URBAN AND REGIONAL REPORT No. 73-6

REPORT ON BOMBAY

Main Report

(This report has four annexes)

B. B. KING and Others

March 31, 1971

These materials are for internal use only and are circulated to stimulate discussion and critical comment. Views are those of the author and should not be interpreted as reflecting the views of the World Bank. References in publications to Reports should be cleared with the author to protect the tentative character of these papers.
This report is based on the findings of a mission that visited Bombay from November 10 to December 5, 1970. The mission consisted of the following members:

King, Benjamin B. - Chief of mission
Bahl, Roy W. (Consultant) - Fiscal Affairs
Bargholtz, Percy B. - Public Utilities
Berrie, Thomas - Public Utilities
Kraft, G. (Consultant) - Transportation
Mera, Koichi - Urban Economics
Strombom, Donald A. - Transportation
# REPORT ON BOMBAY

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I - SCOPE AND SETTING</td>
<td>1</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>A Brief Anatomy</td>
<td>1</td>
</tr>
<tr>
<td>The Metropolitan Region</td>
<td>5</td>
</tr>
<tr>
<td>Center, State and Municipality</td>
<td>6</td>
</tr>
<tr>
<td>II - TRANSPORTATION</td>
<td>9</td>
</tr>
<tr>
<td>Mass Transportation</td>
<td>9</td>
</tr>
<tr>
<td>Movement of Freight</td>
<td>17</td>
</tr>
<tr>
<td>Air Transport</td>
<td>21</td>
</tr>
<tr>
<td>III - PUBLIC UTILITIES</td>
<td>22</td>
</tr>
<tr>
<td>IV - LAND USE, HOUSING AND THE URBAN PRICE MECHANISM</td>
<td>27</td>
</tr>
<tr>
<td>Housing</td>
<td>27</td>
</tr>
<tr>
<td>The Urban Price Mechanism</td>
<td>28</td>
</tr>
<tr>
<td>Land Use Plans</td>
<td>31</td>
</tr>
<tr>
<td>V - THE FUTURE OF THE REGION</td>
<td>33</td>
</tr>
<tr>
<td>The Fiscal Position of Greater Bombay</td>
<td>33</td>
</tr>
<tr>
<td>The Twin City</td>
<td>34</td>
</tr>
<tr>
<td>Planning for the Region</td>
<td>36</td>
</tr>
<tr>
<td>APPENDIX ON STATISTICS</td>
<td>38</td>
</tr>
</tbody>
</table>

**ANNEX I*|

MAPS

STATISTICAL TABLES 1.1 to 6.8

* Bound separately for easier reference to the maps and tables mentioned in the text.
REPORT ON BOMBAY

CHAPTER I

SCOPE AND SETTING

Introduction

1. This report does not purport to be comprehensive in any sense of that word. On the basis of a three-week visit such a claim would be presumptuous. It is typical of cities that information either does not exist or is not readily accessible in many fields; where it does, it may be uncertain in meaning or conflicting. Bombay is no exception although the position is in some respects much better than one might expect. Therefore, more questions will be asked in the report than judgments given, the questions themselves will be on different levels, and such judgments as are made will be made with different degrees of confidence. The report is an opening gambit and must be thought of as such.

2. One theme runs through the report, superseding but not excluding others. This is the allocation of resources to the development of the city. What motivates the allocation for each purpose? On what information and under what constraints does each agency make its decision or put forward its proposals? How are all the allocations put together and what sense does the final result of this process make?

A Brief Anatomy

3. Bombay is the financial capital of India and its leading port. After Calcutta it has the largest population and largest industrial output. It is the capital of the State of Maharashtra. Greater Bombay, the present jurisdiction of the Bombay Municipal Corporation, has a population estimated in 1968 at about 5.4 million. This is less than 1% of the total population of India, but the income generated in Bombay is in excess of 3%. Industrial output is of the order of 20% of the total for all India. Bombay's importance in the economy is very much greater than its share in population.1/

1/ See Table 1 on the following page. The figures are rather old; they have been chosen to ensure comparability.
<table>
<thead>
<tr>
<th></th>
<th>India</th>
<th>Maharashtra</th>
<th>Greater Bombay /1</th>
<th>Bombay as % of India</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population (1961)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (millions)</td>
<td>439.2</td>
<td>39.55</td>
<td>4.15 (5.28)</td>
<td>0.9</td>
</tr>
<tr>
<td>Urban (millions)</td>
<td>78.9</td>
<td>11.16</td>
<td>4.15 (4.64)</td>
<td>5.3</td>
</tr>
<tr>
<td>Males per 100 females</td>
<td>106</td>
<td>107</td>
<td>152</td>
<td>...</td>
</tr>
<tr>
<td><strong>Income, 1960/61</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (Rs. billion)</td>
<td>133.1</td>
<td>15.4</td>
<td>4.25 (4.80)</td>
<td>3.2</td>
</tr>
<tr>
<td>Per head (Rs.)</td>
<td>307</td>
<td>393</td>
<td>1,025 (925)</td>
<td>...</td>
</tr>
<tr>
<td><strong>Industry, 1961</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value added (Rs. billion)</td>
<td>12.0</td>
<td>3.0</td>
<td>2.3</td>
<td>19.5</td>
</tr>
<tr>
<td>Employees (millions)</td>
<td>3.70</td>
<td>0.78</td>
<td>0.51 (0.54)</td>
<td>13.8</td>
</tr>
<tr>
<td>Value added per industrial worker (Rs.000)</td>
<td>3.2</td>
<td>3.9</td>
<td>4.6</td>
<td>...</td>
</tr>
<tr>
<td><strong>Public Expenditure (Rs. billion)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual (1966/67)</td>
<td>61.4</td>
<td>4.6</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Fourth Plan (1969/70 – 1973/74)</td>
<td>159</td>
<td>9</td>
<td>n.a.</td>
<td>...</td>
</tr>
</tbody>
</table>

/1 Figures in parentheses are for the metropolitan region.

**Note:** Annual expenditure includes all capital and current expenditure. For India it is the consolidated total of the center and the states; for Maharashtra and Bombay, only the budget expenditure of the state and municipal authorities. "Plan" expenditure includes most capital and some current expenditure.

**Sources:**
- BMC municipal accounts.
4. Bombay was founded as a fortified trading post on a collection of islands long since consolidated by reclamation into one, flanking the best natural harbor on the west coast of India. The central business district is still known as the Fort. From this origin, Bombay has expanded up through Salsette Island to the north, and northwards and northeastwards onto the mainland. There are three Bombays, reflecting this historical development. In ascending order of size — and descending order of density of population — they are Bombay City, Greater Bombay, and Bombay Metropolitan Region. Bombay city — or the island city 1/ — was until 1950 the extent of the jurisdiction of the Bombay Municipal Corporation (Table 1.1). 2/ Its jurisdiction was extended in two stages (in 1950 and in 1957) to embrace the suburbs which occupy most of Salsette Island to the north (see Map 1). The city plus the suburbs together are known as Greater Bombay. The metropolitan region is neither a political nor a historical entity. It was defined under a Regional and Town Planning Act as the basis for a study by an ad hoc board known as the Bombay Metropolitan Regional Planning Board. It includes the rest of Salsette Island and large areas to the north and east of it on the mainland.

5. Like all metropolitan areas, Bombay has grown faster than the country of which it is part (Table 2.1). In 1901, its population was less than one half percent of India's. Growth has fluctuated; there was none in the decade 1921 to 1931 because of the recession, while during World War II there was very rapid growth, a decennial rate during the decade 1941-51 of about two thirds. In the following decade, 1951-61, the decennial rate was 38%. Growth has taken place lately largely in the suburbs, whose population has more than doubled in each of the two decades from 1941 to 1961. The principal industrial growth took place in the suburbs and, more recently, beyond. There has been substantial industrial expansion in Thana just beyond the municipal limits, in Trans-Thana across Thana creek on the mainland, and in the complex of towns further east around Kalyan and Ambernath, mainly on industrial estates operated by the MIDC, a state-owned corporation. The various towns along the Central railway from Thana to Kalyan, some of them already dormitories for Bombay, had a combined population of 350,000 in 1961. The growth of these towns has almost certainly increased as they have come into the ambit of the metropolitan area.

6. With few exceptions, which may be statistical rather than real, the structural characteristics of Bombay's population have changed little in the last 60 or 70 years. A preponderance of the immigrants have always been men, who most often retain ties to their villages; they may come temporarily for work or they may bring their families later. Consequently, the ratio of women to men is low, as in Calcutta; in 1961 it was 663 per thousand (Table 2.2). Consequently, there is a very high proportion of men in the 15-59 age bracket, 42% of the total population compared with 26% in

1/ The word "island" is used here and henceforward as shorthand for Bombay city as opposed to the suburbs or Greater Bombay as a whole.

2/ Tables and maps referred to here and henceforward are in Annex I.
the rest of Maharashtra; correspondingly, there are far fewer children of either sex (Table 2.3). At the census of 1961, two thirds of the people were born outside Bombay, a proportion not quite as high as it was in earlier years. In the first four decades of the century net migration may have accounted for more than the increase in population; in the decade 1951-61 about half the increase.1/ The origin of the migrants appears to have been changing. In 1961, close to 40% of the "out-born" came from states other than Maharashtra or nearby Gujarat; this seems to be a higher proportion than hitherto (Table 2.4).

7. The outward development of Bombay and the transportation system which goes with it broadly resemble the form of the letter "Y". The trunk is the island; the crotch is the southern tip of the suburbs; the arms extend into the suburbs of Salsette Island, which is divided in the center by a national park, the airport of Santa Cruz and other open spaces, and onto the mainland beyond. Despite the growth of industry in the outlying towns and in the suburbs, there are more employees living there than there are jobs; the reverse is true on the island (Table 3.4). Therefore, the principal movement in the morning is from the two arms of the "Y" down to its trunk, and the reverse in the evening. Broadly speaking, the island provides industrial employment in the northern part of it; wholesale and retail trade and work on the docks further south; and office employment in commercial houses, banks and government offices in the Fort area close to the tip.

8. Bombay is often identified with internal and external trade and with associated activities such as commodity and stock exchanges and financial institutions. These have always been important in Bombay, but they are by no means predominant. Bombay has long been one of the leading textile centers in India. Employment in this industry has however grown little in recent years; growth has switched to less traditional industries, like chemicals and engineering. In the 1961 census about 40% of workers were in manufacturing of all kinds, but factory employment would be substantially less, of the order of 30%. The government is also a large employer, about 20% of the labor force; this includes not only the three levels of government proper, center, state and city, but also the Railways, the Port and various financial institutions.2/ Bare statistics, however, hardly do justice to the quality of employment in Bombay, which probably is the leading center in India for sophisticated skills and specialized ancillary and consultant services to industry and commerce.

