

# Newsletter

## Newsletter Vol. 02/2023

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DAVeMoS is an Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (*Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie*, BMK)'s Endowed Research Group with a mission to strengthen the competitiveness and knowledge building in the field of digitalisation and automation in the transport and mobility system at local, regional, national, and the EU levels.

Read more about DAVeMoS at:

[www.davemos.online](http://www.davemos.online)

Head of the group:

Univ. Prof. Dr. Yusak Susilo

[yusak.susilo@boku.ac.at](mailto:yusak.susilo@boku.ac.at)

Hosted by BOKU Institute for Transport

Studies: [www.boku.ac.at/en/rali/verkehr](http://www.boku.ac.at/en/rali/verkehr)



AI Generated Figure with prompt = "BMK Endowed Professorship in Digitalisation and Automation in Transport and Mobility System"

### 1. Co-Piloting Transport Planning with AI generative pre-trained transformer (GPT) method

Since it was released on 30<sup>th</sup> of November 2022, Chat GPT has become a global phenomenon. Some loves it, some fear it. Some (try to) ban it, some embrace it. It has been used for different purposes, from generating fake pictures of the Pope<sup>1</sup>, passing an MBA Exam<sup>2</sup> to writing codes and models for research and data analysis. In short, the emergence of OpenAI's ChatGPT has put intense spotlight on generative AI (Gen-AI) systems and their possible impacts on everyone's daily lives.

Now, how about in transport planning and the analytic domain? With the dawn of ChatGPT and its Artificial Intelligent, and the availability of large open mobility datasets, we can expect that it would be much easier to provide information and optimize the choices and systems based on the observed/recorded/reported needs of the population in the given dataset. With the availability of such comprehensive information, it is also very tempting to believe that one would be able to generate personalized recommendations for each traveler, based on their location, travel needs, and personal preferences (let's put our concerns on the ability to analyse and predict personal attitudes and preference over time aside for the moment). Given that the traffic information may be available for ChatGPT and alike, such platforms are expected to be able to provide real-time updates on traffic conditions, helping users avoid congested routes and save time. With the same approach, we can also use ChatGPT-driven systems to encourage users to use public transit or other sustainable modes of transportation that may be faster and more reliable from an operational point of view.

1 (<https://www.nytimes.com/2023/04/08/technology/ai-photos-pope-francis.html>)

2 (<https://www.springboard.com/blog/news/chatgpt-revolution/>)

At the same time, having working with big data and algorithms in the past, I am very well aware that our algorithm output quality would only be as good as, or as biased as, the quality of our datasets or data inputs. Thus, if the data used to train ChatGPT is biased and only covers a small part of population, it will provide biased recommendations for transportation options, leading to disparities in travel behavior and limiting the potential for behavior change and any possible transformative policy designs. In this sense, ChatGPT is neither superior or inferior to any of our existing (and beloved) models that we generated using the same (biased) datasets. The fallacy is that when one really believes everything that AI/ChatGPT produces, the output will be superior to our existing transport analysis outputs, whilst in a traditional/more manual approach, we may still acknowledge the importance of qualitative knowledge and design thinking in our long-term strategic planning processes.

With the rise of technology dependency, it is normal to expect that people will become too reliant on ChatGPT or other AI systems for travel recommendations and decision-making. Given the nature of computation approaches being efficient and effective, this will limit people's ability to make independent and informed choices about their travel behavior. Once everything is limited and optimized, then people's 'curiosity' and 'spontaneous' daily/leisure trips may disappear, as will human creativity (despite its positive influence on people's happiness).

Perhaps, it is necessary to remind us what Sam Altman, the OpenAI CEO, creator of ChatGPT said: that we should not place AI as the pilot (in our analyses / planning / decision-making processes), or even as a 'fact-database'. Instead, we should use it as a co-pilot and, in our (research) case, as a complementary reasoning-engine. I believe that any technology development, like ChatGPT, should not discourage our curiosity to understand the real science underlying human decision-making processes. Nor should it limit our choices of actions in the future. But it can serve as our co-pilot or helper, in particular in working with large-scale number crunching that may not be easily done with the existing methods.

As a closing of this editorial, to demonstrate how ChatGPT can reproduce the knowledge, I put the English version of this editorial text into Chat GPT, with a prompt "*rewrite it in a popular article for transport stakeholders*". You can find the result on the following page for you to judge where content, arguments or theoretical thinking may have been lost, added or significantly modified in the process. Enjoy!

Yusak Susilo

Acknowledgement: Some parts of the above text is a reduced version of Yusak Susilo's article that has been published at IATBR Newsletter 3, which can be found in: <https://iatbr.weebly.com/september-2023.html>



AI Generated Figure with prompt = "Austria Future Transport and Mobility System"



AI Generated Figure with prompt = "Austria Future Transport and Mobility System in 2030"



Certainly, let's transform the key points into a popular article for transport stakeholders:



### **Title: "AI's Game-Changing Role in Transport Planning: Opportunities and Cautions"**

In the ever-evolving landscape of transportation planning, a new player has taken the stage – Artificial Intelligence (AI). AI, like the famous ChatGPT, holds immense promise and potential for revolutionizing how we manage transportation. It's making waves, but there are important factors to consider as we ride this technological wave.

#### **The Power of AI in Transport Planning**

Imagine having an AI system that not only crunches vast amounts of transportation data but also tailors recommendations to each individual's unique needs. This is the game-changing potential of AI in transport planning. It can optimize routes, provide real-time traffic updates, and suggest sustainable travel options, all with the aim of making our journeys smoother and more efficient.

#### **The Data Dilemma: Quality and Bias**

However, there's a critical challenge we need to address - data quality and bias. The AI is only as good as the data it's trained on. If this data is biased or doesn't represent all groups of people, the recommendations it offers can inadvertently perpetuate inequalities in transportation. It's imperative that we ensure our data is diverse and unbiased to create equitable solutions.

#### **AI as a Partner, Not a Replacement**

While AI brings exciting possibilities, it's vital to remember that it should complement human expertise, not replace it. Our transport experts have valuable qualitative insights and design thinking that AI can't replicate. AI can help analyze mountains of data, but humans provide the finesse in strategic planning and decision-making.

#### **Balancing Efficiency and Creativity**

Over-reliance on AI could potentially stifle our spontaneity and creativity in travel choices. If we always follow AI recommendations, we risk losing our sense of adventure. We need to strike a balance between AI's efficiency and our human capacity for exploration and curiosity.

#### **The Wisdom of Sam Altman**

Sam Altman, the CEO of OpenAI, rightly suggests that AI should be a co-pilot, not the primary pilot. It's here to assist us, particularly with complex data analysis, but it should not replace our decision-making power or human creativity.

