

## ***Multimodal Sustainable Transport: which role for the internalisation of external costs?***

**Brussels, 17 December 2018**

### ***Preliminary results of the study: "Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities"***

#### ***Background and purpose of the study***

The issue of internalising the external costs of transport, e.g. via appropriate pricing, has been on the agenda for a long time. The Commission has committed to this principle for instance in the 2011 White Paper<sup>1</sup>; and there is large agreement amongst transport economists on the merits of this concept. While many studies have been carried out and also individual initiatives have been taken forward on this basis, notably on road pricing in the Eurovignette Directive, a comprehensive up-to-date overview of the external effects compared with internalisation measures of different transport modes has been missing. A systematic analysis of transport infrastructure costs is also not available.

This is why the European Commission services have decided in 2017 to try and establish in a comprehensive way the underlying facts and figures, with a view to inform future policy debates.

The purpose of this work is to provide a comprehensive, up-to-date overview of the state of play regarding the "user pays" and "polluter pays" principles. We do this by assessing the external and infrastructure costs of different transport modes and comparing them with the taxes and charges paid by transport users.

This study covers all transport modes in the EU's 28 Member States and other advanced economies, differentiating passenger and freight.

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<sup>1</sup> 'Roadmap to a Single European Transport Area - Towards a competitive and resourceefficient transport system [COM(2011) 144].

From a methodological perspective, this high ambition implies the need to make various important assumptions, in particular where reliable data is missing<sup>2</sup>. Notwithstanding the methodological challenges, external costs are real costs related to non-market items (lives, health, air quality, time, etc.). Somebody ultimately bears them and ideally it should be the one producing them as 'polluter' or 'user'. Therefore, it is important to regularly estimate these costs also in monetary terms, with the best methodologies and data available.

### ***Preliminary insights***

The preliminary results allow for first tentative yet important insights: **the overall size of transport external costs is estimated at around 1 000 billion euro annually.** To put this in context, this corresponds to almost 7% of EU28 GDP. These include external costs related to accidents, environment (air pollution, climate change, the costs related to energy production, i.e. the well-to-tank emissions, noise, habitat damage) and, only for road, congestion costs of more than 250 billion euro<sup>3</sup>. Infrastructure costs are not included in this figure<sup>4</sup>. These external costs are a quantification in monetary terms of non-market items, merely expressed as % of GDP for an idea of their size. Therefore they cannot, for instance, be compared to the share of transport in the economy.

The level of external costs is significantly higher than previously quantified for most categories. This is partly due to an increase of the real external effects, but also reflects a different, updated methodology — new research results have been taken into account, and other developments such as the real life emissions have also been reflected.

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<sup>2</sup> The complete methodology, together with assumptions and input data will be presented in the report, together with an assessment of the robustness of the figures and a comparison with previous studies. The estimation of external costs draws on a number of sources (such as Eurostat, European Commission's "EU transport in Figures", Intergovernmental Panel on Climate Change, Organisation for Economic Co-operation and Development, International Energy Agency, European Environment Agency, World Health Organization, Joint Research Centre, etc.) and on the most recent scientific literature available. The methodology was also discussed with external experts in a workshop organised by the Commission.

<sup>3</sup> A significant part of the total external cost of congestion is already internalised by the willingness of the users to travel in congested situation.

<sup>4</sup> For road, rail and inland waterway transport, the total infrastructure costs in the EU28 amount to more than € 250 billion for 2016. The main part of these costs are caused by passenger cars and heavy goods vehicles. As for aviation and maritime transport, infrastructure costs are estimated for a selection of (air)ports, no total infrastructure costs figures at the EU28 level are provided.

Figure 1 below shows that environmental costs represent almost 50% of the external costs of transport. In absolute terms, road causes more than three quarters of the transport external costs. The high share of road transport activity compared to other modes contributes to this outcome.

