

Drivers' Route Choice Behavior with Traffic Information in Local City

Seo Chae-Yeon

In this study we carried out the stated preference survey on a model street and its detour in Iri city to analyze drivers' responses when dynamic traffic information was given. We used the Logit Model to analyze the factors influencing drivers' route choice behavior under the advanced traveler information system(ATIS). This probabilistic model was developed for analyzing discrete choice data.

Based on results, it was found that the route choice would be different according to the fact whether drivers receive traffic information or not. This indicates that the drivers' route choice under ATIS depends on their planned route before receiving information. And also, we found out the fact that the travel time information was more effective than the travel speed information when the traffic information by the drivers' route choice model was given to commuters.

Traffic Demand Estimation and Its Counterplan for 2002 Pusan Asiad

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This study focuses on the study of traffic demand estimation and counter plan for 2002 Pusan Asiad. For the traffic demand estimation during the Pusan Asian Game, extensive literature review was conducted on the cities where previously Asian Games were hosted, and traffic demand forecasting during the special event.

The counter plan for the estimated traffic demand consists of supply and demand sides. First, for the supply side, the justification of construction for the new urban rail and subway, named as Asiad Line, and urban express highway were researched. Second, carpool, and regulatory policy, i.e., even and odd license plate number driving permit, were suggested for the demand control side. In addition, construction of distributed event facility, counter plan on traffic demand, supporting regulation, and financial support plan were also suggested for the successful Asian Game.

Study on Establishing and Maintaining a Public Transportation System in and around Local Small Cities

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In Japan, the use of public transport buses has been decreasing nationwide for the last 25 years. The reasons for this decline are manifold, with the spread of private motorcar ownership naturally being the most important factor. The trend is compounded by the demographic fact that Japan's population is decreasing.

This Study has therefore singled out mainly two localities in southern Fukuoka Prefecture, namely Yame-shi and Yame-gun (six towns) to investigate the present usage pattern for the regular service buses in the area and to analyze the future trends so as to examine the problem areas concerning the current public transport services and their maintenance. Four towns out of six of Yame-gun have been designated as being subject to population drift. These are Kurogi-machi, Joyo-machi, Hoshino-mura and Yabe-mura.

Present State of the New Transit System in Japan and Related Issues

Byong doo Jung, Takashi NISHIMURA & Yasuo HINO

Since the first Tokyo Monorail opened in 1964, more than a dozen cities have, during the 1970s and 1980s, developed and placed in service 8 Automated Guideway Transit (AGT) systems and 5 urban monorails (1994), in Japan. Meanwhile, numerous new light rail systems are planned or under construction, with the result that their networks would extend throughout urban areas and provide a large fraction of the services required. Accordingly, the number of passengers has also increased considerably.

With the implementation of many light rail systems in Japan, there is an increasing concern for a post analysis of them, not only on travel demand prediction but also on an evaluation of their performance.

In this paper, we present two types of the so-called new transit systems (or new transport systems), that is, the Automated Guideway Transit (AGT) system and monorails.

The remainder of this paper is organized as follows. The next section outlines the present state of AGT systems and monorails with regard to operations and management. Section 3 reviews current legal and institutional systems along with financial performance. Section 4 focuses on the issues of travel demand forecasting methods and discusses the discrepancies between estimated demand and observed values. Section 5 discusses future prospects of and research into the new transit systems. Finally, section 6 summarizes the important findings of our study.

Problems and Solutions Regarding the Techniques Used in Drafting an Area-Wide Regional Transportation Strategy

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In drafting the transportation planning in an area-wide region, 2 types of methods have been selectively applied to the project according to the scale of the urban region.1).2)

One of them, which is laid down with the urban regions having population of more than 300,000 as objectives, is the 4-step estimation approach established based upon the researching measures including a person trip (PT) survey. The PT survey aims at grasping people's all the movement ranging from an objective's day's traffic action, mass transit, etc. to walking, and the survey was conducted in a full-fledged manner in the Detroit urban region in 1953. In Japan, the survey was performed for the first time in the Hiroshima urban region in 1967. Since that time on, the survey has been being carried out in more than 40 major urban regions throughout the country. The 4-step estimation approach is a method to estimate urban activities in future based upon the population in future, estate utilization, economy indexes, conventional plans, PT survey, cargo transport survey, etc., and also plans future traffic networks. In addition, the approach makes estimation with the following subjects in this order: (1) Trip generation and trip attraction. (2) Trip distribution. (3) Modal split. (4) Traffic assignment.

