

Targeting TDM Policies Based on Individual Transport Emissions



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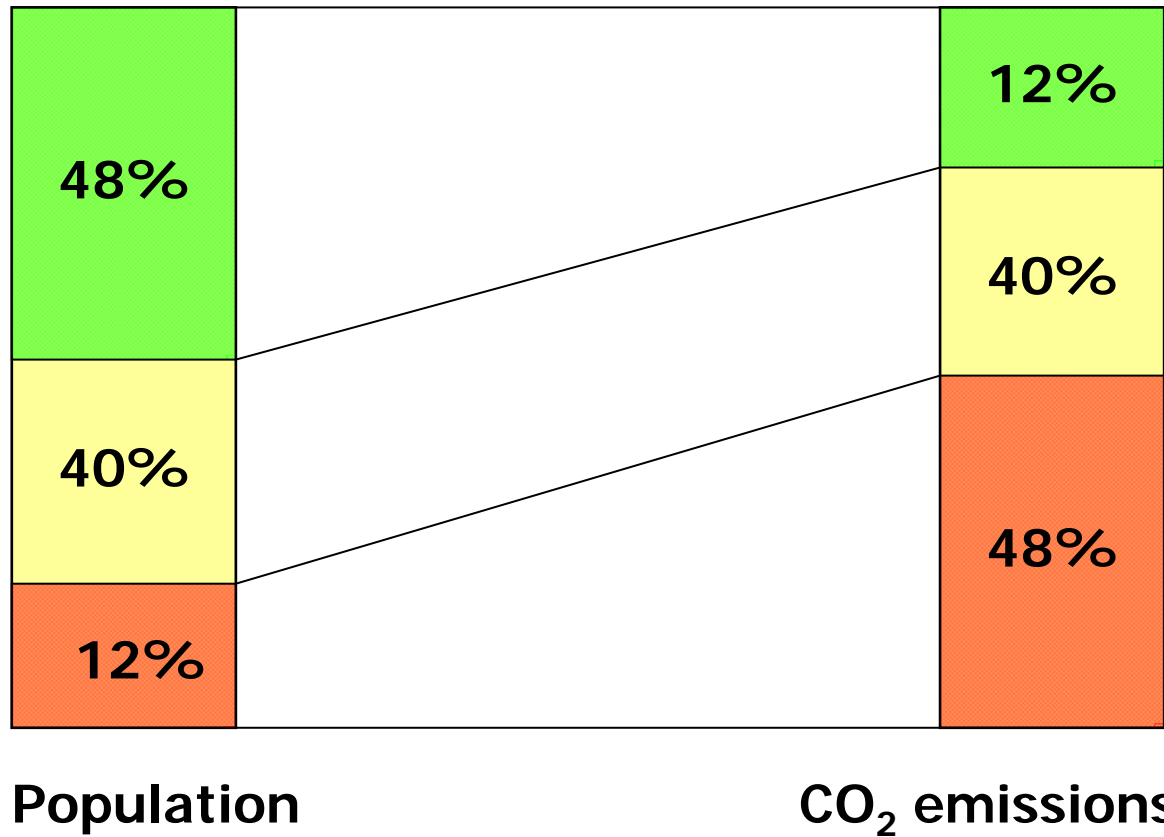
University of the
West of England

4th International Symposium on Travel Demand Management, July 16-18, 2008, Vienna

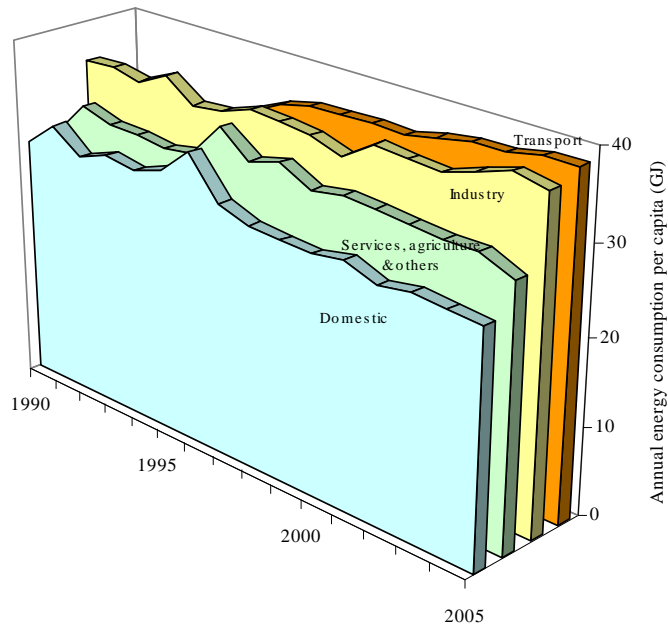


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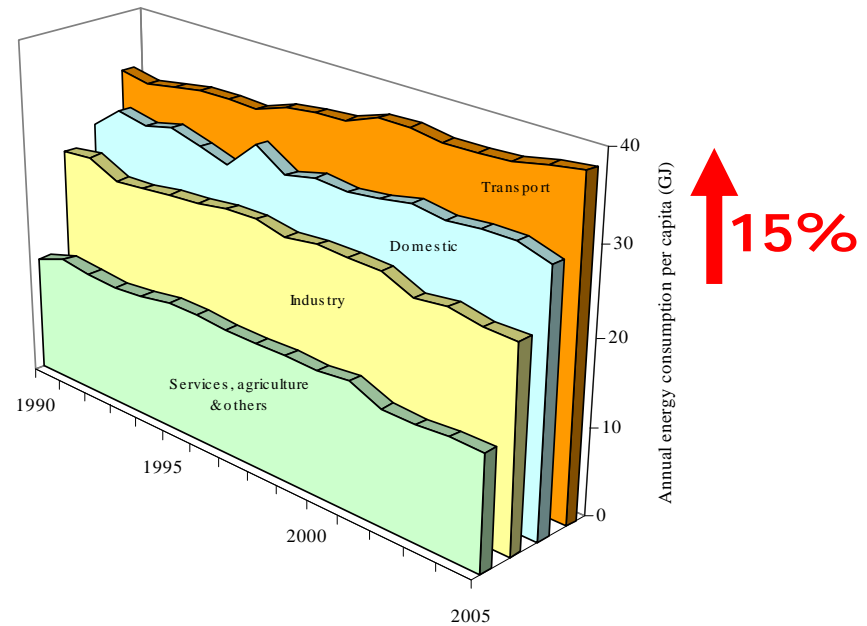
Who has the largest share ?



