SUMMARY OF FINDINGS, CONCLUSIONS AND SUGGESTIONS

The present development of road transport industry in India has a long history. In 19th century the means of conveyance were usually the ‘sligram’ (horse drawn), the ‘rekla’ (bullock drawn). The very first motor transport in India was Tramway. Bombay was the first city in the country to introduce tramways, this service is still exist in the city of Kolkatta. The motor transport has 70 years old history. The faster growth and development of automobile industry has provided the required cushion for the growth of motor transport. With rapid development in bus transport, the country has witnessed a phenomenon progress of over all development in both industry and agriculture.

The State Transport Undertakings have played a tremendous role in the development of bus transport in India. With regard to the State of Tamil Nadu the State Transport Corporations have made an excellent progress by providing bus services to all-important places round the clock.

This study has dealt with two major parts: Physical (operational) performance and Financial performance. Here the researcher has established the following findings.

FINDINGS ON PHYSICAL PERFORMANCE

FLEET UTILISATION

It is observed that all the sample Corporations under study are utilizing the fleet to more than 90 percentage, which is higher than the all
India level. The analysis reveals that KTC is utilising its fleet at low i.e., 91.41 percentage where as CTC is utilising it to the maximum i.e., 98.14 percentage.

As per the coefficient of variation (CV), KTC i.e., 36.18 and MPTC i.e., 70.04 are ranked as first and second respectively. This means that both KTC, MPTC are very consistent in their fleet utilization. PRC and CTC score ninth and tenth rank respectively which means that the authorities have not made arrangement in utilizing their fleet strength consistently.

**BUS UTILISATION PER DAY**

The finding reveals that the utilization of bus per day (in Kms) by the all the sample Corporations showed an increasing trend, during the study period. The utilization growth rate ranges from 5 to 10 percentage when compared from 1989-90 to 2000-2001. It is also seen that the average utilization of bus per day by DCTC was the highest and ranked first i.e., it is utilizing 450.45 Kms per day. It is also evident from the analysis that C.V of CRC was very low i.e., 3.02, which means that the corporation is consistent in utilizing the buses per day. The C.V of CTC worked to be the highest i.e., 14.92 which means the corporation is not consistent in utilisation; this may be due to the factors like road blocks, strike, banth, accidents, poor crew maintenance etc...

**EFFECTIVE KILOMETRE, GROSS KILOMETRE AND DEAD KILOMETRE**

It is found that ATC has utilized the fleet to the maximum extent by increasing effective kilometres and gross kilometres every year by 5 to 6
per cent. At the same time the dead kilometres ranges from 42.33 lakh Kms to 46.23 Kms. In the year 1996-97 the dead kilometres ie., 1.78 per cent is the lowest when compared to all the years. From 1997-98 onwards the percentage of dead Kms shows an increasing trend.

It is observed that CRC is maintaining a level of 6 to 7 per cent of increase in gross kilometres and effective kilometres. The increase in the effective kilometres is slightly lower than the gross kilometres.

The overall increase in the effective kilometres and gross kilometres of CTC, from the year 1989-90 to 2000-01 stood to 5 to 7 per cent. The percentage of dead Kms to gross Kms ranges from 3.44 to 0.55. In the last year the percentage of dead kilometres has declined sharply to 0.55, which means that the management is very keen on reducing the dead Kms.

The findings reveals that the growth of gross kilometres and effective kilometres of KTC show an increasing trend between 6 and 9per cent every year. Among all the sample corporations, there has been a continuous fall in the percentage of effective kilometres to gross kilometres operated and therefore, the percentage of dead kilometres has registered a continuous increase. It precisely indicates that the management has tried to improve the performance in the beginning but has failed to maintain and improve the same consistently over the period.

The finding reveals that MPTC is maintaining the percentage of dead kilometre to gross kilometre in between 2.22 per cent and 1.36 per cent during the study period. It is also observed that both effective kilometre and gross kilometre showed a upward trend up to the year 1995-
96. During 1996-97 because of bifurcation, the effective and gross kilometres have been reduced to 806.90 lakh kms and 823.78 lakh kms respectively.

It is noted from the analysis that the percentage of dead kilometre to gross kilometre in PATC ranges in between 2.34 per cent in 1989-90 and 2.47 in 2000-01. Both gross and effective kilometre shows an increasing trend.

The researcher noted that in PRC, the percentage of dead kilometre to gross kilometre is found high when compared with other sample corporation. It ranges in between 1.87 per cent to 4.4 percent during the study period and the percentage of dead kilometre in TPTC is found to be 2.93 per cent in 1989-90 to 1.70 per cent in 2000-01 which means the authorities have reduced the percentage of dead kilometres.

