Greening Transport

Reduce External Costs

Executive Summary

CER

The Voice of European Railways

April 2012

The real price of transport for sustainable mobility and fair competition

We all know that many people die in road accidents every day. We are all subjected to the smell of exhaust fumes from vehicles. We have all observed congestion or been stuck in traffic jams. We regularly witness extreme weather events that experts say are being increased in their severity and frequency by the effects of climate change. But when we take our car, we typically do not consider the resulting pollution, traffic congestion or the risks we subject ourselves and others to. These effects are external to the transport system because they are created by transport users but not paid by them. This means that the price of the private car is lower than it should be, distorting competition between modes, and incentivising the growth of road traffic.

It is possible to attribute monetary values to external effects. They can be the basis of new incentive taxation. They can also be added to internal costs to calculate the full costs. This allows for more consistent and equitable decision-making.

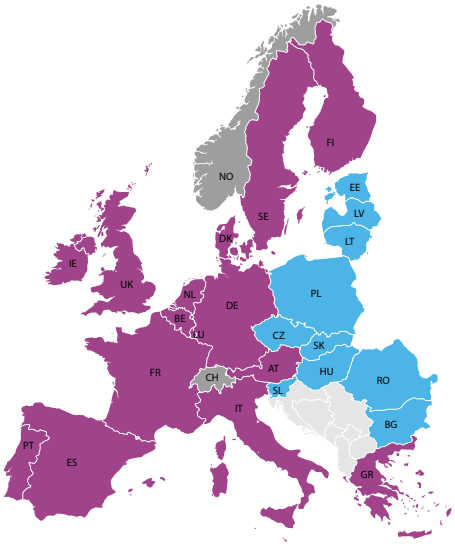


Figure 1: European countries included in the estimation of external costs

The new study

Several studies have previously been undertaken in order to estimate the external costs of the European transport sector. CE DELFT and al. realised in 2011 a new study for UIC, 'External Costs of Transport in Europe: Update study for 2008'[1]. This one uses 2008 data and extends the geographical scope from Western European countries to also include the EU Member States Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Romania, Slovenia and Bulgaria (see map in Figure 1 below). Norway and Switzerland are also added, while Malta and Cyprus are excluded as these countries lack any relevant railway infrastructure. Comparing the different studies that have been done, each one has developed better methodology, with more countries included and more externalities considered.

The new study is the product of an independent well-known consortium of consultants (CE Delft, Infras and Fraunhofer ISI) that also completed the 'Handbook on estimation of external costs in the transport sector' for the European Commission in 2008.

It is currently the most recent (representing scientific state-of the-art) and most comprehensive report related to the external costs, adding not only more European countries but also more external effect components into the analysis (ten, compared to the three considered in the recent revision of the 'Eurovignette directive').

Above all, the results of this study can be used directly at operational level for anyone in charge of designing a new system of taxation or subsidy, in calculations of the socio-economic profitability of business plans for a new exploitation or the socio-economic return on investment of a new infrastructure.

The results of the study are prudent, if not under-evaluated: this is a tendency for many studies where the results imply a raised level of charging or taxation, which is never easily acceptable on political level.

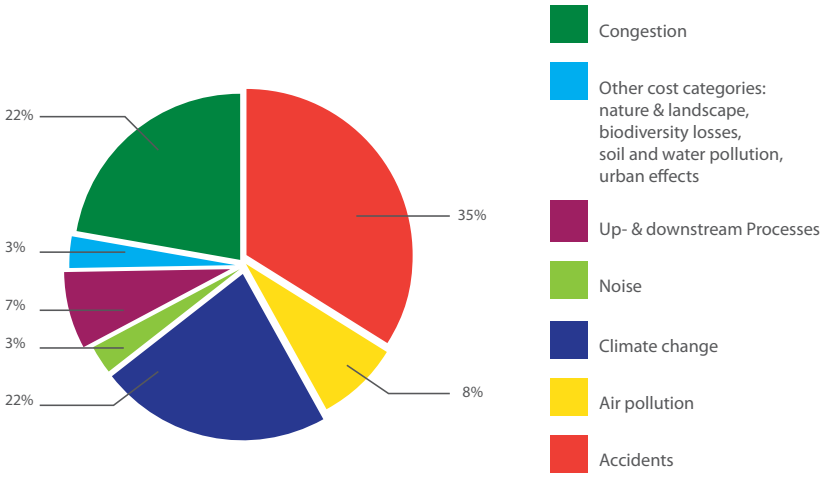
1. CE Delft, INFRAS, Fraunhofer ISI : 'External costs of Transport in Europe : Update study 2008'- November 2011
The study is available at : http://uic.org/IMG/pdf/external_costs_of_transport_in_europe-update_study_for_2008.pdf

