

## CALCULATION OF EXTERNAL COSTS IN THE TRANSPORT SECTOR - A COMPARATIVE ANALYSIS OF RECENT STUDIES IN VIEW OF THE COMMISSION'S "GREENING TRANSPORT PACKAGE"

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**CLIENT:** *European Parliament, Directorate General for Internal Policies of the Union*

**YEAR:** 2008-2009

### DESCRIPTION OF ACTIVITIES

#### *Objectives of the project*

TRT Trasporti e Territorio was in charge of this study on behalf of the Directorate General for Internal Policies of the European Parliament, in order to provide the Members of the Committee on Transport and Tourism with useful background information related to external costs in the transport sector. This study was developed within the Framework contract awarded to TRT by the European Parliament in 2006.

The internalisation of external costs in the transport sector is one of the most important, challenging and controversial issue in the European Transport Policy.

The Eurovignette Directive currently in force (Directive 2006/38/EC) allows Member States to introduce road pricing scheme for heavy goods vehicles, but tolls and user charges have to reflect only infrastructure cost and not external costs. The current approach followed by the European Commission in road freight policy is to propose a strategy to consider the need of internalising external costs generated by road freight transport.

In fact, in the 2007 the European Commission has commissioned the IMPACT study (*Handbook on estimation of external costs in the transport sector*) aiming at reviewing and modelling the existing estimates of external costs in Europe to carry out an impact assessment of internalisation of external costs for all transport modes.

Moreover, during 2007 and 2008 the European Commission held a workshop with stakeholders to test the main assumption and orientation undertaken in the IMPACT study.

Finally, in 2008 the European Commission has launched the Greening Transport Package which consists of five parts contributing to the elaboration of a strategy which sets out how external costs can be internalised for all modes of transport. In particular, the European Commission intends to revise Directive 1999/62/EC (as modified by the Directive 2006/38/EC) on HGVs charging, in order to establish a common framework to calculate road tolls on the basis of both infrastructure costs and

the basis of both infrastructure costs and external costs.

Within this context, the purpose of this study was to develop a comparative analysis of the most recent and significant findings on transport-related external costs, by analysing in particular the IMPACT Handbook on estimation of external costs in the transport sector, and the Greening Transport Package issued by the European Commission.

#### *Methodology and project structure*

The study was divided into six chapters.

**Chapter 1 and 2** introduced the concept of externality in the transport sector and provided some background by addressing the definition of external costs and the main methodologies for their estimation. In this respect, the core question was determining how the external costs of transport may be quantified and transposed into monetary values.

**Chapter 3** compared the existing literature on external costs, by reviewing the main studies on this issue, and assessing their main findings according to the different types of surveyed externalities (accidents, noise, air pollution, climate change and congestion).

This chapter analysed each externality according to type of cost, methodology and key factors for calculation, estimates of principal studies considered. Overall, a high degree of convergence in the estimates was observed for accident, air pollution and congestion, whilst a medium convergence was identified for noise pollution. A low degree of convergence applied, instead, to climate change, mainly due to the particular nature of this externality and the lack of convergence in the current scientific debate.

**Chapter 4** illustrated and analysed the prepared by the IMPACT project on behalf of the Directorate for Transport of the European Commission.

The IMPACT Handbook may be considered as a valuable starting point for the analysis of the external costs because it successfully sets all relevant lit-

erature on them, such in a way that data became comparable, transferable and ready for policy use.

**Chapter 5** presented the European Commission's Communication on external costs within the Greening Transport Package, by analysing the adopted approach, and to what extent the Commission included the IMPACT's recommendations in its legislative proposals.

The European Commission intends to revise Directive 2006/38/EC on HGVs charging. The proposed revision of the Directive aims at modifying this scenario by extending the scope of the current legislation, namely by allowing Member States to charge road freight vehicles over 3.5 tons, both for recovering the infrastructure costs and also including those costs which are associated with congestion, noise and air pollution. The proposed revision also intends to introduce common charging principles, using a method which calculates chargeable costs and caps and the setting up monitoring tools which should avoid any discriminatory implementation of the charging scheme.

**Chapter 6** drew up the conclusions of the study and assessed the scientific soundness of the values adopted in the proposed directive, as well as their feasibility in policy implementation.

## Conclusions

The Greening Transport Package is almost in line with the recommendations of the IMPACT study, although some important discrepancies were highlighted in relation to the transport modes covered and the external costs considered.

Firstly, the Greening Transport Packages proposed immediate actions solely for road freight transport through the revision of the Directive 2006/38/EC.

Secondly, the Greening Transport Package proposed charging for only air pollution, noise and congestion, but excluded climate change and accidents, whereas the IMPACT study provided values for all categories of external costs.

Thirdly, *cap values* were introduced to standardise the results for the specific application of the formulae. Their application, which was not suggested by the IMPACT study, both simplifies and harmonises the pricing scheme, while avoiding overpricing.

Externality	Cost components	Key drivers
Accidents	Material damages Administrative costs Medical costs Production losses Risk value	<i>Road transport:</i> Type/characteristics/maintenance of vehicles; vehicle speed; traffic volume and speed; time of day; weather conditions; infrastructure layout, technology and maintenance. <i>Air transport:</i> Level of maintenance of aircraft, weather conditions and the education and training level of pilots. <i>Rail transport:</i> Type/characteristics/maintenance of rolling stock, level of infrastructure maintenance. As for air transport, for rail transport the education and training level of the train drivers is also crucial.
Air pollution	Human health costs Material damages costs Crop losses	Population and settlement density. Receptor density close to emission source. Sensitivity of area. Level of emissions, (according to the different transport modes).
Climate change	Prevention costs to reduce risk of climate change. Damage costs of increasing temperature.	Type of vehicle and its equipment. Speed. Driving style. Fuel consumption and the carbon content of fuel.
Congestion and scarcity	Congestion: time and operating costs.  Scarcity: delay costs and opportunity costs.	<i>Congestion:</i> type of infrastructure, traffic and capacity levels mainly depending on time of the day, location, accidents and type of infrastructure construction. <i>Scarcity:</i> type of infrastructure, traffic and capacity levels mainly depending on time of day, location.
Noise	Annoyance Medical costs	Time of day. Receptor density close to emission source. Existing noise levels.