CE Delft

Size, Structure and Distribution of Transport Subsidies in Europe

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Section 1. Introduction

1.1. Background

European transport subsidies are substantial and have important economic, social and environmental effects. By providing financial benefits to consumers or producers, subsidies lower the costs of transport, thereby encouraging additional transport and increasing the overall volume of traffic. In addition, governments' subsidies to specific modes of transport encourage use of some modes over others, because the resulting drop in user costs leads some transport users to switch to subsidised modes.

It is well known that transport has significant environmental effects. These effects include air pollution, climate change, ecosystem fragmentation, loss of natural habitat and increased noise. Transport accounted for 30.7% of energy use in the EU-25 in 2004 – more than any other sector, (e.g. industry, households, and services).[1] By altering transport use and affecting modal choice, transport subsidies directly affect the environment.

Transport subsidies affect the environment at four different levels:

1) They influence the **environmental performance** of vehicles. Subsidies may provide incentives for cleaner engines or advanced technology and can bridge the gap between the costs of "green" vehicles and others. They can also lessen the costs of meeting certain legal requirements for vehicle manufacturers and users, thereby reducing political opposition to stricter environmental regulations. Other subsidies (e.g. subsidies to diesel fuel) can have negative effects on some aspects of vehicles' environmental performance.
2) They affect **transport management** decisions about volume and composition of vehicle fleets, load factors, route planning, etc. This may change the relation of costs and benefits of investments in transport services and logistics.
3) They affect **modal share** by altering the price competitiveness among different modes of transport. Subsidies may reduce or increase the competitiveness of sustainable transport modes and lead to a shift from one means of transport to another.
4) By lowering the costs of transport, subsidies increase **transport demand**, i.e. the number of trips and their distances. The resulting transport growth affects the environment through higher emissions, increased need for infrastructure, urban sprawl, habitat fragmentation, etc.

Not all transport subsidies have a negative impact on the environment. Most governments have introduced transport subsidies that benefit the environment by encouraging transport users to switch to less environmentally harmful technologies and transport modes. For example, some EU Member States have introduced subsidies for less environmentally harmful types of fuels, vehicles and modes. Governments are also reforming some transport subsidies they deem environmentally harmful, seeking to eliminate or reduce these subsidies.

In most cases, subsidies affect the environment on more than one level. Some of the indirect impacts can support the intended effects or counterbalance them. Grants for low-noise trains improve the environmental performance of trains directly, but they also affect transport

[1] Energy use data from Eurostat (2006). *Final energy consumption, by sector*. Available at http://epp.eurostat.ec.europa.eu.

management and support modal shift; subsidies to railway users may not only encourage modal shift, but also increase transport demand and lead to additional and longer trips. If a subsidy has environmental impacts at several levels—some positive, some adverse—it is not easy to assess its overall environmental effect.

Many of the impacts of subsidising transport, especially where they affect transport demand, are of an indirect nature and are felt in the long term. The availability of cheaper and faster transport—often combined with subsidies for housing—affects peoples' choices of residence and the location decisions of businesses. The consequences are longer distances between homes, workplaces and shopping facilities, and thus, more transport. Such developments are path dependent in the literal sense and are consequently difficult to change or reverse.

1.2. Study aims, approach and methodology

1.2.1. Study aims

The size, structure and distribution of transport subsidies within the European Union are not systematically monitored, making the data on transport subsidies scattered and incomplete. Without this information, political decisions to support transport are not always well balanced and consistent, as they do not take environmental aspects and unwanted side effects adequately into account.

The European Environment Agency (EEA) commissioned this study to gain better information on the size, structure and distribution of transport subsidies in the European Union. This is intended to give policy makers a better understanding of environmentally relevant transport subsidies. The study complements other work being conducted by the EEA, in particular on the Transport Environment Reporting Mechanism (TERM).

In a previous study conducted in 2005, the EEA sought to understand the nature, effects and types of transport subsidies. Part of that study was the creation of a substantial literature database, which compiled information on the relevant literature into a searchable repository.[2] The current study furthers this past work by systematically collecting and categorising the actual monetary value of transport subsidies in the European Union. These values are presented in this study as annual estimates.

1.2.2. Study approach

This project collected data on all kinds of fiscally relevant, transport-related subsidies that directly or indirectly affect the environment. Within the scope of this project, it was not feasible to provide a complete overview of all data on all types of fiscal and non-fiscal support for all transport modes and all EEA Member States. In order to provide a result that is as consistent and comprehensive as possible, the project team focused on gathering data from existing international studies, conducting only limited data gathering from Member State contacts. Data were not gathered directly from national accounts. Given that the data collection was not exhaustive for all subsidies in all Member States, the aggregate numbers presented in this study should be considered a lower bound for the overall level of European transport subsidies.

The primary focus of this study was to find the aggregate monetary value of each transport subsidy. This is comparatively more difficult than gathering information from Member States

[2] See Ecologic (2005).

on the legal and administrative details of payment, taxation or charging that lead to subsidies. This is one of the key reasons that this project relies on previous international studies rather than direct contact of government offices. To give a concrete example, information on income tax deductions for commuters (in Euro per kilometre) was available in some cases for countries, but without corresponding information on how much this represents in total tax deductions within these countries. Information on the legal and administrative details of each subsidy was not systematically collected and compared.

In September 2006, an expert workshop brought the project team and other selected European experts together to discuss the data collected and the preliminary research findings. In addition, the project team contacted additional experts early on in the research as a means of locating data sources and expediting the research process. These experts were also involved in a review of preliminary results and a draft report. The comments of these experts have proven very helpful and are reflected in this report (see Annex 1 for a list of experts consulted during this project).

1.2.3. Data methodology

Data on European transport subsidies are not regularly and systematically collected. Instead, data on specific subsidies have been collected in ad hoc international and national studies. This study relies on this literature, which extends from studies conducted as early as 2000.

To obtain estimates of annual transport subsidies from the gathered data, two types of double counting were removed from the data. First, intra-year double counting was removed, which occurred whenever two or more studies covered the same subsidies in the same year. In addition, inter-year double counting was removed (i.e. only the most recent year of data for each subsidy was retained). Data were also converted into consistent monetary units (i.e. 2005 Euro). These data were then combined to generate estimates of annual European transport subsidies. The assumption behind this methodology is that the subsidies found continue to exist at those levels existing the last time they were studied in the surveyed literature. More information on this methodology and its implications for data quality can be found in Section 5.

1.3. Structure of this report

Section 2 provides an overview of the definitions and classifications of transport subsidies as they are used in this report. The section explains the concepts of *on-budget* and *off-budget* subsidies and introduces the classifications of *incidence* and *mode*.

Section 3 presents the numerical findings regarding the size, structure and distribution of transport subsidies in Europe.

Section 4 addresses a number of issues that are relevant in relation to the demand for transport and the ‘level playing field’ between transport modes, but which are not considered to be subsidies under the definition used in this study. These include externalities, transport infrastructure, PSO and regulation.

Section 5 provides an assessment of the quality of the data collected in this study. The implications of missing data, biases, and assumptions for the reliability and usability of the data are explored.

Section 6 closes with the key conclusions of the study.

Annexes – Two annexes provide further detail on the data: a list of sources and experts consulted (Annex 1); and a brief guide to the most important literature sources for the data (Annex 2).

Section 2. Definition and classification of subsidies

Definitions of the term "subsidy" differ widely. On the one hand, a broad welfare economic approach defines transport subsidies as all transport costs that are not covered by users, including all kinds of externalities, infrastructure costs or different regulation (see Nash, 2004). On the other hand, a fiscal policy approach counts as subsidies only those economic advantages that are granted from public budgets without a direct service in return (e.g. grants and tax deductions). Both approaches have their advantages and disadvantages in different contexts. However, the implications for the delineation of subsidies are very different, affecting, for example, to what extent infrastructure costs are to be taken into account. Given the focus of this study and in light of other transport-related EEA activities and products, this study relies on a fiscal policy approach. This necessarily excludes many economically relevant transport issues (for a discussion of some of these issues, see Section 4: "Subsidies in context").[3]

2.1. Definition of subsidies

Even within a fiscal policy approach, there is no single definition of subsidies among European Member States.[4] This study uses as its starting point a definition that has been used in several recent OECD publications, defining subsidies as "a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs" (OECD, 2005, p. 16). This definition would include activities such as direct payments from government budgets, tax exemptions and rebates, and subsidies stemming from regulatory preferences beneficial to certain market actors (e.g. preferential market access, accelerated depreciation, limited liability, "soft" loans, and special exemptions from meeting regulatory requirements).

Only fiscal supports with direct relevance to public budgets and with no direct service in return are considered subsidies in this study. Under this definition, government payments to provide public service obligations (PSO) that ensure a sufficient quality of public transport services are not regarded as subsidies.[5]

The subsidy data collected for this study include both "on-budget" and "off-budget" subsidies. The EEA defines on-budget subsidies as "cash transfers paid directly to industrial producers, consumers and other related bodies . . . [that] appear on national balance sheets as government expenditure". The EEA defines off-budget subsidies as "transfers to . . .

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[3] For further information on the definition and classification of transport subsidies, please see Ecologic (2005, pp. 2-13). PSO are described in further detail in Section 4 of this report.

