Stakeholder Mapping and User Perception of Mobility Management for Commuters and Students: A Comparison of 7 Case Studies in Central Europe – the GreenPATH Project

Roman Klementschitz, Valerie Jeepjua, Oliver Roider

(Dr. Roman Klementschitz, Universität für Bodenkultur Wien, Institut für Verkehrswesen, Wien, Österreich, roman.klementschitz@boku.ac.at)

(Dipl. Ing. Valerie Jeepjua., Universität für Bodenkultur Wien, Institut für Verkehrswesen, Wien, Österreich, valerie.jeepjua@boku.ac.at)

(Dr. Oliver Roider, Universität für Bodenkultur Wien, Institut für Verkehrswesen, Wien, Österreich, oliver.roider@boku.ac.at)

1 ABSTRACT

The GreenPATH project is a collaborative initiative aimed at addressing sustainable commuting challenges in Central European Functional Urban Areas (FUAs). It focuses on students and employees, promoting innovative and green mobility solutions through co-designed strategies, action plans, and pilot projects. The project involves 11 public administrations, mobility agencies, operators, universities, and research bodies, along with 12 associated partners. Its primary goal is to reduce private vehicle dependency, improve air quality, and enhance commuter well-being by encouraging the use of sustainable transport modes such as public and shared transport, cycling, and walking.

GreenPATH emphasizes the importance of stakeholder mapping and engagement to ensure the success of its initiatives. Stakeholders, including commuters, local administrations, businesses, and public transport operators, are identified and mapped based on their power and interest. Commuters and local governments are the most frequently identified stakeholders, with influence levels varying across pilot regions. This mapping process helps tailor strategies to the specific needs and challenges of each region. Awareness-raising campaigns are accompanying activities of the project. These campaigns aim to educate communities about the benefits of sustainable transport and provide information on available transportation options. Real-time information and personalized travel options are also offered to improve the commuting experience and encourage the adoption of sustainable modes of transport.

Based on the results of the user surveys in the 7 pilot areas, the project highlights the need for improved infrastructure to support sustainable commuting. Key recommendations include better lighting, enhanced cycling paths, and pedestrian-friendly conditions to improve accessibility and safety. Gender-specific and accessibility-focused improvements are emphasized to reduce barriers for all commuters. Behavioral aspects, such as improving car drivers' attitudes towards cyclists and pedestrians, are also identified as areas for improvement. Despite a general willingness to adopt sustainable commuting behaviors, only a small percentage of respondents have participated in mobility management initiatives before the GreenPATH project kicked of. This indicates the need for customized activities such as challenges and to improve awareness of available services and infrastructure. GreenPATH promotes role modelling by encouraging frequent users of sustainable transport modes, such as cyclists and public transport users, to share their experiences. This approach aims to inspire others to adopt similar behaviors, contributing to reduced private car usage and lower CO2 emissions.

GreenPATH leverages transnational cooperation across countries like Italy, Germany, Austria, Slovenia, Hungary, and Croatia to develop scalable solutions and formal agreements for long-term implementation. This collaboration helps overcome national legislative barriers and ensures the development of applicable mobility management tools across the region. The project's outputs include collaborative solutions for sustainable mobility, a comprehensive strategy, and action plans for each FUA, which are expected to be endorsed by decision-makers to ensure their adoption and long-term impact.

Keywords: mobility management, commuter, students, stakeholder mapping, planning

2 INTRODUCTION

GreenPATH develops an innovative approach to commuting in Central European Functional Urban Areas (FUAs). It aims at co-design smart and green mobility solutions with public and private stakeholders, benefiting students and employees by promoting sustainable transport. The project addresses the challenge of decarbonizing urban mobility through a set of tested solutions, strategies, and action plans. It involves 11

