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The Use of Subsidies, Taxes and Charges in the EU Transport Sectors

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Table of Contents

1. Introduction	1
1.1. Background.....	1
1.1. Study aims, approach and methodology.....	1
1.2. Structure of the report	2
2. Understanding Subsidies	2
2.1. Defining Subsidies	2
2.2. Objectives of Transport Subsidies.....	7
2.3. Negative Effects of Transport Subsidies.....	7
2.4. Why Undesirable Transport Subsidies Persist.....	8
2.5. Classifying Subsidies	8
2.6. Measuring Subsidies	11
3. Classifying Transport Subsidies.....	13
3.1. Classification by incidence	14
3.2. Classification by transport mode	14
4. Subsidies, Taxes and Charges in the European Transport Sector.....	17
4.1. Overview—Transport Subsidies in Europe.....	17
4.2. EU transport subsidies—by incidence	20
4.3. A closer view—subsidies by mode	23
5. Recommendations and Way Forward.....	39
6. References.....	42
Annex A. Environmentally Harmful Subsidies in EU Member States (Transport)	46
Annex B. Vehicle Purchase and Registration Charges in Europe	68

1. Introduction¹

1.1. Background

Ensuring fair competition is a key goal of the European Commission, and transport is no exception. The Commission has repeatedly argued that there is a need for fair and efficient pricing in the transport sector. However, the Commission recognises that competition is not only a matter of market regulations, as many of the effects of transport (positive as well as negative) do not have a market price or do not accrue to the people using transport. To compensate for these market imperfections, European governments have established various subsidies, charges and taxes. This report and accompanying database provide an overview of subsidies, taxes and charges in the European transport sector. While the main focus of the report is on subsidies, taxes and charges are considered in so far as different treatment of specific sectors or users through exemptions and tax breaks affects the level playing field among transport modes. In this report, exemptions taxes and charges will be subsumed under the term subsidy for brevity.

Some subsidies are rooted in quantifiable benefits or costs, but others have been introduced for political, historical, social or other reasons. As transport is merely a means to an end (access), it is no surprise that many subsidies were introduced to affect development in other sectors (e.g., foster economic development, prevent social exclusion, etc.). Over time, however, subsidies may simply remain because it can be politically difficult to change the status quo, even when the original reasons for the subsidy no longer exist.

If subsidies distort the level playing field for competing transport modes or increase travel demand above what it would otherwise have been, the subsidies may have negative impacts on the economy, the environment or both. For this reason, it is important to understand the nature and magnitude of European transport subsidies.

1.1. Study aims, approach and methodology

The main objective of this study is to provide some initial assessment of the nature and magnitude of fiscal measures for transport as a means of integrating environmental aspects into transport policy. The study's core tasks are as follows:

- **Review the literature** — provide an overview of the current state of research in the field of transport subsidies, taxes and charges, identifying what is generally known and where gaps in knowledge still exist.
- **Build a literature database** — create a tool that summarises what has been published on these issues in different countries and provides access to these studies.

¹ The authors would especially like to thank Claus Doll, Burkhard Huckestein, and Wouter de Ridder for reviewing this report and providing their helpful comments.

- **Summarise known facts** — describe, to the extent possible, the nature and scale of transport subsidies in the EU-25.
- **Make recommendations** — identify desirable follow-up activities for supporting the knowledge base on this issue.

The main focus of this study is on subsidies. Taxes and charges are also considered in so far as different treatment of certain transportation sectors or users through exemptions and tax breaks affects the level playing field among transport modes. External social and environmental costs, though they have significant impacts on the level playing field among transport modes, are not the focus of this study. It is also beyond the scope of this study to estimate an overall level of subsidies based on the literature.

1.2. Structure of the report

The theoretical aspects of the topic are explored in **Section 2**. This section provides definitions of the term “subsidy” and details the various ways subsidies can be classified. The section also briefly explains how subsidies work, why they exist, and how transport subsidies can positively and negatively affect the economy, society and environment. **Section 3** explains the classification scheme used in this report, breaking down transport subsidies along four dimensions: grantor, instrument, incidence and transport mode. The empirical portion of the study is described in **Section 4**, where current subsidies, taxes and charges in the European transport sector are presented. Lastly, **Section 5** identifies open questions in need of further research and proposes a way forward on the topic.

2. Understanding Subsidies

European governments have introduced a wide variety of transport subsidies, charges and taxes in their efforts to achieve various economic, social and environmental aims. Usually introduced in pursuit of desirable goals (e.g., better connectivity and lower travel times), such measures can have significant negative side effects when they distort the level playing field between transport sectors, increase overall travel demand, or harm the environment. Through its work on transport subsidies, the EEA is assessing the imbalances introduced by existing subsidies and evaluating the ability of different instruments to adjust the balance towards a more efficient distribution of subsidies, taxes and charges.

2.1. Defining Subsidies

The concept of subsidies is complex and there is no single definition of transport subsidies among European Union Member States. Definitions range from narrow (like those used in official budget statistics), to wider definitions that also include subsidy types commonly referred to as “implicit” or “indirect.” The choice of subsidy definition is not merely of academic importance—it is also critically important to policymakers. Efforts to reform subsidies will have varied effects (and quite possibly, opposing effects) depending on the definition used and the kinds of government support measures being reformed. For this reason, opposing interest groups try to scope the definition of subsidies in a way that suits their political aims. In an effort to be balanced and transparent, this study uses the

OECD's widely accepted definition of the term subsidy as a starting point and clearly states in the text whenever different definitions are used.

Subsidies. In this report, a subsidy is defined 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). Using this definition, several government support measures could be considered subsidies, including policies such as tax exemptions and rebates, preferential market access, limited liabilities, accelerated depreciation allowances, and selective exemptions from government standards.

Taxes and charges. *Taxes* are government-mandated payments that are unrequited—going to public budgets without any direct services in return. Taxes are sometimes *earmarked*—designated to pay for specific purposes, ones that are often related in some way to the taxed activity.² *Charges* are explicitly related to the provision of services to the payer of the charge, and can be paid to public or private entities. Highway tolls, congestion charges, and transit fares are all examples of transport charges. Taxes and charges are considered transport subsidies only to the extent that *differing* tax rates or *differing* charge amounts create market distortions that either 1) affect the overall level of transport activity, or 2) shift transport activity among sectors.

Provision of transport infrastructure. Infrastructure costs are an enormous portion of transportation costs and the frequently free access to transport infrastructure affects transport decisions and the level playing field among modes. Analysts agree that transportation infrastructure frequently meets the characteristics of a public good: it is largely non-exclusionary, meaning that it is difficult to exclude people from using infrastructure once its built; and it is partially non-rivalrous, that is, one person using the infrastructure does not prevent someone else from using it until it reaches its design capacity. Because of these characteristics, public goods cannot be efficiently provided by private markets and therefore require government provision. There is broad disagreement, however, about whether or not to consider all government payments for transport infrastructure as subsidies. As seen in Figure 1, the governmental definitions of subsidies do not consider provision of general infrastructure to be a subsidy, whereas some transport economists, such as Rothengatter (see Figure 2) do consider this a subsidy. Due to the critical importance of transport infrastructure costs to the level playing field, they are included in this report.

Other uncorrected market failures. Significant externalities (e.g., pollution and congestion costs) exist in the transport sector. Government failures to correct market imperfections such as these are also considered subsidies by some transport economists, and are referred to as hidden or implicit subsidies. For example, Nash (2002) and Rothengatter (2001) consider externalities a type of subsidy. However, external costs are generally *not* considered subsidies by economists for two main reasons: 1) externalities stem from a lack of government action, whereas subsidies are the results of a policy intervention, and 2) externalities are difficult to measure due to the assumptions, uncertainties, and significant economic modelling required (Honkatukia, 2002, p. 4). The focus of this report, however, is limited to those subsidies caused by policy interventions, excluding those subsidies caused by a lack

² An example of an earmarked tax is provided by the German ecotax, the revenue of which is used almost exclusively to support the government pension scheme, in order to reduce non-wage labour costs and stimulate employment.

of policy intervention. The EEA is investigating such market imperfections in other work, especially the TERM fact sheets on external costs.³

Public service obligations. In public transport, for example, payments are made to service providers to guarantee service when it would not otherwise be profitable to do so (e.g., to sparsely populated regions or late at night). These payments may be viewed as subsidies to transit riders, but are usually viewed instead as payments for public service obligations (PSO), which provide a real value of service for the money. Payments for ship building, aircraft exports, etc. are also interpreted in different ways, with respect to whether there is any service provided in return.

This report is based on the above definition of what constitutes a subsidy. Understanding other definitions of the term is useful, however, because many different definitions are encountered in the transport and environmental literature. Figure 1 provides a few other common definitions of the term and Figure 2 provides transport-specific definitions from the literature.

³ Transport and Environment Reporting Mechanism (TERM) is a set of indicators used to monitor the progress of the EU's transport and environment integration policies (EEA, 2005c).

Figure 1. Subsidy definitions and reporting—practical examples

SNA statistics. Data and material used in SNA⁴ statistics usually contain financial aids and tax reductions given to the different sectors of society. It should be noted, however, that there is only rarely uniform treatment in international statistics. In addition, reporting on subsidies is often embedded in general government reporting systems, so not all subsidy data are shown in the subsidy reports. Instead, the reports only reference other publications.

EU. Within the reporting system of the EU, all governmental financial transfers are seen as subsidies as long as they are subject to the supervision of the EU subsidy system and endanger (or threaten to endanger) free trade within the EU (COM, 2001b, pp. 12-15). As a consequence, a rather broad band of different types of subsidies is included, but only in certain cases. The resulting volume of EU subsidies is therefore much smaller as for the same sector within the national German reporting system, for example.

Germany. In Germany, the Report on the Subsidies of the Federal Government (German Ministry of Finance, 2003) discriminates only between the general type institution receiving the subsidy (with government institutions by definition not capable of receiving subsidies). As a consequence, all financial transfers for infrastructure costs in rail, road, waterways or air travel are never defined as a subsidy although user costs are considerably influenced by these large transfers. The same holds true for the German “Länder” or communities (and other EU Member States). Export guarantees and other types of financial transfers are defined as general administrative tasks and are thus not included as subsidies.

Kiel Institute for World Economics. The definition of the Kiel Institute in Germany, by contrast, does not define subsidies according to the addressee of the financial transfer or the type of effect but only on the types of goods which are favoured by the financial transfer (Laaser, 2001). Here, a subsidy is defined as financial support or as tax exemptions which distort the efficient allocation of resources. All public goods (e.g., infrastructure) are not perceived as subsidies although the institute discusses that controversy itself.

World Trade Organisation. The only definition of a subsidy that is both legally binding and agreed across sectors and across countries, is the definition the WTO established in the “Agreement on Subsidies and Countervailing Measures (SCM Agreement).” This definition is relatively comprehensive and includes the direct transfers of funds, fiscal incentives and the provision of goods and services other than general infrastructure. The WTO definition also serves as a starting point for many sectoral definitions used in practice. However, the SCM Agreement is an instrument of international trade law and, as such, may be unduly restrictive in terms of defining all subsidies which may, for example, be environmentally harmful. Three issues stand out as requiring further attention in this regard: market-price support, government-provided general infrastructure and the treatment of uninternalised externalities.⁵

⁴ SNA stands for “System of National Accounts,” which was jointly created by the UN, the Commission of the European Communities, the IMF, the OECD, and the World Bank to establish an international statistical standard for the measurement of the market economy (United Nations Statistics Division, 2005).

⁵ See OECD (2003) and OECD (2005).

Figure 2. Subsidy Definitions in the Transport Sector

Within the transport sector, some other definitions or frameworks have been developed for the treatment of subsidies. Three dominant approaches are given by Rothengatter (2001), Nash (2002) and Laaser (2001).

Rothengatter. W. Rothengatter, professor of economics at the IWW, University of Karlsruhe, starts with the definition of subsidies as “payments by public institutions to individuals or companies, for which the state or other institutions receive no goods or service in return” (Schreyer, 2004, p. 68). In his works, he proceeds to discuss pros and cons of a broader understanding of subsidies in the transport sector and suggests the following classification:

- Subsidies for the transport sector as defined in SNA statistics
- Further direct and open financial support from the state to the transport sector
- Indirect and hidden subsidies (Rothengatter, 2001, p. 176).

In his work, Rothengatter concludes that SNA statistics cover only the “tip of the iceberg” because many transport subsidies are classified differently and will be found in public payments to other sectors of society (e.g., support given to ship building and aircraft industries, payments for research, development and innovation in the transport sector, for structural aids and more) (Rothengatter, 2001, p. 177). Rothengatter concludes that the report on subsidies in the German federal government underestimates the real value of subsidies by a factor of three to four, that is, it covers only 25-33% of the total value resulting from a broader definition.

Concerning further direct and open financial support from the state to the transport sector, Rothengatter also considers “items which are reported in statistics but not defined as subsidies” (2001, p. 178). These items include investments in public transport infrastructure, dedicated aids paid to the railway sector and payments to support regional and local public transport. Concerning indirect and hidden subsidies, Rothengatter does include costs which are incomplete in statistical reporting such as overhead costs for public administrations, external costs of transport infrastructure and infrastructure use.

Laaser. In his work at the Kiel Institute for World Economics, Laaser (2001) extends the definitions given by Rothengatter even further. Subsidies are defined by asking “whether the financial transfer is necessary to prevent market failures.” As stated, public goods (defence, infrastructure) are not affected by this definition—they are never classified as subsidies. Therefore that definition—which is even questioned by the Institute itself—does not apply to road transport but it does apply, for example, to subsidies for privately financed maglev transport.

Nash. In Nash, et al. (2002) yet another method of defining subsidies is used, which proceeds in two ways. In the first method, Nash compares total social costs with total revenues, including infrastructure costs for each transport mode. This method indicates whether the “user pays principle” is being met and quantifies subsidies as the value of total costs above total revenues. In a second method, Nash addresses efficiency issues more directly and considers the relationship between marginal social cost and prices. The second method indicates whether short-term efficiency criteria are met and quantifies subsidies as the value of marginal social costs above the prices paid. Both these approaches seem clear and productive from a theoretical perspective, but difficulties may arise from data availability and interpretation.

2.2. Objectives of Transport Subsidies

Subsidies alter the attractiveness of certain activities, either in absolute terms (e.g., making it actually profitable for a private company to provide rail service) or in relative terms (shifting commuters to public transit by charging reduced transit fares). Thus, subsidies work by providing *incentives* to engage in certain activities. Policymakers use these incentive properties of subsidies for a wide variety of purposes and objectives, which can be primarily economic, social or environmental.⁶

- **Economic objectives.** Transport subsidies are often created to foster economic growth or regional development; support particular sectors of the economy; preserve or create jobs; reduce travel times or costs; reduce traffic congestion (e.g., through subsidising public transport); avoid the need for additional infrastructure; introduce new technologies into the market; help technologies mature; phase out old industries and technologies; or improve safety.
- **Social objectives.** Transport subsidies are often implemented to provide transport access for a broad segment of society. Subsidies may be used to grant access to distant services; satisfy “socially necessary services” (transport is often described as a “merit good”);⁷ support the travel needs of low-income groups and people with disabilities; allow people to reach new workplaces; stabilise community communications; develop socially disadvantaged regions; or improve safety.
- **Environmental objectives.** Transport subsidies are sometimes intended as a means to reduce the burden of transport on the environment. For example, subsidies may be used to reduce emission factors and introduce cleaner technologies; reduce air pollution; reduce noise emissions; reduce greenhouse-gas emissions; alter land-use patterns and separation effects; or improve safety.

Of course, there is some overlap in these categories. Safety, for example, spans all three groups, and health-related environmental objectives could also be viewed as social objectives. However, these three classifications are useful because they provide practical distinctions meaningful to policymakers and the public.

