

# Developing a Predictive Model for Metro Trip Satisfaction Level

Mostafa Abbaszadegan, Ph.D. Assistant professor, Iran University of Science and Technology.  
(Corresponding Author)

Razieh Rezazadeh, Ph.D. Assistant professor, Iran University of Science and Technology.

Maryam Mohammadi, Ph.D. Candidate, Iran University of Science and Technology.

Sajad Alipour Eshliki, MUP Student, Iran University of Science and Technology.

## Abstract

Tehran with over 10,000,000 populations has an inadequate transportation system. One of the solutions to Tehran transportation system's problem is development of sustainable urban transportation systems such as an underground rail system called metro. Tehran is benefiting of such a system since few years ago and now several lines with many stations are under construction. Despite its partial completion metro is already is accepted as a satisfactory mode of transportation in Tehran.

Although some of the effective factors on trip satisfaction is related to speed, scheduling, safety and so forth, in this article a model is proposed in which the trip satisfaction as one of the sustainable urban transportation indices is studied against users' personal characteristics, and investigates the affective independent parameters. Therefore the research hypothesis is to examine the effects of users' personal characteristics on metro trip satisfaction. The aim of this article is to develop an optimum model to predict the metro trip satisfaction level through personal characteristics. Data is gathered through questionnaire survey.

Two metro stations in vicinity of two universities of "Sharif" and "Iran Science and Technology" were selected for comparative purposes. 160 questionnaires were distributed equally within the neighborhoods in vicinity of the two metro stations. Also 240 questionnaires were distributed among metro passengers at the stations. Two major dependent variables were measures, "metro trip satisfaction level" and "metro trip satisfaction level in comparison with other transportation means". The independent variables are gender, age, education, occupation, place of work, distance from metro station and finally the reason for using metro.

The results show that two variables of "distance from metro station" and "place of work have correlations with both dependent variables. Also "education level has a very high correlation with "metro trip satisfaction level". Considering the type of the data, for nominal data (gender and occupation), chi square, and for rank order data (age groups and education level), Gamma statistics were used for correlation study.

The statistical analysis shows that the distance from metro station, place of work, and age are important and affecting the metro trip satisfaction level. While these statistics show the existence of relationship between variables, it does not provide a predictive model for behavior, which is of high importance for planning and design of urban environments. A regression analysis is need to build a predictive model, however due to variation in data which includes nominal as well as ordinal a rank-order regression model is used.

This analysis shows that there is a much higher potential for selecting metro as a transportation mode for lower educated users than for higher educated ones. Also it shows that an increase in age would contribute to possibility of using metro as a satisfying means of transportation. Also the analysis shows that the lower distance to metro stations, would increase trip satisfaction level with metro.

There are planning implications for these results including that in proximity to metro stations, job locations must concentrate, while sport and cultural facilities with younger users could be located further away.

**Keywords:** sustainable urban development, sustainable urban transportation, trip satisfaction level, personal characteristics, ranked order regression.