The main Results

Total external costs

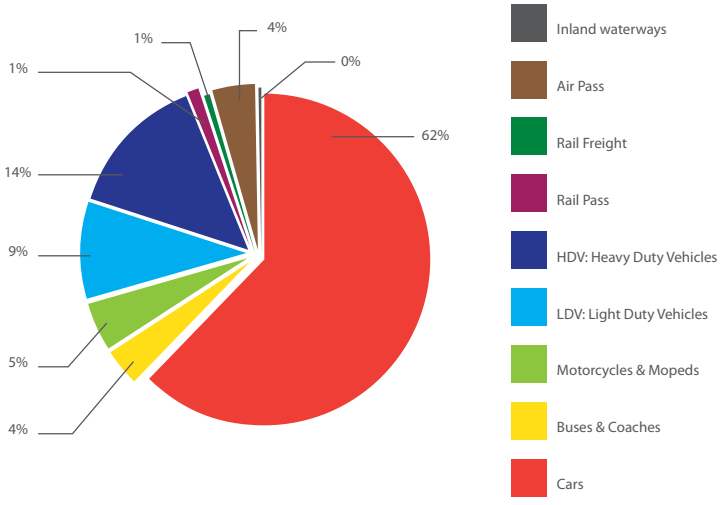
Total external costs for 2008 for the 27 European countries included here have been estimated at €510 billion, excluding congestion. Adding congestion in, the costs amount to €660-760 billion, depending on whether low or high congestion values are used. Accidents, congestion, climate change and air pollution represent 86% of total costs but other externalities should not be neglected (see Figure 2).

Figure 2: Total external costs of transport 2008 by externality



The total external costs represent 4% of the total GDP of the 27 countries considered in the study, excluding congestion. Congestion costs amount to 0.9%-1.9%, bringing the total impact of externalities to between 5% and 6% of GDP.

Figure 3: Total external costs of transport 2008 by transport mode



Turning to the relative impact of each mode, Figure 3 below shows that the road sector users generate 93% of total external costs between them. Rail accounts for 2%, the aviation passenger sector 4%, and inland waterways a negligible amount (0.3%).

Average external costs

Total costs divided by traffic volumes indicate the average costs for each transport mode. It allows for an intermodal comparison, calculating the costs that could be avoided by means of shifting from one mode to another one with less external impact.

When considering the charts below (Figures 4 and 5) it becomes clear that average external costs for road transport are more than four times higher than rail for freight and more than six times higher for passenger services (excluding congestion).

Figure 4: Average external costs 2008 for EU-27: passenger transport (excluding congestion)
without motorcycles and mopeds[2]

