Discussion Paper No. 10
February 1993

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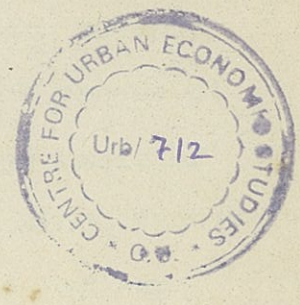
ABSTRACT$^{\varphi}$

In this paper the author attempts to provide a comprehensive account of the passenger transport service in the City of Calcutta and evaluates the performance of various modes of passenger transportation, like state bus, tram, private bus, mini bus, taxi and slow-moving vehicles. And to complete the scenario, brief reviews of sub-urban train services, ferry services and metro-railway have been included also. It has been found that while people in Calcutta are relatively more dependent on private transport services, the service provided by the state agencies, namely, state bus and tram are quite substantial.

φ This study is based on data upto 1984-85 only.

The author is grateful to Prof. Biplab Dasgupta and Sri Pabitra Giri, both from Centre for Urban Economic Studies, for their comments and suggestions at various stages of the preparation of the paper. However, the usual disclaimer applies.



PASSENGER TRANSPORT IN CALCUTTA METROPOLITAN DISTRICT

Sudeshna Sen

I

I. Introduction

This study attempts at presenting a comprehensive account of the mass road transport situation in the city of Calcutta, and examining, for the past decade, the performance of various modes of passenger transportation.

In Section II, a tentative overview of all the major modes of passenger transportation, such as, state bus, tram, private bus, mini bus, taxi and slow moving vehicles is given. To complete the picture, some information regarding suburban train service, ferry service and metro railway system have also been provided.

In Section III, the relative importance of different modes of transport are analysed on the basis of three chosen indicators. For lack of data, this analysis is confined only to four modes of transport : state bus, tram, private bus and mini bus. In Section IV, the cost effectiveness of those four modes of transport are examined on the basis of their yearly earnings and expenditure figures. Since figures for yearly capital expenditure are not available for any of the above modes and those for depreciation costs are available only for state bus and tram, comparison of different modes is carried on in two sub-sections : one, where

state bus and tram have been compared by taking into account depreciation costs, and the other where all the four modes have been compared on the basis of yearly earnings and yearly operational and maintenance costs. Section V deals with various problems associated with the passenger transport sector and also some suggested measures which might lessen the severity of their impact.

In Section VI, we discuss how far the urban poor can take advantage of the prevalent transportation system and in what direction transport policies should be guided to serve them adequately. In Section VII, the general transport policy implications of our discussion have been analysed as also some investment programmes specific to Calcutta. Section VIII brings together the main conclusions of this paper.

Data have been collected mainly from the following official sources : The Calcutta State Transport Corporation; The Calcutta Tramways Company; Transportation Planning and Engineering Directorate, Transport Department, Government of West Bengal; Public Vehicles Department, Calcutta, Government of West Bengal; and Statistical Section, Calcutta Traffic Police, Lalbazar, Calcutta. In addition, various books, reports, and published and unpublished papers have been consulted. These data mainly cover the Calcutta city and its suburbs, and occasionally also other parts of the Calcutta Metropolitan District. It must be added that our study has been severely handicapped by data shortage and virtual non-availability of data for the private sector.

II. An overview of the transportation system in the Calcutta Metropolitan Area

The basic function of urban transport is to link residence and employment, and producers and users of goods and services (both intermediate and final). In addition, urban transport performs a large number of other urban public services mainly by making various facilities accessible to the citizens, e.g. by determining for a neighbourhood whether, or how, solid waste is collected, water, sewerage, drainage and electricity networks are provided and maintained, and schools and health care are maintained within the reach of the urban dwellers.

To take account of the demand of the inhabitants for transport services we have sub-divided Calcutta Urban Agglomeration (excluding Calcutta and Howrah) into the following zones : North-east, south-east, north-west and south-west. Table 1 shows the population figures for these four zones and Calcutta and Howrah cities.

From Table 1 it is clear that the north-east zone, together with Calcutta city, has about 63% of the population of Calcutta Urban Agglomeration, followed a long way behind by south-east and north-west, whereas the share of the south-east is very low. So, the demand for transport service comes mainly from Calcutta city and the north-east zone of Calcutta Urban Agglomeration.

To maintain the transport links several alternative modes of transport are available, e.g. bus, tram, taxi, mini-bus, rickshaw, train and ferry service, all of which are commonly recognised as mediums of public transport. Now, not all these transport facilities are used for linking the city with its suburban area or to maintain link between different suburban areas. (See Table 2).

Although this study is only concerned about road transportation within the city of Calcutta, transport modes other than those which are road-based and transport links with areas outside the city are also mentioned in the above table.

Rail transport

The rapid expansion of urban settlements within the Calcutta Metropolitan District has brought about chronic deficits in the transportation system. Rail transport has, to some extent, helped to lessen the degree of crisis in the transportation system. Until 1983, railways have been providing services primarily to the suburban passengers as far as Burdwan, Krishnanagar and Bongaon on the north and Kharagpur, Diamond Harbour and Canning on the south.

There are 230 kilometres of rail track within the Calcutta Metropolitan District, covering 85 stations at an

average interval of 2 to 2½ kilometres,[1] and 8 junction stations located at Bandel, Seorafully, Dum Dum, Bally, Barasat, Ballygunj, Sonarpur and Barrackpur.[2] Besides, the only two terminal stations are located at Sealdah and Howrah. To deal with the continuously increasing suburban passenger traffic, electrification was first introduced in 1957, and the three sections in CMD were electrified as indicated below.[3]

	Branch	Year of opening
Eastern Railway	Howrah Division	1957-58
South Eastern Railway	Sealdah Division	1963-66
South Eastern Railway	Howrah Division	1968

Suburban passengers handled at the two terminal stations registered an increase of 5.2 per cent, as indicated in Table 3, on the basis of the number of tickets sold during 1971-72 to 1980-81.

Table 3 shows that although the number of passengers served by eastern railway, as well as, south-eastern railway have maintained a rising trend upto 1978-79, after that there has been a decline. Some possible reasons might be stated for this. Firstly, since these figures are based on ticket sales, there might always be gross underestimations of the actual use. Secondly, the development of long-distance suburban bus service in recent years might have drawn away a certain proportion of passengers who would have otherwise used the railways.

In CMD, however, the number of passengers carried per day by the suburban trains was noted to be 1713000 in

In CMD, however, the number of passengers carried per day by the suburban trains was noted to be 1713000 in 1978-79[4] and a head count during April 1981 revealed that approximately 235000 and 353000 suburban passengers arrived at Howrah and Sealdah Stations, respectively, on an average weekday.[5] Of these 131000 and 149000 came to Howrah and Sealdah Stations, respectively, during the morning peak period between 8 a.m. to 11 a.m. Moreover, of these passengers, more than 50,000 per hour did so during 9 a.m. to 11 a.m. in each of these stations,[6] but the hourly figure for Sealdah between 9 a.m. to 10 a.m. was 57,900 on an average weekday.[7]

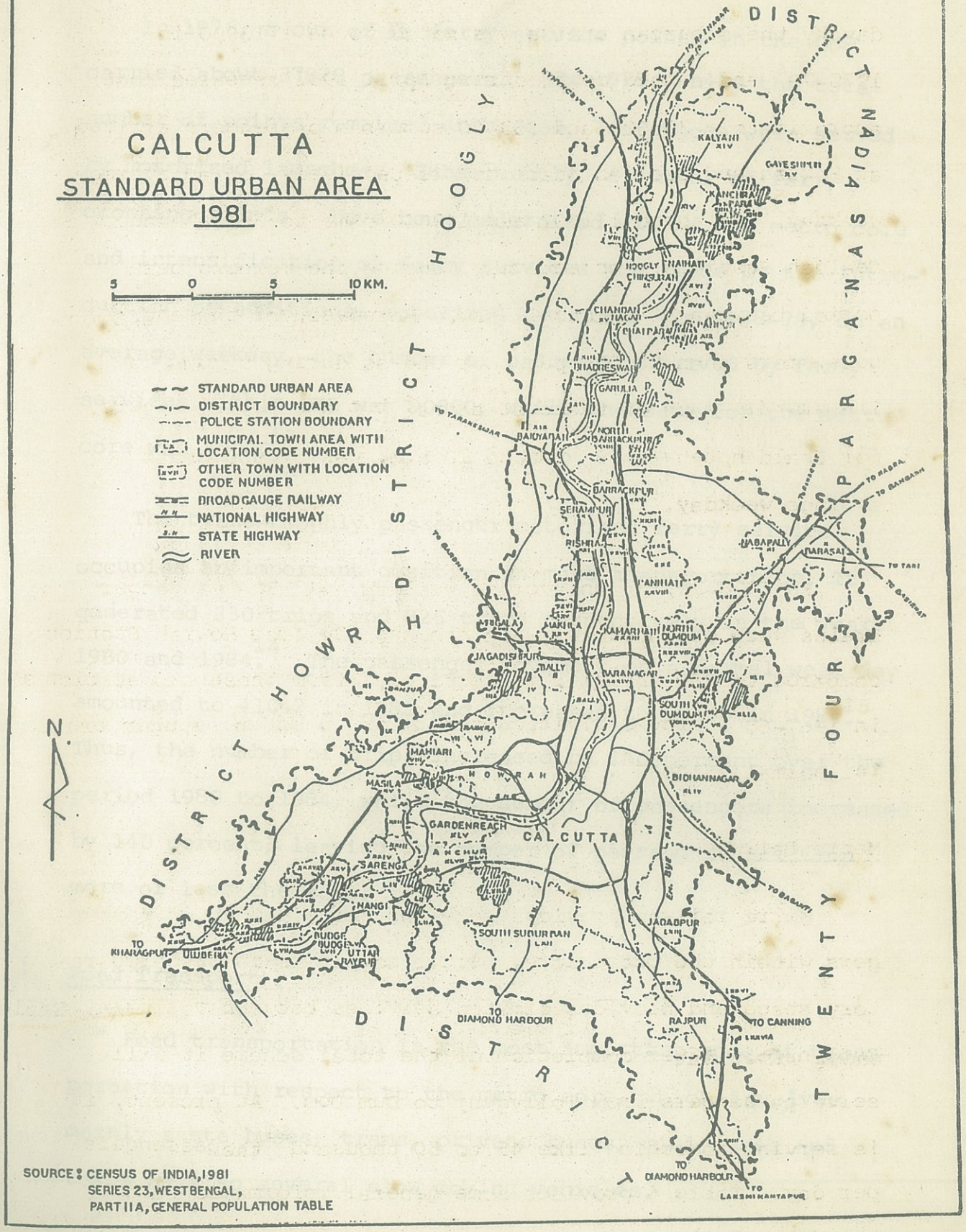
In 1978-79, on an average weekday, 412 EMU passenger trains were operated from Sealdah and 284 from Howrah Station[8] compared to 360 and 216, respectively, from these two stations in 1967-68[9]. The carrying capacity of an EMU passenger train is normally 1600[10].