**SEAT KILOMETRE, LOAD FACTOR PER CENT OF OCCUPATION RATIO**

It is learnt that, passenger carried and seat kms of the ATC show an increasing trend from 1989-90 to 1999-2000. The volume of increase of these two variables ranges between 5 and 10 per cent. It is also noted that in the last year the passenger carried has come down to 3865.20 lakh compared to the year 1999-2000. The change in the fare structure by the State Government made the general public to choose railways to travel, which becomes a cheaper mode of transport.
The finding also reveals that even though the occupancy rate, which was above 90 per cent but load factor was only around 60 to 72 per cent. This means that the corporation has lost revenue by allowing concession.

It is clearly noted from the table that CRC is able to carry 2661.16 lakh passengers in 1989-90 and 4039 lakh passenger in 2000-2001. During the entire period, the rate of increase in passenger carried ranges marginally between 2 and 5 per cent. It is also interesting to note that there is no declining trend in passenger carried in any year. This shows that the public in this region depends more on road traffic than any other mode of transport. The percentage of load factor showed a declining trend during 1990-91 to 1993-94 and thereafter it increased to 86.09 per cent in 2000-2001. The occupation ratio ranges above 90 per cent in all the years.

The Cheran Transport Corporation (CTC) holds large number of buses when compared to others so naturally it is able to carry more number of passengers and produce more number of seat kilometres. The finding shows that the passenger carried has increased from 5273.73 lakh in 1989-90 to 6331.00 lakh in 2000-01. It is also observed that the passenger travelled per bus shows an increasing trend except in the year 2000-01.

The occupancy ratio ranges from 90 per cent to 104 per cent during the 12 years period. The percentage of load factor also shows a mixed trend during these 12 years, which ranges from 64.3 per cent in 1989-90 to 71.94 per cent in 2000-01.
It is observed from the analysis that the passenger carried by DCTC show an increasing trend from 2470.60 lakh in 1989-90 to 3847.89 in 1999-2000. Even though there is no change in the fleet strength it reduced to 3281.57 lakh in 2000-01. The occupation ratio show a marginal increase during the study period and it is more than 100 per cent in many years. At the same time the load factor ranges from 64.87 in 1989-90 to 72.70 per cent in 2000-01. It is also noted that average seating capacity is maintained more than 50 per bus.

The find reveals that the passenger carried per bus by JTC has increased from 999 in 1989-90 to 1185 in 1999-2000. The growth rate was found to be below 2 per cent, which is very minimum when compared to other corporations. In the year 2000-01 the number of passengers carried has come down to 1083. The occupancy rate shows an increasing trend in all the 10 years except in the year 1992-93 and 98-99. The growth rate of load factor is found constant throughout the study period.

It is observed that passenger kilometres and seat kilometres of KTC has increased steadily during the year form 1989-90 to 2000-01. In 1999-2000, passenger carried (1225) by bus per day by JTC was found highest among all the years. The occupancy ratio is 85.20 per cent in 1989-90 has increased to 97.12 per cent in 2000-2001. The load factor during the last 7 years from 1994-95 shows an increasing trend. The occupancy ratio in the year 1999-2000 indicates the extent of occupation of seats offered was highest, the 78.30 per cent load factor shows that the corporation has lost some amount of revenue on account of free pass and concession travel facility.
The finding reveal that the number of passengers carried PATC has increased from 791 in 1989-90 to 1080 in 2000-2001. The growth rate of passenger carried per bus ranges from 3 per cent to 10 per cent. It is interesting to note that occupancy ratio during all the 11-year period ranges from 90 per cent to 114 per cent, which is not normally seen in other corporations. At the same time the percentage of load factors also ranges from 75 per cent to 80 per cent. This percentage is the highest rate when compared to other corporations. This shows that PATC has lost only a meagre amount of revenue on account of free travel and concession.

It is obviously noted that the number of passenger carried by PRC bus per day in all the years was found highest among all other corporations. It is also interesting to note that during the 12 years period of study, passengers carried has never come down to below 1366. This shows that the corporation is utilising its capacity to the full extent.

The findings on occupancy ratio of PRC reveals that in most of the years the percentage remained at 100 per cent, which is not normally seen in other sample corporations. During 1997-98 the occupancy ratio is found highest i.e., 111.26 per cent. As far as the load factor is concerned it is between 63.30per cent and 76.58per cent. This means that the corporation has lost very minimum revenue on account of free travel and student concession.

It is understood from the analysis that the passenger carried per TPTC bus in 1989-90 is 844 which is very less when compared with other corporations. The growth of passenger carried per bus is very marginal. In 2000-01 it is found to be only 1037. The occupation ratio shows
fluctuating trend during the study period and the 104.55 in 1996-97 is found highest among all the years. The percentage of load factor is increasing from 69.25 per cent to 80.08 per cent in 1999-2000. It is also seen that the seating capacity ranges from 53.37 to 50.85.

