Digitally Mediated Urban Mobility: Barrier-free for People with Anxiety Disorders?

Researching Use and Usability of Passenger Assistance Systems and Communicative Support in Vienna's Urban Public Transport.

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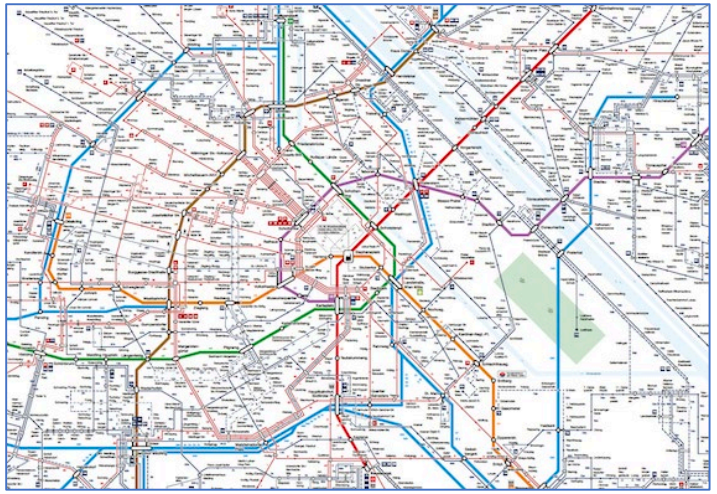
Urban public transport in Vienna, Austria



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- Complex public transport infrastructure
  - Buses, trams, subway, trains
- 2 mio passengers every day (almost)
- High accessibility standards, however:
- **Barrier-free infrastructure does not yet support the needs of people with phobias, anxiety and compulsory disorders**
- Research gap
  - How can information and communication technology (ICT) support accessibility for people with anxiety disorders?

Why is participation in public transport important for people with anxiety disorders?

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- **satisfaction of daily needs:** therapy, doctor visists
- **social needs:** integration in groups, social activities
- **mastering of everyday tasks:** work mobility, shopping

Hauger, Georg; Angelini, Alessandra; Nagler, Matthias; Rohsner, Ulli; Dominko, Christian & Schlembach, Christopher (2019). Access to transport services and participation in traffic for people with mental health diseases—Challenges to meet the UN sustainability goals (SDGs) to provide an overall inclusive transportation system. *IOP Conference Series: Materials Science and Engineering, 603*(2).

“Mobile without Fear”
Research Project in Vienna (2020-2022)

- potential of information and communication technology (ICT)
  - digital route planning applications, real-time location-based services, and future technologies
- to enable people with anxiety disorders
- to use public transport

- interdisciplinary project team
  - communication scientists, traffic psychologists, mobility planners, and experts from public transport provider “Wiener Linien”

https://www.angstfreimobil.at/das-projekt/

Sensitive Method Mix

- 12 qualitative **semi-structured interviews** and 3 accompanied **mobility walks**
- **Purposive Sampling**: 20-59 years old, 7 female, 5 male, wide range of anxiety disorders
- Qualitative content analysis
- High **ethical standards** for academic research