[4] Though not the formal definition of subsidies used in this study, a related concept is that of "State aid", which is central to subsidy control in the EU and included here for context. To be considered State aid, a measure must meet all four of the following criteria: "1) granted by a Member State or through state resources; 2) favour certain undertakings or the production of certain goods; 3) distort or threaten to distort competition; and 4) affect trade between Member States. Source: Article 87(1) of the EC Treaty, available at http://ec.europa.eu/comm/competition/legislation/treaties/ec/art87_en.html

[5] The issue of PSO is discussed in Section 4.

producers and consumers that do not appear on national accounts as government expenditure[s]" (EEA, 2004, p. 11). Examples of on-budget subsidies include direct government payments out of public funds, whereas tax exemptions would be off-budget subsidies. It is significantly easier to obtain definitive statistics for on-budget subsidies than to obtain accurate data for off-budget subsidies.[6]

2.2. Classification of subsidies

Transport subsidies can be classified by incidence and by mode. The term "incidence" refers to who or what initially receives the subsidy. Though subsidies often flow through to other end beneficiaries (their "final incidence"), knowing the initial incidence helps to understand what specific kinds of activities are being encouraged. Incidences relate to the incentives being created by subsidies. The directly relevant incidences for transport subsidies are infrastructure; means and vehicles; users; and fuel. Other incidences exist as well, such as subsidies for housing, regional settlement and trade. Table 1 provides definitions for each incidence and categorises the subsidies quantified in this study according to their incidence. Note that on-budget subsidies were found for three incidences: infrastructure, means/vehicles and users. Due to the large number of specific subsidies found and the difficulty of clearly classifying some subsidies into one incidence or the other, subsidies to means/vehicles and users are grouped into the classification "other on-budget subsidies".

This study also distinguishes subsidies by the four main modes of transport: road, rail, air and water. This study does not, however, provide data broken down by further subclassifications of these mode types (e.g. passenger, freight, and transit).

Table 1. Classification of transport subsidies

Initial incidence	Description	Relevant subsidies quantified in this study
Infrastructure	Public spending on transport infrastructure network (roads, rail, waterways, airports and air traffic control) including investment, running and hidden costs; minus charges for use or access to infrastructure.	Infrastructure subsidies
Fuel	Subsidies for production, distribution and use of fuels.	Fuel-tax exemptions
Means/Vehicles	Subsidies for production, distribution, use and disposal of vehicles.	Other on-budget subsidies
Users	Subsidies for transport provisions and activities of companies, households, private and public institutions, including subsidies to operators for reduced fares.	VAT exemptions; Other on-budget subsidies
Other	Subsidies with indirect impact on transport demand (e.g. for housing, building, settlement, regional development, trade and distribution).	Note: subsidies with indirect transport impacts are not quantified in this study.

[6] To determine the exact value of tax exemptions, for example, requires detailed knowledge of demand elasticities and, in some cases, sophisticated economic modelling techniques. Such techniques were not used in this study.

Section 3. Empirical findings on European transport subsidies

The section presents the estimated values of annual European transport subsidies based on the data collected for this study. Due to missing data on the value of some transport subsidies, the figures presented should be considered a lower bound for the actual level of European transport subsidies. Despite the fact that the transport subsidy picture is still incomplete, these data provide useful information on the size, nature and distribution of European transport subsidies.

The presentation of the data follows the definition and classification scheme introduced in Section 2. Empirical findings are organised by subsidy type, incidence and transport mode. The types of subsidies presented include on-budget subsidies; infrastructure costs and revenues from infrastructure-related charges; exemptions from fuel excise taxes; and VAT exemptions on passenger services.

3.1. Total transport subsidies

This study found annual transport subsidies of between 159 and 293 billion Euro in the European Union. This wide range in estimates—most significant for road transport—is due to varying interpretations in how to categorise infrastructure charges and fuel taxes (discussed later in this section). Table 2 provides an overview of the subsidies found, broken down by subsidy type and transport mode. The total value of on-budget subsidies (between 119 and 229 billion annually) greatly exceeds the value of off-budget tax exemptions (40 to 65 billion). On-budget subsidies are most significant for the rail sector, whereas the off-budget subsidies stemming from tax exemptions are most significant for the air sector. Not all on-budget subsidies could be attributed to a single mode; 30 billion Euro annually fall into this “multiple modes” category.

Table 2. Overview of total annual subsidies found, by incidence and mode (billion 2005 EUR)

	On-budget subsidies		Off-budget subsidies		Total
	Infrastructure subsidies (EU-15)	Other on-budget subsidies	Fuel-tax exemptions	VAT exemptions	
Road	0* - 110	7	0*	9	16 - 125
Rail	36 - 37	33	0 - 1	3	72 - 73
Air	0*	1	8 - 16	18	27 - 35
Water	10	1	3 - 19	0	14 - 30
Multiple modes		30			30
Total	46 - 156	73	11 - 36	29	159 - 293

Note: Numbers may not add to totals shown due to rounding. For infrastructure subsidies and fuel-tax exemptions, low and high estimates are provided. Infrastructure subsidies equal infrastructure costs minus charges. For infrastructure subsidies, zeroes marked with an asterisk signify that included charges exceed infrastructure costs. For fuel-tax exemptions, the zero marked with an asterisk signifies that the tax rate for roadway fuels exceeded the rates selected as references to calculate subsidies. This table is based on incomplete data; the total value of European transport subsidies remains unknown. This note must accompany any use of this table.

3.2. On-budget subsidies

3.2.1. Infrastructure subsidies (infrastructure costs minus infrastructure charges)

Public expenditures on investments and running expenditures for the maintenance, improvement and enlargement of infrastructure are a major source of fiscal support for

transport. Unfortunately, there is no reliable set of European statistics available on Member States' actual expenditures on transport infrastructure. Data on infrastructure *costs* are available from other studies, however. These infrastructure costs are not calculated on the basis of actual government spending, but rather on the annual amortisation of the total value of infrastructure plus running costs. Though the differences between expenditures and costs can be significant, data on infrastructure costs are a useful proxy for expenditures. The UNITE project[7] has studied public accounts in the EU-15 in detail and provides data on infrastructure costs and charges. These data represent the best source of information on public infrastructure costs and are used here as a proxy for the inadequate data on the annual public expenditures on transport infrastructure.[8]

UNITE includes both charges directly related to infrastructure costs, like the Eurovignette charges, and other charges which are indirectly related to infrastructure costs, like circulation, vehicle, registration, insurance and vehicle sales taxes and excise taxes on fuels. In some European countries, the latter are regarded as contributions toward infrastructure costs as well, while in other countries they are regarded as general taxes. In UNITE all these other types of transport charges are not included in infrastructure charges. Figure 1 shows infrastructure costs, infrastructure charges and other charges that are frequently regarded as infrastructure charges even if revenues are not earmarked to fund transport infrastructure.

In this study, net public expenditures on infrastructure are considered a form of subsidy. It should be noted, however, that many governments and official bodies do not consider public provision of general infrastructure as a subsidy.[9]

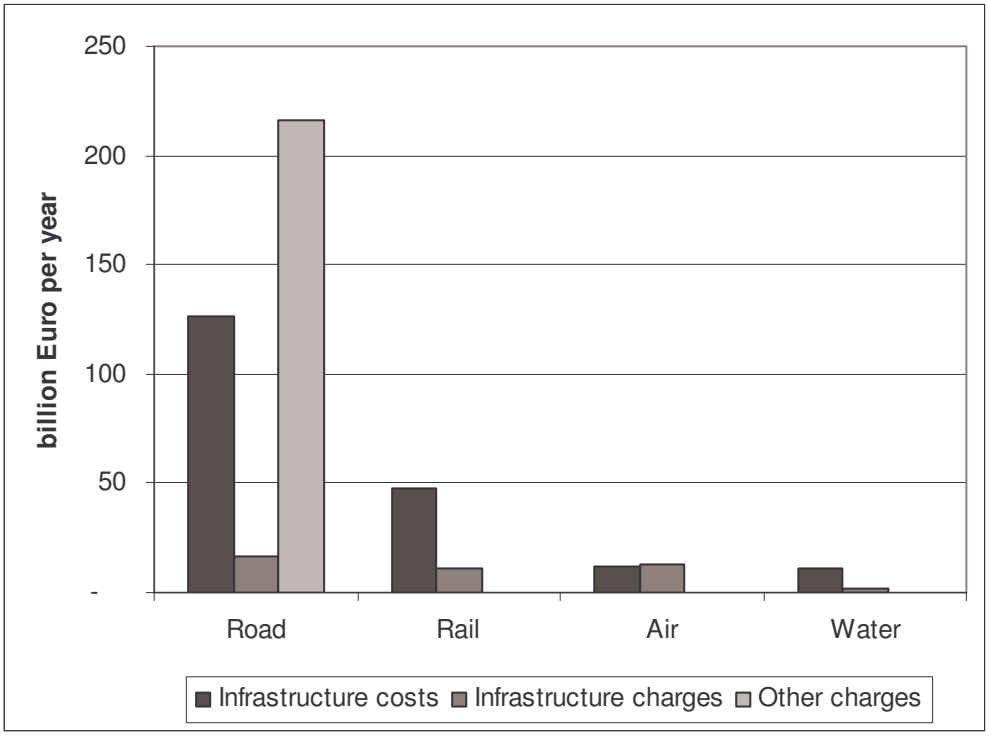
For rail, infrastructure charges are much lower than the infrastructure costs, yielding a high level of subsidies (about 36 billion Euro per year). Depending on whether one credits "other charges" as infrastructure charges, road-infrastructure subsidies could range from zero to as high as 110 billion. The graph also contains data for aviation and waterborne transport, but the UNITE data for these modes are considered less reliable than for the other two modes.

[7] UNITE stands for UNIfication of accounts and marginal costs for Transport Efficiency, and was funded by the European Commission within the 5th Framework Programme.

[8] The UNITE data are the most complete and recent data on infrastructure costs for the EU-15 as a whole. The European Conference of Ministers of Transport (ECMT) is currently working on an overview of infrastructure costs, but these results are not expected to be ready in time for this study.

[9] For example, the WTO and EU State Aid rules do not consider net public expenditures on infrastructure to be subsidies. One reason for this is the positive externalities associated with well-functioning transport networks. Like education or a well-functioning legal system, transport creates a number of external benefits that extend beyond the pure provision of transport services. In addition, some transport infrastructure is considered a public good that require government provision because it is difficult to exclude people from using the infrastructure.