**CANCELLED KILOMETRE**

The cancelled kilometre is a controllable parameter; some of the transport corporation's management were able to control this to some extent. It is learnt that the cancelled kilometre of all the corporation during 1989-90 to 2000-2001 shows an upward and downward trend. The average cancelled kilometres of TPTC is observed to be low i.e., 8.33 lakh Kms. The cancelled kilometre is high in KTC i.e., 64.97 lakh, which means that there may be frequent roadblocks, banth, strike or want of crew or bus, etc. At the same time the C.V of TPTC is calculated to be 51.19, which means that the management is not consistent in maintaining the level of, cancelled kilometres.

**STAFF STRENGTH**

The number of employees working in ATC increased from 5753 on 31st March in 1990 to 6708 by 31st March 2001, an increase of 16 per cent when compared to 1989-90.

It is also found that the staff ratio per bus is 8.59 in 1989-90, which is the highest ratio when compared to all the years. By the serious steps taken by the authorities the ratio has come down to 7.52 in 2000-2001. By means of reduction in manpower ratio by 1.07, the ATC is able to reduce the labour cost to the maximum extent.
It is interesting to note that from the year 1989-90 (8.93) to 2000-2001 (7.67) the staff ratio per bus of CRC showed a declining trend. During the study period the corporation is able to reduce manpower to the extent of 1.32. This reduction in staff ratio will help the management to have maximum control on labours, which leads to increase in the productivity. The reduction of staff ratio will also considerably reduce the overall labour cost.

Being the CTC large holder of buses among the sample corporations, naturally the staff strength is found to be the maximum. The total staff strength during the period 1989-90 is 9439, which increased to 11436 in 2000-2001. It is found that staff ratio per bus was almost constant, i.e., nearly 7.30 during the period 1989-90 to 1992-93. From 1994-95 onwards there was a sudden increase in the ratio and it reaches the maximum at 8.77. After the manpower planning by the authorities, the ratio has been brought down to 8.01 in 2000-2001.

The finding about the staff-ratio of DCTC reveals a declining trend during the first 3 years i.e., from 8.52 in 1989-90 to 7.91 in 1991-92. Then in the next year onwards the ratio increases up to 8.06. Due to constant check and manpower planning, the management is able to curtail the level of staff ratio below 8 during 1993-94 to 1999-2000. And further, in 2000-2001 it has reduced to 7.48, which is below the recommended standard ratio of 7.5.

The finding of staff strength of JTC from the year 1989-90 shows constant increase. It is interesting to note that the management was able to maintain the bus staff ratio below 8 during the entire study period. From
1994-95 onwards, the corporation maintain the staff ratio per bus at a rate between 7.50 and 7.70. This shows a good evidence that the authority does every thing on manpower planning and management.

It is clearly observed that the staff strength of KTC has increased from 5714 in 1989-90 to 6468 in 2000-01. It is also seen during all the years the staff bus ratio remained more than 7.66, which is not normally seen in other corporations and it is somewhat higher than the recommended ratio by Pattabiraman Committee.

In the first 2 years, the staff ratio per bus is found to be more than 8 and in 1991-92 it has slightly come down to 7.89. During all the years, the staff ratio per bus more or less remains constant between 8.31 and 8.59. This higher ratio is due to the higher ratio of driver and conductor.

It is clearly seen that the total staff strength of MPTC has decreased to 5166 in 1989-90 to 4083 in 2000-2001. The reason for decrease in staff strength is the bifurcation of the MPTC in 1996-97. The staff ratio per bus shows an increasing trend from 8.1 in 1989-90 to 8.75 in 1991-92. From the next year onwards the staff ratio has comparatively come down to 7.36 in 2000-2001. Even staff bus ratio is found less than the recommended rate; the corporation is able to function efficiently.

The findings of PATC's staff strength show an increasing trend from 6876 in 1989-90 to 7399 in 1991-92. And thereafter it shows a declining trend. The bus staff ratio has reduced from 8.16 in 1989-90 to 7.47 in 1994-95. During 1995-96 to 97-98 the bus staff ratio has increased to more than 8. During the last 3 years the bus staff ratio was maintained at the level of 7.89, which is very nearer to the recommended ratio of 7.5.
It is noted that the staff strength PRC increases in all the years according to the number of buses held. It is also found that the overall bus staff ratio during the study period ranges from 8.55 in 1989-90 to 8.16 in 2000-2001. It is noted that PRC is having the maximum staff ratio when compared to other corporations. This over staff ratio may have a direct effect on manpower productivity and cost sheet of the corporation.

It is evident from the analysis of TPTC that the average staff ratio per bus on road ranges from 7.61 in KTC to 8.37 which is more than the recommended ratio of Pattabiraman Committee. The CV of JTC was found to be 3.71 and scored the first rank. This means that staff ratio per bus is consistent in JTC when compared to other corporations. The KTC is ranked as 10th rank, CV is 8.33 which is the highest. This means that authorities of KTC are not consistent in utilizing the staff per bus. The management has to take necessary corrective steps and proper manpower planning to reduce the staff bus ratio.

