National Capital Region Planning Board
(Planning Committee)

23rd Meeting
29 Nov. 1991

Agenda & Minutes

B. N. SINGH
Chief Regional Planner
Tel. : 3325496

(137)

राष्ट्रीय राजधानी क्षेत्र योजना बोर्ड
NATIONAL CAPITAL REGION
PLANNING BOARD
7th Floor, 'B' Wing,
Janpath Bhavan, Janpath,
शहरी विकास मंत्रालय
(Ministry of Urban Development)

No. K-14011/65/91-NCRPB(23rd)

नई दिल्ली, तारीख

Dated, New Delhi the 8 -11-1991

MEETING NOTICE

Subject: 23rd Meeting of the Planning Committee of the NCR Planning Board to be held at 10.30 AM on 29 -11-1991 in the NCR Planning Board Office, New Delhi.

The 23rd Meeting of the Planning Committee of the NCR Planning Board will be held at10.30AM on 29 November, 1991 in the office of the National Capital Region Planning Board, New Delhi. The Agenda items together with notes for the meeting are enclosed. You are requested to Kindly make it convenient to attend the meeting.

Encl: As stated above.

(B.N. Singh)
Chief Regional Planner
&
Member-Convenor

To

1. Chairman and all members of the Planning Committee.
2. All officers of the NCR Planning Board.

LIST OF MEMBERS OF THE PLANNING COMMITTEE TO BE HELD ON 30.8.91

1. Shri K.K. Bhatnagar,
Member Secretary, NCRPB

2. Shri N.K. Verma,
Secretary,
Urban Dev. & Housing Deptt.,
Govt. of Rajasthan, Jaipur. -302001

3. Shri R.S. Mathur,
Principal Secretary,
Housing Department,
Govt. of Uttar Pradesh,
Janpath, Lucknow-226001.

4. Shri Cecil Noronha,
Vice Chairman, DDA,
Near INA Colony,
New Delhi-110023

5. Shri T.T. Josepth,
Secretary (L & B),
Delhi Administration,
I.P. Estate, New Delhi-110002

6. Shri D.S. Meshram,
Chief Planner,
Town & Country Planning Organisation,
I.P. Estate, New Delhi-11002

7. Shri V.K. Arora,
Chief Engineer (Planning),
Ministry of Surface Transport,
Transport Bhawan, New Delhi-110001

8. Shri Pradeep Kumar,
Secretary,
Town & Country Planning & Urban Estate,
Government of Haryana,
Haryana Civil Secretariat, Chandigarh.

9.
Chairman & Managing Director,
Housing & Urban Development Corporation,
HUDCO House, Lodi Road, New Delhi-11003

10. Shri S.M. Mittal,
Executive Director (MTP),
Railway Board, Rail Bhawan, New Delhi-110001

11. Shri R.C. Meena,
Director (Planning),
Department of Power,
Shram Shakti Bhawan, New Delhi-110001

12. Shri Raj Kumar,
Director, T&CP & Urban Est.
Chief Administrator,
Haryana Urban Dev. Auth.,

Sector 18, Madhya Marg,
Chandigarh-160018

13. Shri C.S. Mehta,
Chief Town Planner,
Town & Country Planning Dept.
Jaipur.

14. Shri J.P. Bhargava,
Chief Town & Country Planner,
Town & Country Plg.Deptt.,
Govt. of U.P.,
7, Bandaria Bagh,
Lucknow-226001

15. Dr. D.P.S. Seth,
General Manager(Telecom.Plg)
Deptt. of Telecom,
Sanchar Bhawan,
New Delhi.

16. Dr. S. Maudgal,
Adviser (1A-1),
Deptt. of Environment,
Ministry of Env. & Forest,
CGO Complex., Lodi
Road, New Delhi.

17. Shri D.N. Basu,
Adviser (HUD),
Planning Commission,
New Delhi-110001

18. Shri P.S.A. Sundaram,
Joint Secretary,
Min. U.D.,
New Delhi.

19. Shri B.N. Singh,
CRP.

Copy forwarded to:-

1. Shri J.C. Gambhir, Commissioner (Planning), D.D.A.,
Vikas Minar, New Delhi.
2. Shri B.D. Gulati, Chief Coordinator Planner - NCR,
Sub-regional NCR, Gurgaon

AGENDA ITEMS FOR THE 23RD MEETING OF THE PLANNING COMMITTEE TO BE HELD AT 10.30 A.M ON NOVEMBER 29, 1991 IN THE OFFICE OF THE NCR PLANNING BOARD, NEW DELHI.

Item No.1	Confirmation of the minutes of the 22nd meeting held on 30.8.1991.
Item No.2	Review of the action taken on the decisions of the last meeting held on 30.8.1991.
Item No.3	Approval of Draft Functional Plan for Delhi Metropolitan Area.
Item No.4	Finalisation of Sub-regional Plans for NCR Sub-regions.
Item No.5	Allotment of land in the priority towns for Govt./Public Sector Offices.
Item No.6	Studies as a prelude to the revision of Regional Plan 2001.
Item No.7	Resettlement of Squatters from Delhi in the National Capital Region.
Item No.8	Any other item with the permission of the chair.

AGENDA ITEMS FOR THE 23RD MEETING OF THE PLANNING COMMITTEE

Agenda Item No.1 Confirmation of the minutes of the 22nd Meeting held on 30.8.1991.

The 22nd Meeting of the Planning Committee was held on 30.8.1991 and the minutes of the same were circulated on 12.9.1991. The Planning Committee may like to confirm the minutes.

Agenda Item No.2 Review of the actions taken on the decisions of the last meeting held on 30.8.1991.

1. Consideration of Approach Paper - Investment Plan for NCR Eighth Five year Plan (1992-97).	The Approach and strategies for Investment Plan for the Eighth Five Year Plan was approved by the planning committee. Based on the above, the investment proposals for Eighth Plan (1992-97) were submitted to Ministry of Urban Development for consideration of the Planning Commission. A copy of the proposal is enclosed.

Agenda Item No.3 Approval of Functional Plan for Delhi Metropolitan Area.

The Draft Functional Plan for Delhi Metropolitan Area was circulated for consideration of the Planning Committee in its 21st meeting on 3rd July, 1991. The Committee decided that time may be allowed, for the participating States to offer comments/suggestions on various aspects presented in the Draft Functional Plan. No comments from the NCR states have since been received. The suggestions by the Delhi Administration have been appropriately incorporated in the revised Functional Plan now circulated in this meeting (copy being sent separately). The Planning Committee may approve the revised draft so that the same could be placed before the Board for its approval.

Agenda Item No.4 Finalisation of Sub-regional Plans for NCR Sub-region.

The need for finalisation of Sub-regional Plans for various Sub-regions in NCR was time and again, impressed upon the State Governments particularly in the context of the rapid developments taking place in the Sub-regional areas and also to guide the implementation of the Regional Plan-2001. A draft Sub-regional Plan was received from the Chief Town & Country Planner, U.P. which was discussed in a meeting of the Sub-group constituted for this purpose and returned for modifications. The modified draft has not yet been received. The Chief Town Planner, Rajasthan and C.C.P. of Haryana had informed that the Draft Plans for the respective Sub-regions would be submitted for informal discussion in August, 1991 and October, 1991 respectively. These are yet to be received. As far as Sub- regional plan of Delhi is concerned, creation of a Planning and Monitoring cell in Delhi administration as well as DDA have recently been sanctioned by the NCR Planning Board enabling the preparation of Delhi Sub Regional plan without further loss of time.

In the 13th meeting of the NCR Planning Board held on the 30th September, 1991, the Board impressed upon the States for expeditious finalisation of Sub-regional Plans for all the sub-regions including Delhi UT by March, 1992.

The State Government and Delhi U.T. may apprise the progress regarding the preparation of Sub-regional Plans for the respective Sub-regions in the meeting. The Planning committee may like to discuss the modalities for finalisation of Sub regional plans, particularly in the context of statutory requirement for the completion of the Regional Plan-2001 having already been enforced with effect from 23-1-1989.

Agenda Item No.5 Allotment of Land in the priority/DMA towns for Govt./Public Sector Offices.

In response to the suggestions made earlier by NCRPB vide No.K-14011/62/86-NCRPB, to indicate the land requirements of the various Ministries and Institutions, certain Departments/organisations have came forward with their requirements in the NCR Towns as follows:

i) Indian Institute of Public Administration (IIPA) had requested for land for their institution in NOIDA. This request was intimated to NOIDA. NOIDA had agreed to allot 10 acres of land in

Sector-11 at the rate of Rs.1580 /sq. mtr. 25% of the premium is to be paid as registration charges amounting to Rs.1.58 crores. This was indicated to IIPA and their response is awaited.

ii) The State Farms Corporation of India Ltd. (SFCI) had indicated the need for 8 hectares of land in any sector of NOIDA. Accordingly, a letter was sent to Chairman, NOIDA, requesting him to indicate the availability of land with terms and conditions.

In response to this, the Chairman and Chief Executive, NOIDA has informed that allotment of land to the SFCI could be considered at Rs.1580/sq.m. 25% of the premium is to repaid as registration charges, amounting to Rs.3.16 crores. This was communicated to the Chief Administrative Officer, SFCI. Their reply is awaited.

iii) Similar requests had come from National Seeds Corporation, Commissioner of Security , Civil Aviation for allotment of land in NOIDA and on NH 1 within the radius of 40 km from Delhi respectively.

The position of the land requirements as indicated by the Govt./Public Sector undertakings is summerised in Annexure-I

In order to consider such requests by the in future, there is a need to evolve certain tentative guidelines for allotment of land. The Planning Committee may like to consider the draft guidelines as indicated below to streamline the process of allotment of land in the DMA/Priority Towns to Govt./Public Sector offices.

1. The Government Departments / Organisations / Institutions/Public Sector Undertakings while requesting for allotment of land for their offices may indicate the existing strength of workers including possible expansion in the near future in their applications. Such requests would be considered for allotment of land based on policies of NCR Plan-2001 as per stipulated norms as contained in the respective Master plans.

2. They are also required to indicate alternatively their willingness to occupy the built up space, if any, offered by Urban Development Authorities/Improvement Trusts of DMA/Priority Towns. Such requests would also be considered based on the space norms, as contained in the respective Master plans.

3. A committee under the Chairmanship of Member Secretary, NCRPB with Urban Development Authorities of DMA/priority Towns as members, would take decisions on such requests in future. The Committee will serve as a facilitator in terms of ensuring availability of land/space to the Institutions etc., as per the NCR Plan policies.

4. All the Urban Development Authorities/UITs in NCR may furnish information/data on the availability of developed land/built up space or future proposals and the reserve price/sale price per unit area of developed land/built up space for institutional areas in their respective urban areas along with relevant terms and conditions, on regular basis to the NCR Planning Board say every six months. This information would facilitate decisions by the Committee.

5. The status of availability of the basic civic services water supply, sewerage, drainage, electricity, transport etc. may be indicated along with the information for developed land/spaces for allotment.

In the context of stipulations of Regional Plan - 2001, the policies regarding Govt and Public Sector offices are presented in the Annexure- II

Agenda Item No.6 Revision of Regional Plan - 2001.

In the last meeting of the National Capital Region Planning Board held on September 30, 1991, it was decided that in view of the provisional results of 1991 census being available, and the statutory provision requiring revision of the Regional Plan after every 5 years of the date of its coming into operation, studies may be initiated now itself to complete the review of the Regional Plan in time. The Regional Plan came into force on 23.1.1989 and therefore, the review together with such amendments as approved by NCR Planning Board should become effective after completion of 5 years i.e. with effect from 23.1.1994. To comply with this statutory obligation, studies to ensure better appreciation of the existing scenario on the demographic, economic, social, spatial and infrastructural fronts and directions for future growth in the context of the analyses emerging out of these factors, are proposed to be initiated in a time-bound manner for NCR Plan with a future perspective of 2011. In the design of the studies it is proposed to cover the deficiencies of the earlier exercises on the Regional Plan - 2001.

2. It is proposed to cover the following aspects in the proposed studies :

(a) Demographic Profile of NCR.

(b) NCR's economy.

(c) Employment in NCR - organised and unorganised and household income.

(d) Infrastructure development (power, water, sanitation, traffic and transportation, telecom).

(e) Existing landuse and Base Maps for the NCR based on Aerial Photography.

(f) Environment and Ecology.

(g) Legislative aspects.

(h) Land-supply and demand, prices, housing development.

(i) In order to ensure access to common data base and to eliminate repititive efforts for collection and compilation of the data a ''Basic Data Hand Book'' covering the aforesaid subjects on National Capital Region .

3. To ensure a high quality of research input, it is proposed to involve national level specialised institutions relating to various sectors to carry out the studies. In order to ensure inter-face of the research institutions with the State level Organisations/Central Ministries, NCR Planning Board, it is proposed to constitute a Steering Group under the Chairmanship of Member Secretary, NCRPB with a view to provide overall policy level directions and to help identify areas of special emphasis with Director, IIPA, New Delhi, Director, NIUA, New Delhi, Director-General, National Council of Applied and Economic Research (NCAER), New Delhi, Director, School of Planning and Architecture, New Delhi as members and Chief Regional Planner, NCRPB as Member-convenor. The Committee will interact with the Research Teams carrying out the studies at regular intervals and will serve as a brain-trust in the entire study programme. The period of study is proposed to be minimum of one year.
The Planning Committee may like to deliberate on this item for further suggestions.

Agenda Item No.7 Resettlement of Squatters from Delhi in the National Capital Region.

A proposal was received from Delhi Development Authority (DDA) vide their letter dated 26th august 1991 (copy enclosed) that National Capital Region Planning Board may help in identifying certain specific land pockets in the DMA/Priority Towns for resettling some of the squatter households in Delhi, who may remain "ineligible" for resettlement within Delhi after 31.1.1990, being the cut off date for resettling such families. The NCRPB took up this matter vide letter no. K-14011/57/91-NCRPB dated Sept. 11, 1991 with the Secretaries of the Urban Development Departments of the participating States viz.. Haryana, Rajasthan and Uttar Pradesh and sought their comments on the proposal, possible locations and necessary financial arrangements required to execute the proposal. The response from the State Governments is awaited. The meeting may discuss the proposal of DDA.

ANNEXURE-I

LAND REQUIREMENT

Institutions	Purpose	Area required	Location desired by Institution	Location suggested by NCRPB	Response of Urban Development Authorities
1. Air India	Housing Complex Staff Quarters, School, Play Ground, Post Office,. etc.	16,000 sq.ft.	Delhi	Gurgaon on NH-8	vide D.O Letter no. MS/741/D/90-NCRPB dated 14.11.90, along with copy of the letter dated 2.11.90 from Shri S.K Gupte, Chairman, Air India, The Chief Administrator, HUDA, was requested for indicating the land availability in Gurgaon. Response is awaited.
2. Indian Institute of Public Admn.	Training Institute	15 acres	Delhi, Ghaziabad NOIDA	NOIDA	NOIDA agreed to allot 10 acres of land at the rate of Rs.1580/sq.m,
3. State Farms Corporation.	Not Indicated	8 hect.	DMA Towns preferably NOIDA	NOIDA	NOIDA agreed to to allot 8 hect. of land at the rate of Rs 1580/sq.m
4. National Seeds Corpn. Ltd.	Hq. Office	2 acres	NOIDA		NOIDA has been requested vide letter no. D.O. No. K-14011/29/91-NCRPB dated 1.11.91 to consider the request and apprise the Board accordingly.
5. Commissioner of Security, Civil Aviation.	Training cum Demonstration complex	6 acres	on NH 1 Within the radius of 40 km from Delhi.		Communication vide letter no. K-14011/29/91-NCRPB dated 4.11.91 sent to HUDA for consideration of the request.

ANNEXURE- II

Goverment and Public Sector offices :

a) Strict control within the Union Territory of Delhi

With regard to Goverment offices, the present policy and mechanism for screening the location of new Government offices and expansion of existing Government offices should be continued. The main criterion for location of offices in the Capital should be that they perform ministerial functions, protocol functions or liaison functions which, by their nature, cannot be performed anywhere else except in the National Capital. The existing offices which do not perform any of the above functions should be identified and shifted from Delhi. In the case of Public Sector offices, there is an urgent need to scrutinise the list of existing offices and allow them to retain only very small establishment to cater for ministerial and liaison functions. The rest of establishments should be shifted out of Delhi. The accommodation which may thus become available could be used to cater to the needs of the essential growth of Central Government offices.

A study of the decisions taken by the Committee set up to scrutinise requests for fresh locations in Delhi shows that in 17 out of 27 cases, the offices have been located in Delhi itself.

b) Control outside Delhi but within the DMA

A similar control on the opening of new Central Government and Public Sector offices in the DMA Towns should be exercised. Relocation or expansion of Government offices which have ministerial, protocol or liaison functions which make it incumbent upon them to be located in Delhi alone should be allowed to be located in DMA towns. In so far as Public Sector Undertakings are concerned, the restrictions on their opening new offices or expanding the existing ones should apply equally to the DMA also. Rest of them have to go out to the Priority Towns to be developed in NCR or in the Counter-magnet areas identified by the Board.

c) Incentives outside DMA but within NCR.

The Central Government offices which are considered for being shifted from Delhi and the DMA towns should be located in other towns of the NCR and, incentives in the form of CCA, HRA etc. as given to employees working in Delhi, should be given to employees who may

be affected by this shifting for a limited period. Other incentives like providing Government accommodation, allowances for study of their children also be given to act as an incentive. For locating the new Central Government and Public Sector offices in the DMA and / or the Priority Towns, alternative sites should be identified and developed by the development agencies in consultation with the Board's secretariat.

CONFIDENTIAL

CECIL NORONHA
Phone : 697900

VICE-CHAIRMAN
DELHI DEVELOPMENT AUTHORITY
Vikas Sadan
New Delhi-110023

D.O.No.F.P M/1810/P-III/S-I/91

August 26, 1991.

My dear Bhatnagar,

At the outset, I must convey my sincere thanks to you for taking time out of your busy schedule to attend the meeting convened on 17th July, 1991 in which we interalia discussed various aspects of the problem of the squatters in Delhi and action being taken by Delhi Administration/Delhi Development Authority for their removal and/or resettlement as per a time-bound programme.

As explained in the meeting, the policy of Delhi Administration for resettlement of squatters is that, on the one hand, no fresh encroachment is to be permitted on public land and on the other hand, those jhuggies which have been in existence prior to 31.1.1990 should not be removed without being provided with alternative sites and services on a cooperative basis. Thus, all those who had squatted on public land till 31st January, 1990 and have been given ration cards in terms of the Prime Minister's directive are eligible for such resettlement. The problem that arises is what is going to be done with the remaining squatters who are not eligible for resettlement as per this policy and will have to be removed from the site at the time of clearance.

In a recent exercise undertaken by the Slum Wing to determine eligibility of the squatters for resettlement as per policy, it has been found that on an average about 30% of the JJ households are ineligible for resettlement. In view of the fact that most of the JJ inhabitants in Delhi hail from the States of U.P., Haryana and Rajasthan, it would be appropriate to consider if resettlement operations in Delhi could be linked with the implementation of the developmental works in the National Capital Region, where such ineligible squatters could be permitted to stay in holding zones/permitted squatting zones.

Slum Wing has carried out a socio-economic baseline survey of 457 JJ Clusters located in West of River Yamuna comprising 1,27,460 jhuggies and a population of about 4,57,224. This survey which was conducted w.e.f. October 2nd, 1988 and completed on 31st May, 1989 provides some useful information which is given in the statement enclosed (Annexure).

The problem of squatters in Delhi is a national one and a total solution thereto cannot be found within the confines of the Union Territory of Delhi. As you well know, with the number of inhabitants having reached a figure of 9.3 million, the population absorbing capacity of the Union Territory of Delhi is virtually exhausted. The civic services of Delhi are badly over-stretched, particularly with respect to water supply.

It is with this in view that the concept of National Capital Region has been envolved and satellite towns are proposed to be developed in the neighbouring

Contd.....2.

States in order to help decongest Delhi. Under the National Capital Region plan, specific funds are proposed to be allocated for operating various programmes in neighbouring States under the control of the National Capital Region Board. Accordingly, it is for consideration if certain specific land pockets forming part of the integrated development programme of satellite towns could be identified by the N.C.R. Board (particularly in sites which are adjacent to railway stations), for resettlement of such ineligible squatter families.

Incidentally, if the holding zones are set up in N.C.R. to which all ineligible squatter families of Delhi could be shifted, it could conceivably result in faster development of satellite towns as these zones would provide the manpower required for generating a variety of economic activities within the satellite towns through various programmes of the Government relating to Nehru Rozgar Yozna, Building Centre for production of alternative building materials and so on. The concept of holding zones/permitted squatters zones which involves carving out of plots of 10 to 12.5 sq. mtrs. to enable the shifted squatted families to erect their shelters, is not entirely a new one. It has been tried out in Delhi where the minimal basic civic amenities have been extended under the Plan programme for environmental improvement in urban slums.

Bearing all these positive aspects in mind, I would be grateful if you could give this idea some urgent thought and let us have your views and reactions thereon at the earliest.

With regards,

Yours sincerely,

(C. Noronha)

Shri K.K. Bhatnagar,
Member of National Capital
Region Planning Board,
7th floor, B-Wing, Janpath Bhawan,
New Delhi.

INVESTMENT PROPOSALS
NCR
VIII FIVE YEAR PLAN
(1992-97)

National Capital Region Planning Board
Ministry of Urban Development
Government of India

September 1991

NATIONAL CAPITAL REGION PLANNING BOARD

INVESTMENT PROPOSALS - NCR

VIII FIVE YEAR PLAN (1992-97)

1. INTRODUCTION

1.1 The National Capital Region Planning Board had approved in its 10th meeting held on 17.7.1989 the Investment Plan Proposals for the VIII Five Year Plan (1990-95) for the N.C.R. These proposals were submitted to the Ministry of Urban Development for consideration of the Planning Commission.

1.2 Now, in the context of the decision that the VIII Plan will be for the period 1992-97 and the years 1990-91 and 1991-92 to be treated as separate Annual Plans, the Investment Plan Proposals for N.C.R. have to be revised based on the 1991-92 price levels.

1.3 This document spells out the broad Regional Plan objectives, strategies, thrust areas and framework of the envisaged development programmes during the VIII Plan (1992-97). It also discusses the financing mechanism for the development programmes highlighting the participative role of Central, State and Private sector agencies and funding institutions and inter-state Joint ventures.

2. REGIONAL PLAN - 2001 FOR NATIONAL CAPITAL REGION - GOALS AND OBJECTIVES

2.1 The Regional Plan - 2001 for the National Capital Region was approved by the National Capital Region Planning Board in its 9th meeting held on November 3, 1988 and was notified for implementation with effect from January 23, 1989. The core objectives of the Plan are:

i) reducing pressure of population in Delhi; and

ii) achieving a balanced and harmonious development of the National Capital Region.

2.2 These goals and objectives are sought to be achieved through a package of inter-related policy measures relating to various sectors of development and adopting strategies of selective decentralisation aiming at:

a) containing the growth of Delhi UT within a manageable population size of 112 lakhs by 2001 AD,

b) moderate growth of Delhi Metropolitan Area (DMA) excluding Delhi U.T. to accommodate a total population of 38 lakhs by 2001 A.D.; and

c) induced growth of the rest of the Region to hold 49 lakhs of urban population in towns/complexes identified for priority development i.e., 19 lakhs additional population in Priority Towns between 1990 and 2001 A.D.

2.3 The general strategies for implementation of the policy measures in the above context would be as under:

i) Development of economic and employment generating activities in:

(a) **Formal Sector** : (Industries, Wholesale distributive trade and commerce, and Government and Public Sector Offices) leading to dispersal from Delhi to: a) D.M.A. Towns and b) Priority Towns.

(b) **Informal Sector** : Development of Informal Sector activities both in the rural and urban areas through skill upgradation programmes and promoting the local skills and crafts based entrepreneurial efforts to increase their employment generating potentialities.

ii) Promoting induced development of identified Priority Towns (Meerut, Hapur, Bulandshahr-Khurja, Panipat, Rohtak, Rewari-Dharuhera-Bhiwadi, Palwal and Alwar) in the Region through a package of incentives with a view to decentralise economic activities mentioned in para (i) above together with emphasis on creation of employment opportunities particularly in informal sector activities. This would also include upgradation of skills, provision of other social welfare measures and services.

iii) Provision and upgradation of physical and social infrastructure viz., telecommunications, transport both road and rail, and power at the regional level and, water supply, sanitation, solid waste management, education and health facilities at the local levels at norms and standards comparable to that of Delhi.

2.4 The Eighth Plan proposals of the N.C.R. Planning Board will have main thrust in the following areas :

i) Large Scale Employment Generation in Priority Towns by making developed land available for Industries, Wholesale Trade and Commerce, Shelter and location of Office complexes.

ii) Development of Regional Infrastructure : Transport, both rail and road, and telecommunications, through a separate Special Component Plan for the NCR.

iii) Development of local infrastructure in Priority and D.M.A. Towns.

iv) Improvement of State Highways and Transmission and Distribution System for Power in the State Grid.

3. INVESTMENTS DURING THE VII PLAN

During the 7th Plan, the total investments by the NCR Planning Board in the implementation of NCR Schemes was of the order of Rs.33.54 crores. The NCR schemes upto 1985 were those taken up under Integrated Urban Development Programmes (IUDP) under Centre's loan assistance since 1974, and these schemes were continued for their completion under NCRPB's assistance since March 1985. During the period 1974 to 1985, before the constitution of the NCR Planning Board, the investment by the Central Government was of the order of Rs.13.68 crores. Thus, from 1974 till the end of 7tth Plan, an Investment of Rs.47.23 crores have been made in the NCR area under the State Sector as Centres' share. As against this release of funds,the expenditure during the 7th Plan Period has been Rs.88.73 crores and during 1974-85 Rs.39.35 crores totalling Rs.128.08 crores upto March, 1990.

4. FINANCING MECHANISM FOR DEVELOPMENT PROGRAMMES IN THE VIII PLAN:

The framework of development programme envisaged for the 8th Plan for NCR is multi-sectoral in nature as it strives to achieve a harmonious development of the Region through a multiple programme of employment generation, economic activities both formal and informal, creation/upgradation of social and physical infrastructure prioritised temporally and spatially. To compliment such a programme, the financing mechanism would require the right mix of State, Central and Private Sector participation including inter-State Ventures and institutional sources.

State Sector: The envisaged development programmes are spatial in nature and therefore, each of the participating States would have a well-defined role to play in operationalising the programmes - conceiving appropriate schemes/projects, financing and implementing. The integration of these programmes would be achieved within the framework of the respective Sub-regional Plans prepared within the broad policy framework of the Regional Plan - 2001 for NCR. As an effective strategy, while each State formulate their respective State Plans, there should be a Sub-Plan of NCR in them truly reflecting the development programme component as applicable to the respective Sub-regions.

Central Sector: The initiatives of the Central Government for the planned development of the Region surrounding the country's National Capital City, have acted as catelysts for a well-knit Centre -State joint effort for achieving the coveted goal of a harmonised development of the Region and therefore it would be appropriate that it continues to play the lead role in implementing the development programmes. The investments proposed for the Central Sector relate to :

i) Development of railways;
ii) Development of roads (National Highway and Expressways)
iii) Development of telecommunications;
iv) Provision of additional power supply in the Region.

These would fall within the jurisdiction of the Ministries of Railways, Surface Transport, Telecommunications and Energy respectively. There is a need for according priorities for investment in these sectors and it would only be appropriate that the respective Ministries create an "NCR Component" in their investment - proposals of the Eighth Plan so that the process of Plan allocation, programme implementation, monitoring and evaluation etc. could be systematically managed.

Private Sector : The experience in the delivery of urban development programmes has revealed that the Government alone cannot undertake the financing and implementation of these programmes which are of stupendous proportions both in terms of resource, variety and magnitude. The expertise, resource mobilisation capabilities and the organisational and managerial capacity the private sector need to be tapped in a sizeable measure by providing a conducive financial and legal climate.

Tie-ups with Public Sector Development/Financing Institutions: In the financing mechanism envisaged for the development programmes, the public sector development/financing institutions are assigned a significant role. Programmes related to infrastructure in

the various Sub-regions can be financed through the HUDCO window on Urban Infrastructure. In order to facilitate larger and quicker flow of funds through this institutional set-up, the NCR Planning Board would assist the concerned State Governments/Development Authorities/Local Bodies to develop the requisite expertise in project formulation so that they conform to the Project Appraisal requirements of HUDCO Window.

Inter-State Joint Efforts : In the context of de-centralisation of population and economic activities from Delhi, a joint partnership approach between Delhi and participating States can be evolved through the concept of Joint Ventures structured in the same manner as joint sector industrial ventures. The States may help in acquisition of land and allotting/developing the land in accordance with the objectives of the NCR Plan. The States may have full control over the management while Delhi may finalise the development of the projects by linking such dispersal and decentralisation of economic activities identified to be shifted away from Delhi U.T. and providing necessary financial support for such joint ventures. The Delhi Plan may earmark such funds under the NCR component.

5. FRAMEWORK FOR DEVELOPMENT PROGRAMME FOR EIGHTH FIVE YEAR PLAN

Thrust Areas	Policy Zone/ Town	Development Programme
1. Land acquisition and development for economic activities and employment generation	Priority Towns	1. Induced growth of Priority Towns by development of economic activities for employment generation through: (a) development of industrial estates. (b) development of wholesale trade and commercial complexes. (c) Locating Central Government and Public Sector Offices.

		2. Decentralisation/deconcentration of economic activities from Delhi through :
	DMA excluding Delhi UT and rest of the region.	(a) location of wholesale trade and commerce complexes
	Rest of the region outside DMA.	(b) Re-location of obnoxious, polluting and non-conforming industries.
	DMA excluding Delhi UT and rest of the region.	(c) Locating Central Government and Public Sector Offices.
		3. Development of informal sector activities for employment generation through:
	Priority Towns, Sub-regional Centres, Service Centres, Basic Villages.	(a) Development of Work- cum -Shelter Complexes.
		(b) Skilled upgradation of artisans.
		(c) Promotion of local skills and crafts-based entrepreneurial efforts.
2. Provision and upgradation of infrastructure		
(a) Local Level	Priority Towns	1. Residential development
	DMA excluding Delhi UT, and Priority Towns	2. Provision of Urban infrastructure: (a) Water Supply (b) Sanitation (c) Solid Waste Management
	DMA excluding Delhi UT and Priority Towns.	3. Upgradation of social infrastructure.

(b) Regional level	Entire NCR	1. Transport (a) Roads (NH/SH/ Expressways) (b) Railways
	DMA excluding Delhi UT and Priority Towns	2. Telecommunications
	Entire NCR	3. Power Development.
3. Strengthening of infrastructure for fostering rural-urban continum	Priority Towns, Sub-regional Centres, Service Centres, and Basic Villages.	1. Upgrading / establishing linkages : - roads, telecom facilities; 2. Providing economic support : - processing and marketing facilities. 3. Providing social infrastructure : - education, health. 4. Providing / upgrading physical infrastructure : - shelter, water supply and sanitation.

6. FINANCIAL REQUIREMENTS OF NCR PLAN IN THE VIII PLAN :

(Rs. in Crores)

1.	Land Acquisition and Development for :	
	a) Residential use.	648.00
	b) Economic Activities.	
2.	Development of Sub-regional Centres	66.00
3.	Development of Counter Magnet Areas	100.00
4.	Bridging the Interest Rate gaps	10.00
5.	Institutional Strengthening for Plan Implementation.	5.00
6.	Upgradation of Regional Roads (Inner and Outer Grids)	176.00
7.	Power Development	(Under discussion)
8.	Augmentation and Rehabilitation of Urban Infrastructure in DMA and Priority Towns	111.00
	TOTAL	RS.1116.00 CRORES

Details are in Annexures I to IX.

7. FINANCING THE NCR PLAN

A. Outlays needed for funding on sharing basis by NCR Planning Board and the participating States.

(Rs. in Crores)

Items	Total	Share of the Board (Loan Assistance by the Board)	Share of the States/ Implementing Agency.
1. Land Acquisition & Development	648	324	324
2. Development of Regional Centres	66	33	33
3. Development of Counter-Magnet Areas	100	50	50
4. Bridging Interest Rate Gaps	10	9	1
5. Institutional Strengthening for Plan Implementation	5	5	-
Sub Total	829	421	408

B. Outlays needed in State Plans

1. State/Implementing Agencies Share of counterpart funding by NCRPB	408	-	408	
2. Development of Regional Roads (Inner & Outer Grids)	176	-	176	
3. Power Development		-	(Under discussion	
4. Local Infrastructure Schemes to be financed through Financial Institutions	111	-	-	Financial Institutions 111
Sub Total	695	-	584	111
TOTAL NCR PLAN	1116	421	584	111

Thus, out of the total investment requirement of Rs.1116 crores, the share of the NCR Planning Board would be Rs.421 crores, that of the States Rs.584 crores and the institutional sources (HUDCO) Rs.111 crores.

8. RESOURCES FOR NCRPB'S SHARE IN THE NCR PLAN.

8.1 The share of allocations to be provided by the NCR Planning Board is proposed to be through the following sources :

a) Budgetary Support thorough the Ministry of Urban Development.	Rs.276 Crores
b) Market/Institutional borrowings	Rs.100 Crores
i) Institutional borrowing such as LIC, GIC, UTI etc. Rs.75 crores	
ii) Issue of Bonds-Rs.25 crores	
c) Internal accruals of the NCRPB	Rs. 45 Crores
TOTAL	RS.421 CRORES

8.2 Raising of funds from the market and the financing institutions would be under the provisions of Section 22 (i) (c) of the NCR Planning Board Rule, 1985 which authorises the Board to receive sums from such other sources as may be decided by the Central Government in consultation with the participating States and the Union Territory. An additional source of financing should be the Delhi Plan which should have an NCR Component in the shape of contributions to the NCR Planning Board Fund.

9. NCR COMPONENT PLAN FOR SCHEMES OF CENTRAL MINISTRIES

9.1 The Regional Plan - NCR 2001 is an integrated development plan envisaging on the one hand, investments falling directly under the Central Ministries for removal of regional infrastructural gaps in the sectors of transport, both rail and road, telecommunications; and creation of employment opportunities, provision of shelter, and upgradation of local level infrastructure and power development in the State sector on the other. The investments for regional infrastructure have to be made by the Central Ministries of Railways, Surface Transport, and Communications, out of their budgets as part of an NCR Component Plan. The Board will be responsible for the necessary coordination for the preparation, monitoring and evaluation of this Component Plan. Additional financial allocations to the concerned Central Ministries for this NCR Component Plan could be made by the Planning Commission in their budgets as additions to their own efforts for the accelerated development of the National Capital Region. The outlays so provided shall be reflected in a separate budget head under the Ministry of Urban Development. Details of the Projects are at Annexures C 1 - C 5.

9.2 The funds required for the NCR Component Plan for the Eighth Plan are as follows:

	(Rs. in Crores)
National Highways (Ministry of Surface Transport)	259.00
Expressways (Ministry of Surface Transport)	95.00
Railways (Ministry of Railways)	443.00
Telecommunications (Deptt. of Telecommunications)	
(a) Within NCR	375.00
(b) Counter-Magnet Areas	155.00
TOTAL	RS.1327.00 CRORES

* Details are in Annexures C-1 to C-5.

