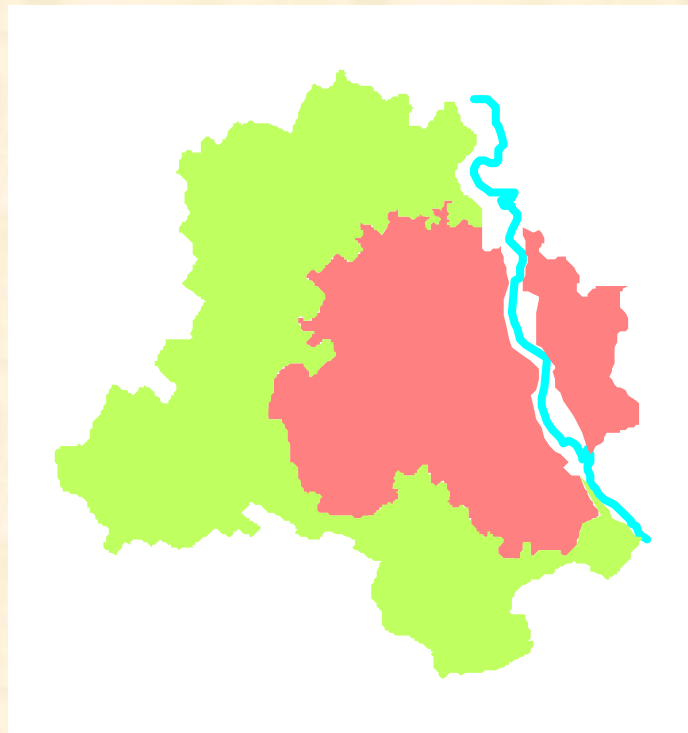


Delhi Urban Environment and Infrastructure Improvement Project (DUEIIP)

DELHI 21



January 2001

**Government of India
Ministry of Environment and Forests
and
Government of National Capital Territory of Delhi
Planning Department**

"DELHI 21"

This document has been prepared as part of the **Delhi Urban Environment and Infrastructure Improvement Project** with the help of a Team of Consultants interacting with concerned officials, agencies and interest groups and individuals from civil society. The **Government of National Capital Territory of Delhi** and **Ministry of Environment, Government of India**, sponsored this study with Japanese funding through the **World Bank** with a view to examine the existing situation and formulate policies, action plans and a shelf of investment projects for leading Delhi from its present situation to a more environmental friendly and better governed city in the next 20 years. The Team of Consultants consisted of specialists in various fields placed together by **GHK International, UK** and **Operation Research Group, India**. A series of consultations through a number of Workshops, seminars, discussions and presentations took place before the document was finalised.

Followed with all necessary zeal and interest the series of strategic actions suggested are expected to lead Delhi to "**a well managed, clean and dynamic city serving its citizens, the nation and the world**"

January 2001

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List of Acronyms and Abbreviations

ADB	Asian Development Bank
BAU	Business As Usual
BOD	Biological Oxygen Demand
BOT	Build, Operate and Transport
BOLT	Build, Operate, Lease and Transfer
BOOM	Build Own Operate Maintenance
CBO	Community Based Organisation
CCTV	Closed Circuit Television
CETP	Common Effluent Treatment Plant
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
CPWD	Central Public Works Department
DDA	Delhi Development Authority
DEFF	Delhi Environment Funding Facility
DFID	Department for International Development (U.K.)
DJB	Delhi Jal Board
DMA	Delhi Metropolitan Area
DMRC	Delhi Metro Rail Corporation
DoED	Department of Education
DOEF	Department of Environment and Forest
DoLBD	Department of Land & Building Department
DoTr	Department of Transport
DoUD	Department of Urban Development
DPCC	Delhi Pollution Control Committee
DTC	Delhi Transport Corporation
DUAC	Delhi Urban Arts Commission
DUEIIP	Delhi Urban Environment and Infrastructure Improvement Project
DVB	Delhi Vidyut Board
EG	Enforcement Group
EPPCA	Environment Pollution (Prevention and Control) Authority
ESP	Electro Static Precipitator
GNCTD	Government of National Capital Territory of Delhi
GoI	Government of India
HUDCO	Housing and Urban Development Corporation
ICE	Information Communication and Education
IDG	Infrastructure Development Group
INTACH	Indian National Trust for Art and Cultural Heritage
JBIC	Japan Bank for International Co-operation
JJC	Jhuggie – Jhoparis Cluster
LPG	Liquid Petroleum Gas.