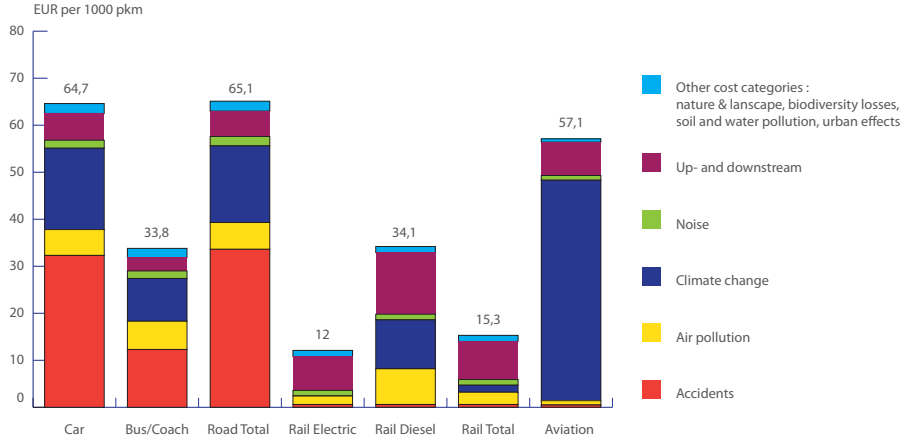
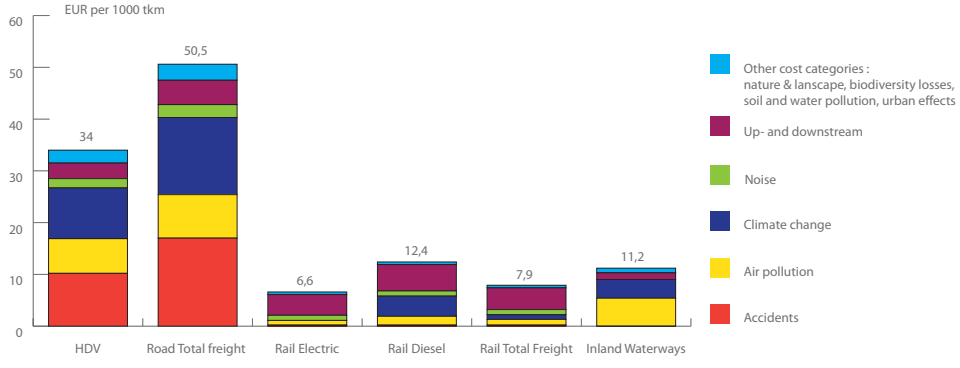


Figure 5: Average external costs 2008 for EU-27: freight transport (excluding congestion)
without LDV[3]



2. Motorcycles and mopeds not presented. These modes are less in competition for long distance traffic
3. LDV not presented. These modes are less in competition for long distance traffic

Case Studies: Comparing modes for passenger and freight traffic

The study presents two case studies of passenger transport by each mode in competition on two corridors: Paris-Brussels by car, by high speed train and by air and Berlin-Warsaw by car, by standard train and by aviation. All costs are calculated with the specific average national values. These are shown in Figure 6.

Costs are very low for HST on Paris-Brussels because the load factor is very high and the electricity source is largely nuclear, which produces zero carbon emissions when generating the energy. Results remain lower for standard train compared to car and airplane on the Berlin-Warsaw route. (These results do not include congestion and therefore external costs are under-estimated for car and airplane.)

For freight, we can see the clear advantages that train and internal waterways (plus combined transport on the Rotterdam-Genoa route) have compared to road transport.

Figure 6: Corridor results passenger transport per passenger and 100 corridor-kilometres

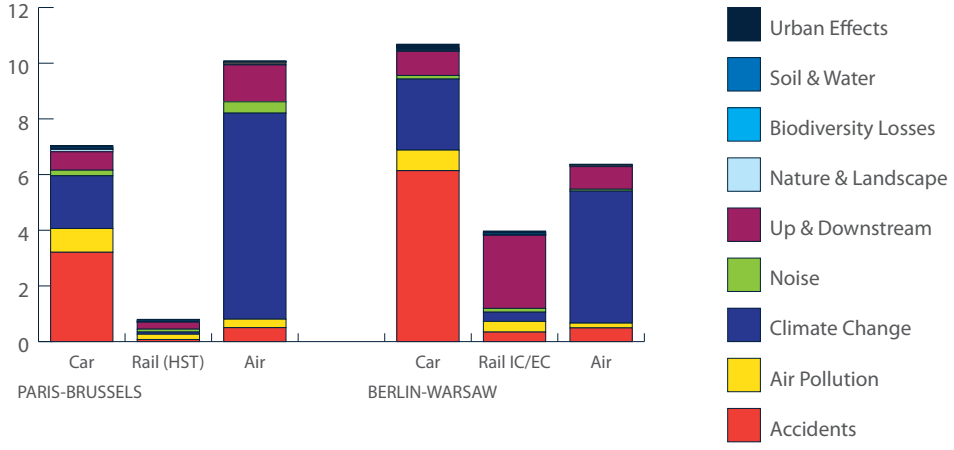
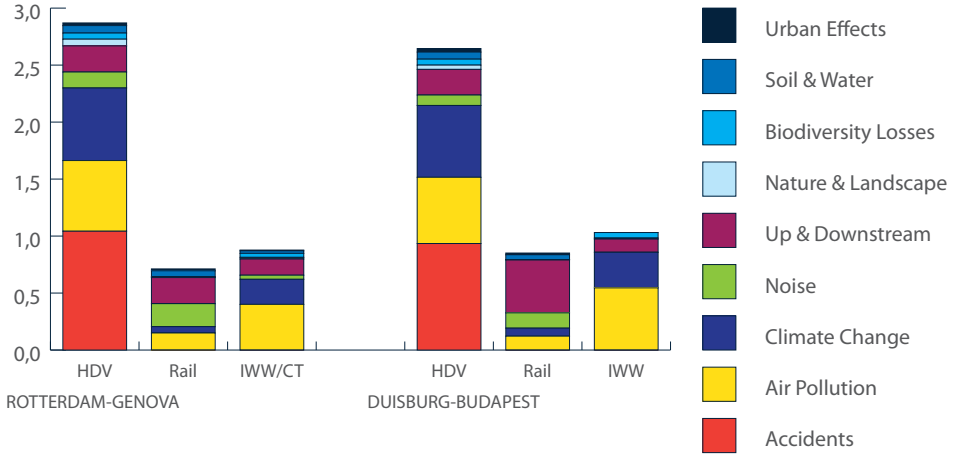