ANNEXURE - I

LAND ACQUISITION AND DEVELOPMENT FOR RESIDENTIAL AND ECONOMIC ACTIVITIES

The participating States will concentrate on the provision of serviced land for shelter and employment generating activities (development of industrial estates, informal sector activities, wholesale trade and commercial complexes, office complexes) in the Priority Towns in NCR. Since the availability of land in the right quantity is the corner stone of the strategy for meeting the objectives of the NCR Plan, the NCR Planning Board would assist the State Governments in acquiring the land in Priority Towns required for their induced growth and also for catering to the incremental population due to their natural growth.

The requirement of land works out to 5641 hectares for various uses, of which 1878 hectares stand acquired in Meerut, Bhiwadi and Panipat. It is proposed that in addition to meeting the cost of land acquisition of the remaining 3763 hect, 3099 hectares land would be developed through Plan funds provided through the NCR Planning Board and the States on matching basis. The remaining 2542 hectares of land could be developed through finances obtained from the institutional sources such as HUDCO, National Housing Bank and through private sector.

By and large, 2/3rd of the land developed would cater mainly to residential use and the rest 1/3rd for economic activities and associated uses. In developing residential areas, emphasis will be on provision of plots for low income groups. It is proposed that atleast 55% of the plots should be for EWS category households below the poverty line and in addition 20% for low income group households above the poverty line and the remaining 25% to be provided for middle and high income groups.

The development of industrial, wholesale trade, commercial and office complexes will be based on standards prescribed in the respective Master Plans of the cities and the developed land shall be disposed off at remunerative prices. Similarly, the plots for higher income groups and non-residential purposes shall be priced higher to ensure full cost recovery.

The following table indicates requirements of funds for Land Acquisition and Development for residential and economic activities.

LAND ACQUISITION AND DEVELOPMENT FOR RESIDENTIAL AND ECONOMIC ACTIVITIES 1992-97.

SUB-REGION	LAND REQUIREMENT (Ha)	LAND ALREADY ACQUIRED (Ha)	LAND TO BE ACQUIRED (Ha)	LAND TO BE DEVELOPED (Ha)	C O S T (RS. LAKHS)		
					L.A.	L.D.	TOTAL
Haryana	1704	80	1624	946	9744	11960	21704
Rajasthan	815	345	470	482	2350	5895	8245
Uttar Pradesh	3122	1453	1669	1671	14187	20690	34877
TOTAL	5641	1878	3763	3099	26281	38545	64826

NOTE : The unit cost of land acquisition has been taken as Rs.6 lakhs/hect. for Haryana Rs.5 lakhs/hect for Rajasthan and Rs.8.5 lakhs/hect for Uttar Pradesh, while the land development cost has been taken at an average rate of Rs.13 lakhs/hect.

ANNEXURE II

DEVELOPMENT OF SUB-REGIONAL CENTRES

The Regional Plan - 2001 for NCR, inter alia, envisages developmet of settlements in a hierarchical manner. In addition to the towns identified for Priority development, the settlement system comprises Sub-regional centres, Service Centres and Basic Villages. The identification of these three categories of settlements has already been taken up by the participating States through the preparation of Sub-regional Plans for their respective Sub-regions. It is proposed that the development of Sub-regional centres should be taken up during the Eighth Five Year Plan in addition to the Priority Towns in the State Sector. The development proposed include land acquisition and development for non-agricultural activities such as agro-processing and cottage industries, agricultural produce markets and activities in informal sector, facilities for repair and servicing of agricultural and non-agricultural tools and machinery in addition to provision of sites and services for shelter and related infrastructure as required. It will enable the Sub-regional centres to play their role in fostering rural-urban continuum and sub-serve the rural areas.

2. Pending finalisation of the Sub-regional Plans by the participating States, a study of the settlement system analysis by the Physical Research Laboratory, Ahmedabad can be taken as the basis for identifying the Sub-regional Centres. The above study has identified following Sub-regional Centres in the participating States:

Haryana	13 Sub-regional Centres
Rajasthan	3 Sub-regional Centres
Uttar Pradesh	17 Sub-regional Centres
Total	33

It is proposed that an investment of atleast Rs.2 crores be made in each Sub-regional Centre during the Eighth Plan. This would be provided on matching basis by the NCR Planning Board and the participating States. Thus, in all Rs.66 crores would be required during the Eighth Plan.

ANNEXURE III

DEVELOPMENT OF COUNTER MAGNET AREAS

Five Counter Magnet Areas have been identified outside NCR are Patiala in Punjab, Hissar in Haryana, Bareilly in Uttar Pradesh, Gwalior in Madhya Pradesh and Kota in Rajasthan. The Outline Development Plans for Patiala and Kota have since been approved while for the rest, the plans are under preparation by the concerned States. A National Capital Region Counter-Magnet (Name of the town) Development Fund would be created under the State Sector for each counter magnet town to take up programmes relating to acquisition and development of land for various uses. It is proposed that a total investment of Rs.20 crores would be made in each counter-magnet town for the development of residential, economic activities infrastructure, on matching basis by the NCR Planning Board and the States. Thus, the total outlay required would be Rs.100 crores during the 8th Plan.

ANNEXURE - IV

BRIDGING THE INTEREST RATE GAPS

It is proposed to raise funds from the institutional sources as well as market borrowings to the tune of Rs.100 crores. The interest rate of these borrowings would be around 14 to 15%. Over and above to this, there would be expenditure of about 1% towards the establishment charges for appraisal, sanctioning and maintenance of loan accounts, maintenance of banking transactions and other services, etc. Thus, the effective lending interest rate to the State Governments/ Implementing Agencies would be around 15 to 16%, which would be on the higher side as compared to the rates of interest applicable under the NCR Planning Board Rule, 1985. At present, the interest rates charged by the Board on loans to the State Government is 10.75% and to the Implementing Agencies (when paid directly) is Rs.11.50%. In view of this differential rate of interest, it is proposed that the Board may finance the projects particularly for land acquisition and development etc., by subsidising the rate of interest on loan assistance to be given to the Implementing Agencies. However, part of the burden in this respect shall be shared by the State Governments/Implementing Agencies. This is particularly required in view of the fact that the NCR Plan envisages induced development of the priority towns and the State Governments would have to be assisted with a view to encouraging them to accelerate their developmental efforts in inducing the growth to meet the objectives of NCR Plan.

The funds required for bridging the interest rate gaps as detailed above would Rs.10 crores during the Eighth Plan, out of which the Board may take the burden substantially to the extent of Rs.9 crores.

ANNEXURE - V

INSTITUTIONAL STRENGTTHENING FOR PLAN IMPLEMENTATION

(A) SETTING UP PLANNING CELLS IN THE PARTICIPATING STATES AND DELHI U.T. AND STRENGTHENING OF NCR PLANNING BOARD SECRETARIAT.

For effective implementation of the Regional Plan of NCR and Sub-regional Plans of the respective States and the U.T. of Delhi, Planning Cells have been set up in the States and U.T. These Cells would continue to function and perform their designated responsibilities relating to planning, project formulation and overseeing the implementation of the Regional Plan /Sub-regional Plan and help the Board in monitoring and evaluation of the progress of the various programmes.

In addition, the NCR Planning Board Secretariat would have to be suitably strengthened to effectively coordinate the efforts of all the concerned States/UT and Central Ministries in the implementation of the Regional Plan and assist in project formulation, appraisal, monitoring and evaluation of the projects.

On both the above counts, the outlay required will be Rs.3 crores during the Eighth Plan.

ANNEXURE - VI

(B) SURVEYS, STUDIES AND TRAINING PROGRAMMES

The NCR Planning Board, as part of its responsibility for coordinating the implementation, monitoring and evaluation of the Regional Plan Programmes, has to provide necessary research and training support to the various agencies engaged in these tasks. Detailed research studies on housing requirements, informal sector activities and other infrastructural programmes would have to be taken up periodically for the Priority Towns, Delhi Metropolitan Area and the rural areas of the Region to draw up appropriate development programmes. It is expected that for engaging the services of expert consultancy organisations for carrying out the specific studies, surveys and for conducting training courses, to train the personnel of the various organisations to equip them adequately to carry out their assigned tasks, the required financial outlay would be Rs. 2 Crores during the Eighth Plan period.

ANNEXURE - VII

REGIONAL ROADS - INNER AND OUTER GRIDS

The NCR Plan envisages development of Inner and Outer Grids in the region by developing the existing State Highways. It is proposed that the right of way of the grids may be taken as 30 meters in the first phase, thus obviating the need for major land acquisition. However, the land acquisition for byepasses would be taken up during the Eighth Plan. The detailed cost estimates for the development of these roads amount to Rs.176 crores as per details given below:

REGIONAL ROADS - INNER AND OUTER GRIDS:

State/Sub-Region	Length (km)	Total Area only for bye passes (acres)	Unit Cost for Land Acquisition (Rs. lacs/ acre)	Total Cost for Land Acquisition (Rs.in lacs)	Unit cost for construction (Rs. lacs/km)	Total cost for construction (Rs.lacs)	Total cost for R.O.B. (Rs.lacs)	Total cost (Rs.lacs)	VIII Plan (Rs. lacs)
1 2	3	4	5	6	7	8	9	10	11
I. HARYANA									
i) Outer Grid	295.03	360.00	0.79	284.0	14.00	4219.0	1104.0	5607.0	5607.0
ii) Inner Grid	145.03	-			14.00	1915.0	345.0	2260.0	2260.0
Total:	440.06	360.00		284.0		6134.0	1449.0	7867.0	7867.0
II. UTTAR PRADESH									
i) Outer Grid	226.6	233.00	0.95	221.0	26.00	5868.0	1500.0	7589.0	7589.0
ii) Inner Grid	71.8	113.00	0.95	107.0	26.00	1795.0	240.0	2142.0	2142.0
Total:	298.4	346.00		328.0		7663.0	1740.0	9731.0	9731.0
III. RAJASTHAN									
i) Outer Grid	90	-	0.19	-	24.00	2191.0	-	2191.0*	
Total:	90	-		-		2191.0	-	2191.0*	
Grand Total:	828.46	706.00		612.0		13797.0	3189.0	17598.0	17598.0

* Project Funded under World Bank Aid, Excluded from the estimated grand total costs.

ANNEXURE VIII

POWER DEVELOPMENT

Ministry of Energy is of the view that the additional power for NCR could be met from the existing central power stations in and around NCR. They have however, identified lack of proper transmission and distribution facilities as the bottleneck. They have directed the Central Electricity Authority to carry out detailed discussions with the State Governments at the time of the formulation of their plan proposals to identify the needs for transmission and distribution and have them included as a Sub-plan in the Power Sector Plan of the State. They expect that since this would be included in the State Plan, their funding would be in the State Sector.

The details are yet to be finalised.

ANNEXURE - IX

URBAN INFRASTRUCTURE SCHEMES

There is a large deficit in urban infrastructure services such as water supply, sewerage, drainage and solid waste management in Priority and DMA Towns. As this would require huge investments, it is proposed that the development be taken up in phases. During the Eighth Plan, backlog existing in the beginning of 1992-93 should be removed as indicated below:

Water Supply	-	Removal of 50% of the deficit.
Sewerage	-	Removal of 50% of the deficit on account of un-catered population. (To cover 25% of target population with normal sewerage system and 75% of target population with low cost sanitation).
Drainage	-	50% of the unserved population.
Solid Waste Management	-	The unmanaged garbage.

Based on the above criteria, the estimated cost works out to:

(RS. IN CRORES)

	DMA TOWNS	PRIORITY TOWNS
i) Water Supply	14.90	18.84
ii) Sewerage	27.06	28.52
iii) Drainage	7.16	5.82
iv) Solid Waste Management	3.05	5.52
TOTAL	52.17	58.70

TOTAL RS.110.87 CRORES SAY RS.111 CRORES

It is proposed to obtain these funds through Infrastructure Window of HUDCO.

Annexure C-1

NATIONAL HIGHWAYS - UPGRADATION

	Section	Length km	Existing lanes	Proposed lanes	Unit cost (Rs. cr/km)	Total cost (in Rs.crores)	VIII Plan
i)	Delhi-Gurgaon (NH-8)	16	4	6	1.2	19.2	19.2
ii)	Gurgaon-Behror(NH-8)	102	2	4	1.2	122.4	122.4
iii)	Faridabad-Hodal(NH-2)	70	2	4	*	*	*
iv)	Ghaziabad-Hapur(NH-24) (bypass)	20	2	4	1.2	24.0	24.0
v)	Delhi-Bahadurgarh-Rohtak-NCR Boundary	78**	2	4	1.2	93.6	93.6
	Total:	286				259.2	259.2

* Under ADB Assistance

** Delhi-Bahadurgarh stretch is already 4 lanes.

ANNEXURE C-2

EXPRESSWAYS - NEW ALIGNMENT

	Section	Length (km)	R.O.W. (m)	Lanes	Unit cost of Land Acquisition (Rs. Crs/hec)	Unit cost of construction (Rs. Crs/km)	Total cost (crores) (LA+ Const.)	VIII* Plan (crs) For LA only
1.	Delhi-Ghaziabad -Meerut	60	60	4	0.085	1.4	115.0	31.0
2.	Sonepat-Panipat	50	60	4	0.085	1.4	96.0	26.0
3.	Faridabad-NOIDA -Ghaziabad**	40	60	4	0.10	1.4	94.0	38.0
	Total:	150					305.0	95.0 *

* Land acquisition for all the three expressways.

**Construction of Faridabad-NOIDA-Ghaziabad expressway would also be taken up through institutional sources at an estimated cost of Rs.56 crores.

ANNEXURE C-3

RAILWAYS:

S.NO.	SECTION	LENGTH KM.	PRESENT STATUS	PROPOSAL	UNIT COST PER KM/LINE (CRORES)	TOTAL COST (CRORES)	VIII PLAN
1.	(i) Ghaziabad-Muradnagar-Meerut	18	Muradnagar-Meerut (Unelectrified)	Electrification of single line.	0.2	7.2	7.2
	(ii) Muradnagar-Meerut Cantonment	30	Double line between Ghaziabad-Muradnagar and single line between	Doubling	0.2 (Electrification) 1.1 (Laying of lines)	39.00	39.00
2.	Palwal-Faridabad-Tughlakabad Section	40	One line already added	Laying and Electrification of an additional line.	1.2	48.00	48.00
3.	Delhi-Ghaziabad-Khurja	83		Laying & Electrification of additional pairs of lines between Ghaziabad-Khurja.	1.2	199.2	199.2
4.	Delhi-Alwar		(One meter gauge	Laying of single B.G.			
	(a) Delhi-Gurgaon	34	line)	line (new)	1.0	34.0	14.0
	(b) Gurgaon-Alwar	126	-do-	-do-	1.0	126.0	51.0
5.	Regional Rail Bypass (Khurja-Palwal-Sohana-Rewari-Rohtak)	210		New Alignment	-	481.25	85.00
	TOTAL					934.00	443.00

ANNEXURE C-4

TELECOMMUNICATTIONS

WITHIN NCR

TOWN	EXISTING NO. OF LINES	NO. OF ADDL. LINES PROPOSED	TOTAL COST RS. CRORES FOR ADDL. LINES	VIII PLAN PROPOSAL, RS. CRORES (1990-95)
I. D.M.A. TOWNS				
1. Faridabad-Ballabhgarh	6900	42100	93.01	93.01
2. Bahadurgarh	600	1400	3.09	3.09
3. Gurgaon	4096	24904	55.02	55.02
4. Ghaziabad-Loni	13840	24160	53.37	53.37
5. NOIDA	7400	30260	66.85	66.85
6. Kundli	400	-	-	-
TOTAL	33236	122824	271.34	271.34
II. PRIORITY TOWNS				
1. Rohtak	6000	6400	14.14	14.14
2. Rewari	2200	1800	3.97	3.97
3. Panipat	4000	8500	18.77	18.77
4. Dharuhera	400	-	-	-
5. Palwal	1300	2100	4.63	4.63
6. Meerut	12600	18300	40.43	40.43
7. Hapur	2000	1500	3.31	3.31
8. Bulandshahr	1500	1500	3.31	3.31
Khurja	1100	1400	3.09	3.09
9. Alwar	4400	4100	9.05	9.05
10. Bhiwadi	700	1300	2.87	2.87
TOTAL	36200	46900	103.57	103.57
GRAND TOTAL (NCR)	69,736	1,69,724	374.91	374.91

(SAY RS.375 CRORES)

ANNEXURE C-5

TELECOMMUNICATIONS

COUNTER MAGNET AREAS

S.No.	Town	Existing No. of Lines	Additional No. of Lines proposed during VIII Plan	Cost (Rs. in crores) including on telex transmission media required for inter-connection
1.	Hissar	5600	8700	28.98
2.	Patiala	10000	5300	17.65
3.	Bareilly	8700	6300	20.99
4.	Kota	7800	12220	40.71
5.	Gwalior	10000	14000	46.64
	TOTAL	35080	46520	154.97

SAY RS.155.00 CRORES

MINUTES OF THE 23RD MEETING OF THE PLANNING COMMITTEE HELD AT 10.30 A.M. ON NOVEMBER 29, 1991 IN THE OFFICE OF THE NCR PLANNING BOARD, NEW DELHI.

The list of the participants is annexed.

2. The Member-Secretary welcomed the participants to the meeting, and thereafter agenda items were taken up.

AGENDA ITEM NO.1: Confirmation of the minutes of the 22nd meeting held on 30.8.1991.

Minutes were confirmed.

AGENDA ITEM NO.2: Review of the action taken on the decisions of the last meeting held on 30.8.1991.

Member Secretary said that the Planning Committee in the 22nd meeting held on 30.8.1991 had approved the Approach Paper for Investment proposals for NCR for the Eighth Five Year Plan (1992-97). The NCR Planning Board Secretariat after making necessary changes and incorporating the cost estimates at the current prices submitted a revised proposal to the Ministry of Urban Development for consideration of the Planning Commission. A copy of the said revised proposal had been circulated to the members with the agenda of this meeting. He further stated that certain positive developments had taken place since then. The NCR Planning Board was able to make a presentation of the Investment Proposals to the Member, incharge of Urban Development in the Planning Commission. The Board also made a similar prosentation to the Deputy Chairman, Planning Commission where Secretary, Urban Development and the Chief Secretary, Delhi Administration were present. Though, no indication of the Eighth Plan likely allocations for the NCR was available, there was a general appreciation of the NCR Plan and its implementation as a total package by the Central Ministries, States [illegible] Union Territory. There was a general feeling that Central Ministries should take a lead in the implementation of the NCR Plan. He further stated that the Deputy Chairman, Planning Commission would shortly be convening two meetings - one with the Chief Ministers' of the participating States and Lt. Governor of Delhi and the other with the Central Ministers and he was quite hopeful that the Planning Commission would be able to obtain a positive response from the the Central Ministries and accommodate the NCR Plan requirements in their respective Eighth Plan proposals.

Shri Pradeep Kumar, Secretary, Town & Country Planning, Haryana said that the requirement of power would be quite substantial in Haryana, in addition to the need for strengthening the transmission and distribution network. He stated that the earlier Eighth Plan (1990-95) had included Rs.697 crores for power generation which had now been reduced substantially to accommodate for transmission and distribution system only. Member Secretary reacting to the above said that this was based on the position taken by the Secretary, Ministry of Energy who had stated in the last NCR Planning Board meeting that the power requirements in the NCR could be met from the existing sources though while the real bottleneck was in transmission and distribution system. The Central Electricity Authority would be discussing these requirements with the State Governments and funds could be made available for this purpose by the Power Finance Corporation to the State Electricity Boards. Secretary, Haryana, however, again emphasised for the need for additional power generation to ensure uninterrupted power supply in NCR.

Agenda Item No.3: Approval of Functional Plan for Delhi Metropolitan Area.

Initiating the discussion, Member Secretary said that the Functional Plan for Delhi Metropolitan Area had been discussed in a couple of Planning Committee meetings earlier. The State Governments had requested to allow some more time for study of the Plan during which certain comments had been received from Delhi and NOIDA. Since the draft Functional Plan needs to be finalised and placed before the NCR Planning Board in its next meeting for consideration and approval, he requested the members to expedite their comments.

Secretary, Town & Country Planning, Haryana said that they had circulated the Draft Functional Plan to various Departments and would be in a position to send their comments in next 15 days. If no comments were communicated, it may be presumed that Haryana had no comments to offer on the Plan.

Principal Secretary, Housing Department, Uttar Pradesh said that there was no problem in general in approving the Draft Functional Plan for DMA.

Shri J.C. Gambhir, Commissioner, Planning, DDA said that he had made certain suggestions and the comments were sent to Delhi Administration. However,

he mentioned the following problems which needed to be addressed in the Functional Plan :

1. Unauthoritised constructions/squatter colonies in Delhi and Delhi Metropolitan Area.

2. Developments taking place around Loni in close proximity of Delhi Union Territory.

3. Industrial Pollution at Ghaziabad and Faridabad.

4. Elaboration of transport proposals.

Shri Gambhir suggested that the Functional Plan should contain a chapter on 'Action Plan' for implementation of the policies and strategies indicated in the Plan.

He further said that Air Pollution in Delhi has become very high and such pollution is equally pronounced in DMA towns. He stated that the transport is one of the major contributors to the pollution in Delhi. Reacting to the above, Principal Secretary, Housing, U.P. said that it would be incorrect to presume that all DMA towns are facing pollution problems. For example, NOIDA is a pollution-free industrial township. He also said that all heavy industries need not be polluting industries whereas small units could be equally polluting. Member Secretary informed the Committee that Tata Energy Research Institute is conducting a study for the National Capital Region on the environmental aspects, and it would be possible for the Board to incorporate the major findings of the above study in the DMA Functional Plan before its consideration by the NCR Planning Board.

Agenda Item No.4: Finalisation of Sub-regional Plans for NCR Sub Regions.

Member Secretary said that draft Sub-regional Plan for Uttar Pradesh had been received only recently and the same is under examination by the Board. He further requested the Principal Secretary to send sufficient number of copies along with large size maps, for circulation amongst the Sub Group Members for their study and comments. The Additional Chief Town Planner, Rajasthan said that the Draft for Rajasthan Sub-region was under typing and would be submitted to the Board by the end of December, 1991. Member Secretary said that this Sub-Regional Plan had been inordinately delayed. Secretary Town & Country Planning, Haryana said that

the Draft Sub-Regional Plan would be submitted by the end of December, 1991 to the Board. Shri J.C. Gambhir, DDA said that the date for preparation of Draft Sub-Regional Plan for Delhi Union Territoy had been fixed as 31.3.1992. Member Secretary, however, requested him to prepare an outline of the Sub-regional Plan by January 1992.

AGENDA ITEM NO.5: Allotment of Land in the Priority/DMA Towns for Government/Public Sector Offices.

Member Secretary explained the proposal. After discussions, it was decided that NCR Planning Board would compile information relating to available land in various NCR towns, with the assistance of the State Governments which would be periodically updated. This would facilitate disseminating information to the institutions seeking land in the NCR towns. Commissioner (Planning), Delhi Development Authority said that the NCR Planning Board would be in a better position to help various institutions/organisations seeking allotment of land in Delhi which could be diverted to NCR towns.

AGENDA ITEM NO.6: Revision of Regional Plan - 2001.

The members while agreeing with the need to initiate studies on various aspects as included in the Agenda, felt that the item listed in para 2(g) on legislative aspects need to be deleted as this would be decided among the participating States in the course of discussion on legal aspects. As regards constitution of a Steering Group for providing overall policy level directions and help in proper conduct of the study, members said that State representatives should also be included in the Steering Group. The Chief Town & Country Planner, Uttar Pradesh said that the Planning Cell should be actively associated in the conduct of the study and this would provide a valuable input on the part of the participating States while undertaking the revision of the Regional Plan for NCR. Member Secretary, appreciating the views of the members, accepted the suggestions.

AGENDA ITEM NO.7: Resettlement of Squatters from Delhi in the National Capital Region.

Member Secretary stated that this item was included in the Agenda based on the suggestions received from the Delhi Development Authority. He

requested Commissioner (Planning), DDA to apprise the meeting with the issues relating to re-settlement of squatters from Delhi in the NCR towns. Shri Gambhir said that there were 2.40 lakh squatter households in Delhi and the Delhi Administration has adopted a 3 pronged strategy in this regard :

i) Squatters on project land to be shifted and resettled;

ii) Squatters on other land to be provided with on-site development of infrastructure; and

iii) Environmental Improvement Programmes to be undertaken in the other jhuggi clusters.

He suggested that those squatter households who have become in-eligible for resettlement in Delhi after 31.1.1990 could be located in the NCR towns. He further stated that as a policy, 25% of the land being developed by DDA is reserved for squatter settlements in various schemes.

Reacting to the above, Principal Secretary, Uttar Pradesh stated that such approach was 'elitist' in nature and the problems need to be tackled in totality rather than in isolation. He said that people are migrating to Delhi in search of employment opportunities and therefore steps were needed for reducing the flow of migrants to Delhi by creation of similar employment opportunities elsewhere. He further said that there was equally another problem of depriving the people of their livelihood with the acquisition of land for meeting the fast growth of urban centres.

Secretary, Haryana said that the development of work centres and better employment opportunities were required to address the problem of migrants. He said that the DMA towns in Haryana were equally faced with the problem of squatter settlements. He suggested that activities such as regional wholesale markets etc. must move out of Delhi in NCR towns which would have the effect of not only reducing congestion in Delhi but also creating employment opportunities for the potential migrants to Delhi.

The representatives of Rajasthan said that it was not possible to accommodate the squatters in the towns of Rajasthan Sub-region.

Member Secretary reacting to the above, stated that he too subscribed to the view that creation of employment opportunities was essential to tackle the

problem of squatters. The States could follow the approach of creation of work-cum-shelter in their development schemes with likely impact to the reduction in the inflow of migrants to Delhi. Shri J.P. Bhargava, Chief Town & Country Planner, Uttar Pradesh said that the priority towns need to follow such an approach and financing of such development schemes should be given priority by the NCR Planning Board.

The meeting ended with a vote of thanks to the Chair.

No.K-14011/65/91-NCRPB
N.C.R. Planning Board,
7th Floor, 'B' Wing,
Janpath Bhavan, Janpath,
NEW DELHI - 110001.

New Delhi, the 16th December, 1991

Copy forwarded to all the members of the Committee and participants.

(B.N. SINGH)
Chief Regional Planner
&
Member Convenor

RO(M)

LIST OF THE PARTICIPANTS IN THE MEETING HELD ON 29.11.1991 AT 10.30 A.M. IN THE OFFICE OF THE NATIONAL CAPITAL REGION PLANNING BOARD, NEW DELHI.

---

1. Shri K.K. Bhatnagar, In Chair
   Member Secretary,
   NCR Planning Board,
   New Delhi.

2. Shri R.S. Mathur,
   Principal Secretary,
   Housing & Urban Planning,
   Uttar Pradesh,
   Lucknow.

3. Shri Pradeep Kumar,
   Secretary,
   Town & Country Planning & Urban Estate,
   Govt. of Haryana,
   Haryana Civil Secretariat,
   Chandigarh.

4. Shri G.K. Marwah,
   Joint Secretary (L&B),
   Delhi Administration.

5. Shri S. Kumar,
   Director (MTP),
   Railway Board,
   New Delhi.

6. Shri K.K. Malik,
   Director (TPS),
   Telecom. Commission,
   New Delhi.

7. Shri D.P.S. Seth,
   Deputy Director General,
   Deptt. of Telecom.
   New Delhi.

8. Shri Satinder Pal Singh,
   Superintending Engineer (Planning)
   Ministry of Surface Transport,
   (Roads Wing)
   New Delhi.

9. Shri S.K. Bansal,
   Assistant Secretary,
   Department of Power,
   New Delhi.

10. Shri K.T. Gurumukhi,
Addl. Chief Planner,
Town & Country Planning Organisation,
New Delhi.

11. Shri J.C. Gambhir,
Commissioner (Planning),
Delhi Development Authority.

12. Shri Raj Kumar,
Director, T & C.P.
Haryana.

13. Shri J.P. Bhargava,
Chief Town & Country Planner,
Uttar Pradesh.

14. Shri B.D. Gulati,
Chief Coordinator Planner,
Planning Cell, Gurgaon.

15. Shri B.L. Mehra,
Additional Chief Town Planner,
Rajasthan, Jaipur.

16. Shri B.N. Singh, Member-Convenor
Chief Regional Planner,
NCR Planning Board,
New Delhi.

NCR PLANNING BOARD

1. Shri S. Arunachalam, Senior Planning Engineer.
2. Shri R.P. Rastogi, Regional Planner.
3. Shri V.K. Thakore, Senior Research Officer.
4. Shri Pran Nath, Deputy Director.
5. Shri K.L. Sachar, Finance & Accounts Officer.
6. Shri P. Jayapal, Asstt. Town Planner.
7. Shri M.M.A. Baig, Asstt. Town Planner.
8. Shri P. Sisupalan, Research Officer.
9. Shri Manmohan Singh, Research Officer.

DRAFT

FUNCTIONAL PLAN
FOR
DELHI METROPOLITAN AREA

National Capital Region Planning Board
Ministry of Urban Development, Government of India

NOV.1991

1

FUNCTIONAL PLAN FOR THE D M A: CONCEPT, NEED AND OBJECTIVES

1.1 CONCEPT

The preparation and enforcement of the Regional Plan - 2001 for the National Capital Region has been a milestone in planning for the development of the Region. The other planning exercises envisaged by the NCR Planning Board Act, 1985 are :-

a) **Sub-Regional Plans :** Section 17, 19 and 20 of the Act, provide for preparation of Sub-Regional Plans by each participating State and UT, for their respective Sub-regions, with the approval of the Board. The work for preparation of Sub-regional Plans had been taken up in hand since August 1987, and these are under various stages of preparation. The finalisation of the Sub-Regional Plans would enable detailing of various development aspects and give an integrated picture for preparation of detailed Project Plans for development of respective Sub-regions.

b) **Project Plans :** Under Section 18 of the Act, a participating State or the Union Territory, may by itself or in colloboration, with others, prepare Project plans for one or more elements of the Regional Plan, Functional Plan or Sub-Regional Plan. A number of initiatives have already been taken by the Board and the States, the notable ones being :

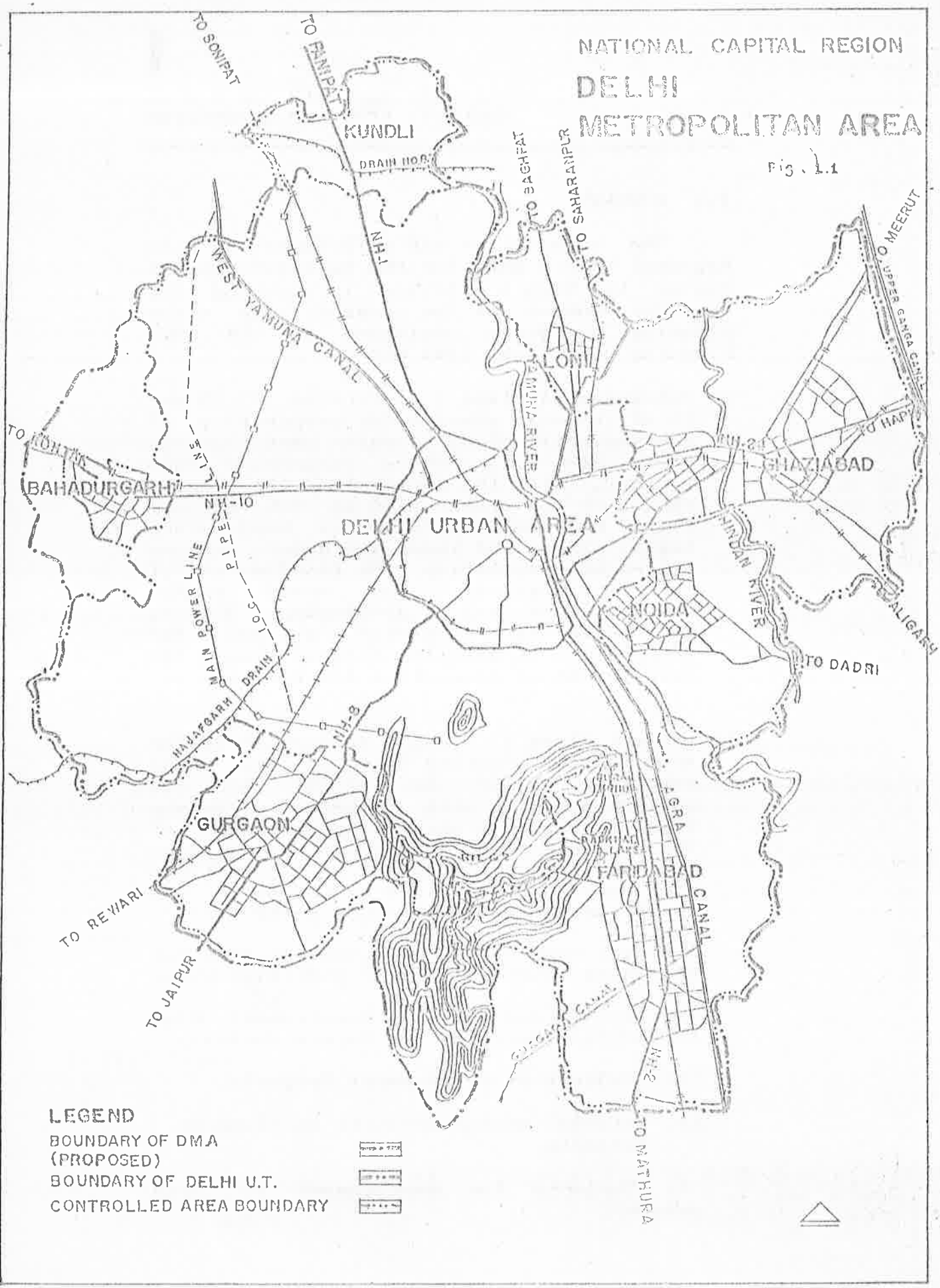
i. Joint Land Use and Development Plan for Dharuhera (Haryana) and Bhiwadi(Rajasthan)

ii. Joint Land Use and Development Plan for Kundli (Haryana) and Narela (Delhi).

iii. Industrial Development Projects.

iv. Informal sector activity development projects.

v. Projects for development of Road network.


NATIONAL CAPITAL REGION
DELHI
METROPOLITAN AREA
Fig. 1.1
TO SONIPAT
TO PANIPAT
KUNDLI
DRAIN NO.8
NH-1
TO BAGHPAT
TO SAHARANPUR
TO MEERUT
UPPER GANGA CANAL
WEST YAMUNA CANAL
LONI
HINDON RIVER
TO HAPUR
GHAZIABAD
TO ROHTAK
BAHADURGARH
NH-10
DELHI URBAN AREA
MAIN POWER LINE
PIPE LINE
NOIDA
HINDAN RIVER
ALIGARH
TO DADRI
DRAIN
NAJAFGARH
NH-8
GURGAON
AGRA
CANAL
FARIDABAD
TO REWARI
TO JAIPUR
GURGAON CANAL
NH-2
TO MATHURA
LEGEND
BOUNDARY OF DMA (PROPOSED)
BOUNDARY OF DELHI U.T.
CONTROLLED AREA BOUNDARY

c) Functional Plan : Section 16 of the Act provides for preparation of Functional Plans by the Board, with the assistance of the Planning Committee, for the proper guidance of the participating States and the Union Territory after the Regional Plan has come into operation. Section 2 (d) of the Act defines 'Functional Plan', as 'a plan prepared to elaborate one or more elements of the Regional Plan'. Functional Plan for the Delhi Metropolitan Area is the first such Plan.