- Abbreviations continued on page iii

MCD	Municipal Corporation of Delhi
MGD	Million Gallon Per Day
MLD	Million Litre Per Day
MoEF	Ministry of Environment & Forest
MoRly	Ministry of Railways
MoUDPA	Ministry of Urban Development Poverty Alleviation
MRTS	Mass Rapid Transit System
NGO	Non Government Organisation
NAAQM	National Ambient Air Quality Monitoring
NCR	National Capital Region
NCRPB	National Capital Regional Planning Board
NCT	National Capital Territory
NCTD	National Capital Territory of Delhi
NDMC	New Delhi Municipal Council
O & M	Operation and Maintenance
PD	Planning Department
PMCU	Project Management and co-ordination Unit
PPG	Policy Planning Group
PPP	Public Private Partnership
PPW	Public Participation Window
PSP	Private Sector Participation
PTG	Public Transport Group
PWD	Public Works Department
RIAP	Revenue Improvement Action Plans
RWA	Residents Welfare Association
SHC	Social Housing Corporation
SME	Small Medium Enterprises
SPM	Suspended Particulate Matter
SSI	Small Scale Industry
STP	Sewage Treatment Plant
STp	Strategic Transport Plan
SWM	Solid Waste Management
TMG	Traffic Management Group
TSM	Transport System Management
UDD	Urban Development Department
ULB	Urban Local Body
UFW	Un-accounted For Water
UNCHS	United Nations Center for Human Settlements
WB	World Bank
WTP	Water Treatment Plant

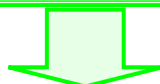
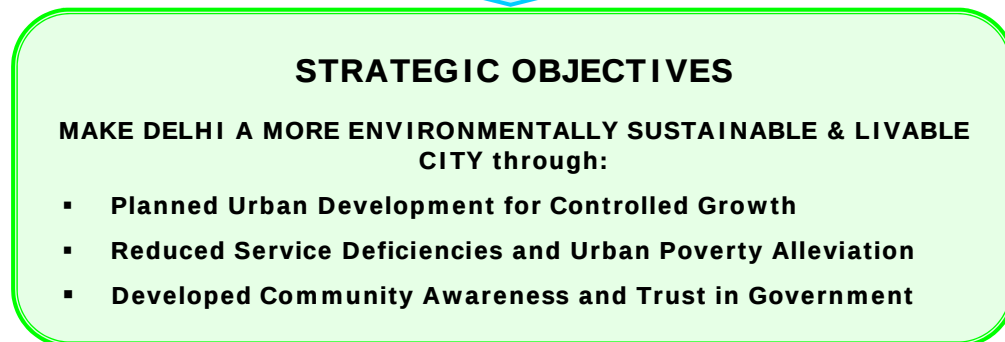
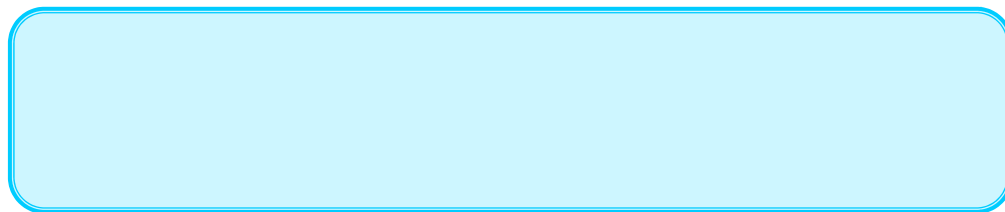
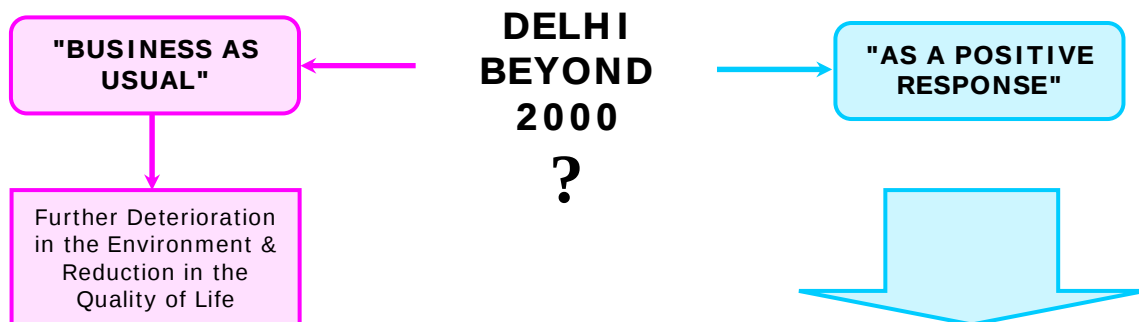
SECTION I