Another is the one in execution with the urban regions whose mother cities are of the population scale of less than 300,000, and is an individual facility plans complying with the excelled travel demand, i.e. a road network planning method based upon the automobile's origin-destination (OD) survey. The automobiles' OD survey consists of driver interviews based upon the origin-destination inspection allowing inter-region traffic or long-distance transportation to be surveyed and vehicle owner interviews based upon the origin-destination survey asking questions to vehicle owners concerning the day's traffic affairs. Automobile's OD surveys have been conducted as road traffic census in conjunction with general traffic volume surveys including traffic volume observation more than 100 urban regions since 1933. A road network plan which is drafted in local urban regions based upon automobile's OD survey is a method to predict the urban activities in future from the future population, estate utilization, conventional plans, economy indexes, automobile's OD surveys, etc. By planning future traffic networks, the method estimates the subjects shown below in this order. (1) Trip generation / trip attraction. (2) Trip distribution. (3) Traffic assignment.

In Kofu urban region, one of the local urban regions, a road network plan was drafted based upon the automobile's OD survey in the 3 years from 1991 to March 1993.3) At that time, (1) a system to propose road networks by investigating future images of the urban regions and (2) a system to examine supply/demand balance of future traffic of the proposed road networks were built up as a measure to improve weak points of the conventional methods. By attaching importance to the former, especially detailed investigation was provided.

The purpose of this study is to introduce a traffic plan settling method attempted in the road network plan of Kofu

urban region, and furthermore make investigation with the plan in a methodological manner.

A Location Guidance Programme for Transportation Demand Management

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Transportation demand management has recently attracted city planners' attention in developed countries (Ohta, 1993). There are several reasons for thinking that it is effective in those cities. One of them is the difficulty to physically improving the urban transportation network there. Future demand cannot be anticipated because population growth is about to stabilize or may decrease and this discourages new investment. Expensive land prices and scarcity of space to accommodate transportation facilities in crowded city centers are added factors. Moreover, people in these cities become more conscious of environmental quality of city life than they are of economic prosperity as their income increases. Thus, they are induced to manage urban growth rather than investing in transportation facility improvement (Kashiwadani and Asakura, 1995).

Land use control is considered to be a powerful way of transportation demand management because it can manage original trip generation. Several studies have proposed a job dispersion policy or a short distance policy between job and house location (Mayer, 1991 and Keihanshin Kotsu Chosa Iinkai, 1974). But there are fewer studies which have tried to study land use control for transportation demand management quantitatively.

We propose a new measure which evaluates zones in a city where urban land use activities are allocated from the point of view of transportation demand management. This measure is related to an explicit planning goal problem and expected to help planning authority guide land use activity location towards a dose approximation of the planning goal. In chapter 2 the planning goal is shown. A location guidance program is proposed in chapter 3 and test computation in Matsuyama city is tried in chapter 4.

Demand Analysis of Access Travel Mode to New Hiroshima Airport Based on Stated Preference Data

Akimasa FUJIWARA & Yoriyasu SUGIE

As growing traveler's income and value of travel time, travel demand of high-speed long-distance trips by air has recently increased. Consequently many new airports have been constructed in suburbs of Japanese cities. Not excepting, New Hiroshima International Airport was opened at Hongo-cho located about 50km west of Hiroshima in 1993. It averaged about 7,000 passengers a day one year after the opening. Because of inconvenient access to the airport, the number of passengers has decreased 20% as compared with that of the former airport located close to the city center.

To keep rapidity and reliability of air trips, introduction of the following three different plans for access travel modes to link the city center and the new airport has been investigated:

- Plan I: Development of Magnetic Levitation and Steel Wheel Systems (i.e. Maglev) using a flat linear motor to link the Higashi-Hiroshima Rail Station and the new airport,
- Plan II: Development of Maglev to directly link the city center and the new airport, and
- Plan III: Extension of existing railway into the airport.

Since there does not exist such a super-express transit as Maglev in case of plan I and II in Japan, it is difficult to use only conventional revealed preference (RP) data for estimating the number of passengers. While stated preference (SP) data can be easily obtained the choice probability of new alternatives that could not yet exist, it happens often that SP data which are a kind of intentional data are not consistent with the actual travel behaviors. This paper aims to improve the models based on SP data for forecasting Maglev trips.

Priority Rating in Improvement of Links in Urban Road Networks

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& Tetsuo MITANI

Improvement in the condition of city streets is implemented after decisions are made on urban planning and approval for it is given. In many Japanese cities, however, financial constraints make it very difficult to improve and expand road networks to keep up with increasing traffic volume. Road administration requires efficient infrastructure investment, and how to set order of priority for those roads waiting for their improvement is crucial.