1.2 CONSTITUENT AREAS AND LOCATIONAL CHARACTERISTICS :

The Delhi Metropolitan Area as delineated in Regional Plan - 2001, NCR comprises of the following :

i) Delhi Union Territory (1485 sq.km)
ii) Ghaziabad-Loni Complex (496.91 sq. km)
iii) NOIDA controlled area (149.15 sq. km)
iv) Faridabad Complex Admn. (393.98 sq. km)
v) Gurgaon (266.71 sq. km)
vi) Bahadurgarh (174.03 sq. km),
vii) Kundli township (137.22 sq.km)
viii) extension of Delhi Ridge in Haryana, i.e., the portion in Faridabad Complex and Gurgaon Complex, as well as, the part between Faridabad and Gurgaon (78.85 sq. km). (Fig.1.1)

Physiographically, Delhi Metropolitan Area is part of the Yamuna basin and, except the Ridge,is almost a flat plain. The Ridge itself is an extension of Aravali range on the south-west, and some parts of north and central Delhi. The slope is from north-west to south-east with the elevation ranging from 220 metres in the north-west to 200 metres above MSL in the south-east of DMA. The small flat lands in between the hills have created picturesque lakes in the hills. These lakes namely Surajkund, Badkhal and Damdama are being utilised as tourist resorts by Government of Haryana. Delhi Metropolitan Area is drained by the rivers Yamuna and Hindon, and a number of drains e.g. Nangloi, K.S. Nagar, Mangeshpur and Gandhi which meet and flow through Bahadurgarh to join the Najafgarh drain in the south. There are in all 17 major drains falling into the river Yamuna from Wazirabad upto Okhla Barrage.

1.3 DELHI METROPOLITAN AREA IN EVOLUTION

The concept of Delhi Metropolitan Area owes its origin to the Delhi Master Plan, 1962. The Delhi Master Plan 1962, in fact identified some of the present DMA towns as 'Ring Towns' in the vicinity of Delhi to be developed as self-contained entities in matters of workplaces and housing but having strong economic, social and cultural ties with the mother city - Delhi. The ring towns were expected to absorb the population increase in the Region, and the spill-over population of Delhi could be diverted to these towns. These towns were more strongly oriented towards industrial activity since Delhi was not to promote new heavy and medium scale industries.

A **Sub-group** was constituted by the Ministry of Urban Development, in 1983, to:

i) examine the present policies in the States of Haryana, Uttar Pradesh and Delhi UT relating to location of industrial and other employment generating activities, housing, acquisition, development and disposal of land, provision of infrastructure and utilities; and

ii) in the the light of such examination, propose such steps for harmonising these policies for the growth of DMA and coordinated implementation of programmes in various sectors within the framework of the NCR Plan 1973.

The Sub-group consisted of :

1. Secretary, Town Planning Department, Government of Haryana.

2. Secretary, Housing & Urban Development, Government of Uttar Pradesh.

3. Secretary (Land & Building), Delhi Administration.

4. Vice-Chairman, Delhi Development Authority.

5. Chief Planner, Town & Country Planning Organisation, Government of India.

6. Director, Urban Development,
Ministry of Urban Development.

7. Commissioner (Planning),
Delhi Development Authority.

The Sub-group, defining DMA as stated earlier, stressed the need to evolve a comprehensive urban development programme for its development, and recommended adoption of policies which would ensure restricted growth of urban Delhi, maintain the growth of the other DMA towns and accelerate the growth of the other NCR towns. It observed that such an objective could be achieved through a package of incentives/disincentives in the empoyment generating sectors of the economy, such as Central government, industry, Public Sector Undertakings and wholesale trade & commerce. The Sub-Group made the following recommendations on the major employment generators in Delhi :

1. Only those Central Government offices which directly serve the Central Ministries should remain in Delhi and offices requiring limited expansion should be shifted within the existing urban area and those need be closer to Delhi could be located in DMA. In addition, new Central Government offices should be set up in counter magnets with the provision of proper infrastructural facilities and incentives for employees. It recommended discouragement to location of offices of the Public Undertakings of all India nature in Delhi. Such Public Sector offices were to be shifted to DMA and NCR.

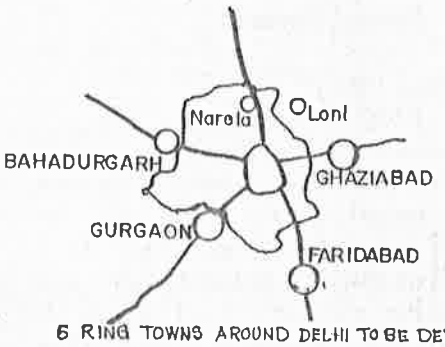
2. The industrial policy for the DMA should be geared towards dispersal from Urban Delhi. There was a need for restricting the growth of industries in Delhi through fiscal and other measures and to encourage the growth of industries in DMA and NCR. The Heavy industries should be discouraged in the towns of the DMA as well. Special infrastructural facilities needed for industrial development should be provided in industrial areas within DMA and NCR.

3. In regard to development of wholesale trade and commercial activities, only those commodities which were directly

DMA IN EVOLUTION 1962-1990

Fig.1.2

1962 DELHI MASTER PLAN

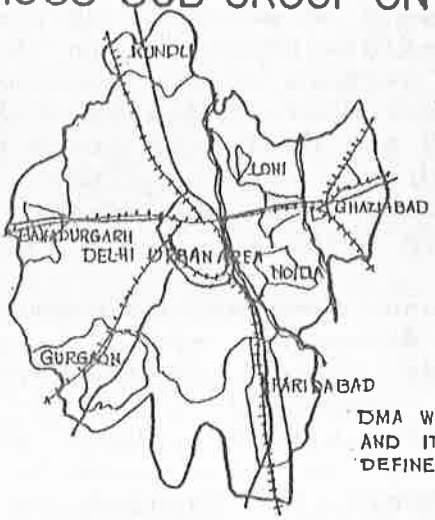


6 RING TOWNS AROUND DELHI TO BE DEVELOPED AS SELF CONTAINED SATELLITE TOWNS TO ABSORB OVER SPILL OF DELHI'S POPULATION.

1973 REGIONAL PLAN

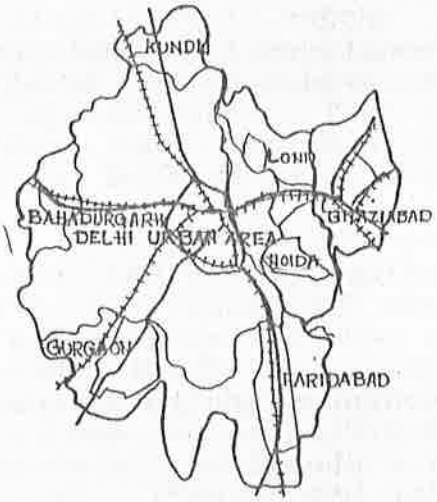
RING TOWNS TO BE TREATED AS IDENTIFIED REGIONAL CENTRES

1983 SUB GROUP ON NCR



DMA WAS RECOGNISED AS A SPECIAL AREA AND IT'S ADMINISTRATIVE BOUNDARIES WERE DEFINED.

MPD: 1990-2001



1. ADMINISTRATIVE BOUNDARIES OF DMA AS DEFINED BY SUB-GROUP WERE ADOPTED.
2. PLANNING DEVELOPING DMA AS ONE URBAN AGGLOMERATION

1989: NCR PLAN FOR 2001

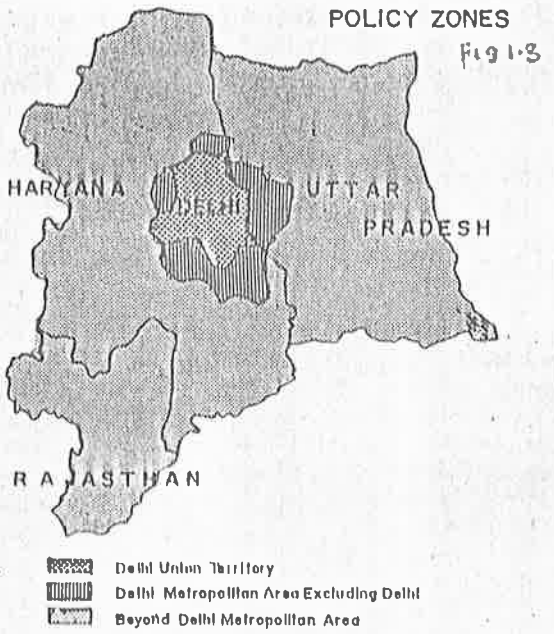
DMA IS RECOGNISED AS ONE OF THE THREE POLICY ZONES FOR PLANNING AND DEVELOPMENT

consumed in Delhi should be distributed through Delhi. Other trades of primarily distributive character were to be located in DMA and NCR. The National markets should be located outside the Delhi metropolitan area. Considering the nature of the activity, the Dry Port should be carefully located within the NCR and not necessarily in DMA.

The Sub-Group also suggested suitable housing, infrastructure and taxation policies, which would encourage movement of population to the DMA and NCR and discourage inmigration into these areas. DMA in its evolutionary stages is depicted in Fig. 1.2.

1.4 NEED FOR FUNCTIONAL PLAN FOR DMA

The Regional Plan 2001 for the National Capital Region, after taking into consideration the socio-economic parameters, including the growth rate and development potentials, has identified DMA, excluding Delhi UT as a distinct zone which would require a package of policy measures different in degree and mix from that for the two other Policy Zones viz. Delhi and the remaining part of the Region (Fig 1.3).



The Plan has reiterated that in terms of functional needs for regional landuses, the DMA, including Delhi, will have to be planned in an integrated manner due to limited availability of land in Delhi UT.

Such an integrated planning is also necessary to meet the needs of commuters in the contiguous urban sprawl of DMA towns, infrastructure requirements for integrated development and to achieve complimentarity with objectives of Master Plan for Delhi. The Master Plan for Delhi 1990 (MPD-1990-2001),following this objective has similarly advocated an integrated approach in planning and developing this huge urban mass of DMA as one urban agglomeration.

1.5 OBJECTIVES

In the light of the above, it is necessary to :

i) define the role of each of these towns and in relation to Delhi;

ii) design their development programme in an integrated manner;

iii) phase the inter-sectoral programmes for each town so as to achieve the overall objective of developing self contained DMA towns in matters of employment, housing and infrastructure; and

iv) identify dominant regional and local functional requirements and corresponding landuses.

The Functional Plan for the Delhi Metropolitan Area primarily aims to achieve the above objectives.

2

DEMOGRAPHY

In response to the strategy of developing Ghaziabad-Loni, Faridabad, Gurgaon, Bahadurgarh and Narela 'Ring Towns' as enunciated in the MPD-1962, the State Governments of Uttar Pradesh and Haryana initiated large scale acquisition and development of land for industrial and housing activities in these towns resulting in very high rates of growth during the last three decades. Moreover, since Delhi too has continued to register high rates of growth, the population of the DMA, including Delhi is likely to reach 170 lakhs in 2001 - 132 lakhs in Delhi and 38 lakhs in the other DMA towns. In view of the enormous problems the Capital would face in the wake of such growth, the Regional Plan for the NCR has adopted the following overall strategy for DMA :

i) Decelerated and restricted growth in the Delhi UT; and

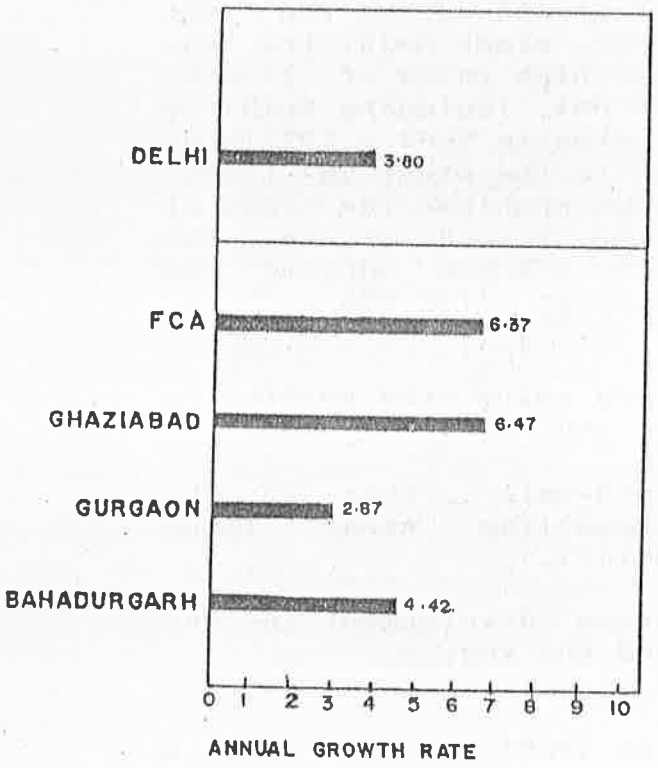
ii) Controlled moderate growth of the Delhi Metropolitan Area Towns (excluding Delhi).

iii) Infra-structure development in the DMA towns and the Region.

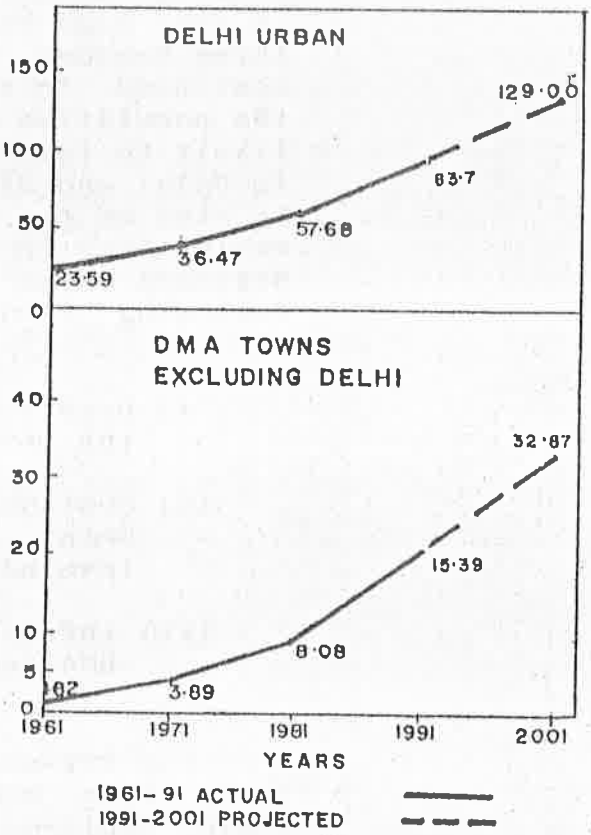
The Regional Plan -2001 for NCR expects that these measures, along with the large scale employment generation in the Priority Towns of the Region would be able to deflect 20 lakh migrant population from Delhi and contain the population of Delhi to 112 lakhs in 2001. The other DMA towns continuing with their projected growth of population would grow up to 38 lakhs from 8.08 lakhs in 1981 and 15.39 lakhs in 1991. In the process, however, the population of the entire DMA would be restricted to 140 lakhs, in place of the figure of 160 lakhs, projected by the Registrar General of Census.

Figure 2.1

ANNUAL POPULATION GROWTH RATE IN DMA TOWNS : 1971-91



POPULATION GROWTH



2.1 DEMOGRAPHIC GROWTH TRENDS

With Delhi Urban Area in its core, the DMA has exhibited extraordinary dynamism in its growth in the recent decades. This rapid growth has been mainly due to industrial development around Delhi, creation of NOIDA township across UT border by Uttar Pradesh, inclusion of Narela town within Delhi Urban Area and, spurt in the concentration of industrial and institutional activities along the National Highways leading to Gurgaon and Faridabad - Ballabhgarh from Delhi.

i) Growth trends 1971-91

The development of DMA towns was initiated in the Sixties as part of the strategy of developing Ring towns around Delhi in the context of the projected population of 46 lakhs for Delhi Urban Area (this was subsequently revised to 53 lakhs in 1973). In 1951, the total population of the ring towns was 1.25 lakhs, and they had a weak economic base. The MPD-1962 proposed strengthening of their economic base, through industrialisation and location of Government offices, by deflecting part of such activities from Delhi. In this context, a total population of 7.70 lakhs was assigned (excluding Narela) to these towns by 1981. The DMA towns, excluding Delhi, reached a figure of 1.82 lakhs in 1961, 3.89 lakhs in 1971, 8.08 lakhs in 1981 and 15.39 lakhs in 1991. While the Delhi Urban Area registered an annual compound growth of 3.80% during 1971-91, Faridabad - Ballabhgarh registered 6.37%, Gurgaon 2.87%, Ghaziabad including Loni 6.47% and Bahadurgarh 4.42% respectively. The DMA towns, excluding Delhi, grew at the rate of 6.66% during the same period (Table 2.1 and Fig 2.1).

Table 2.1 : POPULATION GROWTH TRENDS OF DMA TOWNS 1961-2001

(POPULATION IN LAKHS)

Unit	Population				Compound Growth Rate %					Projected Popn. 2001		Population Assignment 2001
	1961	1971	1981	1991	1961-71	1971-81	1981-91	1961-81	1971-91	1961-91 basis	1971-91 basis	
1. Delhi U.T.	-	40.60	62.20	93.70	4.33	4.36	4.18	4.34		132.60*	132.60*	112.00
2. Delhi Urban	23.59	36.47	57.68	83.75	4.45	4.69	3.80	4.57		129.00*	129.00*	110.00
Other DMA towns:												
1. Faridabad-Ballabhgarh	0.59	1.78	3.31	6.14	11.68	6.40	6.37	9.01	6.39	11.14	11.40	10.00
2. Gurgaon	0.38	0.57	1.01	1.34	4.14	5.89	2.87	5.01	4.37	3.17	3.05	7.00
3. Bahadurgarh	0.15	0.26	0.37	0.57	5.65	3.59	4.42	4.62	4.00	0.60	0.84	2.00
4. Kundli	-	-	-	0.11	-	-	-	-	-	1.50	1.50	1.50
5. Ghaziabad-Loni	0.70	1.28	2.97	5.56	6.22	8.78	6.47	7.49	7.62	15.98	11.58	11.00
6. NOIDA	-	-	0.42	1.67	-	17.97	14.80	-	-	5.50	5.50	5.50
DMA(excluding Delhi)	1.82	3.89	8.08	15.39	7.89	7.56	6.66	7.72	7.12	37.89	32.87	37.00
DMA (including Delhi)	23.40	44.49	70.26	109.09	4.59	-	4.50	4.63	4.59	170.49	165.47	149.00

* Registrar General's Projections.

ii) Growth trends 1991-2001 and Population Assignment 2001

The growth dynamism exhibited during 1971-81 by the DMA towns is not so pronounced during 1981-91. At the rate of growth they registered during 1971-81, the DMA towns, excluding Delhi, were expected to reach a population of 37.89 by 2001 A.D. (Table 2.1 and Fig.2.1). However, the declining growth trends observed in 1981-91 decade, indicate the possibility of the DMA towns, excluding Delhi, achieving a figure of only 32.87 lakhs as per 1971-91 growth rate, using 1991 population as the base year. The growth rate has come down to 6.66% in 1981-91 as compared to 7.56% during 1971-81.

Against the desired growth trend as reflected by the assignment of population in the Regional Plan-2001 for NCR, some of the towns such as Ghaziabad, and NOIDA have shown high growth trends and capacity for population accommodation. On the other hand in towns such as Gurgaon, Bahadurgarh and Kundli, the rapidity of growth has not been visibly in consonance with the desired trend which needs to be corrected to ensure balanced growth of the DMA towns.

3

EMPLOYMENT AND ITS GROWTH IN KEY SECTORS

In its regional setting, Delhi and the DMA have, over a period of time, developed a great deal of mutual dependency. A strong interaction is visible between DMA towns and Delhi in all walks of life. As of 1987, every day about 3.12 lakh passenger trips were made between Delhi and DMA towns (Transport Sector Plan for NCR, Operations Research Group, Baroda, 1989). These trips were mainly undertaken to attend to work and the social needs,like medical and educational purposes. Delhi with the availability of higher level infrastructure facilities, its entrepot and distributive character, marketing facilities etc remains attractive for people living in DMA towns. At the same time a large number of workforce living in Delhi also commute to the industrial areas of DMA towns. Since Delhi is a big consumption centre the region sorrounding Delhi also acts as a vast hinterland and feeder zone for Delhi's day to day needs. The analysis in the study on the "Distributive Trades in the National Capital Region" (Operations Research Group, Baroda, 1990) the characteristics of goods movement showed a very strong interaction between Delhi, NCR and outside NCR. This commodity flow has been noticed through major corridors which pass through the DMA towns.

3.1 EXISTING SCENARIO

a) DMA Towns

In the first master plan of Delhi prepared in 1962, as part of the ring town development strategy specific proposals for creation of employment opportunities to the tune of 1,64,000 by 1981 in Government and Public Sector offices and industry in these towns, were made. The recommended workforce in these activities and the actuals as of 1981 were as in Table 3.1.

Table 3.1 : RECOMMENDED WORKFORCE - MPD AND ACTUALS - 1981

Town	Recommended		Actuals-1981	
	Govt. & Public sector offices	Industry	Other Services	Industry
Ghaziabad	20000	50000	31911	24720
Loni	-	2000		
Faridabad	15000	43000	23478	62572
Ballabhgarh				
Gurgaon	5000	5000	9882	6380
Bahadurgarh	-	4000	2891	3404
Narela	10000	10000	-	-
Total	50000	114000	68162	97076

Industrial Sector : The industrial base in this area, got further strengthened with the coming up of the industrial township of NOIDA, just on the eastern periphery of Delhi in Uttar Pradesh in the year 1975. The magnitude of the industrial progress in the DMA towns can be judged from the fact that Ghaziabad and Faridabad accommodated 60% and 45% of the registered factories, and 64% and 66% of the factory employment of Uttar Pradesh and Haryana Sub-regions respectively. The two important factors which helped the State Governments in this endeavour were the policy of restriction of large and medium scale industries in Delhi as recommended in the Master Plan, and the nearness of Delhi with marketing and supporting facilities.

Government & Public Sector : As regards Government and Public sector offices, out of the six DMA towns, three towns viz Ghaziabad, Faridabad and Gurgaon being district headquarters have substantial work force. The percentage of workforce in this sector varies from about 21% in Faridabad to about 39% in Gurgaon.

About 400 ha. of land was acquired by the Central Government in Ghaziabad as a follow-up action of MPD-1962. Though most of those land stands allotted, it has been only

partially utilised. About 180 ha. of land which has been allotted to Lal Bahadur Shastri National Academy is lying vacant. In NOIDA, although plots have been allotted to various important Public Sector Undertakings and Institutions like Indian Oil Corporation, National Thermal Power Corporation, Bharat Heavy Electricals Limited, Bharat Petro-chemicals Ltd, Institute of Chartered Accountants etc, in most of these are lying vacant. A number of Central Government offices of the Ministry of Communications, Agriculture and Cooperation, Commerce, etc and Institutions like Management Development Institute, National Oil Seeds and Vegetable Oil Seeds Development Board have come up in Gurgaon. In Faridabad too, a number of Central Government and Public Sector Offices and Institutions such as Steel Aurhority of India Limited, Central Warehousing Corporation, Life Insurance Corporation, National Textile Corporation, Indian Oil Corporation, Geological Survey of India, etc. have come up. However, no worthwhile sucess has yet been achieved in efforts to shift or locate new Central Government and Public Sector Undertakings away from Delhi.

Trade and Commerce : Along with industrial develoyment, trade and commerce activities also developed in these towns. The percentage workforce in the 'Other Services' sector is the highest (20.24) in Bahadurgrh. It is quite low (10.63) in case of Faridabad-Ballabhgarh.

The proportion of workforce in DMA towns in different categories as of 1981 Census was as in Table 3.2.

Table 3.2 : DISTRIBUTION OF WORK FORCE IN DMA TOWNS - 1981

(Percentage in Brackets)

S.No.	Category of workers	Ghaziabad-Loni	Faridabad-Ballabhgarh	Gurgaon	Bahadurgarh
1.	Cultivators	1857 (2.15)	3385 (3.02)	270 (1.07)	559 (5.30)
2.	Agriculture Labour	1622 (1.88)	1303 (1.16)	187 (0.74)	296 (2.81)
3.	Livestock, forestry, fishing, etc.	839 (0.97)	408 (0.36)	322 (1.27)	29 (0.31)
4.	Mining and quarrying	31 (0.04)	526 (0.47)	28 (0.11)	6 (0.10)
5.	Manufacturing, repairing, etc.				
	(a) Household	2365 (2.74)	3115 (2.77)	947 (3.76)	319 (3.02)
	(b) Other than household	22,355 (25.93)	59,457 (52.97)	5433 (21.50)	3085 (29.25)
6.	Construction	3215 (3.73)	4675 (4.17)	1176 (4.65)	311 (2.95)
7.	Trade and Commerce	12,129 (14.07)	11,930 (10.63)	4681 (18.54)	2135 (20.24)
8.	Transport, Storage, Communication.	9903 (11.48)	3966 (3.53)	2338 (9.25)	915 (8.61)
9.	Other Services	31,911 (37.01)	23,478 (20.92)	9882 (39.11)	2891 (27.41)
	TOTAL WORKERS	86,227	1,12,243	2,05,234	10,546
	PARTICIPATION RATIO	30.30	33.92	31.20	28.13

Source - Census of India - 1981.

b) Delhi UT

The growth pattern of economic activities in the DMA towns has not had any appreciable impact on the proliferation of these activities in Delhi, since employment in the three major employment sectors viz Industry, Government and Public Sector Offices, and Trade and commerce in Delhi has grown unabated (Table 3.3). Particularly employment in manufacturing and trade & commerce has grown from 23.9% to 29.1% and 19.3% to 22.25% during the period 1961 to 1981 respectively.

Table 3.3 : DISTRIBUTION OF WORKFORCE IN DELHI 1961 - 1981
(Percentage in Brackets)

Categories	1961	1971	1981
Cultivators	5178 (0.7)	5176 (0.5)	7727 (0.39)
Agri. Labours	1242 (0.2)	3603 (0.3)	4772 (0.25)
Livestock, Forestry, etc.	-	-	13091 (0.70)
Mining and Quarrying	5446 (0.7)	9091 (0.8)	4745 (0.25)
Manufacturing, Processing			
a) Household Industry	12684 (1.7)	25017 (2.2)	31349 (1.69)
b) Other than house-hold	155099 (20.7)	242733 (21.7)	510748 (27.49)
Construction	32540 (4.4)	61517 (5.5)	118699 (6.39)
Trade and Commerce	143809 (19.3)	239719 (21.6)	413430 (22.25)
Transport and Communication	47387 (6.3)	107324 (9.6)	168457 (9.07)
Other Services	343430 (46.0)	422667 (37.8)	584663 (31.47)
Total Workers	746815 (100.0)	1116937 (100.0)	1857545 (100.0)
Participation Ratio	31.65	30.62	32.20

Source : Census of India, 1961, 1971 & 1981

The consistent growth in industrial activities in Delhi over the years has brought a change in the functional character of Delhi. In 1951, Delhi was mainly an administrative centre with 46% of its workforce engaged in administration. This declined to 31.5% in 1981. Whereas, the industrial workforce which was only 17% in 1951 rose to 29.1% in 1981. However, in absolute numbers the employment in administrative services sector grew more than four times from 1.59 lakhs in 1961 to 6.31 lakhs in 1988.

Significanly, huge complexes for accomodating the offices in Delhi UT have also come up during the last five years and more are coming up on sites allotted by the Government itself.

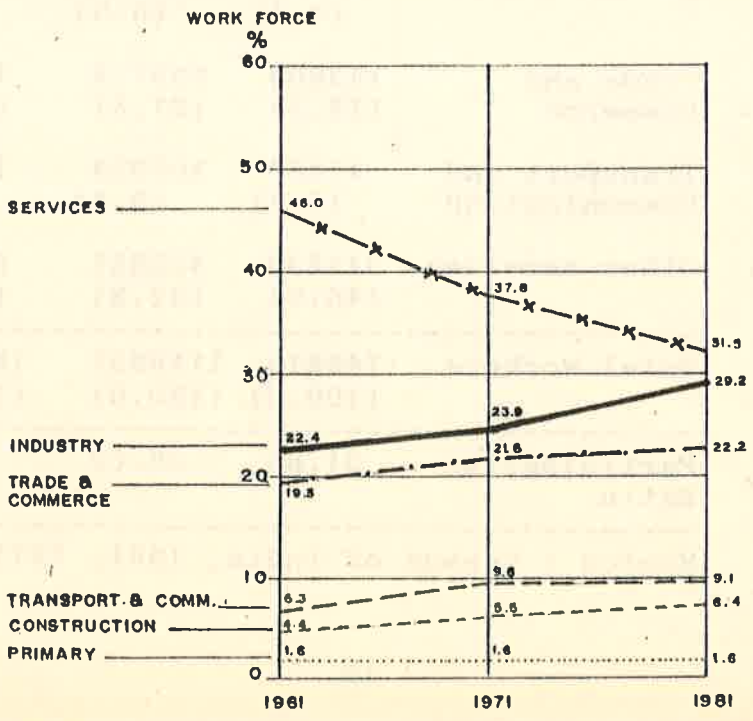
A. Newly constructed complexes

i) Central Government Offices Complex, Lodi Estate
ii) Scope Complex I at Lodi Estate
iii) Scope Complex II at Laxmi Nagar
iv) Jawahar Vyapar Bhawan, Janpath.

B. Complexes under construction

i) India Habitat Centre, Lodi Estate
ii) Bikhaji Kamaji Complex

DISTRIBUTION OF WORK FORCE IN DELHI 1961-81 **Figure 3.1**



Facilitated by the converging transport network pattern and the agglomeration economies, the wholesale trade activities have concentrated in the city. The percentage workforce in trade and commerce had almost remained same in the last three decades. However, in absolute figures, it has almost become three times from 1.44 lakhs in 1961 to 4.15 lakhs in 1981. Trend of occupational structure since 1961 is depicted in Fig. 3.1.

3.2 REGIONAL PLAN POLICIES

a) DMA towns :

It has been brought out in the Regional Plan - 2001, NCR that since Delhi, is limited in its territorial extent, as opposed to the DMA towns having relatively extensive areas for expansion, there were inherent advantages of planning the Delhi Metropolitan Area, including Delhi UT, as one urban agglomeration. This has been reiterated by MPD-2001.

It has been envisaged in the Plan that the DMA towns would attract economic activities at a greater scale, and thus the participation rate would be much higher in 2001. These towns would continue to generate employment opportunities in industries and being at take-off stage of physical development, they would also have the potential for employment opportunities in construction, trade and commerce, transport and service sectors.

b) Delhi U.T.

In order to achieve a balanced economic base in Delhi the Regional Plan proposes to have strict control over industrial actvities in Delhi by permitting only small scale industries. However, it foresees increase in over-all participation rate.

3.3 WORKFORCE ASSIGNMENT IN REGIONAL PLAN

a) DMA Towns :

The Regional scenario shows that the basic character of the regional economy is expected to be more diversified in future, since more than 70% of the population would

be engaged in non-agricultural occupations. The economy of the DMA towns has also shown a shift towards 'manufacturing' and 'industrial',from its earlier concentration on 'primary sector'-based activities. Taking cognisance of these changing tendencies and keeping in view the development pattern envisaged for the DMA,the Regional Plan has proposed the following work participation rates and employment mix in major activities for 2001 for the DMA towns and Delhi (Table 3.4).

b) Delhi UT:

The planning process in Delhi, the core of the DMA, would be guided by the Master Plan Delhi - 2001 which has been prepared, keeping in view the overall framework and policies enunciated in the Regional Plan 2001. The participation ratio which is likely to increase from 32.20% in 1981 to 35% by 2001, and the break up of the workforce in different occupational categories recommended in the MPD-2001 is, by and large, the same with minor adjustments, as proposed in the Regional Plan-2001 (Table 3.4).

Table 3.4 : PROJECTED OCCUPATIONAL STRUCTURE, DMA TOWNS - 2001

TOWNS	PROPOSED PARTICIPATION	PROPORTION OF WORKERS (%) IN					
		PRIMARY	INDUSTRY	CONSTRUCTION	TRADE & COMMERCE	TRANSPORT STORAGE & COMMUNICATION	SERVICES
Delhi	35	1.5	29.0	5.0	32.0	11.0	31.5
Ghaziabad	30	0.5	38.0	6.0	15.0	10.0	30.0
NOIDA	35	2.0	40.0	6.0	20.0	12.0	20.0
Faridabad/Ballabhgarh	35	2.0	45.0	6.0	16.0	7.0	24.0
Gurgaon	35	2.0	40.0	10.0	16.0	10.0	22.0
Bahadurgarh	35	6.0	30.0	4.0	25.0	10.0	25.0
Kundli	35	2.0	40.0	10.0	16.0	10.0	22.0

4

ECONOMIC ACTIVITIES

The three major employment generators in Delhi are industries, wholesale trade and commerce and Central Government and Public Sector Offices. For dispersal and development of economic activities in the Region, it is necessary that as against strict control envisaged for Delhi UT in the Regional Plan, the DMA towns should show dynamism and increased level of activity in these sectors.

4.1 INDUSTRY

A) EXISTING SCENARIO

i) DMA Towns

An account of the present level of developments in industrial sector in each of the DMA towns may be usefully recounted here.

GHAZIABAD-LONI : In the Master Plan-2001 for Ghaziabad, the total industrial area earmarked in Ghaziabad (both Cis-Hindon and Trans-Hindon) is 1989 ha. Of this, 1534 ha. of land had been fully developed upto 1981 by UPSIDC and the Directorate of Industries, as per details given below :

INDUSTRIAL AREA	HECTARES
1. Ghaziabad Road (Site I)	279.43
2. Loni Road (Site II)	124.33
3. Meerut Road (Site III)	142.09
4. Sahibabad (Site IV)	585.09
5. Kavi Nagar	138.46
6. Meerut Road (Sector 22)	46.64
7. Loha Mandi	21.15
8. South Side of G.T. Road	187.68
9. Loni Industrial Estate (By DOI)	9.23
TOTAL :	1534.11

Besides this, 410 ha. of land was also developed in private sector, totalling to 1943 ha. Thus, 98% of the land earmarked for industrial use in the Master Plan has been fully developed. In addition, an area of 240

ha. of land is being acquired in two industrial pockets as per details below :

i) Mahrauli Industrial area: 167 ha. (on Hapur bypass road)

ii) Industrial area on Meerut road near village Rasoolpur (GDA): 80 ha.

In the Master Plan - 2001 for Loni, the land designated for industrial use is 21 ha. The total land developed under industrial use by 1984 was of the order of 46.63 ha. In addition, the UPSIDC has proposed an industrial estate named 'Tronica' over 555 ha. in an area shown as green belt in the Master Plan of Ghaziabad-Loni.

NOIDA: In NOIDA, out of 985 hectares of land earmarked for industrial use,an area of about 688 hectares has so far been developed. Out of total 6650 industrial plots to be developed so far, 5106 plots have been fully developed and 4000 occupied. Out of these plots,the number of industrial units that have come up and functioning are 3735 (3675 small scale and 60 medium scale). Thus, 56% of the developed plots have been fully utilised so far.

FARIDABAD: In Faridabad Master Plan, 2000 ha. of land has been proposed to be developed for industrial use. Out of which about 50% i.e. 905 ha. of land has been acquired and developed. In this land, 1022 plots have been developed, allotted and possession given. Out of 1022 plots, construction has taken place on 949 plots, and 73 plots are lying vacant.