Annex A, based on the work of Leurs and Wit (2003), provides a detailed compilation and analysis of European transport subsidies. The main objective of each of the 143 subsidies listed is included.

2.3. Negative Effects of Transport Subsidies

Subsidising transport may distort the level playing field among different transport modes. Generally speaking, all transport subsidies shift users to subsidised modes or allow for more traffic. As transport users change their behaviour based on subsidies, the overall economic efficiency of transport may drop.⁸ Subsidising transport can also increase the overall demand for travel. When this occurs, resources are overused; traffic demand is too high, leading to congestion; too many resources go into

⁶ It is important to understand, however, that the actual effects of a subsidy can differ markedly from the stated objective behind that subsidy’s creation. Subsidies frequently have unintended consequences—ones that can develop and change over time.

⁷ A merit good is a good that has significant positive consumption externalities. Merit goods are often underconsumed since the externalities are not reflected in the consumption decision, consequently their consumption is supported by the government. Typical examples include education or sport.

⁸ Here, financial measures to correct clearly defined market failures or to correct for explicitly stated income inequalities are to be treated differently.

vehicles and infrastructures; investments are drawn from other sectors of the society; noise and pollution grow; greenhouse gas emissions increase; more accidents occur, increasing health and insurance costs; and more financed infrastructure is needed, yielding higher public interest payments. In addition, subsidies need to be administered, transaction costs increase, and protected industries rate of innovation and adaptation slows.

2.4. Why Undesirable Transport Subsidies Persist

Even when a subsidy is deemed undesirable for society, removing the subsidy can be extremely difficult due to a number of factors, commonly known as “lock-in mechanisms” (de Moor, 2002, p. 7):

- **Rent seeking.** Once a subsidy is in place, the beneficiaries receive the concentrated benefits of the subsidy payments. These beneficiaries have a vested interest in seeing the subsidies continue and often organise themselves politically. In contrast, because the costs of the subsidy support are generally diffused throughout society, there is little incentive for taking political action to end the subsidies. For example, industries benefiting from fuel-tax exemptions lobby governments to protect those exemptions.
- **Dependence.** Subsidies can become capitalised in the industries receiving them, with beneficiaries unable to survive economically without the subsidies.
- **International barriers.** Nations have little incentive to end subsidies to particular sectors if they cannot be sure that other nations will reciprocate and end theirs. Nations may also retain subsidies if foreign competitors’ lower costs are due to lower regulatory standards (e.g., lower pollution controls). To act alone would have the counteractive effect of harming one’s own competitiveness vis-à-vis others in the global economy.

2.5. Classifying Subsidies

Subsidies can be classified and measured in several ways and there are no international accounting frameworks that establish one recommended method (Steenblik, 2002, p. 3). Nevertheless, there are some commonalities among efforts to classify subsidies, with subsidy typologies typically based on:

- 1) what actor and activity initially receive the subsidy (*incidence*);
- 2) the method of delivering the subsidy (*instrument*);
- 3) how the subsidy reaches its intended beneficiary (*pathway of benefit*); and
- 4) the intended outcome of the subsidy (*purpose*) (Steenblik, 2002, p. 15).

Subsidies can also be grouped by

- 5) which public entity is granting the subsidy (*grantor*);
- 6) whether the subsidy constitutes a formal government expenditure (*budget impact*);
- 7) whether undesirable consequences of the subsidy (*drawbacks*) exist and,
- 8) how the subsidy mechanism actually works (*economic function*).

Table 1 provides an overview of these subsidy classification schemes. The second column in the table states the implied question behind the effort to classify subsidies in a particular way. Reading down

the list of questions, one can see that the classifications are arranged in a logical order for investigating and describing a particular subsidy. Table 1 also details the common categories used within each classification scheme.

Each classification method is useful for a particular purpose, and additional classification detail may be useful for investigating particular economic sectors. For example, in Sections 3 and 4 of this report European transport subsidies are classified according to *incidence*, with incidence further broken down by transport *mode*—road, rail, air, and sea. This breakdown is the most relevant to understanding transport subsidies’ structure and inter-modal effects.

Table 1. Ways of classifying subsidies

Classification Type	Implied Question	Common Categories
Grantor	Who grants the subsidy?	<ul style="list-style-type: none"> Public bodies at European level, nations, states or provinces, municipalities, semi-private, or private entities
Purpose	What are the intended outcomes of the subsidy?	<ul style="list-style-type: none"> Economic, social and environmental objectives
Instrument	Through what financial instrument is the subsidy delivered?	<ul style="list-style-type: none"> Budgetary expenditures, tax expenditures, market transfers, or under-pricing of public assets
Budget impact	Does the subsidy amount appear in government accounts?	<ul style="list-style-type: none"> On-budget or off-budget
Economic function	How does the subsidy mechanism function in economic terms?	<ul style="list-style-type: none"> Increasing revenue, lowering costs, or transferring funds
Incidence	What actor or activity <i>initially</i> receives the subsidy?	<ul style="list-style-type: none"> Consumers or producers in different economic sectors Outputs, inputs or value-added factors Transport modes
Pathway of benefit	How does the subsidy reach the intended beneficiary?	<ul style="list-style-type: none"> Direct or indirect Explicit or implicit
Drawbacks	What problems does the subsidy cause?	<ul style="list-style-type: none"> Economic, social and environmental problems

Table based on OECD (1998) and Steenblik (2002).

2.5.1. Using the OECD framework: on-budget vs. off-budget subsidies

Another classification method used in this study relies on the OECD approach of distinguishing mainly between on-budget and off-budget subsidies. In its previous work on energy subsidies the EEA has used the OECD framework, defining *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. . . . On-budget subsidies also include low interest or reduced-rate loans, administered by government or directly by banks with [a] state interest rate subsidy” (EEA, 2004, p. 11).

The EEA defines *off-budget subsidies* as “transfers to . . . producers and consumers that do not appear on national accounts as government expenditure[s]. They may include tax exemptions, credits, deferrals, rebates and other forms of preferential tax treatment. They may also include market access restrictions, regulatory support mechanisms, border measures, external costs, preferential planning consent and access to natural resources” (EEA, 2004, p. 11).

On-budget subsidies can be identified and quantified through examination of a government’s financial records. This is the key advantage of using a budget-based classification, and is preferable to the more commonly used method of classifying subsidies as either direct or indirect, which is highly ambiguous. Though subsidies can be clearly identified as either on- or off-budget, off-budget subsidies elude easy quantification due to the myriad assumptions, complex economic calculations, and detailed market knowledge required to assess these subsidies’ impacts.⁹

Risks of budget-based classification. The classification of transport subsidies into on- and off-budget categories could lead to potential problems. Because on-budget subsidies are easier to understand and quantify, there is some temptation to make them the primary focus of policy reform. However, on-budget subsidies are relatively more prevalent in public transport, whereas off-budget subsidies (as well as negative externalities) are relatively more prevalent for road transport. Were policymakers to focus the discussion on reducing on-budget subsidies (especially if infrastructure expenditures are excluded), the net effect of “subsidy reform” could be a reduction in public transport use and increased demand for roadway travel.

Table 2 provides a budget-based classification of various subsidy instruments. Only direct financial transfers are considered on-budget instruments. Off-budget instruments include preferential tax treatments, below-cost provision of government services, government regulations and lack of regulation in the case of market failures (EEA, 2004, p. 10). Table 2 also provides transport-specific examples of the various subsidy types listed.

⁹ Specifically, thorough analysis of off-budget subsidies requires assumption-based “what-if” scenarios, a complete and accurate tallying of the private and social costs and benefits, as well as the use of general-equilibrium economic models that allow analysts to examine the dynamic effects of changes in relative prices.

Table 2. Classification of subsidies by budget impact and instrument

Government intervention	Subsidy Types	Transport Examples
On-budget		
Direct financial transfers	Grants to producers or consumers	Subsidised transit fares
	Low-interest or preferential loans	Subsidised loans to public transport operators for new buses
Off-budget		
Preferential tax treatments	Tax rebates	Rebates for fuel-efficient vehicles
	Tax exemptions	Fuel-tax exemptions
	Tax credits	Tax credits for distribution centres
Below-cost provision of government services	Net public spending on infrastructure and network services	Provision of rail network; Police and emergency services
	Public research and development	Development of cleaner engines
Regulations	Price controls	Minimum legal prices for long distance travel (uncommon)
	Land-use regulations	Building permits granted only within certain distance from public transport stops.
	Market-access restrictions	Permits for railroad operation
	Preferential planning consent	New housing developments only if public transport is integrated
Failure to impose external costs	Environmental externalities	Lack of pollution taxes
	Congestion externalities	Lack of congestion charges

Table adapted from EEA (2004, p. 10)

2.6. Measuring Subsidies

The concept of subsidies is further complicated by the fact that they can be measured in different ways. In the case of transport subsidies, the measurement issue is particularly important. Calculations by Nash et al. (2002) are based on two different methods of measuring transport subsidies: 1) comparing total costs to total revenues, and 2) comparing price to marginal social cost. Nash shows that many economic factors inherent to transport (e.g., economies of scale, externalities, and non-linearity) yield important measurement differences between the two methods. Perhaps even more importantly, the practical effect of “subsidy reform” can achieve opposite results. Subsidy reform that tries to set total revenue equal to total cost would actually increase road use and environmental costs, whereas subsidy reform based on setting prices equal to marginal social cost would decrease road use and environmental cost.

In his summary of OECD work on subsidies, Honkatukia (2002, p. 7) describes five different methods of subsidy measurement. This multiplicity of measurement approaches (as well as the multiple subsidy definitions and classifications possible) make aggregating the monetary value of various subsidies extremely difficult, and frequently impossible.¹⁰

¹⁰ Double counting also becomes an important issue when subsidies are combined across sectors. For example, fuel-tax subsidies affect both the energy and transport sectors. Though such subsidies can legitimately be

Table 3 shows three different methods of subsidy measurement most relevant to transport and compares their various strengths and limitations. The first approach given—on-budget aggregation—follows the OECD’s on-budget classification and aggregates actual budget expenditures. This method has the advantage of providing relatively “hard” numbers, but does not capture the value of off-budget subsidies. The second method—total social costs vs. total revenues—attempts to quantify to what extent users pay the total costs of transport. This method has the advantage of being straightforward to understand, politically relevant and conducive to addressing equity issues (Nash, 2002, p. 2). However, quantifying off-budget subsidies is difficult and the resulting figures involve large uncertainties. Lastly, Table 3 summarises the marginal social cost vs. price method, which is the theoretical ideal for maximising social welfare, but is limited by difficulties and uncertainties involved.

With regard to the second measurement method—total social costs vs. total revenues—another critical point of discussion comes into view. If transport users pay a certain charge for the infrastructure costs, this of course is seen as an exchange for the service they get from using this infrastructure. If the user however pay taxes that are *not earmarked* while using the infrastructure (annual taxes, fuel taxes, etc.), then it is unclear what portion of these taxes, if any, should be treated as an exchange for the service granted by the infrastructure. This question is crucial. For example, Nash et al. (2002) treat all taxes as “equivalent for the service” while others perceive taxes as being totally independent from infrastructure use. The question of how to treat road user taxes, fuel taxes, etc., is therefore crucial to any effort to evaluate level or non-level playing fields. The simple question whether those taxes on road transport are interpreted as “general taxes” or “user charges” determines the conclusions of the discussion rather strongly. Given that some countries use earmarked taxes and some do not, the chosen analytical approach has important effects on the level playing field among countries.

included as subsidies within each sector, a double-counting issue emerges whenever energy and transport subsidies are aggregated into a single total.

Table 3. Comparison of three approaches for quantifying subsidies

Description	Strengths	Limitations
On-budget Aggregation		
Quantifies budgeted transfers associated with government programs.	Provides "hard" numbers due to reliance on actual budget data.	<ul style="list-style-type: none"> • Does not capture full subsidy value due to an inability to measure off-budget subsidies and dynamic market effects. • Findings could lead to transport-subsidy reform that increases environmental costs and is economically inefficient.
Total Social Cost versus Total Revenues		
Estimates the difference between total social cost and total revenues.	Helps policymakers to address equity problems and issues of political relevance	<ul style="list-style-type: none"> • Measuring off-budget subsidies is sensitive to assumptions and results have large uncertainty ranges. • Findings could lead to transport-subsidy reform that increases environmental costs and is economically inefficient.
Marginal Social Cost versus Price		
Estimates the difference between marginal social cost and the price paid.	<ul style="list-style-type: none"> • Most comprehensive method because externalities and dynamic market effects are included. • Helps policymakers to maximise economic efficiency and reduce environmental harm. 	<ul style="list-style-type: none"> • Intensive data and modelling needs. • Method is sensitive to assumptions and results have large uncertainty ranges. • Concept of "subsidy" extends beyond the OECD definition (e.g., includes externalities)

Table based on Honkatukia (2002, p. 7)

3. Classifying Transport Subsidies

In Section 2 of this report, subsidies are defined and described in a general way applicable to subsidies in many different sectors. In Section 4, this report details some of the actual transport subsidies existing in European countries, classifying them by incidence and mode.

This section acts as a bridge between Sections 2 and 4, specifying the definitions and classifications appropriate to transport, and providing the analytical framework for Section 4's detailed and quantitative investigation. Section 3.1 describes five *incidences* relevant to transport—infrastructure, vehicles, means, fuel and other. Section 3.2 describes four *modes*—road, rail, water and air—breaking these down further based on the distinctions of passenger vs. freight and public vs. private.

3.1. Classification by incidence

Classifying subsidies according to who or what initially receives them helps clarify the kinds of activities being subsidised and the incentives being created. In the case of transport, subsidies can be provided to infrastructure; vehicles or other means of transport; transport users; transport services and transport fuel (see Table 4). Examining the economic characteristics of these incidences (e.g., whether they are related to average or marginal costs) can help analysts and policymakers to understand the nature of the incentives being created.

Additional transport subsidies may have incidences that are less directly related to transit. Examples of such subsidies include subsidies to housing, development and trade. Though the incidence of these subsidies lies outside the transport sector, such subsidies flow through to benefit certain transport-related activities. Numerous overlaps exist also with energy subsidies: all subsidies related to an energy carrier that is used in transport would also qualify as transport subsidies. Examples include tax exemptions for bio-fuels found in some EU countries, or preferential treatment for natural gas and diesel as compared to the taxation of petrol.

Table 4. Classification of transport subsidies by incidence

Incidence	Description
Infrastructure	Public spending on transport infrastructure network (roads, rail, waterways, airports and air traffic control) including investment, running and hidden costs; charges for use or access to infrastructure
Means/Vehicles	Subsidies and charges for production, distribution, use and disposal of vehicles
Users	Subsidies and charges for transport provisions and activities of companies, households, private and public institutions
Fuel	Subsidies and charges for production, distribution and use of fuels
Other	Subsidies and charges with indirect impact on transport demand (i.e. for housing, building, settlement, regional development, trade, distribution)

Table based on Burkhard Huckestein, European Environment Agency, personal communication, 31.08.05.

3.2. Classification by transport mode

One of the main effects of transport subsidies is that they may increase market distortions between modes. Understanding how different transport modes are subsidised is thus extremely useful for analysts and policymakers. Table 5 breaks down subsidies by the four key modes—road, rail, air and water—and disaggregates each mode further based on the key uses of the mode (private transport, public transport, freight, etc.).¹¹ As mentioned earlier, charges are considered in this report whenever they are differentially applied. Table 6 offers a glimpse of how transport charges may have a distorting effect on the various modes. The breakdown by incidence parallels that of Table 5, allowing comparisons useful to analysts and policymakers interested in levelling the playing field between modes.

¹¹ Note that the two-dimensional classification shown in Table 5 is still an incidence-based classification, as “mode” is just a special case of incidence.