Figure 1. Annual infrastructure costs and charges, EU-15 plus Hungary (billion 2005 EUR)

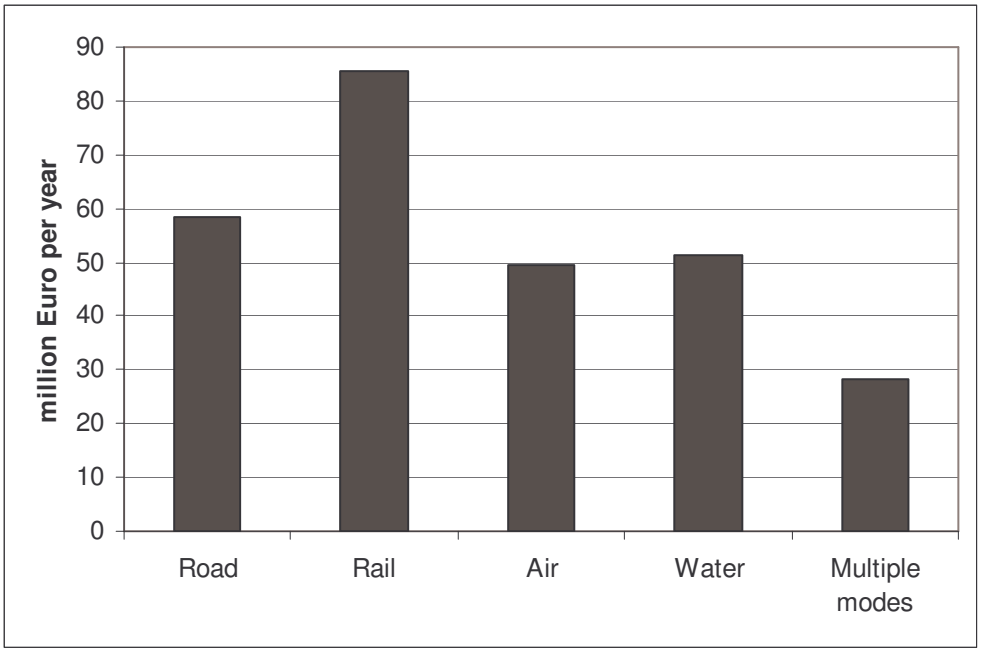


Source: UNITE. Note: UNITE data for aviation and waterborne transport are considered less reliable than they are for the other two modes.

Box 1. European infrastructure funds

In interviews with experts, the international funds for infrastructure have been mentioned as an important subsidy for transport. To provide information on this issue, data on European funds (TEN-T, PHARE, Cohesion and ISPA funds) were gathered. Figure 2 shows an overview of the total average subsidy per year originating from these funds. Note that this figure shows infrastructure expenditures, not subsidies. Rail infrastructure receives the largest share of money from these funds. This is not surprising since revitalising railways has been an important policy goal in the EU transport policy in recent years.

Figure 2. European infrastructure funding per year (million 2005 EUR)

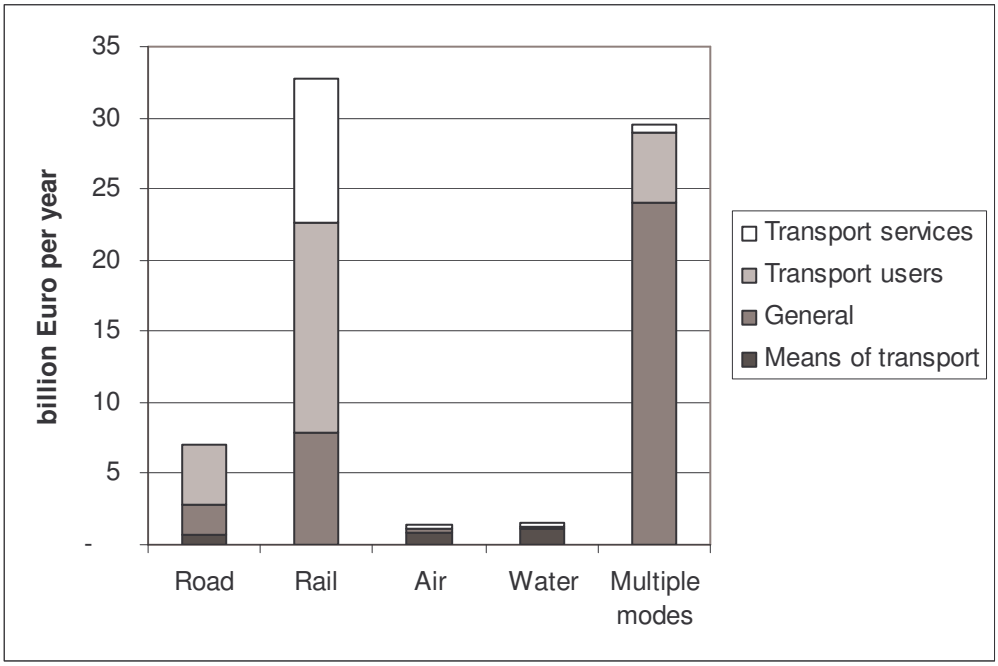


Note: Figures are in millions. Infrastructure expenditures included: TEN-T, Cohesion fund, ISPA, PHARE.

3.2.2. Other on-budget subsidies

In addition to infrastructure subsidies paid out of public budgets, all the transport modes receive other forms of on-budget subsidisation. However, there are significant differences among the modes in terms of the level of subsidies found. Other on-budget subsidies to rail are significantly higher than for other modes, with rail receiving 33 billion Euro in non-infrastructure on-budget subsidies per year (see Figure 3). Rail also receives the highest level of subsidies going to transport services, with most of these payments covering railways' operating losses, paying for the alleviation of past debts, and paying employee salaries and pensions. Note that grants for PSO are not included here. In addition, rail also receives significant subsidies directly to transport users (15 billion Euro) in the form of concessionary fares.

Figure 3. **Other on-budget subsidies, by incidence and mode (billion 2005 EUR)**



Note: This graph is based on incomplete data; the total value of European transport subsidies remains unknown. This note must accompany any use of this graph.

Many of the on-budget subsidies found could not be attributed to a particular mode. These expenditures, totalling 30 billion Euro in subsidies, accounted for about 40% of the non-infrastructure on-budget subsidies found. The majority of the funds falling into this category go to the road and rail modes, but due to their multi-modal character, they could not be attributed to a single mode. Very few on-budget subsidies going to a particular means of transport (e.g. vehicles) were found for any of the modes.

3.4. Differences in fuel excise taxes

Differences in fuel excise duties could be interpreted as preferential taxation, and thus, also seen as off-budget subsidies. To estimate these subsidies for each mode, it is necessary to subtract actual excise taxes collected for the mode from the hypothetical excise taxes that would have been collected were the mode's fuel taxes set at the standard (i.e. higher) rate.

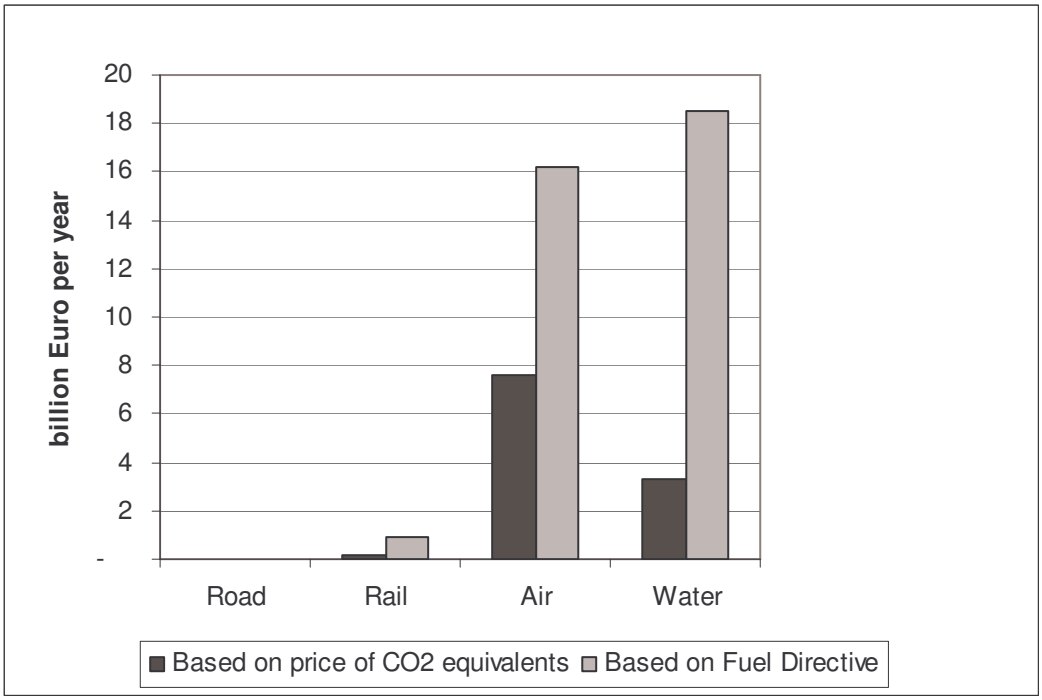
To calculate the actual fuel excise taxes per mode, each mode's energy consumption was multiplied by the current fuel excise duties, expressed as Euro per unit of energy.[10] To calculate the level of subsidy, the choice of a reference value (i.e. the tax level that is considered the baseline) is crucial. The choice of this value is in some ways arbitrary. Based on discussions with experts, two reference cases were chosen:

[10] The data for this calculation were obtained from the EEA's TERM fact sheets.

- Minimum fuel excise duty for road diesel (according to Directive 2003/96/EC)[11]
- Price of the CO_2 emission allowance in the European Emission Trading Scheme (EU ETS), according to an estimated 2006 average price of 20 Euro per tonne[12].