**Figure 1 – External costs by cost category and by transport mode for EU28 in 2016<sup>5</sup>**

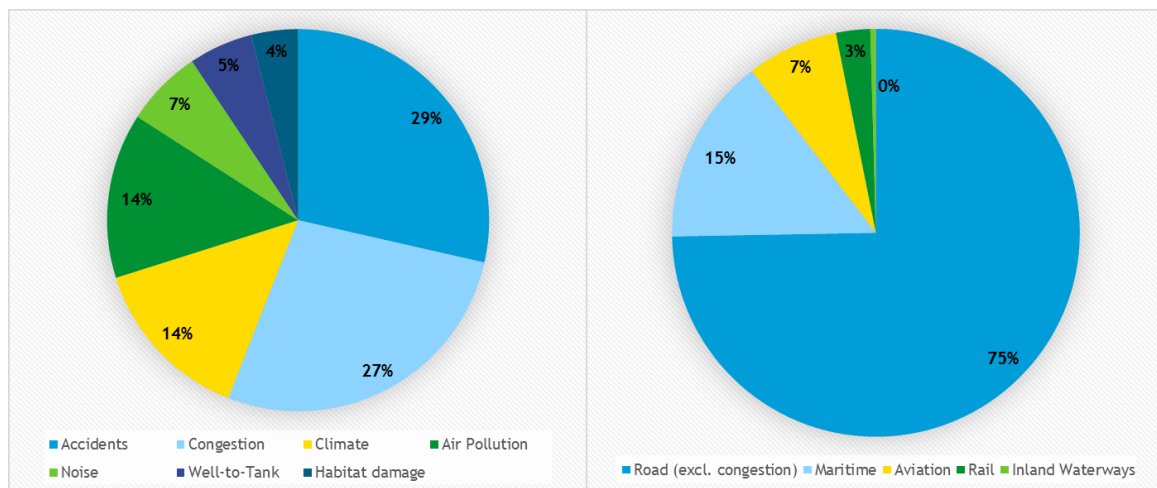


Figure 2 shows that the prevalent type of cost varies by mode. Environmental costs (respectively air pollution and climate change) represent the lion's share in maritime and aviation. In road transport, environmental, accidents and congestion costs are of similar magnitudes (the latter is not shown in Figure 2 as it was estimated only for road modes). The external cost of rail transport and inland waterways are much smaller.

<sup>5</sup> For aviation and maritime the study collected information for a number of specific ports and airports and not for the whole EU. This graph scales up the costs for the selected ports and airports therefore assuming that the traffic to and from them are representative of the EU traffic. Furthermore, for some cost categories the figures are depending on local conditions and therefore cannot be scaled up. The right-hand side figure excludes congestion costs as these have been assessed only for the road modes.

**Figure 2 - Total external costs per transport mode for EU28 in 2016<sup>6</sup>**

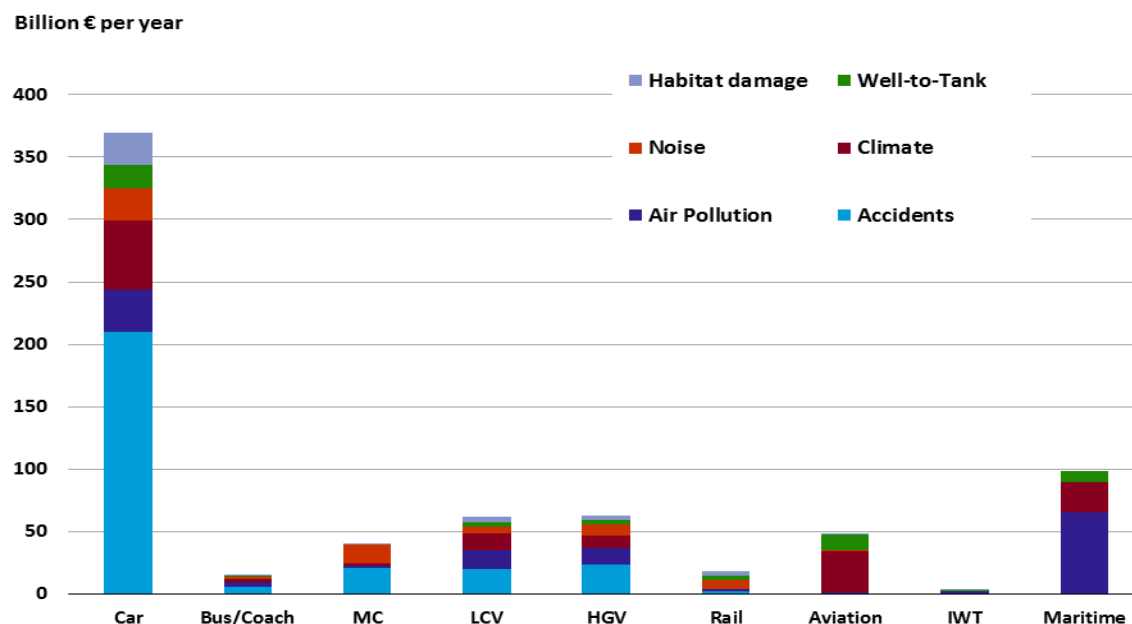
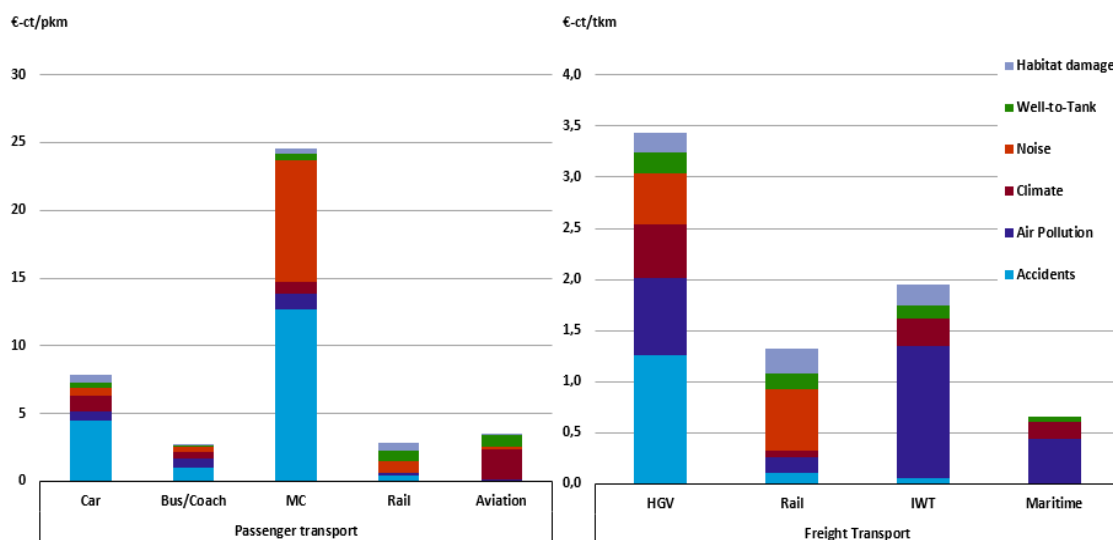


