CHAPTER I
INTRODUCTION AND DESIGN OF THE STUDY

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1.1 INTRODUCTION

It is a shared opinion that transport plays an important role in the economic development of a country. This phenomenon applies not only to India but to the entire world as well. The spread of production trade and ideas and the social and cultural interactions between people all over the world depend upon movement. Transport is important in two areas namely personal transport and movement of raw materials for production and the finished products to its consumers in various locations. As the world has become a global village thanks to the development of science and technology, modern people are greatly interested in visiting places for business and tourism. In a similar way transportation of materials from where it is available in excess to the places of need has also increased phenomenally in the modern times. These things will not become reality without proportionate improvement in transport in the modern world.

The word “Transport” has been derived from the “Latin” word “Transportage”. Trans means ‘across’ and portage means ‘to carry’. Transport means to carry to the other side or from one place to another. Transport as such is a service that helps goods and persons to be carried from one place to another. A good transport system is an important one for the development of the economy of any country.

Transport is the defacto barometer of economic, social and commercial progress. It has transformed the entire world into one organized unit. It carries ideas and inventories to people. Evolution of civilization is one of the contributors to transport. In addition to the above factors, transport assumes greater significance in terms of effective communication.
Economic development of a country is largely conditioned by the adequacy, efficiency, regularity, safety and punctuality of transport services. It links up villages, towns, cities and metro-politics and it also integrates the economy. The development and progress in the field of transport brings different parts of the world in close contact with one another besides reducing the time in covering the distance. Consequently, the world of today is much smaller than what it was some fifty years ago and every progress made in respect of speed makes the present world still smaller.

In the context of globalization coupled with privatization and liberalization, modern technology is essential for swift movement and faster place. In this context, vehicles become very significant. In any economy, transport plays a very vital role especially for moving the goods from the manufacturing point to the point of consumption.

In India, the share of investment in transport schemes was as high as 22 per cent in the first year plan, though it has gradually declined to 13 per cent in the 8th plan. However, in absolute terms, there has been a quantum jump in transport investment from ₹4.34 billion in current prices in the first plan to ₹561 billion in the eighth plan.

Road transport renders valuable services to interior rural areas by connecting them with railway stations, markets and the nearby towns, it serve as feeder to other forms of transport namely Railways, Waterways and Airways. It earns huge revenue to the Government and creates immense employment opportunities.

Transport is an infrastructure, a public utility and a commercial venture and therefore, it is unique in more than one sense. Among the four major modes of transport namely Road, Rail, Water and Air, the first one lends itself to a greater
flexibility, variety and versatility. The road transport which encompasses the passenger and cargo segments is, in fact, the best possible mode of linking remote hinterlands with growing cities. The Government (both the Union Government of India and State Government) realizing the need for, and importance of road transport has established a number of road transport corporations on their own for the purpose of providing transport services to the passengers.\(^2\)

1.2 SIGNIFICANCE OF THE STUDY

In the State of Tamilnadu, the transport services in rural areas are provided both by the TNSTC and private operators. The transport services in rural areas by the TNSTC are inadequate. Some of the rural areas are neglected by them in providing transport facilities. The Government has identified the rural areas which do not have any transport facilities. Such areas are declared as ‘unserved rural’ areas. People living in such unserved rural areas are linked with nearby towns for various purposes. Hence, the Government of Tamilnadu has decided to ply more number of TNSTC city buses in the unserved rural areas with a limited route length of 30 kms, with an overlapping distance of 4 kms in served routes which have already transport facilities.

The TNSTC bus services are introduced mainly for the purpose of linking the people living in unserved rural areas with towns for various purposes. So the main aim of TNSTC city bus services should be to provide quality transport services to the people living in unserved rural areas. The TNSTC city bus charge to passengers, is fixed by the Government of Tamilnadu. They strictly follow the bus fares fixed by the Government of Tamilnadu and they provide quality services to the rural people. This study is significant in that it tries to explore many factors connected with this
TNSTC bus transport system. As transport is a social utility, a study of this nature, would lead to better TNSTC bus services in all the districts of Tamilnadu.

