DeMo - Decarbonizing Mobility and transport through data-driven modal shift

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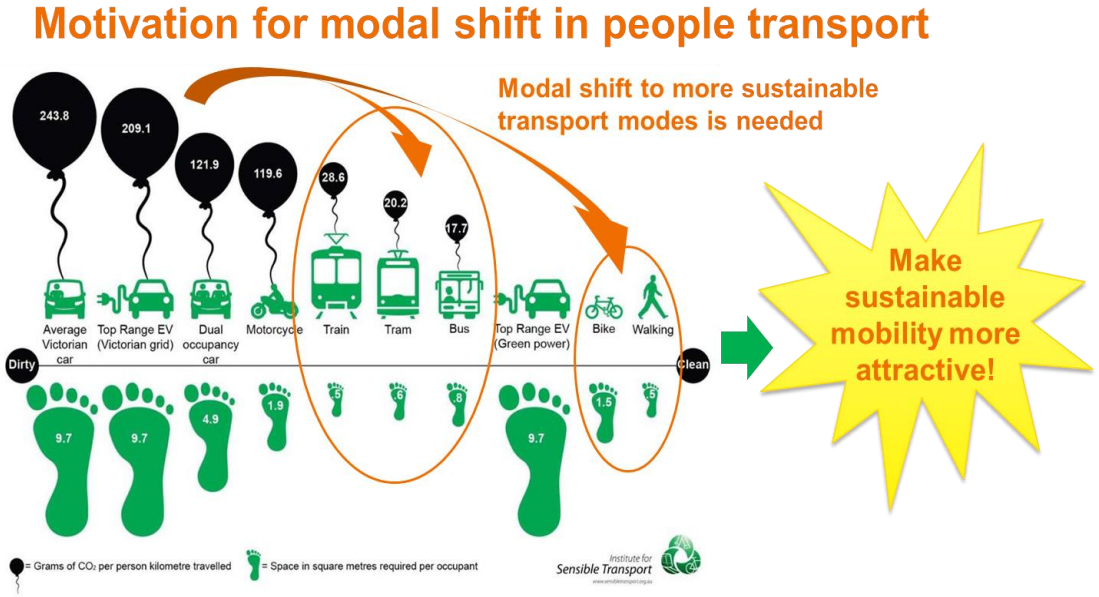
20/12/2024 **VTT – beyond the obvious**

DeMo project

- Decarbonizing urban mobility through data-driven services:
  - How to achieve modal shift?
- Business Finland, Co-Research
  - Decarbonized cities programme
- Consortium:
  - VTT & Tampere University
  - Matkahuolto, PayiQ, Skoda Transtech, Solita, Tietoevry Create, UDT Technologies, Voi Technology, Waltti Solutions
  - Helsinki, Tampere
  - Transport and Communications agency Traficom, Ministry of the Environment
  - ITS Finland



With DeMo towards sustainable urban mobility:
”Proven solutions for cities and companies to achieve true modal shift”

Regional transport models
Usecases, pilots
Mobility needs
Beyond MaaS service concepts
Business models
PPP collaboration models
Data-based solutions

Urbanization → Low-carbon, attractive travel chains → Modal shift → Sustainable transport system → Efficient use of city space → Sustainable urbanization

Case study validation in real environment

Servitization
Digitalization
Carbon handprint
Energy-efficiency

Results and tools

- Understanding and influencing the mobility needs, preferences and experiences of different user groups,
- Designing and validating new Beyond MaaS service concepts,
- Improving PPP cooperation models and practices,
- Solving data quality, compatibility, sharing and regulation issues, and
- Enhancing regional transport models.

Factors behind mode choice

- Complex topic, plethora of dispersed literature, lack of comprehensive synthesis
- Categorization into three main types of motivations:
  - Utilitarian
  - Hedonic/experiential
  - Altruistic

