TECHNISCHE UNIVERSITÄT DRESDEN

AirMetro
Research Training Group
2947 at TU Dresden

T11: Mobility/Urban Planning

Demand for AAM – also for infrequent mobility situations

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Motivation

Demand for Advanced Air Mobility (AAM) applications in passenger transport is expected for trips of 20 to 100 kilometers:

— Complete benefits of low-congestion travel
— Direct travel to the destination despite the urban environment
— Possible disadvantages due to transportation to and from landing sites negligible

To date, trips of 20 kilometers or more are rare and mainly made by individual motorized transport (car) and public transport (PT; see Figure 1).

Smartphone-based surveys are suitable for capturing this demand potential.

However, these have so far mainly been conducted with non-random samples and are therefore not yet suitable for the reliable collection of data for population-representative samples over longer periods of time (see Figure 2).

Methods

Development of a methodology for a representative survey of everyday mobility; special focus on "infrequent" trips:

— Joint survey of all trips using an app with enhanced features for this survey (see Figure 3)
— Sampling as a combination of (1) a sample taken from the register of residents (high representativeness) and (2) a non-random sample (higher willingness to participate)
— Survey period of three months, with net samples of 1,000 people from two metropolitan areas respectively

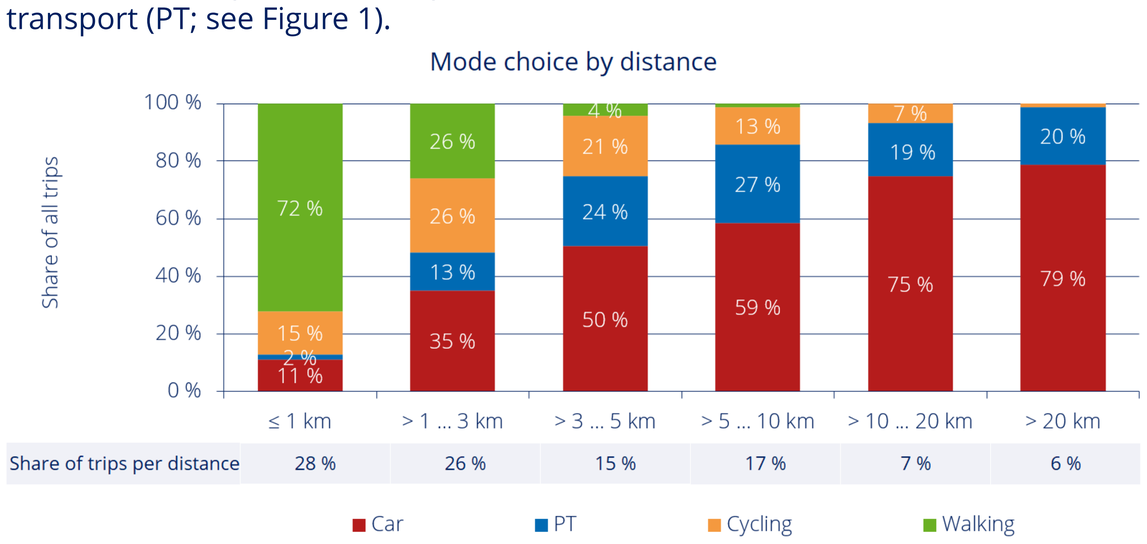

Figure 1: Mode choice by distance for the SrV survey of large cities located in Eastern Germany (TU Dresden, IVST, 2020)

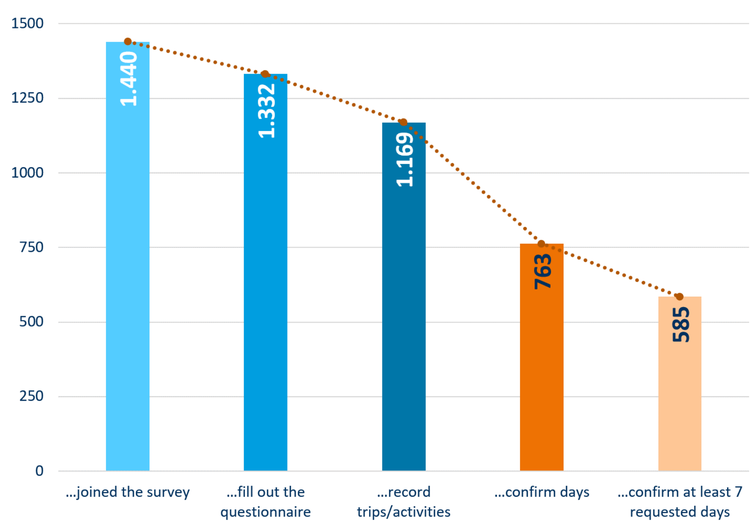

Figure 2: Drop-out rates for mobility surveys via smartphone app using the example of “Dresden in Bewegung 3” (TU Dresden, IVST, 2021)

Results

Evaluation of empirically reliable data:

— complete longitudinal mobility data,
— on interactions between everyday mobility and infrequent trips,
— on the possibilities and limits of shifting trips to AAM

The two survey areas make it possible to record sufficiently high proportions of infrequent trips for different degrees of saturation of the ground-based transport system.

There will be analyses of the survey methodology (e.g., on sampling) and on the mobility behavior.

Networking in the RTG

The result of T11 is a well-founded assessment of the potential use of AAM in passenger transport:

— Basis for T1 for determining external costs, taking into account possible interactions with other modes of transport
— Input for T3 and T4 for the development of procedures for the design and location of Urban Air Mobility (UAM) landing sites
— Basis for T6 and T7 regarding the optimization of the developed robust movement trajectories for the expected future demand

Figure 3: Mockup of a possible survey app (TU Dresden, IVST, 2023)

Literature:

[1] J. Weber, S. Hubrich, R. Wittwer und R. Gerike, “Non-probability recruitment strategies for innovative smartphone-based travel surveys,” Internationales Verkehrswesen, Jg. 72, Nr. 3, S. 58–61, 2020

[2] J. Weber, S. Hubrich, R. Wittwer und R. Gerike, “Non-Probability vs. Address-Based Sampling during SARS-CoV-2 — Findings from Two Travel Surveys by Smartphone App in Dresden, Germany,” in ISCTSC 12th International Conference on Transport Survey Methods 2022

Network member in:

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