

Transport and Environment

Effects, loads, interactions

Survey I.

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On the course:

- Transport and Environment – relations, interactions, conflicts,
- Means, approaches, on sectoral levels, conflict and impact management,
- Presentations, internal, and external consultations, students' abstracts,
- Individual themes, literature surveys, semester paper.

Chairman of Board, Hungarian Traffic Club



European Federation of Transport and Environment

- Transport & Environment's mission is to promote, at EU and global level, a transport policy based on the principles of sustainable development. Transport policy should minimise harmful impacts on the environment and health, maximise efficiency of resources, including energy and land, and guarantee safety and sufficient access for all.
 - Potential for greatest environmental benefits, transport pricing, standards for cleaner vehicles, greening investments,
 - EU policy changes, fuel efficiency, sustainable biofuels, lorries' charges and design,
 - Publications, newsletters, press releases, network,

European Federation of Transport and Environment

Current subjects and news:

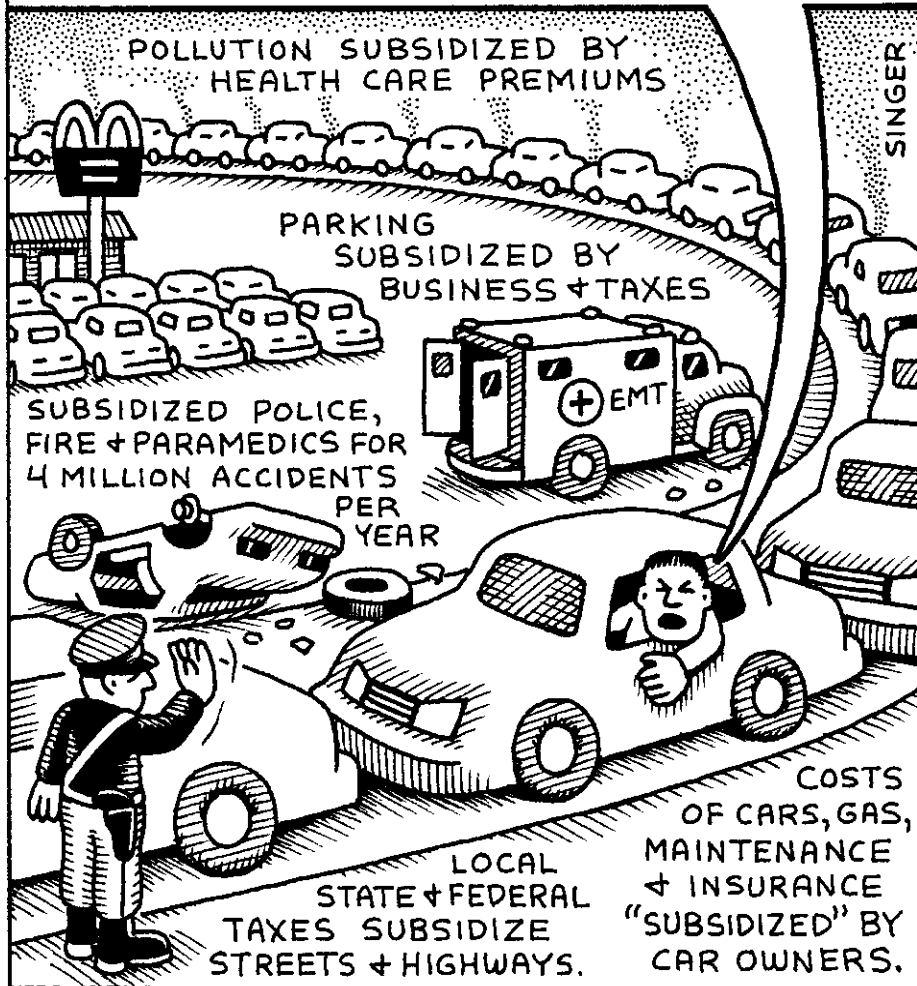
- Palm oil and soy oil for biofuels linked to **high rates of deforestation** - new study,
- **Car CO2 targets** cleared by environment committee,
- **UK air pollution plan** rehashes failed strategy for transport,
- Domestic **aviation fuel tax** in the EU,
- **Planting the forest** at the root of the EU-Indonesia trade relationship.

Transport-Environment - a survey

NO EXIT

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PUBLIC TRANSIT WASTES MONEY. IT ALWAYS HAS TO BE SUBSIDIZED!



NO EXIT

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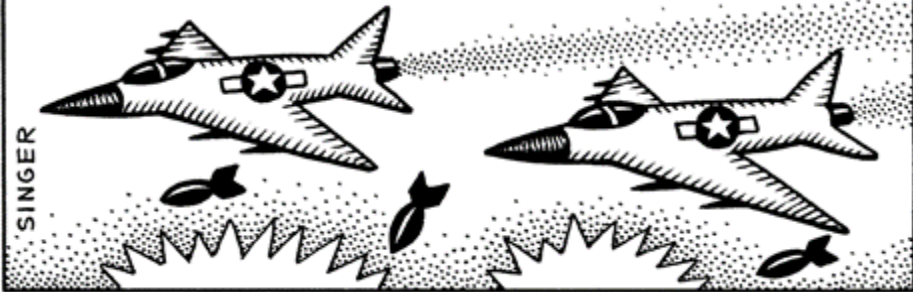
TRANSPORTATION POLICY...



BEGETS ENERGY POLICY...



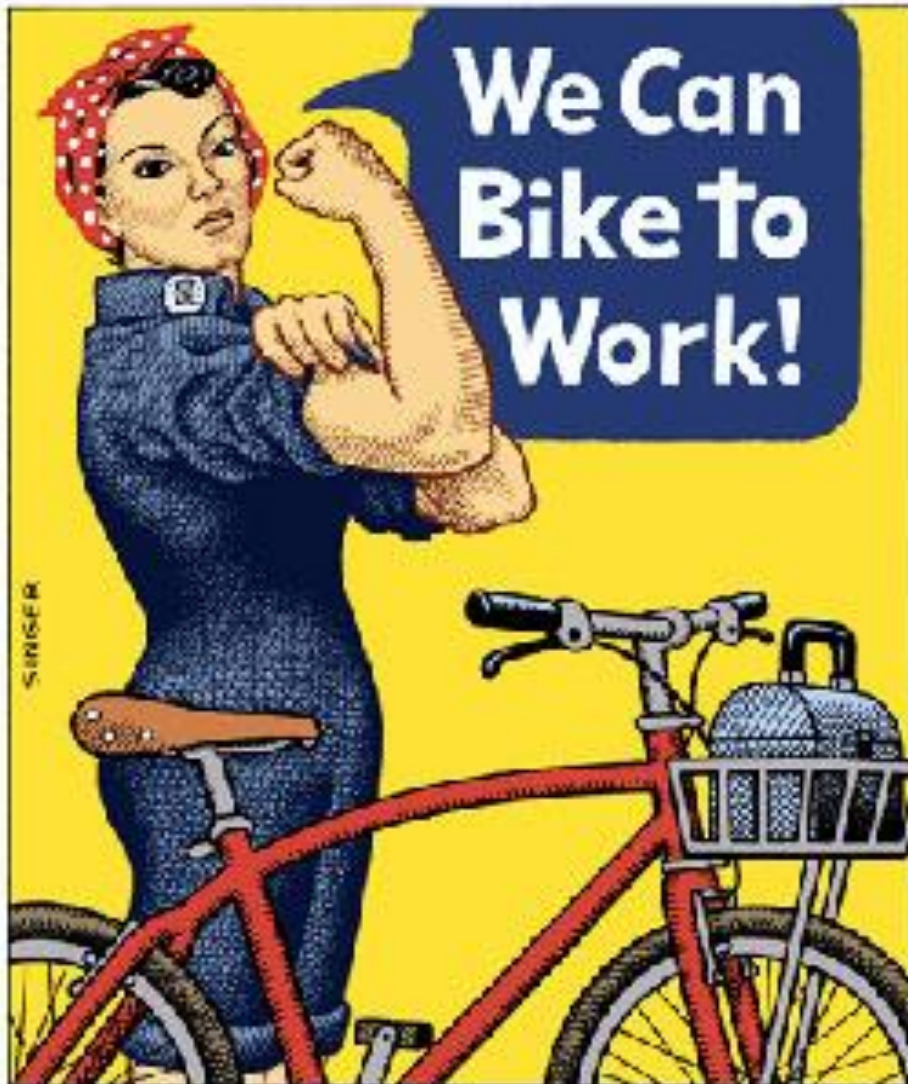
BEGETS FOREIGN POLICY...