Figure 4 shows the various levels of off-budget subsidies that emerge from these hypothetical baseline tax rates. Using the price of carbon permits as the baseline yields a lower level of subsidies. Using the road fuel excise taxes as the baseline yields a higher level of subsidies. As can be seen from the chart, the air and water modes, which benefit from significant tax breaks on fuel, receive the highest levels of off-budget subsidies through fuel-tax exemptions.

Figure 4. Value of exemptions from fuel-excise taxes (based on two hypothetical baseline tax rates



Note: This graph provides estimates of the value of fuel-tax exemptions based on reference values selected by the study authors. This note must accompany any use of this graph.

The road mode receives no subsidies under the two hypothetical reference levels. This is because 1) road excise duties are higher than the cost of the relevant number of CO_2

[11] It should be noted that several of the experts consulted found excise taxes on a roadway diesel to be an inappropriate baseline, as they consider fuel excise taxes a type of user charge for road infrastructure. Other experts objected to the use of CO_2 allowance prices because, as a reference, it has no basis in the fiscal approach used in this study. We acknowledge these issues, but find these to be the two best references for establishing a meaningful range of subsidies stemming from fuel-tax differences.

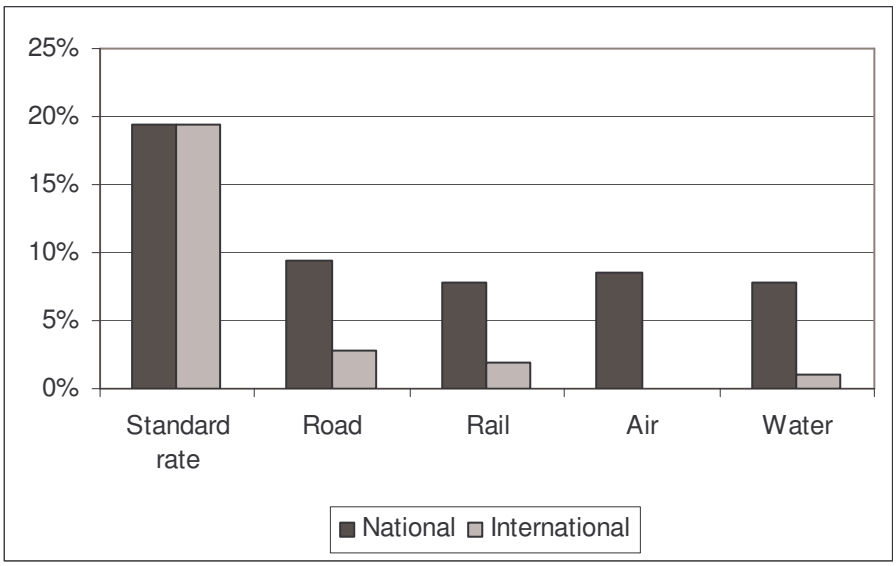
[12] For aviation, the IPCC correction factor of 2.7 has been applied to account for the additional climate impacts of non-CO_2 greenhouse gas emissions at high altitude.

emission allowances, and 2) average excise tax rates on road fuels in the EU exceed the Fuel Directive's minimum duty.

3.5. Exemptions from VAT on passenger services

Passenger services are frequently subject to lower VAT rates than is standard in EU Member States. These differences in VAT rates could also be interpreted as off-budget subsidies. To compute these subsidies, we gathered Member State data about standard VAT rates and VAT rates for domestic and international passenger transport services. Figure 5 shows the average VAT rates for passenger transport in the EU-25.

Figure 5. Average VAT rates passenger transport in EU-25

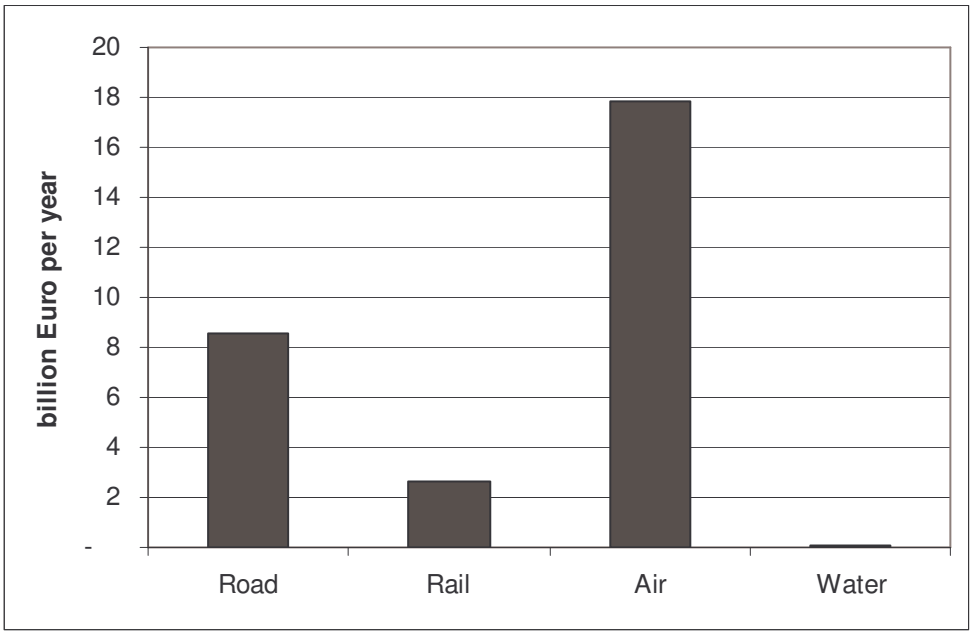


Source: European Commission (2006)

By multiplying these differences by the revenue for the various modes, the total value of VAT exemptions for passenger services was estimated for each mode.[13] Figure 7 shows these estimated values. Air travel, which is exempt from VAT on international flights, receives off-budget subsidies worth over 18 billion Euro annually in the EU-25 due to this tax exemption. VAT exemptions on passenger services generate just over 8 billion Euro in off-budget subsidies for the road sector and over 2 billion Euro for rail. VAT applies to only a very small portion of shipping.

[13] Revenue figures obtained from Eurostat (2006).

Figure 6. Hypothetical extra tax burden per year with standard VAT rates, EU-25 (billion 2005 EUR)



Note: This graph provides estimates of the value of fuel-tax exemptions based on reference values selected by the study authors. This note must accompany any use of this graph.

3.6. Summary by mode

The subsidy profile for each mode is significantly different among the modes. Specifically:

- **Roads (16 - 125 billion Euro in annual subsidies identified).** The wide range in annual subsidies stems from disagreement on whether (and to what degree) to characterise certain taxes and charges paid by motorists as user charges for road infrastructure.

- **Rail (72 - 73 billion Euro in annual subsidies identified)**. The on-budget subsidies identified, at 33 billion Euro per year, are nearly as large for rail as infrastructure subsidies. Of the mode types, rail receives by far the greatest amount and proportion of subsidisation through on-budget subsidies.

- **Air (27 - 35 billion Euro in annual subsidies identified).** Off-budget subsidies—in the form of exemptions from fuel taxes as well as VAT on international flights—are the most important source of subsidies.

- **Water (14 - 30 billion Euro in annual subsidies identified).** In comparison to the other modes, the level of transport subsidies found for water is significantly lower. Infrastructure subsidies are a significant portion of overall subsidies going to water transport, accounting for 30–70% of the subsidies identified for this mode.

- **Multiple modes (30 billion Euro in annual subsidies identified).** A significant quantity of on-budget subsidies to transport could not be attributed to a single mode.

Section 4. Transport subsidies in context

This study has identified annual European transport subsidies in the range of approximately 160 to 290 billion Euro. It is important, however, to put these subsidies in context with other closely related issues. This section briefly outlines a few key issues that should be kept in mind when looking at transport subsidies. These are: the external costs of transport; the relative transport volumes of the various modes; public service obligations (PSO) in public transport, environmentally beneficial subsidies; infrastructure quality; and regulations and land-use policy. In the pursuit of a more level competitive playing field among transport modes, many issues must be considered in addition to the issue of transport subsidies.

4.1. External costs of transport

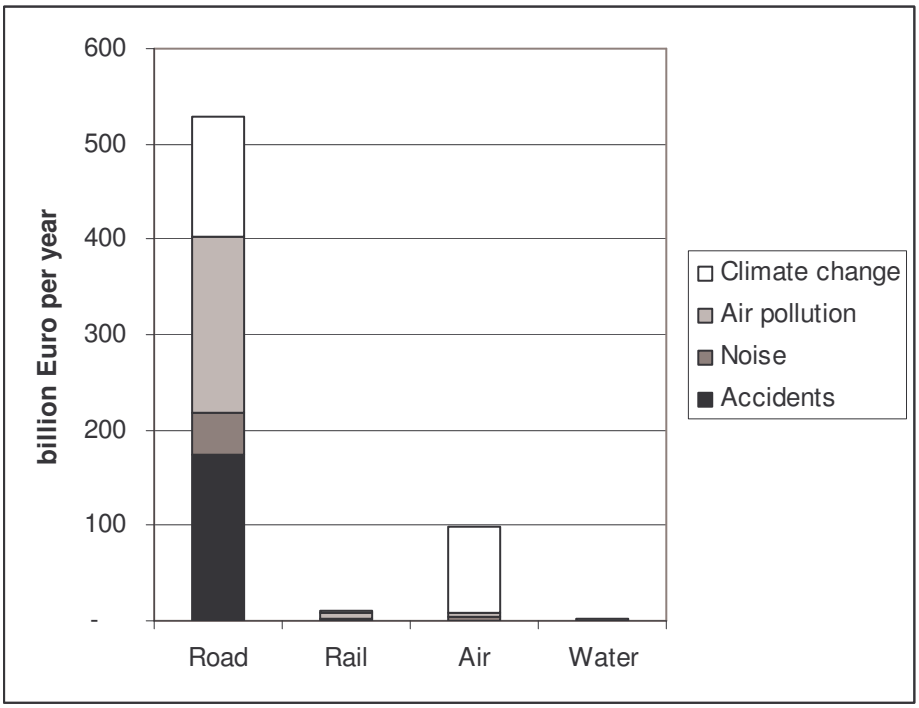
Externalities are not the subject of this report, as they are addressed by other ongoing work at the EEA. However, they are mentioned briefly here for two primary reasons:

1. **Larger effect than subsidies.** The monetary value of externalities has been evaluated by several studies, each of which show that the economic relevance of externalities is significant and the impact of their non-internalisation probably exceed the effect that subsidies have on transport.

