are now clean.

The projects have inspired car manufacturers, private companies and citizens. They have also led to better acceptance for and distribution of biofuels, a reduction of emissions and less noise in the city centres. Clean vehicles are a cost-effective way to reduce emissions and greenhouse gases.

Promotion of clean vehicles requires work on several levels. Crucial for success are ambitious cities and long-term commitment among local authorities. By gathering many buyers in joint procurements, cities can promote the development of clean vehicles. Another way is by creating incentives for companies and private citizens as compensation for the somewhat higher clean vehicle costs."

In the "CIVITAS in Europe" report[103], the following information is provided.

"Alternative fuels are now widely seen as an ideal option for city buses and car fleets. Their use supports the European energy strategy by strengthening the security of supply (reducing the need for oil imports) and by promoting fuel diversity, which lowers pollution due to road transport, and improves air quality while maintaining a high level of mobility for citizens.

New and improved technologies in this field are emerging all the time. Examples include an array of biofuels such as biodiesel, biogas and bioethanol and compressed natural gas (CNG), more common in continental Europe; liquid petroleum gas (LPG), more widespread in Italy and the UK, and electric or hybrid vehicles (often combined electric and petrol engines)."

2.13.3 Transport management systems

2.13.3.1 Current situation

A recent study[104] provides the following analysis, which is applicable to urban public and private road transport.

"The objective of a flexible and efficient use of the existing infrastructure is mainly driven by two factors: the combination of increasing traffic volume and budget restraints in many European countries. Secondly, new options offered by technological progress and by breakthroughs in the field of Information and Communication Technology. Prominent examples are the real time information for public transport passengers, intelligent infrastructure such as dynamic speed control on highways or the development of the Galileo satellite navigation system and its potential applications for both individual navigation and collective transport management or road pricing. Intelligent transportation systems (ITS) or telematic systems encompass a wide range of wireless and wire line communication-based information and electronic technologies. They can contribute to tap the full potential of the existing infrastructure. Looking at the purpose of the systems ITS /telematics can be divided into the following categories:

- Collective systems for intelligent infrastructure (mainly road transport);
- Systems used for public transport and freight transport in bus, rail, air;
- Intelligent systems for individual vehicles."

In the framework of the Commission's public consultation on the preparation of a Green Paper on Urban Transport, the ACEA (European Automobile Manufacturers Association) mentions the following, regarding fundamental traffic management measures[105].

"In many cases, simple solutions can be applied to a problem without resort to complicated and expensive measures. It is invariably the case that these should be tried first before more complex solutions are invoked.

Such solutions include:

- optimising traffic flows through the introduction of traffic light synchronisation;
- redesigning networks including traffic intersections and signs to balance throughput on the basis of sound data;
- co-ordinating road works so that utilities and other organisations carry out necessary work at the same time and with minimum disruption;
- use of multiple function lanes allowing different activity at different times of day (bus lanes, general traffic lanes, unloading or residents' parking);
- facilitating additional parking places both for passenger cars and for commercial vehicles;
- implementing park-and-ride schemes that will allow travelling to urban centres by public transport, linked with large car parks on the outskirts and rail stations, allowing car users to drive from outlying areas without having to actually reach city centres by car."

The potential traffic management systems are as follows (Helmreich and Leiss 2000):

- Urban and motorway traffic control
- Incident management
- HOV and reversible lane management
- Parking management and speed enforcement
- Weigh-in-motion systems
- Surveillance: network and probe vehicle
- Emissions and environmental monitoring
- Automatic train protection, control and operation
- Dynamic route planning and guidance

In the "CIVITAS in Europe" report[106], the following information is provided.

"Intelligent Transport Systems (ITS) cover an array of different ways in which information and communication technologies can have a beneficial impact on the transport system, therefore cutting across many of the other themes addressed by CIVITAS.

In short, it consists of innovative transport systems and traveller services, such as those for intermodal travel information, transport pricing and payment, road conditions, vehicle location and guidance and traffic management, that help to altogether support a more

efficient operation and management of the transport system. Potential applications are consequently relevant both for public and private modes."

The following analysis was made in a presentation during the "Public transport, intermodality and intelligent transport" technical workshop[107], concerning in particular ITS within an integrated transport strategy:

- ITS should not be seen:
  - in isolation
  - as technology driven
- ITS can:
  - provide the flexibility in delivering policies, objectives and services
  - be used to complement or enhance traditional transport facilities
  - manage demand and make the best use of the existing assets and infrastructure
  - provide a cost effective solution compared to road building or major infrastructure provision
- ITS can deliver innovative solutions & the integration of different tools to deliver new and enhanced services and facilities, e.g.
  - demand responsive transport
  - co-modality
  - freight delivery
  - personalised & mobile travel services
  - road user/congestion charging
  - network management / reliability
  - measurement and monitoring
  - cooperative vehicle / highway systems
  - integrated ticketing
  - reducing emissions.
- But to be effective, ITS needs to take account of:
  - Policy objectives
  - User needs
  - Stakeholders

In the draft paper[108] "State of the Art of Research and Development in the Field of Urban Mobility", the Eurforum presents the following analysis.

"The importance of real-time, personalised and integrated **traveller information** is unquestioned. We are facing rapid developments in the field of IT-based traveller information provision. Pre-trip door-to-door planning tools on internet are already widely used, both for car and public transport, and are increasingly based on data concerning the real-time traffic situation. On-trip navigation systems are becoming a more or less standard tool for car drivers. Public transport users increasingly take advantage of real-time information displays on platforms, stops and inside vehicles.

Research has assessed travel behaviour, user acceptance and implementation for the combination of internet-based public transport trip planners with different transport services including car sharing and taxi information, parking information and guidance, electronic booking of car sharing, electronic ticketing of public transport and road pricing.

But there is little knowledge on the influence of different forms of travel information on travel behaviour. Some research reports a reduction of 10% of car use after introducing an integrated public transport trip planner."

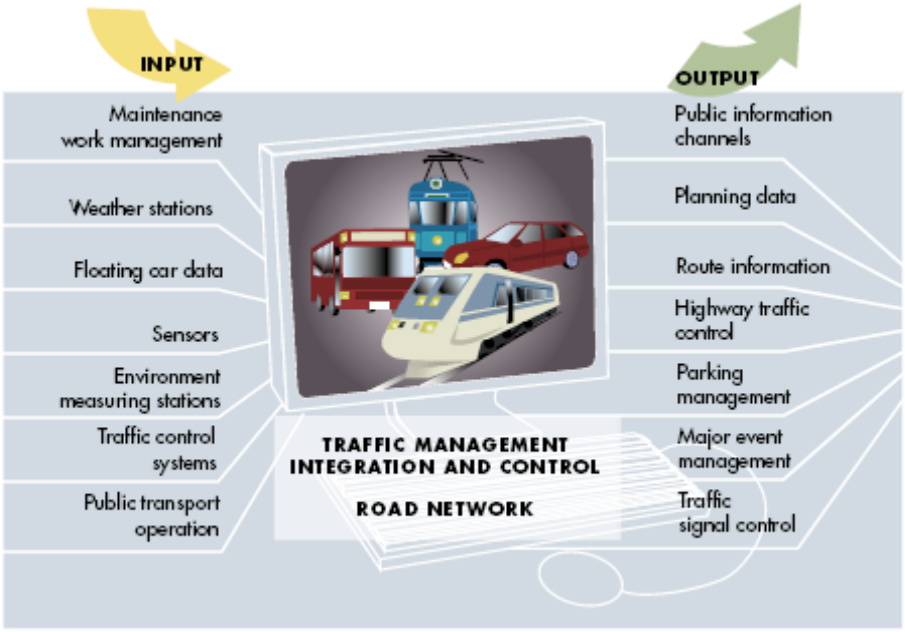
"In public transport, various projects and implementations in several countries with different **electronic ticketing** and fare management options can be seen: contactless smart cards, paper tickets with electronic chips, check-in-check-out systems, long-range technology, etc. Electronic ticketing by mobile phone provides a modern image, but is limited to certain user groups. Sometimes combination with other services like parking payment or museum entrance can be seen. Integration with information systems and operational data management systems is still underdeveloped. Here is a strong link with the economics of urban transport. Electronic ticketing offers unprecedented opportunities for price differentiation as a tool for traffic management. The connection between technical possibilities, consumer wishes and marketing strategies should be optimally utilised."

2.13.3.2 Demonstration projects in European cities

A Trendsetter

In the final report from the European project Trendsetter[109], the following information is provided.

The number of roads, junctions, traffic lights and vehicles in large cities can seem never-ending. But it is possible to monitor the actual traffic situation in real-time and then control the flow using that information. This is what modern traffic management is all about.



Travel times vary depending on congestion, weather, accidents, road works, time of day, etc. The illustration above shows how information from different sources and systems interact in the complex "traffic management puzzle". With reliable real-time information, better decisions can be made. Variable road signs or signals can change the speed limit, drivers can be advised to choose an alternative route and buses can be re-directed.

The collected data also forms a basis for traffic planning, analysing bottlenecks, steering inevitable congestion to areas where they disturb less, improve bus timetables and vehicle usage etc.

A full real-time picture of the traffic situation is also valuable for many other users – taxis, delivery companies or normal road users wanting to find the fastest route, unoccupied parking or a connecting train. This information can be available on the Internet, passed to an on-board route finder or sent to a mobile device.

Thus an advanced traffic management system decreases the demand for new roads as existing roads can be used more efficiently.

Cooperation needed for collection of data

Public transport and big commercial fleet owners, like taxis, are pioneers in collecting real-time data from their vehicles. Road administrations typically collect a large amount of static data – speed limitations, one-way streets, parking regulations – but also dynamic data such as ongoing and planned maintenance or the number of cars that pass a certain point. Other relevant sources of information include e.g. parking garages providing information on the number of cars currently parked in the city.

The challenge is to connect all these data from various sources and to find ways to estimate the situation in areas where too little information is available, in order to give a reliable picture of the real-time traffic situation. What makes it difficult is that most databases are made to fulfil specific needs, other than those required by the traffic management system. They are not compatible with each other and do not refer to the physical road network in a common way.

Simple in theory – difficult in practice

A common experience from Stockholm and Graz is that it takes longer than planned to build a specific traffic management system. One reason is that the system is technically complex. It is dependent on many sources and an incorrect value in a sub-system may affect the whole system.

Tracking the error to the right sub-system is difficult. Another reason for the delay is the large number of stakeholders involved, who have to agree on an issue that they do not immediately benefit from. It also requires a shift of role by road authorities – from building roads to optimizing city traffic. As the system is complex and will take several years to benefit from, it can also be difficult to receive political/high-level priority – both cities have suffered from budget cutbacks.

Economy

Traffic management systems are much less expensive to install than building new roads. However, the systems are complex and operational costs of collecting and validating data are rather high. There are often large communication costs and costs for quality assurance. Maintenance, e.g. closing down a lane, in the most intensive traffic environment is also problematic. There are also risks for increased traffic when congestion decreases. Sticks and good traffic management systems are needed to prevent this.

Stockholm has used the progress made in earlier EU projects, e.g. “Quartet plus” and “Cleopatra”. These systems are easy to adapt to a city since they have open specifications that can be connected to already existing systems. To buy a closed system and let the system provider adapt it to the city, is normally more expensive since local adjustments and behaviour can be a big problem.

B Civitas

In the Civitas 1 cross site evaluation report[110], the following information is provided concerning transport information and management.

"Traffic and mobility management is primarily a demand-oriented approach to promote and enhance sustainable mobility. Its aim is to support and encourage a change of attitude and behaviour towards sustainable modes of transport. Within this context information on public transport networks plays a critical role. Intelligent Transportation Systems (ITS) vary in applied technologies, from basic monitoring applications to more advanced applications which integrate live data and feedback from a number of other sources, such as real-time weather. Additionally, predictive techniques are being developed to allow advanced modelling and comparisons with historical baseline data.

Traffic congestion in cities makes it difficult for public transport operators to deliver services according to schedules. Disruptions to schedules have a negative impact on the quality of service provided to the customer. This is a universal problem, experienced in every major city. One solution being deployed in many cities is the provision of electronic information displays at bus stops, which give the customer an estimate of the waiting time for the next bus. These systems, commonly referred to as Real Time Passenger Information (RTPI) systems, use a variety of technologies to track the location of buses in real time and use this information to generate predictions of the bus arrival-times at stops along the route. All the measures implemented within the Transport Information and Management cluster are dealing with one or more of the following solutions:

- Public Interactive Terminals: located near public transport network facilities as terminals or stations. They are intended to help passengers plan their journeys, to select the bus line and find the arrival and departure times.
- Dynamic Bus Stop Displays: are often the most prominent of passenger information systems equipment. They provide passengers with the real-time information on the next bus arrival. This service will certainly improve journey conditions because it will reduce the uncertainty and discomfort of waiting for a bus and minimise the waiting time by enabling, for example, some last minute shopping without the fear of missing the bus.
- On-board Information: provides passengers with information on the next bus stop along the route. It may also include information of the destination and possible connections to other bus lines. On-board information will reduce the stress of missing the correct bus stop for passengers who are not regular users of that particular bus line.
- Information at Home/Office: is mainly pre-trip information about routes, connections, fares and time-tables although real-time information such as the next bus arrival time at a chosen bus stop can be found. Enquiry office terminals only provide information for personnel from transport companies. Their main purpose is to help personnel to answer user requests.
- Portable information: equipment such as mobile telephones or hand-held terminals are new instruments for providing information to passengers before or during the journey. This area of technology is rapidly developing for example with Wireless Application Protocol (WAP) based communication. In the future there will be even more methods available to obtain user specific travel information."

In the Civitas 1 cross site evaluation report[111], the following information is provided concerning parking management.

"Park and Ride parking management is being considered by all cities as the central issue for traffic and transport urban policies. Parking management is a flexible tool, suitable for targeting various groups and to fulfil a large panel of objectives.

Eleven parking management measures have been supported in ten cities throughout Europe. Three different approaches have been proposed for the parking measures and issues within CIVITAS:

- Berlin's measure focused mainly on innovative technical solutions for improving payment facilities, and overcoming legislative barriers at national and state level.
- Graz, Stockholm and Winchester focussed on 'group-pricing' and parking management in order to increase the attractiveness of clean vehicles.
- Bucharest, Cork, Nantes, Pecs, Rome and Rotterdam aimed at developing a more efficient parking management strategy with a wider range of challenges and goals, e.g. reducing traffic and increasing the liveability of a city. Parking management is implemented as a general traffic demand management tool."

In the "CIVITAS in Europe" report[112], the following information is provided.

"Real-time information helps public transport passengers and staff

Ideally, travelling by public transport should be as easy and efficient as travelling by car. It should also be easy to compare travelling alternatives and to plan trips from door-to-door. The latest technologies make it nowadays possible to provide invaluable information to help

travellers make the right transport choices and to get where they're going in the easiest and most efficient way.

Accordingly, a solution adopted by a large number of CIVITAS cities is the provision of information via electronic displays at bus, tram or metro stops, keeping track of delays and giving patrons an estimate of the waiting time for the next vehicle. These real time passenger information systems combine a variety of technologies to track the locations of public transport vehicles in real time, and generate predictions of arrival times along the route.

Real-time information tools were also widely used in CIVITAS through the internet, mobile phones, and mobility centres and kiosks. Here, travelers are offered the chance to efficiently plan their trips being constantly informed about lines availability, timetables, modal interchanges, trips duration, delays and traffic conditions. The notion of the 'informed traveller', who can make choices about when, how and whether to travel at all, fully emerges from measures such as the TravelBristol info centre, the Graz 'BusBahnBim' web system, the Aalborg kiosks, and the Winchester bus departure information system, just to mention a few.

Finally, the same information can be used by public transport staff to answer passenger questions on delays and to make recommendations on alternative routes."

"Information technologies were also heavily utilised to control the seemingly unmanageable network of roads, junctions, traffic lights and vehicles populating our cities. Traffic management effectively allows monitoring of the real-time traffic situation, which varies depending on congestion, weather, accidents, road works, time of day, etc., and accordingly controls the flow using that information.

A real-time picture of the traffic situation is also valuable for other users, such as taxis, delivery companies or car drivers wanting to find the fastest route, unoccupied parking or a connecting train.

The main challenge lies in the capacity to connect the data collected by various sources (e.g. public transport operators, big commercial fleet owners, road administrations) and estimate the situation in areas where too little information is available, in order to give a reliable picture of the real-time traffic situation, bridging the existing incompatibilities amongst management systems."

2.14 LOGISTICAL TRENDS

2.14.1 Current situation

In the final report from the European project Trendsetter[113], the following information is provided.

"Living and working in inner-city areas where streets, squares and pavements are often packed with delivery trucks and vans can be frustrating. Not only are the vehicles in the way, they also cause noise and bad air. More than half of the emissions in many European cities come from heavy transports, which increase faster than private car transports.

A challenge for cities is the new distribution patterns caused by information technology. Today, customers can search worldwide for the cheapest merchandise. Besides the price, suppliers compete with fast and just-in-time deliveries. Customers adapt their buying habits to also ordering just-in-time. The result is longer, less coordinated and more frequent transports, which are negative for the environment and more expensive for the delivery companies. Also, a growing number of Internet shoppers may lead to more deliveries, even if private car trips for shopping are avoided. In many European cities, the volume of goods traffic has increased significantly the last decade, especially in new EU member states with high economic growth.

The problem is most often not the larger transport companies, but the smaller suppliers. The larger companies usually have efficient daily routes within restricted delivery hours and fill their vehicles. It is the smaller delivery vans and haulier companies with only partly loaded trucks that clog the shopping areas in big cities. But there are ways to reduce the need for many of these deliveries."

A study[114] on freight distribution in Europe provides the following analysis:

"Experiences have been collected from European cities of on-going strategies, concepts and activities for urban freight distribution. The national situation has been reviewed and examples of best practice provided for different areas. These include: (i) delivery solutions, including enlarged time windows, noiseless cargo handling equipment, scheduled day and time, (ii) market initiatives, including consolidation, (iii) environmental initiatives, including combined passenger-freight transport, environmentally-friendly vehicles, policies aimed at reducing congestion, (iv) land use and infrastructure, including location of industrial and logistics activities and of supermarkets, urban freight platforms, underground freight distribution (only feasibility study stage).

Urban freight transport planning appears to be neglected in many cities compared to passenger transport. Priority issues with which most cities are dealing are co-operation among all local actors, coordinated urban freight policy, information, statistical data/data acquisition and use of innovative vehicle technology for city distribution.

A few innovations were tested: emission reductions were achieved but results were unsatisfactory from an economic viewpoint. More specifically:

- Regional or local bundling using cooperative distribution were found difficult to implement;

- new city/small loading units for urban intermodal transport have uncertain commercial perspective with transhipment costs as main barrier;
- new ICT applications for distribution network optimisation could not show distribution cost savings;
- in-time provision of traffic information proved effective in eliminating a substantial part of the delays at the intermodal centres;
- combined passenger and freight transport concepts showed limitations for the size of the cargoes and organisational difficulties for transhipment; and
- alternative fuels, rape seed oil and biogas, showed as main barrier the competition with other fuels having massive supply infrastructure.

A study[115] on "Green logistics" in Europe provides the following analysis:

"As urban populations grow, the number of City freight movements is forecast to increase on a B2B basis. It is envisaged that locating freight consolidation centres outside of city centres, so that they become the 'final' destination for logistics operators, would see 'last mile' deliveries to city centre locations made in smaller vehicles and retailers, in particular, made to be more acutely aware of the impact that their deliveries have on city environments. Transport planners must increase their awareness regarding the development of shared and consolidated load solutions if their network and route optimisation strategies are to remain competitive.

In B2C markets, the rising popularity of internet shopping across Europe contrasts with low first time delivery success rates, often facilitating repeat trips for courier and parcel companies. Adequate 'home' delivery strategies, such as the development of wide-scale 'drop-boxes' are yet to be implemented that will maximise efficiencies in fulfilling such orders and reduce 'delivery miles'.

For all commercial vehicle operators, be they courier and express companies, road hauliers, logistics operators (in-house or outsourced operations) or even the municipal fleets of the cities themselves, City policies on vehicle access regulations and emissions standards will have a significant bearing upon future transport strategy and investment in fleet."

The following analysis was made in a presentation during the "Integrated urban transport approaches for successful and attractive cities" technical workshop[116].

- Problem issues:
  - Dedicated freight infrastructures enable ports, airports, and inland terminals to cope with the increasing traffic. In urban areas, freight must share limited infrastructure at a disadvantage.
  - The use of vehicles that would be optimum from a logistics perspective is often compromised by physical factors, requiring an arbitrary split of the volumes to several vehicles and tours.
  - The circulation of commercial vehicles is often impeded by regulatory and capacity limitations of road and roadside infrastructures, that induce unproductive delays that must be recovered with additional vehicles further increasing the burden.

- Delivery windows in inner cities are compressed by shift-back opening hours and static curfews; shorter time windows must be compensated by additional vehicles, adding to peak traffic loads.
- Commercial vehicles account for 10% of traffic, but 40% related energy use and 50% emissions. Efforts to cope suffer from divergent goals and solutions for local and global pollutants, volatile policies and limited market offers for alternatives.
- Freight has been off the urban agenda for years, draining municipal awareness and competences. Receivers usually do not care for good logistics, leaving 15-50% of deliveries unorganised

The background analysis within the BESTUFS[117] project is reproduced hereafter.

More than 80% of today's road freight trips in European conurbations are on distances below 80 km and can be defined as urban or urban-regional transport.

The delivery and collection of goods within urban and metropolitan areas, especially in the core areas of cities with old and established centres has a major impact on the local community concerning the economic power, quality of life, accessibility and attractiveness of a city. This means that an efficient and environmental friendly urban transport system is essential for the economic health and the quality of life of cities.

It is therefore important to assess the opportunities and chances of technical (vehicle technology, telematics applications, etc.), organisational (cooperation, etc.), operational (route planning, etc.) and political (time windows, weight limits, etc.) approaches for improving the urban transport systems.

In the "CIVITAS in Europe" report[118], the following background analysis is provided.

"Urban goods transport policies aim at introducing new concepts and solutions for freight, like innovative logistics services using clean and energy efficient vehicle fleets, dedicated infrastructures and information services.

These policies are acquiring ever-growing relevance in today's inner city areas, where streets, squares and pavements are packed with delivery trucks and vans. Here, living and working can often be a frustrating experience. Not only do these vehicles represent a real physical obstacle to free movement but they also cause noise and pollution. In many European cities, more than half of harmful emissions come from heavy goods transport.

Another challenge for cities is the advent of new distribution patterns linked to emerging information technologies. Today, for example, consumers can search worldwide, via the internet, for goods and services at the best possible prices, that were previously out of reach. Suppliers are competing to provide fast, 'just-in-time' 24-hour delivery services. The end result is longer, more frequent and less coordinated goods transport movements.

These changing transport patterns are a particular problem for smaller suppliers. Larger ones tend to fill large delivery vehicles and maintain efficient and well-established delivery routes.

The impact of unnecessary freight movements can be quite high in terms of energy consumption, noise and air pollution, and in terms of related impacts such as economic efficiency, quality of life and public health. Thus, optimising goods distribution and logistics services is a crucial element for any plan to improve urban transport."

In the draft paper[119] "State of the Art of Research and Development in the Field of Urban Mobility", the Eurforum presents the following analysis.

"(…), freight transport plays an important role in urban transport. According to the PORTAL report on inner urban freight transport, freight transport with lorries over 3,5 tons is responsible for about 10 % of all urban transport. If vans and cars are added, the share would be much higher. BESTUFS states that urban freight traffic accounts for up to 25 % of the total traffic in France.

Therefore, transport of freight should have an important contribution in urban transport planning, both environmentally and economically. Freight traffic is necessary for the delivery of goods and services. It makes cities dynamic and versatile, and creates jobs. On the other hand freight traffic is responsible for severe damage in the city's living environment, emissions, noise hindrance and it decreases traffic safety."

2.14.2 Demonstration projects in European cities

2.14.2.1 Trendsetter

In the final report from the European project Trendsetter[120], the following information is provided.

"Co-transportation of goods to shops, restaurants and construction sites can dramatically reduce the number of delivery vehicles. This is shown within three Trendsetter projects in Stockholm and Graz. Fewer delivery vehicles result in less emissions, noise and street clogging.

So far, this type of goods distribution is not very common. However, cities could create a demand for more coordinated logistics. This is done through information, coordination of schemes, initial funding and other assistance to participants.

Hesitant parties could be convinced if the new transport solutions also offer other benefits, e.g. storing facilities, packing/ unpacking of goods, hanging of clothes and price tagging."

Consolidation reduces transports

"Imagine that half-empty trucks and small delivery vans from different suppliers reload their goods and co-transport them to the customer. A better load rate and more efficient distribution would mean fewer vehicles in the city and thereby better living and working conditions. Visitors and businesses would also benefit from less jammed streets.

A key solution to consolidating goods in this manner is establishing logistics centres. Trendsetter projects show how logistics centres for well defined areas with evident logistics problems, such as the narrow streets of old European cities, can be successful."

Creating a demand for consolidation

Goods consolidation is still uncommon, even though most players would gain from it. One reason is that no person or organisation is responsible for coordinating the actions. Another reason is that suppliers lose direct contact with their customers through the driver, and that they prefer to have their own cars with logotypes. There are also no complete systems to join.

One of the big barriers in the projects in Graz and Stockholm has also been the lack of customer demand and involvement. Owners of shops and restaurants generally lack knowledge about logistics as they mostly receive their goods free of charge. The real transport costs are hidden and the suppliers have no interest in changing their system.

Cities need to take the lead

To make things happen, local authorities have to take action. Cities need to inform potential stakeholders about the possibilities and effects, coordinate the consolidation schemes and help contractors with administrative and legal issues. Political support is also important, since funding is needed in the beginning. Motivation among participants could also increase with positive incentives, e.g. access to bus lanes or better unloading services.

Awareness campaigns might be a solution to encourage the public to ask for specifications of transport costs. Similar campaigns from the European Commission to the cities in Europe could increase the knowledge of logistics and environmental issues, which could boost the interest in new forms of goods distribution."

2.14.2.2 Civitas

In the "CIVITAS in Europe" report[121], the following background analysis is provided.

"CIVITAS cities have developed new concepts and are implementing real and effective measures to reduce delivery vehicle mileage within urban areas, curbing increasing freight movements that put stress on the environment and lead to unnecessary fuel consumption.

Measures taken under the CIVITAS Initiative include bundling of goods delivery, guided routes for goods delivery and the promotion of the use of clean vehicles. Measures relating to bundling of goods have included the use of inner city logistics centres, permits for certain types of delivery vehicles and restrictions on other types, and the promotion of closer contacts between companies to foster co-operation and bundling agreements.

'Bundling' of goods to shops, restaurants and construction sites can dramatically reduce the number of vehicle movements. Unfortunately, the trend is now moving in the opposite direction, towards the 'atomisation' of deliveries, due to sharp increases in internet retail business.

CIVITAS-backed logistics centres are aimed at the efficient pooling of goods for combined deliveries to customers. Bundled deliveries mean fewer delivery vehicles on the road, lower emissions and noise, and less street clogging.

Positive effects of better coordinated goods delivery have been found in several CIVITAS cities."

"The introduction of clean delivery vehicles in four CIVITAS cities is an additional measure that has helped to put pressure on vehicle manufacturers to develop and provide clean vehicle technology at more competitive prices.

Effective information campaigns, coordination of schemes, financial incentives and other assistance to participants are important elements of an integrated approach and can motivate potential partners in freight consolidation schemes. Parties who are not fully convinced can be swayed when benefits and services are included, such as new storage facilities, packing and unpacking of goods, displaying of merchandise and price tagging."

2.14.2.3 Bestufs

The themes treated within BESTUFS[122] are reproduced hereafter. The following catalogue of themes has been determined to be considered with priority within the BESTUFS project.

Methodology

- Models and methods to deal with the complexity of urban freight transport chains and the shared responsibilities
- Goods transport efficiency, assessment and costs
- Statistical data, data acquisition and data analysis

Planning and policy

- Land use planning and business models for urban freight platforms
- Traffic, land use, infrastructure and regulations planning and policy
- Integration of distribution centres and traffic management

Transport concepts and management

- Door to door freight transport aspects
- Improved management of the urban road space and the kerbside access
- Interfaces between public and goods transport
- City access, parking regulations and access time regulations
- Road pricing, tolls and heavy vehicle fees
- E-commerce and distribution (home shopping)
- Night delivery

Co-operation and organisation

- Co-operation of transport operators
- Public-private-partnerships (PPP) and stimulation e.g. via freight forums
- Win-win situations

Transportation technology

- Transport units and intermodal transfer facilities
- Innovative urban freight transport ideas (e.g. via underground systems, pipelines, etc.) and unusual transport modes (bicycles, etc.)
- Urban rail freight
- Vehicle technology and functionalities (e.g. low-emission vehicles), weights and dimensions

Supporting technology and infrastructure

- Intelligent transport systems (ITS), transport telematics applications and systems for urban goods transport
- Enhanced signage and information systems (e.g. VMS)
- Infrastructural solutions (e.g. to improve loading and unloading)
- Enhanced usage and maintenance of infrastructure (e.g. via a road map for transport vehicles)
- Enforcement support (e.g. by video control)

Legal issues

- Relationship and harmonisation between the urban, regional, national and European legislation

2.15 CHALLENGE

How to increase accessibility while at the same time reducing congestion, accidents and pollution is the common challenge to all major cities. More than anyone else, city dwellers directly experience the negative effects of their own mobility and may be open to innovative solutions for creating sustainable mobility.

3. STAKEHOLDERS' CONSULTATIONS

The European Commission has organised the following consultations of stakeholders within the process of the preparation of the Green Paper on Urban Transport.

The results of these consultations are presented in dedicated reports. Some extracts of these reports are reproduced in the following chapter of the present report.

3.1 INTERNET CONSULTATION

The European Commission has launched an Internet consultation which was intended to collect views from interested parties on how best the EU may contribute to improving transport and mobility in urban areas.

The Internet consultation was opened for two months, from February 28 to April 30, 2007.

The results of the Internet consultation are presented in a dedicated report.

3.2 STAKEHOLDER CONFERENCES

Two stakeholder conferences were organised as follows:

- On January 31, 2007 in Brussels on the following subject: "Urban transport: problems, solutions and responsibilities".
- On June 4, 2007 in Brussels on the following subject: "Towards a European policy for urban transport".

These conferences were attended by stakeholders and citizens who registered for the meetings.

3.3 TECHNICAL WORKSHOPS

Four technical workshops were organised as follows:

- On January 31, 2007 in Brussels on the following subject: "Urban transport and green propulsion"
- On March 6, 2007 in Budapest, on "Urban transport financing: experiences from different cities"
- On March 7, 2007 in Budapest, on "Public transport, intermodality and intelligent transport"
- On May 16, 2007 in Brussels, on "Integrated urban transport approaches for successful and attractive cities"

These workshops were attended by stakeholders invited by the European Commission.

4. PROPOSALS FOR SOLUTIONS AND ACTIONS

For the main problems identified in the diagnostic of urban transport in Europe, a series of solutions and actions potentially exist. The solutions and actions presented in this part of the report have been proposed by stakeholders during the consultation process presented in the previous chapter. These solutions and actions are essentially based on previously tested experiences. They could be analysed and possibly implemented to achieve positive impacts on issues such as urban accessibility and mobility, energy, environment, safety, economy and society.

The following table synthesizes the proposals classified according to their fields of influence and the issues on which they can have an impact.

The proposals are then detailed for each of the issues identified.

Each of these proposals could be implemented alone; however the combination and / or integration of several proposals will have a significantly greater impact for addressing urban transport issues.

