CHAPTER 8

FINDINGS, CONCLUSIONS, HYPOTHESES TESTING AND SUGGESTIONS

8.1 Introduction:

Urban roads play a crucial role in the development of a city by facilitating the smooth movement of goods and passengers within the city as well as by linking the city to the highway network. In India, urban roads are provided by the local government. In order to ensure the availability of an efficient road network, urban local governments are required to incur a large amount of expenditure on building and maintaining urban roads and their related services.

In order to find out the various kinds of expenditure made on roads and the relative importance of each, the city of Pune was selected for study.

The aim of this research was to study the trends in the budgeted and actual expenditure on roads made by the Pune Municipal Corporation. The period selected for this study was 1985-86 to 2008-09. This study also aimed at finding out whether there were any changes in the composition of the expenditure over the years and, if so, what were these changes and what caused them. The study also wanted to find out the priorities given to the various functions of the Road Department of the Pune Municipal Corporation. With these aims in view, data was collected from the budgets of the Pune Municipal Corporation and analysed so as to arrive at some conclusions.

The precise objectives of this study were:

1. To study the growth in the budget and actual expenditure on roads by the Pune Municipal Corporation during the period 1985-86 to 2008-09.
2. To find the variation in the expenditure incurred on roads by the Pune Municipal Corporation between 1985-86 and 2008-09.
3. To study the budget utilization (percentage share of the budget actually spent) for the various types of expenditure on roads incurred by the Pune Municipal Corporation between 1985-86 and 2008-09.
4. To forecast the trend in the budget and actual expenditure on roads for the period 2009-10 to 2014-15.
5. To study the composition of planned and actual expenditure on roads during the period 1985-86 to 2008-09.
6. To find the priorities assigned to the various functions of the Road Department and related departments over the period 1985-86 to 2008-09.

The first four objectives required an item-wise analysis of the expenditure on roads by the PMC for the selected period, which was done in Chapters 4 and 5 of this study. The conclusions related to objectives 5 and 6 were derived from Chapter 6, where the expenditure on roads was arranged year-wise, as required by these objectives. A functional classification of the expenditure was made to assess the relative priority given to different functions of the Road Department.

Sections 8.2 to 8.11 present the conclusions of this analysis. Section 8.12 gives a summary of these conclusions. The hypotheses on which this study was based are tested in Section 8.13 followed in Section 8.14 by a few suggestions arising out of the analysis. The study is concluded in Section 8.15.

8.2 Findings and conclusions regarding growth in the expenditure on roads:

The first objective of this study was to measure the growth in the expenditure on roads incurred by the Pune Municipal Corporation during the period 1985-86 to 2008-09. The data collected from the budgets of the Corporation and its analysis showed the following:

1) **Absolute growth in expenditure:** There has been a very substantial growth in the budget allocations as well as in actual expenditure on all items in absolute or rupee terms. The total budget for roads was Rs.5.31 cr. in 1985-86, which grew to Rs.427.48 cr. in 2008-09. Actual expenditure, which was Rs.3.67 cr. in 1985-86, increased to Rs.341.89 cr. in 2008-09. The budget in the final year of the study was 80 times that in the first year and actual expenditure in 2008-09 was 93 times that incurred in 1985-86.

   It can be concluded that there was a very substantial growth in both the budget allocations for and actual expenditure on roads during the period 1985-86 to 2008-09.

2) **Growth was not continuous:** The annual growth rates for each of the items of expenditure showed that the growth in the budget allocations and in the actual expenditure on each item was not continuous. Both the budget estimates and the actual expenditure on each item were alternately increased and decreased several times during the study period. The magnitude or size of these fluctuations in
expenditure was different for different items. Annual growth rates for the individual items varied between a low of -97% to a high of +29,606%.

It may be concluded that growth in the expenditure on roads showed very high fluctuations.

3) Overall growth in expenditure: Although the expenditure on all items was increased and reduced several times during the study period, the overall growth in the expenditure as shown by the Compound Annual Growth Rates revealed that there was substantial growth in the expenditure on all items. The Compound Annual Growth Rates show that the budget for items of revenue expenditure grew at average annual rates varying between 8% and 30% and actual expenditure at rates varying between 7% and 35%. Growth in the revenue expenditure category was slowest for salaries and miscellaneous revenue expenditure and highest for road improvement and moving electrical poles. In the capital expenditure category, growth rates were higher, ranging between 16% and 38% for the budget and between 16% and 40% for the actual expenditure. Growth was slow for purchase of machinery and IRDP and high for new roads, cement-concrete roads and footpaths.

The budget and actual total revenue expenditure grew at about 14% on an average each year. The budget allocations for total capital expenditure grew at about 26% and the actual total capital expenditure grew slightly faster at about 30% per year. The growth in the total expenditure on roads for the period 1985-86 to 2008-09 (for both the budget and actual expenditure) was equal at about 21% per year, on an average.

The compound annual growth rates were nearly equal for several items of expenditure, even though the actual amounts allocated and actually spent were different. Different items of expenditure showed different rates of growth over the period 1985-86 to 2008-09, but it may be concluded that there was substantial growth in the expenditure on all items and that growth was higher for items of capital expenditure than for revenue expenditure.

4) Higher level of expenditure from 2005-06 onwards: The budget estimates for and actual expenditure on most items was at a much higher level from 2005-06 onwards as compared to previous years, in both the revenue and capital expenditure categories. The largest increase was in the expenditure on resurfacing. The period 2005-06 to 2008-09, therefore, represents a different phase in the expenditure on roads, characterized by a much higher quantum of expenditure on this head. Total revenue expenditure grew 34%, total capital expenditure grew by 69% and total
Expenditure increased by 60% in 2005-06 as compared to 2004-05. Moreover, both the budget and actual expenditure on roads has consistently increased after 2005-06, although at slower rates.

8.3 Findings and conclusions relating to variation in expenditure:

The coefficient of variation was calculated to find the variation in the budget and actual expenditure on roads. Due to the frequent changes (increase and decrease) in the budget and actual expenditure, some of which were very large, the overall variation was high for most items. The coefficients of variation for the budget and actual expenditure during the period 1985-86 to 2008-09 were as shown in Table Nos. 4.1 to 4.18 and 5.1 to 5.27.

