

The Process of Growth and Cityscape Transition in Modern Osaka

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Most of big cities in modern Japan had been growing up remarkably with modernization from the Meiji period. Especially, the structure of space has been changing dramatically throughout a revival development in the post-war and in the high economic growth period. As the result, it have been become difficult to see the cityscapes of the past which built up with the modernization. However, in recent years after the arrangement of urban infrastructure settled down, the community development or a tourism using the historical environment have been carried out, and the interest in history has been increasing. In other words, to keep the historical environment has been increasing importance as property of city. On the other hand, GIS becomes more familiar to us by geospatial information technology spreads rapidly in recent years, in the middle of a highly information-oriented society. Especially, the utilization GIS is effective for the historical research, because it can process long-term spatiotemporal information like transition analysis.

Osaka was prosperous as the Aqua Metropolis in Edo period, and has become the modern city crowded with public transport and high-rise buildings in Kansai area at present. In this study, the authors are trying to investigate the historical transition in Osaka with modernization by using geospatial information technology. And they are going to recognize again the existence of characteristics in urban space which formed and disappeared with modernization, and to aim at reconstructing the historical environment.

It becomes necessary to arrange the long-term change efficiently in the study of urban transition. Therefore the authors decided to use the topographical map for six terms in this study from the middle of Meiji period when the modernization began. The authors make the spatial data which the street and the wetlands from this topographical map. And they constructed the urban transition database by using both these data and the database which was already built the river and the railway in our laboratory. As a result of expressed urban transition, the authors grasped that Yodo River which was the most catchment area in the present was formed with repairing Nakatsu River in the late Meiji period. And, the Dohjima canal was dug in Umeda from the early Meiji until before the war, the authors thought that this area was different urban space from present day. Paying attention to the street, the right bank area of the old Yodo River focusing Umeda has been becoming earlier urbanization than the other areas. At the same time, the reconstruction of buildings in the built-up area repeated with modernization, and the authors found the possibility that a changing of the scene was taking place close to the old Yodo River. From these results, the authors direct their attention to Umeda and the old Yodo River basin, and tried to simulate of the cityscape transition using the three-dimensional models in this study.

A terrain model is important for constructing urban model. In this study, the terrain was created 140 kilometers square using digital elevation model (DEM) data based a knowledge of the precedent study. The features are created as landmarks and general houses using CAD/CG. The authors selected Osaka station of Umeda and the mint of the old Yodo River basin for landmarks. These are reconstructed in great detail basing historical materials. As a results of the simulation, the authors could visualized the landscape transition in Umeda and the old Yodo River basin with modernization.

As the result of this study, the authors clarified the historical transition in the part of Osaka by using GIS and CAD/CG. At the same time, they reconstructed the historical environment as property of Osaka. In the near future, they are going to construct the animation of the transition of Osaka for the communication tool by using created spatial data. And it is necessary for three-dimension models to improve the accuracy.

Keywords: modernization, cityscape transition, Umeda, old-Yodo River