Figure 7: Corridor results freight transport per tonne and 100 corridor-kilometres



HST: High Speed Train
EC: Eurocity train
IC: Intercity train
IWW: Inland Waterways
CT: Combined Transport

Transport Policy: introduce a consistent, fair policy framework for external costs

If we want "real prices" in transport that incentivise the best choice of mode of transport for sustainable mobility, we need to pursue internalisation:

- in each mode of transport, at the same time
- for all external effects, with the same definition in each case
- set at the 'right', scientifically-based level and not at the minimum level necessary for political acceptance.

The 'right' level is that which achieves the reduction target for each negative impact. For example, the price per tonne of CO2 should incentivise the reduction of greenhouse gas emissions to ensure that the EU White Paper's target for transport of a 60% cut in emissions by 2050 will be met (in coordination with the other measures planned).

The 2008 IMPACT handbook for the European Commission recommended a range of strategies for internalising external costs. These included kilometre-based charges for the internalisation of air pollution, noise and congestion costs, differentiated by vehicle characteristics, location and time of the day; for external accident costs, either a kilometre-based charge or the charging of insurance companies based on accident rates; local road pricing schemes as an alternative to differentiated kilometre based charges for congestion costs; and for climate change costs, carbon-content based fuel taxes or emissions trading (particularly suitable for maritime shipping and aviation).

There are various economic instruments currently in use to reduce different external effects. These include taxation for road vehicles, and for fuels (with fiscal incentives for more environmentally-friendly vehicles and fuels); regulations, which vary according to the external effect targeted and the means of transport (e.g. EURO standards for heavy road vehicles); cordon charging in urban areas for road vehicles (e.g. in London); permit trading via the EU Emissions Trading System for energy consumed by electric transport, for aviation and potentially for the maritime sector; and track access charge for railways in relation to their noise levels (e.g. in the Netherlands and Germany).

These instruments have been introduced at different times and for different reasons, usually without coordination. Measures need to be converged as part of a coherent approach that seeks to fully internalise all external costs for all modes. With this approach in mind, the European Commission has already said that it intends to bring out a report in 2012 on the further internalisation of external costs. This will consider what measures need to be taken for the full and mandatory internalisation in road and rail, and the internalisation of local pollution and noise costs in ports and airports, by 2020, as was envisaged in the 2011 Transport White Paper.

A complete internalisation of external costs at the efficient level should realize a more fair competition between the different modes of transport, create the conditions of modal shift in favour of the less polluter modes and reduce negative effects on environment.

Act today

The impacts of the external effects of transport can manifest themselves in both short and long-term ways – for example, the immediate impact of fatal accidents and noise, as opposed to the longer-term impact of air pollution in urban areas and climate change. Experience has shown that we need to address both the immediate and the longer-term impacts if we do not want to be faced with much larger costs in the future. Decision-makers should apply the precautionary principle to all external costs, adopt a long-term vision, and act today.

Greening Transport - *Reduce External Costs*

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