

Young Researchers Seminar 2013

Lyon, France , June 5-7 2013



Laboratoire d'Economie
des Transports

Unité Mixte de Recherche du CNRS n° 5593
Université Lumière Lyon 2 - ENTPE



Impact of ITS Measures Towards Reaching Emissions Targets

Juho Kostianen

VTT Technical Research Centre of Finland





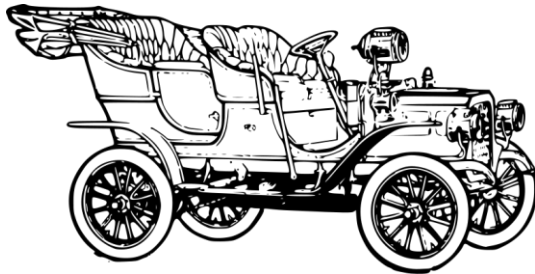
Objective

- Find out
 - What are the GHG emissions targets?
 - What are the GHG impacts of ITS (Intelligent Transport Systems and Services)?
 - How are the impacts evaluated?
- to determine
 - The effect ITS can have on emissions
 - The need for impact evaluation



Focus

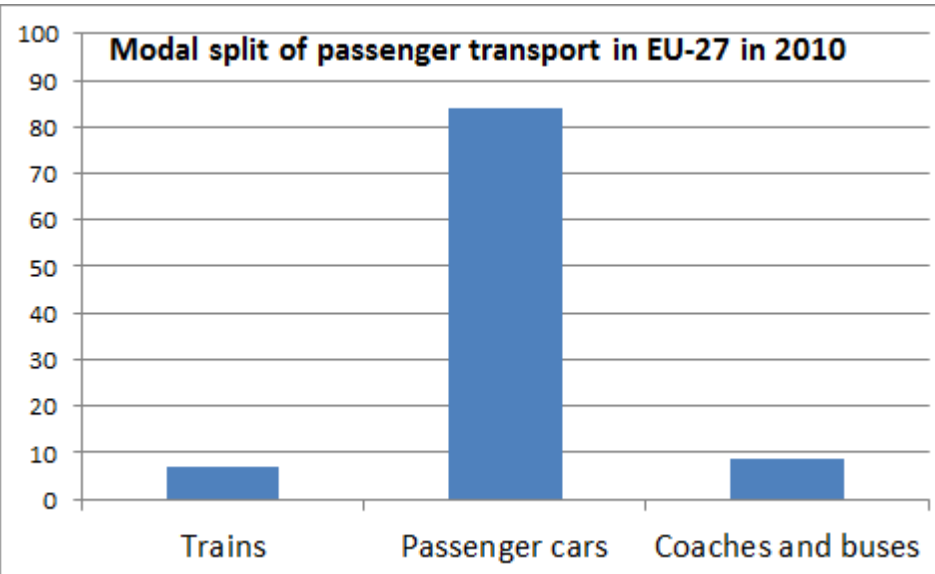
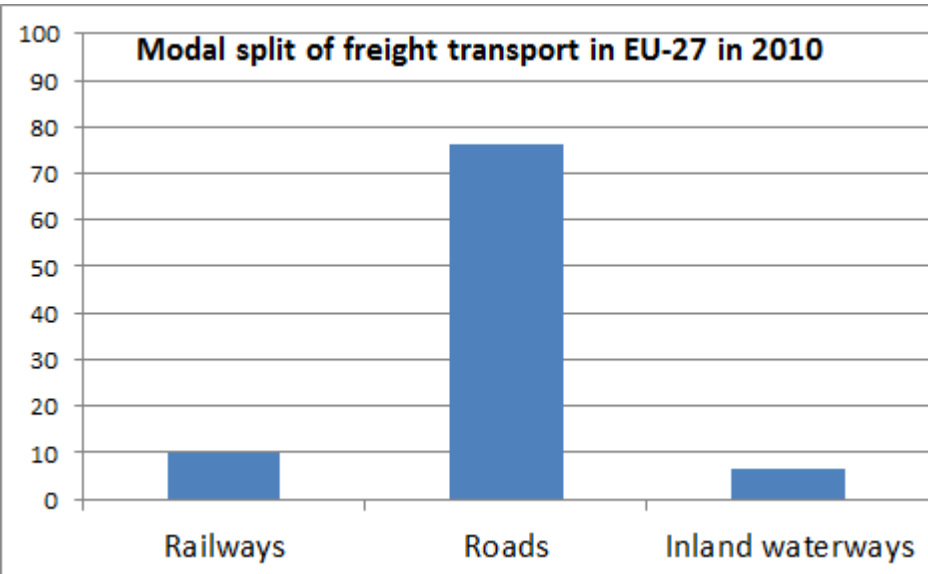
- EU
 - Finland as an example of regional differences
- Road transport





Background

- Road transport accounts for 23% of the EU's total CO₂ emissions
- Large, private cars generate high CO₂/km





