Small Communities: Big Ideas

CIVITAS Forum - Session A3:

Session A3: Enabling innovation for public transport in cities

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CIPTEC
COLLECTIVE INNOVATION FOR PUBLIC TRANSPORT

Applying marketing research methods to investigate users' preferences regarding Public Transport innovations and revealing hidden groups

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Presentation structure

- Why conjoint analysis?
- Research design, tools & methods
- 1st survey – MaxDiff
- 2nd survey – CBC
- Conclusions

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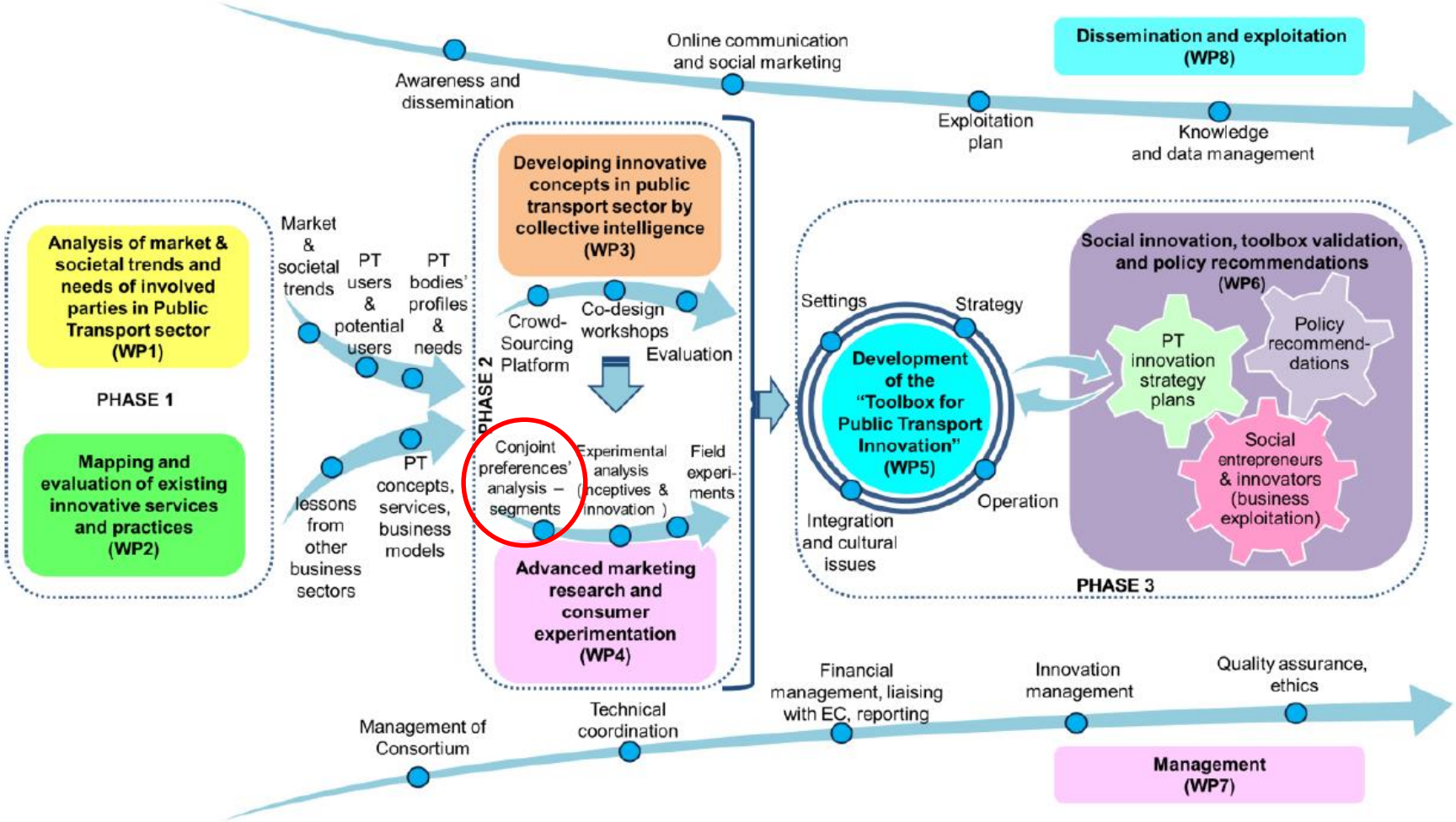
Why Conjoint Analysis?



Why Conjoint Analysis?

