



# Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities

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## Overview of the Study

- **Objective:**

*To assess the extent to which the 'user pays' and the 'polluter pays' principles are implemented*

- **Time frame:** September 2017 – May 2019

- **Project team:** CE Delft, Ricardo, Infras, TRT, Planco, ISL, PMR

## Scope of the study

- **Transport modes:**
  - Road, rail, inland waterway (entire network)
  - Aviation, maritime (selected (air)ports)
- **Geographical scope:**
  - EU28/27 and all Member States
  - Selected countries (Norway, Switzerland, Japan, USA (California and Missouri), Canada (Alberta and British Columbia))
- **Base year: 2016**

## Deliverables



### Close to finalised:

- Handbook on the external costs of transport
- Overview of transport infrastructure expenditures and costs
- Transport taxes and charges in Europe

### Work in progress:

- The state of play of internalisation in the European transport sector  
*(comparison of costs with taxes & charges)*
- Summary report providing an overview of the main findings of the other four deliverables, policy applications and the potential for further internalisation of transport externalities

# Handbook on external costs of transport

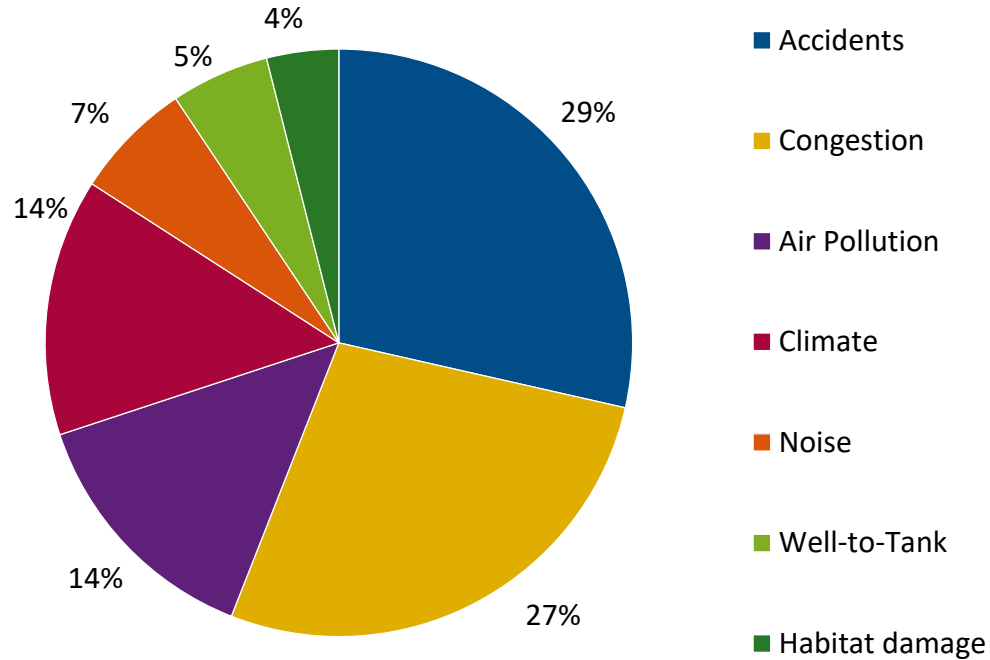
- Methodology and data for each cost category:
  - Based on latest available literature
  - Peer reviewed by external experts
  - Up-to-date input values (unit costs) and output values (cost per km)
- Previous Handbooks focused on *marginal* costs
- This Handbook *also* focuses on *total* and *average* costs
  
- Cost categories:
  - Accidents
  - Air pollution
  - Climate
  - Noise
  - Congestion
  - Well-to-tank
  - Habitat damage
  - Other