Proposals for solutions and actions by types of issues identified and by target groups

Targets	Vehicles	Infrastructures			Users				Authorities						
Issues	Promote use of clean and energy efficient vehicles and alternative fuels	Infrastructure development	Intermodality/ Integration of transport systems	Access restriction	Modify travel behaviour through mobility management, traffic, parking and information management	Promote use of public transport, cycling, walking	Promote new forms of vehicle use and ownership	Promote efficient freight logistics and delivery services	Taxes and incentives	Road / urban pricing	Parking pricing	Integration of transport and land use	Exchange of best practice	Promote research	Communication, education and awareness campaigns
Accessibility		X	X	X	X	X		X				X	X		X
Traffic congestion		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Energy use	X	X		X	X	X	X	X	X			X	X	X	X
Environment	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Safety		X		X	X	X							X	X	X
Affordability/ acceptance			X			X	X		X	X	X	X	X		X

Several proposals for solutions and actions also concern the following "horizontal" topics, which are relevant for various target groups and types of issues:

- Financing
- Institutional aspects
- Statistics

4.1 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING ACCESSIBILITY

Potential solutions and actions to alleviate accessibility problems are constituted by the following proposals.

4.1.1 Infrastructure development

4.1.1.1 Contribution from Ms Inès Ayala Sender, Member of the European Parliament and of the Committee on Transport and Tourism[123]

Ms Ayala Sender urges those cities which still have a tramway network, notably cities in the new Member States, to keep and modernise it.

4.1.1.2 Contribution from Ms Danuta Hübner, Commissioner for Regional Policy[123]

If achieving a sustainable change is really wanted, all these instruments that can be seen in many cities have to be used, for example in the UK especially where pedestrianisation of the city simply made the city easily accessible to pedestrians and also changed the habits and the customs and eliminated the cars from a number of areas in the cities.

4.1.1.3 Contribution from a representative of the city of Bremen[124]

Optimisation of traffic lights, as part of an integrated mobility approach, very often generates disadvantages for cyclists and pedestrians. It should not be forgotten that 20% of trips are done by foot.

4.1.1.4 Contribution from Mrs Eleni Kopanezou, DG Tren[125]

Good transport is a key element of cities' attractiveness. The target is to provide:

- clean, efficient, affordable and effective intra-urban mobility
- connections to inter-urban and long distance networks (TEN-T).

4.1.1.5 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

See under 4.1.5.6

4.1.1.6 Contribution from Mr. Tomassini, representative of the CURACAO project[126]

The investments of the municipalities in infrastructure have to be preserved in time. The responsibility of the infrastructure in cities should remain with the Mayor and should never be privatised.

4.1.1.7 Contribution from a representative of the European Cyclists Federation[126]

Concerning EU funding of transport infrastructure, often projects aim at improving the situation for cars but make it worse for cyclists and pedestrians. The impact of new projects on cycling and walking should also be considered.

4.1.1.8 CIVITAS[127]

Public perception of the role of the EU in encouraging sustainable transport policies is sometimes confused because it can appear that there are more (or more prominent) regional road projects providing for increased car use, than urban projects enabling reduced car use. Yet even on the trans-European networks, the majority of traffic in any one area is mostly not international traffic, but is short and medium distance traffic which impacts on the cities and towns in the area. A shift in the balance of EU support is needed, including financial support from structural funds, to urban projects.

New member states (and the same can apply to some less developed regions in old member states) are marked by poor infrastructure, the inheritance of low levels of historic investment, and sometimes current economic difficulties. It is therefore fair that they should receive a proportionately greater share of resources and attention. It is important for the cities in the new Member States to develop and enhance their public transport systems, protect against excessive growth in traffic, and develop environmentally friendly centres and shopping areas.

4.1.1.9 Polis[128]

The EU should affirm the need to continuously improve the accessibility of transport systems and the mobility of mobility-impaired persons. Therefore, Polis invite the EU to support European cities to determine services for those who still face transport barriers when substantial improvements have been delivered to mainstream public transport; and to monitor the ridership and service quality indicators of passengers who experience transport barriers to measure outcomes.

Polis members call upon the European Union to support cities to explore the relevance of demographic changes for their specific transport system and to integrate the demographic changes in the formulation of sustainable urban transport policies.

4.1.1.10 ECMT and IRU[129]

The ECMT and IRU joined forces to develop a set of recommendations for vehicle design for manufacturers, especially to improve the accessibility to taxi services given that there are in excess of 45 million disabled people across Europe, including as many as three to four million wheelchair users.

4.1.1.11 UNIFE[130]

Considering that an important role for rail-bound transport is essential for an efficient and sustainable transport system in European urban areas, a number of immediate obstacles can be identified:

- Mobility is a huge challenge to the economic competitiveness of European cities, faced with ever growing demands to transport people and goods in and out of cities.
- Limited public funds are an obvious threat, both in terms of infrastructure and rolling stock investments but also for the financing of operations.
- Restricted competition at the operational level increases the costs in the area of urban rail-bound transport.
- Limited operational harmonisation and restricted technical standardization lead to small markets and proprietary products, also raising the costs.
- A common European cross-acceptance structure is missing, leading to the current intransparent and long lasting acceptance processes that need to be changed.
- Competition from road increases with the introduction of longer and higher capacity buses (competing with Light Rail Vehicles).

4.1.1.12 SNCF[131]

It is necessary to identify the factors which remain a potential threat or block to the development of successful/sustainable urban transport. For example, urban space is particularly critical, as it is scarce and infrastructure, which is limited, needs to be shared (both in road and rail). Solutions can be found partially through the user pays principle (from various sources: access charges, congestion charges etc.) and through legislation aimed at restricting the use of the private car in urban areas (such as the ZTL measures in Italian historic towns and cities).

4.1.1.13 Bundesministerium für Verkehr, Bau und Stadtentwicklung - Berlin[132,133]

The challenges to the public transport infrastructure posed by demographic change should not be neglected. Cities need some guidance from the European Union to help them explore the relevance of demographic and economic change to their specific transport-related context.

4.1.2 Intermodality/ Integration of transport systems

4.1.2.1 Contribution from Mrs Sabine Avril, EMTA[126]

On social inclusion in the Paris region:

- Allobus - Roissy offers a 24/24 hours service to serve Paris-CDG Airport platform from 9 communities around with 4 bus lines on a demand responsive scheme. It is a mix between demand responsive transport and regular lines operated by minibuses.
  It gave positive results with regard to social inclusion and safety, but expensive so it is partially mixed with fix lines.
- Night bus lines in Paris:
  - Through the night service
  - Main reason is working shift hours
  - Quality and security appreciated.

4.1.2.2 Contribution from Mrs Kardacz, DG TREN[126]

An e-ticketing system that can be used for bicycle parking and for public transport exists in Odense (Denmark). It has been developed as part of a Civitas-Mobilis project.

4.1.2.3 Contribution from Mrs Ollier, UITP[126]

Concerning e-ticketing and information of travellers, many networks are developing their own system so that the chance of a common EU initiative is fading. The UITP looks to find interoperability of the systems, not to create a single system.

4.1.2.4 Contribution from Mr Jakič, representative of the city of Ljubljana[126]

Mr Jakič is in favour of cross border ticketing. In Ljubljana, special technology using e-ticketing and GSM has been developed locally and could be brought throughout the EU. However, it is impossible to pay a parking fee in Budapest with a Slovenian GSM, considering the existing high roaming costs applied. An initiative should be taken in this field by the DG TREN and the other DGs concerned.

4.1.2.5 Contribution from Mr. Javier Aldecoa, Consorcio de Transportes de Madrid[126]

- Objectives about intermodality
  - Creation of different rings of interchanges all around Madrid city for reducing the time of the journey.
  - Looking for efficiency of public transport.

  - Increase the quality standards of intermodality.
  - Real time information.
  - Real sense of security
  - Effectiveness in the management of interchanges
- Intermodality plans from 1986 to 2013
  - 1986 – 2000 Implementation of intermodality (administrative, fare and infrastructural integration)
  - 2004 – 2007 First ring of urban interchanges plan construction (inside Madrid city)
  - 2007 – 2011 Second ring of regional interchanges plan construction (metropolitan area)
  - 2007 – 2011 Park & Ride plan construction (50,000 parking places)
  - 2009 – 2013 Bus lanes plan construction (under principal highways).

4.1.2.6 Contribution from Mr. Janos Monigl, Transman Consulting, Budapest[126]

Elektra Hungaria is an electronic system to be created by different operators: BKV, MAV, Volán, and other transport operators. On top of it, there will be a management and clearing centre.

Conclusions:

- E-ticketing is not only a tool for collecting revenue, but also a data collection means for the operators and the users.
- The implementation of e-ticketing is only possible with strong political will and the commitment of operators.

4.1.2.7 Contribution from Mr Julien Juge, Véolia Transport[134]

- Integrated systems: the Limburg experience
  - Dutch Province of Limburg: Population: 1.2 million inhabitants
  - 2005: call for tender for the whole region combining: Regional rail services, Fixed routes buses, Transport on-demand and taxis
  - Purpose of the project:
    . To end competition between train and bus services
    . To co-ordinate public transport in urban and rural areas.
- Integration and flexibility
  - PTA's requirement:
    . Operator to be flexible in terms of rail vehicles used
    . Able to adapt train formation
    . Able to adapt permanently to the demand
  - Operator's answer:

- Integrated control centre managed by Veolia Transport for trains, buses and transport on-demand
- Multi-skilled personnel at the control centre and for the operation (drivers able to drive trains and buses)
- Transport on-demand on a large scale to complete fixed route systems.

4.1.2.8 Contribution from Mr. Perlot, representative of the Association of European Motorcycle Industry[134]

Co-modality should be the approach for transport policy:

- A role of motorcycles for freight transport could be to support the urban delivery for small goods.
- Motorcycles are used as taxis in some cities (example of London).

4.1.2.9 EFIP: Inland Ports' contribution[135]

General awareness of the key role of Inland Ports for city mobility, logistics, distribution should be more emphasized and reinforced, and taken into consideration in urban planning projects along waterways. It is essential to ensure that inland ports can still develop in the future, as space has become scarce and it is essential for them to be in a position to further expand their activities. Urban planners and architects do not always consider the use of inland ports and would prefer to use these spaces for real estate, leisure or office buildings activities. For instance, in its reaction to the NAIADES Action Programme for Inland Waterway transport, EFIP urged decision-makers to launch spatial planning and economic policies at European, regional and national levels, that would aim to preserve waterside sites and could be used for instance for logistical purposes.

4.1.2.10 Eurocities[136]

Eurocities urges the European Commission to engage with cities in the revision of the links between cities and TEN-T connections.

Eurocities would like to underline its support for the co-modality approach as defined in the mid-term review of the Commission's White Paper on Transport – i.e. the efficient use of different modes on their own and in combination. A clear focus on environmentally-friendly modes is needed when talking about co-modality. All of this needs to be part of a strategy within cities to achieve genuine sustainable mobility that integrates economic, environmental and social policies.

EUROCITIES strongly supports the creation of a European logistics platform that aims to institutionalise intermodal logistics for cities. Cities, together with Member States and industry, should act as focal points carrying out a continuous exercise of identifying and addressing existing bottlenecks to freight transport logistics. They could share know-how, identify best practices, and give input to policy development. Professional organisations and labour unions should also participate in order to:

- Ensure a better utilisation of transport infrastructure.
- Develop multimodal liability regimes, which could contribute to this policy.

- Provide a better quality of service (including through a rail-freight oriented network)
- Introduce smart technologies into all modes of transport.

4.1.2.11 SNCF[131]

The introduction of the tram-train system has provided urban transport communities with an extremely versatile mode of transport that allows passengers to have a regular service from the suburbs into the city centre through the use of the "classical" rail network and then to benefit from frequent stops within a city centre thanks to the driving as a tram mode.
The aim of the introduction of such a system is not only to provide an integrated public transport system, but also a form of transport that is attractive to the user as well as being efficient.

4.1.3 Access restriction

4.1.3.1 EuroCommerce[137]

EuroCommerce calls on the EU, national, regional and local authorities to recognise that:

- The commerce in cities plays a important role, as well as the freight transport;
- access to city centres is vital for the commerce sector and the attractiveness of the cities. For example, restricting access to city centres will encourage customers to switch to suburban shops which can usually only be reached by car;
- over-simplistic approaches aimed at banning private transport are detrimental;
- tailor-made solutions are needed.

Public-private partnerships and co-ordination could help to find innovative solutions regarding practical problems such as waves of concentrated goods transport at peak times due to limited delivery time slots and working time regulations for the transport sector.

4.1.4 Modify travel behaviour through mobility management, traffic, parking and information management

4.1.4.1 Contribution from Mr. Camille Durand, Vice-president of Nantes-Métropole[123]

Mobility should be mentioned in the Green Paper and in particular companies' mobility plans.

4.1.4.2 Contribution from Ms Inès Ayala Sender, Member of the European Parliament and of the Committee on Transport and Tourism[123]

Regarding quality of public transport operation, Ms Ayala Sender mentions that users often complain about the lack of information about transport services. User information systems can bring solutions concerning real time information about trip duration, regularity and compliance to the time schedules, possible problems on route.

4.1.4.3 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

See under 4.1.5.6 ("Pull measures")

4.1.4.4 Contribution from a representative of the UNIFE[126]

Concerning passengers' information, in Germany journeys can be planned and booked from door to door for all modes of transport on the Internet. The system is similar to the one of London and is used by the UIC.

4.1.4.5 Contribution from Mr Christer Ljungberg, Trivector[134]

- Mobility Management:
  - Economic alternative to building infrastructure
  - Complement to traditional measures
  - A way to make transport more efficient
  - A way to start processes, together with other stakeholders, leading towards a sustainable transport system.

4.1.4.6 Landes Nordrhein-Westfalen[138]

Unlike the planning and provision of infrastructures and the specific control of traffic flow, mobility management requires "soft" action. This action is based on the following pillars: information, communication, organisation and coordination. This action means for example informing road users of the targeted, comprehensive use of the existing traffic systems. Mobility management aims mainly at using more efficiently the existing infrastructure.

4.1.4.7 CIVITAS[127]

CIVITAS cities argue that cities must and can decouple traffic growth from economic growth. The central task for sustainable urban transport policy has to be the provision of better access to opportunities, by means other than increases in vehicle kilometres travelled. An efficient disposition is the development of methods of improving the quality of “mobility” while using less movements, such as telecommuting or e-shopping.

4.1.4.8 SNCF[131]

A number of advanced (IT and radio based) tools can help passengers with their daily commute and travel arrangements within cities as well as for travel from the suburbs into major cities. These are all aimed at providing the customer with the most information possible and making it as easy as possible for them to buy tickets for urban transport.
The solutions which have shown to be successful are:

- Detailed passenger information systems using a number of sources: on-line (through call centres, the internet or SMS), on location (via screens and other equipment at stops and interchanges) and onboard (through video screens etc. on buses and trams). For example, the Mobiltransilien system provides individual web portals for public transport customers via RSS flows[139]. Such information can also concern the parking areas and their availability. Systems to reserve parking spaces through the Internet or through a call centre at major locations are in favour of the development of the use of the train, as the passenger knows he can arrive at major stations at the last minute.
- Integrated ticketing systems;

The development of advanced, cost effective, solutions should be encouraged in all cities around Europe so as to reinforce the technologically advanced nature of the European public transport sector and follow the Lisbon agenda of making the European Union the most competitive and dynamic economy in the world.
It is important that the technology that is used is developed following common technological standards (as was done for RFID technology for example) that can be applied across European countries to ensure that the cost of buying, installing and eventually improving the selected systems is minimized and easier to use.

4.1.4.9 Eurochambres[140]

In view of the diversity of urban areas in terms of size, topography, financial situation, demographic structure and local business activities, common solutions are bound to work well only for some cities, while they might be completely inappropriate for other urban areas. For example, while demand management measures such as the pedestrianisation of a street in one city may have the positive side effect of creating a lively shopping and café area, in another city it may cause businesses to move out of the centre, leaving areas less attractive to locals and tourists alike. Eurochambres encourages the Commission not to impose legislation on urban transport. The principle of subsidiary should apply.

4.1.5 Promote use of public transport, cycling, walking

4.1.5.1 Contribution from a representative of the city of Bremen[124]

See under 4.1.1.3

4.1.5.2 Contribution from Mr János Mangel, Budapest Metropolitan Engineer's Designing Company[125]

The objectives of the integrated transport network development project in the City of Budapest and in the suburban area are to offer more attractive public transport services:

- Improving the image of public transport
- To provide for equal opportunities
- More favourable environmental impacts
- Limiting the increase of individual transportation.

4.1.5.3 Contribution from Mrs Anelia Stefanova, CEE Bankwatch/Friends of the Earth[125]

Support for urban public transport in Operational Programmes 2007-2013 in CEE countries is inconsistent and insufficient. It is not acceptable that there is almost nothing concerning urban transport in some countries' Operational Programmes.

EU should spend less on building roads and more on improving public transport and other alternatives to the car. Moreover, 10% share of financing for urban transport is not sufficient, considering the period where public transport has been underfinanced. More is expected: 75% of the EU funding should be allocated to sustainable transport.

4.1.5.4 Contribution from Mrs Katalin Tánczos, Budapest University of Technology and Economics[125]

To achieve urban public transport and economic/financial sustainability, the requirements for public transport services are:

- Unified ticketing systems
- Availability, accessibility, attractivity
- Intermodality
- Integrated land use and transport planning.

4.1.5.5 Contribution from Mrs Katalin Tánczos, Budapest University of Technology and Economics[125]

Vertical integration of intermodal centres (transport and retail) is an excellent opportunity to collect funding for these centres.

4.1.5.6 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

- Sustainable urban transport plans (SUTP):
  - Adoption and implementation obligatory in some Members States

  - Included in the thematic strategy on urban environment of the Commission
  - Global policy of transport (persons and freight), very important link with land-use
  - Including push measures to develop walking, cycling and PT, and pull measures to control the use of cars
- Push measures
  - Developing all alternatives to single user car: PT, cycling, car sharing, car pooling, taxi, …
  - Developing intermodality
  - Sharing the road space:
    . Sidewalk and areas for pedestrians
    . Lanes for bicycles and buses
    . Right of way for BRT and LRT
  - Priority for buses, BRT and LRT at traffic lights
- Pull measures
  - Parking control and restriction
  - Traffic plans no friendly for cars
  - Taxation of the use of cars: petrol tax, road pricing

4.1.5.7 Contribution from Mr Zsolt Denke, Budapest Transport Association[125]

- The aim of Budapest Transport Association (BTA) is that the public transport system be: more social, affordable, accessible.
  How? With the use of tools and instruments like:
  - Integrated public transport network
  - Integrated tariff system
  - Intermodal nodes
  - Development of passenger information system.

4.1.5.8 Contribution from Mrs Kardacz, DG TREN[126]

See under 4.1.2.2

4.1.5.9 Contribution from Mrs Duchène, GART[126]

In Lyon a bicycle can be rented with a monthly public transport ticket.

4.1.5.10 Contribution from Ms Maryline Jouaillec Cassassus, French federation of taxis (FNAT) [134]

- Exploiting the potential of taxis in urban passenger and freight transport:

- With the growing development of housing on the outskirts of cities, taxis are the most adapted means of transport to serve the less populated areas which are the furthest from town centres
- They also complement public transport by catering to the furthest areas with less traffic (for example the ends of public transport lines)
- Some authorities in charge of organising transport even call directly on taxis in order to preserve the environment as well as the adapted financial policy to serve some cities or villages all day long or at certain hours (Compiegne, Albi).
- To secure the balance of the tight network, "*départements*" call on taxis to provide a regular transport service.
- Transport on request
  - thirty-six percent of them were made by taxis.
  - outsourcing (taxis provide about forty percent of it).
- Their practice of transport for seated sick persons: taxis allow access to medical care for everybody and even for the most vulnerable part of the population.
- In the country or for children with particular needs, all year long, taxis are the ones transporting them from home to school.

4.1.5.11 Contribution from Mr Julien Juge, Véolia Transport[134]

- Transport on-demand to answer new mobility needs
  - Fixed route systems are sometimes not adapted to:
    - Low density areas
    - Some categories of population (disabled)
    - Some specific services (from suburb to suburb)
  - Transport on-demand, a perfect complement with fixed route systems
    - ⇨ A possibility to fill the gap between the private car and the "classical" public transport (Limburg Province, The Netherlands)
  - Transport on-demand makes possible:
    - To adapt public passenger transport to urban sprawl (ex.: "Creabus", France)
    - To serve specific segments of population and answer new needs ⇨ SuperShuttle (USA) for business trips between airports and city centers
    - ⇨ To minimize the use of private cars.
- Transport on-demand: the staff issue
  - To pay attention to employees' status in order to encourage the implementation of transport on-demand services
    ⇨ Collective agreements presenting heavy constraints in terms of work organization
  - Examples of good practices:

- Rouen urban system (France): subcontracting with taxi companies to operate services from certain hours and in low density areas
- "Djopper" (the Netherlands): voluntary help for specific services.
  With the technical help of a public transport operator to meet the security requirements

4.1.5.12 Contribution from Ms Ann Frye, Ann Frye Ltd[134]

- Focussing on walking:
  - A safe walking environment is the key component of local independent mobility;
  - Older people spend 30-40% of travelling time on walking;
  - Older pedestrians are particularly vulnerable to trips and falls;
  - Many people (particularly women and older people), are too frightened to walk to and from bus stops etc;
  - For many older and disabled people, the streets and pavements are the biggest barrier to mobility.
- Planning routes and services around community needs:
  - Transport providers need to be more focussed on individual and community needs;
  - They need to recognise changing patterns and priorities (different ethnic neighbourhoods etc);
  - They need to work in partnership with highway authorities to match pedestrian access to vehicle access.

4.1.5.13 Contribution from Ms Maria Nyman, representative of the European Disability Forum[134]

Accessibility is linked to sustainability. There are economic and environmental benefits in promoting accessibility, for example when bringing clients to shops. Accessibility to urban public transport for disabled people is a key issue for people not able to use private cars. Therefore proper accessibility should be included in the issue of sustainability.

4.1.5.14 SNCF[131]

To promote the use of cycling, the SNCF underlines the need for developing parks for the bicycles close to the stations which is more convenient than transporting the bicycle in the trains. To promote the use of cycling, there exist several solutions. One example is the cycling solutions pursued by the local authorities such as in Bologna, Italy. The scheme allows those people wishing to cycle in the centre of Bologna the use of free bikes located at major interchanges in the city centre: bus and rail stations, car parks, commercial areas, universities and pedestrian zones. The service consists of an automatic bicycle pick-up and set down facilities in a dedicated area with video surveillance, the use of low-cost vehicle markings to deter theft, free tyre inflation services at a number of nearby facilities, as well as a website managed by local authority setting out information about network, initiatives and news, and other services. Part of this scheme is also an education programme that promotes the use of private areas as ideal for long-term bicycle parking and public areas for

short term parking. In addition, new courses for specific road education on the new bicycle network have been set up and new bus tickets have been issued to allow users to take public transport in adverse weather conditions.

4.1.5.15 CIVITAS[127]

In conditions of city life, access to destinations and opportunities can very often be most efficiently delivered by public transport, walking and cycling. Even where the geographical pattern of movements stays unchanged, by changing the mode choices, better access and reduced traffic can be delivered. The principle is simple: the space and other resources allocated to each mode should reflect their relative efficiency in use of scarce space, and their ability to achieve the best economic and environmental outcome. This will result in an increase in the allocation of scarce road space to public transport, walking and cycling. Wider pedestrian footways and pedestrian zones are widespread and effective. Cycle facilities, including cycle lanes, are also an extremely important tool of encouraging behavioural change.

The initiative notes that many cities are now finding that street-running trams or light rail services (both new systems and improved traditional systems) are highly successful in attracting new generations of public transport users, and moving very large numbers of people into the heart of city commercial and retailing centres. But also, when buses are used rather than (or in addition to) trams, they also need to have priority allocation of road space with the same determination and political will as can be given to trams. These instruments involve bus lanes, preferential turning movements, bus-sensitive traffic signals, and access into areas closed to other vehicles.

4.1.5.16 Landes Nordrhein-Westfalen[138]

State programmes promoting local public passenger transportation can improve the quality and the attractivity of the whole public local transportation system. It is of particular importance to further improve bus transportation as an environmental-friendly mode (by creating bus lanes, by regulating traffic lights, etc.) and not to neglect the power of bicycle to reduce individual car usage (promote bicycle with bicycle stations, working committee, etc.)

4.1.5.17 Union des Transports Publics et Ferroviaires[141]

The UTP recalls the importance of the quality of the transport public. Quality is the key element to shift from car to public transport.

4.1.6 Promote efficient freight logistics and delivery services

4.1.6.1 Contribution from Mr Peter Sonnabend, DHL[134]

- Alternative delivery modes

  Single households can account for more than half of all addresses in cities. For these clients that are typically unavailable to accept normal deliveries, traditional alternatives can be augmented with unattended parcelbox or lockerbox solutions.
  - Preselect option with one time registration
  - Uptake particularly strong in urban areas
  - Used to 90% in conjunction with workplace
  - Supports deliveries as well as shipping
  - About 800 *packstations* in Germany
- Way ahead: action items
  - Get freight back on the urban agenda – not as singled out culprit but as level player acknowledging its vital role to sustain the living city
  - Restore logistics competence in municipal decision making and planning, with leverage in the formulation of truly integrated mobility policies
  - Support local authorities to embark on serious infrastructure management giving priority to collective transport systems for passengers and freight
  - Intensify the proliferation of urban logistics demonstrators combining consolidation and last mile aspects to broaden awareness and acceptance
  - Push clean commercial vehicles through operational benefits of value, with a clear roadmap but without choking existing operations
  - Promote products instead of prototypes!
  - Promote solutions instead of studies!

4.1.6.2 Contribution from Ms Lisa Sundell, City of Goteborg[134]

- Increased load factor in the city centre
  - Three new areas defined within the Environmental Zone (each 2km²)
  - Voluntarily programme
  - Requirements for the incentives defined:
    - 1) 65% weight or volume of total capacity or 50 stops OR
    - 2) Clean Vehicle
  - Consolidation is required for all vehicles
  - Incentives developed in cooperation with the transport industry (parts of the local freight network)

- 5 dedicated loading zones in each of the 3 areas (total 15)
- Access to 3 public transport lanes
- Access to a normally restricted road

4.1.6.3 Contribution from Mr Marcel Rommerts, DG Tren[134]

- Evaluation of the results from CIVITAS 1:
  - Distributing goods efficiently by
    - Multi-use lanes and night time delivery
    - Logistics centres
    - Coordinated distribution services
    - Clean delivery fleets

4.1.6.4 Contribution from Mr. Perlot, representative of the Association of European Motorcycle Industry[134]

See under 4.1.2.8

4.1.7 Integration of transport and land use

4.1.7.1 Contribution from Mr. Arcangelo Merella, Urban mobility and transport councillor, Municipality of Genoa[123]

The accessibility principle is sacrosanct; however we also see cities whose inhabitants have to travel greater and greater distances to access their workplace, which presents a high social exclusion risk.

4.1.7.2 Contribution from Ms Ann Frye, Ann Frye Ltd[134]

- Re-thinking traffic management and land use planning:
  - Traffic can divide communities – physically and socially;
  - Traffic impacts on health and road safety (particularly of children and older people);
  - Increasing car dependency increases exclusion for those without cars;
  - The legacy of out of town developments reduces choice and opportunity for non-car owners;
  - The health and wellbeing of local communities should always carry more weight than the speed and convenience of traffic.

4.1.7.3 Contribution from Mr. Birsul, representative of the UNIFE and Siemens[134]

Previously there were small shops at each corner. Today, with supermarkets and shopping malls, big lorries are needed.

4.1.7.4 CIVITAS[127]

The geographical linking of origins and destinations changes dynamically in response to the facilities offered and the changing condition of the market, often led by commercial forces not city plans. Spatial planning gives detailed consideration to the effects of land use patterns of travel demands. One example of this is the use of land use planning methods (both in strategic plans and in day-to-day development control) that bring destinations closer to origins, maintain a high density of smaller local facilities, and favour development in locations which can be well served by public transport and local access.

4.1.7.5 SUSTRANS[142]

Urban transport policy should recognize the distinction between mobility and accessibility. This means that transport policy needs to be well integrated with land use, development and zoning policy, so that the journey distances are not made longer than they need to be. The need for motorized transport could be reduced by encouraging the local production and consumption of goods, which encourages local patterns of travel for both freight and people. This can also contribute to a sense of community identity within neighbourhoods and support the local economy.

4.1.7.6 Landes Nordrhein-Westfalen[138]

A good accessibility of the work place or for the customers is the major concern of commuters and suppliers; retailers need accessibility and parking places whereas residents and visitors want quiet and liveable residential and commercial streets, open spaces and walking space. For that purpose, integrated urban development concepts provide different complementary approaches:

- orientating the settlement structure on internal development; that is providing the land needed in the future by using land in the city centre which has already been developed and avoiding to a large extent to allocate land in the countryside;
- Traffic planning must channel unavoidable and necessary traffic flow according to urbanistic and social considerations so that a peaceful coexistence of the different user groups is possible.

4.1.8 Exchange of best practice

4.1.8.1 Contribution from Mr. Emil Calota, Mayor of Ploiesti[123]

Barriers to the implementation of appropriate actions could be avoided through a good assessment of integrated urban planning measures based on knowledge gained in the context of the participation to the CIVITAS Initiative: therefore regional networks should be considered and created to assist cities in the new Member States.

4.1.8.2 CIVITAS[127]

An important new range of initiatives should aim to assist transfer of best knowledge and experience from Western Europe to the new Member States – including failures and mistakes.

4.1.8.3 EuroCommerce[137]

Measures aiming at reducing the negative aspects of freight transport by the commerce sector exist already and have been implemented at local level. For example, logistics platforms at the entry of cities to coordinate and optimise deliveries are developing as well as special tail lifts to limit noise pollution. Other examples include the increasing use of the river Seine in Paris for urban transport or electrical vehicles for distribution in Reggio Emilia in Italy. There is, however, no workable alternative to last mile delivery by road transport. EuroCommerce calls for an inventory of all the best practices and for its dissemination.

The EU could make some useful, non-legislative contributions:

- Recognise the contribution made by and the needs of commerce in urban areas
- Act as facilitator by gathering, exchanging and disseminating best practices. One possibility could be for the Commission to carry out a BEST project on the issue;
- Encourage public-private partnerships (PPP) at local level. Guidelines on PPPs and commerce involvement in the field of urban transport should be drawn up.

4.1.8.4 Eurochambres[140]

Eurochambres believes that EU can contribute to better urban transport solutions, without imposing legislation by continuing to enable exchange of experiences and best practices between cities, and common learning. (e.g. on efficient public transport or parking solutions, or on better traffic management using new signalling solutions or optimised time planning of public works.)

4.1.9 Communication, education and awareness campaigns

4.1.9.1 Eurochambres[140]

Eurochambres believes that EU can contribute to better urban transport solutions, without imposing legislation :

- raise awareness among city authorities that their initiatives may also have repercussions on a wider area, and encourage them to work together in solving them, e.g. very different rules for access for vehicles to city centres (differing definitions of times and vehicle categories, need to put different stickers on vehicles etc.) can have the effect of increasing the administrative burden on companies and cost of deliveries into the city.
- Encourage cities to include representatives of business stakeholders in their transport planning processes, as it is essential to know enterprises' needs in order to develop appropriate urban transport solutions. This is also true for public private partnerships, which can offer a great potential for combining the advantages of both the public and private sectors. But for PPPs to work, business partners have to be involved from the outset, not only be viewed as contributors of financial means to predetermined concepts.

4.1.9.2 UBA[143]

In order to convince the inhabitants in the cities that public urban transport is a good alternative for individual transport, targeted communication and actions are needed beside long-term secured financing and attractive services. The European week for mobility is a good example for this.

4.2 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING TRAFFIC CONGESTION

4.2.1 Infrastructure development

4.2.1.1 Contribution from Mr. Cicatiello, representative of CEEP[126]

In relation with buslanes, even in the biggest capitals the only way to improve public transport is to increase its commercial speed and provide sure time of transport.

One of the goals of the Green Paper is to leave the road to public transport and to treat buslanes as the underground system:

- with the help of ITS;
- as far as funding is concerned: an increase of 20% of the commercial speed will enable a better use of the rolling stock without investment.

