

RECORDIT

REAL COST REDUCTION OF DOOR-TO-DOOR
INTERMODAL TRANSPORT

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Deliverable 5: Identification and calculation of taxes, charges and subsidies

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Abstract	The objective of this report is to identify the nature and structure of taxes, charges and subsidies in several countries, to establish a methodology to calculate the sum of taxes, charges and subsidies associated to any given corridor in the European Union, and to calculate these values for three selected corridors.
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EXECUTIVE SUMMARY

Objective of report

The objective of WP5 is to identify the nature and structure of taxes, charges and subsidies associated to intermodal and all-road freight transport, to establish a methodology to calculate the sum of taxes, charges and subsidies associated to any given corridor in the European Union, and to calculate these values for three selected corridors.

. These calculations are needed for comparison with the price that shippers have to pay for intermodal and road transport and to determine possible policy instruments for promoting intermodal transport. By analysing the cost structure, of which the sum of taxes, charges and subsidies is part, the RECORDIT project aims at developing and validating a methodology of calculation of real costs in intermodal transport.

Identification

Apart from its role as an important source of revenue, taxation in transport is also being turned to as a potential instrument to pursue other policy objectives, both at national level and increasingly, at European Community level. Taxes can be divided into three categories, associated with purchase, possession and use. Taxes are levied without a discernible service required from the government or for a service that is not in proportion to the payments. Charges require a direct and clear service in proportion of the payment on the part of the government. They can also be used as environmental policy instruments e.g. emission charges: fees related to the quantity of discharged pollutant. Subsidies are public aid by a government for which it receives no products or services in return. The purpose of such payments is to make a particular service or product available at a price that the public can readily afford.

Main categories of taxes, charges and subsidies

Taxes	Charges	Subsidies
Circulation tax (vehicle tax)	Road/rail infrastructure charge	Tolls subsidy
Fuel tax	Fuel charge	Fuel subsidy
Insurance tax	Road charge	Purchase subsidy
Registration tax	Road tolls	
Eco/energy tax	Harbour and berth dues	
	Terminal charge	

Calculation methodology

When dealing with transport through several countries one should consider how to calculate the taxes, charges and subsidies in a corridor. The starting point is the value of taxes, charges and subsidies per loading unit per kilometre. The number of kilometres in each segment of the corridor then multiplies this figure. The total sum of taxes, charges and subsidies per segment then forms the basis for the comparison with external costs.

1. *Tax, charge, subsidy per LU per km* $[Tax/LU/km]_{segment}$
2. $[Tax/LU/km]_{segment} * km_{case, country} [km] = [Tax/LU]_{segment}$
3. $[Tax/LU]_{segment} = [Tax/LU]_{corridor}$

Taxes, charges and subsidies are calculated in total, per segment, for both road and intermodal transport, disaggregated per category and per country. Detailed assumptions on a number of technical and operational parameters (vehicle technology, type of loading units, load factors, etc.) are made at the outset to ensure comparability and consistency. For truck refuelling, it is systematically assumed that the truck driver will choose the most economically convenient solution, i.e. that he will fill up on the border site where fuel is cheapest.

Results

Based on the above methodology, the sum of taxes, charges and subsidies is calculated for the three identified corridors, resulting in the following aggregated values.

- ?? for the corridor Athens – Gothenburg the sum of taxes, charges and subsidies for the all road solution amounts to 1317 Euro per semi trailer, while for the all rail solution the comparable figure is 638 Euro per Class A swap body.
- ?? for the corridor Genoa – Manchester, the sum of taxes, charges and subsidies for the all road solution (Italian truck) amounts to 305 Euro per TEU, to be compared to a total of 181 Euro per TEU for the intermodal solution.
- ?? for the corridor Barcelona – Warsaw, the sum of taxes, charges and subsidies for the all road solution (Italian truck) amounts to 524 Euro per Class A swap body. The all rail solution yields a negative result of -76 Euro per swap body, whereby subsidies exceed taxes and charges.

Conclusions

Summary conclusions can be drawn from both data collection and calculation:

- ?? Taxes and charges applied to road transport are systematically higher than for intermodal transport. CEE countries apply hardly any charges to rail transport.
- ?? Taxes in intermodal transport, for both rail and inland shipping, are low.
- ?? Subsidies to intermodal transport are higher than for road.
- ?? The assumption concerning the national origin of trucks impacts on the final results mainly in relation to the difference in circulation tax.
- ?? Road transport is subject to a wider variety of taxes and charges than intermodal transport. This can be seen as a wider array of opportunities to cover external costs.

-
- ?? Circulation taxes vary between 250 and 4700 Euro per truck per year. Using a truck with high circulation tax results in high taxes per loading unit per kilometre. Harmonisation of circulation tax in EU can eliminate distortions of competition between road transport undertakings.
 - ?? The registration tax does not significantly influence the total amount of taxes.
 - ?? Not every country fulfils the requirements of fuel tax harmonisation. In the defined corridors, this is the case for the Czech Republic, Greece, Hungary, Poland and Spain. Refuelling is much more profitable in those countries.
 - ?? CEE countries are well below the maximum rate of 1250 EURO per year¹ This means that the road charge in Hungary, Poland and Czech Republic will increase when joining the European Union.
 - ?? The lack of harmonisation of rail transport charges influences the differences in figures between the three corridors.
 - ?? Information about subsidies is very hard to find and to convert to Euro per loading unit.
 - ?? Taxes do not belong to the competence of the European Union, which largely contributes to explain the observed variation in taxes between the European Union countries.

¹ EU Parliament and Council Directive 99/62/EC of 15 June 1999 on the charging of heavy goods vehicles for the use of certain infrastructures

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1 INTRODUCTION

1.1 Objective of Deliverable 5: comparison of the sum of taxes, charges and subsidies in road and intermodal transport

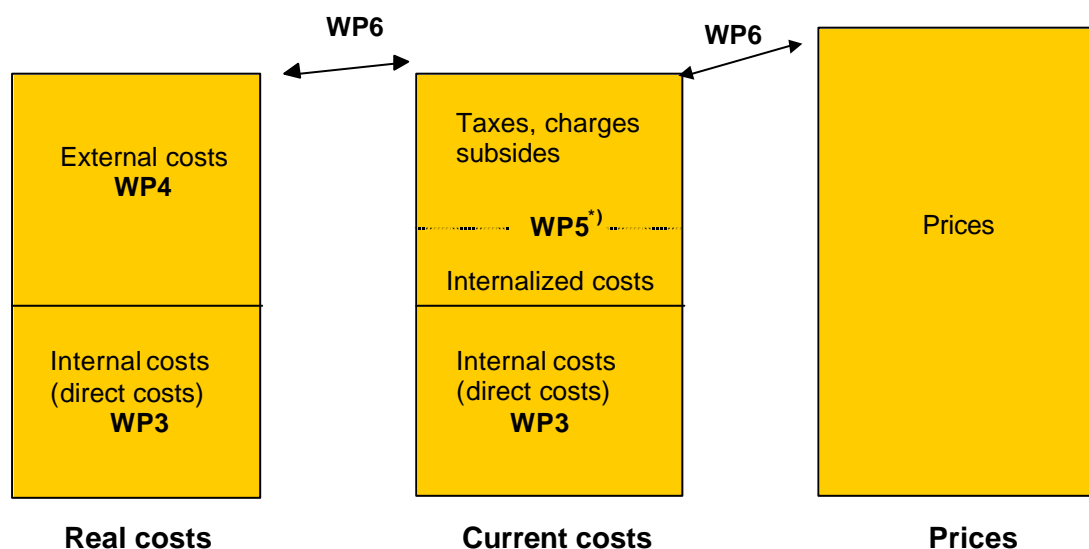
The objective of WP5 is to identify the nature and structure of taxes, charges and subsidies associated to intermodal and all-road freight transport, to establish a methodology to calculate the sum of taxes, charges and subsidies associated to any given corridor in the European Union, and to calculate these values for three selected corridors.

These calculations are needed for comparison with the price that shippers have to pay for intermodal and road transport and to determine possible policy instruments for promoting intermodal transport.

1.2 Position of D5 in relationship with other RECORDIT deliverables

RECORDIT aims at analysing the cost structure of door-to-door intermodal freight transport services. This includes the development and validation of a methodology for the calculation of the real costs of intermodal freight transport and the comparison of real costs to the taxes, charges and subsidies currently paid. The latter are provided by the calculations developed within this deliverable, and represent the contribution of WP5 to the overall framework of objectives.

Figure 1 below illustrates the basic approach to carry out the required comparisons, as will be taken forward by WP6.



*) Internalized costs, like harbour dues and infrastructure costs are both identified in WP3 and WP5. In the comparisons in WP6 these costs will be compared and analysed.

Figure 1: Relationship between validation and analysis of the RECORDIT case studies

1.3 Results of Deliverable 5

The main result of this deliverable is the calculation of taxes, charges and subsidies for different corridors. Both intermodal transport and the corresponding all road solutions in the identified corridors were calculated and compared. To this end, a simple arithmetic model was developed allowing for easy and straightforward changes to individual values and the subsequent adjustment of results.

The adopted approach follows a three-step sequence. (See Figure 2).

The first task is to identify all relevant taxes, charges and subsidies in the countries and in the corridor, so as to assess the exact nature and structure of taxes and charges currently applied in road and door-to-door intermodal transport. The next step is to collect all relevant data on taxes, charges and subsidies on intermodal and road transport. A data format based on the taxes, charges and subsidies and the relevant countries has allowed to streamline data collection while ensuring its consistency across corridors and countries. The expected output is the quantitative evaluation of taxes, charges and subsidies currently applied to door-to-door intermodal and road transport.

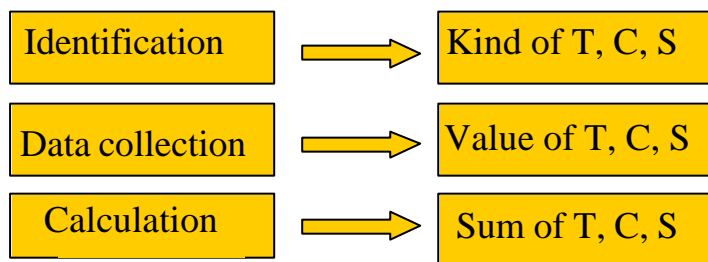


Figure 2: Approach of Deliverable 5

The data calculation then provides the sum of taxes, charges and subsidies in several intermodal and road cases in the selected corridors. The corridors are considered as a sequence of building blocks². The expected output is the total sum of taxes, charges and subsidies in door-to-door intermodal transport and in the corresponding all road solution. Preliminary conclusions are finally formulated after comparison, to be further extended and elaborated in WP6, where current imbalances in pricing and cost structure are analysed.

1.4 Outline of the report

The structure of the deliverable follows the three-step sequence outlined above. Chapter 2 focuses on the identification of the different kind of taxes, charges and subsidies available in most European countries. Chapter 3 then explains the arithmetic methodology and the use of specific policy instruments in the corridor-based approach. Chapter 4 illustrates the outcomes and compares the results both within and across each corridor. Preliminary conclusions are presented in Chapter 5.

² The same sequence building blocks are used in the case studies for calculating the external and internal costs.

2 IDENTIFICATION OF TAXES, CHARGES AND SUBSIDIES

This chapter identifies the different types of taxes, charges and subsidies available in most European countries. Measures aimed either at revenue generation, or/and at the introduction of environment-related charges are first illustrated, followed by a comprehensive identification and illustration of all existing kinds of instruments. Fiscal harmonisation in goods transport in the European Union sets the minimum value of taxes and charges and the minimum requirements of fiscal regulations. The last paragraph deals with the scope of the identified taxes, charges and subsidies and the relationship between cost, prices and taxes, charges and subsidies.

2.1 Origin and definition of taxes, charges and subsidies

2.1.1 Taxes and charges as policy instruments

All Member States of the European Union rely heavily on a range of tax instruments to ensure significant budgetary receipts from both private and commercial road users. It has been an important source of revenue for a long time. Apart from its role as an important source of revenue, taxation in transport is also being turned to as a potential instrument to pursue other policy objectives, both at national level and, increasingly, at the European Community level.

Sweden has been the first country in developing principles for the cost responsibility of different modes of transport. First in 1988 the Swedish parliament laid down that all modes of transport were to bear their own costs, including accident costs and environmental impact. This model distinguishes between fixed and variable charges. The variable traffic charges must as far as possible correspond to the socio-economic marginal costs, while the fixed charges must, in principle, correspond to the difference between the marginal cost and the total socio-economic costs of transport. In the costing liability of Swedish road transport, for example a portion of petrol tax is designated a 'charge' for vehicular emissions of NO_x and hydrocarbons. The carbon dioxide taxes in some of the Nordic countries are also levied on petrol and diesel fuel, and fiscally speaking are components of the fuel taxes. Fuel consumption is not directly related to the cost of damage to the road network. If costs are internalised in the diesel fuel tax, heavy trucks will probably pay too little, given their relatively high loading of the road track. For these two reasons, it is desirable to introduce a form of road-pricing, with tax being paid on the basis of vehicle weight, and increased according to the mileage driven in the country in question.

Such systems could very well be expanded to include payment of additional disturbances/costs. It provides an incentive to the users to reduce the negative impact of transport by employing better technologies, or by shifting to other modes of transport. Several examples exist of internalisation of external costs. Civil aviation, for example, pays most of its infrastructure costs through airport and

landing charges. Ship owners pay harbour and canal dues. Road transport companies pay a fuel charge and in some European countries transport companies should buy an Eurovignette.

To some extent external costs have already been internalised, but it is important to relate the internalisation to the number of kilometres. As far as possible, all variable costs should be internalised through traffic charges, rather than via annual charges, since the latter do not relate to mileage driven. This is generally possible to achieve for aircraft, trains and large short-sea vessels. For road transport the best solution would be a weight-distance tax that also takes exhausts, noise and the average risk of accidents into consideration.

Such a system, as and when be harmonised throughout Europe, might serve as a forerunner for the general introduction of road pricing. Until the actual realisation of such a system, fuel tax, vehicle tax, toll collection and the Euro tax disk offer sufficient scope of internalising traffic costs, provided that the amount of externalities is well assessed. In cases where there is a significant gap between specific taxes/charges and the amount of externalities, this could be corrected by increasing the corresponding taxes/charges.

Besides the need for realistic internalisation, the council of the European Conference of Ministers of Transport (ECMT) intends to promote the harmonisation of taxes and charges in international road freight transport. The consistency and levels of such taxes and charges should also be systematically examined from an environmental point of view.

2.1.2 Subsidies for environmental sustainability and other social benefits

Road transport is one of the main causes of both pollution and global warming induced by CO₂. To stimulate the use of more environmentally friendly transport modes governments can introduce subsidies, in particular circumstances. In practice, governments then use subsidies to accrue environmental and other social benefits. It is important to ensure that unfair subsidies are avoided/removed, considering that distortions of trade and competition may occur when favouring specific modes of transport at the expense of others without taking into account e.g. the environmental costs.

Both direct and indirect subsidies exist. The former aim to directly influence the utilisation of transport services, thereby contributing also to the achievement of a decrease in both environmental damage and market distortion. The value of these direct subsidies can be derived from the company's accounts, where they are recorded as, e.g. discounts on taxes and charges paid by the users. Indirect subsidies account for costs not paid for by users, such as e.g. the expenses incurred by a government for financing the provision of infrastructure.

Because of the nature of subsidies, i.e. their distinction in direct and indirect, it is difficult to calculate the impacts at corridor level of indirect subsidies, e.g. for infrastructure provision. This is the reason

why in this report, when dealing about subsidies, we include those direct subsidies that can be found in the account statement of any company, and we will exclude the indirect subsidies

Furthermore, such an approach fits with the short-term period assumed in the calculation of costs. The assumption concerning a given infrastructure endowment justifies the exclusion of the calculation of subsidies for infrastructure provision.

2.2 Definition

The policy instruments taxes, charges and subsidies should be defined to make a comprehensive view on the fiscal climate in European countries.

Table 1: Definition of taxes, charges and subsidies³

Taxes	a levy that must be paid with no discernible service required from the government or a service that is not in proportion to the payments. Taxes include e.g. income tax, sales tax, property tax, corporate tax, inheritance tax and excise tax. Custom duties and tariffs are both taxes levied on imported products
Charges	a levy which requires a direct and clear service in proportion of the payment on the part of the government. An entrance fee to a museum is a charge, since as a service, the payer is allowed to enter the museum. User charges are often used as environmental policy instruments e.g. emission charges: fees related to the quantity of discharged pollutant
Subsidies	Contribution by a government for which it receives no products or services in return. The purpose of such payments is to make a particular service or product available at a price that the public can readily afford, when the service or product cannot otherwise be profitably supplied at this price.