Metro Railway

Metro railway provides services for movement of passengers within the metro core. Still now it is in its preparatory stage and provides limited services between Tollygunj Esplanade. After the completion of the total scheme it will serve passengers from Tollygunj to Dum Dum. At present, it is serving something like 45 to 50 thousand[11] passengers per day. Table 4 provides some general information about the Metro Railway.

CALCUTTA

STANDARD URBAN AREA 1981



SOURCE: CENSUS OF INDIA, 1981
SERIES 23, WEST BENGAL,
PART IIA, GENERAL POPULATION TABLE

Water Transport

In 1976, 6 out of 31 ferry service points in the CMD carried about 37828 passengers.[12] By 1978, while the total number of points remained unchanged, 7 of those were served by motorized launches. Subsequently, a number of ferry crossing points have been modernized within the metro core and intensification of ferry services was made by the introduction of additional motorized launches. In 1978-79, on an average weekday, the number of passengers served by ferry services within CMD was 90000, while the same for the metro core was 40000.[13]

The trans-Hooghly passenger motorized ferry service occupies an important position in mass transportation. It generated 330 trips and 825 trips respectively in the years 1980 and 1984.[14] The passenger movement on a normal week day amounted to 41042 in 1980 and increased to 98340 in 1984.[15] Thus, the number of trips increased by 150 percent over the period 1980 to 1984, while the number of passengers increased by 140 percent, leaving the number of passengers per trip more or less the same.

Road Transport

Road transportation is the most important mode of transportation with respect to the metro core, which involves mainly state buses, trams, private buses, mini buses and taxis as also several slow moving vehicles.

State Bus

The Calcutta State Transport Corporation (CSTC) is a public sector undertaking of the Government of West Bengal in the metro core and in its suburban area. From a humble beginning in 1948 as a Directorate under the State Government, with a fleet of 25 petrol driven buses, it was constituted into a Corporation under the Road Transport Corporation Act, 1950 on 15th June 1960 with the main objective of providing an efficient passenger transport service in Calcutta.[16] From 1960 to 1966, the CSTC buses were practically the only bus system for intra city travel and during this period the number of bus routes increased from 28 to 31. Even in 1970-71 the number of routes was 30.[17] The Corporation had about 9200 employees in 1960-61 which rose to 13300 in 1982-83 and 14300 in 1986-87,[18] by when the number of routes also had increased to 68 for the city routes and to 90 for the long distance routes.[18] Some operational data from 1975-76 to 1984-85 are provided in Table 5.

It is observed that the number of passengers carried and the percentage of outshedding reached their peaks in 1979-80 when the cars on road and kilometres travelled per day were also significantly high. Since then all these variables have shown a decline (excepting for buses on road/day in 1980-81 and 1982-83, and for kilometres travelled/day in 1983-83). The only variable to show an increase is that relating to fleet strength, but when adjustment is made for outshedding, the

number of buses on road was lower in 1984-85 compared to 1979-80. Furthermore, the number of buses on road does not always correspond to the mileage covered in a year : in 1979-80 only 721 buses were outshedded and they travelled, on averages 117500 kilometres per day; whereas in 1980-81 and 81-82 while buses on road were 738 and 723, respectively, the average kilometres travelled were 116330 and 116470, respectively. It is clear that the average trips performed per bus was higher in 1979-80 than in 1980-81 and 1981-82.

Tram

In this city trams first rolled on tracks as far back as February 24, 1873 under the Calcutta Corporation.[20] The trams were then horse-driven and the routes were from Sealdah to Armenian Ghat via Baitakkhana Road, Bowbazar Street, Dalhousie Square, Customs House and Strand Road.[21] However, this pioneering venture was soon abandoned because the Corporation of Calcutta sustained a loss of Rs. 500 per month on this project.[22] It took another seven years before, under the Tramways Act of 1880, the newly set up Tramways Company re-introduced horse-driven tram cars from November 1, 1880.[23] The first electrically operated tram car was introduced on March 27, 1902.[24]

The Company being British owned, there was a demand for its nationalisation after the independence of the country. Accordingly, in 1951, the Calcutta Tramways Act, 1951 was enacted, conferring the right on the Government of West Bengal to purchase the Company on January 1, 1972, or at any time thereafter.[25] Following this legislation,

the British management of the Company stopped any further investment towards normal maintenance of rolling stock, tracks and overhead system and towards further extension of any line. By the mid-sixties the entire tramway system was in shambles; the management even failed to pay the workers their due wages. Therefore, in July 1967, the management of the Company had to be taken over by the State Government.[26] Finally, in 1978, this was converted to a state-owned company, The Calcutta Tramways Company (1978) Limited, enforcing the Tramways Acquisition Act, 1976.[27]

Trams are operated in three shifts from 9 termini and 7 depot, which are mostly located within the city thereby reducing dead kilometre run to the minimum.[28] The holding capacities of various depots are as follows.[29]

Depot	Capacity (No. of cars)
Belgachia	109
Rajabazar	102
Park Circus	57
Gariahat	62
Kalighat	21
Tollygunj	53
Khidderpur	33
	437

In 1973, the number of passengers carried by trams was 767123 per day,[30] while the number of routes was 25 and the route length in kilometre was 69.44.[31] Although the fleet strength was 411, the average daily number of trams put on road was 318.[32]. The number of employees in the Company was about 7900 in 1973 which

is at present 9097.[33] At present there are also 10 sub-stations and 65.5 kilometres of double track for the operation of tram-cars.[34] Some operational data are provided for the period from 1975-76 to 1984-85 in Table 6.

Table 6 shows that the fleet strength of the Company has continuously declined over this period. While the number of passengers carried per day increased over the period from 1976-77 to 1980-81, it declined in the following years. It should also be noticed that the number of passengers carried per day does not correspond to the outshedding percentage when fleet strength remains the same. This may be due to variation in average trips performed per tram. Again, though, in 1975-76, with the peak fleet strength, the highest number of kilometres was travelled and a large number of cars were on road than in 1980-81, the number of passengers carried per day was much less than in 1980-81. This too might be due to the far higher average number of trips performed per tram in 1980-81 than in 1975-76.

Private bus

Besides the two nationalised organisations, the Calcutta State Transport Corporation and the Calcutta Tramways Company, mass transportation by roads is also provided by quite a large number of private operators, among which the service provided by private buses is the most valuable. Private buses are run by private operators on sanctioned routes; permits and licencesfor individual vehicles and/or routes are issued by the Public Vehicles Department and Regional Transport Authority (RTA) under the Home (Transport) Department, of the Government of West Bengal. The Regional Transport Authority (RTA) fixes the fare structure with the approval of the State Government, while the frequencies and the trip times on the routes are controlled by the concerned route associations. The employment of staff on the buses and other liabilities lie with the owner/association of each bus/route. All private buses are single-decker with seating capacities varying from 36 to 40.

Under the Motor Vehicles Act (1939), the Regional Transport Authority was constituted in 1940, and about 550 stage carriages owned by 332 private owners used to ply in 23 routes in Calcutta to serve 2.17 million resident population.[35] Until 1948, when state buses started to operate, the private buses had monopoly over passenger transport by bus in Calcutta.

In the initial period after its formation, the Calcutta State Transport Corporation did operate their buses only in routes where there was no competition, but, subsequently, it enlarged its services by the taking over in phases routes operated by the private buses. By 1966, except for three routes all others were operated by the Calcutta State Corporation.[36] In 1968, follow strikes in the Calcutta Tramways Company and the Calcutta State Transport Corporation, private buses on suburban routes were again allowed to extend their services into the city.[37]

By 1973, there were about 85 routes of private buses, of which 29 were city routes.[38] By 1976, 1480 private buses operated in 60 routes within the area of the metro core on an approximate total route length of 1304 kilometres.[39] Like state buses and trams, private buses too carry passengers in overloaded conditions. It was noted in 1976 that private buses carried 3 to 5 million passengers daily, rising from 2.8 million in 1970-71.[40] By 1978-79, private buses carried 5.74 million passengers daily within CMD.[41] The road length on which the private buses ply has increased from 26.97 kilo metres in 1964[42] to 215.50 kilo metre in 1971 and to 339.18 kilo metre in 1980-81 in the metro core, of which 273.66 kilo metre was

in the east bank and 65.52 kilometres in the west bank.[43] Since 1970-71, the private buses are providing services to 60 percent of the total transit passengers within the metro core, their highest share, of 64 percent having been reached in 1976.[44]

Information about the physical strength of private buses are available from the following three sources :

(i) Transportation Planning and Engineering Directorate, Transport Department, Government of West Bengal. The information provided by them are mostly based on surveys conducted on different roads for a period of twelve hours.

(ii) Public Vehicles Department, Government of West Bengal. Since they are entrusted with the task of issuing permits to the private operators, the information provided by them are based on those.

(iii) Statistical Section, Calcutta Traffic Police, Lalbazar, Calcutta. They provide information on the number of vehicles registered with them.

Table 7 provides information on the physical strength of private bus over the period 1973 to 1986, based on these three sources. A comparison of the three sets of figures, provided by three different sources, shows a large degree of variation among them. Figures provided by source (i) are always less than those given by source (ii), since source (i) indicates buses actually on road while source (ii) indicates the sanctioned strength of buses with valid permits. Again, figures from source (iii) are greater than those from source (ii) as the former includes also those registered in adjoining 24-Parganas district. Inspite of all these variations, the table shows that the physical strength of private buses has considerably increased over the period from 1975 to 1985. Although, both sources (ii) and (iii) show that during this period the figures have more or less doubled, the less than proportionate increase in figures given by source (i) implies a fall in outshedding percentage.