Table 5. Classification of transport subsidies by mode and incidence

Incidence	Mode								
	Road			Rail		Water		Air	
	Car and Motorcycle	Bus and Taxi	LDV and HDV	Passenger train	Freight train	Maritime shipping	Inland shipping	Passenger planes	Air freight
Infrastructure	<ul style="list-style-type: none"> Net public spending (i.e., exceeding revenues of user charges for road infrastructure) Subsidies for road constructing and management companies 			<ul style="list-style-type: none"> Net public spending on rail infrastructure Subsidies for rail track companies 		<ul style="list-style-type: none"> Net public spending for waterways, harbours (incl. access) and other shipping infrastructure 		<ul style="list-style-type: none"> Net public spending for airports (including access) and air traffic control 	
Means/Vehicles	<ul style="list-style-type: none"> Subsidies for road vehicles (i.e., to vehicle production, distribution use and disposal) and related services (e.g., repair) 			<ul style="list-style-type: none"> Subsidies for production, distribution, use and disposal of railway cars and locomotives 		<ul style="list-style-type: none"> Subsidies for production, distribution, use and disposal of ships and vessels 		<ul style="list-style-type: none"> Subsidies for production, distribution, use and disposal of aeroplanes 	
Users	<ul style="list-style-type: none"> Subsidies for road transport services (taxi, bus, freight transport) and for user of vehicles (i.e. purchase privileges, depreciation, tax-deductible amount for vehicles, etc.) 			<ul style="list-style-type: none"> Subsidies to railway companies Public transfers (in cash or in kind) to rail users (e.g., cheaper train tickets) 		<ul style="list-style-type: none"> Subsidies to shippers and hauliers 		<ul style="list-style-type: none"> Subsidies to airlines and their services (reduced VAT on tickets, duty free shopping, etc.) 	
Fuel	<ul style="list-style-type: none"> Subsidies for production, distribution and use of fuels (e.g., biofuels, agro-diesel, CNG, etc.) Mineral-oil tax reduction 			<ul style="list-style-type: none"> Subsidies for electricity and diesel for railway cars and locomotives (e.g., reduced taxes) 		<ul style="list-style-type: none"> Subsidies for shipping fuels (e.g., no mineral oil tax for maritime and inland shipping) 		<ul style="list-style-type: none"> Subsidies for aviation fuels (no mineral-oil tax on kerosene and avgas (for commercial use)) 	
Other	<ul style="list-style-type: none"> Subsidies for residential buildings Distance-oriented income tax reduction, etc. 		<ul style="list-style-type: none"> Subsidies for settlement, trade, distribution, etc. 	<ul style="list-style-type: none"> Reduced income tax for commuters 	<ul style="list-style-type: none"> Subsidies for bulk industries 	<ul style="list-style-type: none"> Export grants, etc. 	<ul style="list-style-type: none"> Subsidies for bulk industries 	<ul style="list-style-type: none"> Export grants 	?

Table based on Burkhard Huckestein, European Environment Agency, personal communication, 31.08.05.

Table 6. Classification of transport charges by mode and incidence

Incidence	Mode								
	Road			Rail		Water		Air	
	Car and Motorcycle	Bus and Taxi	LDV and HDV	Passenger train	Freight train	Maritime shipping	Inland shipping	Passenger planes	Air freight
Infrastructure	<ul style="list-style-type: none"> Road pricing, parking fees; Indirect user charges (e.g., for road access) 			<ul style="list-style-type: none"> User charges; Indirect user charges (e.g., for side track) 		<ul style="list-style-type: none"> Harbour dues, charges for coast guard and meteorological services; Indirect user charges (for access to waterways) 		<ul style="list-style-type: none"> LTO fees, charges for air traffic control, meteorological services, security, etc. 	
Means/Vehicles	<ul style="list-style-type: none"> Charges for road vehicles (e.g., vehicle tax, purchase tax, VAT, disposal charges); Liability 			<ul style="list-style-type: none"> Charges for railway cars and locomotives (if any) 		<ul style="list-style-type: none"> Charges for ships and vessels (e.g., taxes and VAT on private boats, liability, disposal, etc.) 		<ul style="list-style-type: none"> Charges for aeroplanes (including liability, disposal, etc.) 	
Users	<ul style="list-style-type: none"> Charges for car rental, maintenance, repair, etc. (e.g., VAT) 	<ul style="list-style-type: none"> Charges for bus- and taxi companies, and their services 	<ul style="list-style-type: none"> Charges for hauliers and carriers, and their services 	<ul style="list-style-type: none"> Charges for railway companies and their services 		<ul style="list-style-type: none"> Charges for shipping companies; Tonnage tax 		<ul style="list-style-type: none"> Special charges for airlines and their services 	
Fuel	<ul style="list-style-type: none"> Charges on fuel (e.g., mineral-oil tax) 			<ul style="list-style-type: none"> Charges on mineral-oil, electricity 		<ul style="list-style-type: none"> Charges on shipping fuels (mineral-oil tax) 		<ul style="list-style-type: none"> Charges on kerosene and avgas 	
Other	<ul style="list-style-type: none"> Charges against urban sprawl (e.g., land taxes, rateable values for real estate taxes, charges for house and estate owners and companies depending on access to roads, etc.) 				<ul style="list-style-type: none"> Charges to rail-affiliated sectors 	<ul style="list-style-type: none"> Tariffs and customs 	<ul style="list-style-type: none"> Charges for bulk industries 		<ul style="list-style-type: none"> Tariffs and customs

Table based on Burkhard Huckestein, European Environment Agency, personal communication, 31.08.05.

4. Subsidies, Taxes and Charges in the European Transport Sector

This section of the report provides an overview of the current state of knowledge regarding the nature and monetary value of transport subsidies in Europe. Using the classification structure introduced in Section 3, European transport subsidies are broken into groups based on the subsidies' incidence and mode. The text and table notes in this section indicate which subsidy definitions and classifications are used to generate the figures presented.

In order to identify the most relevant types and examples of subsidies, some 200 studies and reports were evaluated more closely. Special concern was given to sources not officially published but still available. A small number of experts were also interviewed to provide additional literature sources. In the end, about 110 publications were included in the database.

Due to the restricted scope of this study it should be noted that this report reiterates the findings of other studies without validating the information. Some of the data may be outdated by now. It was not possible to carry out comparisons or summaries of and between figures and studies due to the various definitions and methodologies used throughout the literature.

In order to increase the transparency of transport subsidies, the on- vs. off-budget distinction was useful (see EEA 2004). It should be noted, however, that in terms of the total value of transport subsidies, on-budget subsidies in transport have less impact than on-budget subsidies have in other sectors. In transport, the level playing field is more distorted by other factors, such as the (lack of) internalisation of external costs, different types of infrastructure provision and financing, unequal framework conditions and indirect or hidden subsidies which are partially on- or off-budget.

4.1. Overview—Transport Subsidies in Europe

Transport subsidies in the EU are widespread and have significant impacts on both the overall level of transport and the modal choices made by transport users. Despite the important influence of transport subsidies, the dynamic effects of the system of subsidies in Europe is still poorly understood. There is some agreement that particular transport subsidies are undesirable due to their economic, environmental, and social effects. Economic and scientific research can provide helpful insight into which subsidies are most undesirable and recommend strategies for reform.

Four recent reports are especially relevant to this effort.

- In November 2002, the OECD held a conference in Paris on the topic of environmentally harmful subsidies. One study paper for the conference (Nash, 2002) provided an overview on the environmental impact of transport subsidies—findings described in further detail in chapters 4.2 and 4.3.
- Research recently published by Kjellingbro and Skotte (2005) “guesstimated” the level of subsidisation to road transportation at roughly 225 to 300 billion USD per year worldwide. In this sum, so called “perverse subsidies”—subsidies that are harmful both to the environment and to the economy—of about 110 to 150 billion USD per year are included.
- An important study on subsidies, especially for road traffic, is the ICLEI-Study on hidden subsidies in the budgets of communities: How much does your municipality invest in traffic? ICLEI developed worksheets to uncover hidden subsidies towards motorised private transport (see Krauth, 2005).

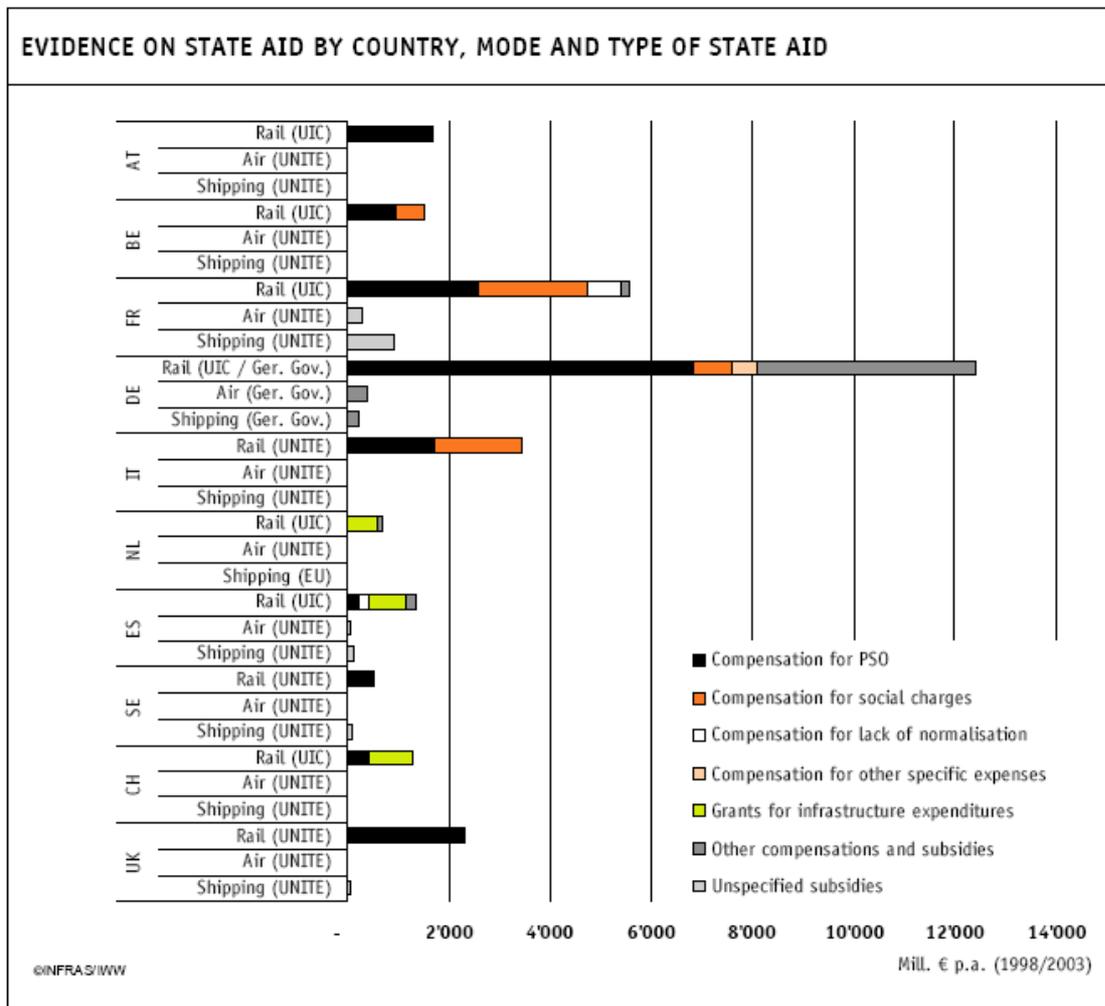
- In their study for DG Environment, Leurs and Wit (2003) developed a list of environmentally harmful support measures in EU Member States. This list covers several sectors of society as well as the transport sector and shows that subsidies are an important issue in transportation, as well. Leurs and Wit provide 143 examples of different transport subsidies in 12 different states of the EU. Of course, some of these environmentally harmful measures may provide beneficial effects in other fields of society or when other objectives are considered, but the list points to a regulatory and economic system with significant negative impacts on the environment. Annex A details the support measures from the Leurs and Wit study that are related to transport.

The differences among the studies with regard to subsidy definition are rather large. In the work of Nash, general efficiency and equity considerations (both at the national level and at the level of individual vehicles) are addressed, but the OECD definition is not adhered to. Kjellingbro and Skotte do not explicitly address the OECD definition, concentrating instead on the economic and social aims of the policy intervention. The work of Leurs and Wit is focused on any “support measures” of governments at any level which are “harmful to the environment,” with advantages to users and producers only relevant to the extent that users or producers generate some environmentally harmful reaction.

What is the overall level of transport subsidisation in Europe? The order of magnitude of several estimates of subsidisation in transport are not too different from each other. To give an example, in a fact-finding study by IWW of Karlsruhe University and INFRAS in Zuerich (IWW - INFRAS, 2004), evidence on “state aids” was given for 10 European countries and for rail, air and shipping transport. As a result, it was concluded that average subsidies per passenger-kilometre (or per ton-kilometre) are in the range of 1 to 10 € per 1,000 pkm or tkm. This amounts to average subsidies of up to one cent per kilometre travelled by a person or by a good of 1 ton weight. This is an average figure—the actual subsidy for certain flights or vehicles or polluting transport modes could be much higher. FACORA includes distortions such as level of external costs, unequal taxation, infrastructure charging and infrastructure cost recovery, public sector contributions and subsidies as well as different social standards. Some of these (e.g., the effects of different social standards) are not the focus of this study, so the corresponding figure for subsidies according to the OECD method would be smaller.

Some figures from the FACORA research provide a good first impression on the level and size of transport subsidies and market distortions. Figure 3 shows different state aids by country, transport mode and type of aid. Transfers for Public Sector Obligations (PSO), social charges, and infrastructure subsidies constitute the largest types of aid. Note that road transport is not included in Figure 3.

Figure 3. Evidence on State Aid by country, mode and type of state aid



Adapted from FACORA (IWW - INFRAS, 2004, p. 71). Based on the subsidy definition of Rothengatter (2001). The figure contains both on-budget and off-budget subsidies as defined by OECD.

Though there are some figures available concerning transport subsidies, the data show a huge variety regarding, 1) which costs and revenues of transport are included in the concept of subsidy, and 2) how the particular components of subsidies are calculated. For example, there are great differences between external costs calculated in UNITE and in the UIC-study carried out by INFRAS/IWW.

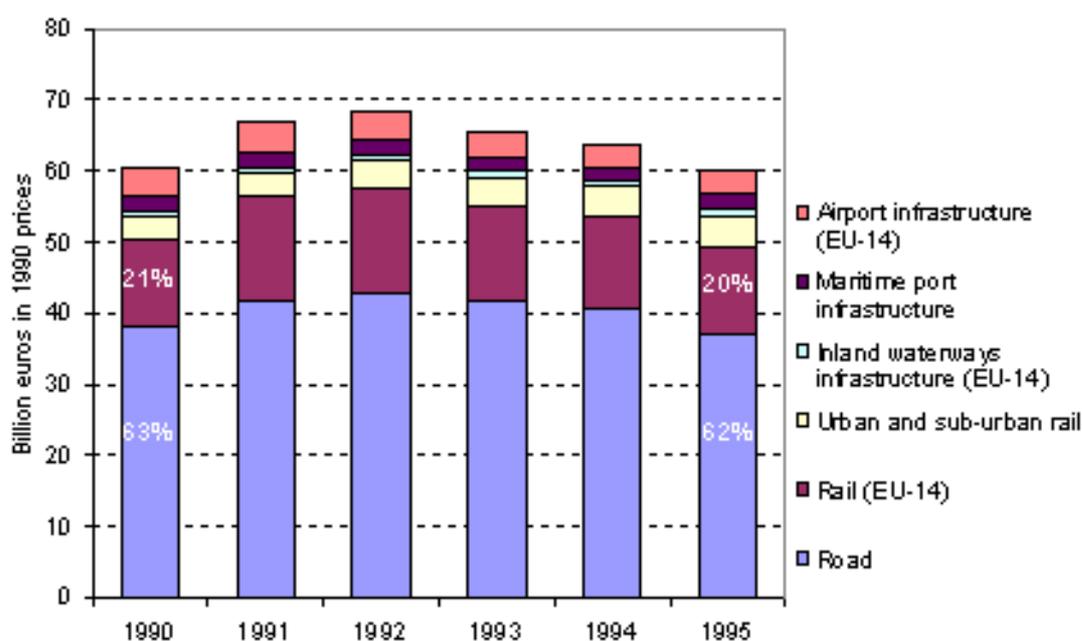
The literature database provided to the EEA in conjunction with this report offers further details about transport subsidies within the EU. The database allows users to search the relevant literature for transport subsidies based on incidence, mode and country, as well as other important attributes. The remainder of Section 4 is devoted to surfacing the most important findings from that literature, categorising them by incidence and mode.

