# Poster 28: Estimating and Explaining the Value of Travel Time Savings for Autonomous Driving

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1. INTRODUCTION ---

Autonomous driving will potentially impact mobility:

- Perception of **travel time** might change
- **New user groups** gain access to individual transportation
- **New mobility options**, e.g. Vehicles on Demand (VoD), become available
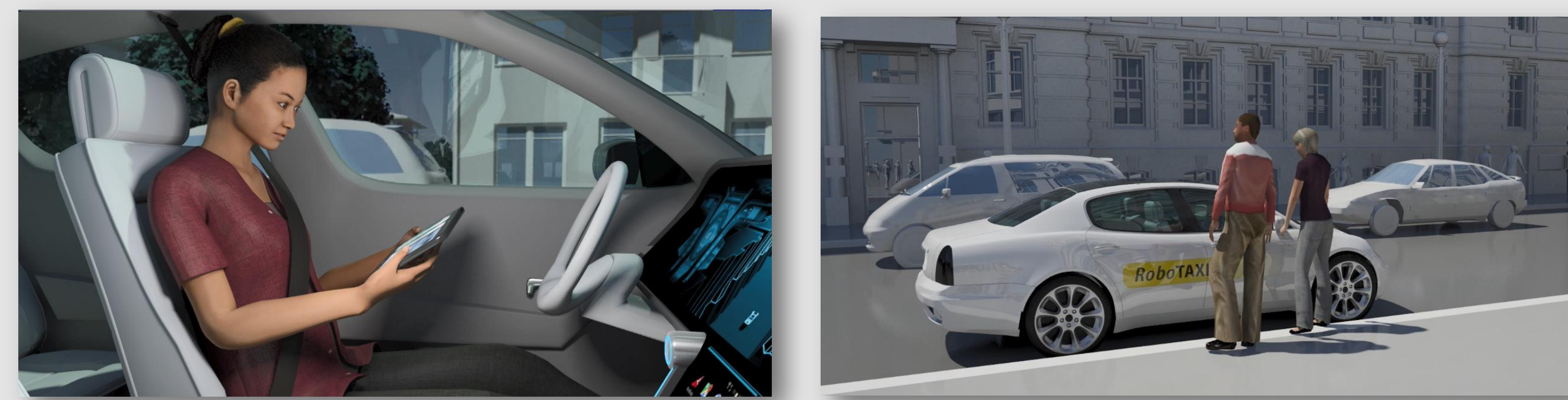
Simultaneously:

- **Lack of empirical data** on user preferences and factors influencing the mode choice related decision making process

- Such data is needed in order to predict **the impact of automation**

2. FOCUS OF THE RESEARCH -------------------------------

- **How might autonomous driving affect VTTS?**
  Addressed in a first study

- **How can the changes in VTTS be explained?**
  Addressed in a follow-up study build upon the first one

3. STUDY DESIGN --------------------------------------

- Online survey, sample size: 485
- Commuting, shopping, leisure trips
- Two Stated Choice (SC) experiments – current and future available alternatives
- Two concept of autonomous driving – private autonomous vehicle (AV) and driverless taxi (VoD)

- Including psychological constructs (e.g., attitudes, perceptions)

Imagine that all of the following modes of transportation are available for your trip. The trip duration and the trip cost are as presented below.

Please mark below which of the following modes of transportation would you choose.

	Option 1	Option 2	Option 3	Option 4	Option 5
Mode of transport	Walk	Bicycle	Public transport	Private AV	Driverless taxi (SAV)
Trip duration	2 h 45 min	42 min	27 min	30 min	23 min
Access/ egress time		2 min	5 min		
Waiting time			10 min	2 min	5 min
Ridesharing					No
Cost		3,15		1,98	4,05
Total trip time:	2 h 45 min	44 min	42 min	32 min	28 min
	○	○	○	○	○

Figure 1. Example of a choice situation as presented in the study

4. MODEL ESTIMATION -------------------------------

- **Mixed Logit model** with random parameters for in-vehicle and waiting time

- **Hybrid choice model** incorporating psychological constructs

5. RESULTS --

Estimated changes in the VTTS

- **VTTS reduction of 34%** when driving autonomously vs. driving manually, however, only for commuting

- In-vehicle time in an AV is perceived similar as using public transportation

- Riding a **privately owned AV** in automated mode is **more attractive than** using a **driverless taxi**

Conceptual model to explain the VTTS changes

- Based on behavior theories and theoretical considerations on positive utility of travel

