THE HUMAN FACTOR
OF SUCCESSFUL MOBILITY SOLUTIONS

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CHALLENGES CAUSED BY INCREASING URBAN TRAFFIC

- Safety
- Congestion
- Pollution
- Inequity
- Self driving cars
CHALLENGES CAUSED BY INCREASING URBAN TRAFFIC

- Safety
- Congestion
- Pollution
- Inequity
... AND THE POTENTIAL SOLUTION

Self driving cars
Integrated Mobility Systems
AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

OWNERSHIP STRUCTURE

50.46%
REPUBLIC OF AUSTRIA
(through the Federal Ministry for Transport, Innovation and Technology)

49.54%
FEDERATION OF AUSTRIAN INDUSTRIES

1,300
EMPLOYEES

140m EUR
TOTAL REVENUES

75 m EUR
Contract research revenues (incl. Grants)

46 m EUR
bmvit funding

19 m EUR
Other operating income, incl. Nuclear Engineering Seibersdorf
CENTER FOR MOBILITY SYSTEMS
OUR FOCUS: MOBILITY AS A SYSTEM
Focus topics

- Mobility Data Collection and Analysis
- Integrated Mobility Systems
- Transport Optimization and Logistics
- Road Transport Infrastructure Assessment and Modelling
- Innovative Road Transport Safety
- Reliable and Silent Transport Infrastructure
MOBILITY BEHAVIOUR

CONTEXT

time constraints

means of transport

conditions

HABITUS

information

interests

habit(s), purposes

aversions

attitudes
MODE CHOICE INFLUENCES
CURRENT EXPLANATORY MODELS

Rational Choice Modelling

Theory of Planned Behaviour

- Attitude
- Norm
- Control

Intention → Behaviour

Exogenous Variables
- Income and percent workers who are male

Endogenous Variables
- Use of land
- Auto ownership
- Choice of mode
- Travel time

Exogenous Variables
- Family Size
- Quality of public transport
- Percent workers in labor force
- Land price
MODEL APPROACH

Region:
Spatial structure & culture

Options:
Social Practice Theory
[Reckwitz, 2002]

Decisions:
Dual Process Theory
[Evans & Frankish, 2009]
LOCATION-BASED QUALITY OF TRANSPORT OPTIONS

- Assess the quality of transportation options under sustainability aspects
- Identify group-specific requirements concerning accessibility of facilities
- Gender-oriented evaluation model as information tool or planning instrument
projects TransitBuddy / TransportBuddy
example: riding next to parked cars
the further you are riding

the higher your organization will rank

Distance 5.2 km
Project Virtual Pursuit
INTEGRATED MOBILITY SYSTEMS

... understanding human mobility choices and identifying homogeneous behaviour groups...

... by combining qualitative and quantitative methods and bridging different scientific disciplines ...

... for developing models for impact assessment enabling decision makers to set successful and socially accepted measures for sustainable behaviour change.
RESEARCH DIMENSIONS

Identify
- Consider the complexity of group characteristics
- Define target groups with homogeneous behavior
- Select features determining behavior patterns

Involve
- Select appropriate methods/combinations of methods
- Detect and handle bias
- Modelling behaviour patterns

Inspire
- Develop target-group specific motivation strategies
- Assess effects of implementation
- Select appropriate media and communication channels
Profiles of older people for developing targeted solutions

- Identify **typical combinations** of physical, mental and lifestyle characteristics
- Describe profile-related **mobility barriers** and **transportation needs**
- Define research needs and develop **effective solutions for an ageing society**
Pedestrian typology in shopping environments

- Identify **typical combinations** of motion behaviour and lifestyle characteristics
- Describe **motion patterns** and identify **influence factors**
- Customise **information services, simulation models, shopping environments**
Exploring groups of the transportation disadvantaged

- Definition and identification of **barriers** which impede mobility
- Identification and representative **quantification** of mobility impaired groups
- Develop solutions and measures for improving **equity in mobility**
Evaluating infrastructure designs in a virtual environment

- 3D-Model inside DAVE and VR headsets
- Allows to intuitively navigate in a virtual pedestrian infrastructure
- Include and test guiding systems and planning alternatives
Software solution for automated mode detection on smartphones

- **Travel Mode Identification** and mobility surveys on smartphones
- Cellular Data Analytics and **Mobility Data Exploration**
- Data base for **Travel Time Predictions**
Waiting time perception

- Measure the effect of distracters on the perception of waiting time
- Analyse group-specific reactions and waiting behaviour patterns
- Identify most effective distracters for different types of stations
Game mechanics for motivating informed decisions

- Measure the **effect of specific game mechanics** on target behaviour
- Investigate potential correlations between **player types and mobility styles**
- Focus on **encouraging informed decision making** (not sustainable modes)
Sustainable behaviour driven by fun

- „Green“ routing services are merely used by people with „green“ attitudes
- Provide routing information via a game can raise awareness and interest
- Users learn about qualities of alternative modes / routes (also routine trips)
### Persuasion types for encouraging active mobility

- Use the concept of **social milieus** to disclose mobility-related information needs
- Identify milieu-specific **mentalities, values, preferences and aversions**
- Develop **persuasion types** and strategies for promoting **active mobility**
Future research
USER SEGMENTATION

Value of Travel Time

Digital Divide

Transition Points
SP-OFF-RP SURVEYS
QUICK ASSESSMENT TOOL

LONDON

STATIONS TOTAL: 742
STATIONS TOTAL: 8216

TRIPS TOTAL: 34609
HORINHS: 12314
SHORT TRIPS (6K-14K): 22295

ROUND TRIPS: 1005
SHORT TRIPS (6K-14K): 18019

TRIPS PER MINUTE

INSPIRE
Traffic demand from morning until noon
ACCESSIBILITY HIERARCHY

Proximity

Connectivity

Mobility
MERCI!

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