4.2.1.2 FEMA and ACEM: Motorcyclists' contribution[144],[145]

Local transport plans should integrate the Powered Two Wheeler (PTW)'s option with other transport choices to encourage different modes according to their relevance and practicality for each journey. Most congestion at peak time can be attributed to single-occupancy cars. Powered Two Wheeler could make a positive contribution to relieve congestion by increasing vehicle capacity on congested urban roads, alleviating gridlocks on high volume roads and using less space in the park than a car.

FEMA calls the European Institutions to encourage Member States to exempt PTW's from congestion charges that may be applied to motorized vehicles accessing city centres. This is fully justified with regard to the role that PTW's can play in relieving congestion in urban areas and at the same time using less fuel, hence reducing emissions. FEMA also calls the European Institutions to promote improved mobility for PTW's users through institutional investment, subsidies and legislation. These investments would concern in particular the design of safe and secure parking spaces for PTW's at railway, subway and bus stations, schools and workplace, town and city centres. The legislation would give PTW's access to bus lanes, high occupancy lanes and to city centres closed to individual motorized traffic. It would be helpful to introduce double stop lines at traffic lights with the advanced line reserved for PTW's.

4.2.1.3 Polis[128]

The European Union should remove technical barriers to the deployment of new technical solutions through standardisation and the interoperability of systems such as information systems or charging systems. The interoperability of the various components of a complex ITS system at the European level, including the interoperability of the components of traffic

management systems, is essential for the rapid deployment of the technologies. The ITS platform for European cities referred to above could support efficiently this process.

The development of a European standard by which any city's ticketing software can be delivered "over the air" as a software application to visitors' contactless mobile phone handsets, or compatible standards for internet based parking reservations, should for instance be supported at the European level.

The use of mobile phone for mobile payments of transport services such as parking or public transport should be facilitated by harmonization of national legislation on the integration of these services in phone bills.

4.2.1.4 ERF, IRF[146]

The provision of real time traffic information is one of the most cost-effective value added services by allowing motorists to make informed route choices and book car parking ahead of their trip.

4.2.1.5 CEMR[147]

CEMR recommends a strong EU standardization of urban transport equipment (vehicles, intelligent transport systems, ticket machines, road pricing systems, low emission zones systems etc.).

4.2.1.6 UEAPME[148]

A number of possible approaches could be explored:

- Bigger investments in alternative receiving options (key-sharing, goods vaults, early delivery etc.);
- Moving access times for lorries to inner cities outside peak hours and extending load / unload times;
- Development of distribution platforms. However, to this point, pilot projects with distribution platforms have not shown satisfactory results for locally or regionally acting craft and SMEs;
- Opening bus lanes to taxis and commercial vehicles;
- Office parking facilities are less used during the weekend and in the evening. They could be used more efficiently for shopping rush hours (i.e. Saturday);
- Exploring innovative parking solutions. In the long term parking, solutions can be found in automatic parking systems without driving space between the parking spaces.
- Promote a better and wider use of car pooling.
- Creation of joint purchasing structures to optimise supply (examples exist in construction, car repair etc.);
- Collecting tradesmen of different enterprises by one single vehicle to transfer them to the building site. Successful models can be found in construction and other sectors.
- Exploring the practicalities of promoting regional supply chains to reduce traffic. Solutions must avoid market distortions.

4.2.1.7 FederMobilità[149]

Many initiatives require funds that the Local Authorities and Regions do not have available in their entirety. Therefore, directions on the part of the European Union would be useful for:

- Stimulating and encouraging the Member States to co-finance local public transport development programmes;
- Favouring the enactment of legislation including the owners of buildings and lands whose value is increased by the realization and modernization of public transport systems to co-finance the relevant works;
- Earmarking for the benefit of the Local Authorities and Regions part of the receipts coming from the application of "eurovignette" type regulations, for the purpose of contributing to the financing of the investments in sustainable urban mobility systems.

4.2.1.8 UNIFE[130]

Liberalisation of urban transport has to be achieved, with the aim to reduce costs through competition throughout the value chain.

The supply industry calls for a technically harmonised market in rolling stock, signalling and infrastructure regarding basic standards.

- Technical harmonisation needs to start with increasingly harmonising the operational requirements, with the aim to reduce costs and to increase the market
- The development of common essential requirements would lead to a more standardised market for urban rail equipment: e.g.: loading gauge, curve radius, axle load, crash worthiness…
- Cross-acceptance of urban rail equipment and common homologation standards would simplify homologation processes leading to an increased number of products available, and boost the development of a leasing market. At EU-level the objective shall be to ensure that products homologated in one urban area within the EU shall also be considered safe everywhere else within the EU.

4.2.2 Intermodality/ Integration of transport systems

4.2.2.1 INE[150]

Today, the revival of waterway transport inspires a number of cities to optimally use this existing asset reaching deep into their heart to fight congestion and pollution. A set of successful examples:

- Since road access to the historical centre was restricted, the beer boat on the Utrecht canals successfully supplies cafés and restaurants replacing the heavy truck loads of the past.

- Île-de-France consumes 2.6 tones construction materials per inhabitant per year. 29% is carried in by barge. If this volume returned to the roads, it would spell trouble. The port of Paris therefore actively works on an attractive integration of port activities in city planning to keep goods flowing.
- With growing congestion, road transport increasingly fails in just-in-time deliveries putting the logistics schemes of customers under pressure. The AMS barge, a container crane ship, in Amsterdam provides all waterside companies in the wider port area with reliable deliveries.
- During the ring road works in Antwerp, port and terminal operators decided to facilitate night shifts for inland waterway transport to avoid any traffic disruption of goods. Lots of companies discovered the benefits of using the waterway and remained clients after the works.
- Waste: London produces 4.4 million tones of municipal waste every year, of which only 18% is currently transported by river. This seemingly small percentage saves around 100,000 lorry movements per annum, reducing the environmental impact and congestion on London's roads.

Four barriers to innovative urban freight projects could be solved by turning waterways into an asset for carbon-low and congestion free cities.

First, there are no integrated visions and strategies yet on urban and mobility planning. Clogged traffic arteries and raising pollution now require new cross-discipline strategies and pro-active planning. Cities like Paris show this is perfectly possible by a shared use of the waterfront for both leisure and transport with innovative architecture and new job opportunities for low skilled workers.

Secondly, there is a lack of public involvement and support for co-modal transport. Cities can leave everything to the market or decide to take an active role. As a neutral actor, they can bring interested partners together which otherwise would not meet spontaneously and help to reach critical mass for new projects. Such a catalyst role is a good means for cities to monitor and attain their own goals in terms of mobility, sustainability, welfare, social inclusion, etc.

Thirdly, the regulations and permits constitute an administrative labyrinth. To set up a multi-modal transhipment facility, are confronted with lots of administrative barriers, such that many innovative and interesting projects stop. If interested in socioeconomic return of the project, urban authorities could guide and support businesses through the process and signpost red tape to the regional, national and European level with a message to streamline regulation without decreasing protection and safety levels.

Finally, inadequate funding is a reason for start-up projects to fail. It is difficult to convince market parties to financially participate in unknown and untested freight solutions. By providing an early-stage grant or helping project partners to apply for EU funds, new concepts can prove their worth in the first 3 years.

4.2.2.2 IRU[151]

IRU suggests the EU to eliminate distortion of competition between transport modes and encourage inter-modality. Collective transport services by bus, coach and taxi should be brought as close to the citizen's doorstep as possible by eliminating distortions of competition between transport modes, further integrating urban and inter-urban bus and

coach services, encouraging inter-modality and facilitating interchange, multi-modal ticketing and passenger information prior to and during the journey.

4.2.2.3 CEEP[152]

A strong instrument can be the infrastructures design to provide a smooth, friendly, fast and easy way of transfer from a transport mode to another, mainly if they are design and prepared, from the beginning, for all modes that arrive there. This includes railways which have an important part to play in Europe's sustainable transport future. They need adequate funding and must be incorporated into passenger information and traffic management systems.

4.2.2.4 CER[153]

Rail transport, being environmentally friendly and energy-efficient, can play a key role in reducing CO_2 emissions. Progress with the European Commission's work on a primary rail freight network for Europe can contribute in the long run to reducing urban transport problems and negative environmental impacts, by encouraging a modal shift.

4.2.2.5 SNCF[131]

The focus of the Commission's attention should be on providing efficient interchange and inter-modal sites for passengers where they can switch from one public transport mode to another, and from private to public modes of transport, not only from the car but also from "soft modes" such as bicycles to public transport with the provision of secure parking locations at key interchange points.

4.2.2.6 UBA[143]

The interlinking of different transport means should be further improved, e.g. within one transport mean (e.g. by co-ordination of the schedules), or between public urban transport and individual transport (e.g. by user-friendly concepts for bike & ride and park & ride, sufficient and safe parking lots for bicycles, cheap possibilities to take the bicycle along). . An optimal interlinking of different transport means (including barrier-free access) can considerably increase the image and attractiveness of public urban transport and increase the shift of traffic towards public transport.

4.2.3 Access restriction

4.2.3.1 Contribution from Mr Maurizio Tomassini, representing the CURACAO project[125]

When the limited traffic zone was introduced in Rome at the end of the 80's, the situation was unbearable in terms of congestion, noise and pollution. A law has been introduced to

protect heritage in towns. Modifications were introduced softly enough to be accepted by the population.

The example of the closing to private cars of the Piazza del Popolo, which was a parking until 5 years ago, showed that after a lot of initial protests and negotiations, the project has eventually been accepted and people are attracted by the new situation, which shows that the city is not dying at all. Also, in the area of Trastevere, after negative reactions on car access restrictions at night, a good compromise has been found with the creation of a large parking with free shuttle buses. After six months of trial, there is no evidence that the economic life has been reduced.

4.2.3.2 Contribution from Mrs Christelle Godinho, Mobility Agency of the City of Paris[126]

Measure implemented or to be implemented with an ITS dimension: Create or extend new reduced traffic sectors or roads: New access control cameras on main roads.

4.2.3.3 Contribution from Mr Marcel Rommerts, DG Tren[134]

- Access restrictions: evaluation of the results from CIVITAS 1:
  - Some results
    - Major inner-city areas in Barcelona, Bristol, Cork, Gdynia, Nantes and Rome
  - Impacts
    - Air quality and noise improvements
    - Reduction of congestion
    - High appreciation by residents, shop owners and couriers (after opposition)
  - Lessons
    - Extremely effective tool for better air quality (and quality of life in general)
    - Must be part of a package
    - Communication and consultation

4.2.3.4 Brussels-Capital, Ile-de-France, London[154]

Some guidelines and support measures to facilitate the introduction of Green Zones and/or congestion charging, regulated/restricted access for certain vehicles and/or during certain periods, and with speed limitations (measures which introduce pricing elements into road use, as well as car and fuel types), could be of high interest. For example, a legal framework for cities to enforce charges and penalties where these are incurred by residents of other Member States is important to maintain the credibility of charging schemes.

4.2.3.5 UEAPME[148]

A number of cities have developed successful solutions. The inhabitants of Amsterdam, for example, are prepared to park their car outside the city (´park & ride´) and use other ways of transport in the city (bicycle and public transport). Obviously, this system works thanks to specific attitudes and cultural backgrounds. It cannot be simply transferred to other cities.

UEAPME therefore warns of a policy that would ban cars from accessing urban areas. Inhabitants must continue to have the choice between public transport and their private cars.

The consequence of strict demand management schemes such as parking controls and access restrictions is an exodus of companies from the city centres to the outskirts, which can – especially in smaller cities with few tourist attractions – eventually lead to the opposite of what is intended: unattractive, dormant city centres with hardly any companies and marred by decaying buildings. The trend to move from the centres to the suburbs can already be clearly observed in many European towns and cities.

One can distinguish two kinds of access restriction for transport vehicles:

- Access restrictions on certain moments of the day. In this case, the receivers of goods (manufactures, shops, etc.) should be encouraged to enable delivery outside opening/office hours.
- Access restriction for lorries above a certain weight. This solution has the negative effect that one heavy vehicle may be replaced by several smaller ones leading to even more traffic.

4.2.3.6 Confcommercio[155]

In Italy, with the aim of reducing its traffic congestion, municipal administrations have implemented measures like for the creation of Vehicle Restricted Areas (VRA). Being the average density of examined cities vehicle restricted areas equal to 2.54 m2/inhabitant, the Municipalities with higher results were Ascoli Piceno, Ferrara, Florence, Lecce, Mantua, Pisa, Viterbo, Siena and Pavia, all exceeding the 10 m²/inhabitant.

Concerning traffic restrictions, the following measures are implemented in Italian Municipalities: permanent restriction inside VRAs; programmed restrictions for more polluting vehicles, total restriction when limits were exceeded, restrictions by number plate and green Sunday. Special treatments are envisaged for individuals and companies whose mobility has less impact on the environment: Euro 4, vehicles joining Mobility Management Plans and vehicles with more than three persons on board are often exempted from the restrictions.

As a matter of fact, the homogeneous application of traffic restriction measures on a wide area, such as the regional one, increases its effectiveness, managing to have effects on areas which are not purely local and making information easier for users.

4.2.4 Modify travel behaviour through mobility management, traffic, parking and information management

4.2.4.1 Contribution from Mr. Tomassini, representative of the CURACAO project[125]

In Rome, 20 park and ride facilities were put in operation in 2001, as well as on street parking payment to filter inbound traffic to the centre.

4.2.4.2 Contribution from Mr Zsolt Denke, Budapest Transport Association[125]

- Development of passenger information system
  - Internet based information
    - On line route planner
    - Fare calculator
  - Paper based information
    - Leaflets e.g. timetables
  - Network maps
  - Numbering of regional bus and rail services
  - Renaming of connecting points

4.2.4.3 Contribution from Mr. Cicatiello, representative of CEEP[126]

See under 4.2.1.1

4.2.4.4 Contribution from Mr. Ken Laughlin, Hampshire County Council[126]

- Core Transport Long Term Strategy / Philosophy: "Reduce", "Manage", "Invest"
  - Reduce the number of journeys made, and the average length of journeys where there is no impact on quality of life or the economy
    - Land use policies
    - Travel planning and other initiatives
    - Marketing behavioural change
    - Discourage unnecessary journeys through demand management

  - Manage the existing transport networks effectively to make best use of existing capacity
    - Minimise delays and improve journey time reliability
    - Traffic management, inc ITS
    - Junction improvements and local bypasses
    - Continued commitment to road safety and casualty reduction
    - Improved information to the travelling public and businesses about travel options
  - Invest in additional capacity, where shown to be essential, with emphasis to investing in public transport networks, particularly those catering for shorter journeys
    - Improved public transport as alternative to car, especially for shorter journeys
    - Measures to promote public transport links to the main transport hubs
    - Improved walking and cycling facilities
    - Improvements to ferry services and their interchanges
    - Road improvements to create more capacity.
- ITS within an integrated transport strategy
  - ITS should not be seen:
    - in isolation
    - as technology driven
  - ITS can:
    - provide the flexibility in delivering policies, objectives and services
    - be used to complement or enhance traditional transport facilities
    - manage demand and make the best use of the existing assets and infrastructure
    - provide a cost effective solution compared to road building or major infrastructure provision
  - ITS can deliver innovative solutions & the integration of different tools to deliver new and enhanced services and facilities, e.g
    - demand responsive transport
    - co-modality
    - freight delivery
    - personalised & mobile travel services
    - road user/congestion charging
    - network management / reliability
    - measurement and monitoring
    - cooperative vehicle / highway systems

- integrated ticketing
- reducing emissions.

– But to be effective, ITS needs to take account of:
  - Policy objectives
  - User needs
  - Stakeholders
  - --> Requirements definition
  - --> Systems architecture.

4.2.4.5 Contribution from Mrs Christelle Godinho, Mobility Agency of the City of Paris[126]

▪ The main policies adopted or to be adopted
  – Develop alternatives to individual motorised journeys
    - Institutional framework and transport networks:
      - The State, Region and "départements" finance heavy investment undertakings (trains, undergrounds, tramways, motorways and the main road network).
      - The City councils undertake the lay-out and maintenance of all other public spaces. The Region and "départements" take part in the financing of environmentally- friendly alternatives and roadways.
      - In Paris, the national Police Force is in charge of the control and enforcement of traffic and parking
    - STIF: the public transport authority within the Ile-de-France region. The STIF missions: define transport supply, finance the development of networks, promote public transport services. It approves contracts with operation companies and controls their activity.
    - The objectives:
      - A rising part of public transport, taxis, bicycle and pedestrian from 75% in 2001 to 80% of journeys concerning Paris in 2013, and reaching 83% of individual journeys in 2020
      - Between 2001 and 2013, a 20% increase in journeys within the public transport, a 30 % increase between 2001 and 2020
      - An increase of bicycle journeys of 400 % is forecast between 2001 and 2020
    - Create new underground lines as bypasses
    - Create new tramways and dedicated bus lanes
  – Reduce motorised traffic on Parisian roadways.
    - The objectives:

    - A decrease of 40% in network traffic by 2020 compared to 2001. A decrease in traffic of 18% against 2001 has been measured in 2007
    - This 40% decrease includes an increase in goods movements and services of 11%
    - To stabilise the development of two-wheeled motorised vehicles
  - Creation of Green areas.
- Place pedestrians and cyclists at the heart of the public area
  - develop the cycling network : 500 km in 2010
  - develop zones 30 km/h, green zones and network, pedestrian-exclusive roadways, reverse-direction bicycle lanes
- Develop initiatives in favour of residential parking
  - Metered parking
  - Priority for residential parking

4.2.4.6 Contribution from Mrs Christelle Godinho, Mobility Agency of the City of Paris[126]

Measure implemented or to be implemented with an ITS dimension:

- Reduce dependency on the car and encourage alternatives for journeys home to work
  - Increase the number of park & ride facilities
  - Improve public transport operation: traffic light priority
  - Video surveillance of buslanes.
- Adapt the use made of the main ring road
  - Regulating maximum speed allowed in real time
  - Regulating Heavy Goods Vehicle traffic according to their size, extent of pollution and their destination
  - Implementing new ways of working and priority for taxis, emergency service vehicles, vehicles for car pooling, the less polluting vehicles, express bus lines.

4.2.4.7 Contribution from Mr. Alexio Picco, AMI, Genoa[126]

- Recommendations for other cities
  - ITS means innovative systems and services; they need political support
  - Support EU and national R&D projects
  - Use projects as start up for systems and services that should be economically sustainable
  - Develop a coherent business plan (implementation and management)
  - Create integration with IT systems of other policy areas (i.e. environment)
  - Develop ITS in an “user friendly” way
  - Create partnerships

  - Involve stakeholders
- Recommendations for ITS actions at EU level
  - Define main criteria for interoperability of systems and services
  - Support the development and the use of standards
  - Develop ITS in new areas (walking, cycling, goods, ..)
  - Support of large ITS demonstration "policy driven" projects with strong involvement of the cities at political and technical level (integrated approach, also outside mobility, ITS focused, digital sites, ...)
  - Support take-up actions from "advanced" cities to "learning cities" (i.e. Genoa – Krakow)

4.2.4.8 Contribution from Mrs Wass-Danielsen, City of Copenhagen[126]

Mrs Wass-Danielsen mentions the concept of "flexible roads": the function of a road can vary along the time, with the use of ITS.

4.2.4.9 Contribution from Mr. Maes, DG TREN[126]

ITS could be a way for public transport operators to earn revenue: there is an increasing demand for more reliable traffic information and public transport operators can get a lot of interesting data such as bus tracking, delays, congestion. Navigation systems use static data. Demand will increase for dynamic information on congestion, etc. Private service providers will be interested to get this information from public transport operators, which could sell it to them.

4.2.4.10 EPOMM[156]

Mobility Management is the organisation of smart and sustainable travel and transport. Mobility Management offers a toolbox of instruments and measures that use a combination of both restrictive and incentive-based policies aimed at influencing individuals' transport choices with the key aims of:

- reducing the need to travel
- changing the times that journeys are made
- changing destinations of journeys
- changing the mode used for the journey

4.2.4.11 SUSTRANS[142]

It is now understood, and we are encouraged to see that the Commission recognises this, that 10% of all car trips in urban areas are less than 1km long; 30% under 3km and 50% under 5km[157]. These are clearly trips that should be made by walking, cycling and in some cases by public transport, not by car or motorcycle.

A range of cost-effective tools are available to deliver behaviour change, focused on improving individual knowledge, perceptions and attitudes and raising awareness of the alternatives to car use. These measures include workplace travel plans, car sharing,

teleworking and individualised travel marketing such as the TravelSmart technique piloted in the UK by Sustrans. Forthcoming research from the UK's Department for Transport estimates that if implemented now, measures such as these could save the equivalent of up to 14.2 million tonnes of carbon emissions by 2015 in the UK alone[158].

4.2.4.12 Polis[128]

Polis members call upon the European Union to set as one of its main objectives the reduction of the dependence on private cars and the promotion of modal shift from private cars to other modes of transport, specifically in urban areas. Modal shift, coupled with sustainable urban freight delivery strategies, is the most effective way for local authorities to support EU objectives on competitiveness, energy efficiency, road safety and the environment.

To achieve this goal, European urban transport policy should approach urban transport as an intermodal and multi-modal system. Intelligent Transport Systems can help to move away from a modal towards a systemic approach to urban transport. This would also mean moving away from a mode-specific to a systematic person-journey approach of transport planning and management.

Highly developed network management systems and techniques will better respond to environmental challenges and better manage traffic and congestion on the network, providing accurate, timely and effective information and prompt and timely adaptation of policy network management controls and instruments.

4.2.4.13 UEAPME[148]

Urban areas have to develop a long-term strategy through mobility plans which must include a well thought parking system of short-term parking zones, loading zones and night parking space for residents. Intelligent and co-ordinated traffic lights could significantly speed-up traffic in many European cities.

UEAPME is of the opinion that effective information systems can help reduce / avoid traffic problems. This should include :

- information on space availability of parking facilities;
- information on accidents, road works etc. with alternative routes;
- information on the Estimated Time of Arrival – ETA - to destinations;
- The increase of car navigation systems and combining this with traffic information can be an excellent way to help reduce delay times. But this can attract extra traffic to secondary roads, which the inhabitants of these areas have to be prepared to accept.

4.2.4.14 ECTRI[159]

ECTRI is of the opinion that e-activities (internet shopping, etc.) should be considered, considering that they could substitute private travel and in turn generate other journeys, such as deliveries by light vans.

4.2.4.15 Confcommercio[155]

To tackle effectively the chronic problem of urban traffic congestion, also, promoting innovative ways of organizing and rationalizing urban mobility –such as mobility management, car and van sharing and car pooling- appears to be fair and appropriate.

4.2.4.16 Landes Nordrhein-Westfalen[138]

The use of traffic telematics at local level contributes to alleviate traffic problems and to optimize the existing communal road network. An example of traffic system management is mentioned: The Ruhrpilot in North Rhine-Westphalia.

4.2.5 Promote use of public transport, cycling, walking

4.2.5.1 Contribution from Mrs Lucinda Turner, Transport for London (TfL)[125]

See under 4.2.9.5

4.2.5.2 Contribution from Mr Attila Nagy, Debrecen Transport Company[125]

- Maintenance of market position
  - by the modernisation of vehicle fleet. Vehicle reconstruction, purchase of modern, energy-efficient vehicles.
  - by the refurbishment and extension of existing infrastructure,
  - Development of traffic control, organization and vehicle positioning systems. Further improvement of passenger information system.
  - Training and efficient employment of human resources.
  - Integrated system of fares, single tariff system.
  - Development of the ISO 9001-2000 insurance control system.
  - More intensive marketing and advertising activity

4.2.5.3 Contribution from Mrs Christelle Godinho, Mobility Agency of the City of Paris[126]

Measure implemented or to be implemented with an ITS dimension: Increase use of bicycles. Self service bicycles: 1000 points available on July 2007 with 14 100 bicycles; an objective of 1451 points at the end of 2007 with 20 600 bicycles.

4.2.5.4 Contribution from Mr. Birsul, representative of the UNIFE and Siemens[134]

Mr. Birsul has noted the remarkable decrease of public transport share in Prague. It has to do with the reduction of public funding for public transport and with the decrease of reliable connections between modes. So, the lack of acceptance of such "non-service" is one of the reasons for the decrease of the public transport share.

4.2.5.5 BUSTRIP[160]

Based on the practical knowledge and experiences from the BUSTRIP project, the organization supports the Commission in taking urgent action to stimulate the use of public transport, cycling and walking and promoting a less car dependent life-style. Walking, cycling and public transport must be cheaper, more attractive and more easy to use. Cities need to make private personal transport users pay the full environmental cost and use the money to cross subsidies sustainable transport and improve the environment – no more free or subsidized parking and the more polluting vehicles must pay more.

4.2.5.6 IRU[151]

IRU puts forward the need for a pro-active policy for a shift from the private car to bus, coach and taxi. Collective passenger transport by bus, coach and taxi can ensure a viable safe and environmentally-friendly alternative to the private car. Therefore, their fundamental role for solving congestion problems should be recognized. A proactive policy framework for a shift from the private car to bus, coach and taxi should be developed in cooperation with the road transport industry and implemented at EU, national, and city level.

4.2.5.7 Brussels-Capital, Ile-de-France, London[154]

The Green Paper should show the real cost of the negative effects for the communities of traffic congestion.

The commercial speed of surface public transport should be improved by the implementation of several measures (“sites propres” or bus-only lanes, pedestrianised areas, priority for public transport at crossroads, reduce traffic volumes and congestion by developing local traffic plans, etc.).

There is a need to identify and share best practice (accessibility, comfort, service quality, frequency, regularity and schedule (night included), speed, cleanliness, quality-price ratio, etc.)

4.2.5.8 CEEP[152]

A powerful tool to shift more passengers from private to public transport is to guarantee punctuality and reliability of trips. This may be obtained by increasing the number of bus lanes, as many metropolitan areas in Europe are actually doing. The Green Paper should

indicate new funding opportunities for the improvement of bus lanes in recognition of the important role they can play in boosting public transport ridership.

4.2.5.9 UEAPME[148]

The urban strategy should include the promotion of public-private partnerships. Private transport businesses can take over public services. For example, taxis can be charged with social missions such as the transport of ill or handicapped people. Taxies can also play a part in the normal public transport system by providing minibus services to specific destinations. Successful examples can be found in France.

4.2.5.10 UITP[161]

Public transport has a vital role to play in ensuring that every city-dweller (whether motorized or not) has access to work, shops, services and leisure facilities. Economic dynamism and social cohesion are at stake. Public transport costs the community less than cars, consumes far less road space and energy and is more environmentally friendly as well as less damaging to the health of city-dwellers. The UITP recommended actions cover:

- Promote research on urban mobility aspects. In this regard, the European Research Forum on Urban Mobility (EURFORUM) represents a powerful tool to help identify the research priorities on urban mobility[162],
- Promote standardisation and harmonisation, as a powerful tool to improve the technical and economic efficiency of the public transport systems.
- Developing clear economic incentives on a technology neutral basis (using market based instruments and taking into account the environmental impact) to promote the renewal of the bus fleets and in particular the introduction of the "cleanest technologies".
- Creating European awareness and information campaigns to encourage more sustainable mobility behaviour of citizens. Promoting a "good feeling" and getting a sense of pride from using public transport (with newest and cleanest technologies) represents a powerful way to facilitate their introduction.

4.2.5.11 UITP-ETF[163]

Employees are key to the success of public transport operations. The quality of the working environment is an essential element for assuring quality services to the customers. It is therefore important to promote the availability of occupational training to improve quality and service.

4.2.6 Promote new forms of vehicle use and ownership

4.2.6.1 CIVITAS[127]

A core element of a new mobility culture is the promotion of car-sharing services – as alternative to car ownership. This "car-on-call" service is not yet sufficiently known in many European countries but supplements public transport and cycling. It is a smart chance to regain valuable street space in our cities: there are short term options of achieving about 3.8 million car-sharers in EU25 – regaining the space of 500.000 private cars in our cities: equivalent to a row of 2.500 km parked cars. As Car-Sharing has such a potential to win back urban public space and thus urban life quality, it should get more into the focus of European Research and Demonstration programmes.

4.2.6.2 Brussels-Capital, Ile-de-France, London[154]

Good practice in more effective promotion of alternative modes of transport can be encouraged through regulated access or pedestrianisation of cities' sensitive zones and the construction of safe cycle and pedestrian paths. Also they can be promoted by developing alternative uses of the private car such as car sharing, car clubs, car pooling, collective taxis etc. Re-allocation of street space and street layout, in order to grant priority to public transport and alternative transport modes, could be encouraged.

4.2.6.3 EPOMM[156]

EPOMM underlines the theory that if an individual makes the choice (as opposed to being forced because of cost) then that behaviour is more sustainable over time.

Several programmes are implemented across Europe which seek to influence individual choice through education and smart organisation. The key programmes in this area are School Travel Plans, Work Place Travel Plans, Event Travel Plans (e.g. Netherlands-Belgium Euro 2000, London Olympics 2012), Residential Travel Plans and Travel Awareness. These programmes create a demand for other innovative solutions such as home delivery, car sharing and flexible working. They also work well in combination with other MM-fields: multimodal travel (car-PT, Bike-PT), multimodal information systems (such as mobility centres), carpooling, vanpooling, P+R, E-work, E-school, E-meeting, ICT facilities, parking policies etc.

Results obviously vary from place to place, however, there is significant evidence that these solutions can cut demand for car transport by over 10% across urban areas and by 30 à 50% on specific sites (e.g. inner cities) – thus making cities more attractive and competitive.

4.2.6.4 SNCF[131]

Car sharing solutions are more and more popular. There are over 600 such projects worldwide that range from providing restricted lanes for multi occupancy vehicles to schemes set up by local authorities that provide a fleet of vehicles that can be shared by a number of users in urban areas.

4.2.7 Promote efficient freight logistics and delivery services

4.2.7.1 Contribution from Mr. Camille Durand, Vice-president of Nantes-Métropole[123]

Freight transport and delivery operation is another concern that must be addressed: freight transport operators want to use bigger vehicles in cities. Therefore, the organisation of the cities should be thought so that appropriate means for long and short distance transport are used. Solutions such as night operation have been envisaged but inducing possible noise problems.

4.2.7.2 Contribution from Mrs Christelle Godinho, Mobility Agency of the City of Paris[126]

Measure implemented or to be implemented with an ITS dimension: Facilitate professional journeys

- Information system on delivery conditions
- Other modes like delivery tricycle for final deliveries
- Encourage less polluting vehicles and reduce more polluting.

4.2.7.3 Contribution from Mr Peter Sonnabend, DHL[134]

- Logistics organisation

  Solutions aim to bundle unorganised deliveries in collective distribution networks around an urban consolidation centre (UDC). The logistics setup equals existing schemes for construction sites, manufacturing plants or airports; the challenges are rather in the organisation of participants and economic funding of such services.
  - Huge savings of up to 70% freight traffic
  - Applicable also to reverse logistics or waste
  - Service models must respect competition rules
  - Apportioning of extra costs to beneficiaries
  - Receiver participation is essential.
- Off-peak deliveries

  Conventional and innovative logistics schemes may be moved outside peak hours, e.g. in night times, to relieve the local infrastructure.
  - Lock-and-key solutions for specific clients
  - Silent vehicles, equipment, and procedures

4.2.7.4 EFIP: Inland Ports' contribution[135]

EFIP would like to draw the attention to the added value of inland ports for a sustainable urban transport network in Europe. European inland ports bring a non negligible contribution to the development of intelligent, efficient, reliable and safe urban logistics solutions. They are essential as nodal points, by combining the different transport modes, ensuring the connections between the transport modes in a way that contributes to bring trucks off the roads in the cities. By delivering additional services in logistics centres, the inland ports also contribute to the creation of added value in or nearby the cities.