#### **The Ethical Imperative**

Lastly, as we embrace AI in transport planning, we must uphold ethical principles. We must respect data privacy, be transparent in how AI shapes recommendations, and ensure fairness in its application. An ethical approach will build trust and promote responsible use of this powerful technology.

In conclusion, AI is a game-changer in transport planning, but we must navigate this new era with caution and responsibility. It's a co-pilot that can enhance our journey, but let's not forget that the driving force behind transportation decisions should always remain in human hands, guided by fairness, creativity, and ethical considerations.

## 2. Backcasting the decarbonization of the Viennese transport system by 2040

The city of Vienna, hailed as the world's most livable city in the 2023 Global Livability Index, has set ambitious goals for 2040, aiming to tackle climate change and improve overall quality of life. Recognizing the significant impact of transport emissions on climate change, Vienna has incorporated strategies and measures into its policy documents that align with Kevin Lynch's Theory of a Good City (ToGC). This theory highlights the aspects that make a city "good" and the measurements required to enhance the quality of life. The analysis of Vienna's policy documents reveals a correlation between most of the city's performance indicators for 2040 and Lynch's ToGC measurements. One of Vienna's key objectives for 2040 is the integration of micromobility solutions to address urban challenges. Consequently, the study's visioning phase focus around factors such as Accessibility and Opportunity, Mobility-Environment and Energy, Mobility-Transport Demand, Speed, Traffic Safety, Prosperity, and Equity. Figure 1 shows the scenario development schematic, which was thoroughly analyzed.

To map out how Vienna can achieve its 2040 goals, the study employs a method known as backcasting, which involves envisioning future goals and working backward to identify the steps required to attain them. This approach is particularly well-suited for addressing complex, long-term challenges and has not only considered policy objectives but also the diffusion of micromobility. Vienna presents an ideal study area due to its early adoption of shared bike schemes since 2003 and shared scooter schemes since 2018. The researchers use the Metropolitan Activity Relocation Simulator (MARS) for a dynamic simulation of transport and land use interactions in Vienna.

The backcasting process in this study consists of three phases: vision and goal creation, definition of the policy package, and the development of policy pathways. Two scenarios, the baseline and policy scenarios, were simulated, focusing on CO2 emissions, total energy consumption, and modal split between 2022 and 2040. The policy scenario envisions motorization rate reduction, widespread adoption of battery electric vehicles, and substantial investment in micromobility infrastructure and sharing system.

The simulation results point to a significant reduction in CO2 emissions in both scenarios (figure 2). However, both scenarios fall short of the goal of a decarbonization by 2040. Currently automated optimization algorithms are used to identify policy instrument combinations meeting the decarbonization target. Meanwhile, the modal split in the policy scenario aligns more closely with Vienna's goals, caused by the decrease in car availability due to the low motorization rate (figure 3).

The research so far concludes that achieving Vienna's energy consumption targets and ensuring full decarbonization by 2040 will be difficult and remains uncertain. The primary challenge is the delay in fleet renewal, making a complete transition to battery electric vehicles by 2040 unlikely. While the modal split target seems attainable in the policy scenario, the reduction in motorization rates requires further policy development. In summary, the backcasting approach, coupled with simulations and the use of various policy instruments, offers valuable insights into the city's pursuit of its 2040 goals. While initial findings suggest some deviation from the targets, the backcasting provides a solid base for guiding Vienna toward a more sustainable and livable future.