---

1/ See K. C. Zachariah, Migrants in Greater Bombay, 1968, p. 15. As the author points out (pp. 93-106), there is substantial emigration concealed in the 'net' figure.

2/ For various employment statistics, see Tables 3.1 to 3.3, 4.1 and 4.2.
9. The income level in Bombay was estimated in 1961 about three times that of the rest of Maharashtra. One need not look far for an explanation. In the rest of Maharashtra the great majority of people are engaged in low productivity occupations, such as agriculture and household industry. Even outside of agriculture, the productivity of the average worker in Bombay is a great deal higher than in the rest of the state. Income has the usual skewed distribution. A recent enquiry (in 1968) suggests that about two thirds of the households have an income of less than Rs. 400 per month, perhaps an average per capita annual income very roughly of the order of Rs. 500, which would still be substantially higher than the average for India as a whole. Among the poorer people, however, there is a submerged class, about a sixth of the total population, with household incomes of under Rs. 150. These probably correspond to the so-called "hutment" dwellers or squatters on vacant land.

The Metropolitan Region

10. The Bombay Metropolitan Regional Planning Board, which was constituted in 1967 at the time when the region was first defined, presented its Draft Regional Plan to the state government in 1970. The principal operational significance of the Plan is a land use plan for the metropolitan region which, when accepted by the state government, will be binding for the next ten years. Beyond that, the Board made a large number of recommendations and it included in its report a list of projects called an "Immediate Operational Program for Other Bodies to be Completed". What it did not say and, in the circumstances, probably could not say was how these projects could be financed. Nor will it be able to do so in the future because once its plan has been accepted by the state government, the Board will go out of existence. The Board recommended against the constitution of a development authority for the region and, instead, recommended a high level coordinating council. Such a council has in fact been formed subsequently with the Minister for Urban Development as chairman, but it has no staff. The report of the Planning Board was thus a one-shot affair.

1/ It is tempting to couch comparative statements about income in terms of income per worker and, indeed, there are figures to this effect in Table 3.1 in the annex. However, these can be quite misleading. Despite the much higher proportion of men of working age in Bombay, the so-called participation rate is lower than in the rest of the state, 41% as against 49%. This is because of the prevalence of family labor in the rest of the state engaged principally in agriculture. Bombay has a high proportion of students and of women engaged in household duties who do not form part of the labor force. In the rest of the state the people in these categories are a much lower proportion, since many in the corresponding age-group are classified as agricultural workers (Table 3.2). One may well question a simple statistical comparison between a family on the one hand, in which the man works, his wife stays at home and the children go to school, with another family in which all of them work on the land but are in different degrees not fully employed on it.
The most far-reaching recommendation of the Planning Board was the development of a new city across the harbor from Bombay on the mainland, known variously as the Metrocenter or Twin City. Without this development the Board projected Greater Bombay would grow from a population of a little over four million in 1961 to nearly ten million in 1991 and the outlying urban areas from about half a million to one and a half million in the same period. This projection was based on the continuation of the present trend for the development of Bombay, in which the centers of economic activity are mainly down on the island while the population is strung out in a northerly and northeasterly direction along the railway lines. In order to prevent the growing "congestion" this causes, the twin city was proposed as a new focus of economic activity which together with other satellite towns would draw people from the city to the extent of nearly three million (Table 2.5).

In essence, the notion of a twin city has been accepted with the creation of the City and Industrial Development Corporation of Maharashtra (CIDCO), a state corporation with very wide powers for urban development throughout the state. Its principal task initially, however, is well recognized to be the development of the twin city; already 55,000 acres in the project area have been "notified", that is, the owners have been put on notice that the government may exercise an option within the next three years to buy the land, during which time their use or sale of it is restricted. The metropolitan region, however, is more than Greater Bombay, for which the Municipal Corporation is the authority, and the twin city to be, for which CIDCO is now responsible. The towns along the railway lines leading out of Bombay, which already contained a population close to 400,000 in 1961 and have grown considerably since, are linked to Bombay by suburban rail services and, together, their industrial employment is in total as large as that of Poona, frequently regarded as the second industrial center in the state (Table 4.2).

Center, State, and Municipality

The figures under Expenditure in Table 1 are significant in two ways. First, one may compare the annual expenditure of the Bombay Municipal Corporation with public expenditure in India as a whole (the consolidated total for center and states) or with the public expenditure of Maharashtra State. Contrary to the trend in other figures, which are higher than the proportion of population, this one is lower. This does not mean that the level of all public expenditure in Bombay is now, but it does indicate the reduced role of urban government in India. The second significant figure is one that is not there, the share in Plan expenditure. If Bombay can be said to have some sort of plan of expenditure comparable to those for India as a whole and for states, it consists of bits and pieces of other people’s plans plus a little expenditure of its own. Financing of expenditure may be by the city, the state, the center or any combination of these, including all three. Capital expenditures under the city’s direct control are very limited. Responsibilities within Bombay, and even more within the metropolitan region, are divided among all three levels of government. It would take considerable time and effort to find out what public expenditure in the Bombay region has been.
14. The Railways, which run the vital suburban services 1/, are operated by two divisions of the Indian Railways, the Western Railway and the Central railway. National roads run into Bombay; the state government, through its Buildings and Communications Department, is responsible for major road construction in Bombay. Virtually all expenditure on railways, civil aviation, and most of the expenditure for ports is the province of the center and its agencies. There is, however, local representation on the Bombay Port Trust, which operates the port of Bombay. The Municipal Corporation, through its subsidiary, the Bombay Electric Supply and Transport Undertaking (BEST), runs the buses in Greater Bombay and electricity distribution in Bombay city (a private company does the latter in the suburbs). Two subsidiaries of the state government, the Maharashtra State Housing Board and the Maharashtra State Road Transport Corporation, are respectively responsible for public housing and for bus transport outside Greater Bombay. CIDCO would have the responsibility for all the usual urban services in the proposed area of the twin city.

15. The story is much the same for public utilities. Telecommunications are wholly national (the Indian Posts & Telegraphs Department). In electric power the national level is engaged through the Central Water and Power Commission, which scrutinizes the expansion plans of the state electricity boards, and through the Atomic Energy Department which is also engaged in power generation. The state is engaged in generation, transmission and distribution, through the Maharashtra State Electricity Board (MSEB), and regulates the private utilities in the sector. The metropolitan region consumes about three quarters of all the power in Maharashtra. For water supply and sewerage the primary responsibility rests with the municipalities, but the state is responsible for the construction of dams; it gives financial assistance to municipalities and other local bodies for investments; it carries out the construction of new facilities for all municipalities but the BMC itself; and, through the Maharashtra Industrial Development Corporation (MIDC), it is directly engaged in water supply and distribution in some areas.

16. Such a list of divided responsibilities is far from being unusual. Nevertheless, it does raise questions about the future planning of the allocation of resources within the metropolitan region. Possible claims on these resources are large and they will need stringent examination before allocation is made; and other economic policies should be consistent with the allocation. It is by no means clear how this is to be done under the existing system.

17. In deciding on the allocation, the authorities will have a formidable list of problems to face. The preamble of the summary version of the

---

1/ One third of all passenger-trips in India by rail are made in Bombay.
Planning Board's report describes them in this way:

"Bombay the beautiful" is no more beautiful. Many parts of it are not even tolerably clean and healthy. Housing deficits are ever widening; and slums, like a cancerous growth, is threatening to break down and serious law and order situations develop on the slightest provocations. The geography of the island imposes severe limitations on the optimum and healthy population size and growth. Despite these limitations, however, the city continues to attract large streams of migrants. Concerted action and co-ordinated planning is necessary to salvage this situation. 1/ 

With one exception this is a pretty fair summary; the exception is an impending shortage of power, which is not yet an actual problem and which it may be possible to forestall to some extent. In the following chapters we shall examine how these problems have been dealt with in the past and how it would appear that the agencies concerned intend to deal with them in the future.

1/ Strategy for Bombay Metropolitan Region, p. 5.
CHAPTER II

TRANSPORTATION

Mass Transportation

18. Mass transportation ranks first among the possible claimants on resources, since proposals in the wind for the next decade could cost as much as Rs.500 crores. Expenditure on this scale is contemplated because of the supposed need to build several subway lines down the length of the island of Bombay city in order to accommodate the growth of commuter traffic. Among commuters to work at the peak hours, about twice as many use the railway as their main mode as use the buses; in terms of passenger-kilometers the discrepancy must be much greater. The need for a subway turns on the assumptions used for determining the ultimate capacity of the railways and the growth of commuter traffic. As we shall see, both these assumptions are open to question.

19. Suburban transportation is provided by the two divisions of the Indian Railways which have their headquarters in Bombay, the Western and the Central (see Map 2). The Western railway line from the terminus at Churchgate near the foot of the island is double-track for about four kilometers to Grant Road, the station before the main line terminus at Bombay Central; it has four tracks for the remaining 30 kilometers north to Borivli, but suburban services extend on the two main lines across the creek as far north as Virar (60 kilometers). On the Central railway, which starts at Victoria Terminus fairly near Churchgate, four tracks run up the eastern side of the suburbs through the town of Thana to the outskirts of the municipal limits as far as Kalyan 54 kilometers away on the mainland. Lesser suburban services run even further, another 67 kilometers to Kasara on the main line to Agra, and southwest 46 kilometers to Karjat on the main line to Poona. These rail lines roughly, but by no means exactly, parallel the main road system running into Bombay, which includes a four-lane expressway through the suburbs on either side of Salsette Island as far as its junction with the island to the south. An extensive network of bus services within Bombay city is provided by BEST. In the suburbs BEST provides principally feeder services to the railheads. There is a limited amount of long distance bus service from outside Bombay operated by the Maharashtra State Road Transport Corporation.

20. The forerunner of traffic studies in Bombay was one made by Wilbur Smith in 1963. Despite the fact that even now only about one in 80 persons owns a car in Bombay, that some 90% of all passenger-trips in

1/ An additional two tracks are under construction on these four kilometers.
Bombay are made by rail or bus and many of the remainder consist of short-distance taxi trips or school bus trips and the like, the study was heavily oriented towards passenger automobiles. In projecting future demand for traffic the study had to take as its basis the existing land use plan for Greater Bombay. The study recommended an expenditure of about Rs. 96 crores in the following 20 years, mainly for freeways up the sides of the island somewhat on the analogy of the West Side highway in New York, with cross-connectors. Little was done to implement these proposals until the Fourth Plan under which 12 crores were allotted (4 crores each from the center, the state and the city) to building parts of the western and probably less necessary of the two freeways, both of which are something of a luxury. Most cities would be happy to have the low volume of automobile traffic that Bombay has.