2.3 Different types of taxes, charges and subsidies

Several, both international and national, documents use different definitions for any tax or charge. This paragraph identifies different categories of taxes and charges within a given framework.⁵

2.3.1 Taxes

The various tax instruments available can be divided into three broad categories.

?? Taxes, associated with acquisition, purchase or registration: registration taxes

?? Taxes, in connection with possession or ownership of a vehicle: circulation taxes, insurance taxes

?? Taxes, related to the use of vehicles: fuel tax, road tax

³ Acknowledgment goes to the Unite EU Project, Interim Report 10.2 “Accounts Approach for Taxes, Charges and Subsidies”

⁵ Framework and identification are based on ‘Vehicle taxation in the European Union’ (Ref XXI/306/98-EN), ‘Port tariffs’ (Port of Rotterdam, 2000), ‘Fiscal Dictionary’ (Kluwer, Dutch)

Registration tax

The registration taxes are normally payable in advance of, or at the time of, registration of a vehicle. They are normally charged only once, at the time of first registration, but in some Member States a new tax arises on each change of ownership. When buying a car the buyer will have to pay a percentage of the price of the car. Only few countries in the EU do have this registration tax.

Circulation tax

A circulation tax is charged on a periodic basis, mostly annual, and usually confers the right to use the public road network. The tax is charged according to various criteria, such as engine capacity, horsepower, fuel type, region of registration, age of vehicle. The circulation tax has to be paid in the country where the transport company is located.

Insurance taxes

Most European countries do not have an insurance tax for freight transport. It is an extra tax above the insurance fee, and in most cases charged in insurance for private cars. Freight trucks are often exempted from this insurance tax, if at all existing.

Fuel tax

Fuel tax is the excise duty on petrol and diesel. Usually it is a percentage of the fuel price (without VAT). The height per kilometre depends on the fuel usage. By September 2000 the high price of the petrol leads to the discussion about lowering the fuel tax, to prevent too high prices for the transport sector. According to some publications, 2/3 of tax revenues from road transport in EU Member States is accrued from excise duties.

Eco-tax

An Eco-tax means that for every product bought, a percentage is paid for the environmental damage generally occurred during the lifecycle of that product. Normally it is based on the amount of energy consumed. In Germany the refrigerated freight transport sector objected this policy measure, because of their high energy usage and the limited opportunities to reduce it⁶. Since 1999 some EU-countries have implemented such tax in several ways, but because of base year 1998 Eco-tax is not explicitly considered in the calculation and comparison.

Charges

Charges applied by governments may be associated to different products/services and to different charging circumstances.. As for freight traffic, charges can be divided into two main blocks

⁶ Since 1999 some EU-countries have implemented such tax in several ways, but because of base year 1998 we do not discuss this Eco-tax is not explicitly considered in the calculation and comparison

?? charges for using infrastructure: toll, infrastructure charge, rail infrastructure charge, lock charge⁸, harbour dues, terminal charge

?? charges for using fuel: fuel charge

Toll

Toll payments are used for direct infrastructure costs, like building costs, maintenance and repair costs. The toll has to be paid by the users of the infrastructure, both passenger cars and freight trucks. Mostly, road *charges* and tolls are complementary to each other. For example, in The Netherlands there is no toll when entering the highway, except for some tunnels and bridges. Payment for infrastructure is provided for through the Eurovignette. On the contrary, highways in France, Italy and other EC countries are equipped with toll places. Depending on the distance driven, both trucks and passenger cars pay a certain amount of money.

Infrastructure charge

Infrastructure charges consist of several elements. Most visible is the road charge for using infrastructure. For several years some Western-European countries have adjusted the so-called Eurovignette, to be paid by heavy load vehicles that would like to trade in those countries. Road pricing is another form of infrastructure charge. The Dutch government is still trying to implement a charging system for the highway in the crowded urban areas during congestion periods, the so-called „Rekening Rijden“. Only recently the Ministry is thinking of a kilometre charge, which is more directly related to the number of kilometres driven.

Rail infrastructure charges

Rail transport is subject to charges in several European countries. Railway companies pay a train- or wagon-related charge for making use of the tracks. In most cases this rail infrastructure user charge per kilometre is calculated by dividing a total annual amount by the total number of kilometres per year.

Harbour and berth dues

Vessels in inland shipping pay several charges when entering the harbour.

Terminal charges

In harbours, inland shipping terminals and rail terminals forwarders must pay a charge for using the terminal. Government-owned terminals would obey a charge for an operator. The more an operator uses a terminal the more he pays.

Fuel charge

Some European countries apply a charge on top of the fuel price (inclusive VAT), and the fuel tax, which is here defined as a *fuel charge*. Only few European countries levy the fuel charge, and the

⁸ Ten locks are present in the Rhine from Basel to Rotterdam, and every lock takes about 45 minutes. No lock charges

difference between the fuel charge and the fuel tax can hardly be determined. In general the fuel charge is especially used for covering expenditures for internalising environmental external costs for fuel emissions. Only in straightforward cases we will explicitly incorporate this charge in the calculation.

2.3.2 Subsidies

As mentioned above only direct subsidies that can be found in the accounting documents of companies will be included. Shipping and forwarding companies, harbour service companies and rail forwarders make use of several subsidy regulations. Each European country has its own regulations, sustained by the European Commission. Some examples are mentioned below:

- ?? Purchase subsidy when purchasing containers and vehicles to facilitate the use of intermodal transport.
- ?? Subsidy when a company would like to be connected with the intermodal infrastructure network
- ?? Subsidies on petrol for vessels and trucks to compensate some part of the excise duty. This subsidy is often incorporated in a lower fuel excise, or can be drawn back by showing bills.
- ?? Subsidy for starting a service between an origin and destination, for both intermodal and road transport, aiming at making new and efficient transport service. This subsidy aims to compensate the expected loss in the first years and to make new transport services competitive.

Owing to the very nature of subsidies, and to the usually aggregated representation thereof that can be found in accounting documents (both public and private) it is in fact very difficult to collect enough data for every type of subsidy. Furthermore, the transformation of the individually paid (or received) subsidies into an amount per loading unit per kilometre is difficult. Direct subsidies are therefore included in the calculation to the extent that data availability allows it.

2.4 Harmonisation in EU Transport Policy

The EU is currently attempting to harmonise taxes and charges in the European countries. This harmonisation is desirable. For selected taxes, the Council has adopted a Directive for maximisation of the rates. It is the Council Directive 1999/62/EC that harmonises the levy systems – vehicles taxes, infrastructure charges – by fixing minimum and maximum rates in order to avoid distortions in competition among haulage firms in member States. This Directive replaces the Directive 93/89/EEC on the application by Member States of taxes on certain vehicles used for the carriage of dangerous goods by roads as well as tolls and charges for the use of certain infrastructures.

Excise duties on diesel oil (fuel tax)

On 19 October 1992, the council adopted a Directive, fixing the maximum rate of excise duty on diesel oil at 245 EURO per 1000 litres. While this Directive simply lays down a minimum rate, it is nevertheless an important measure, since this rate is set at a fairly high level. Substantial progress has been made towards scaling road charges, so that they are not established on a ‘lump-sum’ basis, but

are commensurate with travelling kilometres, energy consumed, use made of the road network and costs generated. International harmonisation of excise duties necessitates national harmonisation with vehicle taxation, road user charges and excise duty on fuel. The last one should be harmonised for the application of the territorial principle in paying for road using.

On June 1993 a policy compromise is reached, which may be qualified as 'historic', since it represents a breakthrough towards not only a fairer system of road taxes and charges, but also toward a more equitable allocation of costs among users. It consists of two parts:

?? Establishment of a minimum rate for taxes and charges on heavy goods vehicles

?? Provision for Member States to introduce charges for the use of trunk roads.

Vehicle tax

From January 1995 until 31 December 1997 the minimum rate for a conventional 2+3 axles vehicle weighing up to 40 tons is set at 700 EURO per annum. Under specific circumstances provision has been made for optional reduced rates (for example for motor vehicles used for combined rail/road or waterway/road transport.) The procedure for levying and collecting is subject to national regulations.

Tolls and user charges

The user charges may not exceed 1250 EURO per annum in 1997⁹ subject to yearly reviews. The user charges must be in proportion to the use of the infrastructure. Member States may only apply annual rates to vehicles registered in that Member State. The toll rates must be related to the costs of constructing, operating and developing the road infrastructure. In border areas, special arrangements may be made. Tolls must be paid by all concerned, with no direct or indirect discrimination based on the haulier's nationality or the origin or destination of traffic. Both toll and charge shall not be imposed at the same time for the use of a single section of road, except for tolls on bridges, tunnels and mountain passes. User charges are differentiated according to emission standards and road damage. Belgium, Denmark, Germany, Luxembourg and the Netherlands have, in fact already decided to co-operate in introducing a common system of user charges.

Infrastructure charges

Only since 1970 the EEC introduced an accounting system allowing to pinpoint expenditures on transport infrastructure (for rail, road and inland waterway). Since 1990 the agreements have been as far as informing the Commission about the outcome of the accounting of expenditure, the amount of credits to finance the expenditure and the figures on the use of transport infrastructure.¹⁰ These data are needed to establish an adequate infrastructure accounting system.

⁹ Council Directive number 93/89/EEC of 25 October 1993 on the application by Member States of taxes on certain vehicles used for the carriage of goods by road and tolls and charges for the use of certain infrastructures.

¹⁰ CEEC Manual – IRU handbook on the European Harmonisation of Road Transport Legislation, in particular Regulation (EEC) 1108/70, amended latest by council Regulation 3572/90/EEC

2.5 Layered model and scope

The transport sector consists of a heterogeneous set of actors linked through distinctive markets and with different objectives and information and communication needs. On the left of the layered model, four types of actors are presented: shippers/passengers, logistics service providers, transport operators/drivers and infrastructure providers. Each has different objectives and performs different tasks in the logistics and transport chain. On the right of the model, four types of markets are presented: the market of logistics services, the market of transport services, the market of infrastructure services and the market of infrastructure investments. Every one of these markets has its own rules of optimisation. Every actor has to pay for several cost items, which amounts to the cost price for this actor. This particular actor adds a profit margin on this cost price, which results in a selling price for this particular service. This price is one of the cost items for the actor one layer above in the model. We will deal with the transport service price that a shipper has to pay for freight transport.

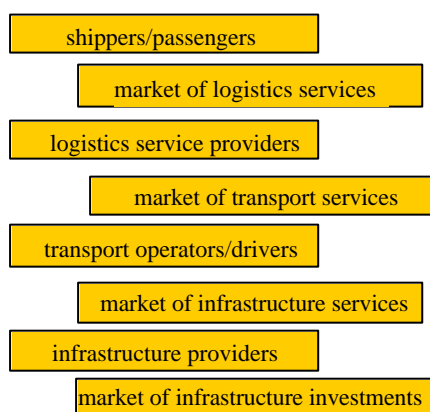


Figure 3: Layered model with actors and markets

To indicate which parts of this transport service price are treated in the direct costs and what costs will be seen as charges and taxes by the government, Figure 4 represents a layout of transport service price in relationship with current costs.

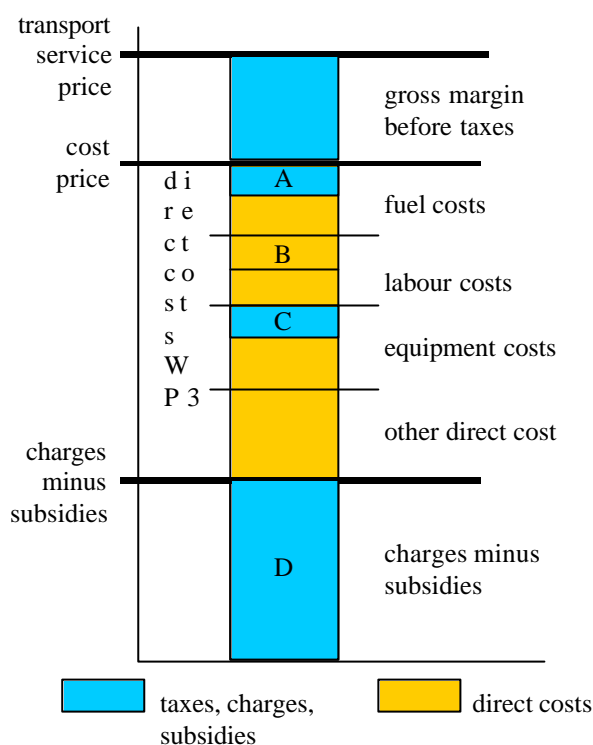


Figure 4: Layout of paid price in contrast to real price

For every building block, its interpretation and the role of taxes, charges and subsidies in the calculations is explained below. fuel related taxation (in picture: A)

These include fuel tax, fuel charge and fuel VAT. Fuel VAT is not included in RECORDIT calculations, as VAT can be fully reclaimed by the operators, While all other fuel taxes and charges cannot be reclaimed. They are an integral part of the fuel price and the direct cost price and therefore economically relevant to the transport decision. Both fuel tax and fuel charge are calculated.

?? labour related taxation (in picture: B)

These include income tax and employer’s social contributions. These costs cannot be reclaimed. They are an integral part of the direct labour costs and cost price, and therefore are directly relevant to the transport decision. Although alleviating these costs can be an important instrument for government economic policy (e.g. sea shipping policy in the Netherlands), labour related taxation is not singled out in the calculation.

?? infrastructure charges and other direct charges and subsidies (in picture: D)

These include tolls, road charges, exploitation subsidies and the like. These elements are not a part of direct costs, and are singled out, as for direct taxes, in the calculation of internal costs. These taxes, charges and subsidies are calculated.

?? equipment related taxation (in picture: C)

These include for instance vehicle removal charges, registration, circulation tax, intermodal connections and may even include company specific government-borne infrastructural subsidies (industry zones, Information technology infrastructure etc.) and loans. The other, more subsidy-

related aspects are very case specific and generally not made public. These taxation elements cannot be reclaimed, they are an integral part of the input prices calculated and included in the sum of taxes, charges and subsidies.

Some taxes are not included in the calculation, like VAT applied on the value of output, e.g. the transport service. Strictly, this tax is a part of the price paid for the door-to-door service. Again, this is mostly reclaimed by the transport customer (shipper or intermediary), and therefore is not relevant to the transport decision. Prices are usually given without any VAT, so this output tax is not included. Also profit tax, revenue tax and other direct taxes are not included. These taxes cannot be reclaimed. They are an integral part of the price paid by the customer and of the direct labour costs.

3 METHODOLOGY AND DATA

In the previous chapter a list of taxes, charges and subsidies is given that are used in the calculation of the total sum. The corridor approach leads to a component-based arithmetic methodology. This chapter describes this methodology, the way to deal with each category of taxes, charges and subsidies, and the premises.

3.1 Arithmetic methodology based on identified taxes, charges and subsidies

3.1.1 Four-step approach and explanation

The RECORDIT calculations concentrate on three Intra-European corridors: the trimodal corridor from Genoa to Manchester, the freight freeway from Patras to Gothenburg, the bimodal corridor from Barcelona to Warsaw¹¹. When dealing with transport through different countries, one should consider how to calculate the taxes, charges and subsidies for a route through these countries. First of all we will have to define loading units per mode segment, as used in several corridors. Next paragraph will deal with loading units. The starting point is the value of taxes, charges and subsidies in the involved countries, which are transferred to values per loading unit per kilometre.

The number of kilometres per mode segment multiplies the values of taxes, charges and subsidies. The resulting values are added up to a total value for this corridor. To end with the tax per loading unit per kilometre in the whole corridor, the sum of taxes, charges and subsidies in every country is divided by the total number of kilometres in this particular solution. This means in general the following four-step approach:

1. *Tax, charge, subsidy per LU km* $[Tax/LUkm]_{country, mode segment}$
2. $[Tax/LUkm]_{country, mode segment} * km_{case, country} [km] = [Tax/LU]_{country}$
3. $? [Tax/LU]_{country} = [Tax/LU]_{corridor}$
4. $[Tax/LU]_{corridor} / km_{corridors} = [Tax/LUkm]_{corridor}$

Taxes, charges and subsidies are calculated in total, per segment, for both road and intermodal transport, per type of instrument and per country. In principle a new value for taxes, charges and subsidies is used after every border crossing. A difference exists between intermodal transport and the all road solution. (See figure 5 and 6).

¹¹ For a more distinctive and detailed description of these corridors, see D2 of the Recordit project: "Methodology for the analysis of mechanisms of cost and price formation at corridor levels", Gruppo CLAS, Milano, 2001.

