



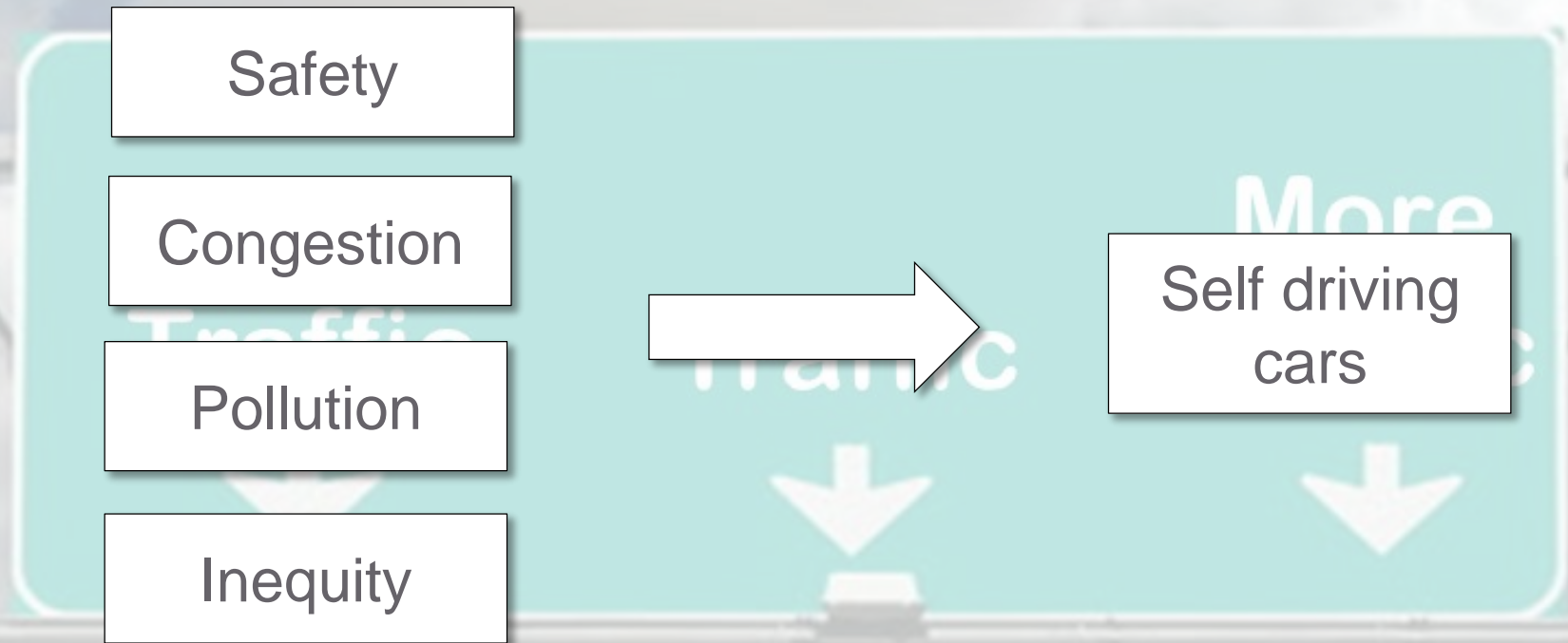
THE HUMAN FACTOR OF SUCCESSFUL MOBILITY SOLUTIONS

25.04.2017

DI Dr. Alexandra Millonig



CHALLENGES CAUSED BY INCREASING URBAN TRAFFIC



CHALLENGES CAUSED BY INCREASING URBAN TRAFFIC

Safety

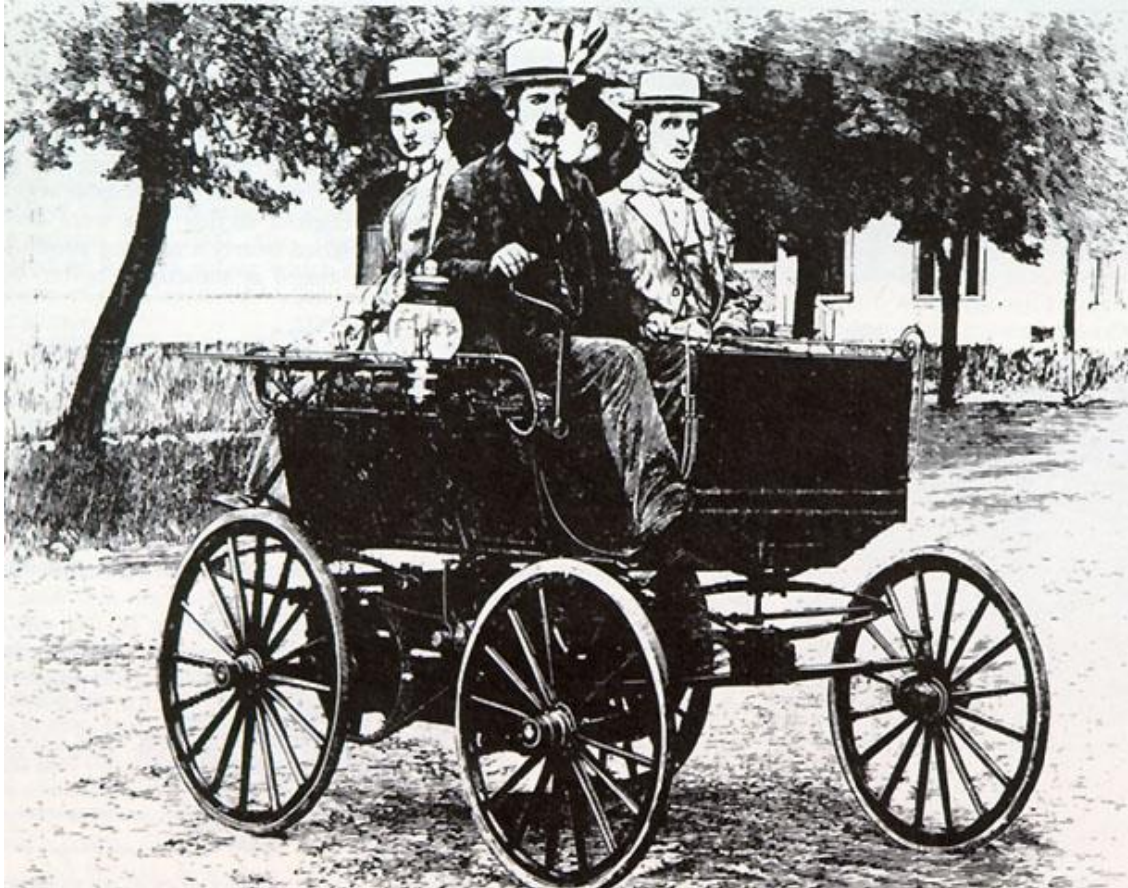
Congestion

Pollution

Inequity



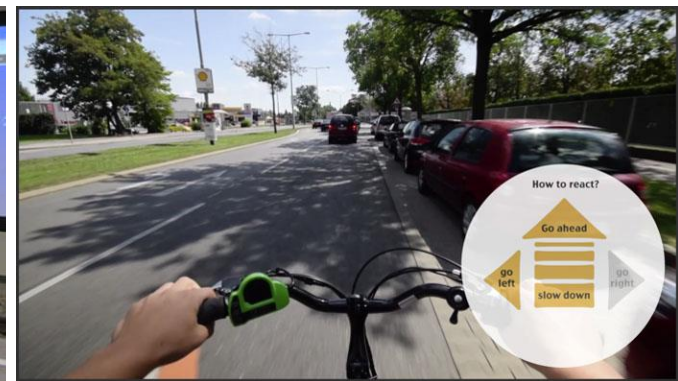
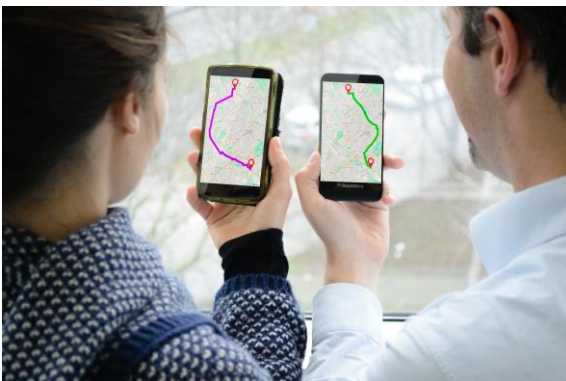
... AND THE POTENTIAL SOLUTION