2. **Some subsidies correct for externalities:** Some subsidies are introduced to correct for the fact that externalities are not addressed in some area of the transport system. Other subsidies compensate for different levels of quality in network infrastructure, the absence of regulation or complement the implementation of environmental requirements. Externalities have significant implications for the level competitive playing field among modes.

Figure 7 shows the results of the most recent study on external costs of transport in the EU-15 plus Norway and Switzerland. It includes figures for the costs of climate change, air pollution, noise and accidents. The INFRAS study identified a total of 650 billion Euro in external costs of transport for the year 2000. The study found that external costs related to road-based transport greatly exceed those of the other modes.

Figure 7. Total external cost of transport EU-15 + Norway & Switzerland in 2000



Source: INFRAS/IWW (2004)

4.2. Relationship to modal share of transport volumes

As shown in this report, different transport modes receive varying amounts of subsidisation. Each mode's subsidy profile (e.g. incidences, what portion is on or off budget) also differs significantly from that of the other modes. However, for policy decisions regarding subsidies, it could be relevant to also consider the transport volumes of each mode. Table 3 compares each mode's share of total passenger and freight transport volume to its share of the total subsidies found in this study. The percent of subsidies going to roads ranges from 12% of subsidies found (low-end subsidy scenario) to 48% of those found (high-end scenario). However, the vast bulk of transport volume (82% of passenger volumes and 46% of freight volumes) is associated with road transport. In contrast, the rail and air modes receive subsidies exceeding their share of transport volumes.

Table 3. Comparison of modal shares of transport volume and subsidies

	Share of transport volume		Share of subsidies	
	Passenger	Freight	Low-end scenario	High-end scenario
Road	82%	46%	12%	48%
Rail	6%	11%	56%	28%
Air	12%	0%	21%	13%
Water	0%	43%	11%	11%

Note: 2001 transport volume shares obtained from EEA (TERM fact sheet 13)

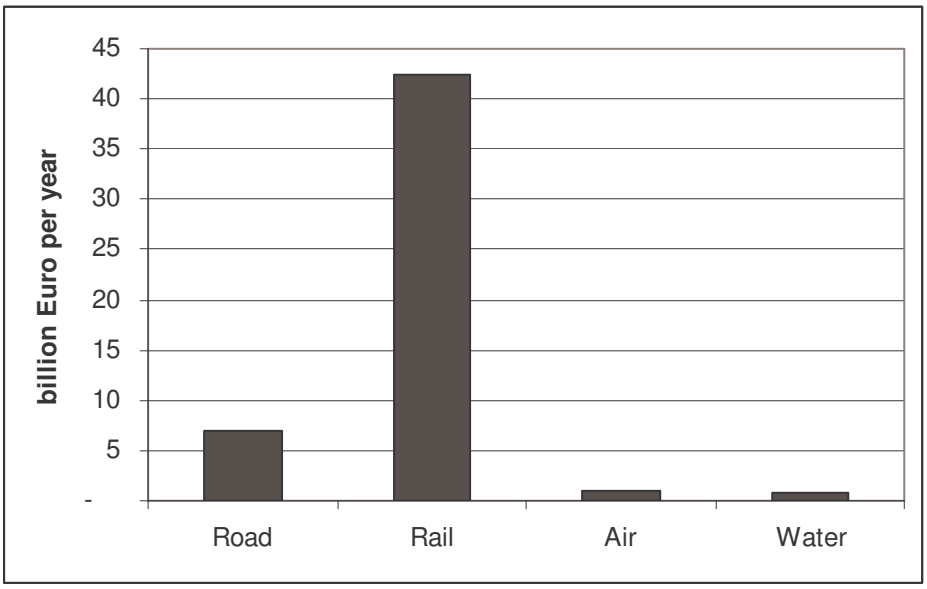
The policy conclusions to draw from the comparison in Table 3 are not obvious. If measured per passenger kilometre or per tonne kilometre (for freight), roads receive a much lower level

of subsidies than other modes. However, it is not agreed to what extent transport volumes should guide decisions regarding whether and to what extent a particular transport activity should be promoted through subsidies.

4.3 Public service obligations (PSO)

Public service obligations (PSO) are payments are made to public transit providers to guarantee service when it would not otherwise be profitable to do so. For example, public funds pay for service to sparsely populated regions or to the small number of transit users travelling late at night. Payments for PSO address the failure of the private market to provide transport services deemed necessary for the public good. The services provided are considered a public service provided in return for payment and thus fall outside the definition of subsidies used in this study. Figure 8 shows the value of PSO found in the course of this study. At just over 40 billion Euro per year, rail receives a much higher level of PSO than the other transport modes.

Figure 8. Value of PSO found, by mode (billion 2005 EUR)



Note: This graph is based on incomplete data; the total value of European transport PSO remains unknown. This note must accompany any use of this graph.

4.4. Environmentally beneficial subsidies

This study does not distinguish between subsidies considered environmentally beneficial and those considered environmentally harmful. Instead, the focus has been on quantifying transport subsidies in a systematic way to determine the overall level of transport subsidies in Europe. The environmental impacts of specific transport subsidies are, of course, important. This is true not only regarding whether a particular subsidy is considered environmentally harmful or beneficial, but also to what degree and in what particular ways it impacts the environment.

Many recent transport subsidies have been introduced with the aim of generating environmental benefits. Examples include: subsidies for vehicles utilising energy efficient and low-emission technologies; subsidies toward the purchase of alternative fuel vehicles; lower

tax rates on biofuels; consumer rebates to encourage the retirement of older vehicles; and mode-dependent commuter tax breaks that allow the costs of public transport for commuting to be deducted from personal income taxes at a higher rate than costs associated with commuting with a private car. Such environmentally beneficial subsidies, though certainly relevant from an environmental policy point of view, were not the primary focus of this study.

4.5. Quality of transport infrastructure

The availability, density and condition of the transport network have significant economic and environmental effects. Transport infrastructure shapes landscapes, urban patterns and settlement structures, and also determines the scope and structure of transport demand. Since most of the existing transport network has been funded by public budgets, there are some clear parallels to current transport subsidies. Though this study relies on past infrastructure costs to estimate annual infrastructure subsidies, the cumulative past subsidies to transport infrastructure are not included within the subsidies definition used in this study. Past infrastructure investments are instead regarded as “sunk costs”. Of course, the annual public expenditures for the maintenance, improvement and enlargement of infrastructure would be included in this study as transport subsidies, to the extent these are not financed by infrastructure-related charges.

4.6. Regulation and land-use policy

Transport is an important object of state regulation via legislation, planning and administration. There are manifold legal and technical requirements for all kinds of transport products, services and activities. These requirements are important for the development and use of infrastructure, vehicles, energy, services and have a large impact on the level and structure of transport. Technical and safety standards, for example, and their level of enforcement are much stricter for some modes (e.g. rail and aviation) than for other modes. This also has important effects on the quality and costs of transport services, transport demand and competition between modes.[14] For example, the provision of international rail services faces major competitive drawbacks due to differing technical standards, safety and signal systems, and licensing requirements for locomotive drivers. These differences hamper competition with road transport, particularly in the market for transporting freight, and also affect competitions among rail carriers.

Another important economically relevant aspect is land-use planning as well as urban and transport planning. These have strong influence on the development of transport in the long run. The transport and land-use planning of previous decades has shaped the existing urban structure and settlement patterns and thus transport needs of today. Planning and regulation also affect the attractiveness, average speed and competitiveness of transport modes rather directly. The most relevant example of policies encouraging private car use in cities is the allotment of attractive and easily accessible parking sites. Free or cheap parking and the right to park on the roadside or on public properties is a very common way of attracting private car traffic, and is seen by some as a type of “implicit” subsidy. Zoning and preferential access to some areas is another way of supporting specific modes and vehicles, as are progressive signal systems for public transport. However, such regulations and land-use policies are not included in the subsidy figures reported in this study.

[14] See IWW, INFRAS: Facts on Competition in the European Transport Market (FACORA), final report, Zürich, Karlsruhe, 9. November 2004, p. 82 ff.

Section 5. Assessment of the data quality

In this section, we describe the way the data presented in section 4 were gathered and processed. Furthermore, we assess the quality of the data regarding its availability, completeness and reliability. This assessment includes a discussion of some biases in the data and a description of the way double counting was prevented.

5.1. The data gathering process

As explained in section 3, different types of subsidies are distinguished in this report: on-budget subsidies to users, services or vehicle producers, infrastructure costs and charges, fuel excise taxes, and VAT on passenger services. In this section, we describe separately the processes of data gathering and processing for all these types of subsidies. In addition, we briefly discuss the way the data about external costs of transport were gathered and processed.

5.1.1. On-budget subsidies

The data gathering process for the on-budget subsidies consisted of three steps:

- Analysis of literature;
- Interviews with main international experts;
- Data search with national contact points

Most of the data was gathered in the first step. In this step, a number of literature sources were investigated, which were mostly selected from a literature database generated in the previous project on transport subsidies by Ecologic and TU Dresden (Ecologic, 2005). Simultaneous with this literature review, interviews were conducted with 10 international experts on the field of transport subsidies (see Annex 2). These interviews provide some additional literature sources. Finally, additional literature sources were also gathered by contacting some national representatives.