Coefficients of variation below 100% have been taken to show low variation, coefficients between 100% and 150% have been taken as moderate variation and coefficients above 150% have been taken as high degree of variation. The following conclusions can be drawn from the coefficients of variation for different items.

1) Differing degrees of variation: Different items of expenditure exhibited different degrees of variation. The tables for each item show that variation was high for 3 items of revenue expenditure, viz., road repair, bridge repair and road improvement. Variation was high for 6 items of capital expenditure, viz., new roads, resurfacing, road development, footpaths, subways and flyovers, and miscellaneous capital expenditure. The variation in expenditure was moderate for the following items: Moving electrical poles and maintenance of machinery (revenue expenditure) and cement-concrete roads, bridges, traffic control, street lights, IRDP and purchase of machinery (capital expenditure). The following items showed relatively low variation - Street lights (revenue expenditure), salaries and miscellaneous revenue expenditure from the revenue expenditure category.

Thus there were 9 items (45%) with high degree of variation, 8 items (40%) with moderate variation and three items (15%) with relatively low variation.

The reason for this pattern appears to be as follows: Those items that are in the nature of fixed expenditure showed less variation since the expenditure on these heads has to be incurred each year. Moreover, this expenditure cannot be suddenly increased or decreased. The three items showing low variation, i.e., salaries, street lights and miscellaneous revenue expenditure (which consisted mostly of loan repayment and interest payments) were all fixed costs for the Road Department. Salaries have to be
paid to employees, electricity charges to the electricity company and interest payments to the lending agencies like LIC, HUDCO, etc. Moreover, these payments are made at rates which do not vary drastically in a short period of time. Salary expenditure does increase every year as higher Dearness Allowance, increments, etc. are paid, but the basic salary structure changed for the Road Department only when the recommendations of the Central Pay Commissions were implemented. Even when these recommendations were implemented, the arrears in the salaries were paid to employees in instalments which ensured that there was no sudden jump in salary payments.

Similarly, electricity charges increased when the rates were raised by the MSEB/MSEDCL and also when the number of street lights increased, as in 1997 when the area of the PMC was expanded. But in other years, there was a slow and even growth in this expenditure. Interest payments are also fixed and do not show a sudden increase or decrease unless some new loans are taken or old ones repaid.

On the other hand, items like road improvement, road development, footpaths, bridge repair, etc. are carried out at the discretion of the Road Department and hence the expenditure is increased or reduced depending on the availability of funds or need for this expenditure. Road repair and resurfacing are actually continuous activities of the Road Department, but they showed high peaks in those years when roads were damaged by exceptionally heavy rain, and hence overall variation appears to be high.

Items like traffic control, street lights (capital expenditure), bridges and cement-concrete roads that showed moderate variation are essential, but not fixed like salaries or interest payments. Hence the Road Department was able to increase or decrease this expenditure as needed, but there was no occasion for frequent and large fluctuations in these activities during the period selected for this study.

It can be concluded that items of expenditure that were fixed in nature showed less variation than those items over which the Road Department had more control.

2) Variation higher for capital expenditure: The coefficients of variation were higher for items of capital expenditure as compared to items of revenue expenditure. This pattern can be seen for individual items of revenue and capital expenditure and particularly for total revenue expenditure for which the coefficient of variation was about 90% and that for total capital expenditure was about 130%. Two reasons can be identified for this. Firstly, as mentioned above, variation was lower for items of fixed expenditures, which are all items of revenue expenditure. On the other hand capital expenditure can be increased or decreased by the Road Department, particularly on
heads like road development, footpaths, resurfacing, etc. Secondly, capital expenditure was incurred on creating new assets like new roads, bridges, flyovers, etc. Consequently, the amount of funds involved was much larger than on most items of revenue expenditure. Hence when any of the activities involving capital expenditure was stepped up, there was usually a large jump in the expenditure as seen after 1999 because the area of the PMC was expanded or when schemes like IRDP were implemented from 2001-02.

It can be concluded that there was higher variation in the items of capital expenditure as compared to revenue expenditure of the Road Department between 1985-86 and 2008-09.

3) **Variation lower for total expenditure than individual items:** This pattern can be seen for both revenue and capital expenditure categories. The growth rates which showed some very large highs and lows for individual items cancelled out when all items of expenditure were taken together. The lower coefficients of variation for total revenue and total capital expenditure reflect this more uniform growth in the total budget and total actual expenditure in both revenue and capital categories.

The coefficients of variation for the budget and actual total revenue expenditure were 94% and 92%. This was lower than the coefficients of variation for five of the eight items of revenue expenditure.

The coefficients of variation for the budget and actual total capital expenditure were 127% and 136% respectively. The variation in the budget was lower than that of eight out of the twelve items of capital expenditure. The variation in total actual expenditure was lower than the variation in seven out of the twelve items of capital expenditure.

Therefore, it can be concluded that variation in total expenditure was lower than that of individual items in both the revenue and capital expenditure categories.

4) **Variation in the budget estimate lower than in actual expenditure:** Comparing the coefficients of variation for the budget estimates and actual expenditure on all items, it can be observed that the coefficients of the two series were the same for street lights (revenue expenditure) and almost the same for moving electrical poles. Of the remaining 18 items, the coefficient of variation of actual expenditure was larger than that of the budget in the case of 16 items and the coefficient of variation of the budget amounts was larger than that of the actual expenditure for just 2 items. Where the coefficients of the actual expenditure were larger than those of the planned expenditure, this difference was small in some cases (e.g.,
salaries, miscellaneous revenue expenditure, bridges, capital expenditure on street lights, traffic control etc.) and in some it was quite large (e.g., subways and flyovers).

The reason for this difference in variation is that the budget of the Road Department is made in an incremental manner hence there is not much change in the budget allocations for a particular item from one year to the next unless there is some specific reason for increasing or decreasing the budget by a large amount. There are small changes in the budget allocations in most normal years. These incremental changes in the budget are made on the assumption that conditions will remain much the same as in the previous year. However, when the budget is actually implemented, there can be several changes in the internal and external conditions that cause large swings in the actual expenditure. For instance, abnormally high rainfall, increase in raw material costs, etc. may cause expenditure on a particular item to be suddenly stepped up. Since the total allocation to the Road Department in the budget of the Corporation is fixed, raising the expenditure on one item can be done only by reducing expenditure on some other item. This had caused fairly high fluctuations in the actual expenditure, which are reflected in the higher coefficients of variation.

