

Comparison of Distribution Characteristics of Green Parks in New Towns of China and Japan Based on Walk Score Method —Cases of Songjiang New Town and Chiba New Town

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Background

The new town is a product of rapid economic growth and large-scale urbanization. Its rise and fall is closely related to the country's economy and urbanization. The essence of the city is that residents live, work, and play within walking distance (L. Krier, 1977). Whether residents can conveniently use parks and green space is an important index to measure the level of urban development and residents' quality of life. Therefore, it is of great significance to study the walking accessibility of the green parks in new towns.

The construction of new towns in Japan started in 1955 and is now coming to an end; construction in China began in the 1990s and is still in the middle stage of development. Although China and Japan have different definitions of "new town," their background and problems have similarities. In this research, we selected as research objects the central area of Songjiang New Town (SNT) in Shanghai's metropolitan area in China and the central station area of Chiba New Town (CNT) in Tokyo's metropolitan area in Japan. We used the "Walk Score" method to evaluate the walking accessibility of the two new towns' green parks, and the reasons for differences were discussed by analyzing the distribution characteristics of green parks in each new town.

Methods

First, the parks were divided into four categories: "comprehensive park," "district park," "neighboring park," and "block park," and weighed separately by the expert scoring method. Next, according to the distance decay curve, we calculated the walking index of different parks, and added up the decayed index of each park to get the walk score. Then, based on the actual traffic distance and time consumption, we drew the chart of area and density of different intervals in distance from the new town's center. Finally, in light of the distribution characteristics of the parks, we compared the green park walk score of the new towns.

Results

Although the area, population, and green space system vary greatly among the two new towns, the green park walk score shows little difference. The decay curves of the distribution of green spaces in two new towns are different. The attenuation regulation of SNT accords with the regulation in general, and can be described by a logarithmic function curve (Wu Bihu, 1994). The decay curve of CNT can be described by the inverted U-Boltzmann curve proposed by S. L. J. Smith. This is because, due to the high opportunity cost of land in CNT, the economic benefits of green space are lower than those of other competitive land use modes (such as commercial land or real estate land), so the development of parks is limited. SNT attempted to imitate the development mode of Central Park in New York, and established a huge central park in the center of the new town to promote the development of surrounding land by the central green space effect. The occurrence frequency of green parks in SNT is 2.0-2.8 km (25-35 min walking distance),

while the occurrence frequency in CNT is 0.4-1.2 km (5-15 min walking distance). The occurrence frequency interval of SNT is significantly larger than that of CNT. This is because SNT is huge in scale and has a wide green parks range area. However, because of the distance decay, parks with a distance of greater than 2.8 km no longer affect the walk score at the starting point. Although green parks in SNT are dominant in number and size, its walk score is lower than that of CNT. The Pearson correlation coefficient showed that the distribution of green park distance had an obviously positive correlation with time consumption in CNT (0.821), while the correlation in SNT was 0.216. This is because the density of intersections in CNT is much higher than that in SNT. This is also the reason why SNT's green park walk score is lower.

Keywords: parks, walk score, distribution characteristic, new town



Fig. 1 Area and density map of the different intervals in distance from the new town center of SNT

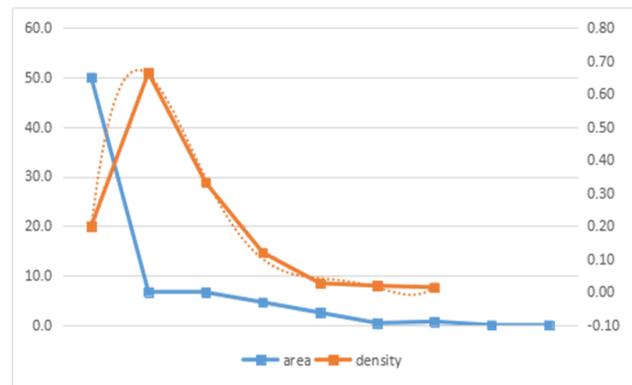


Fig. 2 Area and density map of the different intervals in distance from the new town center of CNT

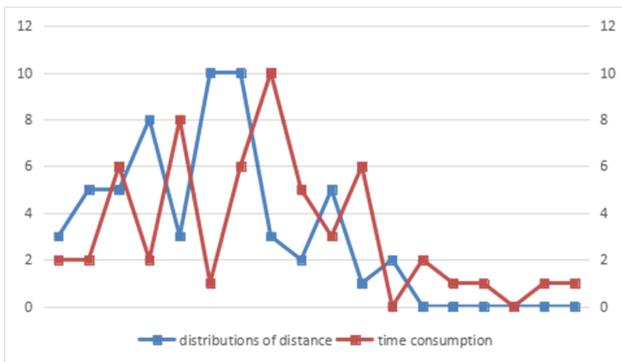


Fig. 3 Comparative line chart of the distributions of distance and time consumption for SNT

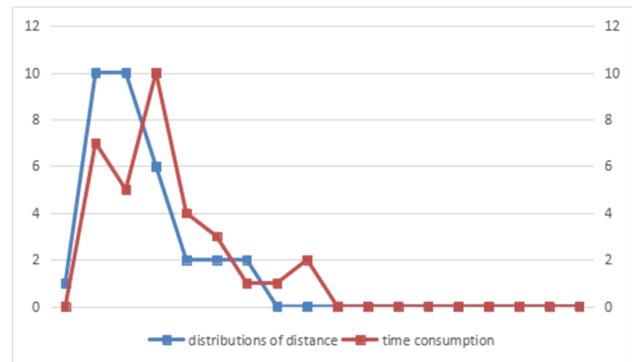


Fig. 4 Comparative line chart of the distributions of distance and time consumption for CNT