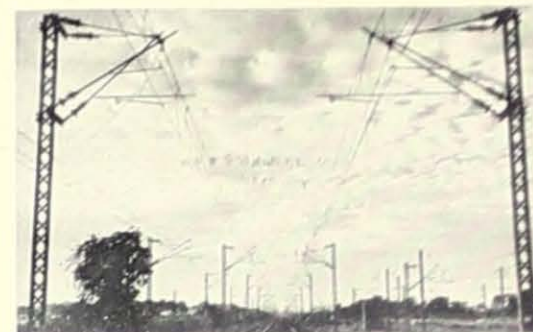
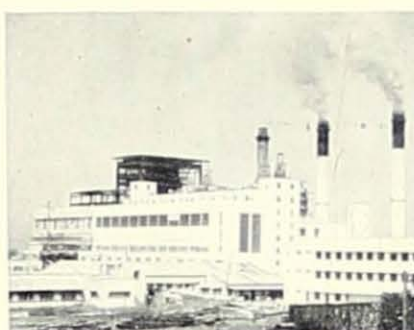


INTERIM DEVELOPMENT PLAN



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ASANSOL - DURGAPUR

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ASANSOL PLANNING ORGANISATION



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INTERIM DEVELOPMENT PLAN

ASANSOL-DURGAPUR

ASANSOL PLANNING ORGANISATION
DEVELOPMENT AND PLANNING (T&CP) DEPARTMENT
GOVERNMENT OF WEST BENGAL

NAVABARSHA
April 15, 1966



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Managing Director
Durgapur Projects Ltd.

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Shri John McCracken, OBE
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General Superintendent
Durgapur Thermal Power Station
Damodar Valley Corporation

MEMBER-SECRETARY

Shri A. K. Gupta

Foreword

In the establishment of Durgapur as a major industrial centre in the State of West Bengal and the Damodar Valley Region, the years after independence have witnessed the success of planned industrial development. The growth of industry in the region, however, has not been confined to Durgapur only. Throughout the Asansol subdivision the concerted efforts of Central and State Governments and the private investors have spread the rapidly accelerating pace of industrialisation.

The growth of industry in the region has brought in its wake a dynamic and substantial increase in the rate of urbanisation. On the established economic base of the Asansol subdivision, consisting of agriculture, coal mining and some basic industry, the patterns of a new design of industrial urbanisation have been superimposed. The State Government therefore are anxious to ensure that the many-sided growth of the region, with its urban, rural, industrial and mining areas, proceeds according to a comprehensive plan for urban and regional development. The Interim Development Plan for Asansol-Durgapur, formulated by the Asansol Planning Organisation in the Development and Planning (T & CP) Department of the State Government, with financial assistance from the Government of India, is a basic plan formulated with this objective.

The Interim Development Plan will now be discussed and scrutinised in consultation with the public and private agencies concerned, and the various recommendations made in the Plan taken up for enforcement and implementation. As a comprehensive document outlining the prospects, policies and programmes for ensuring the planned development of one of the most vital urban areas and development regions in West Bengal, next in importance only to the Calcutta Metropolitan Region, I am glad to welcome the Interim Development Plan for Asansol-Durgapur.



(Prafulla Chandra Sen)

Chief Minister

Government of West Bengal

April 15, 1966

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ENGINEER-PLANNER	Shri S. N. Bhattacharyya
ARCHITECT-PLANNER	Shri B. Bhaskar Rao
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RESEARCH OFFICER	Shri S. P. Gorai
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CALCUTTA METROPOLITAN PLANNING ORGANISATION

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SENIOR PLANNER	Shri G. K. Choudhury
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EDITORIAL AND PRODUCTION

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Preface

The Asansol-Durgapur region—that is, the Asansol subdivision—is today a complex of many growth nodes, with varied economic and physical characteristics. An over-all development strategy, forming the general framework for the growth of the urban and rural areas of the region is therefore an essential requirement for any realistic plan for developing the individual centres like Asansol and Durgapur.

The Interim Development Plan for Asansol-Durgapur has attempted to formulate, in the context of a broad regional strategy for growth, the basic development plans for the two major urban centres of the region—Asansol and Durgapur. The approach to regional development recommended in the Plan Report, however, is not a detailed regional plan; such a plan is proposed to be drawn up later, during the comprehensive planning stage.

As in the case of the Siliguri Interim Development Plan formulated earlier by the State Government, the emphasis in the Asansol-Durgapur Plan also is on growth and on planning and programming its inducement. The Asansol-Durgapur Plan recognises that planned economic growth is an essential concomitant to planned physical growth.

The Interim Development Plan outlines the prospects for the development of two strong urban centres of the State—Asansol and Durgapur—and the policies and steps needed to ensure their planned growth. The Interim Plan is to be followed in March 1967 by a detailed comprehensive development plan. In this Plan Report, it is proposed to present the comprehensive plans for the region, the Asansol urban area, the Durgapur urban area and the other three urban complexes of the subdivision: Greater Raniganj, the Kulti-Barakar complex, and the Chittaranjan-Rupnarayanpur complex.

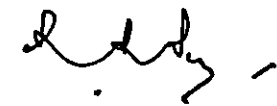
I am grateful to the officers and staff of the Asansol Planning Organisation, who have worked hard and enthusiastically on the preparation of the Interim Development Plan. The Plan, as now finally published, was formulated and written under the guidance of a joint planning team consisting of Shri M. G. Kutty, Director, Calcutta Metropolitan Planning Organisation, and Deputy Secretary, Development and Planning (T & CP) Department; Shri K. C. Sivaramakrishnan, previously Director, Asansol Planning Organisation, and now the Chief Executive Officer, Durgapur Development Authority; Shri Sujit Banerjee, Director, Asansol Planning Organisation; and Shri B. C. Chattopadhyay, Associate Planner, Shri S. N. Bhattacharyya, Engineer-Planner, Shri B. Bhaskar Rao, Architect-Planner, and Shri A. Bhattacharjee and Shri D. N. Basu, Research Officers—all of the Asansol Planning Organisation; and Shri G. K. Choudhury, Senior Planner, Calcutta Metropolitan Planning Organisation.

The Asansol Planning Organisation was unfortunate to lose the services of two of its competent young planners in Shri T. P. Sen Sharma and Shri A. K. Roy Choudhury who died in an accident during the period when the Interim Development Plan was under preparation. Their services to the Organisation are gratefully acknowledged.

I must also express our sincere gratitude to Prof. Leo Jakobson, Professor of Regional Planning, University of Wisconsin, U. S. A., and Consultant, Ford Foundation Advisory Planning Group, who since the inception of the Asansol Planning Organisation had acted as its Adviser during the major part of the planning programme. Prof. Jakobson extended to us the benefit of his long and distinguished experience in regional and city planning. We fondly recollect the warmth of his friendship for, and his pleasant association with, our officers and staff working in the Asansol Planning Organisation. We are grateful to Shri John P. Robin, Chief Consultant, Ford Foundation Advisory Planning Group, Calcutta, who kindly made available to us the services of Prof. Jakobson. Shri Robin has also been kind enough to make it possible for us to draw upon the advice and guidance of Prof. Arthur T. Row, Chairman, Department of Regional Planning, Yale University, U. S. A., in our comprehensive planning effort.

We are also grateful to the members of the Asansol Planning Advisory Council and the Durgapur Development Authority, who in the midst of their busy personal and professional preoccupations assisted and guided the Asansol Planning Organisation in its work. I would especially express our deep gratitude to Shri A. Niyogi, Managing Director, Durgapur Projects Ltd., and Chairman of the Asansol Planning Advisory Council, and to Shri John McCracken, OBE, Director & General Manager, Indian Iron & Steel Co. Ltd., and the Vice-Chairman of the Council. They ably steered the activities of the Planning Organisation in its formative period, and, happily, continue to guide and promote the efforts of the Organisation.

In conclusion, we gratefully acknowledge the financial assistance which the Town and Country Planning Organisation, Government of India, extended to the State Government in the preparation of the Plan. We express our thanks to the Chairman of the TCPO, Shri Gian Prakash, its Director, Shri K. A. Ramasubramaniam, and the Town and Country Planner, Shri C. S. Chandrasekhara, for their assistance and interest in the plan project.



(S. B. Ray)

Commissioner
Town and Country Planning
Government of West Bengal

April 15, 1966

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PLANNING FOR ASANSOL-DURGAPUR

A MAJOR INDUSTRIAL COMPLEX

The Asansol-Durgapur region accommodates a major industrial complex of Eastern India, and is an integral part of the Damodar Valley Resource Region that straddles inter-state boundaries. The five-year plans created the new industrial areas of Durgapur and Chittaranjan, adding to the hierarchy of urban centres of the region: Asansol, Kulti, Burnpur and Raniganj. The traditional industrial base of the region—coal, and iron and steel—has undergone a rapid diversification, and new industrial ventures—heavy engineering, fertilisers and coal-based chemicals—are now making a dominant impact on the region's industrial scene. The planned utilisation of the water resources of the Damodar, and a sustained programme of hydro-electric and coal-based thermal power generation, assisted this process of diversification and modernisation by providing the major infrastructure for the region's growth.

The accelerated industrialisation of the region has brought in its wake problems of scattered and unplanned urbanisation; even where isolated attempts at township planning were made, the cumulative effect has been to create a complex of unintegrated and uncoordinated, planned as well as unplanned, urban development. The Asansol Planning Area, which covers the entire jurisdiction of the Asansol subdivision, thus presents a picture of fragmented urban growth, with wide disparities in standards of services and facilities, and inadequate linkages. A development plan for the whole area, along with detailed plans for its major urban centres, is therefore urgently needed, to guide the future growth of the region, which enjoys a strategic location in the country's economy.

PLANNING AREA AND PLANNING ORGANISATION

The Asansol Planning Organisation (APO) was established in January 1964 by a government resolution, and was charged with the task of preparing a comprehensive development plan for the Asansol Planning Area. The APO functions under the administrative and policy control of the Development and Planning (Town and Country Planning) Department of the Government of West Bengal, and the plan preparation is being currently financed by the Town and Country Planning Organisation, Ministry of Works, Housing and Urban Development, Government of India. An Advisory Council, consisting of a chairman and 19 members, has also been set up to assist and advise the APO. The Asansol Planning Area is confined to the jurisdiction of the Asansol subdivision, an administrative unit well defined by the Ajoy, the Barakar and the Damodar rivers.

The crucial planning concern of the Asansol region is the integration and the linking up of the scattered urban growth in the area; this objective can hardly be achieved by planning for isolated urban centres. The formulation of an adequate regional development plan, accommodating and assimilating the mining settlements, agricultural areas, concentrations of manufacturing industry, and the major service centres, within the framework of an over-all rail and road system, is imperative to the drawing up of urban development plans for areas like Asansol and Durgapur. For such a regional plan, the administrative unit of the Asansol subdivision is the only satisfactory planning area, from the points of view of both planning and implementation.

DURGAPUR DEVELOPMENT AUTHORITY

Under the Durgapur (Development and Control of Building Operations) Act 1958, the Durgapur Development Authority—which now operates under the Development and Planning (Town and Country Planning) Department of the Government of West Bengal—was established to ensure the orderly growth of the Durgapur industrial area. The Asansol Planning Organisation functions in close collaboration with the Authority in the preparation of the development plans for the region and for the Durgapur urban area.

COMPREHENSIVE DEVELOPMENT PLAN

The comprehensive development plan for the Asansol-Durgapur region, with a time span of 20 years, will present a regional plan for the whole Asansol subdivision, and local development plans for major urban centres within the subdivision like Asansol, Durgapur, Raniganj-Andal, Kulti-Barakar-Niamatpur, and Chittaranjan-Rupnarayanpur. The comprehensive plan for the region will provide a statement of goals and objectives for the development of the region; a comprehensive demographic projection

of the future regional population and its urban component; quantitative and qualitative projections of future economic activity; a spatial plan showing the organisation of urban places in the region, including the role of mining settlements in the area, the urban form, urban density and urban structure; a plan for the regional infrastructure including water, power and transport; and projections and programmes relating to financing, enforcement and implementation of the plan.

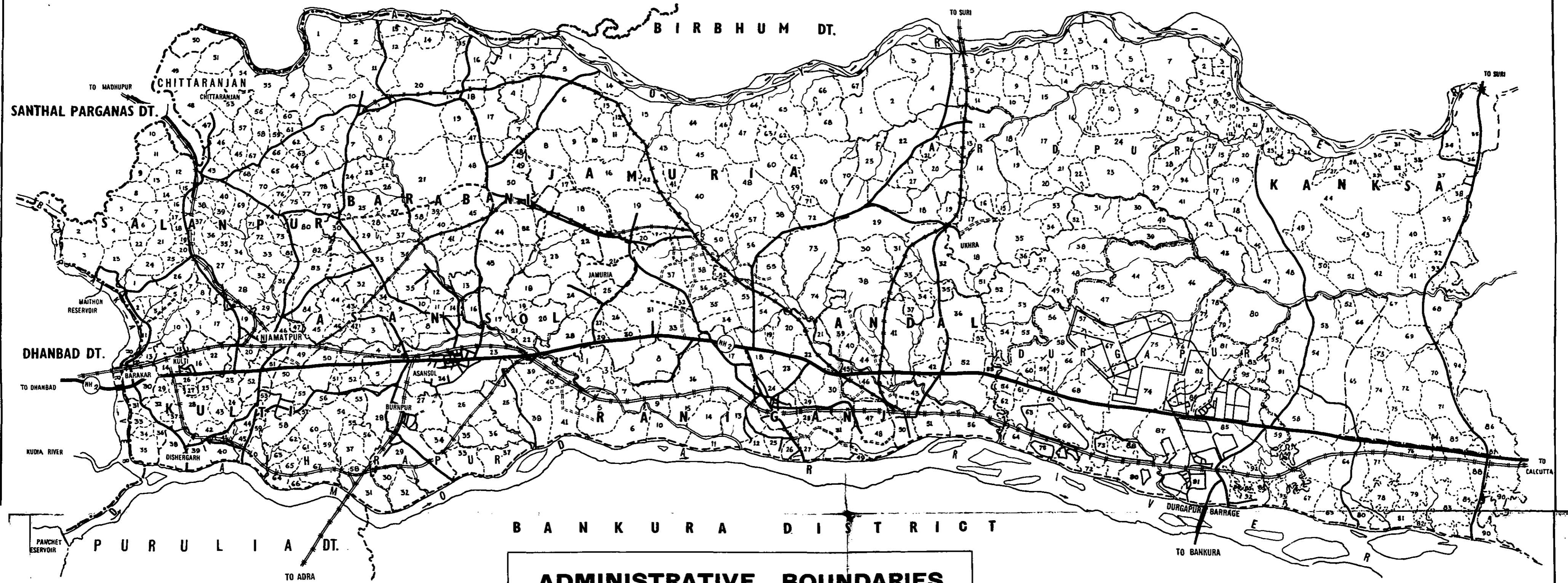
The local development plans for urban centres like Asansol and Durgapur will provide the detailed plans for the development of these centres on adequate considerations of both physical and socio-economic developments, including a detailed physical development plan, showing the phased development of the urban area with a transportation system, and the location of major services and facilities. The plans will also include a capital projects programme for community services and facilities, and a fiscal and administrative programme for their enforcement and implementation.

INTERIM DEVELOPMENT PLAN

The Interim Development Plan (IDP) presented in this report seeks to provide a basic framework within which developmental activities are to be regulated, pending the preparation and adoption of the comprehensive development plan. The Interim Plan includes a general regional development strategy as well as local development plans for Asansol and Durgapur urban areas. The comprehensive development plan will spell out in greater detail the general regional development strategy, and the plans for the five major urban growth nodes and the mining settlements, which have not been dealt with at length in the Interim Plan. The comprehensive plan will, however, conform basically to the framework established in the Interim Development Plan. The Interim Plan formulates the goals and objectives of the region and of the major urban centres of Asansol and Durgapur, estimates the relevant population and socio-economic projections and trends, and proposes a general development plan for the region, with more detailed local plans for Asansol and Durgapur framed in the regional setting. The Plan also presents a capital projects programme for 1966-71, recommendations regarding the enforcement of development controls, and an administrative organisation for plan implementation. The Interim Plan, in brief, seeks to:

- provide* a yardstick against which urban development decisions can be evaluated;
- serve* as a coordinating frame for programmes of private and public agencies;
- indicate* courses of action for the solution of pressing and urgent problems;
- furnish* a basis for initiating broad land-use controls; and
- facilitate* further research and studies to be focused on relevant matters, leading eventually to the formulation of the comprehensive plan.

ASANSOL PLANNING AREA



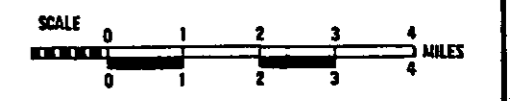
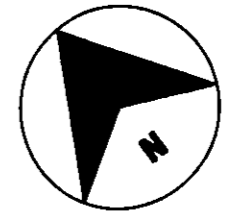
ADMINISTRATIVE BOUNDARIES

L
E
G
E
N
D

- STATE BOUNDARY
- DISTRICT BOUNDARY
- THANA BOUNDARY
- MUNICIPAL OR NOTIFIED AREA AUTHORITY
- NON-MUNICIPAL URBAN UNIT
- MOUZA BOUNDARY WITH J. L. No.

- METALLED
- DOUBLE TRACK
- ← ROADS →
- ← RAILWAYS →

- UNMETALLED
- SINGLE TRACK
- RIVERS
- TRIBUTARY WITH NULLAH



ASANSOL PLANNING ORGANISATION

ASANSOL PLANNING AREA PAST AND PRESENT

SIX DECADES OF GROWTH

Until the beginning of the 19th century, when coal mining was undertaken, the Asansol subdivision was mainly a wilderness, known in land records as a Jungle Mahal. The first coal mine was opened near Raniganj in 1820. Within twenty years extraction of coal became a major economic activity in the subdivision, the output amounting to approximately 36,000 tonnes a year. By 1960 the output had increased to 16.18 million tonnes. These figures reflect the story of waves of migrants who came to work in the coal mines, of the entrepreneurs and traders who followed in their wake, and of the emergence of the urbanising areas of Barakar, Sitarampur, Asansol, Raniganj, Andal and Ukhra as mining and trade centres. Starting with a single-line railway track connecting Calcutta with Raniganj in 1855, the then East Indian Railway became a major network, consuming a third of the coal output of the subdivision.

Iron ore was discovered in the area, about the same time as coal. In 1874, the first iron factory under the management of the Bengal Iron Company was established near Asansol, to emerge later as the Indian Iron & Steel Company (IISCO) with factories located at Burnpur and Kulti.

After 1947 the establishment of the Damodar Valley Corporation (DVC) and of a number of development projects in the public sector hastened the industrialisation and

urbanisation of the area. The locomotive factory at Chittaranjan, the cables factory at Rupnarayanpur, and the industrial city of Durgapur turned the Asansol subdivision into a major industrial centre of the country, raising the concomitant problems of haphazard and uncoordinated urban growth.

In 1904 Asansol became the divisional headquarters of the then East Indian Railway. In 1906 the subdivisional headquarters of the State Government were moved from Raniganj to Asansol. The establishment of many important units of the Central and State Governments, including the offices of the Inspectorates of Mines, Factories, Explosives, etc., and the location of a Sessions Court at Asansol, have added to the importance of the city as a seat for administrative and governmental functions.

PHYSICAL FEATURES

The Asansol subdivision, covering an area of approximately 620 square miles, and located between 23° 25' and 23° 53' N, and 86° 48' and 87° 32' E, is bounded on the north-west by the hilly Santhal Parganas tracts; on the north by the river Ajoy which separates it from the district of Birbhum; on the east by the *sadar* subdivision of Burdwan District, and on the south-west by the rivers, Damodar and Barakar, which separate the area from Bankura District of West Bengal and Dhanbad District of Bihar. The rivers—the Ajoy, the Damodar and the Barakar—are the natural barriers to effective transportation between the subdivision and the surrounding areas.

LINKAGES

The links with Bankura, Purulia and Birbhum Districts depend to a great extent on the provision of adequate crossings over the Damodar and the Ajoy. At present only one railway bridge over the Damodar near Asansol, and a road across the Durgapur Barrage, connect Asansol with Bankura. A single-track railway line from Andal to Sainthia crosses the Ajoy at Pandaveswar, and a road bridge over the Ajoy at Ilambazar connects Asansol with Birbhum District. The subdivision is connected to Purulia over the Panchet Dam through Raghunathpur. Over the Barakar there are at present one road bridge and another rail bridge, in addition to the roadway over the Maithon Dam.

SOIL

Although the Asansol subdivision forms a part of Burdwan District of West Bengal, its physical characteristics are quite different from those of the rest of the district; they are more akin to those of the hill ranges of Central India and the Santhal Parganas of Bihar.

The country is barren, rocky and rolling, with laterite soil rising into rocky hillocks on the right bank of the river Ajoy; and the area is hemmed in on the west, north and

south by the hills of Chotanagpur and the Santhal Parganas. The surface cover in general is clay, in some parts alluvial, while in others the soil is formed through decomposition of rocks. At places, the land is extremely rocky, unfit for cultivation.

MINERAL DEPOSITS

West Bengal's principal mineral deposits are almost wholly confined to Asansol. Coal accounts for 99% of the total mineral output of the subdivision. Coal reserves are estimated to be over 12,900 million tonnes—a little less than one-third of India's total. The coal available (96%) is generally of non-coking quality; 36% of such coal—non-coking Grade I—can be used as metallurgical coke in blend with the coking coal of Jharia.

The other commercially significant mineral is fireclay, which generally occurs in the coal measures of the Gondwana system. Fireclay deposits of about four million tonnes are estimated to be present in the Raniganj coalfields. In these coalfields also, iron ore of an inferior grade, the reserves of which are estimated to be about 500 million tonnes, is available, though these reserves are not exploited at present.

CLIMATE

The climate of the Asansol area is quite different from the rest of Burdwan District and is similar to the climate in Bihar. Summer months are hot, with average mean temperature of about 33°C. In winter the temperature generally is around 18.40°C.

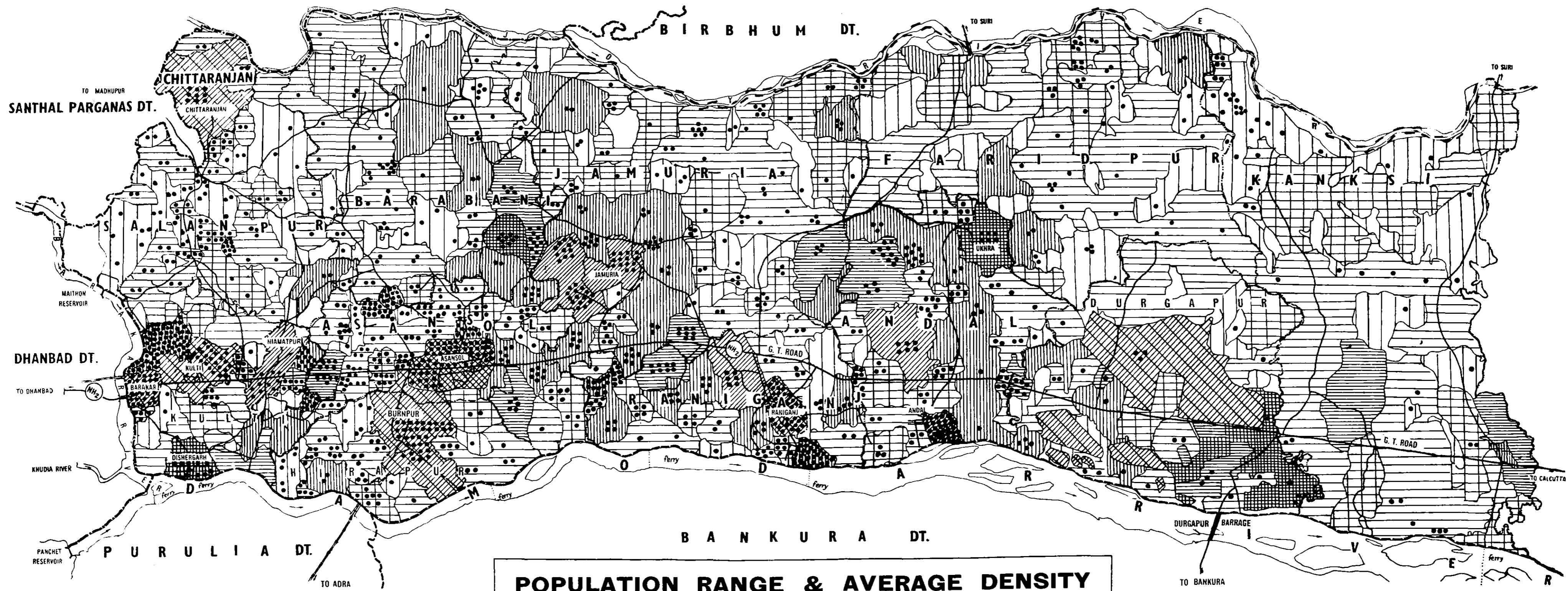
Rainfall is sparse and concentrated during the July-September period. The wind direction during the summer months is generally N/NW and during the winter months E/SE.

POPULATION

The 1961 Census recorded the population of the Asansol subdivision as 10,91,074—7,07,366 rural and 3,83,708 urban. Compared with the 1901 Census figure of 3,70,988, the population would appear to have multiplied nearly three times through the past fifty years.

POST-INDEPENDENCE INDUSTRIAL GROWTH

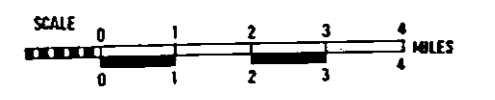
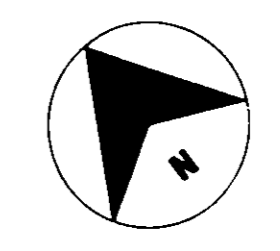
The increase was modest upto 1931; since then the continuous in-migration has raised the population figures considerably. The post-Independence industrial growth in the area further accelerated the migratory flow. During the period 1951-61, population increased by 41%, migration accounting for 18%. The rate of increase in urban population has exceeded the rate of increase in total population. In 1901 only Asansol and Raniganj were counted as urban areas; in 1961 there were as many as fourteen urban areas in the subdivision.



POPULATION RANGE & AVERAGE DENSITY

- STATE BOUNDARY
- DISTRICT BOUNDARY
- P. S. BOUNDARY
- METALLED ROAD
- RIVERS

POPULATION RANGE		POPULATION DENSITY	
	1 - 499 PERSONS		2 500 - 4 999 PERSONS
	500 - 1 499 PERSONS		5 000 - 7 499 PERSONS
	1 500 - 2 499 PERSONS		7 500 - 9 999 PERSONS
			10 000 - 19 999 PERSONS
			20 000 - 49 999 PERSONS
			50 000 PERSONS AND ABOVE
			ONE DOT REPRESENTS 500 PERSONS PER SQUARE MILE



2

ASANSOL PLANNING ORGANISATION

POPULATION TRENDS

Table I indicates the population trends in the subdivision for the last six decades:

TABLE I
POPULATION TRENDS

Year	Total Population	Percentage Increase	Urban Population	Percentage of Total Population
1901	3,70,988	—	30,747	8.29
1911	3,88,582	4.7	37,416	9.63
1921	4,03,904	4.7	41,035	11.58
1931	4,63,080	14.6	68,083	14.70
1941	6,05,689	30.8	1,31,364	21.69
1951	7,69,265	27.0	2,02,554	26.33
1961	10,91,074	41.9	3,83,708	35.17

The urban composition of the total population—35.17%—is higher than the national and the state averages of 18% and 24.52%, respectively. Even this percentage is limited to the 14 urban centres only. These, according to the 1961 Census, are Chittaranjan, Barakar, Kulti, Niamatpur, Dishergarh, Asansol, Burnpur, Outer Burnpur, Rani-ganj, Jamuria, Andal, Ukhra, Durgapur Steel Town and Durgapur Coke-Oven Colony. This group of urban centres excludes the numerous mining settlements, which have marked urban characteristics. About 82% of the subdivisional population are engaged in non-agricultural occupations and only 18% in agriculture.

POPULATION DENSITY

The over-all density of population for the subdivision in 1961 was 1,748 persons per square mile, with an urban density of 6,060 and a rural density of 1,261. The changes in the density over a period of twenty years are shown in the following table:

TABLE II
DENSITY CHANGES IN ASANSOL SUBDIVISION POPULATION: 1941-61

Year	Rural (per sq. mile)	Percentage Variation	Urban (per sq. mile)	Percentage Variation	Total (per sq. mile)	Percentage Variation
1941	792	—	5,234	—	970	—
1951	946	+19.44	8,070	+54.18	1,233	+27.11
1961	1,261	+33.30	6,060	-24.91	1,748	+41.77

The doubling of urban density by 1951 and its subsequent decline by 1961 are explained by the establishment of large townships such as Chittaranjan, Durgapur Steel Town

and Durgapur Coke-Oven Colony, where planned development with low densities occurred; simultaneously only small increases in density were noticed in the Burnpur and Kulti townships.

AGE-SEX DISTRIBUTION

The over-all sex ratio for the subdivision in 1961 was 703 females for every 1,000 males; corresponding national and state figures were 941 and 878, respectively. In urban areas the ratio was 686, and in rural areas 735. In the case of migrants, who constitute 51% of the subdivisional population, the ratio is only 555. In individual urban centres it is observed that the sex ratio tends to be (a) inversely related to the mobility of the population; i.e., the greater the mobility, the lower the ratio; and (b) directly related to the stages of growth; i.e., as in Durgapur, the ratio has been low during early stages of the growth and has tended to increase as the growth proceeds.

The age-composition of the population, with its rural and urban components, may be seen from the table below:

TABLE III
AGE-COMPOSITION OF POPULATION IN PERCENTAGE

Age-Group	Rural	Urban	Subdivision
0-14	34.11	35.83	34.72
15-34	39.57	41.79	40.34
35-59	22.58	19.49	21.50
60 and above	3.72	2.89	3.43
Age not stated	0.02	—	0.01
Total	100.00	100.00	100.00

The high percentage of younger people—0-14 years—in the rural, urban, and total population indicates a high birth rate among the resident population, as the number of in-migrants in that age-group would be quite small. The age-group 15-34, which is the main age-group for the working force, also accounts for a large percentage. The percentage of people in the age-group 35-59 falls sharply, showing the trends in life expectancy. The percentage of people over 60 years of age is very low. The high percentage of 0-14 age-group population indicates the importance of providing educational facilities in the area, including facilities for vocational training.

OCCUPATIONAL STRUCTURE

As mentioned earlier and as shown in Table IV, next page, 18% of the subdivisional population are engaged in agriculture and the remainder in non-agricultural occupa-

tions. Mining, classified as a rural occupation, provides for nearly half the number of rural workers. Manufacturing, especially iron and steel, is the major provider of employment in urban areas. The over-all percentages for the tertiary sector are low—not commensurate with the industrial development in the area.

TABLE IV
OCCUPATIONAL DISTRIBUTION OF WORKING FORCE IN PERCENTAGE

Occupations	Rural	Urban	Subdivision
Agriculture	26.12	1.07	17.95
Mining	44.90	7.95	32.86
Household Industry	1.66	0.80	1.38
Manufacturing	9.56	42.14	20.19
Construction	1.32	6.62	3.03
Trade and Commerce	4.45	12.82	7.18
Transport	2.26	10.75	5.03
Other Services	9.73	17.85	12.38
Total	100.00	100.00	100.00

The percentage of total workers to the total population is 40.83—slightly less than the all-India figure of 42.48. The percentage of male workers to male population—61.00—is higher than the national average of 57, and the percentage of female workers to female population—11.64—is much lower than the all-India figure of 27.96.

THE ECONOMY

The occupational structure described above emphasises the preponderance of employment in mining and manufacturing. For other major sectors of the economy the present position is stated below.

AGRICULTURE

The subdivision has 373 square miles of cultivable land. Only 230 square miles are actually cultivated, the limiting factors being lack of irrigation, depletion of subsoil water due to mining, and poor quality of the soil. Kanksa and Faridpur are the main agricultural areas in the subdivision. Jamuria, Barabani and Salanpur come next in order of importance. The main crops are aman paddy, sugarcane and potato. Some wheat is also grown. Cash crops cover about 26.5 square miles of the cultivated area. Productivity is generally low. For aman paddy, the productivity is 0.7 tonne per acre compared with the average of one tonne for Burdwan District. There is scope for extension of agriculture in Kanksa, Faridpur and Asansol police station areas, if proper irrigation facilities can be extended to these places.

Urbanisation has depleted the large forest areas (mainly sal) which once covered the subdivision. Today forests of sal trees exist in the north-western parts of the subdivision near the Ajoy, and in areas north-west of Durgapur.

MINING

The number of collieries operating in the subdivision is 205. They employ about 1.4 lakh of people. In keeping with the production targets set by the Planning Commission, the capital investment in coal mining has been increasing. Its effects are felt mainly in increased production, though accompanied by a subdued growth of employment because of mechanisation. During 1953-63 the rate of increase in production has been about 7% as shown in Table V, below:

TABLE V
PRODUCTION OF COAL
(in million tonnes)

Year	Non-Coking	Coking	Total
1953	10.20	—	10.20
1960	16.18	—	16.18
1961	17.20	—	17.20
1962	18.43	0.31	18.74
1963	18.80	0.51	19.31

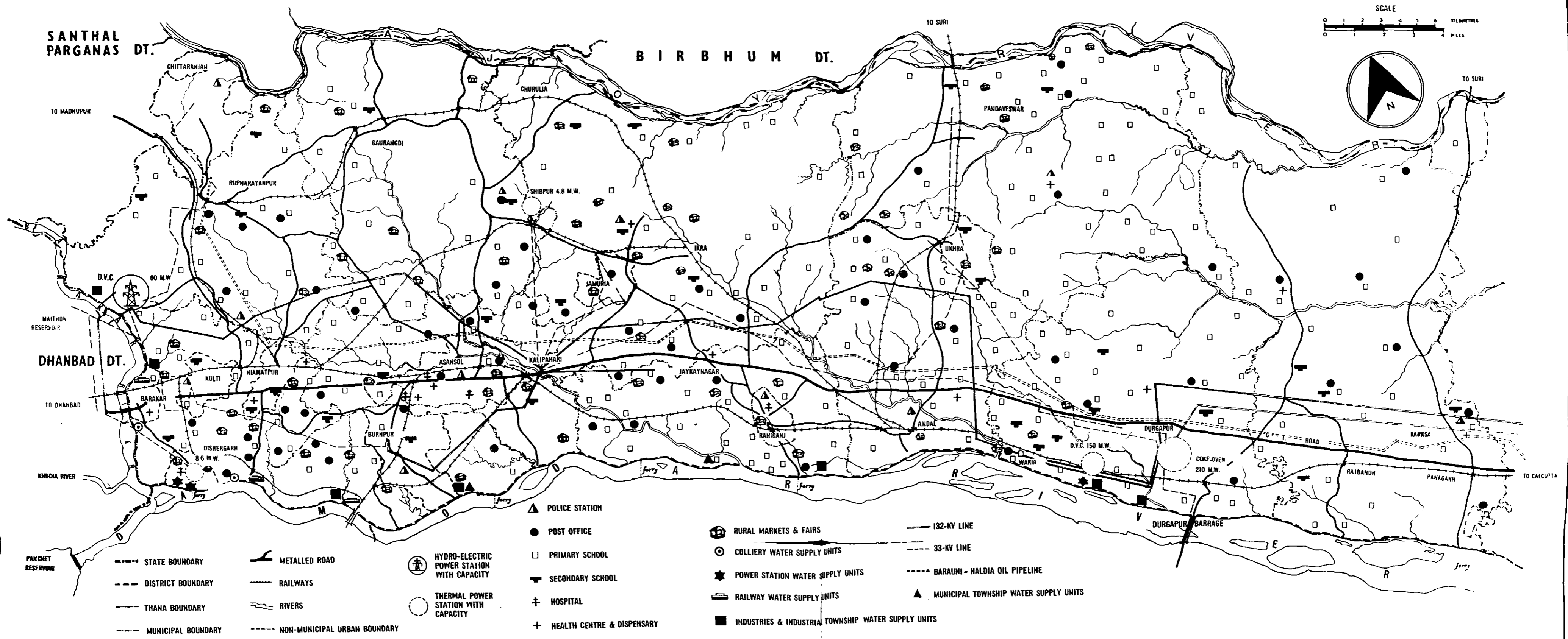
The percentage share of the region in the total output of coal in India during 1951-61 has varied between 28 and 31. While industrial utilisation of coal has a great potential in the country as a whole, scope for its use, especially in the chemical and byproducts industries, exists particularly in this subdivision.

Since the bulk of employment in coal mining is in rural areas, the mining settlements even today stand midway between urban and rural growth, lacking adequate facilities and amenities for their population.

INDUSTRY—MANUFACTURING

Out of about 93,000 workers employed in the manufacturing industry, the basic metals and engineering groups account for nearly 60,000. Industries like refractories, potteries and glass come next, employing between them 5,000 workers. The rest of the workers find employment in chemical and other industries. Between 1951 and 1961, the annual growth of employment in registered manufacturing units was 7.2%, compared to West Bengal's average of 0.9%. The rapid expansion of the basic metals and engineering groups of industries, especially in Durgapur and around Asansol, explains this high growth rate.

ASANSOL PLANNING AREA : SERVICES AND UTILITIES



The manufacturing sector is dominated by iron and steel. With the Indian Iron & Steel Company at Burnpur and the HSL (Hindustan Steel) unit at Durgapur, the Asansol subdivision has become a major centre of the iron and steel industry in the country. Table VI, below, indicates its production trends within the subdivision, as compared with those for the country as a whole.

TABLE VI
PRODUCTION OF IRON AND STEEL
(in thousand tonnes)

Year	Pig Iron		Steel Ingots	
	Asansol-Durgapur	India	Asansol-Durgapur	India
1959	1,023	3,031	832	2,433
1960	1,459	4,140	1,004	2,386
1961	1,010	4,946	1,378	4,084
1962	2,143	5,796	1,604	5,243
1963	2,480	6,602	1,973	5,920

The gross value of the output in this industry was estimated to be Rs. 83.21 crore in 1962-63, out of which the value of local demand—mainly from coal-mining and engineering industries—was Rs. 24.34 crore. Of the total local demand, coal mining claimed 11%, engineering 62%, and the iron and steel industry itself 27%.