*Shahnaz N Fuady, Paul C Pfaffenbichler, Georgia Charalampidou, Yusak Susilo*

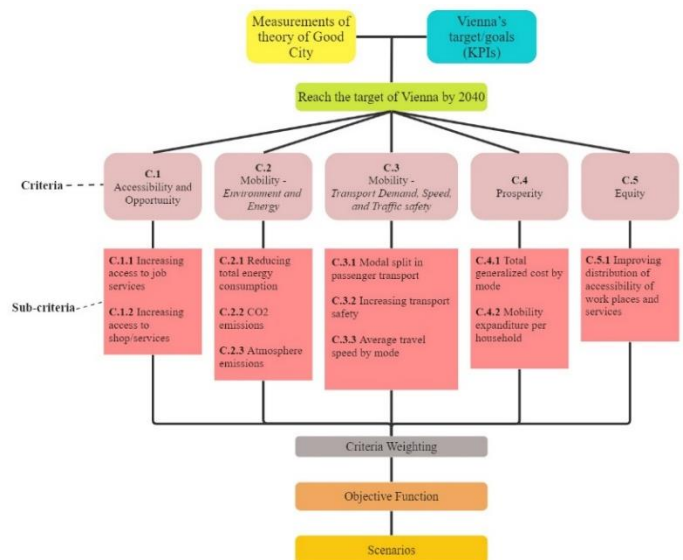


Figure 1 Schematic of scenario development

## 2. Backcasting the decarbonization of the Viennese transport system by 2040

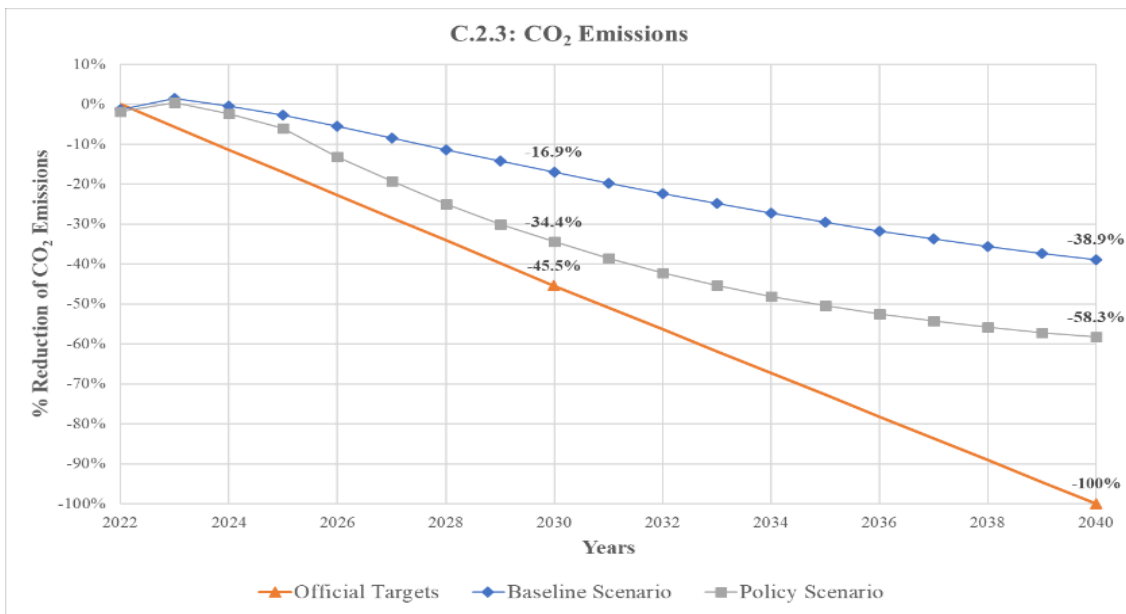


Figure 2 CO2 emissions result

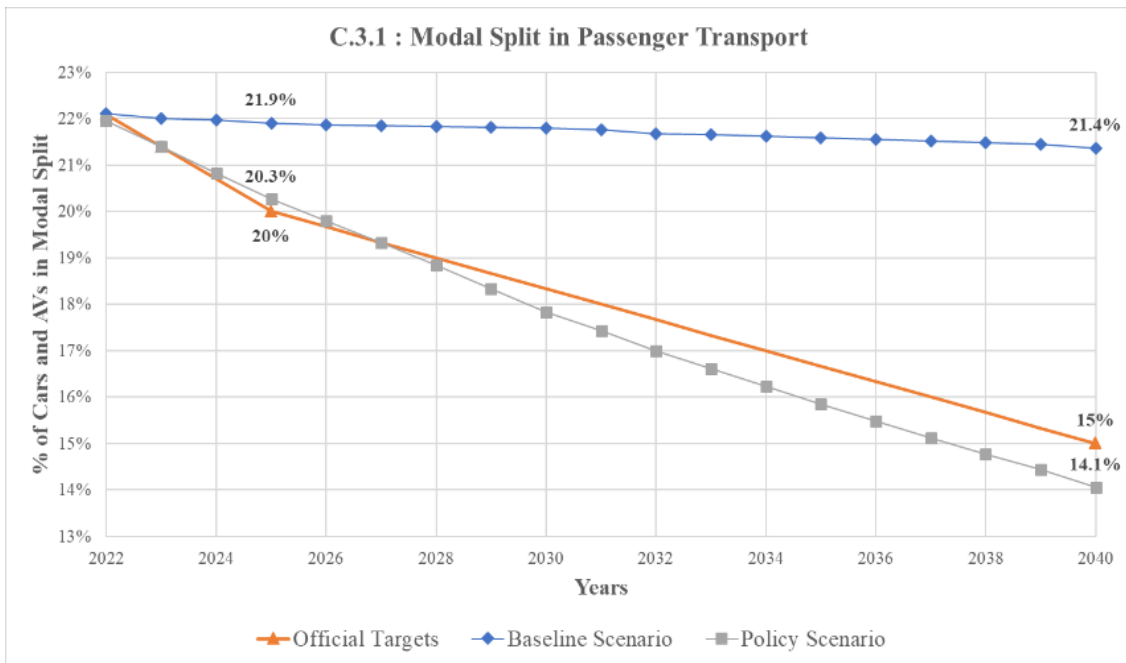


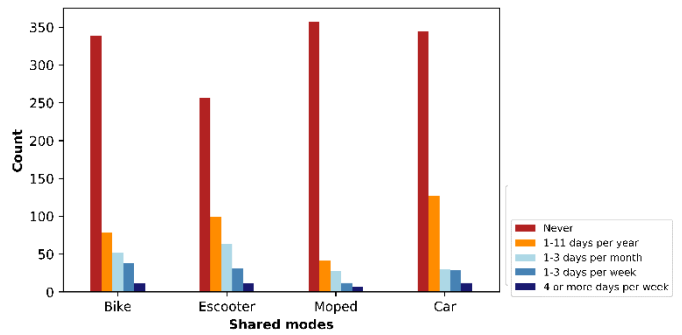
Figure 3 Modal split result

Acknowledgement: This article is a modified version of the authors' work has been submitted for publication consideration at the 103<sup>rd</sup>, Annual Meeting of the US Transportation Research Board, Washington DC.

### 3. Smarthubs project: shared mobility users profiles and preferences in three different cities

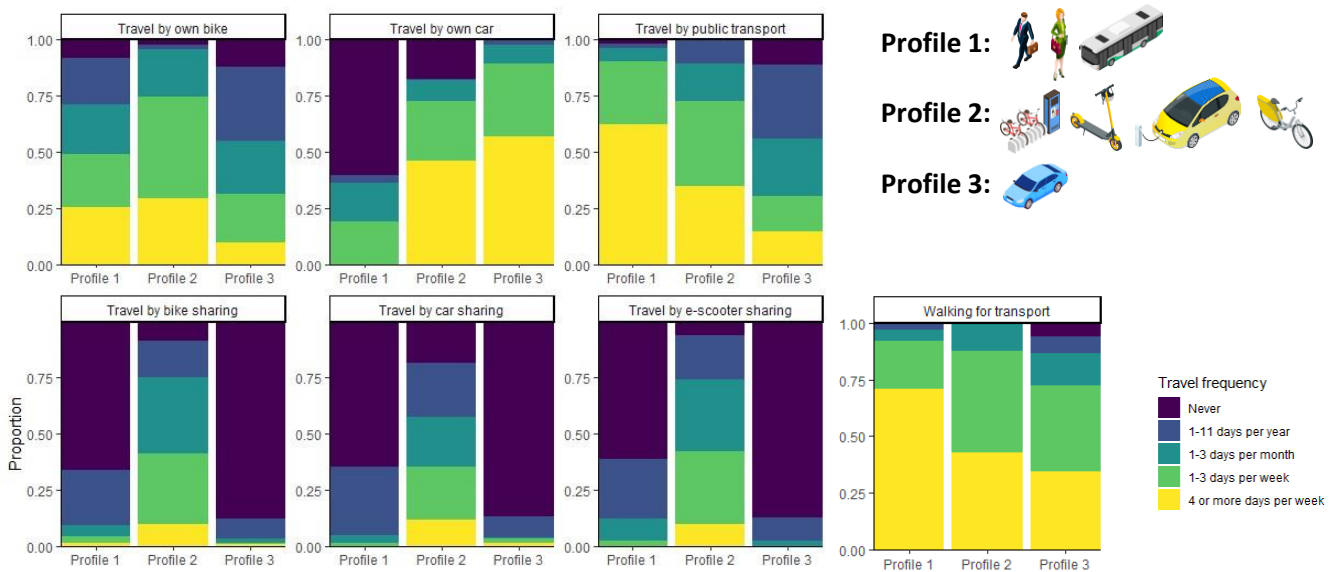
During last winter period (December 2022 - January 2023), together with other colleagues within SmartHubs (<https://www.smartmobilityhubs.eu/>), we deployed a large scale survey which focused on gaining insight into the characteristics (sociodemographic, mobility, and environment) of current and potential users of mobility hubs as well as on people's barriers and willingness to use mobility hubs. The survey explored all three dimensions (physical, digital, and democratic) of the SmartHubs integration ladder (<https://www.smartmobilityhubs.eu/data-publications>). Data were collected via multiple sources, including panel companies and face-to-face interviews in small-scale events. The final valid dataset includes responses from 2,505 people across the four study areas (Brussels, Munich, Rotterdam-The Hague and Vienna-rural Lower Austria).