Self driving
cars



Integrated Mobility Systems



AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

AIT Austrian Institute of Technology

Seibersdorf
Labor GmbH

Nuclear
Engineering
Seibersdorf
GmbH

Energy

Health &
Bioresources

Digital Safety &
Security

Vision, Automation &
Control

Mobility Systems

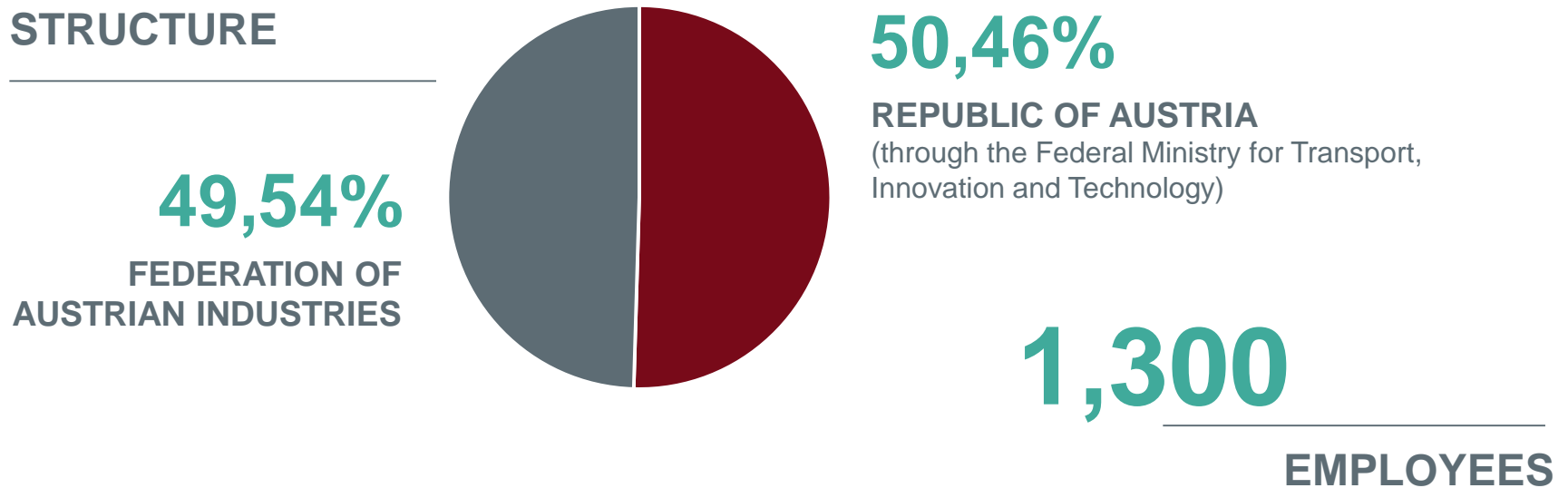
Low-Emission
Transport

Technology
Experience

Innovation Systems &
Policy

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

OWNERSHIP STRUCTURE



49,54%

FEDERATION OF
AUSTRIAN INDUSTRIES

50,46%

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

1,300

EMPLOYEES

140m EUR

TOTAL REVENUES

75 m EUR
46 m EUR
19 m EUR

Contract research revenues (incl. Grants)
bmvit funding
Other operating income,
incl. Nuclear Engineering Seibersdorf