SMALL, MEDIUM AND ANCILLARY INDUSTRIES

Despite the growth of basic and heavy industries in the Asansol Planning Area, small, medium and ancillary industries, less capital-intensive in character, have not yet shown substantial increase. The main reasons for this may be enumerated as follows:

- (i) In relation to the industrial complex of Greater Calcutta there are no cost advantages in the Asansol area in respect of coal, steel, power and skilled labour.
- (ii) Inadequate water supply is a serious constraint for the small entrepreneurs.
- (iii) Procuring of raw materials, especially controlled articles, is difficult.
- (iv) The availability of skilled labour locally is meagre.
- (v) The practice of 'farming out' of orders by bigger firms to smaller ancillary units in the locality is not very much in vogue.

A serious constraint of a general nature on the quicker growth of the area and the flow of entrepreneurs from outside appears to be the lack of an adequate social infrastructure; the existence of such infrastructure on a somewhat large scale has increased the competitive attractions of rival centres like the Calcutta Metropolitan District for new industrialists.

TRADE AND COMMERCE

In the Asansol subdivision only 7.18% of the total workers are engaged in trade and commerce, the percentages in urban and rural areas being 12.82 and 4.45, respectively. During 1951-61 the large increase in employment in manufacturing—64%—resulted in a corresponding increase of 45% in trade and commerce. In areas like Greater Calcutta, however, with the advance of industrialisation, employment in trade and commerce has tended to equal that in manufacturing. Over the period 1951-61 employment in retail trade increased from 19,500 to 28,000 and in wholesale trade from 1,300 to 1,900. Wholesale trade centres in the past have often tended to cluster around mining centres in the rural areas; with greater industrialisation more employment in wholesale trade in the urban areas may be expected. Employment in banking and insurance constituted only about 6% of the total employment in trade and commerce in 1961, indicating the poor development of these facilities in the area.

During recent years, commercial taxes collected in the subdivision rose from Rs. 30 lakh in 1957 to Rs. 173 lakh in 1964. This indicates the growth of the trade and commerce sector in the subdivision, even though the rise in the collection has to some extent been due to increases in tax rates. However, the growth of trade and commerce is yet to attain a pace comparable with that of industrial development in some areas of the region such as Durgapur.

PUBLIC SERVICES AND UTILITIES

POWER

There are at present four power-generating stations in the Asansol subdivision, viz., Dishergarh-Seebpur Thermal (14 MW); Maithon Hydel (60 MW); Durgapur DVC Thermal (150 MW); and Durgapur Projects Ltd. (DPL) Thermal (210 MW). These power stations generated a total of 284 MW in 1963. In addition, a number of industrial undertakings generate their own electricity. A rough estimate of electricity generated by the industrial units for their own use places the total generation at 70 MW for 1963. The over-all position is shown below:

TABLE VII
POWER GENERATION

Generating Units	Power Generated (in million kwh)	
DVC System		
Maithon Hydel Station	150	902
Durgapur Thermal Plant	752	
Durgapur Projects Ltd.		372
Dishergarh Power Supply		85
Dishergarh & Seebpur Units		
Self-Generation by Various Industries (estimated)		300
Total		1,659

The major producers of power—the DVC and the Durgapur Projects—also feed the regional power grid now existing between parts of Bihar and West Bengal to the extent of approximately 50% of their output. Taking this factor into consideration, along with the actual consumption figures, it was estimated that the load within the subdivision totalled 967 million kwh in 1963-64. If the present trends of consumption continue, the subdivision is unlikely to have a power shortage in the near future, when the Durgapur (DVC) power station will have a 140-MW unit in operation and the Durgapur (DPL) power station another 75-MW unit on stream. The total subdivisional consumption of power in 1962 was estimated as 830 million kwh (273 MW).

WATER

The main sources of water in the subdivision are the two rivers, Barakar and Damodar. The locomotive works at Chittaranjan draw water from the Maithon Dam on the Barakar, while the industries and settlements at Dishergarh, Asansol, Raniganj and Durgapur draw water from the Damodar. The Ajoy river till now has not been much utilised; and plans for its use will thus be an important element of any water management plan for the area. Water from pit heads meets both industrial and domestic requirements in the collieries, though in most cases such water is used untreated. The total water demand for the subdivision, as of 1961, is indicated below:

TABLE VIII
WATER DEMAND IN ASANSOL SUBDIVISION IN 1961

Category	Standard (in g.p.c.d.)	Population (in lakhs)	Water demand (in m.g.d.)
Rural	15	7.07	10.605
Asansol Urban	50	1.69	8.450
Durgapur Urban	50	0.42	2.100
Remaining Urban	40	1.73	6.920
Industries *	(28—1,100)	0.93	36.958
Fire allowances	—	—	1.960
Losses	—	—	6.699
Sub-total	—	—	73.692
Agriculture	28	0.840	2.352
Mining	80	1.422	11.376
Total	—	—	87.420

* Per worker use of water varies in different industries

No comprehensive survey of the actual supply as against this demand has yet been made. It is estimated, however, that, except for mining and industrial uses, there were sizeable deficits in all other categories.

According to a DVC estimate, the availability of the system below the Maithon and Panchet Dams totals 193.8 m.g.d. This supply is to be shared among industrial and other uses in the Chittaranjan-Asansol-Durgapur complex on the one hand, and drawn principally for agricultural use below the DVC Barrage on the other. The water demand for the next twenty years has been estimated by the APO, and a more detailed water management study has also been initiated for the comprehensive development plan. Proposals for augmenting supplies of water in the urban areas are presented later in this report.

COMMUNITY FACILITIES

HOUSING

The provision of housing in the Asansol subdivision in general, and in the urban areas in particular, has failed to keep pace with the industrial growth and population increases. Assuming a standard of two persons per habitable room as a desirable person-to-room index, it is seen that the average index for the subdivision is 3.27. In the urban areas the rate is 2.99, which is slightly less than the rural average of 3.55. Single-room houses predominate in the rural areas, and housing is usually confined to the minimum space needs, leaving the major parts of the rural areas to be used for cultivation. The following table illustrates the situation in the subdivision.

TABLE IX
HOUSING IN ASANSOL SUBDIVISION

Number of Rooms	Percentage of Total	Average Persons per Household	Occupancy Rate per Room
One-room	65.5	4.3	4.3
Two-room	22.8	5.8	2.9
Three-room	6.7	7.5	2.5
Four-room	2.6	7.6	1.9
Five-room and above	2.4	—	—

The above table shows the extent of congestion. A notable feature of housing in the subdivision is the predominance of rented quarters, especially in the urban areas. While in the new industrial townships of Durgapur Steel, Durgapur Coke-Oven, Chittaranjan, etc., housing is provided by the industries themselves, the position in

towns like Asansol, Burnpur, Raniganj and Barakar, with only about 25 to 45% owner-occupied houses, leaves much to be desired. The rents here are high, and in areas like Asansol town quite a number of houses—about 8%—are devoted to residential as well as industrial-cum-business uses.

An important social implication of the difficult housing situation is that skilled manpower needed for the industries may find it difficult to settle down in the area in the absence of suitable housing facilities.

EDUCATION

Literacy in the Asansol subdivision is generally high compared to the rates prevailing in West Bengal as a whole. The comparative figures are given below:

TABLE X
ASANSOL SUBDIVISION—LITERACY RATES—1961

Population	Asansol	West Bengal
Rural	24.1%	21.7%
Urban	49.5%	52.8%
Total	33.0%	29.2%

Of the literate urban population, 6.50% are graduates and 10% are educated upto the school final standard. The educational facilities available in the subdivision are detailed below:

TABLE XI
EDUCATIONAL INSTITUTIONS—ASANSOL SUBDIVISION

Institutions	Number
Primary Schools	474
Junior High Schools	40
High Schools	27
Pre-basic Schools	6
Junior Basic Schools	36
Senior Basic Schools	11
Higher Secondary and Multipurpose Schools	26
Post-Secondary Vocational Schools	18
Technical Schools	3
Degree Colleges	4
Teachers' Training College	1

HEALTH

Health services in the subdivision are provided by the State Government, by the various industrial units and by the Asansol Mines Board of Health. The Asansol Mines Board of Health has jurisdiction over the mining settlements, and covers an area of 426 square miles which contain 205 working collieries and about 500 villages, with a total population of 6.5 lakh. The Board has no jurisdiction over the municipal areas of Asansol, Durgapur and Raniganj.

The Board is responsible for control of epidemics, for inspection of medical services in collieries, for maternity and child welfare, for control of leprosy and for health education. It is also responsible for the enforcement of health and food regulations within its jurisdiction. The Board maintains eleven maternity and child welfare centres, a leprosy hospital, 14 leprosy clinics and one laboratory. It is financed from a cess on mine-owners and royalty-receivers, calculated on the coal tonnage raised. The Board also gets grants from the Coal Mines Welfare Organisation of the Government of India.

There are eight hospitals, with a total bed strength of 675, run by coal-mining interests for colliery workers and employees only. In addition, there are nine other industrial hospitals with a total bed strength of 955, including hospitals run by the public-sector industries. These hospital facilities too are available only to the workers of the industrial establishments concerned.

The State Government run four hospitals with a total bed strength of 108, besides 30 health centres for outdoor patients. The health services available to the general population are inadequate, though for industrial workers the facilities are satisfactory. The number of beds per population of 1,000 in the subdivision is 1.4; the number of doctors per thousand persons is 0.2, and the number of nurses 0.3.

RECREATION AND CIVIC AMENITIES

The contrast between company townships and other urban centres in respect of recreational facilities is very noticeable. The company townships have generally provided playgrounds, libraries, clubs and community centres for their employees. For the general population of the area, however, the 24 permanent and seven temporary cinemas are the major centres of recreation, as indicated by the daily average attendance of 8,200 persons. In winter, after the Pujas, nearly 200 jatra performances are held, mainly in the mining settlements. Apart from the district library at Asansol, there are only 13 small libraries in the subdivision for general use. Tourist facilities are restricted to the 40-seat and 100-seat youth hostels at Maithon and Durgapur and a few small dak bungalows. Playgrounds do not exist even in the larger towns like Raniganj; there are only two playgrounds at Asansol.

In brief, the lack of recreational and civic amenities is a major inadequacy in the area.

TRAFFIC AND TRANSPORTATION

The foundations of the existing rail and road communication networks in the subdivision were laid in the nineteenth century to meet the requirements of the coal industry. With the subsequent growth of other industries, this basic framework was expanded. The transportation system of the subdivision today consists of the following major components:

RAILWAYS

The railway system comprises the Eastern Railway's four-track electrified main line running east to west through the subdivision, connecting it with Calcutta in the east and the rest of India in the west; the Eastern Railway's Grand Chord branching off the main line at Sitarampur, linking the Asansol Planning Area with Bihar; the Andal-Sainthia line, connecting the subdivision with Birbhum District; the South Eastern Railway line, connecting the subdivision through Asansol with Bankura and Purulia Districts; and the loop lines of Andal-Gaurangdi with extension to Sitarampur; and the branch lines of Andal-Jamuraia-Barabani-Sitarampur, Toposi-Barabani, Mahishila-Damodar and Damodar-Dishergarh, besides many smaller colliery and industrial sidings. The loop lines and the sidings mainly serve the needs of goods traffic, whereas the other major lines cater to both passenger and goods traffic.

ROADS

The road system consists of the National Highway No. 2 (Grand Trunk Road) connecting the subdivision with Calcutta in the east and Bihar and Northern India in the west; metal-surfaced major roads, 231 miles long—38 miles with bituminised surface—branching off to the north and the south from the Grand Trunk Road, linking centres like Chittaranjan, Barabani, Ukhra, Jamuria, Dishergarh, Burnpur, and Raniganj; minor roads, 159 miles long, mostly kutchha and fair-weather type, linking villages, mining settlements, etc., with the major roads, and at points with the national highway itself.

Accessibility within the subdivision, as provided by the existing road and rail networks, is quite good. The Regional Planning Wing of the Calcutta Metropolitan Planning Organisation has estimated the average accessibility index for the subdivision as about 5.5 miles of roads and railways for every 10 square miles of the subdivision. The average distance of all human settlements in the area from the nearest metalled road is approximately 2.5 miles.

With the large number of accesses to the Grand Trunk Road, which functions as a national highway, the vastly increased movement of goods and people in recent years has generated for the Planning Area many traffic and transportation problems. The situation has also been accentuated by the absence of proper maintenance and rehabilitation of many of the existing major roads in the region. The traffic between Burnpur and Dishergarh, between Jamuria and Ukhra, and between Barabani and Chittaranjan has tended to be diverted to the Grand Trunk Road. In the growing Durgapur urban area, the local traffic makes an exacting demand on the Grand Trunk

Road. The large and growing volume of transit traffic on the Grand Trunk Road has also strained the capacity of this national highway. As a result, the 40-mile stretch of the national highway between Durgapur and Barakar is today one of the worst traffic pressure zones in the country. In 1964, there were 368 accidents on this stretch of the road alone, resulting in 62 deaths and injuries to 502 people. Between January and June 1965, the number of deaths totalled 64, and 304 people were injured as a result of accidents. Considerable urban developments on both sides of the Durgapur-Barakar zone of the G. T. Road and the existence of working collieries nearby have added to the difficulties of bringing about any improvements to the existing situation by widening or improving the road along any length of the highway.

A detailed traffic and transportation survey within the region and in the major urban centres of the region is scheduled to be conducted by the Asansol Planning Organisation to facilitate preparation of the comprehensive plan. For the Interim Plan, however, the data on inter-regional and intra-regional traffic collected through the week-long survey conducted in February 1965 at two check posts in the Asansol and the Durgapur areas have been taken into consideration. The survey was undertaken under the auspices of the Joint Technical Group for Transport Planning (Planning Commission) by the Regional Planning Wing of the Calcutta Metropolitan Planning Organisation, in collaboration with the Asansol Planning Organisation. This survey showed the dominating influence of transit traffic over the total traffic in the Asansol-Durgapur region. The data presented below relate to weekly movements over the Grand Trunk Road.

TRANSIT TRAFFIC

The weekly goods flow from the Calcutta Metropolitan District proceeding beyond the Durgapur-Asansol region amounts to 6,535 tonnes, as against the 21,839 tonnes moved from points beyond the Asansol-Durgapur region to the Calcutta Metropolitan District. The incoming traffic to the Calcutta area is therefore approximately three times the outgoing traffic. About 80% of all trips passing through the Asansol-Durgapur region have Calcutta as their origin or destination point. Commodity-wise, the transit traffic is as follows:

TABLE XII
TRANSIT TRAFFIC ON THE GRAND TRUNK ROAD

Incoming to Calcutta			Outgoing from Calcutta		
Commodities	Tonnes	Percentage	Commodities	Tonnes	Percentage
Coal and Soft Coal	15,919	73.0	Iron and Steel Machinery	2,401	37.0
Iron and Steel Machinery	1,157	5.3	Mineral Oil	743	11.5
Foodgrains and Vegetables	256	1.5	Foodgrains and Vegetables	331	5.0
Building Materials	780	3.6	Building Materials	129	2.0
Miscellaneous	3,727	16.6	Miscellaneous	2,931	44.5
Total	21,839	100	Total	6,535	100

Coal and soft coal constitute 73% of the total transit commodity flow to the Calcutta area from places beyond the Asansol-Durgapur region; and iron and steel, and machinery another 5.3%. The two groups, together, account for 78% of the total incoming commodity flow to Calcutta. As regards the outgoing traffic from Calcutta, the major group consists of iron and steel, and machinery and machinery parts (37%), followed by consumer goods (14%) and petrol (11.37%). The commodity-composition of transit traffic shows the importance of the Calcutta area as a major coal-consuming centre, and as a supplier to the hinterland of iron and steel, and machinery and machine parts, consumer goods and petrol. Beyond Barakar, Dhanbad (about 175 miles from Calcutta) is the single most important terminus. The preponderance of coal in the incoming traffic to Calcutta, perhaps, also shows the comparative advantages and popularity of short-distance haulage of coal by road.

INTRA-REGIONAL TRAFFIC

The volumes of traffic originating or terminating within the Planning Area, i.e., Asansol subdivision, were found to be as follows:

TABLE XIII
TRAFFIC WITH ORIGIN/DESTINATION IN THE PLANNING AREA

Origin/Destination	Tonnes
Originating in Calcutta-Burdwan Area, and Terminating in Asansol-Durgapur Area	2,549
Originating in Asansol-Durgapur Area, and Terminating in Calcutta-Burdwan Area	1,408
Originating beyond Barakar, and Terminating in Asansol-Durgapur Area	1,452
Originating in Asansol-Durgapur Area, and Terminating beyond Barakar	698
Total	6,107
Inter-City Traffic from Asansol to Durgapur	2,090
Inter-City Traffic from Durgapur to Asansol	1,688
Total	3,778

The total volume of traffic originating or terminating within the Planning Area and the inter-city traffic, together, amount to only 9,885 tonnes or about one-third of the

volume of transit traffic that passes through the area every week. Along with the transit traffic, the total goods flow on the Grand Trunk Road per week amounts to 38,259 tonnes. Of the total traffic generated within the Asansol-Durgapur region, about half the volume relates to non-goods movement.

The commodity-wise composition of goods traffic originating from and terminating at Asansol and Durgapur shows the pattern of commodity flows for the two major urban centres of the region. Of the 2,721 tonnes of traffic originating from Asansol, among the major groups, 28% was accounted for by building materials, 25% by coal and soft coal, 10% by iron and steel, 5% by mineral oil, and 5% by unspecified consumer goods. Of the 1,831 tonnes terminating at Asansol, among the major groups again, building materials accounted for 20%, timber 11%, iron and steel 11%, coal and soft coal 10%, fruits and vegetables 8%, and unspecified consumer goods 10%. As against 4,552 tonnes of traffic originating from and terminating at Asansol per week, Durgapur handled a larger volume of 5,515 tonnes. Of the originating traffic of 1,393 tonnes from Durgapur, among the major groups, building materials formed 46.59%, coal and soft coal 20.93%, iron and steel products 8.53%, foodgrains 4.65%, timber 2.43%, and unspecified consumer goods 8.45%. The total volume of traffic terminating at Durgapur amounted to 4,122 tonnes, of which, among the major groups, building materials formed 35.42%, coal and soft coal 21.51%, iron and steel products 9.29%, minerals 4.57%, foodgrains 4.57%, and unspecified consumer goods 15.44%. The above commodity-flow indicates the preponderance of movement of building materials in the present stage of development of the major urban centres of the region. The movement of iron and steel products, coal and soft coal, and mineral oils comes next in order of importance in the flow pattern.

The comparatively small magnitude of intra-regional as against transit traffic, the almost equal division of intra-regional traffic between goods and non-goods, and the predominance of Asansol, Raniganj and Durgapur as generators of intra-regional traffic are very relevant to the formulation of a transportation plan for the region.

The traffic and transportation situation in the region calls for an adequate transportation system that would provide for easy, economical and speedy inter-regional and intra-regional commodity flows and would reduce to the minimum the conflicts involved in simultaneous local, intra-regional and inter-regional movements. With rapid urbanisation and increasing population, and an increased interdependence of local areas within the region, problems of intra-city transportation and of transportation within the Planning Area have also assumed much significance.

PLANNING FOR THE REGION PROBLEMS AND OBJECTIVES

PLANNING PROBLEMS

Urban sprawl in the Asansol subdivision has been induced mainly by the growth of mining and industrial areas and of associated service centres. More than two hundred working collieries, the residential settlements, and ten or more bazar areas serving the colliery population have cumulatively helped to add pronounced urban characteristics to many of the rural parts of the subdivision.

Although the Census of 1961 listed only fourteen urban areas, excluding most of the mining areas, about half the mouzas in the subdivision showed a density of more than 1,000 persons per square mile. In 1901 there had been only two urban areas in the subdivision; in 1931 there were five, in 1941 there were six and in 1951 nine.

The numerical increase in the region's urban areas and in urban population has not, however, led to meaningful or true urbanisation. The standards of civic facilities and services, not only in the mining areas but even in larger urban concentrations like Asansol, have not as yet come up to the minimum levels characteristic of modern urban settlements. The standards of public utilities and services are of course better in the new industrial areas like Durgapur and Chittaranjan; the standards obtaining at these places, however, show a glaring contrast to conditions in the older urban areas and the mining settlements. The absence of compact urban development has

also added to the difficulty of providing an adequate system of civic services for the urban areas. The company towns and industrial townships have often been planned and established in isolation from the surrounding areas; pockets of urban development mingle haphazardly with mining colonies, service centres and rural areas.

The national highway which passes through the planning region has suffered from the lack of adequate control of ribbon development. This has inadvertently aided the scattering of urban growth in the region. The comparatively high levels of accessibility to the highway within the region have also assisted in the proliferation of urban growth over the area. The absence of any policy for regional control and development has been an additional contributing factor.

PHYSICAL CONSTRAINTS

The major planning considerations for physical development of the Asansol subdivision are obviously the coal seams that permeate almost half the entire area of 620 square miles. These coal-bearing sections impose an effective limitation on the availability of land in the region for substantial urban or industrial development. Generally, they are suitable only for the location of light industries having close relationships to coal, or for the location of major and minor service centres for colliery workers. As far as possible, therefore, the large urban and industrial developments will in future have to avoid the coal-bearing lands.

A second limitation on physical planning is the prevalence of fairly good cultivable land, mostly in the eastern areas of the subdivision and especially in the Kanksa police station area. Lands under cultivation today total about 230 square miles. With adequate irrigation facilities there is scope for intensive utilisation of these cultivated lands, so that the region can have its own agricultural hinterland for the urban centres. Apart from the two basic categories—coal-bearing and cultivable lands—much of the other land in the subdivision is good buildable land. Such land is more than sufficient to accommodate the estimated urban population upto 1986, and to provide adequate industrial space for the projected growth in the region. Land in the subdivision is generally high and easily developable, with elevations from 250 to 550 feet above sea level. The railway network that crisscrosses the subdivision and consists of two major and half a dozen subsidiary lines, in addition to many industrial and colliery sidings and loops, constitutes yet another important planning consideration for the location and design of urban and industrial areas and the transportation system.

WATER

With poor rainfall and inadequate ground water supplies, the subdivision cannot but be dependent mainly on the three rivers—Damodar, Barakar and Ajoy—for its water supply. The Damodar river system is already exploited extensively both in Bihar and in West Bengal, and the resources of the Damodar and its tributaries have been developed by the Damodar Valley Corporation for a variety of uses ranging from irrigation to power generation. The total availability of water from the DVC system for this subdivision has been placed at about 194 m.g.d. The actual draw off already

is approximately 109 m.g.d. The additional quantity of water that may be available will have to meet the demands of a variety of users—mines, agricultural, industrial and urban areas.

Most of the collieries depend entirely on pit water. Many large industrial undertakings also have their own waterworks which draw in water from the Damodar and the Barakar. Industrial development and urbanisation will lead to a growth of the urban population in the region. Increasing urbanisation will also demand increased productivity from the agricultural areas through better irrigation facilities. The resources of the Damodar-Barakar system in that event will most likely prove inadequate in the long run. Acceleration in the pace of urbanisation and industrialisation in the Bihar region is also likely to make additional demands on the Damodar river system. The problem has been examined in detail in Chapter 4, and a projection of water demand as well as a tentative estimate for the critical periods when alternative water sources will have to be tapped have been given. It seems safe to presume, however, that during the decade 1976-86 the region will have to utilise the water resources of the Ajoy river as yet untapped or develop other feasible alternative sources. The region's resources being substantial, and the community's investment in the region being strategic for the development plans of the entire State, especially in the context of the need to establish large and viable urban centres for regional dispersal, the water management problem in the region deserves careful and urgent attention. Technical solutions for the region's water problems—solutions which are also economically sound—are most imperative in view of the unavoidable need to develop the Asansol-Durgapur complex to its fullest possible degree, next in importance only to the Calcutta Metropolitan District.

TRANSPORT

Fundamentally, the transportation system of the region was designed to meet the demands of the coal-mining areas and the centres of traditional industries like iron and steel, and refractories. The system also attempted to incorporate in it linkages with service centres and major agricultural settlements. While the above process did result in a high degree of accessibility for the various settlements and urban centres within the subdivision, the transportation system evolved did not produce a framework truly accommodating the traffic needs, demands, weightages and desirable standards. The establishment of individual industrial units or collieries often led to the construction of communication systems without adequate consideration of the regional and sub-regional needs. Had such consideration been given, the facilities might have been better utilised and savings brought about in capital costs. The natural linkages established during the period of unplanned evolution of a region-wide transportation system however do provide a basic framework that can be improved upon and modified. In this respect the subdivision is comparatively in a happy position than other regions where even the basic framework is found to be lacking.

An important aspect of the transportation problem in the region is that the Asansol subdivision today functions as an inter-regional traffic corridor for Eastern India.

linking the developing areas of Bihar and the rest of India towards the west and the north with the Calcutta Metropolitan District. With the development of the new port at Haldia and the linking up of North Bengal and Assam with the Plains over the Farakka Barrage, the significance of this traffic corridor will certainly be increased. Today the transportation problem of the subdivision is largely one of ensuring easy, smooth and economical inter-regional, intra-regional and local movements, free of conflicts. The basic road system of the region must be improved, to provide effective local, intra-regional and inter-regional communications facilities, keeping in view the need to provide for the increasing volume of transit traffic through the Planning Area. The region's transportation system will also have to fulfil the need to link the urban areas, service areas, mining settlements, and agricultural communities with the railway system of the subdivision. The absence of adequate airport facilities in the region with regular air links with other urban areas in the State and the country for civilian transportation is also bound to prove a serious deficiency in the long run.

ECONOMIC BASE

The industrial scene in the Asansol subdivision is dominated by mining, which employs nearly 33% of the working force. Next in importance is manufacturing, which accounts for about 20% of the working force. Mining, the mainstay of the subdivision's working force, is an occupation that is bound to assume less importance in future years. Increasing mechanisation in coal mining, and effects of fuel substitution on future demand for coal, make it difficult to place any substantial reliance on mining in the future employment pattern of the subdivision.

The composition of the employment structure in manufacturing does not also appear to be a balanced one as yet. Whereas mining employed 1,40,000 people in 1961, basic metals employed 33,000; engineering industries, 27,000; refractories, glass, etc., 5,000; chemicals, only 1,000; and other miscellaneous industries, including power generation, 23,900. With two major iron and steel production units in the area, the foundation exists for a well-developed engineering industry in the subdivision. The power situation is satisfactory at present, and there seem to be no serious prospects of a power shortage in view of the expansion programmes for power generation.

It is essential, however, that the industrial employment structure is diversified and made more balanced so that the subdivision can reap the full advantage of the establishment of basic industries. The need for accelerated growth of the engineering industry, both in the heavy and the light engineering sectors, has thus to be viewed as one of the most crucial economic problems of the region. Similarly, attempts have been made only very recently to exploit the coal resources of the region, leading toward the establishment of a coal-based chemical complex. Till such time as the subdivision continues to rely substantially on the export of its basic industrial products—coal, and iron and steel—outside the region for use or processing, the area will likely not reap the full benefits of industrialisation. The growth of the employment potential, which flows from the industrial development of a region, is also likely to be stunted without such diversification and expansion of the industrial base.

The imbalance in occupational pattern is reflected in the volume and the pattern of tertiary sector employment also in the subdivision. Though the tertiary sector, as a whole, employs about 24% of the working force, only 7% are employed in trade and commerce and 5% in transport. About half the tertiary sector is in the services category, admittedly not a very healthy indication for a growing industrial area, when it is remembered that much of the employment in this category relates to marginal or sub-marginal occupations. Even in the urban areas the employment in the services category—18%—exceeds that in trade and commerce—13%. A more stable and productive distribution of employment in the tertiary sector should have occurred in a major industrial region like the Asansol subdivision. In fact, employment in trade and commerce, and in transport has not kept pace with employment even in manufacturing and in mining.

The increasing population of the subdivision cannot be provided with gainful occupations unless the present distorted pattern of employment in the region is corrected through a diversification in manufacturing and through the promotion and planned growth of the tertiary sector. In particular, the promotion of ancillary industries in the region should merit a major effort.

AGRICULTURE

In agriculture, the problem is chiefly one of increasing the productivity per worker employed, and the productivity per unit of land. In the Asansol subdivision, fairly good agricultural lands are found in the eastern parts of the region, mainly in the Kanksa police station area. The cropping pattern, consisting of paddy, wheat, sugarcane and tobacco, is diversified. With an increase in productivity through better inputs, especially of water and fertilisers, the cultivated and cultivable lands of the subdivision can make a valuable contribution as suppliers of food and cash crops to the growing urban areas of the region. Presently, however, largely due to inadequate irrigation facilities, the productivity is quite low; the implications of low agricultural productivity are unhealthy for an area so proximate to growing urban nodes, particularly, in the context of possible diversion of good land from agricultural to non-agricultural uses and of workers from agricultural occupations to non-agricultural pursuits.

IN-MIGRATION

Migration from outside the region has been a predominant factor for promoting population growth in the Asansol subdivision. Such migration has been accentuated since 1931, and during the period 1951-61 more than half the increase in population was accounted for by in-migration. Most of the in-migrants came from non-urban backgrounds; generally, they had no special training or vocational background for the urban occupations in search of which they came. Extractive industries like mining formerly offered considerable incentives for in-migration of unskilled labour from rural areas but now such flow can be expected to decelerate in view of the reasons already stated. The flow of in-migration is bound to continue in future, however, due to the operation of the push factor.

The increasing inability of the agricultural areas to support larger numbers than they already provide for, and the type of industrial and urban occupations that will be available to such migrants, will most certainly make training and vocational preparation imperative. The change-over from rural to urban vocations is therefore bound to be a vital concern for regional manpower management and definition of social policies. With the limited number of sizeable urban centres in the region, both existing and potential, it is likely that the inflow of migrants will be quite large. It is also likely that in the long run, if not immediately, migration from the rural areas of the State itself will be as important as migratory flows from outside the State—once the principal generator of population growth in the mining settlements.

The estimated trends of growth of urban population in the region clearly indicate that the task of providing for adequate training facilities in skilled urban vocations to a large potential urban population will be a major concern of planning for Asansol-Durgapur. It is hardly likely, therefore, that without a suitable policy and programme for regional manpower management the desired smooth change-over of basically non-urban populations to urban vocations and to a truly urban way of life will be possible. Closely allied to the problem of training manpower is the problem of absorption and acclimatisation of the migratory population so that, socially and politically, the migrants may identify themselves with the regional interests and concerns, in the over-all state and national context. This naturally will require the development of an adequate social infrastructure for the region and its urban areas so that the population may develop the fullest and closest bonds to its locale.

UTILITIES AND SERVICES

Consistent with the varied character of development in the region, the standards of civic services and amenities in the urban and rural settlements naturally vary widely. In fact, many areas in the region where planned industrial townships have sprung up side by side with traditional and older settlements, provide studies in contrast. The mining settlements, and many of the older and established urban areas, are even today badly deficient in basic amenities like adequate water supply and housing. Efforts are being made by the Mines Welfare Fund and the Mines Board of Health to improve the conditions in the mining settlements. Considerable progress has already been made towards providing health and medical facilities to the residents, and in respect of housing and water supply a beginning has also been made. Much yet remains to be done. In the case of the older urban settlements, the deficits in respect of water supply, health facilities, housing and recreation are considerable. These deficits, perhaps, act as very real constraints on the growth of the region beyond the perimeters established by the founding of one industrial unit after another. Unless the social infrastructure available to the large population who live outside the company towns and colliery settlements is brought up to a minimum standard of adequacy, comprehensive development of the region and transformation of its urban centres into true centres of regional dispersal for the State may very well be impossible. Without these facilities, for those who are not fortunate to belong to the planned industrial settlements,

the attraction of the established rival centres with comparatively good facilities like the Greater Calcutta area may be hard to resist.

A meaningful strategy for regional development in the Asansol subdivision can evolve from an appreciation of the above issues which are critical to the development of the region. The physical constraints to development, the need for greater balance and viability in the occupational pattern, the intra-regional and inter-regional character of transportation in the region, and the significant social characteristics and the needs of the potential population of the area: these are the basic considerations that should determine the design of the policies and programmes for the future. With an understanding of the above issues—issues which are strategic to planning for the Asansol-Durgapur region—it is necessary to identify the objectives of such planning and the strategy for the development of the region.

OBJECTIVES OF PLANNING FOR THE REGION

The objectives of planning for the Asansol-Durgapur region have obviously to be framed with due regard to the objectives of national and state planning.

The Third Five-Year Plan (1961-66), while dealing with rapidly industrialising and urbanising areas, proposed that as far as possible new industries should be established away from large and congested cities, and that in planning for large industries the needs and problems of the region as a whole should be borne in mind so that the location of the major industry might serve as a regional focal point for development. As a corollary, the Plan stressed the need for increased interdependence of urban and rural areas, with a greater diversification of occupations in the rural sector. The Memorandum on the Fourth Five-Year Plan (1966-71) reiterated the need for balanced regional growth, specifically mentioning that in metropolitan areas like Bombay and Calcutta urbanisation had reached a saturation point, and that it would be desirable to think in terms of other nuclei for industrial development.

The Preliminary Memorandum on the Fourth Five-Year Plan (1966-71) formulated by the West Bengal Government proposed a development strategy based on maximum effort in the primary sector on a priority basis and maximum investment out of the balance of resources available in the industrial sector, including power generation; it also laid emphasis on schemes having the highest employment potential and potentiality for producing the largest volumes of goods in the shortest time. The maintenance of social services at the existing level of efficiency and their expansion to the extent practicable were also proposed in the Memorandum.

The State Plan included provisions for the setting up of an Industrial Development Corporation to help small entrepreneurs with capital, the establishment of industrial estates at regional centres, and the development of the newsprint and coal-based chemical industries in the State. The diversification and the expansion of the industrial base proposed in the Plan were intended to bring about a more balanced distribution

of industry in the State, keeping in view the economic and technical factors of industrial location. The State Plan also kept in view the stresses and strains on the State's premier urban centre—the Calcutta Metropolitan District; and stressed the need to develop adequate countermagnets for a long-term solution to the problem.

The development of the Asansol subdivision, in the context of national and state objectives, must take cognisance of the role of the Asansol-Durgapur region as a major urban industrial complex in the State, next only to the Greater Calcutta area in growth potential. Of the total urban population of the State, enumerated at 8.5 million in 1961, about 6.6 million were concentrated in the Calcutta Metropolitan District. The other urban areas in the districts of Howrah, Hooghly, 24-Parganas and Burdwan had about 0.3 million people. All the other urban areas in the State had a population of only 1.6 million in 1961. Projections of urban population for the next twenty years for West Bengal vary from a conservative estimate of 14 million to a possible estimate of 26 million.

On present indications the major regional centres of growth in West Bengal over the next twenty years will be the Calcutta Metropolitan District, the Asansol-Durgapur region, Haldia and Greater Siliguri. The Calcutta Metropolitan District is expected to have a population of approximately 12 million by 1986. Of the other centres, Haldia and Greater Siliguri, together, may accommodate another one million population. If the total urban population in the State is estimated at 20 million in 1986, another seven million will have to be accommodated in other urban centres of West Bengal. A large segment of this spill-over urban population will, therefore, have to live and work in the Asansol-Durgapur region. This indicates the strategic importance of the Asansol-Durgapur area as a major regional centre for urban dispersal over the next twenty years in West Bengal.

The role of the Asansol-Durgapur region as an important growth node, next to Calcutta, is further highlighted by the paucity of well-developed urban centres all over Eastern India. Even with the planned and proposed urban development in other areas of Eastern India, it is unlikely that the significance of the Asansol-Durgapur region as a vital sector for urban growth in Eastern India will in any way diminish.

The second objective of planning for the Asansol-Durgapur area should therefore be to develop it to the maximum feasible and desirable extent as a regional development node for the State of West Bengal and Eastern India, particularly with a view to relieving the present as well as expected excessive population strains on the Calcutta Metropolitan District.

As stated earlier, the pattern of urban development in the region till now has been haphazard and generally of a single-purpose type. Mining areas, centres of traditional industries like iron and steel, refractories, etc., have tended to grow in isolation without any well-developed regional interlinkages. Sufficient attention has not been paid to all this development, to the regional implications of such development, or inter-area considerations, relationships and potentialities. Most of the growth nuclei

have been treated as separate entities, and their area-wide functions have been considered only in individual sectoral contexts. For example, coal mining has not been properly related to urban development; urban water supply has been tackled on a piecemeal basis; and, even within a local area like Durgapur, urban development has been fragmented to an acute degree through the establishment of numerous disconnected townships. Such development has obviously had its repercussions even in administrative organisation, and in fiscal arrangements for the maintenance and development of civic services and facilities.

The third important objective of planning in the region should therefore be to view the area as a single interlocking complex of growth nodes in which each of the components plays a clearly defined functional role.

Planned regional development will be possible of attainment only if the economic base of the region is diversified and made more balanced than it is today. In the past decade a beginning was made in heavy engineering; plans and programmes are now underway to develop in the subdivision a full-fledged complex of engineering, including ancillary and subsidiary industries, and coal-based chemicals. The need to reduce the reliance on coal mining as a major provider of employment, in view of the adverse employment prospects for the mining industry in the long run, underlines the urgency of determining policies and programmes for diversified industrial and other economic development in the region. The growth of urban population will also make it necessary to increase the productivity of agriculture in the Asansol subdivision, so that the food requirements may be adequately met.

The fourth objective of planning for the region is the formulation of policies and programmes to meet the urgent and compelling need to diversify and enrich the occupational pattern and economic base of the region.

Balanced regional development will require a pooling of resources and a maximum utilisation of the regional potential for development. Optimum utilisation of regional resources and their conservation—in particular, the conservation and development of mining and agricultural areas—will be important corollaries to the objective of balanced regional development.

Another closely related objective of regional development will be the planning and development of an efficient and adequate regional infrastructure of water, power and transportation to facilitate planned urban development and regional economic growth.

