Planning Tasks of Station Squares in Metropolitan Areas in Japan

—Based on transition and actual conditions of the planning standard for station squares in Japan—

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In this study, the authors aim at clarifying planning tasks for station squares in metropolitan areas based on transition and actual conditions of the planning standard while focusing on station squares in Japan. Station squares in the metropolitan areas in Japan are going into the era of renewal as a form for which surrounding view are considered. In recent years improvement of landscape and buffer space by the spread of criteria formulas is seen and squares with landscape elements tend to be high in the landscape and buffer space ratio. In this study, we conclude that in order to form view as an urban doorway, it is required to secure approximately 10% of the landscape and buffer space in addition to the standard value.

Background

Breakaway from the automobile-dependent society has becoming one of the urban problems recently. In the U.S., China, and other developing countries, as a measure for such problems, construction of large-scale railway networks is progress and a number of railroad stations and urban areas around the stations are going to be developed and redeveloped as well as such railway construction. In cities in Japan, metropolitan areas in particular, railway networks have been highly developed, and dependence on railroads is high in urban activity. Urban areas which accumulate various urban functions is formed within walking distance with railroad stations as centers, which form urban areas in succession. In such a situation, a large number of users have come to gather at the station and station squares, where railroad users change to other transportation, have been developed. Station squares are important facilities for raising the convenience of connection to other transportation, and greatly affect the access to the entire city. On the other hand, correspondence to new traffic forms has been progressing in station square that have already been developed, and planning that attaches great importance not only to traffic node functions but also to view functions is progressing with the above renewal as an opportunity.

Purpose

In this study, the authors aim at clarifying planning tasks for station squares in metropolitan areas based on transition and actual conditions of the planning standard while focusing on station squares in Japan, and landscape element around squares such as streets and surrounding buildings are analyzed. Further, for the landscape and buffer space in the criteria formulas, ideal landscape planning for a square is analyzed based on comparison between specific numerical values and actual views. Landscape and buffer space is the space that assumes exchange function and view

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function of the station square, consisting of walking space and rest space, green and water space or multipurpose space for events.

Method

Other than the questionnaire for administrative officers of major cities in Japan, the authors conduct an investigation into the landscape and buffer space in 38 major stations. Tokyo Station Marunouchi square is picked up as a representation case.

Historical Transition of station square

Station squares in Japan were constructed at the time of opening railroads in Meiji era and have been changing together with the role of railroads and stations. The original station squares have been assuming a role of forming landscape to symbolize station buildings, which is a doorway of the city. For example, for the station square at Tokyo Station, frontality of the station seen from Gyoko street, which connects the station square and the Imperial Palace, is considered. After the war, areas around stations were developed as part of war damage reconstruction, railroad suburban railway networks were developed with sprawl of the cities, and their role of a traffic node have come to gain recognition. With such a historical backdrop, planning ideas for station squares have been developing and various criteria formulas have been created.

Transition of planning standard

Starting from "Planning standard for station square" in the war damage reconstruction plan, planning standards such as Area calculation formula by Committee for Study on Station Square (called "1953 Formula"), Konami method, method by Committee for Plan of Station Square Development method (called "1973 Formula") and the calculation method by the Guideline for Station Square Planning (called "1998 Formula") have been proposed so far and development of squares has been progressing based on them. In those equations, area of the required square is calculated by obtaining users of the station square, the number of each transportation mode such as buss, taxi and privately-owned car. In the latest 1998 Formula, not only a traffic node but also attractive urban space is formed by adding landscape and buffer space（Figure-1）.

Present situation of station square

According to the urban planning survey, presently, in the three metropolitan areas in Japan, there exist approximately 1,500 station squares for which city planning has been decided and

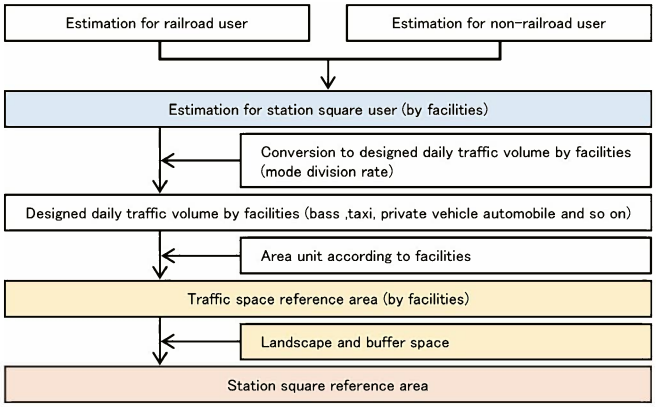

Figure-1　Area calculation flow of 1998Formula

approximately 64% of those are developed as planned. Investigation for staff members of the cities of the main stations concerned has revealed that approximately 24% of the reasons for why they are not developed are consensus formation with land owners and leaseholders associated with the land purchase. Urban functions are densely concentrated on around station, and in the case of development and extension of station squares, it is necessary to satisfy required functions such as traffic functions and view functions in limited public lands.