4.2. EU transport subsidies—by incidence

4.2.1. Infrastructure costs

One of the most important questions in transport policy is how the user is charged for the use of the infrastructure and how that infrastructure is financed and refinanced. In recent decades, investments in transport infrastructure in Europe were considerable. In the EU-15, for example, motorway length has tripled while the size of the rail network has declined by 19,000 km from 1970 to 2001 (Madarassy, 2004). The data published by EEA show the distribution of the funds among the different transport modes (see Figure 4).

Figure 4. Infrastructure investment EU by mode, 1990 to 1995, and shares in 1990 and 1995 of rail and road



Source: EEA (2005b). All figures in the figure are off-budget subsidies as defined by OECD. Infrastructure costs are not a subsidy in the understanding of the WTO's SCM Agreement.

Figure 4 demonstrates the size of the investments. Some 60 billion € were spent annually in those years, mainly for road transport. Information on transport infrastructure investment in the Central and Eastern European (CEE) countries is more difficult to obtain. CEE Bankwatch Network published a study entitled “Heading down dead ends: Transport sector financing in Central and Eastern Europe” which provides information on investments of multilateral institutions in transport infrastructure in those countries (see Madarassy, 2004). The study shows that the investments in transport infrastructure made today focus on motorway construction projects and international transport corridors. Therefore, the authors recommend a shift of investment policy in the CEE countries towards more investment in railways and public transport.

When discussing transport subsidies one has to ask what percentage of transport infrastructure costs are covered by transport users. In many states or modes no transport infrastructure costs are paid by direct user charges at all. And in those cases where transport users do pay some costs, the total monetary value of these payments is frequently unclear.

Infrastructure costs are high both in rail and road transport and smaller in air transport. Any comparison among rail and road should be made carefully as the modes cannot completely substitute for each other. Public transport modes serve the entire public while individual motorised transport modes can only be used by a certain group of people. Thus, rail or bus transport receives compensations for PSO while individual road transport generally does not. With respect to rail infrastructure, the cost of rail infrastructure is only rarely recovered through rail user charges. While this is seen as an unfair advantage of rail travel in some studies, others argue that private and public transportation systems are not competing in one market and cannot substitute for each other. Public systems require organisations, operators, few but large (and thus costly) vehicles, and they are (unlike road travel) open to everybody, so they guarantee access, allow for social inclusion, and are environmentally less damaging. Thus, it is argued, rail infrastructure costs should be supplied to a greater extent by the public. It should be borne in mind, however, that public transport does not always help reduce private transport (and the associated environmental problems) but also produces environmental problems itself.

4.2.2. Fuel taxation

The question of different taxes on fuels (or energy) in different modes or countries is an important one for transport decisions. Table 7 give an impression of the different taxation levels, showing the considerable variation among rates. Air transport (including all international flights and direct inland flights to/from international flights), as well as inland waterway shipping are generally exempt from fuel taxation. Railways often pay reduced taxes for diesel fuel, and in some countries railways are exempt from electricity taxes. The taxation on diesel fuel is lower than petrol in most countries, which can be seen as a subsidy.

Alternative fuels like biofuels, Liquefied Petroleum Gas (LPG), and Compressed Natural Gas (CNG) are treated differently in the various European countries. The White Paper “Fair Payment for Infrastructure Use” of the European Commission (COM, 1998) makes this fact clear. In some countries (Germany, for example), biofuels are exempt from any taxes while LPG and CNG are taxed with reduced rates. The United Kingdom has a partial excise-tax exemption for biofuels. However, the Council Directive 2003/96/EC challenges the Member Countries to comply with the Community minimum taxation levels.

Table 7. Energy and fuel taxes or duties in Europe

Taxes and Duties on Fuel							
	Fuel duties on Diesel (September 2003) in €/l (Sources: BMF 2003/BGL 2002)			Fuel duties on unleaded petrol (February 2002) in €/l (Sources: www.euractiv. com of 25.4.2003)	Fuel duties on kerosene (2000) in €/l (Sources: EEA 2000)	Fuel duties on LPG (2002) in €/kg (Sources: BMU 2003)	Electricity tax (2002) in €/MWh (Sources: UIC survey, DB)
	Road	Rail	Water ^{*)}	Road		Road	Rail
Austria	0,28	0,069	4)	0,41	0,28	0,26	8,72
Belgium	0,29	0	n.a.	0,51	0,55	0	3,00
Denmark	0,37	0	n.a.	0,55	0,35	0,47	n.a.
Finland	0,32	0,316	n.a.	0,56	0,30	0	4,20
France	0,39	0,057	n.a.	0,58	0,37	0,11	3,30
Germany	0,47	0,409	4)	0,62	0,50	0,16	11,42
Greece	0,25	0	n.a.	0,30	0,25	0,10	n.a.
Ireland	0,33	0,013	n.a.	0,40	0,34	0,10	n.a.
Italy	0,40	0,121	n.a.	0,54	0,34	0,28	0,02
Luxembourg	0,25	0	n.a.	0,37	0,29	0,10	n.a.
Netherlands	0,34	0	n.a.	0,63	0,33	0,13	0,06
Norway	0,44	(0,09) 3)	n.a.	n.a.	n.a.	n.a.	0
Portugal	0,28	0	n.a.	0,43	0,30	0,10	n.a.
Spain	0,29	0	n.a.	0,40	0,29	0,80	3,82
Sweden	0,34	0	n.a.	0,51	0,34	0,14	0
Switzerland	0,49 1)	0,112	n.a.	0,47 1)	0,47 2)	0,52	0
U. Kingdom	0,67	0,060	n.a.	0,74	0,28	0,83	6,50

**) only Inland Water Ways*

Source: Adapted from IWW - INFRAS (2004, p. 130). Remarks: 1) Public transport is exempt. 2) No tax on fuel on transit flights and connection flights to international connections; 0,473 €/l for inland flights. 3) Exempt at the moment. 4) Tax exemption. Figures based on the subsidy definition of Rothengatter (2001). All figures in the table are off-budget subsidies as defined by OECD

4.2.3. Vehicle subsidies

Vehicles subsidies include incentives such as wrecking premiums, tax breaks for the purchase of cleaner vehicles, support instruments for the sale of public transport vehicles, and export guarantees for aircraft. The information concerning subsidies to vehicles is spread out among several literature sources. The corresponding data are mostly bottom-up data and due to that approach, examples of single instruments prevail. Because of different study designs, different levels of distinction and often only partial coverage of the subsidies, a conclusion as to how much all these subsidies add up to in the European Union is not possible at this time. First indications, however, indicate that the overall level is not as high as infrastructure costs. Some information on the topic is also included in the following chapters.

4.2.4. User subsidies

User subsidies are usually complex mechanisms used to lower the price of certain trips or modes for certain user groups or all users together. This information is also to be found in different literature sources. The data vary significantly among countries. In Annex A, a number of examples from several European countries are given. A conclusion as to how much all these subsidies are adding up to in the European Union is not possible at this time.

4.2.5. Other subsidies

An additional reason that the overall level of transport subsidies is difficult to estimate is that some of these subsidies are not defined as transport subsidies in the first place. For example, subsidies to home owners in rural areas are usually defined as “building-sector subsidies” but they encourage urban sprawl and generate a considerable amount of traffic, thus constituting a de facto transport subsidy. Such subsidies have important effects on transport, but their overall value (including only the portions attributable to transport) appears lower than that of subsidies targeted directly at transport.

Further examples of these subsidies are also included in Annex A.

4.3. A closer view—subsidies by mode

The following part of the study concentrates on the different modes in more detail. For each of the four modes covered (road transport, rail and public transport, air transport and waterborne transport) the most important or common types of subsidies were discussed if not already covered above. A distinction is made regarding the various incidences—infrastructure provision and financing, vehicle subsidisation, user subsidies and other subsidies. In some modes, however, not all of these subsidies are actually of relevance. Therefore, each chapter is structured individually.

4.3.1. Road transport subsidies

4.3.1.1. General

Instead of concentrating on single support measures or subsidies, a general indication of how much a certain mode or sector is subsidised can be given by comparing the total fiscal flows into a certain mode with the revenues raised from that mode. In a paper prepared for the OECD workshop on environmentally harmful subsidies in Paris in 2002, Nash et al. analysed the road sector from a general

perspective. Recognising that marginal social cost pricing (though it may be the appropriate approach to reach efficiency goals in a sector) requires too much detailed data, he supplies data for total costs and revenues. The figures are based on UNITE studies but compiled by Nash to provide a clearer picture. Tables 8 and 9 summarise the total costs and revenues of road transport.

Table 8. Total road transport costs, in million €, 1998

Country	Infrastructure Costs	Air pollution costs	Noise costs	Costs of global warming	External costs of accidents	Total	
Austria	4,382	833	329	376	1,367	7,287	
Belgium	1,570	1,671	655	625	877	5,398	
Denmark	1,227	496	1)	265	679	2,667	
Finland	1,119	435	112	253	232	2,151	
France	25,520	14,087	3,989	2,611	1,528	47,735	
Germany	26,176	8,411	6,245	3,849	14,592	59,273	
Greece	2,802	978	266	320	3,355	7,721	
Hungary	6,075	1,163	180	191	1)	7,609	
Ireland	2)	263	312	352	165	240	1,332
Italy	13,645	7,229	2,784	2,324	4,145	30,126	
Luxembourg	105	61	33	36	56	291	
Netherlands	4,411	1,482	311	686	1,421	8,311	
Portugal	1,791	472	212	483	501	3,459	
Spain	6,224	2,067	2,965	1,474	2,307	15,037	
Sweden	2,172	456	143	383	953	4,107	
Switzerland	4,030	532	521	302	925	6,310	
UK	12,728	5,192	5,768	2,392	1,994	28,074	

Source: Nash (2002). Remarks: 1) No basic data available for cost estimation. 2) National roads only. Based on the subsidy definition of Nash (2002). All figures in the table are off-budget subsidies as defined by OECD, but infrastructure costs and external costs are not a subsidy in the understanding of the WTO's SCM Agreement.

Country	Charges for infrastructure use		Vehicle Taxes			Fuel taxes		Total		
	Fixed	Variable	Registration tax	Circulation tax	Other	Fuel tax and duty	VAT on fuel tax			
Austria	266	237	1)	834	2)	391	2,591	3)	604	4,923
Belgium	95	18	284	1,153	4)	901	3,297	491	6,239	
Denmark	1)	38	2,439	725	5)	179	1,178	1)	4,558	
Finland	-	-	1)	1,262	1)		1,938	426	3,626	
France	-	4,167	1)	1)	6)	4,983	18,720	16,146	44,016	
Germany	411	-	1)	7,757	1)		28,983	4,565	41,416	
Greece	1)	1,327	1)	280	7)	741	2,765	407	5,520	
Hungary	122	1)	1)	31		76	1,240	413	8)	1,882
Ireland	-	27	770	373	1)		1,223	1)	2,393	
Italy	1)	2,222	865	3,325	5)	934	21,994	3)	6,845	36,185
Luxembourg	3	1)	1	24	5)	8	327	43	406	
Netherlands	91	-	1)	1,873	2)	2,425	5,040	857	10,286	
Portugal	52	332	1)	1,030	9)	63	2,342	1)	3,819	
Spain	-	919	908	1,266	1)		8,428	1,349	10)	12,870
Sweden	59	-	1)	684	11)	30	3,547	887	5,266	
Switzerland	266	-	1)	1,041	11)	125	2,858	12)	192	4,482
UK	259	-	1)	7,500	1)		13)	30,770	5,454	43,983

Table 9. Total road transport revenue, in million €, 1998

Source: Nash (2002). Remarks: 1) None reported within the country account. – 2) Sales tax. – 3) Also includes VAT on infrastructure charges. – 4) Insurance and radio tax. – 5) Insurance tax. – 6) All vehicle taxes: registration tax, insurance tax, taxes on company cars, tax on the vignette and tax on vehicle parts. – 7) All other vehicle taxes. – 8) Not included are subsidies granted for the provision of infrastructure totalling 171 million € in 1998 – 9) Municipal vehicle tax. – 10) Not included in this total are subsidies payments received by private motorway concessionaires for exchange rate risk totalling 197 million € in 1998 – 11) Vehicle import tax. – 12) Also includes VAT on import tax and circulation tax. – 13) Bus fuel duty rebate of 398 million € has been deducted from this total. Based on the subsidy definition of Nash (2002). All figures in the table are off-budget subsidies as defined by OECD (differences between tax rates are interpreted as subsidies).

The data compiled by the Nash study can be interpreted in several ways. When external effects of transport are not considered, total infrastructure costs can be matched to total revenues from road traffic. Assuming that all revenues are perceived as charges and not as general taxes, one can draw the conclusion that road traffic is not subsidised at all but instead creates higher revenues than it costs. With the exception of Hungary, revenues are higher in all countries (see Table 10). This “surplus” of revenues in all 17 countries combined amounts to more than 30 billion € in 1998. Politically, this translates into calls to reduce taxes on road traffic or invest more in infrastructure.

Table 10. Comparison of road costs and revenues
—assuming all taxes are “road user revenues”, in million €, 1998

Country	Total road revenues and taxes	Infrastructure Costs
Austria	4,923	4,382
Belgium	6,239	1,570
Denmark	4,558	1,227
Finland	3,626	1,119
France	44,016	25,520
Germany	41,416	26,176
Greece	5,520	2,802
Hungary		6,075
Ireland	2,393	263
Italy	36,185	13,645
Luxembourg	406	105
Netherlands	10,286	4,411
Portugal	3,819	1,791
Spain		6,224
Sweden	5,266	2,172
Switzerland	4,482	4,030
UK	43,983	12,728

Source: Nash (2002). Based on the subsidy definition of Nash (2002). All figures in the table are off-budget subsidies as defined by OECD.

The Nash data (which come mainly from UNITE) can also be evaluated assuming that all taxes related to road traffic are used for general public purposes and *not* treated as charges. In this case, only the fixed and variable charges for infrastructure use must be matched to the infrastructure costs. Using this approach, revenues are much smaller than infrastructure costs (see Table 11). In this case, the resulting “deficit” is considerable in all 17 countries and totals over 100 billion € per year. Politically, this translates into calls to increase charges for road traffic or invest less in infrastructure.

Table 11. Comparison of road costs and benefits—assuming taxes are for general public purposes, in million €, 1998

Country	Charges for infrastructure use			Infrastructure Costs
	Fixed	Variable	Total	
Austria	266	237	503	4,382
Belgium	95	18	113	1,570
Denmark	1)	38	38	1,227
Finland	-	-	-	1,119
France	-	4,167	4,167	25,520
Germany	411	-	411	26,176
Greece	1)	1,327	1,327	2,802
Hungary	122	1)	122	6,075
Ireland	-	27	27	263
Italy	1)	2,222	2,222	13,645
Luxembourg	3	1)	3	105
Netherlands	91	-	91	4,411
Portugal	52	332	384	1,791
Spain	-	919	919	6,224
Sweden	59	-	59	2,172
Switzerland	266	-	266	4,030
UK	259	-	259	12,728

Source: Adapted from Nash (2002, pp. 8-9). Remarks: 1) None reported. Based on the subsidy definition of Nash (2002). All figures in the table are off-budget subsidies as defined by OECD.