# Shares of external cost categories in total cost EU28

Including estimate for aviation and maritime

Including road congestion: total delay costs

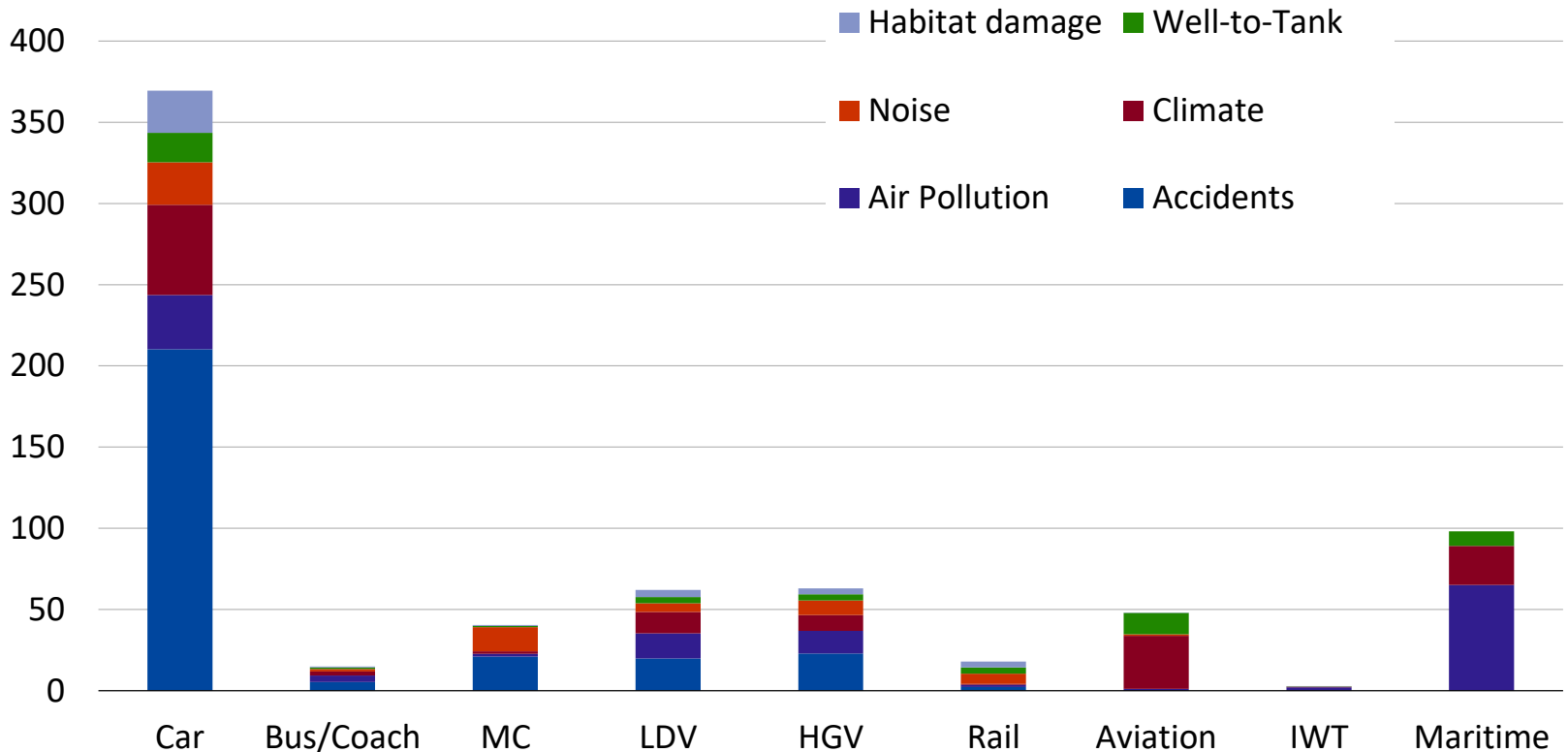


## Total external costs transport for the EU28 in 2016

- Total external costs in EU28 for **road, rail and IWT**:
    - **€ 571 billion**, excl. road congestion
    - + € 270 billion (total delay costs) = **€ 841 billion** incl. road congestion
  - **Aviation** (50% allocated to origin; 50% to destination):
    - **€ 33 billion** for all traffic to/from selected 33 EU airports
    - *Indicative estimate*: **€ 48 billion** for all traffic to/from all EU airports
  - **Maritime shipping** (50% allocated to origin; 50% to destination):
    - **€ 44 billion** for all traffic to/from selected 34 EU ports
    - *Indicative estimate*: **€ 98 billion** for all traffic to/from all EU ports
  - *Indicative estimate* all external cost **all modes** EU28: **€ 987 billion** (6.6% of GDP)
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# Total external costs per transport mode for EU28 in 2016