4.2.7.5 BUSTRIP[160]

Based on the practical knowledge and experiences from the BUSTRIP project, the organization supports the Commission in taking urgent action to improve urban freight transport whose issues at city level are still not well understood or quantified. Many cities have the ambition to become a "logistics centre" without understanding the implications arising from increasing logistics activities such as congestion, noise and air quality impacts. The cities need to be encouraged and supported to recognize the centrality of freight to SUTP. The resources available for managing logistics aspects of city planning need also to be increased.

4.2.7.6 CLECAT[164]

CLECAT mentions actions that could have a positive impact on urban mobility in the EU. For example, to encourage deliveries and collections at off-peak times (better use of the 24 hours of each day). One should however point out that this solution would entail substantial changes in the work methods of many actors in the supply chain (forwarders, carriers, shippers, workers etc.).

4.2.7.7 SNCF[131]

A major concern for urban transport and a cause of substantial amounts of congestion in the urban environment is the traffic caused by urban freight. The main focus needs to be on tackling the externalities caused by road based urban freight. The SNCF gives many examples of best practices (improved management of rail freight in Paris, innovative ICT platform to support various innovative city logistics schemes and the Park-and-Buy project in Sienna. With Park-and-buy, Siena sightseers can purchase goods in the restricted traffic zone and have them delivered to certain parking places or hotels).

4.2.8 Taxes and incentives

4.2.8.1 IRU[151]

City access taxes for touring coaches and taxis are counterproductive to any measure aimed at solving congestion problems in inner cities. It makes coach tourism and taxi use less

attractive and encourages private car use. Charges should correspond to a service offered and be reinvested to improve facilities.

4.2.8.2 EPOMM[156]

Increasing the cost of travelling by a specific mode can influence the individual choice. Road pricing, congestion charging, low emission zones and parking charges are some examples of fiscal disincentives to car use that cities are already applying across Europe. High Occupancy Vehicle lanes, those lanes where only cars with 2 or more people can travel, work well in the USA and incentives more efficient use of the existing road capacity.

4.2.9 Road / urban pricing

4.2.9.1 Contribution from Mr. Camille Durand, Vice-president of Nantes-Métropole[123]

The Green Paper should open the debate addressing competition for public space between the public transport and the private car. How can this be achieved at detriment of the private car? Mr Durand refuses the option of urban road pricing because the disadvantaged inhabitants are to suffer most from it.

4.2.9.2 Contribution from Mr Albert Bore, President of the Commission for Territorial Cohesion Policy, Committee of the Regions[123]

England, Mr Albert Bore's region, is looking to become a pilot region for the British government views of dealing with the congestion issues and therefore using road pricing policies to bring about modal shift. And the technology is there! The technology is currently being used by an insurance company in the UK in providing people with car insurance, i.e. the level of car insurance in the UK through a particular company depends on which road travel is done and at which times of the day. If it can be done by an insurance company, it can certainly be done through other measures to bring about that modal shift and therefore to bring about that distribution of costs between public and private transports. These are the measures that need to be looked at because however much it is invested in transport infrastructures it must be always kept in mind that available financial resources are limited and everything cannot be done by public investments. Consequently Mr Bore believes that other measures must be envisaged to make modal shift happen.

4.2.9.3 Contribution from Mr. Jacques Barrot, Vice-President of the European Commission in charge of transport[123]

Road pricing is a good solution but, as the Mayor of London said in Davos, under condition that road pricing profits are reinvested in the urban public transport.

4.2.9.4 Contribution from Mr Maurizio Tomassini, ISIS, Rome, representing the CURACAO project[125]

See under 4.4.9.1

4.2.9.5 Contribution from Mrs Lucinda Turner, Transport for London (TfL)[125]

The impacts of the central London congestion charging scheme are as follows:

- Traffic entering charging zone:
  - Reduced by 21% (4+ wheels)
  - Chargeable vehicles down 31%
- Broadly neutral on business
- Environmental impact
  - NOx down 13%
  - PM10 down 15%
  - CO2 down 16%
- Bus patronage up, reliability and journey time improved
- Little or no change in number of trips to central area: 50 – 60% moved to public transport

The scheme revenues and costs for 2005/06 are as follows (£ million provisional)

- Charge Revenue £145
- Enforcement revenue £65
- Total Revenue £210
- Total operating cost £88
- Net Revenue £122

The application of net scheme revenues for 2005/06 is as follows (£ million provisional)

- Bus network improvements £100m
- Roads and bridges £14m
- Road safety £4m
- Walking and cycling £4m

The impact on congestion is as follows:

- Initial impact on congestion high: 30% decline in first year and then averaging at 26%
- More recently, congestion has risen in the central zone but remains below levels before the scheme was initiated.
- **The role for road user charging:**
  - RUC must be an element of the policy mix because the objectives and targets for London cannot be met without it
  - The Mayor has indicated that he is keen to implement RUC in London within the context of a national scheme

  - RUC can reduce congestion by reducing vehicle-km, and encouraging a shift to other modes as well as less congested times of the day
  - RUC can reduce emissions by:
    . reducing traffic km and volumes
    . improving traffic flow
    . encouraging take up of less polluting vehicles
    . providing for carbon offset arrangements.
- **The European context:**
  - ensure sufficient flexibility for cities to address specific issues
  - promote collaboration / best practice
  - raise awareness / increase understanding
  - setting key standards / certification systems for vehicles
  - sharing of vehicle registration data
  - info / advice re schemes
  - impetus for technological development
  - cross-border enforcement.

4.2.9.6 Contribution from Mr Maes, DG TREN[125]

The tendency is to link Road User Charges to vehicle characteristics. Isn't it the right time to introduce electronic vehicle identification? The issue is controversial, but is possible at the EU level. Without electronic vehicle identification, the enforcement level will be lower.

4.2.9.7 Contribution from Mrs Sabine Avril, EMTA[126]

On tackling congestion in Stockholm:

- Congestion tax trial lasted for 7 month ending July 2006
- Major challenge for SL Stockholm transport authority
  - Increase of provision of 7% in a 1 year delay
  - Extended tracks and more bus services, new depots, more bike and ride facilities
- Continuous monitoring to collect data and knowledge before and after
  - Anticipation from the population: 10 to 15% would use more public transport in fact 6%-8% only did
  - Patronage increased by 6% (half of it on metro)
- Travelers behaviours, quality of service and satisfaction monitored all along
  - Level of satisfaction higher on bus than metro
  - Relief in traffic made bus more attractive especially new direct routes
  - Punctuality and spare time
- The role of the transport authority is crucial when taking measures to tackle congestion.

4.2.9.8 Contribution from Mr Matthias Ruete, DG Tren[134]

Concerning charging systems, harmonisation of the systems is a key issue, as well as enforcement which should be at the European level and not at the national levels. In this case, there is a need or a possibility for a European approach.

4.2.9.9 CIVITAS[127]

Following experience in Stockholm, London and elsewhere, there is great interest in using pricing which reflects the full costs of travel as an instrument of transport planning. Not all countries allow such initiatives in their national legal systems, and it would be helpful for the EU to encourage states to enable cities to make use of such methods when they feel it is appropriate to do so. These methods are in accordance with the principles of fair competition and economic efficiency. However, Civitas does not believe that this approach should be compulsory. Other cities prefer to use methods of traffic management, parking control, priority allocation of scarce road space, separation and planning. Both pathways are acceptable. There a European framework is needed, in which the general need to reduce traffic in cities is seen as a common objective while the methods chosen will vary from city to city.

4.2.9.10 CEMR[147]

The EU should promote road pricing schemes with a clear earmarking of the revenue to public transport and sustainable modes. There must not be any obligation put on local authorities to introduce such schemes. However, the EU should organize the exchange of best practice on congestion charging and conduct further studies on a wider transport infrastructure system. The European Commission can consider revising the Eurovignette directive by introducing an urban dimension to it (possibility of toll "mark-up" on motorways that cross urban areas) as well as an obligation to earmark the revenue from the tolls (or a large part of it) to public transport.

4.2.9.11 VVM De Lijn[165]

European policies need more coherence, for example, concerning the "Eurovignette"-directive on the charging of infrastructure costs to heavy goods vehicles. Although the internalisation of external costs provided a unique opportunity for introducing an environmental dimension into the Eurovignette directive, the directive ultimately postponed the issue with two years instead of tackling it consistently.

4.2.9.12 CER[153]

The environmental compatibility of the different transport modes has to be reflected in market prices, to influence customer decisions. Including external costs has to be accompanied by the following measures:

- harmonization of the framework tax conditions for the different transport modes;
- equal treatment of the transport modes in the EU Emissions Trading Scheme and inclusion in climate protection measures based on the polluter-pays principle;

- completion of the internal energy market.

The current CER focus for this in the "unfinished business" of the Eurovignette Directive for road freight tolls: but the principle should apply to all transport at all levels (from urban to international). EU measures related to urban road congestion charging would be welcomed by CER.

4.2.9.13 Brussels-Capital, Ile-de-France, London[154]

An approach which includes the full "marginal social costs" of transport (including environmental and congestion costs) could significantly enhance the efficiency and sustainability of the transport system. The authors therefore support work by the Commission to produce a model for the assessment of external costs of transport, as called for in the Eurovignette Directive. This model could prove useful in the on-going debate about how to capture the wider costs as part of an integrated solution to the challenges facing public transport. Cities would then have to decide if and how to use the model, depending on the local circumstances.

4.2.9.14 EETF[166], GART[167]

Road tolls are gaining ground in European conurbations: London, Stockholm, Rome. Such tolls are especially effective and better accepted when the income generated is used to build the range of public transport modes available to users in accessing urban amenities. Caution should be exercised when it comes to:

- the financial income generated by such tolls, which tends to be inversely proportional to their effectiveness as a deterrent. This was the case in London, where traffic in the toll area dropped more than expected, causing a corresponding fall in revenue;
- the positive impact on public transport use, requiring additional financial investment – and putting a strain on local government budgets –; the alternative being an actual drop in use over time in the absence of sufficiently improved public transport service provision.

4.2.9.15 UITP[161]

The recommended actions cover:

- Develop guidance for concrete measures for the internalisation of external costs for car traffic also in urban areas (as part of the analysis that the EU-Commission has to present within the framework of Directive 2006/38/EC (Eurovignette)[168];
- "There may be a need to define Europe-wide technical standards" (for congestion charging): in its latest position paper on urban mobility and congestion charging, UITP has emphasised that "Congestion charging is the most effective tool for demand management. It will improve sustainable economic development, ensure quality of life, improve public transport and lead to more fluent and cleaner traffic." In its recommendations, UITP underlines that "a problem that could arise in the future is incompatibility of various city or even national systems, causing confusion and extra cost for users. There may be a need to define Europe-wide technical standards"[169].
- With the growing interest across the EU in road pricing and environmental/green zones, the problem of cross border enforcement of traffic offences will grow. These schemes,

including parking control, can only be successful if they are enforceable. Action at a European level to trace and then enforce both criminal and administrative offences is urgently needed.

4.2.9.16 Confcommercio[155]

As a consequence of the good results obtained in London by the Congestion Charge implemented by the Mayor Ken Livingstone, also in Italy some Municipalities have started to follow those guidelines.

4.2.9.17 UNIFE[130]

Congestion-charging should be used by local authorities to finance public transportation systems in European cities, and the European Commission shall encourage such action by removing any legal obstacles. In addition, the EU's Structural and Cohesion Funds should be directed to public transport infrastructure rather than roads in the EU Member States, in order to achieve the goal of shifting transport from roads to railways. Furthermore, the EU can financially support the sector in various research projects in the area of urban mobility.

4.2.9.18 SNCF[131]

Congestion charging in London is a way of ensuring that those using valuable and congested road space make a financial contribution. It encourages the use of other modes of transport and is also intended to ensure that, for those who have to use the car, journey times are quicker and more reliable. The project has had positive results: Average traffic speeds during charging days increased by 37% (13 km/h to 17km/h). Peak period congestion delays declined by 30% and bus congestion delays declined by 50%. Bus ridership increased in the central area by over 15%. Inner city traffic
decreased by 15%.

4.2.9.19 ETRA[170]

ETRA fully supports the principle of road user charging, since it can play an important role in establishing a sustainable urban transport system by helping road users to change their attitude and behaviour. Road user charging encourages citizens to think more about how and how much they travel. The principal role of charging should be to reduce the volume of motorised traffic within our cities, thereby reducing emissions from transport and encouraging people to walk and cycle.
Several European cities, including London, Oslo and Stockholm have introduced road user charging combined with improvements in public transport and other measures aimed at reducing car usage. Since congestion charges were introduced in London in 2003, there has been a 21% overall reduction in traffic entering the inner zone. Cycle journeys have increased by 20% and road crashes have declined by 7% [171]. In this framework, ETRA fully supports the idea of a European legal initiative that gives cities the possibility of introducing congestion charging schemes, thus overriding national bans.

The EC should include cycling in the cost-benefit analysis for the purpose of internalisation of external costs.

4.2.9.20 SUSTRANS[142]

Several European cities, including London, Oslo and Stockholm have successfully used road charging coupled with improvements in public transport and other alternatives as a means of reducing car use. Since congestion charges were introduced in London in 2003, there has been a 21% overall reduction in traffic entering the inner zone. Cycle journeys have increased by 20% and road crashes have declined by 7%[171].

However, road user charging should not be used as simply a mechanism to cut congestion. Road space liberated by the charging regime should be "locked in" by reallocating it away from private motor transport. If this is not done, over time motor traffic will expand again to consume the liberated road capacity.

4.2.9.21 UEAPME[148]

UEAPME members are opposed to the introduction of congestion charges in Europe's major cities. The reasons for this are manifold:

- Congestion charges are perceived as an additional financial burden on enterprises working in or being located in inner cities. It affects their competitiveness as compared to enterprises located in suburban areas.
- Unless it can be guaranteed that the cost savings through more fluent traffic and better infrastructure counterbalance the additional costs relating to the congestion charge, transport to and working within the zones covered will become more expensive and thus less attractive. Unfortunately, the income generated by such systems is unlikely to be used for infrastructure improvements but to cover gaps in municipal budgets.
- Congestion charges do not reduce the overall traffic in urban areas, but shift it to the suburbs where the number of kilometres driven per habitant is usually higher than in inner cities.

London was the first European city to establish a toll system (congestion charge) for the inner city. The UK small business associations see the London congestion charge as highly harmful for SMEs.

A survey conducted by the Forum of Private Business in 2005, and another study conducted by the London Chamber of Commerce conclude the following:

- 90% of entrepreneurs say the congestion charge had a negative impact on their turnover
- 1/3 of the entrepreneurs consider relocation of their business,
- Almost 2/3 of entrepreneurs declared their revenues had diminished since the introduction of the congestion charge,
- Almost 2/3 of the entrepreneurs declared the number of clients had diminished.

Based on the experiences from Stockholm, the readiness to accept congestion charges are higher if a clear connection to increased investments in infrastructure is at hand.

4.2.10 Parking pricing

4.2.10.1 Contribution from Mr. Camille Durand, Vice-president of Nantes-Métropole[123]

In Nantes, Mr Durand retained the solution which consists of reducing the public space dedicated to general road traffic thereby facilitating public transport vehicles traffic; in addition free of charge park-and-ride facilities have been created at the periphery of the city and more expensive parking in the city centre for the home to work trips.

4.2.10.2 Contribution from Mr Attila Nagy, Debrecen Transport Company[125]

Parking tariffs are HUF 250 per hour on-street and HUF 150 in the garages, which is an incentive to use underground parking.

4.2.10.3 Contribution from Mr Marcel Rommerts, DG Tren[134]

- Regulated parking: evaluation of the results from CIVITAS 1:
  - Some results
    - Innovative measures in 10 cities, incl. new payment facilities, preferential treatment of clean vehicles, demand management (price, capacity)
  - Impacts
    - Very positive impacts, highest when combined with access restriction (e.g. 80% traffic reduction in Pecs)
    - Social acceptance high
  - Lessons
    - An efficient and flexible tool
    - A more acceptable use of the pricing instrument

4.2.10.4 Confcommercio[155]

The creation of charged parking areas is a way of rationalizing urban space use with the purpose of breaking deadlocks and, so, fluidizing traffic flow. Anyway, in order not to make this measure become a further traffic restriction, it is necessary to reach a satisfactory agreement between circulation freedom, old town centre accessibility, parking availability and life quality.

4.2.11 Integration of transport and land use

4.2.11.1 BUSTRIP[160]

Based on the practical knowledge and experiences from the BUSTRIP project, the organization supports the Commission in taking urgent action to reduce the need for transport. Most cites have a mosaic of actions and polices that are reinforcing the growth of urban sprawl. Few cities collaborate to sustainably locate new 'out of town' shopping centres or settlements, without increasing the need to travel. Most of urban extensions lack an adequate reservation of land for sustainable transport modes (bus lanes, tram lanes, etc.). Cities need to understand and use the principle that "travel and transport arises from where people live, work and have activities" in their spatial planning policies. They need to provide sufficient space for public transport, cycling and walking infrastructure and reserve space for sustainable transport modes in new developments.

4.2.11.2 Brussels-Capital, Ile-de-France, London[154]

Transport policies should contribute to limiting urban sprawl and to enhancing densely urbanised areas which provide a large variety of urban facilities (housing, work, public utilities, private services…). The integration of land use and spatial development measures with transport planning is essential. In parallel, planners should also aim for a redensification of urban centres, allowing a lower level of movement (but without decreasing the mobility capacity of citizens). In designing and implementing development plans, planners must pay particular attention to citizens' mobility needs, being aware of the potentially negative effects of town planning on urban mobility (social exclusion, bad distribution of economic activities, bad location of residential and cultural districts…).

Satellite navigation and positioning services and Earth observation and monitoring services are essential for a better management of land use and spatial development in urban areas. These services should be also promoted by the Commission.

4.2.11.3 UEAPME[148]

The best way forward clearly is living close to work. This can only be achieved, when businesses (and thus jobs) are spread over the totality of urban areas instead of concentrating them in a few office districts and suburban business parks.

Several measures should be considered to help craft and SMEs stay in inner cities:

- Use urban planning mechanisms to provide sufficient space for craft and SMEs in inner cities at reasonable cost.
- Promote the use of options to purchase for lease contracts signed by small businesses;
- Promote favourable financing solutions for the transmission of small enterprises in city centres.

4.2.11.4 Union des Transports Publics et Ferroviaires[141]

The UTP estimates that the densification of spaces increases the effectiveness of public transport and reduces the greenhouse gas emissions. The UTP supports the following measure envisaged in the communication document published by the Commission in February 2004 entitled "Towards a Thematic Strategy on the Urban Environment": each city over 100 000 inhabitants should adopt an environmental management plan for the urban area as a whole, together with targets related to the key environmental impacts, and should implement an environmental management system to manage this process and deliver these objectives. The UTP estimates that these plans should be accompanied by a regular obligatory follow-up to be sure of their effective application: better land use, rationalization, etc.

4.2.12 Exchange of best practice

4.2.12.1 Contribution from Mr. Ken Laughlin, Hampshire County Council[126]

- Specific ITS actions at the EU level:
  - Good practice guide for developing a cohesive ITS deployment plan covering:
    - Needs of the city
    - Interoperability
    - Identification of the legal, organisational, financial, and jurisdictional issues
    - Identification & engagement with stakeholders – partnership working
    - Implementation of deployment plans
    - Evaluation of results – identification of benefits
  - Creation of a framework for the collection / dissemination of best practice
  - Proactive demonstration programme with cities involvement

4.2.12.2 EFIP: Inland Ports' contribution[135]

EFIP agrees with the fact that while respecting the subsidiarity principle and avoiding new legislation, action can be taken by the EU in ensuring exchange of best practices. The exchange of best practices should be further encouraged by the support of EU projects of common interest:

- BESTUFS (Best Urban Freight Solutions): Several inland ports participated in BESTUFS II activities (BESTUFS II being a Co-ordination Action within the 6th Framework Programme for Research and Development) which aim is to increase the awareness of urban freight transport best practice for all those actors involved in its functioning and to stimulate innovative solutions that will enhance its sustainability in the urban area. In particular, identification and dissemination of city logistic solutions should continue to be enhanced.

- CIVITAS: European inland ports would be very much in favour, - as announced by the European Commission in the mid-term review of the White Paper on transport policy -, to build on the experience gained in the CIVITAS Initiative, and on its thematic strategy on urban transport, and continue to promote research on urban mobility. It could focus increasingly also on urban freight transport. This is being considered within the context of the 7th Framework Programme for Research and Development.
- Dipcity: In this project which is supported by the Interreg programme and which involves several EFIP Members, inland ports intend to foster transport of waste and recycling materials on the waterway, attractiveness of the port area, ports as multimodal platforms, distribution of goods towards the city and safety and environmental aspects of the port activities

EFIP may consider the development of a Guide of Good Practices in inland ports as far as urban transport is concerned. This Guide may then be distributed to local authorities where inland ports are situated.

4.2.12.3 UITP[161]

UITP recommends to promote the exchange of best practices between cities, in particular on restrictive demand management for the use of private cars. Such a policy influences the number of cars driving into city centres and thus has a direct impact on the share of the different transport modes. Obviously, the exchange of best practices should also cover "positive" approaches, like for example the promotion of car sharing systems as a valuable complement to public transport. Last but not least, the distribution systems of goods in urban areas have to be addressed by innovative solutions (integrating in some case the infrastructure and the vehicles used for public transport). The exchange of good practices between cities and urban areas should also integrate those aspects.

4.2.12.4 Deutsche Bahn[172]

On EU level an exchange on best practice in integrated transport services could be initiated. EC could underline the importance of integrated transport services in a non-binding recommendation and ask national authorities to better harmonize the pattern of actors and to install common IT platforms.

4.2.13 Promote research

4.2.13.1 Polis[128]

Solutions to urban congestion and the negative impact of transport on the environment at the urban level require the development, implementation and deployment of new policies and technologies. The European Union should actively support the deployment of industrial solutions on the use of alternative energies for transport and future generations of information and communication technologies allowing for the development of Intelligent Transport Systems, such as cooperative systems, smart tags and Galileo, which can

significantly contribute to achieving local and European policy goals. Pre-commercial procurement can play an important role in this respect and should therefore be supported.

Technological development for network management systems requires strong European support for research on cooperative systems for vehicles and infrastructure; network and traffic modelling and data collection and data mining.

4.2.13.2 Eurochambres[140]

Eurochambres believes that EU can contribute to better urban transport solutions, without imposing legislation by continuing to promote innovative transport technologies by financing research and pilot projects, especially on city logistics. But a further promotion of city logistics concepts should lead to economically viable solutions and the decision about the implementation of these concepts should be left to regional actors.

4.2.13.3 Nantes Métropole[173]

Nantes Métropole sets a priority for the EU to develop research projects on the following themes:

- "intelligent" vehicles;
- Traffic regulation;
- Tomorrow's mobility by particularly taking into account the consequences of the structural demographic modifications (ageing and diversification of the populations), the impact of new information technologies and the rarefaction of fossil energies.

4.2.13.4 Deutsche Bahn[172]

Demographic changes require innovative approaches. Technical innovations like e-ticketing, computer-supported operation systems, optimization in real time and environmental-friendly technologies increase the attractiveness of public transport and reduce barriers for users. DB AG stands for public support from the EU or from the member States for the private efforts to increase the attractiveness of public transport under full consideration of the conditions for competition. The 7th programme for research is a step into the right direction.

4.2.13.5 Union des Transports Publics et Ferroviaires[141]

UTP underlines the importance of a research platform on public transport. EC should encourage innovation by a financial support for the most innovative projects.

4.2.14 Communication, education and awareness campaigns

4.2.14.1 Contribution from Ms Moutal, EC DG Information Society and Media[126]

ITS is a technical tool. User awareness should not be forgotten and in particular people should be made aware that ITS systems are available.

4.2.14.2 Contribution from Mr Peter Sonnabend, DHL[134]

- Stakeholder cooperation

  Efficient urban logistics cannot be affected by operators alone, but requires the cooperation of many stakeholders. Cities where a dedicated freight unit or senior logistics coordinator were installed usually show an improvement of the local situation. These can also mediate between the various actors:
  - Public administrations and policy makers
  - Logistics and transport operators
  - Local traders and businesses
  - Technology service providers
  - International exchange.

4.2.14.3 SNCF[131]

SNCF thinks that the European Commission should do more to favour modal shift. Currently not enough is being done in terms of informing the general public about compared internal and external costs of each transport mode, nor is there enough attention being placed on incentivising travellers nor freight clients to switch mode.

4.2.14.4 Nantes Métropole[173]

Nantes Métropole sets a priority for the EU to incite the population to modify their behaviour with a better:

- communication on urban transport and mobility
- information on real costs of travel (internalization of external costs : pollution, road safety, etc.)
- awareness campaigns on road safety, the impact of travel on global warming, the health benefits of cycling, trips optimization, etc.

4.3 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING ENERGY USE

4.3.1 Promote use of clean and energy efficient vehicles and alternative fuels

4.3.1.1 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[123]

Specific policy measures have been taken by the Commission:

- To improve the energy efficiency and CO_2 emissions of cars through voluntary agreements between the EC and the automotive industry
- To promote the market development of alternative fuels through setting of market targets and the possibility of tax reductions and other economic incentives
- To reduce over the years the limits for polluting exhaust gases from vehicles through gradual tightening of the corresponding Euro standards.

4.3.1.2 Contribution from Mr. Camille Durand, Vice-president of Nantes-Métropole[123]

There is a need at European level to standardise new bus technologies (for example for Natural Gas vehicles) to facilitate their market insertion, i.e. to reduce the development and manufacturing costs by economies of scale to be generated through large numbers of vehicles being manufactured. In other words there should be an additional step towards integration. There are presently a number of new technological orientations being favoured, but if efforts are too dispersed, costs will remain high.

4.3.1.3 Contribution from Mr. Kai Lücke, Director Public Affairs, ACEA[124]

ACEA stresses that the available technology on clean and energy efficient vehicles should not be made mandatory, and that cost-effectiveness is one of the key elements to be taken into account.

For ACEA, the environmental challenge is fleet renewal, not lower limits of new vehicles, as:

- Average fleet age is 16 years in some new Member States
- Costly measures delay fleet renewal (issue of affordability)
- Negative environmental effect if Euro 5 keeps Euro 0 cars on the road.

4.3.1.4 Contribution from a representative of the European Aluminium Association[124]

It is often looked at the engine of the vehicles, however the rest of the vehicles should be taken into account for efficiency purposes. For example, fuel consumption should be measured by ton transported rather than by vehicle.

4.3.1.5 Contribution from Ms. Brigitte Ollier, UITP[124]

The UITP-High Level Group on "Building a Sound Future for the Bus Business", with 60 participants from the bus manufacturing industry and operators, have defined recommendations for a bus tender structure, with the following objectives:

- Model for tender harmonisation for a better balanced relationship between all actors in PT supply chain
- Opening up of possibilities to decrease costs for operators as well as manufacturers.

The tender evaluation criteria:

- lifecycle cost analysis
- fuel consumption,

are elements to be examined in the financial conditions.

4.3.1.6 Contribution from Ms. Brigitte Ollier, UITP[124]

UITP recommendations for Organising Authorities are the following (Fuel choices for public transport – Nov. 2006):

- Promote PT and modal shift
- Incorporate environmental impacts in the tender evaluation process
- Recognise the need for public funding and fiscal incentives to encourage clean energy use
- Generate public awareness for the environmental benefits of clean fuels.

4.3.1.7 Contribution from Mr Marcel Rommerts, DG Tren[134]

- Clean vehicles and fuels: evaluation of the results from CIVITAS 1:
  - In 4 years 8000 public and private vehicles using alternative fuels and/or new filters
    - Full conversion of bus fleet in Lille (biogas) and Graz (bio-diesel)
    - Smaller fleets in most other cities
    - Focus: buses, trucks, waste lorries
  - Supporting infrastructure and incentives
    - Joint procurement
    - Financial incentives for market take-up

. Refuelling stations

CIVITAS is a major catalyst for clean vehicle implementation in Europe

– Impacts
  . User acceptance is high
  . Energy consumption is not always lower
  . Costs are often higher
  . Environmental balance is excellent (all major air pollutants and noise)
– Lessons
  . Clean vehicles and fuels are still a niche market
  . Standardisation and stimulation of demand is necessary
  . Supportive regulatory and fiscal framework is important

4.3.1.8 EETF[166], GART[167]

Promoting sustainable energy consumption through:

- Structured work with industry on all technical processes (for instance, it is not enough to recommend NGVs: there is a corresponding need to develop compatible engines);
- Consideration of how rolling stock is used in practice – notably in terms of driving styles – to reduce consumption.

4.3.1.9 FEMA: Motorcyclists' contribution[144]

The motorcycle has a contribution to make and should be taken into account with regard to energy use. Even high performance sports bikes have improved fuel consumption compared to cars on congested roads, consuming between 55% and 81% less fuel than a car on the same journey[174]. For instance, motorcycles are able to make progress in congested conditions and are thus less polluting than other vehicle subject to a stop/start cycle.

4.3.2 Infrastructure development

4.3.2.1 Mayors of CEE New Members States[175]

In the course of the last decade the standard of public transport has been deteriorating in the post socialist metropoles because of decreasing state subsidies. Lines are closing down, the usually 40-50 years old rolling stock is quickly becoming obsolete, travel time grows, the gap between available resources and the necessary investments is growing. As a result of the decreasing quality of public transport and the increasing usage of private cars the modal-split is changing to an unfavourable direction. This change of modal-split in the cities of New Member States recalls the similar tendencies of Western-European cities in the 70's and 80's with the threat that transport policy may commit similar mistakes, for example too much supporting road construction.

The European Commission can check the appropriateness of the share of urban transport in the current supervision of the Operational Programmes.

The EU should establish guidelines related to transport development in the New Member States as follow:

- higher financial support to integrated urban and suburban transport and less financial support to building motorways. More emphasis on tramways and railways instead of road construction;
- Higher share for energy efficient, environment friendly and accessible upgrading of existing tramways, railways and the rolling stock against the currently dominating new investments;
- More political support for the elaboration of national, regional and city-region level integrated strategies and for the establishment of transport associations.

4.3.3 Modify travel behaviour through mobility management, traffic, parking and information management

4.3.3.1 Contribution from Ms. Wilhelm, representative of the EC-Intelligent Energy Executive Agency[134]

There is a wide range of measures for changing behaviour. The options are ranked as follows:

- Reduce need for travelling
- Promote walking and cycling
- Use public transport
- Car sharing/ pooling
- Drive in a more energy efficient way.

The easiest way of changing behaviour is driving in an energy efficient style.

4.3.3.2 CIVITAS[127]

Some very effective transport policy instruments are given as follow: regulatory measures, travel plans for workplaces and schools, provision of better information, car sharing, detailed individual marketing, e-commerce (telecommuting, teleshopping, etc), and initiatives such as 'car free' days which are aimed at understanding and motivation.
'Mobility Management' can help to use cars more efficiently using methods such as car clubs which share car ownership, ride sharing, and car pooling. Even where such developments are not under the control of city authorities, they have the potential to give encouragement to them.

4.3.4 Promote use of public transport, cycling, walking

4.3.4.1 SUSTRANS[142]

Urban transport is very dependent on oil, and a rapid shift away from motor traffic in urban areas can make an immediate contribution to reducing our exposure to this risk.

4.3.5 Promote efficient freight logistics and delivery services

4.3.5.1 Contribution from Mr Marco Monticelli, IVECO[134]

- Energy Efficiency
  - Urban operations are subject to road congestion
    - Engine idling
    - Considerable stop – start operation
  - Out of town distribution centre for in town distribution
    - Good vehicle performance required for out of town vehicle operation (stem mileage)
    - Energy capture for stop – start vehicle operation
    - No unnecessary engine idling
  - All leads to the parallel hybrid powertrain, i.e.:
    - Two power units capable of operating independently or together
    - Downsized internal combustion engine – less powerful, operates more efficiently
    - Electric motor – assists internal combustion engine for high power requirements
    - Regenerative braking – electric motor operates as generator to convert kinetic energy to electrical energy under deceleration conditions
    - Starting from rest under electric motor power only – engine starts only when vehicle exceeds a given road speed.
- Application of Telematics to Freight Distribution:
  - Reduces transport demand by effective driver and vehicle management: Route management by back office in receipt of parcel delivery and collection, updated in real time and scheduled according to minimum vehicle mileage solution.
  - Fewer driver distractions

- Route communication by voice from navigator – no driver intervention.
- Cell phone SMS to spoken voice communication with driver – no driver intervention.