Transport-Environment - a survey

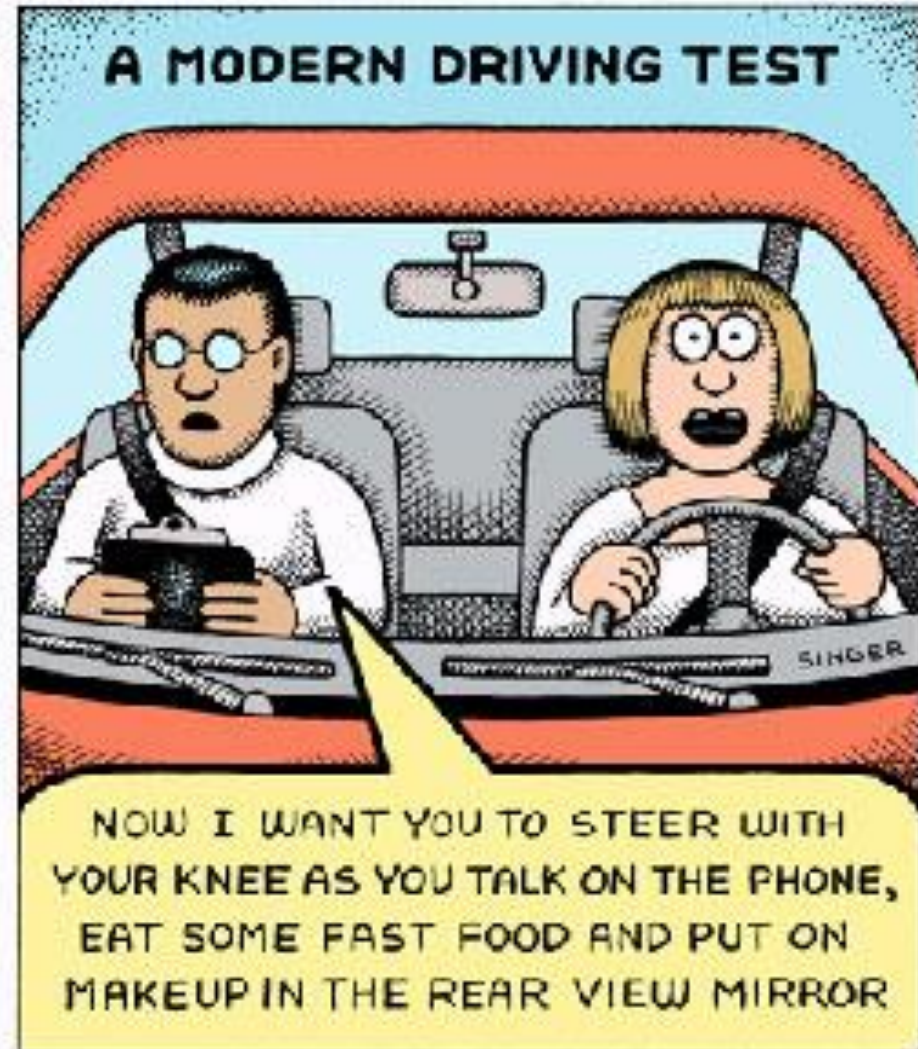
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+ value and paradigm issues

Vicious Circle

DRIVE TO WORK



WORK TO DRIVE

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with actualities...



Environmental effects Survey

- Social and economic benefits of transport prevail on a **very high price**,
 - Strong **public funds**, expenditure loads, demands: construction and maintenance of transport infrastructure, + transport accidents, air pollution, noise load, use of natural resources, → **additional social costs, externalities**,
 - The **main environmental load** on the single market: **transport sector** – on EU level -
- Transport oriented **carbon - dioxide emission** is important factor of greenhouse effect, 80% role of road transport within transport sector.

Environmental effects Survey

- Transport's contribution to the relevant **NO_x emissions** by 60%.
- **Soil and water contamination** by hydrocarbons, and hazardous chemicals by „normal” and accident emissions, emergencies.
- Increasing **land use** by **transport infrastructure** development, endangering the natural ecosystems, by **corridor and split effects**, and degradation on built environment and landscape.

Environmental effects

On local level

- **Transport accidents**, annually 1.200.000 mortal road accidents worldwide, while in Europe it went below 30.000,
- Based on the present **transport growth tendencies**, the NO_x and CH emission will increase again and will reach until 2030, the level of 2000,
- Growing tendencies of **urban transport emission**, where the rates of CO, NO_x , O_3 , CH, and PM will reach 90-95% in urban areas, with clear **public health effects**,
- Definite contribution of transport in **local noise load**, and the intensity of infrastructure has harmful effects on the local ecosystems, landscape values – 65dB equivalent 24 hours – increased in the EU from 15% to 25% of population.