partners, including local administrations, mobility agencies, operators, universities, and research bodies. Transnational cooperation is key, bringing together expertise from Italy, Germany, Austria, Slovenia, Hungary, and Croatia. This cooperation contributes to overcome national legislative barriers and create applicable mobility management tools across the region. GreenPATH aims to deliver formal cooperation agreements, collaborative solutions for sustainable mobility, a comprehensive strategy, and action plans for each FUA. These outputs will be adopted by decision-makers to ensure long-term implementation and cooperation beyond the project's completion, benefiting a wide range of users, including local authorities, service providers, and educational institutions. The project is case study based, including seven pilot areas, which are: Berlin (Germany), Kecskemét (Hungary), Maribor (Slovenia), Monza (Italy), Osijek (Croatia), Ravenna (Italy), and Vienna (Austria), see also figure 1.
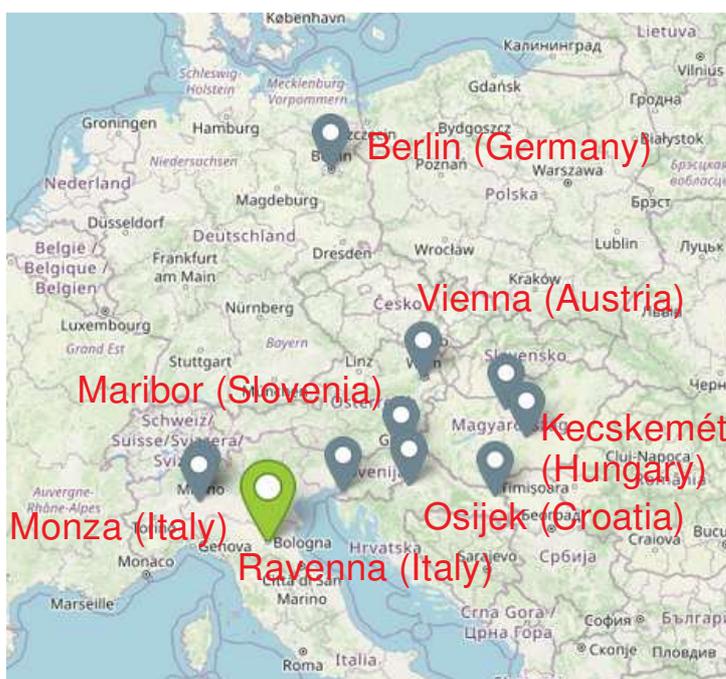

Figure 1: Case studies and partners of the GreenPATH project

An important first pillar of the project activities of the GreenPATH project is to map local stakeholders, governance and mobility management awareness in each pilot area to inform individuals and communities on the benefits and importance of sustainable modes of transportation such as public and shared transport, cycling, and walking. The activity comprises work with local communities, transport and mobility operators, and other stakeholders to develop and implement effective awareness-raising strategies. This includes developing educational campaigns, providing information on available transportation options, and promoting the use of sustainable modes of transportation to reduce the dependence on private vehicles and improve air quality in urban areas, while also improving the health and wellbeing of commuters. GreenPATH provides an overview of key stakeholders and their perspectives on the GreenPATH activities. Another important pillar is to learn about the users (employees and students), their behaviour, attitudes and perceiptions. Thogether with the stakeholder mapping, this forms the basis for a successful implementaiton of mobility management in the respective area, but knowledge gained can be used to transfer the methods and strategies as well.

3 METHODOLOGY

The methodology of stakeholder mapping consists of a multi-step process. Step one: A questionnaire was prepared and distributed among the pilot region leaders. Characteristics of the pilot area and FUA and the desired changes are to be identified in order to guide the pilot action leaders towards the identification of the relevant stakeholders for their pilot action. Based on the given framework conditions relevant stakeholders in the FUA and, in particular, in the pilot area are mapped. This approach is chosen to give pilot action leaders the possibility to reflect upon their activities and therefore to be able to identify the relevant stakeholders. Step two: Based upon the responses of the pilot action leaders stated, the stakeholder maps are analysed to prepare a follow-up Stakeholder Mapping Workshop with pilot action leaders to discuss similarities, and

differences among the identified stakeholders and relevant engagement strategies across the pilot actions. Step three: Approaches for the identification of strategies and plans like SUMPs but also policies for the FUA and pilot area are included to provide accordance of the pilot action with the relevant overarching goals in the region.