The primary water source of the inter-state region, of which Asansol-Durgapur is a part, is the Damodar, and the total demands likely to be placed on the system over the next twenty years by the growing urban and rural areas all over the region are likely to be substantial enough to necessitate recourse to alternative sources such as the Ajoy system. A comprehensive plan and programme for long-term water management for mining, industrial, domestic and agricultural uses in the subdivision is therefore one of the primary requirements for the development of a satisfactory

regional infrastructure. Fortunately, the power situation in the region is not unsatisfactory, and if the projects proposed and under execution now are carried out, the region is unlikely to face any power shortage. The abundant coal resources can augment the thermal generation capacity of the region, to keep pace with the future growth of the power demand.

For planned regional development, an efficient inter-area transportation system, linking the various functional units, is necessary. Besides, a regional transportation plan will be necessary to indicate the most advantageous alignments for major arteries traversing the Planning Area and linking it with its hinterland and the larger region of which it is a part. At present, the Asansol-Durgapur region accommodates a railway and road system which uses the region as a traffic corridor of Eastern India, linking the Calcutta Region with Bihar, Uttar Pradesh, and Northern and Central India. In the future the region is likely to be a transit corridor for traffic between Haldia and North Bengal and Assam, besides Orissa and South India. A major function of the regional transportation system will therefore be to facilitate easy and economical flow of inter-regional, intra-regional and local traffic. The plan for such a system must be based on a proper evaluation of the present and future modes of transportation and the roles of these transportation systems in a temporal context.

Another important objective of planning for the Asansol-Durgapur region will be to plan and organise for optimum land uses for various purposes.

The above objective is intimately related to the preservation and the planned exploitation of natural resources. In a region which has extensive mineral deposits, and lands covering these deposits, and where the limited quantum of agricultural and cultivable land deserves to be carefully developed and used to provide the food requirements of a growing urban population, the significance of planned land use on a regional scale and the enforcement of such planning can hardly be overemphasised.

A large proportion of the expected population increase in the region will be accounted for by in-migration from its hinterland, both within and outside the State. The Asansol-Durgapur region will therefore continue to be a crucible where varied religious, ethnic, occupational, and linguistic population groups will melt and mix. The greater part of the migratory flow will be absorbed in the urban areas of the region. The implications of this phenomenon on social policies for regional development main-

ly relate to the requirements of training and other facilities for the migratory population. The migrants must be helped to make a timely switch-over to urban occupations and urban skills, and a suitable social climate and structure must be created so that the complex agglomeration of people with varied backgrounds can identify themselves with localised urban loyalties and bonds.

A resultant objective of planning for the Asansol-Durgapur region is therefore the development of an adequate social infrastructure that can provide to the present and future urban population of the region an opportunity to acclimatise and identify themselves with the urban environment and urban occupations.

As a corollary to the above objective, many areas in the subdivision, which are urban in character but yet lack basic urban amenities like water, housing and educational facilities, must be provided with these services and facilities. In particular, a regeneration of the mining settlements will be an important item in the regional development programme for the subdivision. Generally, the provision of a satisfactory urban environment throughout the region, wherever urban areas exist or will develop, is an essential prerequisite to the success of the regional planning strategy.

Lastly, the mobilisation of community support for and participation in the formulation and implementation of plans are indispensable requirements for development of the region. Opportunity will have to be provided for public participation in the formulation, enforcement and implementation of decisions that will shape the region of tomorrow. The Plan should therefore aim at creating a base for an effective and viable system of local self-government authorities and development agencies in the region, and should also aim at the mobilisation of the fiscal resources needed to execute development programmes.

Already there are a number of central, state and local authorities executing development programmes in the Asansol-Durgapur region. The strengthening and, wherever necessary, the improvement of these agencies, and the establishment of new institutions to the extent necessary for facilitating development of the region according to plan, should receive the most serious consideration. An effective administrative and fiscal base makes all the difference between a mere "paper" plan and a plan that results in visible and real benefits to the citizens.

THE STRATEGY FOR REGIONAL DEVELOPMENT

DEMOGRAPHIC BASE

A realistic assessment of the future population of the Asansol subdivision should be the starting point for formulating a regional development strategy. In making such an assessment all the relevant factors—like changes in fertility and mortality rates, age-sex composition of the population, and expected migrational inflows—have been considered.

In making the population projections for the Asansol subdivision for the period 1961-86, a general fertility rate of 0.190 for women of the reproductive age-group has been assumed. This rate is more or less the same as that assumed by the Planning Commission for the country as a whole during 1961-66. Over the period 1961-86 a decline in the general fertility rate (annual) on the following scale, operative after 1971, has also been adopted:

DECLINE IN GENERAL FERTILITY RATE				
1961-66	'66-'71	'71-'76	'76-'81	'81-'86
0.190	0.190	0.185	0.180	0.175

A perceptible change in the fertility rate, as a result of deliberate family planning measures, is not likely to be apparent before 1971. A decline in fertility due to natural factors is also not likely to occur before the population generally reaches an adequate economic level.

Mortality trends have been based on recent experience in this country and the trends of increase in life expectancy on the United Nations' Model Life Table for underdeveloped countries, except for the period 1961-66, when the trend recorded during 1951-61 is expected to continue. The projected quinquennial trends in life expectancy at birth are as follows:

LIFE EXPECTANCY AT BIRTH

1961-66	'66-'71	'71-'76	'76-'81	'81-'86
47.5	52.5	55.0	57.6	60.4

The observed sex ratio at birth for Burdwan District has been assumed, and the number of survivors in each age-group, separately for males and females, has been assessed on the basis of survival ratios as given in the U. N. Model Life Tables, corresponding to various life expectancies.

MIGRATION TRENDS

As regards migration trends for the period 1961-86, it may be noted that, during 1951-61, out of an annual compound rate of growth of population amounting to 3.50% for the subdivision, 1.45% of the increase was as a result of net migration. It is difficult to predict with certainty the expected migrational inflow over a period of twenty years in a rapidly industrialising and urbanising area, especially because such migration will depend on a variety of factors like income and opportunity differentials, employment trends, social mobility, investment in the economy in both the public and the private sectors, etc.

The factors above at present defy precise determination over a long term. However, keeping in view the economic potential of the area, and the state and regional population trends, it is safe to proceed on the assumption of an annual compound growth rate of 1.3% resulting from in-migration to the subdivision.

A sex ratio of 65 males : 35 females has been adopted for the in-migrant population on the basis of observed ratios for 1951-61. The age-composition of the migratory population has been based on observed trends in the Calcutta Metropolitan District and other similar areas of the State. The fertility level for the migrants has been generally found to be lower than that for the naturally growing population. Expectation of life for migrants has been assumed to be the same as in the case of the other segments of the population, and the same set of survival ratios has been used in each quinquennial period. The new migrants in five-year periods have been added to the natural increase of existing migrants to arrive at the total projected population due to migrational increase. The general fertility trends for in-migrants have been assumed as follows:

FERTILITY TRENDS FOR IN-MIGRANTS

1966-71	'71-'76	'76-'81	'81-'86
0.170	0.165	0.160	0.155

POPULATION PROJECTIONS

The final population projections have thus been arrived at, with the entire base population —of 1961—accounted for as the natural population, by adding to the natural population the increase due to natural growth plus the increase due to migrational flow, including the natural increase for migrants. The table below shows the total population estimates for five-year periods upto 1986 for the Asansol subdivision:

TABLE XIV
PROJECTED TOTAL POPULATION
ASANSOL SUBDIVISION

1961	1966	1971	1976	1981	1986
10,91,074	12,79,286	15,23,868	18,18,741	21,66,182	25,77,041

AGE-SEX COMPOSITION

The structure of the projected population in regard to age- and sex-groups is an important consideration for planning. A steady improvement in the sex ratio (females/1,000 males) has been assumed as shown below:

SEX RATIO (FEMALES/1,000 MALES)

1961	1966	1971	1976	1981	1986
703	723	743	760	775	788

It has also to be borne in mind that the natural growth by way of new births, with an even male-female ratio, tends to bring the over-all ratio closer to a balanced male-female composition. New migration tends to work in the opposite direction, but this element of population growth is of comparatively less significance in relation to the natural increase of the natural population together with the existing migrants. As living conditions in the region improve, the sex-composition of the migrant population may also improve.

For the purpose of an analysis of projected age-group composition, a classification has been made into (a) dependent children, 0-14 years; (b) manpower age-group, 15-59 years; and (c) dependent aged, 60 years and above. Relatively, the proportion in the third group will increase, whereas in the first two groups a decline is registered. The primary reason for this is that average expectation of life is likely to improve steadily over time, reducing the mortality ratio for the third group; secondly, the base (1961) population has a high proportion of people in the age-group 35-44, who after 25 years will enter the age-group of 60 and above. The decline in the percentage of dependent children (0-14) is similarly the result of a decline in the fertility rate, a decline in the mortality rate in this age-group, and the influence of migration leading to a reduced inflow into this group. The tables, next page, show the age-sex composition of the projected population over quinquennial periods.

TABLE XV-A
AGE-SEX PROJECTIONS: 1961-71

Age-group	1961 (703)*				1966 (723)*				1971 (743)*			
	Male	Female	Total	Percentage	Male	Female	Total	Percentage	Male	Female	Total	Percentage
0-14	2,05,204	1,90,680	3,95,884	36.29	2,34,653	2,25,532	4,60,185	35.98	2,69,427	2,61,511	5,30,938	34.83
15-34	2,67,079	1,62,634	4,29,713	39.38	2,75,929	1,85,250	4,61,179	36.05	2,92,338	2,21,015	5,13,353	33.70
35-59	1,50,640	78,489	2,29,129	20.99	1,89,035	92,825	2,81,860	24.35	2,77,933	1,39,424	4,17,357	27.39
60 and over	17,859	18,489	36,348	3.34	42,843	33,219	76,062	3.62	34,611	27,609	62,220	4.08
Total	6,40,782	4,50,292	10,91,074	100.00	7,42,460	5,36,826	12,79,286	100.00	8,74,309	6,49,559	15,23,868	100.00

* The figures in brackets indicate sex ratios, e.g., 703 females/1,000 males

TABLE XV-B
AGE-SEX PROJECTIONS: 1976-86

Age-group	1976 (760)*				1981 (775)*				1986 (788)*			
	Male	Female	Total	Percentage	Male	Female	Total	Percentage	Male	Female	Total	Percentage
0-14	3,23,590	3,12,706	6,36,296	34.98	3,88,515	3,74,906	7,63,421	35.24	4,57,651	4,40,823	8,98,474	34.87
15-34	3,21,103	2,60,745	5,81,848	31.99	3,75,306	3,13,948	6,89,254	31.81	4,47,775	3,82,108	8,29,883	32.20
35-59	3,40,620	1,76,718	5,17,338	28.45	3,89,641	2,11,597	6,01,238	27.76	4,42,380	2,53,316	6,95,696	26.99
60 and over	47,869	35,390	83,259	4.58	66,826	45,443	1,12,269	5.19	93,822	59,166	1,52,988	5.94
Total	10,33,182	7,85,559	18,18,741	100.00	12,20,288	9,45,894	21,66,182	100.00	14,41,628	11,35,413	25,77,041	100.00

* The figures in brackets indicate sex ratios

RURAL-URBAN DISTRIBUTION OF POPULATION

A basic requirement for the regional distribution of population over the Asansol subdivision is an estimate of the projected rural-urban composition of the demographic base. A declining ratio of rural to urban population from 11.0 in 1901 to 1.8 in 1961 has been observed. In view of the increasing pace of industrialisation and the consequent urbanisation, a steadily decreasing ratio has been assumed, accounting for an urban population growth rate of 5.6% compound per annum, as compared with 1.7% compound per annum for the rural population. This assumption is consistent with the assumptions on migration already indicated. Of the total population increase during 1961-81, about 45%, it is estimated, will be due to total migrational growth, directly by inflow of new migrants and indirectly by way of natural increase of migrants.

The decade-wise trends projected in rural-urban composition of the population for the Asansol subdivision are shown below:

TABLE XVI
RURAL-URBAN POPULATION COMPOSITION.
(in thousands)

	1961	1971	1981	1986
Rural	707.4	830.9	963.0	1,061.0
Urban	383.7	693.0	1,203.2	1,516.0

Over the period of twenty years, a greater balance in absolute numbers of urban and rural population is expected to be achieved, though the growth rate of rural population will be considerably less than that of urban population.

LABOUR FORCE AND WORKING FORCE TRENDS

The age-group 15-59 years corresponds to the total manpower available at any given time in any population. As shown in Tables XV-A and XV-B on page 20, the proportion of persons in age-group (15-59) in the projected population declines very slightly—from 60.37% to 59.17%—during 1961-86, although there is a very sizeable absolute net increase of 8,67,000. This slight decline in the percentage composition is not very significant for planning purposes; the decline is the net result of a variety of demographic factors—including the sizeable migratory composition of the population increase during 1961-86 on the one hand and, on the other, the relative effects of fertility and mortality rates in different quinquennial periods on the age-composition.

The substantial addition of 8,67,000 people to the region's manpower excludes the student population, the female non-working people, and those otherwise inactive, in arriving at the estimate of the potential labour force of the region. At the same time, it is also necessary

to include a part of the population over 60 years in the potential working force, especially in the primary and tertiary sectors. According to the 1961 Census, about 60% of the males and 10% of the females in this age-group are part of the labour force. Over a period of twenty years, with higher standards of living, a possible shift in this pattern is inevitable, as the older people may find it less imperative to join the working force. The participation rates for females in the age-groups 15-34 and 35-59 are likely to increase as more and more women enter the labour market in future.

The following table shows the 1961 labour participation rates and the projected participation rates by age-groups, the projections of manpower (15-59 years), and the potential working force, i.e., the labour force.

TABLE XVII-A
LABOUR PARTICIPATION RATES BY AGE-GROUPS
1961-86

Age-group	1961 (Actual)		1986	
	Male	Female	Male	Female
15-34	0.87	0.18	0.87	0.24
35-59	0.92	0.23	0.95	0.26
60 and above	0.60	0.10	0.37	0.08

TABLE XVII-B
MANPOWER AND LABOUR FORCE PROJECTIONS
1961-1986

Year	Manpower (15-59 years)	Labour Force
1961	6,58,842	4,67,000
1971	9,30,710	6,31,000
1981	12,90,492	8,67,100
1986	15,25,579	10,20,100

For 1961, the labour force has been estimated on the basis of the actual participation rates. An important planning task in the Asansol-Durgapur region will be to indicate the methods and policies through which increasing numbers of the above labour force can be absorbed in gainful occupations. The strategy for economic development in the region takes into account the projected employment trends in the subdivision over the period 1961-86 and the industrial and economic development policies needed to achieve the projected employment targets.

ECONOMIC BASE

INDUSTRIAL EMPLOYMENT

In 1961 the percentage of overt unemployment in the labour force was approximately five per cent in the Asansol subdivision as a whole. But in the industrial urban centre of Durgapur—a new growth area of the region—there was almost full employment. Throughout the subdivision, in fact, new growth occurred at various selected centres during the decade 1951-61. Employment projections for the region should therefore be more in the nature of targets rather than pure estimates of trends. In a newly-growing area, where industrial and other economic developments depend on a number of factors like capital inflow, private-sector investment programmes, etc., which are not always easily predictable over long periods of time, this is inevitable. At the same time it may also be safe to presume that in such an area there are greater chances of an approach toward reasonably adequate levels of full employment, provided a comprehensive plan is framed and implemented. In fact, planning effort for future urban areas in the country should as far as possible avoid projecting employment policies, which would by their very inadequacy defeat the objective of growth of healthy and strong urban centres with sound economic bases.

The manageably low unemployment figure of 1961, and the prospects of growth, especially in secondary and tertiary sectors, in the context of the programmes proposed or under consideration for the industrial development in the region, lend support for a reasonable optimism in the projection of growth trends of the economic base. It has therefore been proposed that the volume of overt unemployment should be reduced to about three per cent by 1971 and should be maintained at the level of two per cent during the rest of the planning period.

The achievement of the above target obviously depends upon a number of important factors, principally the control of urbanisation and the availability of resources and infrastructure. In fact, an examination of the sectoral trends of employment at present and of the needed resource inputs provides sufficient ground to believe that this target is not impossible of achievement.

AGRICULTURAL EMPLOYMENT

In the coming years the transitional nature of the region's economy is likely to be more evident, with the gradual shift in emphasis from the primary sector (including mining) to the secondary and the tertiary sectors. Already, between 1951-61, manufacturing recorded an increase in employment of 5.6% per annum, whereas employment in agriculture recorded no increase, and mining only a 2% annual rise. The tertiary sector has also grown steadily, though its growth rate is not commensurate with the growth rates of the secondary sector and mining.

The projected employment target for manufacturing in 1971 has been estimated on the basis of official targets for the public-sector plants in the region; normal growth in the private-sector enterprises has also been taken into account. The growth of manufacturing

between 1971-86 has been projected on the assumption of a normal and reasonable rate of further growth beyond the stage of development reached by 1971. A corresponding increase in employment in the construction industry over the 20-year period has also been assumed; the increase is likely to be four-fold during 1966-86. As regards mining, however, in keeping with the actual and possibly declining growth rates, particularly because of mechanisation, the annual rate of growth in employment has been assumed to be 1.6% in 1961-71, 1.2% in 1971-81 and only one per cent in 1981-86. These growth rates for mining also take note of the fact that by 1971 the output of coal in this region will account for 28% of the output of the country as a whole, and that during 1953-63 increased productivity per worker had accounted for about 60% of the total rise in the output. In the agricultural sector also the future increases in output are likely to be entirely due to increased productivity per worker. There will be little prospect for any sizeable increase in employment in this sector, especially in view of the already prevalent disguised unemployment. Accordingly, agricultural employment has been assumed to remain almost static over the plan period 1966-86.

EMPLOYMENT IN TERTIARY SECTOR

The growth of employment in the tertiary sector is far more difficult to predict accurately. It is influenced by a number of factors which include growth in the secondary sector and its relationship to tertiary employment; the extent of urbanisation; income levels and the expenditure pattern of the people; the availability of transportation, services, etc. In the initial phases of urbanisation induced by industrial growth, the tertiary sector is usually slow to grow, compared to the rate of growth of the secondary sector. But as industrialisation and urbanisation take firm root, employment in the tertiary sector catches up with industrial employment. The following growth rates have been anticipated for the various components of the tertiary sector, based on the observed relationship between the secondary and the tertiary sectors:

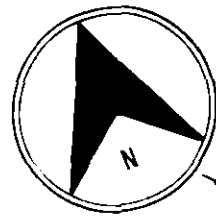
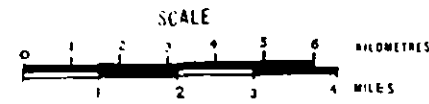
TABLE XVIII
ANTICIPATED GROWTH RATES FOR TERTIARY SECTOR
ASANSOL SUBDIVISION

Period	SECONDARY	TERTIARY		
	Increase in Employment in Manufacturing	Increase in Employment in Trade and Commerce	Increase in Employment in Transport	Increase in Employment in Other Services
1961-71	100	25 to 28	19 to 22	19 to 23
1971-86	100	28 to 33	20 to 25	23 to 28

EMPLOYMENT PATTERN

The table, next page, shows the targeted employment pattern for the Asansol subdivision in the three sectors.

ASANSOL PLANNING AREA : EMPLOYMENT AND INDUSTRIES



- BASIC METALS
- ⊗ CHEMICALS
- ⊙ CYCLES
- ⊕ CABLES
- ⊞ PAPER
- ⊟ COAL-PIT
- ⊠ LARGE ENGINEERING INCLUDING RAILWAY EQUIPMENT
- ⊡ MEDIUM & SMALL ENGINEERING
- ⊢ REFRACTORIES, POTTERIES & GLASS
- ⊣ MISCELLANEOUS
- ⊤ COAL-BEARING AREA

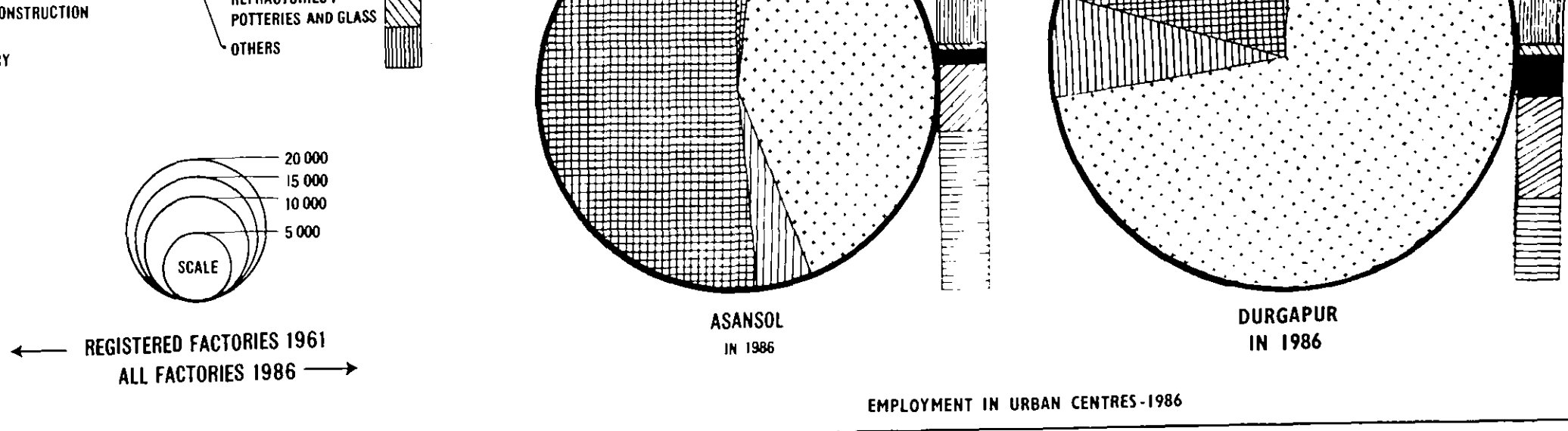
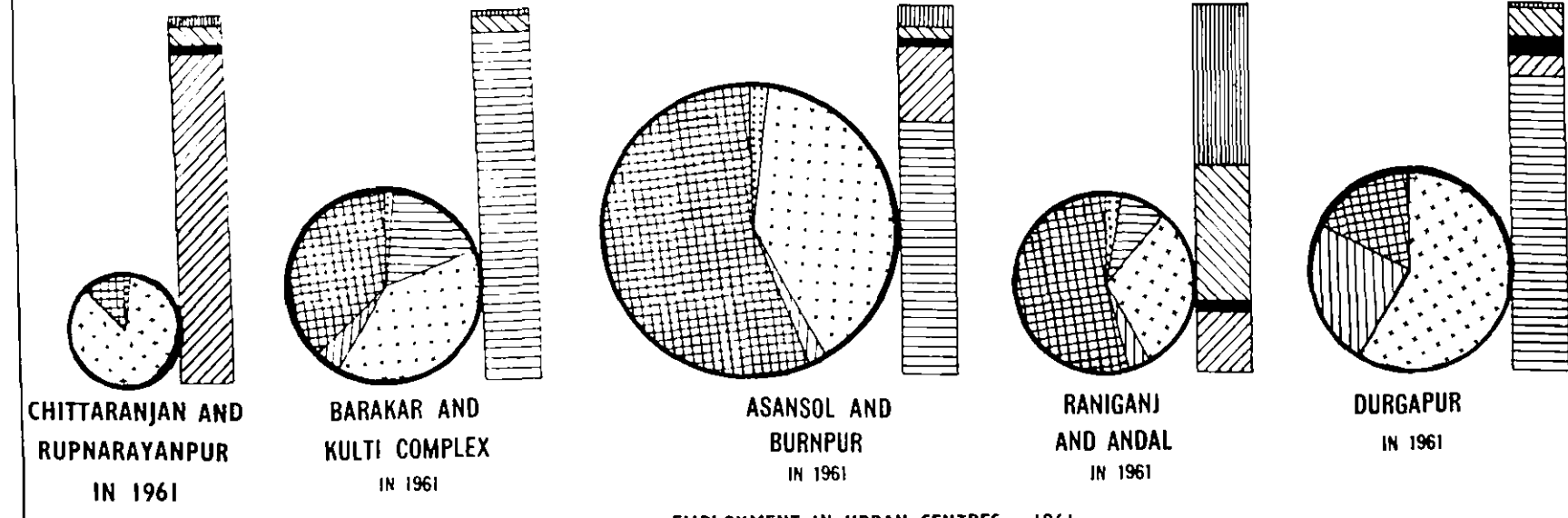
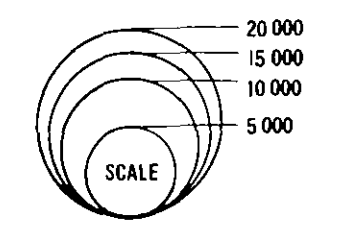
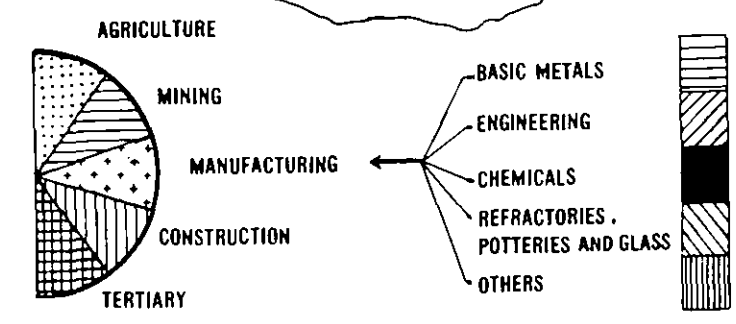
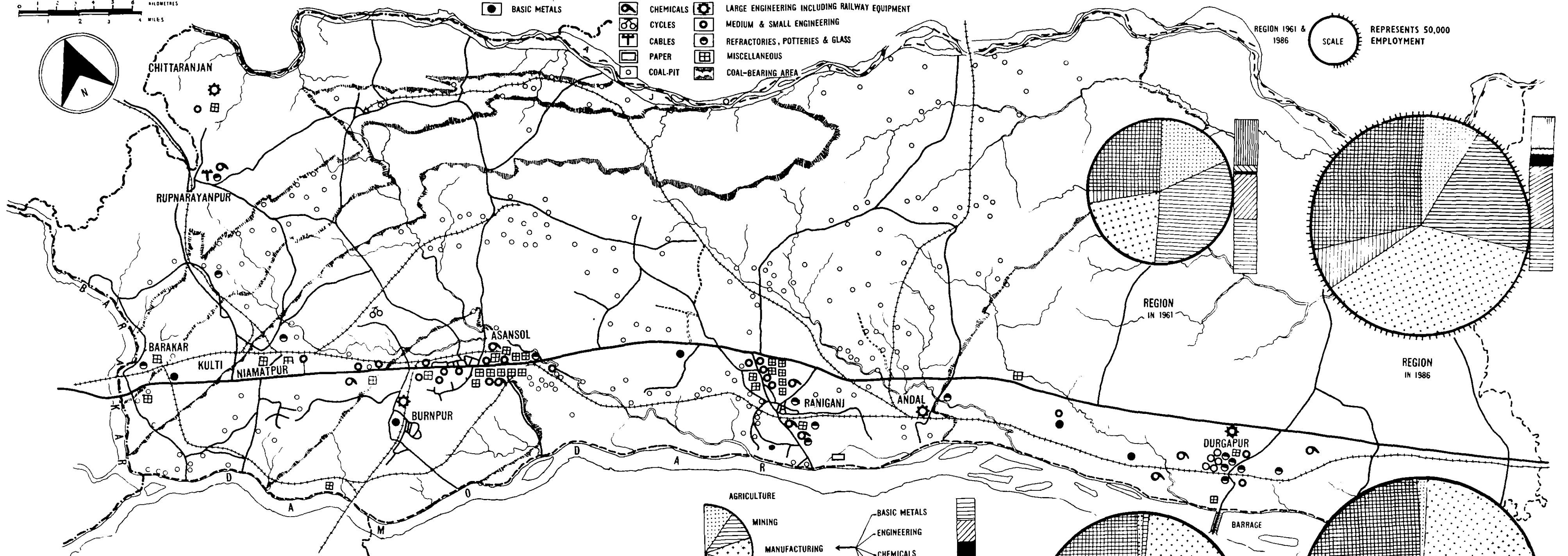
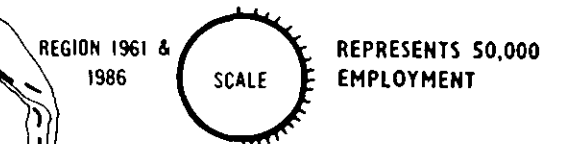


TABLE XIX
EMPLOYMENT TARGETS FOR ASANSOL SUBDIVISION
(figures in thousands)

Year	Primary Sector			Secondary Sector			Tertiary Sector	
	* Agriculture	** Mining	Total	*** Industry	Construction	Total	Trade, Commerce, Transport and Services	Total
	1	2	3	4	5	6	7	(3+6+7)
1961	84.0	142.2	226.2	96.0	13.6	109.6	109.4	445.2
1971	85.0	168.0	253.0	179.0	22.0	201.0	157.0	611.0
1981	86.0	190.0	276.0	281.0	44.0	325.0	236.0	837.0
1986	86.0	200.0	286.0	360.0	61.0	421.0	288.0	995.0

* Includes plantation, forestry, livestock and fishing

** Includes quarrying

*** Includes manufacturing and household industries

PROSPECTS FOR THE MINING INDUSTRY

In the period 1961-86, a nominal increase of about 58,000 workers only can be foreseen, at an over-all annual rate of growth of employment of 1.4% only. Taking into account the targets already fixed for the production of coal in the country by the Planning Commission as well as the problems and prospects of the coal-mining industry in the Asansol subdivision, the following estimates are made of the projected trends in the output of coal in the region:

TABLE XX
OUTPUT OF COAL IN ASANSOL SUBDIVISION: 1961-86

Year	Output in Million Tonnes	Rate of Growth (percentage—annual compound rate)
1961	17	—
1961-71	32	6.5
1971-81	54	5.5
1981-86	67	4.5

The total income or the net value added by the coal-mining industry was calculated, as shown in Table XXI, next column, assuming an annual rise of one per cent in the pit-head price for coal (present value being Rs.20 per tonne) and the net value to be 57% of the gross value of production.

TABLE XXI
INCOME ESTIMATES FOR COAL MINING: ASANSOL SUBDIVISION

Year	Net Value Added (in million rupees)	Year	Net Value Added (in million rupees)
1961	194	1981	739
1971	401	1986	955

The over-all rise in income between 1961-86 is thus expected to be 6.5% per annum.

FUTURE INDUSTRIAL GROWTH

During the period 1966-86 the fulfilment of the employment targets indicated above will depend largely on the growth in the industrial sector, and the consequential growth in the tertiary sector. Industrial growth and diversification of the industrial base truly hold the key to successful regional development of the Asansol subdivision.

The prospects for industrial growth in the region can best be examined by major industry-groups, and thus estimates can finally be made of the phased expansion of employment in each group over the planning period (1966-86).

The decade 1951-61 and the years following have witnessed large investments in basic industries like iron and steel, and heavy engineering in the Asansol subdivision, mainly

in the Durgapur area. It would not, however, be correct to anticipate that in the future the pace of industrialisation in the region is likely to slow down; nor will it be desirable that it should be made to slow down and industrial investments diverted elsewhere. The reasons for this may be found largely in the possibilities for a more diversified utilisation of the region's vast coal resources, and the dire necessity for exploiting fully the locational advantages of the basic industries that have been built up in the subdivision. On present indications, future industrialisation in the subdivision is likely to be more labour-intensive than in the past, and the small and medium units, mostly in the private sector, are bound to make a steadily increasing contribution to the industrial output of the subdivision.

BASIC METALS INDUSTRY

The production of steel ingots in the subdivision is expected to rise from 1.9 million tonnes in 1963 to 5.4 million tonnes by 1971. The output of the Durgapur Steel Plant alone is expected to go up from 0.9 million tonnes in 1963 to 3.4 million tonnes by 1971. The planned expansion of this unit will yield employment for 18,000 additional workers, thus increasing the total employment in the Plant from 22,400 to 40,400. Concurrently, the output of the Indian Iron & Steel Company will go up from one million tonnes to two million tonnes by 1971, increasing the total employment from 22,000 to about 30,000. In addition, expansion programmes in the private sector and in the alloy steel project will provide employment for about 6,000 additional workers by 1971. Beyond 1971 we have not for the present assumed any major expansion programme for the basic metals industry in this region; only a nominal growth rate of 1.5% per annum has been taken into consideration for the period 1971-86.

ENGINEERING INDUSTRY

This major industry-group will play a dominant role in the industrial structure of the region during 1966-86. Already a large number of plants have been projected or are being installed in the region. These include the plants of ACC-Vickers-Babcock; The Mining and Allied Machinery Corporation; The Hindustan Sheet Metal; Jessops & Company; the Sankey Wheels, etc. The National Council of Applied Economic Research (NCAER) has even suggested that all expansion in West Bengal's large-scale engineering industries should take place in Asansol-Durgapur. During 1951-61 high annual growth rate of 11% was observed in employment in the large-scale engineering industry (units employing more than 500 workers) in the Asansol subdivision. As against 4,000 workers in 1951, 13,300 workers were employed in this industry in 1961. According to a survey conducted by the Asansol Planning Organisation, the total employment in the large-scale engineering industry was 24,000 in 1964. In future the large-scale engineering industry group is bound to grow sizeably, following the growth of the basic metals industries in the region. The high average value of Rs.10,130 added per person in 1961-62 in the large engineering industry group, which is almost equal to that in the basic metals and chemical industries, is also likely to act as an incentive for the development of this group of industries in the subdivision.

However, the full impact of the large engineering industry group on employment will be felt only when ancillary industries start growing around the heavy plants. At the present

moment the development of ancillary industries in the region is fraught with many problems, whose solution must be found in the near future because of their vital importance in the economy. The problem of development of the ancillary, medium- and small-scale industries is dealt with separately, in view of the crucial importance of these industries to planning for Asansol-Durgapur. Ancillary industries in the Asansol subdivision will enjoy substantial advantages in view of the fact that the local demand for products of such industries remains as yet largely untapped. The availability of power and transport in the region may be considered an additional advantage. If some of the difficulties which at present stand in the way of adequate growth of these industries are removed—and it is quite feasible to remove them—there should be substantial growth of employment in the ancillary, medium- and small-scale sectors during the latter half of the planning period (1966-86). Accordingly, a nominal growth rate of about 3% per annum in employment in the ancillary, medium- and small-scale engineering industries has been assumed upto 1971; and during the period from 1971 to 1986 it is expected that, with the removal of the obstacles to the growth of these industries, a higher annual growth rate—about 10%—will be feasible.

The growing importance of the engineering industry in the subdivision is evident from the fact that out of about 8,000 acres of land allotted or proposed to be allotted to the industrial units in the Durgapur area by the Durgapur Development Authority, about 3,200 acres will be for the engineering units. The total employment projections for the engineering group have been arrived at by totalling the sectoral projections for the large-, medium- and small-scale engineering units.

CHEMICALS

Only recently the chemical industry has made its appearance on the industrial scene of the Asansol subdivision, bringing in its wake possibilities of a more diversified use of the region's principal mineral wealth—coal. The West Bengal Government's Coke-Oven Byproducts Recovery Plant may be said to have laid the foundation of a coal-based chemical industry in the subdivision. Even so, as has been pointed out recently by the National Council of Applied Economic Research, industrial utilisation of coal is at a very low stage of development in West Bengal. A complex of coal-based chemical industries can produce such varied products as fuel gas, ammonia, coal tar, ammonia sulphate (fertilisers), benzene, toluene, naphthalene, anthracene, phenol and cresol. Pitch, which is a byproduct after recovery of other products, can be used in varied ways for paving, roofing and water-proofing. From the basic intermediates a wide range of finished products like dyes, perfumes, carbolic acid, drugs and medicines, plastics like bakelite, disinfectants, fuel additives, nylon, synthetic rubber, etc., are also derived. With adequate availability of raw materials and with the recovery of coal-chemicals, it should be possible to develop a complex of coal-based chemical industries in the subdivision, with a large number of medium and small units providing sizeable employment.

The fertiliser factory being established near Durgapur by the Fertiliser Corporation of India will employ about 2,500 workers by 1971. The Durgapur Chemicals Ltd., which is being set up by the West Bengal Government to produce caustic soda, chlorine, synthetic phenol, phthalic anhydride, etc., will provide direct employment for about 1,000 workers

by 1971. The expansion programme of the existing Coke-Oven Byproducts Recovery Plant will raise the total employment to 800 by 1971. Besides, the Durgapur Development Authority has already allotted about 53 acres of land for medium and small chemical industries. Employment in the chemical industry can therefore be expected to reach about 5,500 by 1971 in the Durgapur urban area alone. The development of the chemical industry beyond 1971 is expected to proceed at a faster rate, especially as the base will have been laid by 1971.

REFRACTORIES

A comparatively slow growth rate and a declining percentage of employment have been assumed for the refractory industry in the subdivision. The existence of a sizeable unutilised capacity in the industry at the present moment is one of the reasons; future growth in this group is expected to be determined more by increased productivity.

TRENDS OF EMPLOYMENT IN MANUFACTURING

The group-wise projections of employment in manufacturing, excluding household industries, are now shown below:

TABLE XXII
EMPLOYMENT IN MANUFACTURING INDUSTRY IN ASANSOL SUBDIVISION
(figures in thousands)

Groups of Industries	1961	Percentage	1971	Percentage	1981	Percentage	1986	Percentage
Basic Metals	33	35.5	76	43.2	88	31.9	95	26.9
Engineering	27	29.0	54	30.7	106	38.4	146	41.3
Chemicals	1	1.1	6	3.4	18	6.5	26	7.4
Refractories	5	5.4	7	4.0	10	3.6	13	3.7
Other Industries	27	29.0	33	18.7	54	19.6	73	20.7
Total	93	100.0	176	100.0	276	100.0	353	100.0

The above projections provide for an annual growth rate of about 5.5% (compound) in employment in manufacturing over a period of 25 years. The share of employment in percentage of the engineering group increases substantially after 1971—from 30.7 to 41.3. Similarly, the share of the chemical group also rises significantly after 1971—from 3.4 to 7.4. In the seventies and the eighties the engineering group and the chemical group will tend to dominate the industrial scene of the subdivision. As regards the basic metals group, the major expansion will occur during 1966-71, after which the share of employment in percentage will decline from 43.2 to 26.9 by 1986.