- Consider empirical results from studies on acceptance of autonomous driving
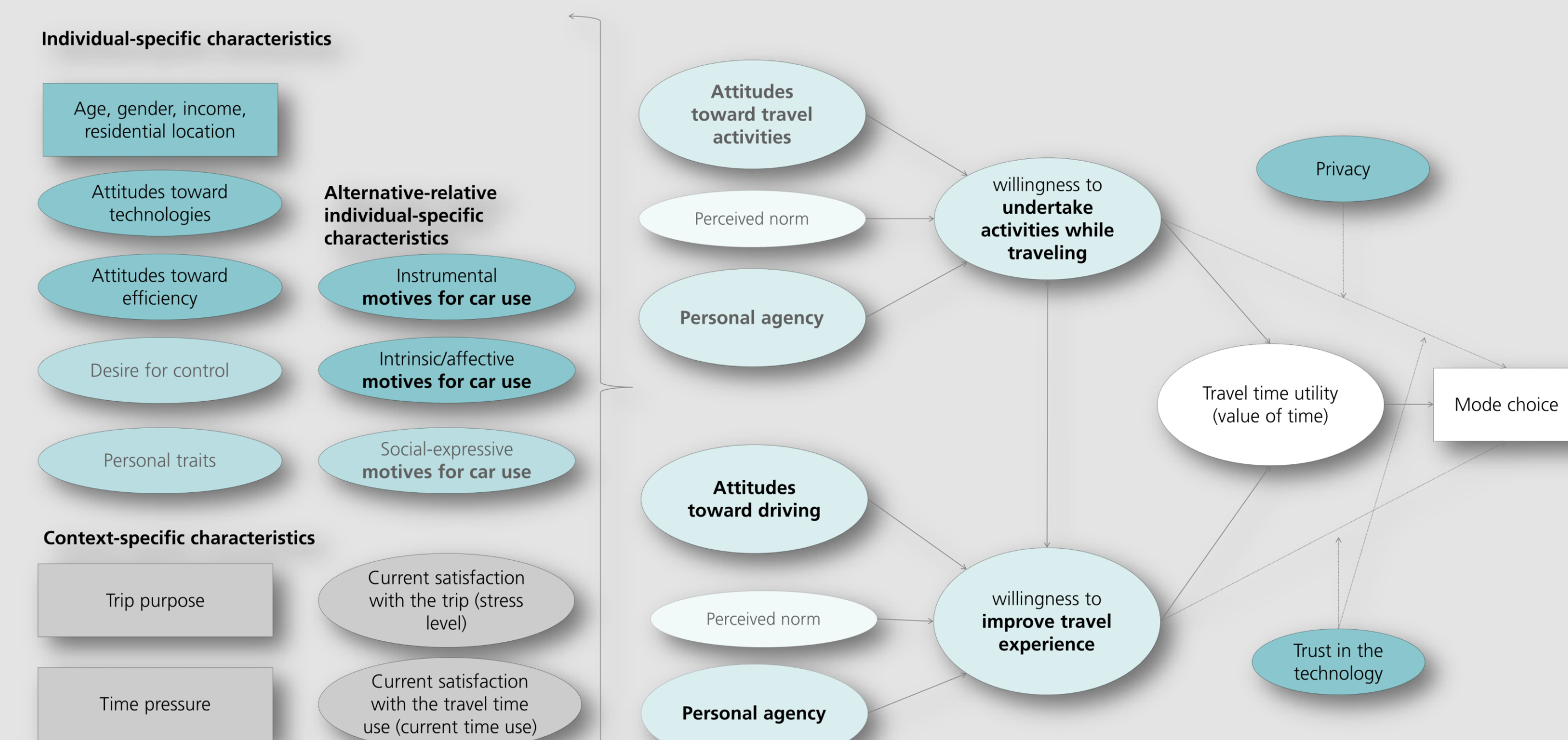

Figure 2. Conceptual model that explains changes in VTTS for autonomous driving

6. NEXT STEPS --

- Follow-up empirical study on VTTS for autonomous driving incorporating psychological factors

RELATED RESEARCH ---
- Steck, F., Kolarova, V., Bahamonde-Birke, F., Trommer, S., and Lenz, B. (2018). How Autonomous Driving May Affect the Value of Travel Time Savings for Commuting. In: Transportation Research Record: Journal of the Transport Research Board.
- Kolarova, V., Steck, F., Cyganski, R., and Trommer, S. (2017). Estimation of value of time for autonomous driving using revealed and stated preference method. European Transport Conference, 2017.
- Cyganski, R., Heinrichs, M., von Schmidt, A., and Krajzewicz, D. (2018). Simulation of automated transport offers for the city of Brunswick. In: Procedia Computer Science 130: 872-879.

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