21. A direct descendant of the Wilbur Smith study was the Mass Transportation Study of Bombay. This study was prepared by an ad hoc body known as the Traffic Cell created in the Directorate of Town Planning of the state government. It carried out its work in 1968 and 1969 and finished its final report in the latter year. As the title would imply, the study is much more heavily oriented toward mass transportation. Such a need had been alluded to in the Wilbur Smith report and subsequently emphasized by a body known as the Metropolitan Transport Team appointed by the Central Planning Commission. One may take issue with some aspects of the methodology followed by the Traffic Cell and with some of its conclusions, but the fact remains that its final report is by far the most comprehensive study of the movement of people in Bombay. It could well have been published to enable those interested in the future development of Bombay to debate the many issues more solidly on facts and less on mere opinions, especially as the Traffic Cell has now been dissolved.

22. According to the Traffic Cell's report, the present pattern of movement in Bombay is as follows. Of the 5.4 million people in Greater Bombay in 1968, about 3 million take regular trips every weekday - to work or to school. About 1 3/4 million, including most of the students, go on foot. The remaining 1 1/4 million use one or more modes of transportation (Table 3.4).

23. Since there are more jobs than workers in the island and vice-versa in the suburbs and outlying areas, the predominant movement at the peak hours is in one direction: north-south in the morning and the reverse in the evening. There is a substantial and apparently increasing movement in the opposite direction, but there is not much evidence to say how much. The volume of the north-south movement begins to taper off in the industrial district of crli and Parel in the center of the island.

1/ For trip distribution see Table 6.3.

2/ For distribution of trips by hour of day see Table 6.6.
(district 6) but it is still substantial at the extremities of the suburban lines. About 300,000 workers travel to the Fort area (the central business district) every day, more than 200,000 arriving by rail at Churchgate or Victoria terminals (Table 3.4, Col. 7). From here most go on by foot, since the distances are not great. The Fort area contains the offices of the state and municipal governments and many branches of the central government, the Reserve Bank of India and many commercial banks, and the head offices of numerous large business firms or public enterprises. Most of it is within one kilometer of the terminals; the great majority of those who walk from the terminals spend less than ten minutes doing so.

24. Some, however, continue by bus, especially to Colaba, the southern tip of the island. They are not many, because there is not much employment in this area at present. This, however, is changing and will continue to do so if the most controversial project in Bombay continues. This is the reclamation of Backbay, a large body of water already partly enclosed. If this project goes ahead and the land is sold for commercial development, maybe another 150,000 jobs will be created there by 1981, increasing not only the load on rail transportation to the two terminals but on road transportation from there on.

25. It is perhaps for this reason that the Traffic Cell concerned itself particularly with traffic arriving in the Fort area and continuing south, at some expense to the treatment of other traffic conditions throughout Bombay. There is however another reason. There are really two different, though related, problems connected with the flow of traffic up and down the island. One is the capacity of the railway and bus services to cope with the flow at peak hours, which appears - the evidence is not very strong - to be at its maximum around Dadar in the industrial north of the island. The total daily flow at about this latitude, if we may call it that, is very much greater than it is further south on the edge of the Fort area, as much as 80% higher on the railways (Table 6.4). The difference, however, may be less at peak hours, although the information on this is not clear. It would appear that about 120,000 people travel south on the railways during the peak hour, but at the two terminals the number is down to 80,000 (Table 6.7). These 80,000 people however give rise to the second problem, since they all get out at the two terminal stations. Those that do not try to board a bus at this time interfere with the buses and other traffic as pedestrians. In other words there is a dispersal problem.

26. The Railway Board, a central body, has commissioned further studies on both these problems, entrusting the work to a specially constituted body known as the Metropolitan Transport Project (not to be confused with the Metropolitan Transport Team). As in considering the capacity problem, the

---

1/ Colaba, incidentally, was served by a direct rail link at one time; it was replaced by a road in 1933.

2/ If all the occupants of the jobs came by rail, they would need 50 train-loads even at the peak density.
MTP has accepted the forecast of future traffic prepared by the Traffic Cell, it is necessary to examine these projections and their underlying assumptions. In making its study the Traffic Cell, following the Wilbur Smith report, established a series of "screen lines" crossing the island east to west in order to identify the number of people crossing these lines every day. The important screen lines for our purposes are screen line No. 1 which divides Colaba from the Fort, screen line No. 2 which divides the Fort from the rest of the island, screen line No. 7 which divides the island from the suburbs, and screen line No. 8 which is to the north of the suburbs.1/ In 1968 the average trip, according to the Traffic Cell's estimates, crosses two screen lines; in 1981 they estimate that the average trip would cross three screen lines. This means that the incremental trips added between these two years would cross an average of five screen lines (Table 6.5). Many trips, including all those which take place entirely within the suburbs, do not cross a screen line at all and therefore count zero.2/ If we make an off-the-cuff assumption that 30% of all trips do not cross a screen line, the remainder of these incremental trips must cross seven screen lines, i.e. they must all come from the suburbs or even further out and go all the way down to the Fort area or Colaba.

27. One may juggle with these figures as one likes but the fact remains that the vast majority of the incremental trips, according to this forecast, come from outside Bombay city and cross the entire island. This is almost too much to believe, even if one accepts, as the Traffic Cell had to accept, the assumption that a very large number of jobs would be created by 1981 as a result of the reclamation of Backbay. How much of the forecast increase in north-south traffic is due to some quirk in the projection and how much to this assumption about the Backbay is not clear. In any case it is the Backbay which is largely responsible.

28. The Traffic Cell in their report threw out some pretty broad hints about the unsatisfactory consequences of their projections for the city's development. At that time of course, the report of the Metropolitan Regional Planning Board had not yet been prepared. Its report went a great deal further and listed among the major policy decisions needed, first, in general, that nothing be done to "perpetuate the north-south development trend" and, secondly, in particular, to abandon the Backbay 1/

---

1/ The remaining screen lines of course fall between screen lines 2 and 7, as shown on Map 2.

2/ Bus trips to a railhead for the purpose of catching a train are counted as separate trips.
reclamation project. They recommended in the first instance giving priority to the Bandra-Kurla reclamation, a project at the southern end of Salsette Island which has been on the books for some time. Ultimately, they recommended shifting as much of the office development from the present central business district to the proposed twin city. The MTP project on the other hand, appears to be under the constraint of planning on the assumption that the Backbay project would continue.

29. This was not the only constraint under which the MTP appears to have operated. Another was the use of main lines into Bombay. Each railway leading into Bombay has two pairs of tracks running down the middle of the island, one pair being primarily for suburban traffic and the other for main line traffic; the Central, in addition, has a purely suburban line along the east side of the island known as the Harbor Branch. Thus there are five pairs of tracks running down the island. At present, some suburban traffic runs on the main lines but the constraint was imposed upon the MTP that no further suburban traffic should run on these two pairs of main lines in 1981, despite the fact that only a dozen or so passenger trains run during the peak hours (9-11 a.m. and 5-7 p.m.).

30. A third constraint was to confine the actual use of the passenger cars to their "marked capacity"; the latter is 1,750 passengers per 9-car rake, which is the normal train. Present conditions, where the actual number of passengers on a train may exceed 3,000, are regarded as intolerable. However, this constraint goes rather far in the opposite direction since it allows something like three and a half square feet per standing passenger. This is better than the conditions endured by commuters in other cities.

1/ They have not been the only ones to raise this sort of question. For example, the following extract from "Work, Wages and Well-being in an Indian Metropolis" by D.T. Lakdawala and others, 1963:

"In this connection attention may be drawn to the extension of the already existing sites or erection of new ones, undertaken or completed in the recent past by the various governmental agencies in the already concentrated areas of Fort and Colaba. This is bound to have given a further twist in the wrong direction and worsen the problem of transportation in a city like Bombay where the traffic is mostly in one direction. The question might be asked whether it were not possible to develop an alternative site by pooling together the resources of all these agencies. As however, the amounts already committed are substantial, for some time to come at least, the opportunity of dispersal has been lost." (p. 703).

2/ There is also a spur from Kurla to the Trombay area, which is also reported to be having capacity problems.

3/ There are 36 mainline passenger trains arriving daily in Bombay and the same number departing, plus three in each direction weekly or biweekly.

4/ Trains in Tokyo are reported to be even more crowded than those in Bombay at present.
31. If one were to abandon these constraints by allowing less relief from present crowding, by turning over the main lines wholly to suburban traffic on the island at least during the peak hours, and if one were to introduce various improvements suggested by the MTP (signalling, use of 12-car rakes on the Central railway, etc.), one could—at considerable expense, but far less than for a subway—increase capacity to a point where one could carry about two and a half times the present number of peak-hour travelers in the center of the island, or just about what the MTP estimated the needs would be even with the Backbay reclamation continuing. If one abandons that constraint too, then there would be ample capacity for many years to come, although not without certain costs. Some of these can readily be quantified, for example the capital cost of introducing various operating improvements on the present lines. Others are less easy, for example the added discomfort to the commuter of losing a square foot of standing space, or of reducing his probability of getting a seat, or the inconvenience to the main line railway traveler of arriving outside the center of the city, but still at a point which is much closer in than most airports, including the one in Bombay.

32. There are also the costs to be taken into account of forcing or, alternatively, inducing organizations to move their offices to the southern tip of the suburbs instead of the southern tip of the island. They would suffer the loss for the time being of what are popularly known as economies of agglomeration. That these economies exist is attested to by the very high prices for land which are paid in the reclamation project, prices which may reflect the benefits anybody occupying the land might expect to enjoy but not necessarily reflecting the costs which he may impose on the urban economy, at least under present conditions.

33. That employers in the Fort area do impose considerable cost on the urban economy seems to be beyond question even at present, without contemplating the prospect of a subway. Very low season ticket fares are available on a monthly basis; for example, a passenger from Borivli to Churchgate pays a monthly rate of Rs. 10.60 for the whole month or, based on 25 days and a 70-km round trip, about 0.6 paise per trip-kilometer; on a quarterly basis, the price is only five sixths of this. A rough calculation would suggest that this fare on a marginal train required only at the peak hour, when most of the season ticket holders would be supposed to travel, may be below the interest cost on rolling stock, let alone any other
A far more searching analysis of costs involved in running commuter traffic is needed. There are, as we shall see, also additional costs involved in providing other public services.

