

Evaluation and Monitoring for the EU Directive  
on Energy End-Use Efficiency and Energy Services

# Modal Shifts in Passenger Transport

Bottom-Up Case Application

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EMEEES Project

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evaluate  
energy savings<sup>EU</sup>

coordinated by



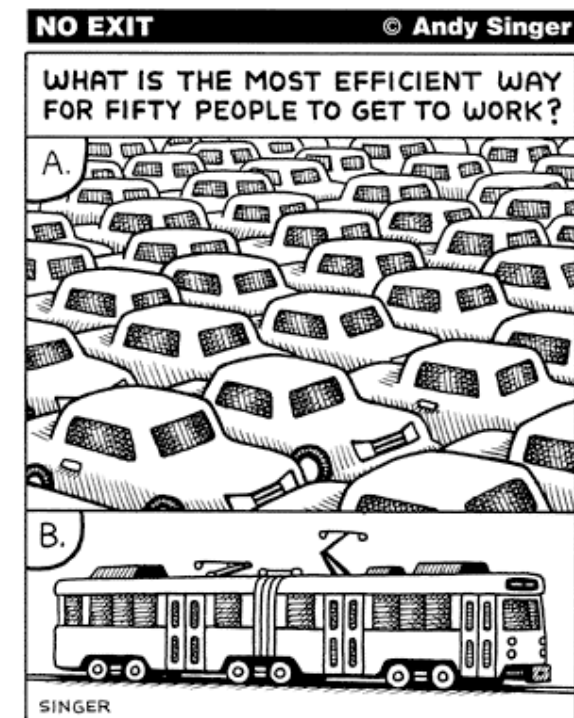
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## Case application: Modal Shifts in Passenger Transport

1. (EEI) Facilitating Measures
2. Calculation process (4 steps)
3. Data collection



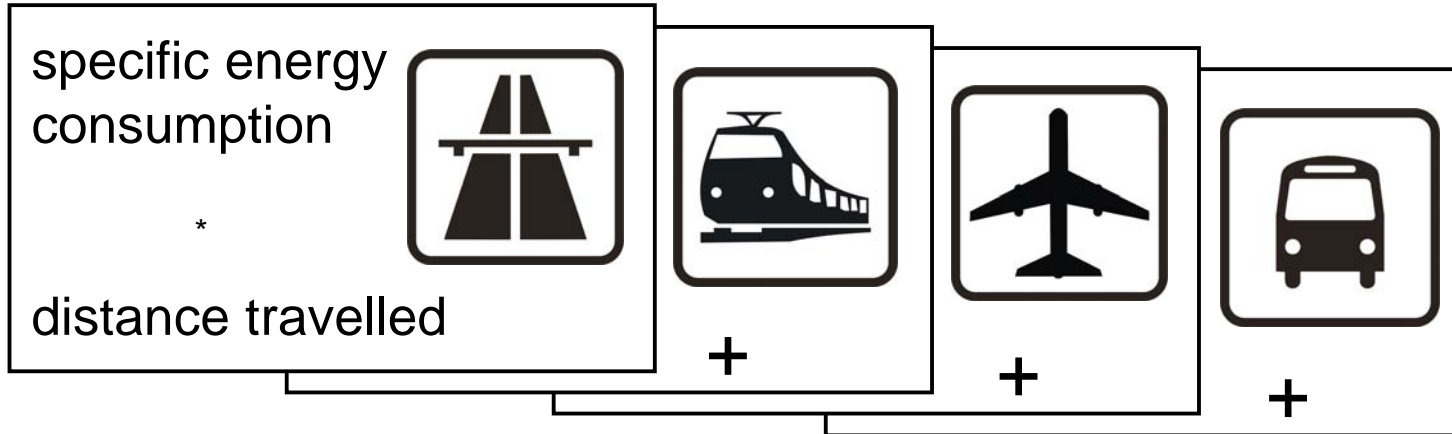
## (EEI) Facilitating Measures for Modal Shifts

	Category	Facilitating Measure
<b>Short distance</b>	Improvement of public transport	Park and ride
		Price reductions
		Frequency improvement
		Comfort/service improvement
		Information/advertisement
	Improvement of infrastructure/ organisation of non-motorised transport modes	Bicycle lanes, Footpaths
		Bike and ride
Traffic management	Car park limitations/parking pricing	
	Congestion charge	
<b>Long distance</b>	Traffic management	Road pricing
	Service improvement of long distance trains	New/faster connections
		Comfort/frequency improvement
		Ticket price reductions