Mini bus

Mini bus was first introduced in the city in 1972. Initially standing in the mini buses was not allowed, but, subsequently, in view of the demand from both the passengers and the operators, it was allowed. As a consequence, today they are no less crowded than any other type of mass transit modes. The mechanisms for the issuing of route permit and licence and the operation of mini buses are similar to those of the private buses.

The total road length on which mini buses ply was about 248 kilometres in 1981-82 within the metro core, in 62 routes, of which 40 were in Calcutta and 22 in Howrah area.[45] One of the important features to be noted is that almost all the mini bus routes touch B.B.D. Bag area; in 1976, out of a total of 39 routes 33 did so while the rest touched Howrah Station.[46] In 1978, the total number of passengers carried daily by mini buses was recorded to be 165000 on an average weekday in CMD, out of which 159000 was in the metro core itself.[47]

The information about the physical strength of mini buses are provided by the three sources which we referred to in connection with the private buses and Table 8 gives the same type of information.

The figures provided by source (ii) are more or less consistently greater than those given by sources (i) and (iii); because source (ii) indicates the sanctioned strength of all the mini bus routes. Inspite of all these variations, it is clear that the physical strength of mini buses has increased to a significant extent over this period.

Other types of buses

Apart from all these bus services, the popularity of hired car service and chartered bus services is increasing greatly day by day. Hired car services are mainly provided to the high officials by both government and private agencies which are generally engaged on a monthly basis. Similarly, chartered bus services are provided by a few transport companies which pick up passengers

at pre-selected points. These types of services are usually availed by moderately paid office employees at a fixed monthly payment.

T a x i

Taxi is another major mode of road transportation, which is used by the economically well off section of the population. The Nos. of taxis which ply on the streets of Calcutta are given in Table 8 for various years. It shows that the registration of taxis has continuously increased since 1978, ignoring an insignificant decrease in 1985.

From 1968, in addition to the normal hired service provided by the taxis, the government has allowed the operation of "shuttle taxi" services from 14 scheduled points to carry 4 passengers at a time from 8 a.m. to 8 p.m.[48] But, ignoring the rules, the shuttle taxis usually carry at least 5 passengers at a time, apart from the driver, charge their own arbitrary rates and operate beyond scheduled hours. At present, the tendency on the part of most of the taxi owners is to provide such types of services, at the cost of the regular taxi services.

Slow moving vehicles

Slow moving vehicles are defined as those which are driven manually or by animals. In Calcutta various types of slow moving vehicles are still plying on roads, the most popular or prominent among those, which provide a very useful door to door service over short distance by carrying passengers are rickshaws. Then there are also hand carts, push vans and cycle vans, which mostly carry goods, and horse-drawn carriages. Table 10 shows the numbers of different types of slow moving vehicles.

Over the 8-year period from 1978 to 1985, the numbers of rickshaws, hand carts, push vans and cycle vans have remained constant, because the state government has refused further registration of slow moving vehicles. For horse-drawn hackney carriages, the figures show a continuous decline since 1979.

Although the registered numbers of slow moving vehicles are either constant or decreasing, it is commonly known that their numbers - when those unregistered are taken into account - are actually increasing. A report indicates that there are about 30,000 rickshaws which ply in the city at present, of which about one in five are registered.[49]

III Relative importance of different modes of mass-transportation within the city

In this section we intend to examine the relative importance of different modes of mass transportation in the city on the basis of some indicators, particularly in cases of state-owned bus, tram, private bus and mini-bus. The following three indicators would be considered in relation to these modes :

(i) Passengers served;
(ii) Kilometres served;
(iii) Passenger- kilometres served

The last, 'passenger-kilometres served' combines the other two indicators, and provides a good measure of the importance of a particular transport mode.

Passengers served

Table 11 shows the absolute figures for passengers carried per day by different modes of transport. It shows that private

buses occupy the most important position among the four major modes of transport, while state bus and trams are more or less of equal importance. However, although the figures for state bus and tram have remained more or less the same for the three years under consideration, the figures for private bus for the year 1981 have decreased, though the reasons for this are far from clear. One of the possible reasons could be that the transport services other than the private bus service have improved.

Kilometres served

The relative importance of alternative modes of transport, in terms of kilometres travelled per day can be observed from the data provided in Table 12. It may be noted that state buses are more important than other modes in terms of this indicator.

Table 12 also shows that among the modes, only for private buses kilometres travelled per day has increased consistently, although figures for 1982 and 1984 are not available. Another important point is that for the year 1981, comparing with Tables 10 and 11, we see that, the number of passengers carried per bus was much higher for private buses than for the state buses.

Table 13 shows the proportion of kilometres served by different modes only for the years 1981 and 1985 for which complete data are available. It shows that state buses and private buses have changed their relative positions in 1985 from what it was in 1981. While the proportions for trams and mini buses were closer in 1981, by 1985 the mini buses have overtaken the trams.

Passenger-kilometres served

To define passenger-kilometre we take into account two variables - total kilometres travelled per day and the average load per vehicle where we are averaging on both distance and the number of passengers carried. Since there is difference

in the number of passengers on board during different hours of the day and over different lengths of the trip, we will consider a range. This range starts from a minimum of the seating capacity of a particular vehicle, while the upper limit of this range is fixed at a maximum of 100 percent overloading for the whole day. This range takes into account the average number of passengers during peak, off-peak and normal periods of the day. However, to make this exercise meaningful, the following assumptions have been made : (i) all the passengers travel the entire length of the route served by a vehicle; (ii) differences in carrying capacities of different vehicles in a mode

None, ignored. Now if,

K = total kilometres travelled per day,
L = average load per vehicle,
P = passenger kilometre, then
P = KL.

Here also we will consider, for the years from 1981 to 1985, three levels of overloading for all the modes of transport - 0 (zero) percent, 50 percent, and 100 percent. The official seating capacities of state bus, tram, private bus and mini-bus are 35, 75, 38 and 22, respectively. Table 14 shows that for the years 1981 and 1983, state bus served a much higher passenger kilometre than private bus. But the picture was reversed in year 1985 when private buses became the most important mode of transport. Table 15 shows that the proportion of passenger-kilometres served by the private buses increased significantly from 30.15 percent in 1981 to 44.48 percent in 1985.

IV Cost effectiveness of alternative modes of transport

The unit cost of urban transport or cost per passenger per kilometre of urban transport varies with the transport mode selected, as different modes have different capital, operating and maintenance costs. The cost figures for state buses and trams include maintenance and operating cost as

well as depreciation costs but those for private buses and mini buses only include maintenance and operating costs. We will, therefore, first compare state bus with tram, since their cost figures include depreciation cost. Then the four modes will be compared on the basis of operating and maintenance costs, excluding depreciation.

In both the cases the two indicators for comparison would be (i) expenditure per passenger kilometre, (ii) net earning per passenger kilometre. To calculate expenditure per passenger kilometre we are to divide total expenditure by total passenger kilometre, while to calculate net earning the total earnings are divided by the total passenger kilometre. When expenditure per passenger kilometre is subtracted from earning per passenger kilometre, the net earning per passenger-kilometre is found. These will be calculated for three levels of overloading : 0 per cent, 50 per cent and 100 per cent.

If we define

I = total earning,
K = total kilometres travelled during the year,
L = load per vehicle,
P = total passenger kilometres served,
E = total expenditure,

then

earnings per passenger kilometre = $T/KL = I/P$

expenditure per passenger kilometre = $E/KL = E/P$.

The earnings of the Calcutta State Transport Corporation may be divided into three heads : (i) operating revenue, (ii) non-operating revenue, and (iii) income from central workshop, while the break up of the total expenditure can be given under

the following heads : (i) salaries/allowances; (ii) bonus, (iii) fuel and lubricant, (iv) tyre and tubes, (v) spare parts, batteries and other stores, (vi) rent and taxes, (vii) central workshop (other than salaries/allowances and taxes and rents), (viii) Office expenses and miscellaneous expenses, (ix)interest, depreciation and other reserve funds. Table 16 shows the total earning and expenditure of the Corporation from 1975-76 to 1984-85.

From Table 16 it is clear that the earnings of the Corporation have steadily increased; between 1977-78 and 1983-84; in seven years, it has more than doubled. On the other hand, the expenditure figures too almost doubled over the eight years from 1977-78 to 1984-85. In 1984-85 the earnings of the Corporation have decreased, although expenditures have increased. For each and every year expenditure is greater than income; for 1975-76 to 1977-78 and from 1982-83 to 1984-85, expenditure figures are more than double the earning figures.

Let us now examine the earnings and expenditure of the Calcutta Tramways Company. The earnings of the Company can be divided into the following heads : (i) traffic receipts, (ii) other receipts from advertisement and scrap-sale and (iii) government subsidies. On the other hand, the itemwise break up of the expenditure is as follows : (i) salary/wages and allied expenses, (ii) materials including fuel and power, (iii) taxes and interest payment, (iv) depreciation and other expenses. Table 17 shows the yearly earnings and expenditure figures for the years from 1975-76 to 1984-85.

It is noticed that, excepting the year 1976-77, earning figures for the Company show a rising trend over the whole period. On the other hand, for the expenditure figures, the rising trend is disturbed by the figure for 1979-80, when absolute loss is also at the minimum, at Rs. 600000 compared to Rs. 7 million deficit

in 1984-85. It is also interesting that, in these ten years, while the earning has doubled the expenditure has increased three times.

Table 18 gives expenditure per passenger kilometre, earnings per passenger kilometre and net earnings per passenger kilometre for state buses and trams. It shows that although for the first four or five years earnings per passenger kilometre are greater for state buses for each level of overloading, these are greater for trams for the last five or six years. On the other hand, expenditure per passenger kilometre for state buses is always greater than that for tram and net earnings per passenger kilometre is also lower for state buses than trams. Neither shows a positive net earning for any year. Net earnings per passenger kilometre are not consistently increasing or decreasing, for either of these two modes. Another feature is that the net loss per passenger kilometre is also lowest at 100% overloading. The lower level of expenditure per passenger kilometre for trams compared to state buses shows that, in the present set up, the supply price of tram service is lower than that for the state buses.