Tales in two countries ...



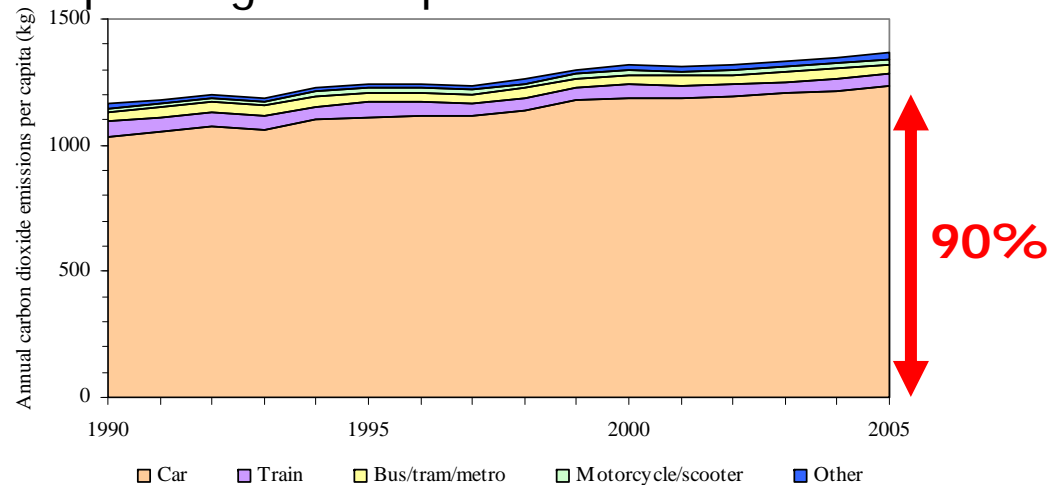
Netherlands



United Kingdom

People and their emissions:

Annual CO₂ emissions from land-based passenger transport:



In the NL:

90% of all CO₂ emissions

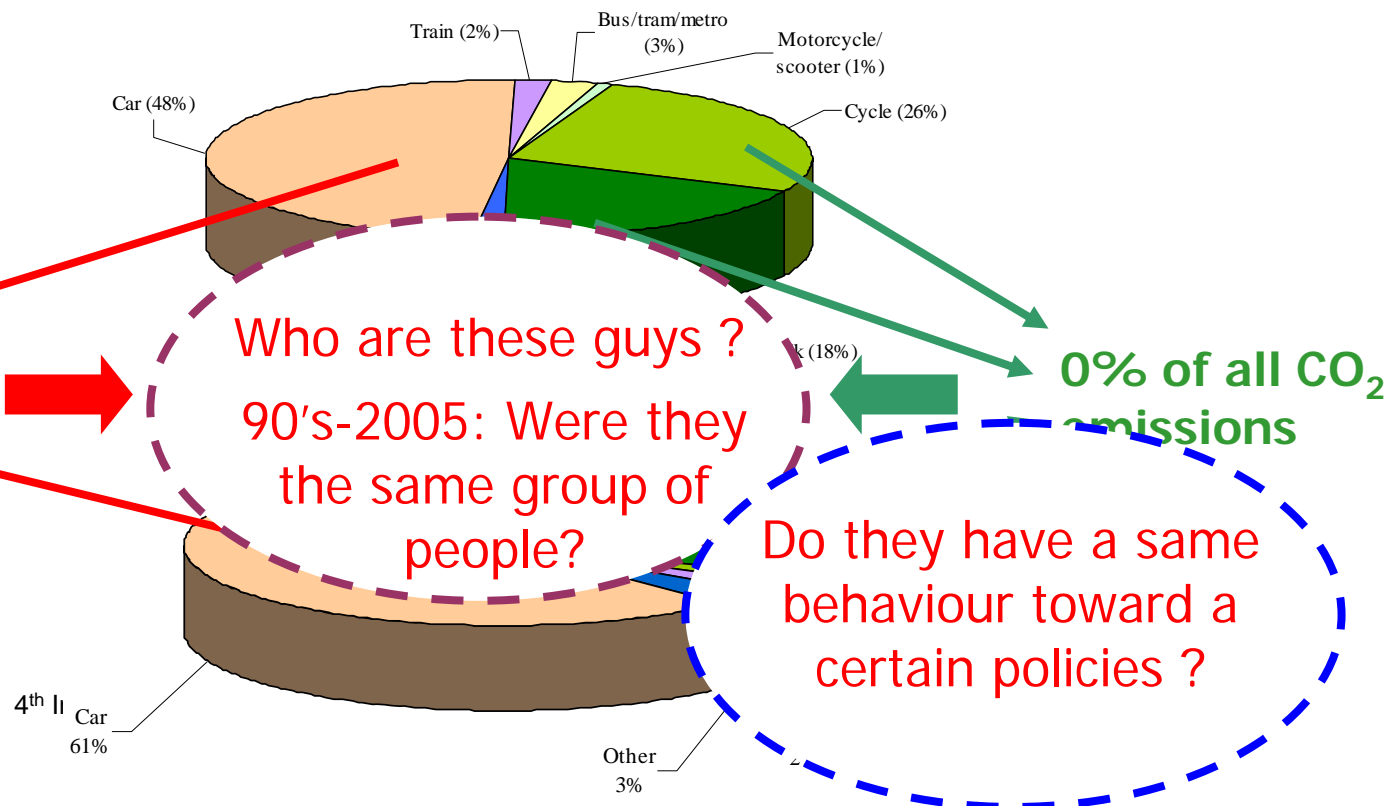
In the UK:

4th li
Car
61%

Who are these guys?
90's-2005: Were they
the same group of
people?

Do they have a same
behaviour toward a
certain policies?

