

## **CHAPTER 4**

### **QUALITY OF SERVICE IN OPERATION OF TNSTC (MADURAI) LTD.**

#### **4.1 Introduction**

Quality of service in operation is one of the determinants of managerial effectiveness and efficiency in any organization including TNSTC (Madurai) Ltd.. The commuters' satisfaction is one of the indicators of better quality of service rendered by TNSTC to its passengers. Apart from commuters' satisfaction, Ten other parameters have been used to analyse the Quality of service rendered by TNSTC (Madurai) Ltd.. They are as follows

#### **Parameters used to assess Quality of Service**

1. Commuters' Satisfaction
2. Reliability
3. Regularity
4. Punctuality
5. Safety
6. Occupancy Ratio
7. Fleet Utilisation
8. Vehicle Utilisation
9. Kilometres operated
10. Average number of passengers carried per day
11. Effective k.m.s run

The above mentioned commuter's related factors have been given as positive statements in the interview schedule. The commuter's satisfaction is measured by using a five point scale with scores as given below:

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
Positive statement	5	4	3	2	1

### **Hypothesis**

There is significant difference among the respondents in their age and their opinion on various factors of quality of services.

### **4.2 Profile of the Respondents**

To assess the extent of quality of service rendered by TNSSTC (Madurai) ltd. both primary and secondary data have been used. The primary data has been collected through the opinion of the selected commuters. The convenient random sampling technique has been adopted for obtaining the opinion from 200 sample commuters who are identified at the terminus of Dindigul and Madurai Mattuthavani bus stands. The sample respondents are spread over to different categories.

#### 4.2.1 Age – Wise Classification of Respondents

The commuter respondents who have given their opinion on quality of service rendered by TNSTC (Madurai) ltd. vary on the basis of their age. The age wise classification of respondents is presented in Table 4.1. The commuters below the age of 20 are not covered in this study.

**Table 4.1**  
**Age of the Respondents**

Age	Total	% to total
20-35	93	46.5
>35-60	74	37
Above 60	33	16.5
Total	200	100

The following information has been observed from the Table 4.1. The researcher has got the information from all sorts of people. The only age group from whom the opinion has not been collected are the people who have not attained the age of 20. The respondents are classified under three sections:

- a) Young age commuters - The people whose age is between 20 and 35
- b) Middle age commuters - The people whose age is above 35 to 60
- c) Old age commuters - The people whose age is above 60

The researcher has chosen 200 respondents as sample during the study period. There are 93 respondents who come under young. The highest respondents belong to this age group only. There are only 33 respondents are old and they are the lowest respondents. From the details given in the Table 4.1, it can be noted that 46.5 percentage of people come under young, 37 percentage of people come under middle age. And there are 16.5 percentage of people come under old group.

#### 4.2.2 Occupation of the Respondents

The commuter respondents who have given their opinion on quality of service rendered by TNSTC (Madurai) ltd. vary on the basis of their occupation. All the respondents are grouped into five categories. They are farmer, industrial worker, office-goers, professionalists and other public. The occupation wise classification of the respondents is given in Table 4.2.

**Table 4.2**  
**Occupation of the Respondent**

<b>Occupation</b>	<b>Total</b>	<b>% to Total</b>
Farmer	18	9
Industrial Worker	62	31
Office-goers	50	25
Professionalists	30	15
Other public	40	20
Total	200	100

The following details have been observed from the Table 4.2 which is about the occupation of the respondents. Among the 200 respondents, the highest respondents are industrial workers who are 62 in number. And there only 18 farmers and they are the lowest respondents too. In the analysis of the percentage the table clearly shows that there are nine percentage of farmers and the industrial workers occupy 31 percentage and there are 25 percentage of office – goers. The respondents with 15 per cent are the professionalists and the rest of 20 percentage cover the other public in the society.

#### **4.2.3 Frequency of travel by bus**

The strength and weakness can not be analysed by a single operation in any activity. Like wise the quality of service can also be not measured in a single trip travelled by a commuter. The commuters those who travel frequently by bus can judge the quality of service. Some of the respondents travel by TNSTC bus rarely. Majority of the respondents are traveling by TNSTC bus very often. The frequency of travel in TNSTC bus by the respondents has been classified to indicate the frequency of their travel. The frequency of travel in TNSTC bus by the respondents is given in a table 4.3

**Table 4.3**  
**Frequency of Travel by Bus**

<b>Frequency</b>	<b>No. of respondents</b>	<b>% to Total</b>
Daily	75	37.5
Weekly	65	32.5
Fort nightly	38	19
Monthly once	14	7
Yearly once	8	4
Total	200	100

The following details have been observed from the Table 4.3 which is about the frequency of travel by bus. Among the 200 respondents, eight people undergo their bus travel yearly once. And the large number of people (75) travels by bus daily. From the details given in the Table 4.3 it is evident that 37.5 percentage of the respondents under go bus traveling daily and 32.5 percentage of the people travel by bus weekly once. And there are 38 people who undergo bus traveling at fortnight intervals. And the people who undergo monthly travel and yearly travel are 14 and eight respectively.

### 4.3 Commuters' Satisfaction

Commuters satisfaction is the satisfaction of the passengers towards various facilities and schemes which are prevailing in TNSTC buses such as cleanliness and neatness, comfortable seating facility, passenger amenities, season ticket facility, E-ticket booking facility, Electric ticket vending machine, friendliness of the drivers and the conductors , repaying the balance money to the passengers, stop the buses in the specified bus stops, ticket fare, extra fares in LSS, express and point to point services and information centers.

The commuter satisfaction has been analysed on the basis of the above said factors in the following pages.

#### 4.3.1 Cleanliness and Neatness

The commuters expect cleanliness and neatness in the bus while traveling in a particular bus. They expect that the bus should be well maintained well and should be always free from dust and dirty. Table 4.4 shows the opinion of the respondents about cleanliness and neatness in TNSTC buses.

**TABLE 4.4**

#### **Opinion about Cleanliness and Neatness**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	45	13	35	93
Middle Age	42	17	15	74
Old Age	20	8	5	33
<b>Total</b>	107 (53.5%)	38 (19%)	55 (27.5%)	200 (100%)

Chi-square value = 9.95

Table value at 1% level =13.3

The following details have been observed from the Table 4.4 which shows the commuters' opinion about cleanliness and neatness in TNSTC buses. From the details given in the table it is evident that 53.5 percentage of the respondents agree and 27.5 percentage of the respondents disagree and 19 percentage of the respondents remain neutral in their opinion about cleanliness and neatness in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards cleanliness and neatness in TNSTC (Madurai) Ltd. buses.

#### 4.3.2 Opinion about Seating Facility

The comfortability in seating arrangements in most of the private buses is comparatively good while comparing the seating facility in TNSTC buses. The commuters normally expect good seating facility in TNSTC buses. The better seating facility is not provided in all TNSTC buses. Table 4.5 shows the opinion of the respondents regarding comfortability in seating facility.

**TABLE 4.5**

#### **Opinion about Comfortable Seating Facility**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	32	23	38	93
Middle Age	45	13	16	74
Old Age	21	6 (	6	33
Total	98 (49%)	42 (21%)	60 (30%)	200 (100%)

Chi-square value = 15.67

Table value at 1% level = 13.3



The following details have been observed from the Table 4.5 which shows the commuters' opinion about comfortable seating facility in TNSTC buses. From the details given in the table, it is clear that 49 percentage of the respondents agree and 30 percentage of respondents disagree and 21 percentage of the respondents remain neutral in their opinion about the comfortable seating facility in TNSTC buses. The hypothesis is accepted, since the calculated value is more than the table value. Therefore, there is significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards seating facility in TNSTC (Madurai) Ltd. buses. It may be due to the high expectations of the youngsters. But, the old people are fully satisfied with the existing seating facility in TNSTC buses.

#### **4.3.3 Amenities & Facilities**

The commuters expect various amenities and facilities in TNSTC buses during their travel. The facilities such as video and audio systems are available in all the private buses. But, these facilities are available only in few TNSTC buses. In order to ensure better quality service these facilities are made available in all TNSTC buses. Table 4.6 shows the opinion of the respondents regarding availability of amenities and facilities.