The first step towards identifying the impacts of mobility hubs is understanding who are the people that currently use or are willing to use hub-based modes of transport (shared mobility and public transport). In Figure 1, the transport habits of the survey respondents in Munich in terms of travel frequency by shared modes are presented. It is noticeable that most respondents have never experienced travelling by shared modes such as cars and micromobility (bikes, e-scooters, and mopeds).



**Figure 1** Current travel frequency by hub-based modes in Munich.

To further understand the users of mobility hubs, we conducted a Latent Class Analysis (LCA). LCA allows for grouping people with similar mobility habits. In total three distinct groups were identified. We found that regardless of the particular shared mode that one prefers, there is a group people who uses multiple travel modes to fulfil their travel needs. These people would frequently travel with their own (bike and car) travel modes as well as with shared modes (Figure 2: Profile 2) and public transport. At the same time, there is also a cluster of travellers who are not likely to use shared mobility alternatives and are either keen on travelling by public transport and on foot (Figure 2: Profile 1) or strongly dependent on private car (Figure 2: Profile 3).



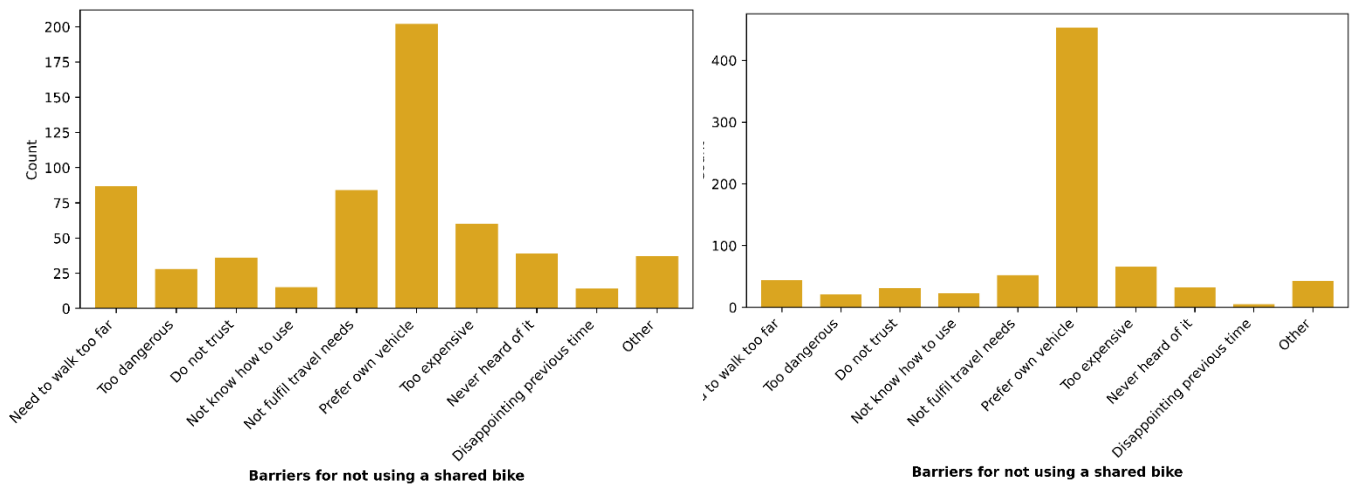
**Figure 2** Latent Class Analysis results for profiling mobility hubs users in Brussels, Munich, and Vienna.

### 3. Smarthubs project: shared mobility users' profiles and preferences in three different cities

Finally, to help cities and operators identify what could make shared mobility more attractive, we analysed the barriers that people currently face. Figure 3 summarises the survey responses regarding the reasons why people do not travel by bike sharing in Vienna/Lower Austria and the area of Rotterdam/The Hague. Although people from both regions revealed their strong preference to travel by their private bikes, residents of Vienna and Lower Austria also reported that bike sharing stations are not in proximity to their trip origin location. This might indicate that our respondents in Austria may be willing to use bike sharing as long as shared bikes are more physically accessible to them.

Further analysis will be conducted in the context of the Smarthubs project to understand the effect of access time and other factors on the attractiveness of shared mobility and mobility hubs overall.

*Roxani Gkavra*



**Figure 3** Barriers for not using bike sharing in Vienna/Lower Austria (left) and Rotterdam/The Hague (right).

Acknowledgement: Further information on the evaluations and results of the analyses regarding users' profiles and preferences for shared mobility in these four cities can be found in the report "D5.1. - Mobility hubs impacts on mobility patterns and behavioural change", which will soon be available at the Smarthubs project homepage ([www.smartmobilityhubs.eu](http://www.smartmobilityhubs.eu)).

## 4. Users' profiles and key determinants of shared mobility usage in Austrian Rural Cities

This article summarizes the results from our recent case study in two rural cities, Korneuburg and Waidhofen an der Ybbs. A survey was conducted to record usage, also in connection with public transportation, socio-demographic and mobility characteristics, user satisfaction, reasons for non-usage and attitudes towards shared mobility. The survey was repeated in each city to account for the development over time after introducing shared mobility. Overall, data was collected from 553 respondents in the first and 161 in the second survey wave, out of which 82 were identified as panelists.

The survey results show that, in Austrian rural context, compared to e-scooter sharing, carsharing was used less frequently for leisure trips, whereas it was used more frequently for trip purposes related to commuting, e.g. for work or education. First- or last mile usage seems to play a considerable role as almost half of the e-scooter sharing users combined it with public transportation at least twice and almost 40% did so for carsharing.

Based on binary logistic regression modeling, major determinants of usage identified are age, mobility app usage, the availability of e-scooters or e-bikes at home as well as the accessibility of shared mobility stations. Notably, users expressed high satisfaction and partial combined shared mobility with public transportation, while the majority of non-users cited no need for shared mobility. The availability of private car within household may explain the gap identified between intention-to-use and usage of shared mobility.