0% of all CO₂ emissions



Objectives, data and methodology

Objectives

- Explore the profiles and trends of travellers based on their transport CO₂ emissions
- Differences between two countries
- The acceptability of various policy measures

Data

- Dutch NTS (OVG/MON) - 1990, 1995, 2000, 2005
- UK NTS - 2000 & 2004

Calculation Method

COPERT : mode, distance, fuel type, vehicle age, occupancy, and speed)

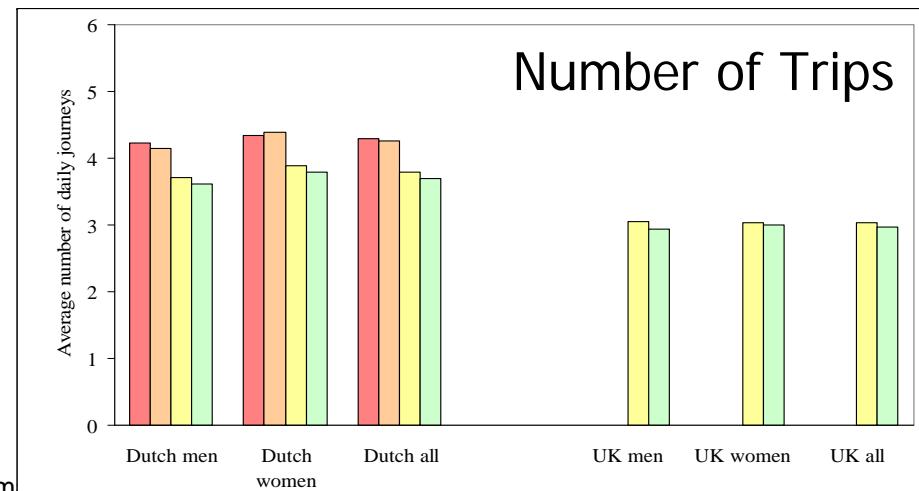
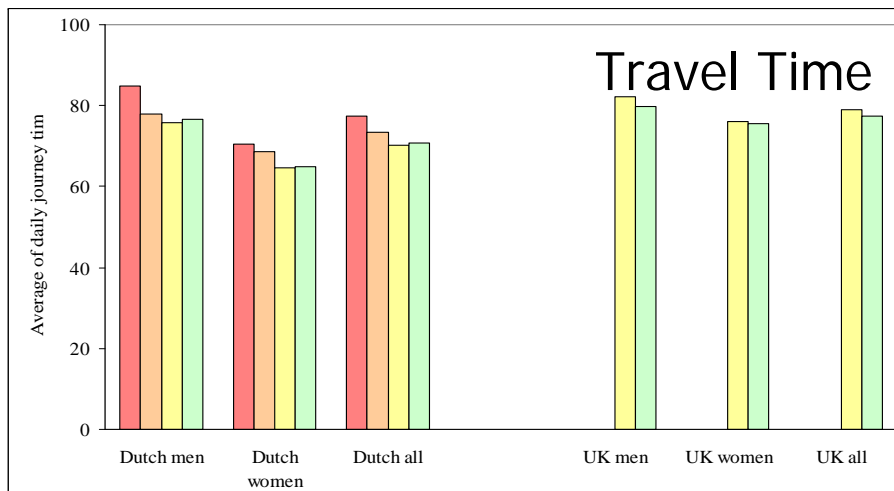
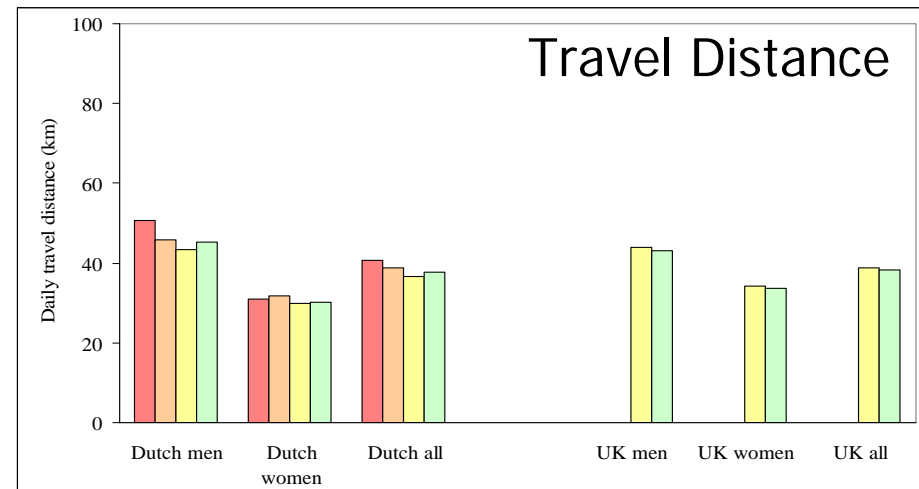
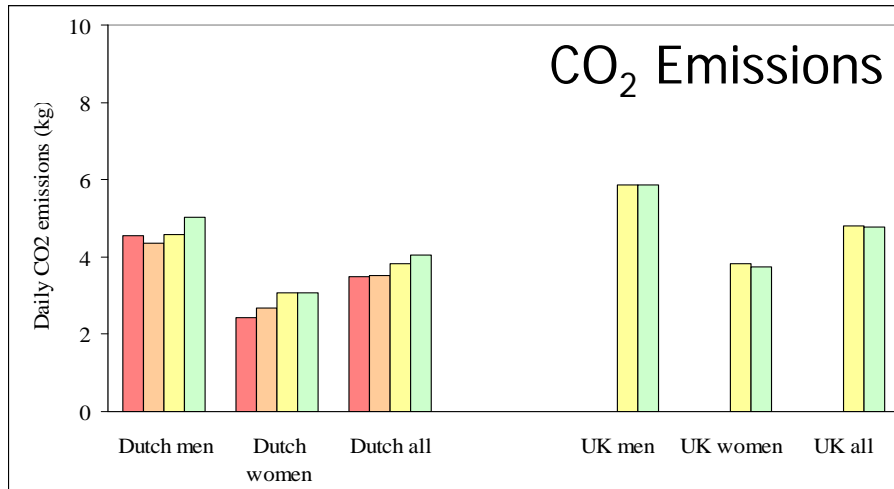
Attitude: EC FLASH-EUROBAROMETER 2007

Analysis outline

- Explore the trends and profiles of travel and CO₂ emissions overtime
- Cluster and identify the 'extremist' and the 'extremist' – who and how
- Influences overtime (regression analyses)
- Match the clustered group with their policy acceptability (Eurobarometer)

