기본연구보고서 2022-4

개인형 공유모빌리티 이용활성화를 위한 건축·도시공간 대응방안 연구

A Study on Architectural and Urban-Space Countermeasures to Activate the Use of Personal Shared Mobility

허재석 Her, Jaeseok
남궁지희 Namgung, Jihee
최가윤 Choi, Gayoon

A Study on Architectural and Urban-Space Countermeasures to Activate the Use of Personal Shared Mobility

SUMMARY

Her, Jaeseok
Namgung, Jihee
Choi, Gayoon

Recently, 'Personal Mobility' has been expanding and spreading as a means of the first-last mile, with the use of personal shared mobility represented by shared bicycles and kick boards quickly increasing in particular. On the flip side of the rapidly increasing use of personal shared mobility, however, it causes various social problems, such as related constant complaints, etc., due to the lack of sufficient space and institutional basis to accommodate the increase. Personal shared mobility produces fewer carbon emissions than passenger cars, occupies less space, and has a high potential value to realize carbon neutrality as an alternative means of short-distance travel and a linkage means to vitalize public transportation. The recent revision of the Road Traffic Act has partially resolved the issue of space for personal transportation. However, spatial and institutional conditions must be further improved to establish personal shared mobility as a major means of transportation. In addition, since the existing bicycle-related infrastructure and policy approach cannot be applied to personal shared mobility as they are now, we need a comprehensive approach, taking spatial characteristics and user behavior into account.

For personal shared mobility to work effectively as a primary means of a first-last mile,

the seamless passage must be ensured from the user's point of view through various means such as bicycles and walking as well as public transportation. Also, measures need to be taken to enhance safety by the road environment and collisions between users in the entire moving process. Given that, this study divided the main spaces on the whole traffic path of personal shared mobility into ① a passage space and ② a parking space, derived issues of each space, and suggested spatial and institutional improvement plans through empirical analysis.

Chapter 2 summarized the significant issues discussed regarding personal shared mobility by space. The study also analyzed the spatial and institutional limitations that exist in terms of activating the use of personal shared mobility through related systems, policies, and case analysis, setting directions for response thereupon. With personal shared mobility being used more and more rapidly, the issue of space is continuously arising. The main issues by space are ① the continuity of the traffic route, ② the safety for the passage space, ③ the connectivity between means, and ④ the accessibility regarding the parking space. Relevant measures to improve systems and establish a desirable use culture by improving users' awareness are being discussed, along with spatial improvement measures, such as essential infrastructure expansion and maintenance, as responses to each issue.

In Chapter 3, this study diagnoses the actual situation of use and suggests countermeasures based on the analysis of the usage status of each personal shared mobility means (shared bicycle, shared kickboard) and the results of the perception survey. This study confirmed a significant difference in the characteristics of the use of the two means of shared bicycles and kickboards from the comparative analysis of the two means. The average travel distance of shared bicycles was about 2 times longer than that of shared kickboards, and the travel time was about 3 times longer. Shared kickboards showed higher concentration on weekdays and during peak commuting hours. Shared bicycles are used for leisure and exercise in addition to simple movement, but shared kickboards are characterized by short-distance travel.

Chapter 4 empirically analyzed the micro-use behavior of personal shared mobility and the characteristics of the space used, suggesting the architectural and urban space response directions to revitalize the use of personal shared mobility. This study limited the empirical analysis targets to station areas where personal shared mobility is concentrated and selected Isu Station and Yeoksam Station by comprehensively

reviewing the comparison of usage characteristics by station area, cluster analysis, and preliminary on-site inspection results. This study examined each issue's micro-use status and spatial features (continuity of traffic route, the safety of traffic space, connection with public transportation, accessibility of parking space) derived earlier through GPS-based rental and return point analysis and traffic route analysis afterward.

The summary of the contents of each chapter above suggests the improvement directions for architecture and urban space in three ways. First of all, the most important is ① reorganizing the urban space (infrastructure improvement) to ensure that various modes of transportation and personal shared mobility can coexist through improving traffic and parking spaces. To this end, ② it is necessary to clarify the role, function, and legal status of the means by establishing the status of individual mobility in the urban transportation system (improving the legal system and social consensus). At the same time, it is necessary ③ to assign the roles and responsibilities of the public and private sectors (improving the legal system and social consensus) as a means for stable settlement, activation, and sustainable operation and management.

This study suggested countermeasures in terms of architecture and urban space for personal shared mobility, which is rapidly increasing in use as a means of c first-last mile transportation. The study identified four issues (travel route continuity, safety of passage space, connectivity with public transport, accessibility to parking space) for the main used space, traffic space, and parking space. It derived evidence-based research results through empirical analysis of usage data. This study utilized various analytical methodologies such as statistical analysis, GIS analysis, questionnaire survey, and field survey. It differs from previous studies in that it analyzes the usage status and spatial characteristics microscopically and in-depth. In addition, this study is significant in that it confirmed the potential of personal shared mobility as a means of improving accessibility and transforming the transportation system based on the results of empirical analysis and presented the direction and rationale for policy improvement in detail in terms of architecture and urban space.

Nevertheless, this study has the following limitations. The first is a limitation of the data used. As the study used data from only specific companies when various companies operate electric kickboards, the study needs to have representativeness. The second limitation of the study lies in the analysis target areas. This study analyzed mainly the areas near the stations in Seoul where the use is active to confirm the characteristics of

personal shared mobility as a means of connecting public transportation. Therefore, it is difficult to generalize the results for non-station areas, small and medium-sized cities, and non-urban areas. Finally, there is a limit to the selection of policy targets. This study limited users of shared bicycles and shared kickboards as the study targets. Still, the study also needs to consider the perception, connection, and interaction of various users, such as pedestrians, drivers, and public transportation users.

Various follow-up studies will be possible based on the results of this study. First of all, an in-depth analysis of the differences between the means of shared bicycles and shared kickboards and the methods of use is needed. Also, discussions about the preemptive response and utilization plan of personal shared mobility in small and medium-sized cities other than large cities should proceed. Follow-up discussions on specific and actionable system improvement plans are also required based on the limitations and improvement plans of related systems derived from the study. Finally, plans to respond to urban space from a long-term perspective need to be sought out, considering the diversification of transportation means such as micro-mobility and low-speed transportation, including personal shared mobility.

key word

Personal shared mobility, shared bicycle, shared kickboard, road space reorganization, tactical urbanism