4.3.1.2. Subsidies to Car Manufacturers

The ninth Survey on State Aid in the European Union estimates state aid to the vehicle industry in 11 European countries. Table 12 shows the development of state aid to car manufacturers from 1995 to 1999. The state aid is provided in the form of regional, rescue and restructuring and training aid. Total aid was estimated to be just short of 2 billion € over a 5-year period, with the highest amount in 1996 (810 Million €) and the lowest in 1999 (10 Million €) (COM, 2001b).

Table 12. State aid to the motor vehicle sector 1995-1999 (not including cases below the notification ceilings), in million €

Country	1995	1996	1997	1998	1999
Austria	0	10	26	2	0
Belgium	33	0	0	6	0
Germany	3	340	59	163	0
Spain	328	202	1	9	29
Finland	0	0	6	0	0
France	0	83	6	52	0
Italy	0	0	107	7	61
Netherlands	7	0	6	0	0
Portugal	0	103	0	0	0
Sweden	0	0	1	0	0
United Kingdom	0	72	65	101	17
Total	371	810	277	340	10

Source: (COM, 2001b, p. 39). The table contains both on-budget and off-budget subsidies as defined by OECD.

4.3.1.3. User Charges/Taxes for using and buying vehicles

Road vehicles have to pay several charges or taxes, commonly including annual circulation taxes and/or registration taxes (the later as a constant fee or as a mark-up percentage on the vehicle price). While circulation taxes are raised in all countries, registration taxes are not. Table 13 provides a brief overview of the main vehicle-tax structures in the EU, showing the vehicle and tax types, as well as the various tax bases used. Annex B provides detailed vehicle user charges and taxes by country and vehicle type.

Table 13. Summary of EU vehicle tax types

Vehicle types	Type of Tax/Charge	Possible Tax Bases
<ul style="list-style-type: none"> • Passenger cars • Heavy goods vehicles 	<ul style="list-style-type: none"> • Purchase tax • Registration tax • Circulation tax • Vehicle excise duty 	<ul style="list-style-type: none"> • Fuel consumption • Engine power • Vehicle weight • Vehicle price/value • Emissions • Noise • Cargo capacity • Presence of catalytic converter • Vehicle age

4.3.1.4. Road user charges

After years of discussions, road user charges are increasingly being implemented in the EU. The reasons for doing this are usually:¹²

- Reduce congestion and improve the efficiency of the road network.
- Charge foreign trucks for using the road to recoup the maintenance and construction costs they impose on the road network.
- Reduce the negative environmental and urban effects of traffic.
- Collect additional money for investment in transport infrastructure.

Typical methods of road user charges are electronic truck-kilometre charges, electronic road tolls, and urban road pricing. Table 14 lists these charges in various European states. The table compiles data from three different studies of road user charges (INFRAS 2000, Speck et al. 2001, and Perkins 2004). In order to capture the full social costs that road users impose, user charges must also cover the external (often environmental) costs of transport, and not just the construction and maintenance costs.

¹² See Perkins (2004, p. 1)

Table 14. Road User Charges in the EU

Country	Road User Charge
Austria	Undifferentiated truck km charge based on roadside microwave transponders.
Belgium	Eurovignette for lorries
Denmark	Eurovignette for lorries, Copenhagen: Trials with road pricing for cars based on satellite monitoring.
France	Motorways are tolled depending on the type of vehicle (HGV, bus, car, etc.) and time of day/week
Germany	Electronic truck km charge based on satellite tracking.
Greece	Tolls on motorways
Netherlands	Eurovignette for lorries. Road pricing on motorways planned
Italy	Most highways are tolled except those in southern Italy and islands. Rome's historic city centre: access control through fixed annual charge for entry during weekday daytime and Saturday afternoons. Automated electronic enforcement with road-side transponders and number plate recognition cameras. Genoa: cordon charge to enter city centre
Luxembourg	Eurovignette for lorries
Norway	In addition to toll rings in Oslo, Bergen and Trondheim, some bridges/tunnels are tolled (concession system) for a specific period, usually 15 years.
Portugal	Motorways are all tolled, tolls are set by government
Spain	Only some motorways are tolled (concession system). Autopista del Sol; Artxanda, Ausol I&II: Summer and winter rates Peak and off peak rates Summer and winter rates
Sweden	Eurovignette for lorries; Stockholm: roadside transponder based cordon charge to enter city to be introduced in mid 2005 with peak and off-peak charges. Gothenburg: trials with road pricing for cars based on satellite monitoring completed in 2003. No intent to go full scale.
Switzerland	Electronic truck km charge. Road side transponder system with satellite tracking back-up.
United Kingdom	Birmingham, M6 motorway relief road: Day toll and night toll, electronic toll option. Central London: flat rate charge for daytime travel anywhere in a 20.5 km ² area); uses automatic number plate recognition. Thames crossing on M25 London orbital road: reduced night-time fee for trucks. Optional electronic tolling.
Croatia	Road toll depends on the type/weight of the vehicle
Czech Republic	Road Toll depends on the weight of the vehicle
Hungary	Road Toll depends on the type of the vehicle
Poland	Single use of the road
Slovakia	Annual fee according to engine size
Yugoslavia	Depending on the type of vehicle

Sources: INFRAS (2000, p. 45); Speck (2001, p. 49-51); Perkins (2004, pp. 25-26). Differences between charges can be interpreted as a subsidy.

4.3.2. Rail transport and public transport subsidies

4.3.2.1. General

Similar to its analysis of the road sector, the Nash et al. (2002) study also analyses the situation in the rail sector. Again, data for total costs and revenues of the rail sector are supplied. Tables 15 and 16 summarise the total costs and revenues of rail transport.

Table 15. Total rail transport costs, in million €, 1998

Country	Infrastructure Costs	Air pollution costs	Noise costs	Costs of global warming	External costs of accidents	Transport operator costs	Total	
Austria	1,933	15	6	7	23	2,183	4,167	
Belgium	1,142	19	38	11	2	2,579	3,791	
Denmark	255	12	1)	9	21	795	192	
Finland	360	7	22	6	5	451	851	
France	4,790	62	51	16	3	10,944	15,916	
Germany	12,621	220	1,031	152	83	7,336	21,443	
Greece	390	6	8	2	4	326	736	
Hungary	505	41	27	6	1)	432	111	
Ireland	2)	22	8	29	2	1)	255	316
Italy	5,605	145	243	61	10	6,673	12,737	
Luxembourg 3)	90	3	1	1	1)	294	389	
Netherlands	1,095	10	22	2	58	2,339	3,526	
Portugal	292	22	5	3	11	558	891	
Spain	3,500	50	219	27	19	2,013	5,828	
Sweden	856	5	43	3	32	1,270	2,209	
Switzerland	2,762	5	60	0	8	2,095	4,930	
UK	3,288	343	107	54	26	6,664	10,482	

Source: Nash (2002, p. 10). Remarks: 1) No data available for the estimation of these costs. – 2) Operating, signalling and depreciation costs only. – 3) Rail owned buses included. Based on the subsidy definition of Nash (2002). The table contains both on-budget and off-budget subsidies as defined by OECD. Infrastructure costs and external costs are not a subsidy in the understanding of the WTO's SCM Agreement.

By comparing Tables 15 and 16, similar conclusions can be drawn as was done in the case of roads. According to the figures provided by Nash et al. (which come largely from UNITE), the amount of taxes coming from rail transport is almost negligible, but rail ticket and freight charges are much higher than road charges.¹³ With or without consideration of taxes, in every case a surplus of total revenues (including subsidies) over infrastructure costs results. When comparing only ticket and stations revenues with infrastructure costs, the situation changes. In some European countries, ticket sales and other station revenues are not sufficient to cover infrastructure costs (Italy and Spain mainly, but also Hungary and Austria). In other countries infrastructure costs are much smaller than revenues from tickets (mainly in the United Kingdom, but also in France, Sweden and Germany).

Especially in rail transport, direct subsidies (see Table 16) are considerable. As only national subsidies were considered within the Nash and UNITE studies, subsidies granted by municipal and city authorities were not included.

¹³ As can be seen from the footnotes in the figures, not all information is complete in all countries here.

Table 16. Total rail transport revenues, in million €, 1998

Country	Revenues		Taxes	Explicit subsidies		Implicit subsidies	Total 1)
	Ticket and freight revenues	Track, station and other infrastructure charges	Fuel and energy tax	For the provision of services	For concessionary fares	Lost revenues due to reduced VAT on ticket	
Austria	1,277	349	2) 5	1,045	619	3)	2,946
Belgium	908	4)	1	1,615	4)	69	2,524
Denmark	566	20	-	219	30	3)	815
Finland	533	54	2) 4.8	53	9	37	600
France	6,380	946	41	5,678	296	3)	12,395
Germany	8,614	4,566	2) 251	5) 7,175	4,244	3)	20,284
Greece	126	4)	2) 9	4)	126	3)	261
Hungary	84	124	27	295	4)	3)	406
Ireland	127	4)	4)	42	4)	3)	169
Italy	6) 3,441	4)	4)	1,740	1,700	3)	6,881
Luxembourg	100	4)	0	104	4)	4	204
Netherlands	1,210	155	4)	81	81	3)	1,372
Portugal	188	4)	4)	10	4)	3)	198
Spain	1,495	4)	-	1,925	8)	3)	3,420
Sweden	1,325	98	4)	500	4)	3)	1,825
Switzerland	2,191	774	4)	1,621	4)	3)	3,812
UK	5,677	3,448	4)	43	2,254	3)	7,974

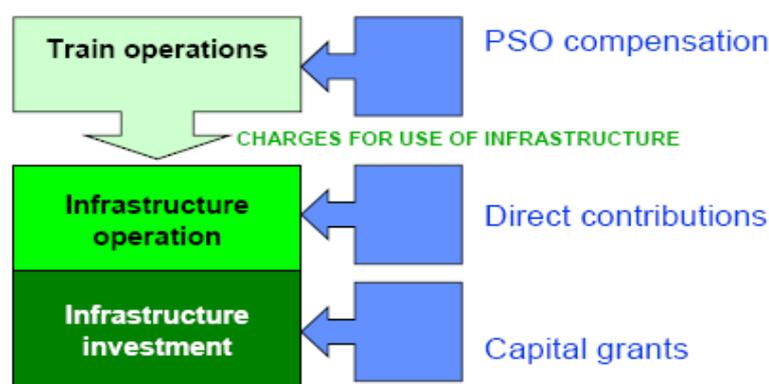
Source: Nash (2002, p. 11). Remarks: 1) Excluding infrastructure charges and implicit subsidies. – 2) Including VAT on fuel tax. – 3) Can not be calculated with the available data. – 4) None recorded within the country account. – 5) Includes financial payments to the Bundeseisenbahnvermögen, a government body outside of the rail sector which took over past national rail debts, parts of the real estate and some of the former rail staff. – 6) Including revenues of € 1517 million from public service contact, which may also be seen as a subsidy. – 7) Revenues, taxes and subsidies from rail owned buses included. – 8) Unknown level of subsidies for concessionary fares included in subsidies for provision of services. Based on the subsidy definition of Nash (2002). The table contains both on-budget and off-budget subsidies as defined by OECD (differences between tax rates can be interpreted as subsidies).

4.3.2.2. Investment and Funding of the Railway Systems in Europe

In general, supplying public transport to users at prices (partly) financed by public bodies can be seen as “transfers in kind” to public transport users. The system of rail infrastructure financing and rail travel financing (by PSO, ticket sales and other sources) is rather intransparent in many (if not all) EU Member States. This holds especially true for local public transport. The reasons behind that are too complex to be discussed here. However, these questions may be viewed as examples for political economy or economic theory of bureaucracy, as the main players and decision makers hope to benefit from the lack of transparency. Over decades a system was developed which combines public expenditures with private funds, public goods with equity considerations, regional aspects with transactions that have purely practical reasons (e.g., when a deficit in railroad operations suddenly occurred and surplus public funds were available in another area, a transfer would be arranged in order to level out the deficit. Once established, the mechanism would continue.) A study by Perkins (2005, p. 9) concludes:

All European Governments finance railways to provide services beyond those that a stand-alone commercial railway would offer, in terms of the geographic coverage of the network, the location of stations and the frequency and speed of services. They do this on the theoretical economic grounds that the long asset lives, lumpy investment patterns and large sunk costs that characterise rail prevent purely private provision of an optimally dimensioned rail system.

The different contributions are connected to each other as depicted in Figure 5:

Figure 5. Main incidence of public contributions

Source: Perkins (2005, p. 12). The figure contains both on-budget and off-budget subsidies as defined by OECD.

Public budget contributions to railways appear in many forms in Europe. In a study for DG Tren, Dodgson et al. (2004) estimated total public budget contributions to railways. Table 17 gives an impression of the results. As already noted, such contributions exist in many forms and countries. In several cases these come from a variety of sources, but in particular from national, regional and local authorities.

Table 17. Estimated public budget contributions, 2001

Estimated Public Budget Contributions 2001, €millions																
Form of Payment	AT	BE	CH	DE	DK	ES	FI	FR	GB	GR	IE	IT	LU	NL	NO	PT
PSO - Passenger services	491	361	346	4,300	512	265	35	1,731	1,727		129	1,799	76	91	152	9
Freight / combined transport	140		63					76	57		2					
Infrastructure maintenance and operations	950	640	787		235	719	335	1,608	1,201		6	1,430	142	953	408	7
Payments for capital investment	122	419	599	2,649	114		61	263		507	176	3,615		1,224	174	87
Staff and pension obligations		520				30		2,131			4			5		
Debt service	213	17	770			209		1,067		106	5					
Restructuring													1,036			
Other				2,091		178				466		48				
TOTAL	1,917	1,957	2,565	9,040	861	1,401	431	6,876	2,985	1,079	322	7,928	218	2,273	734	103
Total, Declared State Compensation	649	2,207	N/A	9,530	898	1,349	403	6,481	3,005	624	372	6,840	208	2,600	N/A	22

Source: company accounts; company data; State Aid submissions; NERA estimates. Note: shaded cells are 2000 figures.

Source: Reproduced from Dodgson, 2004, p. VIII). The table contains both on-budget and off-budget subsidies as defined by OECD.

4.3.3. Aviation sector subsidies

4.3.3.1. General

Air travel is different from the two previously discussed modes in so far as that within the civil aviation transport sector, all international tickets are exempted from VAT and no fuel (kerosene) tax is charged. In addition to that, infrastructure costs are (obviously) much smaller.

With regard to air transport in Europe, there is no comprehensive summary on explicit subsidies for airports. Some studies suggest (e.g., DIW, 2003) that airports receive subsidies from several administrative levels (federal government, state governments, and municipalities) and for several purposes, including subsidies for the running costs of airports, loans and public assumption of private debt, equity participation and capital contributions. With regard to operational costs alone, airport and maintenance fees often generate a surplus for the airport operators.

Explicit subsidies for airlines have declined considerably in the EU during the last decade. The European Commission's report on state aid shows for the aviation sector an amount of 295 million € for 1998, a significant decline from the 2,425 million € in 1994, 2371 million € in 1995, 1395 million € in 1996 and 1635 million € in 1997 (see COM, 2001a). These amounts refer to state aid for airlines only.

However, subsidies still exist for financing of airports and start-up aid to airlines departing from regional airports. Here, it is often thought that those airports might spark economic growth. The discussion about subsidies in the Charleroi case led to "Community guidelines on financing of airports and start-up aid to airlines departing from regional airports"¹⁴.