34. It is only natural that with the cheap fares currently available, people with jobs in the Fort area would tend to move further out, where land prices are cheaper, than they would have done otherwise. The trade-off between the cost of living space and transportation is weighted further out than it would be if economic costs of transportation were charged. That a policy which tends to aggravate this situation is even considered occurs because the cost of adding commuter services at low prices is borne by the union government; the benefit from reclamation of land in the Backbay area in fiscal terms accrues to the Maharashtra Government. However, all resources ultimately come out of the same pot and it is doubtful whether anybody gains from such a policy in the end. The employer of course has no incentive to change his ways because the low fares enable him to pay lower salaries. Were railway fares to be raised, it is commonly believed there would be violent protest; there is no reason to think that this is not a reasonable fear.

1/ Let us take as an example a marginal peak-hour train from Borivli to Churchgate. Since it takes well over an hour with stops to travel the 35 kilometers to Churchgate in one direction, such a peak-hour train is not usable outside the peak hour; or rather, there are enough additional trains available for any non-peak-hour service. The cost of running the train during the peak hour must be measured against the receipts during the peak hour. If we assume that a train from Borivli is packed with 3,000 passengers, which in fact it is not, and that they are all third-class monthly season ticket holders (which is generous, as many would have quarterly tickets), the receipts per month would be of the order of Rs. 32,000. To allow for the fact that there may be some higher charges for first-class passengers, we can adjust this to, say, Rs. 36,000; that is, Rs. 4,000 per car in a 9-car rake. The annual receipts of that peak-hour run would thus be Rs. 48,000 or $6,400 per car. At 10% interest, which is really too low a shadow price of capital, this would be the interest cost, but only the interest cost, on a car costing $64,000. It might be possible to buy a car such as is used on the suburban lines for this price; certainly the price would not be less. Thus, a peak-hour train may not even earn the interest on its capital cost, let alone depreciation and running expenses. The economics of a train from a point somewhat nearer in, such as Bandra, might be a little better since there is a possibility of running the same train twice; moreover, the fares for shorter distances are somewhat higher per kilometer. The trend, however, is of course in exactly the opposite direction towards longer and longer peak-hour trips.
35. If wages were raised to compensate for increased fares, there would again be considerable inequity, because in fact not everybody travels to work from long distances. Because of rent control, a limited number of employees can afford to live much nearer, which means of course that they enjoy to some extent at least an invisible rent. Raising their wages would just increase the rent they enjoy. Thus, the very distorted market, if one could call it that, makes for the familiar results that resources are allocated in a distorted way too.

36. Any increase in the flow of traffic to the Fort area would of course aggravate the dispersal problem. While it is true that there is some congestion as a result of the disorderly flow of pedestrians out of the two main terminuses, there are cheaper solutions, at least at present, than building subway lines further south in order to break up concentration at these two stations. For one thing, the walking distance for most people is, as we have said before, not very great. Secondly, better discipline of pedestrians now overflow onto the street or cross against the traffic could be enforced. Additional traffic lights would be helpful in this respect. If that is not enough at certain crossings, pedestrians overpasses or underpasses would certainly be a cheaper solution than a subway. If the capacity of the sidewalks is not great enough under present conditions, it may be necessary gradually to prohibit along certain streets the vendors who now treat the sidewalks as the free good which it no longer is. It is a sobering thought that the opportunity cost of permitting the sidewalk sale of miscellaneous goods, which like as not may be smuggled, is to put in an expensive underground subway system.1/

37. The road traffic itself is also in need of greater discipline and the segregation of parts of the larger intersections as bus loading stations, much as is done at the Museum, might also help to improve the flow of traffic. It might then be possible to put more buses on the road if, as is alleged, the principal constraint on the number of buses is the condition of traffic in the downtown area. Neither the BEST fleet nor the number of passengers it carried changed very much between 1962/63 and 1967/68, although there appears to have been an increase of about 10% per annum since (Table 6.2). If so (and the evidence is not clear), this is rather a remarkable fact considering that feeder services in the suburbs either have been or could have been growing during that time. Prima facie there would appear to be a good case for additional investment in buses or in traffic engineering to improve their use; in some cases, new investment could be avoided by freer allocation of foreign exchange for spare parts. Moreover, in the case of buses there is, in view of the preponderance of short-distance traffic in the island, a strong case for reducing the proportion of seated versus standing passengers.

1/ Most, if not all, of these remarks apply in some other parts of the island as well.
In all, there are many minor improvements possible before one need resort to more expensive solutions. Perhaps, in the course of time, it might become desirable to continue the existing lines a little further south and to link them so that they form a loop; this would permit faster service. If the need should arise, it is a fortunate accident that both stations are adjacent to the Maidans (open areas) running almost due south. Construction on or under this open space would certainly be cheaper than under existing buildings. If the use of a traditional open space such as the Maidans appears little better than sacrilege, it might be pointed out that reclamation of the Backbay could provide many times the open space that now exists. Moreover, land in the reclamation area could be reserved for part of the extension. Finally, the question still remains as to whether it is a good idea to induce traffic by improving the transportation service, when prices are somewhat inflexible. The prospect might be a never-ending series of capital expenditures to keep up with the demand and only temporary improvement in service. Given the inflexibility of prices, the alternative policy would be to accept a standard of service which approximates more closely the price which is paid for it and does not involve such claims on scarce resources.

No apologies are offered for the length of this section on mass transportation. Not only are the potential expenditures involved extremely large but certain morals can be drawn from the discussion. The first is that, although any study or investigation must of necessity have its terms of reference bounded in some way, it nevertheless should be conducted under the aegis of a planning body with a broader perspective. Furthermore, such a planning body should have a continuous existence; so many of the studies mentioned in this context have been carried out by organizations put together and then dissolved. Yet again, where different levels of government and different agencies thereof stand to gain or lose, at least in the short run, from a particular course of action, they will naturally exert pressure to pursue that course or not, as the case may be, without counting the cost or benefit to others. In this way, all may stand to lose in the long run.

Movement of Freight

As in most cities, the movement of freight in Bombay is less well documented than the movement of people. What is needed is a sort of physical input-output table which would show the origin and destination of goods entering or leaving Bombay, distinguishing between those which merely pass through and those which are consumed or transformed in the region. The facts about certain bulk commodities are reasonably clear. Finished fertilizer is imported from overseas for direct consumption up-country, while phosphate rock is transformed into phosphate fertilizer before it is exported to agricultural areas. Clinker comes in by sea from Gujarat for manufacture into cement. Foodgrains have been an extremely heavy import, but with higher production their importance has greatly fallen off. With the exception of oil, these are the main bulk commodities imported by sea. There are three bulk commodities exported, all of which come from up-country without transformation in the Bombay area, namely sugar, oil cake and
manganese ore1/. Most of the movement to or from the hinterland of bulk commodities is by rail to Bombay city but not necessarily directly to the port, despite the existence of an extensive railway system along the docks owned and operated separately by the Bombay Port Trust.

41. Bombay is the largest importer of oil in India. The oil is unloaded at Butcher Island in the middle of the harbor from which it is piped to Trombay, a large low-lying area of mud flats which juts out into the harbor at the southeastern corner of Salsette Island; this is the location for oil refineries, thermal power plants, fertilizer factories, and the physical plant of the Atomic Energy Department. A large proportion of the output of the oil refineries leaves Bombay, partly coastwise but mainly by rail, to the hinterland of Maharashtra over the steep escarpments of the Ghats. For the rest, not much is known except in a qualitative sense. Obviously, a good deal of food and some building materials such as timber comes in by road to Bombay from the agricultural areas, as does raw cotton for the textile industries on the island. But there is a mass of traffic known in port parlance as general cargo whose destination or origin may be identified as Bombay for the purposes of port statistics, but in reality part of it goes to or comes from the industrial area of Poona to the south, or as far away as the Punjab to the north. There is also said to be a fair volume of traffic by rail which comes down the Western railway from the north, is transshipped onto the Central railway inside Bombay and then goes on to other destinations to the south, such as Poona; similarly, the reverse movement takes place.

42. A number of projects have been proposed in order to cheapen the current movement. One is a railway link between the Western and Central railways on the mainland north of Bombay, for example between Basselin at the western end to Diva at the eastern end, just west of Kalyan.2/ This would eliminate the haul of transit goods into Bombay, its transshipment inside Bombay, and then the corresponding haul out again. A second project, with somewhat the same objective, among others, is the creation of a satellite port across the harbor at Nava-Sheva. In the first instance at least, it would serve as a port for bulk commodities which are transshipped directly into Bombay or from the hinterland and as an industrial area for the transformation of any such bulk commodities; the proposed site falls within the area of the proposed twin city. An advantage of the site is

1/ For port statistics see Table 6.8.

2/ An alternative across the northern end of Salsette Island has also been suggested.
that with a certain amount of dredging, the satellite port would be deeper than the present one and would therefore admit larger and cheaper bulk carriers. A question mark against the satellite port is the future of the bulk traffic; sugar and manganese ore are both doubtful candidates as export prospects, while fertilizer in the finished state should diminish as an import in general and, with the development of other ports, may diminish still more through Bombay. Nhava-Sheva is also conceived of as a container port. While the site has obvious advantages for such traffic to Poona and the east, it has none over the underused port of Kandla in Gujarat for traffic to the north, as and when rail connections therefrom are improved.

43. All traffic by road or by rail from Bombay in any direction, except due north, must cross the Ghas. Construction of new capacity is expensive and at the present it is said that the capacity by rail will soon be exhausted, despite the introduction of more powerful locomotives. Since oil bulks large in the traffic up the Ghas, the question of a pipeline has been mooted; now that a third Ghat line is under consideration, such an alternative has to be taken into account. There is moreover another element. Whatever traffic crosses the Ghas from, say, Poona to Gujarat could in theory take an alternative but longer route up the plateau and round the edge of the Ghas to the north; the difficulty with this is that the pricing system on the railways makes it more expensive for the shipper, though it is not necessarily the case that it is more costly for the railways. If the amount of traffic so concerned is substantial, a question which needs investigation, then the pricing policy itself needs reconsideration. It has to be recognized that distance is not always an adequate proxy for cost.

44. Somewhat the same considerations appear to have intervened in the proposal for a railway bridge across the southern end of Thana Creek which, when linked up at either end to the existing lines, would have reduced considerably the distance between Bombay and Poona. A road bridge in the same place is now nearing completion and some economies could have been achieved by building a dual purpose structure.1/ Shorter distances, however, mean lower freight rates and railway revenues would have suffered, another case of financial considerations being at odds with the economics of the project. Now, the project has to be looked at in a new light, for if the cut-off between the Western and the Central lines is built and if traffic which used to come through the port is shifted to the mainland and if diversion of industry to the mainland continues, the volume of traffic which might have crossed the bridge will be that much less. Thus, all these projects are inter-dependent. Moreover, they have to be weighed against improvements also proposed on the main roads leading out of Bombay to Agra and to Poona. Finally, no physical investment will save time so simply or so cheaply as abolition of the octroi tax.2/

1/ The bridge was also built with such little clearance that even the country craft, which carry for example gravel from the Uhas river into Bombay, must lower their mast in order to pass under it.