- In the case of innovative concepts, **there is a need to support decision makers with fresh knowledge** as there is little evidence regarding their acceptability, in order to:
  - customize their new offers (according to the preferences),
  - avoid costs (e.g. providing something without demand), and
  - improve the appeal of these new services (to all or to certain target groups).
- CIPTEC addressed this issue by applying a Conjoint Analysis, the standard method for optimizing new products & services.

Preparation

175 innov. (Brainstorming session)

Survey 1 (MaxDiff)

Narrowing down the list of 27 innovations in PT to 11

Survey 2 (CBC)

- *General preferences*
- *Reveal hidden groups*
- *Simulation for introducing innovative solutions*

- ✓ Sawtooth software platform
- ✓ Snowballing sampling (S1)
- ✓ Crowdflower (S2)

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Research design

The work in CIPTEC was organized in two main pillars:

1. Survey 1 aiming to:
   - narrow down the initial list of innovations (from WP2), mainly using MaxDiff method (effective for large number of attributes).
2. Survey 2 aiming to:
   - find preferences for the selected of innovations from Survey 1,
   - reveal potential hidden user groups (segments) based on pertinent preferences, using CBC method for both, and
   - examine alternative scenarios regarding respondents' willingness to use PT following the implementation of these innovations, using CA simulation.

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Tools and methods

- **Sawtooth software platform:**
  - Maximum Difference Scaling (MaxDiff) method (S1)
  - Choice-Based Conjoint (CBC) (S2)
  - Simulation (S2)
- **Sampling:**
  - Snowball sampling through contact lists (S1)
  - CrowdFlower platform (S2)
- **An ad-hoc collaborative team of CIPTEC partners (viz. Tero, AUTh, KUL) was setup to work on T4.1.**

1st survey: overview

- ✓ Data collection: **September until November 2016**.
- ✓ **362 respondents** from different European countries.
- ✓ **MaxDiff analysis** applied on the 27 innovations:
  - 6 demographic questions (gender, age, country, city, spatial context, and social group),
  - 14 MaxDiff dynamically created tasks: each had a list of 6 innovations to indicate which is the most important and the least important, and
  - 7 general questions regarding mobility.

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1st survey: questionnaire

1. Please provide your Gender:
- Female
- Male

2. Please provide your age:

3. Please provide your country of RESIDENCE:

4. Please provide your city of reference:

5. In what spatial context do you live in?
- City centre
- Urban area
- Suburban area
- Rural area
- Other:

6. In which of the social groups below do you belong?
- Pupil-Student
- Private sector employee
- Civil Servant
- Self-employed/Entrepreneur
- Retired
- Unemployed
- Other:

7. Please consider how important different innovations/features are when using a public transport service (move the mouse over the innovation/feature for a detailed description).
Considering only these features, which is the Most Important and which is the Least Important?

(1 of 14)

Most Important		Least Important
	Customised travel information for specific groups (e.g. tourists, disabled, etc.)	
	Free battery charging	
	Assistance for special user groups (elderly, disabled, children, etc.)	
	Payment by SMS	
	Real-time travel information at Public Transport stops	
	Free/Improved WiFi	

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1st survey: Maxdiff results

Innovations ranked based on the score (HB) resulted from the Maxdiff analysis

a/a	Innovations
1	Real-time travel information at Public Transport stops
2	Integrated real-time GPS and other information for all transport modes
3	High efficiency bus system with exclusive lanes (Bus Rapid Transit-BRT)
4	Real-time travel information applications
5	Smart card for all mobility needs
6	Special pricing for commuters and loyal PT users
7	Assistance for special user groups (elderly, disabled, children, etc.)
8	Intercity stations served by express bus routes
9	One-stop-shop mobility platform
10	Payment by Card (e.g. credit card, smartcard)
11	Customized travel information for specific groups (e.g. tourists, disabled, etc
12	…..

2nd survey (CBC): overview

- ✓ Data collection: **January 2017 until February 2017.**
- ✓ **805 respondents** from different European countries.
- ✓ **CBC analysis** performed on the 11 innovations:
  - 12 CBC dynamically created tasks: each had 3 PT service scenarios (composed from some of the 11 innovations + price increase), to select the most preferable or “None”.
  - The same questions as in MaxDiff regarding demographics and mobility.