➢Vary by context and individual

➢”Suppression” due to habituation

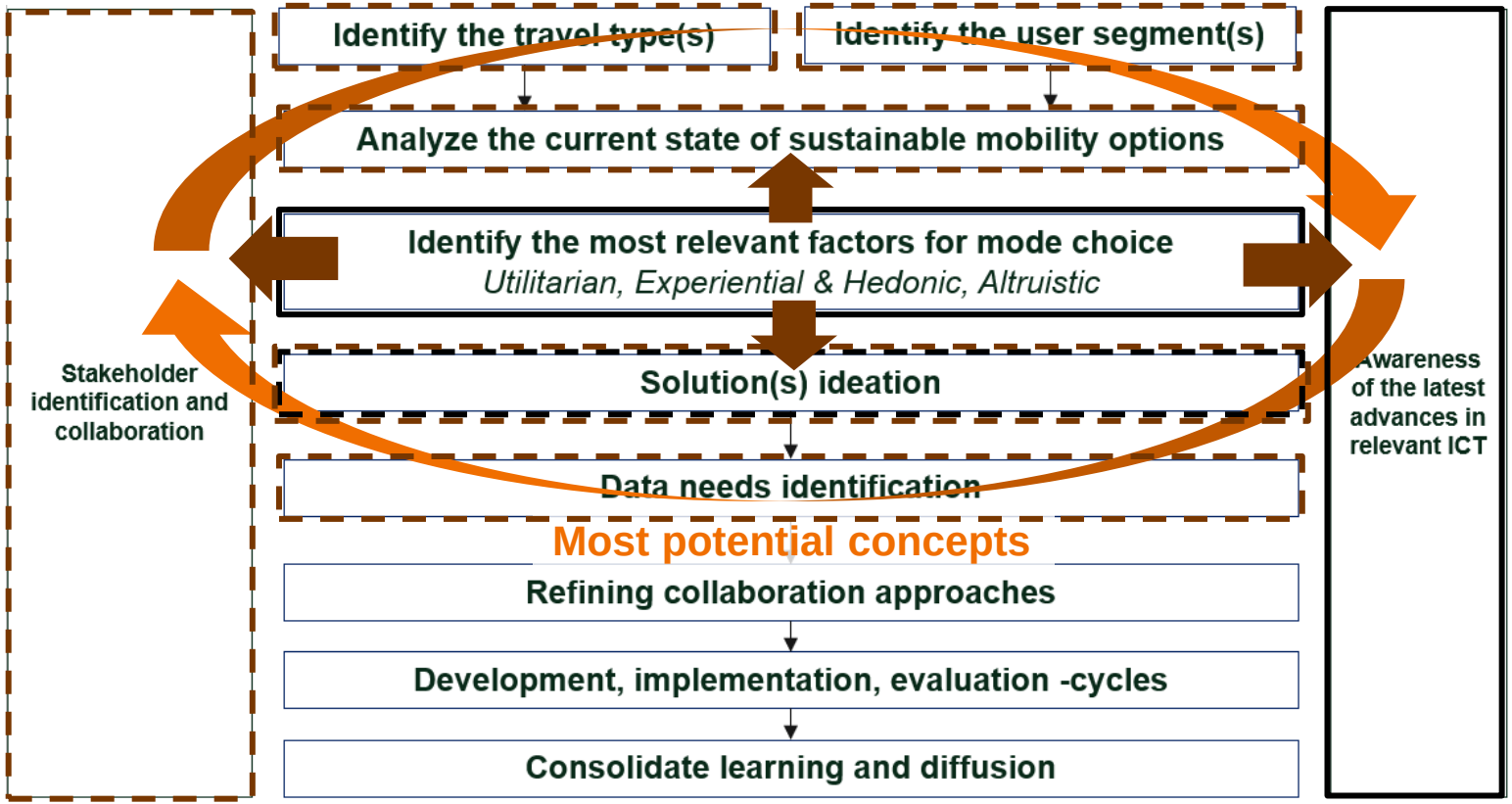
Factors affecting public transport use

Utilitarian	Hedonic/experiential	Altruistic
Availability and accessibility [19]	Possibility to relax [34], [38]	Environmental concerns [34], [38], [40]
Accessibility issues of stations and vehicles [31]	Aesthetics of waiting areas & vehicles [35]	Occupation of space concerns (in comparison to private cars) [36], [41]
Information [35]	Crowdedness of the vehicle, forced proximity of others [31], [34], [38], [39]	
Price [34]		
Ease of planning and travel [30], [35]	Perceived safety [34]	
Dependency on routes and schedules [34]	Perceived security	
Reliability [33], [34]	Comfort (e.g., seat access, noise, driver handling, air conditioning, vehicle cleanliness) [35]	
Utilization of travel time [19], [34], [36]		