The same reason explains the difference between the coefficients for total revenue expenditure and total capital expenditure. Since a large proportion of revenue expenditure consists of fixed expenses, the variation in actual expenditure is lower than that for the budget. On the other hand, actual expenditure on capital items can be varied by the Road Department as and when needed, which accounts for the higher variation in actual total capital expenditure as compared to the variation in its budget.

Since capital expenditure has been the larger component of total expenditure from 1997-98 onwards the variation in total expenditure showed a pattern similar to capital expenditure, i.e., the variation in actual expenditure was larger than the variation in the budget.

8.4 Findings and conclusions relating to Budget Utilisation

Budget utilization refers to the proportion of the budget estimate that was actually spent. Here it is calculated as a percentage in order to facilitate comparison across items and across years. The percentage share of the budget that was actually spent was calculated for each item for each year where both budget and actual expenditure figures were available. From these utilization percentages, the average budget utilization percentages for each item for the twenty-four year period studied here were computed.
These average utilization rates are given in Table Nos. 4.1 to 4.18 and 5.1 to 5.27 from which the following conclusions can be drawn.

1) **Average budget utilization was quite different for different items:** Average budget utilization was high (more than 80%) for seven items viz., road repair, moving electrical poles, street lights and salaries from the revenue expenditure category and road development, footpaths and subways and flyovers from the capital expenditure category. Average budget utilization was medium (50% to 80%) for ten items, viz., bridge repair, road improvement, maintenance of machinery, miscellaneous revenue expenditure, building and improvement of new roads, resurfacing, cement concrete roads, traffic control, street lights (capital expenditure) and purchase of machinery. Low average utilization (below 50%) was seen in the case of just three items, bridges, IRDP and miscellaneous capital expenditure. The budget utilization for IRDP appears to be low because of the system of deferred payment under which payment was made over a period of three years.

It can be concluded that budget utilization was between 50% and 80% for most items of expenditure on roads during the period 1985-86 to 2008-09. Overall budget utilization was moderate at 71%.

2) **Category-wise budget utilization:** The average budget utilization rates show that in the revenue expenditure category which consisted of eight items, four items had high budget utilization and the remaining four had medium. There was no item with utilization rate below 50%. On the other hand, in the capital expenditure category, 3 items out of 12 had high utilization, 6 items had medium utilization and 3 items had low utilization. As a result, budget utilization for total revenue expenditure was high at 87% and for total capital expenditure it was lower at 66%.

It may be concluded that budget utilization was high for revenue expenditure and medium for capital expenditure.

3) **Highest and lowest utilization:** Average budget utilization was highest for subways and flyovers at 169%, i.e., actual expenditure was 69% more than the budget. At the other extreme, miscellaneous capital expenditure had a budget utilization of 26%, i.e., only 26% of the budget allocation was actually spent.

4) **Large variation in actual budget utilization:** Although average budget utilization throughout the study period varied between 26% and 169%, the actual values of budget utilization for each item showed much higher variation. The lowest budget utilization was 0% (i.e., some amount was allocated in the budget but there
was no actual expenditure) for bridge repair, cement-concrete roads, traffic control and miscellaneous capital expenditure. Budget utilization was below 10% for several other items. The highest budget utilization was 2906% for subways and flyovers. For several other items, the actual expenditure was 200% to 600% more than the budget. This low or high level of expenditure was usually due to some exceptional circumstance.

From this it can be concluded that actual expenditure was not equal to the planned or budget expenditure (except once, as mentioned above) on any item and that budget utilization rates for the different items showed great variation during the study period.

8.5 Findings and conclusions relating to trends in the expenditure on roads: The trend was calculated for the budget and actual expenditure on roads to ascertain the general direction in which expenditure on each item was moving. When plotted on a graph, these trend figures gave the trend line, whose slope indicated the growth or decline in the time series data which it represented. The steeper the slope of the trend line, the higher was the growth.

The trend was calculated separately for the first twelve years and the last twelve years in order to get a more accurate trend line. The following conclusions can be drawn from the analysis of the trend for the expenditure on roads by the PMC between 1985-86 and 2008-09.

1) Different trends in the two periods: Most of the items of expenditure exhibited different trends in the two sub-periods. A majority of the items showed a slower growth in the first period and a relatively faster growth in the second period. Items that showed this pattern for both the budget and actual expenditure are road repair, road improvement, salaries, resurfacing, cement-concrete roads, footpaths, traffic regulation, total revenue expenditure, total capital expenditure and total expenditure. Thus 10 out of 23 items (44%) showed this pattern in their growth.

The growth in expenditure occurred at the same or similar rates during both sub-periods in the case of subways, street lights (capital expenditure), purchase of machinery, bridge repair, street lights (revenue expenditure), new roads, road development, bridge building and IRDP. Thus 9 items out of 23 (39%) showed the same or similar growth rates over the two sub-periods.

Finally, four items (17%) showed a clear decline or a slowing down in the second period as compared to the first. They were moving electrical poles, maintenance of machinery, miscellaneous revenue expenditure and miscellaneous capital expenditure.
Thus a majority of the items (44%) showed a faster growth in both the budget allocations and actual expenditure in the second sub-period (1997-98 to 2008-09) as compared to the first sub-period (1985-86 to 1996-97).

The conclusion that emerges is that expenditure grew faster in the latter half of the study period (1997-98 to 2008-09) as compared to the first half.

2) **Overall trend:** Although several items showed different rates of growth during the two sub-periods, if the entire study period of 24 years is taken together, four patterns of growth can be discerned, as follows:

a) **Fast growth:** The items showing fast growth over the entire period are road repair, road improvement, resurfacing, cement-concrete roads, traffic regulation, total revenue expenditure, total capital expenditure and total expenditure.

b) **Moderate growth:** Seen in expenditure on bridge repair, new roads, road development, footpaths, bridge building, street lights (revenue expenditure), street lights (capital expenditure) and IRDP.

c) **Slow growth:** Shown by four items, viz., salaries, maintenance of machinery, subways and flyovers and purchase of machinery.

d) **Decline:** Expenditure actually fell in the case of three items, which are moving electrical poles, miscellaneous revenue expenditure and miscellaneous capital expenditure.

