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Pilot project on kilometre charge for cars in Brussels Regional Express Network zone

Inge Mayeres (VITO, KU Leuven)

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1. GENERAL INFORMATION

Aims of the project

- » Study commissioned by the Flemish government, together with the Walloon Region and the Brussels Capital Region.
- » To what extent are the short run transport decisions of car users influenced by the introduction of road pricing in the BREN-zone? What are the **behavioural impacts**?
- » How are the behavioural changes affected by:
 - » Availability of public transport alternatives
 - » Socio-economic variables: income, household composition, availability of a company car,...
- » What is the **acceptability** of road pricing among car users and which factors explain the attitudes of car users w.r.t. road pricing?

Scientific and interdisciplinary approach

- » **PwC: coordinator.**
- » **VITO: scientific approach and analysis of the results.**
- » **Touring: expertise on Belgian mobility problems and first contact point for the participants, via its helpdesk facilities.**
- » **Magicview: technical aspects** (on-board units; website for the participants; back office).
- » **GfK Belgium: recruitment of representative sample of participants.**

The scientific approach and results were analysed and validated by an **International Scientific Committee**

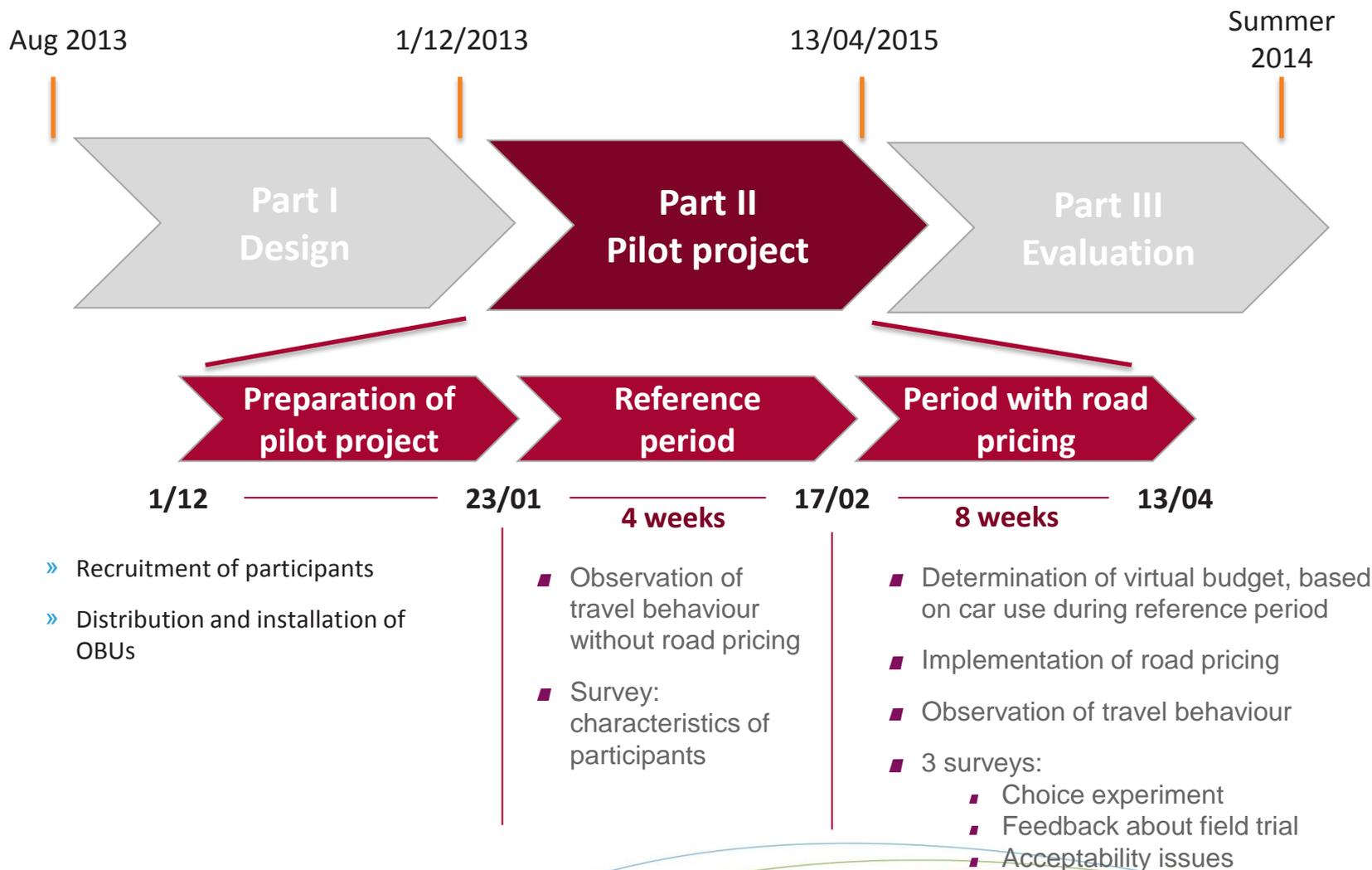
Prof. Dr. Bruno De Borger Universiteit Antwerpen, Belgium	Prof. Dr. Pierre Lannoy Université Libre De Bruxelles, Belgium
Prof. Dr. Jonas Eliasson Royal Institute of Technology, Sweden	Prof. Dr. Jens Schade Technische Universität Dresden, Germany
Prof. Dr. Bart Jourquin Université de Louvain, Belgium	Dr. Kurt Van Dender OECD, Head of the Tax and Environment Unit, France

