ABSTRACT

1. Introduction

Shillong, the capital of Meghalaya has developed as an important administrative cum commercial centre not only for the State but for the entire North-Eastern Region. Shillong has experienced phenomenal expansion of population and economic activity resulting in various social and economic problems. The most critical problem faced by the people of Shillong are inadequate, poorly designed, out-dated road system and over-crowded transport facilities. Frequent stoppages, slow movement of traffic due to over-congestion are frequent occurrences in the city. The National Highways No.40 and 44 in the stretch passing through the Shillong city, has far exceeded the point of optimality of road usage, thus breeding bottlenecks to free and unimpeded movement of traffic. The present transportation network is beset with many problems and this is the main cause of backwardness of the state.

2. Objectives of the Study

A survey of research and literature on transportation revealed that meaningful studies have not been made so far in Shillong, hence it was felt desirable to fill the gaps at
least partially. Specifically, the following are the objectives of the study:

a) To review the development of transport in the state since its inception to the present days.

b) To find out the demand for public transportation in Shillong city.

c) To suggest various measures by which the transportation problem in the city can be solved to a certain extent.

3. Data Base

Considering our topic, "An Econometric Analysis of Demand for Public Transportation in Shillong", both primary and secondary data were required for our analysis. Since secondary data were not adequate, primary data were collected from nineteen different localities of Shillong, covering 500 households. We have, however, not followed strict sampling technique in the case of stratification. We may call that our sampling method is purposive and we covered some clusters.

4. Analysis

Our analysis was divided into three parts:

1) Statistical interpretation of MTC data

2) Econometric analysis of MTC data

3) Econometric analysis of primary data.
Interpretation of MTC data gives us the following results. It may be noted that the empirical demand function for estimating the demand for passenger-kilometre by MTC buses is a best fit by accounting for 75 per cent of total variance by regression coefficient. The signs of the estimate of the parameter are also correct. We can also see that income elasticity is 1.39 and price elasticity is 1.42 which means that with the rise in income there will also be a rise in passenger-kilometre.

In the estimate of the demand for energy both linear and log linear equations show the best fit with $R^2 = .9$. The estimate of the parameter of vehicle-kilometre is significant at 1 per cent level but DW statistics show that there is auto-correlation in the disturbance term.

In the case of empirical Repair Cost function we found high $R^2$ but there is auto-correlation in the disturbance term and the estimate of the parameter of earnings is highly significant.

Then coming to expenditure, we wanted to see how the expenditure are constituted under different levels of cost. In this case we took expenditure as a function of fuel cost, repair cost, tyre cost and administrative cost. Although we expected the signs of the estimated parameters to be positive by virtue of our assumption, but it is seen that the estimate of the parameters of fuel cost and tyre cost bears the
negative sign, which means they are probably not as important as administrative cost and repair cost. Also the estimates of the parameter of fuel cost and tyre cost are not significant, whereas the estimates of the parameters of the repair cost and the administrative cost are significant.

The empirical equation for estimating Tyre Cost with \( R^2 = .85 \) is a best fit with auto-correlation present in the disturbance term.

In the case of estimating the accidents, we have run into certain problems. We should have taken into consideration the gradient of the road, age and experience of the driver, density of traffic and the age of vehicles. All these factors assume to be directly related to the cause of accidents but we do not have such data. Therefore, we use vehicle-kilometre as the only independent variable to estimate the number of accidents. This equation is a poor fit, as it gives only the account of 15 per cent of the total variance by the regression coefficient.

**Econometric Analysis of Primary Data**

We have adopted the following models for analysing the primary data:

\[
\text{Pass-Km} = \alpha_0 + \alpha_1 \text{Income} + u \quad \text{.... (1)}
\]

\[
\text{Travel Expenditure} = \alpha_0 + \alpha_1 \text{Income} + u \quad \text{.... (2)}
\]
From the empirical equations relating to model 1 and 2 we obtain the following results:

We have altogether nineteen equations relating to each locality surveyed. The estimate of the parameters of income in case of travel expenditure comes out to be positive. We note with satisfaction that $R^2$ the coefficient of determination is nearly equal to .50 or more for most of the localities. Therefore, all the equations fit moderately and most of them have a best fit. In the case of log linear equations we found almost similar results. We found that demand for travel inter alia the travel expenditure is income elastic.

Next we have estimated the demand for passenger-kilometre. We have adopted here the log linear version of the empirical regression coefficient and finally we estimated for all the nineteen points of survey. We have found the signs of the parameters are correct, but $R^2$ in some of the equations are so small that it does not guarantee the empirical regression function is a best fit. On the other hand, we have satisfactory $t$ values even for these equations. DW statistics show there is auto-correlation in the disturbance term. However, most of the equations are best fit with high value of $R^2$ and the estimate of the parameters of income are also highly significant. We have found that income elasticity of demand for passenger-kilometre varies
from .23 to .89 and therefore, the demand for travel may be considered to be income elastic.

In conclusion we see that with increase in income, both passenger-kilometre and travel expenditure increase to a significant extent.

Chapter Plan

Chapter-II - Review of Literature - This chapter is devoted to research and literature on transportation in India and abroad.

Chapter-III - State of Transport in Meghalaya - Here we have made a detailed study of the development of passenger transportation in Meghalaya with special reference to Shillong from the olden days to the present. We have also made a detailed analysis of goods and rural transport facilities in the state.

Chapter-IV - Data Base, Methodology and Analysis - As an attempt to study the demand for public transportation in Shillong both primary and secondary data were collected for the sake of analysis.

Econometric models have been designed to estimate the demand for passenger transportation as well as to study the relationship among the concomitant variables besides
understanding the influence of the exogenous variable upon the endogenous variable.

Chapter-V - Conclusion - In this chapter, we briefly review the main findings and highlight various suggestions by which the problem of transportation in the city can be solved to a certain extent.