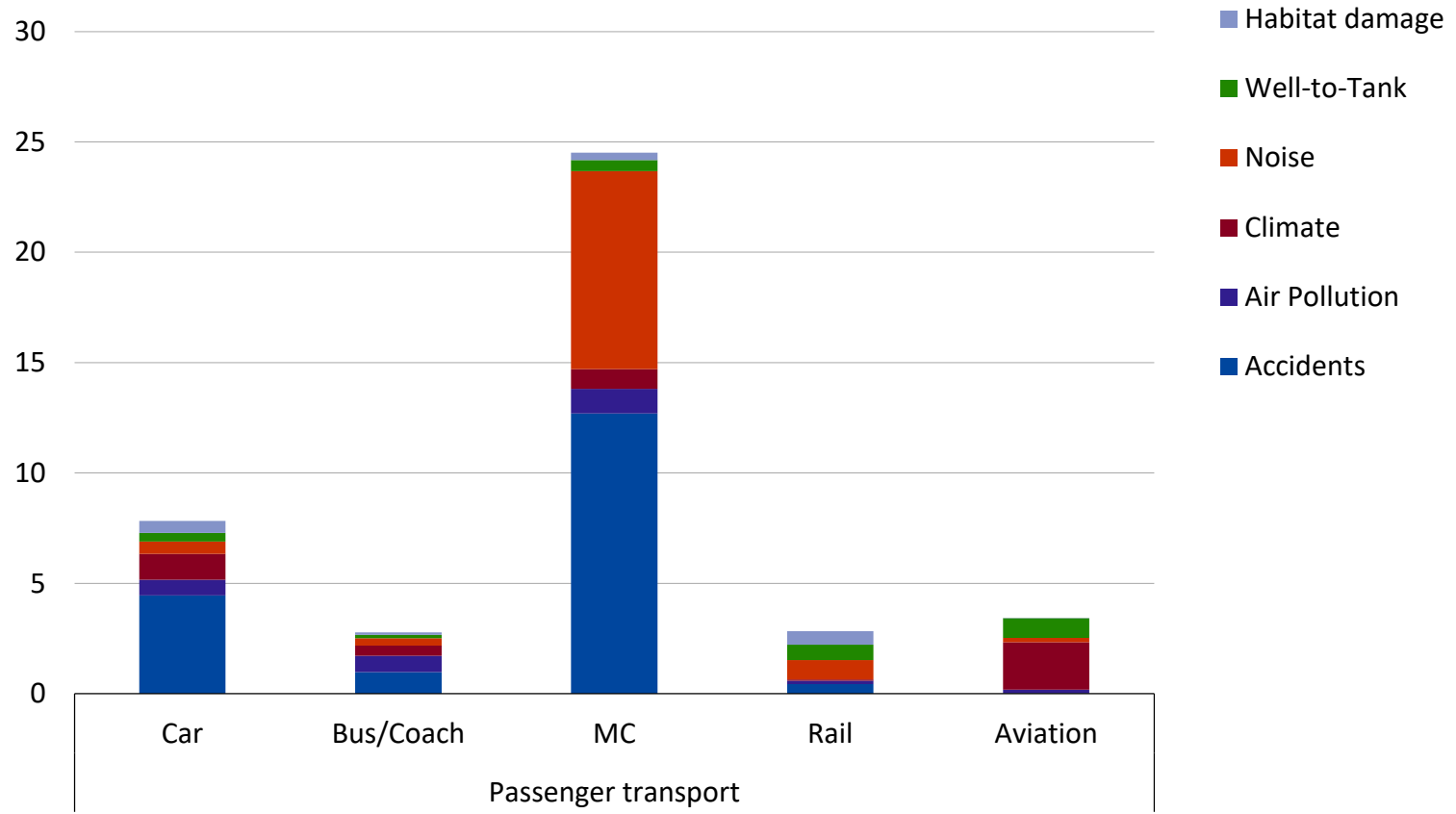
Billion € per year





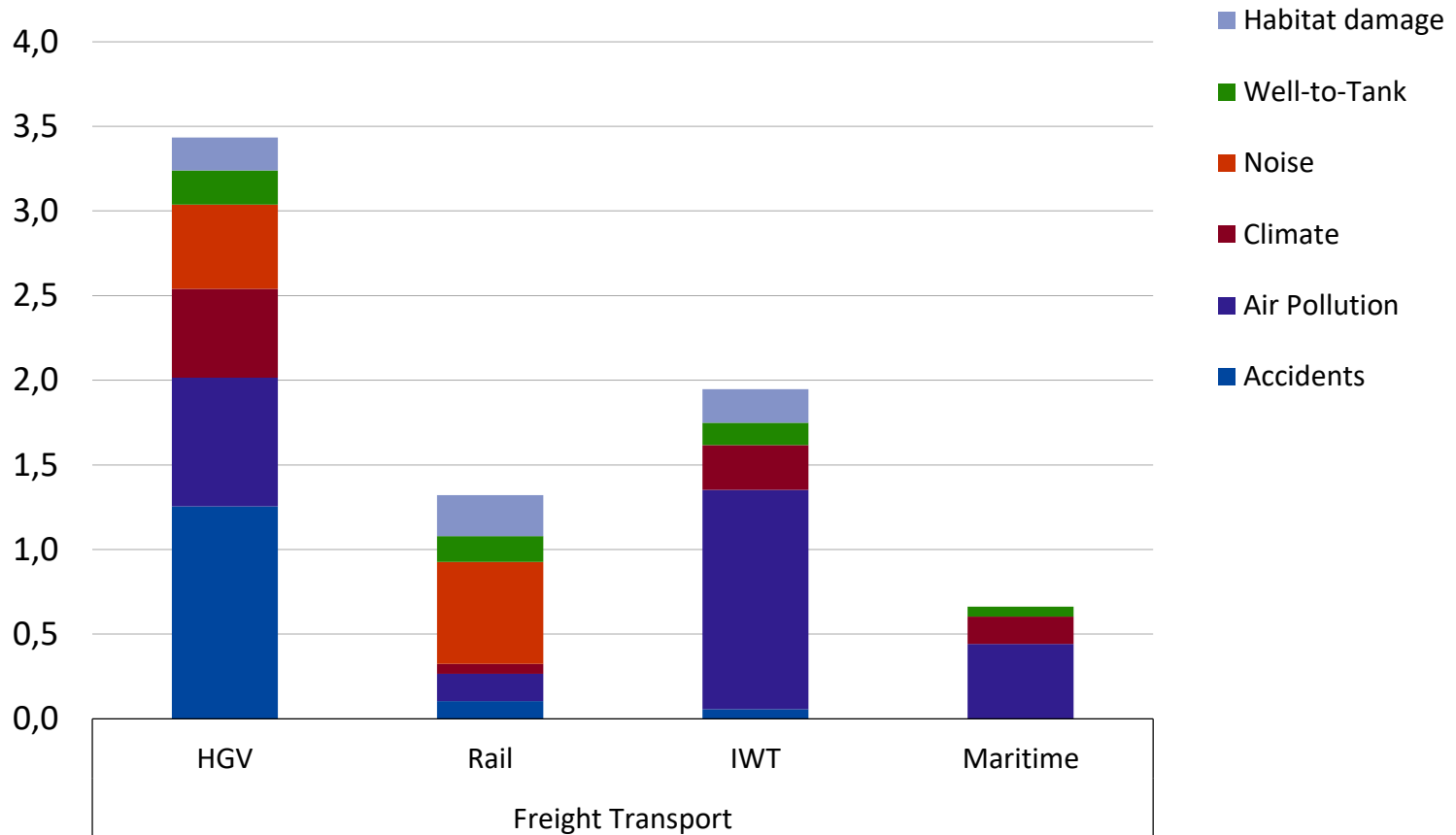
# Average external costs per mode at EU28 level - Passenger