**STAFF RATIO PER SCHEDULE**

The staff ratio per vehicle reveals that all corporations have reduced the ratio considerably except CTC and TPTC. It is also noted that DCTC’s overall staff ratio per schedule is found to be 7.48, which is low when compared with the other corporations.

The CV of DCTC is found to be 3.712 and secures 4th place, which means that the authorities are moderately maintaining the staff ratio per schedule. TPTC is ranked to the tenth place, since CV is 6.202, which shows that the authorities are not maintaining the level of staff per schedule consistently.
MANPOWER PRODUCTIVITY

The manpower productivity reveals that the average manpower productivity of DCTC i.e., 57.45 Kms per day is the highest followed by JTC, which is 54.96 Kms. The lowest is found as 44.65 kms for PRC on the basis of CV, the DCTC is more or less consistent in obtaining manpower productivity.

ENGINE LIFE (KMPL)

The fuel performance of all the corporations show an increasing trend, particularly PATC performance on KMPL is increased from 4.02 KMPL in 1989-90 to 4.35 kms in 2000-01. This may be due to the improved technology in engine design and proper training to employees. The CV for DCTC is found to be 3.11 and ranked as sixth. This means the management is moderately consistent in obtaining fuel efficiency. At the same time CTC's CV is 4.04 and rank to tenth place, which means the management is not consistent in obtaining the KMPL. Its average fuel performance during the entire period is found to be the lowest as 4.09 KMPL.

TYRE USAGE AND MANAGEMENT

The life of new tyre shows an increasing trend in ATC from the year 1989-90 to 2000-01. The growth is accounted to 30.14 per cent up to 1997-98. Then onwards the life of new tyre is doubled i.e., 97.75 per cent when compared to 1989-90. But the life of retreaded tyre showed a declining trend from 30921 in 1989-90 to 26759 in 1997-98. The overall
life of the cumulative tyre kms shows a marginal increase of 9.3 per cent over the study period.

The life of new tyre in CRC during 1989-90 to 2000-01 showed an increase of 63.88 percent. This shows that the performance of the new tyre kilometres is satisfactory. The performance of the retreaded tyre is most satisfactory as there is a continuous increase except during 1993-94. But on the other hand the cumulative life shows an decreasing trend from 158220 kms in 1989-90 to 126006 kms in 1994-95. It is seen that the overall life remains constant during the last three years.

The life of new tyre for CTC has a stable growth during the study period, from 35195 kms in 1989-90 to 57679 kms in 2000-01. The growth rate over a period of twelve years ranges from 2 per cent to 63 per cent. This shows that the performance of new tyre shows a satisfactory trend. At the same time the retreaded tyre life is also satisfactory because it also increases from 19014 kms to 30472 kms, which is 60 percent of growth over the study period. It is also understood that the performance of the total life of tyre shows an increasing trend from 134225 kms in 1989-90 to 178644 kms in 1999-2000.

The overall performance of DCTC tyre management is found to be very satisfactory. The life of new tyre shows a continuous increase from 30915 kms in 1989-90 to 77807 kms in 2000-01. This shows an increase of 151.68 per cent, which is the highest among other corporations. It is also observed from the data that retreaded tyre life shows a mixed growth rate during the study period. The performance of the cumulative tyre kilometres also shows a declining trend in some years, but in the last three
years the life has increased to more than 161000 kms when compared to other years.

The table of Jeeva Transport Corporation clearly explains that the life of the new tyre shows increasing trend in all the years except in 1992-93 and 1996-97. The life increased from 38167 in 1989-90 to 71013 in 2000-01 shows a growth of 86.05 per cent. It is also evident from the table that the management has achieved a satisfactory level in increasing the life of retreaded tyres from 23372 in 1989-90 to 28131 in 2000-01. It is also seen that the cumulative life of tyre also shows a continuous growth in all the years.

The finding reveals that the life of new tyre usage by KTC ranges from 32984 kms in 1989 to 66537 kms in 2000-01. As far as the performance of retreaded tyre is concerned it continuously increases every year except in 1995-96. The performance of retreaded tyre is satisfactory because the corporation has increased the total life from 18263 in 1989-90 to 28522 in 2000-01.

The life of new tyre life of MPTC shows an up and down trend during 1989-90 to 2000-01. During 1990-91 to 1992-93 the corporation used the new tyre for more than 40000 kms. Then in the following years there is a marginal decrease in the life of new tyre, which has come down to 37625 kms in 1996-97. As far as the life of the retreaded tyre is concerned it is not satisfactory as there is a continuous decrease from 24530 kms in 1991-92 to 21004 in 1995-96. The overall cumulative life of the tyre also shows a mixed trend. During 1989-90 to 2000-01 the
cumulative tyre of 1990-91 i.e., 179921 kms, which is the highest, followed by 151453 kms in 2000-01.