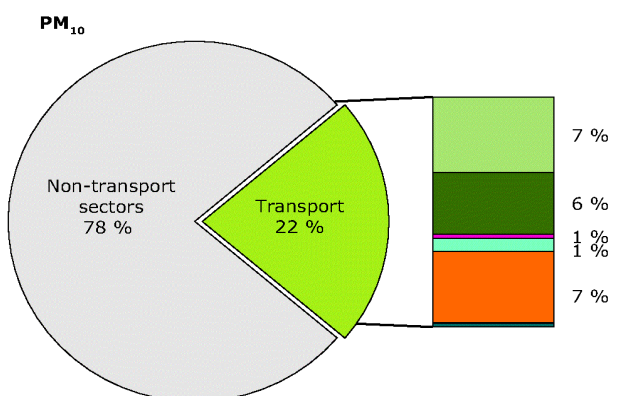
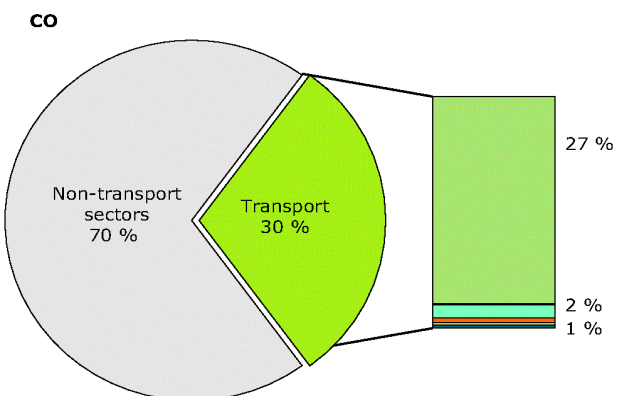
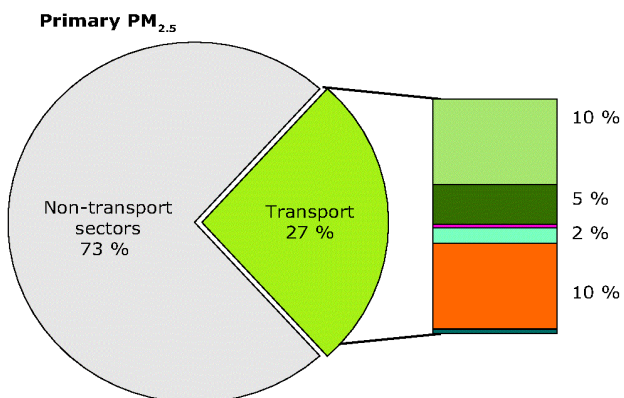
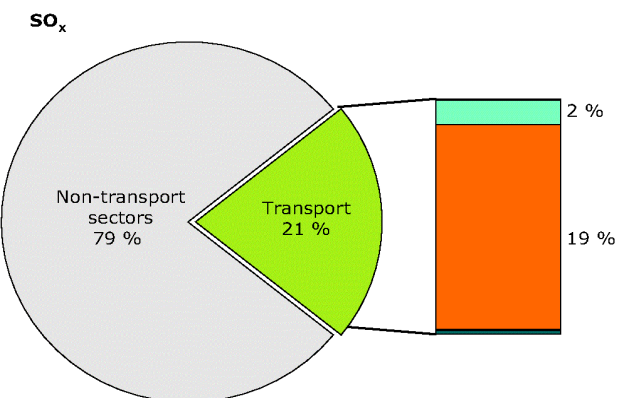
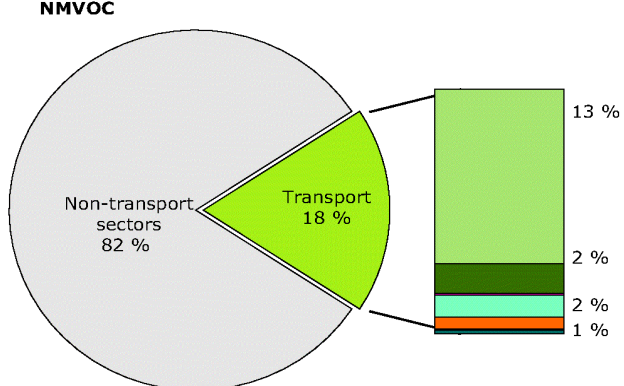
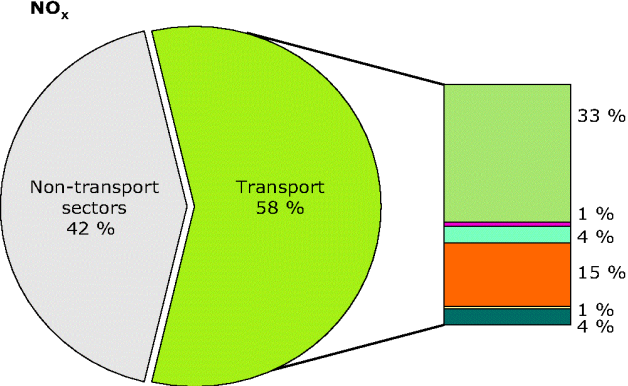
Key facts to road safety

- More than **1.25 million people die** each year as a result of road traffic crashes.
- Road traffic injuries are the leading cause of death among people aged between **15 and 29 years**.
- **90%** of the world's fatalities on the roads occur in **low- and middle-income countries**, even though these countries have approximately **54%** of the world's vehicles.
- Nearly half of those dying on the world's roads are “**vulnerable road users**”: pedestrians, cyclists, and motorcyclists.
- Road traffic crashes cost most countries **3% of their gross domestic product**.
- Without sustained action, road traffic crashes are predicted to become the **seventh leading cause** of death by 2030.
- The newly adopted 2030 Agenda for Sustainable Development has set an ambitious target of **halving the global number** of deaths and injuries from road traffic crashes by 2020.

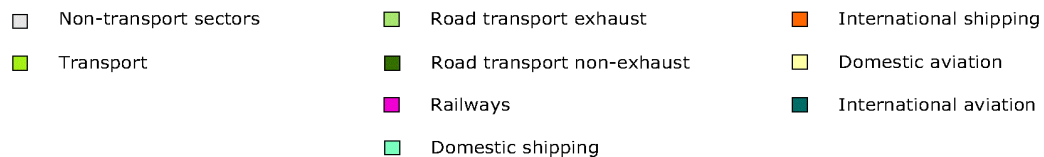
Environmental effects

on regional level:

- Threats of **biological diversity**, and natural habitats - by acidification and deposition of pollutants.
- Road transport development as main risk factor for forests, sensitive nature areas, and regions with cultural values. **Opening up effects**, residential use, access to natural resources, by **crossing** of natural areas, where the minimization of intervention is an important task.
- Regional factors are also, the most **emission gases**, nitrogen-oxides, VOC's endangering the natural and agricultural ecosystems.



Transport share in main emissions - EU 32 - EEA



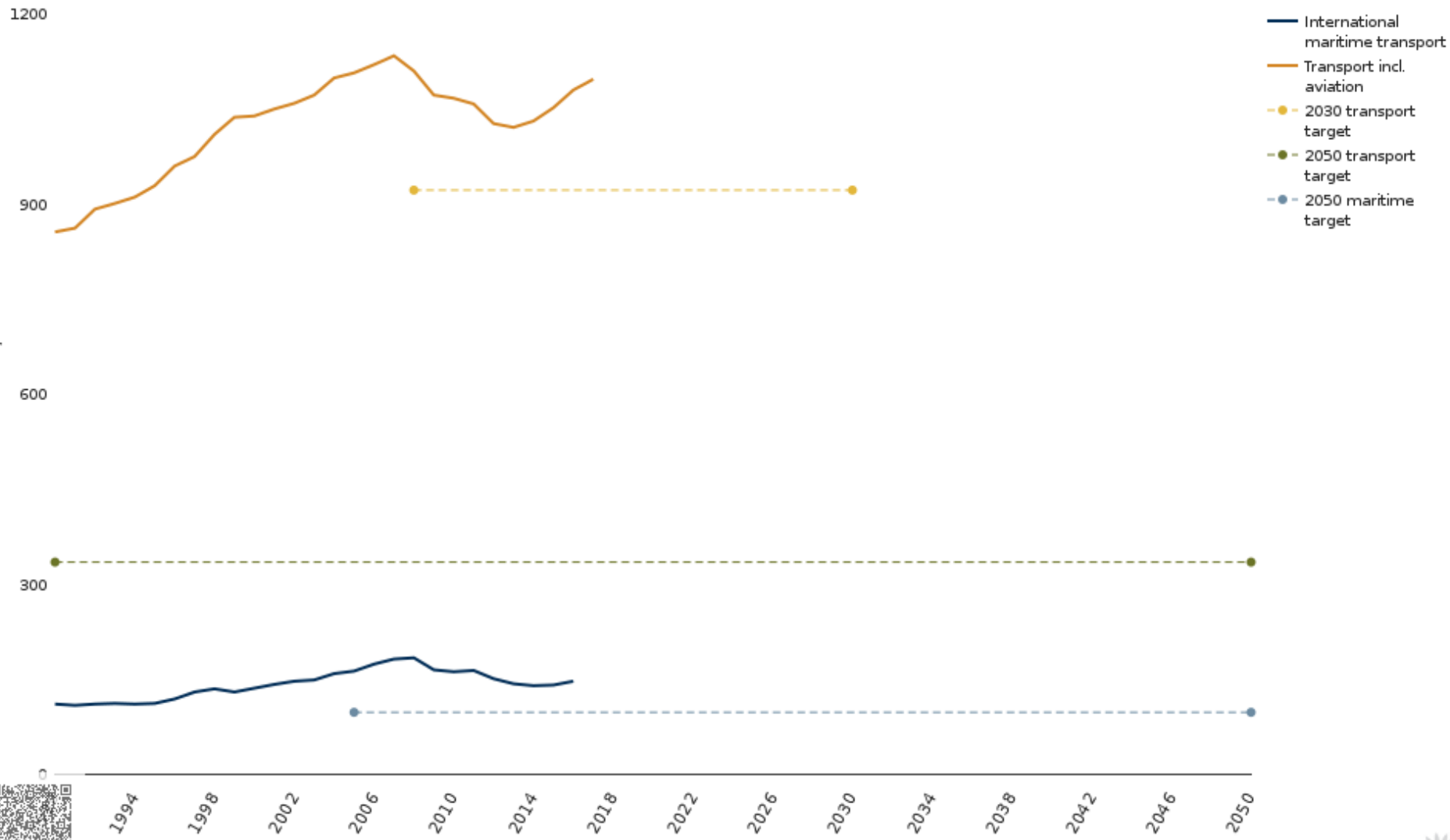
On global level

- 20-24 % transport related CO₂ emission,
- Increasing CO₂ and GHG emission, worldwide, despite of improving energy efficiency of vehicles,
- NO_x's greenhouse effect, with 60% transport background,
- Trends of globalisation, with increasing risks of developing countries, GHG, CH, and other emissions, becoming the biggest emitter.