Interestingly, it was also found that respondents who pondering to give up their household's second car, the usage rates were highest.

For the first survey wave, latent class cluster analysis on the stages of adoption of shared mobility (in reference to the theory of Diffusion of Innovation, Rogers, 2003) identified 3 classes: early adopters, curious and hesitant majority as well as laggards. Early adopters (14%) used shared mobility frequently and were more likely to be male and use mobility apps. About a third of laggards (39%) were not aware of shared mobility and half of them did not intend to use it. Similar to the key determinants of usage, these non-users are likely to be older and live further away from the city center than 10 minutes walking distance.

Based on these results, some recommendations to support the adoption process are elaborated. First is to increase awareness by implementing repeated marketing measures, e.g. for carsharing at crowded multi-modal interchanges or along congested road corridors. A considerable share of the largest class of "laggards" do not know the shared mobility offer despite expressing a positive intention-to-use. Thus, make the shared mobility more visible for visitors and new residents could increase the adoption rate. As for overcoming barriers to usage, tutorials for app usage and e-scooter and e-bike handling are recommended. These measures can facilitate the rural population's usage and support the transition towards a sustainable and innovative transportation system.

*Julia Schilder*



**Presentation of survey results, Waidhofen an der Ybbs, 06.09.2023:** mayor Krammer, mobility councilor Leonhartsberger, office manager Büringer, energy manager Peham, PhD student Schilder (from left to right)



**Accompanying shared mobility introduction with an e-scooter test track and information on carsharing in Waidhofen an der Ybbs, 26.06.2022**



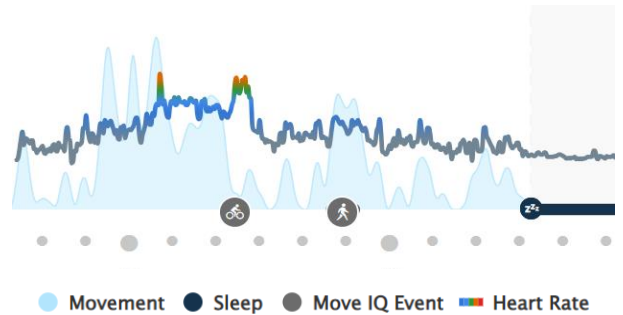
## 5. Analysis of Physiological Responses of Children to Active Travel

The declining physical and mental health of children and adolescents in Austria is a significant concern. Sedentary lifestyles, rising cases of childhood obesity, and inadequate physical activity levels demand effective strategies to promote healthier lifestyles. Active travel, which includes walking and biking, offers a promising approach to enhance physical activity and overall well-being among children. Yet, there is limited research on how active travel directly affects children's physiological responses. This study, as a part of TRA:WELL project (<https://trawell.life>) aims to fill this research gap by investigating the relationship between active travel and children's physiological responses during trips. Heart rate serves as an objective indicator of physical activity intensity and psychological stress, making it a valuable metric to study in the context of travel.

Our research employed a mixed-methods approach involving 73 students from three Austrian secondary schools. Data collection occurred over seven consecutive days, combining surveys and physical activity trackers. The online questionnaire covered personal information, travel modes, and health-related inquiries. Each participant wore a wrist-mounted activity tracker to continuously record heart rate data. The dataset consisted of 1,146 trips, providing a detailed look at the interplay between children's physiological responses and various factors. Data pre-processing included handling outliers, missing values, and removing trips with excessive missing data.



**Questionnaire and tracker data checking during the survey**



**Example of heart rate fluctuations according to activity intensity with different travel modes**

The results of this study provide valuable insights into how active travel modes influence children's physiological responses, with a specific focus on heart rate. Higher levels of active travel engagement were associated with elevated heart rates, emphasizing the importance of considering the proportion of active travel in total trip duration when assessing physiological responses.

Subjective perceptions, including feelings of exhaustion, anxiety, stress, and unhappiness, played a significant role in shaping heart rate responses during travel. The presence of adults during travel appeared to have a calming effect on children's physiological activity, while traveling with peers led to higher physiological responses. Longer trip durations were associated with reduced heart rates, warranting further investigation into the underlying factors.

In conclusion, this research contributes to our understanding of the relationship between active travel and children's physiological responses, shedding light on the importance of promoting healthier travel modes for children's well-being. Further research can build upon these findings and explore additional factors that influence children's physiological responses during travel.

**Acknowledgements:** This research work was developed in connection with the project "TRA: WELL-transport and wellbeing" (2022-2024) which is led by Prof. Dr. Juliane Stark and is funded through the Sparkling Science 2.0 programme by the Austrian Federal Ministry of Education, Science and Research. Further information about the activities and results of the project can be found in <https://trawell.life>

Shun Su

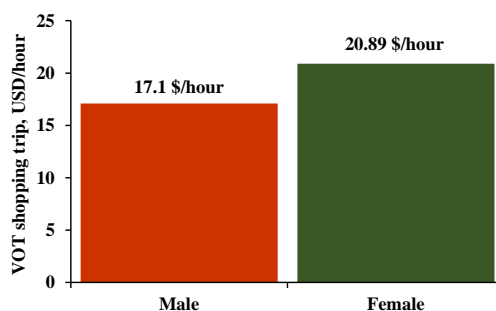
## 6. Post-purchase trip heterogeneity

From the early days of e-commerce, there was a belief that this emerging way of shopping would influence how people travel and the number of products they buy and consume. Transportation scientists like Solomon I. and Mokhtarian P. L. have explored various potential outcomes, such as the complementary effect, that e-commerce could have on shopping trips. However, much of the research in this area has concentrated on how e-commerce affects trips made before and during a purchase, leaving the post-purchase trip phenomenon largely unexplored.

This issue requires attention as, for instance, in the US according to the National Retail Federation and Appriss Retail, the percentage of retail returns surged to 16.6% in 2021, compared to 10.6% in 2020 (Repko, 2020). Moreover, as reported in Statista source, on average, 30% of consumers purchase four or more items of clothing and shoes in a single online order, with some of these items being returned. This phenomenon can be attributed to the nature of clothing and shoes as "experience" goods that consumers prefer to check and try on before making a final purchase decision. Consequently, the reasons behind this return behavior may be linked to the specific features of the online shopping services offered by retailers such as free return delivery options.