It can be concluded that expenditure fell only on three items (13%) and increased in the case of the remaining 20 items (87%). Out of the latter, there was fast growth in the expenditure on 8 items (35% of the total).

**8.6 Findings and conclusions relating to the forecast for the period 2009-10 to 2014-15**

The forecast of the expenditure on roads by the Pune Municipal Corporation during the period 2009-10 to 2014-15 has been statistically calculated by extending the trend line. Therefore, this forecast shows the expected trend in the budget allocations and the actual expenditure on the various heads. Three kinds of trends can be identified in the expenditure during the period 2009-10 to 2014-15.

a) **Fast growth:** Expenditure on the following items is expected to grow at a rapid rate, as shown by the trend line - road repair, street lights (revenue expenditure), total revenue expenditure, resurfacing, street lights (capital expenditure), traffic regulation, total capital expenditure and total expenditure.

b) **Slow growth:** is expected in the expenditure on bridge repair, road improvement, salaries, maintenance of machinery, new roads, road development,
footpaths, cement-concrete roads, bridges, subways, purchase of machinery and miscellaneous capital expenditure.

c) **Decline**: Expenditure is likely to fall on moving electrical poles and miscellaneous revenue expenditure.

It may be concluded that a moderate growth can be expected in eleven items (50%), fast growth in nine items (41%) and decline in two items (9%).

### 8.7 Findings and conclusions relating to Total Expenditure

The total expenditure planned and actually incurred on each item of expenditure during the entire twenty four year period is shown in Table Nos. 4.1 to 4.18 and 5.1 to 5.27.

The Pune Municipal Corporation had estimated a total expenditure of Rs.2533.20 cr. out of which Rs.1793.63 cr. were actually spent. The following conclusions can be drawn from the total budget and actual expenditure figures.

1) The total budget allocated for the different heads of expenditure could not be completely spent, as shown by the total actual expenditure that was smaller than the budget allocations for all items except subways & flyovers.

2) The largest amount of funds were allocated and spent on resurfacing and the least on bridge repair during the study period. Resurfacing was by far the largest expenditure, accounting for almost a quarter (25%) of the total amount of funds spent on roads during the period 1985-86 to 2008-09.

3) Capital expenditure was about 73% of actual expenditure and 78% of the total budget for roads during the study period and revenue expenditure was 27% and 22% of the total actual and budgeted expenditure, respectively. Capital expenditure was about 2.7 times revenue expenditure.

In conclusion, it may be said that out of the total expenditure made on roads during the period 1985-86 to 2008-09 by the Pune Municipal Corporation, the share of capital expenditure was as high as 73%. The priority areas of the Road Department appear to have been resurfacing of existing roads, building new roads and provision of street lights.

### 8.8 Findings and conclusions relating to factors affecting the expenditure on roads:

The growth in expenditure on roads can be explained by two types of factors.

a) **Secular Trend factors**: The overall or long term growing trend in the expenditure on roads was due to growth in the road length in the city as well as the increased wear and tear caused by larger number of vehicles each year. The growth in road length
was necessitated by a growing population which caused the city to spread out. Much of the growth in population was due to in-migration in response to expansion of industries particularly after the policy of globalisation was adopted in 1991 and a large number of manufacturing and IT companies were set up in Pune. At the same time, there was also a fast growth in the number of educational institutions in the city. Thus the factors affecting the long term growth of expenditure were 1) growth of industry 2) growth of population 3) change in government policy 4) growth in road length and 5) growth in the number of vehicles.
b) Erratic factors: There were several factors that caused an irregular pattern of sudden increase or decrease in expenditure. These factors were 1) heavy rainfall 2) expansion in the area of the Corporation 3) increase in electricity charges 4) increase in salaries and 5) short term schemes like the IRDP.

It can be concluded that there were different sets of factors affecting the long term growth and short term fluctuations in the expenditure on roads.

8.9 Findings and conclusions relating to the composition of expenditure on roads:
The following conclusions can be drawn from the analysis of the composition of the planned and actual expenditure on roads.

1. Relative size of revenue and capital expenditure: Revenue expenditure was larger than actual expenditure during the first three sub-periods, i.e., the twelve years from 1985-86 to 1996-97. In the later half of the study period, capital expenditure became much larger than revenue expenditure.

In the first sub-period, the revenue budget per year on an average was almost double (1.94 times) the average capital budget. The average revenue expenditure was 2.6 times the average capital expenditure for this period. In the last sub-period, the pattern had completely reversed, with the capital budget being 4.8 times the revenue budget and capital expenditure being almost four times (3.98 times) the revenue expenditure.

2. Shares of revenue and capital expenditure in total expenditure: In the budget for expenditure on roads, the share of the planned revenue expenditure was larger than planned capital expenditure in the first two sub-periods, i.e., between 1985-86 and 1992-93. From 1993-94 onwards, capital budget became larger than revenue budget, and its share kept increasing till the end of the study period, as shown in Table No.6.2 and Graph Nos.6.7 and 6.8. The share of the revenue budget declined
from 66.02% in the first sub-period to 17.12% in the last sub-period. The share of the capital budget increased from 33.98% to 82.88%.

Actual capital expenditure was less than actual revenue expenditure during the first three sub-periods, i.e. for the twelve years from 1985-86 to 1996-97, after which its share was larger than revenue expenditure and increased continuously till 2008-09. The share of actual revenue expenditure declined from 72.20% in the first sub-period to 20.08% in the last. The share of actual capital expenditure in total expenditure showed a corresponding increase from 27.80% share in the first sub-period to 79.92% in the last sub-period.

In the last four years of the study period, the ratio of capital to revenue expenditure appears to have stabilized at 80%:20%.

From the above two observations about the relative size and relative shares of revenue and capital expenditure on roads, it may be concluded that the Road Department of the PMC gave less importance to the activities that fall under capital expenditure during the period 1985-86 to 1996-97. More funds were being spent only on maintaining the existing road network, with the largest outlay being made on electricity charges for street lights and on salaries, which are fixed costs and have to be incurred every year. The developmental work of building new roads, bridges, flyovers, putting up traffic regulation equipment etc., was given lower priority. It was only after 1996-97 that more expenditure started on developmental work. However, once this change in priorities took place, the expenditure on the items in the capital expenditure category grew very fast and is the priority area at present.