€-ct/pkm



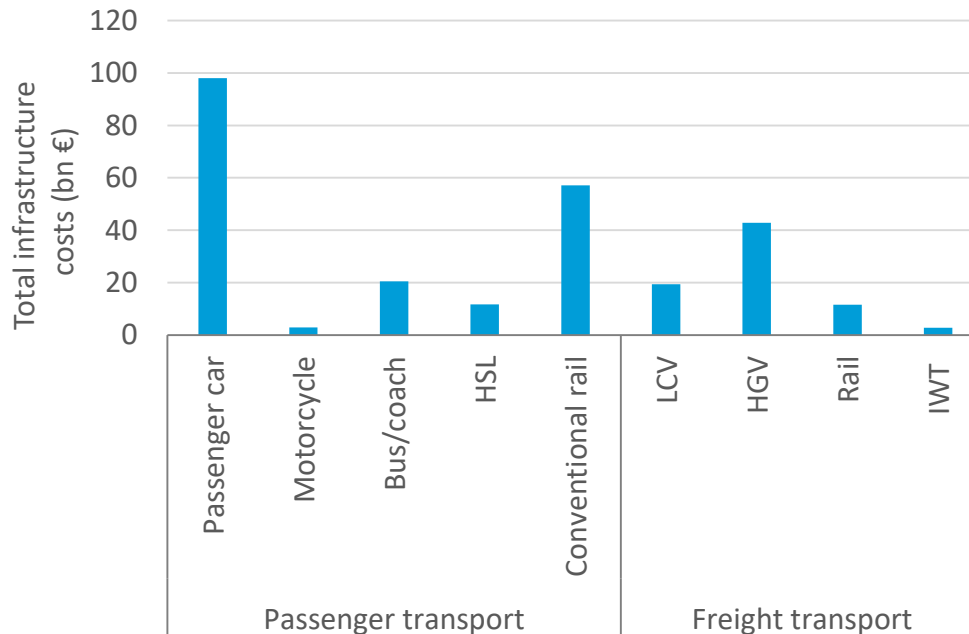
# Average external costs per mode at EU28 level - Freight