Transport Sector GHG Emissions Targets

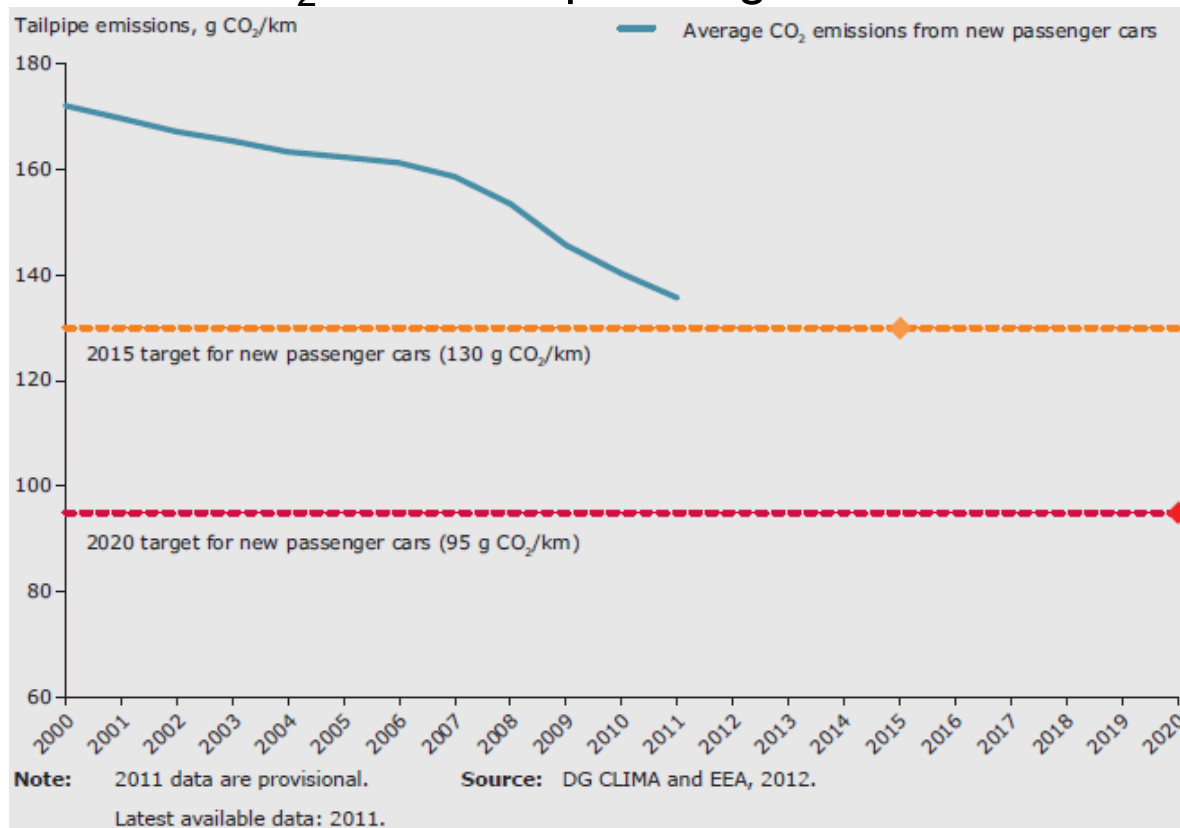
- -20% by 2030 (compared to 2008 levels)
- -60% by 2050 (compared to 1990 levels)

- New passenger car emissions
 - 130 g CO₂/km by year 2015
 - 95 g CO₂/km by year 2020