Some of the reasons that could be identified by this study for this change of priority from 1996-97 onwards were -

b) Expansion in the area of the Corporation to include 38 fringe villages in September 1997.
c) Increasing traffic problems and congestion from mid - 1990s onwards.
f) Rapid growth of industries from 2002 onwards.
g) Excessive rainfall in the years 2005-06 and 2006-07.
3. **Variation in the composition of expenditure:** The composition of revenue expenditure remained almost the same throughout the study period, with four items having relatively large shares and four items having small shares out of total revenue expenditure. In all the sub-periods, street lights and salaries were the two largest items, the others being any two out of road repair, miscellaneous revenue expenditure and moving electrical poles. Road improvement, maintenance of machinery and bridge repair were always the smallest items, showing that they were given low priority.

On the other hand, there was more variation in the composition of capital expenditure. In the first period, the highest actual expenditure was on road development, resurfacing and new roads, in the second period the highest actual expenditure was on resurfacing, road development and new roads. In the next two sub-periods, resurfacing was the largest expenditure, and street lights, bridges, traffic control and new roads also had large shares. In the fifth sub-period, the highest expenditure was on cement-concrete roads and other important items were resurfacing, new roads, street lights and IRDP. In the last sub-period resurfacing was the largest expenditure again, and IRDP, Road development, new roads and traffic control were also important.

From this it may be concluded that the capital expenditure category was more flexible and showed more variation that revenue expenditure in its composition. The difference in the two categories is the result of the fact that in revenue expenditure, there are some committed or fixed expenses like salaries and electricity charges, whereas there is no such limitation in the capital expenditure category. This showed that the Road Department had more discretion in deciding capital expenditure.

4. **Expenditure pattern changed according to circumstances:** The expenditure pattern was not rigid and changed according to the needs of the city and according to the prevailing conditions. For example, when the area of the Corporation was expanded, the pattern of expenditure changed to cater to the needs of the new areas or when roads were damaged by rain, more expenditure was made to repair these roads. It can therefore be concluded that the budget for roads was responsive to the needs of the city.

5. **Changes in the relative shares of each item:** Expenditure on each item, if taken as a percentage share of total actual expenditure, showed different patterns as shown in Table No. 6.2. Several distinct patterns were observed, as given below:
(a) **Falling shares:** Several items showed a continuously falling share, although the actual expenditure on some of them had increased. These items were street lights (revenue expenditure), salaries and miscellaneous revenue expenditure. The shares of road and footpath repair and road development also showed a fall during the first five sub-periods, but showed some increase in the last sub-period.

(b) **Increasing shares:** Only two items showed a consistent increase in their share of total actual expenditure, viz., resurfacing and road improvement. Of these, road improvement had very small shares and the growth was also very small. The share of IRDP also grew, but this expenditure was incurred only in the last two sub-periods. The share of expenditure on cement-concrete roads increased up to the fifth sub-period, but fell sharply in the last sub-period. Thus resurfacing was the only item with a clearly growing share of total expenditure.

(c) **Fluctuation within a narrow band:** Several of the smaller items of expenditure showed this pattern. They were bridge repair, moving electrical poles, maintenance of machinery, bridges, purchase of machinery, miscellaneous capital expenditure, footpaths, subways and flyovers and traffic control. With the exception of traffic control and bridges, most of these items had shares around 1% or less and the fluctuation in their shares was, therefore, confined to a very narrow band, between 0% and 2%.

(d) **Fluctuation within a broad band:** Only two items showed a large fluctuation, where there was successive increase and decrease in the share of a fairly large magnitude. They were new roads whose shares fluctuated between 0.42% and 12.56%, and street lights (capital expenditure) whose share fluctuated between 1.90% and 9.11%.

It can be concluded that resurfacing was the only item whose share was growing. The majority of the items (9 out of 20) showed frequent fluctuation in their share of total expenditure, but these fluctuations were small, within a very narrow band.

From all the above observations about the composition of expenditure, it can be seen that there was a clear movement from items of revenue expenditure such as salaries, street lights and miscellaneous revenue expenditure (interest payments) to capital expenditure items like resurfacing, new roads, cement-concrete roads and road development.

It can be concluded that there was a substantial change in the composition of expenditure on roads during the period 1985-86 to 2008-09.

8.10 **Findings and conclusions relating to the Functional Classification of Expenditure on Roads:**
The analysis of the functional classification of the expenditure planned and incurred by the Road Department leads to the following conclusions.

1. **Variations in the shares of each function:** By dividing the expenditure of the Road Department into seven functional categories, some conclusions can be drawn as to variations in the shares of each function during the study period. The analysis of the functional classification of the expenditure on roads as given in Table No.6.3 shows that the shares of the various functions changed over the period studied. The share of expenditure on provision of roads, on the whole, showed an increasing trend, whereas the share of repair and maintenance of roads, though quite high throughout this period, showed some fluctuation. The share of bridge building and repair was quite low throughout. The average share of the traffic control function increased steadily all through the 24 years. The average share of the safety function was consistently high, between 25% and 35% of total expenditure. Administrative expenditure showed a continuously falling average share. Lastly, the share of miscellaneous functions was fairly high for the first 12 years and quite low in the remaining 12 years.

2. **Shares of developmental and administrative expenditures:** Dividing the seven functions into two categories of developmental functions and administrative functions, it may be seen that in both the budget as well as in the actual expenditure, the share of expenditure on developmental functions has grown and the share of administrative functions has reduced over the period taken for the study. In both the budget and actual expenditure, the average share of the developmental functions increased from about 60% in the first sub-period (1985-86 to 1988-89) to just over 95% in the last sub-period (2005-06 to 2008-09). During the same time, the share of administrative functions fell from about 40% to about 4% of total expenditure. This appears to be a healthy trend as more funds are made available for developmental purposes.

   It is important to note that the actual expenditure in rupee terms has grown throughout the study period on both developmental as well as administrative functions. It is the share of developmental functions that has grown and the share of administrative functions in total expenditure that has declined.