1.3 NEED FOR THE STUDY

It is essential for movement of the people from one place to another place and the increase in population has resulted in a heavy demand for quick, efficient transport system. There is every chance for deterioration of the quality of services provided by transport industries because of healthy competition. Nevertheless, the private sector transport industries have to provide better services because it is a question of survival for them. The need of the study is to find out an answer to the question. How far are the private sector transport industries able to survive the competition extended by their powerful counterparts in the public sector.

The public transport was introduced primarily for the welfare of the people. For providing the necessary amenities to the public, the Government of Tamilnadu has introduced the public transport system in the state. The transport and communication facilities are commensurate with the level of education of the public. As the monopoly nature of the public transport is maintained by the government of Tamilnadu, many public transport corporations like TNSTC in Tirunelveli Division are incurring heavy losses. It is not only a loss to the government but also to the public. The major service provider namely, the Government of Tamilnadu is not able to meet the entire transport needs of the people. Both these aspects should be properly studied to make the corporation more viable. The present study has made an attempt to study the passengers’ view on the public transport services provided to the passengers.
1.4 STATEMENT OF PROBLEM

One of the principal objectives of the economic planning in India has been the progressive reduction of unemployment in the country. The realization of this objective has played an important part in the formulation of policies of the different economic sector in the country’s Five Year Plans. Transport assumes a particular significance in this context not only because it already accounts for a sizable proportion of employment of the country’s organized labour force but also because it generates considerable secondary employment, particularly in the unorganized sectors of the economy through a chain reaction set in motion by transport investments in the form of backward and forward linkages.

The backward chain of linkages starts with material and service inputs used in the construction or operation of the system. Each of these inputs has to be produced which results in additional to manpower to be employed. Forward linkages in utilizing the transport services in any branch of activities will be the need for transport facilities. Transport development helps to open up remote regions and resources for production. Regions may have abundant agricultural, forest and mineral resources but still they cannot be developed if they continue to be remote and inaccessible. By linking the backward regions with the relativity more advanced, transport development helps in the better and fuller utilization of resources. Finally, expansion of transport facilities in itself helps industrialization directly. The demand for locomotives and motor vehicles results in starting of industries which specialize in the production of these goods. Expansion of transport is thus of fundamental importance for a developing country like India.
Passenger transportation is an important aspect of transport and will continue to be so in the future also. People have a propensity for travel and much of the world’s civilization, advancement and structure have been affected by this fact.

Passenger transportation thus becomes not only important to our society but also it creates a lot of problems. Employment is also created through loading and unloading service stations and providing wayside amenities.

India is one of the developing countries and is aware of the factors such as economic development, education, employment and standard of living which are important criteria based on which the country may be adjudged as a ‘developing nation’. Growth is possible only if the country has adequate infrastructure facilities like transport, power, water and the like. The government should take steps for the improvement of the infrastructure facilities such as road transport. An efficient transport system is essential for all areas in India including rural areas for movement of both goods and passengers. An efficient rural road transport helps the rural people to have links with towns and cities.

Road transport is a vital necessary for Tirunelveli District because most of the people are engaged in industries like beedi-making, dairy farming, poultry farming, cement industry, cotton industries, spinning mills, small-scale industries and businesses. Agriculture is the main occupation of the people of the entire district. Many villages are yet to be linked with urban centres. The Tamilnadu Government has identified rural areas and urban areas that lack in transport facilities. The Government of Tamilnadu has already taken efforts to provide TNSTC bus transport facilities to the people of the unserved rural areas which do not have adequate transport facilities.
The present study also focuses on the problems faced by the passengers in the operation of TNSTC bus services in Tirunelveli District. The satisfaction of passengers with the TNSTC bus services and problems faced by the TNSTC bus operators are also analysed.

1.5 OBJECTIVES OF THE STUDY

The following are the main objectives of the study:

- To identify the origin and growth of transport and TNSTC Bus Services and Profile of the study area
- To analyze the socio-economic profile of the passengers vis-a-vis the service provided by the TNSTC buses.
- To study the attitude and overall opinion of passengers towards the TNSTC bus services in Tirunelveli District
- To offer suitable suggestions based on the findings of the study.