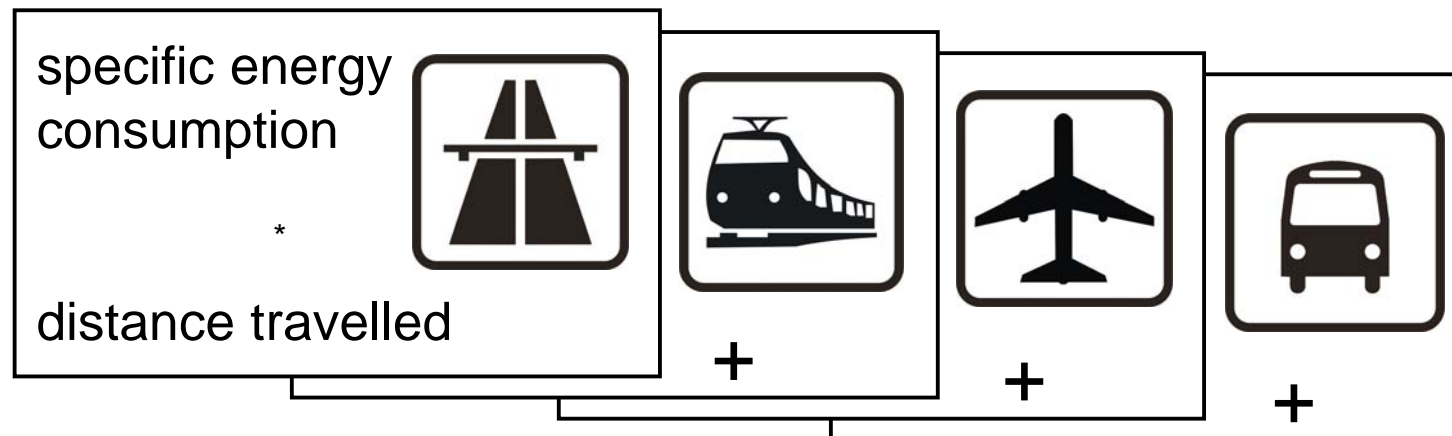
## Step 1: unitary gross annual energy savings

$$ES_{uga} = \sum_{i=1}^N \Delta ADT * En_i$$

- $ES_{uga}$  Unitary gross annual energy savings [kWh/person/year]
- $En$  Specific energy consumption of a mode of transport [kWh/person-km]
- $\Delta ADT$  change of annual distance travelled in a transport mode [km/year],  
baseline case ( $ADT_{bas}$ ) – new case ( $ADT_{new}$ )
- $i$  Mode of transport 1-N
- $N$  Number of modes of transports concerned



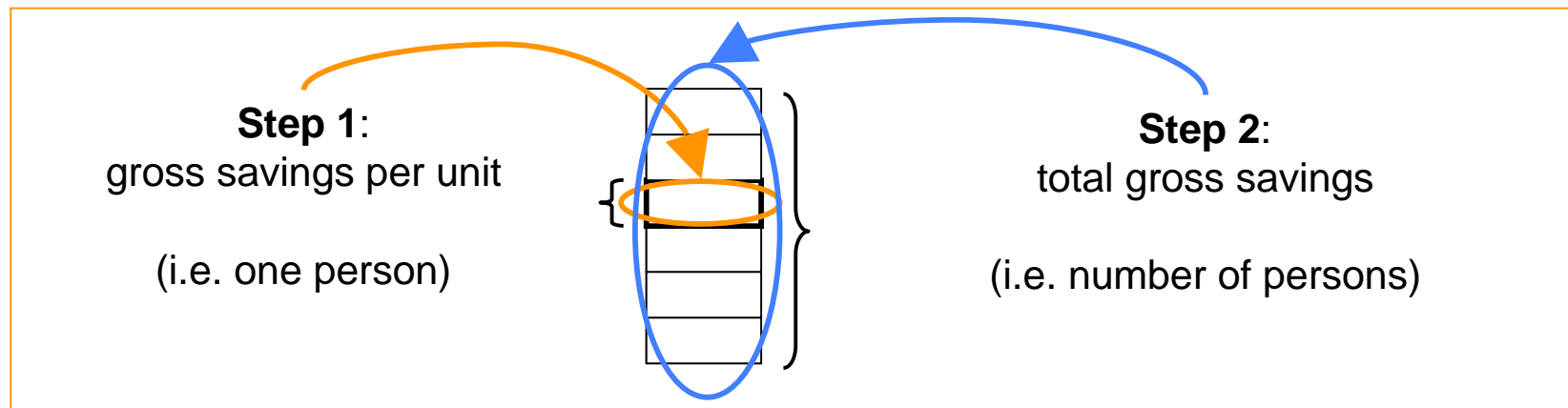
Baseline Case  
(*same for all and additional energy savings*)