Anxiety disorders

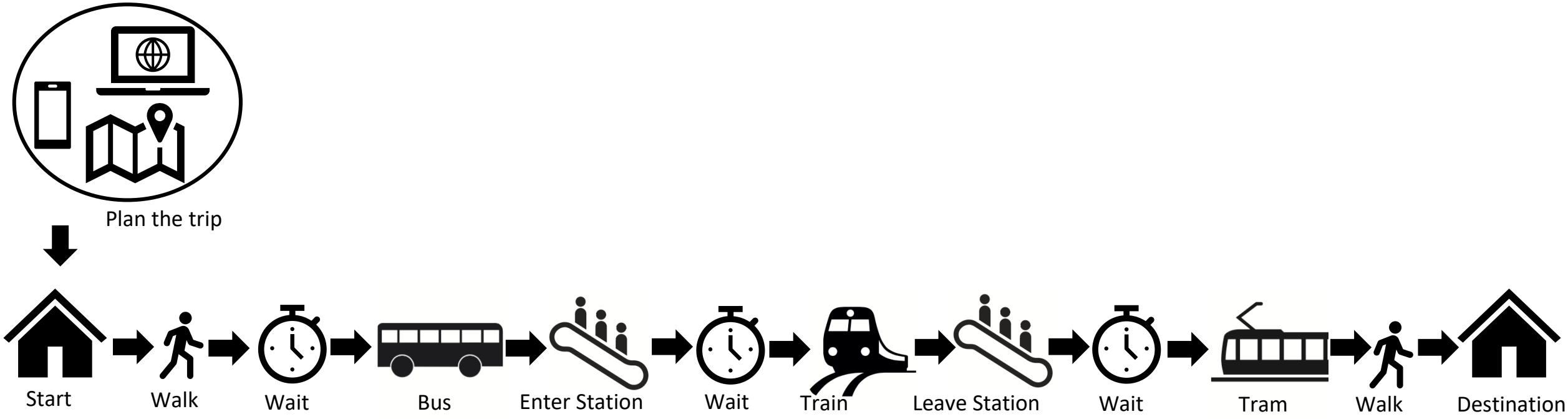
diverse

comprise not only everyday **anxieties, fear**, **and phobias**,

but also obsessive **compulsive disorders, panic attacks** and (not diagnosed) **depression.**

Travel Chain Perspective

*"Applying the travel chain perspective in research emphasizes that all links while moving from origin to destination are included, and **all dimensions of travelling** have to been taken into consideration."* (Carlsson 2004; p. 78)



Carlsson, Gunilla. (2004). Travelling by urban public transport: Exploration of usability problems in a travel chain perspective. Scandinavian Journal of Occupational Therapy - SCAND J OCCUP THER. 11. 78-89.

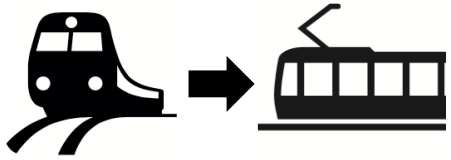
For people with axiety disorders, different parts of a journey with public transport could present as a barrier to travel

Paula, 23

"I'm afraid of not having an escape route. And on public transport you are in a closed vehicle, where you cannot get out at any time."

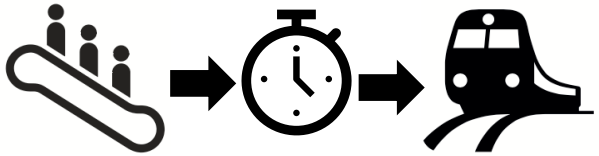
Inge, 37

"Changing lines is very stressful for me: I must not miss the stop where I have to get off. Then I have to look for the next vehicle. And in the worst case I even have to hurry up."



Sarah, 30

"I fear crowds. Environmental changes. Loss of control."



Usability, Accessability and Functional Capacity (Carlsson 2004)

Media domestication (Silverstone, Hirsch & Morley 1994)

Carlsson, Gunilla. (2004). Travelling by urban public transport: Exploration of usability problems in a travel chain perspective. Scandinavian Journal of Occupational Therapy - SCAND J OCCUP THER. 11. 78-89.
Silverstone, Roger; Hirsch, Eric & Morley David (1994). Information and communication technologies and the moral economy of the household. In Roger Silverstone & Eric Hirsch (Hrsg.), Consuming technologies: Media and information in domestic spaces (S.15-31). London: Routledge.