GURGAON: In Gurgaon 1535 ha. of land has been proposed in the Master Plan for industrial use. Out of this land 726 ha. of land has been acquired. The total area developed by HUDA and HSIDC is 367 ha. Out of the total 1630 plots, 1130 plots are developed of which 1114 have been allotted, and possession has been given to 1110 plot holders. There are 690 plots where construction has been completed and 440 plots are lying vacant.

BAHADURGARH: In Bahadurgarh, three industrial areas have been developed as per

the provisions of the approved Master Plan which are Modern Industrial Estate (MIE) Part 1 and Part II) measuring 162 ha., old industrial area measuring 43 ha. In the old industrial area all the 85 plots have been allotted, whereas, in MIE Part I & II, out of 2318 plots, only 1987 plots have been allotted. However, in the Modern Industrial Estate, construction has been done on only 127 plots. Thus, out of total 2403 plots in the two industrial estates, only 210 plots (about 8.74%) are such where industrial activities are taking place.

KUNDLI: Haryana State Industrial Development Corporation (HSIDC) has developed an industrial estate of 43 ha. with 198 plots in 1983. Out of these, only 64 plots have been allotted so far of which 53 are occupied, and only 25 industrial units are functioning thereon.

ii) Delhi UT

Delhi is now one of the largest centres of industrial activities in the country. Whereas there were only 8000 industrial units in Delhi in 1950-51, there are now as many as 80,000 units. The employment in the industrial sector has risen during the last four decades from 69,000 to nearly 700,000 and the value of production from just Rs. 35 crores to well over Rs.4000 crores annually.

B) REGIONAL PLAN POLICIES

The policies proposed in the Delhi U.T. and DMA towns with regard to location of industries are as under:

i) Control within the Union Territory of Delhi Delhi

The present policy of not promoting location of medium and large scale industries within Delhi should be continued.

ii) Control outside Delhi, but within the DMA

While in the long term perspective, the growth of large and medium scale industries in DMA towns may have to be restricted, these industries may be permitted in the DMA towns for a period of 10 years, whereafter the policy shall be reviewed. The emphasis will

be on promoting growth of large and medium scale industries in priority towns, in preference to DMA towns.

C) DEVELOPMENT STRATEGY AND PROPOSALS

i) DMA towns

In the light of the existing situation the emerging scenario of industrial development in each town would be as under :

GHAZIABAD-LONI: In Ghaziabad, out of the total land earmarked in the Master Plan for industrial use about 98% of the land has been fully developed, and about 60% of the developed plots have been put to industrial use. Proposals for development of additional land of 240 ha. which is in the process of acquisition would be over and above the Master Plan recommendations, Enhancement in the area is likely to affect the assigned population for Ghaziabad by 2001 AD, and would go against the recommendations of Regional Plan 2001.

In case of Loni, the area developed under industrial use (46.63 ha.) has already become more than twice the area designated in the Master Plan (21 ha.). The proposal to develop a huge area of 555 ha. for industrial use in addition to this area, would amount to gross violation of the Master Plan, and the Regional Plan 2001 for NCR. It is strongly felt that this area should not be taken up for development.

New Okhla Industrial Development Authority (NOIDA):

In NOIDA, out of the total land earmarked in the Master Plan for industrial use, 70% land has been developed and about 56% of the developed plots have been fully utilised. As such, looking to the pace of development in the past, in the remaining period of the Plan, it is expected that land earmarked in the Master Plan would be fully utilised. The proposed large scale development at the periphery of NOIDA by the UPSIDC under the Greater NOIDA Industrial Authority, is not in conformity with the Regional Plan.

FARIDABAD : In Faridabad, about 50% of the land earmarked for industrial use in the Master Plan has been developed, and about 94% of the developed plots have been put to use. With this pace, it is expected that, in the remaining period of the plan, land earmarked in the Master Plan would be fully utilised. Some of the industrial units in Faridabad have occupied only a marginal proportion of the allotted land and in the name of expansion, they are holding vast areas for a considerable period. Haryana Urban Development Authority (HUDA) is contemplating to make full use of the plots by giving an opportunity to plot holders to sub-let the plots for industrial use or use the vacant portions for residential use of their emloyees. Definite steps to ensure time-bound completion of this programme should be taken by HUDA.

GURGAON : In Gurgaon, about 20% of the land earmarked for industrial use in the Master Plan has been developed and only about 40% of the developed plots have been put to use. The industrial development in Gurgaon has, thus, grown at a slower pace. Efforts will have to be made to achieve the expected level of industrial development in Gurgaon by removing the bottlenecks, particularly, availability of power and water.

BAHADURGARH : In Bahadurgarh, about 43% of the land earmarked for industrial use in the Master Plan has been developed and only about 9% of the developed plots have been put to use. As such the pace of industrial development in Bahadurgarh is very slow. In the old industrial area, all the plots have been allotted and have been put to use, whereas in Modern Industrial Estate Part I and II, although about 86% plots stand allotted, construction has taken place in only about 5% of the plots. In this area, most of the plots were allotted to non-conforming industrial units of Delhi when there was a pressure to shift the non-conforming units outside Delhi. But later on, the units continued to remain in Delhi and, therefore, the plots in these areas remained unutilised. However, it would be appropriate to delink the shifting of these units from Delhi and devise measures for promoting the growth of industries in Bahadurgarh.

KUNDLI : In the land use plan for 2001 AD for Kundli which is under preparation, it is proposed to develop about 445 ha. of land for industrial use. Keeping in view the fact that only about 10% of this area is developed at this stage and only about 13% of the developed plots in this area has been put to use, it seems difficult to achieve master plan targets unless special efforts are made in this direction.

ii) Delhi U.T.

The requirements for land (18,000-24,000 ha during 1981-2001) and infrastructure in MPD-2001 have been worked out for a population of 128 lakhs against 112 lakhs proposed in the Regional Plan - 2001. Besides this, Delhi Administration has taken a policy decision not to develop new industrial estates in Delhi. Keeping these aspects in view, the workforce figures in the manufacturing sector should be brought down to 11.37 lakhs as against 13.30 lakhs as proposed in MPD-2001. The existing hazardous and noxious, heavy and large scale industrial units and non-conforming extensive, light and service industries which have been suggested in NCR/DMA/Industrial use zones in MPD-2001, should be identified and detailed project reports to effectuate shifting, should be prepared by the concerned units/Delhi Administration. For co-ordinating and implementing the policies relating to industrial dispersal and to effectuate shifting of industries as envisaged in the NCR Plan and MPD-2001, a suitable machinery should be evolved.

4.2 WHOLESALE TRADE & COMMERCE

A) EXISTING SCENARIO :

i) DMA Towns

In DMA towns, for day to day retail requirements, trade & commerce facilities are sufficient to make them self-contained. Some of the towns in DMA have large markets dealing in foodgrains, fruits and vegetables etc. Some of these markets also function as production and processing/fabricating centres for a variety of items such as iron and steel,building materials,garments, auto-parts etc, and have close linkages with locally available skilled labour force. These towns are however, deprived of any major wholesale trading activities which are concentrated in Delhi.

ii) Delhi U.T.

The wholesale activity in Delhi is located mainly in the congested parts of the old city and has grown in unplanned manner resulting in congestion, traffic bottlenecks,encroachment on public land and parking problems. The major part of the commodities which are brought to Delhi are distributed outside Delhi. Their distributive character is evident from the fact that about 60-80% of some of the major commodities which reach Delhi are re-exported to areas outside Delhi.

B) REGIONAL PLAN POLICIES

The policies proposed in the Regional Plan 2001 - NCR for Delhi UT and the DMA towns with regard to location of wholesale trade and commerce are as under :

i) Decentralisation of wholesale trade and commerce in Delhi.

There should not be any special advantage in terms of preferential treatment or lower taxes by way of incentives to wholesale trades in Delhi vis-a-vis the adjoining States. Those wholesale trades which are hazardous in nature such as plastic and PVC goods, chemical,timber,food grains,iron and steel and building material and require extensive space, may be

decentralised by developing suitable additional locations outside Delhi.

ii) Development outside Delhi within DMA

There are certain wholesale trades and storages in Delhi which are hazardous because of their location in congested areas,and also due to bulk handling activities relating to plastic and PVC goods, chemicals, timber,food grains, iron and steel and building magterial. These wholesale trades in addition to new trades and related activities should be encouraged to be developed in the DMA towns.

The possibility of developing modern Super Markets should be explored in the Delhi Metropolitan Area towns.

C) DEVELOPMENT STRATEGY AND PROPOSALS

i) DMA Towns

1) The task of suggesting alternative locations involves, firstly, identification of trades in Delhi which have distributive character and secondly, selection of appropriate locations for these trades. A study was undertaken by the NCR Planning Board through Consultants for identification of such trades and suggesting alternative locations. The Study took into consideration 8 wholesale commodity groups viz. foodgrains, textiles and readymade garments, autoparts and machinery, iron and steel, building material, timber, fruits and vegetables, and fuel oils. It has been revealed in the Study that most of the traders in these commodities have shown preferences for DMA towns as alternative choice of location. The Study, after taking into consideration various other factors such as existing commodity flow of direction, nature and magnitude of present trade, potentials of the town, etc. has recommended the following locations in the DMA towns for some of these trades:

Ghaziabad	-	Iron and Steel, Hardware
Faridabad	-	Autoparts
Gurgaon	-	Iron and Steel
Kundli	-	Fruits and Vegetables, foodgrains.

MPD-2001 has also recommended locations for some of these trades in DMA Towns. These locations should be developed expeditiously in a time bound programme.

2) In order to raise general level of trading activities the possibility of developing Modern Super Markets should be explored in the DMA Towns.

3) Marketing yards which could be used both for exhibition and marketing of the local products should be developed in these towns. This would not only encourage industrial development but would also help in buying the necessary inputs locally.

ii) Delhi U.T.

1) The workforce in trade and commerce sector should be brought down to 8.62 lakhs as against 9.76 lakhs as proposed in MPD-2001 by taking 112 lakhs as assigned population for Delhi.

2) The MPD-2001 has proposed a large number of regional level distribution markets at 4 locations on the major entry routes, and as many as 10,513 wholesale shops in 11 regional-cum-local markets mostly falling in the peripheral areas of Delhi U.T. These proposals would seriously aggravate the problem of congestion, and would result in contiguous development. These distribution centres, therefore, should not be developed within Delhi UT, and should be developed in DMA towns. The possibility of joint collaboration with the NCR Planning Board and the concerned States for developing such areas should also be taken into consideration.

3) A suitable machinery needs to be evolved for identification of wholesale trade, warehousing etc. for decentralisation, and to obtain cooperation of the trade for developing alternative locations for them in DMA towns.

4) The proposed Inland Container Depot (ICD) at Tughlakabad on a site of 39 ha. will be the biggest ICD in the country with an estimated through put of 2.4 lakh Twenty feet Equivalent Unit (TEUs) per annum. It is expected to generate a workforce of 75,000 in various formal and informal activities leading to the additional population growth of 2.5 lakhs in Delhi. Besides this, by generating a total traffic of about 5000 vehicles of all types per day, it would impose alarming load of road based traffic within the limited carriageways on Mathura Road and Mehrauli -Badarpur Road alongwith unmanageable parking and warehousing requirements. It is thus logical to consider location of the ICD away from Delhi. NCR Planning Board has proposed Palwal with its arterial rail and road linkages to Bombay, Madras and eastern parts of the country as an ideal loction for the project. This would also help considerably in the economic growth of the region and the growth of the regional transport network. Work on development of the ICD is going on at a very fast pace making a virtual mockery of the efforts being made by various agencies to reduce congestion in Delhi and the NCR Plan.

4.3 GOVERNMENT AND PUBLIC SECTOR OFFICES

A) EXISTING SCENARIO :

i) DMA Towns:

In the Master plans of DMA towns prepared by the respective States, adequate land has been reserved for institutional and Government and Public Sector Office use and is being developed in phases. The land measuring 400 ha. in Ghaziabad and 80 ha. in Faridabad, which were acquired by the Central Government as a follow up measure of the recommendation of the first Master Plan-Delhi have been partly utilised for this purpose.

ii) Delhi UT:

The employment in the Public Sector offices is consistently increasing in the Capital. Among the four categories of employment, there has been considerable increase in the quasi-Government employment which has grown from a mere 6000 in 1961 to 2.19 lakhs in 1988. The growth of employment in the four categories is as in Table 4.1.

Table 4.1: WORKFORCE IN GOVERNMENT AND PUBLIC SECTOR OFFICES

(in Lakhs)

Category	1961	1981	1988
Central Government	0.94	2.25	2.29
Delhi Administration	0.25	0.62	1.00
Local Bodies	0.34	1.09	0.83
Quasi-Government	0.06	1.41	2.19
TOTAL	1.59	5.37	6.31

Source : Delhi Census Hand Book - 1989

B) REGIONAL PLAN POLICIES:

The policies proposed in the Delhi UT and DMA Towns with regard to location of Govt. and Public Sector offices are as under:

i) Strict control within the Union Territory of Delhi.

With regard to Government offices, the present policy and mechanism for screening the location of new Government offices should be continued. The main criterion for location of offices in the Capital should be that they perform ministerial functions, protocol functions or liaison functions which, by their nature, cannot be performed anywhere else except in the National Capital The existing offices which do not perform any of the above functions should be identified and shifted from Delhi. In the case of Public Sector offices, there is an urgent need to scrutinise the list of existing offices and allow them to retain only very small establishments to cater for ministerial and liaison functions. The rest of the establishments should be shifted out of Delhi. The accommodation which may thus become available could be used to cater to the needs of the essential growth of Central Government offices. A High Powered Committee appointed by the Central Government has already made recommendations in this regard which are being pursued by the NCR Planning Board and the Ministry of Urban Development.

ii) Control outside Delhi but within the DMA

A similar control on the opening of new Central Government and Public Sector offices in the DMA towns should be exercised. Relocation or expansion of Government offices which have ministerial,protocol or liaison functions which make it incumbent upon them to be located in Delhi alone should be allowed to be located in the DMA towns. In sofar as Public Sector undertakings are concerned, the restrictions on their opening new offices or expanding the existing ones should apply equally to the DMA also. Rest of them have to go out to the Priority Towns to be developed in the NCR or in the Counter Magnet areas identified by the Board.

C) DEVELOPMENT STRATEGY AND PROPOSALS:

i) DMA Towns:

As a first step, the strategy should be to utilise the unutilised land in Ghaziabad and Faridabad. However,more land can be acquired and developed at these places and in other DMA towns depending upon the demand. Infact, institutions which require large areas (more than 2 ha.) could be located on the outer areas of the DMA towns within the controlled areas particularly in NOIDA and Gurgaon.

ii) Delhi U.T.

(1) The workforce in this sector should be brought down to 12.35 lakhs as against 13.67 lakhs as proposed in the MPD-2001.

(2) The present policy and mechanism for screening the location of new Government offices and expansion of existing offices in Delhi should be vigorously persued. A time bound programme should be prepared for shifting of the offices which do not qualify to remain in Delhi in the light of the criteria laid down in the Regional Plan - 2001 for NCR.

(3) Institutions of National/Regional importance with extensive areas (Say 2 ha. or more) should not be located in Delhi. They should be considered for location in DMA/Priority Towns.

4.4 INFORMAL SECTOR

Informal sector contributes singificantly to employment, and offers income opportunites to a substantial proportion of the economically active population in urban areas. In view of the important position of informal sector in the economy of Delhi and DMA towns, special efforts will have to be made to improve the performance of this sector. The Municipal Bodies and Development Authorities in Delhi and other DMA towns can take a lead and identify actual locations, specific meeds and take up programmes, as suggested in the following paragraphs :

1) Development or reservation or zoning of special areas where such people can work in better environment. The informal sector in this way can be incorporated in trade in the planned development of various use zones particularly, near mass activity centres, trading and entertainment places.

2) The traditional style of retail shopping in the form of weekly markets or hats is very popular in Delhi and most of the DMA towns. These retailing activities take place systematically at various places central to large population on vacant land or road sides. Since these retail markets serve large section of people, specially lower and middle income groups, they should be encouraged. Parking and open spaces in the regular markets or near work centres can be utilised for this purpose.

3) To promote employment and productivity in the informal sector, special training programmes should be organised. These training programmes should aim at developing the ability of the urban poor and slum dwellers to earn their livelihood through upgradation of their skills and entrepreneurship.

4) Provision of facilities like worksheds work-cum-shetter in slums, and localities of poor, and site and service projects for employment generation activities will be very useful in ensuring the success of the schemes undertaken for promotion of informal sector activities .

5

SHELTER

5.1 PRESENT HOUSING STOCK IN DMA TOWNS

For estimating the stock of occupied residential houses (ORH) in the DMA, the normal life span of a house has been taken as 50 years and thus the replacement need has been assumed @ 2% per annum. During 1971-1981, the population of DMA towns increased from 43.99 lakhs to 69.87 lakhs i.e. an increase of 58.83%. The corresponding ORH stock increased from 7.18 lakh units to 9.89 lakh units. i.e., an increase of 37.74% (Table 5.1). Thus, during 1971-81, the pace of growth of population was at a rate much higher than the corresponding net increase in housing stock.

i) Supply and Demand - 1991

The net livable residential units available in 1991 are estimated at 11.55 lakhs (Table 5.1) against an estimated population of 109.09 lakhs. Assuming an average household size of 5 persons, the shortage in housing units is estimated at 10.27 lakhs in 1991. In 1981, there was one housing unit for every 7.07 persons whereas in 1991, the situation deteriorated as there was one unit for every 9.45 persons.

Table 5.1 : GROWTH OF POPULATION AND OCCUPIED RESIDENTIAL UNITS 1971-91

	1971		1981		1981	Net growth 1971-81 (%)	Estimated ORH-1991	Liveable Units after 20% replacement(1991	Pop. 1991 Lakh	Demand for ORH in 1991 in lakhs @ 5 persons per ORH.	Gap-1991 (lakhs)
	Pop.	ORH	Pop.	ORH	Liveable units after 20% replacement						
1. Delhi UT	4065698	664647	6220406	1090065	873652	31.45	1148402	918732	93.70	18.74	9.55
2. Ghaziabad including Loni	127700	17798	297429	53443	42754	140.22	102704	82163	5.56	1.112	0.292
3. NOIDA	-	-	-	-	-	-	-	30022	1.67	0.334	0.034
4. Faridabad-Ballabhgarh Complex	122817	22429	330864	67199	53759	139.58	128796	103037	6.14	1.228	0.198
5. Gurgaon	57151	8728	100877	16686	13349	52.94	20416	16333	1.34	0.268	0.108
6. Bahadurgarh	25812	4063	37488	6397	5118	25.97	6447	5158	0.57	0.114	0.062
7. Kundli	-	-	-	-	-	-	-	-	0.11	0.022	0.022
DMA TOWNS (excl. Delhi UT)	333480	53028	766658	143725	114980	116.83	258363	236712	15.39	3.078	0.716
DMA Towns	4399178	717675	6987064	1237790	988632	37.75	1406765	1155444	109.09	21.818	10.266

ii) Informal Sector Housing

Large scale inmigration of people from country -side to urban areas in search of employment opportunities, offsets attempts to check the growth of slums. By and large, the migrants get employment in informal sector activities. In the context of urban development, informal sector has to be viewed as an integral part of the process of spatial planning.

iii) Squatters and slums in DMA

In 1991, the population of DMA towns was 109.09 lakhs. 13.61 lakhs are estimated to be squatters, and 34.87 lakhs are living in slums (Table 5.2). In Delhi alone, of the 1991 squatter and slum population of 48.48 lakhs in all the DMA towns as much as 44.08 lakhs i.e. 91% live. Taken individually, 12 lakhs out of 13.61 lakhs squatter dewellers of DMA, 32.08 lakhs out of 34.87 lakhs slum dwellers of DMA are found in the capital. Faridabad-Ballabgarh Complex figures the second with about 1.93 lakhs and Ghaziabad the third highest with 1.49 lakhs slum and squatter population, the last being in NOIDA. Thus, about 45% of the total population is estimated to be without adequate shelter facilities.

iv) Squatters and slums in Delhi

The housing situation in the Capital city is particularly alarming as a significantly large part of its population is estimated to be living in jhuggies/jhonpris and slums. In 1971, such population accounted for 36% of the total population in the UT which had increased to 37% in 1981 and 47% in 1991 The efforts made so far to mitigate the housing problem of the jhuggi/jhonpri and slum dwellers, through resettlement of jhuggies and urban renewal programmes for slum improvement, etc have not provided any lasting solution to this problem.

During 1971-80, about 148,000 families from squatter settlements were resettled in 44 planned residential areas. This gigantic programme brought down the number of jhuggi/jhonpri households from 62,600 in 1971 to a mere 20,000 in 1977. However, the number of jhuggi/jhonpri households increased again to 99,000 by 1981 - an increase of about 80,000 within just three years. Subsequently too, the number of jhuggies continued to grow to reach 150,000 households in 1985, 225,000 in 1987 and 240,000 by 1990. This accounts for a population of 13 lakhs living in 652 basties almost 14% of the total population.

5.2 DEVELOPMENT OF SHELTER

On the basis of population assignments the cumulative demand for housing units by 2001 in the DMA towns is estimated to be of the order of 29.80 lakh units. As against this, it is estimated that as of 1991, the number of livable housing units stood at 11.55 lakhs. Thus, by 2001, about 18.25 lakh more units including the backlog of 10.27 lakhs units upto 1991 would be required. Such a large additional requirement is particularly on account of the significant size of the squatters and slum dwellers in the DMA towns, who are to be provided with adequate shelter facilities.

Over 45% of the projected additional requirement during 1991-2001 is to house the slum and jhuggi dwellers of Delhi who in 1990 numbered about 44 lakhs. Thus, a large proportion of the estimated housing demand by 2001 is indeed the requirement to house the predominantly migrant population who are

primarily low skilled, unemployed and unable to afford a formal house, and consequently squat on the public land/slums. It is therefore obvious that any number of resettlement and/or regularisation programme in Delhi alone, would not be able to solve the problem of housing in Delhi, unless a pragmatic policy is followed to meet the demands of this sector. An arithmetical exercise to arrive at figures of land required and hence the corresponding acquisition and development programme, would only bring more migrants in search of work. At the same time, the role of the other DMA towns in easing this problem, by alternately accommodating a sizeable share of this population should be recognised. The DMA towns, now having visibly developed the capabilities of holding the population assigned to them, with commensurate comprehensive living environment as envisaged in the Regional Plan, it would be only appropriate that this positive trend is effectively utilised to ease the problem of housing in Delhi.

The Regional Plan stipulates that priorities be fixed in dealing with different segments of the population in various categories, to provide housing facilities and proposes that the housing programmes should aim at:

i) making available developed land at affordable prices.

ii) introduction of minimum needs programme to ensure an environment of minimum urban normative levels; and

iii) provision of easy access to institutional finance.

5.3 PRIORITIES IN SHELTER DEVELOPMENT

In fixing the priorities for an action programme for providing adequate shelter facilities in the DMA, the following aspects have been given due consideration :

i) the migrants who are most vulnerable to various housing deficiencies are to be given top priority as they constitute a major

chunk of the slum population;

ii) the potential migrants from urban centres to Delhi would need gainful employment opportunities and they would have to be provided with reasonable hygienic and sanitary conditions for living;

iii) persons in the lower and middle income groups to be provided with institutional financial support;and

iv) for those in the category of HIG, developed house sites have to be made available.

It is estimated that the composition of the target groups for additional shelter facilties during 1991-2001 in the DMA would be:

i)	EWS (100% of the beneficiaries for Sites & Services and Slum Improvement)	45%
ii)	LIG (50% of the beneficiaries for institutional financial support and 50% for developed plots)	30%
iii)	MIG (25% of the beneficiaries for institutional financial support and 75% for developed plots)	15%
iv)	HIG (100% of the beneficiaries for developed plots at market price)	10%

Accordingly, an action programme phased over 2 periods - 1991-96 and 1996-2001 should be attempted. In the house building activities, involvement of NGOs, cooperatives and other private building agencies should be thought of and their efforts pooled and coordinated. To moderate the mounting problems of population explosions and consequent shelter needs, especially in Delhi, generation of adequate employment opportunities together with provision of shelter in the form of work-cum-shelter projects in the DMA towns that might lure away some population from

Delhi is being thought of.

The number of shelter units/plots proposed to be developed and the number of expected beneficiaries in various categories proposed to be covered are indicated in the Table 5.3.

There is a large degree of commutation now between Delhi and the towns of DMA and due to the prohibitive cost of shelter in the Delhi Urban Area, more and more people are likely to seek residence on its periphery and the DMA towns. The present emphasis in these towns, however, is towards effortts to attract remunerative enterprises, particularly relting to industry and other economic activities, and unless this trend is suitably regulted, the DMA towns may face severe backlog in the provision o non-remunerative basic services affecting their growth as viable entities. Reversion of this trend, and development of these towns into self-contained towns is possible, only by adequate provision of housing and related infrastrucutre and social facilities in these towns, corresponding to theh provision of employment opportunities and work places.

In order that the shelter requirements in the DMA towns are adequately met by the year 2001, it would be necessary to evolve and implement commensurate residential land development programmes in a stipulated time frame. While there is broadly a need to accelerate the pace of land development in respect of the towns in Haryana and Uttar Pradesh, there is a need to moderate the trend in respect of Delhi.

Table 6.3 : SHELTER PROGRAMME IN DMA - 2001

(Figures in Lakhs)

Category of Beneficiary	Total number of units	Total number of beneficiaries (Households)	Number of Beneficiaries proposed to be covered during	
			(1991-96)	Rest of the period (1996-2001)
1. EWS:				
a)Slum upgradation	2.05	i) 2.05 (100%)	0.82	1.23
b)Sites & Services	6.15	i) 6.15 (100%)	2.46	3.69
2. LIG	5.48	i) 2.74 (50%)	1.096	1.644
		ii) 2.74 (50%)	1.096	1.644
3. MIG	2.74	i) 0.685 (25%)	0.274	0.411
		ii) 2.055 (75%)	0.822	1.233
4. HIG	1.83	ii) 1.83 (100%)	0.732	1.098
TOTAL	18.25	18.25 (100%)	7.300	10.950

Note : i) Institutional finance ii) Developed plots

6

TRANSPORT AND COMMUNICATIONS

6.1 EXISTING TRANSPORT CHARACTERISTICS

At present, the travel from Delhi Metropolitan Area towns to Delhi is time consuming and cumbersome. Development of a well-planned transport network, providing rapid transit within the DMA has thus become imperative. Presently, more than 3.82 lakh passengers travel daily between Delhi and DMA towns. The intracity trips have become equally important in case of DMA towns due to increased socio-economic and industrial activities. As such total transportation system of DMA, including Delhi, need to be viewed as a single multiple mode system.

i) Traffic Volume on Existing Transport Network - 1991.

The existing primary transport network in DMA exhibits a clear pattern of corridor development. There are nine major corridors consisting of Roads (National and State Highways) and Railways (Broad and Metre Gauge), which form the vital transport network system in the DMA (Fig.6.1). Among the various transport routes between Delhi and DMA towns, Delhi-Ghaziabad link carries the highest volume of about 58,406 vehicles, the least being Delhi-Bahadurgarh with 11,682 vehicles. (Table 6.1).

In Rail network too, the line capacity in and around Delhi is heavily strained. In the NCR, 75% of the goods traffic and 65% of the mail/express and passenger trains are handled in this intensely worked Delhi Area. As DMA towns do not have adequate loading and unloading facilities, most of the goods trains are unloaded in Delhi, resulting into heavy goods traffic on road network of DMA.

Figure 6.1

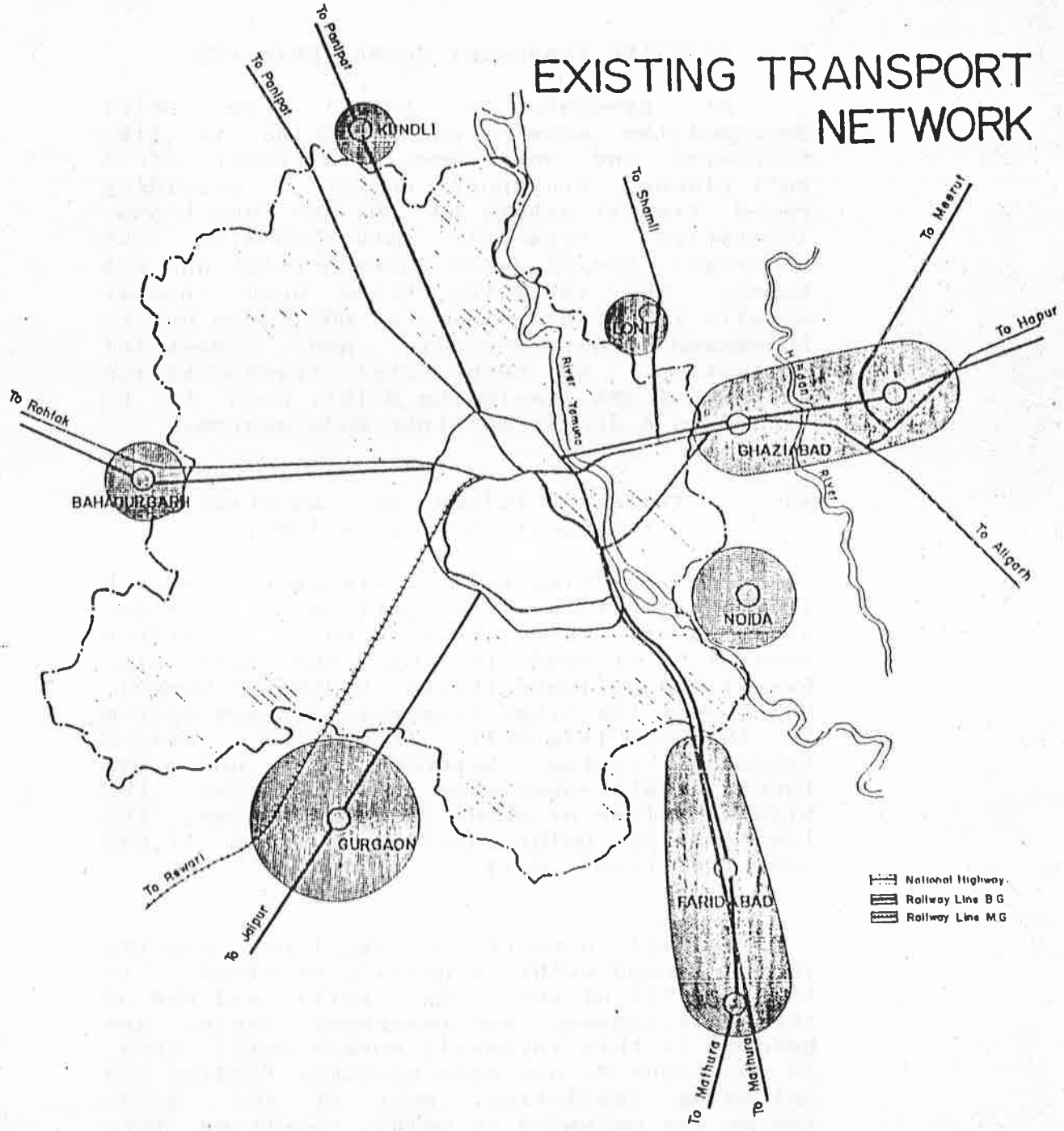

EXISTING TRANSPORT NETWORK
To Panipat
To Panipat
KUNDLI
To Shamli
To Meerut
To Hapur
LONI
River Yamuna
Hindon
To Rohtak
BAHADURGARH
GHAZIABAD
River
To Aligarh
NOIDA
GURGAON
To Rewari
To Jaipur
FARIDABAD
To Mathura
To Mathura
National Highway
Railway Line B G
Railway Line M G

Table 6.1 : TRAFFIC MOVEMENT ON MAJOR CORRIDORS - 1991

Major Corridor	Total pass. vehicle	Total buses	Total goods vehicle	Total volume
1. Delhi-Faridabad	27017	2088	2635	31740
	(85.1)	(6.6)	(8.3)	(100.00)
2. Delhi-Gurgaon	11799	1156	4070	17025
	(69.3)	(6.8)	(23.9)	(100.00)
3. Delhi-Bahadurgarh	7232	1248	3202	11682
	(61.9)	(10.7)	(27.4)	(100.00)
4. Delhi-Ghaziabad	42174	4993	11239	58406
	(72.2)	(8.5)	(19.3)	(100.00)
5. Delhi-NOIDA	25594	2593	2294	30481
	(84.0)	(8.5)	(7.5)	(100.00)
TOTAL				1,49,334

ii) Travel characteristics

The present daily passenger movement (inter-urban) by all modes is estimated at 3.82 lakhs between Delhi and DMA towns. Such a large interaction of DMA towns with Delhi by public and private modes shows the high degree of interdependence (Table 6.2).

Table 6.2 : DAILY PASSENGER MOVEMENT BETWEEN DMA TOWNS AND DELHI U.T.- 1991

Between	Passengers by			
	Public & Private Buss	Personal Vehicles	Rail	Total
Delhi-Ghaziabad	30,560	36,472	31,675	97,707
Delhi-NOIDA	57,147	39,417	-	96,564
Delhi-Faridabad	41,565	54,965	18,337	1,14,867
Delhi-Gurgaon	29,206	15,669	7,337	52,212
Delhi-Bahadurgarh	6,289	6,981	6,163	19,433
Delhi-Kundli	519	730	-	1249
TOTAL	1,65,286	1,53,234	63,512	3,82,032
	(43.3)	(40.10)	(16.6)	(100.00)

Number of passengers travelling daily by road transport facilities in organised sector within DMA are as in Table 6.3.

Table 6.3 : NUMBER OF PASSENGERS TRAVELLING BY SCHEDULED BUS TRIPS

Between	D.T.C.	Haryana Roadways	U.P. Road-ways	Total Passen-gers
Delhi-Faridabad	17,118	9,600	-	26,718
Delhi-Gurgaon	4,891	13,080	-	17,971
Delhi-Ballabhgarh	1,400	1,600	-	3,000
Delhi-Ghaziabad	17,337	-	262	17,577
Delhi-NOIDA	(Intra - Urban Service)			
Delhi-Kundli	N.A.	N.A.	N.A.	N.A.
TOTAL	40,746	24,280	262	1,10,288

Out of the total 3,82,032 passengers, about 1,10,288 (i.e. 28.86%) travel by public buses, 54998 (i.e.14.39%) by private and chartered buses and 1,53,234 passengers (i.e. 40.11%) travel by private (personal) vehicles. The remaining 63,512 (i.e. 16.62%) travel by rail through 100 trains of various classifications. Out of these trains, only about 24 trains run during peak hours. In other words, nearly 40.11% passengers travel by private and charted buses and private vehicles, and 59.88% passengers by public buses and the rail.

iii) Existing Transport Facilities in DMA - 1987

The existing transport facilities in DMA consist of buses run by State Transport Corporations of Uttar Pradesh, Haryana and Delhi; buses run by private owners and chartered buses by various transport companies during fixed hours; shuttle trains and EMUs between DMA Towns and Delhi and various other long journey passenger and Mail or Express trains.