On global level

- In 2016, the transport sector **contributed 27 %** of total EU-28 greenhouse gas emissions.
- **Emissions from transport** in 2016 were 26 % above 1990 levels despite a decline between 2008 and 2013. Emissions increased by almost 3 % compared with 2015. **International aviation** experienced the largest percentage increase in greenhouse gas emissions over 1990 levels (+114 %), followed by international shipping (+33 %) and road transport (+22 %). EEA estimates show that emissions from transport (including aviation) further increased by 1.5 % annually.
- Emissions **need to fall by around two thirds** by 2050, compared with 1990 levels, in order to meet the long-term 60 % greenhouse gas emission reduction target as set out in the 2011 **Transport White Paper**.

Greenhouse gas emissions – Greenhouse gas emissions from transport



Road Transport - Environment

- Transport's 30% share in global energy use
- Out of this 80% road vehicle fuel ⇓
- Freight transport 10-12%
- Emissions: HGV < 10% among vehicles, but 30-40% of emission (NO_x, PM_{10, 2,5})
- Noise, 20% of population directly exposed
- **External costs: » 5% GDP**

Transport intensity (freight)

EEA-33 — Inland freight transport volumes and GDP



Transport intensity (passenger)

EEA-33 — Trends in passenger transport demand and gross domestic product



Transport energy use in the EU

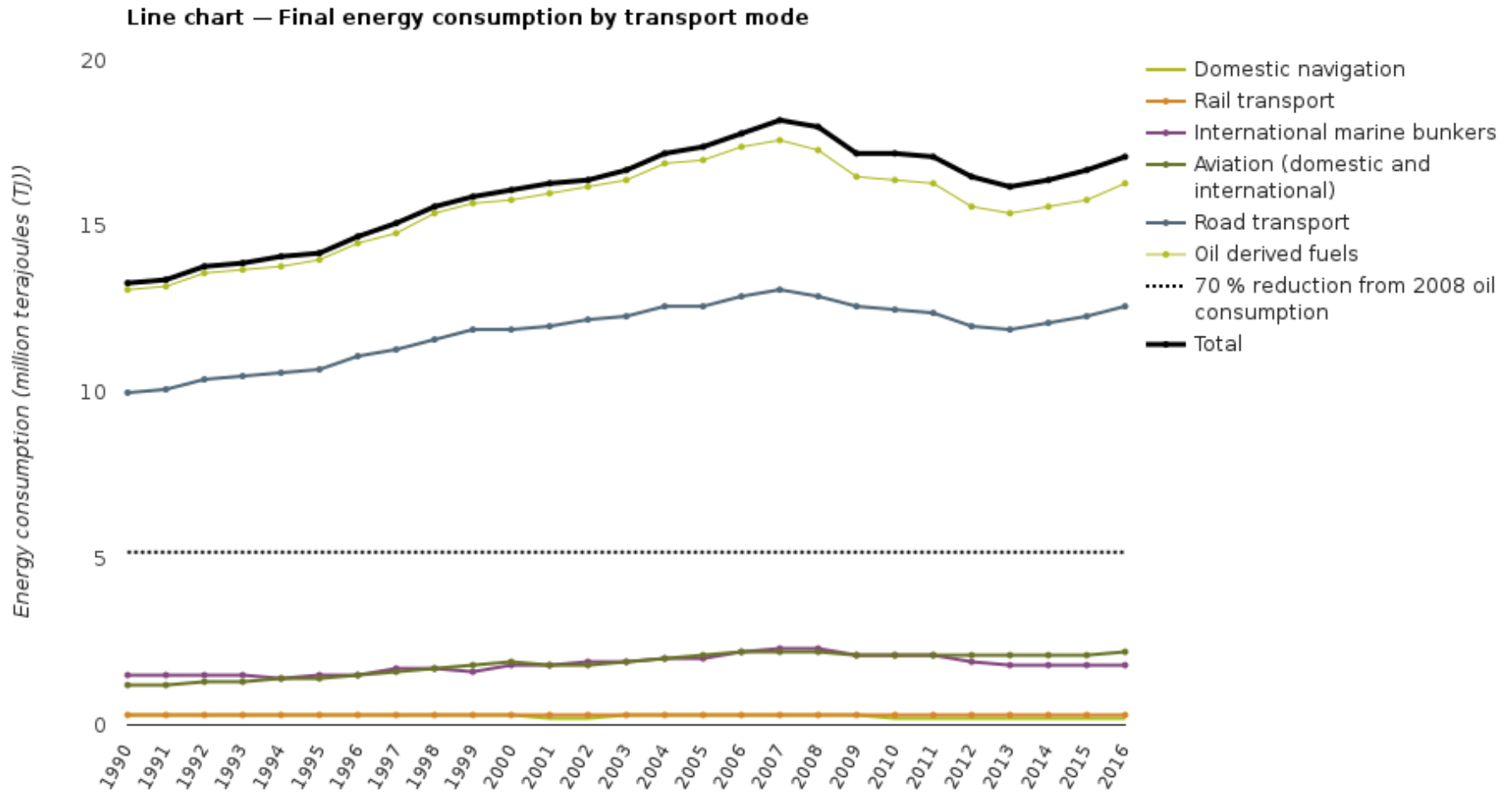
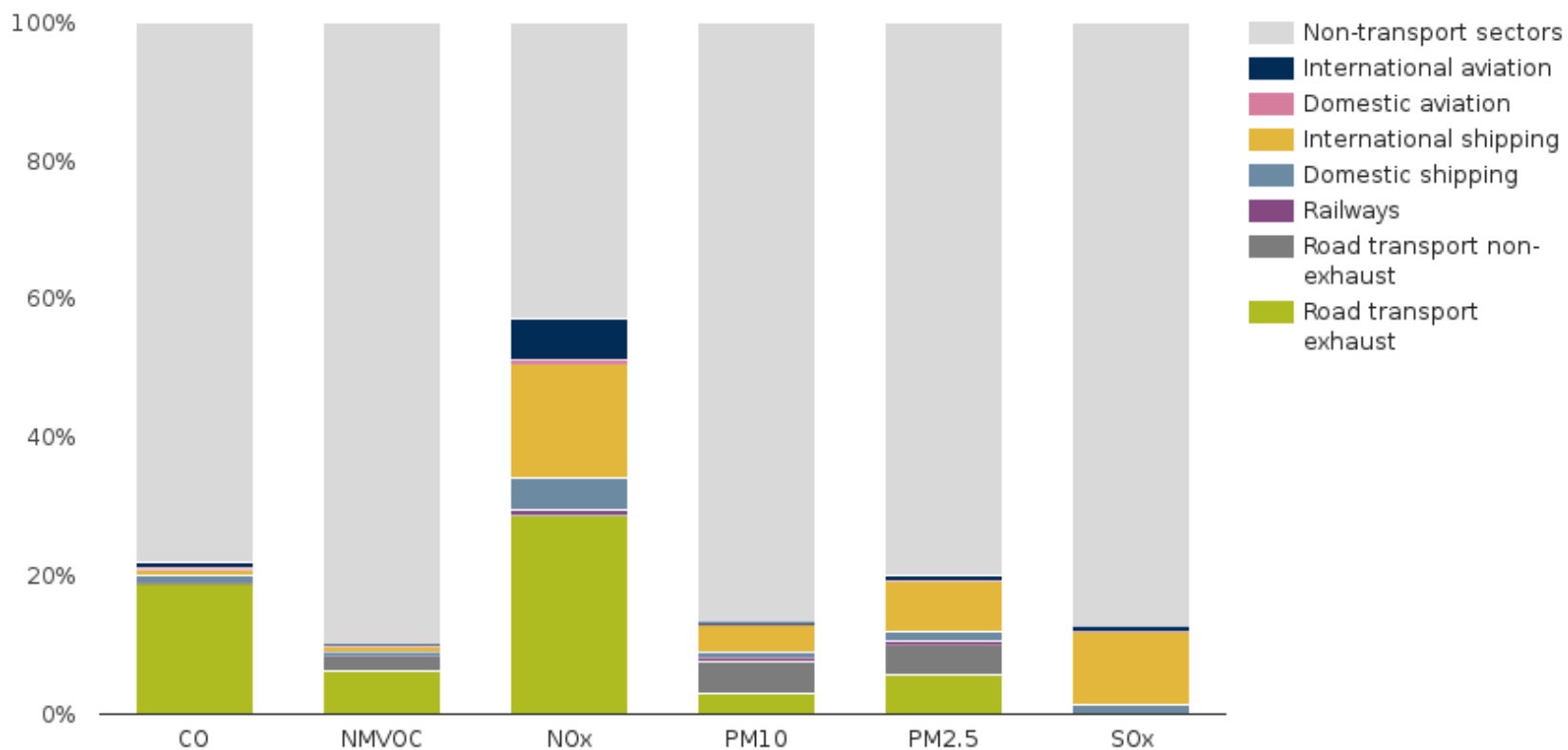
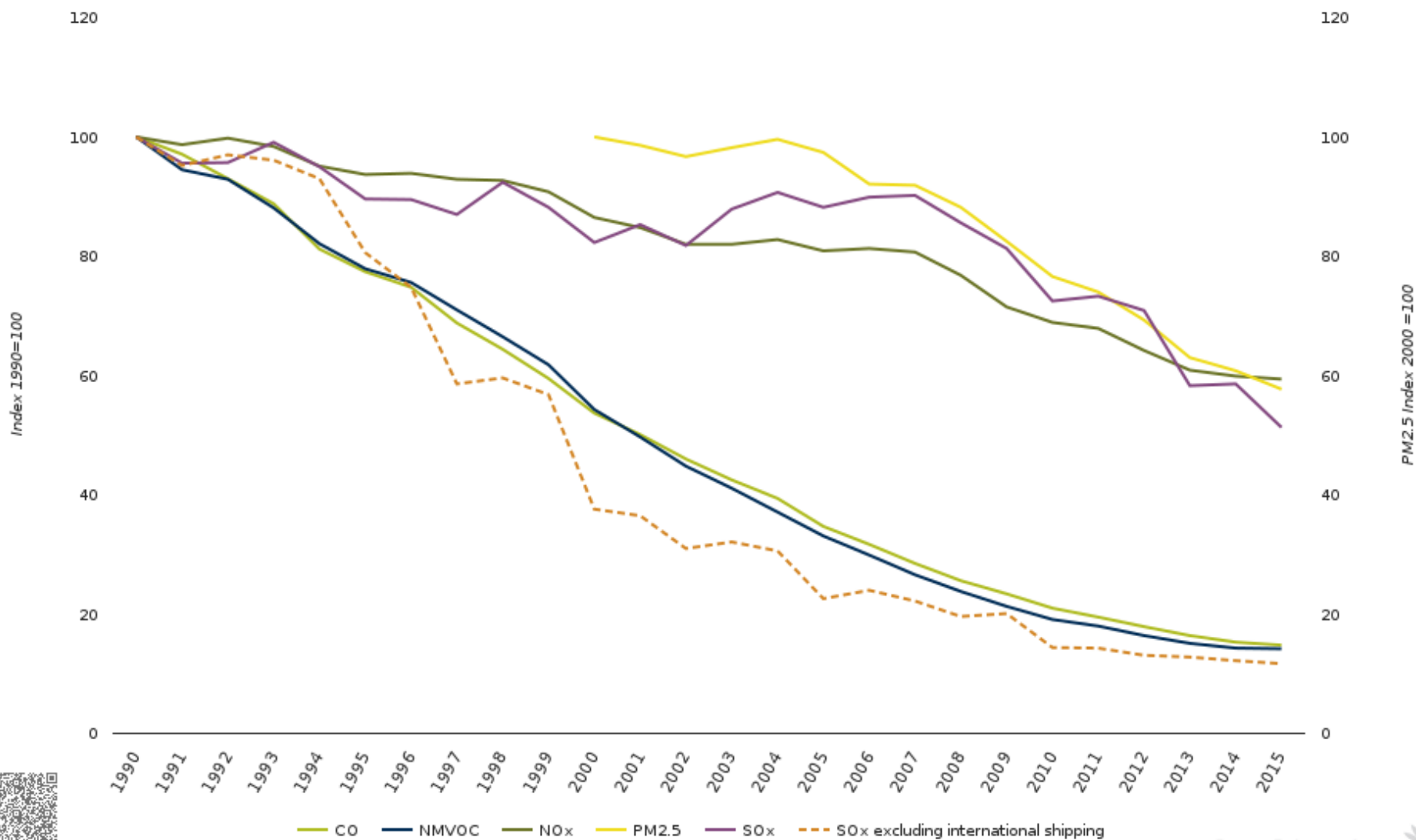