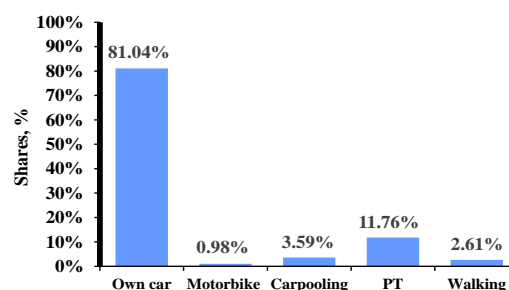
To investigate the phenomenon of product returns, we conducted a stated choice survey in the USA, gathering behavioral data from 507 clothing shoppers. Having such data, we performed a discrete choice modeling approach to investigate the attributes that may trigger the post-purchase return behavior. A particular focus was placed on the availability of free and paid return deliveries within the online shopping offers. The interaction of these option with purchase costs and delivery times allowed us to explore post-purchase trip heterogeneity.

In a first step, we calculated the value of time (VOT), which reflects the amount individuals are willing to pay to reduce travel time by one minute or one hour. This estimation took into consideration the gender differences related to shopping trips to physical stores. The findings are illustrated in Figure 1. The spread in perceived VOT between males and females is almost 22%, indicating heterogeneity in consumer behavior.



**Figure 1** Value of time (\$/hour) for shopping trips

In the next phase of our study, we conducted an analysis of the collected data regarding consumers' actual choices when it comes to returning purchased clothing in previous transactions. This data was categorized into two primary sub-datasets: "No Returns" and "Returns." Consequently, the "No Returns" dataset represents only 23.02% of male respondents and 21.47% of female respondents. Moreover, the "Returns" dataset was subdivided into three subgroups: "Returned only by him/herself," "Returned by him/herself and carrier," and "Returned only by carrier." As a result, the "Only by Carrier" subgroup has the smallest share for both genders, specifically 27.1% for males and 20.76% for females, meaning that large number of people prefer to return clothing to the shops by their own even having free return options. Figure 2 depicts the revealed modal split for post-purchase trips.



**Figure 2** Revealed modal split for post-purchase trips

The results we obtained have enabled us to delve into the contradictory phenomenon concerning consumer behavior before and after making a purchase. It appears that consumers are drawn to the idea of free return delivery options, yet a significant portion of them still prefer to handle returns themselves, often using environmentally unfriendly modes of transportation.

*Oleksandr Rossolov*

## 7. Analysis of Loigom on-demand service in Leogang

The survey on the Loigom demand-response Shuttle service in Leogang, Salzburgerland, was conducted as a follow-up to the surveys on the W3 Shuttle (Pfarrwerfen/Werfen/Werfenweng) and Walsiebus (Wals-Siezenheim) in 2021 and 2022. In July 2023, 248 people, including users and non-users, tourists, day visitors and locals were interviewed. In addition, the stakeholders of the Loigom Shuttle were interviewed.

The Loigom Shuttle was introduced in September 2022 and can be used from Monday to Sunday. The trips are handled by two electric vehicles (8-seaters). The approximately 40 service points make it possible on the one hand to increase the frequency of the existing regular service on the valley axis and on the other hand to connect other places and areas, such as the cable cars, the Schaubergwerk and the two railway stations. The integration into the SVV tariff system means that locally valid tickets are recognised, and the service can also be used with the local tourist card, which all overnight guests receive for free. The service is operated by a local company as subcontractor of ÖBB-Postbus GmbH. Financing is provided by the province of Salzburg, the municipality of Leogang and the tourism association.

The shuttle users are predominantly locals. The service is very well-known: only 6% of the locals have never heard of this on-demand transport service. The most frequent use is in the afternoon, about two-thirds of the shuttle is ordered via APP, the most important purpose of the journey is leisure activities. The strongest relation is the connection between the

districts east of the town centre and the town centre itself. One in two users would have made the trips made with the shuttle by car if the Loigom Shuttle did not exist.

80% of the users are satisfied with the Loigom Shuttle and 93% would recommend it to others. What the users like most is the flexible and practical form of mobility and the spatial accessibility of the service. The most desired changes are an extension of the service times and the service area. Already now, more than 80% of the current non-users can imagine using the shuttle in the future.

*Igor Woloschtschuk & Roman Klementschtz*



## 8. Visitors and new research team members



GEORGIA CHARALAMPIDOU is a Civil Engineer from Greece with an interest in traffic and transport modelling. Her work in DAVeMoS has been focused on back-casting analysis of the transport emissions for the city of Vienna with the use of system dynamics MARS.

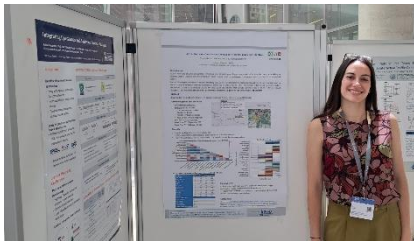


KAORI NAKAMURA is a master's student in the Department of Civil Engineering at the University of Tokyo. Her main interests are disaster management, activity modeling, and policy decisions related to transportation systems.

## 9. DAVeMoS at Conferences

### DAVeMoS at ISFO 2023

From 26th to 30th June 2023, the 4th International Symposium on Freeway and Tollway Operations (ISFO) was co-organised by Austria Tech and the Transportation Research Board (TRB) in Vienna. The conference hosted more than 300 international participants from 36 nations. Over multiple presentations and poster sessions, the conference offered a platform for discussion of research and practices in traffic management.



Roxani Gkavra presented a poster on her work with Prof. Yusak Susilo and Dr. Roman Klementschtz on operation of Demand Responsive Transport systems in rural areas with a focus on the attractiveness of demand transport systems from a users' satisfaction perspective.

*Roxani Gkavra*

### DAVeMoS at hEART 2023

The 11th Symposium of the European Association for Research in Transportation (hEART) 2023 took place from September 5th to 8th, 2023, in Zurich, Switzerland, and was hosted by the Institute for Transport Planning and Systems (IVT) of ETH Zurich. The conference was held at the ETH Höggerberg Campus, where over 120 researchers presented their studies on a diverse range of topics, including traffic and network simulation and optimization, the analysis of big data, discrete choice modeling, multi-modal transportation, activity-based modeling, as well as autonomous and connected vehicles.

During the Public Transport: (Low) fare, equality, and policy workshop, Professor Yusak Susilo delivered a presentation on the operationalization of equity measurements based on the distributional effects of policy interventions. Muhamad Rizki, a DAVeMoS Phd student, presented the effect of apps' transformation and long-term adoption of transport SuperApps and

### DAVeMoS at Universitätstagung

In the beautiful fields of the Abtei Rodluc in Kerkrade, the Netherlands, the Chair and Institute of Urban and Transport Planning of the RWTH Aachen University organised the conference Universitätstagung Verkehrswesen. The three-days conference offered the opportunity to Phd students to present their work and receive constructive feedback from peer students and professors from universities all over the DACH area. DAVeMoS Phd student Roxani Gkavra presented her research on mode choice behaviour in the shared micromobility context. After all formal and informal discussions, the overall concluding point of the conference was that regardless of the exact research area, transition to sustainability of the mobility system appears to be the main driving force.

presented results on the transition pattern of usage behavior when using the SuperApps. The conference also offered opportunities for networking through a range of social activities, including visits to the Swiss Railway Operations Laboratory, Tram Museum, Art Museum, and Swiss National Museum.