CAPITAL INVESTMENT NEEDS

With the above projections for employment in the various industry groups, an estimate is made below of the capital investment needs for the industrial growth in the subdivision. Constant employment-capital ratios have been assumed for 1961-86, but adjustments

have been made for normal price increases. The data on productive capital and employment have been obtained from the survey of industries conducted by the APO.

TABLE XXIII
ESTIMATES OF CAPITAL REQUIREMENTS IN ASANSOL SUBDIVISION
(in million rupees)

Groups of Industries	1961	1971	1981	1986
Basic Metals	1,363.6	3,469.0	4,436.7	5,033.8
Engineering	282.2	752.8	1,420.6	1,904.5
Chemicals	20.3	134.7	446.4	677.6
Refractories	38.2	59.1	93.3	127.4
Other Industries	119.8	161.7	292.3	415.3
Total	1,824.1	4,577.3	6,689.3	8,158.6

The ratios assumed of employment per one lakh of rupees invested, group-wise, are: basic metals—2.4; engineering (large)—5.8; engineering (medium and small)—17.6; chemicals—4.9; potteries, glass, etc.—13.0; other industries—22.5. The average annual investment required for providing additional employment in the manufacturing industry proposed will be approximately Rs.254 million, or Rs.25.4 crore.

On the basis of the average labour productivity, as ascertained by the survey of industries conducted by the Asansol Planning Organisation, and allowing for a 2% annual increase in productivity in the medium and small engineering and in the refractories groups, the following estimates—making provision for normal price increases—can be made of the estimated income (gross value added) by the various industry-groups.

TABLE XXIV
ESTIMATES OF GROSS VALUE ADDED BY INDUSTRIES: ASANSOL SUBDIVISION
(in million rupees)

Groups of Industries	1961	1971	1981	1986
Basic Metals	363.30	931.76	1,191.78	1,352.23
Engineering	149.97	429.27	845.52	1,181.28
Chemicals	12.03	79.72	264.15	401.02
Refractories	16.34	30.74	59.03	88.97
Other Industries	117.07	158.07	285.71	405.88
Total	658.71	1,629.56	2,646.19	3,429.38

As against an increase of 5.5% per annum in employment, the increase in gross value added by the industries will likely be about 6.8% per annum. This higher rate of increase in labour productivity is expected to be brought about by increased labour efficiency in the small and medium engineering industries and in the refractories-potteries industries where, at present, excess capacity exists. Normal price increase will also contribute to the increased value of labour productivity.

POLICIES FOR ANCILLARY, MEDIUM AND SMALL INDUSTRIES

An industry is called an ancillary industry if it produces manufactured goods that constitute a current input to another industry. Generally, these ancillary industries are either medium- or small-scale units; they manufacture ferrous and non-ferrous castings, machined parts, forgings and fabrications, electrical equipment, chemicals, reinforced concrete pipes and other fittings, industrial gases, electrodes and equipment, and wood products. Besides catering to local demands, ancillary industries can also meet external demands from outside the region. In addition to ancillary industries, medium- and small-scale engineering units may also be developed to meet the demands for finished engineering products both from within the region and outside it.

An excellent preliminary survey* of the prospects for ancillary industries in the Asansol-Durgapur region was done in 1964 by the Institute of Public Administration, New York, which had a Calcutta-based project at that time. This survey made an estimate of the potential local demands for ancillary products in the region. A few specific estimates of the local demands for ancillaries, made in the IPA report, are as follows: components for bicycles, railway locomotives and wagons—Rs. 1.7 crore; packing materials (partial demand)—Rs. 27 lakh; soda ash—Rs. 10 lakh; caustic soda—Rs. 25 lakh; industrial gases, electrodes, etc. (partial demand)—Rs. 14 lakh; nuts, bolts and fasteners (partial demand)—Rs. 20 lakh; wire rope (partial demand)—Rs. 20 lakh; electrical equipment—Rs. 1.30 crore; bearings—Rs. 25 lakh; gears and grinding wheels—Rs. 7 lakh; leather products (partial)—Rs. 34 lakh; cutters, drills, pumps, detonators, pipes, cables, timber products, hardware, etc. (partial colliery demand)—Rs. 1.08 crore.

The above estimates of local demand were arrived at mainly from partial surveys; the over-all demand is believed to be considerably larger. During the period 1960-63 estimated annual inputs of machinery and equipment for collieries under the World Bank Loan were of the value of about Rs. 3 crore. The bulk of these inputs could have been manufactured locally. The growth of demand during 1961-65 was estimated by the IPA as 12% on the whole. There is no reason to believe that during the period 1966-86 the demand for colliery equipment will slow down appreciably.

The IPA study has shown that there is a sizeable local demand for ancillary industrial products in the Asansol subdivision at present. No comprehensive estimates are available of the demands for ancillary products for the whole region or of the external demands for these products, or of the demands for general engineering products—small and medium—which may not be ancillaries. A rough estimate made recently suggests that

the value of the demand for ancillary products in the Durgapur area alone might be around Rs. 16 crore annually.

Despite the large demand for these products, ancillary, medium- and small-scale industries have been slow to develop in the region due to a number of inhibiting factors: the absence of cost advantages (compared to Calcutta) for coal, steel, power and labour; the problem of ensuring adequate supply of water, finance, raw materials and skilled labour; and, in the case of ancillaries in particular, the lack of support from the parent firms. These retarding factors can be removed only through concerted and planned organisational efforts on the part of Government, accompanied by a suitable policy of incentives and the provision of infrastructure facilities. The growth of planned industrial areas supported by adequate infrastructure facilities may overcome the reluctance of the ancillary, medium and small industrialists to settle in the region. The lines of development adopted for Durgapur by the Durgapur Development Authority may also be adopted for other areas in the region for planned industrial development. A policy of active state assistance, coupled with other incentives in regard to finance, raw materials, power, etc. will surely be the best way of encouraging the development of the ancillary, medium and small units.

The difficulties now being experienced in distribution and availability of controlled commodities must be removed. The State Government will have to play a major promotional and organisational role in making the requisite skilled labour available to the entrepreneurs, in arranging adequate marketing facilities for the products and, most importantly, in enlisting the support of the parent firms for the ancillary industries. Since the Asansol-Durgapur region already has an industrial base for the development of ancillary, medium- and small-scale products of such units, it is essential that a determined attempt be made to remove the obstacles that hinder the growth of these industries at present. Besides machinery components, colliery equipment, industrial gases, electrical equipment, etc., items like ball- and roller-bearings, industrial spare parts, scientific equipment, glass and polythene products would seem to have substantial prospects. A careful and immediate examination of the prospects for each line of activity is necessary, to enable the Government to frame promotional policies for each such activity, to be followed by institutional and other measures necessary to support, sustain and encourage the enterprises.

POLICIES FOR DIVERSIFICATION OF INDUSTRIAL STRUCTURE

With the proposed programmes for expansion of the basic metals industry in the region, it is also necessary that steps be taken to fully develop a wide range of industrial activities by introducing new lines of production, especially in the engineering sector. In view of the fact that small and medium industries will have to be developed at a faster rate in the future, pig iron, among other raw materials, will be very much in demand. There appears to be a very good prospect, therefore, for establishing one or two blast furnaces in the region during the period 1966-86 with a total capacity of about one million tonnes of pig iron in a year. In the large-scale engineering group, the possibility of establishing an agricultural machinery and a dairy machinery plant deserves consideration. Another new line of activity which would enjoy very good locational advantages is the production of scooters, motor cycles, and similar vehicles. Raw materials will be locally available

* Ancillary Industries in Asansol-Durgapur by John MacDougall (IPA)—Asia

to a large extent to support such manufacturing activity and, with the proposed road link to the new Haldia Port, it will become easier to secure any needed imported components. Such a unit will also encourage a complex of ancillary industries around it in course of time. Other possible lines of new industrial activity may be the production of heavy cranes, road rollers, rolled steel products, railway equipment, cast iron pipes, radio and electronic equipment, metal containers, and machine tools. An aluminium utensils unit may have good prospects, in view of the local availability of the basic metal.

As in the case of ancillary, medium- and small-scale industries, a vigorous promotional policy is called for to develop coal-based chemical industries in the region. With the public-sector coke-oven at Durgapur and the private-sector coke-oven at Asansol as nuclei, it should be possible to encourage the growth of a major chemical industries complex. In order to reap the maximum possible benefits of employment opportunities generated by the production of basic intermediates for chemical industries, the establishment of a series of units manufacturing the end products will have to be carefully planned and encouraged.

There are also prospects for other miscellaneous industrial activities. One of these can be the manufacture of specialised glass and refractory products, and another a wood-based industry for consumer products. A detailed examination of the possibilities for the diversifying of the industrial structure in the Asansol subdivision should be undertaken, in order to exploit fully the advantages of the basic metals industry and the coal-based economy of the region; also to develop a whole complex of industries from which the maximum possible advantages in terms of employment opportunities may be derived for the benefit of the planning region.

REGIONAL DEVELOPMENT STRATEGY

The development strategy for the Asansol-Durgapur region, which is coterminous with the Asansol subdivision, can now be formulated on the demographic and economic bases described in the preceding sections. A consideration of the physical base of the region, along with the demographic and economic bases, yields the general outlines of the methods and policies that should be adopted for the integrated development of the Asansol subdivision. While a regional plan for the area will have to await more detailed studies and surveys during the comprehensive planning stage, the interim strategy for development can provide the broad framework within which the future growth of the region should be contained, and which can at the same time facilitate, within its general confines, the drawing up of a comprehensive regional plan.

REGIONAL URBAN CENTRES

The development of the region envisages an increased rural population of 10.61 lakh in 1986, as against the 1961 population of 7.07 lakh; and an increased urban population of 15.16 lakh, as against the 1961 population of 3.83 lakh. The crucial problem is to provide for the comparatively large increase in the urban population of the region, that is, the Asansol subdivision.

The existing concentrations of urban population in the subdivision cluster alongside the Grand Trunk Road, mainly in the police station areas of Faridpur, Andal, Raniganj, Kulti, Hirapur, Asansol, Salanpur and Chittaranjan. The urban settlements, population-wise as of 1961, rank as follows: Asansol—1,68,689; Kulti-Barakar-Niamatpur—61,084; Durgapur—41,696; Raniganj—30,114; and Chittaranjan-Rupnarayanpur—28,957. There are also some smaller urban centres in the region, but these are the five major regional urban centres. The Kulti-Barakar-Niamatpur complex has a very large component of mining population; its industrial base is smaller compared with that of the Durgapur urban area. In fact, the Durgapur urban complex is likely to witness a faster rate of population growth than Asansol or the Kulti complex, due to Durgapur's stronger and more varied industrial base.

The first and the most fundamental recommendation of the regional development strategy is that most of the additional urban population (approximately 11 lakh by 1986) be accommodated in the already existing major urban concentrations of the Asansol subdivision: Asansol, Durgapur, Raniganj, the Kulti complex, and Chittaranjan-Rupnarayanpur. As a corollary, it is proposed that redevelopment and expansion of these five major centres be planned for and implemented to realise the above strategy. The growth of new urban centres outside these existing major centres is therefore not called for, in the context of the regional needs of Asansol-Durgapur over the next twenty years.

DISTRIBUTION OF URBAN POPULATION

The comparatively high potential of the five major urban centres for further growth, which will generate expanded employment opportunities, will make it possible for them to absorb the additional urban population of 11 lakh by 1986. Considering the employment potential of these urban areas against the background of their existing demographic and economic bases, a distribution of the projected urban population between the Asansol and Durgapur urban areas, on the one hand, and the remaining urban areas of the subdivision, on the other, has been proposed in this Interim Plan. No further distribution of the remaining population among the urban centres other than Asansol and Durgapur has been attempted; this will be done during the comprehensive planning stage. It may be added, however, that almost the whole of this remaining urban population will likely be accommodated in the three other centres.

The Initial Planning Area for Asansol more or less covers (i) the Asansol municipal area; (ii) the extension of the municipal area; (iii) Burnpur, including Outer Burnpur; and (iv) the proposed satellite township, along with a few other nearby mouzas to the north-west of the municipal area. Total employment in the area is expected to go up from 67,300 in 1961 to 1,61,000 in 1986. In manufacturing, in construction, and in trade and commerce, sizeable increases in employment are expected to register during 1961-86. The Asansol urban area should accordingly support a total population of 4,00,000 by 1986.

In Durgapur the 1961 Census included only two very limited areas: the Durgapur steel township and the Durgapur coke-oven township, thus totalling a smaller than actual count of the urban population in the Durgapur area. The Interim Plan for the Durgapur

urban area covers the whole industrial complex of Durgapur with its residential and other areas. In view of the strong industrial base established there the Durgapur urban area is likely to be the fastest growing urban area in the whole of Asansol subdivision in the future. Employment in the Durgapur urban area is expected to go up from 26,000 workers in 1961 to 2,15,000 workers in 1986. It is felt that the Durgapur urban area can absorb a population of 5.18 lakh by 1986.

With this distribution of population, the remaining urban centres in the region will have to accommodate a total population of 5.98 lakh by 1986, as against the 1961 population of Raniganj-Andal, Kulti, and Chittaranjan-Rupnarayanpur complexes which totalled approximately 1.48 lakh. It is possible that some of the additional urban population will be absorbed in such mining centres as Jamuria and Ukhra; but on the basis of employment estimates for the mining industry, it can be presumed that the mining centres are unlikely to witness any sizeable growth of population. Almost the whole of the remaining urban population outside Asansol and Durgapur will therefore be absorbed in the three major urban complexes indicated above. It should be noted, however, that upto 1971 most of the additional urban population will be absorbed in Asansol and Durgapur and that only from 1971 will the three other centres—Raniganj, the Kulti complex, and the Chittaranjan complex—witness sizeable population increases.

The remaining urban population is expected to rise from 1.73 lakh (including the population of mining urban centres) in 1961 to 2.18 lakh in 1971; to 4.77 lakh in 1981 and 5.98 lakh in 1986. The relative distribution of this population amongst the urban centres will be worked out during the comprehensive planning stage, following detailed studies of their development potential. In 1961, the Raniganj-Andal urban area, a major service centre for the entire region, had a population of approximately 48,700. The Kulti-Barakar-Niamatpur-Dishergarh urban area population totalled approximately 70,000 in 1961, and the Chittaranjan-Rupnarayanpur complex totalled 29,000. A very tentative appraisal of the economic and physical development possibilities of these major urban centres indicates that the Kulti complex and the Raniganj-Andal urban area—provided the serious physical constraints to the expansion of Raniganj can be removed—have almost the same degree of development possibilities, the former as an industrial-cum-commercial centre and the latter predominantly as a service centre for the region. Chittaranjan-Rupnarayanpur would rank next, with possibilities for growth based on the establishment there of a smaller industrial complex for the manufacture of railway components and cable-cum-electrical products.

The second recommendation of the regional development strategy is that in the proposed multi-nuclear development of the region Asansol and Durgapur should be developed as the dominant centres. During the period 1966-71 in particular, the maximum stress and attention will need be devoted to achieving a sufficiently rapid rate of growth in these two major centres.

OUTLINES OF PHYSICAL DEVELOPMENT

Against the background of the above recommendations for the development of the urban centres and the distribution of the regional urban population are to be assessed

the potentialities for and the constraints to physical development of the urban areas. The three vital considerations are land use, water supply and communication linkages.

Land Use

Excluding coal-bearing lands, other lands in the Asansol subdivision are generally buildable lands with satisfactory drainage conditions and soil capability. The bulk of these buildable lands is to be found in the police station areas of Kanksa, Faridpur and Andal on the east, in the police station areas of Raniganj, Kulti, Hirapur and Asansol on the south (with some exceptions of coal-bearing lands), and in the police station areas of Salanpur and Chittaranjan on the north-west. Much of the available land in Kanksa and Faridpur is good agricultural land, and thus deserves to be properly reserved for agricultural use. On the whole, it may be therefore concluded that land available for urban settlements is generally situated in a six- to nine-mile ribbon running east-west to the north of the river Damodar and in another ribbon four to six miles in depth running south to north and abutting the Barakar river. Much of this land is already covered by urban settlements, and even this land has many pockets of unbuildable coal-bearing areas. In the case of the Durgapur urban area, however, there is adequate buildable land to the north of the Grand Trunk Road. Similarly, in the Asansol urban area there is a big area of buildable land to the south of the Grand Trunk Road.

The Kulti complex and the Chittaranjan-Rupnarayanpur area also offer adequate room for further physical growth. In the case of the Raniganj urban area, however, there are serious physical constraints to further growth to the north of the Damodar at present. Any expansion of this area north of Grand Trunk Road is not possible due to the existence of coal-bearing lands; in fact, considerable soil subsidence has occurred almost all around the present urban area. Some marginal expansion southwards is possible up to the river Damodar. Whatever further growth takes place in this area will have to confine itself to the south of the river Damodar, within the jurisdiction of Bankura District. The possibilities of such development outside the boundaries of the Asansol subdivision will be examined during the comprehensive planning stage; the construction of a bridge at Mejiaghat and the completion of a north-south regional road link over this bridge will, perhaps, make a trans-river development of Raniganj possible. The road link will also further strengthen the position of Raniganj as a major regional service centre for the distribution of goods coming from Haldia Port, and of agricultural commodities coming from the northern districts—Birbhum and Murshidabad.

Water Supply

As will be indicated later while discussing water management in the region, the Damodar Valley System, with its present storage capacity, will be able to meet the water demands of the subdivision upto 1976. The supply position in the Durgapur urban area, situated as it is close to the barrage, is quite good at present, and the Asansol urban area is likely to receive additional water supply from the Maithon Reservoir. It is only after 1976 that additional sources of water will have to be developed either by exploiting the waters of the Ajoy or by putting up additional dams in the Damodar system. Only a detailed water management study will indicate the precise possibilities, but the task of increasing water

availability from about 193 m. g. d. in 1976 to about 272 m. g. d. in 1986—the anticipated demand—is unlikely to prove unmanageable. The development potential of, and the imperatives of developing, the region as a major centre, next in importance only to Greater Calcutta in the State of West Bengal, clearly indicate the urgency of finding the additional water needed for the region's growth.

Road Communication

The region has a fairly well-developed system of transport linkages by both road and rail. The important problems of road transport in the subdivision are (i) separation of transit traffic from intra-regional traffic; (ii) improvement of the condition and standard of the existing road system; and (iii) development of planned local road systems for the major urban centres in the region.

The existing railway network well serves the subdivision; almost all important urban centres in the subdivision are linked by rail. Therefore, the inadequacy of communication linkages or the difficulties of providing adequate linkages are not likely to be factors hindering the proposed multi-nuclear development of the urban centres in the region.

Giving due consideration to the factors promoting or inhibiting physical growth of the urban centres in the region, the third recommendation of the regional strategy proposes:

1. The Durgapur urban area should be expanded north of the Grand Trunk Road, limiting lateral development toward the east or the west to the minimum extent necessary.
2. The Asansol urban area should be developed between the National Highway No. 2 bypass and the river Damodar, limiting the developments north of the NH 2 bypass to their present dimensions as far as possible.
3. To prevent an unmanageably large ribbon urban development along the Grand Trunk Road, now occurring with the expansion of the major urban centres, the core urban areas (i.e., the Initial Planning Areas for Asansol and Durgapur) should be separated from the rest of the region by Extended Planning Areas wherein new growth is to be almost wholly discouraged, except as accessories to existing developments.
4. The possibilities for trans-river development of the Raniganj urban area across the Damodar in the adjoining district of Bankura should be explored during the comprehensive planning stage.
5. The Chittaranjan-Rupnarayanpur complex and the Kulti-Barakar-Niamatpur-Dishergarh complex should be planned to allow their development as two integrated urban complexes, distinctly separate from each other and from the neighbouring Asansol urban area to the extent feasible.

REGENERATION AND DEVELOPMENT

The fourth recommendation in the strategy for regional development is that the future

growth of these selected urban centres in the Asansol subdivision be achieved through the twin processes of regeneration and planned expansion.

Among the five major centres of the region, the Durgapur urban area will be developed largely through the combined process of planned expansion and of integration of the recent existing developments. In the Asansol urban area, development will be secured through regeneration of existing developed areas as well as through planned expansion of the urban area. In the Raniganj and Kulti complexes regeneration and planned expansion are likely to be applied equally to secure the long-term growth objectives. The problem in the Chittaranjan-Rupnarayanpur complex, however, is similar, though not of the same magnitude, to that in the Durgapur urban area. Here, both planned expansion and integration of existing developments should form the general strategy for development.

AGRICULTURE AND SOIL CONSERVATION

The rural areas of the Asansol subdivision will have a unique opportunity to develop intensive market-oriented agriculture due to three advantageous factors. These are the existence of large urban centres within easy reach; the increase in urban population, present as well as projected; and the high income levels of the industrial and urban population. Agriculture in the subdivision can therefore be made a very well-paying proposition. Kanksa and Faridpur police station areas have good cultivable land; these areas are also served by the DVC irrigation canals and have some reserves of underground water which can be developed. In the coal-bearing areas, agriculture is now conducted as a subsidiary, and often seasonal, occupation. This is especially so in Jamuria police station area. The possibility of utilising excess coal-pit water for agricultural purposes deserves investigation. Some of the open lands in coal-bearing areas might also be developed as grazing lands. A detailed study is required to determine the most favourable location of specific areas as well as the acceptable methods for the promotion of agriculture, especially market-oriented agriculture, in the subdivision.

It is therefore recommended as the fifth strategy for regional development that Kanksa and Faridpur areas be promoted as intensive agricultural areas; and that the possibility be explored of further developing agriculture in the coal-bearing areas like Jamuria, and other such areas in the western half of the region as are suitable.

There have been sporadic attempts in the past to utilise coal-pit water for agriculture. Such attempts did not, however, make much headway because of the lack of adequate pumping facilities and the objections raised by the mining authorities on grounds of possible subsidence of coal-bearing lands. It is therefore recommended that the Agriculture Department of the State Government and the Inspectorate of Mines make a joint study of the potential for pit-water utilisation for agriculture and, if it proves feasible, draw up a programme for utilisation of such water.

Industrial development and the growth of urban settlements in the Asansol subdivision have led to a gradual denudation of the extensive forests of sal which once existed in the region. Efforts are now being made by the Damodar Valley Corporation and the Forests

Directorate of the State Government to undo the damage through reforestation and development of the bare areas of the region that would be suitable for afforestation. The large urban population will need regional recreation areas in future. Woodlands are excellent for such recreational spots. The banks of the rivers and streams in the subdivision could also be developed as green belts and recreation areas. In particular, if the northern bank of the river Damodar could be developed as one long green belt, it would serve the recreational needs of populations of most of the major urban areas in the subdivision. It is also necessary to afforest the banks of the river Ajoy and the highlands alongside the river, to prevent soil erosion.

The sixth recommendation for the regional development strategy is that the forest areas of the region be preserved and selected forest areas developed. The banks of the water courses in the subdivision, especially the banks of the river Damodar and the banks and highlands near the Ajoy, be treated to serve as regional and local green lands and recreation areas.

MINING SETTLEMENTS

The major mining settlements of the region are in Kajora, Ukhra, Satgram, Jamuria, Barabani, Gaurangdih and Salanpur. As stated earlier, employment in mining is likely to register only a very nominal increase over 1961-86, and it is therefore evident that mining settlements will not record in future any substantial increases in population.

The seventh recommendation for the development strategy for the region is therefore directed towards rehabilitation of the existing mining settlements and improvement in their environmental conditions, services and utilities.

A concerted scheme for improving all the important feeder roads of the mining settlements is already underway. When completed, the scheme will make the *inter se* linkages of these settlements adequate; and also their linkages with the major urban centres of the subdivision will be improved.

During the comprehensive planning stage, a detailed examination of the abandoned coal pits and the coal-bearing lands in the region is also suggested. Methods of utilising coal-bearing lands as well as surface lands over the abandoned coal mines for alternative purposes can well be explored.

DEVELOPMENT OF INDUSTRIAL AREAS

A survey of industries conducted by the Asansol Planning Organisation has estimated the land requirements for various industries as follows: basic metals—2,600 square feet/employee; large engineering—2,600 square feet/employee; refractory and glass—2,200 square feet/employee; and chemicals—1,800 square feet/employee. So far as light engineering industries in the subdivision are concerned, there has been a tendency to acquire more land than is actually needed; actual use consequently is more than the 800 square feet/employee generally recommended as a standard. No detailed data are at present available on the space utilisation by other industries in the subdivision. The standards of land requirements for industries are mentioned here only for illustration and as desirable targets in the light of the various local constraints and specific inter-

industry differences. It is not possible at present to apply them strictly to arrive at detailed and precise estimates of future land requirements for various industries in the subdivision. However, it may be estimated that by 1986 the total industrial space requirement for the subdivision will be approximately about 30 square miles. The estimate takes into account the existing developments in the Durgapur urban area where a number of large industrial units have already acquired additional lands to absorb their future expansion. Of this total requirement, more than 20 square miles will be needed in the Asansol and Durgapur urban areas and the rest in other areas of the subdivision. The urban area plans for Asansol and Durgapur have provided for this amount of industrial land space. In view of the availability of land in the Kulti complex and the Chittaranjan-Rupnarayanpur complex for their further industrial growth, there should be no difficulty in finding industrial lands as required outside both Asansol and Durgapur urban areas in the future.

REGIONAL TRANSPORTATION SYSTEM

RAILWAYS

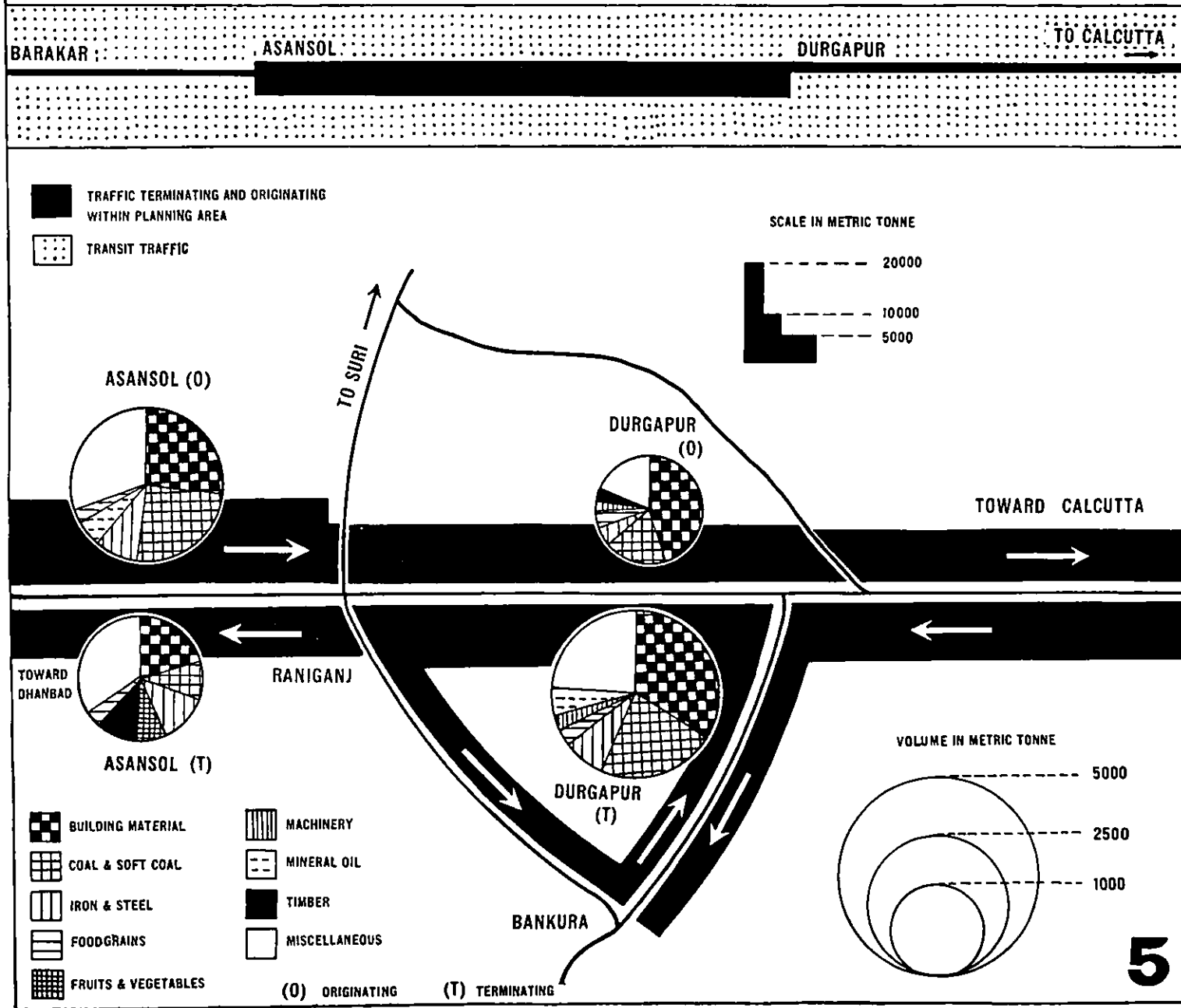
The Asansol subdivision has a fairly adequate rail communication network. In the immediate future further improvements in the performance of this system through better operational methods and the introduction of electric traction are expected. It is therefore unlikely that there will be any necessity for major extensions to the railway network. The mining settlements, major industrial areas, urban centres, service centres, etc., are all more or less adequately served by the present rail system. Improvements in the coming years will very likely contribute to faster turn-round and better operations. The economic advantages of road over rail for short distance transport of commodities are not likely to warrant any substantial growth of the present railway within the region.

ROAD TRANSPORT

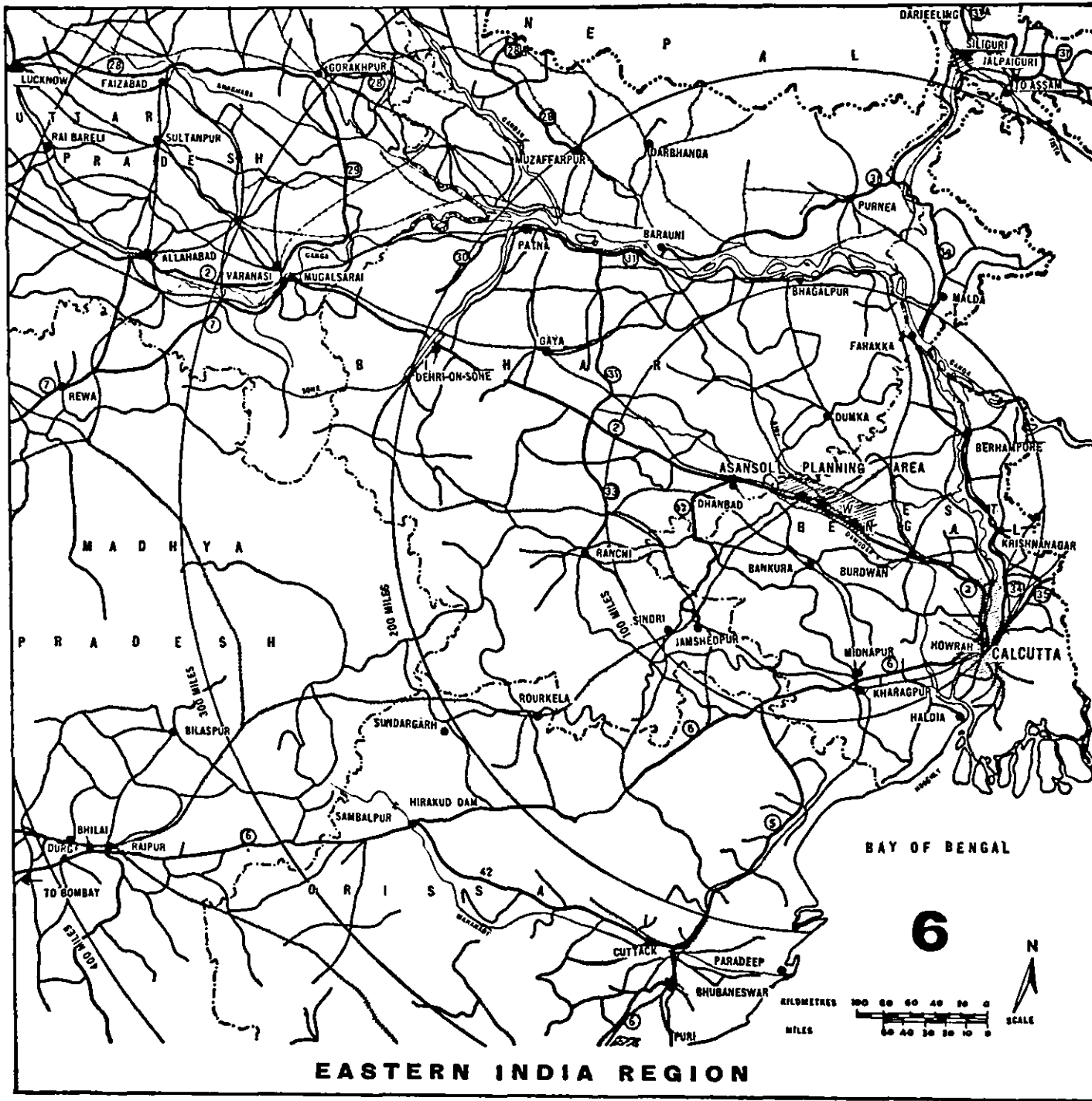
In the field of road transport, the problem is largely one of improving the standards and condition of the considerable existing linkages, and promoting the easy and economic flow of inter-regional traffic into, through and out of the Asansol subdivision. As a result, any strategy for the development of the Asansol-Durgapur region must be tailored to meet the demands of both inter-regional transit traffic and intra-regional traffic.

An analysis of the nature of inter-regional and intra-regional traffic was presented in Chapter 2. The traffic patterns within the subdivision have also been depicted in Map 5. With the Grand Trunk Road (National Highway No.2) as the vertebra, the region functions as a transit corridor for movement of goods between the Calcutta Metropolitan Region and Bihar, and even remoter parts of India to the north. The Grand Trunk Road, which now caters to both intra-regional and inter-regional traffic, is only two lanes wide; and, though a national highway, it is not protected by any access control. It is also difficult at the present stage of urbanisation to introduce any degree of access control on this road. On the basis of the traffic volume data earlier presented, and in the light of the growth rates for traffic as estimated by the Planning Commission and adapted to conditions in the Asansol subdivision, a very tentative assessment of possible traffic growth for 1986 can be made. For the country as a whole, the Planning

ROAD TRAFFIC IN THE PLANNING AREA



5



Commission has estimated the increase in ton-mileage of goods movement by road during the period from 1950 to 1966 as follows:

	1950-51	1955-56	1960-61	1965-66
Ton-Miles	3,358	5,470	10,600	23,350
Percentage Increase	—	62.9	193.8	220.3

The average rate of growth of ton-mileage of goods movement in India during the Third Plan has been about 44% per year. But the fast increase in ton-mileage does not signify the rate of actual growth in traffic which is much lower. The rate of growth of freight traffic during 1960-75, as estimated by the Perspective Division of the Planning Commission, is likely to be between 10-11% per annum.

In a rapidly growing industrial area with a fast-expanding tertiary sector such as the Damodar Valley Region, the rate of increase in road traffic will not only be substantially higher than the rate of growth in over-all traffic in India; it will be even higher than the rate of growth in road traffic in many other regions. The rate of growth in over-all traffic has been estimated at 10-11% per annum. In view of the expected increased movement of manufactured and general merchandise, a 15% rise in road traffic per annum may be assumed as reasonable for Asansol area. In the future, much of the non-bulk traffic moving upto a distance of 300 kilometres (186 miles) will be catered to by motor transport. Local traffic between Asansol and Durgapur is also bound to register substantial increases over the next two decades. At present non-goods traffic, i.e., passenger traffic, is about 50% of all traffic generated within it; this traffic is expected to go up by at least 15% by 1986. Most of this traffic moves between Asansol and Durgapur, and is therefore of an intra-regional character rather than purely local. Under these circumstances it is tentatively estimated that traffic between Asansol and Durgapur will account for about 24,500 car units per day, equivalent to 8,000 heavy vehicle units. For this traffic alone, a four-lane facility will have to be laid.

The above estimates are broad and general; but they indicate that even the expansion of the existing G. T. Road between Asansol and Durgapur to a four-lane facility is not likely to meet the combined demands for intra-regional and transit traffic by 1986. An additional facility providing for at least four to five lanes of traffic will be required to ensure a smooth and economical flow of the east-west transit traffic in the subdivision. The growth of the Damodar Valley and the Calcutta Regions in the coming years is bound to strengthen the interdependence of the producing and the consuming centres in these two adjacent regions, and it will be only reasonable to presume that transport of commodities by road in this area will progressively increase. Generally, the distances involved in road transport between the various centres in this area are also not so large as to make road transport less economic than movement by rail.

Extension of Durgapur Expressway

In view of the existing urban development on both sides of the G. T. Road, and the limitations imposed by coal-bearing land, it does not appear feasible to expand the G. T. Road to more than four-lane capacity. It is proposed that such expansion to four

lanes be accomplished between Asansol and Durgapur, to serve the needs of the expanding volumes of traffic moving among Asansol, Raniganj and Durgapur. To cope with the transit traffic, the Durgapur Expressway, which is to run up to Durgapur from Greater Calcutta, should be extended westwards through Ukhra and Jamuria, meeting the NH 2 bypass near Asansol, close to the bridge on the G. T. Road over the Nunia Nallah. By 1986 the traffic will perhaps demand only a five-lane capacity, but it is recommended that prior reservation be made for a six-lane roadway. For a considerable distance between Ukhra and Jamuria, the alignment of this expressway will follow that of an existing road. Between Jamuria and Asansol, the alignment near the junction of this road with the NH 2 bypass is recommended for a detailed engineering study, in view of the complex physical and technical factors mentioned in Chapter 5 in relation to the Asansol urban area plan. Similarly, at the Durgapur end, the alignment suggested is tentative: at this end it can be on a horizontal axis by extension of the Durgapur Expressway; or, in case the Durgapur Expressway joins the G. T. Road before reaching the Durgapur urban area, the alignment may be laid through a northward extension of the central north-south arterial road proposed in the plan for Durgapur urban area. The alignment of the highway at the eastern end also should therefore be the subject of a detailed study, when the alignment of the Durgapur Expressway upto the boundaries of the Durgapur Extended Planning Area has been finalised.