Chart – Contribution of the transport sector to total emissions of the main air pollutants



Trends of transport air pollution

Chart – Trend in emissions of air pollutants from transport



Future tendencies in Transport

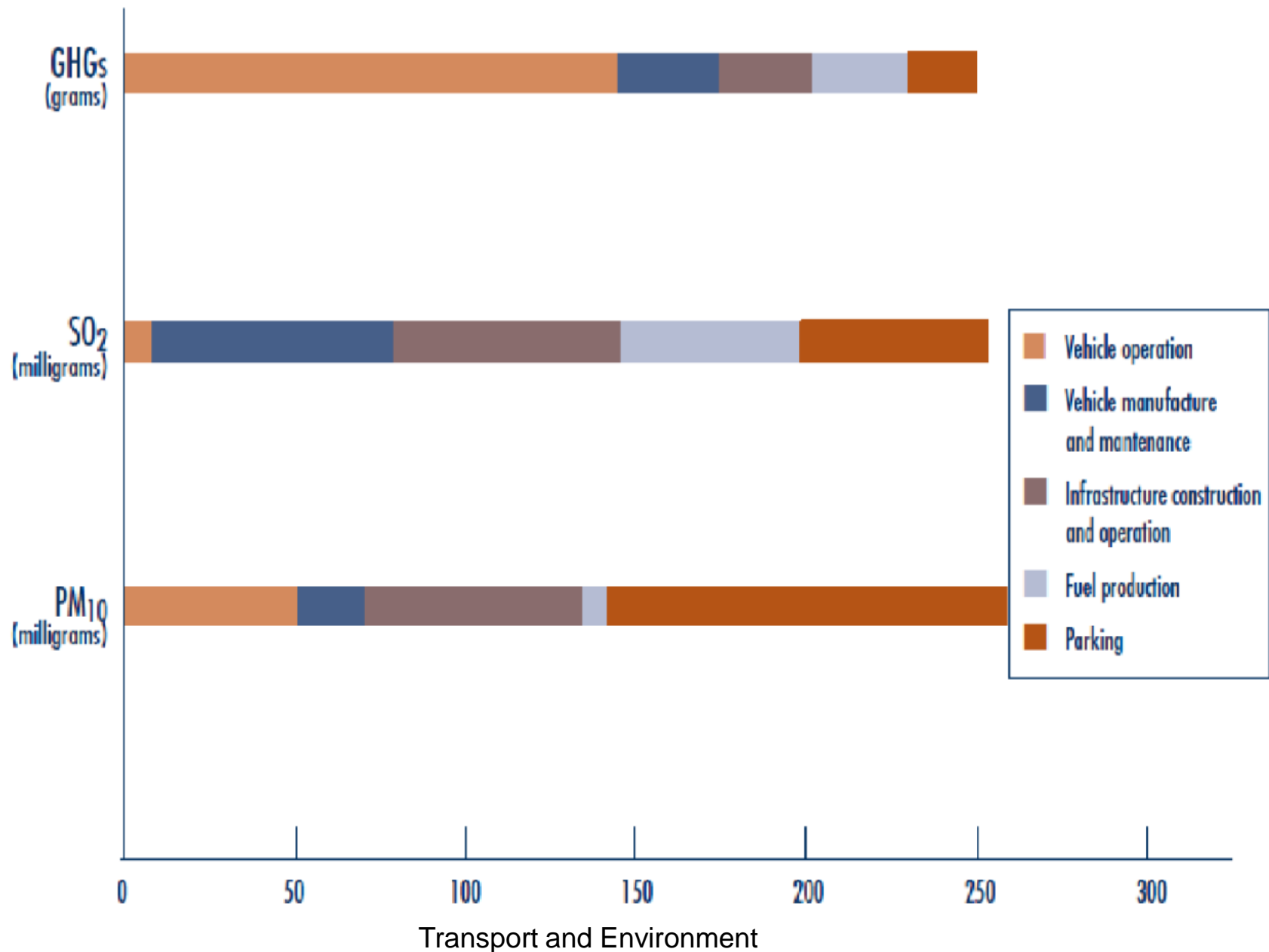
- Global amount of freight: 2000 - 2050 from **15 to 45 Tr. (10^{12}) t.km/year**,
- **Rapid growth** of motorization, air traffic, and road freight industries',
- Declining tendencies of **environmental efficiency** of transport - GDP and t.km, flexible transport systems,
- **CEECs**: international road passenger transport to grow by a factor between 2 and 4 within two decades, > **social costs**.