*Muhamad Rizki*

## 9. DAVeMoS at Conferences

### DAVeMoS at NECTAR, Cluster 3

The NECTAR workshop, titled "Delivering Just Sustainabilities: Green and Equitable Transitions in Last-Mile Logistics," took place from September 20 to 22 in Madrid, Spain. This event was organized under NECTAR Cluster 3, "Logistics and Freight," and hosted by the Polytechnic University of Madrid. The DAVeMoS group was represented by Oleksandr Rossolov, who presented the results of the survey titled "Willingness-to-pay and willingness-to-provide crowd-shipping service for e-groceries: Revealing latent attitudes and mode choice behavior," co-authored with Professor Yusak Susilo. The event young and mature scientists from a list of European, Northern America and Africa countries providing a spectacular platform for sharing cutting edge research conducted in the field of urban logistics.

During our presentation, we shared the outcomes of our behavioral study, which focused on assessing the willingness of urban residents to adopt crowd-shipping

technologies. The key aspect we investigated in this study revolves around the challenges associated with relying on occasional courier services in large cities, where car-centric mobility remains prevalent. Our findings emphasize that the implementation of crowd-based delivery services in cities lacking appropriate policies from local governments can have adverse effects, including increased environmental pollution, traffic congestion, and higher overall external costs.

*Oleksandr Rossolov*



### DAVeMoS at 51th European Transport Conference (ETC) 2023 in Milan, Italy

DAVeMoS team also took part at the 51st European Transport Conference (ETC) 2023, which was hosted at the Bovisa Campus of the Politecnico di Milano, in Milan, Italy. The conference ran from September 6-8, 2023. During the course of the conference, over 250 various research papers were presented. ETC was attended by approximately 550 delegates coming from 30 different countries around the world.

Shahnaz Nabila Fuady (Bella), a DAVeMoS PhD student, together with Dr. Paul Pfaffenbichler, presented her works on measuring the roles and impacts of micromobility to create a "good city" with system dynamic approach. In her research, she used Vienna metropolitan areas as her case study. She did scenarios testing to examine the impacts of micromobility in energy consumption, CO2 emission, mode split, and equity and develop policy pathways to reach the goals of Vienna by 2040.

*Shahnaz Nabila Fuady*



## 9. DAVeMoS at Conferences

### DAVeMoS at NECTAR, Cluster 6 & 7

The University of Coimbra's Department of Civil Engineering, in collaboration with the CITTA research center, organized a joint workshop with NECTAR's Cluster 6 (Accessibility) and Cluster 7 (Social and Health Issues). This event took place in Coimbra, Portugal, from the 21st to the 22nd of June 2023, focusing on the theme of "Sustainable Neighborhoods" with a strong emphasis on mobility, accessibility, sustainable transportation modes, inclusion, and health-related issues. A total of 24 researchers presented their studies covering a diverse range of topics, including sustainable neighborhoods, the 15-minute city concept, accessibility, bike-sharing systems, and mobility planning for networks and hubs. One of the highlights was Yusfita Chrisnawati, a

DAVeMoS PhD student, who presented her work on mobility hubs. She introduced an Agent-based simulation approach aimed at optimizing the locations of mobility hubs in the Greater Vienna region. The conference provided an intimate and supportive environment, enabling students to connect, exchange ideas, and establish new networks in an enjoyable manner.

*Yusfita Chrisnawati*



## 10. FSV Seminar 2023 Demand Forecasting – Limits and Possibilities

The annual FSV seminar in 2023 was dedicated to the challenge of creating traffic forecasts. The state of the art in terms of methods was presented and it was explained which data and information can be used for this. The following questions were addressed in presentations and discussions: What challenges arise in the preparation of forecasts? How do you deal with uncertainties? What are the limits of forecasts?

For the tenth time, the Institute of Transport at the University of Natural Resources and Applied Life Sciences Vienna, namely Roman Klementschtz, Juliane Stark and Oliver Roeder, undertook the conception of the content and moderation of the event. This year the Parkhotel in Bad Schallerbach in Upper Austria was chosen as the venue. In the usual way, the 2 half-day event consisted of a mix of impulse lectures and workshops and group discussions reflecting on them - this year again in cooperation with the BMK Endowed Chair DAVeMoS.

The tried and tested format of the event with two half-days and an overnight stay made it possible to stimulate dialogue among the participants away from the official events. At the end, there was a joint

excursion to the construction site of the Linz Westring Bridge.

Those who could not attend and are interested in the presentations can read them (together with the presentations of the FSV Seminar 2022) in the current FSV publication series 028 „Tools and Applications“ for a glimpse into the future of mobility.

*Roman Klementschtz*



## 10. FSV Seminar 2023 Demand Forecasting – Limits and Possibilities



## 11. Incoming Project: DREAMS

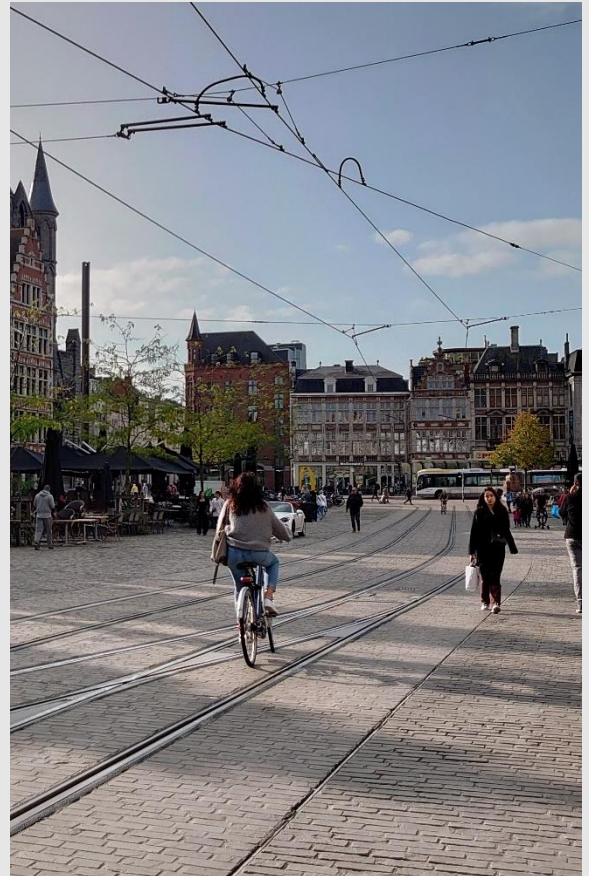
DAVeMoS is a part of another winning team in Driving Urban Transition (DUT) initiative scheme, with a project that focus on Driving Equitable and Accessible 15 Minute Neighborhood Transformations (DREAMS). It is a 3-year research project from the first Driving Urban Transitions call, with 2.2 million euro in total value.

