Measure 57: Infrastructure charging

First page:

Policy package:
1C: Road Pricing, taxation and financing

Measure 57:
In 2002 propose a framework directive setting out the principles and structure of an infrastructure-charging system and a common methodology for setting charging levels, offset by for the removal of existing taxes, and allowing cross-financing.

What is the problem being addressed ?
In the White Paper on the European transport policy for 2010 is announced that the Commission will launch a proposal for a framework directive on the principles of infrastructure charging, on price structures, on a common methodology for setting price levels, and on the conditions of fair competition between transport modes. However, at present this common framework directive covering all transport modes is still to be proposed, and the Commission was able instead only to propose a Directive amending the "Eurovignette" Directive 1999/62 on the charging of heavy good vehicles for the use of certain infrastructures (COM (2003) 448 of 24.7.03), which doesn't cover the internalization of external costs for all modes of transport. Even for road transport, the amendment of the Eurovignette Directive do not allow for the internalization of the external costs as suggested in the White Paper, but aims to set out the principle and structure of road infrastructure charging and criteria for the allocation of revenue from road charges.
Notwithstanding the difficulties that prevented the Commission to present the announced infrastructure charging directive, the aim if this remains clear: to bridge the gap that currently exists between short-run marginal private costs (users' costs) and marginal social costs. The latter are the sum of private (or internal) costs – i.e. those borne directly by the individual user of transport services – and external costs, which may include environmental costs (e.g. damage due to air pollution, climate change, noise), non-covered accident costs (such as loss of labour productivity, but also grief and suffering). Fair and efficient pricing will make it economically more attractive to use cleaner, quieter, more fuel-efficient and safer vehicles in peak periods. As stated in the White Paper, "though a global increase in transport prices may be on the cards, the biggest change will nonetheless be in price structure".
It is important to note that infrastructure costs are not included in the desired structure for efficient pricing. These costs are fixed in the short run, hence including them in variable pricing for the use of infrastructure is not the optimal economic solution. As a consequence, external costs due to non-covered infrastructure costs, fragmentation of landscape, land-take and ecological separation – which belong to the long term impacts of infrastructure provision – are not included in the marginal social costs. Decisions on extending infrastructure should be based instead on social cost-benefit analysis, in which fixed costs are more adequately treated in the context of optimal welfare.
Another important consequence of excluding the costs of new infrastructure by applying efficient pricing in the short run, ignoring the long-term capacity optimization dimension, is that the revenue of marginal cost pricing more than covers infrastructure costs at given capacity (i.e. maintenance costs) for inland transport modes taken as a whole if charges are set to optimize the use of existing capacity, as a result of charges for congestion where capacity is insufficient. Indeed, there are indications that marginal cost pricing will result in a surplus of revenues over public expenditure (Roy 2000), and there is already a considerable discussion on the size and possible use of revenues that accrues for the internalization of external costs. Although there is a clear economic reasoning not to earmark part or all of the revenues for specific purposes, earmarking is often considered necessary for political feasibility of new charging regimes. The White Paper, following the ideas of the European Parliament, proposes earmarking revenues from road transport charges in specific cases, for example to finance new infrastructure for alpine crossings.

Measure's costs and/or benefits:
Although the EU pricing framework for better internalisation of external costs is still under development, a number of Member States, notably Germany and the UK, are taking initiatives to restructure taxes and charges. However, due to incomplete information, the required level of transport taxes and charges under a

fair pricing regime is hard to establish, and therefore the costs and/or benefits for different categories of transport users. Some differentiation of taxes charged is currently done, concentrating mainly on air pollution in the road sector and noise in the aviation sector, and these are the only two sectors where to estimate the costs of new charging schemes seems feasible. Very few measures have yet been taken to internalise the costs of congestion (notably London) and CO_2 emissions and rail and road noise.

Legislative implementation at the EU level:

As noted above, the proposal of an EU infrastructure charging framework directive is still under way. In the meantime, a Proposal for a Directive amending the "Eurovignette" Directive 1999/62 on the charging of heavy good vehicles for the use of certain infrastructures exists, but it must be revised, because it was not possible to find a consensus within the council of the European transport-ministries, especially on the usage of the revenues. The European Parliament made recently (Luigi Cocilovo's Report adopted on 20-22 April 2004) the following points on charging for infrastructure costs:

- the principles of the directive should only apply directly to Trans-European Network roads – they could also apply to some alternative roads but only after consultation with local authorities;
- the weighted average toll definition should be widened to include costs for environmental elements, provided they can be objectively calculated on the basis of the EU methodology;
- the Commission had proposed that tolls could vary according to various elements such as emission standards, accident risks and population density. The Parliament added elements such as the objective measurable air quality;
- Member States may provide fiscal compensation for the introduction of toll charges;
- the revenue from road charges shall be used for the transport sector as a whole.