2/ See Chapter V.
45. As with people, there is also a dispersal problem for freight inside Bombay — and a difficult one. Immediately north of the Fort area is the densely populated and labyrinthine Bazaar area packed with wholesale and retail shops of many kinds.1/ It is about level with the docks, presumably for obvious historical reasons. Between the two, however, there are successive obstacles running north-south. Reading, so to speak, from west to east, first comes the harbor branch of the Central railway with very few crossings2/, the principal one being Carnac road. Next comes the strip occupied by the two main railway freightyards, Carnac Bunder for the Western railway and, further north, Wadi Bunder for the Central railway, and a large number of godowns. Next comes one of the main roads leading out of Bombay on the east side of the island, P. D'Mello road. Almost adjacent to D'Mello road is the Port Trust's own railway line which takes off from the other lines much further north. Finally, we come to the waterfront itself with the docks at the southern end and various commercial or industrial establishments further north. Much of the road traffic on the docks must, if it first gets by the rolling stock of the Port Trust line, then hurdle, if we may so put it, level crossings within the port area; then if it is destined for the godowns or the railway freightyards on the other side of D'Mello road, must overcome that obstacle. Traffic for the city itself has, as pointed out, only limited means of access.

46. The problem of achieving a suitable marriage between the lateral and north-south flows of traffic is aggravated by the very confined nature of the system which allows little room for overpasses or underpasses.3/ Several partial solutions have been put forward. The Wilbur Smith proposal for an Eastern Freeway was the rather expensive device of putting another road on top of D'Mello road, at least for part of the way. The Port Consultants have suggested replacing the port railway — or most of it — by a road (they call it the Link road) as far north as Sewri. In fact, only a small proportion of the port railway traffic is in the main dock area itself; the rest of it, the only profitable or nearly profitable part of it, is further north on land owned by the Port Trust but leased for other purposes, including industry.4/ Thirdly, the Railways have in mind various plans to shift their freight terminals further north. Obviously, all these proposals must be considered as one. They at least provoke the revolutionary thought that one metropolitan railway authority might be better than three, and that a unified metropolitan transport planning body on a continuing basis is also worth thinking about.

1/ Density is as high as 2000 per hectare in parts of this area with few, if any, buildings higher than four stories.

2/ For a short distance out of Victoria Terminus this line runs adjacent to the other Central railway lines.

3/ Unfortunately, a great opportunity was missed when an ammunition ship blew up and levelled much of the area during World War II.

4/ The Port Trust is as much a landowner as it is a port operator and derives much of its revenue from real estate.
Air Transport

47. Since the airlines carry very little freight and can scarcely be considered as mass transportation, they do not conveniently fall in either of the previous categories. Bombay has a single commercial airport at Santa Cruz, with a smaller one at Juhu of no commercial consequence nearby. Santa Cruz is moderately well placed for the present downtown area and, with the completion of the Thana Creek bridge, will not be too badly placed for the twin city area. It would of course be extremely close to any development that might take place at Bandra-Kurla.

48. Although traffic through Santa Cruz has been growing fairly rapidly, growth of aircraft movements has not been happening at nearly the same rate, because of increasing aircraft size and possibly of increasing load factors. Santa Cruz poses no serious congestion problems and, with further increases in the size of aircraft, is not likely to for many years. Two sorts of investment in the airport are contemplated. One which is under way and close to completion is the strengthening of the runways and the provision of more maneuvering room in anticipation of larger aircraft in the international service. The other, and more questionable one, is the construction of a new apron and extended taxiways at a location earmarked for a new international terminal complex. This investment does not appear to be required in advance of the decision to construct a complex, which requires the acquisition of some additional land and, in any case, fails to take account of the very fortunate pattern of arrivals and departures from Bombay. International flights take place for the most part between 1 and 5 a.m., and domestic flights between 6 a.m. and midnight. Extension of the present terminal building, which is already taking place, should suffice, if passenger handling facilities can be made sufficiently flexible to accommodate to the type of traffic according to the time of the day. Otherwise, there would be two terminals each of which is basically unutilized part of the day.
CHAPTER III

PUBLIC UTILITIES

49. The three utility services, electric power, water and telecommunications required for industrial, commercial and residential purposes have a number of common characteristics. For water and power the supply conceptually can be divided into three successive steps: production, transmission and distribution. Telecommunications obviously lacks centralized production, but has transmission and distribution. Water supply carries with it the additional task of disposal of an effluent, but this too may involve similar conceptual steps, only in reverse order. There are economies of scale in production and transmission, not only in the individual production units but in the existence of a supply network which makes for greater flexibility in use, smaller standby requirements, and smaller increments in capacity in relation to the existing supply capacity. On the other hand, as the scale of demand grows, such cheap nearby sources of supply as may exist become exhausted. Distribution of all services, whose cost may easily be half the total cost, normally enjoys economies of density because of shorter connections per consumer supplied. But again there may ultimately be offsetting costs: increasing the capacity of an existing system in a densely built-up area can become increasingly expensive and can increase the risk of dislocation. For example, the higher the building, the greater the expense of pumping water to the top of it and the greater the number of people at risk from the same supply point.

50. The existence of economies and diseconomies associated with urban development has a bearing on the institutional framework and the form and degree of coordination both within public utilities, among them, and with other sectors of the urban economy. For production and transmission there are obvious advantages in having a single metropolitan regional authority, or something closely akin to it. Progress in this direction in Bombay is somewhat different as between power and water.

51. At present, there is a single high-voltage transmission system operated jointly by the Maharashtra State Electricity Board and the Tata power companies with a common load dispatching center; this links production units belonging to MSEB, Tata, the Railways and the Atomic Energy Department. There is no strong evidence that this does not work reasonably well operationally. However, from a planning point of view there is a serious problem ahead. According to the current official demand forecasts, which are likely to be revised upwards, Maharashtra as a whole may expect to have a deficit of the order of 350 MW between maximum demand and firm productive capacity by 1974/75. This deficit in part may be explained by a lack of funds allocated for construction during the Fourth Plan. The problem is likely to get even more serious after the end of the Plan with the deficit getting progressively worse unless some emergency measures are taken. In all this, Greater Bombay, which consumes three quarters of the power in Maharashtra, will be the principal sufferer.
52. One of the advantages enjoyed by Bombay has been cheap power based to a substantial extent on hydroelectric sources in the vicinity. These have come to an end. Apart from interconnecting transmission with other states, the present construction program of the MSEB is largely based on thermal units at Koradi in the east of Maharashtra sited on coal fields containing coal of indifferent quality. The present idea of the MSEB is to speed up the commissioning of two 300-MW units at this site, if funds are made available. However, units of this size have not been made in India hitherto/ and there are doubts as to whether the coal field, which is not producing yet, can build up its supply quickly enough for the units to be commissioned earlier. If these doubts prove justified it will entail the transport of coal by rail from other coal fields to the site of the new 300-MW units in the interim, if railway capacity exists, which has not yet been ascertained. Finally, there is no adequate transmission capacity to carry the power from the new units 500 miles westward to Bombay; construction of a planned 400-kv transmission line has been delayed, pending a decision as to whether it should be at 400 or 500 kv.

53. The impending shortage is most seriously one of total firm capacity at time of system peak demand. This raises two points, one concerning the type and location of units used, the second concerning pricing policy. One way to increase total capacity is to install gas turbines, which can be done quickly. Another way is for Tata to put in a new conventional steam oil-fired generation unit at their existing power plant in Trombay; it would seem that this can be done faster than supplying additional conventional steam generating capacity elsewhere. Besides the comparative economics of these two alternatives, both would depend on importing fuel, which is contrary to present national policy. Furthermore, one of the solutions would involve the political difficulty of expanding private electric power capacity, since Tata's license runs out in 1980 and it has not been the policy of government lately to permit any expansion of their capacity. As to the second point, the pricing system for electricity usage at present contains no penalty for consumption of energy at peak hours. Industrial users, who are by far the heaviest users, pay according to a two-part tariff/ but there is no specific incentive for them to avoid the system peak hours for energy consumption.

54. The difficulties just described indicate how far the problems of Bombay reach out not only to the state, but also to the national level. Resolution of these problems in a satisfactory way would only be possible with adequate consideration of the appropriate "shadow" prices for capital and foreign exchange. It would not appear, however, that the Bombay region, which is in any case not a functioning entity, has a choice of obtaining

1/ The importing of equipment for electric power systems into India is almost invariably prohibited by the Government of India.

2/ Which makes a charge for the maximum demand made on the system separate from the electrical energy consumed.
the power it apparently will need by paying an appropriate premium. That the interests of the Bombay region need some forum of expression is evidenced by the fact that the Regional Planning Board in its report foresaw no electricity shortage and referred only to the need to step up the rural electrification program.

55. Distribution of power in Bombay is carried out by the BEST in the island, by Bombay Suburban Electric and Thane Electric, two private companies until recently managed jointly, in the suburbs and in Thana, and by MSEB in other urban areas in the region. Tata also supplies power to the large industrial users in Greater Bombay, while both Trta and MSEB do so outside Bombay. If these arrangements lead to duplication of distribution lines, there might be some case for changing them. It is worth noting that the sub-transmission system in downtown Bombay was originally designed with a sufficient margin of technical safety to enable it to be uprated from working at 6.6 kv to 11 kv. There is, thus, not much cost involved in increasing its capacity.

56. The water supply picture is a good deal less straightforward. In theory, municipal corporations such as the BMC, which is much the largest consumer in the area, are responsible for construction and operation of their own systems; they get no financial assistance. The state, through its Public Health Engineering Department, constructs and gives liberal financial help to smaller municipalities which usually but not always take over operation and maintenance of the system. In practice, what is gradually emerging in the metropolitan region is two separate major systems (see Map 3). The first is the BMC system which is based on dams to the northeast on the Vaitarna and Tansa rivers; some of these dams have been or are being built and operated by the State Irrigation and Power Department. The water is carried by pipeline into Bombay from the northeast, bypassing the industrial towns and estates to the south of the Ulhas river, which are supplied at the moment by a series of small schemes, most of which are operated by the MIDC. The latter, as a promoter of its industrial estates, has emerged as a major water supply agency. Its latest project now under construction on the Harvi river will have a very large capacity, sufficient to supply presently unforeseen needs of the industrial estates and towns south of the Ulhas river with a fair amount left over for any development in the twin city. An integrated transmission system is under active consideration for the whole area of the mainland south of the Ulhas river; this would make the second system.