Factors encouraging private car use

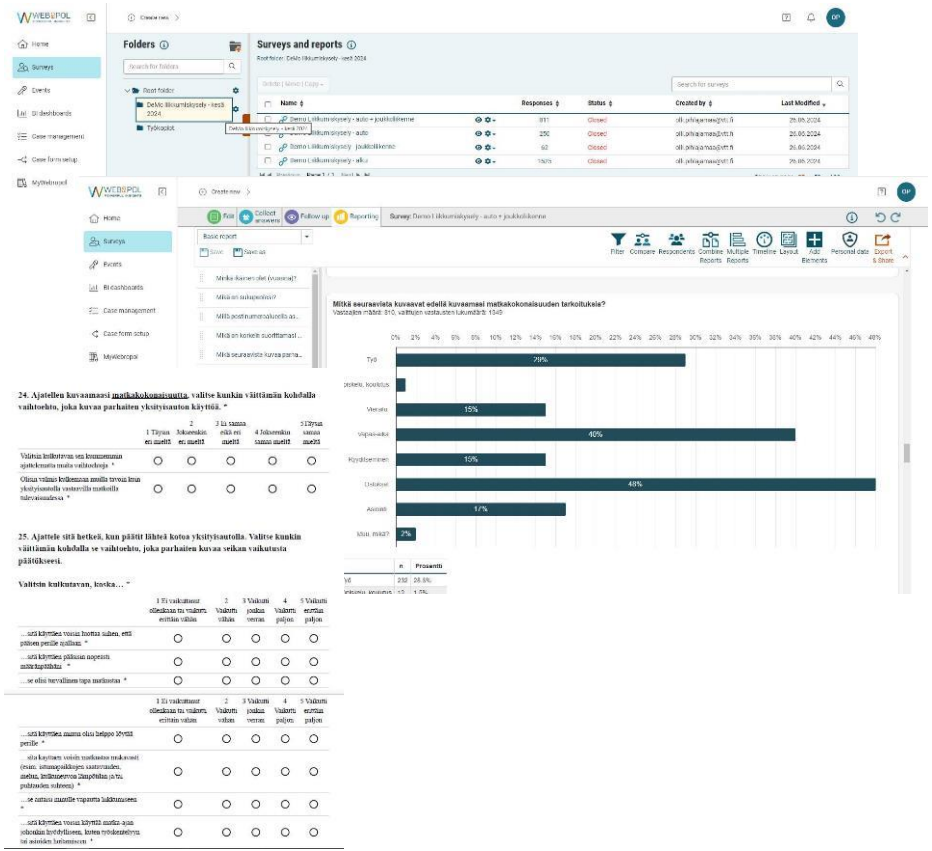
Utilitarian	Hedonic/experiential	Altruistic
Accessibility [19], [34], [39] Flexibility [19], [34], [39] Availability [19], [34], [39] Security [46]	Perceived control [39] Sense of autonomy and freedom [39], [44] Cocoon-like environment [39] Sense of action and uninterrupted movement [39] Form of selective socializing [44] Personalization, sense of ownership [46], [48] Protection from undesired social events [46] Protection from weather [46]	Environmental concerns in the case of e-cars

ICT-based approaches impacting mode choices



Additional data through user questionnaire

- User questionnaire for ~1000 people living in the Helsinki and Tampere Region **to understand their mobility behaviour and motivational factors** to complement the literature survey
- Aim to find **the most promising digital solutions** to nudge people in the selected target groups **towards sustainability in their mobility selections** in different contexts