3. **Change in composition of expenditure, function-wise:** Expenditure on roads during the period 1985-86 to 2008-09 when arranged function-wise shows the change in its composition from being mainly composed of expenditure on
administration and safety provisions to being dominated by repair and maintenance and provision of roads

It may be concluded that composition of expenditure on roads by the Pune Municipal Corporation changed to a large extent during the period 1985-86 to 2008-09.

8.11 Findings and conclusions relating to the priorities assigned to various functions by the Road Department
The work of the Road Development Department of the PMC was divided into seven functions for the purpose of this study. The priority given to each of these functions was inferred from the amount of expenditure made on it. It was observed that in the first sub-period, priority was given to the functions of administration and safety, in the second, third and fourth sub-periods to safety and to repair and maintenance, in the fifth sub-period to provision of roads and safety and in the last sub-period to repair and maintenance and safety. From this it can be inferred that the priorities of the Road Department changed over time. However, safety of the public appears to be the highest priority, followed by repair and maintenance of roads.

8.12 Summary
The conclusions of this study are summarized below:

1. **Absolute growth in expenditure**: There has been a very substantial growth both in the budget (planned expenditure) and actual expenditure on roads by the Pune Municipal Corporation. Growth in this expenditure was faster from 2005-06 onwards.

2. **Variation in expenditure**: Both the budget estimates and actual expenditure on each item were alternately increased and decreased. Hence it may be concluded that there was considerable variation in the expenditure on all items.

3. **Budget utilisation**: Budget utilisation was moderate for a majority of the items of expenditure. Budget utilisation was high for revenue expenditure and medium for capital expenditure. Overall budget utilisation during the study period was 71%.

4. **Trend of expenditure**: Expenditure on 13% of the items showed a falling trend and the remaining 87% items showed an increasing trend. Out of the latter, there was fast growth in 35% of the items. Overall trend of expenditure was increasing.
5. **Forecast:** The forecast for the period 2009-10 to 2014-15 showed that moderate growth can be expected in 50% items, fast growth in 41% items and decline in 9% of the items of expenditure. Thus expenditure on roads is likely to grow in the future.

6. **Priority of expenditure:** The largest expenditure was on resurfacing of roads when the total expenditure over the entire period was taken. Resurfacing expenditure was about 25% of the total expenditure on roads.

7. **Changes in the composition of total expenditure:** Revenue expenditure was greater than capital expenditure for the first 12 years, between 1985-86 and 1996-97. In the latter half of the study period, capital expenditure exceeded revenue expenditure. This shows the change in the priorities of the Road Department.

8. **Changes in the composition of revenue and capital expenditure:** When the composition of each category, i.e., revenue expenditure and capital expenditure was considered, it was seen that the composition of revenue expenditure remained almost the same but there was considerable change in the composition of capital expenditure during the study period.

9. **Changes in the Function-wise composition:** Initially, expenditure was being made mostly on the functions of administration and safety but by the end of the study period the largest expenditure was on repair and maintenance of roads and provision of new roads. It can be concluded that the priorities of the Road Department changed to a large extent during this period.

10. **Change in the expenditure on developmental and administrative functions:** Dividing the expenditure into developmental and administrative functions, it was seen that the share of developmental expenditure in total expenditure had grown and the share of administrative expenditure had reduced over the study period.

11. **Priorities of the Road Department:** The priority functions of the Road Department, measured in terms of the expenditure incurred on them, changed over time. However, safety of the public appears to have been the highest priority, followed by repair and maintenance of roads.

8.13 **Testing of Hypotheses**

This study of the expenditure on roads made by the Pune Municipal Corporation was based on four hypotheses related to the growth, variation and composition of this expenditure. Each of these is examined below.
1. **Hypothesis 1:** The budget allocations for and actual expenditure on roads by the Pune Municipal Corporation has increased throughout the period 1985-86 to 2008-09. To verify this hypothesis, growth in the expenditure on roads was measured in four ways.

**(i) Absolute growth:** Firstly, absolute growth (i.e., in rupee terms) was seen in the budget estimates and actual expenditure figures for each item of expenditure. The growth in total expenditure (as shown in Table No. 5.27) shows that the budget for the total expenditure on roads increased from Rs. 5.31 cr. in 1985-86 to Rs. 427.48 cr. in 2008-09 (80 times). Actual expenditure on roads grew from Rs. 3.67 cr. in 1985-86 to Rs. 341.89 cr. in 2008-09 (93 times).

**(ii) Trend of growth:** The trend values calculated for each item and plotted on a graph to give a trend line showed that the overall direction in which the budget and actual expenditure on roads was moving was definitely upward for 17 out of 20 items (85%) and was falling slowly for only 3 (15%) of items of expenditure.

The trend for total revenue expenditure, total capital expenditure and total expenditure on roads showed a continuous and fast growth throughout the period 1985-86 to 2008-09.

**(iii) Annual growth rates:** The annual growth rates showed very large fluctuations from year to year as expenditure was alternately reduced and increased on all items. Since there were fluctuations in the expenditure on each item, there were fluctuations in total revenue expenditure, total capital expenditure and total expenditure as well.

Planned total expenditure on roads fell in 6 years and increased in 17 years, whereas actual total expenditure fell in 4 years and increased in 19 years during the period 1985-86 to 2008-09.

**(iv) Compound Annual Growth Rate:** Although annual growth rates showed some variation, there was actual growth in the expenditures on all items over the entire period of 24 years as shown by the Compound Annual Growth Rates. The CAGRs for the budget varied between 8.07% for Salaries to 38.04% for Cement-concrete roads. The CAGRs for actual expenditure were between 7.67% for miscellaneous revenue expenditure and 40.20% for new roads. Thus growth was positive for all items of expenditure.
The hypothesis that expenditure on roads increased throughout the period 1985-86 to 2008-09, therefore, is validated since there was a definite overall growth in the budget and actual expenditure on roads during the study period.

2. **Hypothesis 2:** Expenditure on roads by the Pune Municipal Corporation will continue to grow in future.

In order to test this hypothesis, the forecast of the budget and actual expenditure on roads by the PMC for the period 2009-10 to 2014-15 may be used. The forecast showed that a fast growth in expenditure is expected for 41% of the items, moderate growth for 50% of the items and a decline in 9% of the items.