The proposed extension of the alignment of the Durgapur Expressway will also help link organically Ukhra and Jamuria—the two most important urbanised coal-mining centres of the subdivision—with the existing highway system. The coal-mining settlements of Barabani and Salanpur to the west of the subdivision will also have direct access to a highway through Jamuria; coal traffic by road from these areas will not have to travel southwards to the G. T. Road before proceeding to the Calcutta Region. At present, much of the traffic proceeding from the northern areas of the subdivision has to travel all the way down to the G. T. Road in order to proceed on the east-west highway axis, or even to move within the area. With the proposed highway, all this traffic will be able to take advantage of a nearer fast-movement facility; the extension of the Durgapur Expressway will also help to provide a good east-west fast-traffic corridor in the northern half of the subdivision.

It may be argued that an alignment for the proposed highway closer to the existing G. T. Road would facilitate its fuller utilisation by transit traffic as well as some volume of inter-city traffic within the region. A serious impediment to such an alignment, however, is that, because of physical constraints, the existing National Highway No.2 cannot be expanded to the desired ten-lane capacity to accommodate inter- and intra-regional traffic by 1986. Secondly, in the built-up area through which the G. T. Road at present passes, the cost of development of such an expressway is likely to be substantial. Thirdly, there may not be any real necessity to provide for the inter-city traffic within the region among Asansol, Raniganj and Durgapur a facility of more than four lanes in the foreseeable future; this would be met by the expansion of the existing G. T. Road to four-lane capacity. Under the circumstances, the location of the expressway along the present G. T. Road is not likely to be needed to meet a part of the intra-regional demands of traffic moving along the Asansol-Durgapur axis.

The NH 2 bypass project, already under execution, will form the westward extension of the expressway proposed above. This bypass, which has been integrated into the strategy for regional development, provides for the construction of a new bridge over the Barakar, north of the existing bridge. After crossing the Barakar into Bihar over this new bridge, the bypass travels for a short distance eventually meeting the G. T. Road again. The NH 2 bypass will facilitate easy and smooth movement of transit traffic which will thus avoid the congested Asansol urban area. The new bridge will also strengthen the trans-river linkage over the Barakar, which is confined to only one bridge.

Improvement to G. T. Road

A comprehensive improvement scheme for the G. T. Road has already been initiated in the subdivision under the Coal Roads Improvement Scheme. This scheme provides for improving road surface conditions between Asansol and Durgapur, and for building overbridges at Panagarh and Andal and at two railway crossings. In addition, bridges over the Tamla and the Nunia will be improved or reconstructed; a number of culverts are to be improved also. It is recommended that, in addition to the above improvements, and as part of the regional strategy, priority be given to the development of the G. T. Road to four-lane capacity by 1976, and that a system of access controls be applied to the stretch of the G. T. Road between Durgapur and Barakar. Work on the extension of the Durgapur Expressway which is to run towards Asansol may be taken up during 1976-86, the growth in transit traffic prior to 1971 being taken care of by the expanded G. T. Road. As indicated in the Durgapur urban area plan, it is also suggested that in major urban centres where the G. T. Road serves to divide industrial and residential areas, a suitable number of underpasses or fly-overs be provided for separating the local traffic from the inter-city traffic and also from the transit traffic passing through the region, till such time as the expressway has been completed.

North-South Highway

An identifiable north-south traffic corridor now passes through the Asansol subdivision, linking Bankura and Birbhum Districts directly, and through these districts, Midnapur in the south and Murshidabad and North Bengal Districts in the north. The traffic volumes are not substantial at present, consisting predominantly of coal and foodstuffs. With the recent completion of the Dhakeswari bridge on the road from Raniganj to Bankura, the linkage of the subdivision with Bankura District has greatly improved. Through Bankura the traffic originating in and passing through the subdivision also establishes a convenient linkage with Midnapur District. The south-bound traffic from Birbhum and other districts in the north usually follows the Ilambazar-Durgapur-Barrage route to Bankura and Midnapur. Convenient trans-river movement facilities offered by this route, and the lack of bridges over the Ajoy at Pandaveswar and the Damodar at Mejiaghat, are the two obvious reasons for this pattern of movement.

Two major development projects already undertaken in the State are bound to increase considerably the volumes and markedly change the character of the north-south traffic moving through the Asansol subdivision. These projects are the Haldia Port in the south and the Farakka Barrage in the north.

The new port at Haldia will open up a vast new hinterland; all inward port-oriented traffic to the Asansol area, which now comes from Calcutta, will then originate at Haldia, to follow a more direct route to the Asansol area. Similarly, in the reverse direction, port-oriented traffic from or through the Asansol subdivision is bound to take to any direct link that is provided between Asansol subdivision and Haldia.

Completion of the Farakka Barrage, and the establishment of a direct road link with North Bengal over the Ganga, are likely to stimulate greatly the inflow of agricultural commodities from North Bengal to the subdivision. Further, with the rapid growth of various industries, a larger flow of goods to North Bengal and Assam may be expected from the Asansol-Durgapur region. The growing market relations between the Asansol area on the one hand, and North Bengal, Assam, and Birbhum, Bankura and Midnapur Districts on the other, will necessitate a north-south highway. Both Haldia and Farakka are expected to be completed in the seventies. During the latter half of the decade 1971-81, the north-south inter-regional traffic terminating in and originating from Asansol Planning Area is expected to receive much stimulus due to the cumulative effect of these two projects. With the completion of Haldia, the foreign trade linkage of regions to the west beyond the Asansol subdivision will change the pattern of the present Calcutta-oriented traffic through the establishment of a direct link with the new Haldia Port. A regional highway running north to south through the Asansol subdivision is imperative for the development of the region and the State itself.

The two possible alignments of this new regional north-south highway will be (i) via Suri-Ilambazar-Panagar-Durgapur-Barrage-Bankura, and (ii) via Suri-Dubrajpur-Raniganj-Mejia-Bankura. For the first alignment there are the initial advantages of the two existing bridges over the Ajoy and the Damodar and also of a state highway link which can be expanded. Serious disadvantages are that the link will serve only the eastern end of the planning area; it will be comparatively expensive in terms of road mileage and transportation costs, and will likely contribute to the congestion of the existing stretch of the Grand Trunk Road between Panagar and the Durgapur Barrage. Possibly, a new road link to the south of the Grand Trunk Road with a bridge over the DVC Canal will be needed.

The second alternative alignment is recommended as economically and physically more favourable to the region's development. It will of course require a new bridge at Meja, and another bridge at Pandaveswar. A new bridge at Meja will also remove the physical constraints to the growth of Raniganj as a major service centre of the region. This alignment will also have the benefit of an existing stretch of state highway, and for some length it can also follow the alignment of the proposed Durgapur Expressway extension. In terms of transportation costs, the Suri-Raniganj-Bankura alignment will be more economical; it will better serve the whole region being in a more central corridor. It will also link Purulia directly with the Asansol subdivision, and with North Bengal. It is therefore recommended that the north-south regional highway follow the Meja-Raniganj-Pandaveswar alignment; and that it be developed to national highway standards and as a major inter-regional transportation route linking the new Haldia Port with its hinterland.

Linkages with Purulia

With the large thermal power station at Santaldih and the proposed development of industries like cement in the hitherto underdeveloped district of Purulia, the future interdependence between the Asansol Planning Area and the district of Purulia is destined to be more pronounced. It is therefore proposed that a new bridge be constructed across the Damodar near the Adra railway line, in order to provide a direct connection between Asansol and Purulia. In order to fully develop the Purulia-Asansol linkages such a bridge is no doubt necessary in the long run, though a trans-river link exists already over the Panchet Dam. At present and in the immediate future, however, the existing link over the Panchet Dam should be adequate to meet the demands of Purulia-Asansol traffic; moreover, the volume of this traffic will be substantially less than that in the Raniganj-Pandaveswar corridor. The bridge at Mejiaghat near Raniganj should therefore have the first priority, especially as it will serve the port hinterland transportation route. On present indication, it seems likely that the bridge near the Adra railway line over the Damodar to link Purulia may be required towards the close of the planning period, i.e., by about 1986.

Coal Feeder Roads

As part of the Coal Roads Improvement Scheme, 21 feeder roads which, in fact, provide the regional transport network for mining settlements *inter se* and in relation to urban, industrial and service areas, are being improved, and missing linkages provided. The improvement proposed relates mainly to surface conditions. In some cases, however, existing feeder roads not connected at present are being linked up to complete the road network. In view of the mutual proximity and the fairly widespread distribution of urban areas and mining settlements in the Asansol subdivision, this improvement scheme will provide a good regional network of subsidiary roads to feed the regional highways and to facilitate intra-regional traffic within the planning area. The map on regional strategy (Map 7) shows these coal feeder road components in relation to the proposed highway system and the urban and mining settlements in the planning area.

Kulti Bypass

As shown in the Asansol urban area plan (Map 8), the peripheral arterial road on the south of the proposed Asansol urban area can be advantageously extended to serve as a bypass for the Kulti area. By using this road the Kulti-bound traffic may avoid the necessity of having to pass through the congested Asansol urban area. The peripheral road, with its extension to Kulti, can then serve as a regional arterial transportation route of the future for the Asansol subdivision.

AIRPORT

No firm recommendations have been made in the regional strategy regarding the location of a regional airport in the subdivision. With an urban population of 15.16 lakh in 1986, the region will indeed require satisfactory airport facilities for inter-regional travel. There are now a number of airstrips and at least one major airfield in the subdivision. Whether any one of these is to be expanded and developed as a civil airport, will

be considered in the comprehensive planning stage. Tentatively, however, it may be presumed that, in view of the future demand for air travel facilities, the location for a regional airport may be somewhere between Andal and Ninga.

THE DVC CANAL

A description of the regional transportation system is incomplete without a mention of the DVC Canal. There have been many difficulties in regard to the commercial utilisation of this canal so far. If and when these difficulties are resolved, possibilities of commercial exploitation of the canal for inland water traffic between Calcutta and Durgapur should be investigated,

In concluding this discussion on the strategy for transportation development in the region, it may be added that the mistakes committed in the past in regard to the G. T. Road should not be repeated when design and construction of the regional highways are done. It is necessary to ensure from the very beginning that ribbon development along the highways is controlled, and that access control to a desired degree is exercised. By proper planning and enforcement of control measures from the start, it should be possible to protect the regional highways from the strangulating influences that have bedevilled the G. T. Road.

REGIONAL INFRASTRUCTURE

For planned development of the Asansol-Durgapur region to succeed, it is essential to ensure an adequate supporting regional infrastructure. The main components of such an infrastructure will obviously be water and power, besides transportation (already dealt with). In addition, the region as a whole must have adequate housing, education and health facilities—the social infrastructure vitally needed to effectively channel the contributions of the region's manpower for the development.

WATER

The water demands for the entire region are estimated on the basis of per capita requirements for the various water-user groups. A survey conducted by the Asansol Planning Organisation shows that the prevailing supply standard for mining is about 80 gallons per day per worker. At present the supply is secured mainly from coal-pit water. In manufacturing, the water requirement is about 23 gallons per day per worker for light engineering; about 124 gallons per day per worker for refractories, potteries and glass; about 376 gallons per day per worker for large engineering; about 1,100 gallons per day per worker for chemicals; and about 1,100 gallons per day per worker for basic metals. For the remaining user groups the following standards may be adopted: municipal urban—50 g.p.c.d.; non-municipal urban—40 g.p.c.d.; agriculture—28 g.p.c.d (in addition to rain water); and rural—15 g.p.c.d.

On the basis of these standards, the subdivisional demand for water has been estimated as shown in Table XXV, next page. For mining, it is assumed that only about 10% of the supply will have to be met from sources other than pit water.

TABLE XXV
PROJECTED WATER DEMAND FOR ASANSOL SUBDIVISION

Category	Standard g. p. c. d.	1961		1971		1981		1986	
		Population (in lakhs)	Water Demand m. g. d.	Population (in lakhs)	Water Demand m. g. d.	Population (in lakhs)	Water Demand m. g. d.	Population (in lakhs)	Water Demand m. g. d.
Rural	15	7.07	10.61	8.31	12.47	9.63	14.45	10.61	15.92
Asansol Urban	50	1.69	8.45	2.72	13.60	3.31	16.55	4.00	20.00
Durgapur Urban	50	0.42	2.10	2.04	10.20	3.95	19.75	5.18	25.90
Remaining Urban	40	1.73	6.92	2.17	8.68	4.77	19.08	5.98	23.92
Industry	*(28-1100)	0.93	36.96	1.76	89.10	2.76	121.20	3.53	141.42
Fire Allowance	—	1.00	1.96	—	2.63	—	3.47	—	3.89
Agriculture	28	0.84	2.35	0.85	2.38	0.86	2.41	0.86	2.41
Mining	8	1.42	1.14	1.68	1.34	1.90	1.52	2.00	1.60
Losses	—	—	7.04	—	14.04	—	19.84	—	23.50
	Sub-Total		77.53		154.44		218.27		258.56
Mining from Coal Pits	72	1.42	10.22	1.68	12.10	1.90	13.68	2.00	14.40
	Total		87.75		166.54		231.95		272.96

*Per worker use varies between different industries

In view of the poor availability of underground water, especially in the western parts, the region depends largely upon water from the DVC storage system. It is gathered that the DVC system, as presently developed, can supply a total of 193 m.g.d. to the subdivision for the various user groups, out of which the actual drawal now is about 109 m.g.d. only. Therefore, if a proper distribution and off-take system is developed, it should be possible to meet the water demand of the subdivision upto 1976. This of course excludes the needs of water for more intensive agriculture in the eastern parts of the subdivision. In addition to the potential of the DVC storage system, some quantity of water is also now drawn from the lower reaches of the Barakar and the Damodar, especially at Durgapur. A number of industrial undertakings in the public and the private sectors also operate their own water supply units by drawing water mainly from the lower reaches of the Damodar.

A significant aspect of the water supply situation in the subdivision is that the resources of the Ajoy remain as yet untapped. The utilisation of water from the lower reaches of the Damodar and the Barakar also needs closer study and planning. In order to meet the water demand beyond 1976, it appears at the moment that there are two alternative possibilities: (i) developing additional storage capacity in the Damodar system, and/or (ii) exploiting the untapped resources of the Ajoy river.

A comprehensive water management study for the subdivision is thus an immediate necessity, so that early decisions can be taken and the requisite development works initiated for arranging adequate water supplies to the subdivision for the period beyond 1976. It does not seem likely that there will be any real over-all shortage of water resources; the problem essentially will be one of managing the resources which already exist. For a region with the large development potential of the Asansol subdivision, water management should be considered not only from the short-term view of financial commitments, but also from the long-term view of economic and social benefits to the community and the State at large.

A water supply scheme for the 400 square miles of mining settlements with their population of about 6.3 lakh has now been finalised by the State Government. The scheme has also received the approval of the Planning Commission. Under the first phase of the scheme a supply of about 17.5 m.g.d. will be made available to the mining settlements by 1981; and an additional supply of 4 m.g.d. in years beyond 1981. The project proposes two major intakes on the Damodar at Maithon and Raniganj, and two minor intakes on the Ajoy, drawing upon the sub-surface flow. In the first phase about 7 m.g.d. will be available for Barakar and the adjoining mining areas and an equal amount of water for Raniganj. The phase two will cover only certain minor extensions at a cost of Rs.75 lakh.

It is recommended that the execution of the Raniganj Coalfields Water Supply Scheme be taken in hand without further delay, and that efforts be made to find additional resources, if necessary, to shorten the phasing of the entire project. The execution of the scheme may possibly release some pit water for other uses, especially for agriculture. When the comprehensive water management study for the region is undertaken, this aspect of the scheme should be studied in detail. The Asansol Municipal Water Supply Scheme, discussed in Chapter 5, provides for an integrated intake from Maithon for that scheme as well as for the Raniganj Coalfields Water Supply Scheme. In view of their close relationship, it is recommended that the execution of the two projects be dovetailed.

POWER

In an unpublished study, the Institute of Public Administration, New York, has estimated that, in 1962-63, 75% of the total power load in the Asansol subdivision was on account of the industries (including power station auxiliaries) and the coal mines. In view of the prospects for industrialisation in the region, it may reasonably be assumed that the industrial-cum-mining load will not fall below this level during the period 1966-86. In 1961, the industrial-cum-mining load, excluding power station auxiliaries, was 63% of the total load. By 1986, the consumption of power on this account is expected to rise to 65% of the total off-take of power, though the over-all percentage of this user-group will remain at 75% of the total load.

Tables XXVI-A, -B and -C show the projected power needs of the Asansol subdivision, assuming a load factor of 50%.

TABLE XXVI-A
POWER DEMAND IN ASANSOL SUBDIVISION: 1961-86

Year	KWH (in million)	MW	Year	KWH (in million)	MW
1961	1,098	250	1981	3,710	847
1971	2,342	535	1986	4,832	1,103

TABLE XXVI-B
POWER DEMAND FOR COAL MINING IN ASANSOL SUBDIVISION: 1961-86

Year	KWH (in million)	Year	KWH (in million)
1961	204	1981	732
1971	393	1986	995

TABLE XXVI-C
POWER DEMAND FOR MANUFACTURING
ASANSOL SUBDIVISION: 1961-86
(in million kwh)

Industry	1961	1971	1981	1986
Basic Metals	352	810	937	1,012
Engineering	35	133	381	630
Chemicals	10	50	180	259
Refractories, etc	10	14	20	26
Others	81	99	162	219
Total	488	1,106	1,680	2,146

Most of the power generating units in the subdivision supply power to places outside the subdivision, including the Calcutta Metropolitan District. In 1963, the amount of power sent out to other areas was about 45% of the power fed into the grid by the Durgapur DVC Thermal Station and the Maithon Hydel Station. In the case of the Durgapur Coke-Oven (Durgapur Projects Ltd.) Thermal Power Plant, the export amounted to about 57% of the power generated in this plant in 1963. Thus the total power estimates of this subdivision alone will not be an accurate index of the availability of power; in fact, the needs of a much wider region, covering the south-eastern industrial region of West Bengal from Calcutta to Asansol-Durgapur, will have to be taken into consideration. The problem will also have to be considered in the context of the proposed eastern regional power grid. In the comprehensive planning stage it is proposed to undertake a more detailed examination of the power generation programmes and the needs of the region. If the programmes for the expansion of power generation, already under execution or proposed to be executed in the immediate future by the DVC and the State Government, go on stream as scheduled, there should be no shortage of power in the subdivision during the planning period (1966-86). With its abundant coal resources available for commercial exploitation, the Asansol subdivision has a large potential for coal-based thermal power stations, and if suitable programmes are taken in hand in anticipation of the power needs, inadequacy of power should never be an obstacle to the development of the Asansol-Durgapur region.

HOUSING

Without adequate housing, no region can attract and sustain migrants from the hinterland, and develop in them stable links with the social base. In the Asansol-Durgapur region widespread inadequacy of housing may act as a serious deterrent to further growth. On the other hand, the construction industry, if properly organised, can provide a training ground for migrant unskilled labour to learn skilled occupations in the building trades.

In 1961, the average number of persons per room in the Asansol subdivision was 3.17; the number of persons per household 5.03; the number of rooms per household 1.59; and the available floor area was 37.7 square feet per person. A tentative estimate prepared by the Asansol Planning Organisation shows that in 1961 the deficiency in housing was to the order of 4,56,01,000 square feet of habitable space in the rural and 2,26,56,000 square feet in the urban areas, and 6,82,57,000 square feet in the whole subdivision, corresponding to 79,750 units of housing in the rural and 35,600 units in the urban areas, and 1,15,350 units in the subdivision. The comparatively large deficiency in the rural areas is due to the fact that these areas contain a number of mining settlements classified as rural in the 1961 Census.

As regards the future requirements for housing, the Asansol Planning Organisation has made some preliminary estimates, on the basis of a minimum standard of 100 square feet of habitable space per person. According to these estimates, the additional habitable area requirements in square feet, over and above the deficiencies reported in 1961, will total 4,33,00,000 by 1971, 6,42,00,000 by 1981, and 4,11,00,000 by 1986. The corresponding additional requirements of housing units have been estimated as 82,700 by 1971 (58,200 urban; 24,500 rural), 1,19,600 by 1981 (94,000 urban; 25,600 rural), and 75,250 by 1986 (55,700 urban; 19,550 rural). The cumulative additional requirements of housing units between 1961 and 1986 in the urban areas are thus assessed at 2,43,500, in the rural areas at 1,49,400, and in the subdivision as a whole at 3,92,900. The steady increase in the estimated requirements of houses in the urban areas during the period 1961-81 indicates the spread of urbanisation in the region; a decline in the additional requirements of rural housing is expected to register during the period.

The volume of additional housing requirements till 1986 will be slightly less than 10,000 units per year. It should not be an impossible task to provide this additional housing, if concerted efforts are made by the public-sector housing authorities and the private-sector building industry. Private investment in urban housing should be encouraged through suitable incentives. The deficits in housing in the urban areas here are much less than those in the Greater Calcutta area, and more amenable to concerted programmes of public and private action; therefore, no time should be lost in framing and implementing an adequate housing policy for the subdivision. In the mining settlements, which sprawl throughout the subdivision and accommodate substantial populations with inadequate housing facilities, the possibilities of providing for them pre-fabricated or low-cost housing deserve to be carefully explored.

HEALTH FACILITIES

For a region with a high level of industrialisation and large numbers of people employed in occupations like coal mining, the provision of adequate health facilities is of primary importance. In the mining settlements, the Asansol Mines Board of Health and the Coal Mines Welfare Fund have been operating for many years and have performed commendably. Many of the industrial undertakings have their own health and hospital facilities, serving only their employees and the latter's dependents. The subdivision lags behind, however, in regard to hospital facilities for the general public. The State Government have recently proposed the establishment of four regional hospitals in the

State. It is recommended that one of these hospitals be located in the Asansol subdivision, which today is the second largest urban area in the State next only to the Calcutta Metropolitan District. On the basis of a standard of two beds, 0.5 doctor and one nurse per 1,000 population, the total requirements for 1971, 1981 and 1986 have been estimated as follows:

TABLE XXVII
HEALTH FACILITIES NEEDS OF ASANSOL SUBDIVISION
1961-86

Year	Beds	Doctors	Nurses
1971	2,286	457	762
1981	3,791	866	1,733
1986	5,154	1,288	2,577

EDUCATION

The composite and mixed social structure of the Asansol Planning Area enhances the importance of providing educational facilities to help the assimilation of people with many different social and cultural backgrounds, accomplishments, and proficiencies. The period 1966-86 will witness accelerated urban growth in the region; concurrently, the demand for people with vocational and technical skill will grow. The employment pattern will also necessitate a switch-over from rural to urban occupations, a process which only adequate facilities for education and training can foster and accelerate. The requirements of educational facilities have been estimated as follows:

TABLE XXVIII
EDUCATIONAL FACILITIES NEEDS OF ASANSOL SUBDIVISION
1961-86

Year	Primary		Secondary	
	Students	Schools	Students	Schools
1961	1,54,077	513	77,126	128
1971	1,90,867	636	1,25,873	210
1981	2,88,004	960	1,64,540	274
1986	3,38,361	1,128	2,03,548	339

In making the estimates, a cent per cent enrolment for primary education (6-11 years), and a 70% enrolment for secondary education (12-17 years) have been assumed.

By 1986, a large proportion of the additional industrial employment—estimated 2,60,000—will be in industries which require skilled labour, such as engineering and chemicals. It has been estimated that about 50% of all employment in manufacturing will be employed in engineering and chemical industries by 1986. In these two industries alone about 1,44,000 persons will likely be absorbed during the period 1961-86. While no detailed assessment of vocational training needs for the subdivision has yet been made, it is safe to presume that over the next twenty years a minimum of two lakhs of skilled labourers will have to be found in the Asansol subdivision, thus indicating a yearly requirement of about 10,000 persons. It is, therefore, recommended that a comprehensive programme for vocational training in the subdivision be formulated immediately to include both in-service training in industrial establishments and training in public technical institutions. A regional institute for technical training, possibly in the form of a “Central Engineering Organisation”, is needed for carrying out a programme of

manpower management for the region. The existing training institute at Durgapur may serve as a nucleus of such an organisation.

RECREATION

Besides educational facilities, the Asansol subdivision needs large regional recreation areas, and social and cultural amenities like community halls, playgrounds and stadia, to round out an adequate social infrastructure for the region. The regional strategy has made recommendations in respect of large recreation areas and green spaces to be reserved, and in regard to areas to be earmarked for intensive afforestation. An important requirement for the success of any regional development strategy in the Asansol subdivision is the provision of social amenities and the formulation of social policies that will help build stable individual and group loyalties within the population of the subdivision.

**INTERIM
DEVELOPMENT PLAN
ASANSOL**

ASANSOL—AN INDUSTRIAL CITY

In 1904 the East Indian Railway (now Eastern Railway) set up its divisional headquarters at Asansol, which became the nucleus for a large railway community. Two years later the subdivisional administration shifted its headquarters from Raniganj to Asansol. By 1911, Asansol had become a municipal town with a population of nearly 22,000. Soon after, the township of Burnpur, working with steel-making, began to take shape, by 1931 accommodating a population of 5,740. During the years of the Second World War, with Burnpur and Asansol as nodes, an industrial city slowly emerged. In 1941 the two nodes between them claimed a population of about 69,500; ten years later the population increased to 96,800. After Independence, the Burnpur Plant was expanded to a capacity of 0.3 million tonnes of ingot steel. Major industries for the manufacture of bicycles, railway rolling stock, glass, chemicals, etc., were set up. After Partition considerable movement into Asansol of refugees seeking employment in these industries took place. Villages around Burnpur, in particular, became congested with migrant labour. The Census of 1961 recorded the combined population of Burnpur and Asansol as 1,68,700, over 50% increase in one decade.

PHYSICAL FEATURES

Much of the urban growth in the Asansol-Burnpur area has occurred in isolated pockets, and in strips along the present inadequate roads. All this development has

stretched for a length of eight miles along the G. T. Road, with a southward bulge towards Burnpur and the Damodar. To the north of this area flows the Nunia Nallah west to east, and close by the Eastern Railway main line runs on a high embankment. Branching off from Asansol, another major line (South Eastern Railway) proceeds towards Burnpur and Purulia. To facilitate quick movement of ores to the Durgapur Steel Plant from the Purulia side and from Orissa, a third railway line (SER) has been added, again on a high embankment south of the present urban area. Between these three railway lines and the Nunia Nallah no urban growth of any depth has been possible because of the lack of major transportation facilities. As a result, most of the development has perforce to concentrate itself in patches of high lands on either side of the G. T. Road. At Burnpur also planned development is confined to the small township near the steelworks. With the expansion of the steel plant, the numerous villages like Narsingband and Hirapur overnight became dense residential communities. The result of all this haphazard development is today evident in the Asansol-Burnpur area in wasteful land uses, strained transportation facilities, and grossly inadequate water supply and other amenities.

DIMENSIONS OF GROWTH

The rate of industrial growth in this area thus far presages a further expansion of urbanisation. But the developments in the past have been so haphazard that it becomes difficult to determine the spatial dimensions of future growth. The location of the Sen Raleigh Industries, with a large residential colony, away from the built-up areas of Asansol, clearly indicates an effort to break away from its severe congestion; nevertheless that industry and the housing colony continue to be bound to Asansol for economic, transportation and other reasons. In planning for the Asansol-Burnpur urban area, therefore, a two-fold effort becomes necessary: first, to identify the Initial Planning Area, including therein the municipality of Asansol, the township of Burnpur and the numerous developments adjoining them; and, secondly, to identify the Extended Planning Area, which will include the pockets of development, isolated at present, but which will be covered by eventual urbanisation.

An attempt has been made below to analyse the population, employment and physical characteristics in the Initial Planning Area and to outline detailed suggestions for its development in future. For the Extended Planning Area, however, only broad recommendations for conserving the existing uses are made at present; it is expected that at the comprehensive planning stage detailed proposals for this area will be developed.

THE PLANNING BASE

POPULATION

As indicated earlier, between 1951 and 1961 the population of Asansol-Burnpur increased by more than 50%. This was principally due to industrial growth and large-scale migration from outside. While further population increase is expected in the

area, it is unlikely that it will be of the same magnitude as for Durgapur, where a number of large-scale industrial units will function in the next few years. Projections of population in Asansol should therefore be based on natural increase of the existing population, and on migration from surrounding areas, taking into consideration the likely industrial expansion. The anticipated population in the next twenty years in the Asansol Initial Planning Area is given below, supplemented by tables showing the age-sex distribution.

TABLE XXIX-A

PROJECTED POPULATION: ASANSOL INITIAL PLANNING AREA

Year	Population	Year	Population
1961	1,68,689	1981	3,31,400
1971	2,71,500	1986	4,00,000

TABLE XXIX-B

PROJECTED SEX DISTRIBUTION: ASANSOL INITIAL PLANNING AREA

Year	Male	Female	Total	Females/1,000 Males
1961	1,01,645	67,044	1,68,689	659
1971	1,63,177	1,08,323	2,71,500	664
1986	2,29,800	1,70,200	4,00,000	740

TABLE XXIX-C

PROJECTED AGE DISTRIBUTION: ASANSOL INITIAL PLANNING AREA

Age-Group	1961	1971	1986
0- 9	44,998	63,259	97,200
10-19	32,039	51,585	77,200
20-29	37,048	47,784	63,600
30-39	26,836	51,857	58,400
40-49	14,577	32,580	45,600
50-59	7,871	14,933	35,600
60-69	3,777	6,787	15,600
70 and above	1,543	2,715	6,800
Total	1,68,689	2,71,500	4,00,000

EMPLOYMENT

On the basis of population figures and labour force participation rates, the potential working force in the area by 1986 is likely to be around 1,62,000. The estimated employment of 1,61,000 may give an impression of near full employment, but this would not be the case, because the volume of employment in the Initial Planning Area is not confined to the working force within this area, but includes a large number of commuting labour from nearby Barakar, Kulti, Raniganj and similar places. Precise figures indicating the volume of such commuting workers are not available; but even after allowing for such influx, it is estimated that more than 80% of the working force within the Initial Planning Area may be gainfully employed.

The 1961 Census placed the total number of workers in the Initial Planning Area at 67,300. Of them, 37,000 were in the tertiary sector and 27,000 in the secondary sector. After considering the various proposals for expansion of the existing manufacturing industries and the possibilities for new industries, it has been estimated that future employment will be predominantly in the tertiary sector. The anticipated employment pattern in the area is given below:

TABLE XXX
SECTORAL EMPLOYMENT: ASANSOL INITIAL PLANNING AREA
(figures in thousands)

Sector	1961	1971	1981	1986
Primary (agriculture and mining)	3.5	3.0	3.0	3.0
Secondary (manufacturing, construction and household industries)	27.0	45.0	64.0	75.5
Tertiary (trade and other services)	36.8	54.5	70.0	82.5
Total	67.3	102.5	137.0	161.0

It is anticipated that in the secondary sector manufacturing will continue to maintain its present rate of growth. The major unit in this sector, namely, the IISCO, will raise its steel-making capacity from one to two million tonnes by 1971. Assuming that the expansion will provide additional employment of 8,000, IISCO's total employment in 1971 will be around 30,000. The potential in this area for establishing ancillary industries clearly indicates that a large segment of employment will materialise in this sector. In addition, a coal-based chemical plant may be located in the area in the near future. As a result of these various new developments which include normal rate of growth for the existing industries, the pattern of employment in manufacturing is likely to be as shown in Table XXXI, next column.

TABLE XXXI

EMPLOYMENT IN MANUFACTURING: ASANSOL INITIAL PLANNING AREA

Manufacturing	1961	1971	1981	1986
Basic Metals	16,000	30,000	34,000	36,000
Engineering	4,000	5,500	11,000	15,500
Chemicals	400	1,000	2,500	3,500
Others	2,700	5,000	10,000	12,500
Total	23,100	41,500	57,500	67,500

The predominance of the basic metals industries will continue throughout the planning period. While this is in keeping with past and anticipated rates of growth, a balanced economic development demands an equally large growth in other manufacturing industries which, at the end of the plan period, should absorb approximately 31,500 workers. In course of time the occupational pattern of the total working force is bound to change, and by 1986 the secondary and the tertiary sectors are expected to employ about an equal number of persons.

WATER AND POWER

At present the Asansol Municipality draws two million gallons of water per day from the river Damodar to meet its domestic needs. IISCO has another unit of 20 m.g.d. capacity, which draws from the same source. Since the DVC system was established, withdrawals of water for all purposes from the Damodar below Panchet and Maithon have been subject to regulation by the DVC. The availability of water for the Asansol-Burnpur complex from the Damodar must therefore be assessed in the perspective of water needs existing elsewhere in the subdivision, especially in Durgapur. Against the background of the industrial and population growths anticipated in the area, water needs in Asansol Initial Planning Area have been assessed as follows:

TABLE XXXII
WATER DEMAND : ASANSOL INITIAL PLANNING AREA
(in million gallons per day)

Use	1961	1971	1981	1986
Industry	17.374	32.180	41.668	47.194
Domestic (at 50 g.p.c.d.)	8.450	13.600	16.550	20.000
Fire	1.300	1.649	1.819	2.000
Losses	2.582	4.943	6.004	6.719
Total	29.706	52.372	66.041	75.913

Compared to these requirements of water, a shortfall of about six million gallons, particularly in domestic use, even in 1961, is apparent. Even for an unsewered area like Asansol Municipality the per capita availability of drinkink water is less than the minimum desirable standard. In the relatively large areas outside the municipal limits water shortage is even more acute. In the future, most of the Initial Planning Area will have to be provided with sewerage facilities in the interest of public health. When this is done, a minimum of 50 g.p.c.d. will be needed. Again, the rate of industrial growth in future will depend on the availability of water. Immediate action to augment the existing water supply is therefore imperative.

As an interim measure, the Public Health Engineering Directorate of the State Government has prepared a scheme for the supply of ten million gallons of water to the Asansol-Burnpur area. It is not possible to obtain this quantity of water from the Damodar river bed near Asansol, since the surface flow channel at present runs along the opposite bank. In the absence of suitable river training works to change the direction of the flow, which again depends on the stability of the river bed, even the existing intake installations of IISCO and the Asansol Municipality are facing difficulties. The scheme therefore proposes to draw ten m.g.d. from the Maithon Reservoir through an intake located upstream of the Maithon Reservoir. But even after the completion of this scheme, water shortage will be felt in the Asansol-Burnpur area from 1976 onwards and, unless long-term plans are initiated even now, Asansol's growth may be adversely affected.

In the power distribution network, Asansol, like Durgapur, forms part of a larger area served principally by the DVC. In addition, the Dishergarh Power Supply Co. serves the Asansol municipal area. IISCO has a thermal power unit of its own to augment the supply from the DVC. If the various schemes of the DVC, Durgapur Projects Ltd., and the West Bengal State Electricity Board are implemented, and the regional power grid proposed for the Eastern States is introduced, it is expected that the load demand in the Asansol-Burnpur area, as estimated for 1986, will be met.

HEALTH

Based on the standards which were recommended by the Mudaliar Committee for the country, and in keeping with the conditions of an industrial area, the following standards for health facilities are suggested:

TABLE XXXIII
STANDARDS FOR HEALTH FACILITIES

Per Thousand Population	1971	1981	1986
Hospital Beds	1.50	1.75	2.00
Doctors	0.30	0.40	0.50
Nurses	0.50	0.80	1.00

Based on these standards, the needs in the Initial Planning Area will be as follows:

TABLE XXXIV
HEALTH FACILITIES NEEDS: ASANSOL INITIAL PLANNING AREA

Facilities	1971	1981	1986
Beds	407	580	800
Doctors	72	133	200
Nurses	136	265	400

As against these requirements, the existing facilities are confined to the IISCO Hospital, with 280 beds; the Eastern Railway Hospital, with 109 beds; and the State Government Hospital at Asansol, with 74 beds. The IISCO and the Eastern Railway Hospitals provide facilities only to their own employees and the dependents of such employees, who form less than half of the population in the area. Almost a lakh of people therefore depend on the remaining one hospital. The colliery workers enjoy health and hospital facilities provided by the Asansol Mines Board of Health and the many colliery hospitals. Asansol hospital is the only major facility in the whole subdivision available to the non-mining population. Any development plan for the Asansol-Burnpur area must contend with the gross inadequacy in hospital facilities now existing, and include suitable proposals for augmenting these facilities.

EDUCATION

The Initial Planning Area has at present thirty-one primary schools, fourteen secondary schools, three colleges and four technical institutions. Adopting the standards suggested by the State's Education Department and the CMPO for Calcutta, the tables, below and next page, give an assessment of the needs at the primary and secondary stages, on the basis of a standard of 450 students per primary school and 600 students per secondary school.

TABLE XXXV-A
EDUCATION NEEDS : ASANSOL INITIAL PLANNING AREA
(primary—age-group 6-11)

Year	Population in Age-Group	Percentage Coverage	Number in Schools	Number of Schools
1971	33,600	80	26,880	60
1986	55,000	100	55,000	122

TABLE XXXV-B
EDUCATION NEEDS: ASANSOL INITIAL PLANNING AREA
(secondary—junior and high—age-group 12-17)

Year	Population in Age-Group	Percentage Coverage	Number in Schools	Number of Schools
1971	21,350	60	12,810	21
1986	31,780	75	23,835	39

In the Initial Planning Area, there will be about 4,000 students in the age-group 18-20 by 1971 and 5,100 students in the same age-group by 1986, ready to receive collegiate education. It is likely that at least two more colleges, in addition to the existing three, will be required. The need for technical education will also increase in proportion to the increase in employment anticipated, especially in the engineering and ancillary industries. The provision of such educational facilities will have to form part of the manpower management programme for the State as a whole.