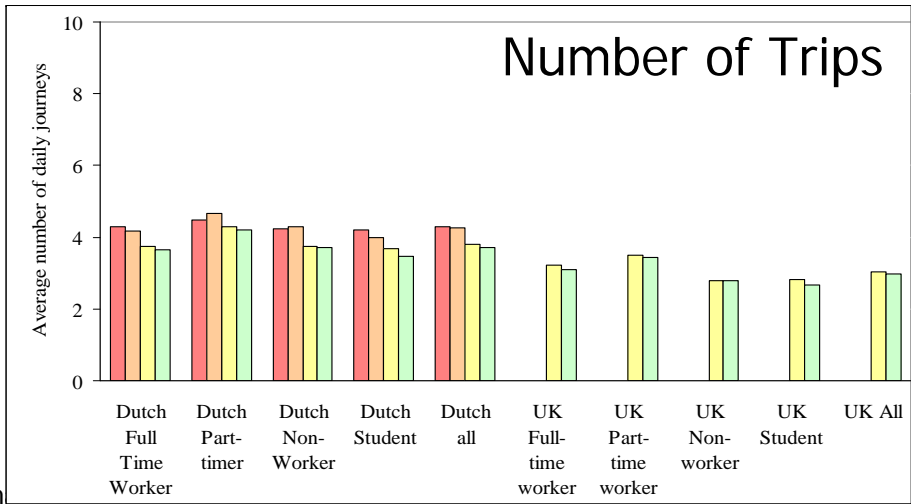
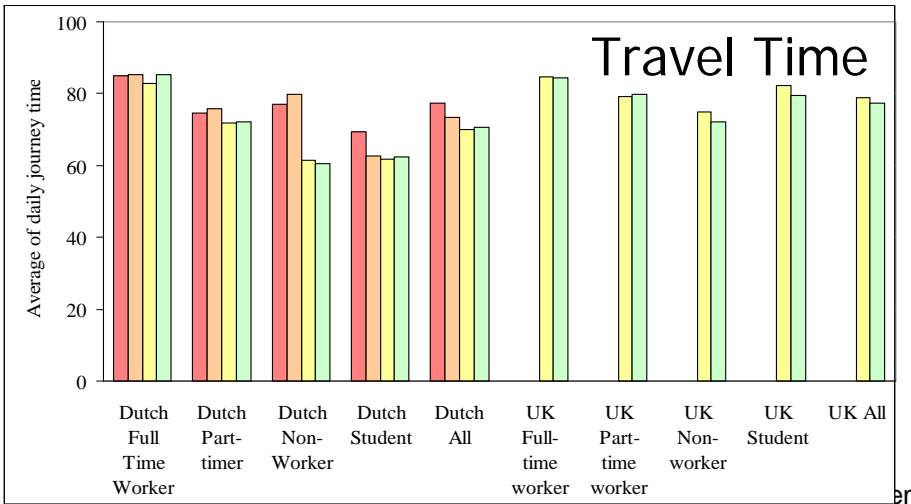
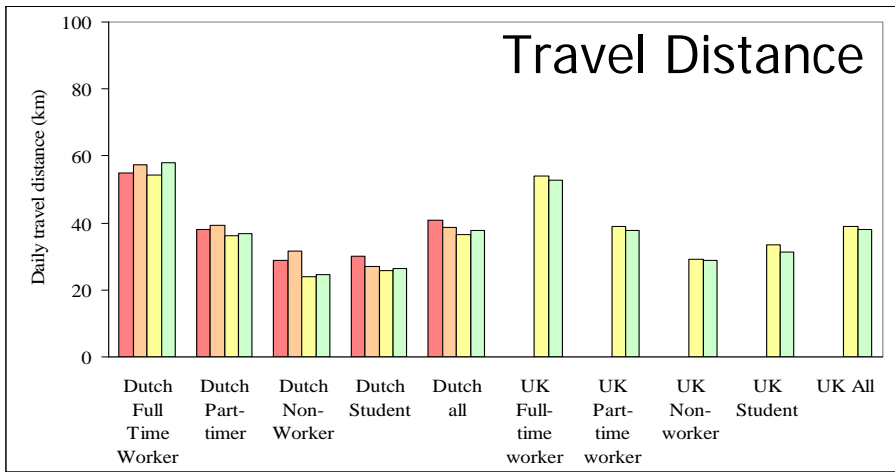
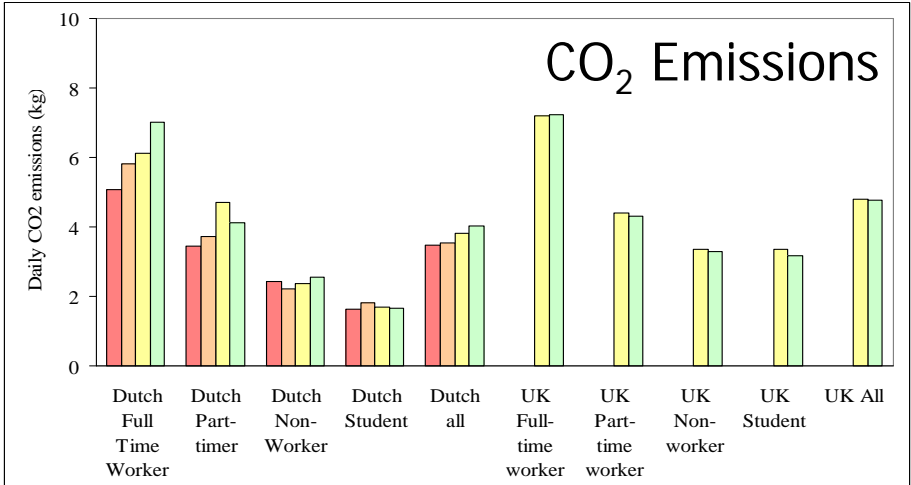