It is generally noted that, the new tyre, retreaded and cumulative tyre kilometres of all the corporations show an increasing trend. In the case of new tyre and retread tyre life, CV of PRC 5.75, 8.54 respectively was found to be lowest, which means that the Department of tyre management is consistent in obtaining the life from both. It is also noted that CV of DCTC in both new and retread tyre is found to be highest i.e., 30.34, 23.12 respectively which means that the tyre management is not obtaining consistency.

The analysis on tyre management of PATC explains the cumulative kilometres of tyre increases from 115670 kms in 1989-90 to 151169 kms in 2000-01. The rate of increase ranges 15 per cent during the study period. The average life of new tyre km also increases year by year. This may be due to maintenance of vehicles and other reasons.

It is observed from the analysis that overall tyre management is not satisfactory in PRC when compared with the other corporation. It is learnt that the new tyre consumption is very low and found to be in between 33821 Kms and 36872 Kms during the study period. At the same time, average kilometres of retreaded tyre has reduced from 26387 in 1989-90 to 24830 in 2000-01. In the case of cumulative life of the tyre is concerned, the usage shows a mixed trend and many years it has reduced from the previous year.

It is understood from the analysis that the new tyre kilometre performance of TPTC shows a very satisfactory level and it increased
from 43393 kms in 1989-90 to 75132 kms in 2000-01. The rate of increase is around 73 per cent. In the case of retreaded tyre life, it shows a mixed trend, and the increase in the usage is very marginal. The cumulative tyre life shows an up and downward trend during the study period

**LIFE AND USAGE OF ENGINE**

It is seen from the analysis that the average life of new engine is showing an increasing trend in all the corporations during the study period. The corporation achieves this through continuous research and preventive maintenance of engine. In this regard Central Institute of Road Transport (CIRT), Pune, helps to improve the performance through research activities. It is noted that the average engine life of PATC found to be 6.210 lakh kms which is the highest when compared with others.

**RECONDITIONED ENGINE**

The overall life of reconditioned engine has marginally increased during 1989-90 and 2000-01. It is observed that the CV of MPTC i.e., 11.78 is the lowest and this means that the corporation is consistent in obtaining the number of kilometres through reconditioned engine. If any corporation is obtaining maximum utilization of recondition engine this may lead to reduce in the maintenance & spare cost of the corporation.

**ACCIDENTS**

It is seen from the analysis that the accident per lakh effective kilometre is very low in CRC i.e., 64100 kms followed by KTC. This also reveals that the officials have concentrated on safety measures. The C.V of KTC 0is calculated to be 14.81, which is the least and ranked as first
which means that the corporation is consistent in accident per effective kilometres.

**REGULARITY OF SERVICE**

Since there exists no monopoly, regularity occupies an important rate in deciding not only commuters satisfaction, but also in deciding occupation ratio, passenger kms etc. It is noted from the analysis that the average regularity maintenance of ATC i.e., 100.16 per cent is very high and KTC is very low i.e., 94.68 percent, but at the outset, the CV of PTC was commuted as 1.36 which is very low and rank as first which means that the PTC is maintaining some consistence in the regularity and punctuality as bus scheduled timings.

**BREAKDOWN**

The finds on break down per 10000 kms reveals that the rate has mixed trend during the study period. Since the break down is an unexpected event, even by taking preventive measures, the break down rate cannot be reduced much or controlled. The analysis reveals that the average break down rate of JTC is 0.08, which is the lowest among other corporations. But the CV of ATC is found to be 20.06, which is the minimum and stands first. This means that the Anna Transport Corporation is consistent in break down rate. This consistency is possible only by taking preventive maintenance technique on their buses.

As per Tables 5.25, 5.26 and 5.27 the findings reveal that the consistency on physical parameters, material consumption, and quality of service, Kattabomman Transport Corporation (KTC) occupies the first
place. Consistency doesn't mean that this corporation's performance is good or satisfactory. It only means that the sample corporation is not varying much in the particular parameter. It is also noted that in physical parameters CRC is not consistent and ranks at 10th place. At the same time, the overall physical performance during the study period is not that much appreciable in the case of CRC, and it stands only at the 10th place. The management authorities must try to improve the physical performance in the future.

The study also reveals that through (Table 5.30) combined index on selected physical parameters, during the study period, it is concluded that DCTC's physical performance is commendable when compared with the other corporations and followed by PATC.