RESULTS: App Use in Sample

YES for **“pre trip”** information

- Control of departure times
- Environmental information
- Individual trip planning/checklists

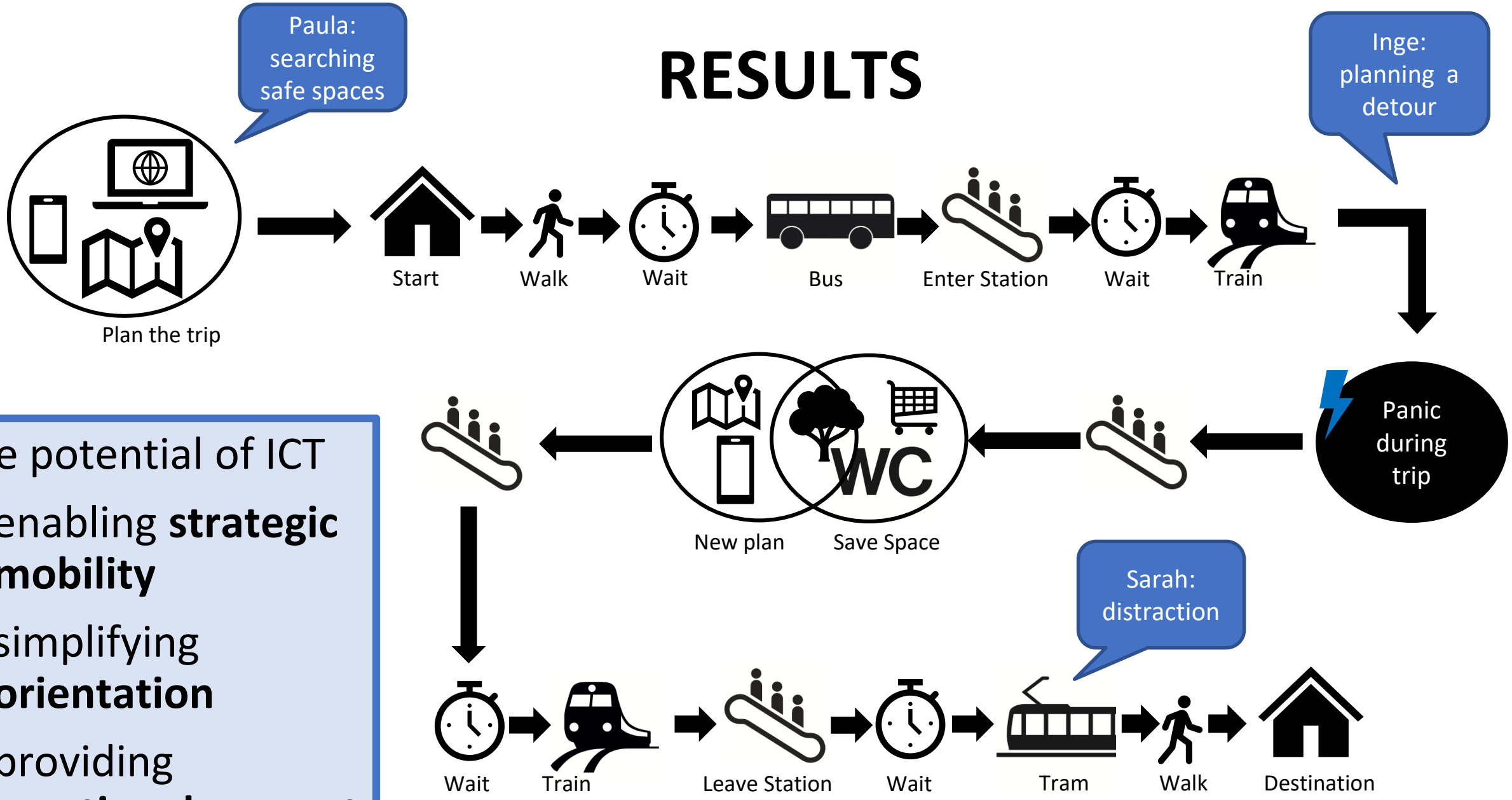
NO for **„on trip“** situations

- Stressful
- Confusing for orientation
- Restricted data volumes
- Lacking access (WLAN)
- Fear of loosing the smartphone

The interviewees

- complain about the poor design: tools lack intuition and convenience
- stress the usability of *Google Maps/Earth* for route planning and overview (shopping areas, restaurants, toilets) “One-Stop-Shop”