Let us now find out the reasons for which the Calcutta State Transport Corporation and the Calcutta Tramways Company are running at a loss for the last ten years. We will consider the case for the Calcutta State Transport Corporation first, for which the gap between earnings per passenger kilometre and expenditure per passenger kilometre has been widening during the last five years. This might be due to many reasons, some of which are mentioned below :

(i) Increase in the fixed cost due to the increase in the price of new buses. Table 19 shows how the prices of single deck buses of Ashok Leyland and Tata have changed over these years.

(ii) Operating revenue from the sale of tickets is the major source of income of the Corporation. However, the fare structure in Calcutta, even after some increases, remains one of the lowest in India, while a more rational and economic fare structure is extremely difficult to impose because of popular resistance. Table 20 shows changes in fare structure from 1975 to 1986.

(iii) If percentage changes in earnings and expenditure are considered over the period from 1980-81 to 1984-85, the widening of gap between earnings per passenger kilometre and expenditure per passenger kilometre might be clarified. Table 21 shows percentage changes in earnings and expenditure over the stated period. It indicates that changes in earnings are always positive excepting in the year 1984-85. For the years 1981-82 to 1984-85 change in expenditure was greater than change in earnings. Only in the year 1980-81 the percentage change in earnings was greater than percentage change in expenditure.

(iv) There are also some other reasons for the continuation of the negative net earnings per passenger kilometre. As is evident from the information given by the Calcutta State Transport Corporation, there is high rate of absenteeism among the drivers and conductors, which is as high as 30% to 40% at present. This leads to a reduction in the number of buses put on road, which in turn reduces the operating revenue of the Corporation.

In case of the Calcutta Tramways Company too, net earnings per passenger kilometre are more or less consistently decreasing over the last five years. We might examine the following possible reasons for this decrease.

(i) Increase in fixed cost of the Company due to increased price of capital goods. Under Calcutta Urban Transport Project,

75 tramcars were purchased at Rs. 1600000 per tramcar (excluding customs and excise duty). But at the time of the extension of tramways from Behala to Joka the cost per tram car increased to Rs. 3334000 (including customs and excise duty) at 1985-86 prices.

(ii) The cost of construction of tram tracks has also increased very sharply during 1975-76 to 1984-85. For both reserved and unreserved tram tracks the costs of have increased 1.7 times between 1975-76 and 1984-85 (Table 22).

(iii) Increase in the maintenance cost of track system also explains increased expenditure per passenger kilometre. In Table 23 labour cost for the maintenance of the existing track system (double track) per kilometre is given. Other items of maintenance cost are not available.

(iv) The major source of income of the Company is sale of tickets. However, as in the case of the buses, the fare remains very low, despite some increases, compared to those for most other cities. (Table 24).

(v) Table 25 shows percentage changes in earnings and expenditure over the five years from 1980-81 to 1984-85. It shows that percentage changes in earnings and expenditure are positive for all the years between 1980-81 and 1984-85, while changes in expenditure are greater than changes in earnings. This explains the widening negative net earnings per passenger kilometre, and also the need both to economise on costs and also to explore the possibilities of increasing passenger fare.

Let us now compare the cost efficiency of various modes of transport when depreciation figures are excluded from their total

expenditure figures. We are excluding depreciation figures for the purpose of comparison with the private modes of mass transportation since neither capital cost nor depreciation cost figures are available for private bus and mini bus. Thus, the four modes will be compared only on the basis of operating and maintenance costs. Here, for state bus and tram, expenditure figures will be computed from Appendix Table 2 and 4, excluding the depreciation costs.

We begin with some information on private bus and mini bus. The earnings and expenditure figures of private bus and mini bus are very difficult to collect. Although for private bus estimated earnings and expenditure for the year 1985 are available and for mini bus approximate estimates of expenditure and earnings are available for the year 1982, no break-up of income figures are available, while only break-ups of expenditure figures are available. It should be noted that any comparison, based on such limited data, is incomplete.

For private bus, the expenditure figures consist of (i) salaries, (ii) fuel and lubricant, (iii) tyres and spares, and (iv) miscellaneous. On the other hand, the main items of expenditure for mini bus are as follows : (i) fuel and lubricant, (ii) tyres, (iii) engine overhauling, (iv) service and maintenance, (v) wage bill, (vi) overheads (garaging, cleaning, etc.), (vii) taxes, (viii) insurance payment, (ix) bank loans and interest payment, (x) miscellaneous. Table 26 provides earnings and expenditure figures for private bus and mini bus for a single year. It shows that the earnings for private bus and mini bus are much greater than expenditures incurred by them.

To compare the earnings per passenger kilometre, expenditure per passenger kilometre and net earnings per passenger kilometre (excluding depreciation cost from total yearly expenditure), the same formulae will be applied as before in this section and the same three levels of overloading will

be considered. In Tables 27(a) and 27(b) earnings, expenditures and net earnings per passenger kilometre have been provided for state bus and tram and private bus and mini bus, respectively.

Table 27(b) shows that, for both private bus and mini bus, and for each level of overloading, the net income per passenger kilometre is positive, which implies that these two are profit earning modes. Some possible reasons might be discussed below :

(i) Outshedding percentage is very high, as high as 90% for both. Since income is mainly generated from ticket sale, more buses on road imply more operating revenue per bus, which in turn increases total income.

(ii) In the private sector the operators earn a high level of profit at the cost of the people who are actually operating the buses i.e., conductors, drivers, helpers, etc., who are offered low wages and are made to work longer hours. It should be mentioned here that since the publicly owned modes are not guided by profit motive and operate to provide an important social service, they apparently seems to be less cost effective than the privately owned modes of transport. While during the early morning and late evening, state buses and trams are there on road to provide services to the passengers, the private buses and mini buses are seen in larger numbers mainly at the peak hours in order to earn a high profit. This difference - both in approach and in functioning - has important implications in terms of social benefits and costs, as distinct from private benefits and costs.

V. Problems associated with passenger transport in Calcutta City

The rapid growth of cities in the developing countries has been accompanied by an increased need for urban transport.

Unlike small cities or towns, where it is possible to reach virtually every point on foot or by bicycle within a reasonable time, large cities require extensive, motorised transport systems to permit the movement of people and goods between various locations. In the city of Calcutta also, for movement of commuters, the demand for transport service is increasing day by day. Although the number of vehicles operated by the private operators, has doubled during the past ten years, for public operators it has remained more or less stagnent. As the figures in section - 2 show, there is a vast gap between the demand for transport service and its supply, which leads to overcrowding, which can be as high as 300% during the morning and evening peak hours. If the qualitative aspect of travel is considered then it also, in general, reflects a very bad condition. Ill-maintained and over-aged carriages reduce the average speed of vehicles and make journies uncomfortable. Although a very large proportion of the city population is dependent upon mass transportation, infrequent service causes a great deal of disadvantage to the commuters. However, the private bus operators seem to have improved the frequency per hour to a significant extent: for private bus, from 2.15 in 1981 and 2.44 in 1983 to 3.54 in 1985, and for mini bus from 2.54 in 1981 to 2.92 in 1984.[50] On the other hand, for private bus, the percentage of vehicles operated at less than 15 minutes interval increased from 35% in 1981 to 38% in 1983 and to 66% in 1985.[51] The improved service is also reflected in decrease in average waiting time at bus stops. For private bus average waiting time at bus stops was 27.47 minutes in 1981, which declined to 17 minutes in 1984; and for mini bus it was 23.63 minutes in 1981 which was reduced to 20.52 minutes in 1983.[52]

As noted elsewhere, one of the major constraints that contribute to the chaos in urban transport is inadequate road

space. In Calcutta, a very low proportion of urban space is devoted to roads, only six to eight percent of the area of the city, which should at least be 20 percent [53] according to world standards.

The peculiar mixture of traffic in Calcutta city also is responsible, to a great extent, for the slow movement of traffic and congestion. In Calcutta, most streets are open to slow moving vehicles like richshaws and hand carts, etc. while trams too occupy a major share of the available road space, where there is reserved right-of-way. Goods vehicles, like trucks, etc. also particularly contribute to this peculiar traffic mixture.

Poor traffic management is another problem. Tables 28(a) and 28(b) show some improvements in traffic operation due to some specific traffic control policies. Table 28(a) shows that a ban on the movement of slow moving vehicles and trucks improve travel speed to a significant extent. Table 28(b) shows the benefits that follow from prescribing one-way movements.

The most important element responsible for the chaotic situation in the transport system are the private automobiles, which take roughly nine times more road space per passenger than does a bus. Table 29 shows the number of automobiles per 1000 population and its rate of growth, along with the rate of growth of population. It shows that the rate of growth of automobiles is much higher than the rate of growth of population. The decadal growth rate of automobiles was a very high 115 percent in 1971-81. Such growth has serious implications for the environment of the city, but the issue is beyond the scope of this paper.

VI Transport and the urban poor

In the preceding sections scant attention has been paid to how transport policies will affect the urban poor or to how policies can be designed to maximise benefits that the poor can derive from an efficient urban transport system. A brief

review of the role transport plays in the lives of the urban poor will help in the policy analysis.

Household expenditure surveys indicate that the urban poor tend to devote, on average, somewhere between one and ten percent of their income on transport.[54] The expenditure data further suggest that in cities of low-income countries a significantly smaller percentage of income is spent on transport by urban dwellers, including the poor; for selected Indian cities for example, the transport share in total household spending does not exceed two percent until one takes into account those who are fairly high up in the income scale.[55]

It is important, however, not to view expenditure on transport in isolation. What is actually demanded (or needed) by the poor is access to employment opportunities or services. Of course access can be obtained by residing close to employment or services, involving little travel. In this case, what is saved in transport costs is usually lost in higher rents, and the reverse is true in the other case. Indeed, the higher central city land and rental values are in large part a reflection of the superior access of these locations at lower transport costs compared with peripheral locations. The poor have essentially three options. First, they can settle at the periphery where land costs remain low, but then they lose either because of higher transport costs or reduced labour earnings from the loss of jobs, particularly for secondary income earners. Second, they can remain (or settle) at relatively central locations and pay higher rents per household. Or, third, they can accept higher densities, lower quality of service or public utilities, greater insecurity of tenure, or all of these combined, so that transport cost and rental payments combined could be reduced to a level that would leave enough for the other necessities of life.