Travel and emissions trends: gender



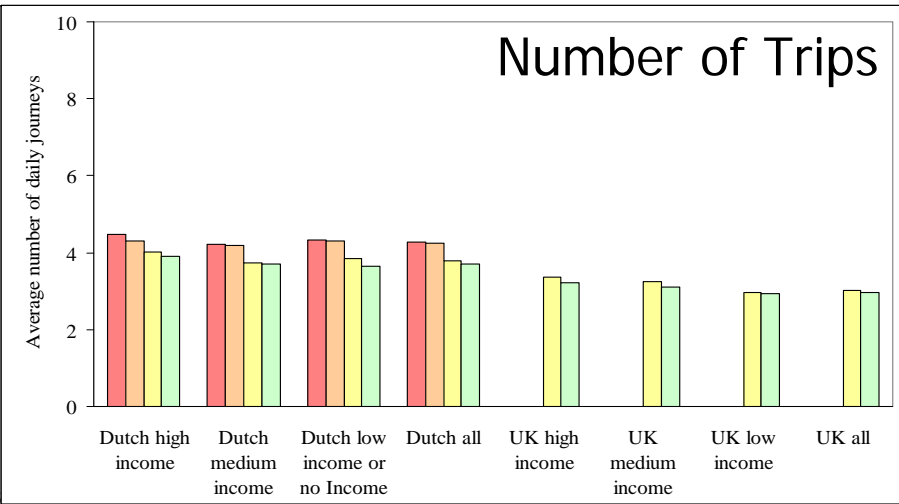
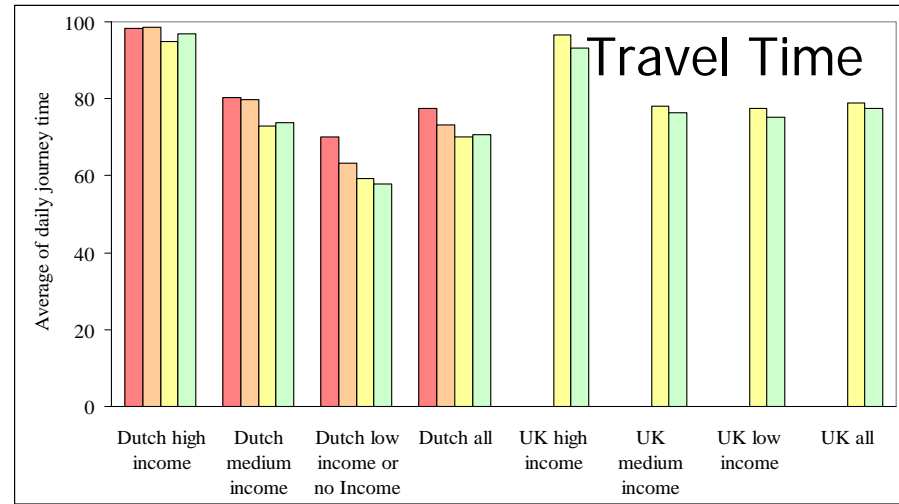
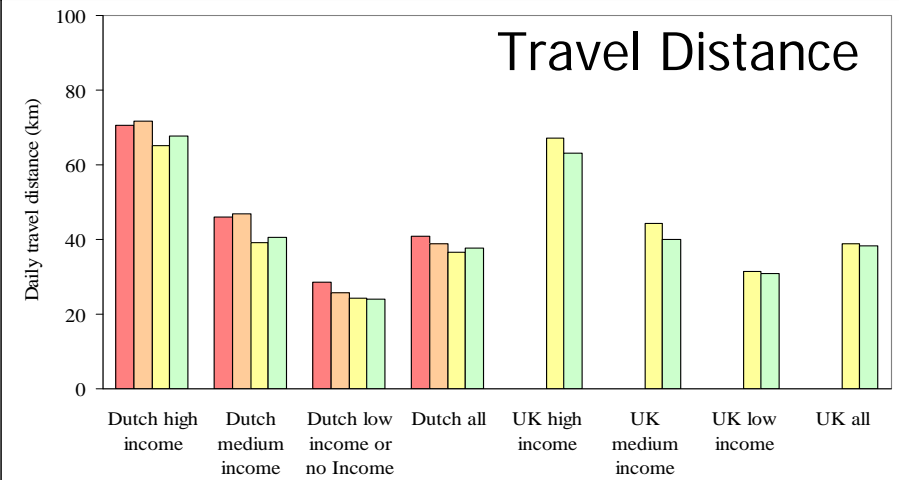
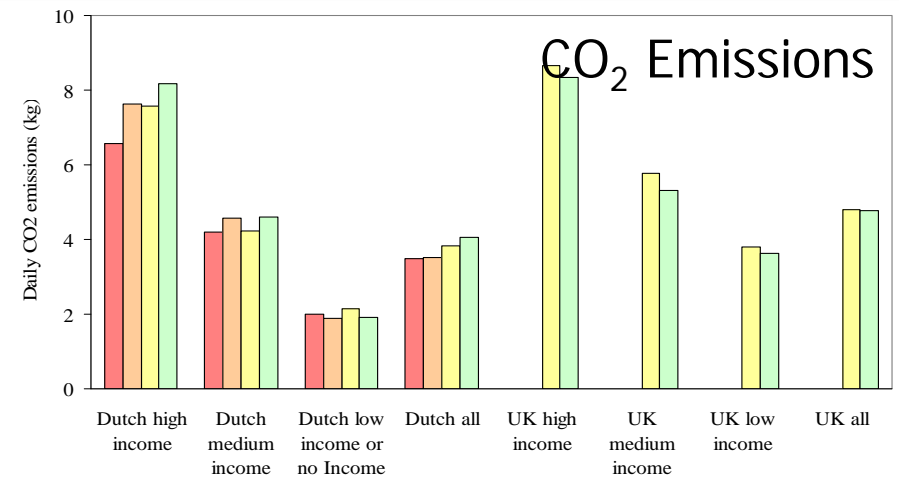
■ 1990
 ■ 1995
 ■ 2000
 ■ 2004 (UK) / 2005 (NL)

Travel and emissions trends: employment



■ 1990
 ■ 1995
 ■ 2000
 ■ 2004 (UK) / 2005 (NL)

Travel and emissions trends: personal income

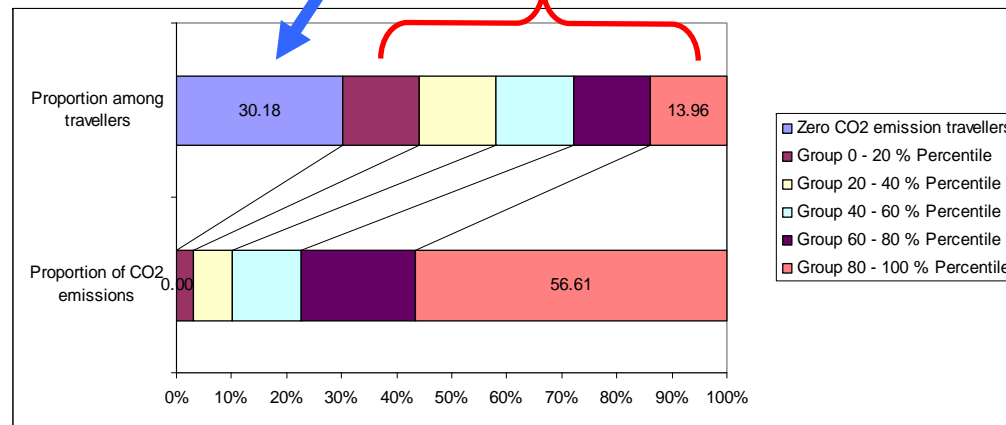


1990 1995 2000 2004 (UK) / 2005 (NL)

