

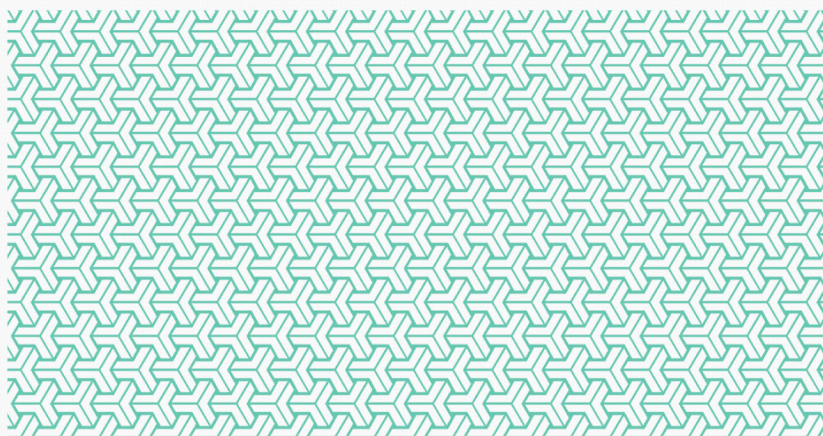
# 보행자길 조성·관리를 위한 보행행태 및 인식 분석 : 보도를 중심으로

Analysis of Pedestrian Behaviors and Perceptions  
for the Installation and Maintenance of Pedestrian Walkways  
: Focusing on Sidewalks

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# Analysis of Pedestrian Behaviors and Perceptions for the Installation and Maintenance of Pedestrian Walkways : Focusing on Sidewalks



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Pedestrian policies and central and local government projects have increased in the past decade. Nevertheless, pedestrians still feel uncomfortable on the street. Even on sidewalks where pedestrians should be able to walk most safely and comfortably, various factors such as narrow sidewalks, obstacles, bicycles, and personal mobility aids cause inconvenience to pedestrians.

To ensure the safety and convenience of pedestrians, above all, it is necessary to provide sufficient sidewalk widths according to pedestrian demand. Therefore, this study empirically analyzed pedestrians' behaviors and perceptions on sidewalks that satisfy the minimum width (1.5 m to 2.0 m) under the current law. The results were used to determine effective directions for installing and maintaining sidewalks.

In chapter 2, this study reviewed the actual conditions of sidewalks in Korea and the regulations and guidelines for sidewalks at home and abroad to derive the current issues. The study found that the standards for installing sidewalks, such as the proper width of sidewalks according to various road conditions, rational layouts of street furniture, and the separation of sidewalks and bicycle paths, is still insufficient in Korea. In addition, regulations for effectively managing the private use of sidewalks, obstacles on sidewalks, and other means of transportation (bicycles, personal mobility aids, etc.) were also inadequate.

In chapter 3, the physical environment was investigated and analyzed targeting 6 sidewalk corridors in Sejong. For the target street, among school routes and commercial streets with a minimum passage width of 1.5 m to 2.0 m for pedestrians, two old town streets (Saenae-ro and Saenae 18-gil) and four new town streets (Jeoljae-ro, Saeromjungang-ro 1-gil, Dasom 1-ro and Bodeum 3-ro) were selected. Skilled investigators measured the width of the sidewalks and fixed elements(e.g., streetlights, trees) and non-stationary elements(e.g., bicycles, billboards) on the sidewalk. The results were visualized using drawings to show the physical characteristics of the sidewalk at each site.

In chapter 4, the pedestrian behavior in each site was analyzed using videos of the sidewalk, which were recorded for one day with fixed cameras. The traffic volume and conflict frequency of pedestrians and other means of transportation were analyzed through video observation, and the pedestrian path and density were analyzed by automatically extracting user objects from the video data (using Python Yolo\_V5 library). The pedestrian volume on the sidewalk showed a difference depending upon the physical characteristics of the site. In Saenae 18-gil, where a narrow sidewalk was installed on only one side of the road, more

pedestrians were observed to pass on the roadway or the roadside area than on the sidewalk. In addition, in Jeoljae-ro, Saeromjungang 1-ro, and Dasom 1-ro, pedestrians passed more on privately owned public open spaces, the front space of buildings setback from the sidewalk, and bicycle paths than on the sidewalk. Conflicts between pedestrians frequently occurred in places where the width of the sidewalk was rapidly reduced, around the main entrance of buildings, street corners, and bus stops. Meanwhile, conflicts between pedestrians and bicycles mainly occurred when pedestrians invaded bicycle paths, or a bicycle invaded the sidewalk. In the case of pedestrian density, it was high near shops or crosswalks, whereas it was low in areas where pedestrian continuity was poor because trees were planted or there were obstacles in front of the buildings.

In chapter 5, pedestrian perception of the sidewalk environment was analyzed based on the results of face-to-face surveys of a total of 420 pedestrians (70 pedestrians per site). The respondents perceived that the width of the sidewalk was relatively narrow in the old town streets than in the new town streets where the sidewalks were adjacent to privately owned public open spaces or the front space of a building. In addition, the old town street respondents often perceived a lower overall satisfaction with the pedestrian environment than that of the new city respondents, and reported that the walking environment was not safe. However, many pedestrians in all sites responded that they felt a threat to their safety even when bicycles or personal mobility aids were operated at low speeds, and people with children and elderly people felt this anxiety more. As such, since the perception of the pedestrian environment differed not only depending upon the physical environment but also depending on the characteristics of the users, sidewalks should be installed and maintained in consideration of these findings. Finally, the following strategies can be considered to make walkable sidewalks. It is necessary to improve existing urban areas by integrating various spatial elements surrounding sidewalks. To this end, the guideline for the District Unit Plan can suggest that pedestrian paths be installed in privately owned public open spaces. In addition, a tactical approach using movable and deformable street furniture can be considered so that the pedestrian zone can be flexibly used depending upon the situation. Ultimately, it is important to make sufficient pedestrian space by reorganizing the spatial structure of the street. In the case of new developments, it is necessary to actively secure sufficient sidewalk widths by clearly separating the pedestrian zone and the furnishing zone from the planning stage and dividing the sidewalk from the bicycle road. In addition, it is necessary

to determine the function of a privately owned public open space as late as possible so that pedestrian behaviors on the sidewalk can be considered according to the use of the buildings adjacent to the sidewalk. Furthermore, where high pedestrian traffic is expected, exterior pedestrian passages within a building site should be considered.

**Keyword**

Sidewalk, Pedestrian Environment, the Width of the Pedestrian Zone, Pedestrian Behavior, Pedestrian Perception