POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION

ANNUAL CONFERENCE 2022

30 November
1 December, 2022
Brussels, Belgium

#POLIS2022

Identifying users' needs of vulnerable groups for autonomous vehicles' services: A serious game co-creation approach

1C. Just transition: Everyone - everywhere

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Agenda

- The consortium
- Objectives
- Outcomes
- The Belgian case
  - Research gap
  - Strategy
  - Game sessions
  - The game
  - Results
- Next steps

CATAPULT

LOIs and Test sites:

POLIS

Austria: Aspern mobil Lab, SURAAA, UML Salzburg

Belgium: SADL, TopNoordrand

Sweden: Funktionsrätt Östergötaland, Östgöta Trafiken, Lindköping

CATAPULT has received funding by the European Union's Horizon 2020 research and innovation programme – URBAN EUROPE - Urban Accessibility and Connectivity Joint Call

Objectives

Initiate change in the mobility system towards:

- target group-specific
- inclusive
- demand-oriented automated mobility solutions in cities and urban regions

Outcomes

- Catalogue of needs and requirements of potential user groups of automated mobility services
- Set of use cases and potenital benefits and impacts
- Handbook for co-design and –creation: Serious Game
- Recommendations for policy makers, regional planners, interest groups
- Step-by-step guidelines for public authorities and practitioners for implementation in and transfer to other regions

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The Belgian case

Research gap

Needs of vulnerable groups

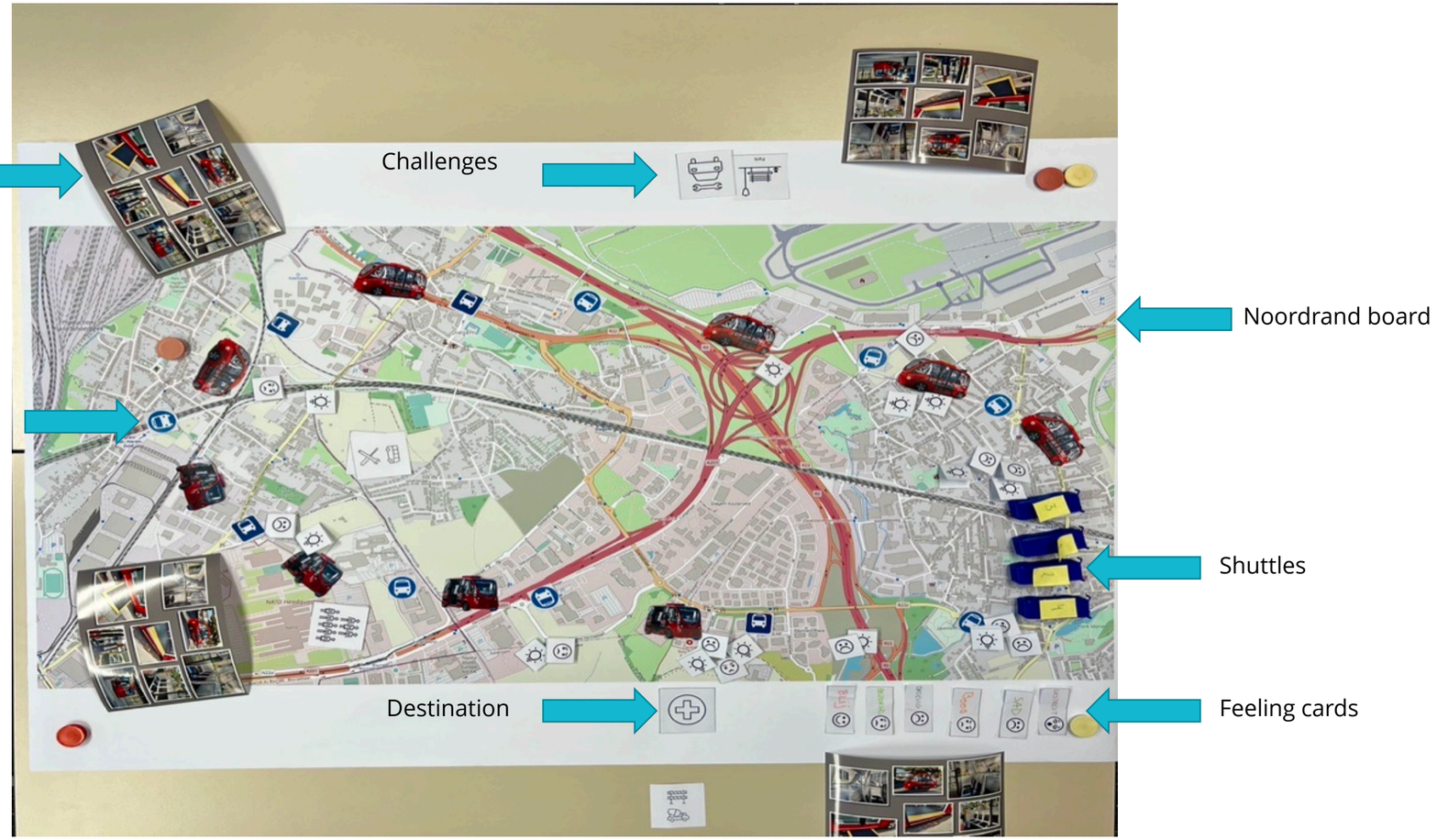
(Source of images, Word office)