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2nd survey (CBC): questionnaire

If these were your only options, which would you choose? Choose by clicking one of the buttons below:

(1 of 12)

Option 1	Option 2	Option 3	NONE
Real-time travel information app	Real-time travel information at Public Transport stops	Customised travel information for specific groups (e.g. tourists, disabled, etc.)	I wouldn't choose any of these.
Integrated real-time GPS and other information for all transport modes	One-stop-shop mobility platform	Integrated real-time GPS and other information for all transport modes	
Assistance for special user groups (elderly, disabled, children, etc.)	4%-7% Increase in the current ticket price	Payment by Card (e.g. credit card, smartcard)	
Intercity stations served by express bus routes		Intercity stations served by express bus routes	
Smart card for all mobility needs		High efficiency bus system with exclusive lanes (BRT)	
Special pricing for commuters and loyal PT users		Smart card for all mobility needs	
7%-10% Increase in the current ticket price		Special pricing for commuters and loyal PT users	
		1%-4% Increase in the current ticket price	
○	○	○	○

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2nd survey (CBC): results

Innovations ranked based on the score resulted from the Choice Based Conjoint (CBC) analysis

a/a	Innovations
1	High efficiency bus system with exclusive lanes (BRT)
2	Real-time travel information applications
3	Special pricing for commuters and loyal PT users
4	Real-time travel information at Public Transport stops
5	Assistance for special user groups (elderly, disabled, children, etc.)
6	Payment by Card (e.g. credit card, smartcard)
7	Intercity stations served by express bus routes
8	Integrated real-time GPS and other information for all transport modes
9	Customised travel info for specific groups (e.g. tourists, disabled, etc.)
10	Smart card for all mobility needs
11	One-stop-shop mobility platform

2nd survey (CBC): factor analysis

Innovations	Factor 1 (special groups)	Factor 2 (high efficiency)	Factor 3 (integration of services)	Factor 4 (real time travel info)
Real-time travel information applications				√
Real-time travel information at PT stops				√
Customized travel information for specific groups (e.g. tourists, disabled, etc)	√			
Integrated real-time GPS and other information for all transport modes			√	
Assistance for special user groups (elderly, disabled, children, etc.)	√			
Payment by Card (e.g. credit card, smartcard)		√		
Intercity stations served by express bus routes			√	
High effic. bus system with excl. lanes (BRT)		√		
Smart card for all mobility needs			√	
One-stop-shop mobility platform		√		
Special pricing for comm. and loyal PT users	√			

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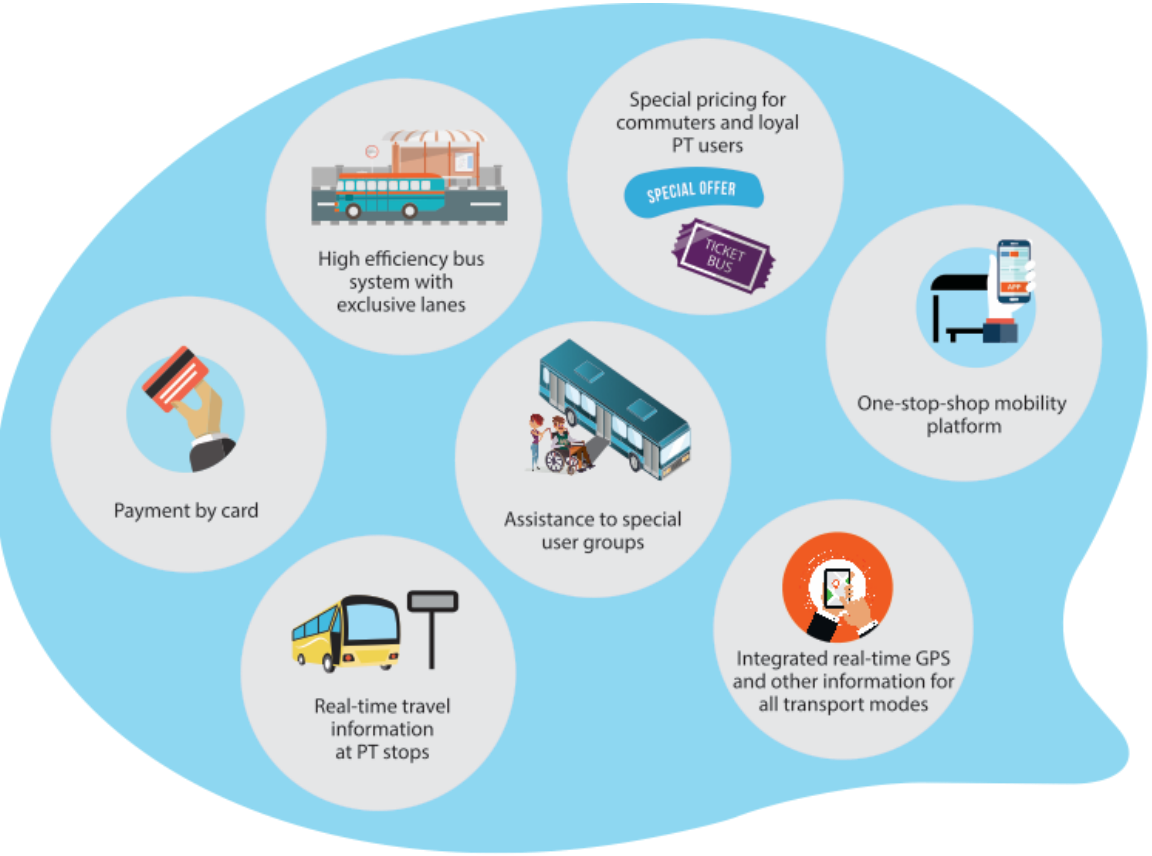
Hidden group 1