Scope of the project

- » Pilot project on road pricing of passenger cars in the **Brussels Regional Express Network zone**
- » +/- 1000 participants:
 - » quota sampling of people living in the BREN-zone (& with a job in the BREN-zone, if employed)
- » During the field trial
 - » Participants had hands-on experience of road pricing
 - » Participants have completed 4 online questionnaires about their socio-economic characteristics, travel choices and attitudes



Time line





2. THE CHARGING SCHEME



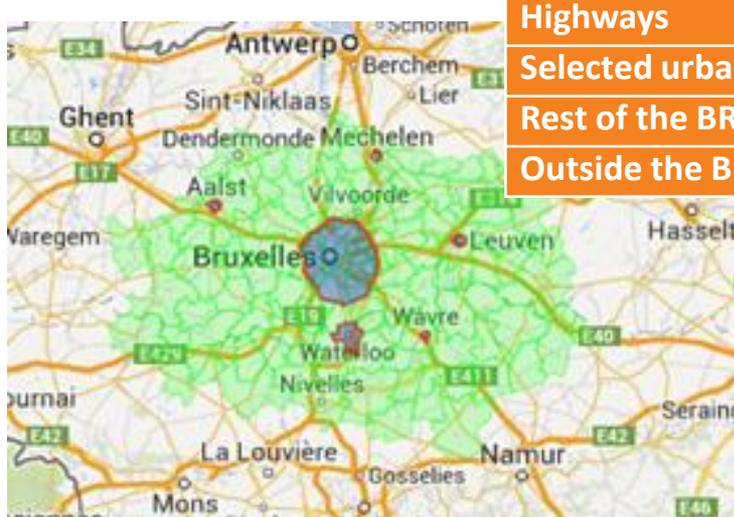
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The charging scheme

» Km charge levels

Eurocent/ car km	Peak	Off-peak	Rest of the day
Highways	5.00	2.50	0.00
Selected urban areas	9.00	4.50	0.00
Rest of the BREN-zone	6.50	3.25	0.00
Outside the BREN-zone	0.00	0.00	0.00



» Km charge periods

	Week	Weekend
05h00 – 07h00	Off-peak	Off-peak
07h00 – 09h00	Peak	
09h00 – 16h00	Off-peak	
16h00 – 18h00	Peak	
18h00 – 22h00	Off-peak	
22h00 – 05h00	Rest of the day	Rest of the day

Budget

- » During the field trial with road pricing the participants received a virtual **budget** based on their car trips during the reference period.
- » They could use this budget to **pay the kilometre charges**.
- » The available budget & the budget already spent on the km charge were published on the personal website and on the OBU during the period with road pricing.
- » At the end of the project, the **remaining budget was paid** to the participants.
- » No extra payment was required at the end of the field trial if the participants used more than their budget.
- » Terms communicated at the end of the reference period.