Nash et al. (2002) analyses total air transport costs (Table 18) and revenues (Table 19), too. Although the data are incomplete (see empty fields and remarks), the importance of subsidies going to air transport is apparent. It is clear, however, that in most countries airport and ATM charges fail to cover airport infrastructure costs. The available data suggest that about 2/3 of the costs are recovered.

¹⁴ For the outcome of that discussion, please see http://europa.eu.int/comm/transport/air/rules/doc/stateaid_consultation/com_2005_en.pdf.

Table 18. Total air transport costs, in million €, 1998

Source: Nash (2002). Remarks: 1) Including the costs of air traffic management services totalling € 154 million

Country	Infrastructure Costs	Air pollution costs	Noise costs	Costs of global warming	External costs of accidents	Total
Austria	509	29	3	41	6	588
Belgium	184	11		116	1	312
Denmark	293	7		9	2	329
Finland		4		17	0	21
France	8,110	60		31	-	8,201
Germany	3,488	162	278	434	35	4,397
Greece	239	6	24	0		269
Hungary	127	2	9	3	-	141
Ireland	401	20		57		478
Italy	571	77	193	197	2	1,041
Luxembourg	37	1		2		40
Netherlands	98	25	186	15	0	325
Portugal	203	106	4	50	1	363
Spain	411	62	188	208	4	873
Sweden	447	2	0	65	1	515
Switzerland	1) 804	17	27	34	10	738
UK	2,236	656	155	49	5	3,101

in 1998. Based on the subsidy definition of Nash (2002). All figures in the table are off-budget subsidies as defined by OECD. Infrastructure costs and external costs are not considered subsidies by the WTO's SCM Agreement.

Table 19. Revenues, charges, taxes and subsidies in the aviation sector, in million €, 1998

Country	Revenues		Taxes	Other charges	Explicit subsidies	Implicit subsidies
	Airport revenues	ATM charges				
Austria	278	151		1) 25		
Belgium	255	120				
Denmark						103
Finland	181				0	231
France	1,687	1,117			2) 279	
Germany	3,121	3) 767		3) 48		4) 252
Greece	5) 767		34			
Hungary	103		2			
Ireland	134					
Italy	795	200	12			
Luxembourg	11	1			-	
Netherlands	224		1			
Portugal	114	86				
Spain	501	341			6) 77	
Sweden	184	119		17		
Switzerland	651	159				
UK		7) 137		8) 1,210	28	

Source: Nash (2002, p. 13). Remarks: 1) Security charge.– 2) € 194 million to airports, € 85 million other general subsidies. – 3) Meteorological services charge. – 4) For Lufthansa only. – 5) All airport and ATM charges.– 6) Subsidies to airlines.–7) Profit from these services going to general budget. – 8) Air passenger duty. Based on the subsidy definition of Nash (2002). The table contains both on-budget and off-budget subsidies as defined by OECD.

4.3.3.2. Subsidies for airlines

Direct financial support to airlines is discussed intensively in the literature. Subsidies consists of direct state aid to Airlines, VAT exemption on international tickets, fuel tax exemption and tax-free sales on board of aircraft (excise duty and VAT).

The EU developed rules to prevent direct subsidies to commercial aviation. A study for the German Ministry of the Environment (DIW, 2003) estimated that the total state aids (including VAT and fuel tax exemptions) for three European airlines were in a range of 1-2 billion € per year (see Table 20).

Table 20. Direct and indirect support to airlines, in million € unless otherwise stated, 1998 (Air France: 1999)

	KLM	Lufthansa	Air France
General data			
Total revenue		11,737	10,300
Operating revenue	6,047		9,105
Revenues transport		10,150	7,920
of which passengers	4,431		6,900
of which international	4,300	7,226	5,900
Profit	111	732	155
Passenger km	57,200	75,438	74,598
Freight: tonne km	3,930	6,221	4,596
Fuel consumption (Mtonnes)	2,789	4,973	4,700
Support			
VAT exemption international flights	155	253	206
Kerosene tax exemption	854	1,523	1,439
Tax free shopping in aircraft, only from & to the EU	64	p.m.	p.m.
Total excl. fuel tax exemption	219	253 + p.m.	206 + p.m.
Total incl. fuel tax exemption	1,073	1776 + p.m.	1,645 + p.m.

Source: DIW (2003, p. 24). Remarks: Assuming for the fuel tax exemption an 80/20 split passengers/freight for KLM and Air France, and a 75/25 split passengers/freight for Lufthansa. VAT exemptions and tax-free shopping on board aircraft are 100 % allocated to passenger transport. The table contains both on-budget and off-budget subsidies as defined by OECD. For details, please see the original study.

4.3.3.3. Subsidies for Airports and Aeroplane Manufacturers

According to the above mentioned study (DIW, 2003), financial support to airports consists of direct financial support, generally for investments in infrastructure, tax-free sales for flights outside the EU (excise duty and VAT), corporate and real estate tax exemptions and ground costs exemptions. Estimates exist, but vary. Compared with the magnitude of some other subsidies, these seem to be of minor interest. This topic, however, should be looked at more closely due to the high environmental impact of air travel.

In many cases, public authorities pay all of the infrastructure costs or contribute parts of the costs. This may include public shares in airport companies, construction of facilities and network connections, aviation control, etc. The publicly stated reasons for such subsidies are often that airports are believed to contribute significantly to economic development of regions (DIW 2003; Treber 2003;

Treber 1998). Such effects are difficult to measure. In the literature search no study was found to prove such effects while a number of papers doubt their significance, arguing that often economic development is just transferred from one sector to the aviation sector or from one other location to the favoured airport.

With regard to aircraft manufacturers, government support for the civil aircraft industry has taken various direct and indirect forms, which makes them very hard, if not impossible, to assess. Examples include synergies between military (i.e., government-funded) and commercial development costs, funding of research and infrastructure, direct financial subsidies for specific aircraft projects, equity infusions, debt forgiveness, and export guarantees against losses caused by exchange-rate changes as well as export guarantees.¹⁵ Again, these support measures may distort competition among airlines. For example, French and German airlines cannot receive French or German export-guarantee benefits for the purchase of Airbus aeroplanes because their legal residence is in France or Germany. All other airlines worldwide get those benefits, however.

4.3.4. Shipping Subsidies

4.3.4.1. Shipbuilding

Figures for aid to shipbuilding were estimated in a paper of the EU Commission (COM, 2001b). Table 21 gives an overview.

Table 21. European aid for shipbuilding, in million €

Aid to the Shipbuilding sector € million				
	Contract related aid		Rescue and Restructuring aid	
	1995 – 1997	1997 – 1999	1995 – 1997	1997 - 1999
Denmark	81	37		
Germany	257	160	314	143
Greece			0,4	7,5
Spain	130	64	426	366
Finland	25	35		
France	37	164	0	93
Italy	287	147		
Netherlands	52	20		
Portugal			12	12
United Kingdo	12	5		
EUR-15	882	632	752	622

Source: COM (2001a, p. 37). All

figures in the table are on-budget subsidies as defined by OECD.

Together with contract-related operating aid granted for new constructions, including ships for developing countries and conversions, a total level of about 1 billion € was estimated per year in those

¹⁵ The difficulties in assessing the subsidies in this sector are illustrated by the WTO dispute between the EU and US over subsidies to Boeing and Airbus.

years. With regard to inland waterways, wrecking premiums are paid to ship owners amounting to roughly 40 million € in Belgium and Germany and about 100 million € in the Netherlands. Direct subsidies (e.g., for unpaid fuel tax, grants, etc.) may add to that but the overall level of magnitude remains comparatively small.

In a recent paper by the EU Commission (COM, 2005) entitled “State aid to the shipbuilding sector”, the amount of state aid to the shipbuilding sector was reported to have fallen from more than 1 billion € in 1999-2001 to about 0,65 billion € for each year in the period 2001-2003. The highest amounts of aid were given to the restructuring of public yards in Spain in 2000 (about 1 billion €). In 2003, a total of 685 million € was granted to the EU-15 shipbuilding sector mainly by Germany (55%), France (13%) and Denmark (8%); from that, about 55% of the overall figure constituted operating aids.

4.3.4.2. Inland waterway operators

Direct subsidies to inland waterway operators or vehicles are relatively rare with the exception of wrecking premiums in some states/years, the “Marco Polo programme”¹⁶ or the “tonnage tax”¹⁷. The main areas of discussion are infrastructure costs of canals and rivers, which in some cases are considered to be very high (charges to vehicles or ships do not covering much of these costs). With regard to inland waterways, the main “infrastructure” in the EU is the Rhine, with about two-thirds of the transport volume. Here, charges are not allowed by multilateral agreement (“Mannheimer Akte”). For most other waterways, Member States levy charges on a variety of principles. Charges for the use of inland waterways in Member States contribute to, but do not cover, variable infrastructure costs. Government subsidies are still required to some extent in all Member States. The following figure summarises the different approaches applied in different Member States.

Table 22. Inland waterway cost recovery

Country	Type of charge	Recovery of costs	Note
Belgium	variable ¹	7.5% of investment	It should be borne in mind that only 20% of the use of inland water ways is thought to be attributable to navigation.
France	Variable	10% of receipts	
Germany	Variable for 20% of traffic	13% of running costs	
UK	Variable	8.75% of maintenance costs	
Finland	Variable	21% of maintenance and development costs	

¹ variable charges tend to change according to weight, distance, boat type, type of travel Source: DGVII Questionnaire.

Figure copied from COM (1998). The table contains both on-budget and off-budget subsidies as defined by OECD.

4.3.4.3. Sea ports

Subsidies for sea ports occur in a number of different types, but usually they are viewed as contributions to infrastructure costs or hinterland connections. Again, infrastructure costs are the main focus of discussion while tax exemptions for the international fleet may be also important. A first

¹⁶ This is an intermodal support programme for promoting short sea shipping, rail and inland waterway transport with the objective to reduce the road freight transport. For more information see: <http://europa.eu.int/scadplus/leg/en/lvb/l24159.htm>

¹⁷ This is an instrument to reduce tax burden of shippers and therefore can be considered as an indirect subsidy to shippers, see e.g. <http://www.emderzeitung.de/news/index.asp?ID=22391&RESS=1&LAY=2>

impression leads to the conclusion that the fuel taxes which are currently not being paid by sea ship vessels might be an important area to investigate further.

Charging systems for some operations or infrastructure costs in the EU differ considerably between European seaports. They nevertheless include certain basic elements such as a description of the port facility and services covered by each type of port charge, the basis of the individual charges and the method of calculation. In general, three types of payment can be distinguished: 1) those related to the provision of services and facilities to enable a ship to enter safely and use the port; 2) payments for specific services or supplies rendered; and 3) rents or charges for the use of land or equipment owned by the port. In most countries, port dues and charges are still subject to approval by the government or municipal authorities. However, the general aim for most sea ports, both public and private, is to ensure that sea ports cover their costs, however those are defined.

5. Recommendations and Way Forward

As shown in this report, transport subsidies affect the level playing field among transport modes and among EU countries. Though subsidies are usually introduced to achieve desirable policy objectives, many subsidies also have negative economic, social and environmental consequences. This report summarises the state of knowledge and research regarding transport subsidies in the EU, but much more needs to be done and understood to support informed policy choices in this area.

Addressing definition challenges. There are many studies that analyse particular aspects of market distortions in the transport sector, most of them with the aim of assessing the level playing field among transport modes. Only some studies use the concept of subsidy and almost no study works with a transparent and clear definition of transport subsidies on a European level. The transport literature classifies subsidies in several ways, including ones quite different from the budgetary definition advocated by the OECD. There is no commonly agreed definition. Different definitions are applicable (and useful) for different questions and under different circumstances. However, the definition used is crucial – analyses using different definitions and classifications can arrive at opposite conclusions regarding whether a subsidy is unjustified and should be removed. For example, the choice of whether taxes on road transport are seen as “general taxes” or “user charges” (see Section 2.6) greatly affects the measurement of subsidies to road transport – and, indeed, this is a choice, as there is no single accepted way of classifying these taxes. Studies show that the percentage of on-budget support in comparison to other distortions of the level playing field is comparatively smaller in the transport sector than it is in other sectors (see IWW – INFRAS, 2004 as well as Figures 3 and 4 and Table 12 in this report). Finally, there is an issue whether the motivation of subsidies should enter into the definition, as some on-budget subsidies can be economically justified with the merit-good character of transport services. As a pragmatic and unambiguous criterion, the budgetary definition (on-budget vs. off-budget subsidies) advocated by the OECD recommends itself; however, this distinction is not widely applied in the literature.

Recognising the data gaps. Data availability generally differs a lot between different countries and incidences. Good data are generally available for taxation comparisons, see for example table 7. In particular, taxes on fuels and electricity are well-documented. Thanks to the UNITE research, figures for infrastructure costs for several countries are also available, although those seem to be in need of an update (Term indicator fact sheet 19, EEA, 2003). However, there are different opinions regarding how to determine infrastructure costs. The situation in public transport is highly complex, and few data on the entire financing system are available. In particular, public service obligations (see Section 2.1) play a central role in public transport, but are dealt with very differently in the different countries, being treated as subsidies in some cases but not in others. There is also little information on the methods of promoting public transport (i.e., who pays how much in various regions for various types of public transport). Lastly, there is no consistent definition of which payments for public transport are considered subsidies and what payments are not. The situation with regard to hidden subsidies in communities and regions needs particular consideration. Yet, with the exception of one study (Krauth, 2005), no data is available on this issue. Data availability for the new Member States and the Accession Countries is especially poor, too. Efforts to improve that situation seem more promising with regard to infrastructure than to the other data gaps.

Improving subsidy measurement. It is not possible to provide one overall figure for subsidies in the transport sector. The literature shows there has been some effort to quantify the value of transport subsidies in the EU-25. However, the picture is still very fragmented and inadequate. More work

needs to be done to standardise an approach to subsidy measurement that informs efforts at policy reform. For example, if country A has very high taxes on road transport fuels (perhaps to account for the externalities of road transport), and country B has very low taxes, then the difference in taxation could be seen as an indirect subsidy in country B. To assess this, however, it would be necessary to see the transport taxes in the frame of the overall taxation levels in each country (e.g., Sweden has consistently higher tax levels than Ireland). Measuring subsidies across transport modes presents similar challenges. If subsidy measures are to be useful to policy reform, a widely adopted approach needs to be agreed upon for how to address these challenges.

Assess the relative importance of subsidies and other distortions. Transport subsidies are only one of several factors that influence the level playing field between different transport modes. The work of UNITE (Nash, 2003) proves that external effects distort the level playing field significantly (see chapter 4.3.1.1) and more so than on-budget subsidies for vehicles, infrastructures, fuels etc (see chapter 4.3.1.2 and 4.2.2). Furthermore, it is also important to recognise that the level playing field between transport modes is strongly influenced by the wider framework conditions outside the transport sector, such as land use policies, commuter tax deductions, etc.

Developing indicators. The degree to which the playing field is level cannot be assessed by any one single indicator. Nevertheless, efforts to develop more detailed sector indicators seem to be rewarding, for example to compare tax exemptions across different countries. A pragmatic approach to developing transport-subsidy indicators would be to focus mainly on simple indicators where presumably much information is easily available in different countries. To this end, on-budget subsidies would appear as a sensible starting point, as their definition is less ambivalent and blurred than others. However, as an indicator, it would have to be interpreted with some caution due to the large size of off-budget subsidies. Any indicator will be more effective if the policy objective has been clearly defined (i.e., an indicator needs to be *directionally safe*, telling us whether society is moving towards the target or away from it). Regarding transport subsidies and fair competition among transport modes, specific policy objectives need to be stated more clearly.