1.6 SCOPE OF THE STUDY

The present study aims to measure the extent of satisfaction of the passengers with the services provided by the TNSTC buses in Tirunelveli District. The TNSTC bus services in Tirunelveli District satisfies the travelling needs of the people belonging to different socio-economic layers and also the people from outstations who visit the town for various purposes. This study is focused on the satisfaction of passengers towards TNSTC bus operators and also deals with the problems faced by the TNSTC bus operators to offer satisfactory services to the passengers. The researcher has decided to study the problems faced by the passengers of TNSTC buses running in Tirunelveli District.
1.7 PERIOD OF THE STUDY

The study covers a period of one year. The primary data was collected for the period of 12 months from 1st May 2016 – 30th April 2017.

1.8 METHODOLOGY

This study is both descriptive and analytical in nature. In order to gather the full first hand information about the research problem, interview schedules were prepared separately for assessing the satisfaction of the passengers towards the TNSTC bus services in view of the objectives of the study. Further efforts were taken to form a clear understanding of the adequacy or deficiency of transport facilities in Tirunelveli District.

1.9 AREA OF THE STUDY

TNSTC – Tirunelveli is the public transport bus operator mainly in the districts of Tirunelveli, Thoothukudi, Kanyakumari. TNSTC – Tirunelveli was formed by merging the erstwhile KTC Kattabomman Transport Corporation and NTC Nesamony Transport Corporation. The universe comprises of all the peoples living in the jurisdiction of the TNSTC bus operating routes. The study area is fully covered by road transport. So the universe of the study comprises of all passengers living in the eleven Taluks of Tirunelvli District namely Tirunelveli, Ambasamudram, Tenkasi, Sankarankovil, Radhapuram, Nanguneri, Sivagiri, Alangulam, Shenkottai, Veerakeralamputhur, Palayamkottai. There are 30,77,233 passengers in the eleven taluks of Tirunelvli District as per the 2011 census. Some of them may migrate from Tirunelveli District to some other districts and some of them may immigrate from other districts to Tirunelveli District.
1.10 CONSTRUCTION OF INTERVIEW SCHEDULE AND PRE-TEST

Appropriate interview schedule has been constructed and used in this study. The variables used in the study have been identified during the discussions with the passengers of TNSTC Bus service in Tirunelveli District.

The variables thus identified by the researcher have been used in the study. Based on the variables identified for the study, an interview schedule was drafted and it was circulated among experts for a critical review with regard to words, formats and sequences. The schedule was suitably redrafted in the light of their comments. The schedule was pre-tested by the researcher with the help of the interview schedule with the categories of passengers such as student community, businessmen, labourers and general people of Tirunelveli District who are utilizing the TNSTC bus services and so on. In the light of their comments the interview schedule was further modified and re-drafted so as to meet the research requirements.

1.11 COLLECTION OF DATA

The required data for the study were collected from both the primary and secondary sources.

1.11.1 Primary Data

For an effective analysis of the primary data related to the study area, the secondary data were supplemented in suitable places in the study. The primary data were collected with the help of an interview schedule. Before preparing an interview schedule, the researcher had gone for a pilot study. Then based on the pilot study, a rough interview scheduled was prepared for TNSTC bus passengers. Before undertaking a survey, a pre-test was conducted. In the light of the pre-test, the interview schedule was modified and restructured
1.11.2 Secondary Data

The secondary data for the present study have been collected from the various sources like books, journals, newspapers, magazines, and websites and so on. The secondary data are mainly related to theoretical aspects such as origin and growth of road transport, nationalization of road transport and so on.

1.12 SAMPLING DESIGN

The satisfaction of passengers in Tirunelveli District towards the services provided by the TNSTC buses has been studied. Utmost care was taken in the selection of the passengers in Tirunelveli District.