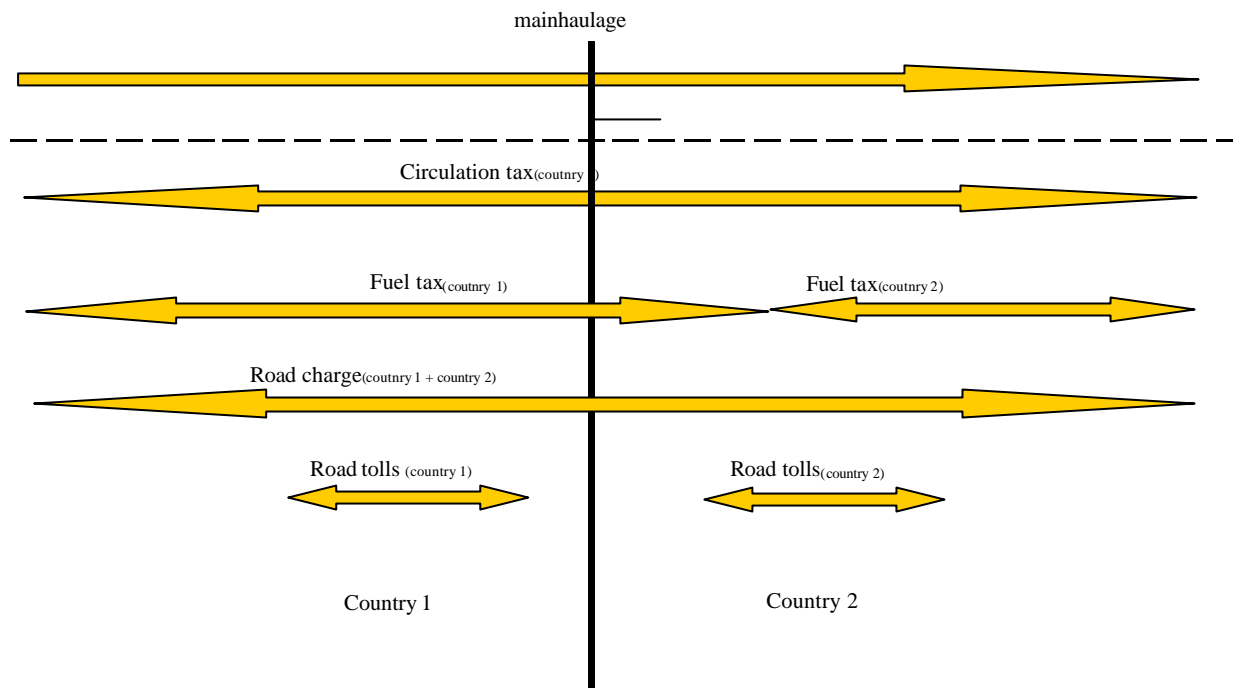


Figure 5: Overview of tax accounting in all road solution

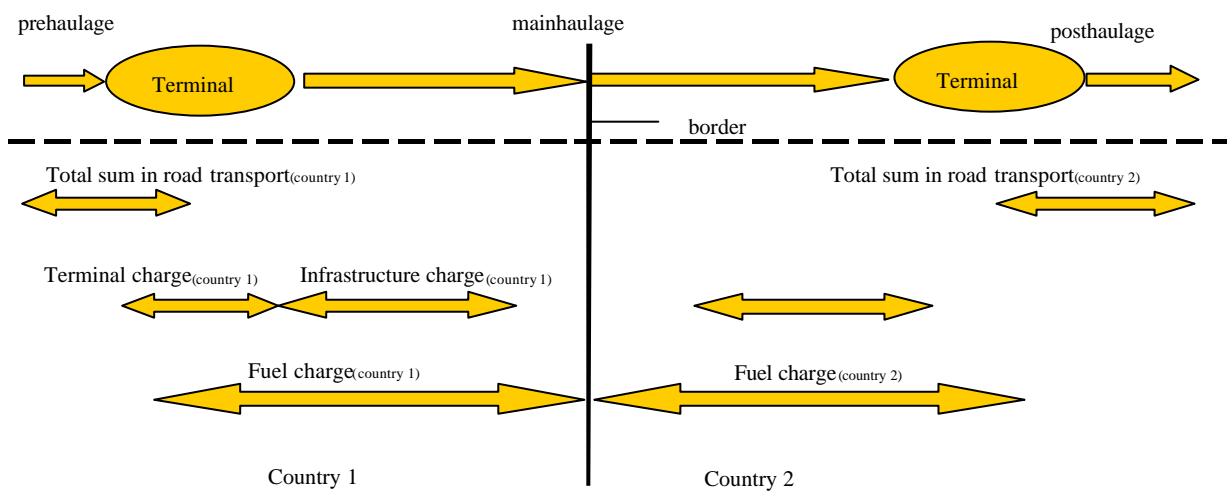


Figure 6: Overview of tax accounting in intermodal transport

A careful interpretation of the two figures above prompts the following comments:

?? the annual circulation tax is paid to the government of the country where the transport company is located. The tax per truck per kilometre is equal to the total annual amount divided by the number of kilometres per truck per year. Insurance tax, although hardly valid for commercial vehicles, can be calculated in the same way.

$$Tax_{circulation} [E/LU^{12}km] = Tax_{circulation, annual} [E/yrtruck] / Annual\ kilometres\ [km/yr] / [LU/truck]$$

?? Fuel tax must be paid for each litre of fuel filled up during the trip. The tax per kilometre is calculated by dividing the fuel tax per litre by the usage per litre. Crossing the border with a filled up tank, the truck can keep driving into the neighbouring country (and beyond). The decision where to refuel in border crossing determines which fuel tax should be used in the calculation.

It should be stated that increasing the diesel fuel tax would have several drawbacks with regard to correct cost allocation. In the first place, a truck with a full fuel tank can drive such large distances that a major proportion of the fuel tax will be paid in a country different from that where the infrastructure is used. For this reason, no great discrepancies will arise between the sum of fuel tax in the countries and in practice the trend will be determined by the EU minimum rate.

$$Tax_{fuel} [E/LUkm] = Tax_{fuel, litre} [E/l] / Fuel\ usage\ [km/l/truck] / [LU/truck]$$

?? Registration tax has only to be paid when purchasing a truck. This means that the economical lifetime of the truck has to be taken into account at some point.

$$Tax_{registration} [E/LU/km] = Tax_{registration, once} [E/truck] / Lifetime\ [yr/truck] / Annual\ kilometres\ [km/yr] / [LU/truck]$$

?? Fuel charge is calculated similarly to fuel tax.

$$Charge_{fuel} [E/LU/km] = Charge_{fuel, litre} [E/l] / Fuel\ usage\ [km/l/truck] / [LU/truck]$$

?? Road charge is nationally based. There is a difference between the annual road charge per country, like in Switzerland and the road charge valid for more countries, like the Eurovignette. This vignette is valid in Germany, Denmark and the Benelux and only has to be paid once in the first entered or home country. The road charge is treated like the circulation tax, with the remark that the sum of road charges in entered countries should be divided by the annual number of kilometres per truck.

$$Charge_{road} [E/LU/km] = Charge_{road, country1} [E/truck] + Charge_{road, country2} [E/truck] / Annual\ kilometres\ [km/yr] / [LU/truck]$$

?? Road tolls are corridor specific. They only should be paid in some locations and situations. The amount per kilometre is equal to the total rate divided by the length of the toll high way. In this calculation method we will use the total amount and only divide by kilometres in step 4.

$$Tolls_{road} [E/LU] = Tolls_{road, truck} [E/truck] / [LU/truck]$$

¹² LU = loading unit, in Recordit a twenty feet equivalent unit (TEU) is chosen.

?? Road pricing and charges for rail infrastructure are valid along the whole corridor and are mostly given in rate per kilometre, while It is here important to calculate the charge per kilometre per loading unit rather than per kilometre per vehicle.

$$Charge_{infrastructure} [E/LU/km] = Charge_{infrastructure, country1} [E/vehicle/km] / [LU/vehicle]$$

Terminal charges, like harbour dues and lock charges are quite dependend on location. These charges use a unity per crossing. We choose the same way of calculation as for road tolls.

$$?? Charge_{terminal} [E/LU] = Charge_{terminal, handling} [E/handling] * [handling/LU]$$

$$Charge_{terminal} [E/LU] = Charge_{terminal, vehicle} [E/vehicle] / [LU/vehicle]$$

?? Subsidies can occur in several ways, as illustrated in chapter 2. The calculation procedure is presented for the example of a toll subsidy Tolls subsidies are given per kilometre , and therefore treated like a negative infrastructure charge.

$$Subsidy_{tolls} [E/LU/km] = Subsidy_{tolls} [E/vehicle/km] / [LU/vehicle]$$

Once the arithmetic methodology for calculation of taxes, charges and subsidies is established, a full set of premises (or assumptions)¹³ must be set to ensure consistency throughout the calculations and subsequent comparisons.

3.2 Premises

This paragraph describes the premises in the calculation, including the layout of the corridor and the loading units used therein. Annex B recapitulates the numeric values illustrating the assumptions made.

3.2.1 Lay-out of the corridor

The corridors are described in detail in Annex C, based on the results presented in Deliverable 2. This paragraph therefore only deals with the main layout features.

Patras – Gothenburg

This corridor is a freight freeway from Athens through Italy, Austria, Germany, Denmark and Sweden. The intermodal corridor starts with pre haulage from Athens to Patras with a short sea shipping link to Brindisi. From Brindisi to Gothenburg it is all the way down with trains, with several transshipments in Milano, Munich and Hamburg, and marshalling in Maschen and Taulov.

¹³ These premises are the same as used in work package 3 and 4, dealing with internal costs respectively external costs.

The all road solution differs from the intermodal solution from Brindisi. An Italian forwarder is assumed to drive in the main haulage part from Brindisi to Gothenburg and fuel is purchased in Austria¹⁴. Every country in between, as Germany and Denmark, is only crossed.

Genoa – Manchester

Transport along this corridor goes through 5 countries: Italy, Switzerland, Germany, Netherlands and the UK. The trimodal corridor starts in the port in Genoa; after by shunting and marshalling the rail haulage to Basel begins. In Italy there are both a single traction and a double traction legs. Transshipment in Basel initiates the inland shipping part of the corridor to Rotterdam, sailing with Dutch fuel. The short sea shipping leg between Rotterdam and Felixstowe is followed by rail transport to Manchester.

The all road corridor starts in Genoa with an Italian truck as well, all the way down to Rotterdam. Short sea shipping on a roll on-roll off vessel between the Netherlands and the UK is followed by road transport to Manchester. The fuel tank is only filled in The Netherlands.

Barcelona – Warsaw

The corridor Barcelona Warsaw goes through 8 countries: Spain, France, Italy, Slovenia, Croatia, Hungary, Slovak Republic and Poland. This corridor starts with pre haulage in Barcelona. The long rail haulage begins in Barcelona and requires transshipments in Port Bou, Lyon, Torino, Bologna, Verona and Budapest, before it reaches Warsaw, where post haulage takes place to the consignee.

The all road solution is a corridor with three segments, each segment using its own original truck and fuel. From Barcelona to Torino an Italian truck is used with Spanish fuel. On the next segment, a Hungarian truck with Croatian fuel drives from Torino to Budapest, while from Budapest to Poland a Polish company with Polish fuel rides the segment.

3.2.2 Loading units

Consistently with the current market reality, different loading units are used in each corridor. On the other hand, within any given corridor the same loading unit is used for both the intermodal and the all road solution. The first and third corridor use a class A swap body in intermodal transport and a semitrailer in the road segments. Both the class A swap body and a semitrailer have a maximum capacity of 24 tonnes and an average load of 18 tonnes per loading unit. The second corridor is trimodal, with container inland shipping as one of the segments, thus the appropriate loading unit is a container. A twenty feet (1 TEU) container is used. The average loaded weight of a TEU is 12 tonnes.

¹⁴ A sensitivity analysis has shown that the choice for the origin of truck does not influence the results very much, mainly due to the low share of registration and circulation tax in the total sum of taxes, charges and subsidies. The origin of fuels is economically determined by the lowest fuel price. By this assumption and the large fuel tanks not much sensitivity is available.

Table 2: Loading capacity and average loading factor of several loading units

Type of loading unit	Maximum capacity (tonnes)	Average loading factor	Average load (tonnes)
20' container	16	0.75	12
40' container	24	0.75	18
Class A swap body (13,6 metres)	24	0.75	18
Class C swap body (> 7 m)	16	0.75	12
Semi trailer	24	0.75	18

All calculations in chapter 4 are based on the average load per loading unit and a maximum capacity of number of loading units per vehicle, train or vessel.

3.2.3 Other premises

?? type of truck

The standard vehicle in the all road corridors is a 40 tonnes articulated truck. The average fuel usage is 2.33 kilometre per litre and the content of the fuel tank is 200 litres in pre and post haulage and 1200 litres in main haulage.¹⁵ The average mileage per truck is 140 000¹⁶ kilometres per year in main haulage and 80 000 kilometre per year in pre and post haulage. The economical life cycle is 5 years. The price of this new truck is 175 000 Euro. A truck can contain 2 Class C swap bodies (7,45 metre), 2 TEU, 1 40' TEU, 1 Class A swap body (13,6 metre) or 1 semi-trailer. The maximum loaded weight per truck is 18 tonnes. The vehicle loading factor in pre and post haulage is 60%, and in long haulage the percentage of non-empty trips is 85%.

?? type of train

The number of wagons and the related average capacity per train differs per segment in the corridors. The average value is about 30 wagons and 800 tonnes. The electricity usage is 0.026 kWh/tonnekm. Rail service per train is 9 Euro/km average. A complete or mixed train has an average loading factor of 0.75. A shuttle train has a high loading factor, namely 0.9. Because the length of a wagon is sixty feet, one train wagon can contain 3 TEU per wagon, 1 semitrailer, 1 Class A swap body or 2 Class C swap bodies. The average number of containers (in the corridor Genoa – Manchester per train wagon is 2 TEU. Maximum wagonload is 50 tonnes. Depending on the segment the train loading factor varies from 50% to 90%.

In shunting the capacity in a terminal is about 8 moves in a conventional terminal and 16 moves in a compact and modern terminal. A shunting locomotive uses 40 litres per hour.

?? kind of short sea ship

The type of ship used for short sea shipping is a Ro-Pax vessel (combined passengers and freight), with a maximum capacity of 350 TEU or 170 semitrailers or Class A swap bodies. Fuel usage in short

¹⁵ This difference is because of the extra fuel tanks allowed to use in international countries.

¹⁶ In UK yearly kilometrage is 70 000 km, in Italy yearly kilometrage is 200 000 km. This distinction influences the circulation tax per loading unit per kilometre and will be much higher in UK than in Italy.

sea shipping is 1.3 tonnes of bunker oil and 0.25 tonnes of service oil per hour. In one of the corridors the capacity of the short sea ship is only 65 semitrailers. The vessel-loading factor is 63%.

?? kind of inland shipping vessel

In inland shipping a containership with a capacity of 200 TEU is used. The vessel-loading capacity is 75%. The maximum tank content is 45000. Downstream and upstream the usage differs, respectively 0.125 and 0.05 kilometre per litre. Annual number of kilometres is 72000.

?? door to door

A door is supposed to be in the surroundings of a terminal and a zone can represent its location. In the intermodal corridor a national truck is used in the pre and post haulage. The all road solution uses one or more trucks for the whole corridor, included the trip from the starting or ending zone. No special truck is separately differentiated for this reason. We assume this door is approximately 50 km from the intermodal starting terminal.

?? origin of truck

Any company in almost every country in Europe can perform the transport, under the conditions of cabotage. The European Union countries have agreed on possibilities for cabotage¹⁸ under several circumstances. The circulation tax depends on the choice of the truck and its original country. Per corridor the choice for the origin of truck differs. In general: the starting point of the case, as is the door, determines the origin of the truck.

3.3 Data collection

Data requirements and the corresponding specifications are summarised in the formats presented below, which were consistently used by all involved partners to collect data in their respective geographical area of competence.¹⁹ Annex A presents the detailed numerical values, per country and per type of taxes, charges and subsidies.

National taxes, charges and subsidies were documented for most European countries. This paragraph provides an illustrative selection of significant figures²⁰.

¹⁸ Cabotage is freight transport by a forwarding company between two foreign countries; i.e. a Dutch forwarder is carrying goods between Germany and Austria.

¹⁹ Partners in the Recordit project have the responsibility to collect data in their respective country. Besides their contribution information is used from the following documents: 'Vehicle taxation in the European Union' (Ref XXI/306/98-EN), 'Port tariffs' (Port of Rotterdam, 2000), 'Fiscal Manual' (Kluwer, Dutch, 2000), 'Country documentation 2000' (TLN, Dutch), 'Effects of calculation the infrastructure costs and external costs in freight transport' (NEI, Dutch, 1993), 'Fuel prices and excise duty in European road transport' (CE, Dutch, 1999)

²⁰ Not all figures are shown in these tables. Annexes A and B contain a complete view on the height of taxes, charges and subsidies in relevant European countries.