Regardless of the specific context of the project's pilot area, collecting comparable and reliable data about employees and students is a challenge. This is due to limited willingness of potential participants to participate in surveys, for example due to privacy concerns, but also limited time availability of participants which can cause incomplete answered questionnaires. Although these challenges exist, collecting mobility related data provides a strong basis for identifying needs of the user group and therefore gaps in the current situation which provides potential for action. Therefore, a user survey is essential to provide guidance on how to engage user via a survey to provide a common approach among all pilot areas and therefore enable a cross-case analysis of the results to gain insights across Central Europe. In GreenPATH students and employees are considered users of the pilot actions. They are crucial for the success of the pilot action implementation in the seven GreenPATH pilot areas. Questionnaires follow a strict structure: mostly but not always, closed questions are asked and therefore different options for answering are offered, which the participant has to choose from (predefined answers). An advantage is the quick performance and answers are mostly comparable. Structured questionnaires can be provided in written form or via an interviewer (Batiajew et al., 2019). In the case of the GreenPATH project, a written approach is chosen, but the survey can be conducted as personal face to face interview as well, where the interviewer enters the oral answers of the respondent.

4   RESULTS OF STAKEHOLDER MAPPING

In the questionnaire, pilot responsibles were asked to map the stakeholders based upon their power and interest. Commuters (employees and students) are mapped most often as stakeholder group (6 of 7 pilot regions). Administration on local level follows with 5 of 7 nominations. Business associations and business/companies are each mentioned in 4 pilot regions, followed by public transport operator and universities/research institutions (each mentioned by 3 pilot areas). Interest groups, public authority and transport sharing scheme operators follow by 2 mentions each. Other nominations mentioned by one pilot area only, are campus owner, NGOs, public transport users, administration on regional level, municipality/government and public transport authority.

Figure 2 shows an overview of the power and interest of different stakeholders per pilot action with regard to the the actions for mobility management for companies/universities. Regarding power: rather stakeholders were mapped with high to medium power (Ravenna, Monza, Maribor). Osijek mapped stakeholders with medium to high power. Vienna, Kecskemét and Berlin mapped along the whole spectrum from low to high power. Regarding interest: stakeholders with high, medium interest were mapped by Ravenna, Monza, Maribor Berlin, Osjiek, Kecskemét and Vienna identified stakeholders across the whole spectrum of interest. Stakeholders with high power and low interest can be critical decision-makers if agreements are needed. Such critical stakeholders occur in several pilot region, such as Osijek, with the city representatives, Ravenna with important companies to have on board and Vienna with the head of the university. It is important to inform, engage and convince these critical stakeholders at an early stage of the project. Contrary to this, stakeholders with high power and srtrong interest can be included in accompanying activities like the municiaplity in Ravenna and Monza, the local government in Kecskemet exisiting working groups in Vienna or the employees themselves in Maribor.

Figure 2: Stakeholder maps ranked according to their Interest

5   RESULTS OF USER SURVEY

The surveys were launched in the pilot areas from December 2024 to January 2025. The number of respondents, who filled in the survey, varied among the pilot areas: Monza stands out with 252, Osijek follows with 119, 118 in Vienna, Maribor with 100, Kecskemét with 71, 63 in Berlin, Ravenna with 59. Overall, 782 respondents filled in the questionnaire. Due to focus upon different target groups across the pilot areas, in Vienna, the participants were students. In Monza and Ravenna, mainly employees answered the questionnaire, in Berlin and Maribor roughly half of the respondents were students, half were employees. In Osijek, the majority were employees. Overall, 205 students answered the questionnaire, 542 employees and 34 who were both students and employees. The questionnaire was designed with non-mandatory questions, to provide the most possible participation. Therefore, the sample size varies across the answers.