57. The emergence of these two major systems, which may one day be unified, has however been preceded and still is, for that matter, by rather less orderly development; in this, Bombay has been the chief victim. Bombay's water supply has been static for a number of years with the consequence that per capita consumption has been going down; taking into account losses in the distribution system of as much as 40%, it is of the order of 20 imperial gallons a day per head. Water is only available 2 to 6 hours a day. To meet the shortage the BMC started a project known as Upper Vaitarna...
in 1963, a multipurpose project. 1/ For various reasons, including lack of financial resources, this has proceeded very slowly and will only be completely finished in 1972. Consultants to the government proposed the Barvi dam as the cheapest means of providing the next source for Bombay, with the additional benefit that the transmission system coming in from the east could serve not only Bombay but the industrial estates and towns that it is now intended for. Thus there would be the beginnings of a unified system. Instead, the state government have started construction of a third dam, the Shatsai, which will also bring water from the northeast. 2/ This would appear to be a clear case when savings could have been realized by a different phasing of increments to a unified system and such cases are likely to occur again in the future.

58. Since Bombay faces very large expenditure for the repair and strengthening of its antiquated distribution system and for the construction of additional sewage disposal facilities, some attention needs to be given to the pricing system as BMC does not appear to earn a reasonable return on the capital invested. Water for residential purposes appears to be subsidized; this may not be true for bulk supply to industrial concerns, which are charged a higher rate. This is the exact opposite of electricity pricing, where industry is favored by low rates, while residential users not only pay higher rates but are also charged a higher electricity duty levied by the state; BEST in fact supports the bus service with the profit from its electricity distribution. Maybe the rationale is an indirect form of income redistribution; consumers of electricity are generally speaking in a higher income bracket than those of water. If so, it is open to question on certain specific grounds. In the first place, one could put more faith in such an argument if in fact there was an adequate water supply. Secondly, electricity is priced according to a block tariff (if one includes the duty), according to which residential consumers who consume large quantities of electricity and can be presumed to have higher incomes, pay a decreasing marginal price. Finally, whatever redistribution there is escapes the stratum of society which has neither housing nor water nor electricity.

59. Telecommunications are controlled by the central Posts and Telegraph Department (P & T); each state has a dependent local organization, but large cities such as Bombay have a special district of their own. Investment in the sector is given a low priority in central plans. The growth

1/ It is perhaps worth alluding to another case for proper shadow pricing of foreign exchange. The pipelines from the Upper Vaitarna project contain valves which are smaller capacity (48 inch diameter) than the pipeline itself (108 inch diameter). This is because there are no such valves made in India and importation was not permitted.

2/ It is this project which has been under negotiations with the IDA for a long time and for which it has been so difficult to find a solution to the so-called additionality problem.
rate of telephones in the Bombay district is a shade over 10% per year; there is a waiting list under the "Own-Your-Telephone" (OYT) scheme, under which an applicant must make a capital contribution of Rs.3,000, amounting to one third the present number of installations. The number of frustrated applicants outside or possibly inside this scheme is unknown. The waiting list is expected to grow very substantially during the Fourth Plan.

60. Bombay Telephones has an enviable financial record by almost any standards. With gross assets of Rs. 40 crores, it has expenditure of Rs. 5.5 crores and revenues of Rs. 15.5 crores, i.e. a surplus of about Rs. 10 crores. One can hardly complain about the pricing in this instance; it is the level of investment which should be questioned. At the present level, the number of calls per line leads to frequent overloading of exchanges and switchboards and, consequently, a low level of service.

61. Given the remarkable rate of return on investment and thus accrual to the fiscal resources of the economy, the clear signals of pent-up demand and the inefficiencies resulting from the present level of investment, it is hard to see what motivates the present policy except possibly for one thing: the general feeling that telephones and similar services, requiring copper which has to be imported, are an out and out luxury in as poor a country as India. While understandable, this feeling needs some examination. Bombay has some three telephones per 100 inhabitants, which is internationally low but much higher than the Indian average. Telephones, however, are considered to have a high income elasticity of demand (possibly 1.5 or more); given the difference in income levels between Bombay and the Indian average, a substantial difference in the rate of telephone installation is to be expected. What is perhaps more to the point is the question whether telephone communication is a luxury consumption good or an essential complement in the production of goods and services. While there may be some elements of the former, there is a good case to be made for putting much more emphasis on the latter. As it is, there are rather different attitudes to the pricing or supply of utility services to industry in Bombay. Relative to residential prices, electricity is favorably priced, while the opposite is true of water; the price and even more the supply of telecommunication services is highly restrictive. In any event, Bombay as an entity has no say in where the trade-off should take place.

1/ On a cash basis; it is hard to believe that the record would not be good on a proper accounting basis.
CHAPTER IV

LAND USE, HOUSING AND THE URBAN PRICE MECHANISM

Housing

62. The Regional Planning Board put the number of tenements (housing units) required up till 1981 at about three quarters of a million at a cost of Rs.845 crores including land, conservatively estimated. This figure is presumably made up partly from the need of the increment in population and partly from an existing "deficit". Just how it was made up is not too relevant since both the quantity and the cost are plainly out of reach. The number of housing units built in Greater Bombay in recent years has not exceeded 30,000 per annum.

63. A half or more of the housing units have been built in a sense by the private sector. A number have been luxury apartments for the well-to-do. Others, catering to a lower but still relatively high income group, have been built by cooperative societies for their members; these societies receive financial assistance from the state. Because of the scarcity of land and the high prices, cooperative societies have been buying land and building on it on the outskirts of Bombay. For the mass of the people, however, no private housing market can really be said to exist.

64. The principal reasons for the shortage is the all-pervasive rent control, which in Bombay has been in force for over twenty years. The effects are familiar. As in most such cases, the iron law of deterioration until the service received from renting the property approximates the rent charged operates. Landlords are not permitted to demolish buildings; they must fall down first of their own accord, and there is little incentive to arrest this process. Since people enjoy an invisible differential income between the rent they pay and the services they obtain from the building, they hang on to their rights, even to the extent of locking up the space they occupy for long periods if they happen to go away. Anyone who wants living space, unless he is lucky enough to obtain public housing, must pay pagri (key money) or sublet from a sitting tenant or find accommodating relatives or members of his community. Some employers, public and private, voluntarily provide captive housing for their employees but they, like everybody else, are influenced by the price of land which goes down as one goes out.

65. The principal public agency in the housing business is the Maharashtra State Housing Board which is permitted to acquire land owned by the

---

1/ In 1969 the State Building Repairs and Reconstruction Board was set up to make repairs on dilapidated houses; it is financed by a cess on residential property.
government, principally in the suburbs, at prices prevailing on January 1, 1948. It hopes to sell attractive parcels of this land for commercial purposes and uses the proceeds to build housing on a substantial scale. Most of this housing is subsidized, in addition to the subsidy implied by the acquisition price of the land. Subsidies are extended for industrial housing and for the so-called "economically weaker sections". The Regional Planning Board estimated that the latter group as presently defined would be approximately the same as those who do not pay income tax at present, that is, about three quarters of the population. Allocations under the Fourth Plan for the whole of the state for these two classes of housing amount to some 9,000 units, but the Housing Board apparently has more ambitious plans than this modest goal would imply.

66. If conceived in present terms and with present standards, the housing situation is plainly unmanageable. The Regional Planning Board recognized the impossibility of maintaining the traditional standards for housing and the traditional means of providing them. They made a number of sensible recommendations in facing this fact realistically. These include greater emphasis on "the provision of environmental hygiene for housing colonies" of the cheapest type, and self-help in construction; much greater incentive for the flow of private capital into housing, including some exemptions from the operation of the Rent Act and various tax incentives; and simple measures for the improvement of existing slums "with minimum dislocation of the families". They also made the telling point that in eastern Maharashtra new housing units built since 1951 had been exempted from the rent control. As a consequence, the housing situation in Nagpur was considerably better than in either Bombay or Poona.

67. One of the most difficult problems in Bombay is the existence of the so-called hutment colonies, whose inhabitants are in fact squatters, frequently on government land. The land is often low lying and swampy. A recent enumeration counted over 100,000 hutments of this type with more than 600,000 inhabitants, but this number does not include those who do not occupy even this kind of regular accommodation. Between them, the hutment colonies share some 1,350 toilets and fewer than 500 water taps. While it is encouraging to see the advocacy of site-and-service plans for these colonies, it is going to be quite difficult to introduce these improvements with the colonies already built. CIDCO, which has the same sort of plans in mind, will have an easier task in the twin city.

68. One must however take issue with the Planning Board on their suggestion that measures be taken to ensure "that land values do not cross the maximum level at which the land ceases to be suitable for low-income housing". One cannot stop land values increasing, if by value one means value of the land in its most efficient use. If one tries to stop the price increasing by artificial restriction, which rarely work, one only succeeds in distorting the market and disguising the value.

The Urban Price Mechanism

69. The reclamation of Backbay is often regarded as the principal, if not the sole, villain in promoting the growing congestion in downtown Bombay.
and on the modes of transportation leading to it. But, as pointed out earlier, it is not the reclamation per se that is at fault but a price system which does not fully reflect costs - or may hardly do so at all. Like most other cities, Bombay suffers from a price system which is distorted in a variety of ways.

70. It is generally maintained that the clustering of businesses, financial institutions, and government offices in downtown Bombay is explained by the so-called economies of agglomeration, a concept which, though ill-defined, nevertheless appears to have some content. If, however, employers and residents of the area do derive substantial benefit from their location, then it should have been possible to extract some of this benefit in the way of revenue in order to finance the services required. While it may be true that the economies of agglomeration exist, several things may have happened to exaggerate them. In the first place, the diseconomies which also patently exist are not reflected in prices that people pay for services, especially transportation and rent. Secondly, the advantages of decentralization cannot be realized, as long as essential ingredients are missing; the restrictive attitude towards telecommunications, an important adjunct of decentralization, may well be an example. The long waiting list for telephones and the high premium that people pay for additional lines suggest that this profitable service is no luxury. Finally, traditional occupants of sites in the downtown area may continue there simply from inertia, because the opportunity cost of not selling their site and moving elsewhere has not been counted.

71. The ideal would be to have a system of prices, including land value, rent, transportation fares and wages, which would reflect not only the economies of agglomeration but the diseconomies which arise largely because of the heavy peak demand on the transportation system in a densely built-up area. In such a market, employers to whom the economies were particularly important would choose to cluster together but, by definition, the benefits would be sufficiently great that they could afford to pay adequate wages to their lower grade employees to compensate for the particular costs that it might impose on them. Alternatively, they could decentralize some parts of their operations. There is an evident parallel in the movement of industry to the suburbs, to Thana and as far away as Kalyan. A number of industrialists have set up plants in these outlying areas and in a number of cases have built housing for their employees in the vicinity, the advantages of which are said to be greater contentment and less absenteeism.