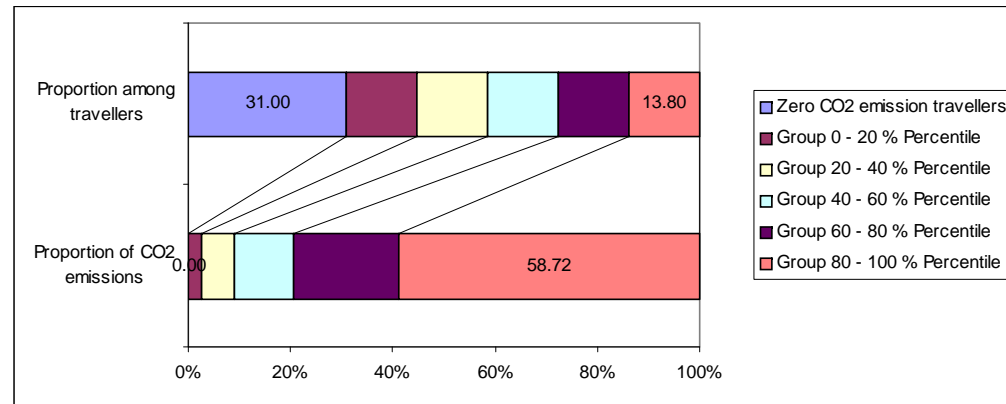
Extremist vs Extremist

In the Netherlands: **Zero emissions travellers** **Percentiles based on daily transport emissions**

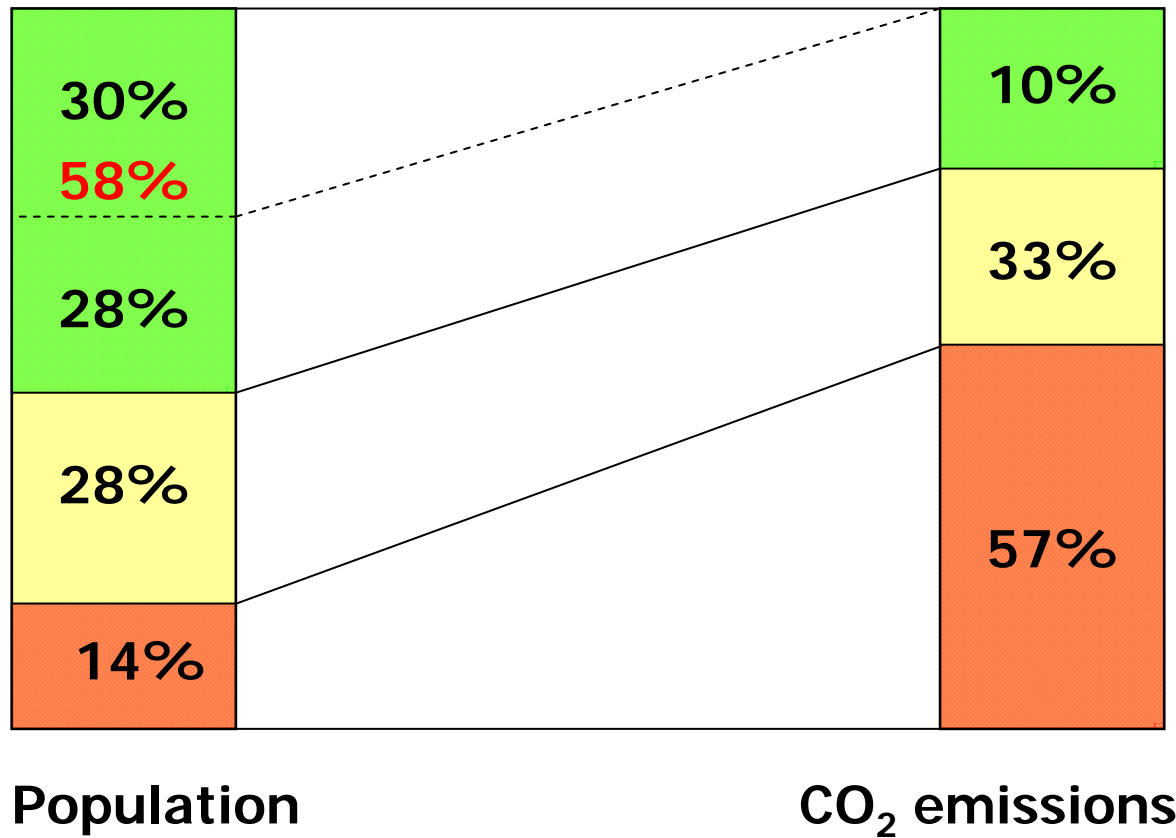
1990:



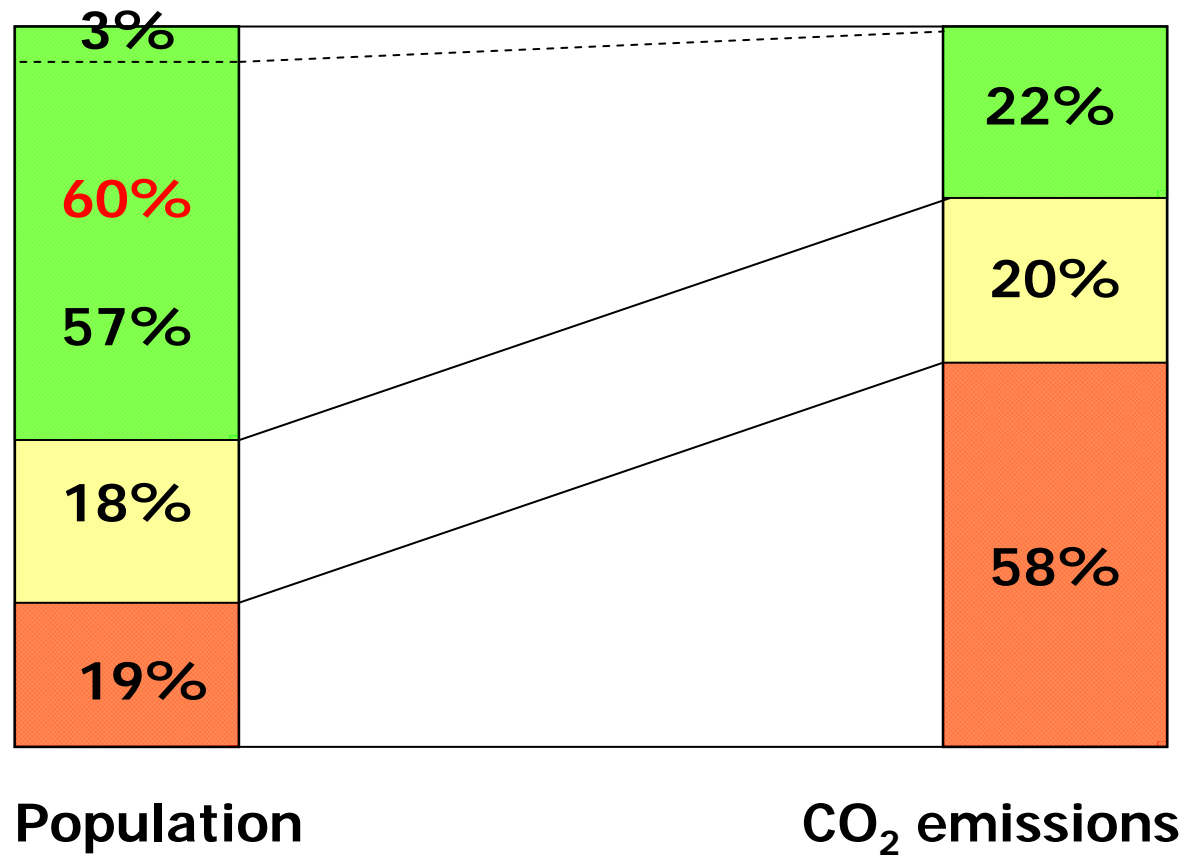
1995:



