1. INTRODUCTION

1.1 INTRODUCTION

Road accidents and deaths are increasing alarmingly in our country. More than 80,000 deaths are reported every year due to road accidents as per available data. In the State of Tamil Nadu itself the road accidents have increased from 12928 in the year 1993 to 45928 in the year 2001. In the year 2001, 9571 people lost their lives in road accidents involving the buses run by the State Transport Undertakings (STU) of Tamil Nadu, which constitute a major part.

The compensation paid to accident victims by the State Transport Undertakings in Tamil Nadu are correspondingly increasing during the last 8 years as shown in Table 1.1. The amount of compensation paid during 1993-94 was Rs.207.65 Million, which had risen to Rs.638.48 million during the year 2000-01. This expenditure contributes a major share and drains out the revenue earned by the State Transport Undertakings, which are presently undergoing financial crisis.

An analysis on causes of road accidents reveals that around 80 percent of the road accidents are caused by the fault of vehicle drivers. The balance 20 percent of the accidents results from the fault of other road users like pedestrians and passengers. Accidents due to other factors like road environment are almost nil. In the 80 percent accidents by the drivers, around 40 percent are due to drivers of State Transport Undertaking’s vehicles. A micro analysis of State Transport Undertaking accidents shows
that certain habits of drivers like exceeding speed limit, improper overtaking, inattentive at the moment result in accidents more frequently. As such the author has decided to study the performance of State Transport Undertaking drivers in relation to road accidents. Improving drivers' performance through proper training will reduce road accidents and improve road safety to a maximum extent.

Five State Transport Undertakings were randomly selected for analysis. The details of accidents involving these State Transport Undertaking buses over a period of five years were analyzed in depth. An opinion survey was also conducted among the selective drivers of State Transport Undertakings to study their characteristics and the reasons they feel which result in accidents. Suggestions of drivers for the reduction of accidents were also gathered through this survey. Statistical tools like multiple regression and factor analysis were used for the analysis.

A mathematical model has also been developed for the prediction of road accidents. Finally all the above analysis were used for identifying the causes of road accidents and suggesting remedial measures to improve the performance of drivers so that the road accidents can be reduced.

1.2 STATEMENT OF THE PROBLEMS

Driving is an information processing activity. It involves four components viz., Identification (I), Prediction (P), Decision making (D) and Execution (E). Any error in any of the four components will result in accident. The identification of road scene is done by the drivers' eyes (around 95 percent) and ear and nose (5 percent of information gathering).
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<thead>
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<th>STU NAME</th>
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<td>2.81</td>
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<tr>
<td>TOTAL</td>
<td>19.98</td>
</tr>
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</table>

TABLE 1.1  COMPREHESION PAID TO ROAD ACCIDENT VICTIMS BY TN STUS - (Rs. in Lakhs) (1993 - 2001)
The prediction and decision making are carried out by the drivers' brain. For each input, the decision that has been made by the brain is communicated to the legs and hands of the driver to implement it. For safe driving, the drivers' physical conditions and mental alertness are essential.

Around 40 percent of the accidents involving State owned buses in Tamil Nadu are caused by the State Transport Undertaking drivers' fault. By identifying the causes of these accidents, the management can implement suitable remedial measures to reduce the accidents. There is a need to study the accidents to know the real causes of the road accidents, which will help to suggest suitable remedial measures. An in-depth analysis of road accidents, especially the State Transport Undertaking buses involved accidents are to be carried out, to bring out the facts to the light. This will help the management to considerably reduce the expenditure on road accidents.

Eventhough, the accidents are unique, there are certain common errors committed by drivers, which normally results in accidents. The peculiar aspect of road accidents is, once the error is committed; there is no chance for the driver to correct his mistake. The driver should remain alert through out his driving time, without any relaxation even for a few seconds.

The success of safe driving of each driver depends on his attitude towards driving. Proper training will enable the driver to have the required attitude to drive the vehicles.

The nine qualities of a good driver should be in the drivers mind, especially during driving. They are responsibility, consideration, concentration, patience, anticipations, confidence, defensive driving,
adhering to the rules of the road regulations and knowledge about the vehicle mechanism.

Through continuous training of STU drivers, these nine qualities can be repeatedly emphasized and made to record in their deep memory. The State Transport Undertakings are taking few steps in this direction to train their drivers once in five years, compulsorily.

This study of driver performance in Tamil Nadu State Transport Undertakings, with respect to Road Accidents, will bring out all related points for consideration by the management to reduce the road accidents.

1.3 IMPORTANCE OF THE STUDY

There is an urgent need among the STUs to reduce the road accidents and thereby reduce the amount of compensation paid to the accident victims. Each STU in Tamil Nadu is spending Rs.3 to Rs.4 crores every year towards compensation. Apart from this, loss of kilometers run, loss of revenues, cost of damages to the buses, time spent by the staff in attending the accidents, etc. are not quantified.

Most of the STUs are running in loss and the accumulated loss of STUs in Tamil Nadu as on 31st March 2001, is around Rs.2300 crores. The cost of operation increases steadily, but, the fare fixation is decided by the Government at its own convenient time, matching the cost per kilometer (CPKM).