Assessing effectiveness. The claim for a level playing field does not require that there no longer be any subsidies. Rather, subsidies should be properly motivated, transparent and designed in an intelligent way that minimises undesirable consequences and prevents lock-in effects. There can be very valid reasons for paying out and maintaining a subsidy, provided some conditions are met. An indication for assessing effectiveness is advocated by Rothengatter (2001, p. 183), who suggest that “the reasons for correcting the market through subsidies can be summarised in two main arguments: (1) correction for market failures, and (2) changes in the distribution of income.” A justified subsidy should meet either one or both of these criteria. Any specific subsidy should also be connected to clear, quantified and time-bound targets; its effectiveness in reaching the stated policy goals should be monitored; it should be controlled whether there is still a need for the subsidy; and if necessary, the subsidy should be removed. The discontinuation of a subsidy is justified once the targets have been achieved, or if the subsidy has proven ineffective or even counterproductive. To support policymakers in assessing which subsidies are justified, criteria like transparency, monitoring of the desired effect (effectiveness), environmental harm and the contribution to general welfare (efficiency) need to be considered. The attributes of various subsidies and their effects need to be understood and clearly explained. There is also a need for an appropriate policy evaluation framework that relies on both *ex ante* and *ex post* analysis.

Supporting policy development. It is critically important to distinguish between “subsidy reform” and “playing-field reform” as policy objectives, because the latter gives a much broader picture. Policy

reforms involving only subsidies (if not accompanied by other policy reforms) could actually decrease the general welfare of society by favouring transport modes and activities that benefit from uninternalised costs. As argued above, even in a world without transport subsidies there would not be a level playing field, as there are many other factors that affect the balance between transport modes. Outside the scope of this report, but critical to effective policy development regarding transport subsidies, is developing a means of effectively informing and supporting policymakers' efforts. Especially critical is ascertaining 1) what exactly is meant by policymakers when they call for a "level playing field," and 2) what reform paths might profitably be pursued to reach that objective.

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Annex A. Environmentally Harmful Support Measures in EU Member States (Transport)

Source: Leurs and Wit (2003, pp. 58–75)

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
AT	Subsidy funds for research activities of trade and industry (Austrian programme)	R&D support to trade and industry, research institutes, scientists, inventors, special partnerships, trade associations and joint ventures	Companies in trade and industry, research institutes, scientists, inventors, partnerships and associations	Different subsidies possible: non-refundable subsidy; Loan (2 years' grace for repayment of principal); assumption of liability; contribution to borrowing fees; combinations of above measures
AT	ERP loans (Austrian programme)	ERP-loans to transport sector to improve rail and inland waterway transportation (Loan amount: min. 100,000 ATS, at least 25% of total investment to be own funds. Credit period: 2 years' grace for repayment of principal)	Transport companies	
AT	Österreich: ERP-Großprogramm für kombinierten Güterverkehr	Support for combined transport	Transport and logistics enterprises	€ 726,728 Euro up to € 1.45 mln.
BE	Distribution centres for foreign	Support for transport and delivery to non-group members	Large distribution centres for	Cost plus taxable

	companies	for account of members in integrated distribution systems	multinationals	profit after ruling
BE	Walloon plan for waterway transport	Support for fleet modernisation	Walloon maritime transport sector	21% of investments
BE	Walloon plan for waterway transport	Support for ship-loading equipment	Walloon maritime transport sector	30% of investments
BE	Walloon plan for waterway transport	Support for ICT and electronics equipment	Walloon maritime transport sector	Maritime fleet. € 7,500 per vessel
BE	N 142 /2000 - AIDE D'ETAT AU TRANSPORT MARITIME	Support to the merchant service and dredging sector	Merchant service and dredging sector	3
DE	N156/2000 Navigation and marine technology	Development of new technologies for maritime industries	Hydrodynamics, information & communication systems and newer, bigger & better offshore-technology	44
DE	N110/2000 Aid to shipbuilding	To enhance the competitiveness of the German Shipbuilding industry	Shipbuilding yards	368

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
DE	"Verkehrsinfrastruktur" programme	Infrastructure programme in addition to the European Fund for Regional Development	10 predefined trans-european networks	1,604
DE	C 63 /2000 - Bahntrans GmbH	Aid to road transport	Transport sector	Not available
DE	N 180 /2000 - NAVIGATION INTERIEURE - AIDE A LA FORMATION (2000-2003)	Aid to inland shipping	Inland shippers	6
DE	Shipbuilding C23/2001	Investment aid to Flender Werft Lübeck	Individual, specific	Not available
DE	Shipbuilding C6/2000	Excess payment for restructuring aid to Kvaerner Warnow Werft	Individual, specific	Not available
DE	Airbus sales financing	To finance Airbus sales	Airbus	138
DE	Aviation research	To finance aviation research	Aviation sector	106
DE	Interest subsidies for shipbuilders	To enhance the competitiveness of the German shipbuilding	Shipbuilding yards	20
DK	Restructuring Aid to COMBUS A/S	To facilitate privatisation of COMBUS A/S	COMBUS A/S	22
DK	"Trafikpulje"	To promote co-ordination of various means of transport	Public sector	7
DK	N 441 /2000 - AIDE A LA FORMATION DES GENS DE MER	To improve maritime know-how in Denmark and develop maritime skills	Shipping companies	0.12

DK	Operation and maintenance of national roads	To maintain road infrastructure	The Road Directorate	252
DK	Grants to promotion of public transport	To promote public transport	Banestyrelsen and The Danish Railroads	70
DK	Airport investments	To modernise safety at the Copenhagen state-owned airport, through investments aid	Copenhagen Airport	99
DK	Airport investments	To modernise state-owned airports	Airports serving Greenland	3
DK	Operating and investment aid to rail operator	To improve the competitiveness of Danish Railroads	Danish Railroads	464
DK	Support to privately owned railroads	To provide country-wide public transport	Private railroad owners	Undefined
DK	Grants to investments in and operation of Danish harbours	To modernise Danish harbours	State-owned harbours	13
DK	Modernisation of the harbour and ferries con connected to the island Bornholm	To enhance security after the accident of the ferry Estonia	The harbour and ferries of Bornholm	6

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
DK	Guarantee Fund for shipyards	To help shipyards financially	Danish shipyards	1
ES	National Aeronautic Programme	To support the Spanish aeronautic industry, facilitate its access to the international market and improve its technological know-how.	Science and Technology) Office of Scientific and Technology Policy (Ministry of	Not available
ES	National Transport and Country Planning Programme	To improve transport security and management of the sector.	Office of Scientific and Technology Policy (Ministry of Science and Technology)	Not available
ES	FINANCING OF CITY TRANSPORT	To provide public transport access to all the towns of Navarra Commune.	NAVARRA, PUBLIC WORKS, TRANSPORT AND	0.083
ES	GRANTS FOR PUBLIC TRANSPORT TRAINING	To modernise the public transport sector	NAVARRA PUBLIC WORKS, TRANSPORT AND COMMUNICATIONS OFFICE	1
ES	GRANTS FOR MODERNISING PUBLIC TRANSPORT SECTOR IN NAVARRA	To modernise the public transport sector	NAVARRA PUBLIC WORKS, TRANSPORT AND COMMUNICATIONS OFFICE	0.36
ES	GRANTS FOR MODERNISING COMMUNICATIONS IN LA RIOJA	To modernise communications, e.g., computer systems, Internet connections	LA RIOJA, ECONOMIC DEVELOPMENT AGENCY	Not defined

ES	GRANTS FOR ISLAND TRANSPORT	To co-finance the charter of maritime and air transport between the various islands of the archipelago	CANARIAS, TOURISM AND TRANSPORT OFFICE	1
ES	GRANTS FOR PROMOTING TRANSPORT SECTOR RESTRUCTURING	To promote associations and mergers of transport companies and improvements to their computer and other technology	CANARIAS, TOURISM AND TRANSPORT OFFICE	0.12
ES	GRANTS FOR MARITIME PASSENGER TRANSPORT	To reduce the adverse impact of particular islands' location,	CANARIAS, TOURISM AND TRANSPORT OFFICE	8
ES	GRANTS FOR UPGRADING PUBLIC TRANSPORT VEHICLES	To upgrade public transport vehicles	CASTILLA LA MANCHA. ROAD AND TRANSPORT OFFICE	0.02 for new vehicles, 0.07 for operational vehicles
ES	GRANTS FOR PUBLIC PASSENGER TRANSPORT BECAUSE OF PRICING REDUCTION	To compensate price cuts designed to benefit large families	LA RIOJA, PUBLIC WORKS, TRANSPORT, TOWN PLANNING AND HOUSING OFFICE	Not defined

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
ES	GRANTS FOR OVERDRAWN PUBLIC TRANSPORT OPERATIONS	Grants to companies with overdrawn operations	LA RIOJA, PUBLIC WORKS, TRANSPORT, TOWN PLANNING AND HOUSING OFFICE	Not defined
ES	LOANS TO RENEW PUBLIC TRANSPORT VEHICLES	To renew public transport vehicles	CASTILLA LA MANCHA, PUBLIC WORKS OFFICE	Not defined
ES	Shipbuilding N757/2000	To modify the existing aid regime	Sectoral	10
ES	Shipbuilding C40/2000	To further restructure publicly owned shipyards in Spain	Sectoral	45 price compensation
ES	Promotion of Road Transport	Grant from National Spanish Budget	Road transport sector	1
ES	Promotion of Maritime Transport	Grant from National Spanish Budget	Maritime transport sector	0
ES	Promotion of Air Transport	Grant from National Spanish Budget	Air transport sector	0
ES	Promotion of Road Transport	Grant from Ministry of Public Works for national road infrastructure and safety programmes and (truck) driver training; projects defined and identified by this ministry	Transport companies, public works companies	786
ES	Promotion of Sea Transport	Grant from Ministry of Public Works budget	Maritime transport sector	30
ES	Promotion of Air Transport	Grant from Ministry of Public Works budget	Air transport sector	153
FI	N53/2000 Transport aid	Aid for regional long-distance road transport within Finland in remote regions with a low population density	Transport enterprises	Annual appropriation reserved in

				government budget
FI	N 33 /2000 - MESURES DANS LE SECTEUR DES TRANSPORTS MARITIMES	To promote the use of maritime transport	Every ship that is registered in Finland and sails under the Finish flag	3
FI	N531/2000 Contract-related aid to shipbuilding	To refit ships with automatic hydraulic systems	Shipyards	Not available
FI	Selective newspaper subsidy	To reduce newspaper transport, delivery and other costs	Newspapers	5
FI	Finnish National R&D programme on Transport Telematics Infrastructure 1998-2000	To promote multi-modal and interoperable services and systems	Government agencies, companies, R&D institutes, collaborations	10
FI	KETJU – International Transport Chains	To increase Finnish Know-How on international transportation chains	collaboration of members of transport chain	6

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
FI	N 856 /2000 – REMBOURSEMENT AUX ARMATEURS DES QOUTISATIONS SOCIALES PATRONALES	Aid to the maritime sector	Maritime sector	16
FI	Shipbuilding	Contract-related operating aid	Sectoral	
FR	N564/2000	Aid for air transport	Small air transporters	1
FR	N593/2000 Refund of social security premiums to maritime carriers	To improve the global competitiveness of French maritime carriers	Carriers based entirely or partly in France and paying taxes there	15.2
FR	N540/2000 Extension of Autoroute concessions	To perform construction work and provide services	Motorway concession market	6
FR	C25/2001 Measures in favour of road transport	To compensate road hauliers for higher petrol prices	Road hauliers	Not available
FR	N 766/2000 – France Remboursement des contributions sociales patronales aux entreprises	To improve the global competitiveness of the maritime carriers	French maritime sector	33
FR	N 639 /2000 - DESSERTERIE AERIEENNE DE LA CORSE –	Not available	Not available	Not available

	LYON			
FR	N 638 /2000 - DESSERTÉ AERIENNE DE LA CORSE – MONTPELLIER	To promote public transport use by several categories of passenger	Several categories of passenger	
FR	C 14 /2001 - Aide à la société Nationale Maritime Corse-Méditerranée	Aid to the maritime sector	Maritime sector in the Mediterranean	Not available
FR	C 65 /2000 - AIDE AU DEMARRAGE DE LIGNES DE TRANSPORT MARITIME	Aid to the maritime sector	Not available	Not available

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
FR	N 24 /2000 - DESSERTÉ AERIENNE DE LA CORSE	Transport subsidy for several categories of passenger	Passengers from Corsica younger than 25 or older than 60, students under 27, and passengers travelling with children	
FR	NN 122 /2000 – SERNAM	Restructuring aid for Sernam	Sernam	448
FR	Subsidies to enterprises of national interest	To promote use of short-distance public transport through subsidies for employees of major French companies	Employees of French companies	913
FR	Aid for air construction	Support for development of the Airbus A340-500/600 and AXXX	Airbus	503
FR	Exploitation subsidies for BAAC – Civil Aviation Budget	State civil aviation budget for safety-related programmes, e.g., technical inspections, certification, investment in infrastructure and training	Companies and governments executing BAAC programmes	32
FR	Subsidies to enterprises of national interest	Support to railway companies for improving the rail network and reducing aggregate corporate debt	French railway companies	2,707
FR	N88/2001 Remboursement aux entreprises maritimes des cotisations d'allocations familiales et assedic	To improve the global competitiveness of French maritime carriers	French maritime sector	23
FR	Investment subsidy	Support to regional transport	Transport sector	4

FR	Investment subsidy	To improve freight transport productivity	Freight transport sector	
FR	Investment subsidy	Support to waterways and inland ports	Maritime sector	4
FR	Investment subsidy	To modernise transport infrastructure	Transport sector	4
FR	Investment subsidy	Support to land transport R&D	Land transport sector	1.5
FR	Assistance et solidarity	Support to Paris public transport system	Paris transport sector	823
FR	Assistance et solidarity	Support to public transport	Public transport sector	296
FR	Exploitation subsidies	Support to civil aviation R&D	Civil aviation sector	217
FR	Subsidies and financial participation for studies, projects and investments	Support to ETW wind tunnel		0
FR	Subsidies and financial participation for studies, projects and investments	Subsidies to various organisations		3
FR	Investment subsidy	Support to a flight simulator		14

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
FR	Fonds de concours	To improve traffic safety	Transport sector and others	13
FR	Investment subsidy	Support to national roadways	National road-building sector	15
FR	Investment subsidy	Individual actions	Individual actors	10
FR	Investment subsidy	Subsidies to local and national associations and other local organisations	Local and national associations	56
GR	Aid for Athens public transport	To replace old buses	Athens Public Transport	107
GR	N788/2000 shipbuilding aid scheme	Support for ailing shipyards	Shipyards	Not available
GR	N541/2000 Olympic Airways state aid decision	To relocate Olympic Airways	Olympic Airways	206
GR	Retex programme	To promote SME exports	SME	
GR	Public transport scheme	To replace old buses	Athens public transport	195
IT	Law 341/95	Fixed investments in e.g., new machinery and manufacturing plant and modernisation, expansion and restructuring of existing plant	Extraction and manufacturing industries	Tax reduction according to investment location and company size (small, medium, large)
IT	Law 388/2000, Art. 8	Investments in new capital goods, material or intangible assets	To support companies investing in capital goods in the southern	Tax credit in compensation for

			(ob.1) or central -northern depressed areas (ob.2) of Italy	other company taxes
IT	Law 140/97 Art.13 - R&D	Investments for innovation in industrial enterprises	Enterprises carrying out industrial activities	Grants according to enterprise location and size
IT	N502/2000 - Shipbuilding aid	To promote modernisation of the Italian fleet	Shipyards	10
IT	N733/2000	To support new qualifications for the taxi industry	Taxis	Not available
IT	N292/2000 - Aid to road transport sector	To compensate for higher petrol prices	Sectoral	0.1
IT	N58/2000 - Promotion of integrated airport systems	To integrate three airports in the Piemonte region: infrastructure and portal systems	Three airports in the Piemonte region	9
IT	C24/2001 - Aid to road transport	Tax –aid/reduction for road hauliers to compensate for higher petrol prices	Road hauliers	Not available