PLAN OBJECTIVES AND PRINCIPLES

The objectives of a physical plan for the Asansol urban area are derived from the broader economic and social objectives outlined as part of the strategy for the development of the Asansol Planning Area as a whole, and the role envisaged for that area within the Eastern Region. In the perspective of this role, the two nodes—Durgapur and Asansol—will continue to grow and become eventually two of the leading urban centres in Eastern India. Admittedly, in the next twenty years Durgapur's expansion will be at a faster rate than that for Asansol in view of the massive capital investments already made in Durgapur and the industrial expansion programmes scheduled for that city in the future. But Asansol can be expected to maintain and develop its role as an administrative centre, as a focal point for the mining industry, as a major industrial area, and as a service city for the planning area. The fulfilment of this role will depend on the extent to which land and facilities for water supply, transportation, public health, etc., are made available to the industry and the increased population. The basic objectives of the Plan for Asansol may therefore be stated as follows:

To enable the compact growth of the urban area in the future through major developments in the large buildable spaces within the urban area and in the satellite town near Kanyapur.

To ensure that a balanced land use is secured among various uses like industrial, residential, commercial, recreational open spaces, etc.

To provide for commercial, civic, and administrative centres that will serve as the focal points of the urban area; and for adequate public facilities and amenities.

To outline a functional circulation system that will overcome the existing physical barriers and effectively link the various parts of the city.

The present proposals cover the Initial Planning Area, which has been identified after considering the dimensions of existing developments, the possibilities of or limitations to their effective integration, and the requirement of space according to the needs projected upto 1986. The alignment of the NH 2 bypass in the north and that of the Damodar-Kalipahari railway line in the south are major constraints to the expansion of Asansol-Burnpur; overcoming these constraints will call for considerable investments in road communications. Such investments should occur only after the existing urbanisable land in the Initial Planning Area has been fully utilised. The Interim Plan recognises these limitations and proposes, as a first priority, intensive development towards the north upto the NH 2 bypass and towards the south upto the Damodar. At the same time, it will be unrealistic to ignore the existence of many isolated residential and industrial developments that surround the Initial Planning Area, the major one being the Sen Raleigh Industries and Colony. It is proposed that these areas be brought into the Extended Planning Area within which the existing land uses will be conserved for the present.

THE PLAN

The proposals for the Initial Planning Area cover about 13,000 acres; i.e., a little more than 20 square miles, which involve an addition of 9,000 acres to the existing area of Asansol-Burnpur. The 20-square-mile area is bound on the north by the NH 2 bypass, on the south by the Damodar-Kalipahari railway line, and on the west by the proposed arterial road to Purulia. Within this area, detailed land use has been proposed for 11,825 acres. The balance—about a thousand acres, consisting of a block of land in the extreme west—is proposed to be held in reserve, mainly for residential development after 1986. The table below shows the existing and the proposed land-use pattern in the area.

TABLE XXXVI
EXISTING AND PROPOSED LAND USE: ASANSOL INITIAL PLANNING AREA

Land Use	Existing		Proposed	
	Acreage	Percentage	Acreage	Percentage
Industrial	1,284	32.53	2,750	23.25
Residential	1,544	39.13	4,010	33.92
Commercial	78	1.98	315	2.66
Community Facilities	157	3.97	1,250	10.57
Transportation	743	18.82	2,250	19.03
Recreation and Open Spaces	140	3.57	1,250	10.57
Total	3,946	100.00	11,825	100.00

It will be seen that large increases in each category of land uses are proposed, the principal increase being in the residential category. The proposals for each type of uses are described below.

LAND USE—INDUSTRIAL

Adopting the standards generally set for the various types of manufacturing industries on the basis of employment provided, it is estimated that the additional space requirement by 1980 will be about 350 acres for the basic metals, 380 for engineering, 130 for chemicals, and 320 for other industries. The Plan proposes that the bulk of this additional space be made available in the area adjoining the land now occupied by IISCO. About 1,200 acres will be available in this block, which is now well served by the S. E. Railway line, the Damodar-Radhanagar branch line, and the Kulti and IISCO railway sidings. The area will also have easy access from the proposed southern and western arterial roads. At present, there are four residential villages in this block; namely, Shanramara, Laknasanta, Purushottampur and Kuilapur, with a total population of about 1,500. Because these villages adjoin a heavy industry like IISCO, their expansion in the near future is unlikely and undesirable. Because of the communication facilities and the existing physical character of the area, they are better suited for industry. The residential pockets may remain for the present but, at a later stage as more and more industries are located, steps will have to be taken to shift the residential pockets possibly north, into an area held in reserve for residential expansion.

In addition to these 1,200 acres, about 80 acres will be available in the satellite town that is planned, and another 100 acres will be held for industrial use in the eastern corner of the urban area near the existing Pilkington Glass and other light engineering industries. On the whole, about 2,750 acres of land, comprising the existing and proposed industrial areas, are expected to be adequate to meet the industrial needs anticipated by 1986.

LAND USE—RESIDENTIAL

In the Initial Planning Area, 1,544 acres are under residential use at present, with a population of 1.68 lakh as recorded in the 1961 Census. The Plan proposes the extension of the residential area to 4,010 acres, to support the additional population of 2.32 lakh expected by 1986. The planned residential area has been divided into twelve major residential sectors, the limits of each defined by a road system and natural features such as streams. Six of these sectors are covered more or less fully by existing residential developments, while the other six are proposed new additions.

Three types of gross residential density are outlined in the Plan; low—between 20 and 40 persons; medium—between 40 and 70 persons; and high—between 70 and 120 persons per acre. The existing residential areas are mainly of medium density, but since these adjoin the major work centres, both existing and proposed, and are situated on the main routes of communication, it is suggested that their extension to sector limits should be guided by high-density standards. Three of the four sectors where

such high-density developments have been suggested are in the east and the centre of the city, while the fourth adjoins the major industrial area near the Damodar railway line in the south.

Among the medium-density developments, the most important is the proposed satellite town scheme near Kanyapur in the northern half of the city. Situated between the NH 2 bypass and the Eastern Railway line, this development, proposed by the Housing Directorate of the Government of West Bengal, will cover an area of about 1,000 acres in the first phase and will eventually extend to 1,300 acres, with a projected 1986 population of 60,000 to 65,000. Though described as a satellite town, the development is mainly in the nature of a major residential extension of Asansol supported by a common economic base. The project includes a complex of technical institutions and small industries. In addition to this major project, medium-density developments are suggested in three other sectors; namely, Narsamuda in the west, and Ismail and Mohisila in the south along the Damodar-Kalipahari railway line.

The only low-density sector suggested in the Plan is to south-east of Burnpur township. Since the population here is expected to be in the higher income group consisting of managerial and professional classes, it is feasible to locate this development away from the work or city centres.

The table below indicates the approximate population that has been placed under the three density ranges:

TABLE XXXVII
APPROXIMATE POPULATION UNDER THREE DENSITY RANGES

Density Range	Acreage	Population in thousand
Low (20 to 40)	390	11.70
Medium (40 to 70)	2,425	133.37
High (70 to 120)	850	80.75
Total	3,665	225.82

Out of 3,665 acres, allowing for community centres and other recreational uses, the net residential area to be available is expected to total 2,456 acres. With the 1,544 acres now under residential use, a total of 4,010 acres will accommodate the design population of four lakhs by 1986.

At this stage the plan proposals for the residential areas are confined to the sector level only. Each sector, on an average, will accommodate about 30,000 people and will be served by a community-cum-work centre where shopping facilities and other

community services such as banking will be located. In the comprehensive plan, the division of sectors into self-sufficient neighbourhoods will be recommended and their detailed planning will be carried out.

LAND USE—COMMERCIAL

One of the serious inadequacies in the Asansol-Burnpur area is the lack of an organised central business district. The existing Asansol bazar, unable to meet the vastly increased needs of the town as well as the surrounding areas, has deteriorated steadily. For a city of 4,00,000 people, as Asansol is expected to be by 1986, a civic-commercial centre, where shopping, office, administrative, cultural and recreational facilities are centrally available, is highly essential. In the Plan, an area of about 200 acres north of Ismail, served by three link roads, has been earmarked for such a centre. In addition, the Plan proposes six other commercial centres, each covering fifty acres, to serve the new and existing residential sectors. Shopping facilities to cater to the needs of 40,000 to 45,000 people will be available in these centres. It is proposed to reorganise and improve the existing Asansol bazar area to serve as one such centre. As considerable renewal effort is involved in the proposal, the APO intends to bring out, separately, a detailed plan for this area only at a later date.

Within the residential sector, the Plan envisages shopping facilities for each neighbourhood of about 15,000 people. Considering all the commercial facilities, existing and proposed at various levels, more than 300 acres have been proposed in the Plan for this use only.

PUBLIC AND SEMI-PUBLIC USES

In a development plan for a city, facilities for health, education, administration, recreation, etc., play a major role. A proposal has been made earlier for the establishment of a city centre covering over 200 acres of land, where—in addition to commercial facilities—business offices, cultural institutions, community gathering places, etc., can be accommodated. It is further recommended that similar community facilities be integrated at the sector level in the six community-cum-work centres earmarked for the whole city. Each of the centres will cover approximately fifty acres and will have adequate space for educational institutions, cinemas, library buildings, and public offices like Posts & Telegraph, Police Station, etc.

As regards health and education facilities, in addition to the existing hospitals belonging to IISCO, the Railways and the State Government, the area will require at least two more hospitals by the year 1986. One of these two will be a 200-bed hospital to be constructed under the Employees' State Insurance Scheme at a site on the Kanyapur Link Road. Another major hospital can be located on the southern arterial road near Ismail.

In addition to the existing three colleges, it is proposed to set up an educational complex on a 70-acre site around Kanyapur Polytechnique now under construction.

Another college can be conveniently situated in one of the three community centres to be developed in the southern half of the city. The Plan also includes estimates of secondary and primary school places required by the year 1986. The location of the schools will form part of the detailed plan for each residential sector. In all, 1,250 acres, i.e., about 10% of the total planning area, are proposed to be utilised for public and semi-public uses.

Open Spaces

One of the important elements of the unsatisfactory physical environment in Asansol is the lack of open spaces. Within the Asansol Municipality there are only five playgrounds for a population of more than a lakh, out of which three belong to the Eastern Railway. There is hardly a place between Asansol and Burnpur that can serve as a venue for public gatherings. To correct the existing situation and to provide adequate facilities in this regard, a major open space, covering some forty acres of land, is proposed to be developed in the city's centre. In addition, in the six community-cum-work centres at least ten acres of land are proposed to be left open to serve as a playground and a meeting place at the sector level. Another major open space indicated in the Plan is an area of 200 acres situated in the northern extreme on the NH 2 bypass. Because of underground coal-workings major construction is not feasible on this site; this therefore can be developed as a regional park. Apart from these organised open spaces, the Plan includes provision for maintaining stretches of open land along roads, railways, etc. In all, 1,250 acres, or a little over 10% of the land, will come under the open space category in the land-use plan.

TRANSPORTATION

The proposals in the Plan refer mainly to three types of roads: trunk, arterial and link. The existing G. T. Road and the NH 2 bypass are the two trunk roads in the urban area. Arterial roads have been suggested to connect important traffic generators and also to function as peripheries of the Initial Planning Area. Link roads will be the major means of communication between work centres and places of living.

TRUNK ROADS

The NH 2 bypass, taking off from the existing G. T. Road at a point west of the Nunia Bridge, proceeds in a northerly direction and runs more or less parallel to the G. T. Road at a distance of about four miles. The bypass, which constitutes the northern limits of the Initial Planning Area, is being constructed with the object of facilitating the free movement of transit traffic which can avoid the congested stretches of the G. T. Road within Asansol, Niamatpur and other urban centres. Since this transit traffic neither originates from nor terminates in the Asansol Planning Area, it has been suggested in the Chapter on Regional Strategy that such traffic will be better served if, besides bypassing Asansol, it bypasses Durgapur also. With that end in view, an extension of the Durgapur Expressway north-west of the Durgapur urban area upto Jamuria and a subsequent link-up of this expressway with the NH 2 bypass has been suggested. The alignment of the link between Jamuria and the bypass will

depend on a variety of considerations, the most important of these being the concentration of collieries between Asansol and Jamuria. Preliminary investigations indicate that an alignment, due south-west from Jamuria, may be feasible, in which case the link-up will occur close to the point where the bypass takes off from the G. T. Road. This means that at such a point a major route selection among local, inter-city and transit traffic can be arranged.

The Grand Trunk Road is the other trunk road that passes through the heart of the urban area for a length of seven miles. After the completion of the bypass this stretch of the G. T. Road will cease to be the national highway; it will nevertheless continue to be the chief inter-city corridor within the subdivision, especially between Asansol and Durgapur on the one hand, and Asansol and Barakar-Kulti-Niamatpur on the other. The unimpeded flow of inter-city traffic through the G. T. Road and its maintenance and improvement are therefore matters of vital importance to the Asansol urban area. The major obstacle to achieving such a free flow on the G. T. Road, however, is at Chattapathar, where the Eastern Railway main line crosses it.

There are three other points where railway lines intersect the seven-mile stretch of the G. T. Road within the urban area: the Ghusik colliery siding, a little west of Chattapathar; the South Eastern Railway line in the middle of the urban area; and the IISCO siding in the western extreme. Since the G. T. Road crosses the S.E.R. line over a bridge and since the other two lines are sidings only, the interruptions to the flow of road traffic are not serious at these points. But, at Chattapathar, especially after electrification of the Eastern Railway main line, the volume of rail traffic has increased vastly. As a result, the period for which the crossing remains closed to road traffic is even longer than the period for which it remains open. The provision of a road bridge at this point is therefore essential. However, the location of the Hindustan Pilkington Glass Works and its colony, the Nunia Nallah and the narrow road bridge over it, the railway fly-over for the Damodar-Kalipahari line, the take-off points for the NH 2 bypass and the proposed southern arterial road, and the possible junction of the bypass and the expressway from Jamuria—all these within less than a furlong from Chattapathar make it one of the most complicated traffic nodes. It is therefore proposed that, in selecting a site for the suggested road bridge, an intensive traffic and site study be conducted for a larger area around Chattapathar as part of the comprehensive plan, so that concrete route proposals can be arrived at, taking into consideration the many physical limitations. At a later stage, it may also become necessary to undertake a similar study for the South Eastern Railway crossing now served by a narrow road bridge.

ARTERIAL ROADS

The arterial roads which connect the major traffic generators within the urban area will have a right-of-way of 160 feet which can accommodate four lanes (six, if necessary) of divided roadway with median strip, pull-out bays for vehicle-stops, side-walks, bicycle tracks and landscaping. Two such arterial roads are suggested in the area. The southern arterial road takes off the G. T. Road at a point west of

Chattapathar and proceeds all along the southern periphery of the Initial Planning Area to the north of the Damodar-Kalipahari railway line. This arterial road will be a major facility, connecting the IISCO and the other heavy industrial complexes with the industrial area around Hindustan Pilkington Glass Works. The western arterial road takes off the G. T. Road near the 141st mile at Fatepur and proceeds due south, forming the western periphery of the Initial Planning Area. At Purushottampur the two arterial roads intersect each other, and thereafter the southern arterial road is projected towards Kulti and the western arterial road towards Purulia over the proposed Damodar bridge.

LINK ROADS

The link roads will have a right-of-way of 100 feet with provision for two to four lanes of traffic, and will accommodate bicycle tracks, side-walks, and pull-out bays for vehicle-stops. The link roads which are outlined in the Plan are mainly logical extensions of the existing roads, which can effectively integrate the urban area after suitable improvements. The proposals for the various link roads are described below:

1. *The northern loop road* consists of (a) the Kanyapur Road taking off from NH 2 bypass, proceeding due south and meeting the Burnpur and G. T. Roads; (b) the Burnpur Road proceeding south, crossing the S. E. Railway line through an underpass, and then proceeding along the northern limits of the Burnpur township; (c) a projection of this road towards the city centre and the G. T. Road; and (d) the Barabani Road which, from this point, moves due north, meeting the NH 2 bypass.
2. *The southern loop road* takes off the southern arterial road near the Kalipahari industrial area, then proceeds west towards the city centre, incorporating a stretch of the existing S. B. Gorai Road, touches the city centre at the north and then proceeds due south, terminating at the southern arterial road again. From the city centre to its termination, the southern loop road follows the alignment of the Asansol water supply main for which a 20-foot right-of-way exists. Since the right-of-way has to be maintained in any case, it is thought that a suitable extension of the right-of-way to accommodate a link road will serve the communication needs better and, at the same time, also assure an access to the water main.
3. *The Chelidanga Road*, to be widened and projected towards the Burnpur township, where it will meet the northern loop road. Thereafter, the existing stretch of road will form its alignment upto the southern limits of Burnpur township. The proposed road will then be projected further south towards the Damodar Station, over an existing bridge across the Damodar-Kalipahari line of the South Eastern Railway.
4. *The existing Radhanagar Road*, to be extended to a termination point at the western arterial road.

5. *The Narsamuda Road*, to serve the industrial areas and the residential sectors in the western portion of the city, taking off from the G. T. Road and connecting with the Radhanagar Road.

6. *The existing Burnpur Airport Road*, to be maintained as it is.

7. *A northwest-southeast link road*, to connect the residential sectors with the city centre, taking off from the Chelidanga Link Road, passing through the city centre and terminating at a point on the southern arterial road.

8. *A short link road*, to define the residential sectors of Burnpur and Naba-ghanadi by connecting the Burnpur Airport Road and the northern loop road.

9. *An east-west link road*, as part of the satellite town development, along the route of the Indianoil pipeline, connecting the northern loop road in the west and the NH 2 bypass in the east.

More link roads will be necessary for effective communication within the built-up areas of Asansol. As these roads have to be formed mainly by improving the existing roads, recommendations for them will take the form of urban renewal proposals at the comprehensive planning stage.

PLAN ENFORCEMENT

To ensure that the future development of Asansol proceeds according to the Plan presented above, it is necessary to make recommendations for the enforcement of the Plan. At present, only within the Asansol municipal limits, which cover less than a fifth of the area, are some kind of building controls exercised under the Bengal Municipal Act. But these are too limited in scope to regulate land uses. Under the Calcutta Metropolitan Area (Use and Development of Land) Control Act, 1965, the State Government are authorised to declare certain areas as 'controlled areas' and designate for them 'Controllers of Land Use' with powers to control development of land within that area. The Act can be extended to other areas in the State, including Asansol, by notification. It is recommended that the following controls should be enforced in Asansol under the provisions of this Act. The controls are to apply to all public and private agencies and all individuals unless specifically stated otherwise.

CONTROLS FOR THE INITIAL PLANNING AREA

Within this area, land uses generally will be permitted only in accordance with the provisions in the Interim Development Plan as indicated in Map 8. Specifically:

1. The land space, designated as trunk, arterial, and link roads, as also open spaces, areas for future extensions and the city centre, shall be reserved.
2. The areas designated for industry shall be used only for industrial and accessory facilities.

3. The areas designated as residential shall be used for residential purposes only, except in locations contiguous to existing commercial areas, where work-cum-residence can be permitted.

4. The areas designated as community-cum-work centres will be used only for commercial and public/semi-public institutional uses.

CONTROLS FOR THE EXTENDED PLANNING AREA

Within this area no change of existing land use and no new use of land shall be permitted. Land spaces designated as trunk and arterial roads shall be reserved.

SPECIAL CONTROLS

In both the Initial and the Extended Planning Areas certain special controls will operate.

Roads

For roads the special controls are:

1. No building shall be constructed within a distance of three hundred feet from either edge of the NH 2 bypass and no building shall have direct access to the bypass.
2. No building shall be constructed within a distance of 100 feet from either edge of the G. T. Road or the arterial roads.
3. No building shall be constructed within a distance of 50 feet from either edge of any proposed link road.

Water Courses

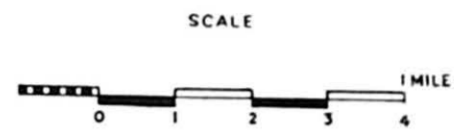
In both the Initial and the Extended Planning Areas the following special controls for water courses are recommended:

1. No construction or excavation shall be closer than 200 feet from the bank of the river Damodar and 100 feet from the banks of any other rivers, rivulets or streams.
2. No industrial, chemical or other waste, or other obnoxious matter likely to be injurious to public health and safety, shall be discharged into any river, rivulet or stream.
3. No structure like a bund, bridge, etc., or excavations for sand, etc., likely to affect adversely the flow of water or drainage in the area, will be allowed in any river, rivulet or stream.

Other Controls

Pending the preparation of a comprehensive plan and the formulation of detailed recommendations therein regarding the alignment of the expressway connections with

INTERIM DEVELOPMENT PLAN ASANSOL



LEGEND

- EXISTING RESIDENTIAL
- PROPOSED RESIDENTIAL
- GROSS RESIDENTIAL DENSITY (20 TO 40 PERSONS/ACRE)
- GROSS RESIDENTIAL DENSITY (40 TO 70 PERSONS/ACRE)
- GROSS RESIDENTIAL DENSITY (70 TO 120 PERSONS/ACRE)
- EXISTING COMMERCIAL AREA
- PROPOSED COMMERCIAL AREA
- EXISTING INDUSTRIAL AREA
- PROPOSED INDUSTRIAL AREA
- EXISTING PUBLIC & SEMI-PUBLIC
- PROPOSED PUBLIC & SEMI-PUBLIC
- EXISTING OPEN SPACES
- PROPOSED OPEN SPACES
- AIRFIELD AREA
- MAIN RAILWAY LINES
- MINOR RAILWAY LINES
- EXISTING LOCAL ROADS
- EXISTING MAJOR ROADS
- PROPOSED MAJOR ROADS
- PROPOSED WIDENING OF MAJOR ROADS
- RIVERS & NULLAHS
- PROPOSED SEWAGE TREATMENT PLANT
- PUMPING STATION
- INITIAL PLANNING AREA BOUNDARY
- MUNICIPAL BOUNDARY
- MOUZA BOUNDARY
- EXTENDED PLANNING AREA BOUNDARY
- COMMUNITY-CUM-WORK CENTRES
- CREMATION GROUNDS
- OTHER OPEN SPACES
- FUTURE EXTENSION

the NH 2 bypass, the bridge over the railway line for the G. T. Road, etc., the following additional special controls are recommended:

1. The open spaces designated in the Plan, north and south-east of the Chhatta-pathar railway crossing, together with the mouzas, Satpukhuria, Banbishnupur, Keshabganj, Chak Keshabganj, Nischinta, Ninga and Sora, shall be reserved.
2. No new excavations for stone, *morum*, sand or brick-making shall be allowed in the Initial or the Extended Planning Area.

INTENTION OF CONTROLS

In applying the restrictions as envisaged above, the Land Use Controller will consider the intention of these controls as stated below:

1. The controls are intended to protect road alignments from encroachment and ribbon development.

2. The controls are intended to prevent dense or major developments from taking place prior to the comprehensive plan.

3. It is not intended that the controls should apply to the developments in pursuance of any expansion programme of major industrial establishments such as IISCO, Sen Raleigh Industries, and Reckett & Coleman Co., within the existing limits of their industrial-cum-residential colonies.

4. It is not intended that these controls should apply to areas under agricultural use except for large-scale processing of agricultural produce; e.g., rice mills.

5. It is intended that all public agencies and departments of the Central and State Governments shall conform to the provisions of the Interim Development Plan and the Comprehensive Development Plan with regard to the use, location and development standards. It is recommended that the Land and Land Revenue Department make it obligatory for these agencies to obtain prior approval of the Land Use Controller before initiating any proposal for land acquisition.

**INTERIM
DEVELOPMENT PLAN
DURGAPUR**

A DECADE OF GROWTH

Urbanisation has come to Durgapur with spectacular suddenness. The immense possibilities of the area became apparent with the development of the Damodar Valley System. Durgapur stands on the fringe of the Raniganj coalfields. Its advantageous location and the availability of water and power influenced the Government of India's decision to locate there one of the major steel plants in the public sector. Meanwhile, the West Bengal Government decided to set up at Durgapur a coke-oven and byproducts project of their own. Durgapur's undulating ground and its dry laterite soil facilitated easy urbanisation. Industries followed one after another—industries for the manufacture of coal-mining machinery, cement-making machinery, boilers, structural steel, etc., to mention only a few. And in the process, in less than a decade, Durgapur emerged as a major industrial complex.

The complex covers an area of roughly 30 square miles stretching east-west from the 108th to the 121st mile on the Grand Trunk Road. On the south flows the river Damodar, towards which the Durgapur area has a general slope. The Eastern Railway main line runs parallel to the Grand Trunk Road for about 13 miles. This trunk road and the railway main line—the two transportation features—have helped, perhaps more than anything else, to give Durgapur its basically linear shape.

This linear development can be divided roughly into three strips. The first strip is the area between the river Damodar and the Eastern Railway main line—a curious mixture of different land uses. It contains the townships set up by the Damodar Valley Corporation, and the Durgapur Projects Ltd. of the West Bengal Government; the Durgapur Thermal Power Station of the DVC and its colony; the large storage reservoir of the Durgapur Steel Plant; several brickfields; and a big stretch of under-utilised river front. The Durgapur Chemicals Ltd. will soon be setting up a chemical plant and a colony in this strip.

The second strip lies between the Eastern Railway main line and the Grand Trunk Road; it is 13 miles long and 1.5 miles wide. The principal work centres for the entire complex are concentrated in this strip, the major ones being the plants of Durgapur Steel, Alloy Steel, Durgapur Coke Oven, Mining and Allied Machinery, and ACC-Vickers-Babcock. There are, besides, several other small and big plants in various stages of installation and operation. At least two more plants will shortly appear in this strip for the manufacture of fertilisers and ophthalmic glass. At one extreme of the strip lie the residential areas of Durgapur town and at the other extreme the Gopalmath rehabilitation colony. Sandwiched between these and the other industries are the old villages of Khairasol, Muchipara and Faridpur.

The third strip stretches from the north of the Grand Trunk Road towards the present limits of the Durgapur complex. The biggest development in this portion has been the steel plant township covering nearly 14 square miles. The townships of the Mining and Allied Machinery Corporation and the AVB factory are the other principal residential developments. A major feature of this strip is the Benachiti market area. Because of its fortuitous location between the steel plant and its township, Benachiti, originally a residential settlement, changed character almost overnight. Despite the shopping and commercial facilities that have since been developed within the industrial townships, Benachiti evolved as, and continues to be, the most important commercial centre in the entire complex.

THE PLANNING BASE

POPULATION

The 1961 Census enumerated the population of Durgapur as 41,696. This figure related however only to the two townships of Durgapur Steel and Durgapur Projects (Coke Oven) Ltd. The growth since 1961 has been such that the Durgapur urban area cannot any longer be regarded as limited to these two townships. The urban area now incorporates many new residential settlements and densely-populated villages whose residents find employment in the industries of Durgapur. The urban area or Initial Planning Area, as delineated in the Plan, covers some 65 square miles. The anticipated population in this area is given in the tables, next column, which also indicate its age and sex distributions.

TABLE XXXVIII-A
PROJECTED POPULATION IN DURGAPUR INITIAL PLANNING AREA
AND ITS SEX DISTRIBUTION

Year	Population	Male	Female	* Ratio of Females to Thousand Males
1961	41,696	31,174	10,522	338
1971	2,04,000	1,37,044	66,956	488
1981	3,95,300	—	—	—
1986	5,18,000	3,27,635	1,90,365	581

* The increasing ratio of females to males is a phenomenon observed usually in industrialising areas, migration to which in the initial stages is characterised by single-male movement. The growth of families takes place subsequently.

TABLE XXXVIII-B
PROJECTED AGE DISTRIBUTION : DURGAPUR INITIAL PLANNING AREA

Age-Group	1961	1971	1986
0-9	6,757	25,296	96,348
10-19	5,163	25,908	68,894
20-29	18,170	62,016	99,456
30-39	6,705	51,816	1,08,780
40-49	2,856	25,704	83,398
50-59	1,450	8,772	42,994
60-69	420	3,468	13,468
70 and above	175	1,020	4,662
Total	41,696	2,04,000	5,18,000

EMPLOYMENT

The above projections for a newly growing urban area like Durgapur obviously cannot be made on the usual assumptions regarding fertility, mortality or migration. Durgapur's growth in the future, as it has been in the past, will be induced principally by industrial growth and the attendant growth in the tertiary sector. Therefore, projections of population for an urbanising area like Durgapur, arrived at by conventional methods related to natural growth and migration alone, will not suffice. The 1971 figures given above were estimated by taking into consideration the projected

employment in manufacturing and by applying a suitable population-worker ratio. After 1971, a net migrational growth, based on the probable employment generation in the area, has been assumed. The dimensions of growth in the past few years clearly establish that Durgapur will be the fastest growing urban complex in the entire Asansol Planning Area. On the bases of surveys * conducted in the area, the estimated perspective programmes for the various industries, the resources of the area, etc., the employment in manufacturing has been estimated as follows, over the period 1961-86:

TABLE XXXIX
EMPLOYMENT TARGETS INDUSTRY-WISE
DURGAPUR INITIAL PLANNING AREA
(figures in thousands)

Industry	1961	1971	1981	1986
Basic Metals	8.4	43.0	50.0	54.0
Engineering	2.5	17.0	40.0	49.0
Chemicals	0.5	5.5	13.0	18.0
Others	3.6	12.0	25.5	32.5
Total	15.0	77.5	128.5	153.5

The output of the Durgapur Steel Plant alone in the basic metals group will go up to 3.4 million tonnes by 1971, thus increasing its present employment of 22,400 workers to 40,400 workers. The Alloy Steel Plant will employ about 3,000 workers by 1971. The engineering industry is expected to play an increasingly important role in future. In this sector many large-scale plants like those of the AVB, the Mining and Allied Machinery Corporation, etc., have recently come up, and many more similar plants like those of the Hindustan Sheet Metal & Tube, Sankey Wheels, and Jessops & Company are taking shape.

The growth in the engineering industry during 1951-61 was at a compound annual rate of 11% in the Asansol subdivision, and the anticipated growth in this field in the Durgapur area will continue to be almost at the same rate. In the chemical industries, Durgapur Chemicals will employ 1,000 workers by 1971, and the big plant of the Fertiliser Corporation of India will employ another 2,500. In addition, there are the existing byproducts plant at Durgapur Coke Oven and a number of subsidiary chemical industries, many of which have already received land allotments from the Durgapur Development Authority.

* "The Diagnostic Survey of the Damodar Valley"; "the Techno-Economic Survey of West Bengal" by the National Council of Applied Economic Research (NCAER); data available with the Regional Inspectorate of Factories; and the Survey of Industries by the APO.

Altogether, the chemicals group will employ about 5,500 people by 1971. As regards ancillary industries, it is well recognised that in the Asansol Planning Area in general, and in the Durgapur Planning Area in particular, there is a considerable scope for a chain of units producing the various components needed for the large industries. One estimate places the annual value of demand for ancillary products in Durgapur alone at Rs. 16 crore. In fact, many schemes have already been drawn up by the various governmental and non-governmental bodies for setting up several ancillary units.* Taking these schemes into consideration, it is estimated that the annual rate of growth in the sphere of ancillary and other industries will, on an average, be about 12% during the period 1961-86.

While the increase in employment in the Durgapur urban area will be mainly in manufacturing, reasonable increases in the other spheres such as construction and household industry may be expected as well. Again, there is the tertiary sector which will, in the long run, grow at a pace to meet the needs of increasing urbanisation. However, in the primary sector, there is little scope for any increased employment in the Durgapur urban area. Rather, it is likely that, as a result of the growth in the tertiary sector and the spread of urbanisation, the volume of employment in the primary sector will register a fall by 1981. The following table indicates the anticipated employment pattern for the area.

TABLE XL
EMPLOYMENT TARGETS
DURGAPUR INITIAL PLANNING AREA
(figures in thousands)

Sector	1971	1981	1986
Primary	3.0	2.5	2.0
Secondary (including construction and household industry)	84.5	136.5	168.5
Tertiary	14.5	28.0	44.5
Total	102.0	167.0	215.0

Applying the participation rate to the manpower age-group, the 1961 Census revealed a working force of 27,000; of this force, approximately 26,000 were gainfully employed. The potential working force in 1971 is expected to be around 1,23,000, and in 1986 around 2,30,000. Of course, the employment figures anticipated are

* Source: Small Industries Service Institute, Calcutta (1963); Eastern Region Ancillary Industries, Development Board, Government of India; Directorate of Industries, Govt. of West Bengal; and Ancillary Industries in Asansol-Durgapur by John MacDougall—Asia.

more in the nature of targets; but given the industrial base and the successful implementation of the expansion schemes for the various plants already underway, it is likely that the present viable situation of almost full employment can be maintained.

WATER AND POWER

Durgapur's growth commenced with the construction of the DVC Barrage, and in its sustenance the availability of waters from the Damodar has continued to make positive contribution. If the present rate of industrial growth is to be maintained in the Durgapur urban area, a careful assessment of the water demand for the future and the adoption of the measures needed to meet such demand is necessary.

The table below gives an assessment of the needs of industrial and domestic water in the Durgapur urban area (Initial Planning Area).

TABLE XLI
WATER DEMAND IN MILLION GALLONS PER DAY
DURGAPUR INITIAL PLANNING AREA

Requirement	1961	1971	1981	1986
Industrial	8.664	49.548	68.810	79.674
Domestic (at 50 g.p.c.d.)	2.100	10.200	19.750	25.900
Fire Allowance	0.647	1.430	1.980	2.270
Losses	1.141	6.117	9.054	10.784
Total	12.552	67.295	99.594	118.628

The present water demand in Durgapur is about 40 million gallons per day. The installed capacity of the water supply unit of Durgapur Projects Ltd., which is the chief source of water in the area, is 35 m.g.d.; the present off-take, however, is at 21 m.g.d. In addition, some major establishments—like Durgapur Steel—have their own water supply systems.

On present indications, with the existing capacity of the supply unit of Durgapur Projects Ltd., in addition to the capacity of the units of other industrial undertakings, the needs of the area till 1976 are likely to be met. But serious attention will have to be given to the question of augmenting the supply and finding additional water sources to meet the demand for the period from 1976 onwards. As elsewhere in the upper and middle Damodar Valley, water holds the key to any development. If timely adequate measures are not taken—and the time is now—lack of water will be a serious constraint to the growth of Durgapur at a later stage. Such a constraint will be all the more unfortunate since power, which is the other major need of the industry, will

likely be easily available in Durgapur. In fact, Durgapur may not have any shortage of power in the near future in view of the current power supply position in the area and of the power generation programmes underway. Besides, Durgapur is now the only industrial area in West Bengal, apart from Calcutta, which has a variety of other favourable factors that should prove advantageous for the location of a wide range of industries.

HEALTH

The requirements of hospital beds, doctors and nurses for a given population depend on a number of factors such as the standard of living and the working conditions of the population. Based on the standards recommended by the Mudaliar Committee for the country, and in keeping with the conditions in the Asansol subdivision, the APO has suggested the following standards for health facilities:

TABLE XLII
STANDARDS FOR HEALTH FACILITIES

Per Thousand Population	1971	1981	1986
Hospital Beds	1.50	1.75	2.00
Doctors	0.30	0.40	0.50
Nurses	0.50	0.80	1.00

Based on the above standards, the needs for the Durgapur urban area have been assessed as follows:

TABLE XLIII
HEALTH FACILITIES NEEDS : DURGAPUR INITIAL PLANNING AREA

Facilities	1971	1981	1986
Beds	306	592	1,036
Doctors	61	158	259
Nurses	102	316	518

As against these needs, at present a total of 385 beds are available in the hospitals run by Durgapur Steel, Durgapur Projects (Coke Oven) Ltd., and Mining and Allied Machinery Corporation. The position, however, should not be regarded as adequate for the following reasons:

1. The employees of the above three industries represent only a segment of Durgapur's total population. The facilities at these hospitals are available only to this segment and not to the general public.

2. The seemingly large number of beds available at these hospitals is based not only on the normal requirements of the resident population; these are also meant for the employees requiring hospital care due to accidents, etc.

3. In an industrial area like Durgapur, where manufacturing industries are concentrated, the standards of living of the resident population are relatively high. A high standard of living calls for a higher degree of health facilities.

EDUCATION

In the field of education, especially at the primary, secondary and higher secondary stages, the needs in the Durgapur urban area will steadily increase. Adopting generally the standards suggested by the CMPO for Calcutta, the figures in the tables below indicate the seats needed.

TABLE XLIV-A
EDUCATION NEEDS: DURGAPUR INITIAL PLANNING AREA
(primary—age-group 6 to 11)

Year	Population in the Age-Group	Percentage Coverage	Number in Schools	Number of Schools
1971	11,200	80	8,960	40
1986	49,000	100	49,000	216

TABLE XLIV-B
EDUCATION NEEDS: DURGAPUR INITIAL PLANNING AREA
(secondary—junior and high—age-group 12 to 17)

Year	Population in the Age-Group	Percentage Coverage	Number in Schools	Number of Schools
1971	17,000	60	10,200	17
1986	41,000	75	30,750	51

It is suggested that primary education be extended to everyone in the 6-11 years age-group by 1976. The targets for coverage adopted for secondary education in Durgapur are slightly higher than those for Calcutta, for in the Durgapur urban area the emphasis is and will be on technical education and manpower training. Greater facilities for secondary education will thus be necessary.

PLAN OBJECTIVES AND PRINCIPLES

The generation of new employment opportunities and the need for a more rational distribution of industrial growth were the major considerations behind the massive investments in Durgapur. These considerations have become all the more compelling in recent years. It can be presumed, therefore, that the expansion of Durgapur to its optimum dimensions and its ultimate growth to a full-fledged major industrial city will continue to be one of the important goals set by the national and state policies. However, the attainment of such a goal calls for appropriate action within the next few years towards meeting the requirements of the area for land, power, water, housing and other public facilities. The Interim Development Plan for Durgapur presents an assessment of such needs, and indicates broadly the guidelines along which action should be taken to fulfil the needs so appraised.

In the layout of any plan for Durgapur the disparate nature of its present growth is a basic consideration. While individually the major industrial projects brought to their respective plants and townships a fairly high degree of planning, there has been hardly any attempt to relate these plants and townships in one integrated, planned development. In the absence of any suitable alternative arterial roads, the Grand Trunk Road has steadily been denigrated from a national highway to a heavily strained local thoroughfare. Among the residential areas, standards have differed considerably as regards density, buildings, circulation, open spaces and provision of facilities for commerce, health and sanitation, for water supply and sewerage. Again, while the residential needs of the employees have been taken care of by the major industrial undertakings within their respective townships, the provision of services to these townships has gone by default.