The Commission was called on to devise, two years after the entry into force of the amendment to the Eurovignette Directive, a generally applicable, transparent and comprehensible model for the assessment of all external environmental, congestion and health related costs to serve as the basis for future calculations of road infrastructure charges. The Commission is also preparing guidelines for a more general and commonly accepted methodology for estimating external costs for all modes of transport, which is clearly a (still lacking) prerequisite for the implementation of the future infrastructure charging framework directive.

What are the objectives ?

A common EU framework for infrastructure pricing has not yet been implemented. And it seems that it will take a long time before all member states have agreed to set up a common methodology for setting charging levels. The objective seems difficult to achieve especially in relation to the overall framework Directive covering all transport modes – still to be proposed by the Commission - but also with the regard to the road sector alone, where the proposal for amending the Eurovignette directive (COM (2003) 448 of 24.7.03) has to be revised.

As it concerns the latter, it will be very difficult to find now within the enlarged European Community (EU 25) a consensus about the implementation of this measure, especially with regard to the solutions proposed for toll differentiation according to emission class of the vehicle and the period of day or season, and possible mark-ups in environmentally sensible areas. The following points summarize the reasons why it is not clear when the amendment of the Eurovignette directive can be achieved:

- some Member States are in favour of the proposal to oblige the Member States that revenues from tolls or user charges have to be reinvested in the transport sector as a whole, others prefer no obligation;
- the interests of the states are very different: states at the periphery wish rather low tariffs when passing through the central countries. Central states have high infrastructure costs because of a large network and intend to cover these costs. They have as well an interest in the possibility of a large differentiation according to emissions and time of day or season in order to manage or avoid congestion.
- the aims are very different: in some countries, a complete new network has to be build and in other countries, a rounding off and relatively few capacity enlargements are to be conducted.
- the organization forms differ: private companies, public companies and state-own infrastructures.

Although these different reasons make a consensus very difficult, a compromise is on the way. One important discussion point had been the use of the charges: must they be re-invested in the infrastructure? Can they be used as "accounting" debts of the states or only debts of private companies? Can they be used for investments in other sectors ? However, the danger exists, that it includes many exceptions (due to the political interests) and that it is a very soft regulation, so that the intention of the objective will at least

partly not be achieved. Some good elements exist: extension to 3.5-t-vehicles and extensions on parts of the inferior network. A strict calculation scheme has vanished from the actual discussion version. Because of the interests of the next two presidency countries which are rather against charging at all, the date of the implementation of the directive remains open.
Whatever will be the future development of the amendment to the Eurovignette directive, it is evident that the experience done with the EU legislation concerning road charging will be a key input also for the development of the overall framework directive covering all modes of transport, whose proposal is now lacking behind. One reason for this delay surely is the difficulty to estimate external costs, which are needed to fix both levels and structure of transport charges and taxes aiming to internalise costs for the various transport modes. The current state of external cost estimates is discussed in the section devoted to the output indicators for the measure (see second page). Indeed, besides the current levels of infrastructure charging also show in that section, levels of charges reflecting the social costs (internal + external) of the various transport modes are the direct target of the measure, and this explain why estimates of external costs are discussed as an element of the output section.

