

Evaluation of Public Attitudes towards Private Car and Public Transport in Lahore, Pakistan

Muhammad Ashraf JAVID¹, Toshiyuki OKAMURA², Fumihiko NAKAMURA³, Shinji TANAKA⁴ and Rui WANG⁵

¹Member of JSCE, Doctoral Student, Department of Civil Engineering, Yokohama National University
(79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan)
E-mail: ma.javid@hotmail.com

²Member of JSCE, Professor, Faculty of Regional Development studies, Toyo University
(2-36-5, Hakusan, Bunkyo-ku, Tokyo, 112-0001, Japan)
E-mail: okamura@toyo.jp

³Member of JSCE, Professor, Department of Civil Engineering, Yokohama National University
(79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan)
E-mail: f-naka@ynu.ac.jp

⁴Member of JSCE, Associate Professor, Department of Civil Engineering, Yokohama National University
(79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan)
E-mail: stanaka@ynu.ac.jp

⁵Member of JSCE, Research Associate, Department of Civil Engineering, Yokohama National University
(79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan)
E-mail: wang-rui@ynu.ac.jp

This paper aims to identify the relationships between service quality factors of car and public transport and peoples intentions to use car and public transport. It has been hypothesized that people's preferences to modes of transportation are dependent on their socio-economic conditions, situational factors and mobility restrictions in using different modes. The findings are based on results of a questionnaire survey and structural equation modeling of survey results. This study revealed that service quality factors, social and mobility restrictions are significant determinants in using car and public transport. This study implicates that improvement in service quality of public transport and mobility restrictions on car use should be integrated together in order to enhance usage of public transport.

Key Words: Travel behavior, service quality, private car, public transport, mobility management, beliefs,

1. INTRODUCTION

(1) Background

Rapid growth in population and vehicle ownership has resulted increase in travel demand and related transportation infrastructure. The high trend of auto ownership and its usage has changed shape of many metropolitan areas and also way of travel ¹⁾. Such trend tends to make road network congested and increase in travel time and cost, and energy consumption. Like other developing cities, Lahore is also facing a problem of achieving some appropriate standard of public transport mobility. The imbalance between demand and supply has resulted road congestion, thus condensing the urban mobility. In Lahore, non-motorized and public transport is mainly modes of poor people. It is unfair to build more road infrastructure just in order to facilitate car users and neglecting the mobility of poor people such as non-motorized and public transport mode users. In

developing countries, for sustainability of metropolitan areas, policy makers and transport planners need to think positively for the development of public transportation. The important features need to consider in policy making concerning about transport is the current and changing nature of society and lifestyle patterns which generate diversified travel demands ²⁾. Other factors such as instrumental functions seem to play an important role, such as feelings of power, freedom, status and superiority ³⁾.

Mobility Management (MM) or TDM measures are considered as effective tools in influencing the travel behavior and have impact on reduction in travel time and cost, and convenience of travel options ⁴⁾. It is very important to promote such policies, which should reduce advantage of car use and increase benefits of public transport usage ⁵⁾. It is believed that combined TDM measures have more influence on expected car use reduction as compared to individual measures ^{6, 7)}.

It is still unsure that the public transport system would be able to provide a service quality that can attract car users to switch to public transport⁸⁾. Transport policies which aim at increasing public transport usage should promote its image, but at the same time public transport systems need to become more market-oriented and competitive²⁾. This requires improvements in service quality of public transportation and it can only be achieved by clear understanding of travel behavior, attitudes and people needs. Therefore, it is essential to evaluate attitudes of peoples towards service quality of transport modes in order to identify the potential factors need to consider in improvement of public transport. It is also required to integrate public transport improvement with some specific car use reduction measures or mobility restrictions in order to make significant shift from car use to public transport.

(2) Scope and Objectives of Study

Lahore is the 2nd largest city of Pakistan with population of almost 8.65 million and surface area 1792 Km². The car ownership growth rate has reached to 17% per year between 2004 and 2008⁹⁾. This rapid increase in car ownership and usage has resulted heavy congestion on road network. The main reasons of increase in car ownership and its usage are banking leasing policy and inefficiency and under development of public transportation system. More than 800,000 passengers are using public transport in Lahore, where only 800 buses are only operating along with concentration of Para-transit service on some routes⁹⁾. Due to under development, there is a big gap between demand and provision of an efficient and environment friendly public transportation. It is believed that Lahore city has high potential of public transport development due to high density urban development in inner zone. The population density varies from almost 450 persons per hectare in inner zone to 100 persons per hectare in outer zone⁹⁾. These situations demand development of an efficient, affordable and sustainable public transport system, which can provide a good mobility to existing users and can also attract the potential users such as car users.