**TABLE 4.6**  
**Opinion about Passenger Amenities**

Age	Agree	Neutral	Disagree	Total
Young	32	35	26	93
Middle Age	36	24	14	74
Old Age	19	9	5	33
Total	87 (43.5%)	68 (34%)	45 (22.5%)	200 (100%)

Chi-square value = 7.02

Table value at 1% level = 13.3

The following details have been observed from the Table 4.6 which shows the commuters' opinion about passenger amenities in TNSTC buses. From the details given in the table, it is evident that 43.5 percentage of the respondents agree and 22.5 percentage of the respondents disagree and 34 percentage of the respondents remain neutral in their opinion about passenger amenities in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards passenger amenities in TNSTC (Madurai) Ltd. buses.

#### 4.3.4 Season ticket facility

The season ticket is made available in TNSTC buses especially for those who have undergone frequent travel. This facility is not available in private buses. Therefore the commuters, who travel regularly in a particular route, prefer only TNSTC bus for availing this facility. Table 4.7 shows the opinion of the respondents regarding season ticket facility.

**TABLE 4.7**  
**Opinion about Season Ticket Facility**

Age	Agree	Neutral	Disagree	Total
Young	67	21	5	93
Middle Age	41	15	18	74
Old Age	15	6	12	33
Total	123 (61.5%)	42 (21%)	35 (17.5%)	200 (100%)

Chi-square value = 20.25

Table value at 1% level = 13.3

The following details have been observed from the Table 4.7 which shows the commuter's opinion about season ticket facility in TNSTC buses. From the details given in the table, it is evident that 61.5 percentage of the respondents agree and 17.5 percentage of the respondents disagree and 21 percentage of the respondents remain neutral in their opinion about season ticket facility in TNSTC buses. The hypothesis is accepted, since the calculated value is more than the table value. Therefore, there is significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards season ticket facility in

TNSTC (Madurai) Ltd. buses. It may be due to the ignorance of the old about the season ticket facility in TNSTC buses.

#### 4.3.5 E – Ticket booking

The e-Ticket booking facility is also available in all the long route TNSTC buses like private buses. This facility is very attractive and very easy to avail in many private buses. Most of the commuters are not aware of the availability of such facility in TNSTC buses due to inadequate publicity. Table 4.8 shows the opinion of the respondents regarding e-ticket booking facilities.

**TABLE 4.8**

**Opinion About E-ticket Booking Facility**

Age	Agree	Neutral	Disagree	Total
Young	25	53	15	93
Middle Age	18	48	8	74
Old Age	5	15	13	33
Total	48 (24%)	116 (58%)	36 (18%)	200 (100%)

Chi-square value = 13.61

Table value at 1% level = 13.3

The following details have been observed from the Table 4.8 which shows the commuters' opinion about e-ticket booking facility in TNSTC buses. From the details given in the table, it is evident that 24 percentage of the respondents agree and 18 percentage of the respondents disagree and 58 percentage of the respondents remain neutral in their opinion about e-ticket booking facility in TNSTC buses. The

hypothesis is accepted, since the calculated value is more than the table value. Therefore, there is significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards e-ticket facility in TNSTC (Madurai) Ltd. buses.

#### 4.3.6 Electronic ticket vending machine

Now a day, in all the buses, electronic vending machine is used for issuing the tickets to the passengers. This system is highly helpful to prevent the passengers from traveling without tickets during their journey and further more no passengers are disturbed unnecessarily for the cause of verifying the tickets. Moreover, this equipment is very useful for the conductors to save their time in issuing tickets to the passengers and the conductors have plenty of time to help the drivers to run the vehicle safely. Table 4.9 shows the opinion of the respondents regarding the implementation of electronic ticket vending machine in TNSTC buses.

**TABLE 4.9**

#### **Opinion about Electric Ticket Vending Machine**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	66	11	16	93
Middle Age	58	9	7	74
Old Age	19	5	9	33
Total	143 (71.5%)	25 (12.5%)	32 (16%)	200 (100%)

Chi-square value = 6.30

Table value at 1% level =13.3

The following details have been observed from the Table 4.9 which shows the commuters' opinion about the implementation of electronic ticket vending machine in TNSTC buses. From the details given in the table it is evident that 71.5 percentage of the respondents agree and 16 percentage of the respondents disagree and 12.5 percentage of the respondents remain neutral in their opinion about the usage of electronic ticket vending machine in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards implementation of electronic ticket vending machine in TNSTC (Madurai) Ltd. buses.

#### **4.3.7 Friendliness of the Drivers and Conductors**

Most of the Commuters have bitter experience with the drivers and conductors due to their unfriendliness. The commuters expect some sort of kindness and friendly attitude from both the drivers and conductors during their traveling time. In some cases, the passengers also irritate the drivers and the conductors which in turn spoil their friendliness with the passengers. Table 4.10 shows the opinion of the respondents regarding friendliness of drivers and conductors with commuters.

**TABLE 4.10****Opinion about the Friendliness of the Drivers and the Conductors**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	58	13	22	93
Middle age	46	10	18	74
Old	13	12	8	33
<b>Total</b>	<b>117 (58.5%)</b>	<b>35 (17.5%)</b>	<b>48 (24%)</b>	<b>200 (100%)</b>

Chi-square value = 10.52

Table value at 1% level = 13.3

The following details have been observed from the Table 4.10 which shows the commuters' opinion about the friendliness of the drivers and the conductors with the passengers. From the details given in the table, it is evident that 58.5 percentage of the respondents agree and 24 percentage of the respondents disagree and 17.5 percentage of the respondents remain neutral in their opinion about the friendliness of the drivers and conductors in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the friendliness of the drivers and the conductors with the passengers in TNSTC (Madurai) Ltd. buses.

### 4.3.8 Repayment of the Balance Money to the Passengers

Many times the controversy arises between the conductors and the passengers when the passengers do not give the exact change for the ticket fare. Some times the conductors do not promptly settle the balance amount after deducting the ticket fare to the passengers. Many passengers face this problem only in TNSTC buses and not in the private buses. Both the conductors and the passengers are expected to act rightly and they have to co-operate with each other in this regard. In every TNSTC bus, the passengers are requested to give the correct ticket fare and this is insisted by fixing the board in the bus itself. Table 4.11 shows the opinion of the respondents regarding the repayment of the balance money to the passengers.

**TABLE 4.11**

#### **Opinion About Repayment of the Balance Money to the Passengers**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	58	22	13	93
Middle Age	52	15	7	74
Old Age	22	5	6	33
<b>Total</b>	132 (66%)	42 (21%)	26 (13%)	200 (100%)

Chi-square value = 2.73

Table value at 1% level = 13.3

The following details have been observed from the Table 4.11 which shows the commuters' opinion about the repayment of the balance money to the passengers. From the details given in the table, it is evident that 66 per centage of the people



agree and 13 per centage of the people disagree and 21 per centage of the respondents remain neutral in their opinion about the repayment of the balance money to the passengers in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the repayment of the balance money to the passengers in TNSTC (Madurai) Ltd. buses.

#### **4.3.9 Stopping the Buses at the Specified Bus Stops**

Normally the buses have to be stopped at the specified bus stands for loading and unloading of the passengers. Certain LSS buses not be stopped in all the specified stops but those buses are to be stopped in limited stops only. Certain non stop point to point buses and express buses are not supposed to be stopped in all the bus stops. Sometimes the ordinary buses are not stopped in their specified bus stops in spite of the request made by the passengers. Some times, the non stop buses are stopped in some places for unloading and loading that irritates the passengers who are inside the bus. The traffic staffs are expected to run the buses as per the rules, because the different types of ticket fares are collected for express service, non stop service, point to point service and ordinary service. Table 4.12 shows the opinion of the respondents regarding stopping of the buses at the specified bus stops.

**TABLE 4.12****Opinion about Stopping the Buses at the Specified Bus Stops**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	56	19	18	93
Middle Age	49	14	11	74
Old Age	23	5	5	33
<b>Total</b>	128 (64%)	38 (19%)	34 (17%)	200 (100%)

Chi-square value = 1.36

Table value at 1% level =13.3

The following details have been observed from the Table 4.12 which shows the commuters' opinion about stopping the buses at the specified bus stops. From the details given in the table it is evident that 64 percentage of the respondents agree and 17 percentage of the people disagree and 19 percentage of the respondents remain neutral in their opinion about the stopping the buses at the specified bus stops. The hypothesis is rejected. Since the calculated value is less than table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards stopping the buses at the specified bus stops in TNSTC (Madurai) Ltd. buses.