– Improved vehicle utilization: Energy efficiency ensures vehicle operator buy-in

4.3.6 Taxes and incentives

4.3.6.1 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[123]

Specific policy measures have been taken by the Commission:

- To promote the market development of alternative fuels through setting of market targets and the possibility of tax reductions and other economic incentives

4.3.6.2 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

See under 4.1.5.6 ("Pull measures")

4.3.6.3 CIVITAS[127]

In some countries, there is a tradition of giving tax advantages to specific classes of travel that are now unhelpful in developing sustainable transport policies in cities. One example is the treatment of 'company cars' and parking which can give an incentive to businessmen and women to use cars more than is necessary. Another example is to favour some types of economic activity (e.g. tax on fuel used for agricultural vehicles) more than others. In general, these measures can cause distortions and it is better if the ownership and use of all classes of vehicle and fuel is based on their true economic costs.

4.3.6.4 ILS NRW[176]

In different countries there exist different framework conditions which affect the objective sustainable urban transport. In Germany e.g. income tax rules allow employers to provide their employees a company car (also) for private usage (with attractive income tax conditions) or providing a parking space is not relevant for income tax but paying for a PT ticket is taxed. There should be an agreement at the European level that the countries check these framework conditions and change them in favour of sustainable urban transport.

4.3.7 Promote research

4.3.7.1 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[124]

Alternative fuels have been given high weight by the European Commission, proposing an indicative target of 20% market share overall for biofuels, natural gas, and hydrogen by 2020.

4.3.7.2 EETF[166], GART[167]

Work on "Bus revival" (following the "Bus of the Future" programme): the potential of this mode has been demonstrated by the success of bus services both in Latin America (Curitiba, Bogotá) and North America (Bus Rapid Transit). There is therefore a need to boost research in the development of vehicles that optimise deployment of bus services.

- Development of a *hybrid parallel* traction chain using energy recovery to achieve a 35% reduction in fuel consumption and CO_2 emissions. If common development at EU level was conceivable, the component parts of such a system (power plant, batteries, supercapacities) could leverage critical mass to substantially lower costs;
- Initiation of a product innovation programme addressing all other aspects (noise, comfort, accessibility, communication protocols, safety, guidance, optimisation of accessories and air-conditioning, etc.), whose outlines should be determined with manufacturers to narrowly identify "competitive" areas…;
- Launch of an "energy plan" setting out an EU policy promoting uses for alternative fuels (vegetable oil methyl esters, fuels from biomass) and natural gas as fuel, with the aim of showcasing public transport as a way to both reduce energy dependency and share available resources. Implementing such a plan requires a strategic framework, support for research, a shared regulatory vision and strong incentives. It should be possible to achieve equal 1/3 shares of diesel, renewable and methane within 10 to 15 years;
- Incentives for the development of BRT or BHNS (*Bus à haut niveau de service*, "high-level service bus"), which are powerful and attractive tools for busses as a public transport mode reconciling:
  - Customer care (reception, comfort, information, accessibility);
  - Quality of provision (frequency, capacity, commercial speed, regularity, predictability);
  - Integration (urban interaction, bus stop equipment, intermodality);
  - Identity (dedicated vehicles, image, customisation).

  This development requires supporting deployment (e.g. with pilot sites) and associated research.

4.3.8 Communication, education and awareness campaigns

4.3.8.1 Contribution from Ms Moutal, EC DG Information Society and Media[126]

The presentations over ITS are always related to demand; what is missing is the car dimension. As cars cannot be banned from cities, they have to be taken into account. Eco-driving and collaborative driving are important issues on which the EC is working and on which a feedback is necessary.

4.4 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING ENVIRONMENT

4.4.1 Promote use of clean and energy efficient vehicles and alternative fuels

4.4.1.1 Contribution from Mr. Jacques Barrot, Vice-President of the European Commission in charge of transport[123]

When we see 4x4 cars circulating along our urban streets, we have reasons to raise the question of the car being adapted to the city. In the past we used to say that cities should be adapted to car use, and now we have reversed this: it is the car that should be adapted to the city.

4.4.1.2 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[124]

On CO_2 emissions from cars, the European Commission has set up a Community strategy based on the three pillars of:

- a voluntary agreement between the Commission and the automotive industry to reduce the average CO_2 emissions of new cars to 140 g CO_2/km by 2008/9;
- a proposed taxation system for cars based on the emissions of CO_2;
- better consumer information through labelling of the CO_2 emissions of cars.

The European Commission has reviewed the Community strategy to reduce CO_2 emissions from cars in order to reach an average of 120 g CO_2/km objective by 2012.

4.4.1.3 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[124]

Vice-President Barrot, in an intervention to the Environment Committee of European Parliament on 21 November 2007, suggested taking a new approach. Reflections on possible ways forward could include, among others, environmental procurement criteria and early application of new Euro standards. The criteria for vehicle procurement by public bodies could include e.g., in addition to the other criteria, life-time costs for energy consumption and for CO_2 and pollutant emissions.

4.4.1.4 Contribution from Mr. Kai Lücke, Director Public Affairs, ACEA[124]

Concerning air quality and CO_2, a trade-off has to be taken into account, as follows:

- Emissions reduction vs. CO_2 reduction
- Size of trade-off depends on many factors and varies between engines
- Thermodynamics: higher combustion temperature means higher efficiency and higher NOx production.

Therefore this issue should be discussed in a holistic way.

4.4.1.5 Contribution from Mr. Kai Lücke, Director Public Affairs, ACEA[124]

Concerning the choice of the best policy for the future, ACEA refers to the study ECCP2 for the Commission (by TNO), which has estimated that, to achieve a target of 120 g/km CO_2 emissions from the present level via vehicle technology only, the average retail price by vehicle would increase by €3650. Other measures, like the use of bio fuels (Brazil), eco-driving or optimal tyre pressure would be much less costly to reach the same goal.

4.4.1.6 Contribution from Mr. Jos Dings, Director T&E[124]

- Public procurement as an instrument: Compromise approach?: Fix minimum goal at EU level: a 'point system' for public procurement of new vehicles, with a minimum tightening per year.
- Specific views on light duty vehicles
  - Key provision: fleet average CO_2 performance – via 140 to 120, 100 and 80 g/km norm
  - Prohibition of:
    - SUVs and other 'high' vehicles – for safety (except maybe specific services)
    - Vehicles over e.g. 250 g CO_2/km to avoid excesses
    - Vehicles with mediocre (pedestrian) safety score
    - Vehicles with bad noise score.
  - Obligation to buy share of very low-CO_2 vehicles (e.g. < 100 g/km), Euro 5/6 cars
  - Intelligent speed adaptation / speed limiters: ensure government officials do not break speed limits;
  - Procurement of energy efficient and quiet tyres, and better lubricants;
  - Cars without air conditioning systems;
  - Gear shift indicators, fuel economy monitors
  - Use 'low carbon fuel'
  - Combining elements in a joint score, and set benchmark for annual progress?
- Specific views on heavy duty vehicles
  - EEV standard is useless: new one is needed. Prepare for Euro 6.
  - Look into possibilities to include GHG emissions into standards.
  - Low carbon fuel.

4.4.1.7 Contribution from a representative of Transport for London[124]

- EC should incorporate carbon dioxide (CO_2) emissions into Euro standards
- In order to reduce carbon dioxide emissions, people should be encouraged to change cars.
- A point scoring system for public procurement is a crucial issue to be explored.

4.4.1.8 Contribution from a representative of VVM-De Lijn[124]

Only new vehicles are concerned by the Clean Vehicle Directive. However in the CEEC's, buses aged 20-30 years are operated, which are most polluting and should be taken out of the circulation.

4.4.1.9 Contribution from a representative of the city of Bremen[124]

It should be focused on the "heavy smokers" in cities, i.e. trucks, delivery vehicles and buses, which represent 10% of all the vehicles and half of the NOx emissions. However, it is difficult to settle a policy without damaging the economy, except for public buses.

4.4.1.10 Contribution from a representative of ACEA[124]

Taking the oldest vehicles off the road is a challenge, as new vehicles are more expensive which does not encourage replacement.

4.4.1.11 Contribution from a representative of T&E[124]

Concerning NOx emissions, new diesel cars are as bad as the previous ones. Concerning scrapping schemes, the issue at stake is how to avoid giving money to people who want to scrap their vehicle anyway.

4.4.1.12 Contribution from Mr. Franz Söldner, DG TREN[124]

Vice-President Barrot, in an intervention to the Environment Committee of European Parliament on 21 November 2006, therefore suggested taking a new approach. Among others, two possible elements could be considered. One could be an early use of new Euro standards in procurement decisions, i.e. after the adoption of the standards by the Council and the Parliament and before their general mandatory application. Another element could be the introduction of life-time costs of energy consumption, CO_2 emissions, and pollutant emissions as award criteria for the procurement of vehicles.

4.4.1.13 Contribution from Mr. Franz Söldner, DG TREN[124]

The importance of taking into account the costs over the whole life-time of a vehicle becomes obvious when considering the case of a bus running in urban areas. Life-time costs for fuel and the damage caused by pollutant emissions in that case can be up to three times the procurement price of the vehicle.

The preference for clean vehicles meeting the latest Euro standard and the extended procurement criteria could then apply to all categories of vehicles and to all providers of public transport services.

4.4.1.14 Contribution from Mr. Patrick Coroller, ADEME[124]

The objectives of the incentives to the diffusion of clean and efficient vehicles are:

- to modify the individual buying behaviours
- to increase the development of clean public transport
- to reduce the impact of goods transport in cities
- to aim to exemplary states and local authorities.

Different instruments are proposed to reach these objectives:

- Awareness tools
- Fiscal incentives for light duty vehicles
- Taxes
- Direct incentives provided by ADEME
- Accompanying measures from the local authorities.

4.4.1.15 Contribution from Mr. Patrick Coroller, ADEME[124]

Several ways of further improvements are proposed:

- A clear definition of clean and economical vehicles at the European level
- Reliable life-cycle analyses of fuels
- The use of new ICT (GPS, etc.) for measuring performance
- Homogeneous incentives among the EU Member States
- Reinforcement of accompanying measures in cities (free parking, low-emission vehicles zones, etc.)
- Other measures (insurance cost reductions for clean and economical vehicles, etc.).

4.4.1.16 Contribution from Ms. Brigitte Ollier, UITP[124]

See under 4.3.1.5

4.4.1.17 Contribution from Mr. Camille Durand, Vice-Président Nantes Metropole[124]

Recommendations for the promotion of clean vehicles procurement:

- There is a need for harmonisation of the homologation of vehicles at the European level
- Ways for better vehicle cost mastery should be investigated
- Tender documents for bus procurement should be harmonised, buyers groups should be organised in order to achieve economies of scale.
- Research programs and definition of norms should be done at European level.

4.4.1.18 Contribution from a representative of the Europabüro der bayerischen Kommunen[124]

The EC should create a tool in order to compare vehicles, that includes environmental criteria. This tool should not be in English only, in order to reach a greater number of cities.

4.4.1.19 Contribution from Mr. Tomassini, representative of the CURACAO project[126]

It is possible that the requirements for car safety are in conflict with car emissions and fuel efficiency for which the EC is currently in confrontation with the car industry.

4.4.1.20 Contribution from Ms Moutal, EC DG Information Society and Media[126]

There is a cooperation with the car industry, for example for the e-safety initiative launched by the EC, which concerns the problems of infrastructures and vehicles. It involves complementary actions and deals on how to better integrate cars in the city.

4.4.1.21 Contribution from Mrs Nina Renshaw, Transport and Environment (T&E)[126]

Euro standards are not as effective as they seem (for NOx emissions of diesel passenger cars, values from performance in urban traffic situations are over the euro standard test cycle values), and Euro 5/6 for cars are still way off US levels (by 2015, Euro 6 standard will be lagging way behind the US standards for NOx emissions).

4.4.1.22 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

Shift to Low Noise Emission Sources: promotion of low noise versions within vehicle categories via incentives (better operational conditions, lower charges) (examples low noise trucks: Heidelberg, Austria).

Reduction of the Noise Emissions: Technical Measures: public procurement of low noise vehicles

4.4.1.23 Contribution from a representative of the Szeged transport company[126]

The speaker takes the opportunity to advocate for trolleybuses from an operational point of view. Trolleybuses are extinct in the EU-15, whereas they still exist in the CEECs.

With the introduction of new gas buses on the market, what can be the role of the trolleybus and how does the trolleybus compare for noise and vibrations? It must be stated that trolleybuses are better for the environment.

A bad tendency has been observed in the cities of Debrecen and Szeged in Hungary, where new buses have been introduced stating that these are better than the trolleybuses, with the risk that other cities want to exchange their trolleybuses with buses following these experiences.

The replacement of trolleybuses with buses has happened in Slovakia and in Romania.

It must be clearly stated to the politicians and to the public what are the levels of pollution of trolleybuses, compared with the euro norms.

4.4.1.24 Contribution from Ms. Brigitte Ollier, UITP[126]

Concerning trolleybuses, the UITP has created a new working group on trolleybuses for one or two years. There are problems in the CEECs and in Russia, and the UITP can be contacted to exchange experiences. Certain Western Europe cities, like Rome, have reintroduced trolleybuses for environmental reasons, along with small electric buses in the historical zones closed to polluting vehicles.

4.4.1.25 Contribution from Mr. Cicatiello, representative of CEEP[126]

Mr. Cicatiello pushes for the use of CNG buses, which are much less noisy and produce less PM emissions than diesel buses, with a similar market cost.

Concerning trolleybuses Mr. Cicatiello considers that it is crazy to dismiss them where they are still operated.

4.4.1.26 Contribution from Mr Matthias Ruete, DG Tren[134]

Green propulsion has an important role to play in urban transport. The slow rotation of the fleets and rolling stock is a real concern. The EU will reflect on how to clean up the older vehicles that still pollute our cities. Public procurement can help to create markets for new, clean vehicle technologies. It has been proposed that the EC intensifies its support, to make it workable.

4.4.1.27 UBA[143]

A strong integration of the environmental protection into the transport policy, e.g. the urban transport policy, is necessary due to the impact of urban transport on the environment and the life quality of the population.

The identification of instruments and measures on EU level should be done on the basis of an **integrated** and optimised global concept for sustainable urban mobility that identifies the specific competences of all actors (community, region, MS, EU, international institution) and assigns specific tasks respectively.

4.4.1.28 Joint Letter : CEMR, Climate Alliance, Energie-Cités, Eurocities, Impacts Europe, Polis, UITP-EU[147]

The main objectives identified by the CEMR, Climate Alliance, Energie-Cités, Eurocities, Impacts Europe, Polis and UITP are the reduction of dependency on the private car, a modal shift towards more sustainable modes of transport, including public transport, cycling and walking, as well as the development of clean and energy efficient urban transport. Innovative policies, practices and technologies for urban mobility are essential to achieve these objectives.

4.4.1.29 SHELL[177]

Shell would recommend that the European Union considers **including Synthetic Fuels** in their urban transport strategy as one of their portfolio of options to improve air quality. This proposal is based upon the unique benefits that synthetic fuels could provide, delivering **significant reductions in local emissions** in the most **cost-effective and easy to implement** manner. For example, in light duty vehicles, GTL Fuel could achieve reductions of up to 40% in particulate matter, up to 60% in hydrocarbons, up to 85% in carbon monoxide and up to 5% in nitrogen oxides (up to 45 % in optimised vehicles).

Shell has demonstrated GTL Fuel in a number of major cities, such as London, Berlin, Shanghai, Los Angeles, and Tokyo. All of these evaluations successfully showed a significant reduction in local emissions while maintaining performance, in existing vehicles without modification. In some engine technologies, GTL Fuel also offers reduced diesel engine noise levels. This makes GTL Fuel particularly beneficial for large urban areas.

The benefits of the clean GTL/synthetic fuels for European Cities are:

- The Clean GTL/Synthetic Fuels could save cost and have immediate impact on reducing city emissions. In considering viable future fuel scenarios, then a scenario

with both biofuels and GTL Fuel provides the most cost effective way to meet government targets of reduced dependency on petroleum and reduction in local and GHG emissions.

- GTL Fuel could reduce CO_2 as much as 10-15% and act as a bridge to renewable fuels, such as BTL which has the potential to be near zero CO_2 on a LCA basis.
- GTL Fuel is probably the easiest alternative fuel to implement. Synthetic Fuels are endorsed by vehicle manufacturers and will provide even greater benefits as technology advances.

4.4.1.30 Polis[128]

The European Union should support initiatives leading to the market deployment of clean vehicles and the use of alternative energy sources. Joint procurement of clean and energy efficient vehicles contributes to promote market development and should be supported at the EU level for instance by setting up a virtual market place for clean vehicles.

Polis calls upon the European Union, asking for the rapid definition of stricter vehicle emissions standards for road vehicles complemented by tough but realistic targets in air quality legislation. Strict noise emissions limits and polluting gas limits should be introduced.

4.4.1.31 CLECAT[164]

CLECAT suggests the following action: rewarding system favouring the use of environmentally-friendly / energy efficient vehicles: one could for instance imagine a system whereby purchase of hybrid vehicles could be promoted through small subsidies or tax rebates; an additional idea, which could seriously entice operators to renew their fleet with less polluting vehicles, is to allow hybrid commercial vehicles or commercial vehicles of superior EURO class to share public transport lanes with taxis and busses.

4.4.1.32 ETRMA[178]

Tyre noise can be changed by about 2 dB(A), while road surface can introduce 10 dB(A) of variation. Reducing the speed from 80 to 60 km/h will decrease tyre-road noise by 4 dB(A).

Highly challenging requirements for vehicle noise, wet grip and future rolling resistance for tyres will place a considerable cost burden on the tyre industry, damaging the European tyre industry's ability to compete on the European market. Tyre industry policy is to continue tyre-road noise reduction while maintaining and improving safety characteristics of the tyres. Therefore, an integrated approach towards compulsory, strict limit values for road surfaces –in particular in targeted areas - is urgently needed.

4.4.1.33 UEAPME[148]

Today's market offers no or hardly any clean vehicles (vans, lorries) adapted to professional needs. The introduction will also require a dense network of service stations, which is also missing today. Public authorities should offer financial and / or fiscal incentives for the purchase of clean vehicles. One could also think about special "privileges" like special parking spaces, less parking costs, longer time-frames etc. The Stockholm congestion

charge boosted sales of environmentally friendly cars as they were exempted. Upgrading existing vehicles (installing particle filters etc.) should be encouraged by fiscal / financial measures.

4.4.1.34 ADEME[179]

ADEME is leading a European project, Starbus, on the inclusion of life-time costs for pollutant and CO2 emissions and for fuel consumption into the award criteria. Starbus project works on decision tool for urban buses to propose best pathways (in term of pollutants, GHG emissions and classics costs) for a given city and bus profile. External costs for pollutants emissions, GHG and noise are added to classic costs (fuel, maintenance…) during all bus life. A single criterion is produced for each pathway. Then comparison between pathways from well to wheels (NGV, LPG, Diesel, biofuel…) is possible. Moreover, pollutant emissions are estimated for each bus profile in real conditions.

4.4.1.35 EETF[166]

As far as motor vehicles are concerned, while existing Directives, notably on car exhaust emissions, require manufacturers to develop cars that emit less than 140 grams of CO_2 per km, this obligation has not been met and on average, cars still release over 160 gCO_2/km into the atmosphere. Europe must stand firm on this issue and avoid negotiations entertaining the demands of the car manufacturing industry.

Increasing the use of soil to produce biomass as a contribution to the progressive development of alternatives to fossil fuels is something that must be undertaken only with sustainable development and organic farming policies firmly in sight. Soil should not be considered a renewable energy source because doing so would amount to solving one problem by creating another and would have consequences in terms not only of energy but also of water management and food supplies. Therefore, it would seem interesting to focus more on the production of algae, a raw material with 30 times the biomass yield potential per hectare of rape or sunflower.

4.4.1.36 Eurocities[136]

EUROCITIES recommendations to the European Commission:

- To continue efforts towards final approval of the Euro 5/6 proposal for light-duty vehicles and to ensure its effective implementation.
- To propose ambitious targets both for reductions in pollutants and for implementation dates in the proposal for Euro VI emission limits currently under preparation. It is vital that emission limits are reproduced in the real world and not just achieved in the laboratory. Consideration should also be given to how implementation of EURO standards can be made coherent with standards for CO2 emissions from vehicles.
- Ensure that EU policy and legislation support improved air quality in cities and facilitate the introduction of environmental zones where cities believe they are necessary, including by developing EU-wide standards for retrofitting technology such as particulate filters.
- To make funds available for practical research on the cost-effectiveness of measures, and on tackling hotspots and problem shifting.

- To continue to foster research and debate in the field of alternative fuels such as biofuels, natural gas and hydrogen, LPG and electric vehicles. Technology in electric and hybrid vehicles appear particularly promising for urban transport. Further research is crucial to achieve a real shift to renewable/low fossil carbon routes11. A European Commission funded research programme would be very useful in this respect.
- Ensure that EU policy and legislation, for example in the case of fuel quality, supports the shift to renewable/low fossil carbon routes.
- To ensure that car manufacturers are also forced to introduce stricter standards, ensuring that a greater number of private cars in the urban environment are also cleaner.

4.4.1.37 CIVITAS[127]

Concerns for road safety are well established in transport policy, but objectives of health, including the health impacts of emissions from transport, need greater attention. Many European Cities suffer poor air quality. Besides all measures for a better management of the urban mobility, there is a need for less polluting cars. The CIVITAS cities urge the Commission to settle the Euro VI standards to be implemented as soon as possible.

Focus must especially be on the “heavy smokers” – those vehicles which contribute actually more than proportionally to the urban air quality problems: light and heavy duty vehicles as well as buses. The large Diesel engines are a major source of particulates and Nitro-oxides. A small proportion of the vehicles is responsible for a high share of problems: the group of heavy duty vehicles, buses and light duty vehicles have usually a share of less than 10% of all vehicles but can be responsible for more than 50% of the transport related NOx emissions.

There is support in many cities for regulations which enable control of vehicle emissions, and market conditions, including procurement, which ensure that manufacturers have an incentive to supply the best vehicle technology at reasonable cost.

But there is an 'unintended consequence' which can sometimes apply, and it is important to ensure this is solved. In some cases (but not always) there is a short term increase in the costs of vehicle purchase or maintenance, which can put extra financial burdens on for example the operators of public transport systems. It is understood that this can be done in a way which provides fair competition between different operators, but there can be a distortion if it means that public transport vehicles have a competitive disadvantage against the private car. This can be solved by ensuring that regulations on emission control are linked with other transport policies such as bus priority lanes, etc, when the combined effect is to encourage both cleaner vehicles and greater operational efficiency.

4.4.1.38 BUSTRIP[160]

Based on the practical knowledge and experiences from the BUSTRIP project, the organization supports the Commission in taking urgent action to promote clean and energy efficient vehicles and alternative fuels. They suggest that public transport vehicle fleet uses alternative fuel and underpin citywide alternative fuel infrastructure that is open for all vehicles. Cities should be encouraged to make greater use of existing instruments to incentive and promote clean vehicles and alternative fuels (e.g. parking management, ‘environmental zones’ for trucks, etc.)

4.4.1.39 FEMA: Motorcyclists' contribution[144]

The motorcycle has a contribution to make and should be taken into account with regard to pollution. According to an independent expert chosen by the European Commission[180], PTW exhaust emissions show a good and very often better trend compared to the overall emissions of road transports. This trend is not only valid for what concerns the three main pollutants, but also with regards to CO2 and particles emissions. At the horizon of 2012, the share of this two pollutants will be under 0,5% of the overall road transport CO2 and PM emissions.

4.4.1.40 VVM De Lijn[165]

Changes in customers' purchasing behaviour (bigger, heavier, extremely powerful cars, 4x4 vehicles consuming a disproportionately high amount of fossil fuel) have neutralised the potential environmental benefits of improved car technologies. The promotion of "clean vehicles" is utterly useless if the Commission does not intend to take far-reaching and bold measures prohibiting the sale of certain types of vehicles judged to be damaging to the environment.

VVM De Lijn recalls the negative effect of the "daytime running lights". While the Commission intends to table legislative proposals making daytime running lights obligatory (also for buses), it tends to obliterate the negative repercussion of daytime running lights in the field of higher energy consumption and shorter life-cycle of batteries.

4.4.1.41 UBA[143]

From the point of view of the UBA, a potential measure on EU level should be the improvement of the support for clean vehicles (e.g. the possibility of support of EURO6 vehicles by the MS as long as EURO5 is not legally binding).

The environmental advantages of the public urban transport (if compared to motorised individual transport) can be maintained also under an increasing pressure from competition by the operation of low-emission vehicles (e.g. EEV standard for buses and particulate filter for rail vehicles / locomotives with diesel engines), demanding noise standards and by improving the load / Occupancy while simultaneously, the quality of the offer is optimised (punctuality, security, cleanliness, comfort etc). Call for tenders in public urban transport from communities should comprehend demanding environmental standards for noise, particulates, nitrogen oxide and greenhouse gases. UBA stands for the fulfilment of the EEV standards by buses; with the further development of the legislation, more demanding standards are to be fulfilled respectively.

4.4.1.42 Koninkrijk der Nederlanden[181]

The Netherlands advocate:

- allowing member states to accelerate the introduction of the Euro 5 and Euro 6 emission standards for passenger cars;
- tighter Euro standards, accelerated phase-out of engines producing high emissions and the promotion of "zero-emissions"

- obliging the motor vehicle industry to introduce cleaner technology more rapidly by tightening standards for vehicle emissions, noise and fuel economy. Air quality could be improved by introducing particulate filters, for example;
- more stringent noise standards for vehicles and tyres based on technology now available.
- Harmonized certification of emissions-reducing technologies such as particulate filters and SCR de-NO_x systems.

4.4.1.1 Berlin[133]

Cities strongly believe that it is time to be emphatic in the support of a strategic technological initiative in favour of an integrated approach in the context of sustainable urban transport. This strategic approach consists of three elements:

- the retrofitting of the existing fleet : a harmonized certification of retrofitting systems accompanied by legal and fiscal incentives reduces costs for manufacturers and consumers; harmonized traffic signs for environmental zones are needed for interoperability.
- stricter emission standards for new vehicles with state-of-the-art technology;
- a preference for clean fuels available today.

4.4.1.2 Nantes Métropole[173]

In order to generalize the commercialization of less polluting vehicles and high technologies, the EU should adopt several measures:

- establishment of technological standards to reduce the production costs and thus the acquisition costs, and to permit an interoperability of the systems at the European scale;
- fixation of standards concerning the allowed polluting emissions;
- standardization on a European scale of the approval of the vehicles;
- facilitation of buying groups of vehicles on a European scale;
- financing of the experiments in the field of innovations;
- help with the emergence of common specifications on a European scale for the innovating vehicles.

4.4.1.3 F.N.AA[182]

F.N.AA shares the idea that it seems more convenient to act on the maintenance of the vehicles than on the renewing of the vehicle fleet. Many households can't afford new vehicles, despite incentives.

4.4.2 Infrastructure development

4.4.2.1 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

See under 4.4.4.3

4.4.2.2 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

Reduction of the Noise Emissions: Technical Measures: construction of low noise surfaces.

Reduction of the Emissions: Traffic Calming: Low noise driving behaviour:

- speed limit reduction (Night time speed limit 30 km/h in Berlin on main road (Schildhornstraße))
- street design: enforcing low noise driving

4.4.2.3 VVM De Lijn[165]

One of the instruments in reducing dysfunctional mobility demand could be the mandatory elaboration of MOBILITY IMPACT ASSESSMENT (analogous to the Environmental Impact assessments). Large-scale real estate developments (new housing developments, hospitals, schools, corporate villages, exhibition halls, leisure parks etc) should be preceded by detailed impact assessments on changing mobility patterns in their neighbourhoods. Ideally, public transport infrastructure should anticipate on future real estate developments (mega-hospital centres, leisure centres, shopping malls, big housing conglomerates etc). Modal shift policies in urban transport should be based on the WCPCP-principle, introducing a transport mode hierarchy corresponding to the degree of sustainability[183]

1. Walking
2. Cycling
3. Public transport
4. Car sharing and car pooling
5. Private car

The Commission should propose the creation of a dedicated fund on EU-level exclusively for financing sustainable transport investment.

The new EU-Member States often possess a unique PT infrastructure (metros, tramways, railway network). It is of paramount importance to create attractive incentives for the new member states to preserve, cherish and develop their PT heritage. The errors made in the "old" member states a half century before, should not be tragically repeated once again in the new member states.

4.4.2.4 SUSTRANS[142]

Measures that can be put in place to reduce the dominance of the car in urban areas include priority lanes for public transport, parking restrictions, pavement widening, raised crossings and re-phasing of light-controlled crossings in favour of pedestrians.

4.4.2.5 ERF, IRF[146]

Traffic management strategies combined with road infrastructure improvements can reduce the levels of noise. It is estimated that pavement properties on a well-maintained road network can reduce noise emission levels by as much as 5 db (A). Acoustic barriers offer another on-site noise solution, typically reducing noise levels by 5 to 10 db (A).

4.4.2.6 UBA[143]

EU is responsible for the further development of demanding requirements for the noise emission from vehicles and their components.

Typical urban measures are:

- Use of low-noise road surfaces. An EU-wide classification of low-noise road surfaces would be useful,
- Limit values,
- Support of low-noise driving, by respective shaping of the streets and education and motivation of drivers,
- Restriction of the access for noisy vehicles, especially during night times.

4.4.3 Access restriction

4.4.3.1 Contribution from a representative of the city of Bremen[124]

Concerning CNG vehicles in Bremen, there is no legal framework to limit access for delivery vehicles or taxis with certain types of fuels. Limits can only be set in terms of emissions.

4.4.3.2 Contribution from Mrs Diana Kiss, Hungarian Ministry of Environment[125]

- An "environmental zone" has been defined as a geographically delimited area, covering more than just a very local area, that due to problems with air pollution, noise, urban quality-of-life, congestion and/or road safety is subject to specific restrictions in either the volume or the nature - or both - of the traffic within the zone.
- The study presented by Mrs Kiss has identified a few environmental zones: examples of implemented environmental zones exist in Sweden and Italy; examples of planned

environmental zones were found in Denmark, UK and Norway. They are characterised as follows:

- Types of restrictions: environmentally-related road traffic restrictions!
  - in most cases for HDV-s
  - focus on the age of vehicles
  - specific technological equipment is required (particulate filter)
  - stricter Euro norm is required.
- Area and road covered:
  - A relatively large area is needed to achieve an effect.
  - The restrictions should preferably not interfere with too many through traffic roads.
  - The perimeter of the zone should have a logical definition.
- Compliance and enforcement: Methodology:
  - manual enforcement by the police: an offence, issue a fine
  - automatic enforcement: fix and mobile cameras, microwave readers and GPS/GNS systems.
- Impacts: the most important improvements were observed for the particulate emissions and for the CO emissions indicators.

- Recommendations on the need and scope for action at Community level
  - Develop a common format for information sharing between Member States about traffic restrictions, e.g. weekend bans, environmental zones, etc
  - Develop a proposal for a Directive, which facilitates the introduction of environmentally related road traffic restrictions
  - Propose an amendment of Directive 1999/37/EC making information about the Euro standard mandatory in the registration certificate
  - Promote a harmonized road sign for those approaching an environmental zone, to benefit drivers traveling to other Member States
  - Develop a common accreditation system for retrofitting of vehicles.

4.4.3.3 Contribution from Mrs Kopanezou, DG Tren[125]

Complex situations have to be taken into account concerning Green Zones in cities, in particular the concept of non-discrimination.