CENTER FOR MOBILITY SYSTEMS



OUR FOCUS: MOBILITY AS A SYSTEM

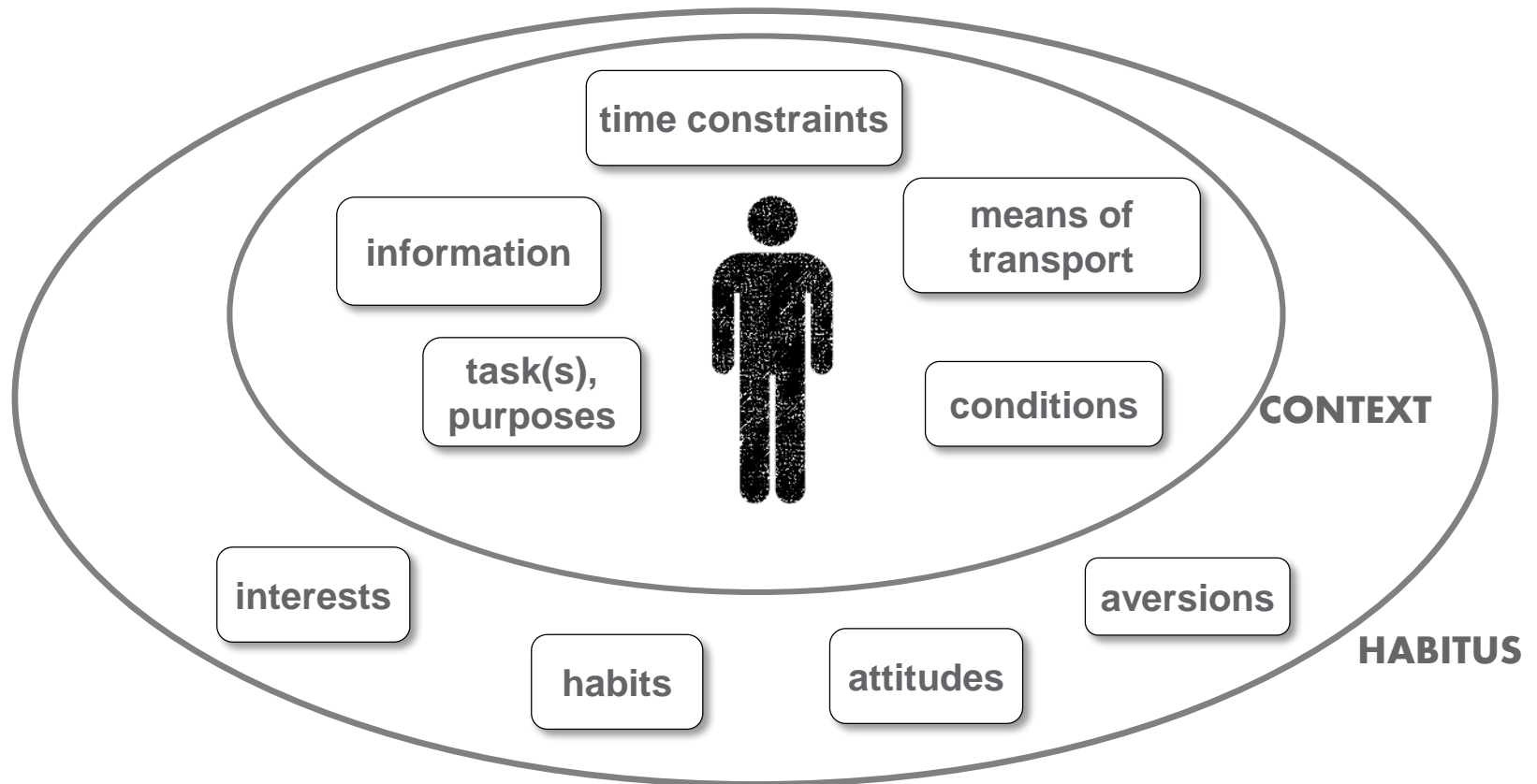


CENTER FOR MOBILITY SYSTEMS

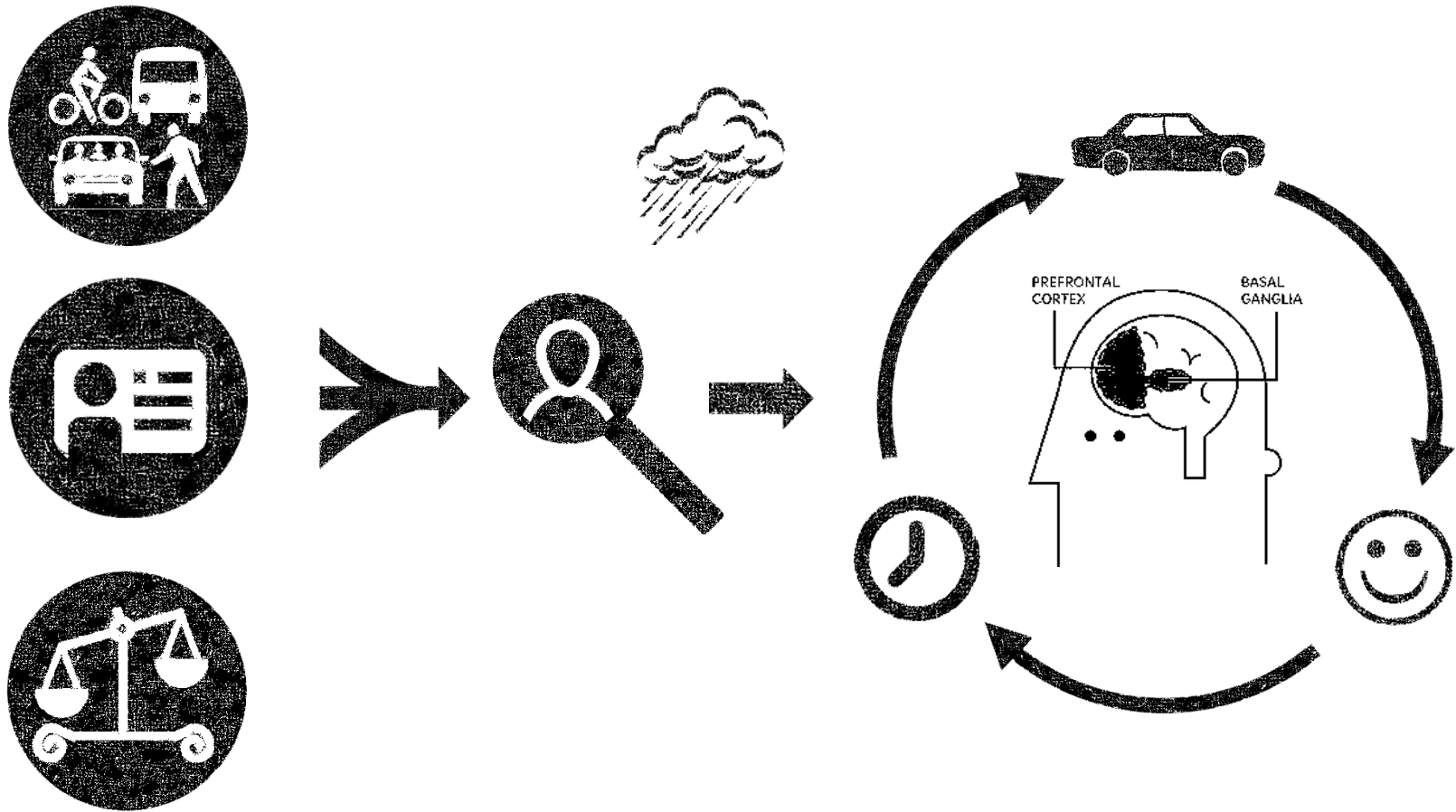
Focus topics

- **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**

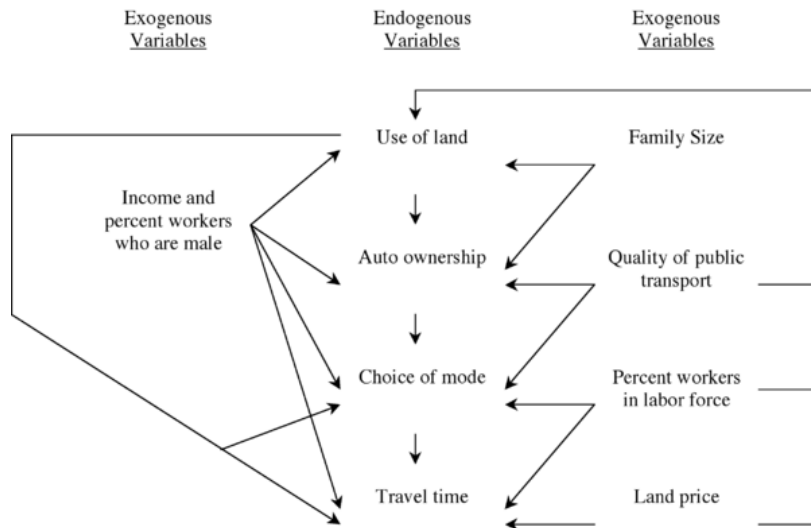
MOBILITY BEHAVIOUR



MODE CHOICE INFLUENCES

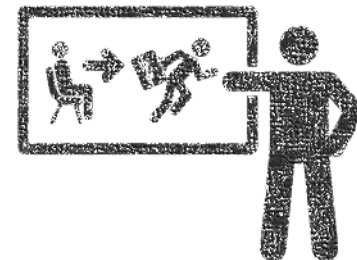
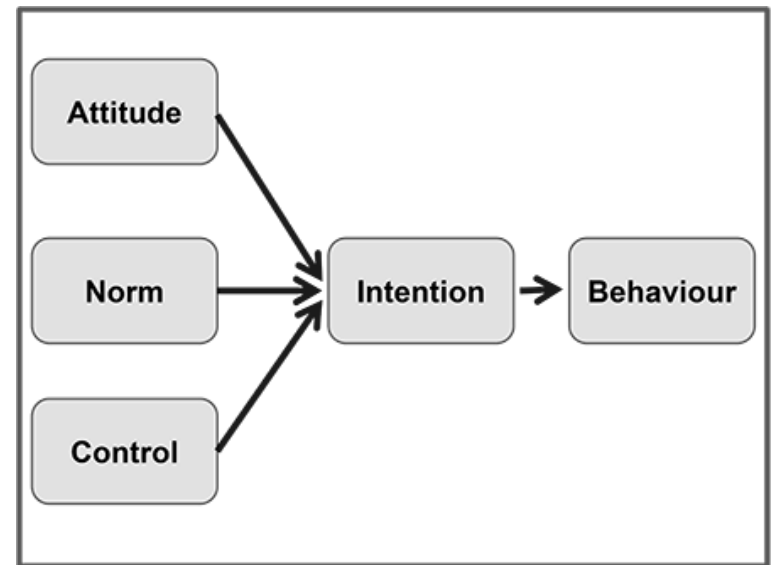


CURRENT EXPLANATORY MODELS



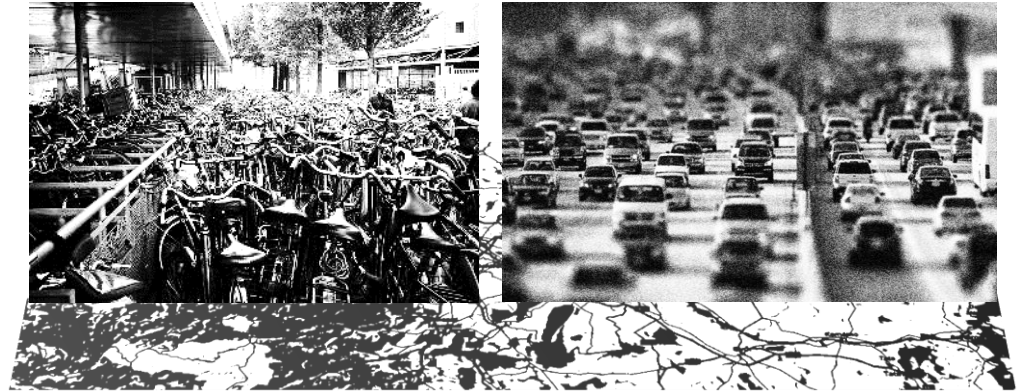
Rational Choice Modelling

Theory of Planned Behaviour



MODEL APPROACH

Region:
Spatial structure & culture



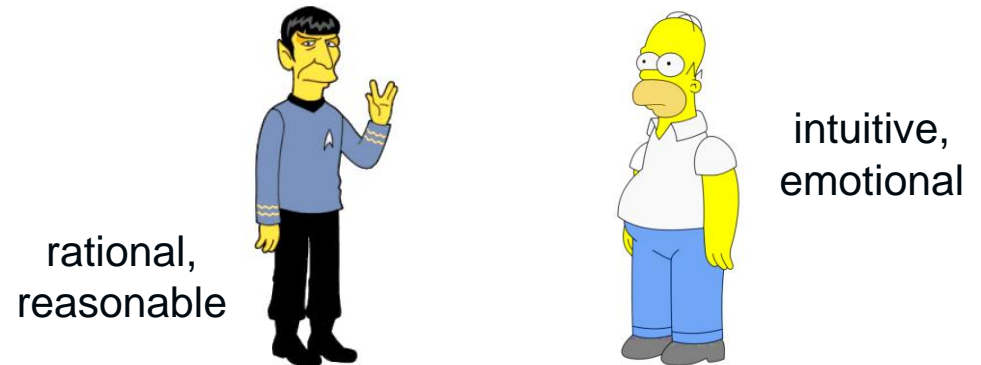
Options:
Social Practice Theory

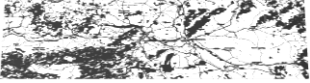
[Reckwitz, 2002]



