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# **IMPACT (Internalisation Measures and Policies for All external Cost of Transport)**

Handbook on external costs

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# Outline

- Context
- IMPACT project
- Handbook
- Brief summary per cost category
- Next steps



## Context

- Environmental challenges and ambitious targets
- Research shows benefits of internalisation
- Implementation of market-based instruments in Member States
- EC: internalisation advocated but not fully allowed
- Revenues required for public provisions





# Background of IMPACT



- Eurovignette Directive:
  - Amendments to EC/1999/62
  - Offers more options for HGV pricing
  - Heavy debate on pricing external cost
- Solution: new study! => IMPACT
  - Deliverable 1 - Handbook on estimation of external costs in the transport sector
  - Two other deliverables (input to EC Impact assessment, not yet public)
  - Three workshops/conferences



We are not the first ones looking at these issues...

GRACE

PETS

High level groups

CAPRI

MC-ICAM

UIC study

UNITE

HEATCO

ECMT work

TRENEN

COMPETE

ExternE

REVENUE

IMPRINT

national studies

EEA work

CAFE



# Handbook on external costs

- Overview of best practice
- Coverage of all modes
- Focus on marginal costs
- No own computation, but comparison of studies/values and value transfer
- Input values in cost per specific unit
- Output values in general in Euro/vkm



# Three different type of costs

<b><i>Cost component</i></b>	<b><i>Social costs</i></b>	<b><i>External part</i></b>
<b>Costs of scarce infrastructure (congestion and scarcity)</b>	Time losses and decreased reliability  Opportunity costs of scarce slots	Costs of additional demand above a certain traffic volume imposed to other users
<b>Accident costs</b>	Material damages Health costs Production losses Suffer and grief	Costs which are not covered by insurance
<b>Environmental costs</b>	Environmental damages: air pollution, noise climate change, others	All remaining costs



# Congestion and Scarcity costs

- Best practice average figures based on UNITE / GRACE case studies
- Recommended approach based on speed-flow-curves, value of time and elasticities
- No real evidence for scarcity costs
- Typical values:
  - passenger cars: 0.10 - 0.75 €/vkm
  - HGV: 0.35 – 1.50 €/vkm





# Accident costs



- Different approaches
- Value of statist. life: UNITE/GRACE (1.5 M€)
- Road: diff. value UNITE case study
- Rail & aviation: average costs
- Value transfer with accident rates and GDP/cap.
- Typical values:
  - Passenger cars: 0.3 – 4 €ct/vkm
  - HGV: 0.3 – 10 €ct/vkm



# Air pollution costs



- Impact-pathway approach
- ExternE/HEATCO as a baseline for PM2.5 (most differentiated)
- CAFE CBA as the baseline for the valuation of NO<sub>x</sub>, SO<sub>2</sub> and VOC
- Typical values:
  - Passenger cars: 0.1 – 14 €ct/vkm
  - HGV: 1 – 38 €ct/vkm



# Air pollution costs: Unit values

<b>PM2.5</b> (€/tonne) HEATCO values	<b>29,200 – 671,500 (metropolitan)</b> <b>9'400 – 216'000 (urban)</b> <b>7'500 – 96'000 (outside built-up areas)</b>
<b>NOx</b> (€/tonne) CAFE CBA values	<b>700 – 9'600 (median VOLY)</b>
<b>NMVOG</b> (€/tonne) CAFE CBA values	<b>200 – 2'700 (median VOLY)</b>
<b>SO2</b> (€/tonne) CAFE CBA values	<b>1'000 – 13'000 (median VOLY)</b>

Translated to Euro per vkm with  
Tremove emission data



# Noise costs

- Different approaches possible, but the baseline is *marginal cost*
- Model values from INFRAS/IWW study as best practice (differentiation, transparency, generalisation)
- Values are within the range of UNITE
- Typical values:
  - Passenger cars: 0.01 – 0.8 €ct/vkm
  - HGV: 0.1 – 7 €ct/vkm





# Climate change costs



- Avoidance and damage costs: recent studies show higher values
- Both increase over time
- Avoidance costs higher in the transport sector (up to 200€/t CO<sub>2</sub>)
- Translated to Euro per vkm with Tremove emission data

Year of application	Central values (€/tonne CO <sub>2</sub> )		
	Lower value	Central value	Upper value
2010	7	25	45
2030	25	55	100
2050	40	85	200



## Other external effects

- Nature and landscape
- Soil and water pollution
- Urban effects: Cost for non-motorised transport: Waiting time
- Up- and Downstream effects: emissions from energy production
- Additional costs in sensitive areas based on GRACE factors



# External cost levels vary a lot

Noisy & dirty vehicle  
high-risk driver  
congested  
urban area



*versus*

Low-emission vehicle  
low-risk driving style  
quiet rural area





## Conclusion / Next steps

- Scientists have done their job
- 10 June 2008:
  - Commission Communication on internalisation for all modes
  - Legislative proposal for amendment to Eurovignette Directive
  - EC impact assessment

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