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2015

MICCE 2015

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On Maritime Infrastructures

August 11-12, 2015

Engineering Faculty, Gowa Campus
Hasanuddin University, Indonesia

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Hasanuddin University, Indonesia

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the 2nd Makassar International Conference
on Civil Engineering*

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Department of Civil Engineering
Kyushu University
JAPAN

WELCOME MESSAGE

Dear Colleagues,

In this opportunity of the 2nd Makassar International Conference on Civil Engineering (MICCE 2015), on behalf of the organization committees, we would like to welcome all of you to attend this prestigious conference in Makassar, Indonesia.

The MICCE 2015 compiles 88 papers that have been submitted and accepted for presentation in plenary session and parallel technical session. The presentation is divided into several sessions, such as water resources, structural and material engineering, geotechnical and geo-environmental engineering, transportation and urban planning, and construction management. In addition, invited speaker from well known universities and government officials also present their technical and research papers.

We sincerely thanks to all member of the scientific committee who have contributed idea and time to support the organization of this conference. We would like also to thank all our colleagues in the organizing committee that having given hard efforts to prepare this conference.

Finally, we wish this conference will have a great success; all participants will deepen their knowledge and experience during the technical sessions and will widen their networking with the colleagues in the same fields of research. We do hope you will have a sweet memory in Makassar.

Yours Sincerely,

Dr. Rudy Djamaluddin
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THE PREFERENCE STUDY ON PRIVATE TRANSPORT MODE OF TRANSFORMATION BASED ON USER BEHAVIOR

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ABSTRACT: One of the causes in congestion that the number of vehicles are not proportional to the volume increase. Nowadays, common people prefer to use private vehicles than public transport and various reasons such as convenience, faster travel time, the capacity of public transport is not operating as it should and so forth. This study is a study exploring perceptions of transformation preference for personal transport users (four-wheel and two-wheel) in terms of the behavior of the user journey mode. Draft analysis approach consisted of descriptive statistical methods to obtain the user travel behavior and perceptions of personal transport modes, as well as structural equation modeling (SEM) to obtain travel behavior user interaction modes of private transport towards the transformation of modes of perception. The Expected results are: (1) the characteristics of travel behavior and user perception of personal transport modes, (2) interaction model the characteristics of travel and travel behavior user and its relation to perception transformation of private transport modes

Keywords: : transformation, modes, travel behavior, private transport

INTRODUCTION

a. Background

Transportation problems in big cities such as Jakarta, Bandung, Surabaya, Medan and Makassar, is an issue that is quite alarming, especially in solving problems associated with public transport traffic jams. Compared with major cities in developed countries, becomes an irony that the public transport service system in our country is very underdeveloped and quite alarming. In developed countries people are more likely to use public transport than the people use of private vehicles. However, in major cities such as Makassar, in general, people prefer to use private vehicles to public transport with a variety of comments and reasons such as discomfort, longer travel time, the capacity of public transport is not operated properly so that security cannot be obtained and there are many other reasons.

Aspects of the population, information technology, and values that are different in developed countries with cities in developing countries such as Indonesia. Therefore, this study specifically conducted on private transport when compared with previous studies, both in terms of types of modes, service level or even more priority to the provision of service (supply) rather than the demand side (demand).

Makassar city with an area of 175.77 km² as the core city of Mamminasata Metropolitan Region and serves as the National Events Centre in eastern Indonesia with a population of approximately 1.5 million people that growth rate of 9% per year. Economic indicators town with PDRB dominated by trade and services sectors. Therefore, the Metropolitan Municipality Makassar very high tensile power, but faced various urban problems, namely urbanization and poverty, slums, transportation, flood, water, sanitation, and trash. An inter-city movement, moda choice factor plays is a fairly important, someone who would move from one city to another would have to consider a lot of things.

Transport problems encountered include: (1) the imbalance of development of road infrastructure dihandingkan with growth vehicle, (2) the growth of road infrastructure of approximately 4% per year, and (3) the growth of the vehicle approximately 14-15% per year. A survey conducted by ARSDS concluded that the ratio of the use of private vehicles and public transport is 611: 35. This clearly shows the inefficiency of use of road space by the pattern of use of the vehicle. The growth of the use of vehicles in Makassar showed the tendency of utilization of the motor vehicle and the disappearance of non-motorized vehicles. it will cause pressure on the environment both energy use and environmental pollution. Governments' policy, beside build the supporting infrastructure also to restrictions on private transport.