Table 3: Essential data requirements

Type of tax	Amount	Measure unit	Payment basis	Drivers
Circulation tax		Euro/year	Annual basis	
Fuel tax		Euro/litre	Per litre	Usage
Insurance tax		%		Price of vehicle
Registration tax		%		Price of vehicle
Eco tax		Euro/kWh		# kWh
Type of charges	Amount	Measure unit	Payment basis	Drivers
Road infrastructure charge		Euro/km	Per transit	# km
Fuel charge		Euro/litre	litre	Usage
Road charge		Euro/year	Annual basis	
Harbour and berth dues		Euro/time	Per transit	Length of ship, destination
Terminal charge		Euro/transit	Per transit	
Road tolls		Euro/pass	Per trip	# kilometres
Rail infrastructure charge		Euro/trainkm		# wagons, length of trip
Type of subsidies ²¹	Amount	Measure unit	Payment basis	Drivers
Tolls subsidy		Euro/km	Kilometre	
Fuel subsidy		Euro/litre	Litre	
Purchase subsidy		%	Price of product	

All data are converted to Euro 1998. In special occasions the differences between countries are highlighted and the relationship with the harmonisation policy is given.

Table 4: Circulation tax and registration tax in European countries

1998 – Road transport	Circulation tax (Euro/year/truck)	Registration tax
Austria	247	-
Croatia	-	-
Denmark	475	-
France	976	28 Euro/year
Germany	2997	-
Greece	382	20 % price of vehicle (once)
Hungary	750	-
Italy	628 ²²	20 % of price of vehicle (once)
Netherlands	1575	-
Poland	404	-
Slovenia	-	-
Slowak Republik	1200	-
Spain	150	-
Sweden	4000	670 Euro (once)
Switzerland	1742	-
United Kingdom	4719	-

²¹ In theory, when gathering information about the sustained subsidies in the corridor it is important to mention for every subsidiary project the total amount of subsidy, the exploitation time (e.g. duration of the project) and the number of activities that profits from this subsidy. Practically seen, it is not possible to collect data in that detail that all subsidies can be calculated per corridor and per case.

²² For pre and post haulage the value for circulation tax is 454 Euro/year/truck

The comparative examination of the circulation tax values highlights a strong contrast between European countries. The lowest value is 150 Euro/year per truck in Spain, the highest tax has to be paid in the United Kingdom, namely 4700 Euro/year. This means that using an UK truck will lead to much higher taxes per loading unit per kilometre than using e.g. an Italian truck in the same corridor. As for the registration tax, it does not bear a strong influence on the total sum, as it is relatively small in comparison with the circulation tax.

Table 5: Fuel tax in European countries

1998 – Road transport	Fuel tax (Euro/1000 litre)
Austria	395
Croatia	-
Denmark	326
France	496
Germany	314
Greece	234
Hungary	280
Italy	504
Netherlands	312
Poland	275
Slovenia	-
Slovak Republic	290
Spain	265
Sweden	313
Switzerland	349
United Kingdom	653

Differences in fuel tax are much smaller than differences in circulation tax. Fuel tax is harmonised within the European Union, with a minimum level of 0.310 EURO per litre on January 1, 1998. Every country, except Croatia, Slovenia, Slovak Republic, Greece, Hungary, Poland and Spain meet this Directive. Because of the low values in these countries, the fuel price is low as well, so refuelling in these countries can be profitable. Highest fuel tax is charged in UK, namely 0.653 Euro per litre. Together with the high fuel charge (0.780 Euro per litre) refuelling in UK is from a company's point of view very uneconomic. Some European countries fulfil the requirements exactly, like Sweden, the Netherlands and Germany. Difference in prices makes refuelling cheaper in the Netherlands than in Germany.

Table 6: Road tolls, road charge and infrastructure charge in European countries (or in the specified corridors)

1998 – Road transport	Road tolls	Road charge (Euro/yr)
Austria (Brenner – Kufstein, 500 km)	0.870 (Euro/km)	1250
Croatia		-
Denmark	98 (Euro/crossing)	1225
France	71 (Euro/crossing)	-
Germany	-	1225
Greece	0.031 (Euro/km)	-
Hungary	0.260 (Euro/km)	38
Italy (Torino – Venezia, 788 km)	0.196 (Euro/km) ²³	515
Italy (Genova – Basel, 184 km)	0.119 (Euro/km) ²⁴	515
Italy (Brindisi – Verona, 945 km)	0.186 Euro/km ²⁵	515
Netherlands	-	1250
Poland	0.077 (60 km)	460
Slovenia	12 (Euro/crossing)	-
Slovak Republic	-	150
Spain	-	-
Sweden	97 (Euro/crossing)	1225
Switzerland	-	5094
United Kingdom	-	-

Road tolls for freight transport are very difficult to compare, because of the differences in charging principles (per kilometre or per crossing). It is noticed that Austria has a very high road toll per kilometre.

Road charge is for the Eurovignette countries more or less the same²⁶. The CEE countries are much below the maximum rate of 1250 Euro per year, stated by the European commission by Directive 93/89/EEC. Their road charge will increase when joining the European Union.

Infrastructure charges on top of road charge, circulation tax and road tolls are not very common in the EU that makes it hard to compare.

In the following chapter data are used for actual calculations based on the RECORDIT methodology. In Chapter 5 preliminary conclusions will be presented, mainly concentrating on the differences in levels of taxes, charges and subsidies between the European countries (a full exploitation of the results presented in this deliverable will be carried out in WP6).

²³ Subsidy on road tolls: 0.020 Euro/km

²⁴ Subsidy on road tolls: 0.012 Euro/km

²⁵ Subsidy on road tolls: 0.019 Euro/km

²⁶ Differences are very small and they exist because of the conversion to Euro and the base year 1998.

4 COMPARISON

This chapter summarises and compares the results of the calculations per corridor. Road and intermodal solutions are compared. The sum of taxes, charges and subsidies are shown in tables and graphs. For each corridor the following figures are given: the amount of taxes, charges and subsidies per solution and per country, the amount and share by type of taxes, charges and subsidies and the amount and share of the sum of taxes, charges and subsidies on a per country basis. All figures are related to one average loading unit as specified in Chapter 3. More detailed comparisons are planned in the following work packages.

In Annex B the detailed results per type of taxes, charges and subsidies and per segment are presented.

4.1 Corridor Patras – Gothenburg

In this corridor, the overall dues are significantly higher for all road than for intermodal transport. In comparison with intermodal transport, road transport companies are subject to a wider variety of taxes and charges, with higher amounts, while they receive fewer subsidies. Taxes and charges in intermodal transport are of the same order. The high level of taxation for road is mainly due to the fuel tax in Austria and Denmark, while the responsibility for the high amount of charges lies mainly with the toll bridges in Scandinavia and the road charges for the main haulage. The fuel charge in intermodal transport is a charge for electric traction service in Italy.

The subsidies in intermodal transport are higher than in road transport, corresponding to the Danish rail infrastructure subsidies. The subsidies in road transport are mainly related to the Italian road tolls subsidy.

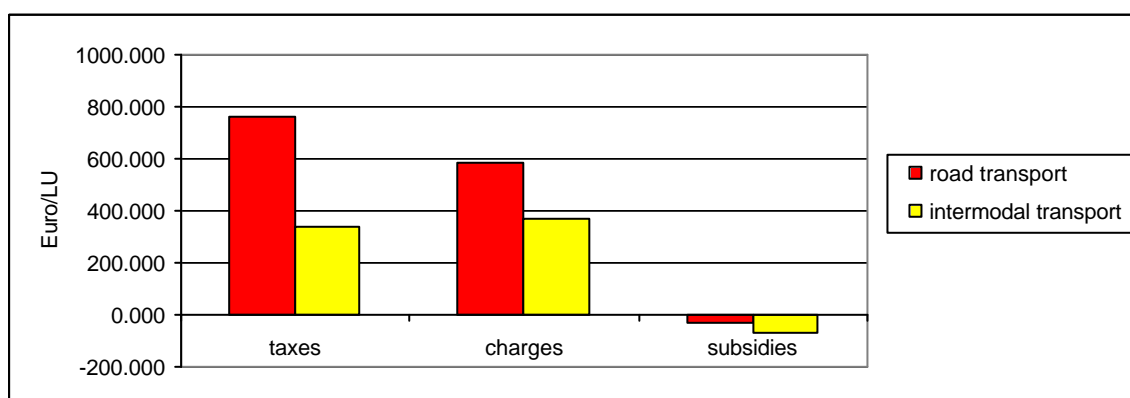


Figure 7: Value of taxes, charges and subsidies per road and intermodal transport for the whole corridor Patras – Gothenburg

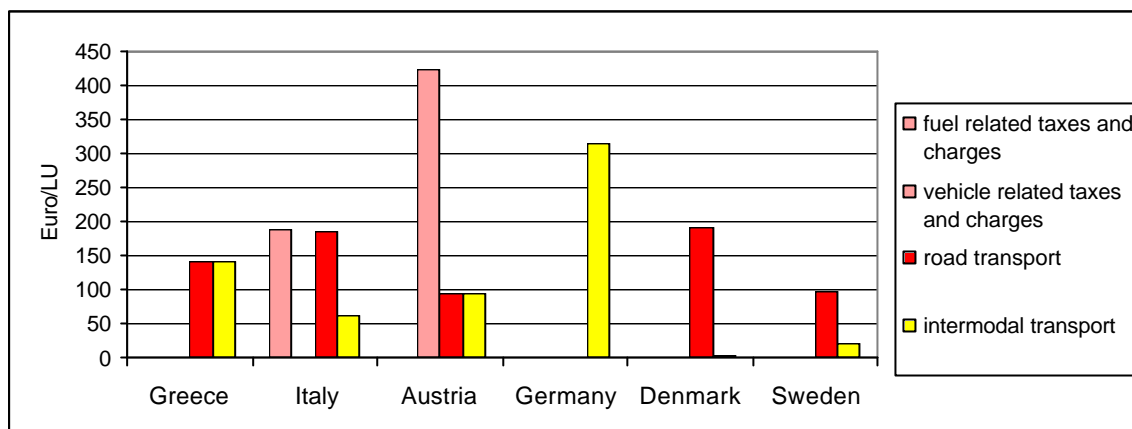


Figure 8: Value of sum of taxes, charges and subsidies divided per country in the corridor Patras – Gothenburg

Table 7: Value of taxes and charges in the all road and intermodal solution in the corridor Patras – Gothenburg

	All road solution	Intermodal solution
Taxes	759	338
Charges	588	372
Subsidies	30	73
Total sum	1317	637

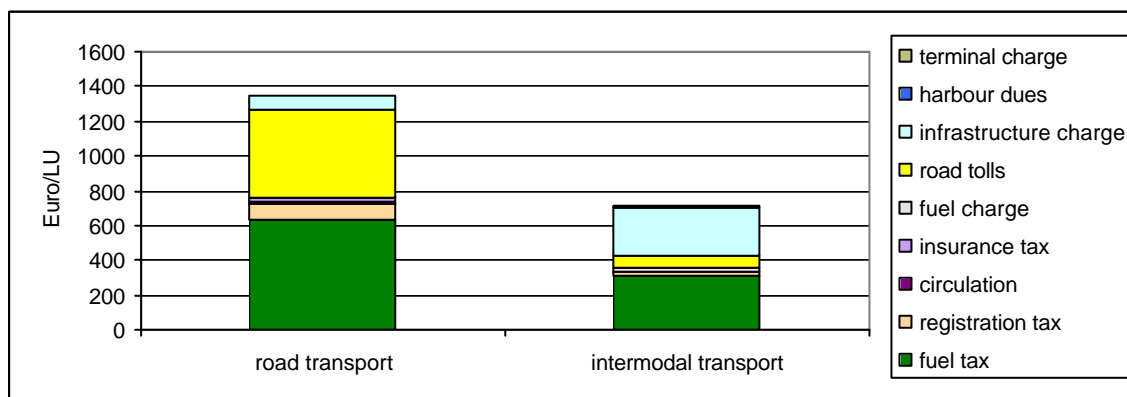


Figure 9: Value of different types of taxes and charges for road and intermodal transport in the corridor Patras – Gothenburg

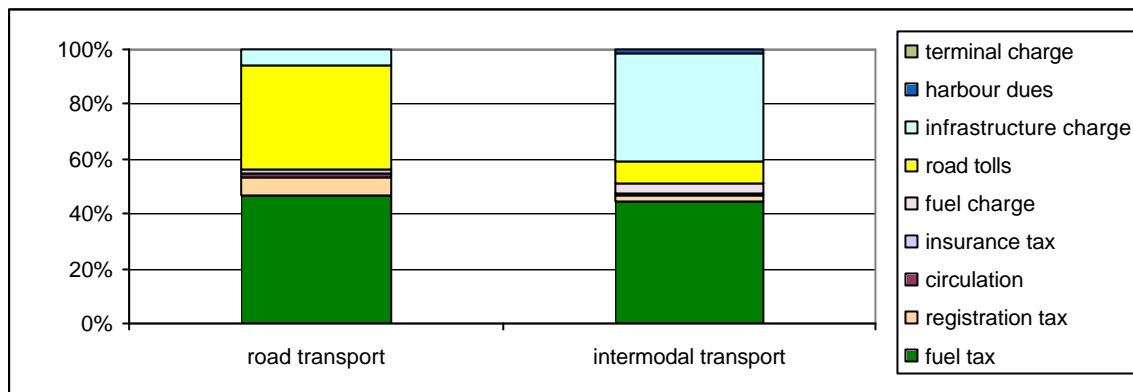


Figure 10: Relative value of different types of taxes and charges in road and intermodal transport in the corridor Patras – Gothenburg



Figure 11: Sum of taxes, charges and subsidies per kilometre per country in the corridor Patras – Gothenburg

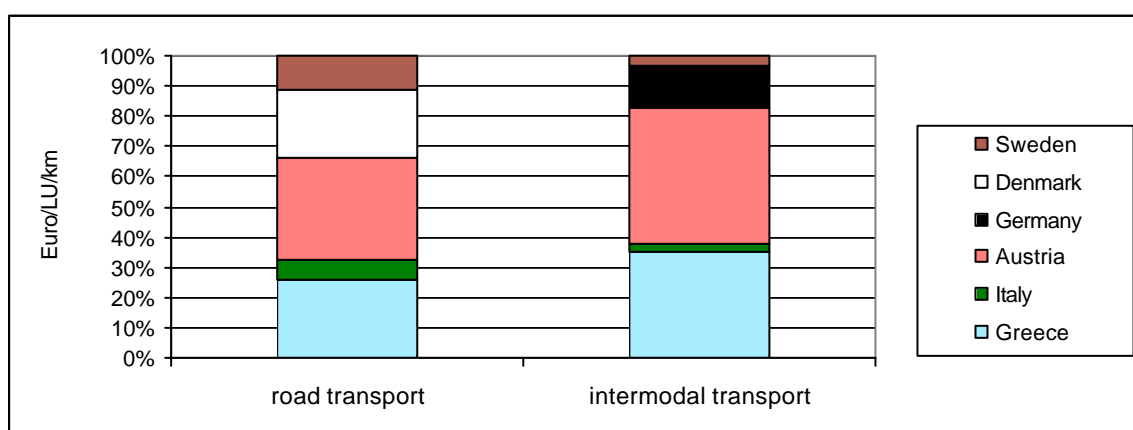


Figure 12: Sum of taxes, charges and subsidies per kilometre in relation with the length of the segment of each country in the corridor Patras – Gothenburg

When related to kilometres per country, the share of each country in the total sum is quite the same for both intermodal and road transport. Only Denmark and Sweden charge obviously more in road than in intermodal transport. The long German segment in road transport does not influence the total sum, due to the lack of taxes and charges. The road charge in Germany is incorporated in the country the truck originates from. Differences in values for Italy are mainly due to the shorter leg in road transport than in intermodal transport.

4.2 Corridor Genoa-Manchester

As concerns the intermodal option, both rail and inland shipping receive more subsidies than road transport²⁷. Intermodal transport is subject to lower taxes than road but, contrary to the previous corridor, charges are higher than in road transport, partially compensating the difference in taxes and subsidies. At the country level, the responsibility of high road taxation lies mainly with the UK and the Netherlands for what concerns fuel tax, and with Italy (purchase and use of vehicle)

It is also clear that in this corridor, given the assumptions made, Switzerland only charges for intermodal transport. In the sum of taxes, charges and subsidies in intermodal transport the higher share is attributable to the Swiss fuel tax and infrastructure charge in rail transport.