A direct outcome of this lacuna in planning has been the deterioration of the residential villages of Khairasol, Muchipara and Faridpur into slums, and a state of congestion and unhealthful environs in the otherwise flourishing bazar areas at Benachiti and Durgapur. A collection of plants and townships does not make an industrial city. If the growth of Durgapur is to be sustained and fostered, the disjointed fragments of urbanism in the area will have to be correlated and integrated, so that a composite industrial city takes shape from such integration. Such a city would ensure within itself a balanced land use, an adequate transportation system and sufficient provisions of public facilities and services.

In accordance with the above objectives and principles, the Development Plan seeks to:

- outline* industrial and residential developments as part of the general programme for Durgapur's growth;
- present* a land-use plan, incorporating the existing developments, and providing, at the same time, enough scope and flexibility for future development;
- provide* civic, commercial and administrative centres to serve as the focal points for the entire development, along with adequate public facilities and amenities;

integrate the existing as well as the future individual developments into a logical pattern, through a network of transportation system and coordinated land development measures;

indicate potential areas for development beyond 1986.

THE PLAN

The Interim Development Plan envisages two planning areas in Durgapur. One is the Initial Planning Area, covering 41,470 acres, for which detailed land-use proposals have been presented. It is expected that the development of Durgapur in the next twenty years will be accommodated within this area. For this area, the plan proposals include 3,640 acres in the north-eastern periphery of the Initial Planning Area, to be held in reserve for the expansion of residential use by and beyond 1986.

All the same, the ramifications of intensive development within the Initial Planning Area will be felt over a much wider area. In the absence of suitable provisions in the Plan, it is likely that these ramifications will result in unplanned developments and ill considered changes in land uses outside the Initial Planning Area. Much of the land surrounding the Initial Planning Area is of good quality, suitable for agriculture; conservation of such land is very essential to ensure the vital rural-urban relationship between the city and its environs. The Interim Development Plan therefore identifies an Extended Planning Area where use of land and other developments will be regulated to assure such conservation and to serve better the needs of Durgapur City.

The main principle running through the Durgapur Plan is the assurance of a balanced land use in the Plan Area. Taking into account the existing developments, it is proposed to distribute the area of 37,830 acres covered by the present Plan as follows:

TABLE XLV

PROPOSED LAND USE: DURGAPUR INITIAL PLANNING AREA

Land Use	Acreege	Percentage
Residential	13,460	35.5
Industrial	12,330	32.5
Commercial	640	1.7
Public and Semi-Public	1,090	2.9
Open Spaces	4,630	12.2
Transportation	4,050	10.7
Railways	1,310	
Roads	2,740	
Agricultural Reserves	1,630	4.5
Total	37,830	100.0

LAND USE—INDUSTRIAL

The land requirement of industries varies not only among the industries but also within the same industry owing to the different processes of manufacture and scales of operations. The per capita space needs have been worked out for various kinds of industries such as basic metals, engineering, etc., according to the standards suggested by the Town and Country Planning Organisation, Government of India. 12,000-odd acres proposed for industry work out to an average density of 13 persons per acre. This comparatively low density is mainly due to the fact that the major industries in Durgapur, namely, Durgapur Steel, Alloy Steel and Durgapur Projects, hold much larger areas than are being actually used. Allowing for the existing industrial uses, the requirement of land for industries is proposed to be met mainly by the extension of the present industrial areas to feasible limits and by the provision of two blocks of industrial land, one east of the proposed fertiliser plant and the other south of the Eastern Railway line and the Bankura Road.

LAND USE—RESIDENTIAL

The predominantly residential portion covered by the Plan for the Durgapur urban area has been divided into a number of sectors. Each sector is well-defined by arterial roads, varying in size from 500 to 1,000 acres. Depending on site consideration, each sector is proposed to be divided into neighbourhoods. A neighbourhood is a self-sufficient residential area, affording within itself local shopping, primary and secondary school facilities, and containing a population of 12,000 to 15,000. The neighbourhood is further divided into residential blocks or clusters of houses, which are built around the primary school and have convenient shopping facilities. It is expected that each residential block will have about 3,000 to 5,000 people. It is beyond the scope of the present Plan to spell out in detail the planned development proposed within a sector, as such developments will depend on a variety of site and building considerations, which are to be more fully explored in the comprehensive planning stage. However, it is envisaged that the residential sectors outlined in the present Plan will accommodate about 40 neighbourhoods, each covering, on an average, 300 acres.

A significant feature of the existing residential developments in Durgapur is that in a majority of cases such developments have been at very low-density levels. The Sagarbhanga housing estate and the CMERI colony are the exceptions where densities are very high. In the steel and coke-oven (DPL) townships, the existing circulation system, and the extent of public utilities and facilities presently provided, are unlikely to permit any vertical or horizontal expansion of the townships. In these circumstances, the Plan provides for these areas to be treated as low-density areas, accommodating less than 40 persons per gross residential acre.

Further residential developments, it is suggested, should be in the medium-density areas, where 40 to 70 persons per acre live. Such medium-density pockets have been earmarked for development around the existing steel township, in the projected Durgapur Development Authority township and to its north, and in the proposed Fertiliser Corporation township as well as in the areas north of it.

The high-density residential sector shown in the Plan (Map 9) already exists, and this has been accepted in the Plan. The density range here is 70 to 120 persons per acre. The CMERI colony is well within this range. It is suggested that this sector, which will be set apart by the proposed north-south road, should be developed to hold approximately 63,000 people.

LAND USE—COMMERCIAL

The commercial facilities suggested in the Plan are of three kinds: convenience shopping in residential blocks, clusters of small shops for neighbourhoods, and major shopping centres for the city as a whole. Two major centres are envisaged in the Plan—one in the Benachiti bazar area and the other in the DDA township. The circumstances which reared the mushroom growth in Benachiti have been described earlier. The levels of its growth, the variety of commercial services available there, and the economic strength that Benachiti enjoys, leave no alternative to this bazar area being developed by suitable renewal and expansion, and by physical improvements, so that it can become one of the major commercial centres in Durgapur. Since Benachiti is almost on the western fringe of Durgapur, the Plan suggests that a second major commercial/civic centre be located in the DDA township. Here again, the Plan takes cognisance of the proposals already made by the DDA. This sector will contain provisions for major government offices and community facilities, such as educational institutions and hospitals. The present market area in Durgapur village, south of the Grand Trunk Road, can continue as a neighbourhood shopping centre, along with the other such centres existing or proposed. In all, a little more than 600 acres in the entire urban area are proposed for commercial uses.

PUBLIC AND SEMI-PUBLIC USES

Health

Six major hospitals are indicated in the Plan to cater to the needs of the population anticipated by 1986. These consist of the existing three hospitals in the townships of Durgapur Steel, Coal Mining and Allied Machinery, and Durgapur Projects Ltd., and the proposed three new hospitals. The new hospitals will be located: in the civic/commercial centre of the DDA township; by the side of the north-south road almost in the middle of the city; and along the proposed east-west arterial road near Benachiti. In keeping with the standards generally prescribed for such hospitals, each hospital will require a minimum of 10 acres of land.

Besides the major hospitals, the Plan provides for nineteen new health centres to serve the new residential sectors. Each of these centres will require about one acre of land and will serve a population of 20,000 to 25,000.

Education

The total area recommended for educational institutions in the Plan is about 300 acres. The table, next column, gives the total requirements for different types of educational facilities and their approximate coverage of pupils.

TABLE XLVI
REQUIREMENTS FOR EDUCATIONAL FACILITIES
DURGAPUR INITIAL PLANNING AREA

Facilities	Total Number of Pupils	Number of Schools Proposed
Primary	49,000	216
Secondary	30,750	51

In addition to these facilities, there will also be colleges and technical institutions. It is recommended that, as far as possible, the new educational facilities should be sited in such a way as to make use of open spaces in the city, so that the children may have access to recreation space.

Besides facilities for health and education, the Plan provides for such other public facilities as post offices, police stations, etc. In all, the total land suggested for public and semi-public facilities will be about 1,000 acres or about four per cent of the total urban area.

Open Spaces

One of the major attractions that Durgapur has is that it is situated amidst open green lands. However, in the past decade, due to the growth of industries, especially in the strip between Grand Trunk Road and the Eastern Railway line, the area has been steadily denuded of all vegetation. In some of the townships large-scale deforestation took place in the early stages of construction. The residents thus have been deprived of the much needed tree-cover and greenery. The strands along and around the water bodies upto now have remained generally under-utilised, and in many places thoughtless excavations and brickfields have damaged their beauty and utility. If the Durgapur urban area is not to degenerate into a mere collection of industries and houses, it is most essential that every effort be made to maintain as well as foster the present comparatively open environment. This can be done by ensuring that, along with residential and industrial developments, sufficient land is earmarked to be kept as open spaces. Besides acting as barriers to the spread of unrestrained growth, such open spaces can accommodate playfields and serve many other community needs. The four major recommendations in the Plan in regard to open spaces are given below:

1. The green belt proposed, and partly achieved, by the DDA should extend along the whole length of the G. T. Road, particularly to the north and, as far as possible, to the south.
2. The water-front along the Damodar, stretching from the DVC thermal power station to Babanabera well below the barrage, should be preserved and developed.

3. The existing open spaces in the middle of Durgapur steel town should be preserved.
4. Major open spaces in the middle of the DDA township and along the north-south road should be kept reserved.
5. Apart from conserving major open spaces, adequate provision should be made within the sectors and neighbourhoods for playgrounds and parks.

In all, 4,630 acres are suggested in the Plan for preservation as open space. This will comprise about 12% of the total Initial Planning Area.

TRANSPORTATION

The transportation system for Durgapur will consist of a network of roads and the railways. As regards the latter, since the industrial area lies mainly to the south of the G. T. Road, the Eastern Railway main line and the industrial sidings together should constitute adequate facilities for movement by rail. The road network suggested in the Plan is based on the principle that the various industrial and residential developments, existing and proposed, should be integrated as far as possible. In formulating proposals for road transportation within the Durgapur urban area, the existing road system has been fully considered; in fact, many of the proposed roads are extensions of the existing roads in the area.

THREE TYPES OF ROADS

The Interim Development Plan deals with three types of roads: trunk roads, arterial roads and link roads. The trunk roads provided in the Plan are the existing G. T. Road and the proposed Calcutta-Durgapur Expressway. The arterial roads will connect major industries and generators of traffic, while the link roads will be the chief means of communication between work centres and places of residence. The arterial roads will have a 200-foot right-of-way with four to six lanes for vehicular traffic, and will have divided roadways. Similarly, the link roads will have a 150-foot right-of-way with four lanes of traffic. Both types of roads will have provision for bicycle tracks and side-walks, pull-out bays for bus-stops, landscaping and controlled access. The right-of-way specifications are slightly larger than what are usually prescribed. This is because in Durgapur, with its concentration of manufacturing industries, heavy vehicular and fast-moving motorised traffic will preponderate. Furthermore, standards have to be high in some cases in order to integrate the road systems in the existing townships which have already been built according to liberal standards.

Collecting traffic from neighbourhoods and affording access to individual properties will be the functions of the next lower category of roads and streets; at this stage the Interim Plan does not spell out any detailed proposals; however, it is envisaged that about 7,000 acres—about 18% of the whole urban area—may have to be devoted to transportation uses. The various proposals for roads are described here.

TRUNK ROADS

The growth of Durgapur has had the following implications for the G. T. Road:

The road has had to cope with increased traffic to and from Durgapur.

Secondly, as industries came to be located to the south of the G. T. Road and residential townships to the north of it, the road became the dividing line between places of living and places of work. This resulted in a considerable volume of commuter traffic crossing the G. T. Road both ways. This, in turn, has reduced its usefulness as a through-way.

Thirdly, in the absence of suitable roads interlinking the major industries and townships, the G. T. Road itself has had to fulfil this need.

Lastly, the construction of the DVC Barrage opened up an all-weather road link to Bankura and Midnapur Districts; consequently, a large volume of traffic to these places, originating in Bihar, Upper West Bengal, and even in Calcutta, uses the G. T. Road.

All these factors have had a cumulative effect on the 11-mile stretch of the G. T. Road within the Durgapur urban area, greatly reducing its capacity and detracting from its usefulness as a national highway.

In view of the increasing industrialisation in Eastern India generally, it can safely be stated that the use of the G. T. Road is bound to increase. Schemes are already under execution to provide bypasses for the G. T. Road between Bally and Adisaptagram and also at Mogra, Pandua, Burdwan and Asansol. With these bypasses, the present tortuous alignments will be avoided and the densely populated areas will be circumvented. Under the Coal Roads Improvement Scheme, stretches of the G. T. Road are being widened and road surfaces suitably strengthened. It is obvious, therefore, that in the region as a whole the G. T. Road will continue to be the major highway for intra-regional traffic. Any transportation plan for Durgapur will naturally have to permit maximum use of the G. T. Road for traffic within the entire region. Obviously, this highway cannot discharge its functions properly if it is used also as a local link for the traffic within the Durgapur urban area.

The Plan therefore proposes that an east-west link road should be provided running closely parallel to the G. T. Road on the north. Since two arterial roads are being proposed in addition, namely, the east-west road and the southern ring road, to perform similar functions, this link road needs only a 100-foot right-of-way to support four lanes of traffic and bicycle lanes. It is further proposed that this link road should be located in the corridor of 1,000 feet to 1,130 feet now available along the G. T. road between the residential and industrial areas. At present, in this corridor, the DDA has provided two green strips—one of 300 feet (in the south) and another of 600 feet (in the north)—while the G. T. Road covers a width of 150 feet. It is expected that sufficient land will be available in the corridor for the proposed road and that it will not encroach upon the green strips.

ARTERIAL ROADS

The following five arterial roads are suggested in the Plan:

(i) *The southern ring road.* This road will take off from the G. T. Road between the 119th and 120th miles, will flank the Durgapur Steel, Alloy Steel, Coke-Oven (DPL) and Fertiliser plants, and then run along the Eastern Railway main line. This road will provide the main road-connection among the major industries, and will be used principally by heavy vehicular traffic. A portion of the road already exists, running along the steel plant.

(ii) *The east-west road.* This road will take off from the expressway in the east, proceed through the DDA township and along the north of AVB and Mining and Allied Machinery townships, cross the north-south road and run south of the steel township, connecting with the northern ring road. The road will be the arterial link for the different townships and, in particular, between the civic-commercial centres of Benachiti and the DDA township. As envisaged in the regional plan for Asansol subdivision, this road is projected towards Ukhra.

(iii) *The north-south road.* This road will originate from the northern ring road, proceed south and, after crossing the Eastern Railway main line, terminate at Durgapur railway station. The road will be the major divider between North and South Durgapur and will be the most important link with the railway station. A portion of this road exists now, running from Waria Station to Durgapur Station.

(iv) *The Bankura Road.* This road will take off from the 109th mile of the G. T. Road, cross the Eastern Railway line and the DVC canal, and run south of the canal upto the barrage. It will facilitate the movement of traffic from Calcutta or Upper West Bengal, proceeding to Bankura and avoiding Durgapur.

(v) *The Expressway Feeder Road.* This road will take off from the G. T. Road at the 109th mile and proceed due north, touching the expressway. The alignment of the expressway, shown in the Plan, is in accordance with the regional plan for Asansol subdivision.

LINK ROADS

Eight link roads have been suggested. These are grouped as under:

(i) *The northern ring road.* This road will take off from the G. T. Road between the 119th and 120th miles, and will proceed north and then east along the periphery of the Durgapur urban area. Apart from containing urban growth within the planned limits, it will also serve as the major link for the various residential developments proposed along the northern periphery of the Initial Planning Area.

(ii) *The north to south link roads.* These proposed roads will make full use of the existing major roads. There will be five such roads—Durgapur Steel Township Road, the Mahatma Gandhi Road, Mining and Allied Machinery Township Road, and two roads on western and eastern peripheries of the DDA township.

(iii) *The east to west link roads.* There will be two such link roads, in addition to the northern ring road. One of these two roads is an extension of the existing avenue that runs through the steel township. The other will be a second parallel road to the G. T. Road, interconnecting the northern entrances of the major industries. Here again, the road is already in existence for some length.

These are the major link roads. The Plan provides for other link roads which in total constitute an effective circulation network.

BRIDGES AND UNDERPASSES

The Grand Trunk Road and the Eastern Railway four-track main line have been the chief instruments in the development of Durgapur; at the same time they are also the effective barriers to the spatial development of the area. The industrial zone to the south of the G. T. Road is divided laterally by the railway line, with the DVC Thermal Power Station, the Durgapur Chemicals and the Durgapur Projects' township being the major developments across the railway on the south. The space allotted for future industrial expansion also falls south of the railway line. Similarly, in the case of the G. T. Road, the residential developments for anticipated population of over 4,00,000 will be on the north and all the work centres, which support this population, be on the south. With the anticipated increase in employment in the industries, it is likely that well over a lakh of people will be travelling daily between places of their living and work places. There will also be considerable movement of various commodities and other necessities of life. The network of arterial and link roads suggested for the urban area is so designed as to cope with this traffic.

The Plan provides for five bridges over the Eastern Railway main line. One of these is already in existence. The Durgapur Projects link road passes over this bridge. Another bridge on the link road between the steel plant and the DVC power station near Waria railway station is to be taken up shortly. The other three bridges are mentioned below; their construction is to be taken up in the order they are mentioned.

1. On the Bankura Road which is a state highway. In the absence of a bridge over this road all traffic from Upper West Bengal and Calcutta, bound for Bankura, has now to go through the core of the Durgapur urban area.
2. At the Nadiha crossing near Durgapur railway station, to ensure an arterial facility for the large block of land south of the railway line that is earmarked for future industries.
3. On the north-south arterial road. This bridge is necessary because the existing overbridge to the east of this road is of inadequate capacity.

All the bridges should have four-lane capacity; the second and the third will need bicycle tracks and sidewalks as well, to cater to commuting traffic.

In the suggested road system, arterial and link roads cross the G. T. Road at eight locations. For five of these, which are link road crossings, underpasses or overpasses

are suggested. For the three arterial road crossings, for the present, no level separation is suggested for the following reasons:

- (i) the arterial roads are intended to connect with work centres in the region and, as such, will not need access to the G. T. Road;
- (ii) a multi-level interchange providing such access will need massive investments;
- (iii) for the present, interchange facilities can be provided at the same level by suitable roundabouts.

Out of the five link roads for which passes are suggested, one has been taken up for execution: the underpass for the Mining and Allied Machinery Corporation Road. The remaining four are suggested in the following order:

1. For the steel township—steel plant road now under construction (since this road leads to the main entrance of the plant, a right-of-way without crossing will carry the bulk of the daily traffic between the township and the plant).
2. For the link road, east of the DDA township, to provide a convenient link between the residential development in the north, including the Fertiliser Corporation township and the host of small and medium industries, in addition to the large fertiliser plant.
3. For the Mahatma Gandhi Road, to connect the Alloy Steel Plant and other industries with the residential developments along the north-south road to its west.
4. For the link road west of the DDA township.

The suggestions of priority for the various crossings made above are naturally of an interim nature. Engineering considerations and the economics of investment in each case will determine the actual priority and the type of crossing. The detailed traffic projections and recommendations for the urban area will be made during the comprehensive planning stage, keeping in mind that a speedy and efficient circulation system is vital for an urban area's growth and sustenance.

AGRICULTURAL RESERVES

The 1,630 acres reserved for agricultural uses are located below the steel township, west of Benachiti. The area has been included in the urban area plan mainly because of this location: it cannot be left out without prejudicing the future character and physical integrity of Durgapur City. However, no significant residential developments are possible in this area because the nearest work centres are the Durgapur Steel and Alloy Steel Plants, for which adequate residential support will be available in the township areas. It is therefore proposed that these 1,630 acres be reserved for intensive market-oriented agricultural uses such as horticulture. The demand for daily supplies of vegetables, eggs and such other produce in a city of more than five lakhs will be considerable, and it will be preferable if the needs, at least in part, can be

met within the area. Most of the lands involved are of good farming quality, and the promotion of their optimum use should not be difficult, considering that Durgapur is already covered by the Burdwan District Intensive Agricultural Development Programme.

PLAN ENFORCEMENT

In the Durgapur urban area, development controls have been exercised thus far by the Durgapur Development Authority, under the Durgapur (Development & Control of Building Operations) Act 1958, through directions issued by the State Government relating to building operations, maintenance of green belts, reservation of areas for developments, etc. The Act does not provide specifically for land-use controls, however. It is therefore recommended that, in addition to the various directions now in effect under the above Act, the Calcutta Metropolitan Area (Use and Development of Land) Control Act 1965 should be applied for matters not provided for in the Durgapur Act. The DDA, or one of its officers, may then be designated as the Controller of Land Use under the latter Act. The land-use controls proposed for Durgapur are described below. These are to apply to all public and private agencies and to all individuals unless specified otherwise.

CONTROLS FOR THE INITIAL PLANNING AREA

Within this area, uses of land and its development shall generally conform to the provisions in the Interim Development Plan. Specifically:

1. The land space, designated as arterial and link roads, open spaces and recreation areas, agricultural reserves, and areas for expansion of residence, shall be reserved.
2. The areas designated for industry shall be used only for industrial and accessory facilities.
3. The areas designated as residential shall be used only for residential purposes, provided that at locations contiguous to existing commercial areas, work-cum-residences can be permitted.
4. The areas, designated as commercial, public and semi-public, shall be used only for shops, offices, business facilities, schools, hospitals, and similar facilities.
5. No building shall be constructed closer than 100 feet from the edge of any arterial road or 50 feet from the edge of any proposed link road.
6. No building shall have direct access to any arterial road.
7. No construction or excavations shall be closer than 200 feet from the banks of the Damoder river and 100 feet from any other river, stream, nallah or canal; and no industrial, chemical or other waste, or obnoxious matter likely to be injurious to public health and safety, shall be discharged into any such river, stream, nallah or canal; further, no construction like a bund, bridge or excavation

for sand, etc., likely to affect the flow of water or the natural course of drainage in the area, shall be permitted.

8. No new excavations for stone, sand or brick-making shall be allowed in the Initial Planning Area.

In formulating the above controls for the Initial Planning Area, it is intended that, subject to the transportation and land-use pattern outlined in the Plan, and within the existing limits of their industrial and residential areas, the major establishments such as Hindustan Steel Ltd., Durgapur Projects Ltd., Durgapur Chemicals Ltd., the Damodar Valley Corporation, the Mining and Allied Machinery Corporation, and ACC-Vickers-Babcock Ltd. will be free to carry out developments in pursuance of their plans for present and future expansions.

CONTROLS FOR THE EXTENDED PLANNING AREA

Besides the controls for the Initial Planning Area, the following additional controls are recommended for the Extended Planning Area:

1. The existing land uses will be permitted to continue.

2. No changes in the existing land use will be permitted, except for residential and small commercial uses closely connected with the existing uses.

3. No industrial or accessory facilities will be permitted.

4. The special provisions regarding roads, water courses, and excavations, as indicated under the controls recommended for the Initial Planning Area as per items nos. 4, 6, 7 and 8, will also apply.

INTENTION OF CONTROLS

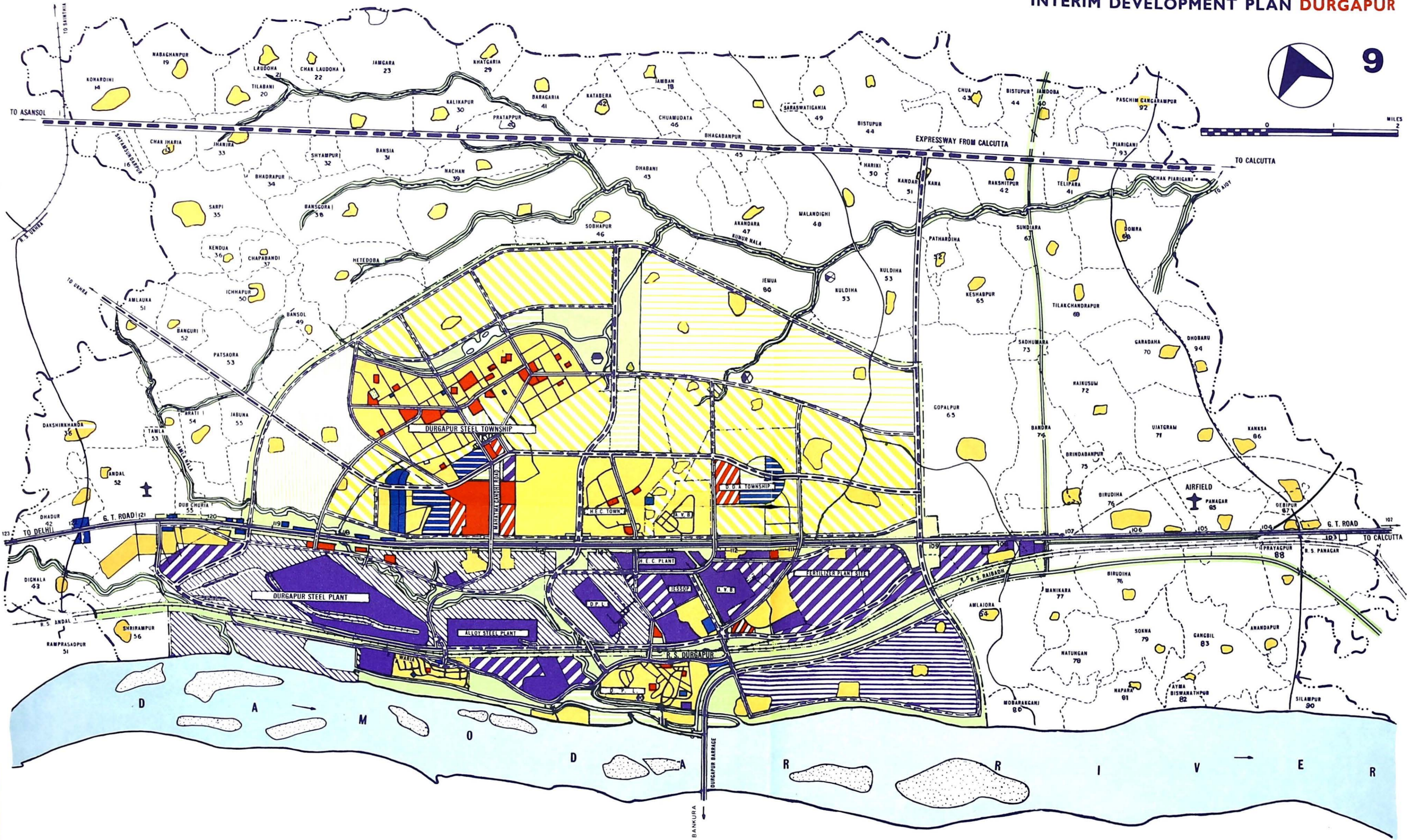
In both the Initial and the Extended Planning Areas it is intended that all the public agencies and all the departments of the Central and State Governments shall conform to the provisions of the Plan regarding land use, location and standards in respect of their projects, and shall obtain prior approval of the Land Use Controller before initiating land acquisition proposals for the same.

It is intended further that the land-use controls will not apply to agricultural uses or uses connected with agriculture, except for such large-scale processing activities as rice mills.

INTERIM DEVELOPMENT PLAN DURGAPUR



9



LEGEND

EXISTING RESIDENTIAL AREA	PROPOSED BUSINESS & COMMERCIAL	PROPOSED PUBLIC & SEMI-PUBLIC	RESERVED AGRICULTURAL AREA	PROPOSED MAJOR ROADS	PROPOSED SEWAGE TREATMENT PLANT	INITIAL PLANNING AREA BOUNDARY
PROPOSED RESIDENTIAL AREA (DENSITY 40-70 PERSONS/ACRE)	EXISTING INDUSTRIAL AREA	EXISTING RECREATION AREA	DURGAPUR GAS PIPELINE	OTHER EXISTING ROADS	WATER BODY	EXTENDED PLANNING AREA BOUNDARY
PROPOSED RESIDENTIAL AREA (DENSITY 70-120 PERSONS/ACRE)	PROPOSED INDUSTRIAL AREA	PROPOSED RECREATION AREA	EXISTING AIRFIELD	EXISTING RAILWAY LINE	INDUSTRY/TOWNSHIP BOUNDARY	FUTURE RESIDENTIAL EXPANSION
EXISTING BUSINESS & COMMERCIAL	EXISTING PUBLIC & SEMI-PUBLIC	OTHER OPEN SPACE	EXISTING MAJOR ROADS	EXISTING SEWAGE TREATMENT PLANT	MOUZA BOUNDARY	FUTURE INDUSTRIAL EXPANSION

PLAN IMPLEMENTATION

THE ADMINISTRATIVE STRUCTURE

The successful implementation of the Interim Development Plan for Asansol-Durgapur and the comprehensive plan when formulated will depend upon the establishment of an adequate planning and implementing machinery both at the regional and at the local urban levels.

At present, the mining settlements and contiguous villages are the responsibility of the Asansol Mines Board of Health (a State Government organisation) and the Coal Mines Labour Welfare Organisation (an inter-state Central Government agency, with headquarters at Dhanbad in Bihar). In the urban areas of Asansol and Raniganj there are two municipalities established under the Bengal Municipal Act 1932. In the Durgapur complex, a Notified Area Authority performs functions of a local government authority for the newly growing industrial area, under the Bengal Municipal (Second Amendment) Act 1960 which, by amending the Bengal Municipal Act 1932, provided for the setting up of the notified area authorities in areas which do not qualify to have a municipality, or are new industrial areas or areas comprised in a newly developing town. In the rest of the subdivision (except Kanksa police station which is covered by a Panchayat, a unit of rural self-government) there is almost a vacuum at the moment in the field of local planning and development. In such areas the State Government has been functioning directly through its departments and local offices since 1947 when the Asansol Local Board was abolished, and subsequently

from the time the District Board started losing its pre-eminent position following the introduction of Panchayats, and the establishment of a Zilla Parishad in the District. In addition to these agencies, the Durgapur Development Authority (DDA) was established under the Durgapur Control of Building Operations Act 1955, primarily for the purpose of control of building activities in the newly growing area. However, the DDA has also been performing developmental functions as an agent of the State Government, on the strength of directions issued by the Government, undertaking schemes like industrial area and township development.

ADMINISTRATIVE REQUIREMENTS OF PLANNING AND DEVELOPMENT

The primary requirement of planning and development in the Asansol subdivision and its major urban centres and mining settlements is that once a plan is formulated and adopted by the Government, the Central, the State and the local authorities should proceed in conformity with that plan in regard to all subsequent planning and developmental activities.

Secondly, planning and development in Asansol-Durgapur should be viewed not only in the perspective of local urban areas, but also in the broad perspective of the entire region. The Asansol subdivision, physically and economically, represents a unique situation, a truly multi-functional yet an organically related region. The subdivision requires planning and development—local and regional; the latter no less imperatively than the former. The administrative processes, and the agencies to be established for the purpose of plan implementation, have thus to provide for both regional and local (urban) planning, and also guidelines for plan implementation.

Thirdly, the planning area already has a number of authorities and agencies and, therefore, attention has to be given primarily to the evolving of processes for coordinated working among these agencies, and for improvement in the jurisdictions, functions, finances and working of the existing agencies, so that they may be able to contribute more towards the success of comprehensive planning and development for the subdivision.

And lastly, the fabric of local urban government in the planning area has not developed at a pace in keeping with the process of industrialisation in the Asansol-Durgapur region. As a result, the old existing municipal bodies like Asansol and Raniganj have continued to operate within their limited territorial jurisdictions and incomes; these limitations have restricted the scope of their operations and the standard of services offered by them.

THE DURGAPUR DEVELOPMENT AUTHORITY

A discussion on the processes and agencies for planning and development in the Asansol subdivision should start with the Durgapur Development Authority, an agency which, under directions issued from the Government, has been carrying on certain

important planning and development functions in one of the two major growth nodes of the subdivision. Under the statute, the Authority is empowered, on the strength of directions issued by the Government in this behalf, to act in any one or more of the following matters:

- (a) the division of any site into areas for the erection of buildings generally, or buildings of any particular class or classes;
- (b) the reservation of land for roads, open spaces, gardens, recreation grounds, schools, markets and other public purposes;
- (c) the development of any site into a township;
- (d) the erection of buildings on any site and the amenities to be provided therein;
- (e) the erection of shops, workshops, warehouses, factories, offices, industrial or commercial establishments or godowns on any site; and
- (f) any other matter which is necessary for the planned development of the area, including the construction by the Authority of buildings with necessary amenities.

After a direction has been issued under the above provisions of the statute by the State Government, no person can undertake or carry out, in the area to which the direction relates, the development of any site or erect any building, except in accordance with the direction and/or with the previous permission of the Authority. The statute also empowers the Authority to adopt penal steps against persons contravening its directions. In addition to building controls which the Authority has been exercising since its inception, the State Government has also entrusted the Authority with the execution of two major development projects in the area—the industrial area scheme for subsidiary industries, and the Durgapur township project. Since the DDA does not have its implementing staff and machinery, the work has actually been executed through the Durgapur Projects Ltd., which body again acts as contractors to the Authority. The territorial jurisdiction of the Durgapur Development Authority extends at present to the police station areas of Kanksa, Faridpur and Andal, but the area to which the directions issued by the State Government under the statute apply is smaller. This is because control of building operations is intended to be kept restricted to an area smaller than the operational jurisdiction of the Authority. Since the growth of Durgapur has been very rapid and further growth is desirable and inevitable, the dichotomy between directional jurisdiction and initial jurisdiction of the DDA is no longer suitable for the planned development of the area.

For the Asansol urban area, however, there is no development authority functioning at the moment. The Asansol Planning Organisation, in accordance with the government resolution establishing it, is responsible for planning in this area too, as in the whole subdivision.

PROPOSAL FOR A WATER BOARD

The establishment of a Water Board has been proposed for the execution and maintenance of the Raniganj Water Supply Project for the coal-mining settlement areas, including Raniganj. This Water Board is also to be empowered to sell water in bulk to municipal units for distribution within the urban areas.

The water management problem of the subdivision is one which requires comprehensive planning and development, in view of the possibility that, if adequate steps are not taken from the beginning, water scarcity may be a serious obstacle to development after 1976. The claims of competing users, and the prevalence of uncoordinated exploitation of water resources of the subdivision, and the need to ensure additional supplies for the region as a whole to ensure its integrated growth, make it essential that water management is viewed as a regional problem for the Asansol subdivision, and that an agency is created to tackle the problem on a regional basis.

PROBLEM OF COMMUNICATIONS

In 1947 the Local Board at Asansol, which used to maintain the sizeable road network of the subdivision, was abolished, and this responsibility was entrusted with the District Board. With a large mileage of roads to maintain with a meagre financial provision of Rs. 2 lakh per year, the District Board has naturally failed to ensure proper upkeep of the roads, which have deteriorated badly. In 1963-64 the State Government with the assistance of the Central Government undertook the Coal Roads Scheme to improve as many as 21 feeder roads and the NH 2; but this scheme has recently run into financial difficulties. Even after the improvement scheme has been carried out, regular maintenance would be necessary if the roads were not to deteriorate and fall again into a state of disrepair.

HOUSING

In the field of housing there are at least three different public agencies operating within the subdivision, viz., the Coal Mines Labour Welfare Organisation in the mining areas, the DDA in Durgapur (the township project), and the Housing Directorate of the Government of West Bengal (Asansol satellite township). The deficits in housing are within manageable proportions, and can be tackled if a concerted attempt is made, both in the public and in the private sectors. In the coal-mining areas in particular there is a need to give impetus to the projects for providing cheap and low-cost housing.

HEALTH, EDUCATION AND RECREATION FACILITIES

Commendable work has been done by the Mines Board of Health in the mining settlements in providing health facilities. A regional hospital constructed by the Coal Mines Labour Welfare Organisation has also been a distinct gain for the area. Nevertheless, for the general public living outside collieries and industrial areas, health facilities are not adequate. In the urban areas, because of the poor financial resources of the local bodies, considerable deficits also exist in primary educational facilities; the position is no better in regard to public amenities like parks and recreation facilities.

STATE GOVERNMENT AGENCIES

A number of major State Government agencies, the Public Health Engineering Directorate and the Public Works (Roads) Directorate among them particularly, also operate in the subdivision within their respective functional responsibilities. The Public Health Engineering Directorate is responsible for the execution of major urban water supply projects; the Raniganj Coalfields Water Supply Scheme and the Asansol Urban Area Water Supply Schemes have been formulated by the Directorate. The Coal Roads Improvement Scheme is being executed through a Special Division of the Public Works (Roads) Directorate at Asansol.

REGIONAL PLANNING AND DEVELOPMENT AUTHORITY

For the orderly growth of the Asansol subdivision, for preservation of its agricultural and mining areas, and for the planned extension of its five major urban growth nodes, the formulation of a regional plan and its implementation are absolutely essential. Without such a plan, and without its implementation and enforcement, the maintenance of a balanced growth pattern that insures against the scattering of urban growth and the spoilation of the subdivision's agricultural and resource areas, may very well be impossible. A regional strategy for the development of the subdivision as a whole has been recommended in Chapter 4. The regional strategy will have to be developed, in greater detail, into a regional plan for the subdivision during the comprehensive planning stage. It will also be necessary to establish a suitable organisation for the enforcement and implementation of the plan.

In the Durgapur Development Authority, the Asansol subdivision is fortunate to have a nucleus for such a regional planning and development authority. Its territorial jurisdiction already extends over three police station areas in the subdivision. The urban areas of the subdivision are expected to have a population of about 15 lakh by 1986; this is by no means a population too large to be handled by one development authority. The establishment of separate development authorities for the other major growth nodes of the region is not desirable in view of the 1986 estimates of population for these areas being relatively small. In fact, a proliferation of development agencies is also not conducive to the over-all economics and efficiency in administration. Physically, the major urban growth nodes almost stretch in a continuous horizontal belt from east to west and upward to the north-west.

It is recommended that, with the Durgapur Development Authority as the nucleus, a Regional Planning and Development Authority be established for the Asansol subdivision. The main functions of the Authority should be the following:

1. Formulation and enforcement of a regional development plan for the Asansol subdivision.
2. Formulation and implementation of local development plans for the five major urban growth nodes of the region, viz., Asansol, Durgapur, Kulti-Barakar-Niamatpur-Dishergarh complex, Raniganj, and Chittaranjan-Rupnarayanpur complex.