#### 4.3.10 Ticket fare

The fixing of the ticket fare for the passenger buses is regulated by the Government of Tamil Nadu. The private bus operators can not revise their ticket fare unilaterally. The uniform bus fare is fixed by the government of Tamil Nadu to all the passenger buses operated within the state. The ticket fare is not revised from time to time due to increase in diesel prices and increasing in the cost of spares and tyres. Normally ticket fare is revised only when it is unavoidable. Table 4.13 shows the opinion of the respondents regarding ticket fare.

**TABLE 4.13**

#### **Opinion about Ticket Fare**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	56	19	18	93
Middle Age	49	11	14	74
Old Age	13	13	7	33
<b>Total</b>	118 (59%)	43 (21.5%)	39 (19.5%)	200 (100%)

Chi-square value = 9.37

Table value at 1% level =13.3

The following details have been observed from the Table 4.13 which shows the commuters' opinion about the ticket fare. From the details given in the table, it is evident that 59 percentage of the respondents agree and 19.5 percentage of the respondents disagree and 21.5 percentage of the respondents remain neutral in their opinion about the ticket fare in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant

difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the ticket fare in TNSTC (Madurai) Ltd. buses.

#### 4.3.11 Comparison with Fare structure Prevailing in Other States

The fare per Kilometer in Tamilnadu is the lowest in the country. The existing fare structure for mofussil services in Tamilnadu with comparative figures of neighboring states is given below in table 4.14

**TABLE 4.14**

<i>State</i>	<b>Fare Effective from</b>	<b>Mofussil (Ordinary)</b>	<b>Mofussil (Express)</b>	<b>Deluxe</b>	<b>Super Deluxe</b>	<b>Ultra Deluxe</b>
Tamil Nadu	06.12.2001	28	--	32	38	52
Andhra Pradesh	08.02.2006	38	44	49	57	62
Kerala	25.11.2005	48	55	60	70	80
Karnataka	11.06.2006	37.50	48.5	60	67	75

Source: Demand Note.

The fare in Tamilnadu has not been revised since December 2001 in the interest of the travelling public<sup>1</sup>. The following details have been observed from the Table 4.14 which shows the comparison of the fare structure prevailing in four different

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<sup>1</sup> Government of Tamil Nadu, Transport Department, Demand No.48 Policy Note (2006-2007)

states. The states which have been taken into consideration are Tamilnadu, Andhrapradesh, Kerala, and Karnataka. From the details given in the table, it is clear that tamilnadu has got the lowest fare structure among the four states. It should be noted that the fare structure of Tamilnadu has not been revised after 06.12.2001. The fare structure of Tamilnadu in mofussil (ordinary), deluxe, and ultra deluxe is 28, 32, 38 and 52 paise per k.m. respectively. The fare structure of kerala and Karnataka is the highest in all type of service buses. The table clearly reveals the fact that the fare structure of tamilnadu is lower than the other three states in all type of services.

#### 4.3.12 Extra fares

The TNSTC charging different fares for different types of buses operated such as express service, ordinary service, LSS service and Point to Point services. The extra fares are collected from the passengers for special types of operations. Table 4.15 shows the opinion of the respondents regarding extra fares collected for special types of operations.

**TABLE 4.15**

**Opinion about Extra Fares in LSS, Express and PP Services**

Age	Agree	Neutral	Disagree	Total
Young	42	26	25	93
Middle age	32	8	34	74
Old	8	10	15	33
Total	82 (41%)	44 (22%)	74 (37%)	200 (100%)

Chi-square value = 14.30

Table value at 1% level = 13.3

The following details have been observed from the Table 4.15 which shows the commuters' opinion about the extra fares in LSS, Express and point to point services of TNSTC. From the details given in the table, it is evident that 41 percentage of the respondents agree and 37 percentage of the people disagree and 22 percentage of the respondents remain neutral in their opinion about the extra fares in LSS, Express and point to point services of TNSTC buses. The hypothesis is accepted, since the calculated value is more than the table value. Therefore, there is significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the extra fare in LSS, Express and Point to Point services of TNSTC (Madurai) Ltd. buses. This may be due to the fact that old aged people do not like to pay extra fare in LSS, express and point to point services of TNSTC (Madurai) Ltd. buses.

#### **4.2.13 Information centers**

The commuters are in need of several information regarding ticket fare, reservation, schedule of arrival and departure time, running time, special buses if any, connection buses to other destinations and the like. Therefore, in every bus stand there must be an office for providing such information to the passengers. The TNSTC is providing the needed information to the traveling public in all the bus stands. Table 4.16 shows the opinion of the respondents regarding the functioning of information centres.

**TABLE 4.16**  
**Opinion about the Information Centres of TNSTC**

Age	Agree	Neutral	Disagree	Total
Young	55	9	29	93
Middle age	46	10	18	74
Old	11	5	17	33
Total	112 (56%)	24 (12%)	64 (32%)	200 (100%)

Chi-square value = 9.83

Table value at 1% level = 13.3

The following details have been observed from the Table 4.16 which shows the commuters' opinion about the information centers of TNSTC. From the details given in the table, it is evident that 56 percentage of the respondents agree and 32 percentage of the people disagree and 12 percentage of the respondents remain neutral in their opinion about the information centers in TNSTC bus stands. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the information centers of TNSTC (Madurai) Ltd.

#### **4.3.14 Reliability of Service**

If TNSSTC ensures the Reliability of service in the operation of buses, there will be better quality of service rendered by TNSSTC. The Reliability of service is determined by the number of breakdown in relation to the number of kilometres operated in a year. Lesser the number of breakdowns more will be the reliability of the service. The breakdowns may be caused due to both mechanical and non-mechanical defects in the operation. Breakdown rate is defined as the number of breakdowns occurring with respect to 10,000 effective kilometers run excluding dead kilometers. The details of the breakdown occurred by TNSSTC Madurai Ltd. during the study period is given in Table 4.17