In total, about 60 literature sources were searched for subsidy data (a list of these sources is given in Annex 2), of which 15 sources contain data about on-budget subsidy levels. In Table 4 an overview of these sources is given, also indicating for which modes and incidences these sources provide data. The allocation of the data to modes and incidences is mainly based on the definitions of the subsidies as defined in the relevant literature sources, which may be more limited than the definition used in this report. However, an assumption was required regarding the data related to public transport. These data were assigned to “road”, unless they refer explicitly to public transport by rail (metro, tram), in which case they were assigned to “rail”. In addition, it was not clear to which transport mode some data were related. In these cases, the data were assigned to the transport mode “other” or “general”.

Table 4. Overview of key literature sources used

	Road	**Rail**	**Shipping**	**Aviation**
Means of transport	European Commission (2006) Eurostat (2006)	Eurostat (2006)	European Commission (2006) Eurostat (2006) OECD (2005)	Eurostat (2006)
Transport users	BMF (2006) Foltynova (2006) Link et al. (2002) Link et al. (2002) Nash et al. (2002)* Steininger (2005)	Foltynova (2006) Link et al. (2002) Link et al. (2003) Nash et al. (2002)*	Link et al. (2003)	Link et al. (2003)
Transport services	BMF (2006) CE (2004) Link et al. (2003) Nash et al. (2002)*	CE (2004) Link et al. (2002) Link et al. (2002) Nash et al. (2002)* NERA (2004) Schreyer et al. (2004)	BMF (2006) Link et al. (2003)	European Commission (2001) Link et al. (2002) Link et al. (2003) Nash et al. (2002)*
Other	Link et al. (2003) Steiniger (2005)	Link et al. (2002) Link et al. (2002) NERA (2004) Schreyer et al. (2004)	Link et al. (2002)	DIW (2003) Link et al. (2002) Link et al. (2003) Nash et al. (2002)
General	Link et al. (2003) Stuz (2003) Volterra Consulting (2003)	Link et al. (2003) Stuz (2003) Volterra Consulting (2003)	Link et al. (2003)	Volterra Consulting (2003)

** Nash et al. (2002) does contain data about transport subsidies. However, these data are not used in this project because exactly the same data are presented by Link et al. (2002; 2003).*

First, some data were presented as an aggregate amount over multiple years. For example, Madarassy et al. (2004) present the support of the EU to ISPA projects in Eastern European countries as the aggregate amount the countries received for the period 2000-2002. We allocated these subsidy levels to a single year, by assuming an average yearly amount for the median year (e.g. 2001 in the example above).

Second, we indicated whether the data refer to a PSO or not. Subsidies were considered to be a PSO whenever this was explicitly stated in the reports from which the data were obtained. This method is likely to underestimate the actual value of PSO.

5.1.2. Infrastructure costs and charges

Section 4 presents infrastructure costs and charges in the EU-15. These figures were all extracted from the UNITE studies (Link et al., 2002; 2003) and are adapted for this project. As was done for the on-budget subsidies, the figures were standardised to 2005 prices, using OECD consumer price indices. Furthermore, to allocate the costs and charges to the various transport modes, the same assumptions were used as in the case of the allocation of on-budget subsidies to transport modes.

In addition to infrastructure costs and charges in the EU-15, data were gathered about European infrastructure funds, like the TEN-T and ISPA funds. These data came from two sources: Madarassy et al. (2004) and Planco (2003). Like the other data, the European infrastructure funds were standardised to 2005 prices. The data on the Phare funds, delivered by Planco (2003), do not distinguish among different transport modes. Therefore, we assumed these funds to be allocated equally over all modes.

5.1.3. Differences in fuel excise taxes

The total fuel excise duties per mode have been calculated on the basis of energy consumption of the various modes and the actual fuel excise duties (both from the most recent EEA TERM fact sheets). For aviation and waterborne modes, no fuel excise duties exist at the moment. For rail diesel, there are fuel excise duties, but there is no consistent overview of these values in the various Member States. For countries where no data on fuel excise duties were found, fuel excise duty for rail diesel was assumed to be zero. This means that the estimates for the rail fuel subsidies represent an upper limit. Data on fuel subsidies do not cover the electric portion of rail transport where electricity charges may sometimes also be lower than the regular rates.

5.1.4. VAT on passenger services

To compute these differences, we gathered data about standard VAT rates and VAT rates for domestic and international passenger transport services from the European Commission (2006). By multiplying these differences by the receipts for the various modes, we estimated the total size of VAT reductions for passenger transport services. The receipt figures come from Eurostat (2006), and we have standardised them to 2005 price levels. However, these figures are related to both passenger and freight transport (except for ‘road’, for which separate figures for passenger transport turnovers are available). Additionally, no distinction between domestic and international transport was made. Therefore, we used expert guesses on both the share of passenger transport in total transport receipts and the share of domestic transport in total transport receipts (see Table 10).

Table 5. Expert guesses on the share of both passenger transport and domestic transport in total transport services receipts

	Road - passenger	Rail	Aviation	Inland shipping	Maritime shipping
Distribution of transport receipts over passenger and freight transport					
Share of passenger transport	100%15	30%	90%	1%	1%
Share of freight transport	0%	70%	10%	99%	99%
Distribution of total transport receipts over domestic and international transport					
Share of domestic transport	90%	90%	5%	50%	50%
Share of international transport	10%	10%	95%	50%	50%

Note: Percentage shares estimated by CE Delft.

5.2. Cleaning the data

The data gathered in the process described above contained double counting. In addition, monetary values were not corrected for inflation. Adjustments had to be made to the data before they could be combined into an estimated annual figure.

5.2.1. Preventing double counting

The method of data gathering which was used in this project could possibly lead to double counting of data. Three (potential) kinds of double counting were addressed in this project:

- *Data for exactly the same subsidy from different sources.* For example, Nash et al. (2002) and Link et al. (2003) both present the same figures with respect to rail subsidies provided by national governments for concessionary fares. To prevent double counting, data were removed so that only data from one source is included.

- *Data for the same form of subsidies from different sources*. Although these data are related to the same form of subsidies, it is not clear whether it refers to exactly the same subsidies. For example, the European Commission (2001) presents data about operating aid granted to shipbuilding. On the other hand, Eurostat (2006) data about support for R&D in the transport sector also contains expenditures for ship building and repairing. It is obvious that both types of subsidies are related. However, both sources do not present the same figures for the various countries. Without an in-depth analysis, it therefore remains unclear whether the figures presented by both sources refer to the same subsidies. To prevent possible double counting, we only included in the analysis the data from the source which provides the biggest or most complete values for a particular subsidy. A drawback of this prevention method for double counting is that the aggregate values for transport subsidies in European countries, as presented in Section 4, could provide an underestimation of the real values.

[15] For road there are separate turn-over data available for passenger transport services.

- *Data for the same type of subsidy for different years from the same source*. For example, Link et al. (2002; 2003) contain for most types of subsidies and countries figures for 1996, 1998 and 2005. To prevent double counting, we used only the most recent real figures in the analyses. Any *estimations* of subsidy levels (like the estimated figures for 2005 in Link et al. (2002; 2003)) are not included in the analysis.

5.2.2. Adjusting for inflation

The data presented in the various sources are related to different years. It was therefore necessary to control for inflation. Using consumer price indices per country from the OECD (2006), all subsidy levels were standardised to 2005 price levels. However, OECD (2006) did not contain price indices for Bulgaria, Estonia, Latvia, Lithuania and Slovenia. For these countries, an assumed price index was used, which is equal to the average price index of these four countries: Czech Republic, Hungary, Poland, and Slovakia.

5.3 Data quality

In this section we assess the quality of the data used in this project. The first topic addressed is related to the completeness of the data. Which data gaps can be identified? Secondly, some potential biases in the data are discussed.

5.3.1. Data gaps

Although this project covers a large part of transport subsidies in Europe, the quality of the data varies and some data gaps remain. It is important to note that not finding data on subsidies for certain modes or incidences does not necessarily refer to a data gap; it is also possible that this kind of subsidy does not exist at all. Some potential data gaps include:

- Subsidies for the production of trains and aircraft are only covered by Eurostat (2006). However, these sources provide only data related to R&D subsidies. Although it is not clear whether other subsidies for these industries do exist, this seems quite likely. For example, some car manufacturers or shipbuilders and their suppliers may benefit from other subsidies, such as business grants and corporate tax exemptions.

- With the exception of data on bus users, data on subsidies for users of motor vehicles (e.g. tax deductible amounts for vehicles) are only available for some countries. However, there is reason to believe that these kinds of subsidies exist in most European countries.

- With the exception of public transport services, no data on subsidies for road transport services are available. This concerns subsidies for car rental, car maintenance and subsidies for hauliers and carriers.

- The total value of infrastructure costs and charges of aviation and shipping used in this project is probably too low, because of incomplete data sets in UNITE (Link et al. 2002; 2003).

- Data with respect to fuel excise duties for rail are incomplete. There are data for only three countries on rail diesel excise duties. For the other countries, a current fuel excise duty for rail diesel of zero is assumed, making the subsequent subsidy estimate an upper limit. In addition, data on fuel subsidies does not cover the electric part of rail transport, where electricity charges may sometimes also be lower than the regular rates.

- Data on subsidies related to biofuels are only available in this project for two countries: Germany and the Czech Republic.

5.3.2. Biases in the data

The data about transport subsidy levels possibly contain some biases:

- Some literature sources provide relatively old data. It could be the case that this kind of subsidy no longer exists or has been replaced by another kind of subsidy for which data were also found. By using these data in our analyses, we possibly overestimate the values of some transport subsidies. Without further research it is not possible to correct for this potential overestimation.

- Fuel subsidies are estimated by calculating the difference between actual fuel excise duties and hypothetical fuel excise duties. For the latter, the following three references are used: average CO2 price in EU ETS; minimal excise road diesel excise duties according to the Fuel Directive; and actual road fuel excise duties. The results for the fuel subsidies are heavily dependent on the hypothetical fuel excise duty used. For example, the fuel subsidy for inland shipping in the EU-25 is 3.0 billion Euro per year if the road diesel excise duties are used as a reference, while the fuel subsidy equals only 0.3 billion Euro per year if the average CO_2 price in ETS is used as a hypothetical fuel-excise duty.