4.4.3.4 Contribution from Mr Maurizio Tomassini, representing the CURACAO project[125]

A synthesis of the results of the Automatic Control System (ACS) in Rome:

- Access flows: - 15/20%
- Permits: about 55.000 (not including Disabled permits)

- PT passengers (local) : + 5%
- Two wheels (access): +10-15%
- Residual violating transit: 20-25.000 /wk
- Pollution concentration: local reductions, almost compensated by the "two wheels" and "evening effect"
- Robust technology (Availability = 99%, Faults = 1%)
- Night peaks in leisure areas: part of historical City Center, Trastevere, San Lorenzo
- Evening peaks.

Concluding considerations:

- The Rome experience, consolidated and expanded, confirms the results of PROGRESS.
- The access control policy using ACS is strongly supported by the Italian Ministry of Environment, as an effective measure to protect environmentally fragile areas.
- Applications are spreading around Italy: currently more than 25 cities, of every dimension, have installed ACS (not all in operation): Torino, Milano, Firenze, Bologna, Verona, Padova, Siena, Venezia, etc.
- It is more accepted than RUC: can be a smooth transition towards integrated (with street parking) pricing policies (implemented under MIRACLES/CIVITAS I Project).

4.4.3.5 Contribution from Mrs Lucinda Turner, Transport for London (TfL)[125]

- What is the London Low Emission Zone?
  - Discourages the most individually polluting vehicles from being driven in London
  - Requires heaviest diesel-engine vehicles to meet strict emissions standards to drive within London
  - Operates 24 hours a day, 365 days per year
  - The LEZ does not ban vehicles from London, non-compliant vehicles can pay a charge
  - Range of compliance options: newer vehicles, retrofit abatement equipment, re-engineering, reorganise fleets, etc
  - Daily charge of £100 for LGVs or £200 for HGVs
  - May 2007 – Mayor to decide whether or not to confirm Scheme Order to implement LEZ
  - If approved, go-live Feb. 2008
- The future:
  - On 14 November 2006: Mayoral announcement:
    - aim to take forward a policy of reducing London's CO2 emissions by introducing emissions influenced charging within extended Congestion Charging scheme
    - complements the existing scheme

- Proposed that:
  - cars with lowest emissions (up to 120g/km CO2 and Euro IV) obtain 100% discount
  - cars with highest emissions (over 225g/km) would pay £25
  - 90% residents' discount withdrawn for VED band G & equivalent cars
- TfL currently developing proposals and undertaking analysis work
- Proposals will be subject to public consultation.

4.4.3.6 Contribution from Mr. Tomassini, representative of the CURACAO project[125]

The two-wheelers represent a large volume of vehicles in Rome. They can access the area free of charge, as they represent an alternative to private cars. The risk of accidents and pollution has grown up as a consequence. The fact that moped plates are small and that moped registration does not clearly belong to an owner, are recognised as two problems.

4.4.3.7 Contribution from Mrs Nina Renshaw, Transport and Environment (T&E)[126]

Solutions at local / regional level

- Low Emission Zones
  - In place:
    - Amsterdam
    - Stockholm, Malmo, Gothenburg, Lund
    - Lombardia
    - Athens
  - Planned:
    - Munich (October 2007)
    - London (February 2008)
    - Berlin (2008)
    - The Netherlands (allowed from April 2007)
    - Denmark (allowed from July 2008).
- 80 km/h zones (NL) (reductions in emissions achieved)

4.4.3.8 Contribution from Mr Marcel Rommerts, DG Tren[134]

See under 4.2.3.3

4.4.3.9 Eurocities[136]

EUROCITIES recommendations to the European Commission:

- To consider tightening noise limits, in particular given their effects on public health. In particular EUROCITIES strongly supports the revision of the legislative proposal by the European Commission to tighten the European noise limits for tyres and vehicles. Initiatives such as the establishment of Low Emission Zones could be transferred to the field of noise and cities could help the European Commission to develop the concept of "noise reduction zones".
- Monitor the growth in, or reduction of, the effects of transportation all over Europe, including noise indicators (noise levels, number of exposed houses or inhabitants, depreciation in value of property and other sensitive locations, unusable estates/zones and health costs).

4.4.3.10 UBA[143]

Periods of higher sensibility (evening, weekend, and mainly nights) should be relieved from traffic as far as possible.

4.4.3.11 SPARKS[184]

Many EU member states are implementing, or planning to implement, low emission zones (LEZs) in their urban centres in order to improve air quality and reduce the negative environmental and health impacts of heavy traffic in urban areas. It is often the case that the success or failure of these schemes rests on the ability of the local authority to implement them effectively. Schemes which rely on camera enforcement and Automatic Number Plate Recognition (ANPR), such as in Utrecht, are simply not enforceable against foreign registered vehicles at the current time.

EU policy should focus on resolving two matters in particular:

- The creation of a common data sharing system for the purposes of enforcing civil traffic offences across EU borders.
- A legal framework for enforcement that includes civil, criminal, and administrative penalties/offences.

4.4.4 Modify travel behaviour through mobility management, traffic, parking and information management

4.4.4.1 Contribution from Mr. Laconte, representative of the EEA[126]

A report on transport was published on February 28 by the EEA. It stresses the link between the extension of infrastructures and the increase of emissions. The external costs of road transport are not supported by those who generate them. Considering the direct EU subsidy of €140 billion per year in addition to local and regional subsidies, the target of reducing traffic by 1% can only be achieved through a better use of intermodality, public transport and ITS.

4.4.4.2 Contribution from Mr. Gregor Resman representative of Telargo[126]

Data from ITS for bus operators and good planning of buses on the road contribute to reduce operation costs and pollution.

4.4.4.3 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

Ranking of Strategies in Urban Noise Protection

- traffic avoidance
- shift to low noise emission sources
- reduction of the emissions
- measures in the sound propagation path
  - increase of distances between source and receiver
  - shielding (barriers etc)
  - increase of sound absorption
  - prevention of reflections
- measures at the receiver
  - sound insulation (windows)
  - orientation of rooms according to their sensitivity
  - shielding through building parts.

4.4.4.4 CIVITAS[127]

There is no doubt that in addition to the technical measures, a behavioural and cultural shift is needed, based on new approaches to mobility which take account of emotional and psychological motivations, not only economic ones. The motor industry has successfully promoted the ideas of cars as part of an overall lifestyle, but these concepts now act as a barrier to improvements: cities have to counter such promotion with a culture reflecting qualities of life which cannot be delivered by excessive car use. There is a new range of policy instruments that address psychological attitudinal and information aspects of choice, sometimes called 'soft' or 'smart' measures.

Evidence to date suggests that they have very much greater potential than has been thought, and they have the great benefit that they both change travel choices and help to change people's attitudes to travel. They sometimes lack resources and support because of the tradition of reliance on heavy infrastructure measures: Civitas considers they are crucial, and need to be much more firmly based in transport packages.

4.4.4.5 VVM De Lijn[165]

Parking management is still too often and exclusively seen as a purely economic, profit-making activity, thus obliterating its full potential as a powerful **tool** for sustainable mobility management. Pricing policies in urban parking facilities should be coordinated with public transport pricing policies. Urban citizens should be able to make an objective comparison between the price of entering the urban area with the private car and buying a bus/tram/metro ticket. The Commission should publish a **guidance document,** containing recommendations based on best practice, for maximising the potential synergies between urban parking management and PT.

4.4.4.6 CIVITAS[127]

Cities should have the power to implement demand management measures such as road pricing when they judge it appropriate; and also the power to use other methods of traffic control and travel demand management, as an alternative to pricing or in combination. Cities want firm statements of principle from the Commission that implementing such policies is not in breach of EU objectives of fair competition and an efficient market, but will contribute to economic growth, and environmental improvement.

4.4.4.7 UBA[143]

Beside technical measures and regulations for emission control, demand-side-measures are important for traffic management and the reduction of traffic-related environmental impairment. Such measures include concepts for traffic abatement, speed limits, the installation of environmental zones with restricted access for specific types of vehicles, city toll and a systematic management of park space in cities and communities. These means can help to reduce the attractiveness of motorised individual transport and to motivate for the use public transport and the bicycle. In order to be effective under the respective local conditions, the measures must be integrated into a comprehensive traffic concept.

4.4.5 Promote use of public transport, cycling, walking

4.4.5.1 Contribution from Mr. Laconte, representative of the EEA[126]

See under 4.4.4.1

4.4.5.2 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

See under 4.4.11.1

4.4.5.3 Cities Network Bike[185]

Anyone should be able to circulate by foot or bicycle without risking neither by accident nor by pollution. For the future liveability of European cities who are phasing with problems of congestion, pollution, noise, the emphasis on walking, cycling and public transport will be vital. These "smart transport modes" are the most logical for short distance trips which are also inherent to urban areas.

The total integration of public transport with transport of bicycles is an important point, that must be completed by a good bicycle road network from public transportation centres (as railways stations) to the city; the possibility of bicycle parking should be ensured close to public transport stations.

There are still important obstacles against such an evolution of urban transport policies. Concerning the most fragile users that are pedestrians, cyclists and people with a motor handicap, four basic principles are to be considered:

- The principle of inclusive decision making: a better inclusion of the weakest users at all the decisional levels in mobility and urban planning;
- The principle of urban support: development of safe and comfortable facilities for vulnerable users (as infrastructure, parking) and supporting measures (as promotion and training activities)
- The principle of sufficient maintenance: existence of efficient maintenance programs of all urban space dedicated to vulnerable users must become a priority;
- The principle of intermodality: total integration between the transport systems for cyclists and handicapped people must be a compulsory goal for each public agent with authority on mobility.

To contribute to improved Cycling and Walking, the "cities network bike" calls upon the European Commission to support development of the "European Congress for Cycling and Walking". Secure parkings of bicycles are needed.

4.4.5.4 SUSTRANS[142]

Carbon emissions per passenger for train and coach travel are six to eight times lower than car travel at average occupancy[186]. Public transport is often perceived as being less competitive in terms of convenience, speed and cost than it really is. This misperception should be addressed through information provision and individualised travel marketing campaigns.

Sustrans' own work for the UK Department for Transport has shown that in representative UK cities 47% of car trips could be replaced by walking, cycling or public transport, without major intervention[187]. Even greater potential exists where significant investment is made in infrastructure to support these modes.

Urban transport policy can have a considerable, positive impact on public health by encouraging a shift to active, healthy forms of travel. One of the easiest ways to increase physical activity is to include walking and cycling in the daily routine, such as during the journey to work or school. In its recent report, 'Promoting physical activity and active living in urban environments', the World Health Organisation stresses the importance of developing urban transport policies that ensure active and sustainable alternatives to the private car are an easy choice for people to make.

The volume and speed of motorized transport – including motorcycles - within cities should be restricted. Particularly important is the reallocation of road space to walking, cycling and public transport, and also to public space – we currently give over too much of our shared urban space to transport uses and too little to other public activity.

The WHO suggests that a reduced traffic speed and to convenient and safe infrastructure (cycle lanes, tracks and paths) would encourage people to walk and cycle.

4.4.5.5 ETRA[170]

The main objective of the European urban transport policy must be to improve the quality of life in urban areas. To achieve this objective, the EU will have to develop a set of measures aimed at dispelling unsuited means of transport from urban areas and encouraging the use of suited means of transport.

ETRA believes that that in order to make cycling a key element in the urban transport policy, the EU must at least take the following actions:

- Cycling needs to be fully integrated in the urban transport policy. It is of paramount importance to set up, at European level, a cycling office that monitors EU policies and drives and assists member states.
- Cycling is almost systematically neglected in EU research and policies for lack of solid data and information. It is essential to collect data on cycling. In order to monitor the developments concerned, the Commission also needs to determine the measuring methods and ensure the harmonisation of these methods. ETRA, together with the other partners of the cycling community in the EU, is able and prepared to assist the Commission in developing data collection on cycling.
- A 3rd essential measure to make cycling a key element in the urban transport policy is a serious review of the allocation of financial resources. The EU must assist local, regional and national authorities in using all relevant financial instruments for the benefit of cycling as a key element in establishing sustainable urban transport.

4.4.5.6 ECF[188]

The ECF position is that cycling must be accepted as an equal and often preferable mode of transport. The bicycle has to be incorporated into all other areas of transport policy, ensuring easy combination of modes of transport (full inter-modality).

There is a need for expansion and improvement to cycle tourism infrastructure, such as EuroVelo, the European cycle route network and the carriage of cycles on all long distance trains to promote sustainable and healthy tourism and to help European citizens discover the benefits of the bicycle.

4.4.5.7 Polis[128]

Cycling and walking are mainstream transport modes in urban areas and should be treated as such by the EU. Cyclists and pedestrians deserve safe and attractive traffic environments and effective networks. These transport modes have a contribution to make towards a fitter and healthier population, as leisure activity and as an aid to recreation and tourism. The European Commission should therefore promote cycling and walking though policies to trigger behaviour changes and programmes supporting the provision of adequate infrastructures and behavioural changing campaigns; and initiatives to research and promote cycling and walking as sustainable alternatives to the car and components of an integrated transport solution.

4.4.5.8 The Helsinki Metropolitan Area Transport System Plan 2007[189]

The Helsinki Metropolitan Area Transport System Plan 2007 aims to attain a better urban environment. It is based on five development steps:

- Demand and methods of transportation, cooperation between transport planning and land use planning authorities;
- Development of public transport services. Practical experience has shown that integrated tariffs and tickets in public transport increase the use of public transport.
- Traffic control and information. Developing traffic information services makes traffic planning smoother and reduces problems caused by disturbances.
- Themed projects that aim to improve the urban environment within the current traffic system;
- Infrastructural investments. These investments ensure the smooth running of the system as a whole.

4.4.5.9 Eurocities[136]

EUROCITES considers that there is an urgent need to change perceptions of ‘smart modes’ of sustainable transport, such as cycling and walking. EUROCITIES encourages the development of initiatives such as public bike schemes, as well as car sharing and car-pooling systems, which transform the individual car into a high occupancy vehicle, minimising their impacts on the roads.

- Actions aimed at changing citizens' travel behaviour and choice of transport modes must be supported by long-term media and advocacy campaigns, given that such a shift of public attitudes can only be achieved if policy measures are accompanied by educational and awareness-raising activities.
- EUROCITIES believes that good public transport is an essential factor in achieving sustainable mobility and therefore asks the European Commission to ensure public transport infrastructure and operations that function well, with high standards of quality.

4.4.5.10 CIVITAS[127]

CIVITAS cities are implementing initiatives to reduce car use and encourage public transport, walking and cycling; to develop city centres which provide a good safe environment not dominated by traffic; and to ensure that the charges paid by all travellers (including car users) more closely reflect the costs caused by their travel.

4.4.5.11 UBA[143]

In order to stand the competition with passenger car, a long-term strategy is needed in order to improve the image of bus, train / light rail, bicycle and walking. UBA gives **pedestrian** and **cycling traffic** an increasing importance for achieving sustainable mobility. Mainly in cities the bicycle is a good alternative to the car as a great part of the journeys are only a few kilometres long. The experiences mainly from the Netherlands and Denmark make it appear realistic that, in the cities, 30% of today's journeys by car under 6 km could be done by bicycle in the middle term. Increasing pedestrian and cycling traffic can considerably reduce the emission of greenhouse gases: a shift of 30% of the car journeys under 6 km to bicycle would lead to a reduction of the CO2 emission by 7.5 mio tons/year. Furthermore, this would help the communities to meet the requirements of the European guidelines for air quality and noise.

More activities not only on national, but also on EU level are necessary to establish the bicycle as an acknowledged, widely used and equal transport mean. This includes measures to improve the image of the pedestrian and cycling traffic, to improve the infrastructure (bike lanes, "parking places", bicycle stations at bus and train stops) and measures to increase safety, especially for children and elderly people. The pedestrian and cycling traffic must become a natural element of an integrated European policy for urban traffic.

4.4.5.12 COLIBI-COLIPED[190]

The bicycle, as proper form of personal transportation, can help society to meet the objectives of a sustainable transport. Cycling policies, based on a full integration and coherence among transport and other policies need to be implemented.

A focus on a shift to non-motorised transport in urban areas will address policy objectives related to transport, mobility, accessibility, environment, public health and energy efficiency:

- Cycling is often the quickest mode of transportation for travel within urban areas, especially for travel less than 5 km;
- It's a common fact that cycling is environmentally and energy friendly;
- Regular cycling is benefit for the health (reduce the risk of coronary heart disease, obesity);

- The liveability of cities is increased by cycling[191].

The success of cities that have implemented a bicycle policy plan or invested in bicycle infrastructure and facilities should be an example to the European policy makers. For example, the cycle Promotion Programme in Graz, the long-term investment in infrastructure and introduction of speed limits in Hanover, the investments in cycle lanes in Brussels and Copenhagen, etc.

COLIBI and COLIPED recommend the EC to:

- develop a cycling strategy and to include the bicycle as a fully-fledged means of transport in the overall picture of a European transport policy;
- encourage local, regional and national authorities to develop and implement sustainable urban transport plans in which they recognise the bicycle as a natural and obvious means to safeguard urban mobility and quality and to take measures to stimulate bicycle usage. Hereto, the Commission could recommend Member States to also appoint a "Bicycle Officer";
- encourage behavioural change by setting an example;
- pursue the exchange of good practice in which the bicycle is presented as a mode in its own right.

4.4.6 Promote new forms of vehicle use and ownership

4.4.6.1 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

See under 4.1.5.6

4.4.6.2 Contribution from Mr Marcel Rommerts, DG Tren[134]

- Car sharing and car pooling: evaluation of the results from CIVITAS 1:
  - Some results
    - Range of 12 measures, including car pooling for employees and travel behaviour of business travellers
  - Impacts
    - Mature concepts with wide benefits (environment, user acceptance, urban space, public transport loyalty)
    - Economically profitable
  - Lessons
    - Not owning but using a car (and paying for its use) is still a "cultural revolution"
    - Measures that can have long-term effects on lifestyles

4.4.6.3 Cities Network Bike[185]

Urban policies must be directed towards a major cultural evolution in the use of the car, which will have to be based not anymore on its individual possession, but rather on its use, through systems of hiring, division of property and shared trips, so as to reach the goal: "less cars, more occupied".

4.4.7 Promote efficient freight logistics and delivery services

4.4.7.1 Contribution from Mr Peter Sonnabend, DHL[134]

- Clean vehicles

  Clean commercial vehicles, when combined with efficient logistics schemes, can help to alleviate environmental effects of urban goods transport. Cities must find ways to promote these:
  - Operational excellence driving total fuel use
  - Emission zones only cut off low performers
  - High (EEV) performers must be rewarded
  - Prioritised use of critical infrastructure
  - Road and roadside access is key.

4.4.7.2 Contribution from Ms Lisa Sundell, City of Goteborg[134]

- Goteborg Environmental Zone:
  - Oldest trucks used in city distribution in an environmental sensitive area
  - Restriction for heavy trucks and buses, Diesel Engine > 3,5 metric ton:
    - 15 +10 km^2 (since April 2007)
    - Since 1996 in the Central area
    - Main rule: 6 years
    - Euro 2 & 3 => 8 years
    - Euro 4 => 2016
    - Euro 5 => 2020
  - Results Environmental Zone
    - More than 50% reduction of PM
    - 6-8 % reduction of HC and NOx
    - Profitable from a society point of view

- Vehicle fleet younger than Swedish average
- 96 % follows the regulation
- Hauliers positive!

4.4.7.3 Contribution from Mr Marco Monticelli, IVECO[134]

- Vehicle requirements for urban applications: 21st century must-haves for urban vehicles:
  - Efficient and safe operations
  - Low exhaust tail-pipe emissions
  - Low vehicle noise
  - Renewable fuels
  - Energy efficiency.

4.4.7.4 BUSTRIP[160]

Logistics competences are a barrier to the implementation of sustainable urban transport plan. City governments need to increase their logistics competence and to address the challenge of urban freight transport. The EU should intensify **research into urban freight,** aimed at developing successful operational models that integrate the work of local authorities with the freight industry. Freight transport needs to receive a higher priority in city policies. There is a need of higher logistics competence in transport planning. This will also require an adaptation of the **academic system**. Traditionally, universities strictly separate the education in the subjects transport and logistics. The EU should support universities that successively have broadened their scope and promote education that integrates transport, logistics and sustainability issues.

4.4.7.5 UBA[143]

Measures to reduce the negative effects from urban freight transport are to avoid freight transports within or through the city, reduce transport distances, increasingly use environmental-friendly transport means, to increase the efficiency of freight transport by technical innovations (logistics) and to reduce the specific emission of the vehicles.

Cities and communities can help to reduce the noise impairment from freight traffic by an appropriate industrial and transport planning. The indication of truck routes that go through non-sensible areas in the city should be considered.

The urban freight transport offers the possibility to reduce the environmental impairment and to improve the economic basis of the transport companies by

- Drivers' training,
- Optimization of routes and tours,
- Use of telematics,
- Purchase of environmental-friendly vehicles,
- Intelligent management of loading zones,
- Advantages (exemption von restricted access) for low-emission vehicles,
- Use of bicycle courier service.

4.4.8 Taxes and incentives

4.4.8.1 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[124]

See under 4.4.1.2

4.4.8.2 Contribution from Mr. Kai Lücke, Director Public Affairs, ACEA[124]

ACEA stresses the need for European-wide taxation structures to promote CO_2 efficiency, as:

- Economies of scale are a precondition for competitiveness
- The taxation systems are fragmented in Europe
- There is a need for a CO_2-based taxation of vehicles and alternative fuels.

4.4.8.3 Contribution from a representative of VVM-De Lijn[124]

There is a need for an integrated approach covering vehicle technology and incentives for people to shift to public transport. For example in the Flanders region, 50,000 people have scrapped their car in exchange for a 3 year public transport pass.

4.4.8.4 Contribution from Mr. Patrick Coroller, ADEME[124]

See under 4.4.1.14

4.4.8.5 Contribution from Mr. Patrick Coroller, ADEME[124]

The current range of measures for light duty vehicles covers:

- Fiscal incentives for alternative fuel vehicles (gas, hybrid)
- Additional taxes for vehicles with CO_2 emissions over 200 g/km and 250 g/km
- For companies, a vehicle tax proportional to CO_2 emissions
- For local authorities and companies, financial assistance from ADEME for electric and natural gas vehicles
- For governmental fleets, procurement policy for new vehicles with CO_2 emissions lower than 140 g/km.
- Incentives for buying electric mopeds.

The current range of measures for buses covers:

- Financial assistance depending on the type of engine (natural gas, LPG, electric) and the size of the bus

- Financial participation in the additional cost of DPF.

The current range of measures for trucks concerns financial assistance, i.e.:

- Participation in the additional cost of DPF
- Support for the purchase of electric and natural gas trucks
- Support for the purchase of garbage collection trucks with natural gas, electric or hybrid engines.

4.4.8.6 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

- Carbon tax for developing public transport?
  - European Council will probably decide on commitment to achieve at least a 20% reduction of greenhouse gas emissions by 2020
  - Transport responsible for 25% greenhouse gas emissions
  - Proposed directive on passenger car taxes contains CO2 element into the tax base: revenue could be used for financing sustainable transport modes.

4.4.8.7 Contribution from Mr. Tomassini, representative of the CURACAO project[125]

In Italy, the legislation considers that revenue from Road User Charges must be used for the local public transport system. Revenue from two other sources, namely permit releases and fines, are also reinvested mainly into public transport, as a decision of the mayor, even if it is not compulsory.

4.4.8.8 Contribution from Mrs Nina Renshaw, Transport and Environment (T&E) [126]

Solutions at national level: Some examples of national policies

- Incentives for particle filters for new cars, vans, buses and lorries and retrofitting (NL, DK, AT)
- Circulation taxes & infrastructure charging based on Euro emissions classes (DE)
- Differentiate seaport charges on basis of NOx emission of ship engine (SW)

4.4.8.9 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

Traffic Avoidance: Pricing Instruments

- Reflecting infrastructure and external costs of transport
- Instruments:
  - petroleum tax (mileage-related)

- motor vehicle tax (can be emission-related)
- road pricing (e.g.. London congestion charge)
- lorry toll (mileage-related, (EU), Germany, Switzerland)
- parking fees
- reduction of subsidies

4.4.8.10 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

Reduction of the Noise Emissions: Technical Measures: incentives for low noise products and procedures

- exemptions from operational restrictions (trucks – see Heidelberg)
- noise emission-related infrastructure charges.

4.4.8.11 Contribution from Ms Maryline Jouaillec Cassassus, French federation of taxis (FNAT) [134]

- Fiscal differentiated incentive to help taxi drivers buy a new car: the incentive will be different if the taxi chooses the best-suited car for the protection of the environment in the range:
  - with less horse power
  - less CO_2 emissions.
- But,
  - Usually beautiful & comfortable car means a big-engine
  - The same goes for cars with an automatic gearbox that professionals prefer because it allows a smooth drive and is more fuel efficient and environment-friendly. These cars usually are in the highest range.
- If the fiscal incentive is well-made to help craft taxis, the present turnover of twelve thousand cars per year can become sixteen thousand per year.

- The FNAT took a step for sustainable development:
  - In its own school, it has chosen a hybrid car for its car pool
  - When the young taxi driver buys his car, he will remember the car he used during his training
  - Fuel expenses have decreased by fifty percent.
- To extend this approach to the whole French territory
  - If car industry starts offering more environment-friendly cars
  - if the taxi activity with these new cars is profitable
  - the FNAT will induce its fifteen thousand members to take part
  - if this choice is coupled with a tax incentive, the things are likely to move quicker!

4.4.8.12 VVM De Lijn[165]

VVM De Lijn calls for more coherence in policy-making on the European Level primarily with regard to the taxation issues in public transport. Directive 2003/96 on minimum levels of excise duties on energy products has an adverse effect on the competitive position of public transport. This directive exclusively concentrates on single market harmonisation issues, omitting the broader perspective of **promoting sustainable transport modes**. The new commission proposal for amending the 2003 directive, namely COM(2007)52 of 13th March 2007 lacks a clear sustainability dimension Although Commissioner Kovacs states that his directive was inspired by the idea of "green taxation" , there is little evidence that this "green" perspective was properly taken into account when writing the text. The Commission stubbornly keeps refusing to envisage **exceptional tax immunisation** for diesel used in public transport activities, although **increasing** the **modal share of public transport** undoubtedly produces beneficial effects on the environment.

VVM De Lijn underlines a lack of coherence in European policies concerning **Green Procurement** proposals. The Commission proposals for imposing "green procurement" of **clean vehicles** on **public authorities alone** (and not on private procuring entities) could cause a **severe distortion of competition.** While the Commission, on the one hand, tries to introduce a competitive dimension in public transport via its proposal for a regulation COM(2005)319 for public service requirements in public passenger transport, it **discriminates against publicly owned PT companies** by imposing the **extra financial burden** of **"green procurement"** exclusively on public bodies. Buying "green " buses entails more entrepreneurial risks, reliability of these kinds of buses is often problematic, maintenance costs are significantly higher., the average lifecycle seems to be shorter.

4.4.8.13 Confcommercio[155]

Incentives for replacing old and polluting vehicles with vehicles more respectful of the environment are fair priorities to be pursued.

4.4.8.14 Eurocities[136]

EUROCITIES recommendations to the European Commission:

- Assist local authorities to engage in joint procurement campaigns to purchase clean vehicles. A package of incentives for public authorities to develop clean vehicles fleet would drive this forward (i.e. VAT bonus, free parking, lowered congestion charges, accurate excise duty price, etc.).
- Regional and local authorities could be urged to introduce a set of incentives for using clean vehicles.
- To continue supporting research, development and demonstration of new vehicle technologies through the 7th Framework Research Programme.

4.4.8.15 GART[167]

Gart is favourable to the future directive on the taxation of the private cars linked to the greenhouse gas emissions. That tax should be used to develop an alternative to private car in urban areas.

4.4.8.16 Deutsche Bahn[172]

Within the revision of the Guideline on Energy Taxes, public transport should be strengthened by an obligatory reduction of the energy tax load.

4.4.8.17 UITP-ETF[163]

It would be helpful to establish all forms and sources of funding for public transport infrastructure and operations at national, regional and local levels and to explore the possibility of additional European Union funds for urban transport projects that favour sustainable systems. Supplements to direct funding by the user can be considered under three main headings: polluter pays (the compensation paid may be used to fund alternative and less polluting forms of transport), beneficiary pays and general public pays.

4.4.9 Road / urban pricing

4.4.9.1 Contribution from Mr Maurizio Tomassini, ISIS, Rome, representing the CURACAO project[125]

The following projects constitute the background:

- PRoGR€SS Project (2000-2003) (Pricing ROad use for Greater Responsibility, Efficiency and Sustainability in citieS): "to demonstrate and evaluate the effectiveness and acceptance of integrated urban transport pricing schemes to achieve transport goals and raise revenue."
- CUPID Project (2000-2004) (Co-ordinating Urban Pricing Integrated Demonstrations) "To provide an advance state of the art knowledge on urban transport pricing schemes, centred around road pricing, through a European level cross-site assessment of demonstration results to produce robust policy recommendations and to widely disseminate the results"

The outcomes are the following:

- The work of CUPID and PRoGRESS has concluded that in the urban context:
  - Road User Charging (RUC) is feasible
  - Road User Charging can be implemented in a major European city and accepted by a majority of the population
  - Road User Charging can achieve a significant reduction in traffic without any major adverse impacts
- Urban RUC is perhaps the only way of reversing growth of traffic in urban areas and meeting EC objectives on vehicle emissions and fuel consumption.
- The outputs of CUPID/PRoGRESS provide overall guidance on the development and evaluation of Urban RUC.

CUPID recommendations are the following:

- RUC must be planned and implemented within the political context.

- The objectives of RUC must be based upon identifiable needs, and used as the basis for scheme design.
- Investing revenues in improved urban transport (& especially in public transport) is potentially a prerequisite for achieving majority support for charging proposals.
- RUC implementation may be best achieved through a quick and extensive process, which combines rapid awareness raising with effective project management.
- A strong scheme promoter will be needed to implement the scheme which optimises performance at the risk of encountering opposition.
- Top-down political support to local decision-makers is needed if RUC take-up is to become widespread in the short to medium term

The objectives and outcomes of the CURACAO project are the following:

- Project objectives:
  - To support and promote fairer and more efficient pricing of road usage in urban areas.
  - Ensuring scientific excellence.
  - Learning from case studies (Bristol, Rome, Oslo, Edinburgh, The Hague and Stockholm) and from best practice (London, Genoa, Bologna, etc).
- Project outcomes:
  - Enable a group of 'early adopter' cities to design pricing schemes that fit their local needs.
  - Successful management of public acceptability.
  - Smooth implementation and operation of schemes.
  - Pricing as (just) one option in the demand management toolbox: Civitas initiative (I, II, Plus) promotes a fully integrated strategy.

4.4.9.2 Contribution from Mrs Lucinda Turner, Transport for London (TfL)[125]

See under 4.4.3.5 ("The future") and under 4.2.9.5 ("The role for road user charging")

4.4.9.3 Contribution from Mrs Chantal Duchène, Groupement des Autorités Responsables de Transport (GART)[125]

See under 4.1.5.6 ("Pull measures")

4.4.9.4 Contribution from Mrs Nina Renshaw, Transport and Environment (T&E) [126]

Solutions at local / regional level

- Urban charging: two successes
  - London

- . 17 February 2003
- . One third less cars
- . More buses, metros, bikes, taxis
- . 16% lower air emissions
- . Business impact negligible
- . Mayor re-elected

– Stockholm

- . 3 January 2005
- . 7 month trial, then referendum
- . 20% less traffic
- . Inner city emissions cut by 14%
- . Much faster deliveries

4.4.9.5 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

See under 4.4.8.9

4.4.9.6 Contribution from Mr Marcel Rommerts, DG Tren[134]

- Integrated pricing: evaluation of the results from CIVITAS 1:
  – Some results
    - . Congestion charging in Stockholm and time-based access pricing in Rome (and several feasibility studies)
  – Impacts
    - . Air quality and "liveability" improved
    - . Successful demand management tool
  – Lessons
    - . Must be part of a package
    - . Communication and consultation
    - . Acceptance by most affected groups can be gained after successful operation

4.4.9.7 UBA[143]

UBA recommends to EC to take measures for the harmonisation of the tools for assessment of the environmental characteristics and the social effects of the different transport means (e.g. support for the development of a methodology to calculate the external costs of the transport).