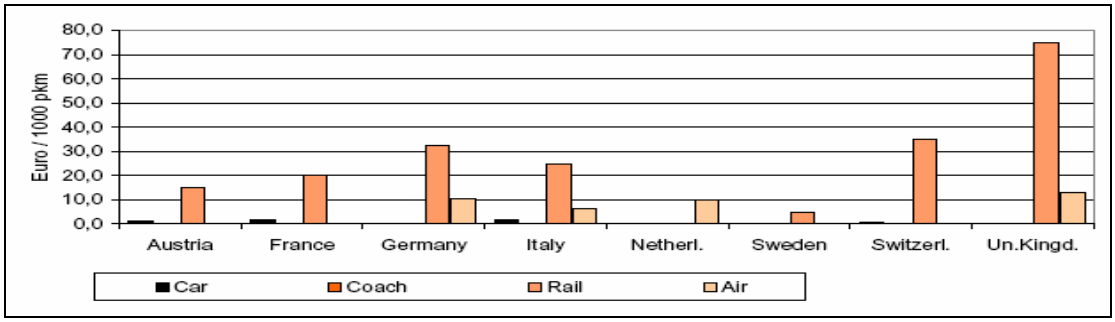
Interactions with other WP measures:
There is a strong interaction with all the measures aiming to the WPs "Shifting the balance between modes of transport" headline objective. From the technical point of view there are also interactions with the measures related to the Galileo system and the digital tachograph, which supply the technical basis for the implementation of an infrastructure charging system.
In relation to the proposal of amendment of the Eurovignette directive, it is interesting to note that, whilst waiting for the implementation of the proposal, a complementary regulatory measure is currently at work ruling the transit system for lorries traveling through Austria, the so named "Ecopoints". Key features of this measure are a ban of the most polluting lorries, unrestricted transit for cleaner lorries, the application of the agreement to the entire territory of Austria and the number of transit points to be allocated to the New Member States and candidate countries. After 31 December 2006, the ecopoints system will be replaced by a new scheme of "eurovignettes". However, if the eurovignettes legislation is adopted and come into force earlier, this new scheme will replace the ecopoints system before 31 December 2006.

<u>Second page</u>:

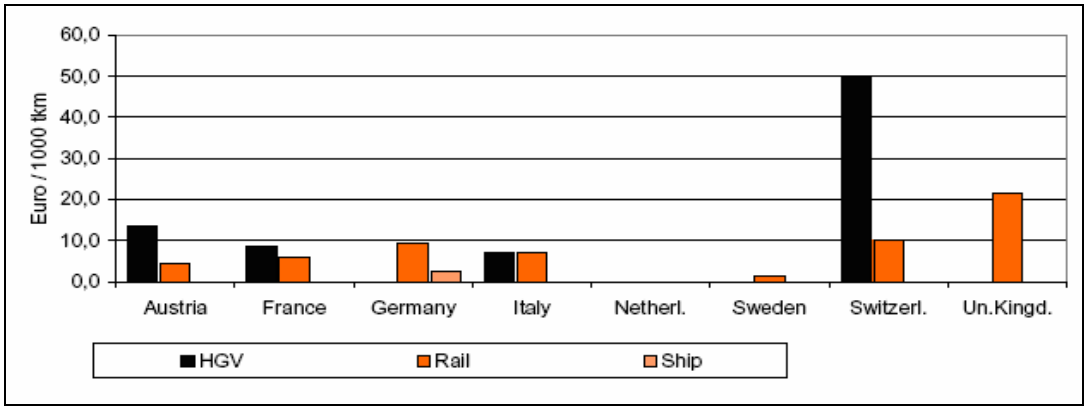
Output indicators:

The output of this measure can be documented with detailed national analyses. The following figures show the actual situation concerning passenger and freight user charges for infrastructure for some EU countries.

<u>Passenger:</u>
The first figure depicts a comparison of direct infrastructure user charges road, rail and air passenger travel. At the moment no information are available for coaches.



<u>Freight:</u>
For Freight a comparison of direct infrastructure user charges road, rail and inland waterways is depicted in the following figure (making the following assumptions: Road: HGV 40t/5 axles, Euro-1 with a payload of 10.2t; Rail: Freight train with payload of 350t.):



Leaving aside fuel taxation (see Measure 58), countries that most frequently apply environmentally differentiated taxes and charging schemes are Sweden, UK, the Netherlands and Germany, followed by Austria, Denmark and Belgium. There are two countries without any scheme: Greece and Ireland. Almost all countries have noise surcharges at airports, but only one (Sweden) has emission surcharges. Only two countries (Sweden and Finland) have a differentiation for ship emissions. Some Member States (Austria, Denmark and the UK) have their fixed car taxes differentiated for fuel consumption/CO_2 emissions. Furthermore, the UK's company car tax regulations are partly based on the CO_2 emissions of the vehicle concerned (see Measure 61). Switzerland introduced, as of January 2001, a heavy vehicle fee. This is a kilometre charging system for HGVs on the entire Swiss road network. The charge depends on distance driven, emission class, and gross tonnage, and will gradually be geared towards EUR 0,52 to EU =,73 per km for a 40-tonne truck as of 2005.