1.12.1 Determination of Sample Size

For the selection of 601 passengers, Stratified Random Sampling Technique has been adopted as the population comprises of 30,77,233 passengers. The stratified random sampling was followed to distribute the determined sample size from among the population. Sample size calculator, from surveymonkey.com is used to determine the sample size. Instead of using the calculator, the following formula also is used to determine the sample size but the researcher has used the calculator for convenient and accurate results.

\[
\text{Sample Size} = \frac{Z^2 \cdot p(1 - p)}{e^2} \cdot \frac{1}{1 + \left(\frac{Z^2 \cdot p(1 - p)}{e^2} \cdot N\right)}
\]

According to the sample size calculator, 601 passengers represent the total population of 30,77,233 passengers at 95 per cent confidence levels. The basis for the selection of passengers is shown in Table 1.1.
### TABLE 1.1
Taluk-wise Sample Selection of Passengers in Tirunelveli District

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Name of the Taluk</th>
<th>Total Population of each Taluk</th>
<th>Sample Size of the Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tirunelveli</td>
<td>6,42,835</td>
<td>125</td>
</tr>
<tr>
<td>2</td>
<td>Ambasamudram</td>
<td>4,28,031</td>
<td>84</td>
</tr>
<tr>
<td>3</td>
<td>Tenkasi</td>
<td>3,99,946</td>
<td>78</td>
</tr>
<tr>
<td>4</td>
<td>Sankarankoil</td>
<td>3,50,144</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>Radhapuram</td>
<td>3,04,652</td>
<td>59</td>
</tr>
<tr>
<td>6</td>
<td>Nanguneri</td>
<td>2,25,602</td>
<td>44</td>
</tr>
<tr>
<td>7</td>
<td>Sivagiri</td>
<td>1,94,156</td>
<td>38</td>
</tr>
<tr>
<td>8</td>
<td>Alangulam</td>
<td>1,76,138</td>
<td>35</td>
</tr>
<tr>
<td>9</td>
<td>Shenkottai</td>
<td>1,41,416</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>Veerakeralamputhur</td>
<td>1,23,137</td>
<td>24</td>
</tr>
<tr>
<td>11</td>
<td>Palayamkottai</td>
<td>91,176</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>30,77,233</strong></td>
<td><strong>601</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data.

https://www.surveymonkey.com/mp/sample-size-calculator/

Taluk-wise Population = \( \frac{Selected \ Samples}{Total \ Population} \times Taluk \ Population \)

**Example**

\[
Tirunelveli = \frac{601}{3077233} \times 642835 = 15
\]

Table 1.1 indicates the selection of the passengers, 601 passengers were selected in all eleven taluks of Tirunelveli District using Stratified Random Sampling Technique. Data were collected only from the passengers of TNSTC buses. For analyzing the satisfaction of the passengers, 601 persons were selected by using Stratified Random Sampling Technique.
1.13 DATA PROCESSING

After collecting the primary data, the interview schedules thus filled up were thoroughly checked to ensure accuracy, consistency and completeness. The whole interview schedule was processed for coding the data in a computer. Then, cross tables were prepared by using SPSS package. Moreover, after consulting the research experts, appropriate tools were framed to get good results.

1.14 TOOLS FOR ANALYSIS

The researcher collected data through an interview schedule and the collected data were codified, classified and then tabulated with the help of a computer. Statistical tools such as simple Percentage, Garret Ranking, Cronbach’s Alpha Test, Chi-square Test, Kaiser –Meyer-Olkin (KMO) and Bartlett’s Test, Factor Analysis, Kendall Co-efficient of Concordance, ‘t’ Test, K.S. Test, Mean Score and Sign Test with the help of SPSS were used for analyzing the collected data.

1.14.1 Percentage Analysis

Percentage Analysis has been used in this study to know the opinion of passengers about the passengers’ satisfaction towards the services provided by the TNSTC buses in Tirunelveli District.

1.14.2 Garret Ranking Technique

In order to analyse the ranking data, Garret Ranking technique has been used. The order of merit assigned by the respondents has been converted into scores by using the following formula:

\[
\text{Per cent Position} = \frac{100 \times (Rij - 0.5)}{Nj}
\]
Rij = Rank given for the $i^{th}$ variable by the $j^{th}$ respondent

Nj = Number of variables ranked by the $j^{th}$ respondents

The Percent position and the Garret value were calculated on the basis of the formula. After the Garret table value, the scores of each rank were multiplied to record the scores. Then by adding the total of each row, Garret score was obtained. Based on the Total score, the average score was calculated. Based on the Average score Ranks were given in descending order.