Research gap

Anticipatory Needs: identification of future needs based on the current perceptions of non-experts

Strategy: co-creation approach with vulnerable groups

A shuttle for everyone



A shuttle for everyone

Storytelling
Three stages,
Two rounds

Co-creation by nature is often small scale (Brandsen 2021)

Game sessions

Zaventem with Sint-Antonius
March, 2022

KU Leuven with person with impairments
April, 2022

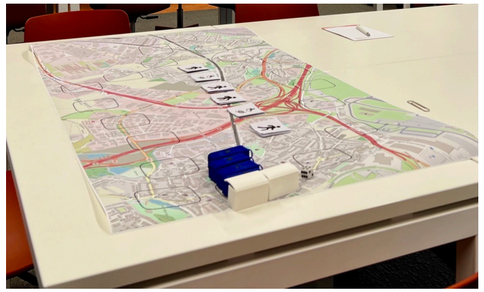
KU Leuven with OKRA
April, 2022

KU Leuven with children
April, 2022

The Game

Presentation:

Instructions:



Results: categories of the results

- Safety refers to the reduction of potential risks for users.
- Ease of use is the “the degree to which a person believes that using a particular system would be free of effort” (Davis, Bagozzi, & Warshaw, 1989, p. 320).
- Accessibility involves different design factors in the automated vehicle that aim to make it accessible for all individuals (Riggs & Pande, 2022).
- Comfort is understood as lack of discomfort of passengers during the ride (Wang, Zhao, Fu, & Li, 2020).

Results

Safety
Emergency bottom
Sufficient poles and handles
Secure access to the vehicle with a rough surface or a heating up area that melts snow (Weatherproof ramp)
Provide information about safety
You can ask for assistance up front (a real-life person). At least the day before
Airbags in the seats
Emergency brake
Ramp and door that can also be controlled manually
Autonomus shuttle connected to emergency services
The shuttle should open automatically in case of a fire
Guidance during all the trip
External cameras to take pics of vehicles disrupting the route and send it to the police
Announcements in different formats to know where they are. It includes screens and voiceover
Redesign the shuttle with two doors
Sounds and warns when bikes or cars are getting close to the vehicle
Communication with operator via the app
Use sounds or flashlights to maintain the distance of the autonomous shuttles with other road users

Results

Ease of use
Easy contact with the operator
Emergency bottom easy to use
Easy access to information of the route via different analogue and digital channels
Clear online Information to educate on the use of the shuttle and what to do in emergencies
Clear and simple design of the bottoms, system, displays and signs
An app that works as user guide
Payment system inside the bus
The screen should include the map with streets and not only the stops (Adults)

Results

Accessibility
Reachable poles and handles
Accessible seats
Sufficient time to access and leave the vehicle
Accessibility also to information of the service
Buttons at knee height
Consider different sizes of wheelchairs
Plenty of places to scan tickets, such as in the seats
Press a button to have more time to leave the shuttle
Sensors or bottoms to leave the doors open longer if needed
When you scan your card: the system knows whether you are a person that needs special attention (that needs more time for example). (children)

Results

Comfort
Enough seats
Public toilets in some stops
Aircon
App that shows the route as well as issues that can be encountered.
App that vibrates or sounds when you must get off the shuttle
App in multiple languages
Leather or similar material that helps to keep it clean
Space for walk aid
Charging stations for phones inside the vehicle
Include in the map of the app the stops that have toilets
Sensors that can allow the shuttle to know if it needs to make the stop, or it can skip such stop if there is no one coming in or out
WIFI in the shuttle

Next steps, SWOT analysis

Strengths	Weaknesses
Emergency button (3.1, 3.2) Fire alarm Video Surveillance (2.2) Ramp and door that can also be controlled manually (3.1, 3.2) Seatbelts (3.1) Announcements in different formats to know where they are, consider the inclusion of both screens and voiceovers (3.2) Use sounds or flashlights to maintain the distance of the autonomous shuttles with other road users. Sounds and warns when bikes or cars are getting close to the vehicle (3.2) The current appearance of the emergency button and the shuttle. Make it colourful or bright colour of the shuttle (3.2) Lack of two doors (they work independently)	Insufficient poles and handles (2.2, 3.1, 3.2) Airbags (3.2) Improve access to the vehicle with a rough surface (it has it now) or a heating-up area that melts snow in the ramp (3.2) (it should not freeze, we are careful not to ride with snow). No information about the current behaviour of the bus or why it is doing what it is doing (3.1) Direct connection to a person for emergencies and an additional emergency number (2.2, 3.1) The noise of the vehicle is difficult to hear (3.1) (louder than a Tesla). There is a ring sound.
Opportunities	**Threats**
Autonomous shuttle connected to emergency services (3.2) Communication with the operator via the app / via the cameras to support interaction between users and operators (3.2) External cameras to take pics of the vehicles disrupting the route and send it to the police (3.2) (privacy issues? German speaking countries) Training for road users how to behave towards an automated shuttle (3.1) (could be added in driving schools)	Lack of a responsible person inside the shuttle, mainly for emergencies and help (2.2, 3.1) (now in pilot, there is an operator) Lack of guidance during the trip (3.2)

Thank you for your attention!

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