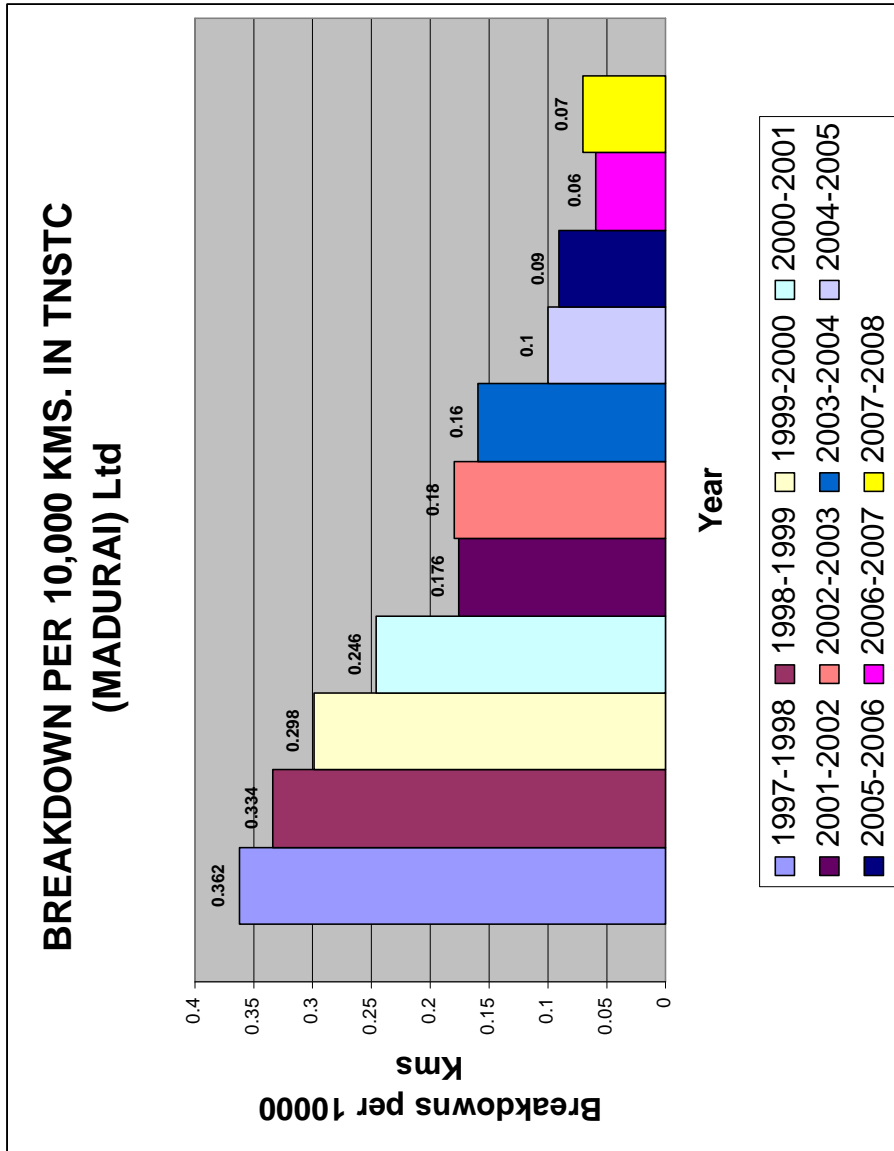
TABLE 4.17

**Breakdown Per 10,000 kms. in TNSTC (Madurai) ltd.**

<b>Year</b>	<b>Number of Break-downs</b>	<b>Break-downs per 10,000 kms (%)</b>	<b>Reliability per 10,000 kms (%)</b>
1997-98	16412	0.362	99.638
98-99	15543	0.334	99.666
99-00	14590	0.298	99.702
00-01	12079	0.246	99.754
01-02	8721	0.176	99.824
02-03	8784	0.18	99.82
03-04	8113	0.16	99.84
04-05	5286	0.1	99.9
05-06	4663	0.09	99.91
06-07	3336	0.06	99.94
07-08	4195	0.07	99.93

Source: Annual reports of TNSTC (Madurai) Ltd.

Figure 4.1



The following details have been observed from the Table 4.17 which reveals the news of breakdown per 10,000 K.m.s in TNSTC (Madurai) Ltd.. At the beginning of the study period there were 16,412 breakdowns in TNSTC (Madurai) Ltd. buses. But, the number of breakdowns has been reduced gradually throughout the study period. At the end of the study period, the number of accidents has been reduced to 4195. It may be due to the regular maintenance of the buses. As the numbers of breakdowns have been reduced there is a gradual decline in the percentage of the breakdown per 10,000 Km. The percentage of breakdowns per 10,000 Km is 0.362 in the year 1997-98. But, it has been decreased to 0.07 percentage in the year 2007-08. As the numbers of breakdowns have been reduced the percentage of reliability per 10,000 Km has been increased gradually throughout the study period. The percentage of reliability per 10,000 Km. is 99.63 in the year 1997-98. But, it has been increased to 99.93 percentage in the year 2007-08. It shows that TNSTC has rendered better quality service to the passenger.

The commuters also have substantiated the better reliability of service through their opinions regarding the rate of breakdown. The breakdowns in TNSTC buses are very rare in their operation. The Survey is conducted relating to this question which gives the following results in Table 4.18

**TABLE 4.18**  
**Breakdown in TNSTC (Madurai) Ltd.**

Age	Agree	Neutral	Disagree	Total
Young	63	9	21	93
Middle Age	55	7	12	74
Old Age	23	5	5	33
Total	141 (70.5%)	21 (10.5%)	38 (19%)	200 (100%)

Chi-square value = 2.26

Table value at 1% level = 13.3

The following details have been observed from the Table 4.18 which shows the commuters' opinion about breakdown in TNSTC (Madurai) Ltd. From the details given in the table it is evident that 70.5 percentage of the respondents agree and 19 percentage of the people disagree and 10.5 percentage of the respondents remain neutral in their opinion about break down in TNSTC (Madurai) Ltd. buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards reliability of service in TNSTC (Madurai) Ltd..

### Avoidance of breakdown

The efficiency of TNSTC not only depending upon the proper traffic management but also depending upon the maintenance management. The proper and regular maintenance of buses by the technical staff will avoid frequent breakdowns of buses in operation. Some time, TNSTC is operating very old buses which are to be condemned but those buses are operated in the worst routes will cause breakdowns and affect the traveling public to large extent. But, private operators are operating only new buses in all the routes. Table 4.19 gives the opinion about regular maintenance.

**TABLE 4.19**

#### Opinion About the Avoidance of Breakdown through Regular Maintenance

Age	Agree	Neutral	Disagree	Total
Young	62	16	15	93
Middle Age	51	11	12	74
Old Age	20	5	8	33
Total	133 (63.5%)	32 (16%)	35 (17.5%)	200 (100%)

Chi-square value = 1.42

Table value at 1% level = 13.3

The following details have been observed from the Table 4.19 which shows the commuters' opinion about avoidance of breakdown through regular maintenance in TNSTC (Madurai) Ltd. From the details given in the table, it is evident that 63.5 percentage of the respondents agree and 17.5 percentage of the people disagree and 16 percentage of the respondents remain neutral in their opinion about avoidance of breakdown through regular maintenance in TNSTC (Madurai) Ltd. buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards avoidance of breakdown through regular maintenance in TNSTC (Madurai) Ltd.

#### **4.3.15 Regularity in Service**

Regularity is determined by measuring the number of trips cancelled out of the total number of scheduled trips to be operated in a year. The TNSTC buses operating its buses regularly.

Normally, the schedule buses are not cancelled by the TNSTC so that the regularity of service can be ensured to the traveling public. For this purpose, TNSTC has got adequate number of spare buses. The cancellation of scheduled trips may arise rarely due to political bandth and employees strike. Table 4.20 shows the opinion of the respondents regarding regularity of service as per schedule without canceling.

**TABLE 4.20****Opinion about Regularity of Buses as Per Schedule without Canceling**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	75	12	6	93
Middle Age	52	16	6	74
Old Age	17	11	5	33
<b>Total</b>	<b>144</b> (72%)	<b>39</b> (19.5%)	<b>17</b> (8.5%)	<b>200</b> (100%)

Chi-square value = 10.59

Table value at 1% level =13.3

The following details have been observed from the Table 4.20 which shows the commuters' opinion about the regularity of buses as per schedule without canceling. From the details given in the table, it is evident that 72 percentage of the respondents agree and 8.5 percentage of the people disagree and 19.5 percentage of the respondents remain neutral in their opinion about regularity of buses as pr schedule without canceling. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the regularity of buses as per schedule without canceling in TNSTC (Madurai) Ltd. Table 4.21 shows the opinion of commuters on cancellation of Buses in Extra-ordinary situations.

**TABLE 4.21****Opinion About Cancellation of Buses as Per the Schedule in Extra Ordinary Circumstances**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	71	12	10	93
Middle age	56	10	8	74
Old	21	5	7	33
<b>Total</b>	<b>148 (74%)</b>	<b>27 (13.5%)</b>	<b>25 (12.5%)</b>	<b>200 (100%)</b>

Chi-square value = 3.07

Table value at 1% level =13.3

The following details have been observed from the Table 4.21 which shows the commuters' opinion about the cancellation of buses as per schedule in extra-ordinary circumstances. From the details given in the table, it is evident that 74 percentage of the respondents agree and 12.5 percentage of the people disagree and 13.5 percentage of the respondents remain neutral in their opinion about the cancellation of buses as per schedule in extra – ordinary circumstances. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the cancellation of buses as per schedule in extra – ordinary circumstances in TNSTC (Madurai) Ltd.



#### 4.3.16 Punctuality of Service

Punctuality of service is determined by measuring the number of late departures and late arrivals in bus operations in a year. In every route, the time schedule is given for operating private as well as TNSTC buses. The schedule time should be strictly adhered for the trips operated by all the buses. This is monitored by the special TNSTC employee in the name of time keeper. He will not permit any bus taking departure by late. Therefore, there will be 100 percent punctuality is expected in operation of TNSTC buses. Table 4.22 shows the punctuality of bus operation in TNSTC (Madurai) ltd. during the study period.

**Table 4.22**  
**Punctuality of Bus Operation in TNSTC (Madurai) Ltd.**

<b>Year</b>	<b>Departure (%)</b>	<b>Arrival (%)</b>
1997-98	99.99	100
1998-99	99.99	100
1999-00	99.99	99.98
2000-01	99.98	99.98
2001-02	99.97	99.99
2002-03	99.99	99.98
2003-04	99.99	99.98
2004-05	99.98	99.99
2005-06	99.99	99.99
2006-07	99.98	99.99
2007-08	99.99	99.99

Source: Annual reports of TNSTC (Madurai) Ltd.