Threats:

- Rising **congestion**,
- **Capacity** extension,
- Environmental advantages of modes like rail, coaches, inland waterway, coastal shipping, **could not be reflected** by environmental costs – **absence of internalization** – ,
- The market shares of environmentally benign modes (in CEECs) likely to **drop**,
- **Railway freight** expected to drop from 70% to below 15% (economic growth(?), low transport regulation scenario).

Environmental efficiency

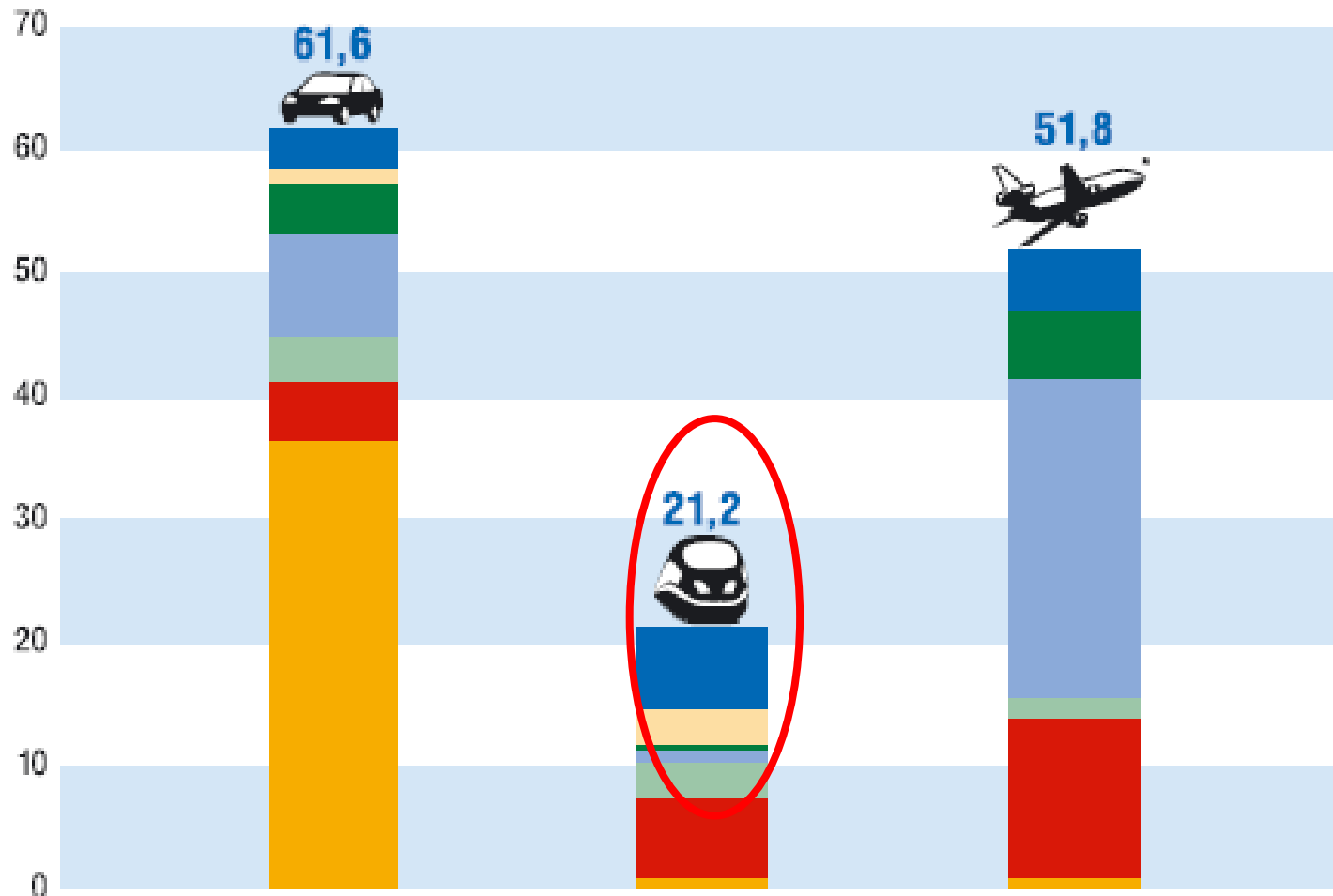
- Efficiency and environmental load of utilized **energy** and natural **resources**,
- Regarding life cycle effects, significant part of GHG emissions is not directly mobility oriented – but refers to fuel **vertical**, **vehicle industry**, and **infrastructure** -