Road transport is subject to a wider variety of taxes, charges and subsidies. This means, among other things, that more policy and taxation instruments are available in this corridor to discourage road transport than to stimulate intermodal transport. The harbour dues are the same because of the short sea shipping leg between Rotterdam and Felixstowe.

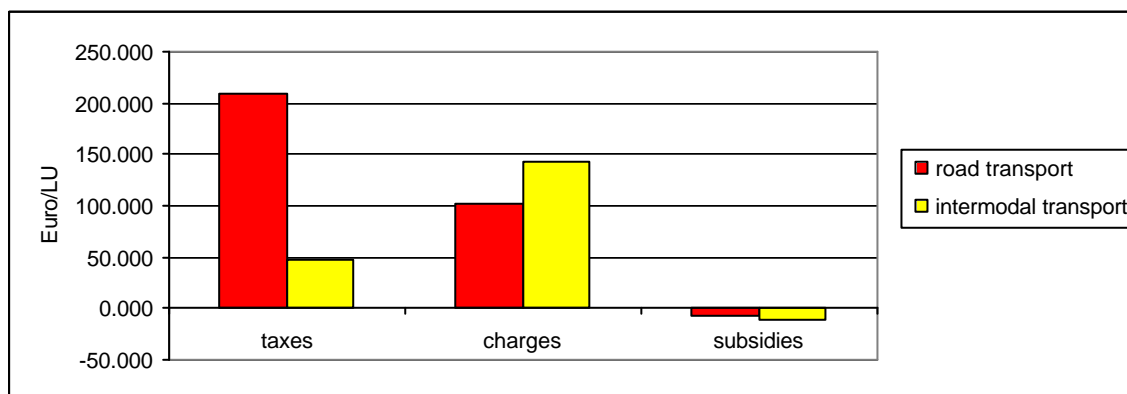


Figure 13: Value of taxes, charges and subsidies per road and intermodal transport for the whole corridor Genoa – Manchester

²⁷ In fact, subsidies in rail and intermodal transport are very hard to find because of their unavailability in statistics and accounts of companies. When subsidies are available it is difficult to convert the figures into an amount per loading unit per kilometre, because of the lack of enhanced data.

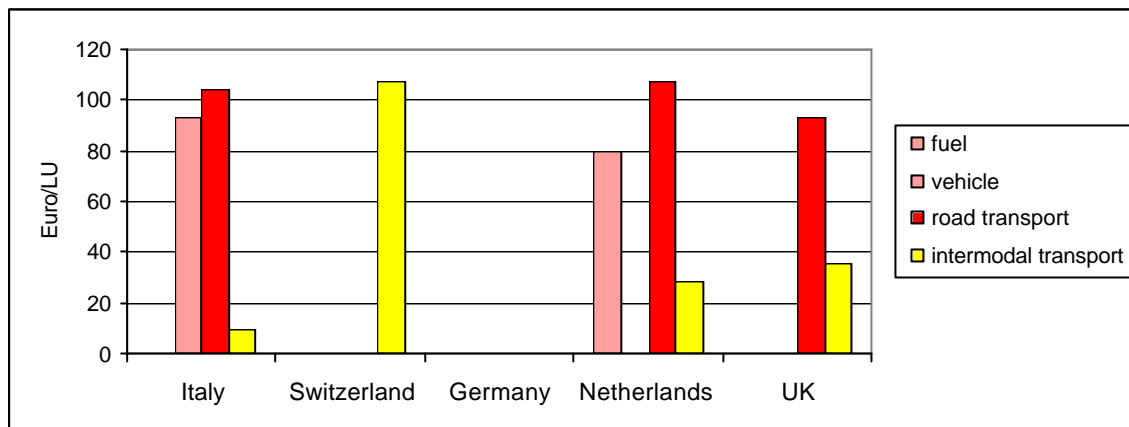


Figure 14: Sum of taxes, charges and subsidies split per country in the corridor Genoa – Manchester

Table 8: Value of taxes and charges in the all road and intermodal solution in the corridor Genoa – Manchester

	All road solution	Intermodal solution
Taxes	209	48
Charges	103	143
Subsidies	7	10
Total sum	305	181

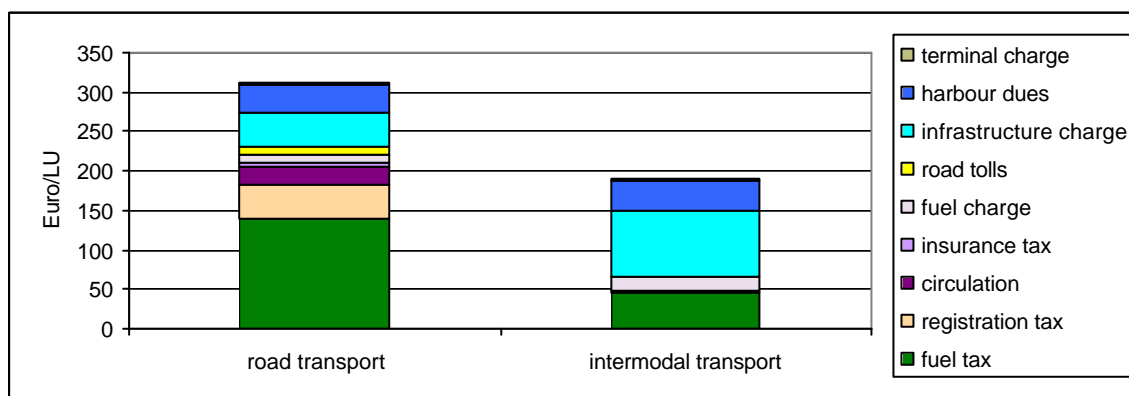


Figure 15: Value of different types of taxes and charges for road and intermodal transport in the corridor Genoa – Manchester

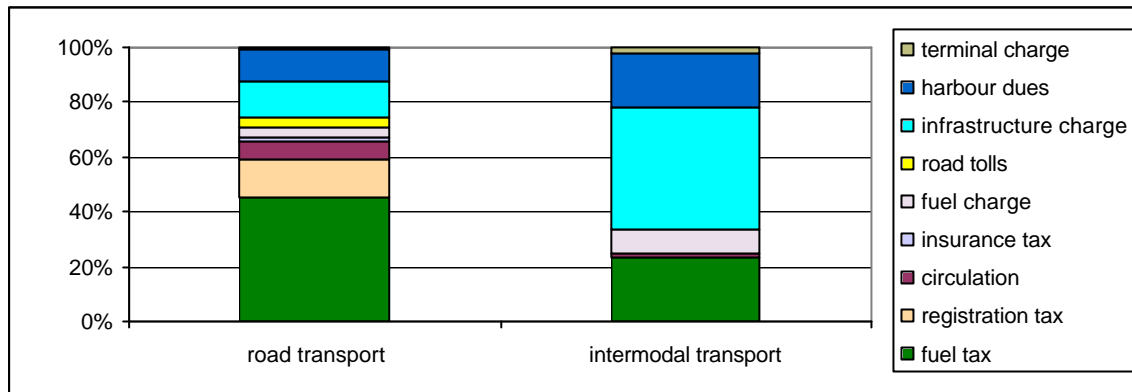


Figure 16: Relative value of different types of taxes and charges in road and intermodal transport in the corridor Genoa – Manchester

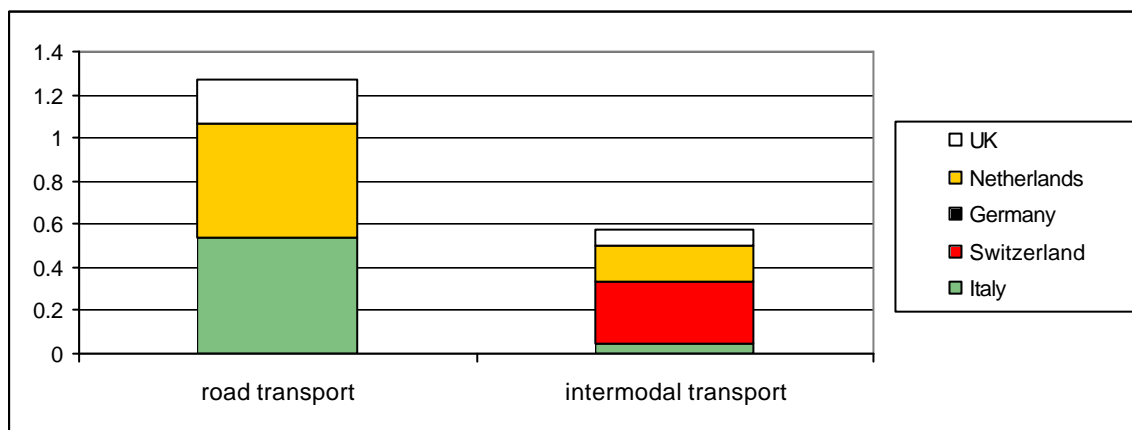


Figure 17: Sum of taxes, charges and subsidies per kilometre per country in the corridor Genoa – Manchester

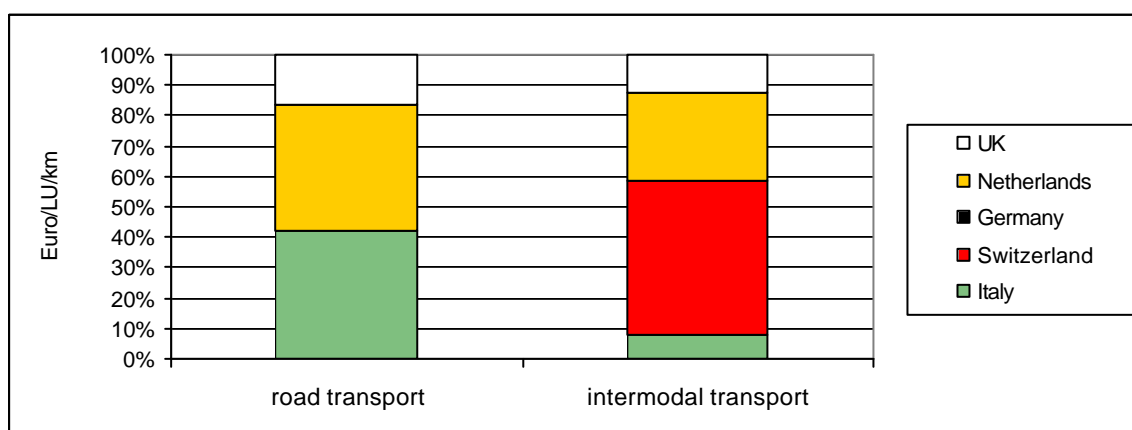


Figure 18: Sum of taxes, charges and subsidies per kilometre in relationship with the length of the segment of each country in the corridor Genoa – Manchester

4.3 Corridor Barcelona – Warsaw

This corridor shows a particularly big difference between the all road solution and the bimodal solution. Both taxes and charges are much higher in road transport, due to road tolls in France, Hungary and Italy and fuel tax in France. In the intermodal corridor the balance of taxes, charges and subsidies is in fact negative, which means that intermodal operators receive more subsidies than they pay for taxes and charges. This is mainly due to the rail freight subsidy in France. Also, the absence of rail charges in the CEE countries contributes to explaining the limited amount of total charges. The relatively high value of fuel charges in the bimodal solution, on the other hand, is attributable to the shunting locomotives in the transshipment terminals, in combination with the fuel charge in Italy. Considering the relative proportions between distances of segments per country, Spain, Italy, Hungary and Poland appear to be primarily responsible for the overall high amount of taxes, charges and subsidies in the all road solution.

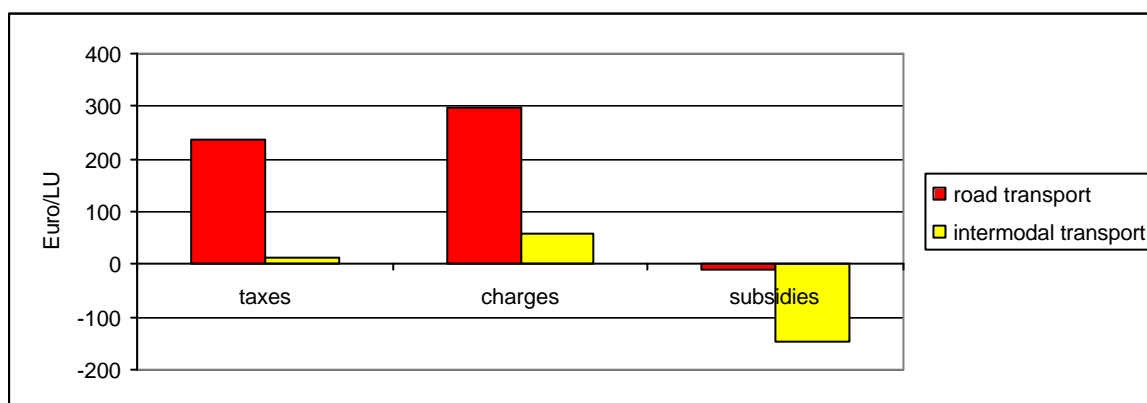


Figure 19: Value of taxes, charges and subsidies per road and intermodal transport for the whole corridor Barcelona – Warsaw

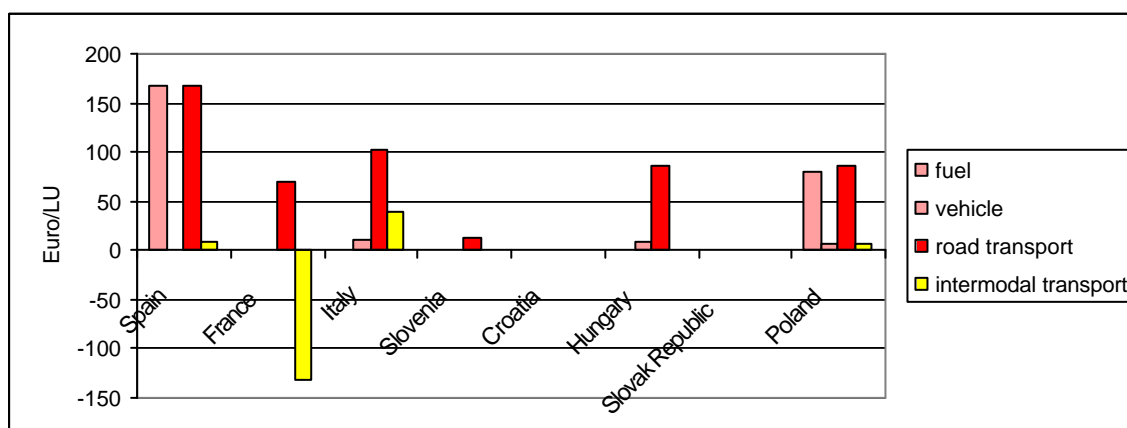


Figure 20: Sum of taxes, charges and subsidies divided per country in the corridor Barcelona – Warsaw

Table 9: Value of taxes and charges in the all road and intermodal solution in the corridor Barcelona – Warsaw

	All road solution	Intermodal solution
Taxes	236	13
Charges	299	57
Subsidies	11	147
Total sum	524	-76

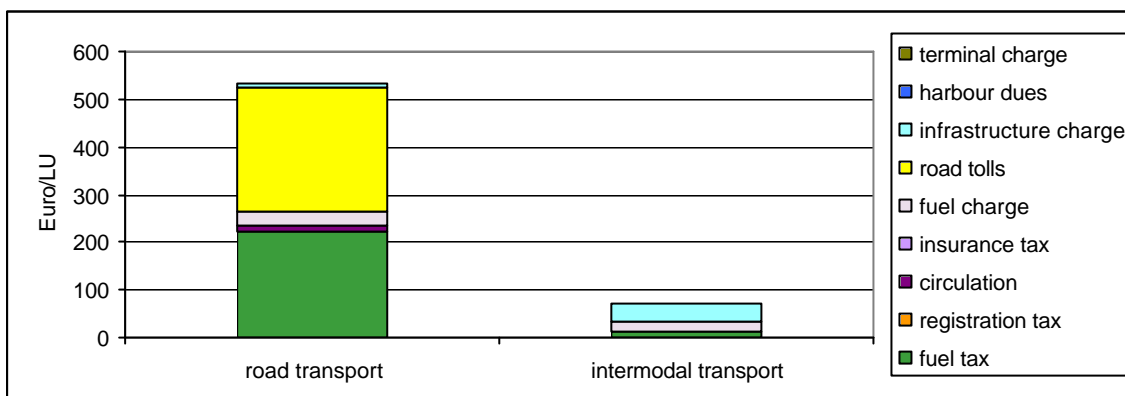


Figure 21: Value of different types of taxes and charges for road and intermodal transport in the corridor Barcelona – Warsaw

