

■ 博士學位論文紹介 ■

논 문 제 목 : 컴팩트도시와 스프롤도시에 있어 밀도에 따른 에너지소비, 접근성, 수단선택 특성에 관한 국제비교연구

(An International Comparative Analysis of the Characteristics of Energy Consumption, Accessibility and Mode Choice by Density between Compact City and Sprawl City (In the case of Korea's Songnam and Japan's Fukuoka))

학 위 취 득 자 : 이재영

현 소 속 : 경기도청 교통과 전문위원

학위취득대학교 : 경원대학교

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전 공 분 야 : 교통계획

출 신 학 교 : 학사 : 중앙대학교 지역개발학과

석사 : 중앙대학교 건설대학원 도시 및 교통전공

Until now, there are many arguments and research with various view points pursuing sustainable urban form or development. Some of those arguments are generally agreed upon already, but some of them are not. Also, there has been little research in Asia and applications and lessons are somewhat limited because most research is based on European and American cities.

The purpose of this research is to find the difference and characteristics through comparative analysis of energy efficiency, public transportation accessibility and behavioural approach for mode choice by density between a compact city and sprawl city, and high and low density residential districts. Songnam City of Korea and Fukuoka City of Japan were selected, and high and low density residential areas were selected for micro analysis.

This research is composed of definition of compactness and hypotheses, and comparative analysis on energy efficiency, accessibility of public transportation, and transportation mode choice. Statistical analysis, CAI(Complementary Accessibility Index) and Logit model were used as a methodologies for verification of hypotheses.

The major conclusions of this research and their implications can be summarized as follows:

To define compactness and characterization of the research cities, urban functional data and spatial distribution analyses were utilized.

The results indicate that Songnam is a compact city and Fukuoka is a sprawl city from spatial analyses.

In case of first hypothesis, Songnam consumes less transportation energy for car and walking when population density is higher while Fukuoka displays no relation between the two factors. Especially, in the case of Fukuoka, the reason that the regression curve is positively increased with increasing density is conjectured because the supply of public transportation is very low compared with the high density area and it diverts people to private cars because the use of public transport is impossible.

Secondly, accessibility to public transportation is analyzed using CAI(Complementary accessibility index) which can evaluate accessibility.

The results indicate that the public transportation accessibility will be affected not by simple density of a district but by spatial distribution of population

between a compact city and sprawl city and high density district and low density district.

As a third stage, the mode choice characteristics and elasticities of variables are analyzed using six logit models. The modal split of public transportation of a compact city and high density residential district is higher than that of a sprawl city and low density residential district.

Also, according to the results of cross elasticity in Songnam, we can know that an effective method to encourage the use of public transportation is to use strong TDM policies enacted for passenger car and policies for time saving by subway, which will contribute to diversion from other modes to

subway. High density residential districts are more sensitive for the cost and time of passenger car and they can be diverted sensitively to the demand of bus and subway. However, in the low residential density district, the change of time for passenger is very inelastic for the change of the demand for subway.

There are many specific different results by nation, city or district even though the general results belong to the general hypotheses of worldwide cities. That is to say, the criteria and directions of urban development policies should be applied differently according to the characteristics of cities such as nation, locality, and urban function.