Taking all items of expenditure together, the trend line for the total expenditure shows a fast growth during the forecast period. The trend value for the total budget is expected to grow from Rs.408.33 cr. in 2009-10 to Rs.565.38 cr. in 2014-15 and actual expenditure is expected to grow from a trend value of Rs.297.86 cr. to Rs.412.43 cr. during the same period.

Therefore, the hypothesis that expenditure on roads will continue to grow in future stands validated.

3. **Hypothesis 3:** Budget utilization for the expenditure on roads by the Pune Municipal Corporation has been low over the period 1985-86 to 2008-09.

This hypothesis can be tested by using the budget utilization rates that have been calculated for each item in each year of the study. From these figures, the average budget utilization rate was found which showed the overall budget utilization for each item during the entire period. These average rates showed that budget utilization was high (above 80%) for 35% of the items, moderate (50%–80%) for 50% of the items and low (below 50%) for 15% of the items. Thus budget utilization was moderate for the maximum number of items. Secondly, average budget utilization for total expenditure was 71%, which can be said to be moderate.

Therefore, the hypothesis that budget utilization was low for expenditure on roads during the period 1985-86 to 2008-09 is disproved since budget utilization was moderate both for total expenditure as well as for the majority of individual items.

4. **Hypothesis 4:** The composition of the expenditure on roads by the PMC has changed over the period 1985-86 to 2008-09.

The composition of expenditure was shown by the relative shares of the various items in the total expenditure for each of the six sub-periods into which the study period was divided and also by computing function-wise expenditure.
The following criteria can be used to identify the changes in the expenditure on roads.

(i) **Relative shares of revenue expenditure and capital expenditure in total expenditure:** The total expenditure planned for roads in the first sub-period 1985-86 to 1988-89 was composed of revenue expenditure with a share of 66.02% and capital expenditure with a share of 33.98%. The share of revenue expenditure successively reduced and that of capital expenditure gradually increased till in the last sub-period (2005-06 to 2008-09), the share of revenue expenditure was 17.12% and that of capital expenditure was 82.88%. Similarly, the composition of actual expenditure changed from a 72.20% share of revenue expenditure and 27.80% share of capital expenditure in 1985-86 to 20.08% share of revenue expenditure and 79.92% share of capital expenditure during the last sub-period, 2005-06 to 2008-09. This was a substantial change in the composition of expenditure of the Road Development Department and related departments.

(ii) **Composition of revenue expenditure and capital expenditure:** There was not much change in the composition of revenue expenditure on roads during the study period. On the other hand, the composition of capital expenditure changed quite frequently, with substantial changes in the shares of the various items.

(iii) **Composition of Total Expenditure:** Taking all items of expenditure together the composition of total expenditure was seen to have changed over the study period. The shares of the various items out of total expenditure showed different patterns in each sub-period.

(iv) **Changes in the relative shares of various functions:** Dividing the expenditure on roads into seven functions, it was observed that the expenditure in the first sub-period was mostly made on administration and safety provisions, in the second, third and fourth sub-periods on safety and repair of roads, in the fifth sub-period on provision of roads and safety and finally in the last sub-period on repair and maintenance of roads and on provision of roads. The composition of expenditure changed from one which consisted mostly of administrative and safety-related expenditure to one which had a larger share of repair and maintenance expenditure.

(v) **Developmental and administrative expenditure:** Lastly, dividing all expenditure into two categories of developmental and administrative expenditure, a clear expansion in the shares of developmental expenditure from about 60% in the first sub-period to over 95% in the last sub-period was seen, accompanied by a reverse movement in the share of administrative expenditure from about 40% to about
5% of total expenditure. Therefore, the hypothesis that the composition of expenditure on roads changed over the period 1985-86 to 2008-09 is validated.

8.14 Suggestions:

From this study of the expenditure on roads and the conclusions drawn from it, the following suggestions can be made for the expenditure on roads by the PMC to be more effective and for controlling this expenditure. A high level of expenditure on roads is an indicator both of the higher priority given to roads and a higher level of the service, which is definitely desirable from the point of view of the citizens. At the same time, since resources are limited, expenditure must be made in the most efficient manner, i.e., giving maximum benefits at minimum costs, reducing wastage and avoiding external pressures.

A few suggestions are given below:

1. **Use of Plastic Waste in Road Construction:** The Indian Roads Congress, an organisation involved in research in road construction has recommended that plastic material be used along with the bitumen for surfacing roads to improve their durability and reduce costs, besides protecting the environment by reducing plastic waste. It has been observed that addition of plastic waste up to 10-15% by weight of bitumen resulted in higher values of softening point and lower values of penetration by water. Such roads can withstand higher traffic load and high temperature variation as they are twice as strong as normal roads. They have high resistance to water stagnation hence no pot holes are formed. They show less melting of the surface layer, in summer. No extra machinery is needed; in fact, it helps to reduce costs by reducing the consumption of the bituminous mix. Finally, burning of plastic waste can be avoided, which reduces air pollution (cpcb.nic.in). This technique can be tried out by the PMC in order to build stronger roads at lower cost and to protect the environment from the rising piles of plastic waste.

2. **Reduce Electricity Charges:** This cost has been very high throughout the study period. The Road Development Department and the Electrical Department need to find various ways for reducing costs and particularly to reduce wastage. Electricity consumption can be reduced by putting timers on all street lights so that the lights can be switched on and off at fixed times. In summer when daylight hours are longer, this time can be shortened to further save on electricity. Some measures like switching on alternate street lights after midnight and using more efficient lamps that consume less
electricity can be tried out. Use of solar power for street lights is another long-term option that may be considered. Similar cost control measures should be worked out for other activities as well.

3. **Traffic Regulation:** As shown by this study, the traffic regulation function was given low priority up to 2000-2001. Although it was given somewhat more importance in later years, it needs to be given more attention in order to solve problems like traffic jams, accidents and pollution. More subways and flyovers on crowded roads, separate lanes for buses (the Bus Rapid Transport System which has been implemented on a few roads), traffic signals for all major crossings, traffic lanes, parking lots etc. need to be provided urgently in all parts of the city as traffic congestion is high not only in the central areas but also in the outlaying areas of Pune City.