1/ The telephone service at, for example, Indian Airlines is so overloaded that even another airline would not consider it worthwhile making a call till after 6 o'clock in the evening.
72. The Maharashtra Government has succeeded quite well in preventing the growth of industry inside the city of Bombay, or at any rate the growth of industrial employment. The latter has not changed much in the last decade and, as far as one can gather, has tended to fall recently rather than grow. This has been accomplished partly by prohibition/ and partly by incentives to move elsewhere. One may raise the question why the same effort has not been put into achieving similar results in the case of office employment which probably aggravates the transportation problem more, since it is more acute. Perhaps it is because it is normal to think of industry as being capital-intensive or labor-intensive, but the distinction is not often made in the case of commercial or financial establishments. Yet, in terms of human capital as well as physical, the distinction is still valid. Decentralization of the labor-intensive parts of an operation may be just as valid a solution as in the case of industry. In both cases, the option remains open to maintain a small headquarters staff in the place where it matters. Such a solution has apparently been adopted by one insurance firm before nationalization.

73. Given a price system free of distortions, decisions on new location and the as yet unmade decisions on relocation would be very different from what they are today. Moreover, it would not only be the private employer who would be making his decisions somewhat differently. Bombay - and it is hardly an exception in this - is very far from such a system, but to suggest that all subsidies and controls can be abandoned in one fell swoop would be irresponsible. To suggest that one move selectively and judiciously toward the ideal rather than away from it is another thing entirely. To redress the present imbalance, a combination can be envisaged of a movement of employment opportunities to where the people are and of housing to where the jobs are, but probably less of the latter. Furthermore, both incentives and penalties can be contemplated to move things in this direction.

74. Given what we know about the transportation pattern - and it is by no means enough - the Fort area is not the sole cause of Bombay's problems in the field of transportation or water supply. While it might be a good place to start, the problems are islandwide. If railway fares can only be rationalized gradually, the next best thing to do is to find some interim proxy. Feasible, though imperfect, alternatives are rents and the imposition of property taxes which are more closely related to location. Rent control could be progressively derestricted in the area in order to bring this about. As in Nagpur, rents on new properties could be derestricted immediately. Progressive steps might be taken to derestrict commercial property. On residential property, where there may be more serious social inhibitions, it might be worth considering the introduction of legislation setting maximum compensation for tenants who have their "rights" taken away. It would be unwise to exclude new commercial

1/ Except for certain exemptions for "small-scale" industry.
development altogether, but, as a temporary measure, such new development might carry with it certain obligations.

75. Reform is necessary in the imposition of property taxes on vacant or underutilized land. In some cases, at present, they are derisory. This would of course give an incentive to develop such land which might be considered perverse in effect; not, however, if the development carried with it the obligation to invest in housing, directly or indirectly.

76. One instrument which is used in determining land use in Bombay is the floor Space Index (FSI); this is the ratio between the floor space of a building constructed on a lot and the superficial area of the lot itself. The permitted ratio in the Backbay runs from 3.5 to 4.5; the maximum falls as one moves out into the suburbs. The FSI can be a useful tool for regulating the density and character of particular blocks of land in order to obtain certain benefits that would otherwise be lost ("externalities"). But in this case it has resulted in a perverse regulatory system. It restricts freedom of choice and restricts it in favor of construction in the downtown area. Whoever might see advantage in bringing employment to the suburbs, at least indirectly, by constructing buildings with a higher FSI than now permitted simply cannot do so. It is impossible of course to say how much development of subcenters of employment around, for example, suburban railway stations has thereby been stifled. Reform of the present restrictions on the FSI might well provide an incentive to decentralize, particularly if it was coupled with development of sites such as Bandra-Kurla and, at the appropriate time, in the twin city itself.

Land Use Plans

77. Town planning in Maharashtra is governed by the Regional and Town Planning Act of 1966 which replaces certain earlier measures. Under this Act, town planning schemes have been or are being prepared for a large number of towns in the state, including Bombay. As the name of the Act would imply, the development plans prepared under it have mainly as their objective the zoning of land in order to control its use for different purposes and the acquisition of land for certain basic amenities, such as open spaces. Once accepted, the plans have a currency of ten years. Generally speaking, these plans have the traditional town planning defect that they are short on economic content and are not usually associated with a financial program leading to their realization. Land use restrictions in Bombay itself would still permit a population of ten million, if exploited to the limit. There

---

1/ For example, the provision of some proportionate investment in housing on the island. The form of the housing and the income level at which it was aimed could be left open. While it is true that this might in the first instance lead to a rash of luxury apartment buildings, the market for such a commodity is not insatiable. Moreover, those who occupy them are going to leave other buildings and there would be the usual trickle-down effect.
is no real analysis in the Bombay plan issued in 1964 as to how to cope with the transportation needs of such a population; moreover, there are certain elements in the plan which are open to serious question.

78. Control of land use has obvious advantages if its principal objective is to realize the external economies and benefits which go with the segregation and appropriate siting of different areas for different uses such as industrial. Ten years, however, is a long time in which to foresee the course of economic development in general, let alone its location. It would be wise to have some provision for earlier modification, if it should so appear that economic forces are tending to run counter to the original conception. The Metropolitan Regional Plan, which covers a very wide area, ought to be no exception in this respect. Industrial requirements for land, which include not only their immediate needs for a site but also provision for expansion, should not be unduly hampered; it should not be difficult to contain the holding of such land purely for the purpose of reaping speculative gains by limiting the option to a particular period. It would be a pity if the efforts to develop the hinterland, which has one ample resource in the form of land, were to be unduly restricted in its use.1/ It is easy to criticize urban sprawl but it does not take place for no reason at all. The important thing is to gauge whether it takes place in response to real economic pressures, in which case it would be as well to be aware of them, or in response to distortions in the price mechanism, in which case it may be necessary to control it and to see what steps can be taken to eliminate the distortions.

---

1/ This is not of course to say that control of pollution and similar diseconomies should be lax. In fact, there is a case for suggesting that stronger control is needed. Some of the MIDC estates have not been too well sited from this point of view.
CHAPTER V

THE FUTURE OF THE REGION

The Fiscal Position of Greater Bombay

79. It is remarkable that in the report of the Metropolitan Regional Board the fiscal position of its foremost entity the BMC was not mentioned at all. It is impossible to conceive of any plan being carried out without considering the means to do so. Like many cities Bombay is in a weak financial position. In 1969/70 current and capital expenditure amounted to Rs. 43.0 and Rs. 9.5 crores respectively. The Municipal Corporation is an elected body with a city manager, known as the Municipal Commissioner, appointed by the state. Its principal responsibilities are water supply and sewage disposal, primary education, and the maintenance and improvement of streets, playgrounds and similar amenities. It carries out very little in the way of housing or slum clearance. Through its subsidiary corporation, BEST, it runs the bus service and electricity distribution.

80. The greater part of capital expenditure for services for which it is responsible has to be financed by borrowing, which is limited as to amount and terms, by the allocations made by the Reserve Bank of India to all public borrowing entities in India. If it could borrow more, it is doubtful whether the debt servicing capacity of the Corporation would permit it to any large extent. The principal sources of current revenue are the property tax and the octroi. In addition, there are various surcharges—what amounts to that—on the property tax. Each of these surcharges is identified with particular services such as sewage disposal, but in practice bears little economic relation to them. Typically, Bombay has suffered from erosion of its tax base. This has happened for several reasons. Mention has already been made of the inadequate taxation of vacant land. More important is the effect of rent control in reducing the taxable valuation of property from what it would have been otherwise and holding it constant. Finally, various types of government-owned land are partially exempt from taxation. Rectification of these deficiencies is needed in order to at least partially restore the financial independence of the city.

81. The octroi tax has repeatedly been assailed as obsolete in India, but Maharashtra at least has not yet replaced it by an alternative. The tax is uncertain in effect, it may be regressive and it is open to corruption. But, principally, payment of the tax wastes time. It is ironic that trucks can save time on the two suburban expressways, only to lose it again, at least in one direction, at the octroi stations. Reform has been held up by failure to agree on some suitable revenue sharing formula for the small towns and large cities. Pending such agreement, Bombay should be regarded as a special case and the octroi replaced by a state sales tax, or something of that kind, with the Municipal Corporation having the option of adding a surcharge if they so wish. This would have the advantage of unified collection. Somewhat the same advantage could be obtained by replacement of
the local vehicle tax, the wheel tax, by merging it with the state vehicle tax. Not only would there be savings in cost of collection, but undoubtedly collections would be improved.

82. Changes of this kind should go some way to improve the fiscal resources of Greater Bombay and, equally to the point, improve their elasticity in relation to the growth of urban income. This should lead to some improvement in the services for which the Corporation is responsible, but when all is said and done, there are many things over which the Corporation has virtually no control. In a number of vital sectors decisions on allocations and policy are made at the center, either directly or indirectly through its allocations to the state. It may be difficult at the center to discern in these broad allocations their local effect after these allocations have been subdivided between rural and urban areas and then again among cities. Sectoral imbalances are liable to appear locally, but they can only be seen locally. We return to this problem towards the end of this chapter.

The Twin City

83. The twin city is a bold idea which has captured many people's imagination. The notion of starting again on green fields and of designing a city from scratch without the overburden of the past laid on it is an appealing one. But the temptation to regard it as a panacea will have to be resisted. One cannot turn one's back on Bombay; its problems will still be there. In the short run, at any rate, the twin city may well aggravate them for one very simple reason, competition for scarce resources. The initial cost of land acquisition will be heavy, about Rs.100 crores in the first five years. Recoupment from sale of this land after all the necessary services have been laid out will mainly take place later. Despite the advantages of catching the increment in value in the fiscal net, the breakeven point will be some time coming. 1/ There is thus a problem of timing. One can also perhaps point to two other issues, location and function.

84. The notified area embraces the entire eastern littoral of Bombay harbor from Trans-Thana to Uran; it includes the proposed new harbor at Nhava-Sheva. The proposed city center near Panvel is at the southern foot of the Parsik Hills, the ridge around which must pass both the new road to Poona continuing from the Thana Creek bridge and any similar railway extension which may be built. Since both of these are arterial intercity routes, it would not be wise to burden them with local traffic more than necessary. The proposed site lies very much off the beaten track of existing intracity

1/ The case for external financing of urban land acquisition should not be dismissed out of hand. While the process involves only a transfer of assets from the private to the public sector, it can be argued that this process is likely to involve national dissaving at one date, followed somewhat later by a corresponding or perhaps even greater saving.
or intraregional transport infrastructure; yet it appears to make little use of what there is. When the new road is built to Poona, the stretch of the old one from Panvel up to Thana which follows the valley east of the ridge will be less used. Down the same valley there runs a single-track rail spur from Diva through Panvel to a place called Apte, which could, with double tracking, eventually be incorporated in the urban rapid transit system. One wonders why this valley, which does have a modicum of infrastructure and links up with the Kalyan-Uhlasnagar complex to the north, has been specifically reserved for agricultural purposes in the land use plan of the region and has not been brought into the ambit of the twin city.