€-ct/tkm



## Infrastructure costs

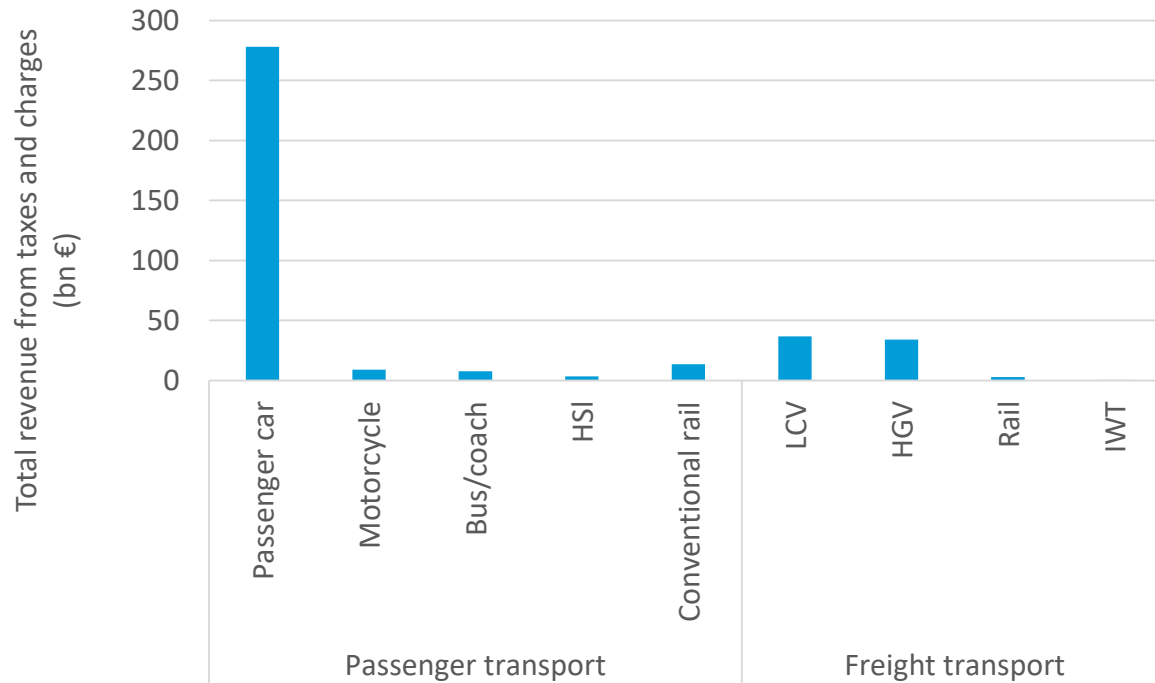
- Detailed data gathering on expenditures for all modes and all Member States
- Translated to costs (capital costs and running costs)
- Total infrastructure costs for road, rail and IWT in 2016 amount 267 billion €



- Total infrastructure costs for 33 airports: 14 billion €; for 34 ports: 1.4 billion €

## Taxes and charges EU28

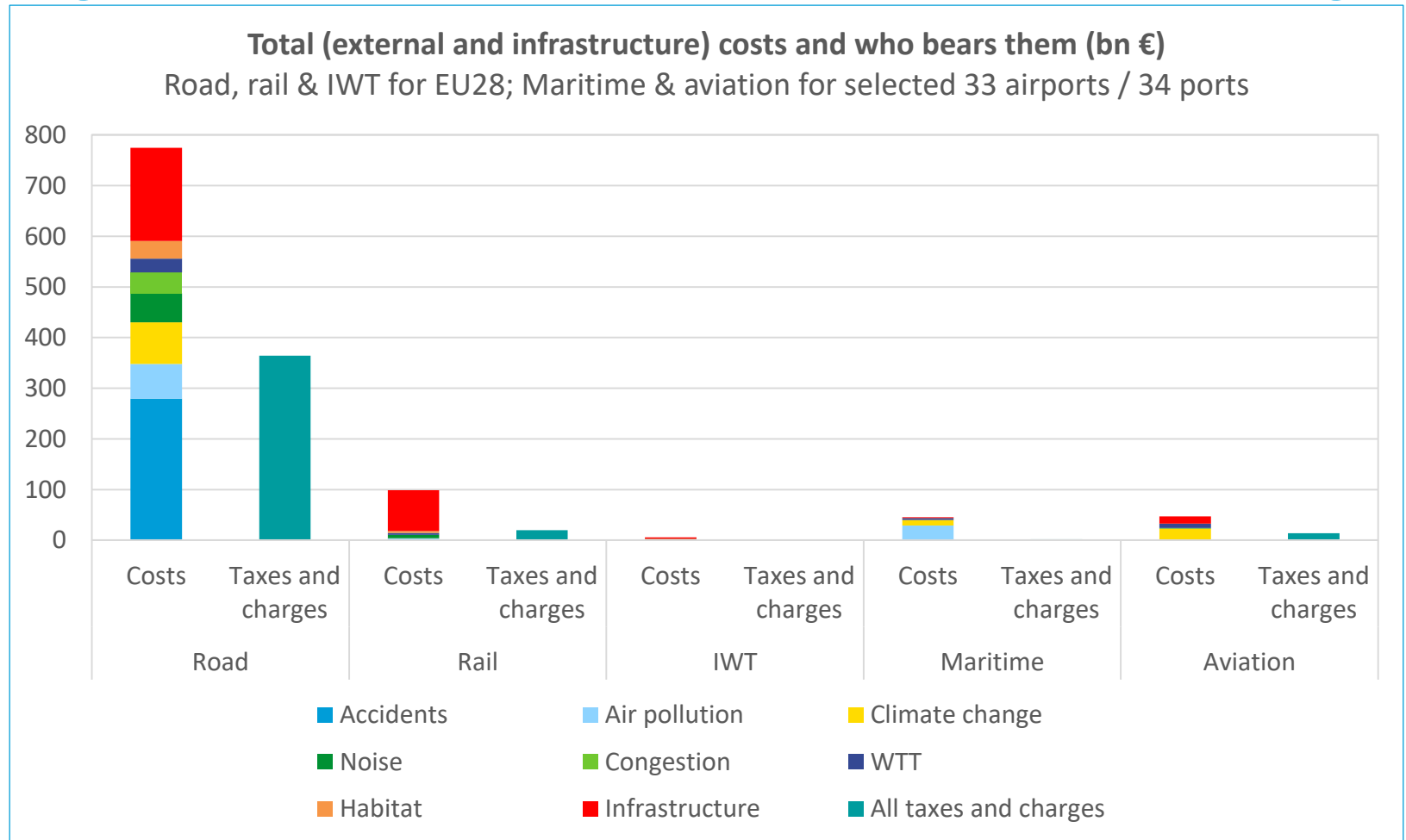
- Detailed data gathering for all modes and all Member States
- Taxes and charges on energy, vehicles, infrastructure use, insurance, other
- Total revenues for road, rail and IWT in 2016 amount 385 billion €