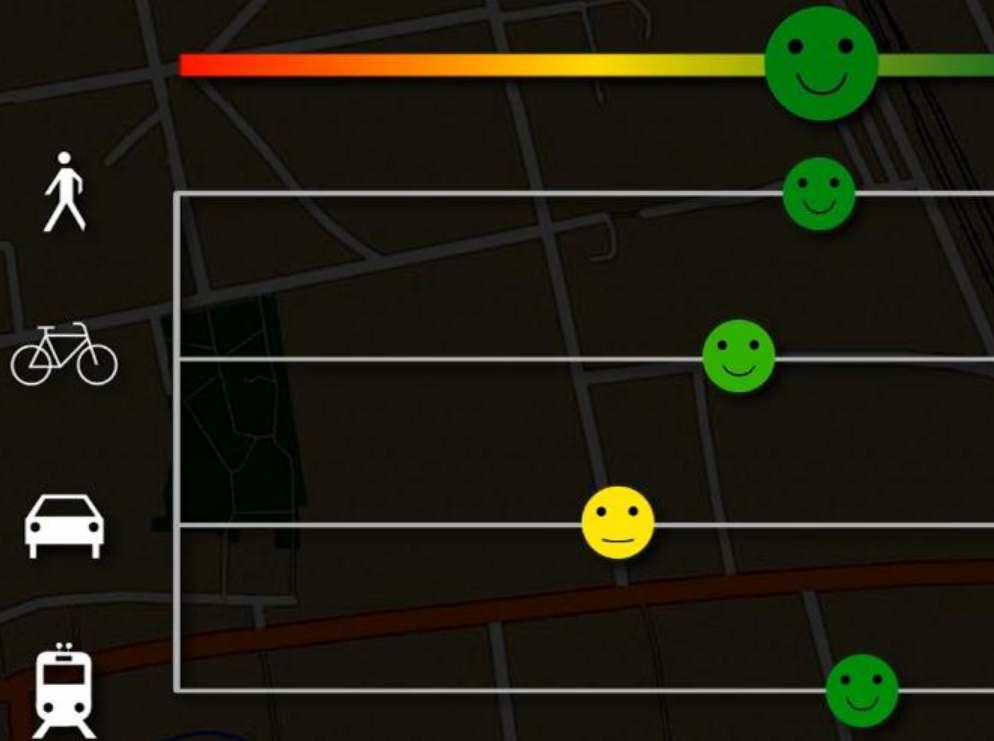
Decisions:
Dual Process Theory

[Evans & Frankish, 2009]





LOCATION-BASED QUALITY OF TRANSPORT OPTIONS

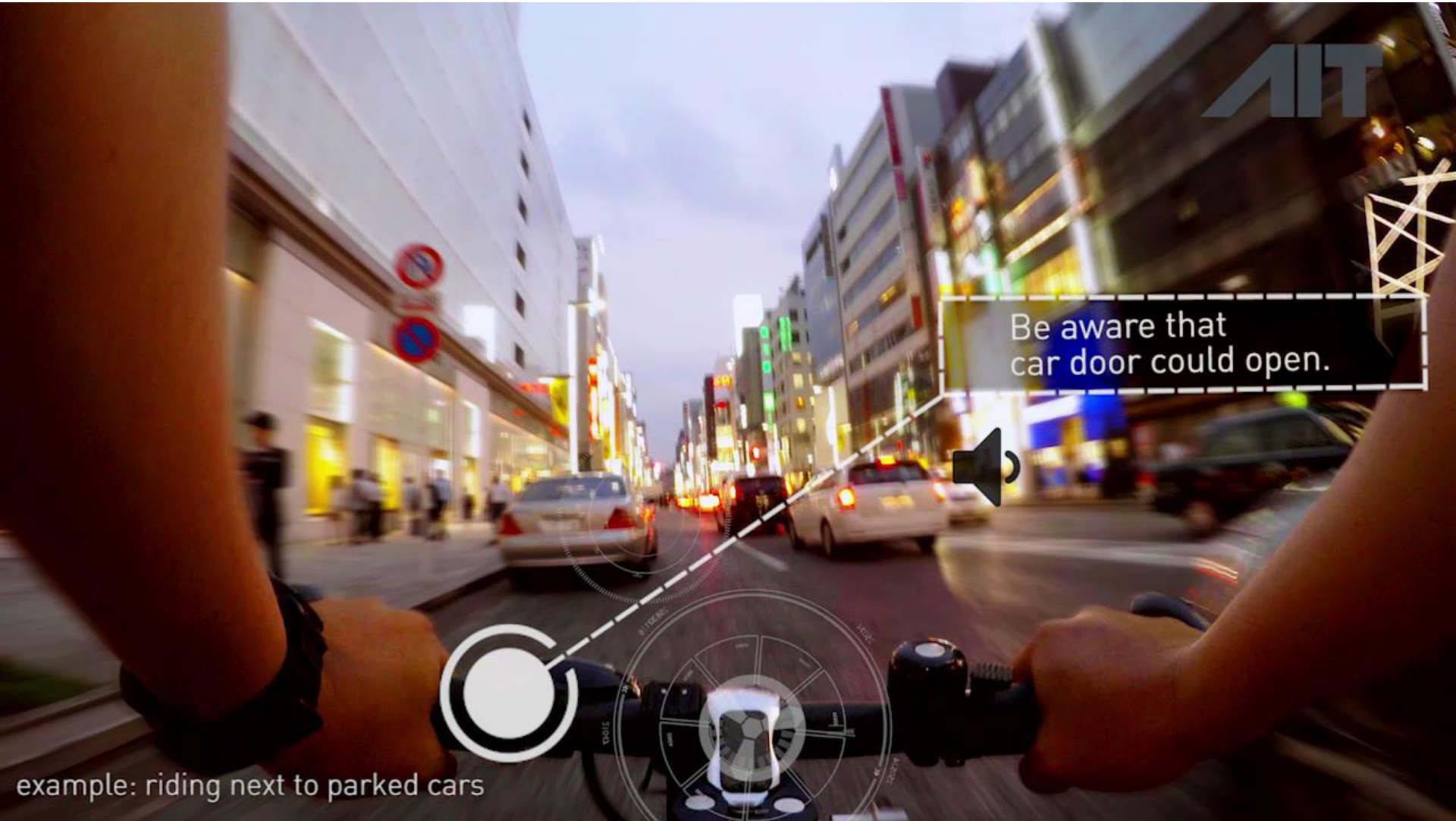


- Assess the quality of transportation options under **sustainability** aspects
- Identify group-specific **requirements** concerning **accessibility of facilities**
- Gender-oriented evaluation model as **information tool** or **planning instrument**



projects TransitBuddy / TransportBuddy





Be aware that
car door could open.