Transport facilities between Delhi and NOIDA in the public sector are provided by DTC only. As these services cater to the

passenger movement from various parts of Delhi to NOIDA and nearby areas, these have been considered as intra-city services. Such trips from different parts of Delhi to NOIDA amount to approximately 1000. A number of private vehicles such as cars and taxies, charted buses and those run by private transporters on different routes, and long journey buses run by State Transport Corporations on regional routes touching Delhi and DMA towns, are in addition to the scheduled trips and share a considerable proportion of the passenger movement in the DMA.

A detailed study on the improvement of transport facilities in the DMA with a view to suggest a Mass Rapid Transit System is now under progress by RITES. This study would throw further light on the existing tranport scenario of DMA.

6.2 TRANSPORT POLICIES IN THE REGIONAL PLAN

In the context of the developments proposed in the DMA towns in the Regional Plan, it has been estimated that about 5.25 lakhs passengers would travel on different corridors from and to DMA towns by public transport, private vehicles and rail by 2001. A high percentage of passengers travel by unorganised modes of travel daily, between Delhi and DMA towns causing delays, loss of energy, pollution and accidents. This shall get further aggravated in the coming years in the light of the enhanced role envisaged for these towns. As such, total transporation system of DMA must be viewed as a single multiple mode system and the strategies for transportation planning in DMA should essentially be based on the principle of modal split manipulations, i.e shifting traditional motor oriented transport to favour mass transport system by giving priority for its development and augmentation. The existing infrastructure should be optimised for maximum output in terms of capacity and efficiency of traffic operations and for better transport environment.

In the above context, the objectives to achieve an efficient and responsive transportation system in DMA should be as

follows :

a) interconnection of DMA towns among each other, and with the Capital by efficient and effective network system for free movement;

b) provision of shortest and free movement network to inter-connect the maximum traffic attracting and generating, urban nodes in the DMA to diminish the centrality of Delhi;

c) decongestion of Delhi roads and terminals by diverting the bypassable long distance through traffic;

d) provision of suitable fast sub-urban operating system for efficient and effective movement of commuters and for boosting up of the development of economic activities in the urban nodes of the DMA; and

e) integration of road and rail network system in Delhi, DMA and rest of the Region in NCR with appropriate inter-facing facilities.

The operational details of the transport strategy for DMA would be evolved based on the recommendations of the said study by RITES on Mass Rapid Transit Network.

6.3 OPERATIONAL POLICIES FOR IMPROVEMENT OF TRANSPORT SYSTEM IN DMA :

Following are some of the policies to improve the Transport system, operating in DMA.

i) Uniform Transport Policy and Rational Fare Structure:

To avoid concentration of people and economic activities in Delhi and to promote them in DMA towns, it is essential that the transportation system should be based upon a rational fare structure and a uniform transport policy in Delhi, U.P and Haryana.

ii) Single Transport Zone For Inter State transport and Para-transit Vehicles.

a) At present, in DMA the bus services are provided by DTC, Haryana Roadways and UP Roadways (Limited Trips) and such trips are treated as inter-city in nature except those of NOIDA. For uniformity of the services in the region, the entire DMA should be a single zone for planning, routing and scheduling of services for avoiding duplication of services and competition among each other. For this purpose all State Road Transport Undertakings can either enter into an agreement in lines of NOIDA with DTC or the number of services should be increased under the existing bilateral arrangements among Delhi Uttar Pradesh and Haryana.

b) The present rate of growth in supply of public transport services in DMA will not be able to meet the future demands especially in newly coming up areas on the periphery of Delhi. As such, introduction of private bus services under fixed schedules and routes similar to private bus operation system under DTC should be identified. The Inter State bus permits for this purpose can be arranged under the Section-108 of Motor Vehicle Act 1988. This arrangement should also cover the operations of para-transit services (autos, taxies etc.,) in DMA towns.

iii) Integration of proposed Delhi MRTS with DMA towns:

There is a proposal to introduce a MRTS initially on East-West Corridor and later on North - South Corridor in Delhi (Fig 6.2). This will operate as an integrated transport system with other existing intra-urban (Ring rail) and inter-urban transport system (State Road transport and EMU's on Delhi- Ghaziabad and Delhi-Palwal sections). To meet the travel demand of DMA adequately and efficiently, on a uniform basis, it is needed to integrate the proposed MRTS in Delhi with the existing intra-city and inter city transport system with an effective feeder service of D.T.C. and with radial spurs of surface railway from the four directional terminals to the DMA towns.

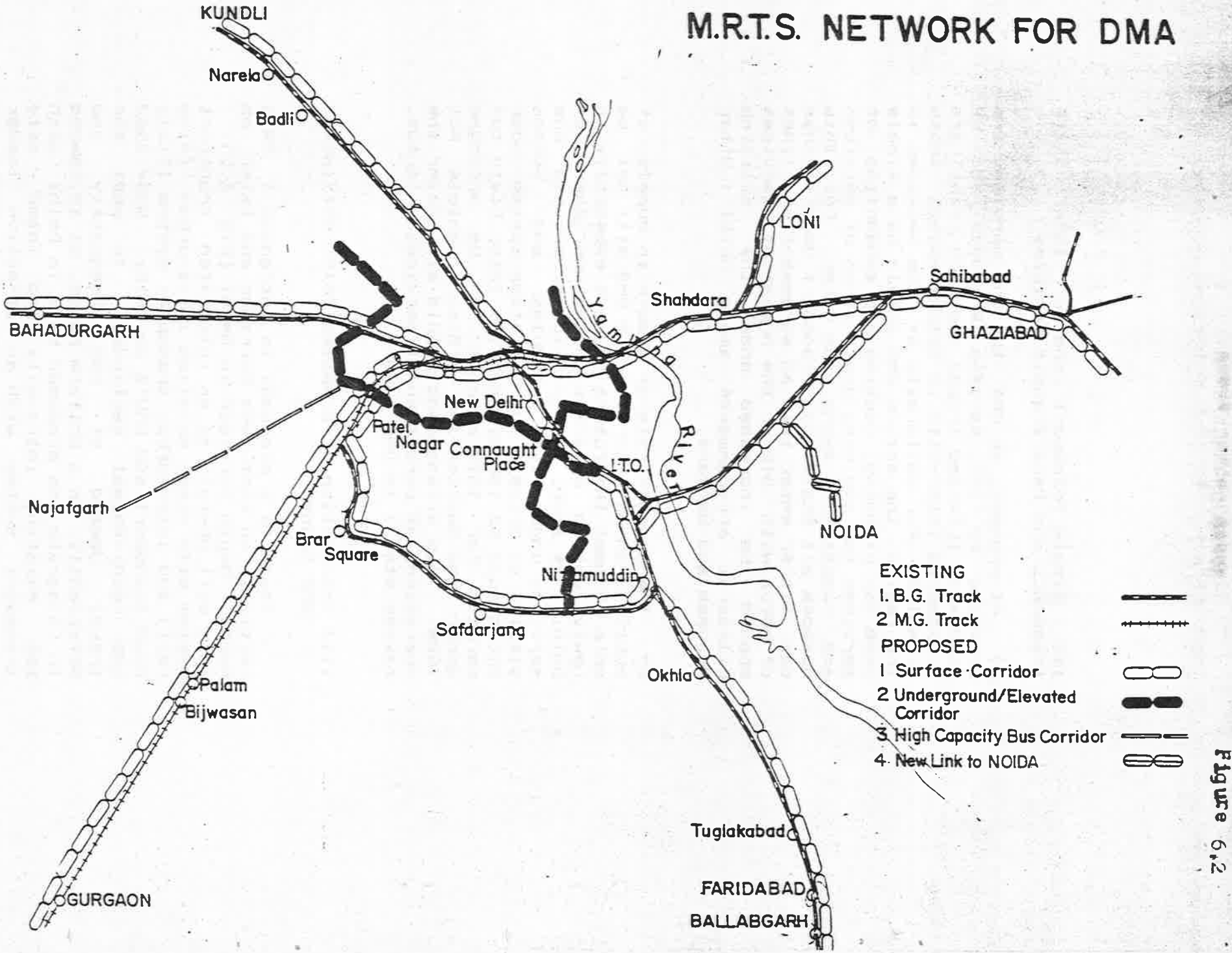

M.R.T.S. NETWORK FOR DMA
KUNDLI
Narela
Badli
LONI
Sahibabad
Shahdara
BAHADURGARH
GHAZIABAD
Yamuna River
New Delhi
Patel Nagar
Connaught Place
I.T.O.
Najafgarh
NOIDA
Brar Square
Nizamuddin
Safdarjang
Okhla
Palam
Bijwasan
Tuglakabad
GURGAON
FARIDABAD
BALLABGARH
EXISTING
1. B.G. Track
2 M.G. Track
PROPOSED
1 Surface Corridor
2 Underground/Elevated Corridor
3 High Capacity Bus Corridor
4 New Link to NOIDA

Figure 6.2

iv) Augmentation of Transport Infrastructure (both road and rail) in the DMA towns:

a) If the available capacities of the Rail Corridors within the DMA and Delhi Urban Area is to be optimised and utilised for, providing intra-urban and inter-urban services, it would be necessary to carry out certain programmes like increasing terminal capacities, remodeling of the yards, laying of dedicated tracks for suburban services, and integrating the two network systems so as to enable optimum utilisation with minimum cost investment.

b) It is also necessary to augment the capacity of existing transport terminals and identifying sites for new bus terminals outside the Delhi Union Territory for catering the needs of growing traffic between Delhi and new areas under DMA.

c) In order to provide immediate relief to commuters from newly developed peripheral areas of Delhi, a short range programme should be worked, out and it should consist of allowing paratransit vehicles, extension of existing DTC bus routes (point to point service) and stopping of trains at new locations etc.

d) Measures should be taken for development of low capacity public transport modes like mini buses, vans etc. to serve needs of the DMA towns other than Delhi.

e) In DMA towns other than Delhi, Scientific traffic management measures are almost non-existent. A large number of unlicensed vehicles ply on roads, and encroachments reduce road width to nearly half. The slowest and fastest vehicles share the same carriage way, severely hampering mobility. As such, it is essential to promote traffic management measures and identifying transportation requirements of the city. Once corridors and land requirements have been indicated,land could be reserved, though construction work could be taken up in phases only when the stage of development warrants

such facilities.

v) Inter-Facing

The synthesis which would be required between inter and intra urban movements can only be achieved through a proper planning of inter-facing facilities. The two major points for consideration are:

a) the effects of the inter-urban movements on intra-urban circulation pattern, and

b) the consequent need for new terminals,

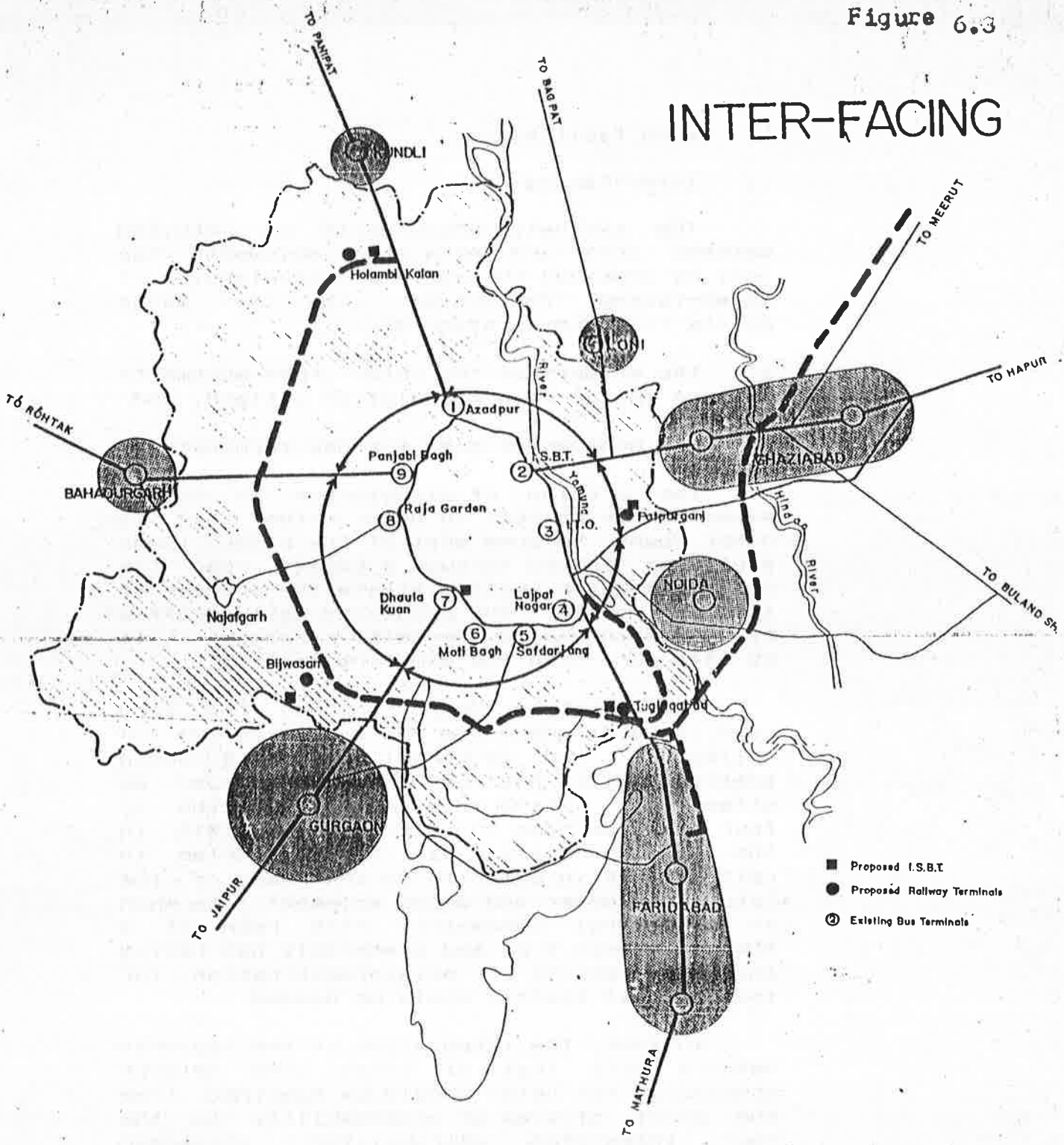
The problem of circulation is mainly expected to be felt in Delhi rather than in other towns, because most of the other towns would be served through a bypass road (as proposed) which would mitigate the problem of through traffic. The projected daily traffic by 2001 which would use Delhi's network will be 144% more than the existing traffic.

The existing Outer ring and the Ring road in Delhi which are the main arteries for collection and dispersal of inter-urban traffic will not be able to cope up effectively taking into account the two to four fold increase in inter-urban traffic in the future. Similar will be the problem in rail network in catering to the needs of the future passenger and goods movement. As such an additional concentric ring road of a limited access type and preferably not having any major points of origin/destination for the regional traffic would be needed.

In fact, the integration of the regional network with that of urban area network specially for Delhi should be examined from the point of view of accessability to the four integrated metropolitan passenger terminals and freight complexes proposed in Delhi Master Plan-2001, which will also serve DMA. These terminals and complexes (Fig 6.3) should be along the proposed concentric ring and also connect the existing outer ring road so that the inter-urban traffic would flow either through these regional roads or proposed expressways and, follow the proposed ring upto its metropolitan passenger terminals/freight complexes. It would branch off using the existing connections nearest to the proposed terminals/complexes and to the

Figure 6.3

INTER-FACING



proposed ring.

It would also be necessary to design intersections between the proposed inter-urban roads and proposed concentric ring road as grade separated inter-changes, to maintain the uniform speeds on both the roads. Similarly , in other important urban nodes of DMA, the terminal facilities would need to either drastically expand their existing facilities or go in for the development of bus terminals at Ghaziabad, Faridabad, Gurgaon and NOIDA and requiring inter-facing with regional roads due to large intra-urban traffic in future.

A rail based-mass rapid transit system has been studied in detail for Delhi. A similar MRTS can be proposed for the entire DMA using the network facilities to be provided in the Delhi MRTS by expanding its radial spurs upto DMA towns.

vi) Integration :

At present, various transport authorities/ agencies are responsible for planning, development and managing of transportation facilities and services in DMA. They operate independent of each other and this has resulted in avoidable long journey time and more expenditure. The agencies charged with such responsibilities need to be strengthened and, a coordinating agency need to be constituted with representation of various transport authorities, which would coordinate and take an overall integrated view of the total transportation system.

The final recommendations of the study by RITES which is now underway relating to the most appropriate mass rapid transit sysuem for Delhi and DMA would be suitably incorporated in the Funcational Plan before its finalisation.

6.4. TRANSPORT PROPOSALS - REGIONAL PLAN 2001 - NCR

A. Network Improvement

I. ROAD

The DMA towns of Ghaziabad, NOIDA and Faridabad come next to Delhi in attracting and generating maximum goods and passenger traffic. In the absence of direct connection among these towns, this unavoidable traffic passes through Delhi and congest the Delhi transport network. The Plan proposes to develop

(i) an Expressway connecting Faridabad-NOIDA-Ghaziabad.

(ii) The highly congested National Highway 8 connecting Delhi-Gurgaon to be upgraded from the existing 4 lanes to 6 lanes by 2001 A.D.

(iii) An Inner Grid to inter-link the DMA towns among themselves to provide inter-action and intra-movement amongst them at the regional level without passing through Delhi. This grid will be developed with 2 lanes initially and for an ultimate capacity of 4 lane -divided, with 60 m R.O.W. on new alignment to connect Bahadurgarh and Baghpat, and strengthening and widening of existing alignment on Rohtak-Sonepat-Bahadurgarh, Baghpat-Meerut and Jhajjar-Gurgaon-Faridabad stretches (Fig 6.4).

II. RAIL

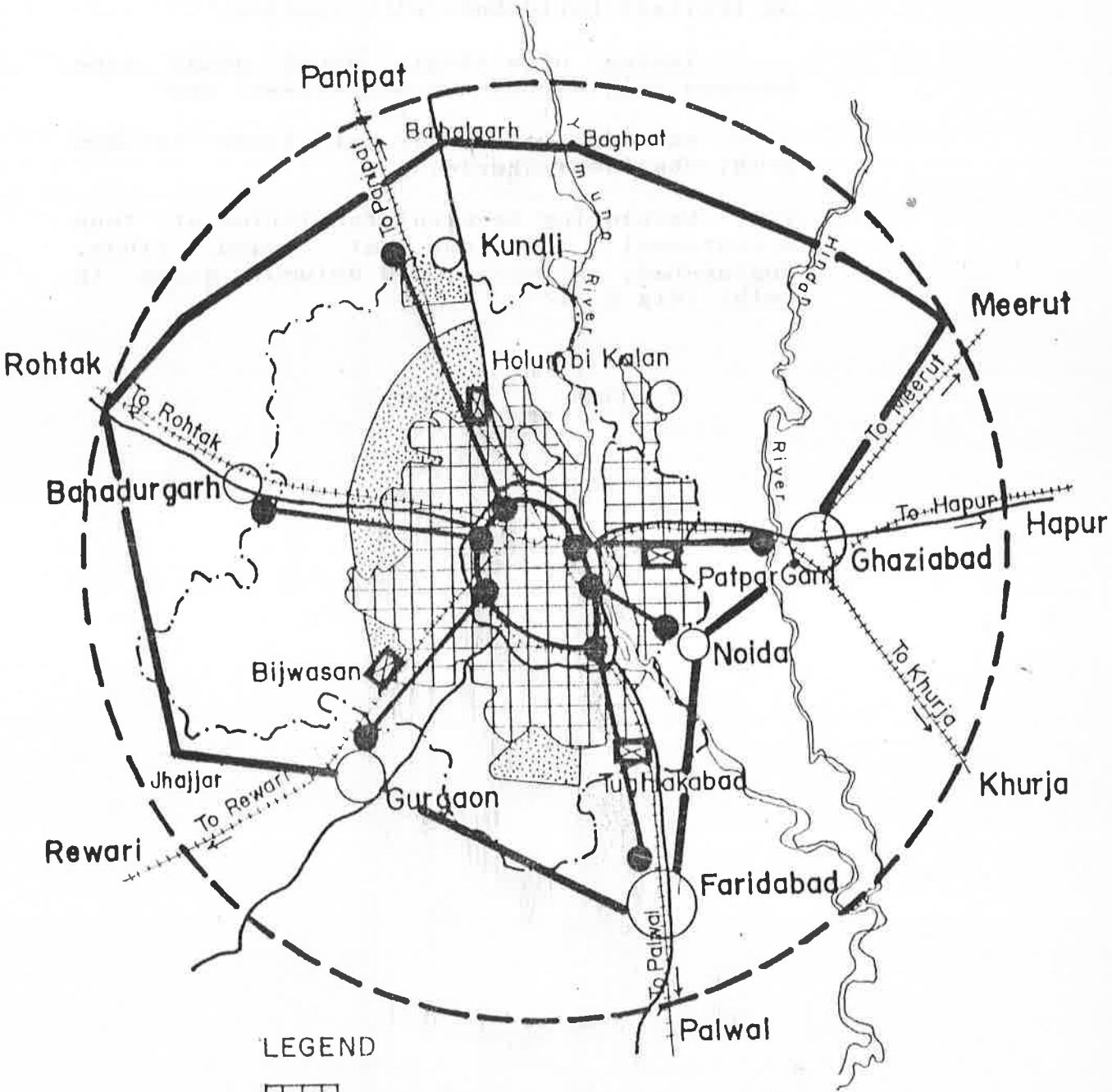
The existing rail network has a number of bottle-necks which can be removed to create larger capacity in the rail network and provide an efficient movement of commuter traffic between the DMA towns and Delhi by;

i) Increasing substantially the carrying capacity of existing passenger trains by adding additional number of coaches.

ii) Rationalising the movement of freight traffic to avoid their concentration in Delhi at present.

Figure 6.4

PROPOSED TRANSPORTATION STRUCTURE



iii) Eliminating the existing bottlenecks on short stretches by providing additional facilities such as

- provision of an additional pair of lines on (Palwal) Faridabad-Delhi section.

- laying of a single Broad gauge line between Delhi-Gurgaon-Rewari-Alwar, and

- an additional pair of lines between Delhi-Ghaziabad-Khurja.

iv) Developing terminal facilities at four directional locations at Anand Vihar, Tuglakabad, Bijwasan and Holumbi Kalan in Delhi (Fig 6.4).

6.5 EXISTING TELECOMMUNICATION SYSTEM

Provision of telecom facilities would be most crucial to create conducive conditions to enable the DMA towns to become self-contained in matters of work places and residences. This could also help to a considerable extent in reducing the number of business trips. As of 1990, the total switching capacity available in the DMA was of the order of 574636 lines and the number of persons in the waiting list accumulated was 216925. The townwise switching capcity and waiting list position is as under:

Table 6.4 : Telecommunication capacity in DMA towns (1990)

	Capacity	Waiting list
Delhi UT	541400	181251
Ghaziabad	13640	4494
Loni	200	Nil
NOIDA	7400	7673
Faridabad	5100	12476
Ballabhgarh	1800	1868
Gurgaon	4096	8247
Bahadurgarh	600	916
Kundli	400	Nil
DMA excl.Delhi	33236	35674
Total DMA	574636	216925

Source : Department of Telecommunications Govt. of India to NCR Planning Board on the 8th Plan proposals.

6.6 TELECOM DEVELOPMENT POLICIES

In recognition of the crucial role the Telecommunications has to play in enabling decentralisation of activities from Delhi UT and their organised development in the DMA towns, the Regional Plan has enunciated the following policy for Telecommunication development in DMA.

i) full automation of telephone services

ii) replacement of all life expired exchanges and related accessories

iii) provision of telephone and telex

facilities practically on demand

iv) extension of subscribers dialling facilities

v) connection of DMA towns with Delhi by reliable cable or radio media

vi) provision of reliable trunk services either by direct dialling or through demand services among the DMA towns

vii) extension of telegraph office facilities

viii) replacement of all the manual and mechanical exchanges in Delhi and other DMA towns by electronic exchanges.

6.7 DEVELOPMENT PROPOSALS

The Department of Telecommunications (DOT) is in full agreement with the enhanced role the DMA towns need to play and the need for provision of telecommunication facilities as envisaged in the Regional Plan. Accordingly, an ambitious programme has been chalked out for provision and augmentation of telecom facilities in DMA. The expected capacity by the end of the VIII Plan as proposed by the DOT in the DMA towns (excl. Delhi) is as under:

Augmentation programme of Tele-communication facility in the DMA towns during VIII Plan.

	Demand Forecast at the end of VIII Plan (1992-97). (Number of lines)
Ghaziabad-Loni	64045
NOIDA	52700
Faridabad	71340
Gurgaon	50223
Bahadurgarh	5640
Kundli	400
DMA excl.Delhi	244348

Source : Deptt. of Telecommunication, Govt. of India to NCR Planning Board on the VIII Plan Proposals.

7

PUBLIC AND ESSENTIAL SERVICES

Public and essential services are under severe strain in the D.M.A. Towns including Delhi and the situation would get aggravated in the times to come due to increased levels of population and economic activities. It is extremely necessary to take an integrated view of the entire situation and suggest short term and long term steps, and also corrective measures to prevent future deterioration.

7.1 WATER SUPPLY IN DMA TOWNS

i) Status of water supply in DMA towns

The DMA is endowed with two rivers, namely, the Yamuna and the Hindon that traverse its central part. Besides, DMA is served by Western Yamuna Canal and Upper Ganga Canal. Supply from surface water sources is confined to Delhi and part of Bahadurgarh and the remaining towns are being served through underground sources. The yields of tubewells vary from town to town: 70 to 138 lpm in Gurgaon and 200 to 1200 lpm in Faridabad. A study on infrastructure in DMA towns conducted by the Board, through a Consultant indicated, that the water-table in the DMA has been sinking continuously to as much as 12 metres over the years, resulting in reduced yield rates, and also deterioration in the quality of water. This is supported by a report from HUDA in case of Faridabad that the draw-down level of the groundwater has sunk by 12 metres during the last two decades. Groundwater in Bahadurgarh, major part of Gurgaon, Ghaziabad and to some extent in NOIDA is brackish, and it is becoming increasingly poorer in quality and availability. According to local sources in Delhi, the tubewells have started yielding brackish and polluted water, particularly in the trans-Yamuna areas. In the years to come availability of water from the ground water source is likely to get reduced further. This, coupled with the increased requirement of water, would force increased dependance on surface water from the Yamuna and the Ganges.

The Regional Plan NCR - 2001 has proposed a norm of 225 lpcd to start with to

reach a target of 360 lpcd by 2001 in DMA. The Delhi Water Supply and Sewage Disposal Undertaking, however, has been following a norm of 315 lpcd (70 gallons per capita a day). Looking to the fact that large additional raw water sources are not immediately in sight, these norms may have to be revised downwards. The table below indicates the present situation of water supply in the towns of the D.M.A. (Table 7.1)

DELHI: Delhi depends on the Yamuna for raw water, though part of Delhi in the trans-Yamuna area, drawns from the Ganges. Tehri dam and Kishau dam in Uttar Pradesh, and Renuka dam in Himachal Pradesh, when complete, would supply major portion of Delhi's water needs by 2001. Production of potable water in October 1991 was of the order of 2129 mld through various treatment plants as given below, giving roughly a per capita production of 226 lpcd which is much short of the norm of 315 lpcd.

Treatment Plant	Capacity & present production: mld
Wazirabad	545
Chandrawal	408
Haiderpur	454
Bhagirathi(Shahdara)	454
Okhla	55
Ranneywells and Tubewells and Deep bore hand pumps	213
Total	2129

By March 1992, this capacity with go up by 15 mld.

By and large (as of October, 1991), there is no scarcity of water in Delhi,except certain pockets at the tail end of the distribution system in south-west Delhi and rural areas. There is also no problem of raw water for any of the water treatment plants. The position, however, is different in J.J. Colonies, resettlement and unauthorised colonies, and even, such unauthorised colonies which have been regularised.

Out of 553 unauthorised but regularised colonies, water supply is available in 541 colonies, and in 4 more colonies, the water

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Table:7.1 WATER SUPPLY POSITION IN DMA TOWNS - 1990-91

DMA Towns	Sources of Supply	Quantity produced in MLD	Quantity treated in MLD	Per capita supply in lpcd	Population covered	Area covered	No. of connections	Yield/ minute
Delhi	Yamuna, Ganga Canal, Tubewells/ Handpumps/Kanney wells.	2129	2129	226	97% (except slums & new colonies)	Full	6170000 domestic	-
Ghaziabad-Loni	Tubewells (98) Handpumps	127	NIL	189	Part	Full	N.A.	N.A.
NOIDA	Tubewells	60 (Chlori-nation)	60	225	Full (except slums)	Full	20000	N.A.
Faridabad	Tubewells (70) Handpumps(150) Standposts (40)	27	NIL	140-150	275000	50%	25000 Domestic 1500 others	1200 lpm near river 200 lpm away from river.
Gurgaon	Tubewells (45) Handpumps (NA) Standposts (280)	9	NIL	60	80%	30 sq km	15777 Domestic 4000 Industry	70 to 380 lpm
Bahadurgarh	Canal (7 days a month) Tubewells (8)	4.1	NIL	70	Full	Full	N.A.	N.A.
Kundli	Handpumps	- Not Available -						

* Figures in brackets indicate the number of source units.

mains are being laid. In the rest of the colonies, which are located in rural areas, skeleton water supply, through deep bore hand pumps, tubewells and public water hydrants has been extended.

There are 486 unauthorised colonies, not yet regularised, (This number keeps on going up every year) with a population of fifteen lakhs out of which 69 are provided with regular water supply and for another 8 colonies, the works are in progress.

The D.W.S.& S.D.U. has so far installed 22 tubewells, 500 deep bore hand pumps, and 500 new public water hydrants. The Undertaking has a proposal to cover the rest of the colonies constructing 100 more tubewells and 1000 feet bore hand pumps, potable stand post and through tankers.

In all the 44 resettlement colonies, potable water is being supplied and more than 1.28 lakh individual connections have been given. In addition, 558 new public water hydrants, 650 deep bore handpumps and 31 tubewells have also been installed after June 1988 in these colonies.

In the J.J. Clusters, numbering 929 with a population of the 15 lakhs, the responsibility of water supply lies with the Slum Wing of the Delhi Development Authority. The Slum Wing has installed about 680 deep bore hand pumps in these clusters. Nearly 3000 public hydrants existed in these clusters even before June 1988. The Water Supply Undertaking has also allowed 588 public water hydrants in 189 JJ Clusters, on the request of Slum Wing of the Delhi Development Authority. All the 108 urban villages and 219 rural villages, and 413 Harijan Basties have been provided with water supply by the Water Supply Undertaking. The yield of the present 50-60 meters deep tubewells is declining, besides some of them are also becoming brackish, 200-300 metre deep tubewells are to be explored. During summer, however, the villages at the tail-end of the distribution system face scarcity of water. Water supply is supplemented in these villages through tankers, and syntex tanks.

Demand forecast and proposals by Water Supply Undertaking & Delhi Development Authority

The raw water requirements and treatment capacity for different population scenarios and norms by 2001 A.D. would be as under:

Population in Lakhs	Water Demand in MLD by 2001 at * 225 lpcd	** 315 lpcd	*** 360 lpcd	Present availability in MLD (Oct.91)
112 (NCR Plan)	2520	3528	4032	2110
128 (MPD-2001)@	2880	4032	4608	
132 (Projected population)	2920	4158	4752	

* Minimum suggested for DMA in NCR Plan 2001.
** Standard followed by DWS&SDU.
*** Maximum suggested by NCR Plan-2001.
@ Master Plan for Delhi - 2001.

ii) VIII PLAN PROPOSALS AND TENTATIVE PROVISIONS FOR DELHI

The Perspective Plan for Delhi by the Delhi Development Authority has projected a population of 104 lakhs by 1995 which would demand at 315 lpcd, a total quantum of 3307 mld.in 1995 and 3465 mld by 1997. Delhi has to depend for its raw water on the neighbouring states as the flows of the Yamuna are grossly inadequate, especially during summer months. The undertaking indents raw water from the Bhakra Nangal against Delhi's share during summer. Ground water in Delhi is meagre and also unpotable for drinking except a few pockets. Tehri dam and Kishau dam in Uttar Pradesh, and Renuka dam in Himachal Pradesh are identified as the sources of raw water for Delhi. 300 cusecs (675 mld) water is earmarked for Delhi in Tehri storage, first phase of which is scheduled for completion by 1995 , 1558 mld (0.5 M A F) in Kishau and 1246 mld (0.37M A F) in Renuka dam. To augment the present productions in order to meet this demand the following schemes have been proposed by the Undertaking.

1) Construction of 90 mld water treatment plant at Bawana. The scheme is reported to be in the process for approval.

2) Construction of second 450 mld water treatment plant at north Shahdara to treat 300 cusecs (675 mld) of water from the Tehri dam.

3) Construction of 100 mld treatment plant at South Shahdara to treat water from Upper Ganga Canal in anticipation of commitments by UP from Tehri.

4) Construction of 450 mld treatment plant at Haiderpur.

5) Sinking of Ranney wells for 10 mld of water.

For the 100 mld treatment plant of Nangloi, water will be drawn from Delhi Tail Distributory of Western Yamuna Canal carrier system in lieu of the water meant for irrigation use in Delhi. Govt of Haryana is said to have been requested by Delhi Administration to release 70 cuses uniformly instead of 277 cusecs for a period of 8 days in a cycle of 32 days. Irrigation in Delhi can be met by treated seweage effluent.

The Haiderpur treatment plant for 450 mld in fact is based on exchange of treated sewage effluent with Haryana.

The Tehri, Kishau and Renuka Dams are included in the 8th Plan for implementation,but firstly, no firm time table for the implementation of the projects is available which will depend on the allocation of funds every year. Secondly, even if the implementation of the dams is to be in time, the more difficult component is the carrier system to convey water to Delhi. This has not been worked out as yet. A Committee set up by the Ministry of Urban Development to decide the possible alignment of carrying system has recommended the Eastern Yamuna Canal and the Uttar Pradesh Government has been asked to work out the details and the time factor for the project. The DWS and SDU, at the same time feels that the parts of Delhi which need priority attention for supply of water include newly coming up Narela, Rohini and Papankalan and as such the Western Yamuna Canal should also be taken into consideration. Similarly, needs

of the developments in the South of Mehrauli-Badarpur road, extension of villages and Abadies beyond Lal Dora limits of the rural villages, also need serious consideration.

The outaly proposed by the Delhi Administration for water supply, both urban and rural in Delhi, during the 8th plan (1992.97) is Rs.125.66 crores including Rs. 79.47 Grant in aid,. The annual plan outlays proposed are Rs. 77.97 crores for 1990-91 and Rs. 73.95 crores for 1991-92. The outlays are yet to be approved by the Planning Commission.

iii) MAJOR PROJECTS OF DDA

The DDA's new development areas at Dwarka might require for the estimated population of 12 lakhs, 382 mld of water whereas only about 100 mld of water from Haiderpur and Nangloi plants has been earmarked by the Undertaking for Dwarka. Moreover, the second 450 mld water treatment plant planned at Haiderpur will be a reality only when additional raw water becomes available from Haryana. Rohini extension (Phase III, IV, & V) will accommodate 8.5 lakh population demanding 270 mld of water. But water supply plant for only three sectors in Phase II has been approved. Narela, to accommodate more than 14.2 lakh population would require 450 mld, and the works of treatment plant are only in the proposal stage. The proposal includes semi-urban area of Alipur also. Patparganj area covering Cooperative Group Housing Societies of Mayur vihar and Dallupura-Kondli Complex, is estimated to demand 90 mld of water and the works are not yet completed. Part of Mayur Vihar complex gets water from 2 ranney wells and from south Delhi mains. The water supply situation in the area may improve only when the second treatment plant of 450 mld capacity in north Shahdara is completed by 1995. This again is based on the assumption that 300 cusecs of water would start flowing in them. For Vasant Kunj, which has been developed in non-conforming area, only 3.5 mld of water is being released by the Undertaking. This colony may get its required supply only when the 2nd 450 mld water treatment plant at Haiderpur is

completed.