1.14.3 Chi-square Test

Chi-square is a statistical test commonly used to compare the observed data with the data we would expect to obtain according to a specific hypothesis. A chi-square is symbolically represented as $\chi^2$ and for the use of a chi-square test, the data is required in the form of frequencies. Chi-square test is one of the simplest and most widely used non-parametric tests in statistical analysis. The symbol of the Greek letter Chi is $\chi^2$. The $\chi^2$ test was first used by Karl Pearson in the year 1900. The quantity $\chi^2$ describes the magnitude of the discrepancy between theory and observation. The data in chi-square tests is often in terms of count or frequencies. The actual survey data may be on a nominal or higher scale of measurement. If it is on a higher scale of measurement, it can always be converted into categories.

Therefore, a chi-square test becomes a much powerful tool for analysis. The researcher has to decide what statistical test is implied by the chi-square statistic in a particular situation. The chi-square test value is computed through the formula:

$$\text{Chi-square Test } (\chi^2) = \sum \frac{(O - E)^2}{E}$$

Degree of Freedom = (r-1) (c-1)
\[ E = \frac{\text{Row Total } \times \text{Column Total}}{\text{Grand Total}} \]

\[ O = \text{Observed Frequency} \]

\[ E = \text{Expected Frequency} \]

\[ df = \text{degrees of freedom} \]

\[ r = \text{Number of rows in a contingency table} \]

\[ c = \text{Number of columns in a contingency table} \]

The calculated value of chi-square is measured with the table value of chi-square for given level of significance usually at 5 per cent level. If the calculated value (C.V.) is less than the table value (T.V.), the null hypothesis is accepted, otherwise it is rejected.

For testing the relationship between the socio-economic variables of the passengers and the level of satisfaction towards the various facilities available in a TNSTC buses, Chi-square test has been applied by using SPSS.

**1.14.4 Cramer’s V Statistic Analysis**

For the purpose of this study the null hypothesis of no relationship between socio-economic variables and the level of satisfaction is rejected. To determine the strength of relationship between the two variables, the Cramer V static is computed when the number of rows is not equal to number of columns. The formula for Cramer’s V static is given below

\[ V = \sqrt{\frac{X^2}{n(f-1)}} \]
Now at the same time, the null hypothesis of no relationship between the monthly income and the level of satisfaction is rejected. To determine the strength of the relationship between size of the family status of the respondents and their level of satisfaction, the strength of the relationship computed through Cramer’s V statistic analysis is used when the hypothesis should be rejected.

1.14.5 Kaiser – Meyer – Olkin (KMO) and Bartlett’s Test

The Kaiser – Meyer – Olkin (KMO) measures of sampling adequacy is an index used to examine the appropriateness of factor analysis. The value between 0.5 and 1.0 indicates that the factor analysis is appropriate. If the KMO values lie between 0.70 to 0.80, then it is meritorious for factoring

Bartlett’s sphericity is a test statistic used to examine the shape of a normal distribution and also to verify the smoothness of the curve. It portrays two tests and they are Kaiser – Meyer – Olkin measures of sampling adequacy and Bartlett’s test of sphericity. They give the statistic of KMO Bartlett’s sampling adequacy and chi-square analysis of association, degrees of freedom and probability.

1.14.6 Factor Analysis

Factor analysis aims at grouping the original input variables into factors which underline the input variables. Each factor will account for one or more input variables. Theoretically, the total number of factors in the factor analysis is equal to the total number of input variables. But after performing factor analysis, the total number of factors in the study can be reduced by dropping the significant factors based on certain criterion.

There are several methods available for factor analysis. But the principal factor method with orthogonal varimax rotation is mostly used and widely available in
factor analytics computer program. One of the final outcomes of a factor analysis is called rotated factor matrix, a table of co-efficient that expresses the relation between the variables and the factors that have been prepared. The sum of squares of the factor loading of a variable is called communalities ($h^2$)

The communalities of a factor are its common factor variance. The factors where factor loading is 0.50 or greater, they are considered as significant factors. This limit is chosen because it had been judged that factors with less than 50 per cent common variations with the rotated factors pattern are too weak to report.