Case study

Tokyo Station was established in the public land in the old Edo-jo Castle in 1914 and a very large station square has developed together with the station. Major transportation in that era was coach other than foot, and a large-scale square was developed to form the view that is suitable for a doorway of the capital city. Although the third floor of the station and the dome-like roof were lost by war damage in 1945, they were restored in 2012 together with development of its surrounding area and renewal development has been progressing for the station square. Since Tokyo Station is located in the doorway of the Imperial Palace, it was used by state guests who visit the Imperial Palace. In the present, it plays a role as the entrance for the Imperial Palace from the station in the case of accession of an ambassador to Japan. Therefore, large space is arranged at the center of the station square, and view integrated with Gyoko street is formed while the traffic line to the Imperial Palace area is being made smooth（Figure-2）.

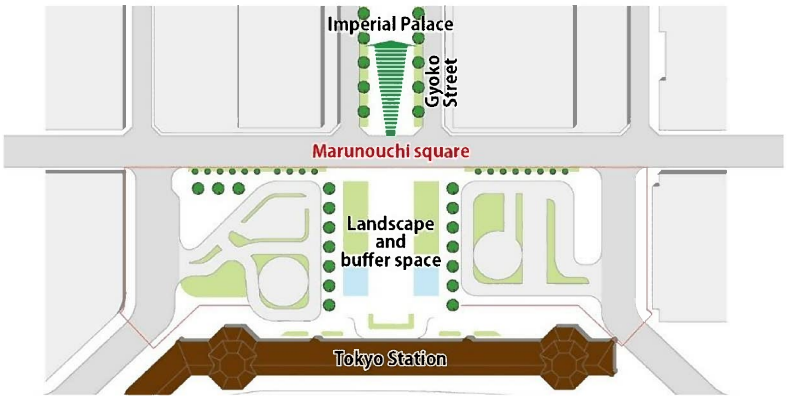

Figure-2　Planning drawing of Tokyo Station Marunouchi square

In this study, the authors analyze landscape elements of the station square such as the points that symbolism of the station is emphasized with Gyoko street corresponding to the center of the station, symmetric facilities placement is achieved with the station at the center, landscape and buffer space is formed as a plaza in front of the station's Chuo Exit, and vista toward the Imperial Palace is placed from the station being harmonized with cityscape with basic tone（Photo-1）.

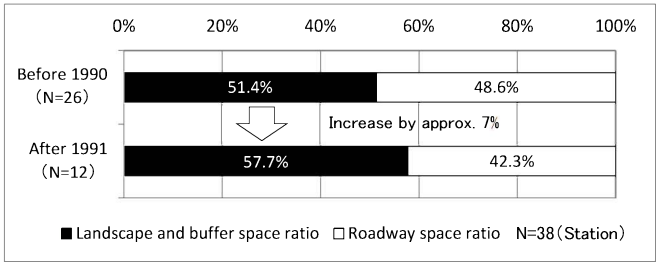

Photo-1(left)　Vista from the Imperial Palace area for Tokyo Station

Figure-3(right) Variation of the landscape and buffer space ratio for square planned around 1990

In 1998 Formula, percentage of the landscape and buffer space within the entire square is 50% . Looking at the landscape and buffer space for 38 squares in major city stations in Japan,its average is 53%. Further, looking at the percentage around 1990s when 1998 Formula spread, it is approximately 51% before 1990 while it is 58% after 1991, showing increase by approximately 7%. From this, it is understood that the idea to position landscape and buffer space has been adopted for square plans accompanied with the spread of the criteria formulas（Figure-3）.

The result of analysis for each landscape element such as "view", "nodes" and "landmarks" for the 38 major city stations has shown that the landscape and buffer space ratio is high for the square with the elements of "view" and "nodes". It is thought that they have large space such as multipurpose space or gathering space other than walking space. Comparing the landscape and buffer space ratio by the presence of landscape elements, it is understood that landscape and buffer space ratio for squares with landscape elements is approximately 13% higher than that for squares without those. In the case of Marunouchi square, increased area corresponds to approximately 2,000 square meters, which is approximately 30% of the urban square of the central section. This is the area required to form space that is integrated to the central walking space of approximately 30m in width on Gyoko street.

From the above, for station square, it is important to attach great importance to landscape elements around streets and buildings to form view as an urban doorway. To this end, setting the landscape and buffer space ratio at the standard value 50% of 1998 Formula alone is insufficient and, approximately 10% is required additionally.

Conclusion and task

Station squares in the metropolitan areas in Japan are going into the era of renewal as a form for which surrounding view are considered. For squares as an urban landmark like Tokyo Station picked up in this study, space forming for which streets and stations are considered in particular is planned. On the other hand, in recent years improvement of landscape and buffer space by the spread of criteria formulas is seen and squares with landscape elements tend to be high in the landscape and buffer space ratio. Tokyo Station is one of them. In this study, we conclude that in order to form view as an urban doorway, it is required to secure approximately 10% of the landscape and buffer space in addition to the standard value. In future, it is needed to develop square that symbolized the attraction of the town by giving not only traffic node functions but also functions as plaza that symbolizes the city.

***Keywords**: station square, public traffic,traffic node functions, landscape and buffer space*

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