

Factors Affecting the Selection of a Mode of Passenger Transportation in the Colombo Metropolitan Area

S P Ravindu Nadeeshan and M R S Mudunkotuwa
CINEC Campus, Sri Lanka

1. Introduction

It is certain that transportation is now an integral part of human life, given that mobility aids in satisfying human needs and performing activities that relate to biological needs, social obligation and self-desires. With time, the complexity of needs tends to grow wider, and turning points such as the industrial revolution, coupled with technological advancements, enabled human beings to explore and develop modes of transportation which were still more advanced. A large choice of modes is presented to humankind, from among which they can opt for the best mode of transportation, and in choosing the best their decisions are usually influenced by many factors. The variations and the level of influence of these factors can be different from one nation to another.

Understanding what influences the decision of the consumer helps planners engaged in decision making for the transport sector to create a service that is satisfactory to the consumer. Thus, what influences, forms and alters their decision process on modes of transportation needs to be studied thoroughly. Thus, this research is conducted to investigate the factors determining travellers' mode choice in the Colombo Metropolitan Area.

2. Literature Review

Various studies have been conducted in both global and local contexts with regard to the demand for public transportation. Whilst some studied the transportation mode choice determinants using numerous variables, it was found that socio demographic variables such as gender, age, education, income, household size and license ownership take prominence in affecting travellers' mode choice [1]. Research on the topic has covered wider ranges of people in different geographical areas and addressing different factors that are similar to those addressed in previous studies. Some were studied with specific requirements such as how factors like perception and decent driver attitude can be considered as major and influential mode choice determinants [2]. They further mentioned that passengers of intercity buses were willing to pay much higher fares for better service.

3. Methodology

This particular section will focus on data collection methods and data analysis methods that were used in research in order to identify the factors affecting the selection of a mode of transportation for regular activities (Education, Employment, Purchasing or Shopping, Others) performed by people in the Colombo metro area. The source of data is directly linked with primary data sources as the researcher has developed means to collect relevant data by himself. Thus, the data is derived from primary data sources, with respondents' data being collected in the form of a questionnaire distributed via e-mail. The questionnaire was designed with the research problem, objectives and sub objectives in mind. The minimum sample size was decided using a sample size calculating formula.

$$n = N/(1+NE^2)$$

where,

n=sample size

N=Population size

E= error tolerance

The selected confidence interval is 95% which implies that the margin of error will be 5%. The population size of the study area is 2,395,000.

$$n=2,395,000/ \{ 1+(2,395,000) (0.05)^2 \}$$
$$=399.93 \approx 400$$

Hence the minimum sample size for analysis was 400 respondents. Based on this, 404 responses were collected through the questionnaire. Regression, ANOVA, and Factor Analysis were carried out with a view to identifying the determinants of passenger mode choice in Colombo metropolitan area.

4. Discussion and Conclusion

It could be concluded that with growing income levels, people prefer to opt for the most spacious and comfortable travel options that they can afford.

The survey on purpose of daily travel routine revealed that the use of these vehicles (Bus, Train, Car, Van, Three-wheeler, Motor Cycle) were for the purpose of going to work.

It was further noted that people who go to work using these private vehicles: i.e., those privately owned by passengers prefer to use a van compared to others as it recorded a higher mean (2.48) than any other ANOVA test.

The number of destinations and the distance between origin and destination appeared to have no significant impact on mode choice relating to private means of transportation.

The gender, age, number of travel companions and distance between origin and the closest bus stop/train station (0-500m, 501-1000m, 1001-1500m, 1501-2000m, and more than 2000m) showed no significance to mode choice. At the same time income ranges, level of occupations, ownership of a valid driver's license and distance between origin and destination had a significant impact on choice of trains as the preferred mode of transport, whereas ownership of a vehicle, daily travel purpose and number of destinations reached daily influenced travellers to favour buses.

Age, number of travel companions, distance between origin and final destination, and distance between origin and closest bus stop or train station had a significant influence when determining mode choice with regard to generalised cost factors.

Gender, income, occupation, daily travel companion, vehicle ownership, daily travel routine, destinations, distance between origin and final destination, and distance between origin and closest bus/train station exerted a significant influence on mode choice with regard to quality.

Congestion and the waiting time were the main related factors, while some demographic factors such as gender, income, occupation level, possession of a valid driving license, private vehicle ownership, purpose of daily travel, number of destinations to be reached daily, distance between the origin and final destination, and distance between origin and closest bus stop/train station were also significant.

References

- [1] Chee, W. & Fernandez, J., (2013), Factors that Influence the Choice of Mode of Transport in Penang: A Preliminary Analysis. *Procedia - Social and Behavioral Sciences*, pp. 120-127.
- [2] Wen, C. & Chou, P., (2011). A latent class nested logit model of intercity bus carrier choice. *Journal of the Eastern Asia Society for Transportation Studies*, Volume 9, pp. 382-394.

Keywords: *Transport, Mode Choice, Public, Private, Gender, Income, Age*