In the present study, the principal factor analysis method with orthogonal varimax rotation is used to identify the significance of different variables and the opinions of the passengers about the behaviour of drivers and conductors.

Mathematically factor analysis is somewhat similar to multiple regression analysis. In factor analysis, each variable is expressed as a linear combination of the underlying factors. The amount of variance, a variable shares with all the other variables included in the analysis is referred to as communality. The co-variation among the variables is described in terms of a small number of common factors plus a unique factor for each variable. These factors are not observed. If the variables are standardized, the factor model may be represented as

$$X_i = A_{ij}F_1 + A_{i2}F_2 + A_{i3}F_3 + \ldots + A_{im}F_m + V_iU_i$$

Where

$$X_i = A_{ij}F_1 + A_{i2}F_2 + A_{i3}F_3 + \ldots + A_{im}F_m + V_iU_i$$

Where

$$X_i = i^{th} \text{ standardised variable}$$
\[ A_{ij} = \text{standardised multiple regression coefficient of variable } i \text{ on common factor } j \]

\[ F = \text{common factor} \]

\[ V_i = \text{standardised regression coefficient of variable } I \text{ on unique factor } i \]

\[ U_i = \text{the unique factor for variable } i \]

\[ M = \text{number of common factors} \]

The unique factors are uncorrelated with each other and with the common factors. The common factors themselves can be expressed as a linear combination of the observed variables.

\[ F_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \ldots + W_{ik}X_k \]

Where

\[ F_i = \text{estimate of } i^{\text{th}} \text{ factor} \]

\[ W_i = \text{weight or factor score coefficient} \]

\[ K = \text{number of variables} \]

It is possible to select weights or factor score coefficient so that the first factor explains the largest portion of the total variance. Then a second set of weight can be selected, so that the second factor accounts for most of the residual variance, subject to being uncorrelated with the first factor. This same principle could be applied for selecting the additional weights for the additional factors. Thus, the factors can be estimated so that their factor scores, unlike the value of the original variables, are not
correlated. Furthermore, the first factor accounts for the highest variance in the data, the second factor the second highest and so on.

1.14.7 “T” Test

To find out the quality of services provided by the public transport services, it should be compared with those by the private sector. To find out the opinion about the 20 statements prepared which are associated with the elements to determine the quality of service by acquiring five point scale, ‘t’ test is used.

For testing the null hypothesis, the “T” – value is calculated the formula is:

\[
T = \frac{\bar{x}_1 - \bar{x}_2}{sp \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}
\]

\[
sp^2 = \frac{\sum n_1 (x_{1i} - \bar{x}_1)^2 + \sum n_2 (x_{2i} - \bar{x}_2)^2}{n_1 + n_2 - 2}
\]

1.14.8 Kendall’s Co-efficient of Concordance

To find out the opinion and the level of satisfaction about the responsibilities of the TNSTC/Crew, Kendall’s Co-efficient test has been used. It is a non-parametric test. It can be used for assessing the agreement among rates, Kendall’s Co-efficient ranges from 0 (no agreement) to 1 (complete the agreement)

Kendall’s Co-efficient of Concordance Test can be used to measure the ranking which is in the top position. It can be applied where there are more than two rankings to be measured. The ranks are given to statements based on the total scores. Hence, the test has
been applied to know the opinion about the responsibilities of the TNSTC Crew members can be measured by using SPSS packages.

The formula used is

\[ \frac{S}{W=\frac{1}{2}K^2(N^3-N)} \]

Where

\[ S = \Sigma(Rj - Rj)^2 \]

\[ Rj = \text{Sum of ranks} \]

\[ Rj = \text{Average of Rank} \]

\[ K = \text{Number of sets of ranking} \]

\[ N = \text{Number of objects ranked} \]

To see whether the value of \( K \) is significant, table value of \( S \) is referred. If the calculated value of \( S \) is less than the table value, the null hypothesis is accepted.

