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Identifying Equitable Solutions for the Parking Problem in Munich's Dreimühlenviertel with an Integrated Travel Behavior and Parking Study

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This work addresses the following topic(s) from the Call for Contributions:
(Please check at least one box)

- Placemaking to integrate urban spaces and mobility
- Promoting sustainable mobility choices in metropolitan regions
- Governing responsible mobility innovations
- Shaping the transition towards mobility justice
- System analysis, design, and evaluation
- other: _____

Extended Abstract

Problem statement

The Dreimühlenviertel is a lively small quarter with around 6,000 inhabitants located near the center of the German city of Munich. Due to its dense development and the lack of large parking lots or parking garages for cars, there is strong competition between different usage claims with regard to the quarter's public street space. While car owners complain that there are not enough parking spaces in the quarter, other residents would like to see public on-street parking spaces repurposed for mobility hubs for sustainable transportation, public recreation areas, or more urban greening.

Research objectives

The aim of this study is to identify measures that could be put in practice to better reconcile the various usage requirements of citizens with regard to the public street space in the Dreimühlenviertel. In particular, the focus is on reducing the parking pressure in the quarter and simultaneously increasing the space available for sustainable forms of mobility.

Methodological approach

To obtain a holistic overview of the on-street parking situation as well as the mobility needs of the residents of the Dreimühlenviertel, we conducted an extensive parking study in July 2023 and a travel behavior survey starting in August 2023. In the parking study, for more than half of the 1,105 available parking spaces in the quarter, parts of the license plates of the parked vehicles were recorded five times a day for five consecutive days (Friday - Tuesday). Furthermore, vehicle types and whether the vehicles had a parking license for the quarter were recorded. Each run lasted approximately two hours, with the first of each day beginning at 6 a.m. and the last ending at 10 p.m. Additionally, a one-time run was conducted two weeks earlier to identify long-term parkers. To allow for representative statements about the parking situation in the quarter, parking spaces from all streets in the quarter were included.

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To comprehend the mobility behavior and needs of Dreimühlenviertel's residents, an online travel behavior survey was launched in August 2023 and is still ongoing. By the end of October 2023 around 160 people living and/or working in the quarter have participated. The survey is based on the concept of the so-called 'travel skeleton', which has been employed in various cities around the world (Magdolen et al., 2019; von Behren et al., 2018). In addition to their sociodemographic characteristics, the survey asks respondents about their travel behavior in a typical week. The reduced response burden due to this pseudo-longitudinal capturing of everyday travel allows for additional modules to be added to the survey depending on the use case. To account for important determinants of car ownership and use, modules on infrequent long-distance travel events and attitudes of the respondents (e.g., toward different modes of transportation) were included in the survey for the Dreimühlenviertel. Furthermore, a module on parking was added, in which the respondents were asked, among other things, about their satisfaction with the on-street parking situation and the livability in the quarter, as well as about the availability of a private parking space. Furthermore, they were asked to report how long they usually have to search for a parking space on different days of the week and times of the day, whether they could imagine renting a parking space in a neighborhood garage on the edge of the quarter, and how many minutes' walk from home they would find acceptable for such a parking space. Since the intersection closest to each respondents' home was also surveyed, the travel behavior survey can be used to identify specific needs and potentials for change in different parts of the quarter. These findings will be combined with the results of the parking study to identify potential measures to reduce the number of private cars in the quarter and make room for better provision of sustainable forms of mobility and more public amenity areas.

(Expected) results

The parking study shows that the mean occupancy rate of public on-street parking spaces in the Dreimühlenviertel is 91%. Thus, according to the definition of Steinmeyer et al. (2012), the parking pressure in the quarter is very high. The mean occupancy rate is the highest in the center of the quarter at 95% percent. The lowest occupancy rate is found in the afternoons on weekend days at 84%. In contrast, the highest occupancy rate can be observed at night, with close to 100% on all days of the week. In addition, however, numerous illegally parked cars were found, so that the actual maximum occupancy rate is at around 107% on Sunday nights. An analysis of the answers of respondents having participated in the travel behavior survey thus far show, that the mean parking search traffic resulting from the high parking pressure is at 6 minutes per parking process in the morning and at noon, and at 20 minutes in the evening. Of the car owners without a private parking space, 59% are dissatisfied or somewhat dissatisfied with the parking situation in the quarter and only 14% are satisfied or somewhat satisfied. The analysis of license plates from the parking study shows that 5% of parking spaces are occupied by vehicles that were not moved within the study period of two weeks, many of which being (camper) vans. This is in line with several camper vans reported to be used only for infrequent long-distance trips in the travel behavior survey. Thus, one of the measures to make space for more sustainable transportation alternatives in the quarter could be to revoke the parking licenses for such vehicles and provide parking spaces for them elsewhere. Through analyzing the data from the travel behavior survey in detail after its conclusion in November 2023, we expect to identify more measures, that could collectively transform the use of Dreimühlenviertel's public street space while preserving the diverging interests of the residents of the quarter.

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