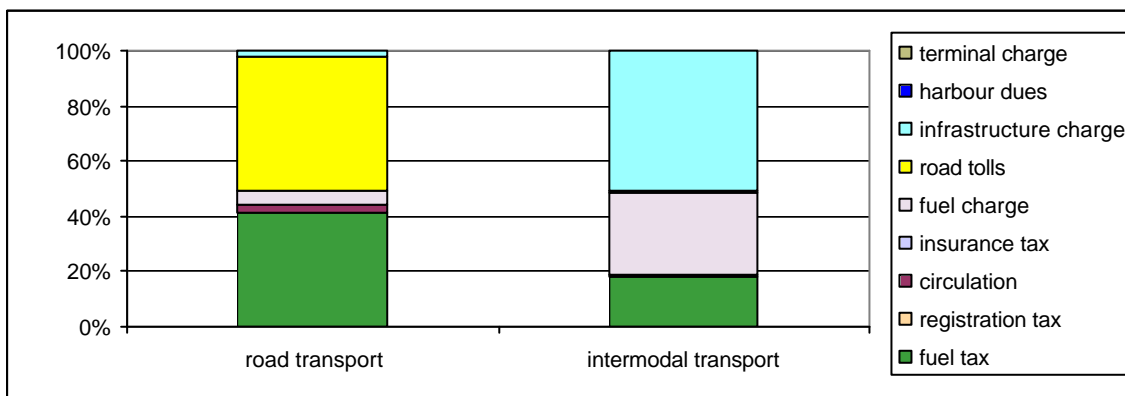


Figure 22: Relative value of different types of taxes and charges in road and intermodal transport in the corridor Barcelona – Warsaw

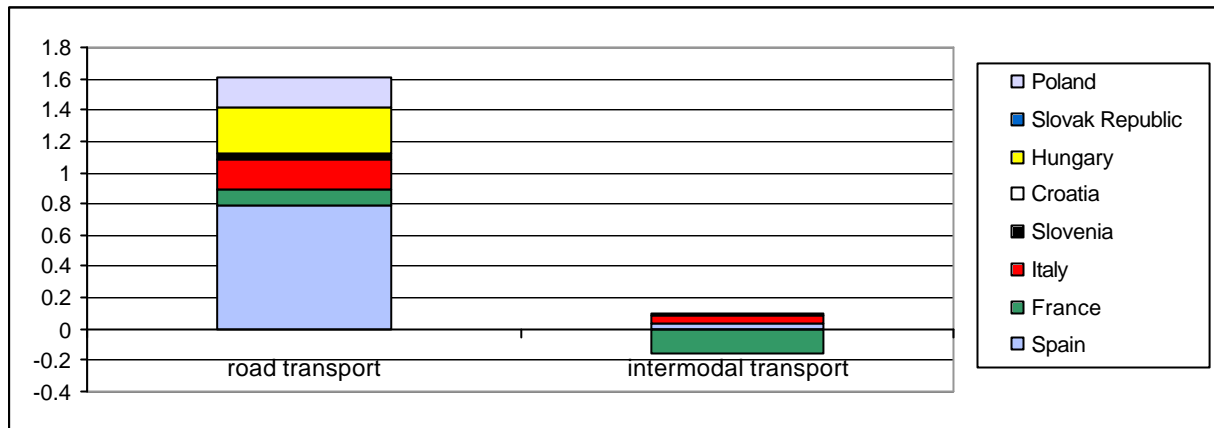


Figure 23: Sum of taxes, charges and subsidies per kilometre per country in the corridor Barcelona – Warsaw

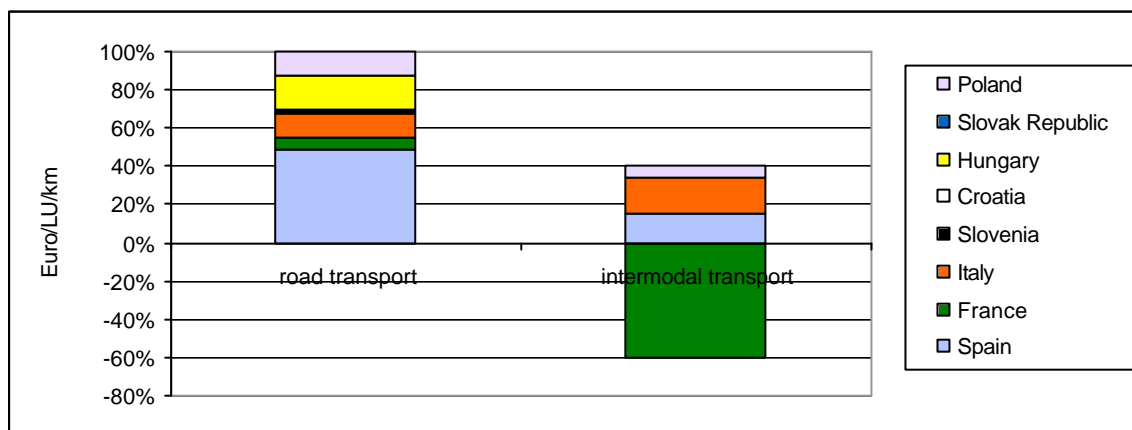


Figure 24: Sum of taxes, charges and subsidies per kilometre in relationship with the length of the segment of each country in the corridor Barcelona – Warsaw

5 CONCLUSIONS

The preliminary conclusions presented hereafter are directly related to the findings of the calculations carried out for the three corridors. It belongs to the subsequent project WPs to provide an in-depth interpretation of these results, and to derive policy implications accordingly.

A first set of conclusions is therefore the summary of the most significant numerical findings, while the second set outlines preliminary, non exhaustive interpretation of those same results.

5.1 Summary of direct findings

These conclusions are mainly based on chapter 4, which draws up the results of the data calculation on taxes, charges and subsidies. Item per item some conclusions are drawn:

- ?? In the corridor Athens – Gothenburg the sum of taxes, charges and subsidies for the all road solution amounts to 1317 Euro per semi trailer and for the all rail solution 638 Euro per Class A swap body.
- ?? In the corridor Genoa - Manchester –the sum of taxes, charges and subsidies for the all road solution (Italian truck) amounts to 305 Euro per TEU, and for the intermodal solution 181 Euro per TEU.
- ?? In the corridor Barcelona – Warsaw the sum of taxes, charges and subsidies for the all road solution amounts to 524 Euro per Class A swap body. The all rail solution gives a negative result of - 76 Euro per swap body, as subsidies are higher than the sum of taxes and charges paid.
- ?? Taxes and charges are consistently higher in road transport. CEE countries have hardly any charges in rail transport.
- ?? Taxes in intermodal transport, both in rail and in inland shipping, are low.
- ?? Intermodal transport consistently receives higher subsidies than road
- ?? The assumption concerning the national origin of trucks impacts on the final results mainly in relation to the difference in circulation tax.
- ?? Road transport is subject to a wider variety of taxes and charges than intermodal transport. This can be seen as a wider array of opportunities to cover external costs

5.2 Preliminary interpretation outline

This outline is mainly based on chapter 3. The analysis of the data collected in view of the calculations lead to the following point by point remarks:

- ?? Circulation taxes vary between 150 and 4700 Euro per truck per year. Using a truck with high circulation tax results in high taxes per loading unit per kilometre. Harmonisation of circulation tax in EU can eliminate distortions of competition between road transport undertakings. The higher amount of taxes, charges and subsidies might affect the choice for a transport company.
- ?? The registration tax does not bear much influence on the total amount of taxes.

-
- ?? Not every country fulfils the requirements of fuel tax harmonisation. Czech Republic, Greece, Hungary, Poland and Spain are among those. An immediate result is that refuelling is much more profitable in those countries.
 - ?? CEE countries are well below the maximum rate of 1250 Euro per year. This means that the road charge in Hungary, Poland and Czech Republic will increase when joining the European Union.
 - ?? The lack of harmonisation of rail infrastructure charges heavily influences the differences in results between the three corridors.
 - ?? Information about direct subsidies is very hard to find and to convert to Euro per loading unit.
 - ?? Taxes do not belong to the competence of the European Union, which largely contributes to explain the observed variation in taxes between the European Union countries.

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Council regulation 118/70 of 4 Juni 1970 introducing an accounting system for expenditure on infrastructure in respect of transport by rail, road and inland waterway

Council Directive 92/81/EEC of 19 October 1992 on the harmonisation of the structures of excise duties on mineral oils

Council directive 92/82/EEC on 19 October 1992 on the approximation of the rates of excise duties on mineral oils

ANNEX A FIGURES ABOUT TAXES, CHARGES AND SUBSIDIES (1998)²⁸

Table A.1: Value of circulation tax and registration tax

1998 – Road transport	Circulation tax (Euro/year/truck)	Registration tax
Austria	247	-
Croatia	-	-
Denmark	475	-
France	976	28 Euro/year
Germany	2997	-
Greece	382	20 % price of vehicle (once)
Hungary	750	-
Italy	628 ²⁹	20 % of price of vehicle (once)
Netherlands	1575	-
Poland	404	-
Slovenia	-	-
Slovak Republik	1200	-
Spain	150	-
Sweden	4000	670 Euro (once)
Switzerland	1742	-
United Kingdom	4719	-

Table A.2: Value of road tolls and road charge

1998 – Road transport	Road tolls	Road charge (Euro/yr)
Austria (Brenner – Kufstein, 500 km)	0.870 (Euro/km)	1250
Croatia	-	-
Denmark	98 (Euro/pass)	1225
France	71 (Euro/pass)	-
Germany	-	1225
Greece	0.031 (Euro/km)	-
Hungary	0.260	38
Italy (Torino – Venezia, 788 km)	0.196 (Euro/km) ³⁰	515
Italy (Genova – Basel, 184 km)	0.119 (Euro/km) ³¹	515
Italy (Brindisi – Verona, 945 km)	0.186 Euro/km ³²	515
Netherlands	-	1250
Poland	0.077 (60 km)	460
Slovenia	12 (Euro/pass)	-
Slovak Republic	-	150
Spain	-	-
Sweden	97 (Euro/pass)	1225
Switzerland	-	5094
United Kingdom	-	-

²⁸ The base year in this project is 1998. Values of previous years or more recent years were transposed to 1998 by using the right EURO conversion rates and the inflation figures.

²⁹ For pre and posthaulage the value for circulation tax is 454 Euro/year/truck

³⁰ Subsidy on road tolls: 0.020 Euro/km

³¹ Subsidy on road tolls: 0.012 Euro/km

³² Subsidy on road tolls: 0.019 Euro/km

Table A.3: Value of fuel tax and fuel charge

1998 – Road transport	Fuel tax (Euro/1000 litre)	Fuel charge (Euro/l)
Austria	395	-
Croatia	-	-
Denmark	326	-
France	496	-
Germany	314	-
Greece	234	-
Hungary	280	-
Italy	504	-
Netherlands	312	0.020
Poland	275	0.509
Slovenia	-	-
Slovak Republic	290	-
Spain	265	-
Sweden	313	-
Switzerland	349	0.191
United Kingdom	653	-

Table A.4: Value of fuel charge in shipping and rail transport

1998 – Intermodal transport	Fuel charge – shipping (Euro/l)	Fuel charge – Rail (Euro/trainkm)
Austria	-	-
Croatia	-	-
Denmark	-	-
France	-	-
Germany	0.314	0.001
Greece	-	-
Hungary	-	-
Italy	-	0.372
Netherlands	-	-
Poland	-	-
Slovak Republic	-	0.29 (Euro/litre)
Slovenia	-	-
Spain	-	-
Sweden	-	-
Switzerland	0.193 ³³	-
United Kingdom	0.150 ³⁴	0.060

³³ Fuel tax in Switzerland in inland shipping is 0.352 Euro per litre. Both fuel tax and fuel charge are not valid for upstream journeys.

³⁴ Fuel tax in UK in short sea shipping is 0.02 Euro per litre

Table A.5: Value of rail infrastructure and harbour dues

1998 – Intermodal transport	Rail infrastructure charge (Euro/trainkm)	Harbour dues (Euro/LU)
Austria	1.061 ³⁵	-
Croatia		
Denmark	1.17	123.648
France	0.0004 (Euro/tonkm)	-
Germany	3.07	10.390 Euro ³⁶
Greece	-	-
Hungary	-	-
Italy	0.852 ³⁷	0.66 Euro/tonne
Netherlands	0.018 ³⁸	1.263 ³⁹
Poland	-	-
Slovak Republic		
Slovenia		
Spain	-	-
Sweden	0.049	-
Switzerland	6.419	0.856 ⁴⁰
United Kingdom	0.120	18.047

³⁵ Austria uses a variable charge in rail transport, height of this charge is 0.001 Euro/tonkm.

³⁶ Only in Duisburg, other terminals in Germany do not have harbour dues. We assume that every ship will have to stop in Duisburg and has to pay the harbour dues. Not the forwarder but the shipper is due to the harbour dues.

³⁷ Infrastructure charges in the corridor Athens – Gotheborg are differentiated: Brindisi – Milano is 0.37 E/km, Milano-Brennero is 0.43 Euro/km. In the corridor Barcelona – Warsaw the rail infrastructure charge is equal to 0.384 Euro per kilometre.

³⁸ Inland shipping in the Netherlands pays 7941 Euro/year per ship for sailing the waterways

³⁹ Inland shipping harbour dues: 1.324 Euro/LU, at the premise of 30 trips per year, in short sea shipping: harbour dues and Vessel Traffic System dues are 0.261 resp. 0.039 Euro/GT. A ship with 15270 GT makes it 16.854 per LU.

⁴⁰ In Switzerland a ship owner pays for handling in the harbour: costs are 51.351Euro/crane/hour. A handling capacity of 60 LU per hour means 0.856 Euro/LU.

ANNEX B: OVERVIEW OF PREMISES

Table B.1: Premises on average weight and maximum weight of loading units

Loading	20' container/Class C SB			40' container/Class A SB			semitrailer/all road		
	Max	load factor	average	max	load factor	average	max	load factor	average
load (tons)	16	0.75	12	24	0.75	18	24	0.75	18
tare (tons)			2.3			4.2			

Table B.2: Train loading factors, varying with the loading unit

Train loading factors	
<i>Wagon technical parameters</i>	
wagon length	60'
wagon max load	50 tons
<i>LU per wagon*</i>	
Class C SB 6m	3
Class C SB over 7m	2
Class A SB 12m	1.5
Class A SB over 13m	1
Semitrailer	1
<i>Containers per wagon*</i>	
20'	3
40'	1.5
*presence of the LU in a wagon assuming the presence of other LUs	

Table B.3: Fuel and energy consumption per transport mode

fuel/energy consumption	litres/vkm	tons/hour	kWh/tkm	tank
<i>Rail</i>			0.026	
<i>Truck</i>	0.43			1200
<i>SSS (bunker)</i>		speed 18,4 kn.: 1,75 speed 17,3 kn.: 1,36 speed 16,0 kn.: 1,01		45000
<i>SSS (service oil)</i>		0.25		
<i>shunting loc</i>	40/h			
<i>IWW (up-stream)</i>	20			
<i>IWW (down-stream)</i>	8			

Table B.4: Capacity per mode of transport

	<i>MoT capacity</i>	<i>Vehicle loading factor</i>
<i>SSS</i>	P&O (Rotterdam-Felixstowe): 350 TEU or 170 SB&ST Med Link (Patras-Brindisi): 65 ST	0.63
<i>train (convoy)</i>	<i>see other file</i>	0.5-0.9
<i>Truck</i>	1 Class A SB/40' container or 2 20' cont. Or 2 Class C SB (on truck and trailer)	Pre/posthaulage: 0.60 Main haulage: 0.85
<i>IWW</i>	200 TEU	0.75

Table B.5: Lifecycle per vehicle

<i>mileage/usage</i>	<i>km</i>	<i>hour</i>	<i>lifetime</i>
<i>long distance locomotive</i>	I:120000/year		20
<i>shunt.locomotive</i>	Oth:150000/yr	8/day conv.terminal 16/day compact term.	20
<i>Truck</i>	140000/year long 80000/year pre/post		5
<i>SSS</i>		4500/year required for NL/UK	20
<i>IWW</i>	72000/year		35
<i>Cranes</i>			15

ANNEX C CALCULATION PER CORRIDOR

PATRAS – GOTHEBORG

Table C.1: Detailed description of the corridor Patras - Gothenburg (intermodal solution)