1.14.9 K.S. Test

For the purpose of finding out whether there is any difference in the importance of ratings given by the borrowers on various statements, the hypotheses have been formulated. The hypotheses have been tested by the researcher with the help of Kolmogorow-Smirnov Test (here after known as KS – Test).

Formula \( D = O - E \)

\( D \) – refers to calculated value

\( O \) – refers to cumulative observed proportion and

\( E \) – refers to cumulative expected proportion.
‘O’ is calculated on the basis of observed frequency that is the actual importance ratings given by the respondents.

To assess the passenger’s opinion about the punctuality and regularity of the TNSTC bus services in Tirunelveli District, hypotheses are framed and Tested by applying ‘KS’ Test.

The Cumulative observed proportion is calculated on the basis of observed frequency that is, observed number. The total number of passengers is 601. In the case of first statement, the observed properties are calculated by dividing 60 by total number of passengers. The resultant value (0.60) helps to grade the observed properties. For all gradations, the same method of calculation is followed. On the basis of observed proportion, the cumulative observed proportion is calculated.

Cumulative expected proportion is calculated on the basis of expected proportion. Since there are five gradations, each gradation (that is, 0.20) is assigned an expected proportion. On the basis of the expected proportion, the cumulative expected proportion is calculated.

For each gradation, the difference between cumulative observed proportion and cumulative expected proportion is calculated. The largest difference is taken as the calculated value. The calculated value is compared with the table value.

If the calculated value is greater than the table value, the null hypothesis is rejected. On the other hand, if the calculated value is less than the table value, the null hypothesis is accepted.
1.14.10 Sign Test

Sign test is one of the easiest parametric tests. Its name comes from the fact that it is based on the direction of the ‘plus’ or ‘minus’ sign of the observations in a sample and not on their numerical magnitudes. The one sample sign test is verified using a simple non-parametric test applicable when used as a sample as continuous symmetrical population in which there is the probability of getting a sample value less than the mean is ½ and the probability of getting a sample value greater than the mean is also ½.

To test the null hypothesis $H_0$ against an appropriate alternative on the basis of a random sample of size “n”, we replace the value of each and every item of the sample with a plus (+) sign if it is greater than $H_0$, and with a minus (-) sign if it is less than $H_0$.

But if the value happens to be equal to $H_0$, then we simply discard it. After doing this, the researcher tests the null hypothesis that these ‘+’ and ‘−’ signs are values of a random variable, having a binominal distribution with $P = ½$.

Using this procedure, the responses of all the samples are recorded in terms of ‘+’ sign. The responses of ‘No’ opinion is ignored while applying the Sign Test. The purpose of this study is to determine whether the ‘Yes’, ‘No’ and ‘No Opinion’ responses of workers for each statement are equal or not.

This test can be applied to the small sample case (n<20) and for the large sample case (n>20). Hence, ‘n’ refers to number of respondents who responded to all eight statements as ‘Yes’ and ‘No’. Due to a large sample, for all eight statements framed for this study, the number of ‘Yes’ and ‘No’ responses of sample customer is greater than 20. The following formula is used to test the level of significance.
For that purpose, the null hypothesis that there is no significant difference between the overall mean and the individual mean of the statements with regard to facilities provided to the customers of TNSTC buses in Tirunelveli Division has been framed.

1.15 HYPOTHESES OF THE STUDY

- There is no significant relationship between the gender, age, martial status, educational status, occupational status, monthly income and size of family of the respondents and the level of satisfaction towards the various facilities available in TNSTC Buses.

- There is no significant difference in the opinion of passengers with regard to the punctuality and regularity of the TNSTC bus services.

- There is no significant differences in the opinion of the respondents regarding the facilities provided to passengers by the TNSTC buses in Tirunelveli District.

- There is no low level of similarity among the opinions about the responsibilities of the TNSTC/Crew in Tirunelveli District.

- There is no significant differences between the opinion of the TNSTC and private sector transport about the quality of services provided to their passengers in Tirunelveli District.
1.16 OPERATIONAL DEFINITIONS OF CONCEPTS

1.16.1 Transportation

It is a system or means of transporting people or goods, transportation on the site includes a monaural. The action of transporting some one or something is the process of being transported.