Figure 3 shows that in relative terms (per passenger-km and tonne-km) the picture is more nuanced but confirms that the road, except for busses and coaches, creates the highest average external costs for both passenger and freight transport.

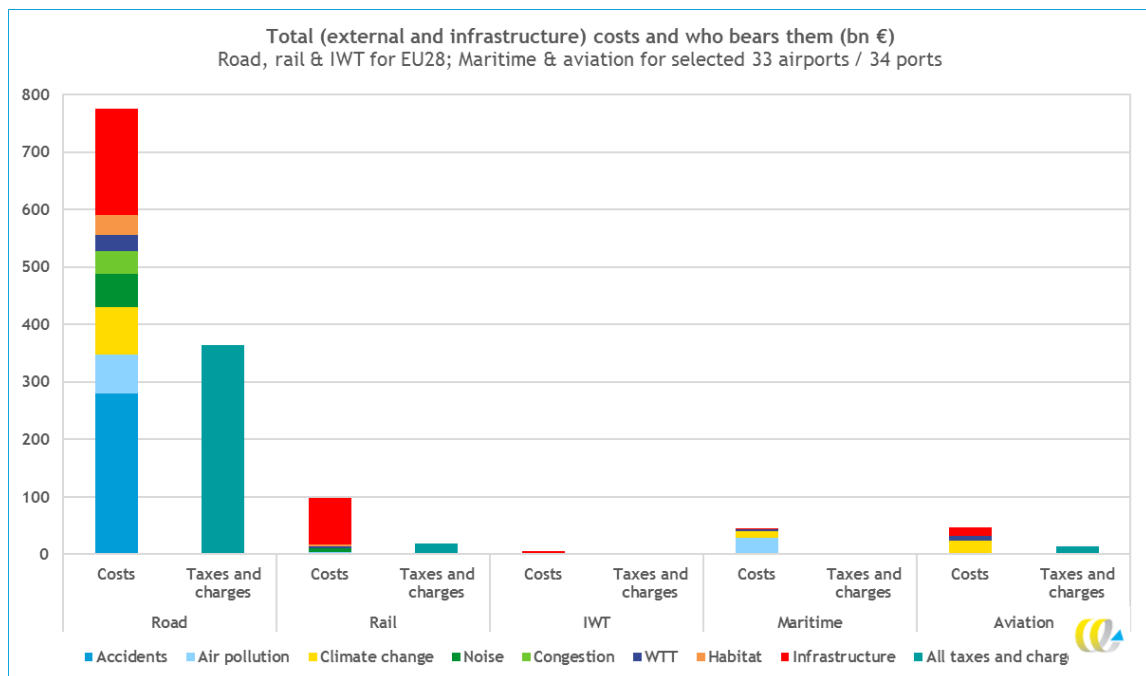
**Figure 3 - Average external costs per mode for EU28 in 2016**



<sup>6</sup> MC: Motorcycles; LCV: Light Commercial Vehicles; HGV: Heavy Goods Vehicles; IWT: Inland Waterway Transport

Comparing infrastructure and external costs with taxes and charges paid by transport users, Figure 4 shows that **users and polluters do not fully pay the total costs (external and infrastructure) that they are responsible for** and this is true for all transport modes. Road users pay for a bigger share of their **total costs** than rail users, but rail users pay for a bigger share of their **external costs**. The burden paid by aviation roughly covers the infrastructure costs, but only a small amount of the environmental costs. Waterborne transport users pay the smallest share of their total costs compared to users of other modes. That means that, for the time being, it is the “society pays” rather than the “user pays” and “polluter pays” principles that is implemented in the EU.

