# **Development of Tools for Utilization of Organic Interaction Effects of Public Spaces in City Centers**

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#### 1. Purpose and Background of Research

With the rapid progress of digitalization, diversification of individual lifestyles and orientation toward providing a more abundant life for all persons, including well-being, etc., in the post-COVID era, initiatives aimed at creating innovation through encounters and exchanges with diverse people and realizing more abundant humancentric lifestyles by the formation of walkable "comfortable town centers where people want to walk" through joint publicprivate efforts are progressing in city center areas throughout Japan. To enhance the effects of these efforts in spite of limited investment resources, it is important to develop and implement concepts that will have a ripple effect on the entire city center area, and thereby increase its value, by encouraging city streets, plazas, parks, rivers and other public spaces (hereinafter, PS), which are not only flow lines for people's everyday lives, but also hubs for a diverse range of activities, to form a complex, mutually-interrelated whole that demonstrates synergistic effects. On the other hand, because the elements and extent of those effects were unclear, there were problems when attempting to deploy urban revitalization programs in the community. Therefore, the aim of this research is to construct a methodology that will be useful in improving local programs by measuring and observing the elements of the organic interaction effects of PS and the modes in which they are expressed.

## 2. Urban Revitalization Based on Organic Interaction of PS

Fig. 1 represents the management cycle from planning and implementation of urban revitalization programs until

realization of the outcomes required in the future, by evaluation and analysis of PS interaction effects and repeated improvement and implementation of plans.

The element items of these PS interaction effects were classified in a total of nine categories based on the 3 approaches of the physical aspect, activity aspect and the psychological and social aspect from the 3 viewpoints of users, facility administrators and community development organizations involved in urban activities. It is assumed that these will be used as axes for predicting the interaction effects of PS in the planning stage of urban revitalization programs, properly understanding the conditions at actual sites in the implementation stage, and continuously monitoring the manifestation of effects.

#### 3. Results of Street Interview Survey of Users

Among the elements of PS interaction effects, the Urban Facilities Division conducted street interviews focusing on the perspective of users during FY 2022 (Nov.-Dec. 2022). Preconditioned on the establishment of a future vision for the area and the possibility of observing leading initiatives that display an awareness of PS interaction, three target areas (Katamachi, Korinbo and Hirosaka areas of central Kanazawa, Minato Mirai in Yokohama, and the Otogawa Riverfront area in Okazaki) were selected as three cases with different local characteristics, different availability of PS and different user characteristics and other features. The changes in behavior, awareness, etc. due to linkage between PS in these areas were investigated by interviewing PS users in each area. Interviews were conducted on two days (one weekday, one holiday) between 10:00 and 16:00, and the sample size was around 200 in each city (about 100 on each day).



Fig. 1 Image of utilization of PS interactions of in the urban revitalization management cycle

The results clarified two types of effects, namely, improvement of the life satisfaction of the users in the area as a whole and an increase in the scope of behaviors and content of activities, etc., corresponding to the characteristics of the urban space and the purpose of visiting the area (**Fig. 2**).



Fig. 2 Toward study in FY 2023: Consideration of the causes and effects of interaction

### 4. Sensory Survey of Modes of PS Interaction by Expert Investigators

In FY 2023, a composite study was conducted to understand the mutual spatial relationships at the microscale, rather than in area units. This was a multi-scale investigation of PS units, diverse transportation networks and the furniture scale, and was carried out by a mixed method involving quantitative and qualitative surveys. The feasibility of applying the 9 categories as a whole, also including the standpoints of administrators and community development organizations, and the extent and appropriateness of the element effect items, the mutual interrelationships between the items and other relevant issues were verified in a comprehensive and detailed manner by interviews with each of the entities concerned. From the perspective of users, a field survey of the modes of physical interaction between multiple PS and the condition of human activities, focusing on perception by the five human senses, was also carried out by five investigators with expertise in the urban field. To confirm the condition of each PS, the questionnaire prepared for this field survey included not only physical aspects such as the condition of stagnant and movement spaces, the physical outlook, etc., but also the activity aspect, that is, the types of human activities according to Jan Gehl and attributes of visitors, and the psychological/social aspect, in which spatial perception was understood by the SD method. In addition, the concept of "imageability" (legibility: ease-of-understanding, visibility: ease-ofseeing, etc.) was added to the indices used in evaluating PS interactions, and image maps and Link & Place maps expressed in terms of the 5 elements proposed by Kevin Lynch (Path, Landmark, Edge, Node, District) were created and visualized, and the relatedness between the PS was confirmed from these viewpoints (Fig. 3).

This survey was conducted in the central areas of 5 cities,

Sumida Ward (Tokyo), Okazaki, Shizuoka, Osaka and Nagano. The results suggested the possibility that areas where interactive relationships, including the use of surrounding land, etc., i.e., linkage and wholeness, and the diversity of options for various kinds of static and dynamic activity spaces can be experienced physically as a comfortable chain through the five senses of sight, smell, sound, touch (+ somatic and deep sensation) and taste, are natural and comfortable areas that invite walking, which leads to vigorous walking, greater diversity of activities, and stimulation and heightening of sensitivity. On the other hand, even while individual PS spaces are welldesigned, it was found that some organic interactions were clearly lacking in areas that were seldom used by people. The survey also suggested the importance of carefully excluding unpleasant factors that hinder interaction through the PS, such as continuous scattering of trash and soiling, the spread of bad odor and noise, traffic congestion and disruptions, uneven and rough road surfaces, and the impact of electrical wiring and various types of barriers on scenery, etc., and preventing negative interactions, for example, continuation of uninteresting, commonplace PS spaces due to homogenization.



Fig. 3 Condition of imageability survey and mapping (framework)

### 5. Future Initiatives

It is assumed that the questionnaire and other tools prepared in this work will be used as common searchlight tools for sharing the conditions of various kinds of interactions and cooperation with stakeholders, and will be useful in study of the content of policies considering PS interactions and consensus-building when promoting initiatives for co-creation type urban development though workshops and other activities held under local government-private leadership. In the future, we plan to refine the indices through monitor surveys, etc. in the field and systematize the evaluation methodology. We also hope to study a flexible use methodology and present guidelines for appropriately customizing the evaluation items according to the local characteristics and purpose of policies in each area.

For more information

1) FY 2023 Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Proceedings of the National Land Technology Research Conference, pp. 22-27

https://www.mlit.go.jp/chosahokoku/giken/