Section 6. Conclusions

Transport subsidies have significant effects on transport choices and the environment

Transport subsidies in Europe are significant. This study found European transport subsidies worth at least 160 - 290 billion Euro annually. Though not all transport subsidies can be labelled as environmentally harmful, some of them are. The distribution of subsidies among modes does not reflect their environmental performance. If excise-taxes on fuels are excluded as a form of infrastructure charge, road transport receives 125 billion Euro in annual subsidies—the highest level of subsidisation found in this study. Aviation, as the mode with the highest specific climate impact, enjoys significant subsidies in the form of preferential tax treatment, in particular exemptions from fuel tax and VAT, which add up to 27 - 35 billion Euro per year. Rail benefits from subsidies worth 72 - 73 billion Euro per year (not including payments for PSO). Some stakeholders justify these subsidies on environmental grounds as a means to foster a modal shift from less environmentally friendly modes, in particular from road and to some extent from aviation. For water-borne transport, 14 – 30 billion Euro in subsidies have been identified— the lowest level of subsidies for all transport modes.

Different modes benefit from different types of subsidies

It is notable that different types of subsidies are at work for the different modes of transport. For three of the four transport modes, there is one subsidy type that dominates all others: lower VAT in the case of aviation, fuel-tax exemptions in the case of shipping, and infrastructure funding in the case of road transport (if excise-taxes on roadway fuels are not considered a type of infrastructure charge). In each of these, one subsidy type accounts for more than all other subsidies combined. By contrast, while fuel subsidies are dominant in shipping, they do not play any big role in road and rail transport, and are only of some relevance for aviation. Reduced VAT, which is the dominant subsidy in aviation, is only somewhat relevant for roads, and marginally relevant for rail and shipping. On-budget subsidies are highly relevant for rail but are only a very small portion of aviation subsidies.

Environmental concerns are seldom the rationale for subsidies

Regarding the objectives for the transport subsidies found, environmental objectives are not a significant motivation for the bulk of subsidies, with the exception of subsidies to rail transport. For many subsidies, their environmental drawbacks are regarded by policy makers as being less important than their economic or social benefits. Rail subsidies are sometimes justified based on the better environmental performance of rail compared with the competing modes of road and air. However, not all subsidies for rail transport can be assumed to be environmentally beneficial.

In welfare theory, subsidies can be an instrument to internalise external benefits. If some specific transport services create external benefits (e.g. transport infrastructure that makes labour markets more flexible), targeted fiscal support may be warranted. However, this does not apply to transport subsidies outside infrastructure, where public-goods aspects are negligible. As a second-best solution, subsidies could be justified to balance the existence of external costs of competing modes, e.g. when an internalisation of the externality—for whatever reason—encounters strong political opposition. This characteristic does apply to some of the subsidies for rail, since its competing modes, particularly road and air, have significant higher external costs.

Subsidies are only one aspect of a policy environment that affects transport levels, and not necessarily the economically most relevant

Transport enjoys several privileges compared to other sectors. Besides the fact that transport is subsidised, there are several economically relevant issues related to transport. Transport generates external costs. In many cases these are not fully internalised, which means many transport activities do not pay their full costs. Furthermore, transport depends on a historical network of infrastructure, which though not considered a form of subsidy in the present, was predominantly financed by public budgets in the past and plays a large role in shaping present transport patterns. Additionally, transport modes can benefit extensively from regulations and land-use policies. And, as shown in this study, transport is fiscally supported by various forms of subsidies.

All of these aspects contribute to the attractiveness of transport in social and economic terms and are a main reason for the current level and structure of transport demand. The relevance of each of these factors differs among modes and is difficult to assess. An assessment of these issues is outside the scope of this study.

The data found represent a conservative estimate

The numbers given in this study represent a conservative, albeit indicative, estimate because not all types of subsidies in all Member States are covered. The numbers have been derived mainly from literature and expert consultations. However, the figures found indicate an order of magnitude. Future work on the transport subsidies issue could improve data quality and allow a much more complete picture to be drawn regarding the size, structure and distribution of transport subsidies in Europe.

Also, the availability of data on subsidies in a certain country does not necessarily indicate a prevalence of subsidies. It could indicate that there is simply much interest in the issue, or more transparent information on subsidies in that country. Likewise, a lack of data does not necessarily indicate an absence of subsidies, but could stem from a lack of interest or knowledge about subsidies. Estimations were conducted on the basis of different base years and time periods. Expert consultations were used to judge whether individual subsidies have persisted beyond that period, have been phased out or been replaced by other subsidies. Therefore, the annual data that were estimated also reflect the data availability and the level of expert judgement.

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Annex 1. List of sources consulted

The following table lists the literature sources consulted in the effort to obtain data on European transport subsidies. Of these, 15 sources provided data on subsidies.

Table A2-1. Literature sources consulted in this study

Author	Year	Title
NERA	2004	Study of the financing of and public budget contributions to railways
OECD	2005	Environmentally Harmful Subsidies, Challenges for reform
Madarassy et al.	2004	Heading down dead ends
Nash et al.	2002	The environmental impact of transport subsidies
Volterra Consulting	2003	Fiscal Treatment of Public Transport
DIW	2003	Financial Support to the Aviation Sector
CE	2004	The Price of transport - Overview of the social costs of transport
CE	2003	Environmentally harmful support measures in EU Member States
Krawaczyk et al.	2003	Financing Transport Infrastructure in Poland - past experiences and future plans
European Commission	2001	Ninth Survey on State Aid in the European Union
ECMT	2004	Road Haulage Taxation Database
OECD	2003	Environmentally Harmful Subsidies, Policy Issues and Challenges
Baumgartner	2001	Prices and Costs in the railway sector
Eurostat	2004	Panorama of transport, Statistical overview of transport in the European Union, Part 2
Pietrantonio, L. di, Pelkman, J.	2004	The Economics of EU Railway Reform
Zivec, B.	2003	Financing of Transport Infrastructure in Slovenia
NERA	2004	Evaluation of the Feasibility of Alternative Market-Based Mechanisms to promote low-emission shipping in European Union Sea Areas
Adler et al.	2002	Marginal cost pricing implementation paths to setting rail air and water transport charges
Perkins, S.	2004	Charging for the use of roads: policies and recent initiatives
UITP	2005	Mobility in cities
International Center for Integrated Studies (ICIS)	2005	Tax Flights – An Investigation into the Origin and the Development of the Exemption from various kinds of Taxation of International Aviation
European Environment Agency	2004	Energy subsidies in the European Union

Holland, M., Watkiss, P.	2002	Benefits Table database: Estimates of the marginal external costs of air pollution in Europe, BeTa Version E1.02a
EEA	2000	Environmental taxes: recent developments in tools for integration
Link et al.	2002	UNITE D5 (UNIfication of accounts and marginal costs for Transport Efficiency). Pilot Accounts-Results for Germany and Switzerland
Nijkamp, P., Ubbels, B.,Verhoef, E.	2002	Transport Investment Appraisal and the Environment
Gleister, S., Graham, D.	2003	Transport Pricing: Better for Travellers
Perkins	2005	Tax Incentives for fuel efficient Cars is Climate Change Priority
Ecotec et. al.	2001	Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States. Final Report
Link et al.	2003	UNITE D12 (UNIfication of accounts and marginal costs for Transport Efficiency). Pilot Accounts - Results for Belgium, Finland, Greece, Hungary, Italy, Luxembourg, Portugal, Sweden
Macário et al.	2003	UNITE D6 (UNIfication of accounts and marginal costs for Transport Efficiency). Supplier Operating Costs Case Studies
Doll et al.	2002	UNITE D7 (UNIfication of accounts and marginal costs for Transport Efficiency). Transport User Cost and Benefit Case Studies
Maibach et al.	2003	UNITE D16 (UNIfication of accounts and marginal costs for Transport Efficiency). Policy perspectives
T.I.S.	2002	Study on vehicle taxation in the Member States of the European Union
INFRAS	2000	Variabilisation and Differentiation Strategies in Road Taxation
Perkins, S.	2003	Reforming Transport Taxes and Charges
Environmental Assessment Institute	2005	Environmentally Harmful Subsidies – Linkages between subsidies, the environment and the economy
Ecotec et. al.	2001	Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States. Final Report
Krauth, V.	2005	Hidden subsidies for urban car transportation
Friederiszick et al.	2003	Evaluation of the effectiveness of state aid as a policy instrument: the railway sector
Link et al.	2002	UNITE D14 Future approaches to accounts
Link et al.	2003	UNITE D8 (UNIfication of accounts and marginal costs for Transport Efficiency). Pilot Accounts- Results for Austria, Denmark, Spain, France, Ireland, Netherlands and UK
Schreyer et al.	2004	Facts on Competition in the European Transport market (Facora)
Planco	2003	TEN Invest

Eurostat	2006	New Cronos database.
Speck, S., McNicholas, J., Markovic, M.	2001	Environmental Taxes in an Enlarged Europe - An Analysis and Database of Environmental Taxes and Charges in Central and Eastern Europe
Nash et al.	2003	UNITE - Final Report for Publication
BMF (Bundesministerium für Finanzen)	2006	Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2003 bis 2006 (20. Subventionsbericht)
Steiniger & Prettenthaler	2005	Reforming environmentally harmful subsidies in the transport sector in Austria. Summary
Foltýnová & Máca	2006	Promotion of the Biofuels Utilization in the Czech Republic by Using Economic Tools
STUZ (Society for Sustainable Living)	2003	Charles University Environment Centre in Prague: Alternative State Budget of the Czech Republic for the year 2004, with a perspective until 2013.
Statistiches Bundesamt Deutschland	2005	Finanzen und Steuern: Jährliche Einkommensteuerstatistik auf Basis der Geschäftsstatistik der Finanzverwaltung Sonderthema: Analyse der Entfernungspauschale.
Knight et al.	2000	Fair and Efficient Pricing in Transport -- The Role of Taxes and Charges. Study commissioned by DG TREN, EC DG TAXUD and EC DG ENV. April.
Sjoelin	2000	Environmental taxes and environmentally harmful subsidies. Statistics Sweden report prepared for DG Environment and EUROSTAT.
Köppl	2004	Reform umweltkontraproduktiver Förderungen in Österreich
Riedinger	2006	French Environment Ministry. personal communication.
EEA	2006	TERM factsheet 1 Transport energy consumption
EEA	2006	TERM factsheet 21 Fuel prices
Schreyer et al.	2004	External costs of transport
European Commission	2006	VAT rates applied in the Member States of European Community

Key experts consulted

Experts in the field of transport statistics and subsidies were consulted regarding data sources for transport subsidies. In addition, some experts participated in the expert workshop held by the EEA in September 2006. The following table lists the key experts consulted.