Ideally, road as well as other transport modes charges should reflect the values of external costs they cause. Several organisations carried out studies that have estimated external costs of transport. The studies differ considerably in their scope, the specific transport modes considered, the kinds of impacts evaluated. The following values of marginal external costs of passenger and freight transport are taken from the Infras-IWW study (Infras, 2000) which addresses total, average and marginal costs of all transport modes in EU15 countries, taking into account of all the main kinds of external impacts (without congestion):

Figure 1: Marginal external costs of passenger transport (not including congestion), minimum and maximum values per transport mode (EUR/vehicle-km for aviation; EUR/10 vehicle-km for other modes)

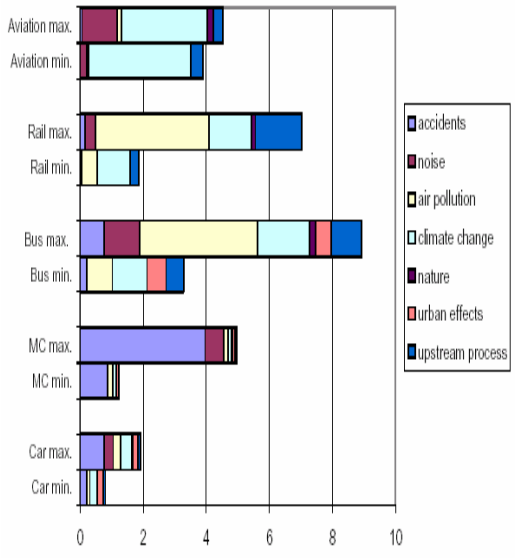
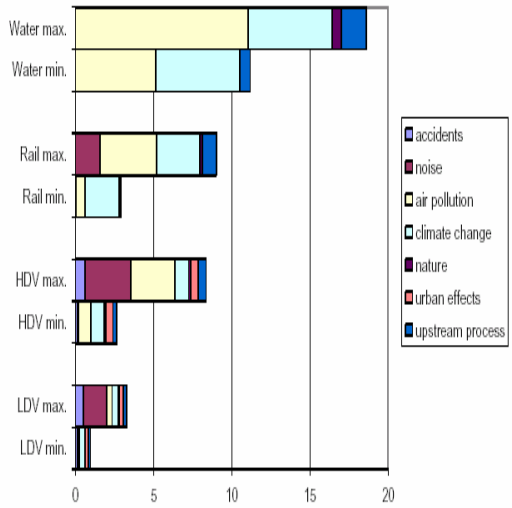


Figure 2: Marginal external costs of freight transport, minimum and maximum values per transport mode (not including congestion)(EUR/10 vehicle-km for road freight; EUR/vehicle-km for other modes)



NB: MC = motorcycle; HDV = heavy-duty vehicle (3.5–40 tonnes); LDV = light-duty vehicle (< 3.5 tonnes). Values given are averages for EU-15 plus Norway and Switzerland. Congestion and infrastructure costs are not included. Nature

The differences between maximum and minimum estimates are consistent, and the ranges vary also across the different studies. Therefore, is still not possible to apply these estimates as robust quantitative parameters for taxation and charging purposes.

Outcome indicators: intermediate impacts on the transport markets

Changing the modal split and reducing transport volumes are not explicit aims of the internalisation of external costs, although such changes could be one of the most important outcomes of this measure. In particular, the implementation of a common road charging system could lead to a decrease of good transport by road and to an increase of good transport by rail, inland waterways and air.

