Integrated Transport Systems

Workshop on Gaps and Barriers for Energy Technology Development and Deployment – a view from the Technology Collaboration Programmes (TCPs)

Merja Penttinen, VTT & Magnus Lindgren, Trafikverket

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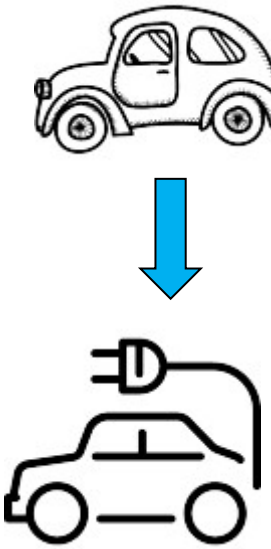
Integrated transport systems – what and why?

- A clear need to cut the CO2 emissions
  - FI -50% by 2030, SE -70% by 2030
- Renewal of car fleet is not enough
  - E.g. in Finland the goal could be achieved by changing ALL personal cars into electric ones…
    - Average age of a FI car is above 12 years
    - Average wrecking age 20 – 25 years

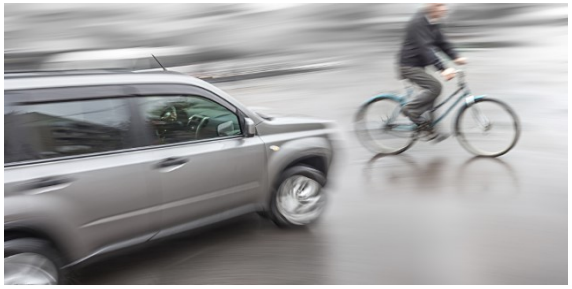
  ⇨ the full replacement will not happen in 13 years!



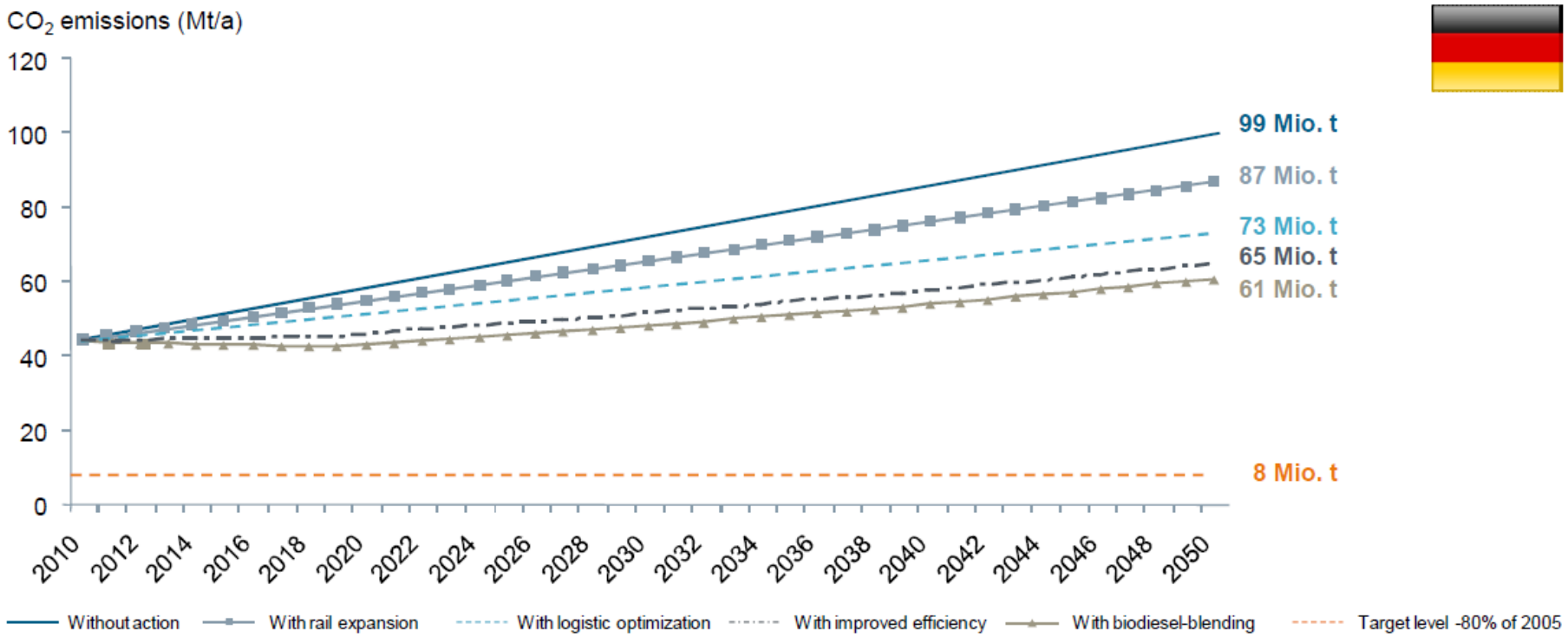
- Modal change is needed, too
- MaaS helps a little – but not as the only solution
- Different tools for different problems:
  - Urban transport, Intercity transport, Mobility and accessibility in rural areas