In the DREAMS project we will examine how co-created and user-centric mobility services, mobility and flexible activity hubs can contribute to accessible, sustainable and inclusive 15mC neighborhoods in urban outskirts in European cities and regions. DREAMS will conduct a research in a variety of low- to mid-density suburban and urban outskirts in six living labs.

The experiment in Austria would include deploying pop-up stores to investigate what encourage people to live, play and work in the same neighborhood, and to build a multi-layer, interactive, data-driven, decision support system for our stakeholders.

The project will start on 01 January 2024. The Austrian consortium include colleagues from TU Wien (MOVE), Mobyome, StadtLand, Morgenjungs, and MO.POINT.

*Yusak Susilo*



## 12. List of DAVeMoS activities (04/23 – 09/23)

### *In Management:*

1. Our visitors, Victor Flensburg, Claudia Andruetto, and Robin Palmberg, have returned to Technical University of Denmark/BahneDanmark, KTH Stockholm, and CrossModal AB, respectively. During their time with DAVeMoS, Ms. Andruetto have provided seminar and organized meetings, including with ThinkPORT. During his visit, Mr. Flensburg also have stimulated knowledge exchanges, including with colleagues from SCHIG mBH.
2. In recent months, our new members include intern Georgia Charalampidou, a graduate from Aristotle University of Thessaloniki, and Kaori Nakamura from Tokyo University. Ms. Charalampidou is working with MARS System Dynamic, whilst Ms. Nakamura is working with our Virtual Reality lab.

### *In Research:*

1. In the last six months, the DAVeMoS has published 1 web-of-science publication, 9 conference articles and 3 invited presentations at TU Munich and ETH Zürich.
2. During this period DAVeMoS has also built one of very few multi-modal, multi-agent micromobility simulator
3. DAVeMoS completed another survey of a new DRT service in Leogang municipality, Salzburg.
4. DAVeMos has delivered 2 SmartHubs deliverables, including a report which focuses on Vienna and Lower Austria Living Labs
5. DAVeMoS has been visited by professors from the University of Melbourne (Australia), Rensselaer Polytechnic Institute (USA), University of Stavanger (Norway), University of Leeds (UK), and Bandung of Institute of Technology (Indonesia).
6. Together with International Association of Travel Behavior Research (IATBR) community, DAVeMoS has organised two webinar series, which focuses on South Asia and South East Asia Regions.
7. DAVeMoS has successfully secured an external funding from Driving Urban Transformation scheme.
8. DAVeMoS has presented survey results on shared mobility use in Waidhofen an der Ybbs, Lower Austria.

### *In Education:*

1. During the spring semester of 2023, DAVeMoS has (co) organizing three Guest Professors lectures, by Samatha Jamson (University of Leeds), Antonio Nelson Rodrigues da Silva (University of Sao Paulo, Brazil) and Jose Holguin-Veras from Rensselaer Polytechnic Institute, USA.
2. DAVeMoS has co-organized 2-days FSV planning seminar focuses on the possibilities and limits of traffic/transport demand forecasting. The seminar took place in Bad Schallerbach on 11-12 May 2023.

## 13. List of DAVeMoS publications (04/23 – 09/23)

### *Peer-reviewed journal articles:*

1. Gkavra, R., Susilo, Y.O., Klementschtz, R. (2023) Determinants of Usage and Satisfaction with Demand Responsive Transport Systems in Rural Areas. *Transportation Research Record*, 1-14, doi: 10.1177/03611981231198834.

### *Conference presentations:*

1. Rossolov, O. and Susilo, Y. (2023) Willingness-to-pay and willingness-to-provide crowd-shipping service for e-groceries: Revealing latent attitudes and mode choice behavior. NECTAR cluster 3 meeting on Delivering Just Sustainability: Green and Equitable Transitions in Last-Mile Logistics, Madrid, Spain.
2. Gkavra, R. (2023) Mode choice behaviour in the shared micromobility context. Universitätstagung Verkehrswesen 2023, Kerkrade, the Netherlands.
3. Fuady, S.N., Susilo, Y.O., Pfaffenbichler, P.C. (2023) Investigating the impact of micro mobility on the objective of “a good city”: A system dynamic approach. European Transport Conference 2023, Milan, Italy.
4. Rizki, M., Joewono, T.B., Susilo, Y.O. (2023) Exploring the Effect of Apps Evolution and Users’ Personality on Mobile Apps Adoption and Post-Adoption Pattern Over Time: Evidence from Super-Apps Users in Indonesian Cities. The 11th symposium of the European Association for Research in Transportation (hEART), Zurich, Switzerland.
5. Susilo, Y.O. (2023) Cognition and behaviour research based on physiological measurement in virtual reality. Bridging Transportation Researchers Conference 2023.
6. Fidler, M., Palmberg, R., Susilo, Y.O. (2023) An Exploration of the Applicability of Information Processing Theories in Road Hazard Perception Context. The 2023 World Conference on Transport Research Society (WCTRS), Montreal, Canada.
7. Gkavra, R., Susilo, Y.O., Klementschtz, R. (2023) Attractiveness of on-demand transport systems: users' satisfaction. The 4th International Symposium on Freeway and Tollway Operations, Vienna, Austria.
8. Chrisnawati, Y., Flötteröd, G., Susilo, Y.O. (2023) Optimizing Mobility Hub Locations: An Agent-Based Analysis of the Greater Vienna Region. NECTAR cluster 6 & 7 meeting on Sustainable neighbourhoods: Urban and transport planning for sustainable urban living, Coimbra, Portugal.
9. Shun, S., Fidler, M., Palmberg, R., Susilo, Y. O. (2023) An experimental dataset to study the behaviour of E-Scooter users in virtual reality through physiological measurement. NECTAR Cluster 4 meeting on Active Micro-Mobility – Modeling Spatial Behaviour of Cyclists and Pedestrians, Lyon, France