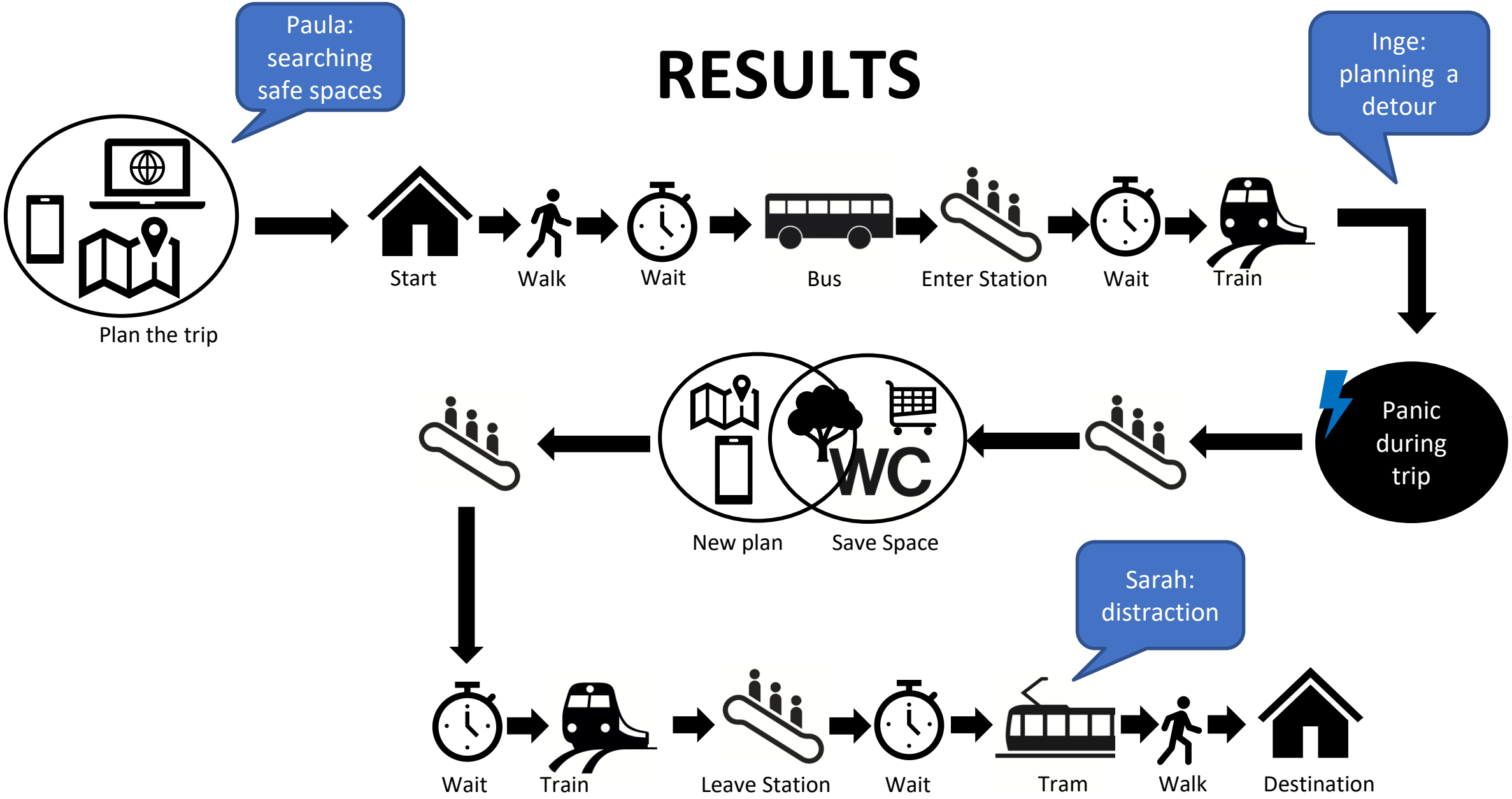
RESULTS



The potential of ICT

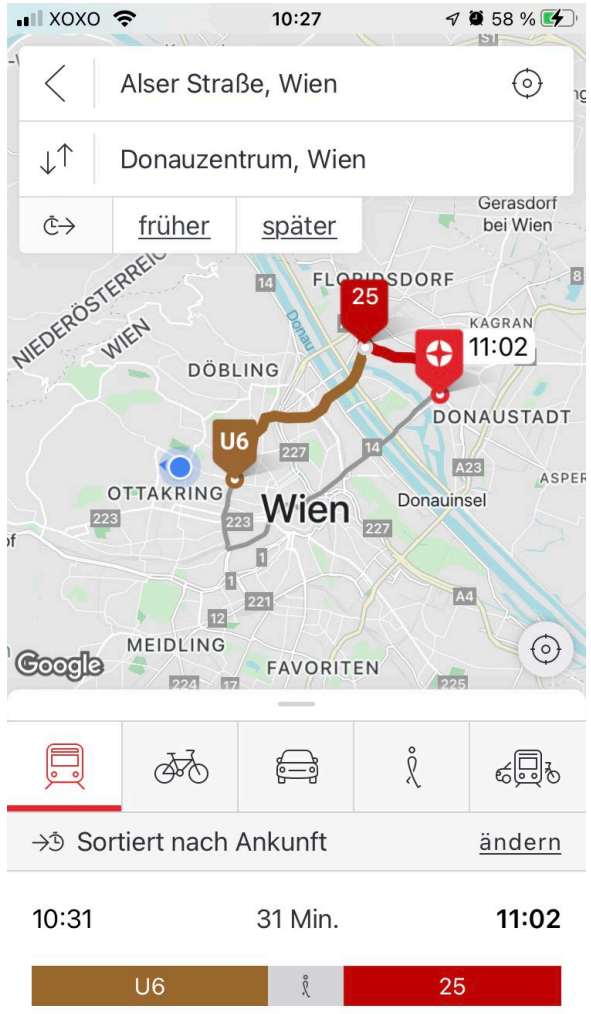
- enabling **strategic mobility**
- simplifying **orientation**
- providing **emotional support**

RESULTS


Paula: searching safe spaces
Inge: planning a detour
Plan the trip
Start
Walk
Wait
Bus
Enter Station
Wait
Train
Panic during trip