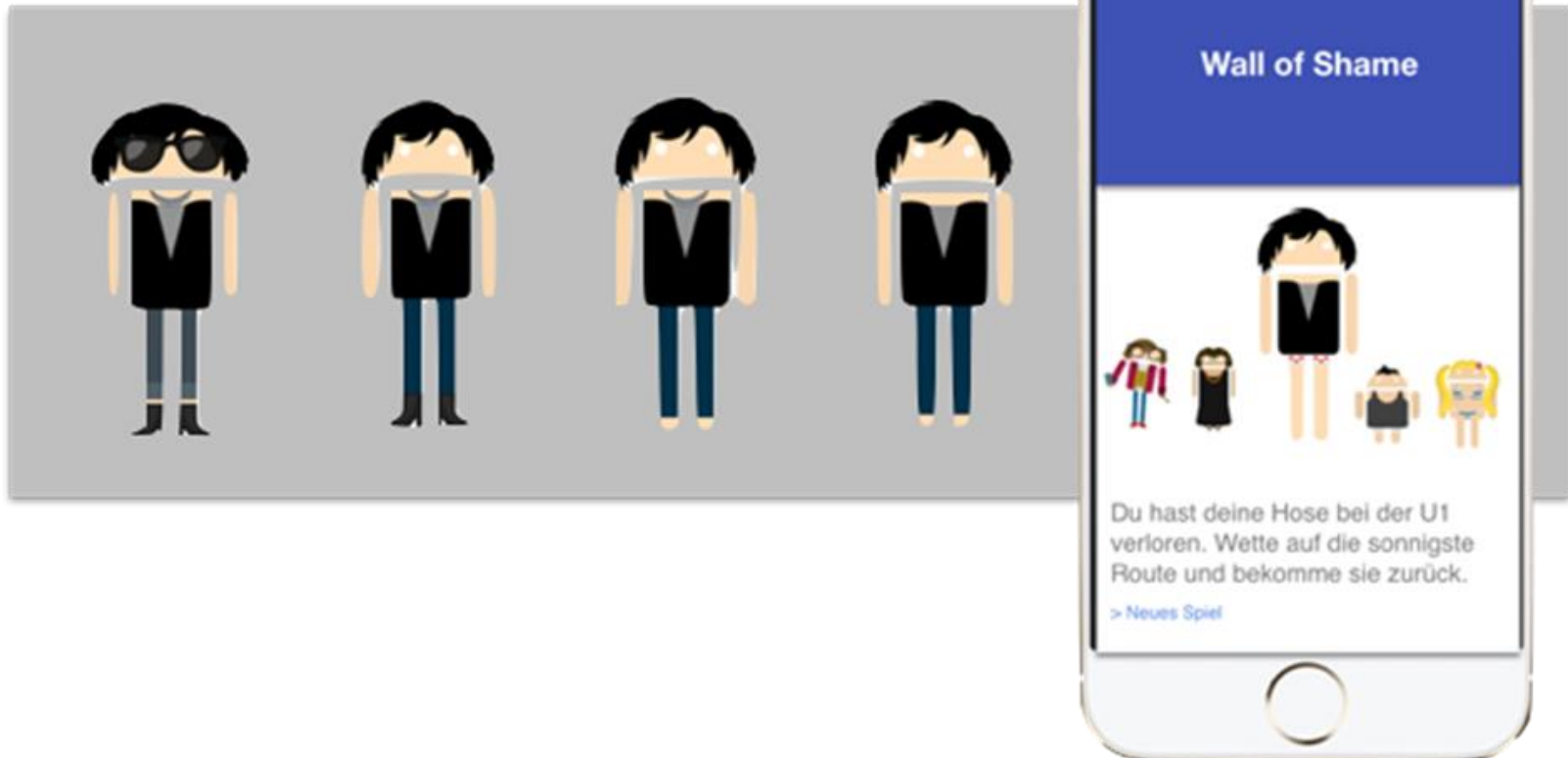
example: riding next to parked cars



the further
you are riding

the higher your
organization will rank

Distance 5,2 km



INTEGRATED MOBILITY SYSTEMS

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

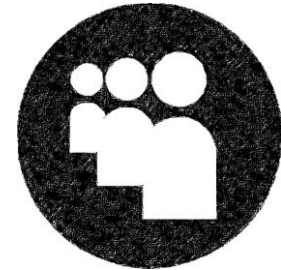
... by combining **qualitative and quantitative methods** and **bridging different scientific disciplines** ...

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

RESEARCH DIMENSIONS

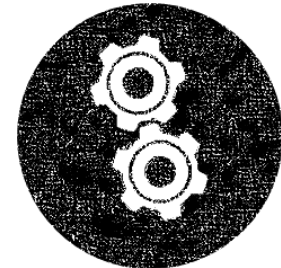
Identify

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



Involve

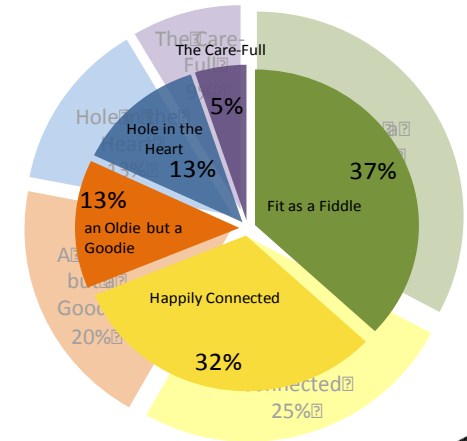
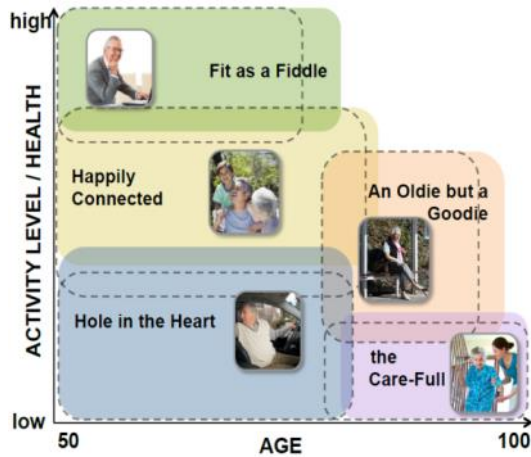
- Select appropriate methods/combinations of methods
- Detect and handle bias
- Modelling behaviour patterns



Inspire

- Develop target-group specific motivation strategies
- Assess effects of implementation
- Select appropriate media and communication channels

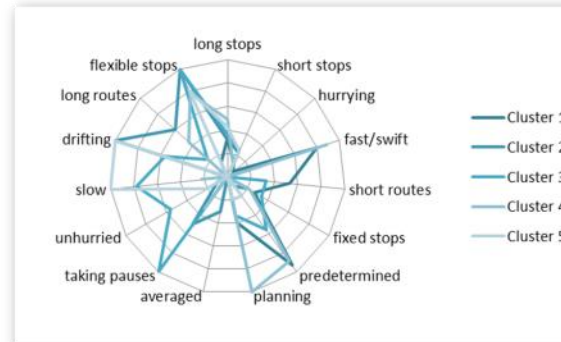
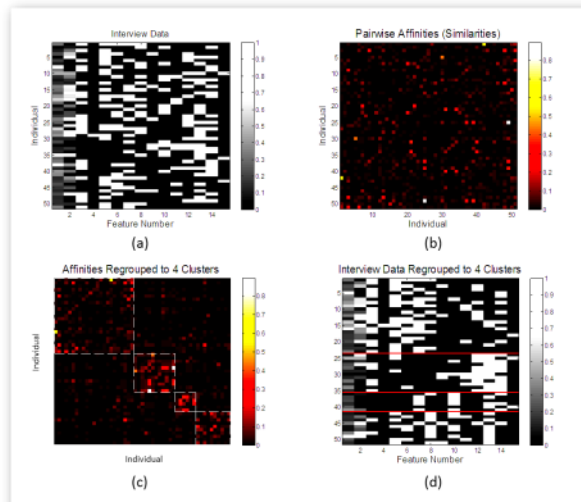