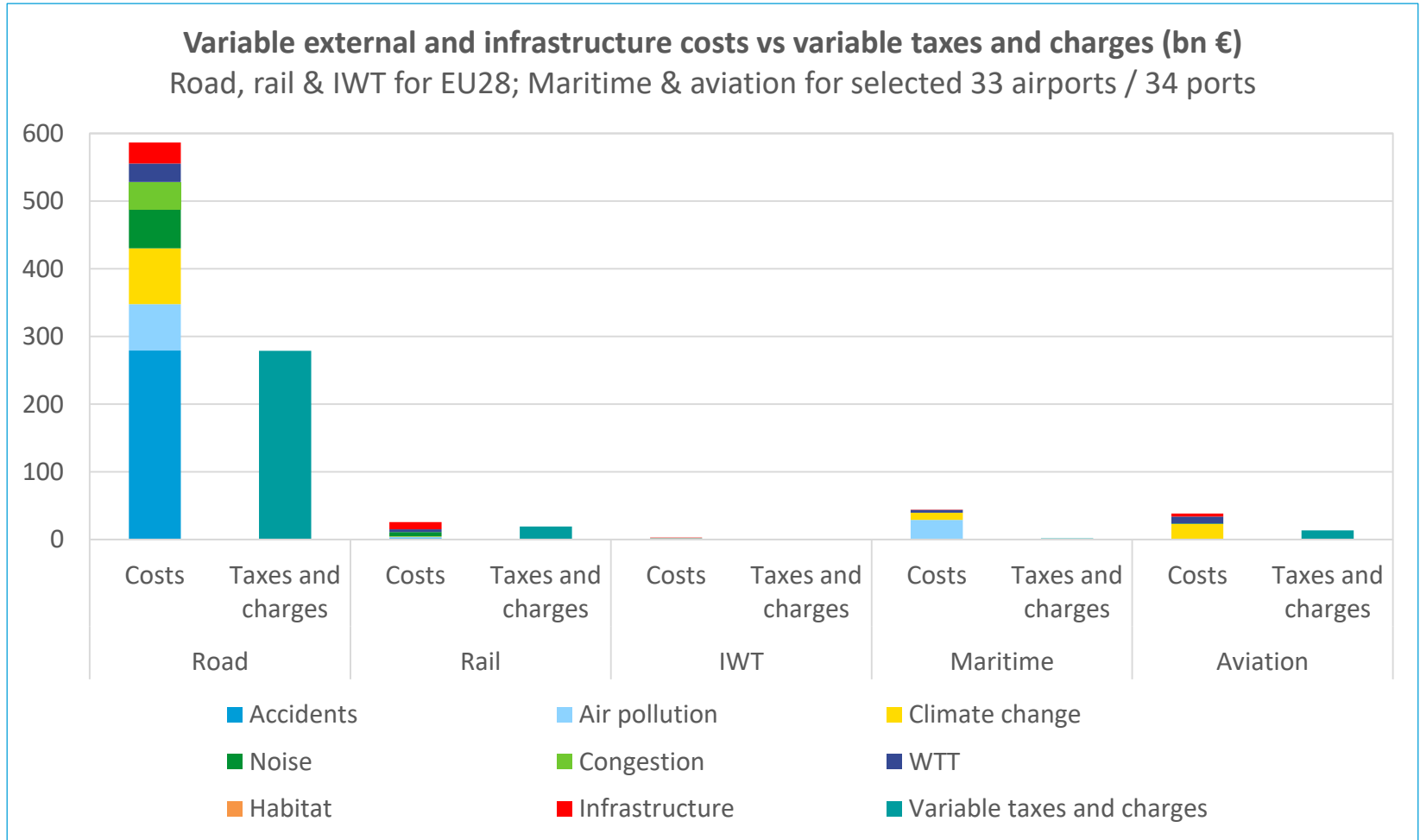
12 Total revenues for 33 airports: 13.5 billion €; for 34 ports: 1.8 billion €