Extremist vs Extremist (NL)



Extremist vs Extremist (UK)



Socio-economic profile by quintile (NL)

zero emissions	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
30%	14%	14%	14%	14%	14%



↓ age < 24

↓ age > 64

↓ not in work

↑ in full-time work

↑ received higher education

Socio-economic profile by quintile (UK)

zero emissions	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
3%	19%	19%	19%	19%	19%



- ↓ age < 24
- ↓ age > 64
- ↓ not in work
- ↓ low income

- ↑ in full-time work

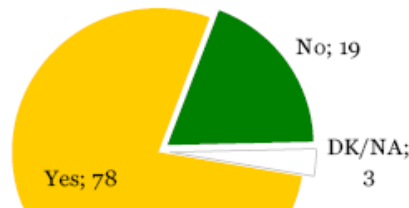
Validity test: Regression analyses

- The most significant variables that influence the amount of CO₂ emissions: car availability, full-time employment, and income
- In the NL:
The influences of car availability and being a full-time workers have continuously increased
 - Car availability: + 2.2, +2.3, + 2.4, + 2.7 kg CO₂
 - Full-time workers: +1.3, +1.4, +2.3, +2.4 kg CO₂
- In the UK:
 - Men: + 1.1, +1.3 kg CO₂ - Full-time workers: +1.9, +1.5 kg CO₂
- Consistent with quintiles analysis:
 - No full-time employment, no car, low income ⇨ lower quintiles
 - Full-time employment, car availability, high income ⇨ higher quintiles

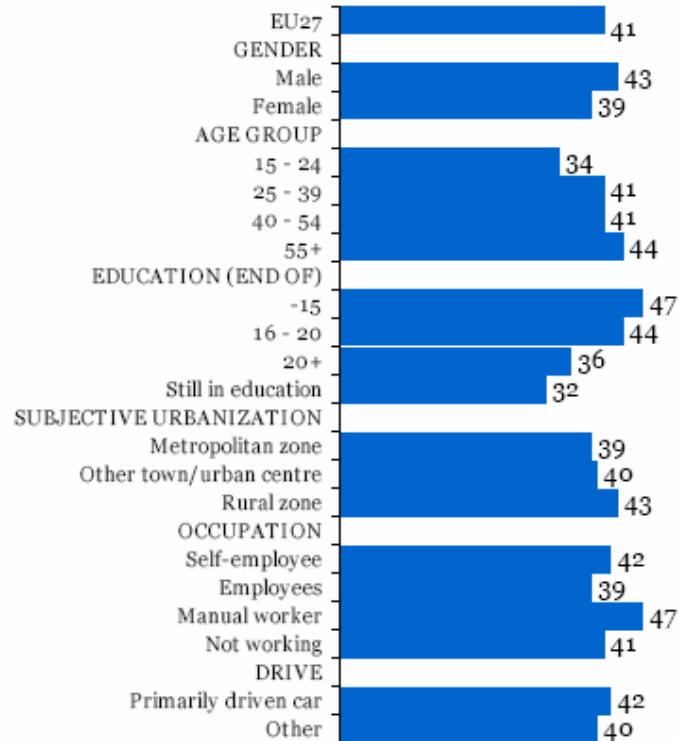
How about the policy
acceptability of these group of
people ?

Mix responses toward various policies

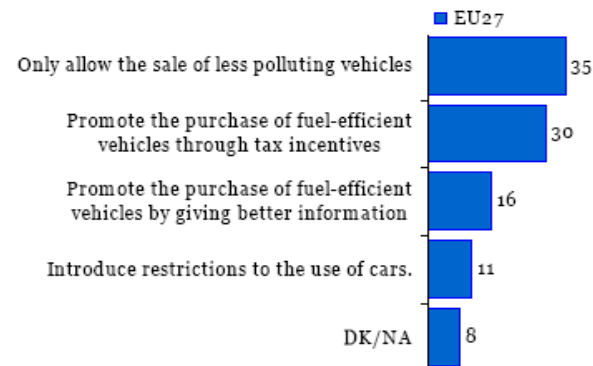
The type of car and the way of its usage has an important impact on the environment in the respondents' area



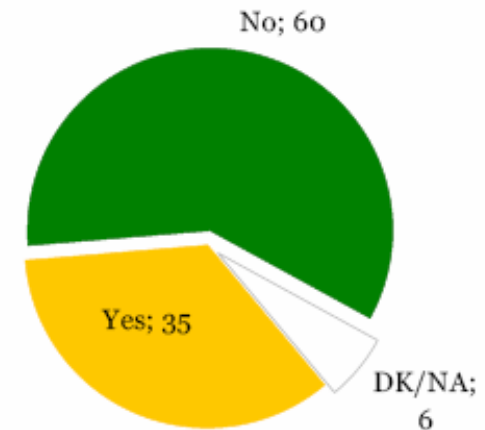
Preparedness to pay more for using a less polluting transport: not prepared to pay more



The best way to reverse the rise of CO₂ emissions from road transport



Paying for congestion and environmental damage through road tolls



Source: EC (2007)

Who support which ?