Challenges for sustainable cities

- Ever-growing congestion
  - No more space for new routes, optimizing the use of current infrastructure
  - Wasted time in transit
  - Incidents, emissions, air quality
- Making alternative (public, non-motorized) transport easy & attractive
- Environmental quality, CO2 & energy efficiency targets
- Traffic safety, vulnerable road users
- Efficient logistics and distribution



Measures to reduce road freight CO_2 emissions



Source: German Ministry of Environment (BMU), March 2013

A possible conclusion – HGV's

To free the roads from dependence on fossil fuels must largely be through action in the road transport system.

Bio-fuels ...
Electro fuels...
Electrification...
- ERS
- Batteries
- Fuel Cells

increased efficiency...

All the tricks will be needed...

Elements determining the environmental impacts of traffic

Community structure

Traffic volumes and choice of transport mode

Energy for transport

Vehicles and user behaviour

System level

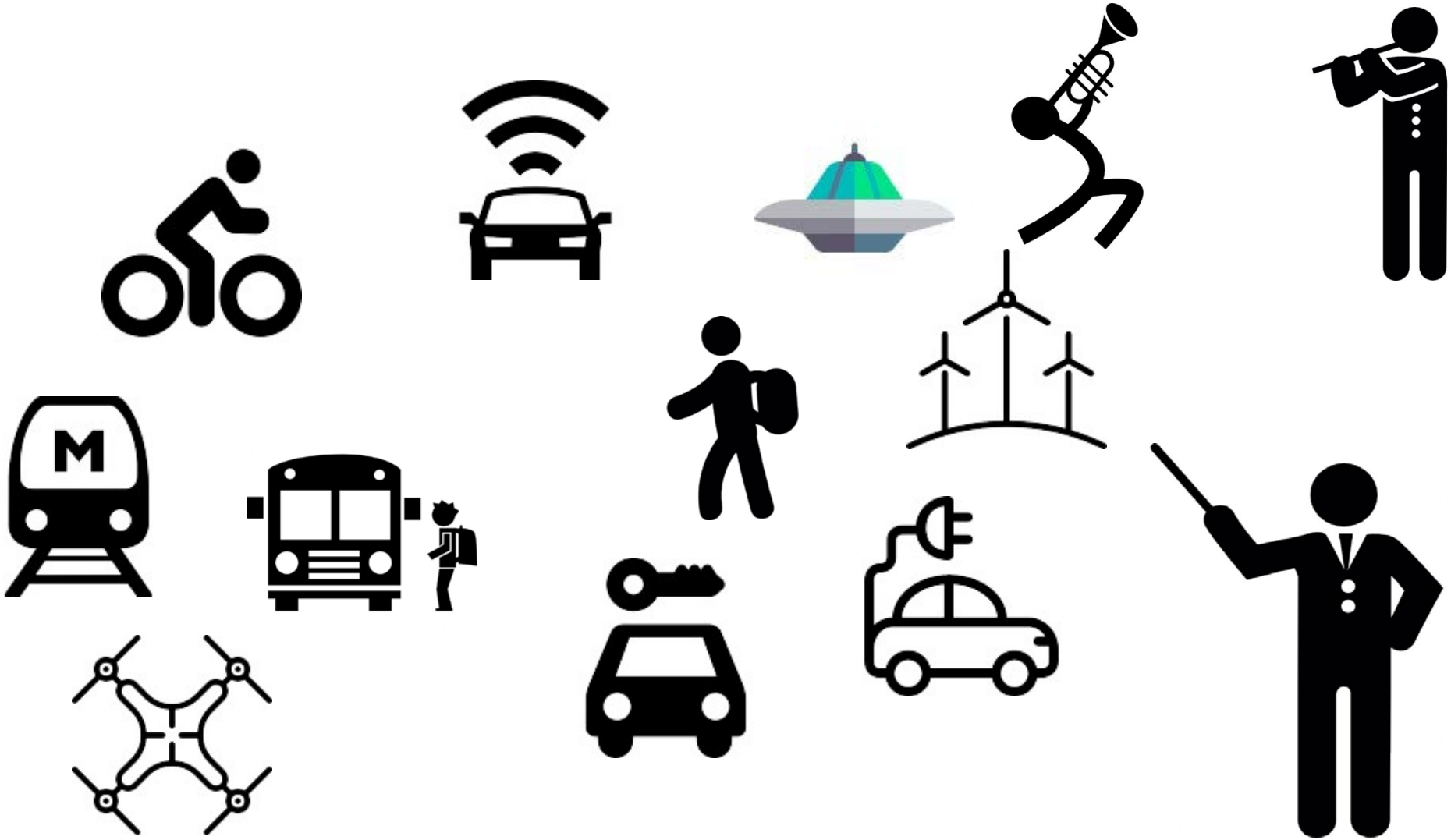
Consumer level

Policy orientation

Technology orientation

Source: Nils-Olof Nylund

It’s like a skilled orchestra playing masterpiece – with the needed instruments and the word-class conductor



Routes for creating a sustainable transport system

- To reduce the greenhouse gas emissions from the transport sector and its dependence on imported oil requires a true transition of the transport sector and its energy system

- The main ingredients to realize such a transition are:
  - reducing the energy demand of vehicles (technology, driving style)
  - shifting towards less carbon-intensive and carbon-neutral, renewable energy carriers
  - shifting towards more energy-efficient or less carbon-intensive modes of transport
  - curbing the growth of transport demand
  - utilising the whole transport system in a more effective way

Source: Nils-Olof Nylund

Integrated urban transport system

- Mass transit for large cities and high demand areas
  - typically subway, trains
- Mass transit for mid-size cities:
  - Trams, buses, local trains
- Public transit in smaller cities/towns
  - Typically buses, even taxis for e.g. rides to schools
- Non-motorized modes – health benefits
  - Shared bikes, safety and security
- Last mile & first mile?
  - Transport of people and transport of goods
  - Waiting time
  - Multimodal travelling, changing the mode
- More livable cities
  - Urban boulevards -> critical planning needed (safety)

The current megatrends in transport sector do help – with good planning

- eVehicles:
  - eBuses, eCars, careful planning of policies to support eCars
- Automated transport:
  - Automated public transport vs. automated (robot)cars