**Figure 4 - Comparison between total costs (external and infrastructure) and total taxes and charges<sup>7</sup>**

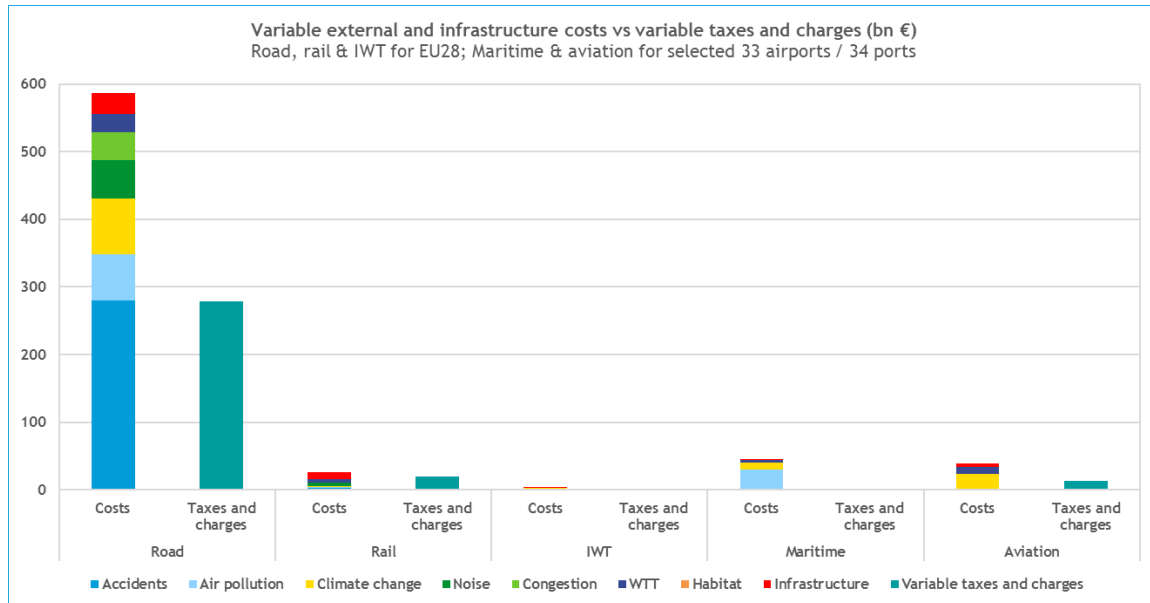


One of the main principles behind the internalisation of external costs is that the final price paid by users should be close to the so-called social marginal costs. The price for a transport service should then cover the *marginal* cost of externalities and the *marginal* infrastructure costs. Given that the marginal infrastructure costs are not affected by the relatively high fixed costs of rail infrastructure, Figure 5 shows a

<sup>7</sup> Figure 1 and 4 cannot be compared as different methodologies are used to calculate the congestion costs. The one used in Figure 1 (left-hand side) is more in line with the methodology to estimate the other external costs and is used to calculate the overall external cost of transport. The one used for Figure 4 is more relevant for comparison to taxes and charges and is roughly 6 times smaller than the former.

slightly different picture: users and polluters still do not fully pay the (marginal) costs that they are responsible for, but the rail users pay for a higher share than road users.

**Figure 5 - Comparison between variable costs (external and infrastructure) and variable taxes and charges**



The final study report will provide a large number of indicators to illustrate these points, as described in the following section. A breakdown by Member State will be available.

### **Next steps**

The outstanding building blocks of the study will look into exploiting the data collected analytically so as to establish (i) to what extent revenues from infrastructure charges cover expenditure on: a) maintenance, and b) maintenance and capital costs together?; (ii) who bears the costs (public sector, the general public, transport users) per mode and how the users of different modes compare in terms of compliance with the 'polluter pays' and 'user pays' principles?; (iii) what is the potential for further internalisation? and (iv) how internalisation measures are deployed in countries as part of a wider policy toolbox aimed at more sustainable transport (e.g. subsidies/incentives which complement road tolls)? This will also include cross-country and cross-mode comparisons based on taxation and incentives.

Notwithstanding the methodological challenges, the findings of this study, once completed, will be an important input for forthcoming debates on the future of EU transport policies.