4.4.10 Parking pricing

4.4.10.1 Contribution from Mr Maurizio Tomassini, ISIS, Rome, representing the CURACAO project[125]

See under 4.4.3.4

4.4.10.2 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

See under 4.4.8.9

4.4.11 Integration of transport and land use

4.4.11.1 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

Traffic Avoidance: Short Distance City

- aim: enabling „zero emission mobility“ by walking and cycling
- via urban land use planning (mixture of use, decentralisation, condensation)
- via promotion of the „pedestrian and bicycle friendly town“:
  - increasing safety (speed reduction of motorised traffic) and performance (privileged and spacious networks)
  - combined transport systems (e. g. bike and ride with public transport).

4.4.11.2 SUSTRANS[142]

Home zones embody the design principles of safety through uncertainty, whereby an absence of priority along with short driver sight-lines, social activity and a lack of clarity regarding vehicle routes, significantly reduce vehicle speeds. The application of these principles need not be limited to residential areas: in northern Europe they have been successfully applied to shopping areas and public squares and spaces.

4.4.11.3 EETF[166], GART[167]

Sustainable Urban Transport Plans can play a useful role in achieving sustainable urban transport. European intervention is needed to support Sustainable Urban Transport Plans at local level. The EU should provide a framework for the development of these plans, including a local vision on sustainable urban transport objectives, indicators and policy measures which must consider the safety aspects by setting targets of reducing the number of accidents, injuries and fatalities connected with road transport. Urban Transport Plans should spur the integration of land-use and transport planning.

The EU could:

- make EU funding conditional on the existence of such plans at local level (this is in line with existing recommendations for EU funding);
- provide guidance on how to structure such plans and disseminate knowledge on best practices;
- encourage national governments in making these plans a requirement for large cities.

4.4.11.4 UITP[161]

Policies need to be based on a long-term vision, often exceeding the usual term of political mandates.

"Sprawling cities demand more energy supply, require more transport infrastructure and consume larger amounts of land. This damages the natural environment and increases greenhouse gas emissions. Among the consequences are climate change, increased air and noise pollution. As a result, urban sprawl impacts directly on the quality of life of people living in and around cities[192]."

The recommended actions cover:

- Requirement for cities to establish, implement and monitor a sustainable urban transport plan. Such a European framework should not set details as far as content or assessment of those plans are concerned in order to avoid any duplication with existing national legislation (where applicable). Cities must retain the freedom to adapt the plans to their unique local circumstances. The European framework should make sure that the plans, as long-term planning tools, include the necessary information for local decision makers:
  - Ensuring the accessibility offered by the transport system to all categories of inhabitants, commuters, visitors and businesses,
  - Reducing the negative impact of the transport system on the health, safety and security of the citizens, in particular the most vulnerable ones,
  - Reducing air pollution and noise emissions, greenhouse gas emissions and energy consumption,
  - Improving the efficiency and cost-effectiveness of the transportation of persons and goods, taking into account the external costs,
  - Contributing to the enhancement of the attractiveness and quality of the urban environment.
- Redirecting EU Structural and Cohesion funds, so that more funds are available for the development of sustainable transport modes, in particular public transport[193]. In addition, the European Environmental Agency (EEA) has underlined that urban sprawl is particularly evident where countries or regions have benefited from EU regional policies and funding[192]. It is therefore of utmost importance to ensure that those funds do not promote but - on the contrary - help to avoid and mitigate sprawl.

4.4.11.5 UBA[143]

In order to support environmental-friendly transport, settlement areas must be kept dense, thus enabling short distances and a cost-effective public transport service.

In the development of cities as well as transport and spatial planning policy, the challenges from the demographic change must be observed, e.g. net emigration from some regions (resulting in a larger number of unoccupied apartments) and an increase in the share of older persons in the population.

The establishment of transport development plans / concepts should be done according EU Guideline 2001/42/EG.

4.4.11.6 ECF[188]

The ECF ask the Commission, the member states and the cities to recognize that there is a strong relationship between on the one hand the distances people have to travel and their demand for transport (modes), and on the other hand 'city-planning', land use policy and e.g. the scale of organizing the society. City-planning and land use policy should contribute to keep the distances short and foster cycling and walking.

4.4.12 Exchange of best practice

4.4.12.1 Contribution from Mr. Fotis Karamitsos, Director, European Commission, DG TREN[124]

See under 4.4.1.2

4.4.12.2 Contribution from Mrs Diana Kiss, Hungarian Ministry of Environment[125]

See under 4.4.3.2 (Recommendations)

4.4.12.3 Polis[128]

Polis members call upon the European Union to support an ITS platform for European cities to exchange and benchmark their policies with the goals of raising the level of awareness on Intelligent Transport Systems and to facilitate the deployment of ITS solutions. The platform would facilitate dialogue between towns and cities and allow for instance to set references and indicators to better quantify the potential of ITS for sustainable urban transport planning.

The development of efficient benchmarking exercises between cities requires that the European Union should take some initiatives to harmonize data collection on mobility and the urban environment at the local level.

4.4.12.4 CEMR[147]

The CEMR recommends that the EU prioritizes the exchange of information and best practice on current key issues (or issues for which little exchange has taken place) : inter-

modality, intelligent transport, integrated ticketing and pricing, road pricing, barriers against increased use of public transport, low emission zones, urban sprawl, demographic change, transport and climate change, urban freight logistics, behaviour etc.

4.4.12.5 EETF[166], GART[167]

Standardisation is a powerful tool to make transport systems safer and more efficient and optimise operation and provision. It helps improve technical and economic efficiency as well as the reliability, interoperability and compatibility of the component parts of transport systems. Standardisation at European level is closely connected with international standardisation, a relevant aspect namely for potential buyers of transport systems and with a bearing on multi-modal information, electronic ticketing, etc. There should be greater transparency in the intricate standardisation process and a willingness to facilitate the involvement of potential buyers including local government and operators in work and decision-making in the field of standardisation.

4.4.12.6 Brussels-Capital, Ile-de-France, London[154]

Guidelines for noise abatement measures by the detection of individually and globally annoying components of traffic noises could be envisaged.

4.4.12.7 SNCF[131]

SNCF believes that the Commission should address the issue of Urban Transport by facilitating the exchange of best practice through working groups and twinning programmes, through financing directly or indirectly best practice projects that aim on improving urban transport within cities and even through the proposition of legislation.

4.4.12.8 Koninkrijk der Nederlanden[181]

The Netherlands advocate exchanging best practice:

- to promote the sound application of environmental zoning in Europe;
- to demonstrate projects for clean vehicles and fuels;
- related to eco-driving;
- related to the link between physical inactivity and ill-health, promoting “Active Transport”
- related to LL brake blocks, quiet road surfaces, ‘acoustic smoothing” of rails, rail dampers.

4.4.13 Promote research

4.4.13.1 Eurocities[136]

Eurocities recommends to the European Commission to develop opportunities for research that will address the need for a sustainable audit system at the EU level.

4.4.13.2 Cities Network Bike[185]

More research must be dedicated on statistics for urban mobility and connected themes, so that statistics be able to completely measure the situation of a city's mobility; often, statistical measures take into account only the motor vehicles, and do not allow sufficient analysis of pedestrians and cyclists trips.

Particularly, more research is needed into:

- the position of vulnerable road users against other road users
- the position of vulnerable road users and the influence of dedicated infrastructure
- the contribution of vulnerable road users to sustainable mobility
- the economic benefits of vulnerable road users
- the benefits of vulnerable road users on their environment
- the position in terms of social justice of vulnerable road users
- the integration of cycling and walking in traffic infrastructure and planning;
- the effects of investment in cycling and walking in cities on economic, environment and social levels;
- integration of land use planning and cycling and walking.

4.4.13.3 Sweden-Ministry of Enterprise[194]

The Swedish Ministry of Enterprise suggests to provide and support knowledge expansion and knowledge dissemination. Research and development of knowledge about development of existing traffic system as well development of new systems should be supported. The climate challenge stands presently in focus. New and existing knowledge must be communicated and to be spread considerably better. The potential for a wider dissemination of research results must be evaluated, to be clarified and seen in terms of market cases.

4.4.13.4 UBA[143]

EU should support research for reducing the noise of vehicles under urban traffic situations (e.g. by equipment to limit the revolutions per minute (rpm) of the engine).

4.4.13.5 Koninkrijk der Nederlanden[181]

The Netherlands advocate:

- research on the transition to sustainable mobility, the creation of a European market in innovative sustainable vehicle and fuel technologies by promoting their use;
- research into the application of biogas, hybrid vehicles and CO2 emission reduction;
- standards for smart systems and intelligent transport applications (ITS)
- the promotion of technologies which enhance the safety of heavy goods vehicles particularly in urban areas with many vulnerable road users;
- research into the use of transport systems by the elderly, given the ageing population in Europe;
- innovative uses of better (safer, more environmentally-friendly, cheaper) materials and technologies for road an rail infrastructure.

4.4.13.6 Nantes Métropole[173]

Nantes Métropole sets a priority for the EU to develop research projects on the following themes:

- alternative and low polluting energies;
- "clean" vehicles (in particular buses);
- Environment friendly mobility forms (car sharing, car pooling, bicycle, etc.)

4.4.14 Communication, education and awareness campaigns

In May 2002, the Council of Ministers formally approved the EU Environmental Noise Directive (2002/49/EC). Now being implemented in the EU Member States, the Directive is a direct result of the 1996 Noise Policy Green Paper and covers the assessment and management of transportation and industrial noise. It requires that noise maps and action plans be developed for:

- Agglomerations with populations greater than 100 000;
- Major roads carrying more than 3 000 000 vehicles per year (approximately 8 000 per day);
- Major railways carrying more than 30 000 trains per year;
- Major civil airports providing for more than 50 000 flights per year (approximately 135 per day).

4.4.14.1 Contribution from a representative of ACEA[124]

CO_2 emissions could also be reduced by eco-driving, which should be encouraged.

4.4.14.2 Contribution from Mr. Patrick Coroller, ADEME[124]

See under 4.4.1.14

4.4.14.3 Contribution from Mr. Patrick Coroller, ADEME[124]

The label indicating the energy consumption and the CO_2 emissions for new cars is an efficient tool. It is suggested to harmonise its format in the EU as it currently differs in several Member States.

4.4.14.4 Contribution from Ms. Brigitte Ollier, UITP[124]

See under 4.3.1.6

4.4.14.5 Contribution from Mr Michael Jaecker-Cueppers, representative of the CALM project[126]

- Reduction of the Noise Emissions: Technical Measures: information on low noise products (eco labels)
- Reduction of the Emissions: Traffic Calming: training, education and control of drivers (low noise driving ≡ fuel saving)
- EU plays an important role in urban transport noise abatement, e. g. :
  - regulations (noise emission and reception limits according to the state of art resp. noise effects)
  - harmonisation of assessment methods and definitions (eco-labelling)
  - legal framework for pricing instruments
  - information (networks, good practice guidelines, campaigns)
  - promoting mobility and noise related research (noise effects, technology, etc)

4.4.14.6 BUSTRIP[160]

The EU can add value by removing obstacles that hinder local authorities in successfully implementing SUTP's. Priority areas for action should be training and awareness raising programmes, the development of a key indicator set for sustainable urban transport, the promotion of 'bad practice', supporting urban freight research and education.

The experiences from the cities in the BUSTRIP project which are currently implementing their SUTP's show that there are several barriers in the implementation process:

- The BUSTRIP project has confirmed that there remains considerable confusion over the respective responsibilities of towns, cities agencies, regions and member states for SUTP. There is a need for support on how to implement Sustainable Urban Transport Plans. The EU should use the experiences made in EU funded projects like PILOT and BUSTRIP to prepare **guidance material** addressing responsibilities, financing, etc.
- Significant support is required to build understanding and capacity among all stakeholders to convert sustainability from a "catch phrase" with few policies and little

implementation to a guiding principle. **Training and awareness raising programmes** provided by the EU for politicians, staff and stakeholders can add substantial value for this. This would also help to overcome lack of continuity in decision makers and staff with a high turnover.

- The EU should define a **key indicator set for sustainable urban transport**. All cities would benefit from a core set of indicators to monitor the achievement of strategic and operational SUTP objectives. The indicator set should provide detailed descriptions of each indicator to avoid misinterpretation and ensure validity and comparability. Practical application of a common indicator set is crucial. The EU should provide methods and tools on how to organize and conduct the monitoring process of these indicators.

4.4.14.7 Eurocities[136]

EUROCITIES recommendation to the European Commission:

- Develop guidance on how to organise and implement SUTPs, which, where necessary, should be supported by accompanying legislation at Member State level, to achieve the overall objective of a sustainable urban development;
- The funding that is already being provided by the Commission should be targeted towards those cities that are already implementing SUTPs, and to those willing to develop them. Member States should also be more actively involved in ensuring an integrated urban approach, for instance by introducing into their legislation a framework to make sustainable urban transport plans binding. The results of PILOT[195] and BUSTRIP[196] Projects may be helpful and the Commission could consider promoting the results of these and other relevant studies;
- Cycling and walking must be an integral part of city planning and this should be made explicit in the Commission guidance documents for SUTPs. "Urban settings" must be developed in a way that is also more favourable to short distance trips, in order to limit peripheral urbanization;
- Awareness and information campaigns should be launched, using national and local media, to illustrate the benefits of SUTPs. Results of the "Liveable cities project"[197] may serve as a starting point.

4.4.14.8 Brussels-Capital, Ile-de-France, London[154]

Environmental monitoring in urban areas must also be linked to the GMES programme[198] for in-situ measurements as well as aerial and satellite monitoring. The requirements for environmental monitoring in urban areas are very specific and should be addressed specifically in the GMES programme.

4.4.14.9 EETF[166]

The Civitas Initiative launched by DG TREN in 2000 supports towns and cities across Europe that are willing to commit to sustainable urban transport policies. Support is provided in the form of funding to test and deploy technology measures and innovative policies. Nineteen large European cities were selected under Civitas I in 2000 and were joined in 2004 by 17 smaller cities (Civitas II, 2005-2009). These formed partnerships for

four-year demonstration projects implementing a range of local measures pursuant to the eight urban mobility priorities defined at Community level. EU funding for the 36 cities amounted to €100 million out of a total budget of over €300 million. The focus of Civitas includes the development of strategic plans integrating the transport dimension and involving all public and private local stakeholders to better meet local needs.

The initiative provides member cities with opportunities to compare their own transport policies against other towns and cities, it informs them of future EU funding opportunities.

4.4.14.10 EETF[166], GART[167]

In the long run, information and educational campaigns are effective instruments to change people's behaviours. The EU should maintain and intensify its efforts in this area by allocating additional funds to support EU-wide information and education campaigns. More specifically, the EU should:

- enlarge and intensify *European campaigns* to support the use of public transport and non-motorized means of transport;
- consider alternative approaches like individualised marketing;
- *name and praise and reward* (with awards) the best performing regions in the field of sustainable urban transport;
- benchmark urban transport sustainability in all towns and cities based on comparable indicators about individual municipal transport systems.

4.4.14.11 Cities Network Bike[185]

Communication policies should stress the evidence that cyclists and pedestrians do contribute to economic dynamics of urban centres; particularly, a deeper knowledge about benefits of pedestrian and cyclist customers for urban commercial activities should be diffused.

4.5 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING SAFETY

4.5.1 Infrastructure development

4.5.1.1 Contribution from Mrs Maria Wass-Danielsen, City of Copenhagen[126]

- Safety trends and developments in Copenhagen: in 1998, 569 people were killed or seriously injured in traffic accidents. In 2005, this figure was more than halved, to 242 people. This by far exceeded the 2012 goal set in the city's traffic 2001 plan. These remarkable results were achieved:
  - By close cooperation between national and local authorities:
    - At the national level (National Safety Plan, campaigns, changes to the law, especially the introduction of a penalty point system and restrictions for drunk driving)
    - Local level (action taken by police, in connection with both drunk driving and speeding)
  - By influencing road user behaviour through traffic safety campaigns, especially in the area of drunk driving and speeding. The press also played an important role.
  - By targeting rebuilding projects: crossroads rebuilding projects in 2002-2004 were a big factor in 50% fewer deaths and serious injuries

4.5.1.2 Contribution from Mr. Reiter, representative of FGM-AMOR[126]

The introduction and enforcement of a 30 km/h speed limit has encountered good results in the city of Graz, which is an example to be followed by other cities in order to reduce the number of accidents.

4.5.1.3 Contribution from Mr. Birsul, representative of the UNIFE and Siemens[134]

Concerning the prioritisation of urban transport within the city, pedestrians' traffic lights are not adapted for the crossing of disabled persons and young students. This can cause accidents.

4.5.1.4 Sweden-Ministry of Entreprise[194]

High traffic security and good quality should be a starting point for the city transport. There exist today possibilities to assure the quality transports, among other thing through using of new technology that guarantees sober drivers and supports correct speed. The formulation of

the town environment has crucial importance in order to facilitate the interplay between different traffic user groups and ensure that accidents can be avoided.

4.5.2 Modify travel behaviour through mobility management, traffic, parking and information management

4.5.2.1 Contribution from Mrs Christelle Godinho, Mobility Agency of the City of Paris[126]

Measure implemented or to be implemented with an ITS dimension: Reinforce road safety. Traffic lights management system considered for reducing speed at night.

4.5.2.2 CEEP[152]

In-vehicle information systems (IVIS) can contribute to a safe and efficient traffic flow, but can also have negative effects on road safety due to driver distraction. This may be particularly relevant in large urban areas where the road network is complex, traffic volumes are high, and different road users are sharing the streets. A clear commitment to encouraging manufacturers to develop systems which are not distracting could help ensure that IVIS plays an important part of road safety in future.

4.5.3 Promote use of public transport, cycling, walking

4.5.3.1 Contribution from Mrs Maria Wass-Danielsen, City of Copenhagen[126]

- A new Traffic Safety Plan has been implemented, with a 2012 target of 40% reduction in the number of killed and seriously injured people. It focuses on the following areas:
  - Accidents involving cyclists (previously, casualties had only slightly decreased)
  - Accidents to pedestrians (which represent 25% of the total)
  - Accidents at crossroads (remodelling junctions with high accidents frequency has proved to be one of the most effective measures)
  - Accidents involving young, high-risk, male motorists (which are overrepresented in the statistics)
  - Innovation (getting in a dialog with drivers about safety)
- One of the City of Copenhagen's expectations from the EU: Clearer and detailed goal. Focus on pedestrians and cyclists.

4.5.3.2 Contribution from Mr Repussard, DG TREN[126]

Modal transfer can generate conflicts and not necessarily improves safety: for example, a modal transfer towards bicycles or powered two-wheelers.

4.5.3.3 SNCF[131]

Public transport takes advantage of a much greater safety compared to the car (lower rate of accidents). Fundamental to drawing passengers to public transport is also the understanding that their journey will be a secure one for goods and persons.
The creation and implementation of new customer service adviser (mediation officer) should be promoted. The purpose is to prevent disagreements between passengers or between the staff and passengers.

4.5.3.4 ETRA[170]

Today, lack of road safety still deters many people from cycling in urban areas. ETRA does not believe that safety for cyclists can be improved by new technologies alone. ETRA is convinced that speed and the volume of traffic is the most important factor in road accidents. Therefore, ETRA urges the Commission to introduce European harmonised measures with a view to calming traffic and to restricting the volume of traffic.

4.5.4 Exchange of best practice

4.5.4.1 Contribution from Mrs Maria Wass-Danielsen, City of Copenhagen[126]

One of the City of Copenhagen's expectations from the EU: Exchange experience in an Annual European Road Safety Conference. There is a need to exchange experiences between countries, to improve legislation, engineering and education. A lot can be learned from successful cities, which can act as mentors for others.

4.5.4.2 Eurocities[136]

EUROCITIES recommendations to the European Commission:

In order to help cities to monitor and achieve the targets,

- Harmonize data collection techniques across all Member States, to ensure comparability of information, including the figures for how many people are killed or seriously injured in road traffic accidents;
- Identify the whole range of factors affecting road safety in urban areas throughout the EU, including societal and behavioural factors as well as infrastructure;
- Enable closer cooperation between the EU and city networks, such as EUROCITIES, to facilitate greater uptake of the European Road Safety Charter at local level.

- Establish channels of communication between representatives from cities and regions in different parts of Europe to exchange information, knowledge and best practice. This would allow cities from Member States with good road safety records to act as 'mentors' for those cities with traditionally high levels of accidents;
- Support the organisation of an annual Urban Road Safety Conference to allow cities to compare engineering, education and enforcement techniques;
- Establish a funding stream to help cities with the implementation and validation of projects that contribute towards the aims of the European Road Safety Charter;
- Maintain a permanent dialogue with car manufacturers on vehicle safety standards that will help protect vulnerable users such as walkers and cyclists.

4.5.5 Promote research

4.5.5.1 ECTRI[159]

Five road safety sub-policy domains, partly selected because of their varying historical depth, would be investigated:

- drunk-driving
- safety-oriented car-design (emphasis on "out of vehicle" safety, i.e. pedestrian and cycling safety referred to vehicle collision)
- automatic speed enforcement (notably speed cameras systems)
- motorized and non-motorized traffic coexistence
- integrating environmental concerns to "classical" road safety policy (cars emissions as road risks)

4.5.6 Communication, education and awareness campaigns

4.5.6.1 Contribution from Mr. Stefan Heimlich, representative of the European Transport Workers' Federation[123]

The Green Paper should address the problem of the training of the workers of the public transport sector. Transport safety could be enhanced if staff members are properly trained, so clients would be well serviced and patronage would increase. Drivers training should be such that they can always react appropriately in case of accident risk.

4.5.6.2 Contribution from Mrs Maria Wass-Danielsen, City of Copenhagen[126]

See under 4.5.1.1

4.5.6.3 Contribution from Mrs Maria Wass-Danielsen, City of Copenhagen[126]

Two of the City of Copenhagen's expectations from the EU:

- Closer cooperation with car industry: the analysis of accidents between trucks and cyclists shows that the EU must tighten rules to optimize drivers' view e.g. external mirrors
- Establishment of funding stream, to create programmes to promote road safety at the EU level. Closer cooperation between EC and city networks such as Eurocities must be developed.

4.5.6.4 Contribution from Mr Repussard, DG TREN[126]

A European road safety forum will be held on April 27 in Brussels. It will focus on young users and will give the floor to young users associations, in order to identify their needs and requests.

4.5.6.5 Contribution from Mr. Hyatt, Zöld Fiatalok[126]

"Accident" is sometimes a neutral term, which forgets the speed and volume associated. The term "catastrophe" would sometimes be more appropriate.

4.5.6.6 FEMA: Motorcyclists' contribution[144]

FEMA calls the European Institutions and the Member States of the EU to design, promote and run awareness campaigns targeting all users and to support the Directive on Road Infrastructure Safety Management.

London launched a series of campaigns as part of the Transport Strategy and Road Safety Plan adopted in 2000. Analysis of the data on motorcycle crashes and casualties showed that many of the accidents involved cars and lorries crossing the path of the motorcyclist. Changing the behaviour of car drivers is as important as educating motorcyclists how to avoid crashes (BikeSafe initiative[199]). Transport for London (TfL) has commissioned an innovative series of advertisements showing simulated crashes as a way of bringing drivers attention to the problem of 'not seeing' the motorcyclist. The THINK! Campaign[200] targets both urban commuters and leisure riders with specific safety messages. As a result of the safety measures introduced by TfL together with initiatives from national government, the industry and other stakeholders, the number of killed and seriously injured motorcyclists in London fell from 1286 in 2001 to 895 in 2004 representing a 30% reduction, despite a significant increase of the PTW circulating fleet.

As highlighted by the London example, only an integrated system approach addressing all pillars of road safety –the driver, his vehicle and the infrastructure- can lead to significant and lasting results.

4.5.6.7 Polis[128]

Polis members support European initiatives imposing the enforcement of cross-border penalties for traffic infractions and all transport related infractions (failure to pay toll, urban congestion charges, parking). The cross-order enforcement of penalties is hampered because of the patchwork nature of the local data protection rules in place. Harmonization of these rules would facilitate cross-border enforcement of penalties.

4.5.6.8 Brussels-Capital, Ile-de-France, London[154]

The authors fully support the EU Road Safety Action Plan and believe the EU should further encourage the development and the exchange of road safety data and guidelines in the fields of urban transport management. EU accident and casualty databases covering all the transport modes are needed to better describe the current state across the EU, to monitor common transport policies and to help define priorities. In addition, the Commission should continue to examine how to improve the design of vehicles - through standards and regulation - to protect vulnerable road users in the event of a collision. Safety policies and programmes for urban transport will also greatly benefit from the integration of satellite navigation, observation and telecommunication.

4.5.6.9 VVM De Lijn[165]

City Councils should invest in personal counselling of their citizens, proposing “individual”, tailor-made solutions for mobility problems. The approach applied by the city of Gent is revolutionary in its unorthodox way of convincing its citizens to shift to sustainable mobility modes.

4.5.6.10 Koninkrijk der Nederlanden[181]

The Netherlands advocate the harmonisation and improvement of European/national legislation and data exchange. For example, someone banned for a drink-driving offence in one country should not be allowed to drive in another.

4.6 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING AFFORDABILITY/ ACCEPTANCE

4.6.1 Intermodality/ Integration of transport systems

4.6.1.1 Contribution from Mr. Birsul, representative of Siemens[126]

Acceptance of public transport is linked to the information that passengers get. During the night, proper information should be available from the bus drivers concerning traffic means, connections.

4.6.2 Promote use of public transport, cycling, walking

4.6.2.1 Contribution from Mr. Karl Reiter, representative of FGM-AMOR[125]

Mr. Reiter suggests to also take into account the revenue from health costs from walking and cycling.

4.6.2.2 Contribution from Mrs Sabine Avril, EMTA[126]

- On the basis of the experience of Helsinki, foreseen benefits of E-ticketing are clear:
  - For Authorities:
    - Opportunity to achieve mobility in cities
    - Modern approach and new services
    - Seamless journeys multi modal and multi-networks
    - Better control of revenues and subsidies
  - For operators:
    - Gain new customers with new service
    - Increase speed at boarding
    - Source of marketing data for public transport management
  - For customers:
    - Convenience and speed
    - Seamless journeys

- Possibly additional services

4.6.2.3 Contribution from Mrs Andrea Soehnchen, UITP[126]

- Security in public transport is a biased area:
  - Perceived security in public transport is the key problem. However, a lot has already been done in this area. A door to door approach is required, involving public transport and walk, in order to bring the necessary improvements.
  - Problems related to terrorist acts and vandalism leave unprepared operators insecure and helpless.
- Public transport systems are vulnerable:
  - Open and accessible
  - High number of passengers (a passengers full screening system would slow down flows to unacceptable levels)
  - Indispensable for a city's functioning
  - Mobility is a key element of modern lifestyle.

4.6.2.4 Contribution from a representative of the UNIFE[126]

- The personal security feeling depends on the presence of public transport personnel, but there are pressures to reduce public transport costs.
- Video cameras cannot prevent terrorism, they can only track it afterwards.
- The public transport system needs acceptance: in terms of crash worthiness, nobody hesitates to use private cars even if public transport is safer than private cars by a 700 factor.

4.6.2.5 Contribution from Mr Philip Insall, Sustrans[134]

- Potential for sustainable travel modes:
  - % trips per person: Sustainable Travel Demonstration Towns
    - 35%: actual usage of walking, bicycle, public transport
    - 9%: constraints
    - 27%: no adequate alternative
    - 29%: only subjective reasons against sustainable travel modes.
  - Therefore, 64% of trips represent an immediate potential for walking, cycling and public transport
  - The target is 75% of trips by walking, cycling and public transport. Is it idealistic, unrealistic, radical, foolish?
  - It is the mode choice in Basel, Switzerland: 75% of trips per person by walking, cycling and public transport
- Case study: Odense – Denmark's "cycling city": Smart initiatives:
  - "green wave"

    - green LED markers follow the timing of green traffic lights
    - set at easy cycling speed
    - visible to motor traffic too
    - markets cycling to motorists, as well as helping cyclists
  - "you count"
    - cycle counters with visible display
    - running total – you can see that your neighbours also cycle
    - cyclist speed indicators
    - visible to motor traffic too
    - positive feedback to cycle users, recruitment of motorists
  - Odense – results (1999 – 2002)
    - cycling up 20%, still growing
    - car traffic down 15%
    - shift to shorter local journeys
    - increase in walking
    - public transport travel fell too
    - improved road safety
    - raised physical activity levels
    - significant reduction in cost of ill-health.
- Walking and cycling investment is excellent value for money: a cost-benefit analysis of three UK construction projects shows:
  - average benefit : cost ratio 20:1
  - motor transport projects, ratio 3:1
  - many road transport projects have *negative* value.

4.6.2.6 Contribution from Ms. Engelen, representative of the European Bicycle Associations Colibi-Coliped[134]

The bicycle industry wants to appoint a "Mr/ Mrs Vélo" at the EC. Some regions or cities have such a person; it is time for the EC to have one.

4.6.2.7 Contribution from Mr. Insall, representative of Sustrans[134]

The European Economic and Social Committee has envisaged to nominate a "Mr/ Mrs Vélo", and a "Mr/ Mrs Walking" who could work side by side at the EC.

4.6.2.8 SNCF[131]

In addition to demand management, it is central that the focus is placed also on offering dynamic supply solutions to increase the use of public transport. Changing demographics mean that there is a change in what the users require of public transport. Following on from this, it is important that these behavioural changes are monitored more closely at urban and regional levels, and looking at changes work patterns, training and education, housing, etc. For example, there is a greater trend towards "periurbanisation" and a "multipolarisation" of cities which has to be taken into consideration. Passenger needs are not homogenous and the supply has to be congruent with their needs: a segmented approach is compulsory for efficiency. In other words, it is essential for companies to succeed in developing industrial transport solutions that seem to reflect the needs of each individual user.

4.6.2.9 UBA – passenger rights[143]

Passenger rights can increase the attractiveness of public transport through guaranteed quality standards. EU should guarantee that the passengers in the environmental-friendly public transport have at least the same quality standards [and rights] as a passenger in air transportation. In the long run, the users will switch to public transport only if they can expect high standards.

4.6.3 Promote new forms of vehicle use and ownership

4.6.3.1 Contribution from Mr Marcel Rommerts, DG Tren[134]

See under 4.4.6.2

4.6.3.2 FEMA: Motorcyclists' contribution[144]

The motorcycle has a contribution to make and should be taken into account with regard to social and economic value. Given their moderate costs (initial and maintenance), PTW's are affordable means of transport (some of them cost less than 1000 €) playing a social function and giving young generations and low income citizens more opportunities both from an educational and professional point of view.

4.6.4 Integration of transport and land use

4.6.4.1 Contribution from Mrs Sabine Avril, EMTA[126]

European Metropolitan Transport Authorities call for actions from European Commission in the field of the implementation of a legal framework making possible at local level to better coordinate land use policy and transport planning, in due respect of subsidiarity.

4.6.4.2 Contribution from Mr Philip Insall, Sustrans[134]

- Key measures for urban transport
  - reduce the volume of motorised transport (including motorcycles)
  - prioritise walking and cycling
  - recognise common policy objectives
    - physical activity promotion
    - obesity
    - social inclusion and crime reduction
    - environmental and sustainability
  - ensure urban transport policy is fully integrated with policies on land use, development, zoning etc.

4.6.5 Exchange of best practice

4.6.5.1 Koninkrijk der Nederlanden[181]

The Netherlands advocate the exchange of best practice in the field of social inclusion. The possibility of transport enhances the quality of life of people who would otherwise be cut off from the economy and society.