  - Mobility for all?
  - Careful planning – risk of dispersion, share of public transport?
- C-ITS + real-time information
  - Better traffic information, better traffic management, less congestion, less incidents
  - Multimodal transport
- MaaS
  - Last mile, first mile, rural areas, combining the transport of people and goods…

Sustainable transport for smart cities

- In the smart city context, personal mobility must be based on **public transport, cycling and walking**
- **Efficient city logistics is a challenge**, e.g. stringent environmental requirements and on-line shopping will change routines in logistics
- **ICT, ITS and making use of big data** will enhance performance and service in all modes of transport

- **Systems will become increasingly integrated**, transport system, build environment, energy and information systems
- **Various modes, smart combination**, based on the size/form of the city

Mobility as a Service (MaaS)

- Traffic and mobility are more and more **linked to services, economy and business**
- Shift of paradigm, **not everyone has driver's license or own a car**
- Response to **grand challenges in society**
- **Connected services** (and new technology) instead of building infra (from bitumen to bytes)
- **ICT** as an enabler and information in the core
- **Users and their acceptance in the center, long term behavioral modification**
- **Multi-services and travel chain** approach; real-time optimized multimodality
- **New ecosystems** are required
- **Flexibility** and availability of resources

A political decision – how much to invest in emission reduction?

Values in EURO	DK	NO	SE	FI	DE
Time values, EUR per vehicle hours					
Travel time (passenger transport)	24,1	24,7	20,6	12,9	12,8
Delay time (passenger transport)	36,1	N/A	31,0	N/A	N/A
Travel time (freight transport)	66,7	66,7	33,0	25,8	31,2
Delay time (freight transport)	91,9	N/A	49,5	N/A	N/A
Accident values, EUR per accident					
Fatality (one fatality)	2 611 812	3 847 363	2 611 782	2 911 116	1 229 283
Non-fatal injury accident	719 593	344 086	485 411	439 892	143 422
Emission values, EUR per ton CO2	17,3	26,8	118,8	40,0	135,0
Vehicle operating costs, EUR per km					
Light vehicles	0,35	0,20	0,24	0,15	0,40
Heavy vehicles	0,71	0,57	0,85	0,49	0,70

National values in CBA calculations – a few examples

Discussion and questions

- Who would be interested in participating in a new TCP on Integrated Transport System?

- What can your TCP do to increase the exchange of information and cooperation with other TCP in relation to “Integrated Transport System” perspective?

Thank you!

merja.penttinen@vtt.fi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