	Better public transport (%)	Restrictions in city centres (parking, access for private cars or trucks) (%)	Speed limits (%)	Charges for road use (e.g. city tolls) (%)	No need for improvement (%)	Other (%)	DK/NA (%)
Sex:							
Male	49.1	17.9	12.5	5.8	6.3	5.4	3.1
Female	48.0	15.9	20.3	3.9	5.5	2.3	4.2
Age:							
15-24	47.6	20.2	17.1	6.8	4.3	2.1	1.9
25-39	50.7	18.6	15.5	5.0	4.3	3.0	2.8
40-54	53.1	15.1	13.3	5.0	6.4	4.4	2.8
55+	43.1	15.4	10.8	3.9	5.1	1.7	5.0
Age of completing education:			Introduce restrictions to the use of cars (%)	Only allow the sale of less polluting vehicles (%)	Promote the purchase of fuel efficient vehicles by giving better information (%)	Promote the purchase of fuel efficient vehicles through tax incentives (%)	DK/NA
15	44.3	12.1					
16-20	47.7	17.4					
20+	52.6	18.2					
EU27	48.5	16.8					
Sex:							
Male			9.8	33.2	15.5	33.2	8.2
Female			11.6	36.7	17.1	26.8	7.8
Age:							
15-24			11.5	34.7	21.0	28.6	4.2
25-39			8.7	33.9	17.0	35.3	5.1
40-54			10.1	34.3	15.2	32.9	7.5
55+			12.6	36.7	14.6	23.7	12.4
Age of completing education:							
15			14.1	38.1	14.2	20.9	12.6
16-20			9.8	34.4	17.0	31.0	7.9
20+			9.9	33.9	15.8	34.7	5.7
EU27			10.8	35.0	16.3	29.9	8.0

4th Inte

Roughly speaking ...

zero emissions	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile

Different attitudes and opinions across the quintiles

 Better public transport

 Road user charges


 City centre restrictions


 Tolls for congestion

 Better public transport

 Road user charges

 Restrictions in car use

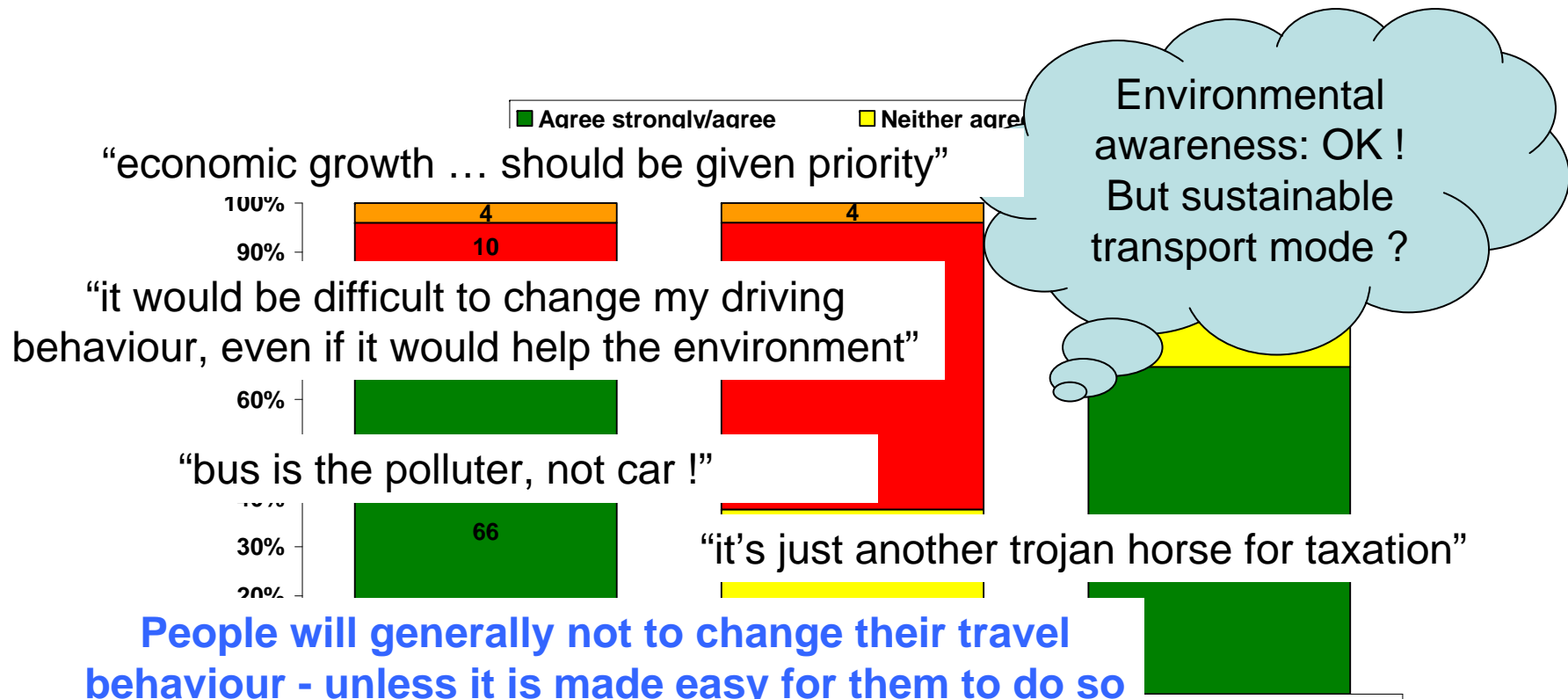
 Tolls for congestion

 Tax incentives for cleaner vehicles

Mostly agreed: clean car !

Based on secondary data, need for further analyses

Recent attitude evidences in the UK



People will generally not to change their travel behaviour - unless it is made easy for them to do so **AND** there is a clear direct benefit from them ...

... people who drive less mentally harmful cars should pay less to use the road

... is wrong - one person doesn't

... reduce how much they use their car

KEY: help people to understand their proxy benefit from the measurements and understand their readiness to change their behaviour

Summary

- Trends and differences between two countries
- Zero emissions group – generally not the well-off, well-educated full-time workers
- High emissions group – fastest growth in CO₂ emissions
- Reduction of emissions in upper quintile by a given proportion will lead to a larger reduction in CO₂ emissions than by the same proportion across all the other quintiles
- Certain instruments (e.g. fuel pricing, vehicle maintenance programmes) are regressive and may affect the greatest emitters least → targeting
- Groups responsible for high CO₂ emissions less supportive of measures to reduce emissions
- **Key:** understanding behaviour and interest of different segment of the population → different needs and readiness to change their behaviour

Questions ?