Nation	km	Intermodal transport blocks PATRAS - GOTHENBURG	distance (km)	amount
Greece	210	Pre haulage from the shipper to the port of Patras	210	
		Transshipment at the Port of Patras		1
		Short Sea Shipping from Patras to Brindisi	442	
Italy	1253	Transshipment at the Port of Brindisi		1
		Haulage by truck from Port of Brindisi to CEMAT terminal	8	
		Transshipment at CEMAT terminal		1
		Haulage Brindisi-Milan by train	895	
		Transshipment at Milano Smistamento CEMAT terminal		1
		Haulage Milano-Munich by train (Milano Sm.-Brenner segment)	350	
Austria	110	Haulage Milano-Munich by train (Brenner-Kufstein segment)	110	
Germany	1167	Haulage Milano-Munich by train (Kufstein-Muenchen Riem segment)	97	
		Transshipment and marshalling at Muenchen Riem terminal		1
		Haulage Muenchen-Hamburg by train	842	
		Transshipment and marshalling at Hamburg Billwerder terminal		1
		Haulage Hamburg-Gothenburg by train (Hamburg Billwerder-Maschen segment)	20	
		Marshalling at Maschen marshalling yard		1
		Haulage Hamburg-Gothenburg by train (Maschen-Flensburg segment)	208	
Denmark	362	Haulage Hamburg-Gothenburg by train (Flensburg-Taulov segment)	109	
		Marshalling at marshalling yard		1
		Haulage Hamburg-Gothenburg by train (Taulov-Malmoe segment)	253	
Sweden	352	Haulage Hamburg-Gothenburg by train (Malmoe-Gothenburg segment)	302	
		Transshipment at Gothenburg KT terminal		1
		Post haulage from the Gothenburg terminal to the consignee	50	
Total	3454		3454	

Table C.2: Values for taxes, charges and subsidies per loading unit per kilometre per segment of the corridor Patras – Gothenburg (intermodal)

Euro/LU /km or Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Prehaulage Greece	0.101	0.083	0.008	0.000	0.000	0.031	0.000			0.000	0.000
Transshipment Patras								0.000	0.000		
Short sea shipping	0.212										
Transshipment Brindisi								11.880			
Truckhaulage Italy	0.216	0.083	0.009	0.027	0.000	0.000	0.011				
Transshipment Brindisi									0.000		
Mainhaulage Italy	0.000				0.019		0.019				
Transshipment Milano									0.000		
Mainhaulage Italy	0.000				0.017		0.022				
Mainhaulage Austria							0.867				
Mainhaulage Germany	0.189						0.126				
Transshipment Munchen	1.163										
Mainhaulage Germany	0.146						0.097				
Transshipment Hamburg	1.163										
Mainhaulage Germany	0.175						0.117				
Marshalling Marchen	1.163										
Mainhaulage Germany	0.204						0.136				
Mainhaulage Denmark							0.062			0.202	
Marshalling Belt bridges											
Mainhaulage Denmark						0.213	0.062			0.202	
Mainhaulage Sweden							0.026				
Transshipment Gothenburg									0.000		
Posthaulage Sweden	0.134	0.003	0.083	0.000	0.000		0.026				

Table C.3: Values of taxes, charges and subsidies per loading unit per segment in corridor Patras – Gothenburg (intermodal solution)

Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Prehaulage Greece	21.123	17.500	1.669	0.000	0.000	6.510	0.000	0.000	0.000	0.000	0.000
Transshipment Patras	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Short sea shipping	93.685	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Brindisi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.880	0.000	0.000	0.000
Truckhaulage Italy	1.730	0.667	0.076	0.213	0.000	0.000	0.086	0.000	0.000	0.000	0.000
Transshipment Brindisi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Italy	0.000	0.000	0.000	0.000	17.030	0.000	16.939	0.000	0.000	0.000	0.000
Transshipment Milano	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Italy	0.000	0.000	0.000	0.000	6.028	0.000	7.698	0.000	0.000	0.000	0.000
Mainhaulage Austria	0.000	0.000	0.000	0.000	0.000	0.000	95.372	0.000	0.000	0.000	0.000
Mainhaulage Germany	18.358	0.000	0.000	0.000	0.000	0.000	12.255	0.000	0.000	0.000	0.000
Transshipment Munchen	1.163	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Germany	122.932	0.000	0.000	0.000	0.000	0.000	82.062	0.000	0.000	0.000	0.000
Transshipment Hamburg	1.163	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Germany	3.504	0.000	0.000	0.000	0.000	0.000	2.339	0.000	0.000	0.000	0.000
Marshalling Marchen	1.163	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Germany	42.515	0.000	0.000	0.000	0.000	0.000	28.380	0.000	0.000	0.000	0.000
Mainhaulage Denmark	0.000	0.000	0.000	0.000	0.000	0.000	6.802	0.000	0.000	21.974	0.000
Marshalling Belt bridges	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Denmark	0.000	0.000	0.000	0.000	0.000	53.975	15.787	0.000	0.000	51.005	0.000
Mainhaulage Sweden	0.000	0.000	0.000	0.000	0.000	0.000	7.892	0.000	0.000	0.000	0.000
Transshipment Gothenburg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Posthaulage Sweden	6.717	0.140	4.167	0.000	0.000	0.000	1.276	0.000	0.000	0.000	0.000
Total	314.054	18.306	5.911	0.213	23.058	60.485	276.888	11.880	0.000	72.979	0.000

Table C.4: Sum of taxes, charges and subsidies per loading unit per segment in corridor Patras – Gothenburg (intermodal solution)

Euro/LU	Sum T	Sum C	Sum S	Sum TC	Sum TCS	TCS per km	TCS per activity	TCS per km corridor
Prehaulage Greece	40.292	6.510	0.000	46.802	46.802	0.223		0.223
Transshipment Patras	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Short sea shipping	93.685	0.000	0.000	93.685	93.685	0.212		0.212
Transshipment Brindisi	0.000	11.880	0.000	11.880	11.880		11.880	11.880
Truckhaulage Italy	2.686	0.086	0.000	2.772	2.772	0.346		0.346
Transshipment Brindisi	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Mainhaulage Italy	0.000	33.969	0.000	33.969	33.969	0.038		0.038
Transshipment Milano	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Mainhaulage Italy	0.000	13.726	0.000	13.726	13.726	0.039		0.039
Mainhaulage Austria	0.000	95.372	0.000	95.372	95.372	0.867		0.867
Mainhaulage Germany	18.358	12.255	0.000	30.613	30.613	0.316		0.316
Transshipment Munchen	1.163	0.000	0.000	1.163	1.163		1.163	1.163
Mainhaulage Germany	122.932	82.062	0.000	204.994	204.994	0.243		0.243
Transshipment Hamburg	1.163	0.000	0.000	1.163	1.163		1.163	1.163
Mainhaulage Germany	3.504	2.339	0.000	5.843	5.843	0.292		0.292
Marshalling Marchen	1.163	0.000	0.000	1.163	1.163		1.163	1.163
Mainhaulage Germany	42.515	28.380	0.000	70.896	70.896	0.341		0.341
Mainhaulage Denmark	0.000	6.802	21.974	6.802	-15.173	-0.139		-0.139
Marshalling Belt bridges	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Mainhaulage Denmark	0.000	69.762	51.005	69.762	18.757	0.074		0.074
Mainhaulage Sweden	0.000	7.892	0.000	7.892	7.892	0.026		0.026
Transshipment Gothenburg	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Posthaulage Sweden	11.023	1.276	0.000	12.299	12.299	0.246		0.246
Total	338.485	372.311	72.979	710.795	637.816			0.185

Table C.5: Detailed description of the corridor Patras - Gothenburg (all road solution)

Nation	km	road transport block (PATRAS – GOTHENBURG)	distance (km)	amount
Greece	210	Pre haulage from the shipper to the port of Patras	210	
		Transshipment at the Port of Patras		1
Italy	1153	Short Sea Shipping from Patras to Brindisi	442	
		Transshipment at the Port of Brindisi		1
		Italian truck haulage from port of Brindisi to Hamburg	3157	
		Haulage by truck from Port of Brindisi to Brenner border	1153	
Austria	107	Austrian fuel, haulage from port of Brindisi to Flensburg	2500	
		Border crossing Kufstein		1
		Haulage Milano-Munich by truck (Brenner-Kufstein segment)	107	
Germany	1025	Haulage Munich - Hamburg by truck (Kufstein-terminal Hamburg)	856	
		Haulage Hamburg - Gothenburg (Hamburg - Flensburg)	169	
Denmark	326	Haulage Hamburg - Gothenburg (Flensburg - Copenhagen)	326	
		Danish fuel, haulage from Flensburg to Gothenburg	657	
		Haulage Hamburg -Gothenburg (Oresund Bridge)		1
Sweden	336	Haulage Hamburg - Gothenburg (Great belt bridge)		1
		Haulage Hamburg -Gothenburg (Malmo - Gothenburg) + posthaulage	336	
Total	3157		3157	

Table C.7: Values of taxes, charges and subsidies per loading unit per segment in corridor Patras – Gothenburg (all road solution)

Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Prehaulage Greece	21.123	17.500	1.669	0.000	0.000	6.510	0.000	0.000	0.000	0.000	0.000
Transshipment Patras	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Short sea shipping	93.685	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Brindisi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Italian truck	0.000	74.282	11.662	23.749	0.000	0.000	79.323	0.000	0.000	0.000	0.000
Truck haulage Italy	0.000	0.000	0.000	0.000	0.000	214.458	0.000	0.000	0.000	21.907	8.578
Truck haulage Austrian fuel	423.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Border crossing Austria	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Austria	0.000	0.000	0.000	0.000	0.000	93.090	0.000	0.000	0.000	0.000	0.000
Truck haulage Germany	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Hamburg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Main haulage Denmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Danish fuel	91.879	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Crossing Oresund	0.000	0.000	0.000	0.000	0.000	98.000	0.000	0.000	0.000	0.000	0.000
Crossing Great Belt bridge	0.000	0.000	0.000	0.000	0.000	97.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Sweden	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	630.507	91.782	13.331	23.749	0.000	509.058	79.323	0.000	0.000	21.907	8.578

Table C.8: Sum of taxes, charges and subsidies per loading unit per segment in corridor Patras – Gothenburg (all road solution)

Euro/LU	Sum T	Sum C	Sum S	Sum TC	Sum TCS	TCS per km	TCS per activity	TCS per km corridor
Prehaulage Greece	40.292	6.510	0.000	46.802	46.802	0.223		0.223
Transshipment Patras	0.000	0.000	0.000	0.000	0.000		0	0.000
Short sea shipping	93.685	0.000	0.000	93.685	93.685	0.212		0.212
Transshipment Brindisi	0.000	0.000	0.000	0.000	0.000		0	0.000
Truck haulage Italian truck	109.694	79.323	0.000	189.017	189.017	0.060		0.060
Truck haulage Italy	0.000	214.458	30.485	214.458	183.973	0.160		0.160
Truck haulage Austrian fuel	423.820	0.000	0.000	423.820	423.820	0.170		0.170
Border crossing Austria	0.000	0.000	0.000	0.000	0.000		0	0.000
Truck haulage Austria	0.000	93.090	0.000	93.090	93.090	0.870		0.870
Truck haulage Germany	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Transshipment Hamburg	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Main haulage Denmark	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Truck haulage Danish fuel	91.879	0.000	0.000	91.879	91.879	0.140		0.140
Crossing Oresund	0.000	98.000	0.000	98.000	98.000		98	98.000
Crossing Great Belt bridge	0.000	97.000	0.000	97.000	97.000		97	97.000
Mainhaulage Sweden	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Total	759.370	588.381	30.485	1347.751	1317.266			0.417

GENOA - MANCHESTER**Table C.9:** Detailed description of the corridor Genoa - Manchester (intermodal solution)

Nation	km	Intermodal transport block GENOA - MANCHESTER	Distance (km)	amount
Italy	210	Transshipment at the Voltri container terminal in Port of Genova		1
		Shunting Voltri-Sampierdarena and marshalling at Sampierdarena marshalling yard	10	
		Haulage Genova-Chiasso by train (double traction Sampierdarena-Ronco Scrivia)	25	
		Haulage Genova-Chiasso by train (single traction Ronco Scrivia-Chiasso leg)	175	
Switzerland	369	Haulage Chiasso-Basel SBB by train	364	
		Transshipment at Basel SBB terminal		1
		Haulage by truck from Basel SBB to Kleinhuenigen (Rhine port) terminal	5	
		Transshipment at Kleinhuenigen Rhine Port		1
Germany	693	Haulage Basel-Rotterdam by barge (German border - Dutch border)	693	
Netherlands	167	Haulage Basel - Rotterdam by barge (Dutch border - Port of Rotterdam)	167	
		Haulage with Dutch fuel by barge (Kleinhuenigen Rhine port - Rotterdam)	860	
		Transshipment at Port of Rotterdam container terminal		1
	205	Short sea shipping from Rotterdam to Felixstowe	205	
UK	495	Transshipment at the Port of Felixstowe		1
		Haulage Felixstowe-Manchester by train	446	
		Transshipment at Manchester Trafford terminal		1
		Post haulage to Preston	49	
Total	2139		2139	

Table C.10: Values for taxes, charges and subsidies per loading unit per kilometre per segment of the corridor Genoa – Manchester (intermodal)

Euro/LU/km or Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	fuel subsidy	tolls subsidy perc
Transshipment Genoa	0.672				0.000						
Marshalling Genoa					0.012		0.027				
Haulage Italy					0.024		0.027				
Haulage Italy					0.012		0.027				
Haulage Switzerland	0.072						0.212				
Transshipment Basel									1.698		
Haulage Switzerland	0.078	0.000	0.018		0.044		0.053				
Transshipment Switzerland									1.698		
Haulage Germany											
Haulage Holland											
Fuel haulage barge Holland	0.012									0.012	
Transshipment Rotterdam								20.179	1.263		
Short Sea Shipping	0.004				0.027						
Transshipment Felixstowe								17.179			
Haulage UK					0.019		0.003				
Transshipment Manchester											
Posthaulage	0.131	0.000	0.056	0.000	0.000	0.000					

Table C.11: Values of taxes, charges and subsidies per loading unit per segment in corridor Genoa – Manchester (intermodal solution)

Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Transshipment Genoa	0.672	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Marshalling Genoa	0.000	0.000	0.000	0.000	0.120	0.000	0.275	0.000	0.000	0.000	0.000
Haulage Italy	0.000	0.000	0.000	0.000	0.600	0.000	0.687	0.000	0.000	0.000	0.000
Haulage Italy	0.000	0.000	0.000	0.000	2.100	0.000	4.807	0.000	0.000	0.000	0.000
Haulage Switzerland	26.115	0.000	0.000	0.000	0.000	0.000	77.265	0.000	0.000	0.000	0.000
Transshipment Basel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.698	0.000	0.000
Haulage Switzerland	0.390	0.000	0.091	0.000	0.221	0.000	0.265	0.000	0.000	0.000	0.000
Transshipment Switzerland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.698	0.000	0.000
Haulage Germany	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Holland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fuel haulage barge Holland	10.743	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.354	0.000
Transshipment Rotterdam	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.179	1.263	0.000	0.000
Short Sea Shipping	0.734	0.000	0.000	0.000	5.507	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Felixstowe	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.179	0.000	0.000	0.000
Haulage UK	0.000	0.000	0.000	0.000	8.349	0.000	1.189	0.000	0.000	0.000	0.000
Transshipment Manchester	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Posthaulage	6.395	0.000	2.753	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	45.050	0.000	2.844	0.000	16.897	0.000	84.488	37.358	4.660	10.354	0.000

Table C.12: Sum of taxes, charges and subsidies per loading unit per segment in corridor Genoa – Manchester (intermodal solution)

Euro/LU	Sum T	Sum C	Sum S	Sum TC	Sum TCS	TCS per km	TCS per activity	TCS per km corridor
Transshipment Genoa	0.672	0.000	0.000	0.672	0.672		0.672	0.672
Marshalling Genoa	0.000	0.395	0.000	0.395	0.395	0.0395		0.039
Haulage Italy	0.000	1.287	0.000	1.287	1.287	0.0515		0.051
Haulage Italy	0.000	6.907	0.000	6.907	6.907	0.0395		0.039
Haulage Switzerland	26.115	77.265	0.000	103.380	103.380	0.2840		0.284
Transshipment Basel	0.000	1.698	0.000	1.698	1.698		1.698	1.698
Haulage Switzerland	0.481	0.486	0.000	0.968	0.968	0.1935		0.194
Transshipment Switzerland	0.000	1.698	0.000	1.698	1.698		1.698	1.698
Haulage Germany	0.000	0.000	0.000	0.000	0.000	0.0000		0.000
Haulage Holland	0.000	0.000	0.000	0.000	0.000	0.0000		0.000
Fuel haulage barge Holland	10.743	0.000	10.354	10.743	0.389	0.0005		0.000
Transshipment Rotterdam	0.000	21.442	0.000	21.442	21.442		21.442	21.442
Short Sea Shipping	0.734	5.507	0.000	6.241	6.241	0.0304		0.030
Transshipment Felixstowe	0.000	17.179	0.000	17.179	17.179		17.179	17.179
Haulage UK	0.000	9.538	0.000	9.538	9.538	0.0214		0.021
Transshipment Manchester	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Posthaulage	9.148	0.000	0.000	9.148	9.148	0.1867		0.187
Total	47.894	143.402	10.354	191.296	180.942			0.085