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
NL	Subsidieregeling kennisprojecten verkeer en vervoer (ICES / KISS)	Support to transport sector for R&D on congestion and other traffic issues	Companies	26
NL	Investeringsubsidie NLR, Stb. 1995, 105	Support for fundamental aviation research to improve sectoral competitiveness	NLR	5
NL	Exploitatiebijdrage luchthavens Eelde, Texel, Maastricht en Twente	Operational support to regional airports to maintain airport operability of	Region A	2
NL	Bijdrage LVB-exploitatie regionale luchthavens en vrijgestelde vluchten, Stb. 1992, 368	To improve aviation safety and performance	LVB	7
NL	Bijdrage Koninklijke Nederlandse Vereniging voor Luchtvaart (KNVvL) Overeenkomst	Support for executing government tasks	KNVvL	1
NL	Bijdrage aan de Zoute Vereen (Pas 65+)	Operational support to Wadden Sea ferries	Wadden Sea ferries	0
NL	Bijdrage aan Provincie Zeeland in de exploitatiekosten veerdiensten	Operational support to Westerschelde ferries	Zeeland province	24

	Westerschelde, Stb. 1991, 255 art.3			
NL	Centrum voor Regelgeving en Onderzoek in grond-, weg- en waterbouw en verkeerstechniek (CROW)	Support to road, waterway and soil engineering R&D	CROW	0
NL	Exploitatiesubsidie NLR, Stb. 1995, 105	Support to fundamental aviation research to improve sectoral competitiveness	NLR	17
NL	Bijdragen primaire waterwegen provincies Friesland en Groningen	Support for waterway maintenance	Primarily waterways in Groningen and Friesland provinces	13
NL	Bijdragen infrastructuur OV; Wet en Besluit Infracfonds	To improve public transport infrastructure	Provincial and local authorities	933

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
NL	Bijdragen infrastructuur OV; Wet en Besluit Infracfonds	To improve public transport infrastructure	Provincial and local authorities	543
NL	Bijdragen infrastructuur OV; Wet en Besluit Infracfonds	To improve public transport infrastructure	Provincial and local authorities	522
NL	Bijdragen infrastructuur OV; Wet en Besluit Infracfonds	To improve public transport infrastructure	Provincial and local authorities	401
NL	Gebundelde Doeluitkering (GDU); Wet en Besluit Infracfonds	To improve transport infrastructure	Provincial and local authorities	161
NL	Bijdrageregeling exploitatie OV; Wet en Besluit Personenvervoer; Ministeriële regeling; Stcrt. 1992 251/252/253	Support to public authorities for public transport operations	Provincial and local authorities	1.006
NL	Subsidieregeling De Boer; Ministeriële regeling; Stcrt. 1996, 66	Support to public authorities for extra investments in local public transport	Provincial and local authorities	56
NL	Stimulering OV; Wet en Besluit Personenvervoer; Stcrt. 1992, 251/252/253	Support to public authorities or extra investments in local public transport	Provincial and local authorities, public transport owners	1

NL	Spoorwegaansluitingen, Stcrt. Nr. 245 1994	To improve rail access for employees	Companies	5
NL	Vaarwegaansluitingen; DGV/G3/V-525119 01-10-1996	To stimulate waterway access	Companies near waterways	6
NL	Regionale terminals; regeling SOIT	To stimulate regional transfer points	Transfer companies	2
NL	Bijdrage Binnenvaart Nederland; DGG/S/99000423, 15-01-1999 & DGG/S/98006415, 01-07-1998	To improve the competitiveness of Dutch inland shipping	St. Binnenvaart Ned.	0
NL	Nieuwe toetreders spoor; DGV/WJZ/V-325.664, 1-1-1995	To stimulate new rail transport operators	New rail companies	1

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
NL	Nederlands Instituut voor Maritiem Onderzoek (NIM); brief feb. '95 van EZ namens V&W, DEF, OCW en FIN	To co-ordinate maritime R&D	NIM	0
NL	Nederland Distributie Land (NDL);	To improve the competitiveness of Dutch inland shipping services and associated service companies	Shipping service companies	0
NL	Bijdrage aan haveninterne projecten	To stimulate regional investments in and sustainable development of harbour areas	Dutch sea harbour owners	11
NL	Besluit subsidies zeescheepsnieuwbouw 1994, 1994, 437, 1995, 309, 1997, 618	To maintain shipbuilding capacity	Shipbuilding companies	32
NL	Internationale ruimtevaartprogramma's	To enhance Dutch industrial know-how through participation in international space projects	ESA and NIVR	57
NL	C 26 /2001 - Refund of fuel excise duty to road freight carriers	To compensate road hauliers for fuel price rises through a tax refund	Road freight carriers	
SE	Guarantee to shipbuilding	To support Swedish shipyards	Swedish and foreign shipping companies	Unclear
SE	Regional transport grant	To compensate the cost disadvantages of long-distance	Companies	37



		transportation		
SE	Research grants	Six (for 2001) subsidy programmes to support transportation development	Competent universities and institutes	1

EU Member State	Subsidy Program	Goal	Target Group	Annual Budget (€ Million)
UK	N687/2000 Innovative solutions in rail-based logistics	To raise awareness and disseminate new ideas for the wider freight market and encourage logistics to build on these new ideas and increase their use of rail	Projects confined to rail-track network	10
UK	OG competitiveness offshore	Support to improve competitiveness of the offshore industry	Offshore industry	12
UK	Transport 2010: 10-year plan comprising the following 5 programmes:	To deliver a quicker, safer, more punctual and environmentally benign transport system	Transport companies in the UK	297
UK	Rail transport	To achieve a 50% increase in rail passengers and 80% growth in rail freight	Railway companies	99
UK	Local transport	To reduce congestion and improve public transport	Rural areas, towns and cities	97
UK	London transport	To transform the London Underground and improve commuter rail services	London	41
UK	Strategic roads	To deliver a quicker, safer, more punctual and environmentally benign transport system	Transport companies in the UK	35
UK	Future projects and other transport areas	To deliver a quicker, safer, more punctual and environmentally benign transport system in the future	Transport companies in the UK	25

Annex B. Vehicle Purchase and Registration Charges in Europe

Road vehicle taxes commonly include annual circulation taxes and/or registration taxes. Circulation taxes are raised in all countries. Table B-1 provides an overview of the main vehicle tax structures for EU-15 countries plus Norway and Switzerland.. Table B-2 gives an overview of the situation in other central and eastern European countries.

Table B-1. Purchase and registration taxes in the EU-15

Country	Vehicle	Principles	Differentiation
Austria	Pass. car	Purchase tax on new motor vehicles about 6 to 16% of price. Annual registration tax	Fuel consumption Engine power
	HGV ¹	Appr. 5.2 EURO per ton and month and 16,000 or 32,000 ATS/year (1995).	Vehicle weight
Belgium	Pass. Car	Registration tax plus VAT, 2,500 up to 200,000 BF. Annual circulation tax BF 2,000 up to 51,000 BF	Engine power
	HGV	Annual circulation tax	Vehicle weight
Denmark	Pass. car	Registration tax based on the value of the car: 105% of the value of the car, (incl. the general sales tax of 25%) if value is less than 50,800 DKK, 180% if value is more than 50,800 DKK Green owner tax: about 2–3,000 DKK Taxes on the mandatory liability insurance.	Vehicle price Fuel consumption
	HGV	HGV pay no registration tax Small vans up to 2 t pay 95% of the price above 12,100 DKK Larger vans (2–4 t) pay 30% of the price above 30,000 DKK	Vehicle price
Finland	Pass. car	Purchase tax based on value at custom (tax=100% of value at custom) ² . Annual vehicle tax: Flat-rate charge	Vehicle price technical features (safety equipment, cat. converter)
	HGV	Circulation tax	Weight, number of axles
France	Pass. car	Registration tax (95 FF up to 195 FF per horsepower) Circulation tax (5,900 FF up to 12,900 FF)	Engine power
	HGV	Registration tax (local and para fiscal charge on national level) Circulation tax	Vehicle price Axles, Weight (over 16 tons)
Germany	Pass. car	Annual motor vehicle tax (EURO/100 cm ³): Euro-norm 1 (EN+) – Fuel 6.87/Diesel 11.2; Before 1/1/86 - Fuel 9.78/Diesel 14.2; After 1/1/86 – Fuel 11.2/Diesel 15.6 (1995)	Emissions, cylinder capacity
	HGV	Circulation tax. (S1=Euro 1: Fuel 6.87 EURO/100 cm ³ , Diesel 11.24; S2=Euro 2: Fuel 5.20, Diesel 14.04)	Weight, emissions, noise
Greece	Pass. car	Consumption tax Circulation tax	Cylinder capacity Engine power, reduction for 'clean' cars
	HGV	Circulation tax	Engine power
Italy	Pass. car	Registration tax (plus additional provincial tax) Annual motor vehicle taxes are administratively set by regions. This tax is valid for every type of vehicle (petrol or diesel car). Diesel car registered before 2.2.92 are subject to an extra tax due to higher emissions.	Fiscal horsepower/payload Cylinder capacity, fiscal horsepower
	HGV	Annual circulation tax	Weight
Ireland	Pass. car	Registration tax Circulation tax	Cylinder capacity
	HGV	Circulation tax	Weight, cargo capacity

Luxembourg	Pass. car	Flat purchase levy; annual circulation taxes	Engine power
	HGV	Circulation tax	Weight, axles, type of suspension
Netherlands	Pass. car	Purchase tax based on weight, size of engine and effect of the motor ³ . Annual motor vehicle tax based on the weight of the vehicle.	Weight and size
	HGV	Circulation tax	Vehicle Weight
Norway	Pass. car	Purchase tax Annual motor vehicle taxes for passenger cars and vans.	Weight, size of engine
	HGV	There are 2 taxes, one is fixed for those vehicles weighting less than 12 ton and another for heavier vehicles based on weight and number of axles. There is also a separate tax for (semi) trailers.	Weight, number of axles
Portugal	Pass. car	Purchase tax Annual motor vehicle tax	Cylinder capacity Cylinder capacity and age of the car
	HGV	Annual motor vehicle tax	Net weight
Spain	Pass. car	Purchase tax Annual motor vehicle tax	Engine power
	HGV	The same as for passenger cars plus one surcharged called „Tarjeta de Transportes“.	Engine power
Sweden	Pass. car	Registration tax Circulation tax	Vehicle price Dead weight, type of fuel
	HGV	Circulation tax	Dead weight
Switzerland	Pass. car	Cantonal annual vehicle tax; some cantons have a bonus system for cars with catalytic converters.	Weight, cylinder capacity
	HGV	Annual vehicle tax for trucks and trailers. It can be paid per day, per month or per year (starting in 2001 the fixed charge will be replaced by a variable charge related to mileage and weight of the lorry.).	Weight, Axles
United Kingdom	Pass. car	Vehicle excise duty	flat rate
	HGV	Vehicle excise duty	Weight, number of axles

¹ HGV: Heavy goods vehicles

² Minus a reduction for safety equipment and catalytic converters, about 770 EURO.

³ For the most expensive cars a value-based tax is also levied.

Source: INFRAS (2000, p 41-43). All figures in the table are off-budget subsidies as defined by OECD (differences between tax rates are interpreted as subsidies).

Table B-2. Purchase and registration taxes/charges in central and eastern Europe

Country	Sales/excise tax	Import tax ²⁶	Annual vehicle taxes	Other/comments
Albania	-	Depending on the engine capacity and the use of the vehicle (EUR 299-374)	Annual vehicle tax according to engine capacity and carrying capacity (EUR 37- 172); Registration charge	Additional tax is levied on foreign vehicles (1.08 EUR/day).
BiH	Sales tax: 20% of the value of the vehicle	10-17% of the value of the vehicle, depending on the age and the use of the vehicle	Registration charges differentiated according to engine capacity (EUR 27-703)	Sales tax reduced to 7% for domestic cars. Part of the registration charge (water protection fee) earmarked for water management.
Bulgaria	Sales tax: 2% of the value of the vehicle Excise tax: 40% of the vehicle value	5-25% of the value of the vehicle, depending on the engine size	Annual vehicle tax differentiated according to engine capacity (0.05-1.05 EUR/kWh) and number of seats (for buses); Registration charge	50% reduction in vehicle annual tax for buses and trucks with environmentally friendly motors.
Croatia	Sales tax: 5% ^a Progressive excise tax rates, depending on the value of the vehicle	10% of the value of new cars 12% of the value of old cars	Tax on motor vehicles (EUR 10-102); Public roads use charge depending on engine power, or total weight for lorries	Special purpose vehicles (such as fire-fighting cars) are exempt from the public road use charge.
Czech Republic	-	-	Road tax differentiated according to engine capacity and weight (EUR 34-1,142)	Road tax levied on commercial vehicles. Public and combined transport and electric vehicles exempt.
Estonia^a	Excise tax depending on the type of motor, engine capacity and the age of the vehicle	-	Registration charge	Tax exemptions for pensioners, disabled persons, and families with 3 or more children.
Hungary	Sales tax: Motor<1600cm ³ - with catalytic converter: 10% - no catalytic converter: 32% Motor>1600cm ³ - with catalytic converter: 20% of - no catalytic converter: 32%	Car<4 years: - with catalytic converter: 13% - no catalytic converter: 18% Car>4 years: - with catalytic converter: 43% - no catalytic converter: 48%	Annual vehicle tax based on the weight of the vehicle (0.023-0.038 EUR/kg)	Incentive for younger cars with catalytic converters; import of old cars banned. Additional taxes levied on foreign vehicles.
Latvia	Excise tax based on the age of the vehicle (EUR 134- 446)	-	Annual vehicle tax based on the weight of the vehicle (EUR 13-178); Registration charge (EUR 2.5)	The highest excise tax rates applied to new and very old vehicles; lowest rates for 5-7 year-old vehicles.
Lithuania	Excise tax of 15% of the value of imported vehicles	5 to 10 year old cars: 5% of the value of the vehicle Cars older than 10 years: 10% of	Annual vehicle tax depending on the class of vehicle (light duty, heavy duty, special road	Additional tax on the use of roads paid by vehicles registered in other countries

		the value of the vehicle	vehicles: EUR 27- 270); Registration charge	and vehicles exceeding standard dimensions.
FYR Macedonia	Excise tax of 25% of the vehicle value	Rate depending on the age of the vehicle	Annual vehicle tax; Road charges	Sales of cars older than 6 years are banned.
Poland	Excise tax: Motor>2000cm ³ - 17.6% of the value of the vehicle Motor<2000cm ³ - 6.4% of the value of the vehicle	10% of the value of the vehicle (for cars imported from EU and candidate countries)	Annual vehicle tax applied to lorries and buses, based on load capacity (EUR 402-520); Registration charge applied to all the vehicles	Import duties vary according to country of origin (up to 35%). Annual vehicle tax is earmarked for environmental fund.
Romania	Excise tax, which is dependent on engine capacity and pollution level (high, normal, low)	20% of the retail price	Annual vehicle tax (EUR 15- 45); Registration charge (EUR 20-40)	The Romanian Auto Register determines pollution category, based on annual or bi-annual vehicle check-ups.
Slovakia	-	7% of the value of imported car	Commercial vehicles tax according to engine size (cars: EUR 30-130; lorries EUR 42- 1,490); Registration charges for all the vehicles	Import of cars older than 5 years and with no catalytic converters is banned.
Slovenia	n.a.	n.a.	Registration charge	-
Yugoslavia	Sales tax: 17% of vehicle value	Depending on the engine capacity and age	Registration charge; Road taxes	Import of old vehicles banned recently.

Symbols: n.a. = data not available; - = no tax/charge

^a The city of Tallinn levies additional local vehicle tax (EUR 0.32/kW of engine capacity per year), used for road maintenance

Source: Speck (2001, p. 49-51). All figures in the table are off-budget subsidies as defined by OECD (differences between tax rates are interpreted as subsidy).