Table 32 gives data on journey to work by various income groups in the city of Calcutta. It can be seen that modes preferred by different people in different income groups are clearly distinguished. Relatively poorer people generally prefer train, bus and tram and relatively richer section of the population prefer to travel by taxis, cars, scooter and richshaws etc. They also prefer mini bus, de-luxe bus and shared taxi.

VII Policy implications and some investment programmes

For each of the major areas of policy action - investment, pricing and regulation - the proposed policies can be contrasted with those commonly found in the cities of the developing countries. The differences are significant, and the changes in policy perceptions required are extensive. Such changes cannot obviously be expected overnight; they have to be carefully argued over and motivated on the grounds that they convey a wide range of benefits in line with many of the common goals of government policy. Some of the changes are already occuring in some countries and cities, but much remains to be done in the majority of developing country cities to come to grips with the deterioration of urban transport systems. In particular, since the urban transport sector represents a highly inter-connected system of competing and complementary activities, it is important to design a comprehensive strategy covering as many as possible of the policy actions listed below.

Many of the proposed policies involve constraints on ownership and use of private automobiles. Implementation of such policies is likely to encounter considerable opposition because automobile ownership and use are common popular aspirations, not only as a means of transport to and from work, but also as a means of greater general mobility and independence and as status symbols. The control of automobile ownership and use, therefore, requires concerted policy actions at all levels of government that combine the use of such instruments as import tariffs and annual vehicle fees, with appropriate investment, pricing and regulatory actions at the regional and city levels.

- 30 -

Investment

Traditional investment policies have involved :

(1) Highway construction to meet the needs of the private automobile explosion.
(2) High technology rapid transit in a few cities.
(3) Neglect of bus, commuter train, bicycling, and walking facilities,
(4) Neglect of access roads for low-income neighbourhoods, shutting them off from access to many complementary services.
(5) Encouragement of segregated land use, including the relocation of slum dwellers to peripheral locations.

Appropriate investment policies should include :

(1) Reduced emphasis on general purpose arterial road construction mainly benefitting automobiles.
(2) Extremely cautious evaluation of modern technology, rapid-transit investment; only for the largest city in the advanced countries might these options be desirable.
(3) Emphasis on improved existing mass transport facilities, especially buses and mini buses; this would involve improving the stock of vehicles and providing road repair facilities; reserved bus lanes and preferential treatment of public transport at inter-sections; bus loading bays, shelters and terminals.
(4) Neighbourhood street-paving programmes, especially in the poorer neighbourhoods; this should especially involve bus penetration routes that can also provide access to other vehicles.

(5) Support for bicycle and pedestrain traffic, including construction of bicycles paths, sidewalks and footpaths, pedestrain bridges to permit crossing of busy arterial roads.

(6) Efforts to decentralise employment location close to low-income residential neighbourhoods. Decentralised employment location, although it reduces congestion in the city centres, may also increase the need for public and private transport to and from peripheral areas, which can be quite costly.

Investment policies such as these can provide considerable benefits to the poor. The relative emphasis on the different components of the proposed investment strategy would vary between countries and cities and would depend mainly on income levels. In the wealthier cities, particularly in the middle-income countries, emphasis on urban bus services (and rail service, where already existing) is quite appropriate. But in the cities of the low income countries, especially the poor ones, an emphasis on improved bicycle and pedestrian traffic, coupled with a well-focussed decentralisation of employment opportunities, might be more appropriate.

Other policy measures that might be considered in the persuit of an urban strategy designed to improve the systems efficiency and its services to the poor, are discussed below.

1. Staggered working hours, which may help to relieve high peaks of congestion and public transport use and thus reduce the need for costly investment in peak-related capacity. The effect of these measures, however, is not likely to be very large, especially if the urban transport system operates under condition of excess demand for much of the day anyhow, as is often the case in developing country cities like Calcutta.

2. Fringe parking and shuttle buses, which may be useful complements to a policy of controls on automobile use in Central cities.

3. Complete nationalisation of mass-transit facilities, especially of urban bus services, is not likely to improve service provision in most circumstances. Although there are a few examples of successful public urban bus companies (e.g., in Bombay), the overwhelming experience appears to be that private operators can provide bus service cheaply and efficiently, even under the most adverse of circumstances. At the same time, private operators may not be that keen in offering services during off-peak hours, A judicious balance between the two-public and privately owned mass transit services - is called for.

4. Improved credit facilities for the purchase of public transport vehicles, including non-motorized vehicles such as rickshaws.

5. Improved management, accounting, automobile registration, and enforcement of regulations, which are essential elements in an effort to rationalize urban transport and to ensure that improved services are provided to the poor.

6. Comprehensive urban transport sector planning and administration and its integration into overall urban road use planning and implementation. These measures are essential; urban transport requires a comprehensive approach relating to all major modes and policy instruments. The fragmentation of responsibility of the transport sector among many public institutions, which prevails in most developing country cities, often prevents coordinated action. Finally, the need to put transport planning and policy in the context of wider land use planning considerations derives from the close complementary relation that urban transport has with residential, employment and public service location decisions. Public policy planning in these areas should always consider the implications for the transport system; similarly, urban transport strategy must explicitly deal with its

relation to, and effects on, public and private decisions regarding residential, employment and service location.

VIII Conclusions

From the analyses above, it is clear that the Calcutta Metropolitan Area or, in other words, its inhabitants are relatively more dependent on private transport services, although the services provided by state buses and trams are also substantial. The operation and management of the Calcutta State Transport Corporation and of the Calcutta Tramways Company must be improved and there should be a fuller utilisation of the physical resources in their possession.

Although, from the point of view of services provided, trams are as good as state buses, there is a point of view which argues for the withdrawal of tramways from the city of Calcutta. The debate has mainly arisen due to the fact that tramcars cause congestion in the streets of the city. However, those streets where trams do not operate, are no less congested; slow moving vehicles cause congestion to a greater extent. Some regulations on the parking and provision of separate lanes for the slow moving vehicles and strict execution of those regulations might improve the situation to a great extent. From the point of view of pollution control, some argue for encouraging a greater role of the non-motorized modes of transport, including cycles, in the transport system, who also prefer, in order to have an effective check on congestion, discouragement of the alarming increase in the number of automobiles. With population explosion, an 'automobile explosion' is also on its way which may take a very dangerous form if no regulations on automobiles are enforced and executed from right now. From the point of view of energy consumption, trams should be highlighted as they use electricity for their

operation which is a renewable source of energy. Three types of buses, state bus, private bus and mini bus cover 2.7 kilometres, 2.5 to 4 kilometres and 5 to 7 kilometres of distance per litre of diesel consumption, which is a costly, as well as a non-renewable source of energy. A multi-modal approach including para-transit options is, therefore, necessary for the city of Calcutta.

One of the prerequisites for an appropriate policy framework is the realization that transport is only a means to an end, which is access and communication. These goals can be fostered not only by direct action in the transport sector but also by appropriate land use policy. Of particular importance are the decentralisation of the employment opportunities away from the congested centres within metropolitan area and the location of public service facilities close to the intended consumers, especially in the case of public administration, health and educational facilities. The most important aspect here is the encouragement of a land use pattern that reduces the need for lengthy commuting trips by encouraging a balanced spread of employment opportunities as the city grows. This is of course, easier said than done. What can certainly be avoided, however, is the kind of policy that actively encourages the spatial segregation of economic activities and residential location.

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T A B L E - 1

Zonewise Population for Calcutta Urban Agglomeration, 1981

	Population (Millions)	% Share
South-west	0.28	3.05
North-east	2.53	27.53
South-east	1.14	12.40
North-West	1.20	13.06
Calcutta City	3.30	35.91
Howrah City	0.74	8.05
Calcutta UA	9.19	100.00

Note: North east zone consists of all towns on the east bank of the Hooghly river and the north of Calcutta city; south-east zone consists of all towns on the east bank situated to the south of Calcutta city. On the west bank towns to the north of Howrah city are included in north west zone, and towns to the south and west of Howrah city are included in south west zone.

Source: Computed from data Census of India, 1981, series 23 West Bengal, Final Population totals (Paper 1 of 1982)

T A B L E - 2

Alternative modes of transport for passenger movement

Within city		City - suburban		Intra - suburban	
Public	Private	Public	Private	Public	Private
State bus, Tram, Metro Rail	Private bus, Mini bus, Taxi, Rickshaw, Ferry service	State bus, Train	Private bus, Mini bus, Taxi, Ferry Service	Train	Private bus, Ferry service, Rickshaw

T A B L E 3

Growth of Suburban Passenger Traffic in CMD

(in million)

Year	Passenger carried annually		Total
	Eastern Railway	South Eastern Railway	
1970-71	240.40	29.90	270.30
1975-76	324.80	54.40	379.20
1976-77	371.60	63.50	435.10
1977-78	385.50	65.70	451.20
1978-79	398.60	61.20	459.80
1979-80	351.00	57.80	408.80
1980-81	354.00	59.70	414.60

Source: Calcutta Metropolitan Development Authority, "Eastern Railway in Economy and Development of Calcutta Metropolitan District - 1983 - 2000 A.D." Economy and Employment in CMD (1983-2001), (Seminar Volume published by CMDA, 1983).