The Estimated (forecast) Effective Kms. For the year 2003-2004 for each sample corporation is given in the following table. At par with the values during 2000-2001, values are assumed for the year 2003-2004 for those predictors included in the respective equation by step-wise method.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>TNSTCs</th>
<th>Assumed values for the Predictors in the model*</th>
<th>Estimated (Expected) Effective Kms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ATC</td>
<td>Average No. of buses on Road : $X_1 = 930$</td>
<td>155668412.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff Strength : $X_2 = 6750$</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CRC</td>
<td>Average No. of buses on Road : $X_1 = 950$</td>
<td>151859707.7</td>
</tr>
<tr>
<td>3</td>
<td>CTC</td>
<td>Loss of Kms due to want of Crew : $X_4 = 5.7$ lacs of Kms</td>
<td>170131669.0</td>
</tr>
<tr>
<td>4</td>
<td>DCTC</td>
<td>No. of trips operated : $X_7 = 40.2$ lakhs</td>
<td>162143540.3</td>
</tr>
<tr>
<td>5</td>
<td>JTC</td>
<td>Average No. of buses on Road : $X_1 = 925$</td>
<td>155682485.7</td>
</tr>
<tr>
<td>6</td>
<td>KTC</td>
<td>Average No. of buses on Road : $X_1 = 800$</td>
<td>116880309.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss of Kms due to want of Crew : $X_4 = 22$ lacs of Kms</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>MPTC</td>
<td>Loss of Kms due to want of Crew : $X_4 = 6.2$ lacs of Kms</td>
<td>95774270.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kilometres per litre of HSD : $X_6 = 4.75$ lakhs of Kms</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PATC</td>
<td>Kilometres per litre of HSD : $X_6 = 4.5$ lakhs of Kms</td>
<td>106222409.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. of trips operated : $X_7 = 26.0$ lakhs</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PRC</td>
<td>Average No. of buses on Road : $X_1 = 860$</td>
<td>112021657.1</td>
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<tr>
<td>10</td>
<td>TPTC</td>
<td>No. of trips operated : $X_7 = 33.5$ lakhs</td>
<td>12989816.57</td>
</tr>
</tbody>
</table>

*Note : As per model fitted by the step-wise method, values are assumed only for the variables included in the respective equations. The variables, which are not included in the respective equation, are supposed to be maintained in the same level without much variation.*
FINDINGS ON FINANCIAL PERFORMANCE

TOTAL COST PER DAY PER BUS ON ROAD OF THE SAMPLE TRANSPORT CORPORATIONS

It is known that in any industry where input costs are increasing total cost will increase automatically. Here it is noted that even if the input costs are increasing, some of the corporations like JTC and CTC were maintaining the level of average total cost to the lowest. CV of PATC is found to be very low i.e., 32.34, which means it is consistent in maintaining the total cost. But at the same time, CV of KTC is worked out to be 40.23, which is the highest and ranked at tenth place and it means that it is inconsistent in maintaining the total cost during the study period.

TOTAL COST PER EFFECTIVE KILOMETRE

The average total cost per effective kilometre operated by JTC i.e., Rs.6.71 is the least among other corporations. The CV of TPTC is found to be 29.46, which means that the corporation authorities are maintaining the level of total cost when compared with others. KTC is ranked at tenth, since CV is 37.46, which is the highest. This corporation is not consistent in maintaining the cost total per effective kilometre over the study period.

REVENUE EARNED PER EFFECTIVE KILOMETRE

The study also reveals that the earnings per effective Kms are not comparatively proportionate to the increase in the total cost. It is noted that in 1989-90 the earnings of MPTC is Rs.4.11, which is very low when compared to others. Then due to hike in fare structure, the revenue
generation shows an increasing trend. The CV of CTC is found to be 27.85, which is the lowest and ranked as first, which means that the earnings generated is consistent during the study period. The CV of TPTC and PATC are worked out to be equal to 34.86, which scores the ninth and tenth rank. These two corporations are inconsistent in the earnings per effective Kms during the study period.

**TOTAL COST AND TOTAL REVENUE PER PASSENGER KILOMETRE**

It is learnt from the analysis that the fixed cost and variable cost show increasing trend in all the corporations during the study period. It is observed that in ATC, DCTC, PATC and TPTC the fixed cost is less than the variable cost in all the years. This shows that the corporation authorities are very vigilant in checking the cost escalation. Whereas in other corporations the fixed cost is more than the variable cost in very few years. This increase in fixed cost may be due to the increase in salary, interest payment, depreciation etc. It is observed from the analysis the revenue collected per passenger kilometre is not equal in many corporation i.e., Break even cost per kilometre is more than the revenue per passenger kilometre.

**RETURN ON CAPITAL INVESTMENT**

It is found from the tables 6.7 (a), (b), (c), (d) that for all the years, the amount of capital employed could be worked out only for three corporations namely DCTC, PATC and TPTC. For many of the corporations the capital employed cannot be worked out since the current
assets are less than current liabilities. It is also observed that this situation has arisen because these corporations have borrowed some short-term loans for specific purpose and these have been booked under the head of current liabilities instead of term loans under the head of secured loan. And also it is noted that income generated over the period is not recycled in own investment category. The investment policy of the corporation depends upon the government policy. It is observed that some of the generated funds have been diverted to other government welfare activities.