Clean and safe traffic on quiet roads at peak-off hours could become cheaper, whereas polluting and unsafe traffic, driving in congested areas in peak hours would become (much) more expensive with the application of marginal social cost pricing. The expected increase in the costs of road freight transport may cause an increase of transport prices for the shippers, although competition may limit price increases while favoring a different response of road haulers, who can try to recover profits through higher transport efficiency. Indeed, before a price increase that could be problematic on a competitive road markets, differentiated kilometer charges (for the internalization of congestion, accident and environmental costs) and fuel taxes (for the internalization of the costs of CO_2 emissions) will probably provoke an upward impact on load factors, with road haulers optimizing their trips in response to the charging schemes. The baseline load factors used in the Infras/IWW study are shown in the table below:

Load factors per country used in Infras/IWW 2000

Unit: passengers per vehicle or tonnes per vehicle

Load factors (road)	Car (passengers)	Bus (passengers)	LDV (tonnes)	HDV (tonnes)
Austria	1.48	30.0	0.30	9.8
Belgium	1.46	11.6	0.30	5.0
Denmark	1.86	20.0	0.30	8.9
Finland	1.40	12.9	0.30	6.2
France	1.86	18.5	0.30	4.6
Germany	1.44	18.5	0.30	4.6
Greece	1.98	10.7	0.30	7.4
Ireland	1.71	8.5	0.30	7.3
Italy	1.88	16.9	0.30	5.5
Luxembourg	1.60	17.7	0.30	6.8
Netherlands	1.63	22.2	0.30	7.5
Norway	1.81	11.3	0.30	5.6
Portugal	2.46	27.7	0.30	3.9
Spain	2.02	25.2	0.30	5.6
Sweden	1.64	13.2	0.30	4.7
Switzerland	1.67	18.7	0.30	5.6
UK	1.66	8.9	0.30	6.9
Total	**1.74**	**17.2**	**0.30**	**5.62**

Source: Infras, 2000.

Outcome indicators: final impacts on transport users and non users

Infrastructure charging is expected to increase the direct road user costs and, as a consequence, to contribute to the shift of passenger and freight transport to other modes (especially rail), and to increase the efficiency of road transport itself, with greater occupancy rates and loading factors per vehicle-kilometre travelled. This will lead to a reduction of congestion and further favourable consequences consisting in:

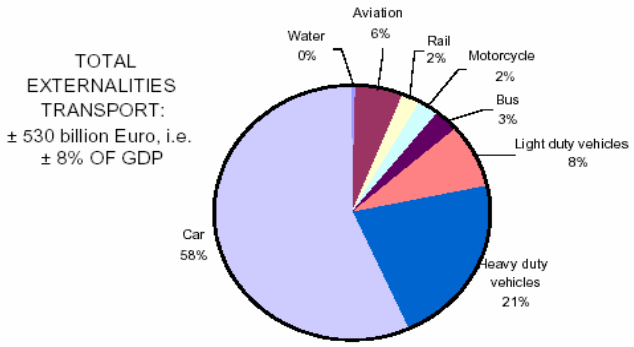
- Travel time savings for the road users
- Reduced emissions
- Reduced accidents

Despite the different approaches followed in their computation, estimates of external costs can be used as an indicators of the expected final outcomes of infrastructure charging. At least some qualitative conclusions can be drawn at this regard as follows:

- external costs are large in absolute terms;
- air pollution, climate change and accidents have large shares in total external transport costs;
- road transport – the largest share of both passenger and freight mobility volumes – is also the largest contributor to total external costs;

- the marginal external cost of road transport varies considerably according to where and when the trip is taken. Urban trips cause a much higher impact than rural trips, mainly because the higher population density in urban areas results in more people being exposed to the health effects of air pollution. The valuation can also vary considerably among different urban areas, depending on the population densities and climatic and geographic characteristics.

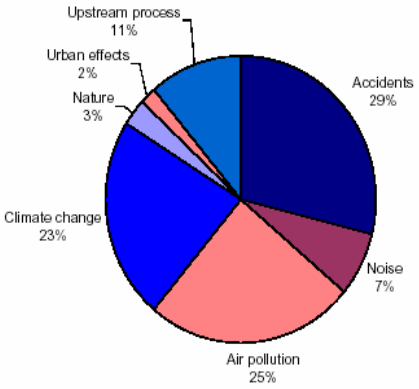
Box 1: Composition of external costs of transport in EU-15 plus Norway and Switzerland by transport mode



Source: Infras, 2000.

The above figure shows that passenger cars are responsible for more than half of the total external costs of transport. Road transport as a whole amounts to 92 % of total external costs. The share of rail and water transport in the total external costs is negligible.

Box 2: Composition of external costs of transport in EU-15 plus Norway and Switzerland by cost category



Source: Infras, 2000.

The most important cost category of transport is accident costs, closely followed by air pollution and climate change. Together, these three cost categories are responsible for more than 75 % of total external costs.