New Case

## Step 2: total gross annual energy savings

$$ES_{tga} = ES_{uga} * \text{Number of persons switching the mode}$$

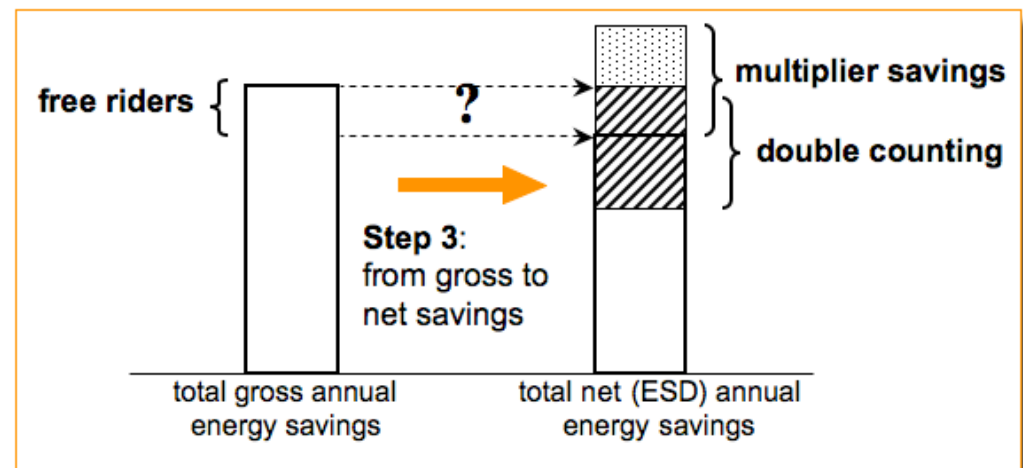


## Step 3: total net annual energy savings

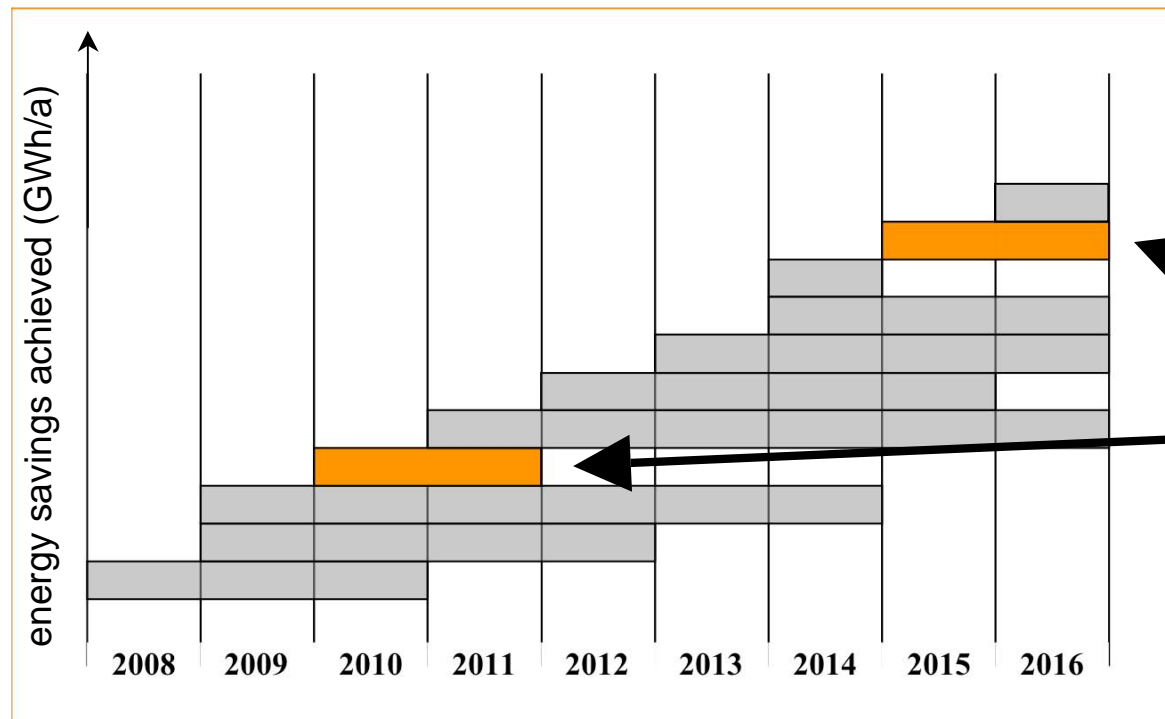
**Example for Free Riders:** People switch to public transport due to a rising oil price and not because of the facilitating measure.

**Example for Multiplier Savings:** People switch to local public transport because of the facilitating measure. Later they decide to deregister their vehicle as they realise how cheap and comfortable travelling by public transport is.

**Example for Double Counting:**  
A number of local facilitating measures aims at improving public transport infrastructure.







## Step 4: Energy Saving Lifetime



CEN WS 27 Agreement: 2 years for measures aiming at changing behaviour  
**Potential solution:** confirm longer lifetime by regular surveys;  
 Later, when enough experience, adapt defaults

## Data Collection: Specific Energy Consumption of transport modes (at level 1 harmonisation)

Mode of transport	Vehicle consumption	Occupancy level
	National average available (ODYSSEE indicators)	EEA for some EU-15 Members: 1,6
	ICE	33%
	Airbus A320	75%
	Not considered at level 1 harmonisation	

## Data Collection: Distances Covered

- Source: either own survey or regularly conducted national/local survey (with own assumptions)
- Own assumptions: trip purpose, number of trips; trip distance,...
- Rule: keeping conservative, explaining assumptions, citing relevant literature

## Data Collection: Correction Factors

- Free rider effect: survey necessary (but experiences from other measures might be adopted)
- Multiplier savings: survey necessary (otherwise assumed to be negligible)
- Double counting: either survey or evaluation in package (in practice, measures aiming at modal shifts are usually implemented in package in order to complement each other)

# Thank you for your attention!

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