Group 1

- Urban dweller
- Weekly trips: Pedestrian or by private car
- PT only out of necessity
- 0-10% of monthly budget spent for mobility issues
- Ready to change mobility habits

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Hidden groups 2 & 3

Group 2

- Lives in urban or suburban area
- Weekly trips mostly by private car
- Not frequent PT user
- 0-10% of monthly budget spent for mobility issues
- Sensitive to price increase
- Not willing to change travel behaviour
- Most likely to never have had a traffic accident

Special pricing for commuters and loyal PT users

Assistance to special user groups

Group 3

- Urban dweller
- Weekly trips mostly on foot
- PT user mostly out of necessity
- 11-20% of monthly budget spent for mobility issues
- Moderately ready to change travel behaviour
- Most likely to never have had a traffic accident

Real-time information applications

Smart cards for all mobility needs

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Hidden groups 4 & 5

Group 4

- Urban dweller
- Weekly trips mostly by private car
- PT user mostly out of necessity
- 0-10% of monthly budget spent for mobility issues
- Not ready to change travel behaviour
- Never have had a traffic accident

Real-time travel information at PT stops

High efficiency bus system with exclusive lanes

Group 5

- Urban dweller
- Weekly trips mostly on foot or by private car
- PT user mostly out of necessity
- 0-10% of monthly budget spent for mobility issues
- Ready to change travel behaviour
- Most likely to never have had a traffic accident

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Hidden groups 6 & 7

Group 6

- Urban dweller
- Weekly trips mostly on foot
- PT user mostly out of necessity
- 0-10% of monthly budget spent for mobility issues
- Moderately ready to change travel behaviour
- Most likely to never have had a traffic accident

Integrated real-time GPS and other information for all transport modes

Customized travel information for specific groups

Assistance to special user groups

Group 7

- Urban dweller
- Weekly trips mostly on foot
- Not frequent PT users
- 0-10% of monthly budget spent for mobility issues
- Not ready to change travel behaviour
- Either never have had a traffic accident or one with only minor damages

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2nd survey (CBC): increase (1-4% in. price)

Innovations ranked based on the percentage of the 'PT choice increase' given a price increase of 1-4%

Innovation - Scores
High efficiency bus system with exclusive lanes (BRT)
Real-time travel information applications
Real-time travel information at Public Transport stops
Special pricing for commuters and loyal PT users
Intercity stations served by express bus routes
Integrated real-time GPS and other information for all transport modes
Assistance for special user groups (elderly, disabled, children, etc.)
Payment by Card (e.g. credit card, smartcard)
Smart card for all mobility needs
Customized travel information for specific groups (e.g. tourists, disabled, etc)
One-stop-shop mobility platform

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Conclusions

- ✓ The 11 most preferred innovations were highlighted (the 5 most important of which follow):
  1. High efficiency bus system with exclusive lanes (BRT)
  2. Real-time travel information applications
  3. Real-time travel information at PT stops
  4. Special pricing for commuters and loyal PT users
  5. Intercity stations served by express bus routes

- ✓ There are innovations that can be categorized into 4 larger factors according to user preferences:
  1. Related to special groups
  2. High efficiency of the innovations
  3. Integration of services
  4. Real-time travel information

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Conclusions

- ✓ Hidden groups were revealed, most of which (2 to 6) were highly sensitive to an increase of ticket price.
- ✓ The introduction of each innovation even with a 1%-4% increase in ticket price increases the modal share of PT.
- ✓ Even a larger increase could be accepted in certain cases.
- ✓ The introduction of combined sets of innovations has multiplier effects on modal share of PT, when these sets are relevant to the factors and the needs of the hidden groups.
- ✓ Introducing the “wrong” innovations could result in marginal effects: innovations should be strategically selected and rolled out in order to take advantage of the synergetic and multiplier effects.

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Conclusions

- ✓ PTAs, PTOs, and practitioners may:
  - use the aforementioned results to decide which innovations should be offered and how much they should charge, and
  - be inspired to employ these marketing research methods (ideally by a rolling CA survey, e.g. every 5 or even more frequently) to modify and diversify their services.

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