Thus, in practically is to encourage the private vehicle users become public transport users. However, Makassar economic growth and rapid population. The rapid growth impact the increasing public revenues, which encourage the people to have private vehicle. The Improved of transport infrastructure quality and the bad of public transport services, also increasingly encourage people to have a private vehicle. Those things, will become an obstacle

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to "socialize" the use of public transport. Beside the economic capability of a person and the availability of public transportation, the environmental factors affect a person's tendency to choose the mode of transport. A study in the United States shows that the issue of security and safety of users of public transportation services, such as crime becomes a major constraint to consider in the management of public transport.

Based on the foregoing, the author conducted research entitled " The Preference Study on Private Transport Mode of Transformation Based on User Behavior".

b. The purpose and Objective of the research

The objectives of the research is to determine the mode transformation preference in private transport based on the characteristics of travel and travel behavior.

While the goal are:

1. Analyzing the behavior of the user journey mode of private transport
2. Analyzing the transformation perception of private transport modes
3. Build the interaction model of the user travel behavior private transport in relation transformation of modes perception.

c. Limitation of the research

The limitation of the problems as follows:

1. The material of this research is limited in private transport modes (two-wheel, four wheels).
2. The research was conducted in private transport modes users of two-wheeled and four-wheel travel as office workers.
3. The Location of research conducted at one of the government agencies in Makassar region.
4. Data collection is done by simple random sampling
5. The data were analyzed by using Structural Equation Model (SEM)
6. The behavior variables of the user journey mode of private transportation.
7. Individual response sensitivity in transformation of the use of private transport modes (two-wheel, four wheels).

LITERATURE REVIEW

a. Modes of Transport

Basically, transport is an essential means to move people or goods from one place to another place. The aim is to help someone or groups of people to reach the desired place or to send goods from place its place to a destination. Vuchic (1981) divides the transport modes according its type and use as follows:

1. Modes of private transport
2. Modes of transport for public/public transport)
3. Modes of transport for-hire

According to Quality Insurance (LPM) of ITB (1997), mode of transport can be grouped into two kinds based on the use and manner of operation, namely:

1. Personal Transport (private transport): transport owned and operated by and for the benefit of the owner's personal use of private infrastructure and public infrastructures.
2. Public transport: namely transport owned by the operator that could be used for public purposes with certain prerequisites.

The public transport system in general can be categorized into passenger transport systems and freight transport system. However, the discussion in this paper is more emphasizing on passenger transport system. Some procedures modal choice modeling the movement with only two modes of transport, namely public and private transport. Models of realistic modal choice is disaggregate, behavioral and probabilistic. The disaggregated model type is akin of individual travel behavior. It is considered as a behavioral model due to two considerations: the first is concerning with the economic and psychological behavior of consumers in determining the decision. Both models are based on hypotheses related to the identification of variables in determining the decision to take. It is then called probabilistic model since the model indicates a probability of the outcome of the decision-making of potential traveler.

Factors that influence a person to choose a mode of transportation, according Tamin (2000) can be grouped into:

1. Characteristics of traveling performers, such as:
 - Socio-economic conditions and the level of income.
 - The availability or ownership of the vehicle.
 - Possession of driver's license.
 - Household structure (young couples, families with children, pensioners and others).
 - Other factors such as the need to use the car to the workplace and the needs of the kids to school.
2. Characteristics of movement
 - The purpose of the movement.

For example the movement into the workplace in developed countries is usually easier to use public transport because of the timeliness and level of service is excellent and the cost is relatively cheaper

- compared to private transport (car). However, the opposite occurred in developing countries, people still use private car to work, although it is more expensive because of timeliness, convenience and other reasons that can not be met by public transport.
- The timing of the movement.
If we want to move in the middle of the night, we definitely need a personal vehicle because at the time public transport is hard to find or even not operating.
 - Distance traveled.
Distance traveled has influence in selecting a mode of travel, the farther away, the more we tend to choose public transport compared to private transport.
3. Characteristics of the transport system
Personally, the level of service offered by each means of transport is the determining factor in choosing the means of transportation. Service levels are grouped into two categories:
- a) Quantitative factors, such as
 - The length of travel time includes the time in the vehicle, the time of waiting and walking time.
 - Transportation costs (fares, fuel costs, etc.).
 - The availability of space and parking rates.
 - b) Qualitative factors, such as:
 - Comfort and convenience.
 - Reliability and regularity.
 - Security.

b. User Behavior

The most important factor of the decision to travel is the process of choosing. Performer's of a journey is always faced with a condition to determine the choice. This condition can occur at any time and every situation. For example in determining the location of residence, determine the mode of transport that will be used in the work, to shop, to school, and others. There are several levels of individual behavior in selecting mode (Manheim, 1979: 61), which is based on the lifestyle aspirations, the pattern of the desired activity, site selection activities/location choices, and travel travel choices/decision.