The following details have been observed from the Table 4.22 which shows the punctuality of bus operation in TNSTC (Madyrau) Ltd. The table reveals the departing and arriving time of the TNSTC buses as per schedule during the study period. From the details given in the table, it is evident that TNSTC (Madurai) Ltd. has maintained 99.97 of punctuality in operating their buses throughout the study period. The transport corporation has maintained 100 percentage punctuality in its arriving time during 1997-98. The reason for not maintaining 100 percentage punctuality during the remaining years may be the changes in the climatic conditions, unexpected agitations and the like. Table 4.23 shows the opinion of the respondents regarding departure of buses as per the time schedule.

**TABLE 4.23**

**Opinion About Departure of Buses as Per the Time Schedule**

Age	Agree	Neutral	Disagree	Total
Young	63	18	12	93
Middle Age	54	15	5	74
Old Age	19	5	9	33
Total	136 (68%)	38 (19%)	26 (13%)	200 (100%)

Chi-square value = 8.51

Table value at 1% level =13.3

The following details have been observed from the Table 4.23 which shows the commuters' opinion about the departure of TNSTC buses as per time schedule. From the details given in the table, it is evident that 68 percentage of the respondents

agree and 13 percentage of the people disagree and 19 percentage of the respondents remain neutral in their opinion about the departure of TNSTC buses as per time schedule. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the departure of TNSTC buses as per the time schedule in TNSTC (Madurai) Ltd..

**TABLE 4.24**

**Opinion about Arrival of Buses as Per the Time Schedule**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	43	23	27	93
Middle age	42	16	16	74
Old	11	10	12	33
<b>Total</b>	<b>96 (48%)</b>	<b>49 (24%)</b>	<b>55 (28%)</b>	<b>200 (100%)</b>

Chi-square value = 5.38

Table value at 1% level =13.3

The following details have been observed from the Table 4.24 which shows the commuters' opinion about the arrival of TNSTC buses as per the time schedule. From the details given in the table, it is evident that 48 percentage of the respondents agree and 28 percentage of the people disagree and 24 percentage of the respondents remain neutral in their opinion about the arrival of TNSTC buses as per time schedule. The hypothesis is rejected, since the calculated value is less than the table

value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the arrival of TNSTC buses as per time schedule in TNSTC (Madurai) Ltd.

#### **4.3.17 Safety in operation**

General feeling of the commuters is the operation of buses by TNSTC is with high safety than the private operators. In order to attract the speed liking passengers, the private operators are running their buses with very high speed which leads to fatal accidents. The TNSTC is spending the considerable amount for creating awareness regarding “safety travel” to both commuters and traffic staffs. It shows, the TNSTC is taking care of passenger’s safety. The safety in operation has been determined by measuring the number of accidents in relation to the total number of kilometers operated in a year. It is an occurrence in the use of a vehicle on revenue earning trips resulting is injury to or death of a person and for damage to property.

#### **Classification of accidents**

Accidents may be classified under four heads, such as (a) fatal (b) major (c) minor and (d) insignificant, depending on the nature and the extent of damage caused.

The Table 4.25 shows the safety of bus operation in TNSTC during the period under study.

**TABLE 4.25****Accident per 1,00,000 k.m.s. in TNSTC (Madurai) Ltd.**

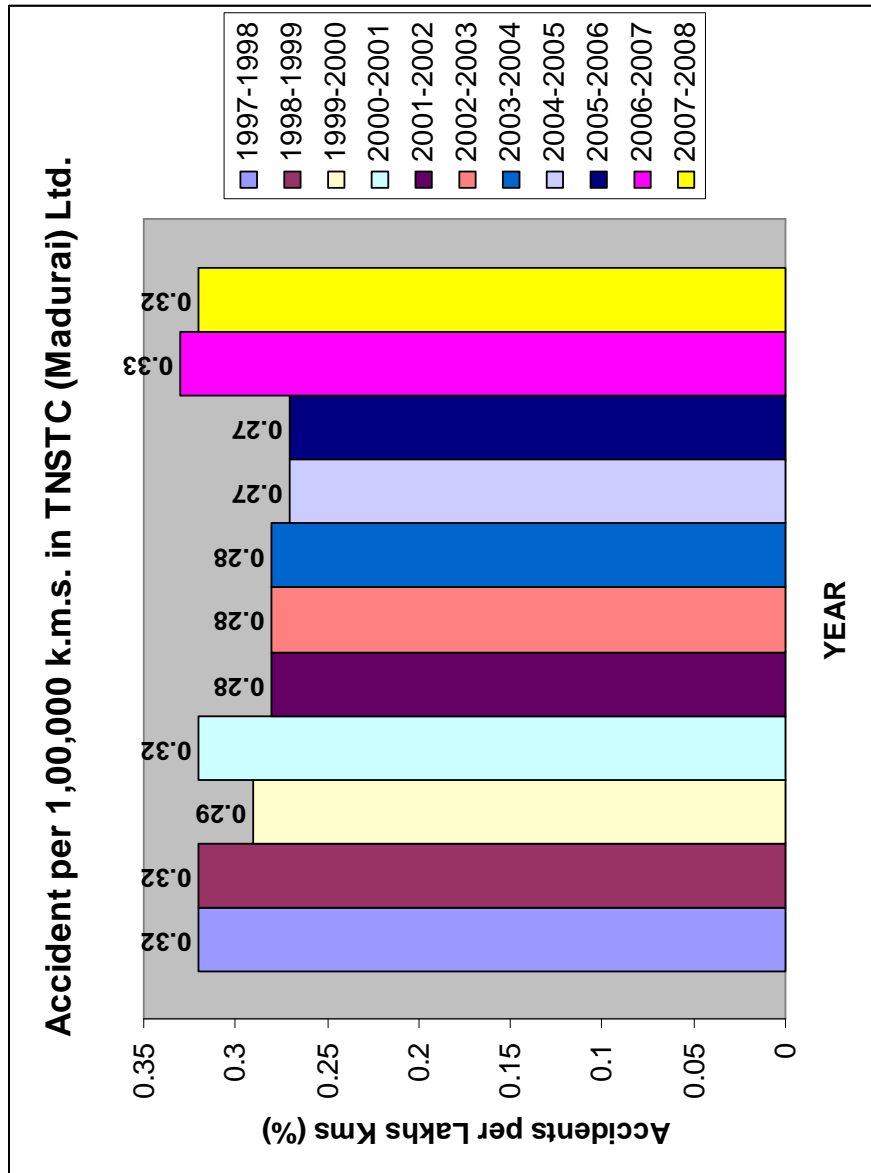
<b>Year</b>	<b>Number of Accidents</b>	<b>Accidents per Lakhs kms (%)</b>	<b>Safety per Lakhs kms (%)</b>
1997-98	1904	0.32	99.68
1998-99	1936	0.32	99.68
1999-00	1486	0.29	99.71
2000-01	1482	0.32	99.68
2001-02	1398	0.28	99.72
2002-03	1437	0.28	99.72
2003-04	1712	0.28	99.72
2004-05	1643	0.27	99.73
2005-06	1555	0.27	99.73
2006-07	1775	0.33	99.67
2007-08	1839	0.32	99.68

Source: Annual Reports of TNSTC (Madurai) Ltd.

The following details have been observed from the Table 4.25 which bears the news of accident rate per 1,00,000 k.m.s in TNSTC (Madurai) Ltd.. There were 1904 accidents happened at the beginning of the study period. But, it has been reduced gradually throughout the study period. It should be noted that the number of accidents have been increased in some of the years whereas there is a gradual decline

in most of the years. For instance, there were 1398 accidents happened in the year 2001-02. But, it has been increased to 1437 in the next year and the number of accidents has been further increased to 1712 in the year 2003-04. It may be due to the growth of population, poor maintenance of the road, the carelessness of the drivers as well as the motorists on the road. And the numbers of accidents have been reduced gradually year by year. There were 1839 accidents in the year 2007-08 whereas there were 1904 accidents in the year 1997-98. The reason for the gradual decline in the accidents may be due to the awareness and the strict implementation of the traffic rules, the careful attitude of the drivers, proper maintenance of the bus as well as the roads. The percentage of accidents per lakh Km. is 0.32 in the year 1997-98. And it has been gradually reduced to 0.29 percentage in the year 1999-2000 and 0.32 percentage at the end of the study period. The percentage safety per lakh k.m.s is 99.68 in the year 1997-98 and it has been increased to 99.73 per cent in the year 2005-06 and it has been decreased to 99.68 percentage at the end of the study period.