TABLE 4

Metro Railway at a glance

1.	Projected length, terminus to terminus	16.4 kilometre
2.	Stations : Overground	2
	Underground	15
	Total :	17
3.	Average inter-station distance	1.02 kilometre
4.	Coaches per train	8
5.	Classes	One
6.	Each coach measures: in length	19.50 metres
	in width	2.75 metres
7.	Highest speed	80 kilometre/ hour
8.	Average speed	30 Kilometre/ hour
9.	Electricity for trainsat peak demand	750 Volts D.C.
	for the system	53 megawates (65 MVA)
10.	Supplied through	a third rail
11.	Travel time: Dum Dum to Tollygunj	33 minutes
	Tollygunj to Esplanade	15 minutes
	Esplanade to Dum Dum	18 minutes
12.	Each coach will carry	218 standing 54 seating
13.	Each train will carry passengers	2500 (approx.)
14.	Interval between trains	2½ minutes (later 1½ minutes)

Source: Office of the Metro Railway

TABLE 5

State buses : Some basic information

(1975-76 - 1984-85)

Year	Passengers carried per day (in lakh)	Fleet strength	Outshedding percentage	Buses on road/ day	Kilometres travelled/ day (in '000)
1975-76	7.48	886	61	540	80.11
1976-77	8.13	983	62	609	97.33
1977-78	7.14	938	61	572	86.42
1978-79	7.93	998	63	629	97.93
1979-80	9.93	1059	68	720	117.50
1980-81	8.19	1099	67	736	116.33
1981-82	8.51	1141	63	719	116.47
1982-83	8.61	1130	65	735	119.38
1983-84	8.29	1172	61	715	114.11
1984-85	7.14	1118	58	648	104.29

Source : The Calcutta State Transport Corporation.

T A B L E 6

Tram Cars : Some basic information
(1975-76 - 1984-85)

Year	Passengers carried per day (in lakh)	Fleet strength	Outshedding percentage	Trams on road/ day	Kilometres travelled/ day (in '000)
1975-76	7.53	450	68	306	46.40
1976-77	6.74	438	66	289	36.75
1977-78	6.86	438	69	302	37.05
1978-79	6.92	438	70	307	36.93
1979-80	7.22	438	68	298	37.30
1980-81	7.86	438	66	289	36.21
1981-82	7.60	438	73	320	33.35
1982-83	7.12	380	76	289	32.01
1983-84	6.15	380	72	274	31.58
1984-85	5.14	380	72	274	28.83

Source : The Calcutta Tramways Company.

T A B L E 7

Fleet strength of private buses according to different sources from 1975- 1985

Year	Source - 1 Transportation Planning and engineering directorate, Transport Dept., Govt. of West Bengal	Source - 2 Public Vehicles Department, Govt. of West Bengal	Source-3 Statistical Section, Calcutta Traffic Police, Lalbazar, Calcutta (φφ)
1975	1105	N.A.	N.A.
1976	N.A.	1639	N.A.
1977	N.A.	N.A.	N.A.
1978	N.A.	N.A.	2120
1979	1035	N.A.	2059
1980	N.A.	N.A.	2086
1981	N.A.	N.A.	2086
1982	N.A.	N.A.	2115
1983	N.A.	2334	3596
1984	N.A.	2553	3918
1985	1786	3555	4093

N.A. = Not available.

φφ Figures were computed after deducting the figures for state buses from the total number of buses.

TABLE 8

Fleet strength of Mini buses according to different sources from 1975 to 1986

Year	Source 1 Transportation Planning and Engineering Directorate, Transport Dept., Government of West Bengal	Source 2 Public Vehicles Dept., Govt. of West Bengal	Source 3 Statistical section, Calcutta Traffic Police, Lalbazar, Calcutta
1975	N.A.	501	N.A.
1976	N.A.	505	N.A.
1977	N.A.	505	507
1978	N.A.	505	507
1979	N.A.	505	512
1980	N.A.	619	512
1981	372	735	565
1982	N.A.	788	643
1983	N.A.	860	803
1984	828	922	865
1985	N.A.	935	866
1986	N.A.	1029	N.A.

TABLE 9

Serviceable fleet of taxis

Year	Registered number of taxis
1978	7278
1979	7324
1980	7348
1981	7424
1982	7538
1983	9999
1984	11988
1985	11985

Source: Statistical Section, Calcutta Traffic Police, Lalbazar, Calcutta.

TABLE 10

Number of slow moving vehicles in Calcutta, 1978 - 85

Year	Rickshaw	Hand-cart	Push van	Cycle van	Hackney carriage
1978	5986	11417	622	1925	50
1979	5986	12111	491	2398	60
1980	5986	12111	491	2398	60
1981	5986	12111	491	2398	60
1982	5986	12111	491	2398	60
1983	5986	12111	491	2398	41
1984	5986	12111	491	2398	37
1985	5986	12111	491	2398	N.A.

Source : Statistical Section, Calcutta Traffic Police, Lalbaar, Calcutta.

TABLE 11

Relative importance of different modes of transport in terms of passengers carried per day
(in 100000)

Year	Passengers carried by state buses per day	Passengers carried by trams per day	Passengers carried by private buses per day	Passengers carried by mini buses per day
	(1)	(2)	(3)	(4)
1976	7.97	6.94	35.50	N.A.
1978	7.72	6.91	N.A.	1.59
1981	8.43	7.67	27.10	N.A.

Sources: (i) for column (1), The Calcutta State Transport Corporation.

(ii) for column (2), The Calcutta Tramways Company.

(iii) for column (3), and column (4), Calcutta Metropolitan Development Authority, Calcutta Metropolitan Statistics, Calcutta, 1983.

TABLE 12

Relative importance of different modes of transport in terms of Kilometres served per day (1981-85)

Year	Total Kilometres travelled by state buses per day	Total Kilometres travelled by trams per day	Total Kilometres travelled by private buses per day	Total Kilometres travelled by Mini buses per day	Total Kilometres travelled per day
	(1)	(2)	(3)	(4)	(5)
1981	1,16,437	33,845	85,094	30,937	2,75,313
1982	1,18,654	31,873	N.A.	N.A.	1,50,527
1983	1,15,429	32,426	88,033	N.A.	2,35,888
1984	1,06,742	29,044	N.A.	73,424	2,09,210
1985	1,00,359	28,171	1,52,475	73,000	3,54,005

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(ii) for column (2), The Calcutta Tramways Company

(iii) for column (3), and (4), Government of West Bengal, Transportation Planning and Engineering Directorate, Transport Department.

T A B L E 13

Proportion of Kilometres served by different modes of transport in 1981 and 1985
(in percentage)

Year	Proportion of kilometres served by state buses	Proportion of kilometres served by trams	Proportion of kilometres served by private buses	Proportion of kilometres served by mini buses	Total
1981	42.29	12.29	30.91	14.51	100
1985	28.35	7.96	43.07	20.62	100

Source: Computed from Table 11.

T A B L E 14

Relative importarce of different modes of transport in terms of absolute passenger kilometres served : 1981 - 1985
(Unit-100000 passenger kilometres)

Year	Overloading (%)	Passenger kilometres served by State bus	Tram	Private bus	Mini bus	Total
1981	0	40.75	25.38	32.34	8.79	107.26
	50	61.13	38.08	48.51	13.19	160.91
	100	81.51	50.77	64.68	17.58	214.57
1982	0	41.53	23.90	-	-	65.43
	50	65.43	35.86	-	-	101.29
	100	83.06	47.81	-	-	130.87
1983	0	40.40	24.32	33.45	-	98.17
	50	60.60	36.48	50.18	-	147.26
	100	80.80	48.64	66.90	-	196.34
1984	0	37.36	21.78	-	16.15	75.29
	50	56.04	32.68	-	24.23	112.95
	100	74.72	43.57	-	32.30	150.59
1985	0	35.13	21.13	57.94	16.06	130.26
	50	52.69	31.70	86.91	24.09	195.39
	100	70.25	42.26	115.88	32.12	260.51

T A B L E 15

Proportion of passenger kilometres served by different modes of transport : 1981 and 1985
(in percentage)

Year	Proportion of passenger kilometre served by				Total
	State bus	Tram	Private bus	Mini bus	
1981	37.99	23.66	30.15	8.20	100.00
1985	26.97	16.22	44.48	12.33	100.00

T A B L E 16

Annual earnings and expenditure of the Calcutta State Transport Corporation, 1975-76 to 1984-85
(Unit- Rs.100000)

Year	Total earnings	Total expenditure	Net earnings
1975-76	798.37	1795.91	- 997.54
1976-77	1065.01	2179.81	- 1114.80
1977-78	985.87	2160.98	- 1175.11
1978-79	1247.13	2464.08	- 1216.95
1979-80	1513.74	2897.95	- 1384.21
1980-81	1703.08	3049.24	- 1346.16
1981-82	1811.89	3300.11	- 1488.22
1982-83	1877.11	3771.11	- 1894.00
1983-84	2050.12	4179.71	- 2129.59
1984-85	1843.51	4216.93	- 2373.42

Note : Detailed break-up of earnings and expenditure is provided in Appendix Tables 1 and 2.

Source: The Calcutta State Transport Corporation.

T A B L E - 17

Annual earnings and expenditures of the Calcutta Tramways Company, 1975-76 to 1984-85

(Unit- Rs. 100000)

Y e a r	Total earnings	Total expenditure	Net earnings
1975-76	703.00	831.00	- 128.00
1976-77	647.00	860.00	- 213.00
1977-78	860.00	1079.00	- 219.00
1978-79	923.00	1138.00	- 215.00
1979-80	983.00	1043.00	- 60.00
1980-81	1122.00	1448.00	- 326.00
1981-82	1364.00	1669.00	- 305.00
1982-83	1390.00	1848.00	- 458.00
1983-84	1474.00	2097.00	- 623.00
1984-85	1546.00	2247.00	- 701.00

Note : Detailed break-up of earnings and expenditure is provided in Appendix Tables 3 and 4.

TABLE - 18

Earnings, expenditures and net earnings per passenger kilometre for State Buses and Trams : 1975-76 to 1984-85

(Unit : Rs./ passenger kilometre)

Year	Earnings					
	State buses			Trams		
	Overloading			Overloading		
	0 per cent	50 per cent	100 per cent	0 per cent	50 per cent	100 per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1975-76	0.08	0.05	0.04	0.05	0.04	0.03
1976-77	0.09	0.06	0.04	0.06	0.04	0.03
1977-78	0.09	0.06	0.04	0.08	0.06	0.04
1978-79	0.10	0.07	0.05	0.09	0.06	0.05
1979-80	0.10	0.07	0.05	0.10	0.06	0.05
1980-81	0.11	0.08	0.06	0.11	0.08	0.06
1981-82	0.12	0.08	0.06	0.15	0.10	0.07
1982-83	0.12	0.08	0.06	0.16	0.11	0.08
1983-84	0.14	0.09	0.07	0.17	0.11	0.09
1984-85	0.14	0.09	0.07	0.20	0.13	0.10

TABLE - 18 (Contd.)