Overall, private car usage as a driver is an (almost) daily mobility behaviour across the pilot areas (except for Berlin and Vienna with its focus on students). Private car commuters hold the potential to provide carpooling options for colleagues, which could support a reduction in CO2 emissions. Commuting in a private car as a passenger is less common across the pilot areas so far. But those, who commute as passengers in private cars, could be valuable role models for sharing their advantages (compared to driving by themselves) and therefore help reduce private car usage as a driver. Apart from car usage, active transport modes like cycling with a private bicycle and walking exist as commuting behaviours as well. Cyclists and PT users are potentially interesting to address as role models: eliciting their preferences for their daily mode choice and broadcasting their strategies to deal with barriers along their commuting trip with their mode of transport might encourage current car users to switch to public transport modes (if the personal circumstances match). Apart from role modelling, existing frequent mobility behaviour of cycling, walking and PT usage are essential to address via sustainable provision of infrastructure, e.g. cycle paths, improvements of infrastructure (surfaces, lighting etc.) to sustain the already existing sustainable commuting practise in the long-term. Therefore, promoting actions for addressing commuters' needs might raise awareness for sustainable transport modes which might lead to encourage further commuters, who might not commute by active transport modes yet. Regarding other activities than working in combination with commuting (like bringing/ picking up kids meet friends after work, do some shopping before arriving at work): high shares of the respondents state to include (almost) never or less frequently than monthly such activities in their commuting trips. This is an important information, as such activities make trip chains more complex and less flexible to be changed in the course of mobility management activities. Factors for mode choice: Overall, all discussed factors are considered important by the respondents but the factors price, comfort and environment vary regarding importance across the pilot areas. The factor health is considered as an important reason for choosing private bicycle for commuting. Addressing health related aspects of active mobility in mobility management campaigns can be a strong argument to shift modal split towards active transport modes. Figure 3 shows the results about the general experiences of commuting. Only a minority of a maximum of 27% really enjoy their commuting time, whereas up to 67% are not happy at all.
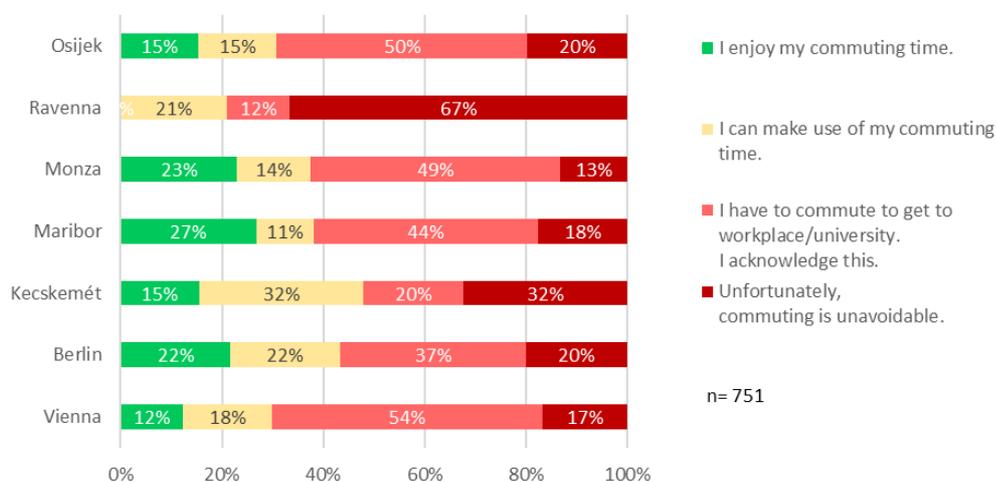