New plan
Save Space
WC
Sarah: distraction
Wait
Train
Leave Station
Wait
Tram
Walk
Destination

RESULTS
ICT enables strategic mobility

What helps Paula?
Information!



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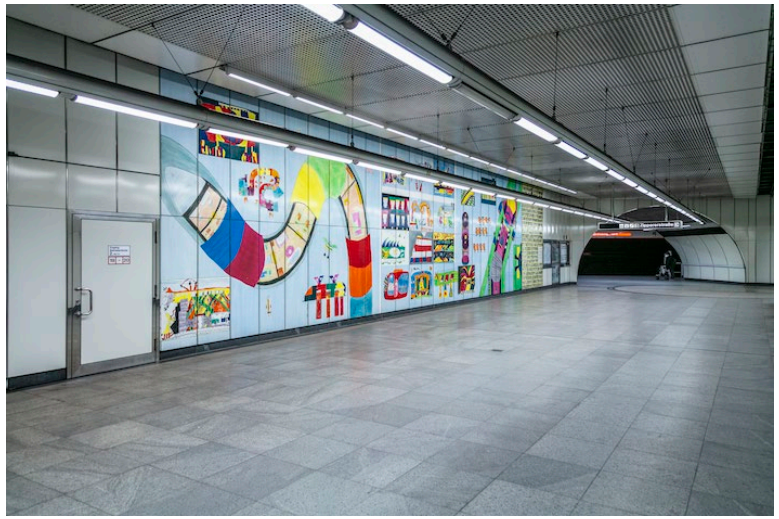
RESULTS
ICT simplifies orientation

What helps Inge?
Organizational support!