The Estimated (forecast) Total Revenue for the year 2003-2004 for each sample corporation is given in the following table. At par with the predictor values during 2000-2001, values are assumed for the year 2003-2004 for those predictors included in the respective equation.
### Assumed values for Predictor Variables in the model *

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>TNSTCs</th>
<th>Assumed values</th>
<th>Estimated Revenue Rs. In lakhs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ATC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passenger Kms : $X_1 = 72200$ lakhs Kms</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 6200$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff Salary in Rs. : $X_3 = 7500.00$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dead Kms. : $X_7 = 65.43$ lakhs</td>
<td>18667.4472</td>
</tr>
<tr>
<td>2</td>
<td>CRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passenger Kms : $X_1 = 78000$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 5900$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trips Operated : $X_4 = 35.50$ lakhs</td>
<td>1788.650741</td>
</tr>
<tr>
<td>3</td>
<td>CTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 6900$ lakhs</td>
<td>24579.989</td>
</tr>
<tr>
<td>4</td>
<td>DCTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passenger Kms : $X_1 = 80500$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 6600$ lakhs</td>
<td>19545.592</td>
</tr>
<tr>
<td>5</td>
<td>JTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 6200$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trips Operated : $X_4 = 15.50$ lakhs</td>
<td>18810.528</td>
</tr>
<tr>
<td>6</td>
<td>KTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passenger Kms : $X_1 = 57800$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 5200$ lakhs</td>
<td>13966.542</td>
</tr>
<tr>
<td>7</td>
<td>MPTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passenger Kms : $X_1 = 50500$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel Cost in Rs. : $X_2 = 4000$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss of Kms due to Strike, want of crew, etc : $X_4 = 5.75$ lacs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trips operated : $X_4 = 18.75$ lakhs</td>
<td>11996.961</td>
</tr>
<tr>
<td>8</td>
<td>PATC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel cost in Rs : $X_2 = 5400$ lakhs</td>
<td>19053.985</td>
</tr>
<tr>
<td>9</td>
<td>PRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss of Kms due to Strike, want of crew, etc : $X_4 = 20$ lacs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concession in Rs. : $X_5 = 1000$ lakhs</td>
<td>16292.067</td>
</tr>
<tr>
<td>10</td>
<td>TPTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diesel cost in Rs. : $X_2 = 7300$ lakhs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Staff Salary : $X_3 = 8000$ lakhs</td>
<td>20745.465</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concession in Rs. : $X_5 = 1600$ lakhs</td>
<td></td>
</tr>
</tbody>
</table>

*Note: As per model fitted by the step-wise method, values are assumed only for the variables included in the respective equations. The variables, which are not included in the respective equation, are supposed to be maintained in the same level without much variation.
FARE POLICY DESIGN

The breakeven cost index can be calculated for any given price hike index. So the breakeven costs per seat kilometer are estimated with base value 9.250238 for the year 1989-90 for different levels of price hike indices (assumed values) are tabulated below for four years.

ESTIMATED BREAK-EVEN PRICE

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Price hike indices (X) assumed</th>
<th>Estimated Breakeven Cost Indices (Ye)</th>
<th>Breakeven points (paise) 0.09250238 x (Ye)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2002</td>
<td>420</td>
<td>281.8447</td>
<td>26.07313</td>
</tr>
<tr>
<td>2002-2003</td>
<td>450</td>
<td>298.6360</td>
<td>27.62450</td>
</tr>
<tr>
<td>2003-2004</td>
<td>480</td>
<td>315.4273</td>
<td>29.17780</td>
</tr>
<tr>
<td>2004-2005</td>
<td>510</td>
<td>322.2186</td>
<td>30.73100</td>
</tr>
</tbody>
</table>

The table shows that the estimated cost per seat kilometer for the year 2004-2005 must be 30.73 paise, if the expected price hike index is 510.
SUGGESTIONS

Based on the observation and findings, the researcher makes the following suggestions for the improvement of both financial and physical and financial performance of Transport Corporations.

SUGGESTIONS ON PHYSICAL (OPERATIONAL) PERFORMANCE FOR MAXIMIZATION OF RESOURCES AND REVENUE

1. More powers to be vested with Traffic Department; so that the operational policies can be changed according to changing scenario of economic development of Tamil Nadu.

2. The traffic department must conduct periodical survey at least once in a year to provide service according to the need of the passengers.

3. The traffic department authorities should frame only demand based schedules rather than introducing trips or schedules under political pressure.

4. Authority with powers should be given to the concerned managers to have effective utilisation of vehicle through proper scheduling.

5. The staff ratio per bus has to be reduced or brought near to the recommended ratio of 7.5 by Pattabiram Committee. The remaining over staff has to be transferred or promoted to checking or traffic inspector squad. This will help reduce the leakages of revenue.
6. Traffic managers should be given freedom to decide the policy for service mix so that business unit will be able to compute and operate for revenue maximisation.

7. The management can go for productivity-based agreement with trade unions. For instance, additional production bonus can be offered to the employees of the corporations when the physical performance and revenue performance are above certain level.