At the highest level, the pattern of the desired activity of individuals depends on the aspirations of his lifestyle. Then to support his activities, the individual must be at a certain location at a certain time; this is referred to as site selection activities. Finally, to support activities in locations that have been selected, the travel decisions will be taken by considering where, when, and how the journey will be done.

Selection of the mode of transport is influenced by the stage of the traveling performers in deciding the choice of a transportation mode (variable behavior). The traveling steps of traveler in deciding the final selection of the mode of transport to be used can be divided into several stages (Rosmiati, 1990; Koppelman and Pas, 1980).

c. Structural Equation Model

Structural Equation Model (SEM) is a set of statistical techniques that allow testing of a series of relative relationship "complicated" simultaneously. The complex relationships can be defined as a set of relationships built between one or more dependent variables with one or several independent variables where each variable shaped both dependent and independent factors built by several indicators that are observed or measured directly (Waluyo, 2011).

Structural equation modeling generally uses the Linear Structural Relationship, estimation method that is commonly used is the Maximum Likelihood method (ML). ML parameter estimation method in LISREL requires how critical assumptions such as sample size of at least 10 times the amount of indicators or more than 100 units of observation, the data spread following the normal distribution. LISREL provides several approaches that can be used as parameter estimation models, including the Bootstrap or use Weighted Least Square method. However, the both approaches still require relatively large data so as to model a complex with a relatively small sample size and the data do not spread normally takes a new approach. One new approach introduced by Herman Wold is Partial Least Square (PLS) and is often called soft modeling. PLS is possible used structural equation modeling with relatively small sample size where it is not build multivariate normal assumption. (Jaya IGNM, Sumertajaya IM, 2008)

RESEARCH METHODS

a. Research Design

The method used is descriptive analysis, which depicts an event then conducted an analysis of the problems arisen. The study began by collecting literature and secondary data relating to the research conducted, then determines the survey technique used. In this study the events that will be observed is the selection of private transport modes. The variables that will be studied are the attributes of travel behavior. Data collection techniques are the interviews or questionnaires to users of private vehicles on the work (employees) with random system. Form question survey form

covers two things planned. First, the question is focused to determine the existing condition of the characteristics of current users of private vehicles. In this case we want to know the socio economic condition of the user and trip information that is done using private transport modes. Secondly, the question is directed to know the preferences of respondents who have offered several hypotheses conditions such as travel costs, travel time, trip distance, access to parking and so on. By using the respondents' perception of data is then analyzed to determine the characteristics of behavioral variables traveling on private transport modes in Makassar.

b. Location and Research Period

The research is conducted in the city of Makassar, especially to users of private vehicles on the work in one of the government agencies that performed directly personally to the respondents, especially during the questionnaire. This research will be carried out on every week day.

c. Instrument of Data Collection

1. Primary Data

Primary data in this study was obtained from the results of the survey interview, in this case is a questionnaire. Respondents selected criteria are as follows:

- Respondents are residents or non-residents of Makassar Makassar but do work activities as employees in a government institutions in one of the government agencies in the city of Makassar.
- Respondents using private transport as a means of transport to get to work.
- Fill out questionnaires to complete.
- Respondents on the consistency and influence will be tested by appropriate logic Structural Equation Model (SEM).

2. Secondary Data

Secondary data will be obtained from:

- One of the government offices in the city of Makassar, in the form of the number of employees in the private transport modes users to travel to the office.
- Makassar in figures 2014 at the BPS office of Makassar.

d. Variables and Indicators of the Research

Variables and indicators in this study can be seen in Table 1

Variables	Indicator
Accessibility	- Passenger load factor - Access to parking
Mobility	- Frequency of use - Traveling time
Socio Economic Preference	- Revenue - Age - Education - Job - Gender - Ownership of vehicles - Frequently use transport modes

e. The Technique of Data Analysis

Data analysis method that will be used in this study are generally divided into three, namely:

- Methods Descriptive Statistics
This method is used to determine the travel behavior of private transport users in the form of tables and diagrams, so it is easy to understand. The data used in this method originated in questionnaire distributed to a sample transport users private cars and motorcycles in the office employees of government agencies. The method of sampling will use the Simple Random Sampling.
- Descriptive Qualitative Method
This method is used to determine the transformation of the perception of personal transport users based on user travel behavior mode of personal transportation in the city of Makassar.
- Method of Structural Equation Model (SEM).
This method is used to analyze the interaction of the user travel behavior modes of private transport in relation to the perception of the transformation of the mode of personal transportation.

EXPECTED RESULTS

The expected results of this study are:

- a. Characteristic behavior of the user journey mode of personal transport
- b. Perceptions of personal transformation transport modes
- c. User interaction models of travel behavior modes of private transport and its relation to the perception of personal transformation transport modes.

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