IDENTIFY

Profiles of older people for developing targeted solutions

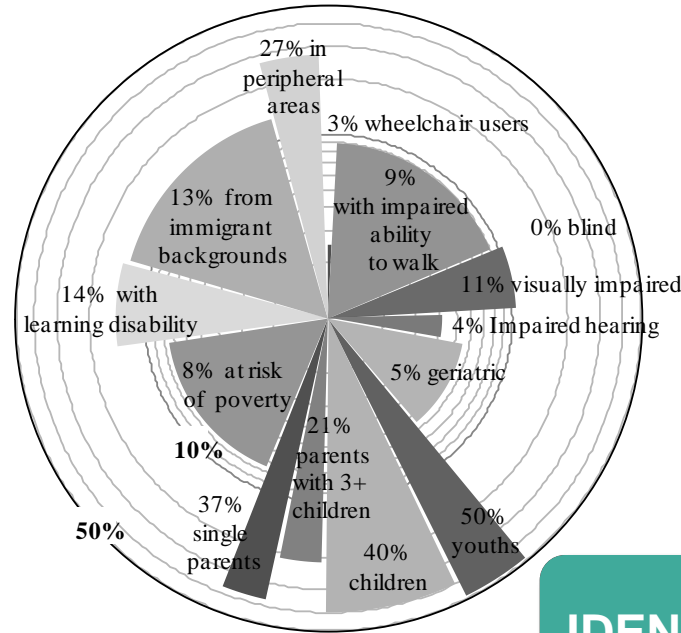
- Identify **typical combinations** of physical, mental and lifestyle characteristics
- Describe profile-related **mobility barriers** and **transportation needs**
- Define research needs and develop **effective solutions for an ageing society**



IDENTIFY

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**

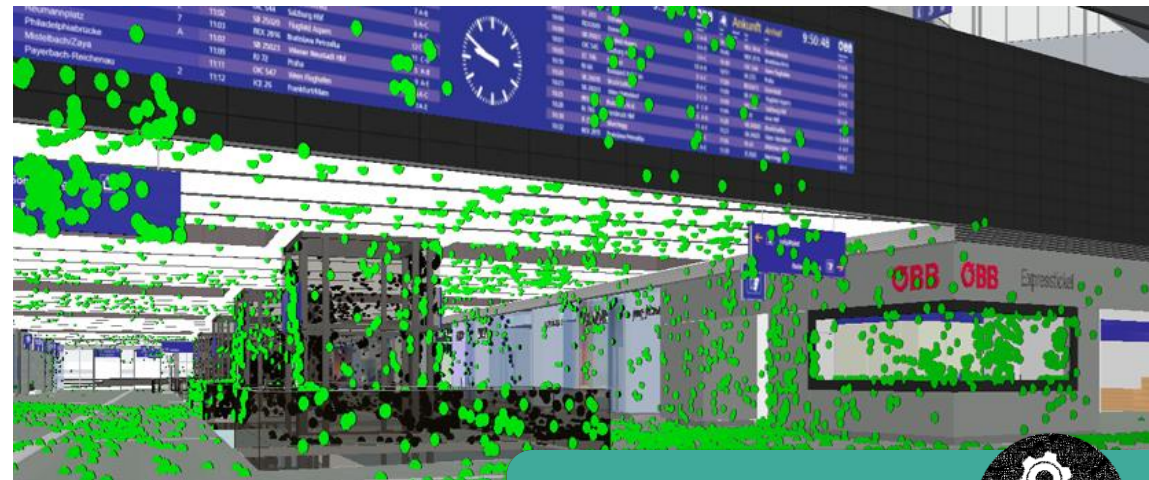


IDENTIFY



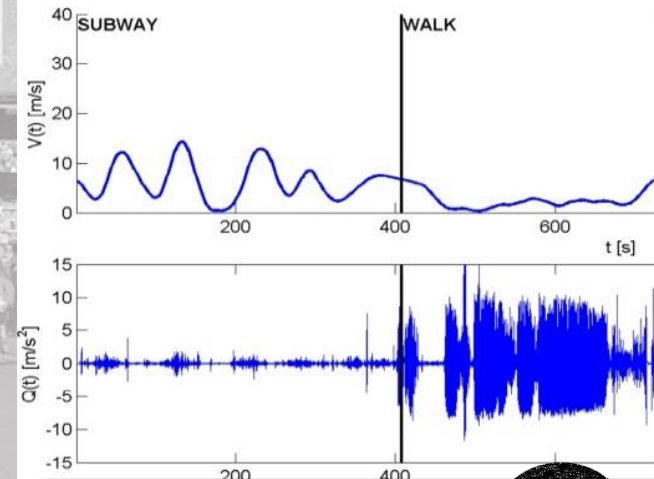
Exploring groups of the transportation disadvantaged

- 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**



INVOLVE



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**

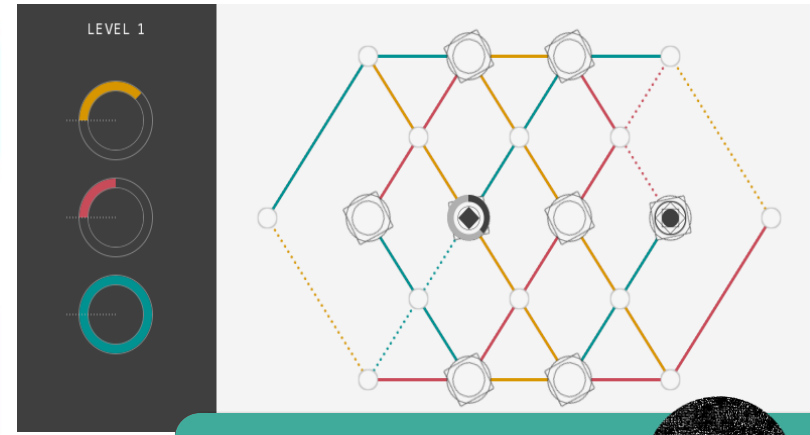
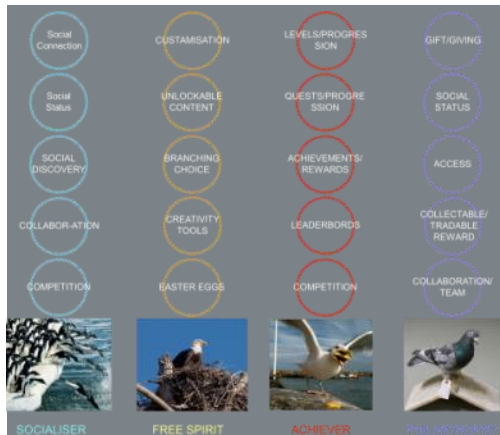


INVOLVE



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**



INSPIRE

YES
You can

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)

<p>Geld Alle Klassen</p>  <p>Wirf einen Würfel, und addiere das Ergebnis zum Konto. Benutze die Karte nur, wenn du in derselben Runde mit einem Helden unterwegs bist. Lege diese Karte weg, wenn du sie gespielt hast.</p>	<p>Verteidigung Reise-Schutzbrief</p>  <p>Wehre einen Angriff ab. Wirf einen Würfel, und ziehe das Ergebnis vom Angriff ab. Nimm die Karte aus dem Spiel, wenn du sie gespielt hast.</p>	<p>Verteidigung Alternativ-Route</p>  <p>Wehre einen Angriff ab. Ziehe mit einem anderen Helden, wenn du noch einen hast. Die Strecke und Kosten richten sich nach dem neuen Helden. Nimm die Karte aus dem Spiel, wenn du sie gespielt hast.</p>	<p>Style Langstrecke</p>  <p>Wirf einen Würfel, und addiere das Ergebnis zum Konto. Lege die Style-Karte unter eine Heldenkarte der Klasse. Sie ist dauerhaft für Züge mit diesem Helden gültig.</p>
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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)

	on-the-go fun type 	eco-informed type 	efficient on-the-go type 	Conservative efficient type 	efficient habits type 	low mobility literacy type
Mobility style	multimodal, flexible, urban	public transport, bike, walk	different options, stable	stable behavior, but open minded	habitual behavior	fixed patterns
Motivation	efficiency, flexibility, experience	responsibility, sustainability awareness	efficiency, rationality, planning	pragmatic, reliability, novelty	costs, planning, stability	security, costs, stability
Interest in sharing						

Planungskommunikationsmatrix (Welche Informationskanäle werden für die Planung der eigenen Mobilität (bzw. von Wegen) genutzt)