4. **Cement-concrete roads:** Several cement-concrete roads were built during the period 2001-02 to 2006-07 but since then the allocations to this activity appear to have been reduced. Considering the higher durability of these roads as compared to tar roads, the road development department should plan to convert more roads to cement-concrete.

5. **Road Development:** The study showed that the road development activity was not given a high priority during the period 1985-86 to 1998-99. Although expenditure on this head has been stepped up from 1999-2000 onwards, it can be given more attention. Facilities like dividers, railings, speed breakers, parking lots etc. need to be provided on all roads for the smooth flow of traffic.

   A special mention needs to be made of storm drains. Every road needs a system to allow rain water to flow off the road either through underground storm drains or concrete channels on either side of the road. This is necessary because flooding not only causes accidents and traffic jams, but also reduces the life of the road. The Road Development Department is then required to spend large amounts on repairing and resurfacing such roads repeatedly. This amount could be saved and used elsewhere to provide better facilities. Water logging in main squares where traffic is heavy needs to be urgently addressed as this causes huge traffic jams and accidents. Not only do storm drains need to be built, they need to be cleaned frequently to ensure that they are not blocked. The expenditure analysis in this study showed that the road development department gave more importance to this function only after 2006. This work needs to be stepped up further.

6. **Regular maintenance:** The outlay for maintenance of bridges, machinery, street lights and other assets was quite low during the period 1985-86 to 2008-09, as
shown by this study. However, if regular maintenance is carried out, less expenditure will be required for major repairs at a later date.

7. **Cleaning of streets**: This activity (part of road improvement in this study) was also given very small allocations. The road development department needs to improve on this service firstly by employing more cleaners and ensuring regular cleaning and secondly by putting strong deterrents in place that will stop people from throwing rubbish on the roads.

8. **Shifting service lines**: Underground service lines for water supply, drainage and electricity and telephone cables must be laid at the sides of the road, at least for new roads and shifted from under old roads wherever possible, so that the roads are not damaged by the other service providers.

9. **Co-ordination between service providers**: Where service lines cannot be shifted, co-ordination between the road departments, water supply department, drainage, electricity and telephone departments is required to avoid frequent digging of roads. All these departments must plan their work together so that damage to roads is minimized.

10. **Outcome budgeting**: The system of budgeting used by the road development department appears to be the traditional system of incremental budgeting that is focused mainly on the outlays or expenditure on various items, without finding out the result of that expenditure. The next step could be to move to a system of performance budgeting, which shifts the focus from inputs to outputs or end-results. Performance budgeting takes into account the relationship between the flow of financial resources and the actual physical targets achieved, thereby becoming a measure of performance control.

    Outcome budgeting goes one step further and evaluates expenditure in terms of intended outcomes. Outcomes are expected benefits from a particular service. For example, in the case of roads, the input is the amount of money allocated for a specific purpose. The output is the physical product, such as kilometers of roads or number of street lights. Outcomes are the benefits resulting from outputs, which correspond to the ultimate aim of the local government. For example, the outcome of expenditure on roads is the benefit accruing to the public if they are able to travel faster, more comfortably, at lower cost, without danger of accidents. Outcome of street lights is the convenience and safety of the citizens.

    The road development department should take into account these final outcomes while preparing its budget so that larger allocations could be made to these activities that have the highest positive outcomes. In other words, the budget should
be made in such a way as to maximize welfare of the citizens and not for achieving any political or administrative goal.

11. **Administrative reforms:** The road department needs to streamline the whole administrative procedure involved from sanctioning of a project to its completion. The process of issuing tenders, awarding contracts and giving the work order needs to be speeded up. Due to delays at this stage, several projects do not get started in the same year as they are proposed in the budget. When the work starts, the engineers need to be more vigilant about the quality of the material being used by contractors to see that it meets the specifications in the tender. The quality of the work needs to be strictly supervised and timely completion insisted upon. The completion certificate should be given only when a job is completed satisfactorily. If the road gets damaged within some specified guarantee period, the contractor should be required to carry out repairs at his own cost.

12. **Public participation in the process of building roads:** The PMC needs to introduce more transparency in the entire process of bidding for tenders and also in declaring the norms through which contracts are sanctioned. Industry representatives, citizens, NGOs, and other stakeholders could be involved in regulating the process of building and maintaining the road network and in making sure that the work is completed on time and also with the quality decided upon in the tender.

13. **Build awareness among the public:** Lastly, one very important responsibility of the road development department is to build awareness among the public to refrain from damaging roads. One of the major reasons for damage to roads is digging of roads by the people for various reasons like putting up pandals during festivals, putting up poles for displaying advertisements, etc. Although permission from the corporation is required for these activities, such rules are largely disregarded and roads are dug up by the people themselves. In this case, the road department cannot be blamed. People in the city should be more responsible and take better care of the roads that are so essential a part of their lives.

8.15 **Conclusion**

This study has shown that the provision of roads is one of the important functions of an urban local government in India. The Pune Municipal Corporation is responsible for building and maintaining the roads in the city of Pune. The Pune Municipal Corporation spends a large proportion of its budget on roads. This
expenditure has been growing throughout the period 1985-86 to 2008-09 and the composition of this expenditure has changed over this period from being concentrated on revenue expenditure to being dominated by capital expenditure. The road network in Pune has been growing both in terms of road length as well as in terms of new facilities like subways, flyovers, cement-concrete roads, etc., which have improved mobility in the city. This study has predicted that expenditure on roads is expected to continue to grow during the period 2008-09 to 2014-15, a finding which is supported by the projected growth in the number and size of industries in Pune, accompanied by a growth in population and in number of vehicles.

Although a large number of industries in Pune were optimistic about its prospects as an investment destination, they did express the view that infrastructure in Pune needs a major boost (MCCIA 2008: 150). The infrastructure gap in Pune, however, needs to be looked at as an opportunity and not a threat. There is no doubt that investment in building world class roads, bridges and other infrastructure facilities needs to be stepped up. It is a proven norm that such investment creates multiplier effects in terms of growth, turnover and employment in the area where it takes place. A high and growing investment in roads, therefore, needs to be looked at as a source of growth and prosperity for Pune in the future.

References