8. For reducing the competition among the STUs the authorities must have proper route sharing and schedule timings.

9. The STUs have to come forward to frame some policies for growth in effective kilometres, vehicle utilisation. Such a type of policy is not adopted in TNSTUs.

10. The ratio of Dead kilometres to gross kilometres has to be kept within 1 to 2 percentages. This can be done by having the depot nearer to the bus stations.

11. For the services of short and medium distance destinations, One Man (Driver) operation can be introduced as many as possible.

12. Since all the corporations are coming under the state government, suitable policy has to be made for the transfer of excess human resources from one corporation to another corporation.

13. In order to reduce the break down considerably, the management has to follow the preventive maintenance technique.
14. Break down due to tyre and tube has to be reduced considerably. This can be done not only by purchasing good quality tyre but also maintaining them properly.

15. For increasing fuel efficiency, the corporation must give proper training to the drivers in handling the buses. At the same time those drivers who operate the vehicles with less fuel should be identified and awarded.

16. Engine fitted in the bus must be given proper attention by the maintenance department.

17. Divisional managers or regional managers should monitor the monthly or quarterly performance of staff bus productivity of vehicle utilisation and revenue generation of the corporation.

18. The corporation should give due attention for safety management, which may minimise the number of accidents and reduce the amount spent on compensation.

19. A better incentive wage payment scheme should be introduced rather than taking a certain percentage as commission (collection bata).

20. On experimental basis, the facility of night city services can be introduced in other major towns.

21. It is suggested that an agreement can be made with any agencies for periodical maintenance of buses.
SUGGESTIONS ON MARKETING IN STUs

1. Each corporate office as well as zonal office, regional office of STUs may have a marketing cell. This cell may estimate the total demand, area of operation and routes. To provide better service,

2. The STUs must go in for "Product Mix" strategy. This includes introduction of buses according to the requirement of the passengers likely a) Hi tech service b) luxury service c) sleeper coaches for long and medium distance (from 150 kms to 300 kms) d) Semi luxury coaches.

3. Flat pricing technique can be adopted for short distance city services.

4. Round trip service can be introduced in city service.

5. The STUs might introduce different pricing policy for the service like 1) Hi Tech, 2) Deluxe Service, 3) Luxury, 4) Semi Luxury and 5) Ordinary.

6. Discount can be allowed to advance bulk booking of more than 10 tickets.

7. Computerised passengers information system may be available at each centralised bus station.

8. Periodical meetings of the crew, checking staff and other employees should be arranged to redress their grievances. Consequently the staff members may be motivated.
9. For the convenience of passenger, the passenger seat layout must be standardised.

10. It is also recommended that there must be trained manpower for maintaining the new technology buses.

11. Seasonal ticket facility can be introduced in moufssil service.

12. In many STUs checking squads are not allowed to go out of their jurisdiction. Thus, it is suggested that the checking squads should be allowed to cross-divisional and regional limits.

**SUGGESTIONS TO INCREASE ADDITIONAL REVENUE**

1. Transporting of parcel and goods scheme can be introduced through private booking agency. At the same time the loading and unloading can be given to private persons on contract basis.

2. Commercial advertisements inside and outside bus, bus station will help generate additional revenues.

3. It is suggested that efforts should be made towards the better investment decision and allocation of resources. It is suggested that funds generated should be reinvested in their own investment of the corporation.

4. The government authorities should come forward to have the revised fare structure whenever necessary or they should find a formula for increasing the fares.
5. It is suggested that the costing department must identify the unnecessary costs and they should try to eliminate the same. They should seriously exercise the cost reduction and cost control technique in STUs.

CONCLUSION

Road transport in Tamil Nadu occupies a prime position not only for rural and urban mobility but also for accelerating social and economic development of the region.

This present study highlights the overall physical and financial performance of Tamil Nadu State Transport Corporations. On the basis of the analysis in the chapters V and IV for all the corporations, the physical performance namely the fleet utilisation, vehicle productivity, occupancy ratio, passenger carried per bus, etc., are found to be at satisfactory level when compared with all India standards. Among all the sample corporations, DCTC is ranked first in the physical performance during the study period. On the other hand, the financial performance and position of each sample corporations are found very gloomy. Due to social obligations and political pressure, the government is not changing the fare structure on the basis of price increase in inputs or whenever necessary. Whenever there is a price change, the government authorities should come forward to frame a proper fare structure.

It is also concluded that to overcome the heavy losses faced by TNSTUs, the authorities must classify the routes to identify those, which are not earning to meet out even the fixed cost. In such routes, the number of schedules must be reduced.
Finally it is concluded that the government should come forward to have productivity based wage settlement with trade union in the near future, which may increase the overall performance of the corporations.

In the recent years, in Tamil Nadu, there is a cry for privatisation of State Transport Undertakings. It is observed that only these transport corporations are really rendering flexible and fantastic service to the people in rural areas. If the government is rolling back for privatisation of bus transport, these types of services may not be available to rural population (or public). And also it may lead to cut throat competition in near future.

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