However, understanding of travel behavior and preferences of people is required before making any policy regarding public transport development. This would help in assessing the significant factors to be responsible in mode choice behavior. Therefore, the objective of this study is to examine attitudes of people towards car and public transport i.e. how people regard various car and public transport oriented beliefs, and how they prefer to use car and public transport under socio-economic and mobility restrictions on car use. Finally, this study tries to

develop a structural modal of people's attitudes towards car and public transport using structural equation modeling techniques. This paper is organized in this way. Chapter 2 briefly describes theoretical and methodological background of study. Questionnaire design and data collection methods have been elaborated in chapter 3. Chapter 4 discusses results and analysis. Key findings and implications of this study has been discussed in last chapter.

2. LITERATURE REVIEW

It is very important to understand the travel behavior and to find the reasons for preferring one mode over another mode. Different transport modes provide travel alternative options in different way. Each mode has some merits and demerits over another from users, social, and environmental perspectives. Different studies provide different factors, which are important in use of private car and public transport. Car is the most attractive mode and convenience, speed, comfort and individual freedom are well defined factors behind use of car^{10, 11, 12)}. The people's intentions to use public transport are also influenced by individual characteristics and lifestyles, trip characteristics, and perceived service performance of each transport mode²⁾. Public transport has been considered as one of important alternative to private car. A lot of money has been spent on development of public transport system that expected to reduce traffic problems such as traffic congestion. It is believed that transport policies which aim at increasing public transport usage should promote its image to existing users as well as potential user, and also public transport systems need to become more market oriented and competitive. This requires an improvement in service quality, which can only be achieved by clear understanding of travel behavior, consumer needs and expectations²⁾. Therefore, it is essential to evaluate the public attitudes towards service quality in order to identify the potential strengths and weaknesses of public transport systems. The users of different modes have different preferences in mode choice depending on their socio-economic and lifestyles. However, travel behavior is very complex, sometimes its sequential choice among various factors and sometimes simultaneous. For different types of trip, people have the choice between different transport modes, each having specific characteristics. In general, convenience, speed, comfort and flexibility are well known arguments in case car^{10, 11)}.

To make effective improvements in public transport, both operators and authorities need to understand what are the most important attributes of

service quality that are perceived by current and potential users. For example, researchers have shown that travel time and schedule reliability is a decisive factor¹²⁾. Symbolic and functional type attributes of public transport result positive impact on commuters satisfaction and preferences to use public transport, whereas cost and time factors have negative impacts¹³⁾. Similarly, attributes like frequency and comfort are also highly valued by commuters, being key elements of consumer satisfaction¹⁴⁾. Some other attributes e.g. information, driver behavior, and physical conditions of vehicle also have some influence on consumer's satisfaction¹⁵⁾. Therefore, it is important to understand behavior and perceptions of different mode users of specific region, because different mode users behave differently and their satisfaction will be influenced by different attributes. In this regard, market is segmented according to socio-economic demographic variables, lifestyles and transport use. Behavioral comparison is made between different segments and key elements identify for each segment. Transport policy measures are adapted according to the need of each segment.

In the field of transportation and behavioral research, structural equation modeling (SEM) techniques have been used widely to evaluate travel behavior and level of service quality of transport modes^{13, 16, 17)}. An SEM includes measurement model, which identify latent constructs underlying a group of observed variables, and/or structural equations, which depict the directional relationships among latent and observed variables. In this study, factor analysis was conducted to categorize the beliefs into different factors and a structural model was developed using structural equation modeling techniques.

3. DATA COLLECTION

(1) Questionnaire Design

Seeking the objectives of this study a questionnaire has been designed consisting of following four parts (1) Personal information: sex, marital status, age, income, education, occupation, vehicle ownership; (2) Trip information: travel pattern with different mode options and travel pattern on certain day; (3) Perceptions to service quality of car and public transport; (4) Preferences to use car and public transport under social and mobility restrictions.