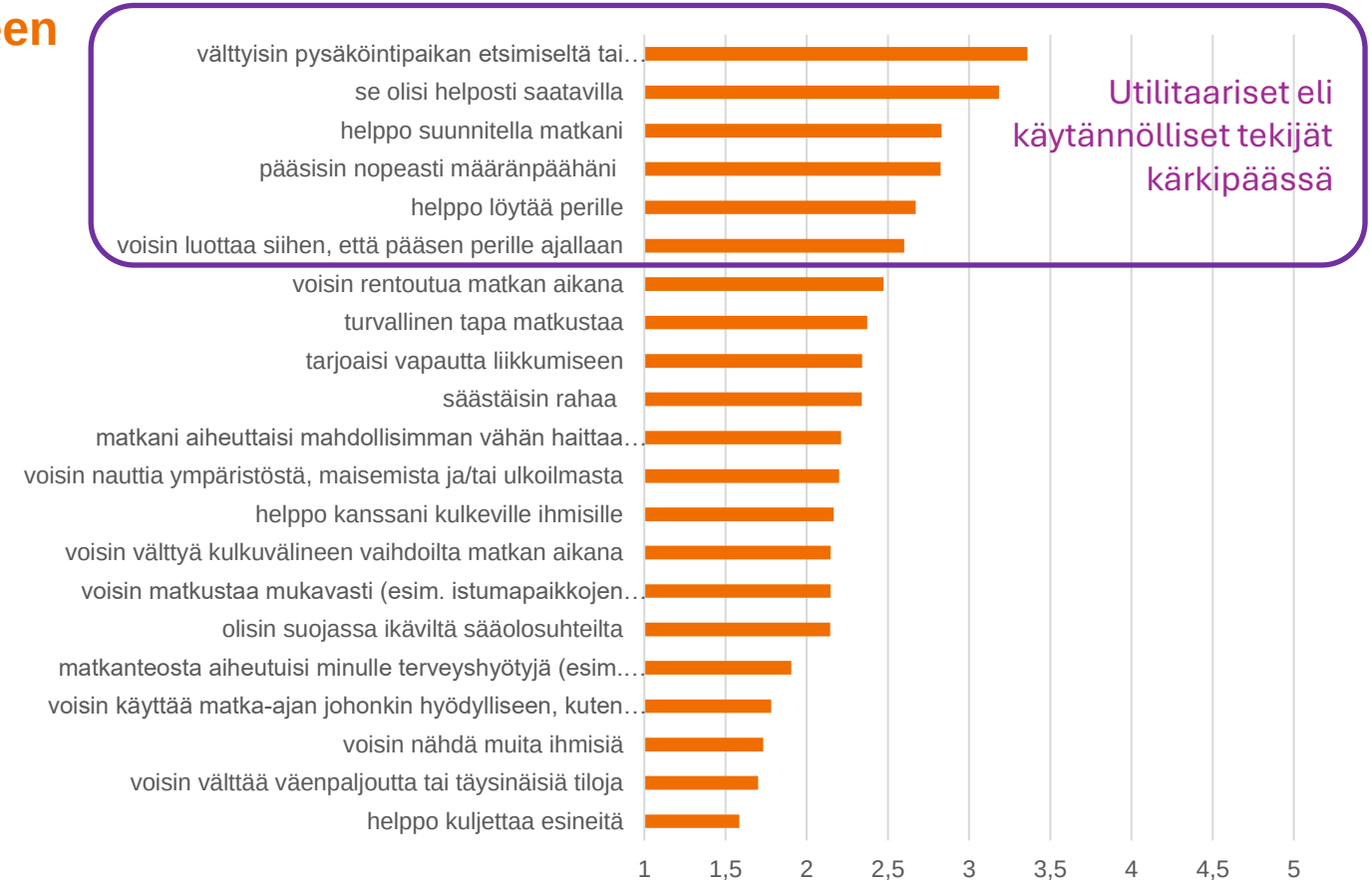


Basic information of respondents (driving + public transport)

- Average age: 50 years, range 19-87 years
- Gender distribution: 53% women and 46% men
- Living arrangements: 27% live with a spouse and children, 39% with a spouse only, 26% alone
- Travel purposes: Not asked directly. The purpose of the trip was asked as a multiple-choice question, with leisure being one option.
  - **Leisure travel: 40% of trips** made by both car and public transport were for leisure
  - Tampere region respondents: **36% by car, 39% by public transport**
  - Possible differences in motivational factors for different types of trips (leisure vs. work, errands) is an interesting research question

Sneak peek: Joukkoliikenteen valintaan vaikuttaneet tekijät vapaa-ajan matkoilla (n=325)

Vaihtelua paljon ja tekijöitä tarkoitus analysoida syvällisemmin, myös maantieteellisenä tarkasteluna postinumeroalueisiin nähden



1 = Ei vaikuttanut ollenkaan tai vaikutti erittäin vähän; 5 = Vaikutti erittäin paljon

Data & ICT-based approaches impacting mode choices

Category of motivational factors	Thematic area	Examples of technologies and design approaches
Utilitarian	*Providing information for easy and accessible trips*	Desktop and mobile trip planners Augmented reality guidance
	Easing the journey execution through integration	MaaS & Beyond MaaS -based implementations
	Enabling access and improving availability	Shared mobility apps
	Persuasion based on individual benefits	Self-tracking and persuasive technology
	Enabling the utilization of the travel time	On-board virtual and mixed reality Smart transit stops
Hedonic-experiential	*Experiential route planning*	Route planners and recommenders Social networking and community apps
	Turning mobility into a site of enjoyment and voluntary socializing	Location-based games and gamification On-board gaming Geofenced chat apps
	Overcoming the limitations of physical space	On-board virtual and augmented reality
	Enabling personalization and ownership	Geo-tagged markings Augmented reality
Altruistic	*Nudging through altruistic motives*	Self-tracking and persuasive technology
	Integrating collective benefits to journey planning	Trip planners that incorporate environmental impacts
	Enabling tangible acts of altruism through mobility	Charity apps based on activity tracking Games and gamification

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Thank you!

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