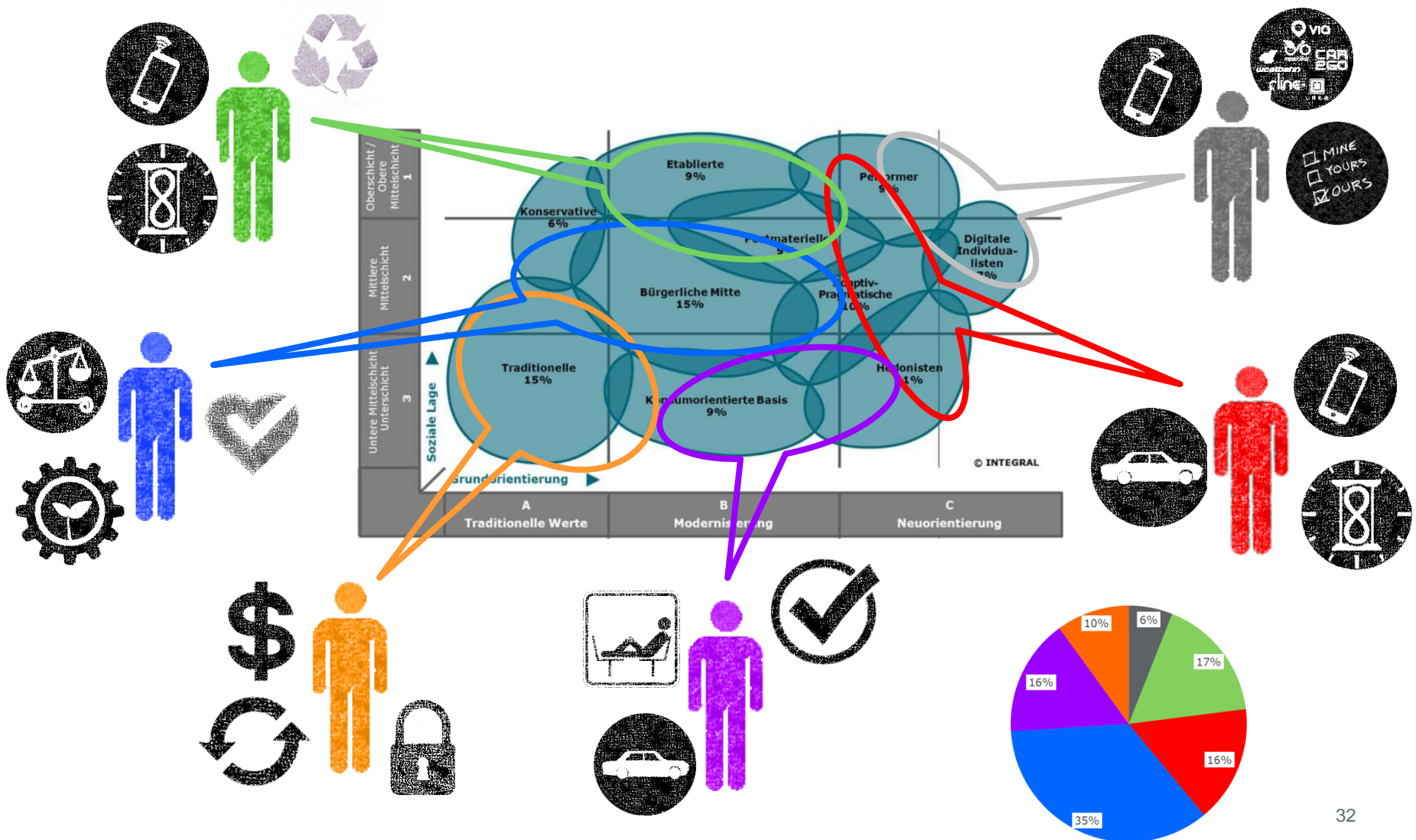
	Informationskanäle	Informationskanal													
		1[1]	2[2]	3[3]	4[4]	5[5]	6[6]	7[7]	8[8]	9[9]	10[10]	11[11]	12[12]	13[13]	14[14]
1[1] Spontan - on the go	++ +	Nutzung: ++	Nutzung: ++	Nutzung: ++	Nutzung: ++	Nutzung: ++	Nutzung: 0	Nutzung: +	Nutzung: -	Nutzung: 0	Nutzung: +	Nutzung: 0	Nutzung: -	Nutzung: -	Nutzung: -
2[2] Hochformierte Nachhaltigkeit	++ ++	Nutzung: ++	Nutzung: ++	Nutzung: ++	Nutzung: ++	Nutzung: ++	Nutzung: +	Nutzung: +	Nutzung: 0	Nutzung: 0	Nutzung: +	Nutzung: 0	Nutzung: +	Nutzung: 0	Nutzung: 0
3[3] Effizienzorientierte Infoaufnahme	+ 0	Nutzung: +	Nutzung: +	Nutzung: +	Nutzung: +	Nutzung: +	Nutzung: +	Nutzung: +	Nutzung: +	Nutzung: 0	Nutzung: -	Nutzung: 0	Nutzung: -	Nutzung: -	Nutzung: 0
4[4] Interessiert-Konservativ	0 +	Nutzung: 0	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: 0	Nutzung: 0	Nutzung: 0	Nutzung: 0	Nutzung: +	Nutzung: 0	Nutzung: 0	Nutzung: 0	Nutzung: 0
5[5] Niedriger Bedarf	-	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -
6[6] Digital Literates	-	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -	Nutzung: -