Figure 3: Attitude towards commuting per pilot area

Road safety issues are experienced in all pilot areas but it varies in the pilot areas (9% in Maribor and 47% in Vienna, who experience this on regular basis). Stress is occurring by the majority of the respondents, but very little in Maribor (5%) where commuting by walking is used (almost) daily by a rather high share of the respondents. Conditions for walking in Maribor might be beneficial for their trip experience. Also, across all pilot areas it needs to be considered that between 2% to 20% of the respondents state to experience harassment/ cat-calling regularly, which might impact the overall trip experience and needs to be addressed. Gender-specific improvements: Addressing light conditions is crucial and can be a gender-specific obstacle if kept unaddressed, but also addressing bad road conditions (for walking and cycling) and car drivers' behaviour towards other road users have the potential to act as gender-specific barriers along commuting trips. Therefore, potentials for gender-specific improvements are seen by the respondents in better lighting, improving the conditions of sidewalks and cycling paths and improvements to reduce safety and security concerns. Accessibility-specific improvements: Providing sufficient infrastructure for cyclist and pedestrians and sufficient light is essential to improve accessibility for commuters, who arrive by bicycle or by foot to counteract existing safety concerns. Also, implementing measures that keep those infrastructures clear of undesirable objects that prevent the movement upon those (like trees, e-scootersm parked vehicles) but also regarding aesthetics (like dog excrements and trash) might improve accessibility. Infrastructure provision or improvements (light, cycle path, etc.) for pedestrians and cyclist are suggested by respondents to improve accessibility but also behavioural aspects were mentioned, like car drivers' behaviour towards cyclist and pedestrians is considered improvable.

The willingness to change behaviour by the respondents towards more sustainable modes exists throughout all the pilot areas between a third (30% in Berlin) and more than the half of the respondents (56% in Ravenna). The existing willingness to change the behaviour will be addressed within GreenPATH activities. On the other hand, survey results showed a lack of knowledge about existing infrastructure and services by some respondents (either stating not to know or state that it is not available, but it is). Information provision about available services and infrastructures might need be considered by the pilot areas to improve mobility related knowledge among employees or students in their pilot area. Additionally, only a little share of the respondents has actually joined/consumed a mobility management measure before. Knowledge about mobility management alone is not enough to actually join the mobility management initiatives. Respondents were asked if they know what mobility management is. Roughly half of the respondents in the pilot areas stated to know what mobility management are, except for Osijek, where only 19% stated to have knowledge about this matter. In Maribor (58%) and Kecskemét (55%), the majority stated to not know about concrete mobility management measures in their pilote area, whereas in Ravenna (59%), Berlin (52%) and Vienna (51%) the majority of respondents stated to have knowledge about such. However, the implementation of mobility management actions at their university or workplace is considered rather important by most of the respondents across all the pilot areas. Monza shows the highest agreement (83%), followed by Vienna (82%), Ravenna (76%), Maribor (67%), Berlin (66%), Osijek (65%). Kecskemét shows the lowest agreement with 48% only.

6 CONCLUSIONS

GreenPATH demonstrates that combining stakeholder mapping with user surveys provides a solid basis for targeted mobility management in Central European FUAs. Commuters and local administrations emerge as the most frequently mapped stakeholders, confirming their central role in shaping interventions. Power–interest analysis reveals critical high-power/low-interest actors; engaging them early is essential for pilot success and formal agreements. Awareness-raising, real-time information, and personalized travel options are complementary levers to shift commuting behavior toward sustainable modes. User surveys show dominant private car use (except student-focused areas), indicating potential for carpooling and role modelling by cyclists and PT users. Safety and comfort are decisive: better lighting, improved cycling and walking infrastructure, and addressing driver behavior are widely prioritized. Safety issues and harassment persist across pilots, varying by context, underscoring the need for gender- and accessibility-sensitive measures. Willingness to change exists (about 30–56%), but knowledge gaps about existing services hinder uptake; information provision should be intensified. Most respondents value mobility management at workplaces/universities, indicating strong acceptance and implementation potential. Overall, the project points to pragmatic next steps: engage critical stakeholders, close information gaps, and invest in user-

prioritized infrastructure to reduce car dependency. Formalized outputs (cooperative solutions, strategies, action plans) position GreenPATH for durable impact beyond the project term are now planned based on this output.

7 ACKNOWLEDGEMENT

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