Figure 4.2



### Fatal Accident

Fatal accident is one involving loss of human life. Major accident results in grievous hurt to human beings or loss of damages to property the value of which exceeds Rs.1000, while minor accident refers to some simple physical injuries to human beings or loss and or damage caused to the property exceeding Rs.100 but not exceeding Rs.1000. All other accidents that are not included in any of the above mentioned classification can be considered as insignificant ones. Table 4.26 shows the total number of accidents and total number fatal accidents during the study period.

**TABLE 4.26**  
**Fatal Accidents in TNSTC (Madurai) Ltd.**

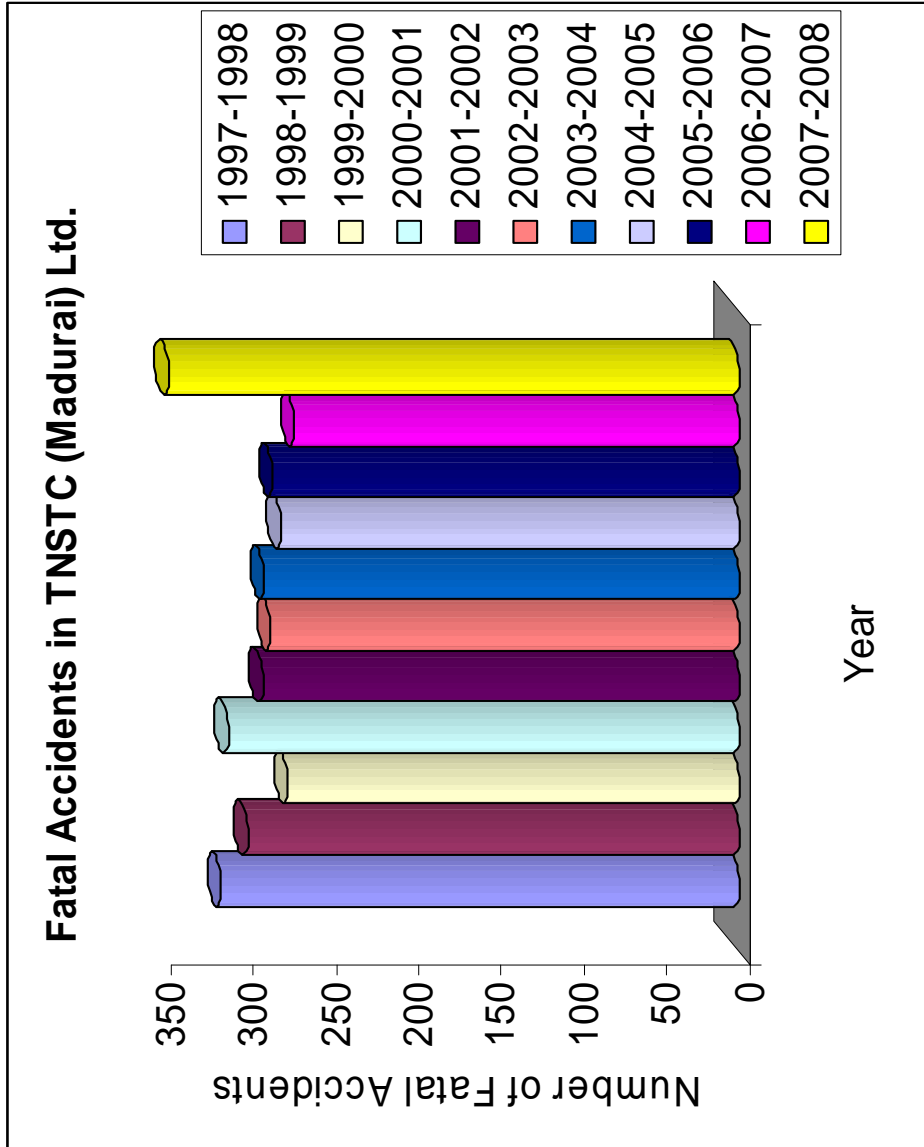
<b>Year</b>	<b>Total number of Accidents</b>	<b>Total number of fatal Accidents</b>	<b>% of Fatal Accidents to total Accidents</b>
1997-98	1904	313	16.43
98-99	1936	297	15.34
99-00	1516	273	18.00
00-01	1482	309	20.85
01-02	1398	288	20.60
02-03	1437	283	19.69
03-04	1712	287	16.76
04-05	1643	277	16.85
05-06	1555	282	18.13
06-07	1775	269	15.15
07-08	1839	345	18.76

Source: Annual Reports of TNSTC (Madurai) Ltd.



The following details have been observed from the Table 4.26 which shows the occurrence of fatal accidents in TNSSTC (Madurai) Ltd. There were 1904 accidents happened in the year 1997-98 and it has been increased to 1936 next year. But, the number of accidents has been reduced to 1516 in the year 1999-2000. And again there is a gradual decline in the total number of accidents for the next few years. At the end of the study period there were 1839 accidents happened whereas there were 1904 accidents at the beginning of the study period. In the analysis of the fatal accidents, it is clear that there were 313 fatal accidents happened in the year 1997-98. And it has been decreased gradually throughout the study period. But at the end of the study period the total number of fatal accidents has been increased. It may be due to the growth of population, poor maintenance of the road, the carelessness of the drivers as well as the motorists on the road. The percentage of fatal accidents to total accidents is 16.43 in the year 1997-98 and it has been decreased to 15.34 percentage next year. But, it has been increased to 18 percentage in the year 1999-2000. And there is a gradual decline in the upcoming years. But, at the end of the academic year, the percentage of fatal accidents to total accidents has been increased to 18.76 percentage. Table 4.27 tells the opinion of the respondents on fatal accidents.

Figure 4.3



**TABLE 4.27****Opinion about Fatal Accidents in TNSTC buses**

<b>Age</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Total</b>
Young	55	19	19	93
Middle Age	35	13	26	74
Old Age	14	10	9	33
<b>Total</b>	104 (52%)	42 (21%)	54 (27%)	200 (100%)

Chi-square value = 6.90

Table value at 1% level =13.3

The following details have been observed from the Table 4.27 which shows the fatal accidents in TNSTC buses. From the details given in the table it is evident that 52 percentage of the respondents agree and 27 percentage of the people disagree and 21 percentage of the respondents remain neutral in their opinion about the fatal accidents in TNSTC buses. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the fatal accidents in TNSTC (Madurai) Ltd. Table 4.28 shows the opinion of the respondents on speed of TNSTC buses.

**TABLE 4.28**  
**Opinion about Speed of TNSTC Buses**

Age	Agree	Neutral	Disagree	Total
Young	45	32	16	93
Middle age	55	14	5	74
Old	22	5	6	33
Total	122 (61%)	51 (25.5%)	27 (13.5%)	200 (100%)

Chi-square value = 14.26

Table value at 1% level = 13.3

The following details have been observed from the Table 4.28 which shows the speed of TNSTC buses. From the details given in the table, it is evident that 61 percentage of the respondents agree and 13.5 percentage of the people disagree and 25.5 percentage of the respondents remain neutral in their opinion about the speed of TNSTC buses. The hypothesis is accepted, since the calculated value is more than the table value. Therefore, there is significant difference among the different categories of respondents such as young, middle age and old in their opinion on satisfaction towards the speed of TNSTC buses in TNSTC (Madurai) Ltd. This significant difference may be due to the reason that the youngsters prefers very high speed than old and middle age respondents , they prefer only normal speed.