# Degree of internalisation for EU28 – total cost, taxes, charges



# Degree of internalisation EU28 – variable cost, taxes, charges

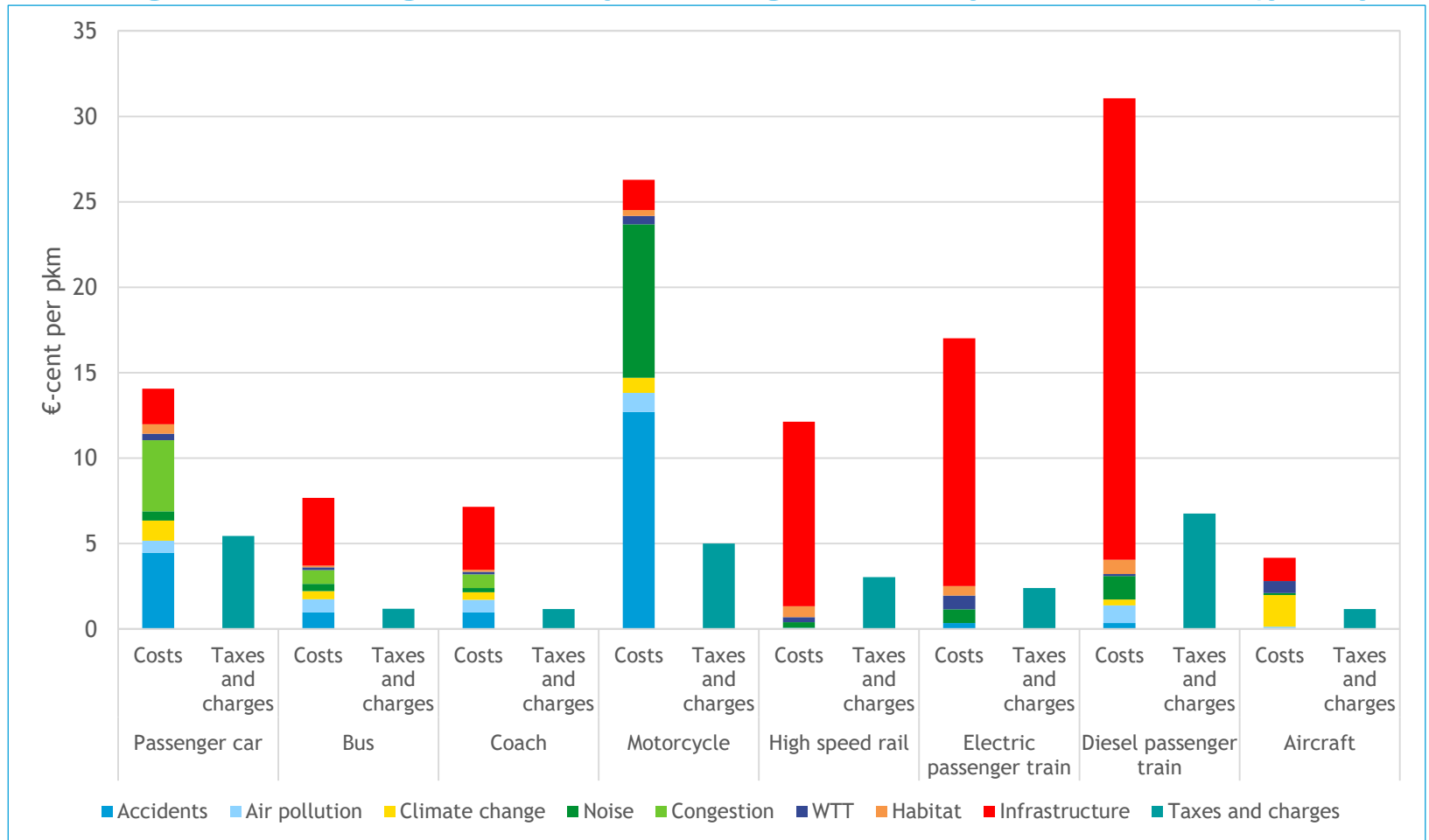


## Comparing transport modes on degree of internalisation

- For passenger transport: cost per passenger-km (pkm)
- For freight transport: cost per tonne-km (tkm)
- Relative costs also affected by type of load (e.g. heavy bulk has much lower cost per tkm than containers)
- Transport modes compete in specific markets