OBSERVATIONS:

1. Delhi will continue to face shortage of raw water at least till 1995 even if the proposed Tehri project is on schedule. Since there is no firm schedule at the moment, additonal raw water from the source cannot be expected even till 2001.

2. There are no reasonable chances of getting additional raw water from Yamuna and from Haryana in exchange of treated sullage water.

3. There is total lack of coordination between the development plans of DDA and the programmes of the DWS & SDU.

4. Major development proposals of DDA in Narela, Rohini, Dwarka, Vasant Kunj, Patparganj and Mayur Vihar are likely to suffer set back, either due to non-availability of raw water or non-availability of treated water.

GHAZIABAD: Groundwater is the only source of water supply at present. There are 98 tubewells yielding 127 mld of water supplying 25 mld for non-domestic use and 102 for domestic uses. Rate of water supply in the city is 189 lpcd (1990).

The population of the city complex including Loni, as of 1991, is estimated at 5.56 lakhs and the assigned population for 2001 AD is 11 lakhs. The requirement of water by 2001 A.D. will be as follows:

At per capita supply of (lpcd)	Cis-Hindon (6.60 lakhs population) 2001 A.D. MLD	Trans-Hindon including Loni (4.40 lakhs population) 2001 A MLD	Total in MLD
225 (Minimum suggested for DMA towns in NCR Plan)	148.5	99.0	247.5
360 (Target suggested in NCR Plan)	237.6	158.4	396.0

*Present Availability : 127 mld - overall and 102 mld for domestic

Projects under execution and proposals: In order to supply water to newly developed colonies at Vasundara, Vaishali and Kaushambi in the Trans-Hindon area, a separate scheme is under execution. Two tubewells along Meerut road have been bored for this purpose to yield 3.6 mld of water. To supplement the supply and also to cover Indirapuram, a scheme to bore 28 tubewells in the Cis-Hindon area 9 km away, is under execution and, 10 tubewells have already been bored. On completion, the scheme would supply 89.10 mld of water.

Financial aid is also being provided by World Bank for Ghaziabad water supply scheme. Under this programme, supply of water to Sectors 1 to 12 of Trans-Hindon area where tubewells are not successful, and also reorganisation of water supply in Patel Nagar and Kaila Bhatta area in Cis-Hindon side, are covered. The project envisages 17 tubewells at Tila Mode and conveyance of water over 14 km by gravity, and construction of 3 zonal water mains alongwith laying of distributive mains. Out of these, 2 zonal water mains have been commissioned already with 10 tubewells. 5 more tubewells are almost ready. 31.44 mld of water will become available on completion of this project in

the Trans-Hindon area. In Cis-Hindon area, 4 tubewells and reorganisation of distribution mains are taken up, and of which 2 tubewells are already bored.

Govindrapuram water supply scheme comprises 4 tubewells, of which 2 tubewells have been bored. Uttar Pradesh Government is said to have approved release of 50 cusecs of water from Ganga Canal for Ghaziabad. The water will be tapped at Mussorie Fall and will be replenished through tubewells to be constructed by Irrigation Department. The project is under finalisation by U.P. Jal Nigam at a likely cost of Rs.42 crores. However, no implementation schedule for the project has been intimated.

With the detection of fresh potable underground drinking water in Kaushambi area, further efforts are reported in progress to ensure tapping maximum quantity of local underground water in Trans-Hindon area.

All these new efforts are estimated by the Ghaziabad Development Authority to add 140 mld of supply taking the total supply to 267 mld. The deficit thus would be 129 mld at 360 lpcd. If the proposal to receive 50 cusecs from Ganga canal materialises, that would offset the shortage by 122 mld leaving a marginal 7 mld of supply uncovered by 2001 AD. However,the underground water sources, over time, deplete in quantity and quality, and thus cannot be totally depended upon for time to come. This would require long term solution in identifying surface water sources in terms of drawing more raw water from Ganges or recycling of waste water after proper treatment. The later could meet the requirements, other than drinking.

NOIDA: Groundwater is being tapped through 56 tubewells. Against the installed capacity of 80 mld, the present production is 60 mld supplying 225 lpcd average. Another 20 standposts also supply water at 100 lpcd in limited localities. The entire town population except slum population is catered to by proper water supply system. One ranney well has recently been constructed, and another is under construction.

This industrial township would require normally more per capita supply than a

residential urban centre, as the industrial requirement is much more than for domestic use. By 2001 AD, the town will require for a population of 5.5 lakhs:

At a supply of (lpcd)	Water Demand in MLD in 2001 AD	Present Availability in MLD
225 (Minimum suggested for DMA towns in NCR Plan)	125	60
360 (Target suggested in NCR Plan 2001)	198	

At present, 15 out of the 56 tubewells are throwing up brackish water. The quality of water is deteriorating over the passage of time. For adequately supplying the town with potable water, locating a surface water source is inescapable. Exchange of treated sullage for raw water from Irrigation Department or sharing of water from an independent canal to DMA from the Ganges could be possible solutions. Moreover, NOIDA should meter water onnections for all users to plug wastages.

GURGAON: The present source of water is ground water through 45 tubewells yielding 70 to 380 lpm each, and a total of 9 mld. Water is generally brackish and the static level is going down gradually. The supply is 60 lpcd. In all, 80% of the population has access to organised water supply system.

The State Public Health Engineering Department and the Haryana Urban Development Authority, have taken up a project to bring surface water from the Delhi Branch of West Yamuna Canal over 73 km from Pai village, near Sonepat to Gurgaon at an estimated cost of Rs. 47 crores to supply 70 cusecs or 175 mld.

The requirement of water for the population of 7 lakhs assigned in the Regional Plan would be as indicated below:

At a supply of (lpcd)	Water Demand in MLD in 2001 AD	Present Availabi-bility in MLD
225 (Minimum suggested for DMA towns in NCR Plan)	157.5	9
360 (Target suggested in NCR Plan-2001)	252	

Till such time the canal water becomes available, resort would have to be undertaken to more tubewells alone.

FARIDABAD-BALLABHGARH: The source of water supply is ground water. The city gets water supply through 70 tubewells. There are also 150 handpumps. The total supply is 27 mld giving a per capita consumption of 100 to 140 lpcd. 50% of the city area and 2.75 lakh (45%) population have access to water supply system.

The Faridabad Complex Administration and the HUDA have proposals to augment the supply through 5 ranney wells yielding another 18 mld. The draw down of the water table during the last 2 decades is about 12 metres according to the HUDA. Since the water table is going down and the area is not fit for tapping groundwater, a surface water source should be identified.

The demand for 10 lakh population at suggested norms is as follows:

At a supply of (lpcd)	Water Demand in MLD in 2001 AD	Present Availabi-bility in MLD
225 (Minimum suggested for DMA towns in NCR Plan)	225	27
360 (Target suggested in NCR Plan)	396	

At the end of 1994-95, the Ranney wells project may add another 18 mld. The city would have to augment its water supply substantially for which, a canal as in the case of Gurgaon, or exchanging treated sullage with raw water from Irrigation Department, should be considered on priority basis, since these schemes have long gestation periods.

BAHADURGARH: The town depends upon Bahadurgarh Minor Canal from Bhalot distributary passing near Rohtak town, and, tubewells. Canal water is received only for 7 days in a month and stored. HUDA and Municipal Water works have a storage capacity of 135 million litres for this purpose. Both together supply 4.1 mld, giving a consumption rate of 70 lpcd. Further scope to draw more water from Bahadurgarh minor and also from underground sources is limited. There is a proposal to tap the canal being taken to supply Gurgaon to meet the supply of Bahadurgarh (30 cusecs) also.

By 2001 AD, for 2 lakh population, the town would need:

At a supply of (lpcd)	Water Demand in MLD in 2001 AD	Present Availability in MLD
225 (Minimum suggested for DMA towns in NCR Plan)	45	4.1
360 (Target suggested in NCR Plan)	72	

KUNDLI: Presently, there is no water supply sysem in Kundli. Only groundwater is tapped through handpumps. For the assigned population of 1.50 lakhs by 2001, the requirements would be:

At a supply of (lpcd)	Water Demand in MLD in 2001 AD	Present Availabi-bility in MLD
225 (Minimum suggested in DMA towns in NCR Plan)	38	NA
360 (Target suggested in the NCR Plan)	54	

Groundwater availability is, generally adequate to meet the future needs of the assigned population.

iv) FUTURE SCENARIO

Water is a crucial requirement and the sceanrio for the future, appears to be grim, particularly for Delhi and Faridabad. The situation would become comfortable in Gurgaon and Bahadurgarh in case the proposed canal is completed. It would be comfortable in Ghaziabad and NOIDA in case water from Ganges is released.

As of 1990 the overall water supply scenario in the DMA towns is not very unsatisfactory at a norm of 225 lpcd for all DMA towns. The total demand is of the order of 3,328 mld against whiie the supply was of the order of 2356 mld. Town-wise situation, however, reveals a dismal picture in the case of Gurgaon and Faridabad Complex.

By the year 2001, the demand may shoot up to 5364 mld for the assigned population at a norm of 360 lpcd for all DMA towns including Delhi. The likely availability on the basis of information from the various local bodies and authorities, would be only about 2475 mld which is less than half the requirement. This is particularly so because the chances of realising the proposals of local bodies and various water supply organisations, for augmenting the water suply seem remote. (Table 7.2)

- In the case of Delhi, the future supply of raw water is on the basic assumption of water becoming available from the 3

Table : 7.2 Water Quantum in MLD

Name of town	1990 Demand @	1990 Supply	2001 Demand at 360 lpcd	2001 Likely Availability MLD	Remarks population (in lakhs) 1990 Estimated	2001 Assigned
Delhi UT	2950	2129	4032	2070	90.0	112.0
Ghaziabad-Loni	180	127	396	267	5.8	11.0
NOIDA	60	60	198	80	2.68	5.5
Gurgaon	34	9	252	9	1.5	7.0
Faridabad-Ballabgarh	90	27	360	45	4.0	10.0
Bahadurgarh	13	4.1	72	4.1	0.58	2.0
Kundli	1.1	Nil	54	NA	0.05	1.5
	3328.1	2356.1	5364	2475		

@ For Delhi UT at 315 lpcd and for others at 225 lpcd.

Note:1) In Delhi, the proposals to get raw water from Tehri, Kishau and Renuka dams may not materialise by 2001 as the execution of the former two projects is in the initial stage whereas for the last one, the feasibility is still under evaluation. The requirement will also certainly go up since in the absence of steps to contain its population to 112 lakhs, it will go beyond the figure in 2001.

2) For Ghaziabad, the supply may not improve beyond augmentation through tubewells as the proposal to tap Ganges for 50 cusecs is still in the contemplation stage only.

3) For Augmentation of water supply in Gurgaon and Bahadurgarh, HUDA pins its hope only on the 73 km long Gurgaon canal becoming functional. But as on date, the project is in the initial stages.

4) For Kundli water supply, there is no concrete proposal so far.

dams, namely, Tehri and Kishau in U.P. and Renuka in Himachal Pradesh. The first two are under excution and the last one is still to be taken up. Looking from the overall resource constraints and normal gestation period of large dams of this nature, the supply of raw water as proposed for Delhi may not materialise by 2001 A.D. The only solution is to persuade U.P. to release water from the existing supply from the Ganges and recoup it by boring tubewells as is being proposed for the supply to Ghaziabad. The possibility of using the existing Hindon river as the channel for carrying this water should also be explored. this will be economic and water can be obtained at the earliest.

- In the case of Ghaziabad - Loni, about 50 cusecs of water is expected from Ganga Canal. No programme for the project has ,however, been indicated.

- As regards NOIDA, the town has to depend on ground water fully. As on date, more than 25% of the existing tubewells have failed. As the large scale developments in and around NOIDA would also tap the ground water, water table will fall fast, affecting the quantum and quality of water over the years.

- To supply Gurgaon with water, a project is under execution by way of constructing a canal for 73 km length from the Delhi Branch of Western Yamuna Canal. The project is in the beginning stage of its implementation. It is the main source of water supply to Gurgaon in future.

- For Faridabad-Ballabhgarh Complex, the main source of water supply is the ground water. The Draw Down of ground water table since recent past has been faster, and teh chances of many tubewells drying up are quite likely. As of today, there is also no proposal for any canal water supply to the town complex.

- Bahadurgarh town has a serious problem of water supply and its future depends on tapping the Gurgaon canal presently

under execution. Till the canal project is completed which may take years, Bahadurgrh would continue to suffer from scarcity of water as its ground water is brackish and un-potable.

v) RECOMMENDATIONS:

The supply of water for the entire DMA has become a vulnerable factor and, recourse will have to be taken to augment drinking water supply, by diverting water from irrigation use, and drawing additional water from the future projects on the River Ganges. The issue of a proper conveyance system for Delhi and the other DMA towns also needs to be approached from a total angle to meet the requirements of all the DMA towns, including Delhi. The Central Water Commission should undertake studies on a priority basis about its need, feasibility and possible alignment, rather than living it to each town to plan its own programmes.

7.2 SEWERAGE

Provision of sewerage system is next only to water supply in importance lest the decay in environment will prove determinental to human well being and health.

DELHI: About 1700 mld of sewage is generated in Delhi as of 1991. The capacity (October 1991) of the sewage treatment plants is around 1270 mld and the plants are at Okhla, Coronation Pillar, Keshopur, Rithala, Vasant Kunj and Shahdara, in addition to oxidation pond (54 mld). 17 nallahs carry the sullage to empty it into the river Yammuna in its stretch between Waziarabad barrage and Okhla barrage. In 1981, 70% of the population did not have access to regular municipal sewerage and this at the end of 7th Plan improved to 50% , but in absoulute terms, the population unserved rose from 42 lakhs to 45 lakhs.

Of the 553 unauthorised regularised colonies, only in in 201,sewerage facilities exist. The plan is to extend the sewerage facilities in all the remaining 352 colonies by the end of the 8th Five Year Plan at a cost of Rs. 50 crores.

Only 17 of the 44 resettlement colonies have sewerage system. In addition, in 10 colonies at a cost of Rs. 9.90 crores sewerage system is being taken up. These are expected to be completed by the end of 1992. The remaining 17 colonies will also be covered by 1997 at a cost of Rs 50 crores.

80 out of the 108 urban villages have sewerage system. 5 more are expected to be covered by the end of the current year and the remaining 23 by the end of the 8th Plan at a cost of Rs. 15 crores.

To the unauthorised non-regularised colonies which are about 486 in number, the present policy is to extend low cost sanitation facilities. So also at present more than 650 JJ clusters and the rural villages, the proposal is to cover them all by low cost sanitation measures.

The treatment capacity in Delhi is expected to reach 2265 mld by the end of the

8th Plan (1997) against the need for 2770 mld which is the likely generation of sewage according to the programme for supply of water. It may, therefore, leave a very huge gap of waste water untreated by the end of the 8th Plan and beyond.

GHAZIABAD : Trunk sewers covering avbout 20% of the Cis-Hindon area and 30% of the Trans-Hindon area have been laid. In all, about 80% of the area has been provided with branch sewers. The topography of the city being largely flat with drainage depressions zones, the problems of sweage disposal is acute, as deep cuttings and pumpings are involved in the sewage disposal system. At present, obnoxious industrial affluents also get discharged mostly into the Hindon river without any treatement, Residential areas in many parts get flooded with sewage at the risk of human health and environment. During monsoon, parts of the city remain water logged for days together. Absence of intermediate and main sewage pumping stations create sewage pools in residential areas. There are open sewers which need to be covered. These actions require priority attention to ameliorate impending risk to human health and environment.

Three projects by GDA with an aggregate estimate of Rs 36 crores are with HUDCO for financing. For the newly coming up Trans-Hindon Area, the GDA has planned an integrated sewage disposal system including a treatment plant. The work is in progress. The effluent from the industrial areas need special treatment before disposing it into the river course or on land. This would require a detailed study to design an efficient sewerage network system to this would be generated is about 220 mld on the basis of the likely quantum of water supply, but the latest treatement facility would be only of the order of 50 mld.

NOIDA : The sewage is collected at intermediate sewage pumping stations, from where it is taken to the main sewage pumping stations, before reaching the treatement plant site. at present, the sewage is treated through an oxidation pond. another oxidation pond is under construction. The effluents from the oxidation pond are let into irrigation channel to reach finally the

river Yamuna. The proposal for sewage treatment plant has been there since long. Which should be expedited by 1995. The sulllage that may be generated by 2001 AD is 65 mld on the basis of the most probable quantum of water supply.

FARIDABAD COMPLEX: The town complex has a separaste sewerage and storm water drainage system in operation. The total flow of the sewage in the complex is about 22 mld. However only about 50% of the population has access to the sewerage system. 18 mld of sewage is being treated through oxidation pond within the Complex . Though only 20% of the sewage is let off into the river course, the pollutant load being obnoxious and toxic makes the river water dangerous for any use. In Ballabgarh zone, the sewage is being let into the Agra Canal rendering it harmful at the down-stream. The efforts by HUDA to construct a sewage treatment plant in Faridabad may succeed before long. The FCA and HUDA are together examining the possibility of going for a second treatment plant. The PHED and HUDA have also prepared proposals to set up Sulabh Sauchalayas in the squatter settlements.

The entire sewerage system should be designed to cope with 2001 AD need of sewage generation in the three parts of the complex as well as areas developed by HUDA. Low cost sanitation measures should be extended in the slum and squatter settlements as a short term measure.

GURGAON: Combined sewerage sytstem exists in part of the city. Nearly 5 lakh litres of sewage is generated every day and 60% population is covered by the proper sewerage system over 2 sq km area. Three sanitary latrines covering a population of 200 and, 1000 septic tanks for 5000 population are provided at present. The treatment plant at Dhanwapur for 70 mld is not properly functioning, One exidation pond is under construction. The sewage is disposed of on land without treatment.

Source of water supply being meagre, it may not be possiable to improve the water carrying sewerage system as it needs enough liquid to dilute and carry the sewage. Low cost sanitation measures, including Sulabh

The overall picture that emerges for 2001 AD is as under:-

Name of the Town	Assigned population by 2001 AD in lakhs	Likely generation of sewage in MLD in 2001 AD	Present capacity of treatment in MLD	Likely Capacity of treatment by 2001 AD for which proposals are in hand
Delhi Urban	110	3168	1270	2270
Ghaziabad-Loni	11	317	Nil	50
NOIDA	5.5	158	10	20
Gurgaon	7	201	Nil	70
Faridabad-Ballabgarh	10	288	18	40
Bahadurgarh	2	58	Nil	Nil
Kundli	1.5	43	Nil	Nil
Total	147	4223	1298	2450

On the basis of likely realistic situation in respect of water supply, the sewage that might be generated (at 80% of the likely water supply) is of the order of 4223 mld. Except in Delhi, there is hardly any effective treatment arrangement in other DMA towns. In NOIDA, on the basis of a second oxidation pond being under construction, the treatment capacity may go upto 20 mld by 2001 AD. In Gurgaon, the 70 mld capacity treatment plant lying non-functional may become functional by 2001 AD. If the second treatment plant under contemplation by HUDA and FCA comes through, the treatment capacity may go up to about 40 mld in Faridabad Complex. Except large portions of Delhi sewage that may be treated,in all the other DMA towns, the position of sewage treatment will remain unsatisfactory even by the turn of the Century.

sauchalayas and septic tanks, may have to be adopted and extended to improve the sanitation system.

BAHADURGARH : Only 60% of the population has access to sewer system. About 2.87 mld of sewage is generated and used for irrigation purposes, without treatment. At present there is no treatment plant in the town. Treatment plant requires to be constructed to treat the sewage before disposing it of on land. Temporarily, low cost sanitation measures could be thought of.

KUNDLI : Np sewer system exists in the town. The sewage joins the Drains number 8 and 6 without being treated.

Till such time a proper treatment plant with adequate capacity is constructed, low cost sanitation measures should be adopted to improve and provide a healthy environment.

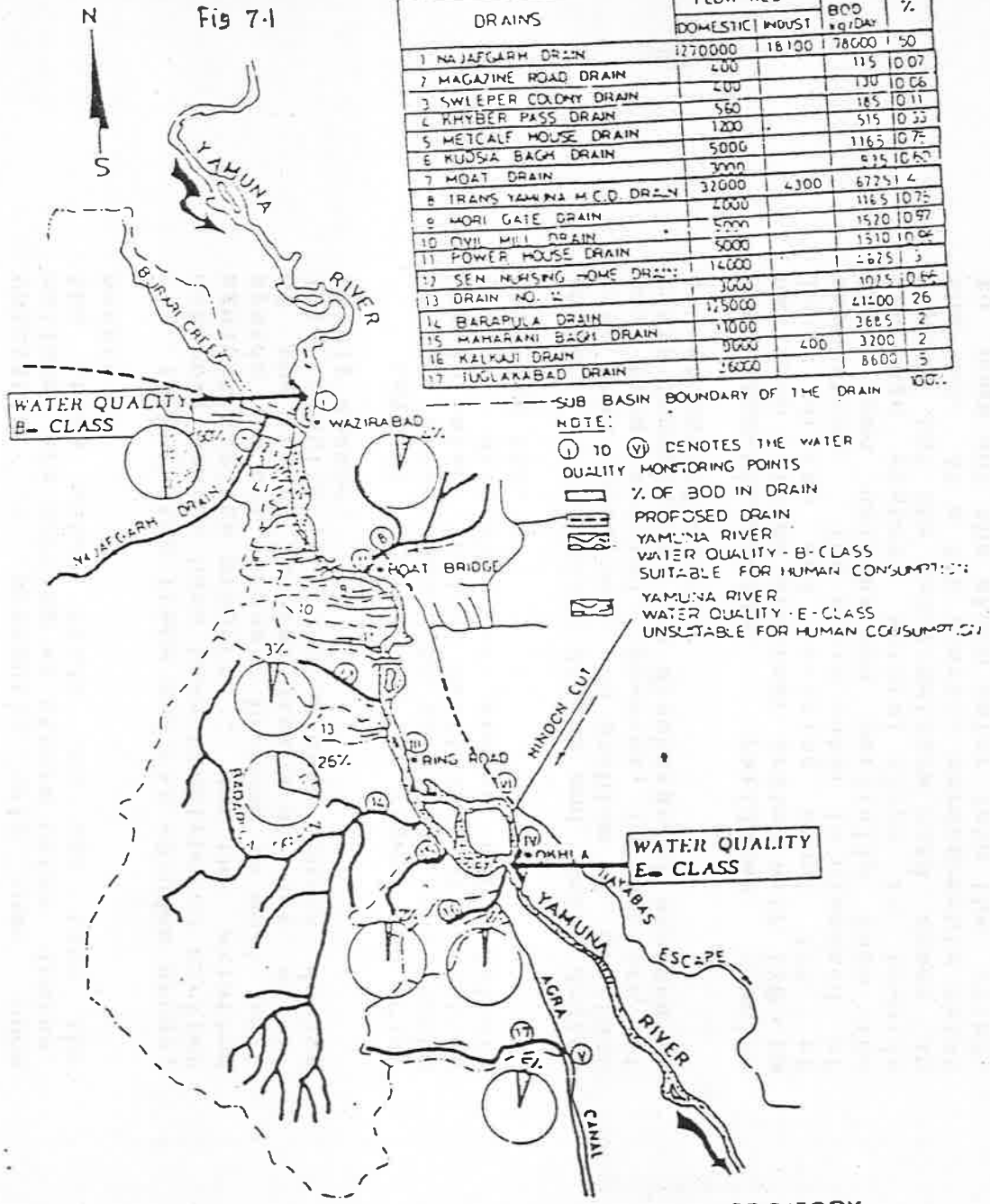
7.3 STROM WATER DRAINAGE

Drainage has tow components - storm water discharge and flood protection. Delhi Metropolitan Area is drained by the rivers Yamuna and Hindon, and a number of drains such as Najafgarh, Nangloi, KS Nagar, Mangolpur drain, and in Delhi UT west Juan drain, Padamda drain and Gandhi drain which join together, and flow through Bahadurgarh to meet the Nagafgarh drain in the south Badarpur drain originates from Delhi ridge and flows north-eastward touching the northern part of Faridabad to meet the Yamuna. Dasna drain runs through Ghaziabad and joins the river Hindon at a place south of Ghaziabad. (Fig.7.1)

DELHI: Flood protection and storm water discharge in Delhi are not local but have regional bearing covering areas in Haryana and Rajasthan. Najafgarh drain and Barapula Sushak drains draining the urban area of Delhi run to their capacity in monsoon months. The flood affected catchment area of the Najafgarh drain is over 2630 sq km and that of the Yamuna drainage zone is 3276 sq km in Delhi UT.

The drainage channels in Delhi are not sufficient to carry heavy storms. Flood waters entering the Territory from the

Fig 7.1



DRAINS	FLOW KLD		TOTAL BOD kg/DAY	%
	DOMESTIC	INDUST		
1 NAJAFGARH DRAIN	1270000	18100	78000	50
2 MAGAZINE ROAD DRAIN	400		115	0.07
3 SWEEPER COLONY DRAIN	200		130	0.08
4 KHYBER PASS DRAIN	560		185	0.11
5 METCALF HOUSE DRAIN	1200		515	0.33
6 KUDSIA BAGH DRAIN	5000		1165	0.75
7 MOAT DRAIN	3000		935	0.60
8 TRANS YAMUNA M.C.D. DRAIN	32000	4300	67251.4	
9 MORI GATE DRAIN	2000		1165	0.75
10 CIVIL LINE DRAIN	5000		1520	0.97
11 POWER HOUSE DRAIN	5000		1510	0.96
12 SEN NURSING HOME DRAIN	14000		4625	3
13 DRAIN NO. 12	3000		1025	0.65
14 BARAPULA DRAIN	1250000		41200	26
15 MAHARANI BAGH DRAIN	11000		3685	2
16 KALKAJI DRAIN	9000	400	3200	2
17 TUGLAKABAD DRAIN	26000		8600	5
				100%

DRAINS IN DELHI UNION TERRITORY

Haryana side could be managed through construction of drains, namely, Najafgarh drain, and new supplementary drain to the Najafgarh drain. Possibility of a new major drain in the south through Haryana or Delhi to carry the discharge from Sahibi basin needs examination. The drainage system should be planned with adjoining states and implemented in an integrated manner which would require detailled studies.

GHAZIABAD : presently only some open nallahs are serving as strorm water drains, the storm water finds its way into the sewers.

In both the Trans and Cis -Hindon areas, external drains have been constructed earlier against various projects . But the existing system is not adeauate because in most part of the town, lateral drains do not exist. This results in flooding many parts during rainly season.

Lateral drains in the Trans and Cis-Hindon areas should be provided. the works should also include desilting of existing drains, diversion of drains and culvert crossing etc.

NOIDA : Roadside drains and main drains have been completed. No problem of drainage has been reported. However, in sectors of plain topography, the discharge of stormwater is not satisfactory.

FARIDABAD-BALLABGARH: Faridabad complex has open sufrace drainage system with 126 km long drains and covering about 45% of population. The storm water is disposed of into open nallahs and partially into the sewerage system. Natural slope is towards Yamuna but the Delhi-Mathura road comes in the way. At a few places, arrangements exist to pump out the storm water into the river. This warrants a detailed study to design an efficient drainage system for the Complex.

GURGAON: About 480 ha of town area is covered under drainage scheme. It covers 40% of total population. Drainage is combined with sewerage system in the old town area, and for new developments, HUDA has separate system. Presently, no serious drainage problem exists in the city.

Though drainage is not a serious problem in the city, measures to avoid storm water pools and stagnations have to be initiated to avoid health hazard.

BAHADURGARH : The town has open surface drains covering about 80% of area and population. Water from drains is pumped into open fields. Bahadurgarh is said to be flood-prone, as topography of the town is saucer shaped.

In north-eastern part of Bahadurgarh areas along the railway line and in west of MIE parts I and II along Mangeshpur drain are water logged.

Effective drainage system need to be designed and provided to avoid stagnation of storm water in the city area.

KUNDLI : The drainage of the entire area is through drain No. 8 traversing the town. Part of Kundli area drains into Delhi UT and Haryana to work out an integrated plan for a permanent solution to avoid drainage problem in Kundli and also in Delhi UT.

7.4 SOLIDWASTE DISPOSAL

DELHI: The city's solidwaste is dumped into the sanitary landfills and also in depressions. Presently, there are tow mechanised compost plants (MCD) one each run by MCD and the NDMC locatged near Okhla Sewage Treatment Plant. Nearly 0.65 kg of garbage is produced by each person in Delhi, and nearly two-thirds of the waste is being managed properly.

GHAZIABAD: The per capita generation of garbage is on an average 275 gm a day of which only 200 gm is managed. Around 30-35 tonnes of solid waste is not being properly disposed of. It is being dumped in open grounds causing serious environmental problems in the city.

NOIDA: Nearly 36 tones of solid waste is produced a day at 275 gm lper capita a day. The garbage is dumped in select sites outside the city's built up areas.

FARIDABAD-BALLABGARH: The complex produces fairly big quantity of garbage at 290 gm per capita of which over 260 gm is manged. Disposal is through landfilling.

GURGAON: About 180 gm of garbage is produced a day per capita of which 140 gm is manged. The waste is dumped in open grounds.

BAHADURGARH: The town generates garbage at 270 gm a day per capita of which about 150 gm is properly disposed of. the disposal is through dumping on the open ground at the outskirt of the town.

Except part of the solidwaste in Delhi, in other DMA towns, the solidwaste is not properly managed. Disposal of wastes of hospitals, slaughter houses, fruits and vegetable markets, dairy forms require special care to be exercised.

An indication of the magnitude of arrangement required to manage the garbage by 2001 in each of the DMA towns may be had from theh following estimates for assigned population:

in Tonnes

DMA Town	Managed in 1990 per day	Generation by 2001 AD per day	Per Capita of garbage in kg a day
Delhi	2700	7300	0.650
Ghaziabad-Loni	80	300	0.275
NOIDA	40	150	0.275
Faridabad Com.	100	290	0.290
Gurgaon	25	125	0.140
Bahadurgarh	7	55	0.270
Kundli	-	40	0.270

Recycling of garbage, scientific management of solidwastes in the form of sanitary landfill, composting and incineration should be adopted. Production of gas from landfills, generation of electricty and compost manure besides recycled materials could be useful and economic methods in the management of garbage.

7.5 EDUCATION AND MEDICARE:

The general level of availability of education and medical facilities in the DMA towns is, by and large, satisfactory to meet the requirements of the local population. (Tables 7.3. and 7.4). However, none of these towns has medical or engineering colleges.

The Regional Plan-2001 NCR, in view of the need to enable population to reside in the DMA towns and reduce their dependence on the Capital, has proposed provision of higher order educational and medical facilities in the DMA towns based on an assessment of the regional needs rather than that of the individual towns. In the light of the same, location of an University in Ghaziabad and an other in either Gurgaon or Faridabad need consideration. Establishment of engineering and medical colleges in the DMA towns also merit consideration. The implementation of these proposals will automatically reduce pressure on similar institutions in Delhi.

Table 7.3 : Educational Facilities in DMA Towns

Town	COLLEGES				SCHOOLS			
	Art, Science, Commerce College	Medical	Engineering	Polytecnic	Others	Higher Secondary/ Inter	Secondary/ Matric	Junior Secondary Middle	Primary
Delhi UT	52	14			13	981		379	1797
Ghaziabad-Loni	4	-	-	-	1	16	17	37	76
NOIDA	1	-	-	-	-	-	-	-	-
Faridabad-Ballabgarh Complex	3	-	-	1	3	12	18	31	62
Gurgaon	2	-	-	-	4	4	11	16	21
Bahadurgarh	2	-	-	-	1	4	5	5	9
Kundli	-	-	-	-	-	-	1	1	3

Note : In addition Delhi UT has five Universities and institutions deemed as Universities.

Table 7.4 : Medical Facilities in DMA Towns

Town	Hospitals	Dispensaries	Health Centres	Primary Health Centres	T B Clinic	Family Planning Centres	Nursing Homes	Others	No. of Beds
Delhi UT	49	609	107	8	10	183	NA	-	NA
Ghaziabad & Loni	4	6	1	-	6	-	1	1	357
NOIDA	2	-	-	-	-	-	1	-	300
Faridabad-Ballabgarh	3	16	-	-	-	1	-	-	432
Gurgaon	3	3	1	-	1	1	-	1	164
Bahadurgarh	1	3	-	-	-	1	-	-	30
Kundli	-	1	-	-	-	-	-	-	8

7.6. POWER

i) PRESENT POWER REQUIREMENT AND SUPPLY

Power is a pre-requisite for any development and rather it is the barometer of the level of development. The NCR Stte es are experiencing shortage of power year after year, and unless the problem of power scarcity is reasonably solved and power is supplied uninterruptedly as the Regional Plan for NCR envisaged, the development process would be seriously hampered.

a) DELHI :

Delhi Electric Supply Undertaking, a stautory body have to meet the power requirements of all developments and industrial growth in the entire Union Territory of Delhi. The DDA which is the main agency for development of land in Delhi is accelerating construction activities and its development programmes are in areas south of Hindon Cut, Papankalan, Madan Pur Khaddar, North of Wazirabad Road, Mehrauli, Kigsway Camp, Rohini, Narela etc.

The maximum demand for power in Delhi was 1435 MW in January 1991. The Thirteenth Power Survey Committee of the Central Electricity Authority has projected the demand to 2389 MW by the end of the 8th Five Year Plan. Apart from the DESU's Stations at Rajghat and Indraprastha, Badarpur Thermal Power Station, Barasuil Hydel Station, Signrauli Super Power Station, and the Northern Regional Grid supply power to Delhi. In order to meet the growing demand, DESU has set up Gas Turbines for 180 MW and has established 135 MW Thermal Power Replacement at Raj Ghat Power House. The Gas Turbines have now been modified for adoption of natural Gas.