4.6.6 Communication, education and awareness

4.6.6.1 Contribution from Mrs Andrea Soehnchen, UITP[126]

- Involvement of Public transport stakeholders on traveller security and anti-terrorism security in urban public transport issues
  - Reason: responsibility for passengers, staff, systems
  - Role as partner of:
    - Governments (The problem of combating terrorism is not the problem of public transport operators which provide transport services. However, public transport operators agree to invest in CCTV cameras, etc. i.e. tasks devoted to the police, and finally the end-user pays for this)
    - Industry (there is no specific technology for public transport control: the existing technology is too slow and not reliable enough)
    - First responders (the system cannot be closed in case of alert. The events cannot be avoided, but the operators could be more prepared and the severity of actions could possibly be reduced)
    - General public and Media (the general public must be aware of risks and its cooperation is needed. This depends on the cultural backgrounds and differs from country to country) - (descriptions of terrorist acts by the media have a

very negative effect on public transport. Relations with the media are not controlled)

- Challenges of traveller security and anti-terrorism security in urban public transport issues
  - Think about the problem in quiet times! (Could the EC bring support to face basic reflexions?)
  - Build partnerships and resilience teams!
  - Share knowledge to learn from existing experience!
  - Educate, train and practice! (there is a need to reduce the gap among the most advanced and the less advanced operators).

4.6.6.2 Contribution from Mr. Birsul, representative of Siemens[126]

See under 4.6.1.1

4.6.6.3 Contribution from Mr. Haon, representative of Polis[134]

For the sustainable city of tomorrow, an integrated approach is necessary, implying the coordination of all actions. Cities should be encouraged to involve stakeholders in the consultations, so as to achieve a better acceptability of solutions.

4.6.6.4 UITP[161]

Europe is facing a considerable threat from terrorism. Increased security through improved anti-terrorist measures are seen as essential by all key stakeholders, including operators, passengers, authorities, etc… Only a combination of sound organisational practices, surveillance and detection systems, etc. can possibly reduce the frequency and intensity of those attacks. In addition it should be noted that not all Member States (and public transport networks within one Member State) face the same the risk from terrorism. The UITP EU-Committee would like therefore to underline its strong opposition to developing a common European approach and/or policy on security which would be binding for all public transport networks in the EU.

The recommended actions cover:

- Promotion of best practice exchange between operators on the most appropriate ways towards improving security (depending on local circumstances),

Increasing the knowledge base about possible security strategies (and systems) addressing the unique character of mass land passenger transport in all its different aspects. The Counteract project represents within this framework an excellent tool. Its recommendations and results should be used in an appropriate way by the Commission services.

4.7 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING FINANCING

4.7.1.1 Contribution from Mr Matthias Ruete, DG Tren[134]

The Civitas Initiative helps ambitious cities in introducing and testing packages of innovative measures to radically improve their transport situation through an integrated approach. This initiative will continue in the future. In Civitas, the idea emerged to create more stable funding for urban transport projects, so why not create a dedicated fund for urban transport with the EIB?

4.7.1.2 Contribution from Mrs Anelia Stefanova, CEE Bankwatch/Friends of the Earth[125]

- EU funds have a special role in the CEEC's: they represent significant amounts of money and they shape the development.
- If EU funds are following EU policies, they should move towards more sustainable transport modes in the CEEC's.
- The situation of public transport in CEE countries has evolved as follows: In the 1990s, funding for public transport was cut back in the cities of Central and Eastern Europe. In Budapest, for example, municipal subsidies to the public transport company were reduced by two thirds between 1990 and 2000. The result has been higher fares and a lack of funds for the renewal of vehicles, encouraging a switch to private car use.

4.7.1.3 Contribution from Mrs Anelia Stefanova, CEE Bankwatch/Friends of the Earth[125]

The role of the banks is modest in urban transport. Banks usually finance large infrastructure projects; what about other types of projects? Do they plan to increase the share of urban transport? It is easier for banks to manage large projects but there are innovative approaches for small credit lines, which could be awarded to companies which are doing best in energy efficiency. Also, banks have a wide knowledge and could provide assistance.

4.7.1.4 Contribution from Mr Aymerich, representative of the European Investment Bank[125]

Total activity of the EIB in urban mobility is around 10% of its whole activities, of which 5% in urban public transport projects, including intermodal centres and railway stations. If more projects are submitted to the Bank, they will be appraised. There is no specific limit or target for urban mobility projects.

The top priority of the EIB is sustainable mobility.

Large motorways or high speed lines projects can reach € 5 billion, while the typical size of urban transport projects is in the range of € 200-300 million.

The EIB has a lot of experience which it tries to transfer to the local authorities. The Jaspers and Jessica initiatives were created for this purpose.

The EIB has encountered problems for projects financing, due to the financial weakness of local authorities in France and other countries. In these cases, the EIB was forced not to finance the projects.

In the framework of the Jessica initiative, another mandate is given to the EIB, i.e. "The EIB has to take more risks". The EIB cannot specify which additional risks it will take, and assumes that it can perhaps be the case:

- in the construction phase
- in the strengths and weaknesses of the financial promoters
- not requiring guarantees from other authorities (State), i.e. accept the "single signature" from promoters.

Anyway, the EIB will remain very selective in the project appraisals. As it is clear that urban transport is a main priority of the Bank, this sector will be affected by this risk taking.

4.7.1.5 Contribution from Mrs Lucinda Turner, Transport for London (TfL)[125]

See under 4.2.9.5

4.7.1.6 Contribution from Mr. Béla Kilyénfalvi (ING Bank) [126]

- Concerning the evaluation of traffic risks for PPP projects, the following conclusions may be drawn from various projects carried out in Hungary and other countries.
  - Consider subsidies to cover non-user benefits
  - Consider minimum revenue guarantees to reduce traffic risk
  - Availability payments target governments aims for project
  - Artificial structures (shadow tolls, congestion charges) are generally unattractive
  - For municipalities, the allocation of risks is a key to success
  - Traffic is a very sensitive issue for PPP in urban transport.

4.7.1.7 EETF[166], GART[167]

The EU can contribute to improve targeting of financial resources at urban level by:

- creating a specific program and fund to help the development of urban transport project
- using structural funding to kick-start urban transport projects;
- considering connections with urban transport in cities across the TEN-T.

4.7.1.8 UBA[143]

Limited public funds, increasing energy prices and increasing private car traffic make the competition between public and individual motorised transport more critical and create problems in financing of public urban transport. New forms and sources of financing are needed. An example for this could be private public partnership (PPP) for financing the infrastructure and the procurement of vehicles. The proposal for a decree for financing public passenger transport services on rail and road which currently is in the process of agreement between EC, parliament and council of ministers should be used. The new proposal for the decree should have laid down the obligation to consider demanding quality and environmental standards.

4.7.1.9 Polis[128]

Polis members call upon the European Union to launch an ambitious European initiative for the financing of transport systems and infrastructure. More specifically, the allocation of regional funds should require authorities to demonstrate that two objectives have been successfully merged: protecting the urban environment from the negative effects of traffic and the provision of effective and efficient regional, national and trans-national surface transport.

The European Union should support research on new forms of financing for urban transport systems and infrastructure, including land-value capture and infrastructure charging. It should for this purpose move towards producing guidance on the internalization of external costs. The European Union should better take into account the connection between the Trans-European networks and urban centres when financing the TENs.

4.7.1.10 EIB[201]

The difficulties in promoting public transport, in particular in a constantly changing urban and – even more - metropolitan context, are well known. Apart from a solid technical feasibility of the project[202], success requires a mixture of budgetary, regulatory and financial instruments that take a long-term view and help the implementation of appropriate policies. In this sense, EIB financing for urban transport projects my facilitate the undertaking of projects that are part of a medium-long term transport policy of urban agglomerations and meet other key EU policy objectives, such as energy efficiency and environmental sustainability. It is to be stressed that a major feature of the Bank's appraisal is to check that suitable mitigation and compensation measures are properly identified (and subsequently implemented) and that any potential residual environmental impact is acceptable.

The EIB can play an important role in this respect and recognizes the critical importance of involving both private and private sector participants in the development and deployment of innovative solutions. To this purpose, the EIB has joined forces with the Commission to develop new financial instruments. Another area, in which EIB is particularly active within the urban transport framework, is that of financing public-private partnership initiatives (PPP).

4.8 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING INSTITUTIONAL ASPECTS

4.8.1.1 Contribution from Mr. Arcangelo Merella, Urban mobility and transport councillor, Municipality of Genoa[123]

As far as subsidiarity is concerned, a reference framework should be aimed at clarifying the distribution of decision powers among the different authority levels.

4.8.1.2 Contribution from Mr. Mario Aymerich, European Investment Bank[125]

- Urban public transport projects require public support:
  - Infrastructure (100%)
  - Operation (x%, depending on operator's efficiency)
- Therefore:
  - A "technical fee" and an "operation contract" must be assumed at political level
  - Efficient allocation of tasks and risks need to be well understood by all parties, and properly shared
  - A metropolitan transport authority, separating planning and operation, might be required.

4.8.1.3 Contribution from Mrs Mary Crass, European Conference of Ministers of Transport (ECMT)[125]

- Evolving Institutional Context
  - Decentralisation of responsibilities for urban travel (a fact in the CEECs and in other countries like in France in recent years, for public transport)
  - Local and regional governments – larger role in decision-making;
  - Problem: incomplete or excessive decentralisation:
    - Transfer of authority to lower levels of government must be accompanied by transfer of commensurate resources;
    - Usually requires reform to fiscal and regulatory structures, so difficult, but often necessary to facilitate implementation.

4.9 PROPOSALS FOR SOLUTIONS AND ACTIONS REGARDING STATISTICS

4.9.1.1 Contribution from Mrs Sabine Avril, EMTA[126]

European Metropolitan Transport Authorities call for actions from European Commission in the field of harmonisation of standards and data collection: EMTA publishes a barometer, for which it faces problems of data definitions and content.

4.9.1.2 Contribution from Mrs Duchène, representative of the GART[126]

Concerning the production of performance indicators, there is a need for data with the same definition and the same collection specifications.

4.9.1.3 Contribution from Mr. Ensink, representative of the ECF[126]

Harmonisation of data collection should also cover cycling and not only public transport.

4.9.1.4 Contribution from Mrs Ollier, UITP[126]

Concerning data collection, there is no harmonisation in Europe. The UITP has developed a data base by collecting comparable data in various cities across Europe. For other data, the content is not harmonised. Therefore there is the need for an EU proposal to help the UITP collect comparable common indicators.

4.9.1.5 Contribution from Mrs Maria Wass-Danielsen, City of Copenhagen[126]

One of the City of Copenhagen's expectations from the EU: Harmonizing data collection techniques: it is currently difficult to compare accident data between Member States because of different methods and criteria.

4.9.1.6 Contribution from Mr Repussard, DG TREN[126]

- The existing CARE data base on road accidents is constituted from the police reports made in a harmonised way. There is still room for improvement, and the EC is working on it, but it can take five years before the police agrees on it. The EC will publish the best practice on data collection.
- There is a project at the pilot stage, considering in-depth data collection on samples of accidents, looking in particular into the cause of accidents and involving more than 500 criteria, instead of 40 in the present police reports.

4.9.1.7 Contribution from Mr Josef Mikulik, European Conference of Transport Research Centres (ECTRI)[134]

- Proposed Research Agenda: Data
  - Urgent need for collection and provision of urban transport data
  - Observation and monitoring of urban mobility to allow evaluation of its development
  - Development of "European Models" for transport analysis
    - ⇨ develop data collection standards and rules
    - ⇨ make data sets available for analysis, prognosis and scenarios
    - ⇨ make behavioural "mechanisms" evident.

4.9.1.8 Contribution from Ms. Engelen, representative of the European Bicycle Associations Colibi-Coliped[134]

Concerning the bicycle industry, the EC could provide clear statistics, which is not currently the case for bicycles. Bicycle use should be measured in the EC statistical booklet. Several statistics are available in some countries, but there are no common standards, so that figures cannot be compared.

4.9.1.9 EETF[166], GART[167]

There is a crucial need to produce an annual collection of statistics on urban and other public and non-motorised modes of transport in the Member States of the European Union. Such a collection should at least include data on :

- network characteristics, use, accident figures and respective modal shares of public transport and non-motorised modes and private cars;
- operational and investment management and finance;
- direct and indirect employment in the sector. It would also be advisable to define indicators allowing for a link to be established between utilisation of the different modes (public transportation, cycling, walking and private cars) and energy consumption.

Notes

[1] Keep Europe moving – Sustainable mobility for our continent. COM (2006) 314 final

[2] For example:

- the Thematic strategy on the urban environment
- the Energy efficiency Green Paper and its Action Plan,
- the Mid term review of 2001 Transport White Paper,
- the Communication on Cohesion policy and cities,
- the Communication "Regions for economic change";
- Cars 21 initiative;
- the clean vehicle procurement proposal for a directive;
- the public transport services proposal for a regulation.

[3] Source: United Nations, Department of Economic and Social Affairs, Population Division (2006). World Urbanization Prospects: The 2005 Revision. New York, United Nations

[4] The United Nations Statistics Division makes the following remark regarding a common definition of urban population: "Because of national differences in the characteristics that distinguish urban from rural areas, the distinction between urban and rural population is not amenable to a single definition that would be applicable to all countries. National definitions are most commonly based on size of locality. Population which is not urban is considered rural."

[5] Source: National policy frameworks for urban transport, (European Commission Contract No. ETU/B2.704/STD/002/2002), Final Report: Urban Transport Statistical and Public, Perception Data, Project Deliverable 5.5, November 2005

[6] Source: Commission Staff Working Document, Annex to the Communication from the Commission to the Council and the European Parliament on Thematic Strategy on the Urban Environment - Impact Assessment {COM(2005) 718 final}, Brussels, 11.1.2006, SEC(2006) 16.

[7] Source: "The impact of demographic change on local and regional government, research project, Council of European Municipalities and Regions, Brussels, May 2006

[8] Source: Senatsverwaltung für Stadtentwicklung, "Demgraphic and economic changes – Urban transport", Berlin, March 2007.

[9] Source: Source: Energy & transport in figures 2006, European Commission, Directorate-General for Energy and Transport in co-operation with Eurostat

[10] Source: Source: Energy & transport in figures 2006, European Commission, Directorate-General for Energy and Transport in co-operation with Eurostat

[11] Source: Source: Energy & transport in figures 2006, European Commission, Directorate-General for Energy and Transport in co-operation with Eurostat

[12] Source: Energy & transport in figures 2006, European Commission, Directorate-General for Energy and Transport in co-operation with Eurostat

[13] Source: Energy & transport in figures 2006, European Commission Directorate-General for Energy and Transport in co-operation with Eurostat

[14] Source: Energy & transport in figures 2006, European Commission Directorate-General for Energy and Transport in co-operation with Eurostat

[15] Source: Energy statistics, Eurostat.

16 Source: European Commission Interservice Group on Urban Development, "Guide. Part 2. The urban dimension in the other Community policies for the period 2007-2013"

[17] Source: Transport and environment: on the way to a new common transport policy, TERM 2006: indicators tracking transport and environment in the European Union, European Environment Agency report n°1/2007

[18] Source: European Commission, Directorate-General for Energy and Transport, "European energy and transport, Trends to 2030 – update 2005", May 2006

[19] UITP, "Mobility in cities" database, Brussels, July 2006

[20] Pj= Petajoules (10^{15} joules)

[21] Estimated from the 2005 figure of 358 933 000 inhabitants (Source: UN) with a decreasing annual growth rate of 0.34% (average annual trend over the 2005-2030 period)

[22] Source: Transport and environment: on the way to a new common transport policy, TERM 2006: indicators tracking transport and environment in the European Union, European Environment Agency report n°1/2007

[23] Source: EEA, op. cit. page 18

[24] Note: Cities did not necessarily present data for all the pollutant emissions.

[25] Source: EEA, op. cit. page 19

[26] Source: EEA op.cit. page 19

[27] Source: European Environment Agency/ European Topic Centre on Air and Climate Change (in Eurostat)

[28] Source: Eurostat

[29] Specific footnotes (Eurostat)

Population weighted yearly sum of maximum daily 8-hour mean ozone concentrations above a threshold /Council Directive 96/62/EC and Directive 2002/3/EC of the European Parliament and of the Council.

Last update: October 2006

Source: European Environment Agency/European Topic Centre on Air and Climate Change (EEA/ETC_ACC).

Notes

- For EU-15, no data were available for IE and LU.
- Only 4 new Member States (CZ, PL, SI and SK) reported data.
- No conclusions can be drawn on time trends from data in two individual years only, because of large year-to-year fluctuations in the indicator values.
- EU-15 and EU-25 estimates for 1999 – 2004. Estimations have been done on the basis of existing data (missing values for 8 countries). No imputation technique has been used and no missing value has been estimated.

[30] Specific footnotes (Eurostat)

Population weighted annual mean concentration of particulate matter at urban background stations in agglomerations /Council Directives 96/62/EC and 1999/30/EC.

Last update: October 2006

Source: European Environment Agency/European Topic Centre on Air and Climate Change (EEA/ETC_ACC).

Notes

- For EU-15, no data were available for DK and LU.
- Only 5 new Member States (CZ, EE, PL, SI and SK) reported data.
- No conclusions can be drawn on time trends from data in two individual years only, because of large year-to-year fluctuations in the indicator values.
- EU-15 and EU-25 estimates for 2001 – 2004. Estimations have been done on the basis of existing data (missing values for 7 countries). No imputation technique has been used and no missing value has been estimated.

[31] Source: EEA, op. cit. page 17

[32] Source: EEA, op. cit. page 16

[33] Source: European Commission, Directorate-General for Energy and Transport, "European energy and transport, Trends to 2030 – update 2005", May 2006

[34] Source: Commission staff working document, Annex to the communication from the Commission to the Council and the European parliament on the Thematic Strategy on the Urban Environment-Impact Assessment, {COM(2005) 718 final}, Brussels, 11.1.2006, SEC(2006) 16

[35] Source: "European Common indicators - Towards a local sustainability profile", Ambiente Italia Research Institute, Milano, Italy, May 2003

[36] Source: "Transport 2025 - Transport vision for a growing world city", Transport for London, November 2006

[37] Source: GHG and CO_2 emissions, IBGE, Institut Bruxellois pour la Gestion de l'Environnement

[38] Source: "Relazione sullo stato dell'ambiente del comune di Milano", Agenzia Milanese Mobilità Ambiente, 2003

[39] Source: European Commission, DG TREN website

[40] Sources: UITP, "Clean fuels for road public transport", 2004 and UITP Focus position paper "Ecology and Economy: the fuel choice debate", September 2000

[41] Source: Guidelines for Community Noise, edited by Birgitta Berglund , Thomas Lindvall, Dietrich H Schwela, World Health Organization, 1999

[42] Source: National policy frameworks for urban transport, (European Commission Contract No. ETU/B2.704/STD/002/2002), Final Report:, Urban Transport Statistical and Public Perception Data, November 2005

[43] Source: "European Common indicators - Towards a local sustainability profile", Ambiente Italia Research Institute, Milano, Italy, May 2003

[44] Source: CARE website

[45] The data always refer to the most recent year for which the data are available.

[46] Based on data from CARE, "Road accidents on EU – 2004" and "Road victims on EU – 2004", July 2006

The data for Ireland, Luxembourg, The Netherlands, Poland and Greece were only available for 2003. The data for Germany made no distinction between injuries and fatalities, and are not taken into account for the percentage.

[47] This figure is estimation because the number of injuries inside urban areas is not available for Germany. In the EU-14 (EU-15 without Germany), 8 768 persons were killed and 720 992 were injured. As the number of injuries in Germany was 440 126, the number of injuries inside urban areas is estimated to 280 000 (63%).

[48] Based on data from CARE, Annual Statistics Report 2005. The data refers to the year 2003, except those for Belgium (2001), Italy (1998), Luxembourg (2002), Sweden (2002) and United Kingdom (2002). The data by mode of transport are not available for Germany.

[49] Based on data from CARE, "Road fatalities – 2004", July 2006. The data refers to the year 2004, except those for Ireland, Luxembourg, The Netherlands, Poland and Greece (2003).

[50] The data for the year 1998 refers to the CARE, Annual Statistics Report 2005. The data for the year 2004 refers to data from CARE, "Road accidents on EU – 2004" and "Road victims on EU – 2004", July 2006. The data for Ireland, Luxembourg, The Netherlands, Poland and Greece were only available for 2003.

[51] i.e. EU-15, without Germany

[52] Source: Communication from the Commission to the Council and the European Parliament , Keep Europe moving - Sustainable mobility for our continent, Mid-term review of the European Commission's 2001 Transport White Paper, Brussels, 22.06.2006 COM(2006) 314 final

[53] Source: Commission Staff Working Document, Annex to the Communication from the Commission to the Council and the European Parliament on Thematic Strategy on the Urban Environment - Impact Assessment {COM(2005) 718 final}, Brussels, 11.1.2006, SEC(2006) 16.

[54] Source: "A Congestion-Free Bus Network", UITP position paper, December 2001

[55] Which of course depends on how the city is actually defined: this is a major problem as quite often administrative boundaries are considered while functionally speaking such boundaries are not relevant. On the other hand available data are usually based on administrative boundaries and not on functional areas, urban or metropolitan ones.

[56] Source: National policy frameworks for urban transport, (European Commission Contract No. ETU/B2.704/STD/002/2002), Final Report:, Urban Transport Statistical and Public Perception Data, November 2005

[57] Source: Central London Congestion Charging Scheme, Impacts monitoring, First Annual Report.

[58] Source: Central London Congestion Charging Scheme, Fourth Annual Monitoring Report, June 2006.

[59] COMPETE, Analysis of the contribution of transport policies to the competitiveness of the EU economy and comparison with the United States, Final Report, ISI Fraunhofer Institute Systems and Innovation Research (Germany), INFRAS (Switzerland), TIS Transport, Innovation and Systems (Portugal), EE Europe Economics (UK), 2006

[60] A phenomenon which currently happens in urban congested areas is by a bus being delayed because of traffic conditions and meanwhile waiting passengers abnormally accumulating at subsequent stops, with a result that not only the delay of this bus progressively increases at each stop but also this bus is finally caught up by the next bus of the same services: the service is disturbed because of non compliance with the time schedule and lack of regularity.

[61] Source: Urban Sprawl in Europe, the Ignored Challenge, the European Environment Agency, 2006.

[62] UITP, "Mobility in cities" database, Brussels, July 2006

[63] Source: National policy frameworks for urban transport, (European Commission Contract No. ETU/B2.704/STD/002/2002), Final Report:, Urban Transport Statistical and Public Perception Data, November 2005

[64] Urban Transport Benchmarking Initiative, Year Three, Annex A1, Common Indicator Report, July 2006

[65] The data displayed relates to the study year of 2003 except for: Budapest (1994), Lyon (1995) Madrid (1996), Lisbon and Warsaw (1998), Athens and Rome (1999), Bucharest (2000), Emilia Romagna and Rotterdam (2001), Dublin, Bristol, Oxford, Naples, Gdansk, Clermont Ferrand, Suceava, Helsinki, Cologne, Dresden, Barcelona and Vienna (2002) and The Hague, Preston and Santander (2004).

Walking and cycling data was unavailable for Belfast.

The data for non-motorised modes displayed for Rome, Prague, Barcelona and Alicante in Figure 4.6a and 4.6b reflects the combined modal shares of walking and cycling.

Data for Dublin reflects all the daily trips that are made to places of work, school and university only (irrespective of start time) do not therefore reflect the total level of daily trips. The figures are therefore of more non-car based modes, because the majority of these types of trips take place during the peak daily transport hours.

Data for the Emilia Romagna region related to daily systematic trips (e.g. commuting and school trips).

It should be noted that 4% of all urban transport trips in Bucharest were attributed to lorries. This figure has been removed from Figure 4.5a and 4.5b and 4.6 for improved comparability.

Data for Cardiff is not presented, because figures relating to the number public transport trips were the only data available and it was not therefore possible to calculate a modal split.

[66] UITP, "Mobility in cities" database, Brussels, July 2006

[67] 31 European cities ranged by increasing road network investments : Clermont Ferrand, Rome, Lisbon, Bern, Budapest, Geneva, Vienna, Graz, London, Athens, Manchester, Bilbao, Stockholm, Helsinki, Berlin,

Copenhagen, Lille, Newcastle, Paris, Madrid, Dublin, Marseilles, Brussels, Oslo, Ghent, Tallinn, Glasgow, Prague, Seville, Lyons, Warsaw.

[68] 42 European cities ranged by increasing public transport investments : Ghent, Seville, Marseilles, Bologna, Clermont Ferrand, Tallinn, Stuttgart, Milan, Geneva, Dublin, Turin, Glasgow, Barcelona, Rome, Helsinki, Graz, Manchester, Nantes, Paris, Newcastle, Amsterdam, Krakow, Bern, Valencia, Budapest, Munich, Bilbao, Warsaw, Stockholm, Lyons, Rotterdam, Brussels, Vienna, London, Prague, Copenhagen, Oslo, Athens, Lisbon, Madrid, Berlin, Lille.

[69] 44 European cities ranged by increasing population : Ghent, Graz, Clermont Ferrand, Bern, Tallinn, Geneva, Bologna, Nantes, Krakow, Marseilles, Zurich, Amsterdam, Brussels, Helsinki, Oslo, Newcastle, Lille, Seville, Dublin, Bilbao, Prague, Lyons, Rotterdam, Munich, Turin, Vienna, Valencia, Warsaw, Budapest, Copenhagen, Stockholm, Glasgow, Hamburg, Stuttgart, Milan, Manchester, Lisbon, Rome, Berlin, Athens, Barcelona, Madrid, London, Paris.

[70] 42 European cities ranged by increasing GDP per inhabitants : Tallinn, Krakow, Budapest, Seville, Athens, Warsaw, Valencia, Prague, Lisbon, Barcelona, Newcastle, Madrid, Berlin, Bilbao, Glasgow, Lille, Manchester, Marseilles, Brussels, Clermont Ferrand, Nantes, Rome, Ghent, Turin, Lyons, Rotterdam, Graz, Milan, Bologna, Stuttgart, Stockholm, Amsterdam, Copenhagen, Vienna, Bern, Dublin, London, Helsinki, Paris, Geneva, Hamburg, Zurich, Oslo, Munich.

[71] Source: National policy frameworks for urban transport, (European Commission Contract No. ETU/B2.704/STD/002/2002), Final Report:, Urban Transport Statistical and Public Perception Data, November 2005

[72] Source: "Light rail and metro systems in Europe-Current market, perspective and research implication", ERRAC, Brussels, April 2004

[73] Urban Transport Benchmarking Initiative, Year Three, Annex A1, Common Indicator Report, July 2006

[74] Data relates to 2003, except for; Oxford, Clermont Ferrand, Suceava, Dresden, Rotterdam, Helsinki, Bristol, Warsaw, Vienna, Barcelona and Cologne (2002) and Preston, Santander and Sofia (2004).

[75] List of cities ordered by increasing GDP: Krakow, Budapest, Seville, Athens, Warsaw, Valencia, Prague, Lisbon, Barcelona, Newcastle, Madrid, Berlin, Bilbao, Glasgow, Lille, Manchester, Marseilles, Brussels, Clermont Ferrand, Nantes, Rome, Ghent, Turin, Lyons, Rotterdam, Graz, Bologna, Stuttgart, Stockholm, Amsterdam, Copenhagen, Vienna, Bern, London, Helsinki, Paris, Geneva, Hamburg, Zurich, Oslo, Munich

[76] Source: National policy frameworks for urban transport, (European Commission Contract No. ETU/B2.704/STD/002/2002), Final Report:, Urban Transport Statistical and Public Perception Data, November 2005

[77] Urban Transport Benchmarking Initiative, Year Three, Annex A1, Common Indicator Report, July 2006

78 Source: European Commission, Directorate-General for Energy and Transport, in co-operation with Eurostat

[79] Source: "Transport business statistics: Buses and urban railways largest employers in the passenger land transport sector", Aurora Ortega Sánchez, Statistics in focus, Eurostat, 2000

[80] Source: "Public Transport, the Lisbon Strategy and Sustainable Development", UITP, July 2005

[81] Source: "Joint statement by the UITP European Union Committee and the European Transport Workers' Federation on the proposed Green Paper on Urban Mobility ", UITP-ETF, January 2007

[82] Special Eurobarometer 228, Passengers' rights, fieldwork : February – March 2005, publication : July 2005, Directorate General SANCO, with Directorate General TREN

[83] Eurobarometre Special N°260

[84] The Directorate General for Energy and Transport website on Clean Urban Transport

[85] Urban Transport Benchmarking Initiative, 2004-2006

[86] European Common indicators, Ambiente Italia Research Institute, Milano, May 2003

[87] Data refers to 2003, except for Oxford, Helsinki, Bristol, Gdansk, Rotterdam, Lyon, Lisbon, Dresden, Naples, Warsaw, Suceava, Barcelona, Vienna Cologne and Rome (2002), Belfast, Brescia, Bristol, Brussels,

Cardiff, Copenhagen, Glasgow, Malmo, Merseyside, Paris, Prague, Preston, Santander, Sofia and The Hague (2004) and Aalborg (2005).

[88] Data refers to 2003, except for Aalborg, Belfast, Copenhagen, London, Malmo, Prague, Preston, Santander, The Hague and Paris (2004)

[89] Data relates to 2004, except for; Clermont Ferrand, Rome, Helsinki, Dresden, Vienna, Cologne, Lyon, Bristol, Oxford, Rotterdam (2002) and Lisbon, Ile de France, Warsaw, Brussels, (2003)

[90] Data refers to 2003-2005

[91] Source: Presentation on "Urban transport, social aspects and inclusion" at the technical workshop "Integrated urban transport approaches for successful and attractive cities" within the framework of the preparation of the Green paper on urban transport, Ann Frye, Brussels, 16/5/2007.

[92] European Technology Assessment Group ITAS. DBT. viWTA. POST. Rathenau, The Future of European Long Distance Transport , Background Paper for Workshop 28th March 2007, Paper prepared by Jens Schippl, Institute for Technology Assessment and System Analysis (ITAS), Karlsruhe

[93] Source: Schippl et al 2007; JRC 2006

[94] Source: Preparation of the Green Paper on urban transport, Technical Workshop "Urban transport and green propulsion", Brussels, 31 January 2007, Background Paper on the Promotion of Clean and Energy Efficient Vehicles, DG Tren/G.4, Brussels, 16 January 2007

[95] COM(2001)547

[96] Directive 2003/30/CE

[97] Directive 2003/96/CE

[98] Source: "Well-to-wheels analysis of future automotive fuels and powertrains in the European context", EUCAR, CONCAWE and JRC (the Joint Research Centre of the EU Commission), WELL-to-WHEELS Report Version 2c, March 2007

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[107] Source: Preparation of a Green Paper on Urban Transport, "Public transport, intermodality and intelligent transport" technical workshop, Presentation on the role of ITS in provision of safe and sustainable urban transport by Mr. Ken Laughlin, Hampshire County Council, Szentendre, Hungary, 7 March 2007

[108] Source: Draft paper "State of the Art of Research and Development in the Field of Urban Mobility", European Research Forum for Urban Mobility, Eurforum, 17 February 2007

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[111] Source: Civitas 1 cross site evaluation, Meteor deliverable 6, Final report, November 2006

[112] Source: CIVITAS in Europe, "A proven framework for progress in urban mobility", January 2007

[113] Source: Sustainable Urban Transport, Final report from the European project Trendsetter, 2006

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[125] During the technical workshop "Urban transport financing: experiences from different cities", Budapest, March 6, 2007

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[130] UNIFE: Green paper on urban transport, Position paper , May 2007

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[139] The RSS system is an information source that allows the flow of information in a customisable manner

[140] Eurochambres: Position Paper 2007, Urban transport: Eurochambres' comments on the Preparation of the Green paper, 31 May 2007

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[198] The 'Global Monitoring for Environment and Security' (GMES) represents a concerted effort to bring data and information providers together with users, so they can better understand each other and make environmental and security-related information available to the people who need it through enhanced or new services.

[199] http://www.bikesafe.co.uk/

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implementation strategies they intent to put in place in order to minimize risks and biased estimations (that is, to exhibit the quality of the project).