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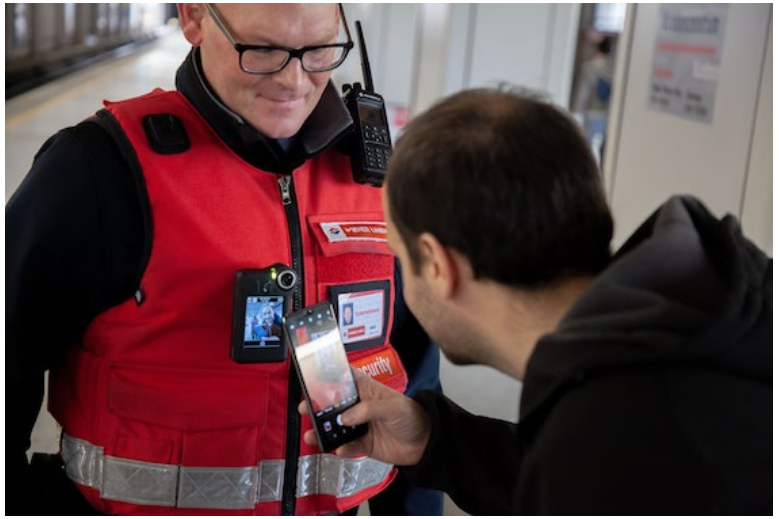

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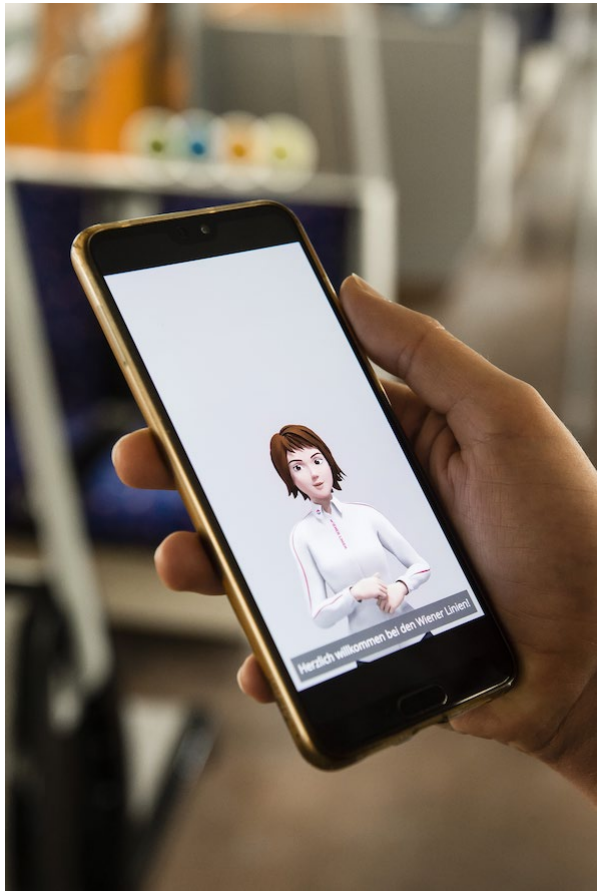

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RESULTS
ICT gives emotional support

What helps Sarah?
Mood management!

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Results
Beyond ICT – what else could help?

- **Deep understanding** and public awareness for anxiety affected passengers (= SOCIAL support)
- **Human interfaces** (trained service personnel in stations and on board) (= EMOTIONAL & SOCIAL support)
- **On trip trainings and tutorials** (= PLANNING and ORGANIZATIONAL support)

Conclusion

- Current ICT planning tools show a lack of usefulness and usability
- People with anxiety disorders require more human interfaces, also via ICT

- All stages of the public transport travel chain should be as predictable as possible:
  - „Easy information is key“
  - „User centered design“
  - „One ICT Solution for all“

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