External costs of passenger transport

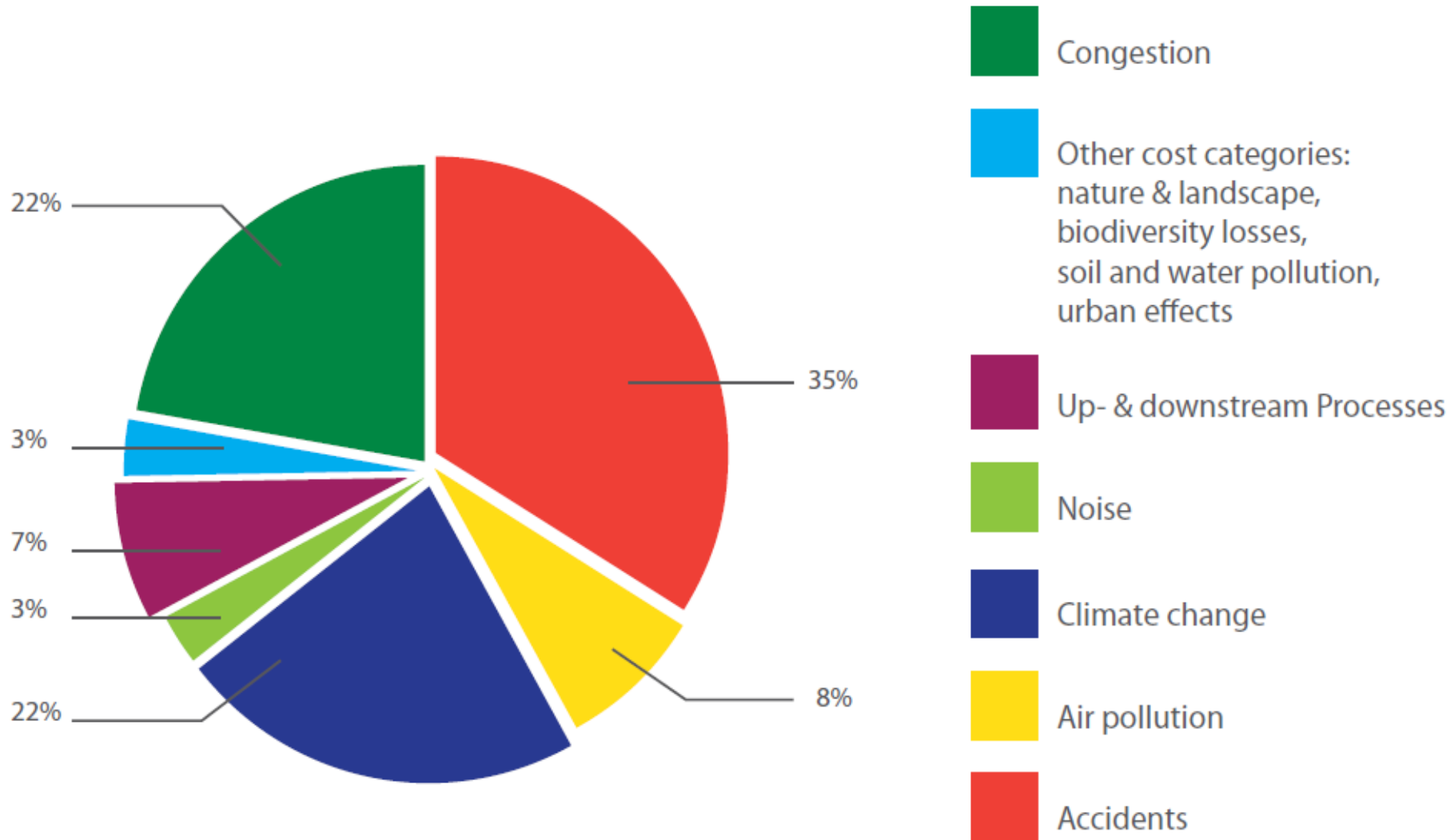
Externe Kosten im Personenverkehr (in Euro pro 1.000 pkm)

- Vor- und nachgelagerte Prozesse
- Zusatzkosten in städtischen Räumen
- Natur und Landschaft
- Klimakosten
- Luftverschmutzung
- Lärm
- Unfälle

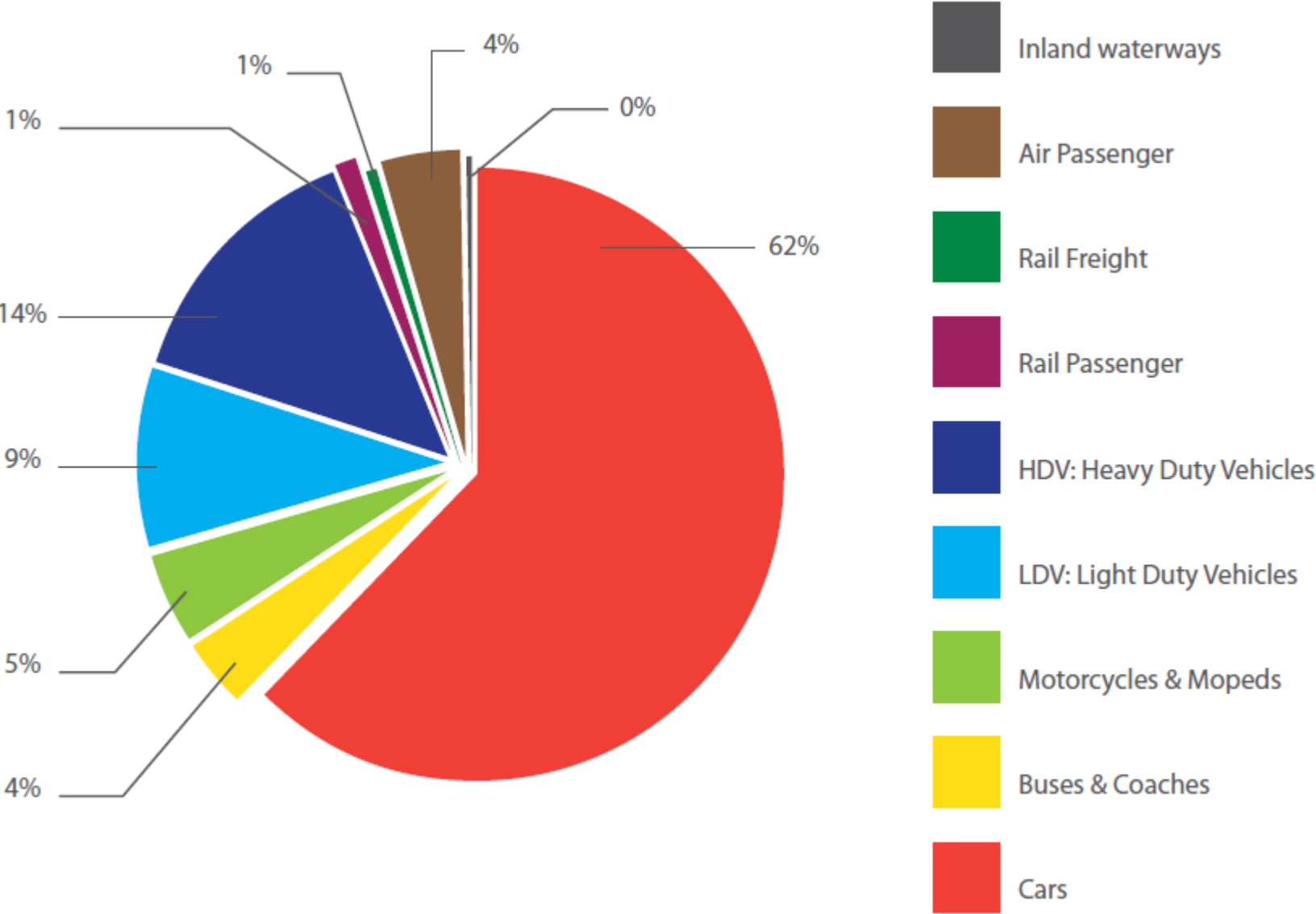


Transport and Environment

Structure of external costs



External costs based on modes



Total external costs of Transport – EU 28, 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
- Transport and Environment
- *Indicative estimate* all external cost all modes EU28: € 987 billion (6.6% of GDP)