Table C.13:Detailed description of the corridor Genoa - Manchester (all road solution)

Nation	km	Road transport block GENOA - MANCHESTER	distance (km)	amount
Italy	194	Transshipment at the Voltri container terminal in Port of Genova		1
		Italian truck haulage from port of Genoa to Rotterdam	1261	
		Main haulage Genoa - Basel by truck (Genoa -Chiasso)	194	
Switzerland	279	Main haulage Genoa - Basel by truck (Chiasso - Basel)	279	
Germany	584	Main haulage Basel - Rotterdam by truck (Basel - Duisburg)	584	
Netherlands	204	Main haulage Basel - Rotterdam by truck (Duisburg - Port of Rotterdam)	204	
		Dutch fuel, haulage from port of Genoa to Manchester	1261	
	205	Transshipment at the port of Rotterdam Containerterminal		1
		Short Sea Shipping from Rotterdam to Felixstowe	205	
UK	446	Transshipment at the port of Felixstowe		1
		Main haulage Felixstowe - Manchester by truck (+ post-haulage)	446	
Total	1912		1912	

Table C.14: Values for taxes, charges and subsidies per loading unit per kilometre per segment of the corridor Genoa – Manchester (all road solution)

Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	road tolls	Infrastructure charge	harbour dues	terminal charge	subsidy	tolls subsidy perc
Transshipment Genoa	0.672										
Italian truck haulage		0.034	0.003	0.003			0.033				
Mainhaulage Italy						0.058				0.006	0.000
Mainhaulage Switzerland											
Mainhaulage Germany											
Mainhaulage The Netherlands											
Dutch fuel haulage	0.064				0.004					0.005	
Transshipment Rotterdam								20.179	1.263		
Short Sea Shipping	0.004				0.027						
Transshipment Felixstowe								17.179			
Mainhaulage UK + post haulage	0.131	0.000	0.040	0.000	0.000	0.000					

Table C.15: Values of taxes, charges and subsidies per loading unit per segment in corridor Genoa – Manchester (all road solution)

Euro/LU	fuel tax	registration tax	Circulation tax	insurance tax	fuel charge	road tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Transshipment Genoa	0.672	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Italian truck haulage	0.000	43.270	3.882	4.147	0.000	0.000	42.143	0.000	0.000	0.000	0.000
Mainhaulage Italy	0.000	0.000	0.000	0.000	0.000	11.171	0.000	0.000	0.000	1.127	0.000
Mainhaulage Switzerland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage Germany	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainhaulage The Netherlands	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dutch fuel haulage	80.731	0.000	0.000	0.000	5.170	0.000	0.000	0.000	0.000	5.946	0.000
Transshipment Rotterdam	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.179	1.263	0.000	0.000
Short Sea Shipping	0.734	0.000	0.000	0.000	5.507	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Felixstowe	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.179	0.000	0.000	0.000
Mainhaulage UK + post haulage	58.208	0.000	17.687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	140.346	43.270	21.569	4.147	10.677	11.171	42.143	37.358	1.263	7.072	0.000

Table C.16: Sum of taxes, charges and subsidies per loading unit per segment in corridor Genoa – Manchester (all road solution)

Euro/LU	Sum T	Sum C	Sum S	Sum TC	Sum TCS	TCS per km	TCS per activity	TCS per km corridor
Transshipment Genoa	0.672	0.000	0.000	0.672	0.672		0.672	0.000
Italian truck haulage	51.298	42.143	0.000	93.442	93.442	0.074		0.074
Mainhaulage Italy	0.000	11.171	1.127	11.171	10.045	0.052		0.052
Mainhaulage Switzerland	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Mainhaulage Germany	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Mainhaulage The Netherlands	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Dutch fuel haulage	80.731	5.170	5.946	85.901	79.956	0.063		0.063
Transshipment Rotterdam	0.000	21.442	0.000	21.442	21.442		21.442	0.000
Short Sea Shipping	0.734	5.507	0.000	6.241	6.241	0.030		0.030
Transshipment Felixstowe	0.000	17.179	0.000	17.179	17.179		17.179	0.000
Mainhaulage UK + post haulage	75.895	0.000	0.000	75.895	75.895	0.170		0.170
Total	209.331	102.613	7.072	311.944	304.871	0.159		0.159

BARCELONA - WARSAW**Table C.17:**Detailed description of the corridor Barcelona - Warsaw (intermodal solution)

Nation	km	Intermodal transport block BARCELONA - WARSAW	distance (km)	amount
Spain	215	Pre haulage from the shipper to Barcelona terminal with a Spanish truck	50	-
		Transshipment at Barcelona terminal	-	1
		Haulage Barcelona - Port Bou by train	165	-
		Transshipment at Port Bou terminal	-	1
France	845	Haulage Port Bou-Lyon-Torino by train (Port Bou-Lyon segment)	545	-
		Transshipment at Lyon Venissieux terminal	-	1
		Haulage Port Bou-Lyon-Torino by train (Lyon-Modane segment)	300	-
Italy	834	Haulage Port Bou-Lyon-Torino by train (Modane-Torino segment)	100	-
		Transshipment at Torino Orbassano terminal	-	1
		Haulage Torino-Verona by train (Torino-Bologna Interporto segment)	330	-
		Transshipment at Bologna Interporto terminal	-	1
		Haulage Torino-Verona by train (Bologna Interporto-Verona Q.E. segment)	117	-
		Transshipment at Verona Quadrante Europa terminal	-	1
		Haulage Verona-Budapest by train (Verona-Villa Opicina segment)	287	-
Slovenia	305	Haulage Verona-Budapest by train (SLO: Villa Opicina/Sezana-Sredisce border segment)	305	-
Croatia	42	Haulage Verona-Budapest by train (HR: Sredisce-Kotoriba segment)	42	-
Hungary	520	Haulage Verona-Budapest by train (H:Murakeresztur-Budapest segment)	213	-
		Transshipment at Budapest Jozsefvaros terminal	-	1
		Haulage Budapest-Warsaw by train (H:Budapest-Hidasnemeti segment)	307	-
Slovak Rep	116	Haulage Budapest-Warsaw by train (SK: Hidasnemeti-Plavec/Muszyna segment)	116	-
Poland	445	Haulage Budapest-Warsaw by train (PL:Muszyna-Warsaw segment)	395	-
		Terminal operations in Warsaw terminal	-	1
		Post haulage from the Warsaw terminal to the consignee	50	
Total	3322		3322	

Table C.18: Values for taxes, charges and subsidies per loading unit per kilometre per segment of the corridor Barcelona – Warsaw (intermodal)

Euro/LU/km or Euro/LU	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	Tolls subsidy perc
Prehaulage Spain	0.142	0.000	0.003	0.002	0.027	0.000	0.000				
Transshipment Barcelona									0.000		
Haulage Spain	0.000						0.000				
Transshipment Port Bou									0.000		
Haulage France	0.000						0.018			0.174	
Transshipment Lyon									0.000		
Haulage France	0.000						0.018			0.174	
Haulage Italy					0.016		0.017				
Transshipment Torino									0.000		
Haulage Italy					0.026		0.027				
Transshipment Bologna									0.000		
Haulage Italy					0.022		0.023				
Transshipment Verona									0.000		
Haulage Italy					0.025		0.026				
Haulage Slovenia							0.000				
Haulage Croatia							0.000				
Haulage Hungary							0.000				
Transshipment Budapest									0.000		
Haulage Hungary							0.000				
Haulage Slovak Republic							0.000				
Haulage Poland							0.000				
Transshipment Warsaw									0.000		
Posthaulage Poland	0.110	0.000	0.008	0.000	0.000	0.010	0.000				

Table C.19: Values of taxes, charges and subsidies per loading unit per segment in corridor Barcelona – Warsaw (intermodal solution)

	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	infrastructure tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Prehaulage Spain	7.106	0.000	0.173	0.112	1.344	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Barcelona	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Spain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Port Bou	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage France	0.000	0.000	0.000	0.000	0.000	0.000	9.804	0.000	0.000	94.752	0.000
Transshipment Lyon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage France	0.000	0.000	0.000	0.000	0.000	0.000	5.397	0.000	0.000	52.157	0.000
Haulage Italy	0.000	0.000	0.000	0.000	1.621	0.000	1.673	0.000	0.000	0.000	0.000
Transshipment Torino	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Italy	0.000	0.000	0.000	0.000	8.496	0.000	8.770	0.000	0.000	0.000	0.000
Transshipment Bologna	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Italy	0.000	0.000	0.000	0.000	2.560	0.000	2.643	0.000	0.000	0.000	0.000
Transshipment Verona	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Italy	0.000	0.000	0.000	0.000	7.118	0.000	7.347	0.000	0.000	0.000	0.000
Haulage Slovenia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Croatia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Hungary	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Budapest	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Hungary	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Slovak Republic	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Haulage Poland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Transshipment Warsaw	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Posthaulage Poland	5.507	0.000	0.421	0.000	0.000	0.479	0.000	0.000	0.000	0.000	0.000
Total	12.612	0.000	0.594	0.112	21.139	0.479	35.633	0.000	0.000	146.908	0.000

Table C.20: Sum of taxes, charges and subsidies per loading unit per segment in corridor Barcelona – Warsaw (intermodal solution)

	Sum T	Sum C	Sum S	Sum TC	Sum TCS	TCS per km	TCS per activity	TCS per km corridor
Prehaulage Spain	7.391	1.344	0.000	8.736	8.736	0.175		0.175
Transshipment Barcelona	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage Spain	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Transshipment Port Bou	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage France	0.000	9.804	94.752	9.804	-84.948	-0.156		-0.156
Transshipment Lyon	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage France	0.000	5.397	52.157	5.397	-46.760	-0.156		-0.156
Haulage Italy	0.000	3.294	0.000	3.294	3.294	0.033		0.033
Transshipment Torino	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage Italy	0.000	17.265	0.000	17.265	17.265	0.052		0.052
Transshipment Bologna	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage Italy	0.000	5.203	0.000	5.203	5.203	0.044		0.044
Transshipment Verona	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage Italy	0.000	14.465	0.000	14.465	14.465	0.050		0.050
Haulage Slovenia	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Haulage Croatia	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Haulage Hungary	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Transshipment Budapest	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Haulage Hungary	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Haulage Slovak Republic	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Haulage Poland	0.000	0.000	0.000	0.000	0.000	0.000		0.000
Transshipment Warsaw	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Posthaulage Poland	5.927	0.479	0.000	6.407	6.407	0.128		0.128
Total	13.319	57.251	146.908	70.570	-76.339	0.171	0.000	0.171

Table C.21:Detailed description of the corridor Barcelona - Warsaw (all road solution)

Nation	km	Road transport block BARCELONA-WARSAW	distance(km)	amount
Spain	213	Truck haulage from Barcelona to La Jonquera	213	
		Spanish fuel, haulage from Barcelona to Torino	988	
France	665	Truck haulage from La Jonquera to Modane	665	
Italy	525	Truck haulage from Modane to Torino	110	
		Italian truck, haulage from Barcelona to Torino	988	
		Truck haulage from Torino to Villa Opicina	415	
Slovenia	327	Truck haulage from Ville Opicina to Omoz	327	
Croatia	60	Croatian fuel, haulage from Torino to Budapest	1012	
		Truck haulage from Omoz to Letenye	60	
Hungary	291	Truck haulage from Letenye to Budapest	210	
		Hungarian truck, haulage from Torino to Budapest	1012	
		Truck haulage from Budapest to Parassapuszta	81	
Slovak Rep	209	Truck haulage from Parassapuszta to Chyzne	209	
Poland	445	Truck haulage from Chyzne to Warsaw	445	
		Polish fuel, haulage from Budapest to Warsaw	735	
		Polish truck, haulage from Budapest to Warsaw	735	
Total	2735		2735	

Table C.22: Values for taxes, charges and subsidies per loading unit per kilometre per segment of the corridor Barcelona – Warsaw (all road solution)

	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	road tolls	Infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls subsidy perc
Truck haulage Spain						0.000	0.000				
Truck haulage, Spain fuel	0.142				0.027						
Truck haulage France						0.104	0.000				
Truck haulage Italy						0.196				0.020	
Truck haulage, Italian truck		0.000	0.006	0.000			0.004				
Truck haulage Italy						0.196				0.020	
Truck haulage Slovenia						0.037					
Truck haulage, Croatia fuel	0.000				0.000						
Truck haulage Croatia						0.000					
Truck haulage Hungary						0.260	0.011				
Truck haulage, Hungarian fuel		0.000	0.006	0.000			0.003				
Truck haulage Hungary						0.260					
Truck haulage Slovakie							0.000				
Truck haulage Poland											
Truck haulage, Polish fuel	0.110				0.000						
Truck haulage, Polish truck			0.003	0.000			0.004				

Table C.23: Values of taxes, charges and subsidies per loading unit per segment in corridor Barcelona – Warsaw (all road solution)

	fuel tax	registration tax	circulation tax	insurance tax	fuel charge	road tolls	infrastructure charge	harbour dues	terminal charge	tolls subsidy	tolls perc	subsidy
Truck haulage Spain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage, Spain fuel	140.409	0.000	0.000	0.000	26.564	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage France	0.000	0.000	0.000	0.000	0.000	68.923	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Italy	0.000	0.000	0.000	0.000	0.000	21.560	0.000	0.000	0.000	2.200	0.000	0.000
Truck haulage, Italian truck	0.000	0.000	6.083	0.000	0.000	0.000	4.240	0.000	0.000	0.000	0.000	0.000
Truck haulage Italy	0.000	0.000	0.000	0.000	0.000	81.340	0.000	0.000	0.000	8.300	0.000	0.000
Truck haulage Slovenia	0.000	0.000	0.000	0.000	0.000	12.211	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage, Croatia fuel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Croatia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Hungary	0.000	0.000	0.000	0.000	0.000	54.600	2.237	0.000	0.000	0.000	0.000	0.000
Truck haulage, Hungarian fuel	0.000	0.000	6.378	0.000	0.000	0.000	2.602	0.000	0.000	0.000	0.000	0.000
Truck haulage Hungary	0.000	0.000	0.000	0.000	0.000	21.060	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Slovakie	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Poland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage, Polish fuel	80.948	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage, Polish truck	0.000	0.000	2.494	0.000	0.000	0.000	3.203	0.000	0.000	0.000	0.000	0.000
Total	221.358	0.000	14.955	0.000	26.564	259.694	12.282	0.000	0.000	10.500	0.000	0.000

Table C.24: Sum of taxes, charges and subsidies per loading unit per segment in corridor Barcelona – Warsaw (all road solution)

	Sum T	Sum C	Sum S	Sum TC	Sum TCS	TCS per km	TCS per activity	TCS per km corridor
Truck haulage Spain	0.000	0.000	0.000	0.000	0.000	0	0	0
Truck haulage, Spain fuel	140.409	26.564	0.000	166.973	166.973	0.169	0.169	0.338
Truck haulage France	0.000	68.923	0.000	68.923	68.923	0.104	0.104	0.207
Truck haulage Italy	0.000	21.560	2.200	21.560	19.360	0.176	0.176	0.352
Truck haulage, Italian truck	6.083	4.240	0.000	10.323	10.323		0.010	0.010
Truck haulage Italy	0.000	81.340	8.300	81.340	73.040		0.176	0.176
Truck haulage Slovenia	0.000	12.211	0.000	12.211	12.211	0.037	0.037	0.075
Truck haulage, Croatia fuel	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Truck haulage Croatia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage Hungary	0.000	56.837	0.000	56.837	56.837		0.271	0.271
Truck haulage, Hungarian fuel	6.378	2.602	0.000	8.980	8.980		0.009	0.009
Truck haulage Hungary	0.000	21.060	0.000	21.060	21.060		0.260	0.260
Truck haulage Slovakie	0.000	0.000	0.000	0.000	0.000		0.000	0.000
Truck haulage Poland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Truck haulage, Polish fuel	80.948	0.000	0.000	80.948	80.948		0.110	0.110
Truck haulage, Polish truck	2.494	3.203	0.000	5.697	5.697		0.008	0.008
Total	236.313	298.540	10.500	534.853	524.353			0.192