Table A2-2. List of experts consulted regarding European transport subsidies

Last	First	Institution
Barbosa	Pedro	European Commission, DG Environment
Delsalle	Jacques	European Commission, DG Environment
De Ridder	Wouter	Environmental Assessment Agency (MNP)
Doll	Claus	Fraunhofer-Institut für System- und Innovationsforschung (ISI)
Erba	Stefano	Milano Politecnico
Fernandez Balbin	Matilde	Ministry Public Works and Transport
Fergusson	Malcolm	Institute for European Environmental Policy
Friedrich	Axel	Umweltbundesamt
Gleissenberger	Eva	Federal Ministry for Agriculture, Forestry, Environment
Kjellingbro	Peter Marcus	Environmental Assessment Institute
Kleinegris	Winfried	DG TREN
Kövesti	Istvan	Institute for Transport Sciences
Laaser	Claus-Friedrich	Institut für Weltwirtschaft Forschungsgruppe ”Verkehrswirtschaft”
Liechti	Markus	T&E
Link	Heike	DIW Berlin
Lukács	András	Clean Air Action Group (CAAG)
Madarassy	Judit	CEE Bankwatch
Markandya	Anil	FEEM, Italy
Mederer	Wolfgang	DG Competition
Nägele	Andreas	DG Transport
Nash	Chris A.	Institute for Transport subsidies, University of Leeds
Oosterhuis	Frans	Institute for Environmental Studies (IVM)
Perkins	Stephen	OECD
Ponti	Marco	Milano Politechnico
Rietveld	Piet	VU Amsterdam Department of Spatial Economics
Rosenstock	Manfred	DR ENV
Rothengatter	Werner	Universität Karlsruhe Institut für Wirtschaftspolitik und Wirtschaftsforschung
Schlegelmilch	Kai	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
Schreyer	Christoph	INFRAS

Last	**First**	**Institution**
Steenblik	Ronald	Global Subsidies Initiative International Institute for Sustainable Development
Steinbach	Nancy	Eurostat
Steininger	Karl W.	University Graz
Sutter	Daniel	INFRAS
Walter	Felix	ECOPLAN

Annex 2. Brief guide to the data sources for European transport subsidies

This annex shows the data sources used, ranked by their contribution of total value of subsidies found. It thus shows which sources were the most important for this study. The text lists each key study, the total value of subsidies it contributed to the estimate of annual transport subsidies, and describes each study in more detail.

International Centre for Integrative Studies (2005). This study was the source for 4 data items with a total value of 68,891 million EUR. The data are from 2002 and cover financial support for airlines in the EU-15. This paper discusses the origins and development of the exemption of aviation from taxes and charges for the United States and Europe with a special focus on the Netherlands.

NERA (2004). This study was the source for 50 data items with a total value of 53,645 million EUR. The data are from 2001 and cover rail transport for EU-15, Norway and Switzerland. The study focuses on assessing the public budget contributions of the financing of railway undertakings and rail infrastructure managers, as well as on reviewing their financial position. It contains a large amount of data and gives a comprehensive overview of the situation in the European railway sector.

European Commission (2001). This study was the source for 62 data items with a total value of 26,029 million EUR. The data span the years 1995 to 1999 and cover the modes road, rail, shipping as well as combined transport for EU-15. This is the official report of the European Commission on state aid that is published regularly. It covers all sectors of society.

Link et al. (2003a). This study was the source for 23 data items with a total value of 16,177 million EUR. The data span the years 1996 to 1998 and cover all modes of transport. This study is part of the project UNITE (UNIfication of accounts and marginal costs for Transport Efficiency) that was funded by the European Commission within the 5th Framework. In this deliverable, the methodology and pilot accounts for Belgium, Finland, Greece, Hungary, Italy, Luxembourg, Portugal, Sweden are presented.

Schreyer et al. (2004). This study was the source for 12 data items with a total value of 10,995 million EUR. The data is from 2000 and cover all modes of transport. Typically referred to as the FACORA study, this study provides a comprehensive and methodological sound analysis of market distortions in the transport sector. Spatially it covers EU-15 plus Norway and Switzerland for all modes of transport. As it was carried out for the UIC there is a focus on gathering data that is relevant for policy activities of stakeholders in the railway sector. The following distortions are included: level of external costs, differences in taxation (VAT, fuel and vehicle taxes) and in pricing schemes, infrastructure investments, public sector contributions (e.g. for public transport and aviation as well as safety and social regulations). The data used is of high quality. Deficiencies in data quality and quantity are found only regarding public sector contributions.

Link et al. (2002). This study was the source for 6 data items with a total value of 10,867 EUR. The data span the years 1996 to 1998 and cover all modes of transport. This study is one part of the project UNITE (UNIfication of accounts and marginal costs for Transport Efficiency) that was funded by the European Commission within the 5th Framework. In this deliverable, the methodology and pilot accounts for Germany are presented.

Link (2003b). This study was the source for 31 data items with a total value of 6,385 million EUR. The data span the years 1996 to 1998 and cover all modes of transport. This study is

one part of the project UNITE (UNIfication of accounts and marginal costs for Transport Efficiency) that was funded by the European Commission within the 5th Framework. In this deliverable, the methodology and pilot accounts for Austria, Spain, France, UK, Netherlands, Ireland, Spain and Denmark are presented.

Madarassy et al. (2004). This study was the source for 34 data items with a total value of 3,562 million EUR. The data are from 2001 and cover all modes of transport for CEE-10. This study was produced by the CEE Bankwatch Network in order to analyse the investments of multilateral institutions in transport sector infrastructure in the Central and Eastern European (CEE) region. Recommendations are given for positive change in CEE transport sector financing.

DIW (2003). This study was the source for 8 data items with a total value of 3,173 million EUR. The data span the year 1998 and cover air transport. The aim of this study is to give an overview of the overall dimension of (on-budget and off-budget) aviation subsidies. Various definitions of subsidies are discussed ending with developing a definition for the work in the study. Based on this, a methodological framework for empirical analysis of financial support to the aviation sector is developed. This framework is applied to several case studies for the financial support of the aviation sector in Germany, France and the Netherlands.

BMF (2006). This report was the source for 13 data items with a total value of 2,070 million EUR. The data are from 2006 and cover the following modes: rail transport road, rail combined and shipping for Germany. The report is the official report of the German government about financial aid and tax relief measures, which is published regularly and covers all sectors of society. In the report, a rather narrow definition for the term of subsidy is used. One reason for this is the intention to avoid overlapping with other official reports.

Planco (2003). This study was the source for 130 data items with a total value of 1,826 million EUR. The data span the years 1991 to 1999 and cover all modes of transport for the EU-25. This study aims at providing the Commission with detailed technical information on the status of the TEN-T network, including investments that have been made and are foreseen until 2010 and an outlook ahead to the year 2015. It is a comprehensive data collection on current and future transport Infrastructure costs and investments, including an inventory of the technical Status of the trans-European transport network.

Eurostat (2006). This Excel sheet was the source for 21 data items with a total value of 828 million EUR. The data span the years 1999 to 2004 and cover the modes road, rail, shipping and air transport for Czech Republic, Estonia, Greece, Hungary, Poland, Portugal, Sweden, Slovenia, Romania, Spain, Austria and Germany. This source contains data tables from Eurostat website that are published regularly.

CE (2004). This study was the source for 4 data items with a total value of 441 million EUR. The data is from 2002 and cover the following modes: road and rail for the Netherlands.

OECD (2005). This study was the source for 3 data items with a total value of 185 million EUR. The data span the years 1998 to 2000. Subsidies for shipbuilding are included for Norway, Poland and Slovakia. The study is divided into three sections: definition and measurement of subsidies, developing a checklist for environmentally harmful subsidies, and political economy of environmentally harmful subsidies. It covers all sectors of society.

Krawaczyk et al. (2003). This study was the source for 1 data item with a total value of 184 million EUR for EU grants for transport infrastructure modernisation. The data span the year 1998 and cover the all modes of transport. The study gives an overview about the current situation in Poland concerning infrastructure policy and financing.

Foltýnová and Máca (2006). This study was the source for 4 data items with a total value of 78 million EUR. The data span the years 2001 and 2003 and cover the modes road and rail. This paper focuses on analysis of financial measures on promotion of biofuels production and consumption in the Czech Republic during the period of 1997 - 2003. The amount of financial support during this period is assessed by using the cost effectiveness analysis (CEA).

ECMT (2004). This study was the source for 4 data items concerning fuel tax refund of 0,02 to 0,04 Euro per litre in the countries France, Italy, Netherlands, Sweden. The data span the year 2004 and cover road transport. This table contains the ECMT database on transport charges in European countries. It covers vehicle taxes, transit or overstay fee, fuel taxes, fuel tax refund, vignettes and tolls.