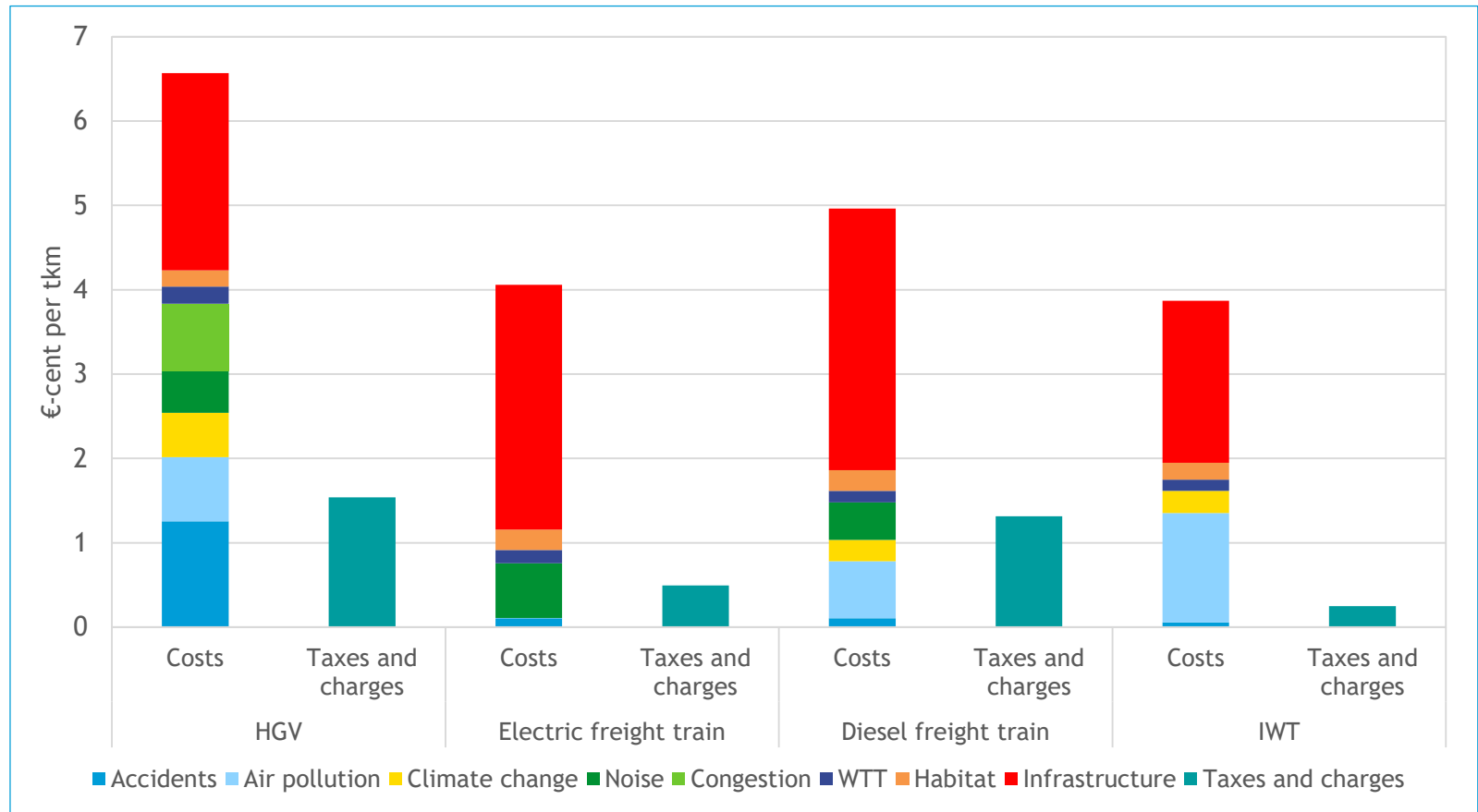


# Coverage of average cost - passenger transport modes (per pkm)





## Coverage of average cost - freight transport modes (per tkm)



- Light commercial vehicles: cost 22.0 €-ct/vkm; taxes & charges 6.8 €-ct/vkm

## Robustness and limitations

- External costs:
  - Methodologies are very mature but continuously evolving
  - Data limitations in some countries and for some cost; assumptions needed
  - Just impacts included that are fully proven
- Infrastructure costs
  - Extensive data search in all countries
  - Still many data gaps which have been filled by extrapolation
  - Some cost data is very sensitive, particularly for (air)ports
- Transport data:
  - Data limitations for some modes and vehicle categories: motorcycles, light commercial vehicles, aviation, and particularly maritime shipping



# Thank you for your attention!

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