1.16.2 Transport

Transport means take or carry people or goods from one place to another place by means of bus, car, lorry and the like.

1.16.3 Passenger

A person who travels in a TNSTC bus, excluding the crew members of the transportation vehicle.

1.16.4 Services

The term ‘service’ has been used in this study in a limited sense meaning plying of TNSTC bus services within the unserved rural and urban areas.

1.16.5 Driver

Driver is the person who acts as a steersman of the motor vehicle.

1.16.6 Conductor

The Conductor, in relation to a stage carriage, means a person engaged in collecting fares from passengers, regulating their entrance into, or exit from, the stage carriage and performing such other functions as may be prescribed.

1.16.7 Fares

Fares includes sums payable for a season ticket or in respect of the hire of a contract carriage.
1.16.8 Motor Vehicle

Motor Vehicle or vehicle means any mechanically propelled vehicle adapted for use upon roads whether the power of propulsion is transmitted thereto from an external or internal source and includes a chassis to which a body has not been attached and a trailer.

1.16.9 Break Down

A breakdown is defined as stoppage of vehicle on road due to mechanical defects or other failures rendering the vehicle immobile or unfit for continuation of revenue earning trip.

1.16.10 Attitude

Attitude may be defined as the person’s feeling towards TNSTC bus service.

1.16.11 Ticket

Ticket refers to a piece of paper or card giving the holder a right to travel in a TNSTC buses.

1.16.12 Organized Labor Force

It refers to labor employed on a regular basis in the organized sectors of the economy. These cover all establishments under the public sector and all non-agricultural establishments in the private sector employing 25 workers and more

1.17 LIMITATIONS OF THE STUDY

This study is also subject to the following limitations:

1. This study is undertaken in Tirunelveli District only. Hence the findings of this study may not be directly applied or generalised as a whole.

2. This study does not cover the financial aspects and administrative aspects and also does not discuss the bus services rendered by the Government of Tamilndu
3. The factors influencing the utilisation of TNSTC bus services may change from time to time.

4. This study does not include the job satisfaction of drivers and conductors.

5. The significant study is to explore many factors connected with this public and private transport system. As transport is a social utility, a study of this nature, would lead to better TNSTC bus services in Tirunelveli District.

6. This research has explained collection of data only from the passengers who are able to understand and give their answers for the questions asked for this research work.

7. Therefore the inferences made may not be fully applicable to other districts of Tamilndu.

1.18 SCHEME OF THE REPORT

The present study titled, “A Study on Satisfaction of Passengers of Tamilnadu State Transport Corporation -Tirunelveli District” contains seven chapters as given below:


The second chapter deals with Review of Literature. It discusses the views of the different authors related to such studies already undertaken.
The third chapter portrays the Origin, Growth of Transport and TNSTC Bus Services and Profile of the Study Area. It includes the origin, growth and development of road transport in India and Tamilnadu, History and growth of TNSTC Transport in Tamilnadu and a profile of the study area.

The fourth chapter analyses the Socio-economic Conditions and Behaviour of Passengers such as gender, marital status, age, educational qualification, occupation, monthly income, size of family of the passengers of TNSTC bus services, regular users of TNSTC bus services, travelling distance of TNSTC customers daily, number of years availing TNSTC bus facility in the town, purpose of using TNSTC buses, other modes of transport, types of vehicles used, reasons for inadequate bus services, time management of TNSTC Bus/Crew, convenient timings of TNSTC buses, convenient time to attend the work and so on.

The fifth chapter deals with the Attitude of Passengers towards the TNSTC Bus Services in Tirunelveli District. It covers all the passengers availing the various facilities in TNSTC buses, opinion of passengers about the behaviour of the drivers and conductors, opinion of the passengers about the quality of services provided in terms of the social responsibilities of the TNSTC/crew, punctuality and regularity of the TNSTC bus services, the safety aspects of the TNSTC buses and opinion of the passengers about the various facilities offered by the TNSTC buses in Tirunelveli District.

The sixth chapter contains the Summary of Findings, Suggestions and Conclusion. It offers suitable suggestions for improving the effectiveness of TNSTC bus services and conclusion.
REFERENCES