3. RESULTS

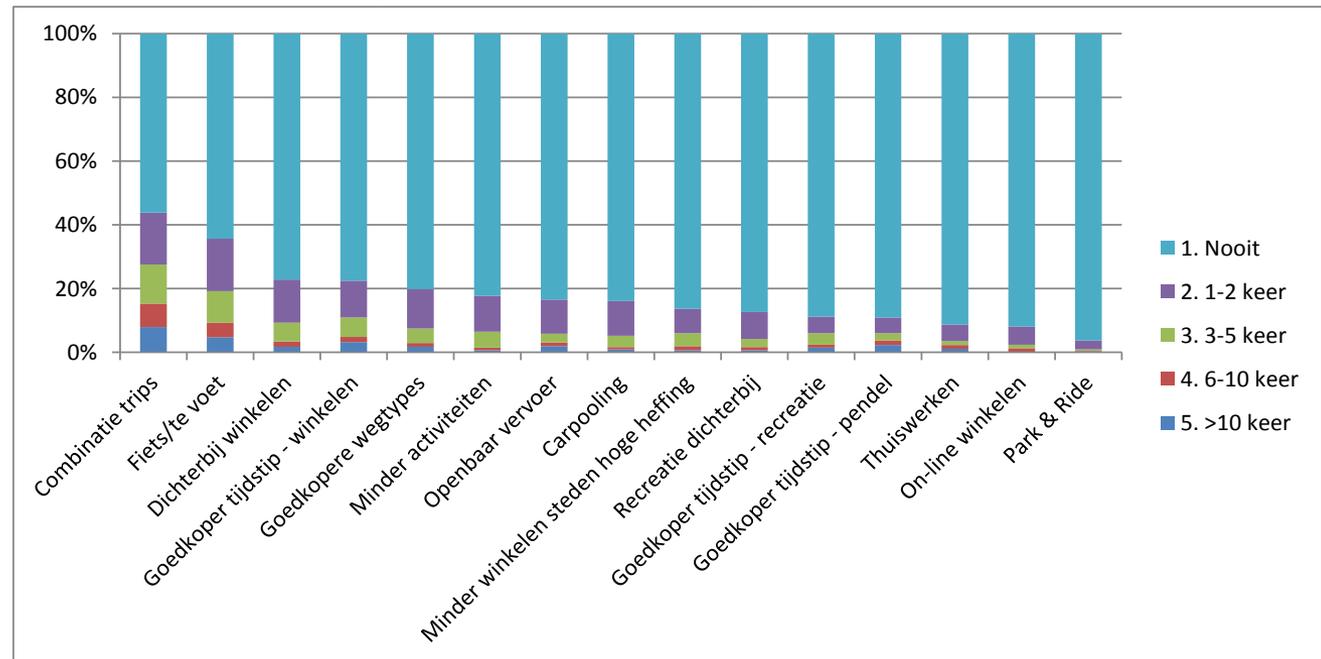
Did the participants change their travel behaviour?

- » General reduction of car km in BREN-zone by 5.5%
- » Shift in road types: from the more expensive to the cheaper road types
 - » Reduction of car km by 8% in urban areas with higher km charge
 - » Smallest reduction on highways (lowest km charge)
 - » Increase by 4% outside of BREN-zone
- » Timing of car travel
 - » 3.6% less car km in peak period
 - » 2% less trips in peak period
- » Weekly budget for km charge decreased compared to reference period for 60% of households.

Did the participants change their travel behaviour?

Which alternatives were chosen?