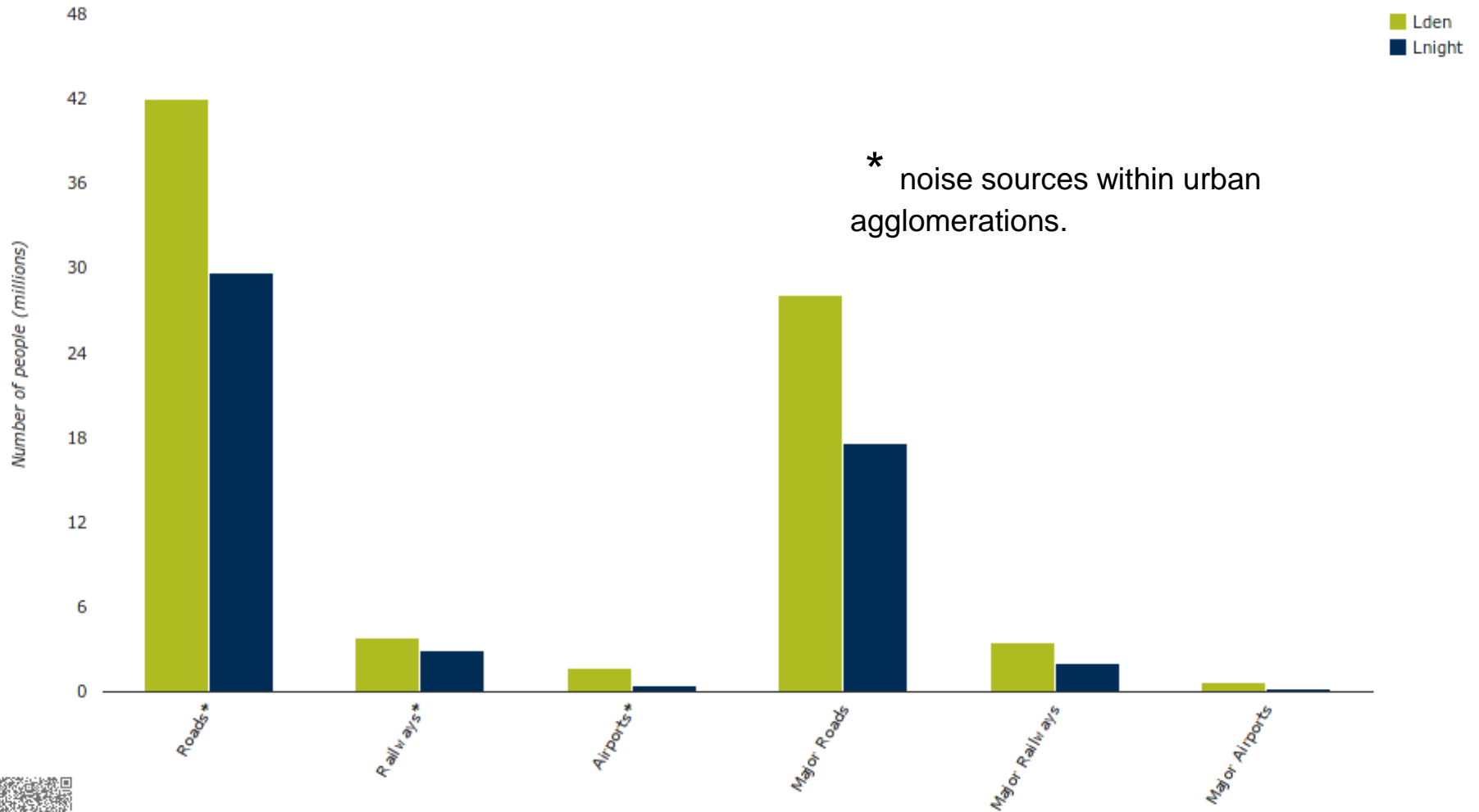
Environmental factors, loads

- Environment and its elements, as **natural basis** of human activity, used in production and consumption, but also for **disposal of wastes, and emissions,**
- **Integrated approach** on factors, and loads, **external costs,** factors causing **deterioration of environmental** quality. **Critical levels,** endangering human life, quality of life, and demoting ecosystems.

Noise

- Disturbing social being, affecting human health, impairing **physical and mental health**,
- Loads above 85 dB causing hearing disorders, above 60 dB nerve reactions, circulatory and hormonal **diseases**,
- Significant **correlation** between transport noise and public health conditions, exposed by noise, facing bigger heart disease risks.

Chart – Number of people exposed to transport noise

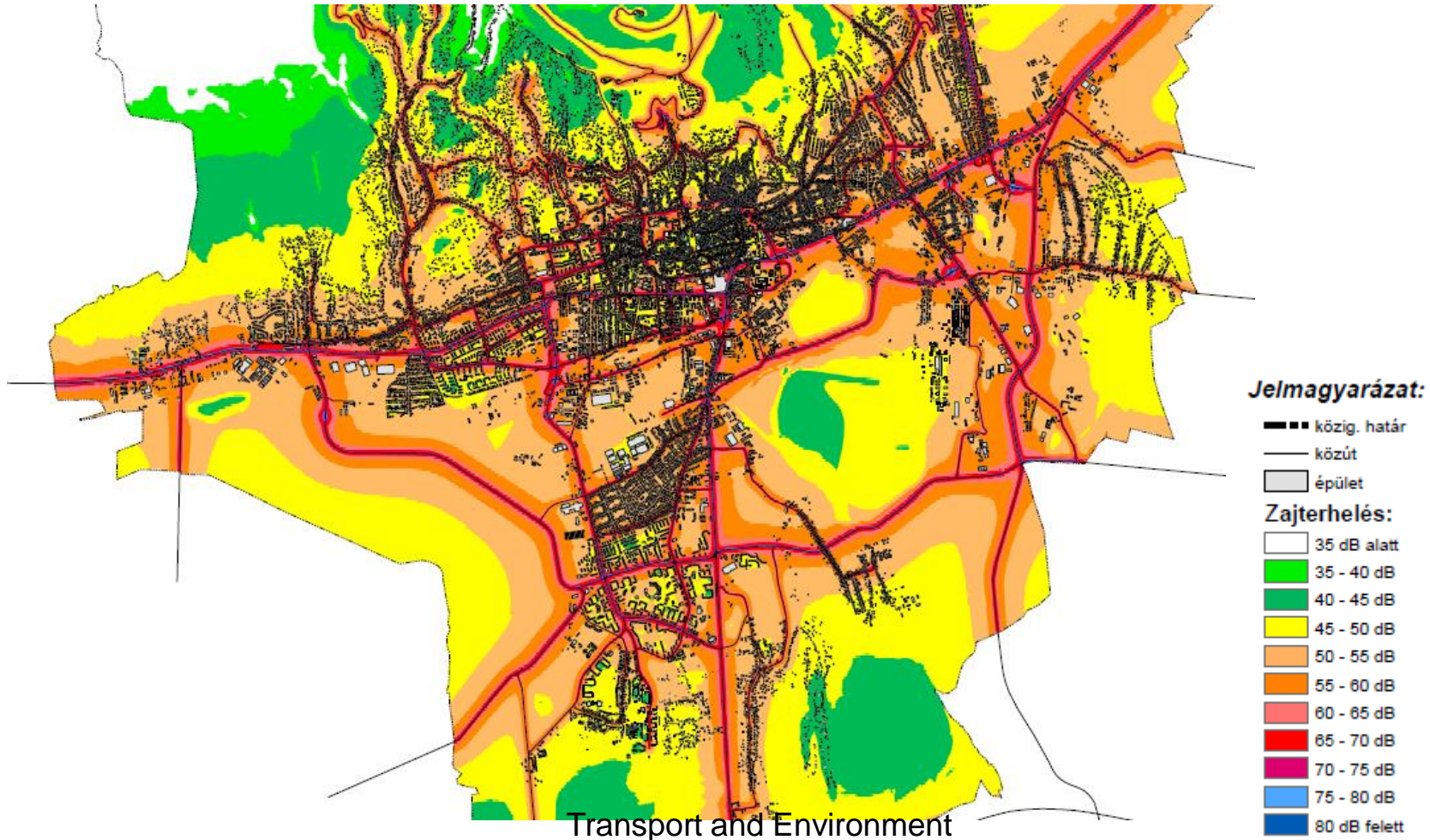


Increasing heart infarct risks, caused by transport noise

Place of investigation	Noise level (dBA)		
	65-70	70-75	75-80
Caerphilly, Speedwell (UK)	+20%	-	-
Berlin	-	+20%	+70%
INFRAS/IWW adata	+ 20%	+30%	

Noise map of Pécs

Daily – L_{den} (0-24 hours)



To be continued, further details for the subject:

<http://www.transportenvironment.org/>

<http://www.eea.europa.eu/themes/transport>

https://ec.europa.eu/transport/index_en



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