#### **4.3.18 Occupancy Ratio**

Occupancy ratio represents the percentage share of passenger kilometers obtained to seat-kilometres offered. This ratio is important, since it throws light on the volume of traffic and indicates the extent of seats provided were occupied. Every seat-kilometre provided but not occupied is a dead loss to the undertaking. One cannot naturally expect all the seat-kilometres offered to be always occupied but a less than 70 per cent occupancy ratio is generally considered as suggesting scope for improvement. If the load factor is low, it would mean that there are number of vacant unoccupied seats and consequent loss of revenues to the undertaking. Alternatively, if the load factor is high and beyond hundred, it can be interpreted as representing a situation of overcrowding which, of course, is financially profitable but in terms of the quality of service, reveals that there is considerable scope for augmentation of buses. Thus, while the occupancy ratio should be higher than 70 and approaching hundred, it is not considered as generally acceptable if it is more than hundred. This ratio is affected by the factors like competition from other operators, unscientific bus scheduling, lack of industrialization of the area where the buses operate, low density of the population, lack of amenities to passengers, nature of service and the like. This ratio is important since it affects the revenue earnings and the profitability of the organization. If the ratio is more than 80 per cent, it would result in frequent overcrowding in the buses. Table 4.29 shows the occupancy ratio of TNSTC (Madurai) ltd. during the study period.

**TABLE 4.29**  
**Occupancy Ratio of TNSC (Madurai) Ltd.**

Year	Occupancy ratio in percentage (including pass kms)
1997-98	72.37
1998-99	74.898
1999-00	78.062
2000-01	77.738
2001-02	74.686
2002-03	71.39
2003-04	70.14
2004-05	75.48
2005-06	75.77
2006-07	80.08
2007-08	81.09

Source: Annual reports of TNSC (Madurai) Ltd.

The following details have been observed from the Table 4.29 which shows the occupancy ratio of TNSC (Madurai) Ltd. At the beginning of the study period the percentage of the occupancy ratio is 72.37 and it has been increased to 74.89 percentage in the year 1998-99 and 78.06 percentage in the year 1999-2000. And there is a gradual decline for the next four years. In spite of the gradual growth and decline in the occupancy ratio of TNSC during the study period, has been greatly increased to 81.09 percentage at the end of the study period.

#### 4.3.19 Fleet Utilization

The fleet utilization gives an idea of the share of the revenue earning vehicles which is calculated by expressing the average number of vehicles being operated as against the average number of vehicles held by the corporation during the specified period. It is indicative of average number of vehicles available for operation by the corporation. If fleet utilization is better, it means that a higher percentage of buses is available, requiring low/no cancellations in services and lower breakdowns and the like. Thus it reflects the efficiency of the maintenance department of the corporation. Table 4.30 shows the fleet utilization made in TNSTC (Madurai) Ltd. during the study period.

**Table 4.30**

**Fleet Utilisation Percentage in TNSTC (Madurai) Ltd.**

<b>Year</b>	<b>Percentage of fleet utilisation</b>
1997-98	92.76
1998-99	92.78
1999-00	91.69
2000-01	92.07
2001-02	91.81
2002-03	93.64
2003-04	94.34
2004-05	94.89
2005-06	94.87
2006-07	95.09
2007-08	95.85

Source: Annual reports of TNSTC (Madurai) Ltd.

The following details have been observed from the Table 4.30 which shows the percentage of fleet utilization in TNSTC (Madurai) Ltd. At the beginning of the study period, the percentage of fleet utilization is 92.76 and it has been increased to some extent in the very next year. And it has been reduced to 91.69 percentage in the year 1999-2000. From the details given in the table, it is evident that there is a gradual growth as well as decline in the percentage of fleet utilization during the period. But, the percentage of fleet utilization has been increased to 95.85 percentage at the end of the study period.

#### **4.3.20 Vehicle Utilisation**

Kilometers covered by a vehicle on road each day is called vehicle utilization and it indicated the extent of use of vehicles made available for operation. It is an indicator of efficiency of the traffic department of the undertaking. While it is important that the maximum number of buses held should be on road, it is equally important that they should be run for the maximum number of kilometres possible every day. Higher vehicle utilization helps in distributing the fixed cost like the cost of personnel, motor vehicle taxes and the like, over a large number of kilometres there by reducing the unit cost of operation and leads to better margin. The improvement in vehicle utilization also strengthens the economy of the undertaking by reducing the need for new vehicles. This is influenced by conditions of the roads on which the fleet is operated, speed of the buses and the length of the routes. Table



4.31 shows the kilometre per bus per day in TNSTC (Madurai) Ltd. during the study period.

**TABLE 4.31**  
**Kilometres Per Bus Per Day in TNSTC (Madurai) Ltd.**

Year	K.M.s
1997-98	394.4
1998-99	400.8
1999-00	400.2
2000-01	408.2
2001-02	413.6
2002-03	427
2003-04	430
2004-05	427
2005-06	428
2006-07	431
2007-08	436

Source: Annual Reports of TNSTC (Madurai) Ltd.

The following details have been observed from the table 4.31 which shows the vehicle utilization especially in Km. per bus per day in TNSTC (Madurai) Ltd. From the details given in the table, it is evident that 394.4 Km. has been covered by a single

TNSTC bus per day at the beginning of the study period. But, the distance covered by the bus in a day has been increased gradually throughout the study period except in the year 2005-06 where there is a decline of 3 Km. per day. At the end of the study period 436 Km. has been covered by a single TNSTC buses per day.

This can be attributed to the prudent policy of maintenance of vehicles by the management and to the efficiency of operational crew as well. The level of vehicle utilization percentage is the direct outcome of better fleet maintenance by TNSTC (Madurai) Ltd. The following factors contribute to good fleet maintenance.

- Low breakdown and accident rates because of good maintenance and driving habits.
- Strict adherence to maintenance schedule.
- Prompt provision and replacement of genuine spare parts and stores.
- Employment of trained and skilled operation crew.
- Decentralisation and proper equipment of workshop network within jurisdiction.

#### **4.3.21 Kilometres operated**

The services offered to the traveling public are measured in the growth of k.m. operated per year as well as per day. An ideal transport planning should aim at increasing trend in the rate of growth of Km. operated. Only then, the objective of running a transport system will be achieved. Table 4.32 shows the total kilometres operated by the TNSTC (Madurai) ltd. during the study period.

TABLE 4.32

## Total Kilometres Operated by the TNSTC (Madurai) Ltd.

year	Total Effective kms. Operated during the year (in lakhs)	Percentage increase/decrease over previous year	K.M.s Per day (in lakhs)	Percentage increase/decrease over previous year
1997-98	4671.49	--	13.11	--
1998-99	4804.09	2.84	13.29	1.37
1999-00	4734.19	-1.46	13.07	-1.66
2000-01	4784.77	1.07	13.25	1.38
2001-02	4786.22	0.03	13.26	0.08
2002-03	5028.37	5.06	13.9	4.83
2003-04	5103.11	1.49	13.95	0.36
2004-05	5140.4	0.73	14.08	0.93
2005-06	5193.42	1.03	14.22	0.99
2006-07	5357.92	3.17	14.68	3.23
2007-08	5755.14	7.41	15.72	7.08

Source: Annual Reports of TNSTC (Madurai) Ltd.

The following details have been observed from the Table 4.32 which shows the total Km. operated by TNSTC (Madurai) Ltd.. At the beginning of the study period, the TNSTC (Madurai) Ltd. has operated 467.49 lakhs Km. which has been tremendously increased to 5755.14 lakhs k.ms at the end of the study period, inspite

of a gradual decline in the year 1999-2000. The percentage of the total Km. operated by TNSTC is 2.83 in the year 1998-99. But, 1.45 percentage has been reduced in the very next year. And then there is a gradual growth throughout the study period. The percentage of the total Km. operated by TNSTC has been increased to 7.41 at the end of the study period.

At the beginning of the study period 13.11 lakhs Km. has been covered by the TNSTC buses in a day. And it has been greatly increased to 15.72 lakhs Km. at the end of the stud period. The percentage of total Km. operated by the TNSTC bus in a day is 1.37 during 1998-99. And then there is a gradual growth during the study period. And it has been increased to 7.08 percentage at the end of the study period over the previous year.

#### **4.3.22 Average Number of Passengers Carried Per Day**

Rate of growth of average number of passenger carried per day is an indicator measuring mobility of the people. This reflects the capacity of the people. This reflects the capacity of the bus transport undertaking to cater to the transport need of the public. This depends on the following factors:

- a) Strength of the fleet
- b) Density of passenger en route
- c) Passenger capacity of the fleet
- d) Number of routes as well as trips per route.

Table 4.33 shows the number of passengers carried in TNSTC (Madurai) Ltd. during the study period.