GHG Emissions Targets - Progress

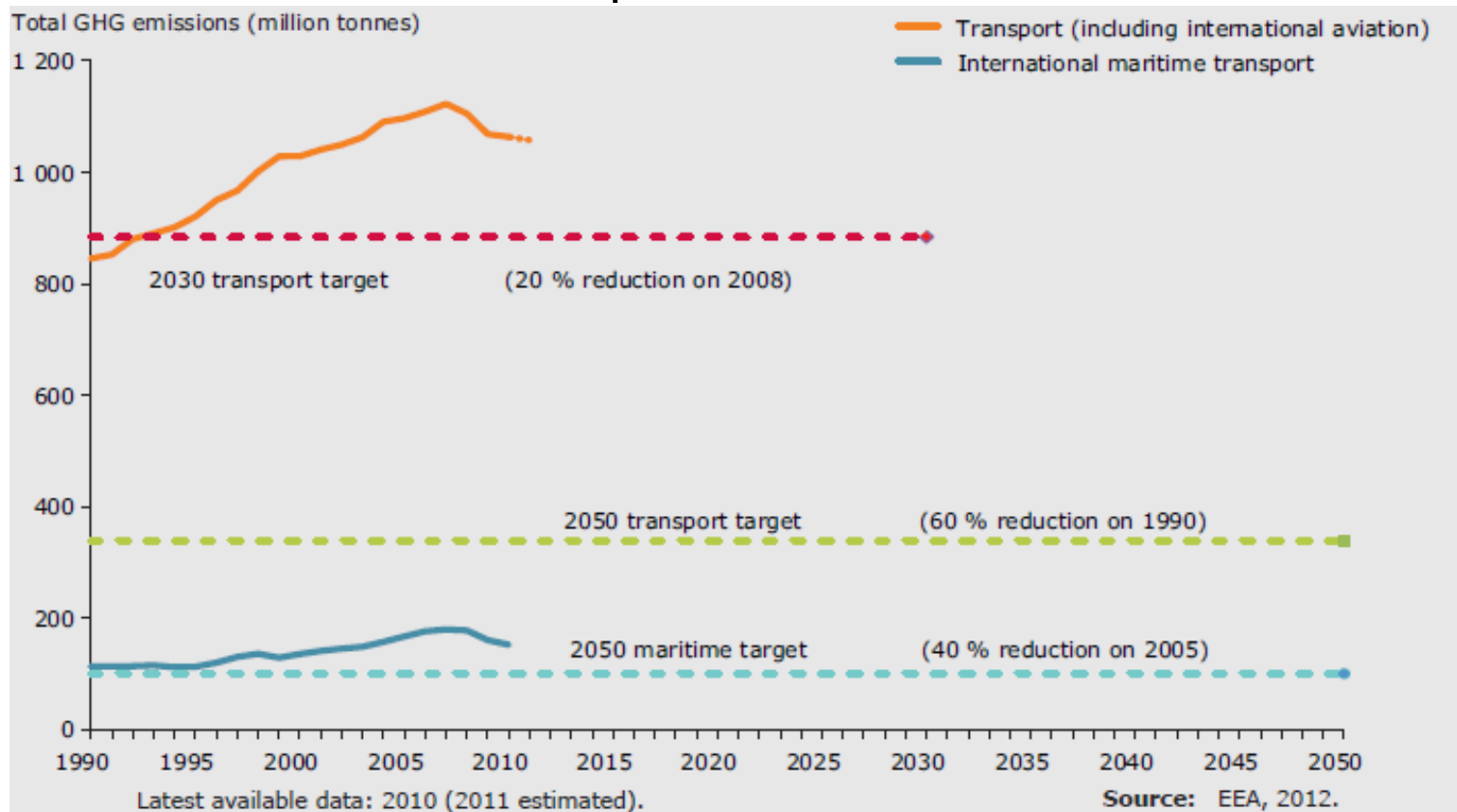
CO₂ from new passenger cars





GHG Emissions Targets - Progress

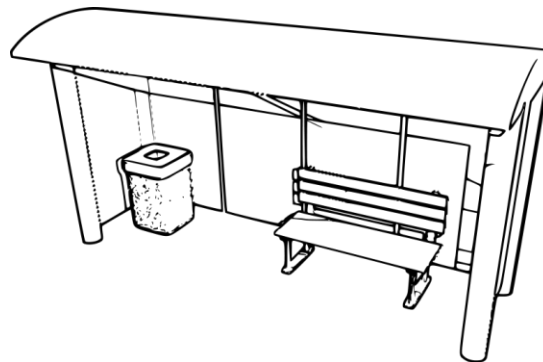
Total transport GHG emissions





ITS Measures – Main Ways to Impact

- Reducing congestion
- Affecting choice of transport mode
- Eco-friendly driving habits



www.odysa.nl



ITS Measures – Impacts

Evaluated GHG impacts

#	Solution	Evaluated CO ₂ Effect
1	Intelligent adaptive speed systems advising driver	35%
2	Adaptive traffic lights	30%
3	Dynamic speed suggestions for approaching traffic lights compared to adaptive cycle time	17%
4	Congestion charging	16%
5	Rigidly enforced speed regulation	15%
6	Integrated traffic and mobility management system to improve traffic flow	15%



ITS Measures – Impacts

Estimates by TNO (2009)

#	Solution	Potential CO ₂ Effect
1	Eco-driving coaching	15%
2	Eco-driver assistance	10%
3	Pay-As-You-Drive	7%
4	Platooning	6%
5	(Adaptive) cruise control	3%
6	Fuel-efficient route choice	2%
7	Dynamic traffic light synchronisation	2%
8	Automatic engine shutdown	2%
9	Trip-departure planning (freight)	2%
10	Tyre pressure indicator	1%
11	Congestion charging	0.5%
12	Slot management	0.05%
13	Lane keeping	0.008%
14	Emergency braking	0.007%



ITS Measures – Regional Differences

Expert estimates of impacts in Finland

#	Solution	Potential CO ₂ Effect	TNO Estimate
1	Congestion charging	10 – 20%	0.05%
2	Management of interruptions	5 – 15%	
3	Management of transport equipment	3 – 6%	
4	Traffic light advantage for public transportation	1 – 3%	
5	Information on alternative ways to travel	1 – 2%	
6	Roadside warnings	0.5 – 3%	
7	Fluency reporting	0.5 – 2%	

- Key factors
 - Initial situation (e.g. congestion levels, public transport options)
 - Conditions (e.g. climate)



Conclusions

- There is little accurately measured data available
- ITS often effects the environment positively
 - Directly (improved eco-driving)
 - Indirect effects (affecting choices)
 - Side effects (not the main goal of the measure)
- ITS can help achieve emissions targets
- Evaluations as incentives and arguments for implementation