Year	Expenditure					
	State Buses			Trams		
	Overloading			Overloading		
	0 per cent	50 per cent	100 per cent	0 per cent	50 per cent	100 per cent
(1)	(8)	(9)	(10)	(11)	(12)	(13)
1975-76	0.18	0.12	0.09	0.07	0.04	0.03
1976-77	0.18	0.12	0.09	0.09	0.06	0.04
1977-78	0.20	0.13	0.10	0.11	0.07	0.05
1978-79	0.20	0.13	0.10	0.11	0.07	0.06
1979-80	0.19	0.13	0.10	0.10	0.07	0.05
1980-81	0.21	0.14	0.10	0.15	0.10	0.07
1981-82	0.22	0.15	0.11	0.18	0.12	0.09
1982-83	0.25	0.16	0.12	0.21	0.14	0.11
1983-84	0.29	0.19	0.14	0.24	0.16	0.12
1984-85	0.32	0.21	0.16	0.28	0.19	0.14

TABLE - 18 (Contd.)

Year	Net earnings State Buses Overloading			Trams Overloading		
	0 per cent	50 per cent	100 per cent	0 per cent	50 per cent	100 per cent
(1)	(14)	(15)	(16)	(17)	(18)	(19)
1975-76	-0.10	-0.07	-0.05	-0.02	0	0
1976-77	-0.09	-0.06	-0.05	-0.03	-0.02	-0.01
1977-78	-0.11	-0.07	-0.06	-0.03	-0.01	-0.01
1978-79	-0.10	-0.06	-0.05	-0.02	-0.01	-0.01
1979-80	-0.09	-0.06	-0.05	0	-0.01	0
1980-81	-0.10	-0.06	-0.04	-0.04	-0.02	-0.01
1981-82	-0.10	-0.07	-0.05	-0.03	-0.02	-0.02
1982-83	-0.13	-0.08	-0.06	-0.05	-0.03	-0.03
1983-84	-0.15	-0.10	-0.07	-0.07	-0.05	-0.03
1984-85	-0.18	-0.12	-0.09	-0.08	-0.06	-0.04

T A B L E 19

Cost of a complete Bus

(Unit - Rs.100000)

Year	Single Decker (Ashok Leyland)	Single Decker (Tata)
1975-76	1.69	-
1976-77	1.54	-
1977-78	-	1.53
1978-79	1.60	1.71
1979-80	1.95	1.99
1980-81	2.15	2.31
1981-82	2.22	2.25
1982-83	2.40	2.67
1983-84	2.39	2.75
1984-85	-	2.87

Source: The Calcutta State Transport Corporation.

T A B L E 20

Change in fare structure of the Calcutta State Transport Corporation from 1975 to 1986

(in paise)

Fare (in paise) 1975	Fare (in paise) 1986
20	50
25	65
30	80
35	90
40	110
	120

Source: The Calcutta State Transport Corporation.

T A B L E - 21

Percentage change in earnings and expenditure of CSTC during 1980-81 to 1984-85

Y e a r	Change in earnings (%)	Change in expenditure (%)
1980-81	+ 12.51	+ 5.29
1981-82	+ 6.38	+ 8.22
1982-83	+ 3.59	+ 14.27
1983-84	+ 9.22	+ 10.83
1984-85	- 10.07	+ 0.89

Source : Computed from Table 15.

T A B L E 22

Construction cost of tram tracks per kilometre over 1975-76 to 1984-85

(Rs. 100000)

Y e a r	Reserved track	Unreserved track
1975-76	32	35
1976-77	32	35
1977-78	38	40
1978-79	40	45
1979-80	45	50
1980-81	45	50
1981-82	45	50
1982-83	50	55
1983-84	55	60
1984-85	55	60

Source: The Calcutta Tramways Company.

T A B L E 23

Labour cost for maintenance of existing tram track system per kilometre from 1975-76 to 1984-85

(Rs. 100000)

Y e a r	Reserved track	Unreserved track
1975-76	1.0	1.0
1976-77	1.0	1.0
1977-78	1.2	1.2
1978-79	1.2	1.2
1979-80	1.5	1.5
1980-81	2.0	2.0
1981-82	2.0	2.0
1982-83	2.0	2.0
1983-84	2.0	2.0
1984-85	2.0	2.0

Source: The Calcutta Tramways Company.

T A B L E 24

Changes in fare structure of the Calcutta Tramways Company from 1975 to 1986

Fare (in paise)	
1975	1986
2nd class	2nd class
25	35
30	40
1st class	1st class
30	40
25	45
35	50

Source: The Calcutta Tramways Company.

T A B L E 25

Percentage change in earnings and expenditure of CTC during 1980-81 to 1984-85

Y e a r	Changes in earnings (%)	Changes in expenditure (%)
1980-81	+ 14.14	+ 38.83
1981-82	+ 21.56	+ 15.26
1982-83	+ 1.90	+ 10.72
1983-84	+ 6.04	+ 13.47
1984-85	+ 4.88	+ 7.15

Source : Computed from Table 16

T A B L E 26

Earnings and expenditures of Private Bus & Mini Bus*
(in Rs. 100000)

Mode/Year	Earnings	Expenditures
Private bus (1985)	5865.55	3339.20
Mini bus (1982)	1482.27	771.68

(*) Break up of expenditure figures for private bus and mini bus are provided in Appendix; Table - 5 & 6 respectively.

Sources: (i) For private bus, Government of West Bengal, Transport Department, Transportation Planning and Engineering Directorate.

(ii) For mini bus, D. Halder and Gurudas Gupta, "The Mini bus in Calcutta", Nagarlok, Volume - XVI, Number - 1, January-March, 1984, pp.17 - 19.

TABLE - 27(a)

Earnings, expenditures and net earnings per passenger kilometre for state buses and trams (excluding depreciation cost from total yearly expenditure), 1975-76 to'84-85

(in Rs./ passenger kilometre)

Year	Earnings					
	State bus Overloading			Trams Overloading		
	0 per cent	50 per cent	100 per cent	0 per cent	50 per cent	100 per cent
1975-76	0.03	0.05	0.04	0.05	0.04	0.03
1976-77	0.09	0.06	0.04	0.06	0.04	0.03
1977-78	0.09	0.06	0.04	0.08	0.06	0.04
1978-79	0.10	0.07	0.05	0.09	0.06	0.05
1979-80	0.10	0.07	0.05	0.10	0.06	0.05
1980-81	0.11	0.08	0.06	0.11	0.08	0.06
1981-82	0.12	0.08	0.06	0.15	0.10	0.07
1982-83	0.12	0.08	0.06	0.16	0.11	0.08
1983-84	0.14	0.09	0.07	0.17	0.11	0.09
1984-85	0.14	0.09	0.07	0.20	0.13	0.10

TABLE - 27(a) (Contd.)

Year	Expenditure					
	State buses			Trams		
	Overloading			Overloading		
	0 per cent	50 per cent	100 per cent	0 per cent	50 per cent	100 per cent
(1)	(8)	(9)	(10)	(11)	(12)	(13)
1975-76	0.13	0.08	0.06	0.06	0.04	0.03
1976-77	0.13	0.08	0.06	0.05	0.05	0.04
1977-78	0.13	0.09	0.07	0.09	0.06	0.05
1978-79	0.14	0.09	0.07	0.10	0.07	0.05
1979-80	0.14	0.09	0.07	0.09	0.06	0.05
1980-81	0.16	0.10	0.08	0.14	0.09	0.07
1981-82	0.18	0.12	0.09	0.17	0.11	0.09
1982-83	0.20	0.13	0.10	0.19	0.13	0.10
1983-84	0.22	0.14	0.11	0.21	0.14	0.11
1984-85	0.24	0.16	0.13	0.25	0.17	0.13

TABLE - 27 (a) (Contd.)

Year	Net Earnings					
	State buses			Trams		
	Overloading			Overloading		
	0 per cent	50 per cent	100 per cent	0 per cent	50 per cent	100 per cent
(1)	(14)	(15)	(16)	(17)	(18)	(19)
1975-76	-0.05	-0.03	-0.02	-0.01	0	0
1976-77	-0.04	-0.02	-0.02	-0.02	-0.01	-0.01
1977-78	-0.04	-0.03	-0.03	-0.01	0	-0.01
1978-79	-0.04	-0.02	-0.02	-0.01	-0.01	0
1979-80	-0.04	-0.02	-0.02	-0.01	0	0
1980-81	-0.05	-0.02	-0.02	-0.03	-0.01	-0.01
1981-82	-0.06	-0.04	-0.03	-0.02	-0.01	-0.02
1982-83	-0.08	-0.05	-0.04	-0.03	-0.02	-0.02
1983-84	-0.08	-0.05	-0.04	-0.04	-0.03	-0.02
1984-85	-0.10	-0.07	-0.06	-0.05	-0.04	-0.03

T A B L E 27(b)

Earnings, expenditure and net earnings per passenger kilometre (excluding depreciation cost from total yearly expenditure) for private bus and mini bus.

(in Rs. per passenger kilometre)

Mode/Year	Earnings			Expenditure			Net earnings		
	Overloading			Overloading			Overloading		
	0%	50%	100%	0%	50%	100%	0%	50%	100%
Private bus (1985)	0.28	0.18	0.14%	0.16	0.11	0.08	0.12	0.07	0.06
Mini bus (1982)	0.36	0.24	0.18	0.19	0.13	0.09	0.17	0.11	0.09

T A B L E 28(a)

Traffic Operational Planning and Management-I

Name of the road	Mid-day bus travel speed	Traffic regulations
Mahatma Gandhi Road	6.6 kilometre/hour	No restriction on movement-February, 1984
	9.1 kilometre/hour	Ban on slow moving vehicles-July, 1984
	9.9 kilometre/hour	Restriction on truck movement-September, 1984.

Source: Government of West Bengal, Transport Department, Transportation Planning and Engineering Directorate.

