Forecasting the traffic share and environmental impacts of BRT using Discrete choice models: case study of Isfahan

Sh.Afanadizade[1], S.A.H.Zahabi[2], N.kalantari[3]

1-Associate Professor of Iran University of Science and Technology, Civil engineering Dept
2-Masters student of Iran University of Science and Technology, Civil engineering Dept
3-PhD student of Iran University of Science and Technology, Civil engineering Dept
amirzus@yahoo.com

Abstract

One of the earliest applications of Logit models is forecasting the share of a new mode of transport. In the city of Isfahan in 2007 a need for a faster and more efficient transit system was highlighted due to the growth of population, traveler demands and the disadvantages of using passenger cars. We have applied multi nominal Logit models to commuter's mode choice in a corridor in Isfahan and used the model to predict BRT rider ship. A sample of commuters was taken for Isfahan Comprehensive Transportation and traffic studies before BRT (Bus Rapid Transit) was open for service and the data set is stated preference (SP). In this corridor, the share of each mode of transport for the present status and after BRT was opened for service has been forecasted by changing the parameters in the utility function like travel time and etc. Regarding the fact that after the accomplishment of the BRT project in this corridor, we could only have a bus line inside our BRT path, we used the same Logit function of the bus with different quantities for its utility function. The predicted share shows a great deal of interest towards BRT by the commuters and shows great deal of reduction in pollution and congestion. The highest percentage attracted to BRT is from commuters using private sector buses and passenger cars.

Keywords: BRT, Multi Nominal Logit Models (MNL), SP, Likelihood function, Utility Function

1. INTRODUCTION

With the development of cities and urbanization, public transport vehicles have found a great roll in inner city transportation. In this regard, creation of public transportation specific path has become very important. Giving priority to public transportation is one of the solutions for persuasion of the citizens to using public transportation. Relating to this, building separated bus lanes not only enhances the movement of buses and increases their speed, but also increases the utility of bus in the minds of the citizens. Since bus is an economic and valuable mode of public transport that can transfer a great deal of passengers, it needs special attention and investment. But since the main problem of this system is the reduction of its speed in city traffic, this incompetence can be fulfilled by assigning separate line for buses. With this action the mobility speed of passengers is increased and the delay time is decreased, the time table of buses approaching the stations is more regulated, the utility for using public transport is risen and the costs are reduced [9].

And also the waiting time of passengers in ordered stations is eliminated and the safety is highly increased. Different studies on transportation goals in Isfahan like comprehensive traffic and transportation studies, Isfahan 2011, study of en bloc transportation show that these goals are principle transportation goals in Isfahan. One short term, effective, economic solution is that the policy of building separated bus lanes or more advanced, BRT1 . This method is easier and cheaper comparing to constructing metro or tram lines or mono-rail and with appropriate management it can transfer a great mass of passengers. One of the most important public transportation corridors at present and in the past in Isfahan is the Ghods-Ghaemie rout. Therefore in this research this line of public transport is chosen, the traffic and transportation status of this rout is studied and construction of BRT and introducing a new mode of transport and its share in moving passengers is discussed using Multi-Nomial Logit Models (MNL).

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[1] .**Bus Rapid Transit**