- » As stated by the participants
- » The most frequently chosen alternatives:
 - » Walking/cycling
 - » Combining trips
 - » Change shopping behaviour (cheaper periods of day or closer to home)



Factors explaining the behavioural changes

- » **The number of trips:**
 - » Falls with the road pricing scheme
 - » Larger reduction:
 - » During school holidays
 - » Households living in an urban area
 - » Smaller reduction:
 - » Households in which one of more of the participants have a season ticket for public transport
 - » Previous experience with carpooling
 - » Car use for professional purposes
- » **The number of car km in the BREN-zone :**
 - » Falls with the road pricing scheme
 - » Larger reduction:
 - » During school holidays
 - » Households living in an urban area
 - » Smaller reduction:
 - » Households in which one of more of the participants have a season ticket for public transport
 - » Elasticity w.r.t. km charge: -0.1

Acceptability of road pricing for car users

- » Survey about acceptability of road pricing by car users [see also Hamilton (2012), Schade & Schlag (2003), Jaensirisak et al. (2005)]
- » First part of survey: Description of pricing scenario
 - » 3 charging structures:
 - » differentiated by time and place (as in field trial)
 - » differentiated by time
 - » differentiated by time and type of car (diesel – gasoline, LPG – other)
 - » 3 charging levels:
 - » low (field trial)
 - » medium (field trial x 2)
 - » High (field trial x 4)
- » Base revenue use: reduction car taxes

Acceptability of road pricing for car users

- » Second part of survey: “If a referendum was organised today on the introduction of road pricing, how would you vote?”
 - » Certainly yes, probably yes, neutral/no opinion, probably no, certainly no

- » Third part of survey: If the measure were changed in the following way, how would this affect your vote?
 - » Accompanying measures
 - » Discount for low income groups/disabled persons
 - » Discount for residents of the urban zones
 - » Fiscal deductibility of road pricing related to commuting
 - » Other revenue uses (various possibilities)

Acceptability of road pricing for car users

- » **Acceptability** of road charging differentiated by time and location
 - » 29.4% “certainly yes” or “probably yes”
 - » 9.3% “neutral/no opinion”
- » **Lower acceptability** among persons who
 - » Indicate that there is a problem with the supply of public transport in their area;
 - » Expect road pricing to have a large impact on their personal costs of car use;
 - » See investments in road transport as the solution to the congestion problems.
- » **No impact or small impact on acceptability of:**
 - » Level of the kilometre charge
 - » Socio-economic characteristics of the participants
 - » Location of residence of the participants
 - » Degree of urbanisation of residence
- » **Acceptability increases** with earmarking revenues and accompanying measures; Highest increase:
 - » Lower income taxation
 - » Fiscal deductibility
 - » Use of revenues for investment in pedestrian and cycling infrastructure or to increase public transport supply

Acceptability of road pricing for car users

- » Acceptability levels are **comparable** to ex-ante acceptability for road pricing projects abroad.
- » **Ex-post acceptability of road pricing often higher**, due to several reasons:
 - » people experience the benefits of the system;
 - » people have a better idea of the technology and the impacts on themselves (De Borger & Proost, 2012);
 - » accompanying improvements in the transport system (Odeck & Bråthen, 2002);
 - » cognitive dissonance (Shade & Baum, 2007);
 - » status quo bias (Börjesson, Eliasson & Hamilton, 2014).

Concluding remarks

Given the set-up of the pilot project, the behavioural effects may be larger with a definitive roll-out on a large scale:

- » **Time horizon:** only short run effects are measured. One can expect the changes (price elasticity) to be larger in the long run, because there are more possibilities to adapt. Structural changes are more difficult in the short run (e.g. moving house, finding a carpool partner,...).
- » **Temporary project:** Since it is a temporary project, the urge to find new solutions is smaller than with a definitive roll-out.
- » **Level of the kilometre charges:** the project used relatively low charging levels (as pointed out by the International Scientific Committee). A higher level (for some periods) could lead to stronger impacts.
- » **Availability, price and quality of the alternatives:** As more attractive alternatives become available, the price elasticity increases. In the pilot project there were no changes in the set of alternatives.
- » An extra strong reaction because of the introduction of a new measure does not seem to have taken place during the pilot project.