T A B L E 28(b)

Traffic Operational Planning & Management-II

Name of the road/street	Travel speed before oneway : Kilometre / hour		After oneway
Park Street	A.M.	14.30	19.31
	P.M.	11.15	26.11
Shakespear Sarani	A.M.	10.17	19.69
	P.M.	10.47	17.44
Camac Street	A.M.	15.70	24.20
	P.M.	10.16	18.06

Source: Government of West Bengal, Transport Department, Transportation Planning and Engineering Directorate.

T A B L E 29

Growth of automobiles in the city of Calcutta

Year	Number of automobiles per 1000 population (1)	Rate of growth of automobiles (%) (2)	Rate of growth of population (%) (3)
1950-51	18.40	49.54	8.46
1960-61	25.37	(1951-61)	(1951-61)
1970-71	29.31	24.27 (1961-71)	7.57 (1961-71)
1980-81	59.96	114.72	4.96
1984-85	93.94	(1971-81)	(1971-81)

Sources: (i) For column (1) and (2) Government of West Bengal, Transport Department, Transportation Planning & Engineering Directorate.

(ii) Column (3) figures computed from Census of India 1951, 1961, 1971 and 1981.

T A B L E 30

Journey to work statistics by I n c o m e G r o u p

Income in Rs./month	0-99	100-249	250-499	500-799	800-1199	1200-1999	2000+	Whole sample
% of sample	3	21	32	22	12	9	1	100
Distance (Km)	3.9	9.1	10.2	10.4	3.4	8.2	6.8	9.4
Time/day (min)	72	106	135	141	121	103	90	123
Cost/month (Rs.)	8.0	11.9	17.0	21.3	24.2	42.6	66.1	20.0
Fraction on (%) journey to work	16.0	6.8	45	3.3	2.4	2.7	2.6	3.4
Females (%)	3	2	17	6	1	0	0	7
Av. age (years)	23	33	33	36	40	42	46	35
Walkers (%)	26	14	4	5	3	1	9	7

TABLE 30 (contd.)

Income in Rs./ month	0-99	100-249	250-499	500-799	800-1199	1200-1999	2000+	Whole sample
Vehicles boarded*								
Cheap modes (%)	100	30	95	91	34	60	36	89
Premium modes (%)	0	0	3	6	13	30	41	8
ear modes (%)	0	1	2	3	3	10	23	3
Modes preferred								
Cheap modes (%)	97	91	89	85	30	69	36	85
Premium modes (%)	3	3	10	15	29	31	64	15
Dear Modes (%)	0	0	0	0	0	0	0	0
% of sample	3	21	32	22	12	9	1	100
Job								
Senior (%)	0	0	0	4	18	39	82	7
Professional (%)	0	1	13	6	14	10	9	8
Clerical (%)	6	19	65	71	59	47	0	51
Industrial Worker%	3	30	11	9	6	0	0	12
Trade/Service (%)	91	51	12	9	4	4	9	20
Distance								
0 - 4 km (%)	71	47	31	21	26	18	45	32
4 - 8 km (%)	12	23	37	40	47	50	27	37
8 -16 km (%)	17	15	12	23	15	16	18	18
Over 16 km	0	16	14	16	12	9	9	13
Cost/Month								
0 -15 Rs. (%)	91	76	58	52	50	25	27	57
15-30 Rs. (%)	9	21	32	31	28	20	0	27
0 - 45 Rs. (%)	0	2	9	9	10	21	36	9
Over 45 Rs. (%)	0	1	1	7	12	31.	27	6

(*) Cheap: tram, bus and train; premium : mini bus, deluxe bus and shared taxi; dear: taxi, rickshaw, car and scooter.

Source: T.H. Thomas and K.S. Sengupta, "Model choice in public transport in Calcutta," Engineering Department, University of Warwick (unpublished paper).

TABLE 31

Calcutta - Howrah investment programme under CUDP-III[1] : 1983-84 to 1987-88

Traffic and transportation		(Rs. millions)
(a)	Durgapur bridge	39.8
(b)	Gazuatri bridge	5.4
(c)	Link road with Deshapran Shasmal - Mahatma Gandhi Road	24.1
(d)	Link road - Anwar Shah Road - Netaji Subhas Chandra Bose Road	8.1
(e)	Subway from ferry crossing	5.4
(f)	Zeerut bridge	10.0
(g)	Garia Bus terminus	15.0
(h)	Calcutta Traffic Engineering Project	25.0
(i)	East-West Road	5.0
(j)	Makardah Road	10.0
(k)	New Howrah Bus Terminus	10.0
	Total:	157.8

1 CUDP - III : Calcutta Urban Development Programme, Phase - III (1983 - 84 to 1987-88).

A P P E N D I X

TABLE - 1

Yearly earnings of the Calcutta State Transport Corporation and itemwise break-up : 1975-76 to 1984-85

(Unit : Rs. 100000)

Y e a r	Operating revenue	Non-operating revenue	Central Workshop	Total
1975-76	634.65	9.76	153.96	798.37
1976-77	817.20	48.38	199.43	1065.01
1977-78	774.67	48.52	192.68	985.87
1978-79	905.35	54.97	286.14	1247.13
1979-80	1181.45	36.15	[illegible]	1513.74
1980-81	1363.65	45.24	[illegible]	1703.08
1981-82	1473.44	36.03	[illegible]	1311.89
1982-83	1532.85	37.69	[illegible]	1877.11
1983-84	1628.95	86.15	[illegible]	2050.12
1984-85	1426.60	108.14	308.77	1843.51

Source : The Calcutta State Transport Corporation

TABLE - 2

Yearly expenditure of the Calcutta State Transport Corporation and itemwise break-up from 1975-76 to 1984-85

(Unit : Rs. 100000)

Item	Year				
	1975-76	1976-77	1977-78	1978-79	1979-80
Salaries/allowances	594.81	672.03	761.00	920.00	1110.00
Bonus	-	40.94	44.81	55.13	62.21
Fuel and lubricant	199.59	241.04	221.00	246.00	299.00
Tyres and tubes	123.18	109.40	137.00	121.00	151.00
Spare parts, batteries and other stores	93.64	147.06	104.00	132.00	120.00
Rent and taxes	23.75	29.02	21.00	24.00	27.00
Central workshop (other than salaries/allowances and taxes and rents)	86.12	116.54	121.00	140.00	168.00
Office expenses and miscellaneous expenses	164.86	204.22	63.00	90.00	107.00
Interest, depreciation and other reserve funds	509.96	619.56	688.17	735.95	853.74
Total	1795.91	2179.81	2160.98	2464.08	2895.95

TABLE - 2 (Contd.)

Item	Year 1980-81	1981-82	1982-83	1983-84	1984-85
Salaries/allowances	1267.00	1448.00	1736.00	1791.00	1861.00
Bonus	67.15	73.11	85.62	99.43	107.38
Fuel and lubricant	411.00	509.00	587.00	633.00	631.00
Tyres and tubes	158.00	179.00	155.00	177.00	160.00
Spare parts, batteries and other stores	156.00	168.00	168.00	190.00	172.00
Rent and taxes	26.00	28.00	27.00	30.00	28.00
Central workshop (other than salaries/allowances and taxes and rents)	137.00	141.00	109.00	107.00	100.00
Office expenses and miscellaneous expenses	138.00	145.00	150.00	161.00	105.00
Interest, depreciation and other reserve funds	689.00	609.00	753.49	991.28	1052.55
Total	3049.24	3300.11	3771.11	4179.71	4216.93

Source : The Calcutta State Transport Corporation

TABLE - 3

Yearly earnings of the Calcutta Tramways Company Limited and itemwise break-up from 1975-76 to 1984-85

(Unit : Rs. 100000)

Year	Traffic receipts	Other receipts	Govt. subsidies	Total
1975-76	460.00	2.00	241.00	703.00
1976-77	497.00	5.00	145.00	647.00
1977-78	512.00	10.00	338.00	860.00
1978-79	496.00	6.00	421.00	923.00
1979-80	531.00	8.00	444.00	983.00
1980-81	569.00	24.00	529.00	1122.00
1981-82	654.00	21.00	689.00	1364.00
1982-83	650.00	22.00	718.00	1390.00
1983-84	731.00	43.00	700.00	1474.00
1984-85	623.00	45.00	878.00	1546.00

Source : The Calcutta Tramways Company Limited

TABLE - 4

Yearly expenditure of the Calcutta Tramways Company Limited and itemwise break-up: from 1975-76 to 1984-85

(Unit : Rs. 10 millions)

Item	Year 1975-76	1976-77	1977-78	1978-79
(1)	(2)	(3)	(4)	(5)
Salary/wages and allied expenses	590.00	600.00	682.00	696.00
Material necessary and fuel	123.00	124.00	158.00	182.00
Taxes & Interest paid	44.00	53.00	108.00	113.00
Other expenses	74.00	83.00	131.00	147.00
Total	831.00	860.00	1079.00	1138.00

TABLE - 4 (Contd.)

1979-80 (6)	1980-81 (7)	1981-82 (8)	1982-83 (9)	1983-84 (10)	1984-85 (11)
670.00	991.00	1218.00	1314.00	1467.00	1593.00
173.00	290.00	277.00	303.00	286.00	301.00
114.00	76.00	81.00	91.00	99.00	103.00
86.00	91.00	93.00	140.00	245.00	250.00
1043.00	1448.00	1669.00	1848.00	2097.00	2247.00

Source : The Calcutta Tramways Company Limited.

TABLE 5

Expenditure of private bus and its itemwise break-up for the year 1985

Items	Amount (Rs.100000)
Salaries	1502.64
Fuel & Lubricant	1001.76
Tyres	233.74
Spares	267.14
Miscellaneous	333.92

Source: Transportation Planning and Engineering Directorate, Transport Department, Government of West Bengal.

TABLE 6

Expenditure of Mini buses and its itemwise break-up for the year 1982

Items	Amount (Rs. 100000)
Fuel and lubricant	107.58
Tyres	74.48
Engine overhauling	18.62
Service and maintenance	31.03
Wage bill	206.88
Overheads (garaging, charging, etc.)	28.96
Taxes	6.21
Insurance payment	20.70
Bank loans and interest payment	225.50
Miscellaneous	51.72
Total :	771.68

Source : D. Halder and Gurudas Gupta, "The Mini bus in Calcutta", Nagarlok, Volume XVI, Number 1, January - March, 1984.p.17.