3. Enforcement of local urban area development plans in such areas as may be directed by the Government.
4. Undertaking and execution of development schemes for housing, urban renewal, townships, roads, parks and recreation areas, sewerage and drainage, etc., in the five major urban growth nodes of the subdivision.
5. Maintenance of the major arterial road system in the subdivision, excluding the regional highways and the roads maintained by departments of the State Government at present.
6. Development and maintenance of regional recreation areas and green belts.

The functioning of the Authority should extend to the whole of the Asansol subdivision, but, in areas within the jurisdiction of the Asansol Mines Board of Health and the Coal Mines Labour Welfare Organisation, the two existing authorities should continue to operate as at present. In view of the crucial importance of the region for the country's major industrial developments the Regional Authority may be vested by the Government with the power to enforce local development plans also, if in any particular area the State Government consider it necessary. In all other cases, normally the enforcement powers for local plans may be vested with the local authorities. Initially, it is recommended that the following steps be taken:

1. A comprehensive legislation be enacted for the establishment of a full-fledged Regional Planning and Development Authority replacing the existing Durgapur Control of Building Operations Act 1955.
2. The operation of the Regional Authority for planning and enforcement purposes be extended to the whole Asansol subdivision.
3. The operation of the Regional Authority be initially confined to the Asansol and Durgapur urban areas for development purposes, and, later, be extended to Raniganj and the Kulti and the Chittaranjan complexes and other areas of the region by notification.
4. The activities of the Authority in respect of development projects be carried out in coordination with the work and functioning of other State and Central Government agencies operating within the region.
5. The Authority should have an adequate organisational machinery for planning, and for plan enforcement and implementation.

The State Government have under consideration a proposal for a unified legislation providing for the establishment of development authorities in the State. To what extent the proposed Regional Planning and Development Authority can be accommodated in this proposed state statute deserves to be examined. If it is not feasible to accommodate the Regional Authority within the purview of the unified legislation, a separate statute for the Asansol-Durgapur Regional Planning and Development Authority will be required.

It is recommended that the Authority be established and made operative in 1966-67. With the establishment of the Authority, the Durgapur Development Authority and the Asansol Planning Organisation should merge with it and thus cease to be separate units.

As regards the financial resources for the operation of the Authority, it is recommended that a detailed study be made to assess the potential sources which can be utilised both at the regional and at the State levels. The road cess on coal annually yields about Rs. 12 lakh, and the receipts from motor vehicles tax in the subdivision are estimated to yield an equal amount. The possibility of making an annual subsidy from the State Government to the Authority for the maintenance of the regional road network should be explored. Many of the schemes like housing, urban renewal and townships can be operated through a revolving fund, with an initial capital grant from the State Government or other sources. Since the major developmental projects in urban areas will be executed by the Authority, a surcharge can also be levied on the local municipal rates for financing the activities of the Authority. A thorough examination of the fiscal base of the region is obviously necessary before any firm proposals can be made for financing the Authority. It is however reasonable to assume that, in a growing industrial area like the Asansol-Durgapur region with higher levels of income than in many other areas of the State, such developmental activities are a precondition to increased productivity and economic efficiency of the population, and that the financial resources needed for such development could largely be raised locally through a proper and rational fiscal approach.

REGIONAL WATER BOARD

The Raniganj Water Supply Scheme, already referred to, proposes the establishment of a Water Board. As in the case of the Durgapur Development Authority, the establishment of a Water Board can be utilised with advantage for setting up a regional agency for water supply in the subdivision. The crucial importance of an integrated regional water management programme, and the present situation of chaos and the lack of coordination in water development and utilisation in the subdivision, make it absolutely necessary, for the growth of the region, to have a regional agency entrusted with the responsibility of planning for and developing the water resources of the subdivision, and ensuring adequate water supplies for the growing urban areas in the region and the mining settlements. In the urban areas the distribution of water may be left to the local authorities as, in view of the distances and physical limitations, it may not be feasible for a regional body to be responsible for the large distribution system also. For these areas, therefore, the Regional Board may serve as a bulk supplier of water. The same procedure may be applied to areas covered by the Asansol Mines Board of Health.

Water supply should in the long run be a self-financing proposition through charges levied on the basis of consumption, with adequate provision also for debt services, payment of interest, operational expenses, etc. The Regional Water Board, as has been

recommended, should be competent to raise loans from the State Government and agencies like the Life Insurance Corporation of India, and to levy water charges that will ensure recovery of capital costs and operating expenses. By suitably assessing the charges, it should be also possible for the Board to provide for some funds for further capital investment and expansion of facilities. The jurisdiction of the Water Board, as in the case of the Planning and Development Authority, should extend to the whole Asansol subdivision. The Board should, however, conform to all planning and development requirements that the Regional Planning and Development Authority may legitimately impose.

It is recommended that, alongside the Regional Planning and Development Authority, the Water Board also be made operative in 1966-67.

ASANSOL MINES BOARD OF HEALTH

Under the Bengal Mining Settlement Act 1912, the Asansol Mines Board of Health is responsible for control of health and sanitation in the mining settlements of the subdivision, largely outside the major urban centres of the region. Under the Act of 1912, the Board functions primarily as an authority for sanitation and health measures and for improvements in the mining areas; maintains dispensaries, maternity and child welfare centres; undertakes vaccination and inoculation drives against epidemic diseases; adopts measures to control infectious and epidemic diseases generally; and undertakes similar other community welfare functions. In 1964-65, out of a total expenditure of Rs. 11,54,570, the Board spent Rs. 62,355 on general administration, Rs. 6,28,859 on medical and sanitary services, and Rs. 1,49,816 on other miscellaneous items of expenditure. The income of the Board is mostly derived from the tonnage cess on coal. In 1964-65, out of a total income of Rs. 9,26,668, excluding the opening balance, Rs. 7,84,870 were received from the tonnage cess on coal; a small sum of Rs. 288 from the royalty cess (income from which has fallen due to legal difficulties in assessment); Rs. 13,802 from licence fees; and the rest from miscellaneous sources, including Rs. 50,000 from the Coal Mines Welfare Fund.

The Act of 1912, under which the Board has functioned so far, is soon to be replaced by a more comprehensive Act, which has already been enacted by the State Legislature. The West Bengal Mining Settlements (Health and Welfare) Act 1964 provides for a wider and more comprehensive range of functions for the Board, as also for a wider resource base. The Act of 1912 only provided for undertaking water supply or other projects by the Board, and that also in the case of default by an owner of mines or lands occupied by the mining settlements. Otherwise, the 1912 Act was largely restricted to health and sanitation controls, including enforcement of sanitary regulations. But the 1964 Act specifically provides, under Section 18, that the Board may, on the recommendations of the Health Officer or otherwise, undertake in the mining settlements such measures as it considers necessary. These measures may relate to (i) the supply of filtered or other water; (ii) ensuring sanitation, drainage, conservancy, maintenance of public health, and prevention or abatement of nuisances;

(iii) the provision of housing for the residents in the mining settlements, whether permanent or temporary; (iv) the prevention of outbreak and spread of diseases and the combating of epidemic and other diseases; (v) the provision of proper treatment facilities for the sick through the establishment and maintenance of hospitals and dispensaries, and a medical staff; (vi) the regular inspection of foodstuffs exposed for sale in the mining settlements and the submission of reports to the Food Inspectors appointed under the Prevention of Food Adulteration Act 1954; and (vii) the registration of births, deaths and diseases in the mining settlements. The Act, in addition, provides for the giving of directions to owners of mines or lands in mining settlements to carry out improvements, etc., failing which the Board itself may execute the work and recover the expenses from the defaulters. The 1964 Act is, therefore, very broad and comprehensive in scope, and, in fact, has transformed the Board into a local authority for the mining settlements.

The 1912 Act relied only on the tonnage cess and the royalty cess for financing the work of the Board. The 1964 Act, on the other hand, provides that the Board may assess on the owners of a mine or mines, whose employees reside within the mining settlements, (a) a fee payable by all such owners, and also (b) a water rate and a conservancy rate payable within the area or areas where the Board may have arranged for water supply or conservancy. The fee, the water rate and the conservancy rate can respectively be fixed as follows: (i) not exceeding Rs. 10 per 100 tonnes; (ii) fifteen paise per tonne; and (iii) not exceeding twenty-five paise per tonne. The Act, unlike the 1912 statute, also provides for the establishment and the operation of a Mining Settlement Fund by the Board to which the fees and rates, and the incomes received from other sources shall be credited.

In the 1964 Act, the mining settlements have been provided a very powerful and comprehensive development authority. The Act vests in the Mines Board of Health a wider range of functions than hitherto and endows it with greater financial resources.

It is therefore recommended that the new Act of 1964 be brought into effect as early as possible and that the Mines Board of Health and its activities be reorganised under the provisions of this Act.

Along with the Coal Mines Labour Welfare Organisation, which attends to major housing, and health and welfare schemes for colliery labour, the reconstituted Asansol Mines Board of Health will meet the requirement of an adequate administrative machinery for ensuring environmental improvements as necessary in the mining settlements. While the Regional Planning and Development Authority would be responsible for planning for the whole region, including the mining settlement areas, it is recommended that such planning should be done by the Regional Authority in close collaboration and coordination with Mines Board of Health. As regards enforcement of the plans for the mining settlements and implementation of the projects which are within the competence of the Board of Health, the Board should have complete freedom and flexibility to operate, subject only to the requirements of the over-all

regional plan for the subdivision. The power of enforcement of the plans may be delegated by the Regional Authority to the Board, insofar as the mining settlements are concerned. The Regional Authority may also leave to the Asansol Mines Board of Health the execution of the development projects which are within the functional jurisdictions of the Board.

STRENGTHENING OF LOCAL GOVERNMENT

The Asansol Municipality had a population of 1,03,659 in 1960-61 with an area of 4.25 square miles, and the Raniganj Municipality a population of 25,352 with an area

of 1.85 square miles. The incidence of per capita taxation in 1961 in Asansol was Rs. 6.02 and in Raniganj it was Rs. 9.26. The civic services provided by these municipalities are not upto the minimum standards expected in modern industrial and urban areas; water supply, for example, among essential services is far below the requirement. The present inadequate territorial jurisdictions and limited incomes have inhibited the activities of these municipal bodies, and consequently the services rendered by them leave very much to be desired.

Tables XLVII, XLVIII and XLIX show the budgetary position and the income of the local authorities in the subdivision.

TABLE XLVII
BUDGETARY POSITION OF LOCAL AUTHORITIES IN ASANSOL SUBDIVISION

Municipality/Authority	Receipts in Rupees			Surpluses in Rupees		
	Actuals 1963-64	Estimated 1964-65	Estimated 1965-66	Actuals 1963-64	Estimated 1964-65	Estimated 1965-66
Asansol Municipality	16,16,408 (4,04,707)	19,67,675 (5,37,576)	19,75,853 (3,05,571)	+ 5,37,576	+ 3,00,770	+ 2,59,436
Raniganj Municipality	—	—	9,88,451 (4,61,767)	—	—	+ 1,23,115
Durgapur Notified Area Authority	4,91,411 (98,604)	6,19,772 (31,372)	11,39,723 (30,725)	+ 2,12,138	+ 79,116	+ 1,63,444
Asansol Mines Board of Health	10,28,763	12,78,104	14,26,319	+ 2,27,902	+ 3,47,656	+ 2,96,678

Figures in brackets show opening balances

TABLE XLVIII
INCOME IN RUPEES OF LOCAL AUTHORITIES IN 1965-66
(excluding Mines Board of Health)

Municipality/Authority	Holding Rate	Water Rate	Lighting Rate	Conservancy Rate	Trade & Profession Tax	Others
Asansol Municipality	39,29,37	3,29,936	6,30,86	5,25,941	55,000	3,03,382 *
Raniganj Municipality	93,200	1,00,285	12,800	1,27,000	12,500	1,80,899 **
Durgapur Notified Area Authority	7,60,000	2,000	2,000	8,32,000	50,000	2,77,000 ***

* Includes estimated Government grants of Rs. 2,18,532

** Includes anticipated grants from Government to the tune of Rs. 1,09,800 towards employees' dearness allowance, road development, education, etc.

*** Includes estimated grants from Government of Rs. 2,22,000

TABLE XLIX
BUDGET ESTIMATES FOR THE THREE LOCAL BODIES: 1965-66

Municipality/ Authority	Income from Rates and Taxes Rs.	Income from Fees and Miscellaneous Sources Rs.	Grants from Government Rs.
Asansol	13,66,900	84,850	2,18,532
Raniganj	3,45,785	71,099	1,09,800
Durgapur Notified Area Authority	16,64,000	55,000	2,22,000
Total	33,76,685	2,10,949	5,50,332

Of the total income of these local bodies, a major proportion is derived from rates and taxes, followed by the income derived from Government grants. Of the income from taxes and rates, the major portion is derived from the conservancy rate, followed by the holding rate and the water rate. The structure of taxation in the three local bodies shows a departure from the usual pattern of dominance of the holding rate in the services of local bodies. From 1965-66 budget estimates, the approximate percentage break-up of the tax structure is indicated as below:

TABLE L
PERCENTAGE BREAK-UP OF TAX STRUCTURE: 1965-66 BUDGET ESTIMATES

Municipality/ Authority	Holding Rate	Water Rate	Lighting Rate	Conservancy Rate	Profession & Trade Tax
Asansol	30.0	25.0	4.5	37.0	3.5
Raniganj	20.0	30.0	4.0	33.0	4.0
Durgapur Notified Area Authority	45.0	0.1	1.0	50.0	3.9

The percentage of income from water rate in the Durgapur Notified Area Authority is low because much of the income from sale of water is derived by the Durgapur Development Authority from Durgapur Projects Ltd. by way of rebate on sale of water by the latter; the 0.1% income relates to house connection fees.

As regards collection performance, it is seen from the 1965-66 budget estimates that, when the three local authorities are taken together, the arrears of holding rate amounted to about 50% of the current dues. But the position would seem better if the Durgapur

Notified Area Authority is excluded; the percentage for Asansol is about 17 and that for Raniganj about 18.

The pattern of expenditure in the local bodies shows the predominance of expenditure on conservancy and drainage schemes, followed by water supply and lighting in that order. The expenditure on general administration is not excessive in any of the three local authorities. The 1965-66 budget estimates show the break-up of expenditure under various heads as follows:

TABLE LI
BREAK-UP OF EXPENDITURE ON SERVICES : 1965-66 BUDGET ESTIMATES

Municipality/ Authority	General Administration Rs.	Water Supply Rs.	Conservancy and Drainage Rs.	Lighting Rs.	Others Rs.
Asansol	1,38,797	2,91,024	4,30,640	36,600	8,19,356 (a)
Raniganj	45,365	1,07,333	1,48,697	13,700	5,50,241 (b)
Durgapur Notified Area Authority	26,119	65,070	91,300	18,000	7,75,790 (c)

(a) Rs. 2,00,560 for education and Rs. 1,70,000 for roads

(b) Rs. 3,61,767 for purchase of road-rollers and tar-boilers, and for repairs of roads; and Rs. 53,838 for education

(c) Rs. 4,98,806 for capital expenditure on public works

Capital expenditure by the three local authorities is at a very low level. In 1965-66 the provisions made in the budget estimates for debt service were only Rs. 29,000 for Asansol, Rs. 26,316 for Raniganj, and Rs. 11,311 for the Durgapur Notified Area Authority. In 1963-64, the actual revenue surpluses of the local bodies amounted to Rs. 5,37,576 for Asansol, Rs. 2,12,138 for Raniganj, and Rs. 2,27,902 for the Durgapur Notified Area Authority. Despite their generally inadequate resources, it appears therefore that these local bodies could have made larger provisions for debt service and raised additional loans for capital expenditure.

The above preliminary examination of the fiscal base of the local bodies and their operating performance clearly indicates a need to scrutinise in greater detail and plan for the reorganisation of the local fiscal base as also the working of the local authorities. The tax incidence as at present in all the three local bodies lends support to the view that a comparatively rich industrial-urban area like the area covered by these bodies could expand its tax base sizeably for financing local services and development. The collection performance also leaves room for improvement, especially in the Durgapur area. With an improved tax base, it should also be possible for these authorities to operate larger debt-financed capital works. The formation of the Regional Water

Board will also relieve these local bodies from the necessity of having to find large resources for capital works for water supply; the task of distribution and maintenance of the supply services will be a manageable job for these bodies with their modest organisational and financial resources.

From the point of view of territorial jurisdiction, and the adequacy of the structure of local government also in the subdivision, a detailed study as well as proposals for reorganisation are called for. The Asansol Municipality covers only a portion of what is actually the Asansol urban area; the present limited jurisdiction is hardly a realistic one when the existing dimensions of the urban area are taken into consideration.

In the urban complexes of Kulti-Barakar-Niamatpur-Dishergarh and Chittaranjan-Rupnarayanpur there are no local authorities functioning now. A major recommendation of the regional strategy, as already stated, is that all urban growth in the future should be concentrated in the five growth nodes of Asansol, Durgapur, Raniganj, and the Kulti and Chittaranjan-Rupnarayanpur complexes. For purposes of local government, and management and operation of civic services and facilities, it

will be quite unrealistic to leave a vacuum in local administration in the Kulti and Chittaranjan-Rupnarayanpur areas.

In the Interim Plan, it is accordingly recommended that (i) the existing municipal jurisdictions in Asansol, Durgapur and Raniganj be extended to cover the urbanised and urbanisable areas in these three growth nodes—in Asansol and Durgapur the municipal jurisdictions will need be extended to cover the Initial Planning Areas as indicated in Chapters 5 and 6; and (ii) in the Kulti complex and the Chittaranjan-Rupnarayanpur complex suitable units of local self-government be established without delay. In view of the fact that both these areas are rapidly industrialising urban areas, the notified area authority form of local self-government appears to be more suitable for them.

The above recommendations are general and indicative in nature; a thorough examination is called for to determine the exact details of the reorganisation suitable for the existing local bodies, and the form of local government suited for the two growth nodes proposed to be covered by new units of local self-government.

ADMINISTRATIVE ORGANISATION FOR PLANNING AND DEVELOPMENT (Asansol Subdivision)

REGIONAL PLANNING AND DEVELOPMENT AUTHORITY

1. Regional planning—formulation, enforcement and implementation.
2. Local planning and implementation for five urban growth nodes.
3. Local plan enforcement in such areas as may be directed by State Government.
4. Housing, urban renewal, townships, roads, parks and recreation areas, sewerage and drainage in five urban growth nodes.
5. Regional recreation area development and maintenance.
6. Maintenance of arterial roads excluding national/state highways.

REGIONAL WATER BOARD	ASANSOL MINES BOARD OF HEALTH	LOCAL AUTHORITIES				
<ol style="list-style-type: none"> 1. Development of regional water resources. 2. Production and distribution of water in the region. 3. Distribution of bulk water to urban areas in the subdivision, the Asansol Mines Board of Health, etc. 	<ol style="list-style-type: none"> 1. Health and sanitation in mining settlements. 2. Community services and utilities in mining settlements. 3. Regional plan enforcement and implementation in mining settlements as may be delegated by the Regional Planning and Development Authority. 	Asansol Municipality	Raniganj Municipality	Durgapur Notified Area Authority	Kulti Notified Area Authority	Chittaranjan- Rupnarayanpur Notified Area Authority
				<ol style="list-style-type: none"> 1. Local government; civic services and facilities. 2. Local plan enforcement according to directions issued by State Government. 		

TABLE LI
CAPITAL PROJECTS PROGRAMME: 1966-71
(in crores of rupees)

PROJECTS	COST OF PROJECTS	TOTAL	EXPENDITURE (to the end of 1965-66)	TOTAL	EXPENDITURE (proposed in 1966-71)	TOTAL
WATER SUPPLY SCHEMES						
		8.735				4.560
1. Raniganj (for 21.5 m. g. d.)	*7.675		—		3.500	
2. Asansol Urban Area	1.060		—		1.060	
HOUSING				0.630		11.000
		11.630				
3. Asansol Satellite Township	2.130		0.130		2.000	
4. Durgapur (DDA) Township	6.000		0.500		5.500	
5. Low-Cost Housing in the Subdivision (5,000 units)	3.500		—		3.500	
TRAFFIC AND TRANSPORTATION				2.820		9.560
		12.380				
6. Coal Roads Improvement						
(a) N. H. 2 Works	6.000					
(b) 21 Feeder Roads	4.000		2.820		7.180	
7. Widening of G. T. Road (to four lanes in Asansol and Durgapur urban areas)	0.300		—		0.300	
8. Traffic Operations Improvement (including lighting on N. H. 2)	0.200		—		0.200	
9. New Arterial Roads in Asansol and Durgapur (30 miles approx. according to Plan)	1.700		—		1.700	
10. Fly-overs/Underpasses on N. H. 2 in Asansol and Durgapur	0.180		—		0.180	
URBAN RENEWAL						0.420
		0.420				
11. Asansol Bazar Area Improvement	0.420		—		0.420	
EDUCATION (ASANSOL URBAN AREA)						2.100
		2.100				
12. Primary Schools for 30,000 Students	0.900		—		0.900	
13. Secondary Schools for 8,000 Students	1.200		—		1.200	
HEALTH						0.530
		0.530				
14. Regional Hospital (150 beds)	0.530		—		0.530	
GRAND TOTAL				3.450		28.170
		35.795				

* Phase I & II (Rs.3.5 crore for Phase I Part I Rs.3.2 crore for Phase I Part II; Rs.0.9 crore for Phase I Part III; and Rs.7.5 lakh for Phase II)

Note: The spill-over expenditure towards completion of the projects—Rs 4.175 crore—is to be incurred beyond 1971.

CAPITAL PROJECTS PROGRAMME 1966-71

The capital projects programme presented in this Interim Plan is not an exhaustive capital budget for the region and its urban areas; it only seeks to present some of the major regional and local projects—some already initiated and some proposed now—which should be implemented during the next five years for the planned development of the subdivision. Industrial investments, and outlays on power, industrial estates, training institutes, etc., have not been included in the programme, which is confined to water supply, housing, traffic and transportation, urban renewal, health and education facilities. Even in the field of health and education facilities, the programme only highlights some of the major projects recommended; in fact, the over-all education and health budget for the region will be substantially higher. A comprehensive capital budget for the planning period ending in 1986 will be prepared during the ensuing planning stage; for the next five years it is recommended that priority be given to the projects presented on page 69 as the quinquennial programme.

The estimates of cost, indicated in the capital projects programme, are approximate estimates (except in the case of the water supply projects and the Coal Roads Improvement Scheme), and more detailed and precise cost estimates will have to be finalised before the projects are taken up for execution. No firm recommendations are made at the present stage regarding the over-all financing of the programme.

All the major projects, viz., the water supply, township, and housing schemes, should be operated on a self-liquidating basis, with provision for the recovery of costs through user charges, sale of developed land, etc. It should be feasible to operate the township schemes with the assistance of a revolving fund established for the purpose. For such schemes, therefore, it is only necessary for the State Government and other agencies concerned to provide adequate loan assistance on reasonable terms to the implementing agency. Urban renewal schemes also can, to a large extent, be operated on the principle of self-liquidating outlays. It is necessary that the financing aspects of these projects should be carefully gone into, to make them self-supporting; there is every

reason to proceed on the assumption that they can be made to pay their way through to completion.

The slowing down of central assistance to the Coal Roads Scheme has virtually led to a stalemate in the execution of this major project under transportation schemes. In view of the importance of the Asansol-Durgapur region to the economy of the whole country, it is essential that this scheme be continued and completed. For the recurring maintenance of the large road system in the subdivision, the feasibility of establishing a Road Development Fund, to be operated by the Regional Development Authority deserves to be examined. It may be possible to operate a sizeable road development fund, if the proceeds from the road cess on coal and a portion of the motor vehicles tax collected in the subdivision could be credited to the Fund.

The Asansol satellite township project is being executed by the Housing Directorate of the State Government and the Durgapur township by the Durgapur Development Authority. The Coal Roads Scheme is being executed by a Special Division of the Public Works (Roads) Directorate. It is recommended that these schemes be continued and completed by the present agencies which are executing them; in the case of the Durgapur township however, when the DDA merges with the proposed Regional Authority, the project will be taken over and executed by the regional body. The water supply schemes should obviously be taken up by the Regional Water Board for execution and maintenance. All the other projects in the programme—excluding those for national and state highways, education and health, which will be executed by the concerned departments of the State Government—will have to be executed by the Regional Planning and Development Authority.

The Asansol-Durgapur region is a vital industrial area in the State and the country as a whole. The problems of development in the Asansol subdivision should therefore be the joint concern of the Local, State and Central Governments. With concerted efforts on the part of these governments and authorities, it should not be difficult to implement a programme of the magnitude suggested for 1966-71.

THE PLAN—A SUMMARY

REGIONAL SETTLEMENT STRUCTURE

The population of the Asansol subdivision will increase from 10,91,000 in 1961 to approximately 25,77,000 in 1986; so will the rural population from 7,07,000 to 10,61,000, and the urban population from 3,84,000 to 15,16,000.

It is desirable, and feasible too, to accommodate the bulk of the additional urban population (approximately 11,00,000) in the five major urban centres in the subdivision—Asansol, Durgapur, Raniganj, the Kulti-Barakar complex, and the Chittaranjan-Rupnarayanpur complex. In order to achieve this objective, the redevelopment and expansion of these urban centres should be planned and carried out.

TWO DOMINANT CENTRES

The Asansol urban centre should be so developed as to accommodate by 1986 an urban population of 4,00,000; similarly, the Durgapur urban centre should be developed for a population of 5,18,000. The other three urban centres will be required to absorb, also by 1986, a total of about 5,98,000 people.

In the proposed multi-nuclear development of the region, Asansol and Durgapur will be the dominant centres. During 1966-71 the maximum stress should be laid on achieving a fast enough rate of growth for these two dominant centres. The growth of all the proposed five major urban centres in the Asansol subdivision will need be directed through a two-fold process of regeneration and planned expansion.

The Asansol urban area should be developed between NH 2 bypass and the river Damodar, limiting developments north of the NH 2 bypass to their existing dimensions

as far as possible. The Durgapur urban area should be expanded north of the G. T. Road, limiting its lateral development toward the east or the west to the minimum extent necessary. To prevent an unmanageably large ribbon urban development along the G. T. Road, now occurring with the expansion of the major urban centres, the core urban areas—the Initial Planning Areas—of Asansol and Durgapur should be separated from the rest of the region by Extended Planning Areas, wherein new growth will be almost wholly discouraged, except as accessories to developments that have already taken place.

RANIGANJ AND OTHER URBAN CENTRES

The possibilities of trans-river development of the Raniganj urban area—across the Damodar and in the adjoining district of Bankura—should be explored during the comprehensive planning stage. The Chittaranjan-Rupnarayanpur complex and the Kulti-Barakar complex should be planned for development as two integrated urban complexes, distinctly separated from each other, and also from the neighbouring Asansol urban area, to the extent feasible.

AGRICULTURE AND MINING

The Kanksa and Faridpur areas should be developed as intensive agricultural areas, and the possibility of further agricultural development in the coal-bearing areas like Jamuria, and in other areas in the western half of the region, which are suitable for agriculture, should be explored.

During the period 1961-86 it is not likely that the mining settlements will witness any substantial population increase. It is therefore recommended that the environmental conditions of these settlements be improved and the availability of services and utilities in these areas be adequately augmented through a redevelopment programme, to be undertaken on the basis of a long-term plan.

FOREST AREAS

The forest areas of the region should be preserved and selected forest areas developed, along with the banks of the water courses in the subdivision, especially the banks of the Damodar and the banks and highlands near the Ajoy, to serve as regional and local green spaces and recreation areas.

THE ECONOMIC BASE

The plans and programmes for the economic development of the Asansol subdivision should be designed and executed in order to achieve a total employment of 9,95,000 by 1986, as against 4,45,000 in 1961. The major expansion of employment opportunities should be provided in the industries—household industry included—with an expansion of employment from 96,000 in 1961 to 3,60,000 in 1986. The employment in the tertiary sector, that is, the trade, commerce, transport and services, is proposed to be increased from 1,09,000 in 1961 to 2,88,000 in 1986. The employment in the construction industry is proposed to be increased from 13,600 to 61,000 within the period from 1961 to 1986.

Mining and agriculture are expected to provide only nominal increases in employment over the period 1961-86; employment in mining is expected to increase from 1,42,000 to 2,00,000, and in agriculture from 84,000 to 86,000. The occupational pattern and the economic base of the subdivision should be diversified and strengthened through the promotion of agriculture, industries, and activities in the tertiary sector.

DIVERSIFICATION OF INDUSTRIAL STRUCTURE

Over the period 1961-86, employment in the basic metals industry is proposed to be increased from 33,000 to 95,000; in the engineering industries from 27,000 to 1,46,000; in the chemical industries from 1,000 to 26,000; in the refractories and allied industries from 5,000 to 13,000; and in other industries from 27,000 to 73,000. The total employment in manufacturing industries (excluding household industries) will thus increase from 95,000 in 1961 to 3,53,000 in 1986. The average annual investment required in the public and private sectors to generate this additional employment has been estimated as approximately Rs. 25.4 crore. It is recommended that a detailed examination of the possibilities for the diversification of the industrial structure in the Asansol subdivision be undertaken by the concerned agencies of the State and Central Governments and the private sector. This will facilitate the full exploitation of the advantages of the basic-metals- and coal-based economy of the region, and also the development of a whole complex of industries from which the maximum possible employment benefits may be derived.

It is recommended that in the fields of ancillary, medium and small industries, and also in coal-based chemical industries in the region, planned and organised efforts be initiated by the State Government. Such efforts should be preceded by a detailed techno-economic study of the above industries, coupled with the initiation of a policy of suitable incentives and the provision of infrastructure facilities for the promotion of these industries. In formulating such a promotional policy, the findings and recommendations in Chapter 4 of the Plan Report, which relate to the economic base of the Asansol-Durgapur region, may be kept in view.

TRANSPORTATION SYSTEM

DURGAPUR EXPRESSWAY

The Durgapur Expressway should be extended westwards through Ukhra-Jamuria, to join the NH 2 bypass near Asansol, more or less in proximity to the bridge on which the Grand Trunk Road crosses the Nunia Nallah.

GRAND TRUNK ROAD

The improvement schemes for the Grand Trunk Road, now underway, should be completed. It is further recommended that priority be given to the development of this road to four-lane capacity by 1976, and that a system of controls be applied to the stretch of the G. T. Road between Durgapur and Barakar. The extension of the Durgapur Expressway through the Asansol-Durgapur region may then be taken up during the decade 1976-86.

REGIONAL HIGHWAY

A north-south regional highway—as proposed in the regional strategy—should be developed according to national highway standards to serve as a major inter-regional transportation route. The highway should follow the Mejia-Raniganj-Pandaveswar alignment, linking the new Haldia Port with its hinterland, and the northern region of the State with the Asansol subdivision.

The colliery-feeder roads scheme should be executed on a top priority basis. A bypass to Kulti should be developed, as proposed in the Asansol urban area plan. The possibilities of adequate commercial exploitation of the DVC navigational canal for inland water-borne traffic between Calcutta and Durgapur should be explored.

REGIONAL INFRASTRUCTURE

WATER RESOURCES

The water demand of the subdivision is likely to be met till 1976 with the existing capacity of the DVC System. However, to meet the local deficit in the Asansol urban area immediate execution of the Asansol Water Supply Scheme, which would provide a supply of 10 m.g.d., is strongly recommended. Further, a comprehensive water management study for the subdivision is recommended for immediate initiation, so that early decisions can be taken and the necessary developmental works undertaken to ensure adequate water supply for the Asansol subdivision for the planning period beyond 1976. On present indications, the development of additional storage capacity in the Damodar System and the exploitation of the untapped resources of the Ajoy river are expected to provide adequate water to meet the demand of the subdivision for the period 1976-86.

HOUSING

During the period 1961-86 the subdivision will need annually about 10,000 units of housing. It is therefore recommended that concerted efforts be made both by the public-sector housing authorities and by the private-sector building industry to meet this housing need in the subdivision.

MANPOWER MANAGEMENT

For the period 1961-86, a minimum of 2,00,000 skilled labour will have to be found in the Asansol subdivision to meet the demand from the expanding manufacturing sector, thus indicating a yearly requirement of about 10,000 persons. It is recommended that a comprehensive programme for vocational training in the subdivision be formulated immediately, and the estimated requirements for skilled workers be met by both in-service training in industrial establishments and training in public technical institutions. The establishment of a regional institute for technical training, in the form of a Central Engineering Organisation, is recommended for carrying out a programme of manpower management for the region. The existing industrial training institute at Durgapur may serve as a nucleus for such an organisation.

DEVELOPMENT OF ASANSOL AND DURGAPUR

The physical and socio-economic development of the Asansol and Durgapur urban areas should be carried out on the basis of the recommendations in Chapters 5 and 6 of the Plan Report, according to the time-phasing indicated therein. The proposed physical structures of Asansol and Durgapur urban areas are presented in Maps 8 and 9, respectively. The development controls, recommended for the enforcement of the plans for Asansol and Durgapur urban areas, should be enforced immediately, to the extent feasible, under the provisions of the Calcutta Metropolitan Area (Use and Development of Land) Control Act 1965.

CAPITAL PROJECTS PROGRAMME AND IMPLEMENTATION

The capital projects programme costing Rs. 35.795 crore, as recommended in Chapter 7, should be immediately undertaken for execution through the concerned State and local authorities. It is suggested that Rs. 28.170 crore be spent during 1966-71.

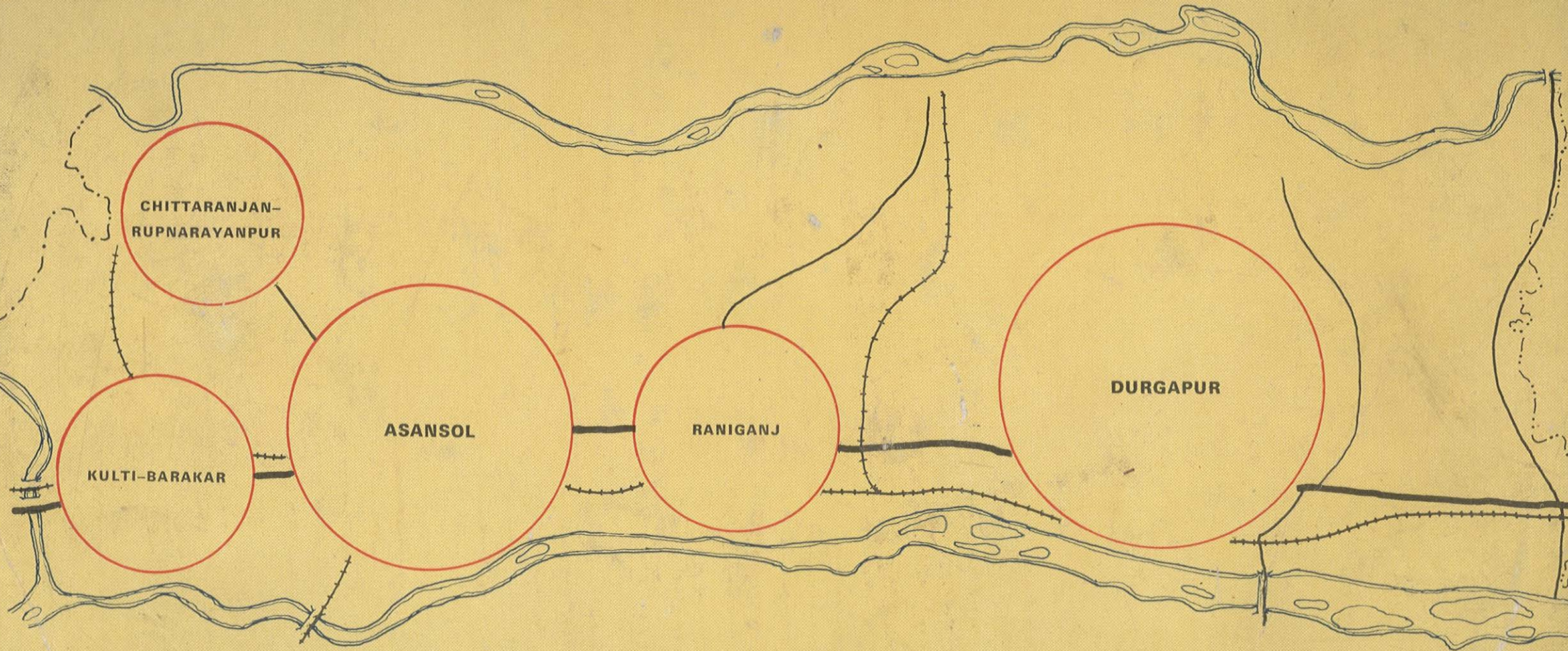
To ensure effective planning, plan enforcement and plan implementation in the Asansol subdivision, it is recommended that a Regional Planning and Development Authority be established, with the present Durgapur Development Authority as the nucleus. The Regional Authority should be entrusted with the responsibilities of regional planning, plan enforcement and implementation; local planning as well as implementation of development plans in the five urban growth nodes of the subdivision; and also local plan enforcement in such areas as may be directed by State Government; the execution of major development schemes for housing, urban renewal, townships, roads, parks, recreation areas, sewerage and drainage, etc., in the five urban growth nodes; the development and maintenance of regional recreation areas; and the maintenance of the arterial road system, excluding the national and state highways.

It is further recommended that for the development of the water resources of the region, a Regional Water Board be established. The Board should be responsible for the production and distribution of water in bulk and should initiate a comprehensive water management programme in the subdivision.

LOCAL GOVERNMENT

The system of local government in the subdivision should be strengthened and developed. Ultimately, the local government structure in the subdivision should consist of the Asansol Mines Board of Health, reorganised on the lines of the Mining Settlements (Health and Welfare) Act 1964; the extended Asansol and Raniganj Municipalities; the extended Durgapur Notified Area Authority; and two other new notified area authorities in the Kulti-Barakar complex and the Chittaranjan-Rupnarayanpur complex. It is recommended that a detailed study be conducted of the fiscal base of the local bodies in the subdivision, and plans be formulated for the reorganisation of the local fiscal base, and also for encouraging local initiative and strengthening local resources.

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**CHITTARANJAN-
RUPNARAYANPUR**

KULTI-BARAKAR

ASANSOL

RANIGANJ

DURGAPUR