In part 1, questions related to household structure and interaction behavior within household members have also been included. In part 2, travel pattern with different mode options such as drive private car and motorcycle, pick-n-drop by others, walk, bicycle, auto rickshaw and public transportation modes has been asked. The respondents were also asked to re-

port their one day travel pattern e.g. all modes of travel, travel time for each mode and travel cost for their usual daily trip. In part 3, various service qualities attribute of car and public transport are evaluated using five point Likert scale. The structure of questionnaire survey is primarily based on Osgood's semantic differential technique with five point adjective scale. The attitudes towards car and public transport are measured by using various beliefs in the form of pairs of opposite adjectives. For example; expensive-cheap, uncomfortable-comfortable, unfriendly-friendly, inconvenient-convenient, unreliable-reliable, traditional-advanced, risky-safe, old-new, slow-fast, inferior-superior, unfriendly-friendly, low social value-high social value, environmentally destructive-environmental friendly.

In part 4, respondents have been asked to show their preferences towards use of car and public transport under social and mobility restrictions. All questions in part 4 are evaluated using five point Likert scale: Never (1), Almost never (2), Sometimes (3), almost every time (4) and every time/always (5). Respondents were asked to show their preference among Daewoo city bus and New BRT line. The social restrictions include; travelling with family members and friends or colleagues. Some mobility restrictions on car use have been included such as limiting parking space, high parking charges, parking very far from destination place, road tax on car use, and car entry restrictions in public transport service area. Some incentives measures have also been included on public transport usage such reliability of service, low travel cost as compare to car, and less travel time by public transport.

(2) Survey

The data has been collected through questionnaire survey in Lahore. The respondents are selected randomly at different locations and questionnaire is distributed. The self-completion method and interview approaches are used in conducting survey considering the literacy of respondents to ensure reliability of data. The target groups are mainly consisted of graduate students, government and private employees, and business related people. It was assured to get a proper mix of different mode users in sample.

4. RESULTS AND ANALYSIS

It has been hypothesized that sample strata should represent a good mix of respondents having different occupation and mode of traveling. From this, a comparison can be conducted among different group of respondents for their beliefs and preferences. The results of questionnaire survey have been

analyzed using factor analysis and structural equation modeling tools. Initially, factor analysis is conducted to identify the latent variables for service quality beliefs. Similarly, factor analysis has been conducted for preference to use car and public transport under certain socio-economic and mobility restrictions. The factor analysis clearly categorizes the preferences into two groups i.e. car oriented and public transport oriented. At the end, structure of beliefs and preferences towards car and public transport need to be constructed as shown in Fig. 1. The results depict that people's beliefs on service quality are significant determinants of people's preferences towards car and public transport.

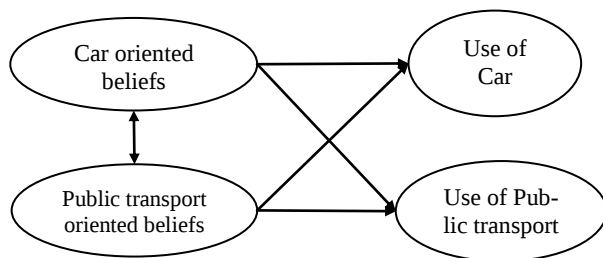


Figure 1: Hypothetical structural model of public attitudes towards car and public transport

5. CONCLUSIONS

The inefficiency and incompetency of transit facilities in comparison to auto modes tend to shape the cities as auto dependent. This causes congestion on road network and enormous consumption of fuel and destruction of environment. It is necessary to assess the beliefs and attitudes of people towards car and public transport. Doing this, it would help to explore mandatory factors need to consider in the development of an efficient and competent public transportation. This could be helpful to provide a good service to existing users and able to potential users. The consideration of car use reduction measures together with transit development would further enhance the performance of public transport. Therefore, this study attempts to identify key factors need to consider in the development of a competent public transportation system. It has been revealed that social and mobility restrictions have significant influence on people preferences towards car and public transport. This study implicates that service quality of public transport should competent somewhat to car service. The development and improvement in public transport need to integrate with TDM measures in order to make its usage effective.

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