Unlike regional trunk roads, urban streets exhibit distinctive features and differ considerably from each other depending on such characteristics as road structure, type of traffic, and how closely they involve people's activities in the area. To improve these streets with such distinctive features, one effective way is to consider these characteristics, and then determine priority of improvement as each route or link serves as a unit. To set road improvement priority, we first evaluate the streets by their functions and then set the order of improvement based on the results.

Against this backdrop described above, this paper proposes methods by which we can set priority of road improvement; regarding the functions of the road, our study focuses particularly on the roles of road networks and their contribution to urban development, and also how difficult such improvement can be for each road. The methods are applied to Tokushima City where serious problems delay the planning and implementation of urban road improvement. Some examples are analyzed.

Priority of road improvement can be set in a variety of ways. In some cases, it is set by summarizing the results of evaluations of such individual factors as road functions, traffic conditions, disaster preventive measures, and access to urban facilities 1).2) ,3) • In other cases, it is determined first by obtaining the total road travel time, route coefficients and other relevant data influenced by land use and traffic conditions which vary depending on the degree of road improvement, and then by combining these findings for comprehensive evaluation 4). Yet in another attempt to set priority, GA (genetic algorithm) is utilized to maximize the benefits from road travel against the total cost of improvements 5). Compared with these previous works, the methods we propose in this paper are designed primarily to prepare information closely related to urban planning administration by local government offices. They can be used to set priority of road improvement from a number of different angles: priority based on cost-benefit analysis with emphasis on efficient utilization of finances; by indicators of promoting urban development; priority based on indicators that show how difficult the improvement of each road is (this last point is the most serious administrative problem). With these functions, our new approach clearly distinguishes itself from other works.

Public Attitude to Traffic Restraint Schemes Mainly Focused on Road Pricing

Yasutsugu NITTA & Nobuhiko MATSUMURA

Metropolitan areas in Japan, like Tokyo and Osaka, have serious traffic problems, especially congestion, environmental pollution, accidents, illegal parking and so on. However, it has been becoming clear that present countermeasures cannot overcome such traffic problems effectively. In order to reduce the traffic problems, it seems to be necessary to introduce some strict traffic restraint measures.

This paper aims to clarify public attitude to traffic restraint schemes mainly focused on road pricing, especially the following three points;

- a) public awareness of urban traffic problems
- b) public attitude to some countermeasures focused on road pricing and
- c) effect of a package approach on public support for road pricing.

A Study on Planning of Residential Streets in Sprawled Areas Based on an Analysis of Inhabitants' Awareness

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The rapid economical growth in Japan was taken place in the beginning of 1960's, when a lot of farmland was changed to residential or industrial area and sprawled areas appeared. The total street space in sprawled areas including private streets is not always small, but the areas consist of narrow streets without local distributors which compose the framework of the districts. At that time, the city planning act, the building standard act and so on, which have to be effective to prevent such developments, were not sufficient. Addition to this, there was not a few illegal developments in those days.

Since it is necessary to establish an effective urban planning system in order to prevent sprawling development essentially, the city planning act has been revised. However, it is also a fact that it is still difficult to prevent sprawl. Therefore it is strongly needed for transportation planning to construct or improve a framework of streets in such areas.

As street space in these areas is quite insufficient from viewpoints of residential environment and disaster prevention, it is quite important to increase street space, especially local distributors in these areas. But if a district has built up, large-scale improvement of street network is not easy, so it is difficult to construct them after sprawled areas have been built up. Therefore such local distributors should be constructed in an earlier stage of development.

Yamakawa²⁾ and Obase⁴⁾⁵⁾ pointed out the importance of road construction in earlier stage of urbanization and distributors in sprawled areas. Saito and Akasaki⁶⁾ have named the distributors "chu-gairo (in Japanese)", and examined an effect of network of "chu-gairo" to maintain a level of residential environment by a simulation. Tsukaguchi⁷⁾⁸⁾ and Yamanaka et al.⁹⁾¹⁰⁾ evaluated the effect of "chu-gairo" on accessibility of emergency vehicles and street environment etc., and proposed desirable levels of "chu-gairo" network respectively. Yamanaka⁹⁾ also evaluated the effect on land value of surrounding areas.

There are two important problems in the planning of local distributors, that is, one is the planning of them in built up areas and the other is the planning in areas which are in danger of proceeding sprawling development. This study aims to examine the planning of residential streets in both areas, mainly based on findings of questionnaire surveys carried out in such areas.