Drawal of power from the Northern Grid results in low voltage forcing sometimes load shedding to maintain the voltage. The Central Electricity Authority has framed project feasibility report for installation of 600 MW Gas Turbine with provision for

Extension to 900 MW at Bawana by 1994-95. The 400 KV Ring taken up by DESU will improve the power supply position in Delhi during 1990-95 according to DESU. The 400 KV Ring around Delhi would enable DESU to draw its share of power from the Centrally sponsored Generating Stations. DESU proposes for a target of 1260 MVA by 1990-95. In order to cater to the power requirements of the areas being developed by DDA and other agencies in the Trans-Yamuna Area, Sarita Vihar, Papankalan, Rohini, Vasant Kunj, etc. DESU is establishing 220 KV Substations near the load centres at Rohini, Shalimar Bagh, Vasant Kunj, Sarita Vihar, Wazirabad alongwith associated Transmission and Distribution System.

b) OTHER DMA TOWNS :

According to the Thirteenth Power Survey, the shortage at the end of 1994-95 in Haryana would be of the order of 40% and in Uttar Pradesh 25%. The demand for power by 2000 A.D. will be enormous being almost double the present load. It is reported that a large number of industrial plots in the DMA towns are lying vacant for want of adequate power and voltage stability.

ii) POWER DEVELOPMENT STRATEGY

The NCR Plan envisages that power being the pre-requisite for any development, it should be made adequately available at all points of consumption in NCR in order to achieve the objectives of induced development of the Regional Centres to ultimately have the balanced dvelopment of the Region. The Ministry of Energy is of the opinion that the additional power demand in NCR during 1990-95 could be met from the Central reserves of the central stations located in and around NCR if necessary supplemented by a captive plant.

iii) PROBLEMS OF DISTRIBUTION

In Faridabad, 800 MW Gas Station, and another 800 MW Gas Station at Bawana, 840 MW Gas Station at Dadri with a possible extension by 400 MW are expected to be taken up during 1990-95. Possibility of privatisation in power generation should be

explored as in the case of Faridabad where Industrialist's Association is proposing a joint project for power generation. The Department of Power is of the strong opinion that while the additional power for NCR might be found from the Central Stations, the transmission and distribution system including sub-systems will have to be strengthened to improve the quality and stability of power supply. At the instance of the Department of Power, the Central Electricity Authority has undertaken an exercise to identify the gaps and weaknesses in the subsystems and plan for strengthening and extending the transmission and distribution systems. the Transmission and distribution requirements at the nodal growth centres - Priority and DMA towns including the load demands have already been tentatively arrived at and that would be finalised by the end of December 1991. Since power is the State subject, the respective State Electricity Boards have to take appropriate action in this respect.

iv) POWER FORECAST

The Central Electricity Authority is in the process of forecess of forecasting the load requirements of NCR which would be completed by March 1991. The power demand for the Delhi Metropolitan Area will be more precisely known then. The load forecast,the Central Stations that would spare power and/or need for a captive Plant, and the sharing formala being attempted by CEA would become available by mid 1991, and that would be suitably incorporated in the functional Plan for DMA subsequently.

8

LANDUSE

Land is a vital but limited and non-renewable resource. The phenomenal increase in population in and around Delhi, and, development of industrial and other activities on the traffic arteries radiating from Delhi exert tremendous pressure on land resulting in its premature and speculative sub-division for various uses in the Delhi Metropolitan Area. The prime agricultural land in this process is being engulfed by unintended urban growth. This necessitates to adopt rational measures to use the land optimally and adopt conservation measures in areas sensitive to undesirable development.

8.1 LANDUSE SCENARIO

i) Present status of Master Plans :

The present status of preparation of the Master Plans for DMA towns indicates that Master Plans for Ghaziabad-Loni, NOIDA and Faridabad are approved, while Draft Master Plans for Gurgaon and Kundli are under consideration by the Government of Haryana, Bahadurgarh Master Plan is under revision. (Table 8.1)

Table 8.1 STATUS OF MASTER PLANS OF DMA TOWNS

Sl.No.	Towns	Perspective Year	Master Plan Population (in lakhs)	Population as assigned by NCR Plan 2001 (lakhs)	Status	Remarks
1.	Delhi	2001	128.00	112.00	Approved	Pop. assignment higher than the Regional Plan assignment.
2.	Ghaziabad-Loni	2001	11.00	11.00	Approved	
3.	NOIDA	2001	5.50	5.50	Approved	
4.	Faridabad-Ballabgarh	2001	10.00	10.00	Approved	
5.	Gurgaon	2016	15.00	7.00	Draft Master Plan prepared.	
6.	Bahadurgarh	1991	1.00	2.00	Revision in Progress.	
7.	Kundli	2001	1.50	1.50	Draft Master Plan prepared.	

ii) Landuse Pattern :

Though, all the DMA towns are predominantly residential in nature, some of them have secondary sector activities as the major economic activity. (Table 8.2)

Table 8.2 : LAND USE PATTERN

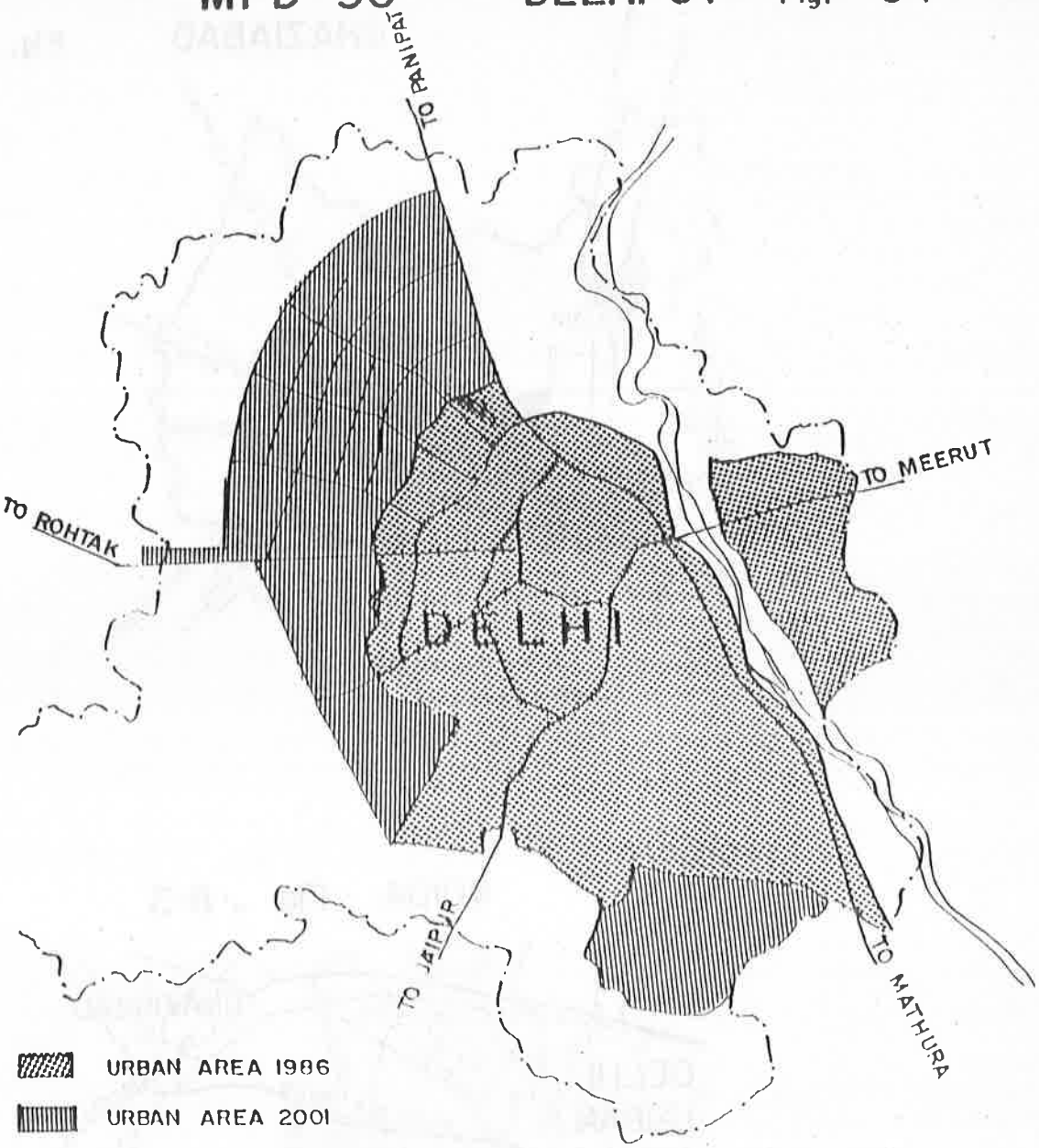
AREA IN HECTARE

Sl. No.	Town (Year)	Residential	Industrial	Commercial	Institutional	Parks & Open spaces	Transport & Communication	Others	Total Area/ Master Plan area
1.	Delhi	N O T A V A I L A B L E							
2.	Ghaziabad	3160.33	1949.63	48.55	132.62	642.50	647.58	-	6576.67
	(1982)	(48.05)	(29.56)	(0.73)	(2.01)	(9.81)	(9.84)		(100.00)
3.	Loni	455.72	46.75	0.60	2.50	45.00	47.06	-	597.63
	(1984)	(76.25)	(7.82)	(0.10)	(.04)	(7.53)	(7.88)		(100.00)
4.	NOIDA	960.50	668.34	52.00	30.86	54.00	300.00	74.14	2139.84
	(1989)	(44.89)	(31.23)	(2.43)	(1.45)	(2.52)	(14.02)	(3.46)	(100.00)
5.	Faridabad††	2261.53	904.00	71.35	N.A.	N.A.	N.A.	5870.39	9107.27‡
	(1990)	(24.83)	(9.93)	(0.78)				(64.46)	(100.00)
6.	Gurgaon††	1868.85	366.94	27.99	N.A.	N.A.	N.A.	7108.22	9372.00‡
	(1990)	(19.94)	(3.92)	(0.30)				(75.84)	(100.00)
7.	Bahadurgarh	206.48	205.87	N.A.	N.A.	N.A.	N.A.	982.47	1394.82‡
	(1990)	(14.80)	(14.76)					(70.44)	(100.00)
8.	Kundli	-	43.50	-	-	-	-	-	1400.00‡
	(1990)		(3.10)						(100.00)

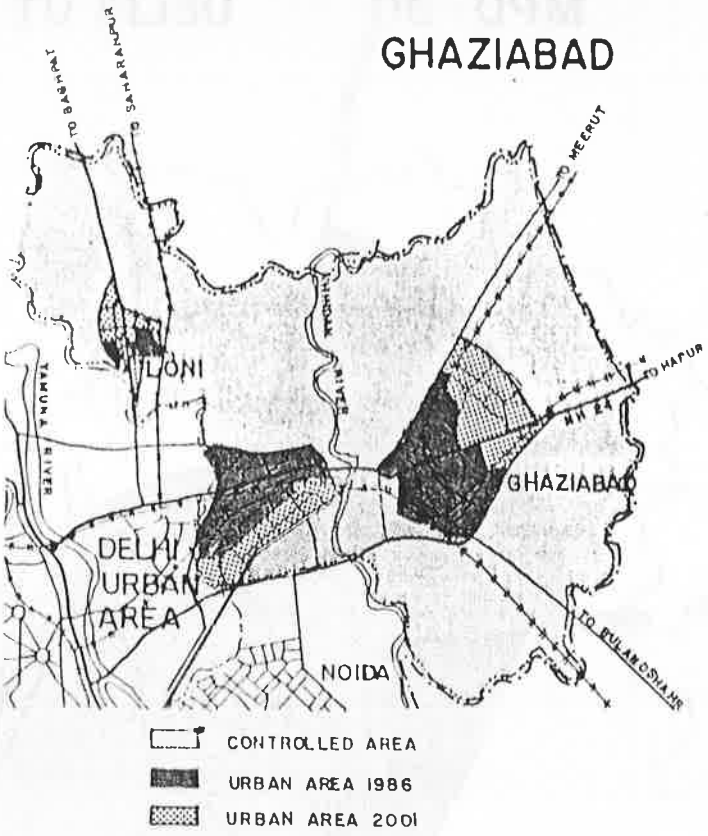
Note : ‡ Total Master Plan area
†† Does not include old city area

Landuse plans of the DMA towns indicating controlled area, urban area 1986 and urban area 2001 along with broad distribution of uses are as in figures 8.1 to 8.7.

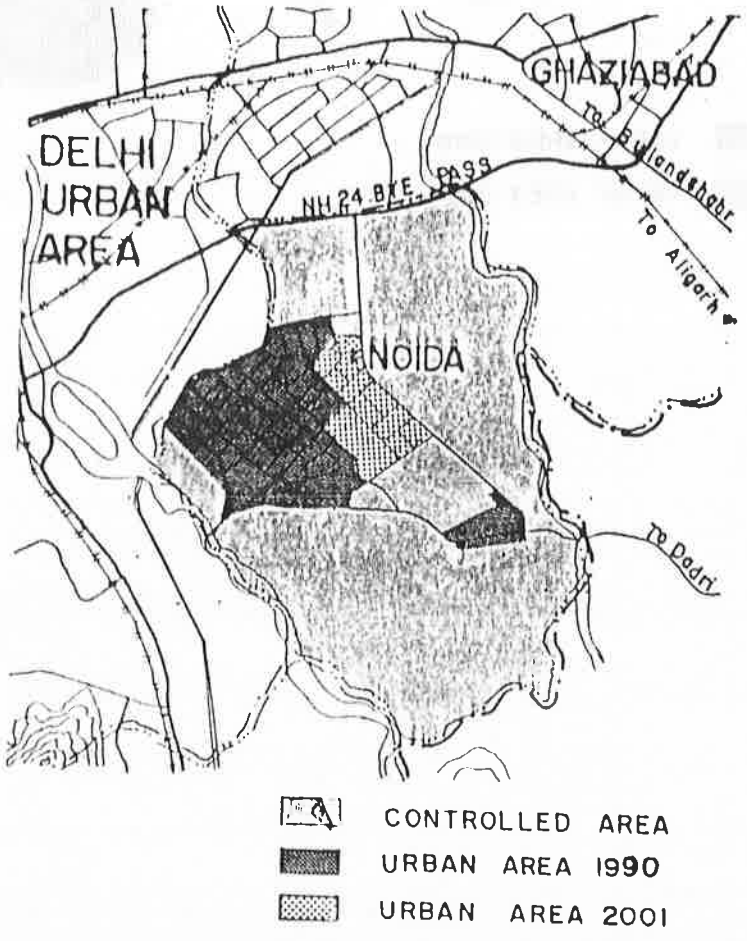
MPD-90 DELHI UT Fig. 8.1



GHAZIABAD Fig. 8.2

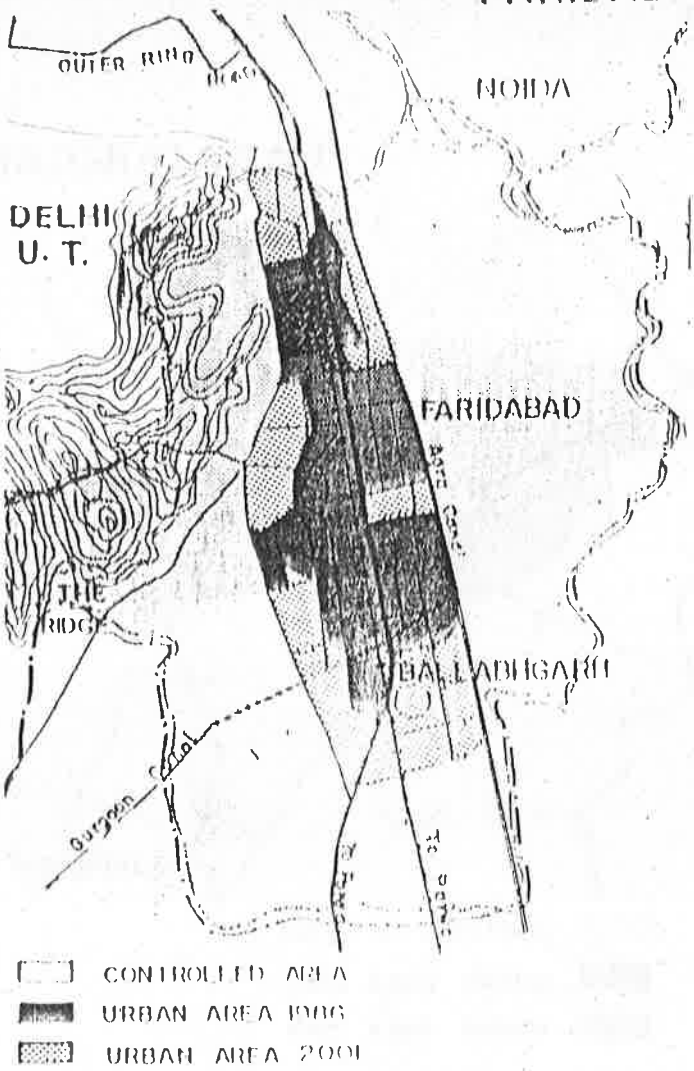


NOIDA Fig. 8.3



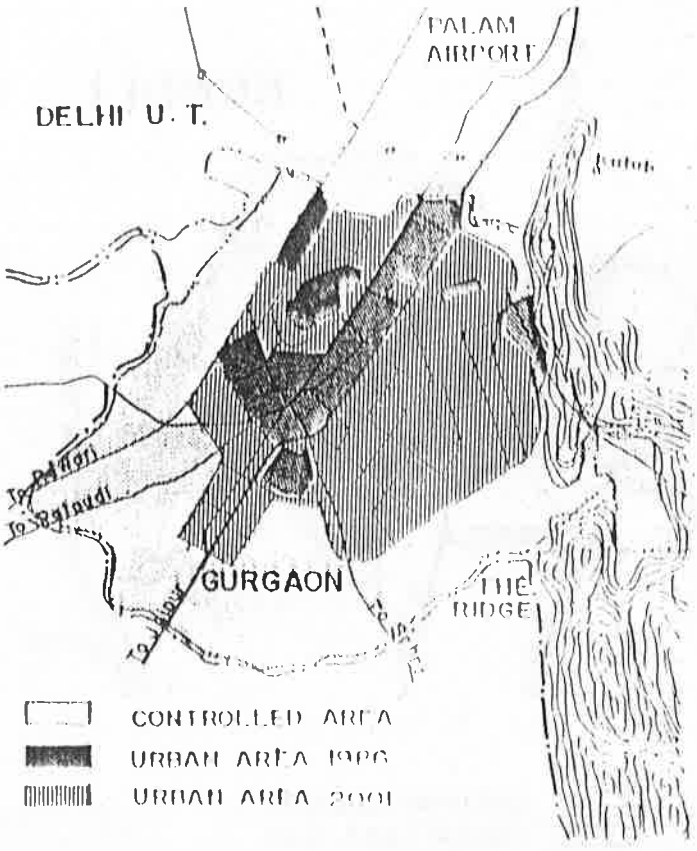
FARIDABAD

Fig. 8.4



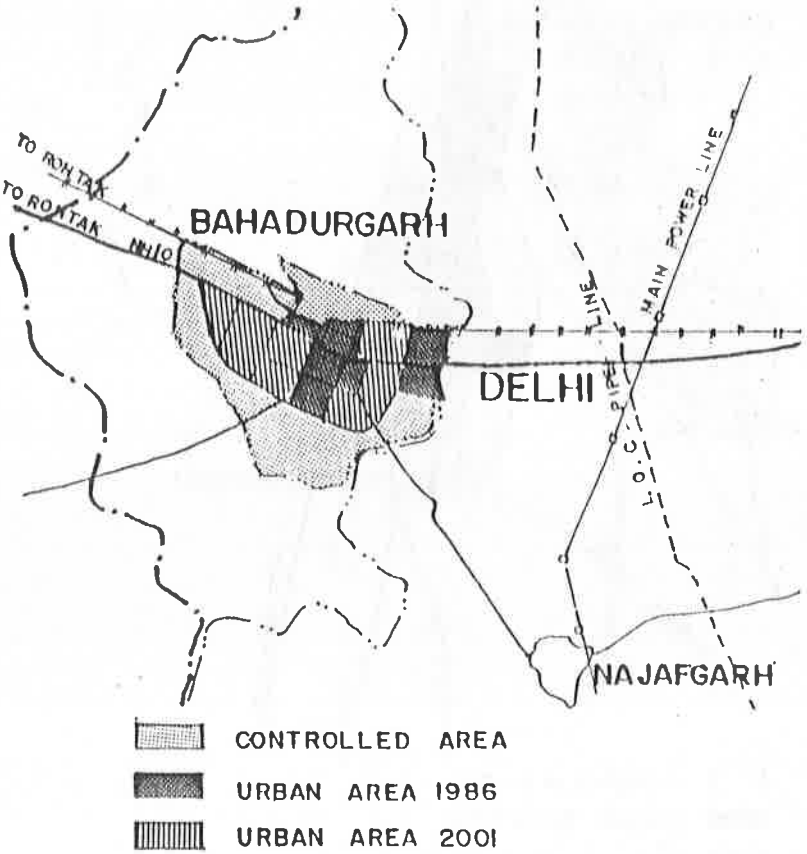
GURGAON

Fig. 8.5



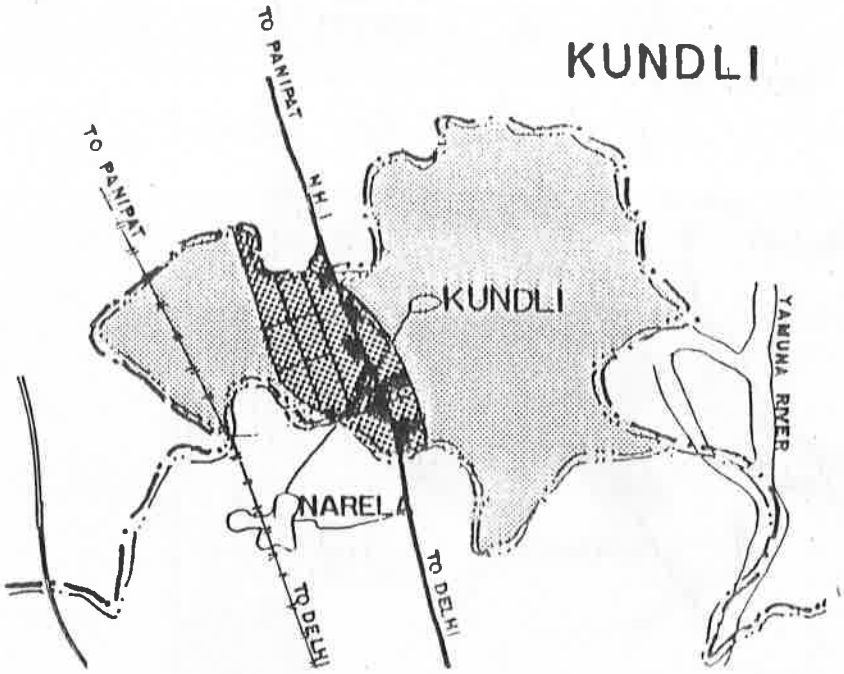
BAHADURGARH

Fig. 8.6



KUNDLI

Fig. 8.7



8.2 LANDUSE POLICIES FOR DMA

Landuse proposals of DMA should be within the framework of the Regional Plan Policies. The Plan broadly suggests the following density norms for the DMA towns:

a) Urban Centres of 1.0 lakh to 5.0 lakh population, a density of 110 persons/ha.

b) Urban Centres more than 5.0 lakh population, a density of 125 persons/ha.

The other landuse policies enunciated in the Regional Plan which have a direct relevance to DMA towns are :

i) All barren lands, rocky areas and culturable waste lands should be afforested/planted.

ii) Urban extensions would have to be largely met from the agriculture land and other non-urban uses. It is necessary to institute measures for the protection of prime agricultural land and to ensure against its needless conversion.

iii) Special attention should be given to check the damage to natural features like the ridge and the River Yamuna.

iv) To avoid haphazard development and ensure orderly development of the rapidly developing urban areas, preparation of Zoning Regulations has been suggested. The landuse zones and suggested major economic activities are as under:

a) Urbanisable area

i) Residential
ii) Commercial
iii) Industrial
iv) Government Offices
v) Recreational
vi) Public and Semi-Public
vii) Circulation
viii) Open spaces, Parks, Playground
ix) Grave yards/Cemeteries/burning Ghats.

b) Green belt/green wedge

i) Agriculture
ii) Gardening
iii) Dairying
iv) Social Forestry/Plantation
v) Quarrying
vi) Cemetries
vii) Social Institutions, School, Hospitals
viii) Recreation.

c) Green buffer along the major Transport Corridors - a width of 100 metres on either sides along the National Highways and, a width of 60 metres on either sides along the State Highways. These areas should be afforested under the control of Forests Department.

8.3 LANDUSE PROPOSALS

i) Density norms and Land Requirements:

In view of the scarcity of the non-renewable land resource in general, and the need to evolve compact urban forms enabling provision of cost effective essential service network, the density norms suggested for the DMA towns in the Regional Plan should be followed. At present Master Plans of all the DMA towns except NOIDA need marginal adjustments in their density standards and this could be achieved by suitably stipulating the density of the newer areas. (Table 8.3)

Table 8.3 : DENSITY NORMS FOR DMA TOWNS

Town	Assigned Population -NCR Plan	Density in Regional Plan-2001 NCR	Master Plan	Land Requirement -Regional Plan-2001 (Ha.)
1.Delhi UT	112.00	177	177	63277
2.Ghaziabad Loni	11.00	125	111	8800
3.NOIDA	5.50	125	124	4400
4.Faridabad	10.00	125	110	8000
5.Gurgaon	7.00	125	144	5600
6.Bahadurgarh	2.00	110	63	1818
7.Kundli	1.50	110	107	1363

The pace of development undertaken by the Development Authorities in the DMA towns has been tremendous in the recent years.

DELHI UT: The total area of Delhi UT is 148300 ha. Out of this 44,777 ha. had been earlier inoluded in urbanisable limits presoribed in Plan. This area as per 1981 oensus aooommodated about 54.5 lakh urban population and had a gross density of 122 persons per ha.

The Regional Plan - 2001 for NCR, has assigned a population of 112 lakhs for the Delhi UT with 110 lakhs for urban Delhi. Delhi Master Plan - 2001 reoommendd a most probable population of 122 lakhs for urban Delhi 2001 but advooated that through effeotive measures during the oourse of the implementation of the Plan, attempts should be made to restriot the population of Delhi U.T. at the lower level of 112 lakhs. Studies have revealed that Delhi Urban Area - 81 urbanisable limit by the year 2001 would be able to aooommodate about 82 lakhs population by judioious in-fill and selective modifioation of densities. The remaining 30 to 40 lakhs population oould be aocommodated by keeping the urban development spread within about fourteen thousand hectares only. In the light of this, during 1990-95, the programme of developing 8810 ha. of land should be soaled down to about half the level i.e. 4400 ha. In fact, the land acquisition and development programme should be phased out, and at every stage, the demand and supply position of land should be reviewed to faoilitate adopting rational and realistic approaoh in the future. This would promote substantially the urban expansions in the DMA towns and allow them to fulfil their assigned role.

The landuse proposals as provided in the Master Plans of the DMA towns are as indioatd in Table 8.4.

As per the Master Plans of the DMA Towns the urbanisable area in DMA including Delhi UT would be in the order of 92692 ha. by 2001. This aooounts for a gross density of 158 persons per ha. which is much higher than the present (1981) density of 90 persons per

Table 8.4 : LANDUSE PROPOSALS IN MASTER PLANS OF DMA TOWNS

Area in Ha.

Sl.No.	Town	Residential	Industrial	Commercial	Institutional	Parks & Open Spaces	Transport & Communi-cation	Others	Total Master Plan area.
1.	Delhi Urban (2001)	29388.00 (50.00)	3527.00q (6.00)	2351.00 (4.00)	4702.00 (8.00)	11756.00 (20.00)	7053.00 (12.00)	- -	58777 (100.00)
2.	Ghaziabad (2001)	4436.84 (49.84)	1989.00 (22.34)	345 (3.88)	461.00 (5.18)	496.56 (5.58)	1134.94 (12.75)	38.05 (.43)	8901.40 (100.00)
3.	Loni (2001)	552.00 (55.81)	21.00 (2.12)	168.00 (16.99)	68.00 (6.88)	--	180.00 (18.20)	--	989.00 (100.00)
4.	Noida (2001)	1600.00 (36.17)	989.00 (22.27)	191.00 (4.32)	720.00 (16.28)	292.00 (6.60)	435.00 (9.84)	-- 1200.00 + .52)	4423.00 (100.00)
5.	Faridabad Ballabgarh (2001)	4017.00 (44.10)	2881.62 (31.98)	341.70 (3.75)	86.23 (0.95)	1159.50 (12.73)	750.20 (8.24)	751.01 (8.25)	9107.29 (100).06)
6.	Gurgaon (2001)	3855.00 (51.38)	765.00 (10.20)	278.00 (3.70)	432.00 (5.75)	632.00 (8.40)	70.00 (1.00)	1470.00 (19.60)	7502.00
7.	Bahadurgarh (1991)	695.80 (44.00)	421.95 (30.34)	85.91 (5.66)	71.28 (4.48)	123.36 (7.77)	126.36 (7.98)	--	15.88 (100.00)
8.	Rundli (2001)	400.00 (28.58)	450.00 (32.15)	250.00 (17.85)	100.00 (7.14)	--	200.00 (14.28)	--	1400.00 (100.00)
Total (DMA)		44945.14 (48.50)	10224.60 (11.03)	4014.28 (4.33)	6640.34 (7.16)	14459.15 (15.60)	9949.55 (10.73)	2459.00 (2.65)	92962.00 (100.00)

Note: Figures in bracket indicates percentage to total Master Plan area.

... Landuse break up for Delhi Urban Area has been derived from Delhi Master Plan-2001 . Figures for Gurgaon have been derived from Draft Gurgaon Master Plan 2016 AD. Area for Gurgaon includes the old city area of 405 ha. As the development process in Bahadurgarh town is very slow, it is presumed that by 2001 the landuse requirement would be same as that in 1991 as prescribed by the Master Plan.

ha. The landuse analysis of the proposed DMA urban mass reveals that DMA would be predominently residential (48%) with adequate parks and open spaces (15%). The industrial use would account for 11% overall in the DMA. Usewise, except Kundli, the other DMA towns will have major part of their areas under residential use. All but Delhi have industries as the second largest user of land, with only Kundli as an exception where in industries are expected to spread over larger areas than other uses.

8.4 REGIONAL LEVEL LANDUSE PROPOSALS

The DMA towns as proposed would serve not only the local population but large population of their hinterlands too. The regional level activities proposed to be located in DMA towns are wholesale markets, Central Government and Public sector offices, higher level educational institutions including universities and national level research institutions, regional recreational facilities such as botonical gardens, stadia etc. Adequate provision for land needs to be consideration to the regional requirements in addition to the town requirements. The possible/ideal location for such facilities n the light of various studies undertaken by the Board and also as a result of discussions held with the respective local bodies, DevelopmentAuthorities and the State Government are as under:

DMA TOWNS	ACTIVITIES
Ghaziabad-Loni	Central Government and Public Sector Offices, Wholesale Market for Iron & Steel, Hardware and Building Materials, Institutions of higher learning, University, Exhibition ground, Stadium, Regional recreational area such as the lake (near Loni), Modern Super Markets.
NOIDA	Central Government and Public Sector Offices, Higher level educational institutions, botonical garden, Marketing yard, low density institutional areas of National importance which may reqire more than 20 ha. on the outer periphery (Greater NOIDA).

Faridabad-Ballabhgarh	Central Government and Public Sector Offices, Wholesale Market for Iron & Steel and auto-parts, University, regional recreational area, Modern Super Market.
Gurgaon	Central Government & Public Sector Offices, Wholesale Market for Iron & Steel, Marketing yard, Institutions of higher learning and research, Modern Super Market.
Bahadurgarh	Central Government & Public Sector Offices, Higher level research institutions.
Kundli	Wholesale Market for Fruits and Vegetables and Foodgrains.

9

ENVIRONMENT AND ECOLOGY

The Delhi Metropolitan Area and its vicinity are endowed with numerous natural features. The major ones are the Ridge, extension of Aravalli Range in Alwar (Rajasthan) and the river Yamuna. The hill forests of Alwar and Behror have been classified as reserved and protected forests. The Sariska Wild Life Sanctuary covering an area of 492 sq km is located in the dense forests of Alwar tehsil. The Aravallis also accommodate a thick forest cover in Gurgaon district and the Sultanpur Bird Sanctuary over an area of 117 ha. is located near Gurgaon. The prominent lakes in the Region are the Silisarh, Kaduki, Badkal and Surajkund. Besides Yamuna, the other important rivers are Hindon, Kali and Sahibi. With the unabated encroachment, these natural features are under constant threat of environmental devastation.

9.1 ENVIRONMENAL STATUS IN THE DMA

a. DELHI U.T.

The green image of the national capital is under severe strain and in some of its areas the image seems to be lost. The World Health Organisation (WHO) has placed Delhi among the highly polluted cities of the world. Delhi records 12 times the national average for respiratory ailments which result from air pollution. The motor vehicles and the industrial units remain the major pollutants in the city.

Motor vehicles: Fifty per cent of the air pollution in Delhi results from vehicle emission. A study by the Indian Institute of Technology, Delhi, at the behest of the Delhi Administration (Impact of Surface Transport on Air environment of Delhi, 1987) found that only 18% of the DTC buses and 10% of the trucks that ply on the Delhi roads have the standard smoke intensity of 65% on Hartridge scale. Nearly, 41% of the DTC buses and 50% of the trucks and, all Tempos monitored by

Table 9.1 : ENERGY PATTERN AND POLLUTION LOAD IN THE INDUSTRIAL AREAS of DELHI

Area	Fuel type	Fuel Consumption T/M	Emission of Pollutants (T/M)				
			Particulate	SO_2	CO	HCS	NO_2
Okhla Industrial Area - Phase I							
	Coal Furnace	215.6	2.156	1.638	9.702	2.156	0.323
	Oil	51.0	0.045	0.346	0.378	0.007	0.328
	LDO	10.0	0.003	0.041	0.007	0.001	0.027
	Wood	6.2	0.031	0.005	0.094	0.113	0.375
	TOTAL		2.235	2.030	9.841	2.277	0.716
- Phase II							
	Coal Furnace	245.5	2.455	1.866	11.048	2.455	0.368
	Oil	12.0	0.011	0.082	0.009	0.002	0.090
	LDO	20.9	0.006	0.085	0.016	0.003	0.057
	Wood	2.5	0.013	0.002	0.038	0.045	0.015
	TOTAL		2.434	2.034	11.109	2.505	0.530
- Phase III							
	Coal Furnace	4.0	0.004	0.030	0.180	0.040	0.006
	Oil	18.0	0.016	0.122	0.013	0.003	0.135
	TOTAL		0.056	0.153	0.193	0.043	0.141
Shahdara Industrial Area							
Jhilmil Tahirpur Industrial areas	Coal Furnace	422.1	4.221	3.200	18.995	4.221	0.633
	Oil	974.0	0.865	6.618	0.722	0.138	0.731
	Wood	4.0	0.020	0.003	0.060	0.072	0.024
	TOTAL		5.106	9.821	19.776	4.431	1.388
Friends Colony	Coal Furnace	732.0	7.320	5.563	32.940	7.320	1.098
	Oil	134.5	0.119	0.914	0.100	0.019	1.009
	Wood	89.5	0.447	0.067	1.342	1.611	0.537
	TOTAL		7.887	6.544	34.382	8.950	2.644
Loni Road, Motiram, GT Road	Coal Furnace	561.0	5.610	4.264	25.245	5.610	0.841
	Oil	626.5	0.557	4.256	0.464	0.088	4.700
	TOTAL		6.166	8.520	25.709	5.698	5.540
Najafgarh Road			794.500	75.300			
Lawrance Road			1402.000	20.400			
Wazirpur			254.100	182.000			
Kirti Nagar			66.100	300.000			
DLF			55.700	2.100			
Moti Nagar			33.400	1.100			

Source : Dry Inventory and Estimation of Pollution Load in Okhla and Shahdara Industrial Area, Central Pollution Control Board, 1983

the Indian Institute of Technology had a smoke intensity average of 90%.

