

## Geographical study on motorization of Naha city using GIS

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Certain efforts of linking the result of quantitative analysis with urban structure have been achieved in motorization research. For instance, the result of one research shows that the motorization in regional city has higher influence than in metropolitan area by comparing the diffusion rate of private cars between metropolitan area and regional city. Moreover, current states of the motorization progress in 84 regional cities has been clarified through multivariate analysis using the crossing and statistical data related to the automobile traffic. Such research has been carried out because it relates urban function and structure with statistical data using quantitative approach. However, not only the approach of placing the base in the study on urban structure, but also the voice of requiring to embedded living activity in the motorization research has become clamorous recently.

Currently, to research the method of decreasing the loss caused by congestion has become a mainstream of the counter measure of the motorization progress in Japan. However, a new approach is being explored considering the further motorization which comes from the supply of increase of the number of the car possession proportional to the problem of road extension of a necessary cost for the road construction and vicious circles of demand. Such method advocates to control the progress of the motorization by reviewing the use of an existing road rather than to build new roads. It is one method that put the brake on the progress of a serious motorization by converting the approach and the policy of managing the traffic of user acting soft demand from the approach to which the hard supply of current road making is required. It is a meticulous analysis of the feature of traffic flow that is requested from such an approach, and, the analysis of traffic flow which considers a regional characteristic is necessary and indispensable.

This research takes the standpoint of the motorization research that specializes in the point of understanding of this regional characteristic which is necessary to control the transport demand beneficially. Then, the living activity of people who live from the necessity to the region in addition to the grasp of the amount of flow that uses the analysis of the urban function and the statistical data for understanding the car traffic flow more meticulously is targeted in the discussion using GIS. Therefore, the attribute, the action, and the selection factor of the residents who are the movement subject are reflected based on the accumulation of the motorization research from a current urban structure, and the motorization in the regional city is analyzed.

Considering the above mentioned, the progress of the motorization took up Okinawa Prefecture Naha City in the region for the research as a remarkable regional city. Okinawa Prefecture is a region where an economic loss caused from the congestion for each 1km time is the largest in whole administrative divisions except three metropolitan areas. The ratio of the private car occupied to flow is also especially high in Naha city that various urban functions of the prefecture consolidated as the capital of the Prefecture. Naha City was selected as a study area where the influence of the motorization had been strongly received. the current state of the motorization in Naha city is discussed based on the analysis of the urban structure and quantitative analysis through GIS considering the transition of statistics data. Then, pattern of the region is discussed through the analysis item previously enumerated, the role in commuting and the living activity of various places, especially the commuting flow that the private car occupies develops according to what factor, and whether it functions is considered. And, this research unites the living activity analysis of urban structural analysis in the former steps and latter part, and clarifies the motorization in the regional city.