**TABLE 4.33**

**Number of Passengers Carried in TNSTC (Madurai) Ltd. (in lakhs)**

<b>Year</b>	<b>Total Passenger In Lakhs</b>	<b>Ave. No. of Daily passenger in Lakhs)</b>
1997-98	14289.22	39.14
1998-99	14982.00	41.04
1999-00	14868.37	40.73
2000-01	13755.88	37.68
2001-02	12682.31	34.74
2002-03	12076.53	33.08
2003-04	12642.69	34.63
2004-05	13566.73	37.16
2005-06	13804.82	37.82
2006-07	14386.81	39.42
2007-08	15125.64	41.33

Source: Annual reports of TNSTC (Madurai) Ltd.

The following details have been observed from Table 4.33 which shows the number of passengers carried in TNSTC (Madurai) Ltd. From the details given in the table it is evident that 14289.22 lakhs passengers have been carried in TNSTC buses at the beginning of the study period. And it has been gradually increased throughout the study period except few years. At the end of the study period 15125.64 lakhs passengers have been carried in TNSTC buses. The average number of daily

passengers who had been carried in TNSC buses at the beginning of the study period is 39.14 lakhs and it has been increased to 41.98 lakhs people at the end of the study period.

#### 4.3.23 Kilometre efficiency

The kilometre efficiency is defined as the ratio of overall Km. operated to the schedule kilometres. Table 4.34 shows the kilometer efficiency of TNSC (Madurai) ltd. during the study period.

**TABLE 4.34**

**Kilometre Efficiency of TNSC (Madurai) Ltd.**

<b>Year</b>	<b>Schedule k.m. Efficiency(%)</b>	<b>Overall k.m. Efficiency(%)</b>
1997-98	92.98	99.24
1998-99	94.56	100.81
1999-00	94.72	98.61
2000-01	96.04	100.10
2001-02	94.97	98.81
2002-03	97.92	102.70
2003-04	98.07	103.23
2004-05	98.21	103.59
2005-06	98.03	104.03
2006-07	98.07	103.28
2007-08	98.33	103.75

Source: Annual reports of TNSC (Madurai) ltd.

The following details have been observed from the table 4.34 which shows the Km. efficiency of TNSTC (Madurai) Ltd. The per centage efficiency of schedule Km. is 92.98 at the beginning of the study period. But, the percentage of overall efficiency is 99.24 at the beginning of the study period. From the details given in the table it is clear that the percentage of overall Km. efficiency is higher than the percentage of schedule Km. efficiency. At the end of the study period the percentage of schedule Km. efficiency is 98.33 whereas the percentage of overall Km. efficiency is 103.75.

#### 4.4 Extent of Commuters' Satisfaction in TNSTC

The commuters' satisfaction scores of the respondents range from 54 to 90. The respondents are classified into three categories such as Young, middle, old age of commuters' satisfaction according to the individual scores.

Arithmetic mean ( $\bar{X}$ ) and Standard deviation ( $\sigma$ ) score 200 respondents are commuted as follows:

##### Young Age Respondents:

$$\begin{aligned} \text{Mean Score ( } \bar{X}_1 \text{ )} &= \frac{6644}{93} = 71.44 \\ \text{Standard deviation ( } S_1 \text{ )} &= 17.50 \end{aligned}$$

**Middle Age Respondents:**

$$\begin{aligned} \text{Mean Score ( } \bar{X}_2 \text{ )} &= \frac{5393}{74} = 72.87 \\ \text{Standard deviation ( } S_2 \text{ )} &= 15.19 \end{aligned}$$

**Old Age Respondents:**

$$\begin{aligned} \text{Mean Score ( } \bar{X}_3 \text{ )} &= \frac{2217}{33} = 67.18 \\ \text{Standard deviation ( } S_3 \text{ )} &= 12.32 \end{aligned}$$

$$\begin{aligned} \text{Overall Mean Score of the} \\ \text{Total Respondents} &= \frac{6644+5393+2217}{93+74+33} \end{aligned}$$

$$\begin{aligned} \text{Mean Score } \bar{X} &= \frac{14254}{200} = 71.27 \end{aligned}$$

$$\text{Standard deviation ( } \sigma \text{ )} = 15.95$$

Those who have scores above mean plus standard deviation are classified as high level and whose scores are below mean minus standard deviation are classified as low level. Those respondents whose scores are in between mean plus standard deviation and mean minus standard deviation are classified as medium level of satisfaction. Accordingly, respondents who have secured above 87 scores are classified as having high level of satisfaction and those who secure below 55 scores are classified as low level of satisfaction. Those who have scores from 55 to 87 are classified as having medium level of satisfaction.



Respondents classified according to the levels of satisfaction towards quality of service in operation of TNSTC (Madurai) Ltd. are given in Table 4.35

**TABLE 4.35**

**Overall Levels of Commuters Satisfaction towards Quality of Service**

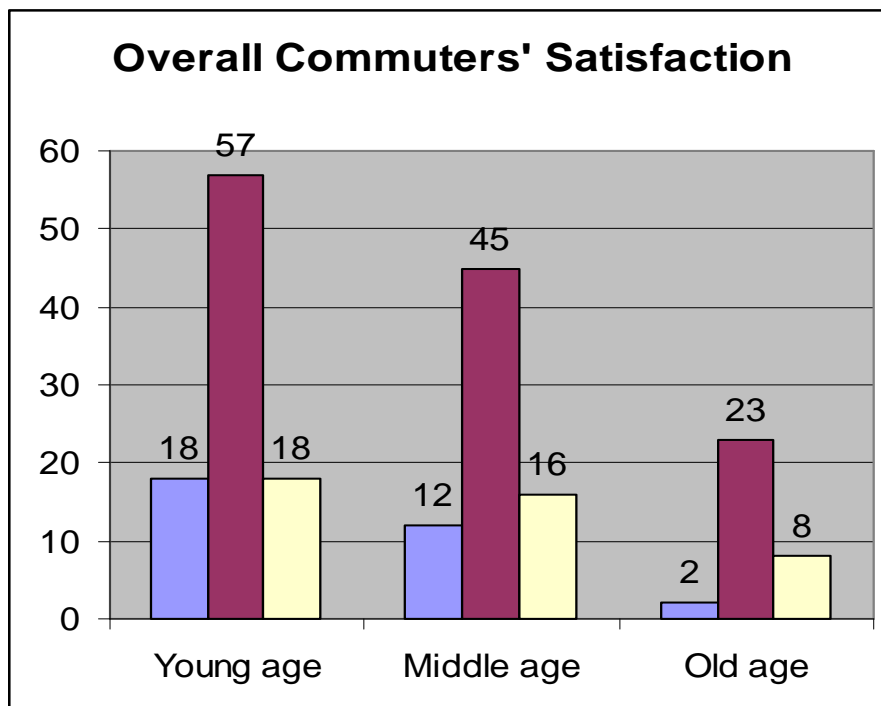
Classification of Respondents	Opinion			
	High	Medium	Low	Total
Young	18 (19%)	57 (61%)	18 (20%)	93 (100%)
Middle Age	12 (16%)	45 (62%)	16 (22%)	74 (100%)
Old Age	2 (6%)	23 (70%)	8 (24%)	33 (100%)
Total	32 (16%)	126 (63%)	42 (21%)	200

Chi-square value = 3.28 Table Value at 1% Level = 13.3

It could be seen from Table 3.46 that out of the 200 respondents, 32 respondents have high level of satisfaction and it amounts to 16 per cent of the total. 126 respondents have medium level and 42 respondents have low level of satisfaction towards quality of service in operation of TNSTC (Madurai) Ltd. The hypothesis is rejected, since the calculated value is less than the table value. Therefore, there is no significant difference among the different categories of respondent commuters such as young age, middle age, and old age in their levels of overall satisfaction.

The levels of satisfaction among the Young age, middle age and old age are presented with the help of multiple bar diagram

Figure 4.4



#### 4.5 Conclusion

The parameters used to assess the quality of service in operation of TNSTC (Madurai) Ltd. have clearly shown the high degree of satisfaction in quality of service in operation. The commuters are generally satisfied with the quality of service provided by TNSTC (Madurai) Ltd. There is no significant difference among the young, middle aged and old aged commuters in their opinion on various factors influencing the satisfaction on quality of service in operation of TNSTC (Madurai) Ltd. It is concluded from this chapter that, the better quality of service in operation of TNSTC (Madurai) Ltd has clearly determined the managerial effectiveness and efficiency in TNSTC (Madurai) Ltd.