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**

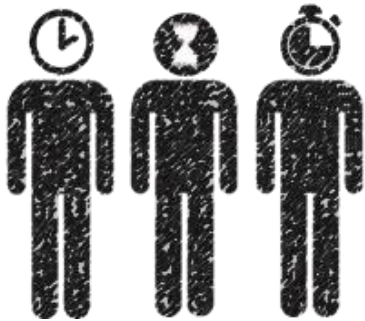
promotion-project.at



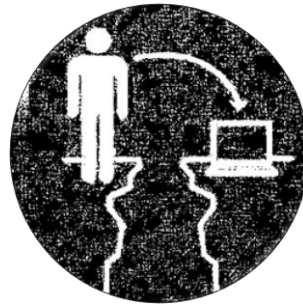
Future research



USER SEGMENTATION



Value of Travel Time



Digital Divide

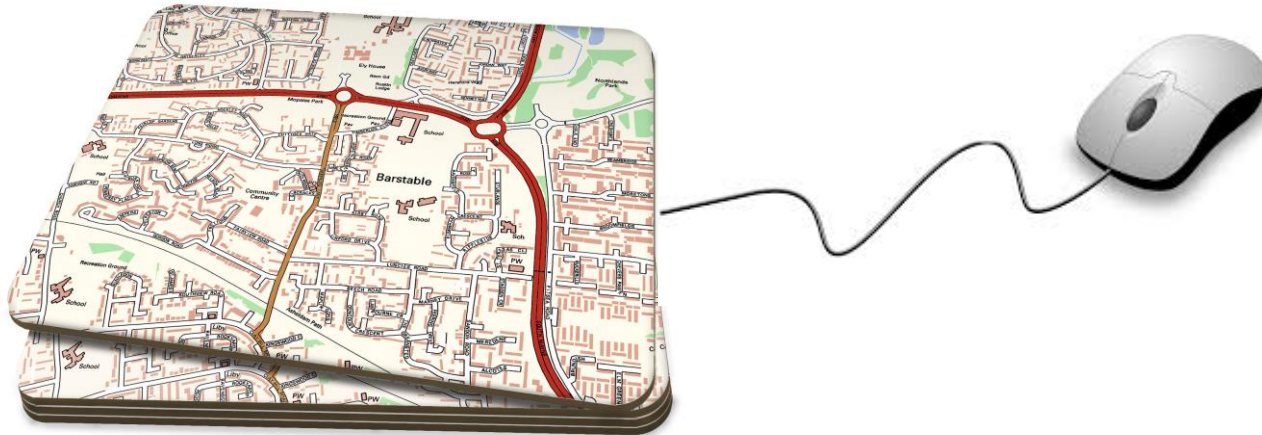


Transition Points

IDENTIFY



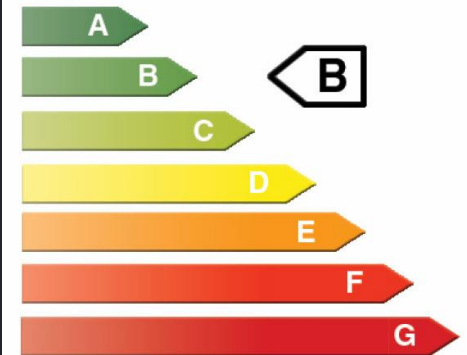
SP-OFF-RP SURVEYS



INVOLVE



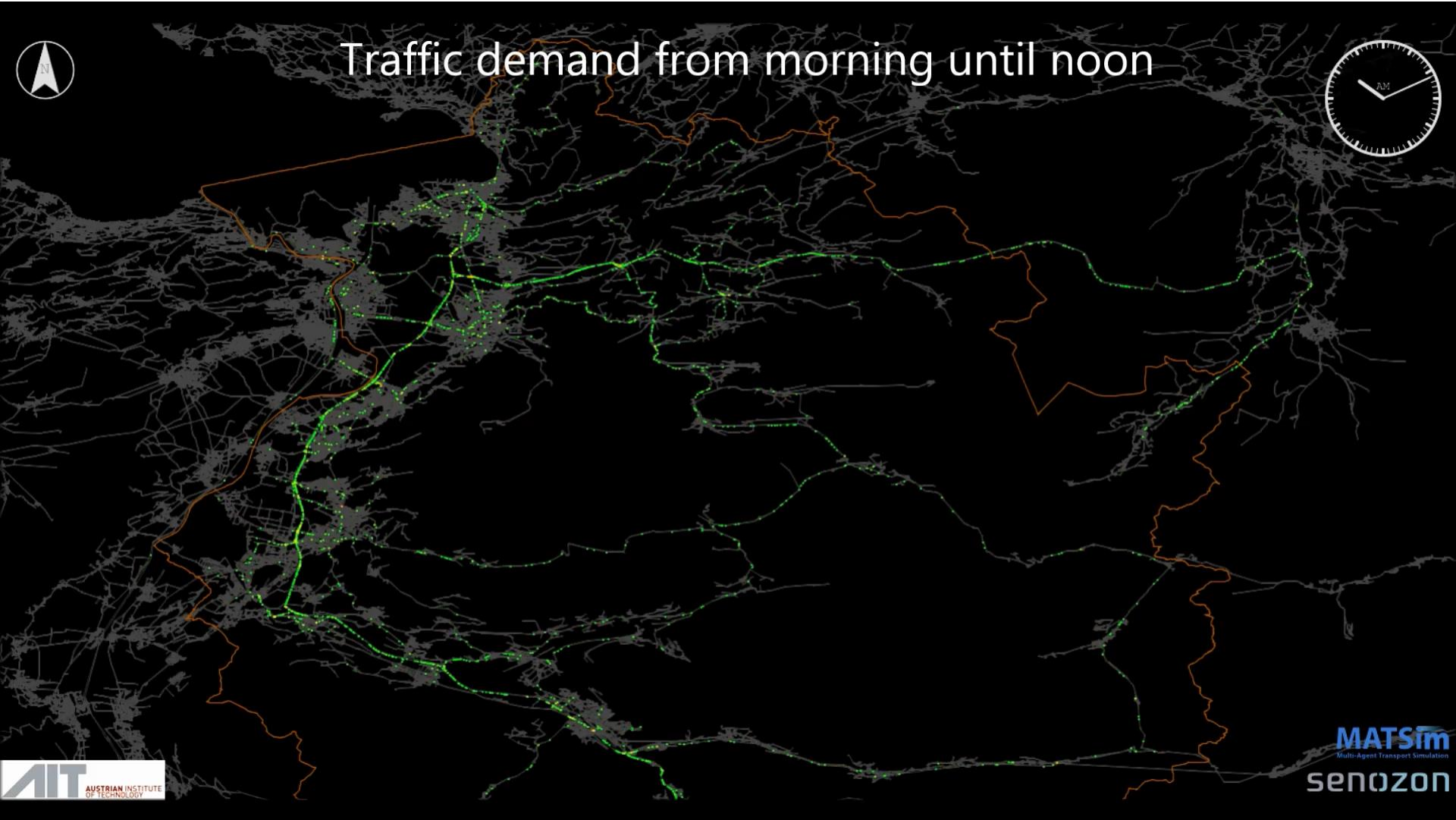
QUICK ASSESSMENT TOOL



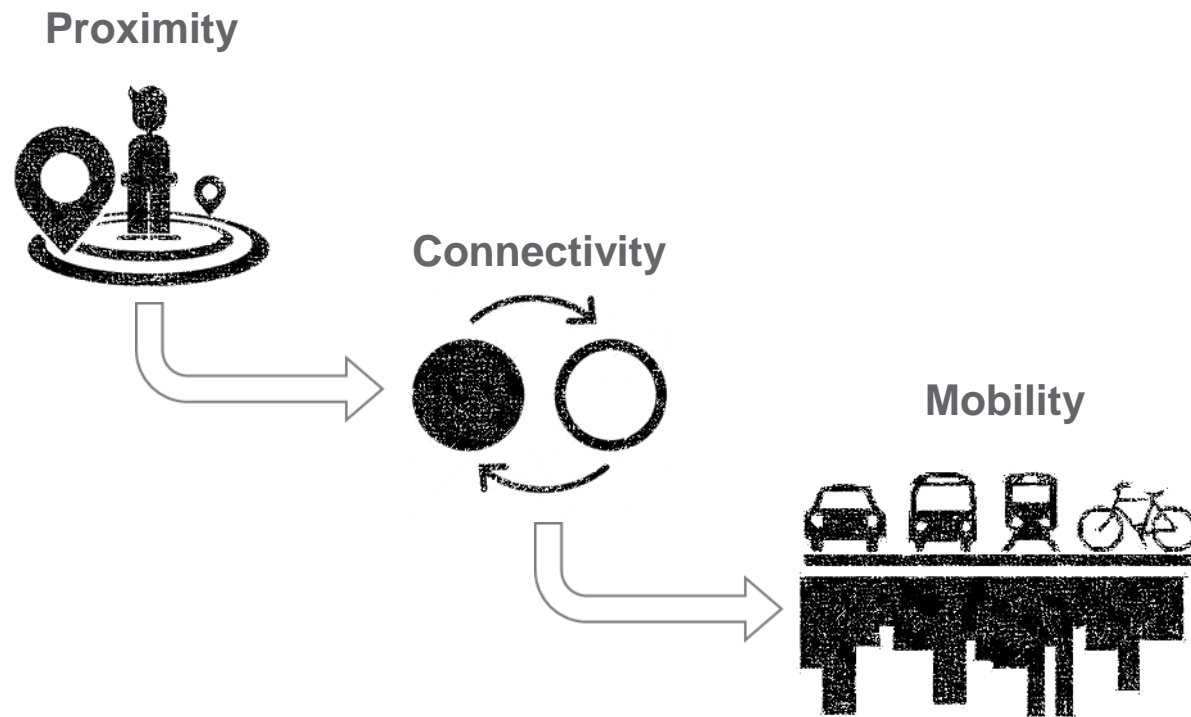
INSPIRE



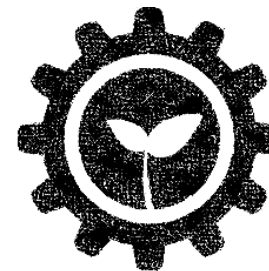
Traffic demand from morning until noon

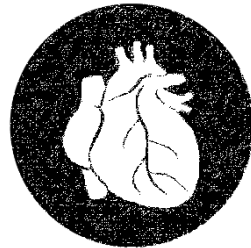
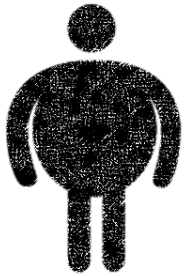


ACCESSIBILITY HIERARCHY









MERCI!

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