The establishment cost, diesel cost, cost of spare parts and the chassis, etc. are not in the control of the management. There is a need to reduce the expenditure in all possible spheres, including accident costs.
One of the areas in which the STUs can concentrate and try to reduce the expenditure is, the compensation paid to the accident victims, by improving the driver performances and reducing the number of road accidents in general and fatal accidents in specific. If a well trained driver avoids one fatal accident, there will be a savings of Rs.4.5 lakhs to the STUs. The amount of compensation being paid nowadays is very heavy when compared to the amount paid before 5 years.

At this time of financial crisis, it is very essential and important to study the driver performance and take all possible steps to improve their performance.

The STU bus driver has to do many jobs while performing his duty. The driver helps the technical wing to maintain the vehicle by writing proper timely reports in the logbook. He checks whether the repairs have been carried out and he ensures the good condition of the bus. By driving the vehicle carefully he can keep the cost of maintenance very low.

By proper methodical driving the fuel performance can be improved by increasing the kilometer of operation per litre of diesel (KMPL) and thus he can help to reduce the fuel cost. By careful driving, the driver can reduce the tyre damages and the tyre cost can be kept under control.

The driver can improve the image of the organization by stopping the bus at the required bus stops smoothly and by picking up the intermediate passengers and the revenue of the bus can be increased.

The driver can ensure the safety of the bus by driving carefully without involving in an accident and thus he can help in reducing or avoiding the
cost of accidents. When the driver performance improves the image of the organization among the public will increase, the revenue will increase, the cost of operation (including the diesel cost, tyre cost and spares cost) will come down and the cost of accidents including the compensation paid to the accident victims will be reduced. The increase in revenue or the reduction in operational cost can be achieved only marginally. But the accident cost can be reduced to the maximum extent possible by reducing or avoiding the accidents. Hence the study on driver performance with respect to road accidents has been undertaken.

1.4 OBJECTIVES OF THE STUDY

i) To study the performance of drivers with special reference to road accidents.

ii) To compare the accident situation among the selected STUs.

iii) To develop a model for prediction of accidents (Total accidents and fatal accidents)

iv) To conduct an opinion survey among the selected drivers working in the STUs and analyse the factors affecting their performance using statistical tools.

v) To suggest remedial measures for preventing accidents in future.

1.5 SCOPE OF THE STUDY

The scope of the study is

i) To analyze various components of road accidents involving buses.
ii) To study the human errors causing the accidents.

iii) To emphasise the need to impart training to the drivers, so as to enable them to improve their driving performance.

iv) To develop and use the multiple regression model to predict the expected number of accidents in future.

v) To identify the various factors that influences the driver's performance during the driving according to their opinion.

vi) To suggest suitable remedial measures to improve performance of drivers so as to reduce the accidents and thereby reduce the amount of compensation paid to accident victims and

vii) To highlight the various benefits of improved driver performance through continuous training.

1.6 METHODOLOGY

The methodology adopted to carry out this driver performance study is described below:

Road accident data have been collected from the secondary sources. The analysis is done using specially prepared computer software. A structured questionnaire was prepared consisting of eight parts. Each part is devoted to specific data collection such as name and address, height, weight, etc., Income and Expenditure, accidents involvement and punishments, opinion on certain relevant points, knowledge about the amount of compensation paid to accident victim, benefits derived from training, family members details and training/refresher training undergone by the drivers. Five STUs have been randomly selected to carry out this survey.
Analysis of this data was done in two stages. In the first stage, through computer software, cross-tabulations among key parameters were made. In the second stage, using 16 key parameters factor analysis was done. Chi-square test for various parameters like Age, education, qualification, experience etc. versus involvement of accidents to find out whether they are dependent on each other or not was done.

Using the secondary data on accident statistics, a multiple regression model was developed to predict the accidents in future.

A comprehensive analysis of all the data collected was done to find out the causes of road accidents in general and the faults of STU drivers in particular. The questionnaire in Tamil is given in Annexure I and English in Annexure II.

1.7 DATA COLLECTION

Bus accident data was collected for the years 1994 to 1999, from the following five STUs, which were selected at random:

- Metropolitan Transport Corporation (MTC) Ltd., Chennai
- Tamil Nadu State Transport Corporation (TNSTC) Ltd., Villupuram
- Tamil Nadu State Transport Corporation (TNSTC) Ltd., Kumbakonam
- Tamil Nadu State Transport Corporation (TNSTC)) Ltd., Pudukkottai
- Tamil Nadu State Transport Corporation (TNSTC) Ltd., Dharmapuri.
A Questionnaire survey was conducted at the above five STUs. The stratified random sampling method was used to collect data from 733 drivers working in five STUs.

Tamil Nadu Road Accident statistics was collected for the period from 1983 to 2000, from the Director General of Police Office, Chennai. The data collected includes Fatal, Grievous injury, Minor injury accidents Number of persons dead and injured.

The vehicle population details are obtained from the Transport Commissioner's Office, Chennai.

All India Accident Statistics was also collected from the Ministry of Road Transport and Highways, New Delhi.

1.8 CHAPTER SCHEMES

The thesis is arranged in six chapters. Chapter 1 gives the introduction to the thesis. The review of the literature is presented in Chapter 2. The general accidents trend analysis is described in Chapter 3. The case study of bus accidents is detailed in Chapter 4. The driver opinion survey analysis, including the factor analysis is explained in Chapter 5. The Chapter 6 presents the conclusions drawn out of this study and recommendations made for improving the driver performance and for future research.

1.9 SUMMARY

Major findings of this research study on Driver Performance in State Transport Undertakings with respect to Road accidents are given below.