Industries : The smoke emitted by the Indraprastha, Rajghat and Bardarpur thermal power plants have been identified as a major source of pollution in the Capital. These power plants in Delhi account for as much as 82% of the total industrial pollution in Delhi. Though the Electrostatic precipitators (ESP) to trap the fly-ash are fitted in these power plants, the Kalpavish Environmental Action Group has found that these ESPs are working at less efficiencies than intended. Of the 15,000 polluting industries nearly 5000 industrial units including hazardous units such as chemicals, electro and nickel plating and plastics are in the non-conforming areas. Each 500 tonnes Crusher throws 3 tonnes of suspended particulate matter daily and, the dust concentration around them varies from 3000 to 8000 micro grains per cubicmetre of air. This is 15 to 40 times the limit prescribed by the Central Pollution Control Board. A project entitled 'Dry Inventory and Estimation of Pollution load in Okhla and Shahdara Industrial Areas' which involved an inventory Survey on industrial pollution was conducted by the Central Pollution Control Board in select industrial areas in Delhi in 1983. The study areas were Okhla Industrial Area (Phase I, II, & III), Jhilmil Tahirpur Area, Friends colony and Loni road-Moti Katra-G T Road. The fuel type, consumption rate and emission of pollutants in the study areas are indicated in the Table. 9.1. The study has identified 54 industries as highly polluting in Okhla Industrial area, 67 in Shahdara Industrial Area, 26 in Jhilmil Tahirpur Industrial area, 30 in Friends colony Industrial area and 11 in Loni Road-Moti Katra- G T Road Industrial Area.

Water Pollution: The river Yamuna has a high level of water pollution. About 1200 million litres of domestic and industrial wastes containing about 100 tonnes of BOD is let into the Yamuna every day from Delhi alone. Nineteen major storm watar drains meet the river in Delhi of which five namely Najafgarh, Civil mill, Power House, Sen Nursing Home and one from Okhla Sewage Plant contribute more than 95% of the Yamuna's total BOD load. The thermal plants discharge

waste oils and chemicals and some of the industries discharge dangerous pollutants into the river.

Ridge Area degradation: According to a study conducted by the School of Planning and Architecture (SPA). New Delhi, in 1989 about 40% of the Ridge has been lost having been encroached upon for construction activities. A number of schools, CRPF camps, Govt. Buildings, Religious Institutions have come up on the ridge area violating the Delhi Master Plan statutory provision of preservation of the ridge as natural forests. More recently, the construction of Transmission Towers on the ridge near Delhi University is another attempt to destroy the only natural environment, of that scale available to Delhi. In fact, as of 1990, the total ridge area in Delhi is 7,777 ha. approximately as under :

Northern Ridge -	87 ha.
Central Ridge -	854 ha.
Southern Central Ridge(Mehrauli)	626 ha.
Southern Ridge -	6200 ha.

The main reasons for haphazard planning and development in Delhi has been the multiplicity of autorities in-charge of the area and absence of concrete action plan for saving the ridge. Presently, the Forest Conservancy Department, Land and Building Department of Delhi Administration, DDA in Delhi and State Forest Department, Development Authorities of Faridabad and Gurgaon are responsible for looking after the ridge area. There exists a considerable confusion among the Authorities about control on the ridge area in Delhi. For example, the Central Ridge in Delhi, is originally owned by the Land & Development Office (L&DO) under the Ministry of Urban Development. The L&DO entrusted the CPWD with the maintenance of the ridge but subsequently some areas of the ridge came to be maintained by the DDA, NDMC and MCD. However, there is no clear documentation with the L&DO or with the MCD, NDMC or DDA to show which area is to be maintained by whom. This has led to substantial degradation of the Central ridge. Further, the L&DO itself had made allotment of land for various purposes inspite of the fact that the Ridge has been declared as Reserved Forest and any diversion of the land

for non-forestry purposes is an offence under the law.

b. Other DMA towns:

Ghaziabad: There are a number of industrial complexes comprising forging units, rolling mills, paper plants, metallurgy plants, pharmaceuticals, rubber industries and electro-plating. A study by the Tata Energy Research Institute (Environmental Effects of Energy Production, Transformation and Consumption in the National Capital Region, 1991) has found that of the 812 registered factories in Ghaziabad district, 109 industrial units are air polluting. Coal followed by fuel oil is the largest fuel used here. Carbon monoxide (CO) emerges as the largest single pollutant (40.1%) followed by patioulate matter (32.7%). The type of fuel used by industries, fuel consumption and emission of pollutants in Ghaziabad are given below:

Fuel type	Fuel cons-consumption T/M	Emission of Pollutants (T/M) Particulate	SO	CO	HCS	NO
Coal	21400	213,996	162,636	962,982	213,996	32,100
Furnace Oil	4522	3,414	26,115	2,847	0.543	33,915
LDO	19135	4,643	62,766	11,460	2,364	50,031
Bagasse	67500	540,000	-	-	-	40,500
Rice Husk	6416	51,318	-	-	-	3,849
Wood	1653	4,131	1,239	24,795	28,101	9,093
Natural Gas	-	-	-	-	-	-
LPG	136	0,030	0,001	0,033	0,012	0,162
Charcoal	-	-	-	-	-	-
Total	-	817,743	259,111	1002,891	245,176	173,025

Source : Interim Report on Environmental Effects on Energy Production, Transformation and Consumption in the National Capital Region, Tata Energy Research Institute, New Delhi (1991).

A study by the School of Planning & Architecture, New Delhi on the 'Environmental Impact Assessment & Guidelines for Industries Development in the National Capital Region (1987) on the basis of the sensitivity indices, has categorised the environmental condition in industrial areas of Ghaziabad as 'bad'.

FARIDABAD-BALLABHGARH COMPLEX : There are about 1800 polluting industries and amongst them, 337 industries including electroplating processors are more polluting. There are a number of private owned electroplating units in the residential areas seriously endangering the health of the residents.

Traces of Zinc have been found in the water drawn from the borewells and, this poses an alarming health hazard to many in the city. Moreover, in the absence of sewage treatment, the raw sewage is let into the drains damaging the environment. The study by the School of Planning & Architecture, New Delhi (1987) has categoried the industrial area as "highly sensitive" and the environmental condition in the industrial area as 'bad'.

The Tata Energy Research Institute in its study (1991) has categorised 330 units in Faridabad district as air polluting. The energy consumption pattern indicates coal (38.8%) as the main fuel used by industries followed by furnace oil (31.0%). Carbon-monoxide remains the single largest pollutant of air over Faridabad. In the total pollutant emission of 839.4 tonnes per month, Corbon-monoxide forms 45%, particulate matters 15.5%, hydrocarbons 15.4 %, Sulphurdioxide 13.6% and oxides of nitrogen 10.5%. The details on the fuels used by industries, and the emission in Faridabad district are indicated below:

Fuel type	Fuel consumption T/M	Emission of Pollutants (T/M) Particulate	SO	CO	HCB	NO
Coal	8393.5	83.935	63.791	377.708	83.935	12.590
Furnace Oil	6719.0	5.968	45.650	4.980	0.949	59.285
Loo wood	667.1	0.196	2.703	0.494	0.094	2.198
Rice Husk	2474.0	12.370	1.856	37.110	44.532	12.370
	3402.1	27.217				2.041
Total		129.686	114.005	420.292	129.510	88.484

Source : Interim Report on Environmental Effects on Energy Production, Transformation and Consumption in the National Capital Region, Tata Energy Research Institute, New Delhi (1991).

GURGAON : In Gurgaon, the polluting industries are mainly ceramics, rubber and iron works. For want of adequate power supply, even the large industries are using diesel generators which aggravate the smoke pollution hazards.

The study by the School of Planning & Architecture, New Delhi (1987) on the environmental sensitivity and status in the industial complexes of Gurgaon indicated a high environmental sensitivity index to

Gurgaon and categorised the environmental condition obtaining in industrial complexes of Gurgaon as 'Adverse'. Still, Gurgaon has maintained the image of a pollutionless town. This has been mainly due to the slow pace of industrial development in Gurgaon. Only 20 per cent of the land earmaked for industrial use in the master plan has been developed and only about 40% of the developed plots have been put to use. The Regional Plan-2001, NCR too has envisaged a major shift in the occupational structure of the town from that of 'service' to 'industry' by 2001. The workforce assigned in industrial activities is 40% by 2001 against the 1981 figure of 25.3%. The master plan proposes to develop and accommodate non-polluting units primarily of electronic industries in Gurgaon.

NOIDA: Development of industries in pre/determined zones and in phases have to a great extent reduced the pollution intensity in NOIDA. 70% of the industrial land has been developed and 56% of the developed plots fully utilised. A systematically phased programme of industrial development would see through the full utilisation of industrial area in NOIDA by 2001 AD. The School of Planning & Architecture, New Delhi (1987) study too has categorised the NOIDA industrial areas as low sensitive and the environmental conditions in the industrial areas as 'tolerable'. However the proposed large scale development outside the periphery of NOIDA by UPSIDC is not in conformity with the Regional Plan-2001, NCR.

BAHADURGARH : To its total size, Bahadurgarh has extensive areas under industries. The industrial area near railway station with about 100 small and large industries and private industries north of the Delhi-Rohtak road causes air and water pollution. Though HUDA has constructed a sewage treatment plant, major part of the sullage is disposed of on land as the plant has not become functional. The SPA study categorised the industrial areas of Bahadurgarh as moderately sensitive and the environmental condition in such complexes as 'bad'.

KUNDLI: Of the 198 industrial plots developed by the Haryana State Industrial Development Corporation(HSIDC), so for only

64 plots have been allotted and 53 of them occupied. Only 25 industrial units are functioning and as such the problem of pollution is not very acute today.

9.2 REMEDIAL MEASURES :

a) Delhi U.T.

The primary pollutants in the city are the hazardous and obnoxious industrial units, and the large and medium scale units located in the non-conforming areas mainly in the residential areas. Taking into account the question of conforming/non-conforming and overall compatibility of industries in Delhi, the Master Plan for Delhi (1990) has proposed that the hazardous and noxious industrial units and new heavy and large industrial units shall not be permitted in Delhi. In addition, no new extensive industrial units shall be permitted (in existing identified extensive industrial areas). Regarding the existing hazardous and noxious industries, the Plan proposes shifting them on priority basis within a maximum time period of three years. Similiarly, the existing heavy and large industrial units shall shift to Delhi Metropolitan Area and the National Capital Region keeping in view the NCR plan and National Industrial policy of the Government of India. In addition, the Plan also proposes shifting of the existing non-conforming extensive industrial units to the extensive industrial use zone within a maximum period of 3 years after the allotment of plots by various Government Agencies. In this regard, the Delhi Administration has decided, rightly, that no new industrial estates are to be developed in Delhi. Further, the hazardous and pollutant industries will not be allowed either the benefit of adhoc registration or offered accommodation in alternative industrial areas from their original non-conforming locations. Rather, these industries would be encouraged to move to the NCR areas. The Delhi Administration is also in the process of ascertaining the possible industries which may like to shift to the Kundli township voluntarily, or by way of expansion of the existing units in Delhi or by way of setting up of new ventures. As shifting has not been contemplated within Delhi, large and medium

and hazardous/obnoxious industries will need to be closed down in Delhi or shift to designated areas in the NCR. So far no exercise has been undertaken for identifying the industries which should be shifted. As such, the Delhi Administration should immediately identify such industries and initiate actions for the shifting of such industrial units. This would not only reduce pollution in the city but also improve the quality of life of the citizens as such lands vacated are intended to be primarily used for community purposes.

2. At present none of the industrial areas developed by DDA has facilities for treatment of affluents. The Delhi Administration has made an initial attempt in deciding to instal a common effluent treatment plant in Wazirpur Industrial Area. Under this scheme, 50% of the cost would be borne by the Delhi Administration and the balance by the polluting industries in the respective estate. A second industrial area identified for such a plant is Mayapuri Industrial Area. In addition to such joint plants, the Delhi Administration has a scheme for individual units involving subsidy upto 50% of the cost of the pollution control equipment subject to a maximum of Rs.50,000.

In the light of identification of a number of polluting industries in the existing industrial areas in the study by the Central Pollution Control Board (1986), individual industry based measures should be detailed out and such polluting industries should be compelled to adopt the suitable pollution control measures. Joint treatment plants should be installed in all the polluting industrial areas.

3. In the light of extraordinary pollution level attained by the river Yamuna, there is an urgent need to check pollution in the river Yamuna on the lines of Ganga Action Plan for the river Ganga. Channelisation of the river Yamuna, pollution control and river front development of Yamuna could form a composite project.

4. In view of the rapid deterioration and disaapearenoe of the ridge area in Delhi and its environs, the following measures should be adopted whioh oould oheok further damage

i) Setting up a wild-life sanotuary in the ridge in oollaboration with Delhi Administration and Govenment of Haryana.

ii) Imposing ban on conversion of forest areas into parks and enoroachment from oonstruotion aotivities.

iii) Conservation of peripheral areas of the ridge into parks whioh can act as a buffer zone for the ridge.

iv) Removing unauthorised developments in the ridge area.

v) Intensive afforestation measures of the denuded pookets in the ridge.

vi) Entrusting the responsibilities of preservation of the ridge areas to a single authority.

b) Other DMA Towns

1. The towns of Faridabad, NOIDA and Ghaziabad are primarily industrial based. As suoh the pollution levels, intensity and the environmental status in these towns range from 'tolerable' to 'bad'. However, industrial development in these towns have been in organised industrial estates and as suoh joint pollution control measures such as joint sewage treatment plants by the Industrial Assooiations with institutional funding should be attempted. The Local Bodies may oollaborate with the Industrial Assooiations in installing joint treatment plants on the lines of Delhi Administration.

9.3 NCR PLAN POLICIES AND PROPOSALS

In order to improve the quality of environment and enhanoe the liveability of the towns of the National Capital Region in general and Delhi and the DMA towns in partioular, a number of measures have been proposed in the Regional Plan-2001, NCR. Some of them are as under :

1) The level of air pollution being severe in partioularly urban industrial areas and major transport oorridors , the pollution impaots have to be identified through appropriate field researoh studies so that the levels and types of industrialisation oan be established.

2) Water Pollution : No industry should be permitted to disoharge its effluents over land or into other water bodies without treating it to requisite pollution oontrol standards and the new industrial areas should be developed with proper effluent treatment faoilities in-situ.

3) Sewage disposal : Detailed sohemes should be prepared at local level for sewage treatment for all the DMA towns and in towns were regular sewerage sohemes are not available, low oost sanitation system for individual family or oommunity may be adopted as a short-term measure.

4) Permission for looation of new industries should take into oonsideration the pollution propensity of individual industries.

5) Afforestation programmes should be undertaken on all barren and unoultivable land by the oonoerned agenoies.

6) Coordination Committee : A Coordination Committee for prevention and oontrol of pollution of water, land and air should be established for the NCR which would ooordinate activities of the State Pollution Control Boards and Environmental Committees constituted at the local levels and provide them with teohnioal assistanoe and guidanoe to carryout and sponsor investigations and researoh relating to problems of water and air 'pollution and prevention, control and abatement of such pollution. It would also advise enforoing law for treatment of liquid effluents from domestio areas, industrial and oommeroial areas for making them fit for reoyoling and also to promote solid waste management for extraoting its nutrient value.

10

ROLE AND DEVELOPMENT PROGRAMME FOR DMA TOWNS 1991-2001

In the light of the need to develop the Delhi Metropolitan Area as a viable entity wherein the constituent units are mutually supportive and complimentary to each other, and it functions as an integrated whole, it is necessary to identify the role each town should play in achieving this goal. Such specified role should recognise the inherent advantages each town is bestowed with in certain areas of activities and the overall objective of making them self-contained in matters of work places and housing. In addition, an inter-sectoral programme for each town should be specified which would enable the achievement of the individual town's goal, within the overall DMA perspective.

10.1 FUTURE ROLE OF DMA TOWNS

Some of the major issues of spatial development in the NCR, which the Regional Plan aims to tackle, arise from the heavy concentration of population and economic activities in the UT of Delhi. This phenomenon has led to wide-spread deficiencies in its infrastructural facilities and imbalances in the development of both the Delhi Metropolitan Area and the rest of the Region. The analysis made in the previous chapters shows that even essential facilities like water and sewerage would be under increasing severe pressures and the quality of life may seriously deteriorate in times to come in the DMA towns. At the same time there is need for the DMA towns to achieve self-containment in terms of employment opportunities, shelter and other infrastructural facilities so as to absorb some of the population and economic activities from Delhi UT to relieve the pressures on the core city. More specifically, in order that the DMA towns can perform these designated functions, they should :

i) Develop as self-contained towns in terms of work-places, housing and community facilities;

ii) Develop such economic activities as requiring de-concentration from the core city; and

iii) Establish linkages among themselves and with the Core city through well-developed transport and telecommunication network.

In fulfilment of these objectives, the specific future role of each DMA town would be as follows:-

10.2 DELHI UT

i) Centre of National Focus

Delhi, the capital city of the nation is the focal point of its socio-economic and political life. There are functions political, cultural and administrative peculiar to a Capital and they, along with certain support functions, like transport and telecommunications, should get top most priority. It is of paramount importance to plan its development efforts, through carefully articulated development policies and programmes so that the city is adequately equipped to perform its premier functions. Delhi, with its well developed transport links with the rest of the country, has also got strong linkages and inter-dependency with the Region which underscores the inevitable need for planning the city in its regional context. The Master Plan for Delhi envisages that the Delhi Metropolitan Area including Delhi UT should be considered as one urban agglomeration for purposes of planning.

ii) Green Image of Delhi :

One of the features which strikes a visitor to Delhi is its large green spaces, shady trees and flowering shrubs, which give the city a green image. The other two prominent physical features dominating the city are the Ridge and the River Yamuna. Another feature needing conservation are the architecutral features and buildings of old Delhi. The Delhi Development Authority and the other development agencies engaged in

looking after the Capital, have been making efforts to preserve this image and the two features. However, the future signs appear to be rather ominous. Some of the reasons which are threatening this green image are recapitulated below and all out efforts is needed to preserve the green image of Delhi which has made it one of the most beautiful Capital cities of the world:

i) Shrinking area of the ridge and other natural forests.

ii) Large unauthorised development, taking place in the Capital, which, when followed by regularisation, hardly leave enough space for maintaining the greenery in the colony.

iii) Large multi-storeyed structures coming up around the Connaught Place area, which will slowly turn this into a concrete jungle. The trans-Yamuna colonies are also generally bereft of noticeable green spaces.

iv) Reduction in the area presently occupied by lawns around India Gate due to setting up of a car park behind Vigyan Bhavan and the construction of the Indira Gandhi Centre for Arts.

v) Demolition of existing barracks constructed during the second world war and their replacement by multi-storeyed structures without devoting sufficient spaces for greenery.

vi) Construction of the Inland Container Depot at Tughlakabad where large scale parking will take place in the adjoining regional green area, since very inadequate space for parking of vehicles is available within the premises of the depot.

iii) Landuses in Delhi UT :

Delhi which is inextricably linked to India's destiny has a proud historical background and distinctive architectural

features. Lutyen's Delhi was laid out with clearly demarcated zones of activities - the administrative complexes and the central vista which now forms the Rashtrapati Bhawan, Central Secretariat, Parliament House and the nearby areas, few residential complexes, prestigious shopping and commercial complexes such as Connaught Place. The future landuse plans in Delhi should facilitate the preservation of this functional predominance of Lutyen's Delhi. The Plan should also demarcate a "Core Area" which should be exclusively reserved for essential functions of the Capital such as political, including international and diplomatic activities and administration. The "Core Areas" should include the areas covered by Lutyen's Delhi and other nearby extensions, extending generally upto the existing Ring road. This "Core Area" already has prestigious cultural complexes but land should also be reserved in the "Non-Core Area" for cultural activities at the regional and national level.

iv) Phasing of Land Acquisition and Development Programes :

The Regional Plan 2001, NCR has suggested restricting the population of the Union Territory to 112 lakhs by 2001. The Master Plan of Delhi states that through effective measures of implementation, attempts should be made to restrict the population to the lower limit of 112 lakhs though the planning efforts in the MPD are geared to serve a population of 128 lakhs. It is necessary for Delhi to take cognisance of the fact that the other DMA towns have reached the take off stage and are fully geared up to absorb the population and economic activities which would be deflected from Delhi in the context of its envisaged restrictive growth strategy. In order that the population policy of both the Regional Plan and the Delhi Master Plan converge to the desired goal, there is a need to phase the land acquisition and development programme of the DDA keeping in line with the envisaged restricted growth pattern for the city.

v) Restriction on Employment Generating Activities :

Specifically, there has to be a definite restriction on employment generating activities in Delhi. Since the offices of the central government and public sector undertakings are identified as having the potential of generating large scale employment, only such offices which perform ministerial and protocol functions should be permitted to be located in Delhi and the others should be encouraged to be shfted outside.

Restriction of Industrial Activities : Industrial growth in Delhi also need to be restricted and only small scale units of non polluting nature which absorb less manpower and energy but more skill and technology need be encouraged.

Decentralisation of Regional Wholsale Trade & Commerce : In order to reduce the congestion within Delhi as a result of concentration of wholesale trade activities, alternative/additional wholesale markets should be developed in the DMA towns. Necessary fiscal measures like rationalising the tax structure, market fees and charges are also required to be taken so that the avoidable transfer of trade between DMA towns and Delhi could be prevented and the consequential pressures on transport network and storage space reduced.

vi) Pragmatic Programmes for Shelter :

There is a need for Delhi UT to recognise the fact that the problem of the unending stream of migrants, particularly of the low income groups, cannot be met by pursuing ad hoc policies of resettlement of squatter settlements and regularisation and improvement of unauthorised colonies and slums. A pragmatic housing programme involving active participation of private sector, Co-operatives and individuals at large should be evolved. The role of Delhi Administration and the DDA should be more of a facilitator in aspects of land acquisition and development, ensuring institutional financial support, regulating construction programme and timely provision of essential infrastructure. Past experience indicates

that the adhoc efforts of resettlement of squatters and regularisation of unauthorised colonies have not offered a finite solution to Delhi's growing low income housing demand. A comprehensive programme which would incorporate Site-and-Services and Environmental Improvement of Slums to benefit 100% of the EWS beneficiary population need to be conceived and pursued. In the resettlement colonies also there should be mixed and integratged development for all income groups, rather than for slum dwellers alone.

vii) Desirable Sectors of Growth for Future:

In order to maintain the identity and characteristics of the city as the National Capital, it would be desirable to develop the following types of activities in Delhi in future.

i) Delhi should be developed as a centre of international commerce, banking and insurance institutions. It should also have extensive facilities for international and National commercial exhibitions such as trade fairs and trade conferences etc.

ii) The city should develop as a focal point to exhibit and expose the diversity and variety of the country's rich cultural heritage to the international tourist community. In addition, it should also be enriched with befitting tourist attractions and resorts.

iii) The city has already hosted a number of prestigious international sports events and in the process an appreciable network of sports infrastructure have been developed. It would only be appropriate that this role of the city is further strengthened in this line and additional facilities of international standards to host bigger international events is established.

iv) A number of international Conferences such as UNCTAD, NAM, CHOGM etc were hosted by Delhi sucessfully. This role should be further strenthened by establishing

adequate network of Diplomatic Centres, Trade Representations and International Conference Facilities.

v) The city still depends on physical movement of people for every basic requirement. Delhi needs to be developed as a city with most modern transport system. A modern Mass Rapid Transport System is an immediate necessity for the city. Further, it should become an important focal point in the International air route and its accessibility through air linkage with other important National cities should be strengthened.

vi) A considerable amount of chaotic conditions on the city's road network could be eliminated if the city adopts a modern communication system. Efforts should to integrate the marketing centres, work places, residences and service centres to the common public through an effective communication network so that the avoidable physical movement is reduced considerably or even eliminated. The city should strive to achieve a position of nerve centre of International communication network and with a proper backward linkage to the important centres within the country it would enhance the country's access to the World information system - both print and electronic media.

10.3 GHAZIABAD - LONI

The growth strategy for DMA stipulates a normal growth for Ghaziabad-Loni. The population of this township had registered a fast rate of 82% in 1961-71, and 132% during 1971-81 and 98% during 1981-91. Spatially too, the town had expanded fast. The Regional Plan has assigned a population of 11 lakhs by 2001 to Ghaziabad - Loni.

Ghaziabad is envisaged to develop predominently in the tertiary sector activities. The Regional Plan proposed a work participation rate of 30%, which would give a workforce of 3.3 lakhs by 2001 and out of this, the work force proposed to be engaged in the tertiary sector is over 55%. Ghaziabad has also been identified as a suitable centre for locating wholesale trades of iron and steel, and hardware as it has

already got a large skilled work force and infrastructure engaged in fabrication of iron and steel items.

With an assigned population of 11 lakhs by 2001 and the location of NOIDA on its south with a population assignment of 5.5 lakhs, in addition to its own, Ghaziabad should reserve land for activities of regional character. Possibilities of locating an International Stadium in Indirapuram, and an Exhibition/fair ground somewhere on the outer periphery of DMA near Ghaziabad should be looked into. In addition to establishing new regional recreational areas, the Master Plan should also identify existing regional recreational areas for their conservation and development such as the lake near Loni.

10.4 NOIDA

NOIDA could be called an extension of East Delhi rather than an independent town. This township has considerable potential for absorbing population and economic activities. The Regional Plan has assigned a population of 5.5 lakhs by 2001. It is envisaged to be developed as a centre having industrial concentration having transport and telecom network connections. It is also expected to have well developed trading and commercial facilities including higher order facilities like Export Processing Zone to serve the Regional commercial needs.

These developments are expected to reach the proposed work participation rate of 35% which will result in the estimated work force of 1.93 lakhs. Out of this, 1 lakh would be in the tertiary sector and about 0.9 lakh in the secondary sector.

The only means of commutation between Delhi and NOIDA are DTC buses and private vehicles. In 1987 total number of passenger vehicles were reported to be 16677 and the buses including chartered buses as 1623. Total number of commuters were reported to be 79400 of which 61000 were the bus passengers and 18400 travelled by private vehicles. If no other means of mass rapid transit system is developed between Delhi and NOIDA, the projected number of commuters by roads by 2001 would be 1.5 lakhs of which 1 lakh would be by buses and another 50000 by other

private passenger vehicles. In the light of that and to enable the industrial units function efficiently, there is a need to remove the transport bottlenecks in NOIDA. This town should be linked with Delhi and Ghaziabad by a railway line and an additional bridge over Yamuna in addition to the Nizamuddin bridge and the proposed connection through Okhla barrage would enable easy access to NOIDA and encourage workforce and population to settle in NOIDA itself rather than commute from Delhi.

In this regard, for a speedy implementation of the GHAZIABAD-NOIDA-FARIDABAD Expressway, land requirement as per the alignment should be identified and notified for acquisition immediately.

Greater NOIDA : Land in the south-east of NOIDA being in close vicinity to Delhi, and NOIDA on either side of the DSC Dadri-Surajpur-Challera road is quite vulnerable for unauthorised development. The UPSIDC has acquired land on a large scale in Surajpur and Kasna villages for intensive industrial development. If this area on the doorstep of the DMA town of NOIDA is developed intensively, unauthorisedly for industrialisation, it would frustrate not only the development policy enunciated for the DMA but would defeat the very basic policy of the NCR Plan viz. achieving a balanced development of the whole region subserving to contain Delhi's explosive size. The NCR Plan does not favour an intensive development near Delhi except in locations identified in the Regional Plan. This area could be suitably utilised for landuses of low intensity such as botonical garden, university, institutions of national importance etc. which may require land more than 20 hectares each.

10.5 FARIDABAD BALLABHGARH COMPLEX

The Faridabad - Ballabhgarh complex is primarily conceived as an industrial centre. It is proposed to have a total work participation rate of 35% (3.47 lakhs) by 2001. The proportion of workers in the industrial activities is expected to be 45%, the highest among all the DMA towns.

The Regional Plan has assigned a population of 10 lakhs to this township which also agrees with the existing Development Plan. The Faridabad-Ballabhgarh Complex is also envisaged to play a vital role in the dispersal and development of economic activities in the Region.

There are large concentration of slums in the town. In 1981 survey, the number was 62,300 persons, which reached the figure of 1 lakh in 64 clusters in the 1986 survey by the FCA. It is necessary to prepare a comprehensive plan for upgradation of existing slums and by granting land tenure rights either in the same locations or elsewhare. Alternate locations should be identified and the programme should have a component of finance for construction of houses too.

This township has been identified as an ideal centre for locating certain wholesale trades such as iron and steel and auto-parts. Being an industrial area of a multitude of products, many of the local industrial units produce goods that are required by other industries in the area itself. At present, the goods produced are sent to Delhi from where they are bought back by other industrial units in Faridabad. There is a great potential and felt need of the industrialists of Faridabad to develop a marketing yard in Faridabad itself which could be used both for exhibition and marketing of their products to avoid this transfer of trade. Establishment of a joint power plant as envisaged by the Faridabad Industries Association would foster industrial development in Faridabad further. A joint sewerage treatment plant by the industrialists of Faridabad with financial assistance arranged by NCR Planning Board would go a long way in reducing land pollution.

To enable organised development of the town, there is an urgent need for a comprehensive transport plan for the town which should indicate the rail over bridges required in the town, requirement of local bus transport system in the light of its linear character etc.

10.6 GURGAON

Gurgaon is envisaged to be a service town along with emphasis on industrial activities of non-polluting nature. Already it has started attracting prominent industrial/administrative establishments of public sector undertakings and private corporate bodies. Along with the large scale housing programmes being undertaken there, both by HUDA and private developers, this town is poised to play its important role in the deconcentration of population and economic activities of Delhi.

The Regional Plan has assigned a population of 7 lakhs for Gurgaon by 2001. However, the past growth trend of this town has been rather modest. In order that the town is well equipped to serve the assigned population and in view of the need for having a viable economic base for the town, the development strategy envisages a shift in the composition of the workforce - from the dominance of tertiary sector to industrial sector activities (50%) by 2001. The proposed non-polluting industrial estates primarily with electronic industries is a right step in the direction of ensuring a better quality of life to its residents. The town has also been indentified as a suitable regional centre for locating wholesale trade in iron and steel. The NH-8 bypass which is operational has benefitted the town in easing the congestion in Gurgaon roads and would act as a facilitator in attracting institutional and industrial activities into Gurgaon.

10.7 BAHADURGARH

The Regional Plan has assigned a population of 2 lakhs to Bahadurgarh by 2001. The town is envisaged to have a balanced activity structure with about 30 per cent of the workforce employed in industry and 25% each in trade and commerce and other services with an overall work participation rate of 35 per cent. Thus a major chunk i.e. 42,000 of the total workforce of 70,000 would be in the tertiary sector and therefore, the town would have to develop predominently as a centre for institutional network, trade, commerce and services.

Bahadurgarh is situated on NH-10 at a distance of 37 km. from Delhi. However, the urban area of Bahadurgarh extends outward starting from the Delhi-Bahadurgarh boundary. Therefore, the area closer to this boundary is under severe pressure of haphazard development. There is a need for the development authorities of Delhi and Bahadurgarh to plan the development of this zone on a collaborative basis so as to regulate and guide the growth in the desired direction. Further, a substatial number of jhuggies have come up on the Industries Department land and appears to have settled permanently. Immediate measures may be taken to rehabilitate them elsewhere and release the land for public uses. As Bahadurgarh is envisaged to have a substantial size of service sector activities, and also because of its close proximity to Delhi and easy accessibility through the National Highway, it would also be desirable to develop residential complexes on a large scale in this township so as to relieve the housing pressures of Delhi.

10.8 KUNDLI

Kundli is envisaged to be developed predominently as an industrial town. A high work participation rate of 35% is proposed which is expected to result in a total employment of 53,000 by 2001.

In view of the large scale development being proposed in Narela, located within the Delhi UT, and closer to Kundli, an integrated planning effort is being made for both these centres.

10.1.1 IMPORTANT STATISTICS AND OUTLINES OF DEVELOPMENT PROGRAMME FOR DMA TOWNS 1991-2001

Towns / Sector	Delhi	Ghaziabad	NOIDA	Faridabad	Gurgaon	Bahadurgarh	Kundli
1. POPULATION							
Population by 2001(Lakhs)	112.0	11.0	5.5	10.0	7.0	2.0	1.5
2. ECONOMIC ACTIVITIES							
a) Employment :							
Participation rate 2001(%)	35	35	35	35	35	35	35
Workforce by 2001 in(lakhs)							
- Industry		1.35	0.77	1.58	0.98	0.21	0.21
- Construction		0.20	0.12	0.21	0.25	0.03	0.05
- Trade & Commerce		0.51	0.39	0.56	0.33	0.18	0.08
- Transport & Communications		0.33	0.23	0.25	0.25	0.07	0.05
- Service sector		0.99	0.39	0.84	0.54	0.18	0.12
b) Industry				-Marketing Yard -Steel yard			
c) Wholesale trade & Commerce		-Iron & Steel -Hardware	-	Auto parts	Iron & Steel	-	-Fruits & Vegetables, -Foodgrains
d) Govt & Public Sector offices							
3. TRANSPORT							
- Expressways		52.5 ha. provision to be made	184.5 ha. provision to be made	118 ha. provision to be made	-	-	-
- Inner grid		Provn. to be made	Provn. to be made	Provn. to be made	Provn. to be made	Provn. to be made	Provn. to be made
- National Highway		-	-		Provn. for widening to be made	-	-

4. TELECOMMUNCICATIONS

- No. of connections to be provided by 1995		38000	31000	49000	29000	2000	400
Towns	Delhi	Ghaziabad	NOIDA	Faridabad	Gurgaon	Bahadurgarh	Kundli
Sector							
5. INFRASTRUCTURE							
a) Water supply							
i) Present supply	2129	127	60	27	9	4	NA
ii) Demand by 2001							
- at 225 lpcd	2520	247	125	225	157	45	38
- at 315 lpcd	3528	420	175	315	220	63	47
b) Sewerage							
i) Present generation MLD	1700	100	48	22	8	3	NA
ii) Treated MLD	1270	NIL	NIL	18	NT	NIL	NIL
iii) Generation by 2001 MLD	2210	340	140	250	170	50	40
c) Drainage							
i) Drainage channels	Combined/ Separate	Open Nallahs	System exists	Open Drains	Combined system	Open Drains	NA
d) Solid waste management							
i) Generation-1990 (Tonnes)	5800	110	40	112	29	12	-
ii) Managed Qty.(Tonnes)	2700	80	40	100	25	7	-
iii) Generation-2001 (Tonnes)	7300	300	150	290	125	55	40

6. POWER

- Power requirement by 2001 F O R E C A S T I N G B E I N G D O N E B Y C E A

7. LANDUSE

- Density	Require marginal adjustment	-	Require marginal adjustment	Drastic reduction from 144 to	Drastic increase from 63 to	Marginal adjustment required
Regional landuse requirements provision for :						
i)Central Govt. and Public Sector Offices	Yes	Yes	Yes	Yes	Yes	
ii)Wholesale Markets	Iron & Steel. Super Hardware. Super Market.	Super Market	Auto parts, Marketing yard, Steel yard, Super market	Iron & Steel Super Market	-	Fruits & Vegetables, Food grain
iii)National level research instns.	Yes	Yes	Yes	Yes	Yes	
iv)University	Yes	-	Yes	Yes	-	-

v) Stadia Yes

vi) Regional recreational area Yes Yes Yes

8. SHELTER PROGRAMME IN DMA-2001

a) Housing requirement (in lakhs)

	Total No. of	1991-96	1996-2001
- EWS	8.20	3.280	4.920
- LIG	5.48	2.192	3.288
- MIG	2.74	1.096	1.644
- HIG	1.83	0.732	1.098
Total	18.25	7.300	10.950

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