For water, as noted earlier, the site is well placed because of the additional capacity available from Barvi. For power, it is neither better nor worse off than Bombay itself. It should have reasonably good access to Bombay and will of course have better connections with the hinterland than Bombay (except by air, but the difference would be small with the completion of the Thana Creek bridge). It is by design a step closer to the underdeveloped region of the Konkan to the south, 1/ but this can only be considered as a very long range advantage. Altogether, while one can think of possible arguments for other sites, none of them are very compelling. Bombay is going to grow along the eastern littoral in any case; indeed, it has already begun to do so. There is a strong case for planning this growth and reaping the increments in land values which ensue. It is hoped that the new city center will compete, and compete successfully, with the present Fort area for the kind of office development which has congregated there. No doubt in the long run such a development is possible, but it is difficult to see it happening quickly without extraordinary inducements. In the short run at least, Bandra-Kurla would appear to offer greater attractions. One cannot be dogmatic about this; it remains to be seen. The fact is, however, that, once it is undertaken, speed is important in bringing the new city to a size where economies of scale and density and the advantages, whatever they may be, of agglomeration can be realized without undue delay; moreover, the quicker the development, the quicker and perhaps even the greater (because of more rapidly increasing land values) the recoupment of the initial outlay for land and services.

One thing which needs to be avoided is the evolution of the twin city as just another dormitory community for Bombay. If this were to happen it could well add to rather than alleviate the problems of Bombay, in particular its transportation system. Because of this threat, the various proposals for building bridges, in some cases rather expensive ones, across the harbor should be looked at with considerable skepticism. New transportation facilities would have to be provided, whereas the present transportation system in Greater Bombay can, through patching and improvement, have substantially increased capacity along the axes already existing. The future of the twin city and the minimization of its more insalutary competition with Bombay itself depend on the decision to give it a clearly defined

1/ A large proportion of the immigrants to Bombay come from this region.
function for which there is no alternative. There is no doubt what that is: the function of government at both state and national levels, insofar as those are represented in the metropolitan region. In 1966 the state government employed 57,000 people in Greater Bombay and the union government 90,000, exclusive of the railways and the port, nationalized banks, and the Life Insurance Corporation. The railways alone employed 96,000 people, but it could be argued that decentralization of employment in this case depends to a substantial extent on decentralization of physical facilities.

87. Clearly, much depends on how serious not only the Maharashtra Government but also the union government address themselves to the question of moving, if not all, at least a large part of their establishment out of the island. This was apparently at one time considered in the context of the Bandra-Kurla development; indeed, the idea of moving - in this case to the mainland - is at least 300 years old. If the twin city is in fact a serious endeavor, few things are likely to advance it as much as the movement of a large bloc of government offices. The worst solution would be to keep a foot in both camps. Neither would Bombay's problems be solved nor would CIDCO be able to develop the city as fast as it should, if it is going to be developed at all. The alternatives which present themselves are: an all-out rush of resources into the twin city; neglect of the twin city in favor of pushing resources into Greater Bombay; and a careful timing of the shift of emphasis from setting Bombay on the right road to the development of the twin city. The relationship of the twin city to Bombay itself and the rest of the region lends added weight, if such is necessary, to the need for some form of forward investment planning for the region.

Planning for the Region

88. If one accepts the present institutional framework in India, the Regional Planning Board's recommendation against a single development authority for the region may well have been right. In some sectors it might well be that a regional authority would be an improvement, but an overall development authority for the region would be in much the same position as the BMC is now with exclusive powers in some sectors, limited powers in others, and practically none in the remainder. The proposal for a coordinating council almost certainly does not go far enough. Coordination is a much abused word; it is often used as though it costs nothing and automatically confers benefits. The question is, as in most things, to determine where the relationship between cost and benefit is most favorable. In the Bombay metropolitan region, as probably in others, the problem appears to lie not so much in day-to-day operations as it does in longer term determination of policy and investment plans.

89. There are numerous trade-offs to be observed and no place to determine how they can best be resolved. Prima facie, the expenditure now being made on the tunnel through the Malabar Hills and associated works for the West Island Freeway is not of very high priority; nor is some of the expenditure at Santa Cruz. On the other hand, if the Thana Creek bridge is to be of any use, the Sewri expressway on the Bombay side and an improvement of the road to Panvel on the other would appear to be earlier requirements.
Perhaps one of the most interesting projects is the cutoff route between the Western and the Central railways. Once this is completed, the freightyards at Dadar and Parel will no longer be needed. They can then be converted to other use. One such which has been suggested is a shift of the main line terminals to that site (although this may not be far enough north). In any event, a number of decisions depend on this one.

90. These cases are quoted merely as examples. If decisions continue to be made at various different levels in the hierarchy of government, and the results of these decisions seep down into the metropolitan economy as an almost accidental allocation of resources, some body is needed somewhere in the framework of the Government of Maharashtra to put the case for and represent the interests of the whole metropolitan region long before the stage of final allocation. It is not only Greater Bombay and the twin city which are involved; there is the whole industrial belt from Thana to Kalyan-Uhlasnagar. This belt, which is industrially as important as Poona, is in need of municipal consolidation and, in its absence, is likely to receive short shrift. Any planning organization would need some sort of instrument of its own to make it in any way effective; otherwise, it will simply remain a planning body without real power. Perhaps, in the context of the present system of Indian planning, the power to present proposals as part of the Five Year Plan would go some way towards the forging of such an instrument. However, this would only be effective if the proposals covered the entire urban region in all its aspects. This would mean making specific proposals for such organizations as the railways, ports and civil aviation within the metropolitan region. This may perhaps be a modification of the present planning system, but, if so, it would be little more than a recognition that planning itself needs adaptation to the realities of urban development.

91. If such a body can prepare a set of investment proposals for the Bombay region and policies, particularly price policies, to go with them, there would be a better chance of coming closer at least to a suboptimal allocation within the region. The problems, however, go somewhat further than preparation of a five year plan. Allocation of foreign exchange is, as examples already quoted show, an additional issue to be taken up with the union government. Such issues can only be attended to if the planning process is flexible and continuous. Planning must also be well founded on adequate data and analysis. Some observations on the deficiencies of the statistical apparatus for the region are noted in an appendix. All this argues not only for a planning body, but one with a staff which has this as their main function. How such a planning organization should be constituted within the present governmental framework is not a matter on which one can pass judgment in this report.

1/ These are not particularly original thoughts. Compare Ashish Bose, Urbanization in India, 1970, pp. 99/100: "It is necessary, therefore, to recommend the setting up of expert bodies which will be charged with the continuous evaluation of the implementation of the master plans. .... The most important aspect of any development plan is the availability of finance... .... It is time the budgeting techniques are re-oriented... Immediate steps may be taken to launch projects for evaluation and the fullest utilization of the existing material - statistical as well as non-statistical...". (Italics in original)
APPENDIX ON STATISTICS

1. The need for an improved information system, if some organization is created to use it, has been alluded to in the report. In this appendix a few examples will be given of the type of thing which would be undertaken. A case in point is employment. Possibly the most reliable figures on employment are those regularly collected by the inspector of factories. Their coverage is quite wide since it extends to factories with 10 or more employees using power and 20 or more employees in factories without power. Moreover, the figures are adjusted in cooperation with the Bureau of Statistics for non-reporting establishments. The Annual Survey of Industries has less wide coverage in that it only takes in plants with 50 or more employees with power and 100 or more without it; smaller establishments are covered by sample. The Annual Survey goes into much more detailed information (cf Tables 4.1 and 4.2). There seems at the moment to be no way of linking the two sources of information. Nor as yet is there a geographical breakdown within the region which should become increasingly useful. A third source are the statistics produced by the Directorate of Employment which has yet a third field of coverage. It covers establishments of 25 or more in Greater Bombay and 10 or more in the rest of the state. These figures which cover all establishments, not just industrial, are produced quarterly but are considerably less reliable. The kind of adjustment for non-reporting establishments, which is made in the case of the industrial statistics of the inspector of factories, is not apparently made in this case. If a geographical breakdown is made it is not published. Understandably, as a result of this somewhat confused situation a variety of figures can be quoted about employment in Bombay, which are difficult to interpret unless one knows precisely what the coverage and the source are. The Traffic Cell in its report gives figures for employment based on a household survey and a work place survey. Here again, however, a precise definition of what is meant by employment is not given. It is possible to assume that regular employment is all that is included but one cannot be absolutely sure (see notes to Table 3.3).

2. Despite the very considerable efforts of the Traffic Cell, there is much more information to be gleaned, for example on passenger movement, than now exists or at least is readily available. Estimates exist, for example, of the number of people who arrive at a railway station and of those who leave. If the first figure is bigger than the second, the difference is the "net" number of people who get out at that station. What we do not know is the gross number, i.e. the number who actually get out and the number of new passengers who get on a train at that point. The difference between these two is of course the net figure. Such figures are known or at least estimated for total traffic, but not for the critical peak-hour traffic. There is, moreover, little information on cross-commutation. Clearly, there is a great deal of statistical information to be gleaned from the railways. Ways of providing this without excessive cost should not be too difficult to devise. Better statistical use might be made of season ticket records, for example.
3. The present method of issuing bus tickets precludes any assessment of the distance distribution of bus trips. It would be worth considering issuing tickets so as to identify the approximate length of the corresponding trip, and its origin and destination at least in broad zones. If this were done, it should not be a difficult matter on occasion to estimate the distribution at different times of the day. In a somewhat different category would be the kind of special investigation into the origin and destination of goods mentioned in Chapter II; this would have to be done on a sampling basis.

4. Regular series of statistics serve a valuable function, even if it is necessary to undertake special studies such as that carried out by the Traffic Cell. Each can serve as a check on the other. There is less likelihood of the results of a special study or at any rate their precise significance being lost. As it is, there is a tendency, not only in Bombay, for a mass of information to be collected and put on to computer cards which are then, to all intents and purposes, "buried".

5. One final observation concerns the census which is to take place this year. Censuses have not hitherto been particularly concerned with urban movement. If it is not too late, it might be worth considering, at least for Bombay as a trial, including one or two simple questions about the regular daily trips that people take, their time and location.