Framework for Delhi 21

Chapters - 1 to 5

FRAMEWORK FOR DELHI 21

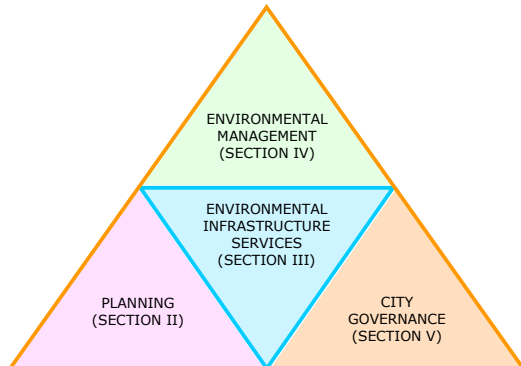
Summary Sheet



1. Overview

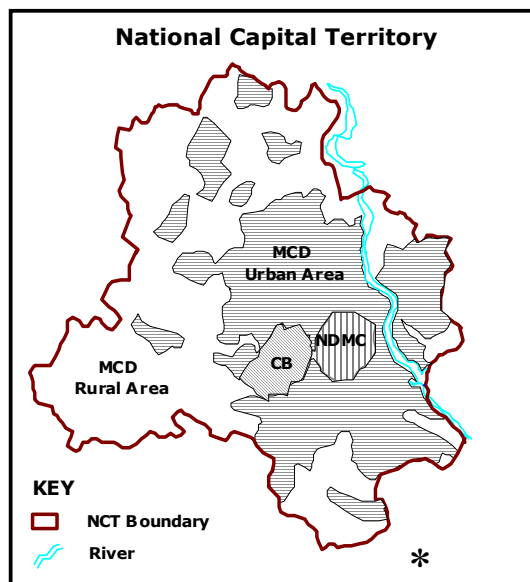
1.1 Context

This Report outlines the course of actions to make Delhi a more environmentally sustainable and liveable city by 2021 and is presented by the *Policy Framework Triangle* below, it is clear that the strength is in the triangle.



A well managed and healthy environment is built on the solid foundation of effective planning and good city governance providing sustainable environmental services.

The study area is the National Capital Territory of Delhi (NCTD) but takes into consideration the strategic importance of the surrounding towns of the Delhi Metropolitan Area (DMA) and the National Capital Region (NCR).



1.2 An Environment and Infrastructure Statement for Delhi in 2000

Delhi with its many green spaces, gardens, trees and forests has become a polluted city, while at the same time it has high levels of income in the Indian context.

Much of this report could be considered to be an environmental impact statement on Delhi. To politicians and residents alike, the description of the existing situation might make a dismal reading. Response to it must not be negative however, on the contrary, its purpose is to:-

- Bring about a change in the way "Delhi" responds to its development and related environmental impacts;
- Inspire and galvanise its readers into action; and
- To make Delhi an internationally competitive and productive city.

In order to succeed, all levels and sections of the Delhi Community should, and indeed must, cooperate and make a positive contribution to the environment of Delhi.

1.2.1 Legacy of the Past Governance

Ever since 1911, however, the governance of Delhi has been problematic. It has been difficult to reconcile the Central Government's desire to be involved in what it correctly regards as a "special place" and the universal belief that no area (not even the metropolitan area) should be deprived of the right of self-government.

This dilemma, which began in 1911, still exists today, and probably gives rise to the environmental situation that now prevails. Throughout its history as the national capital, Delhi's environment, apart from a privileged enclave, has steadily deteriorated.

This is caused by a failure to address the issues emanating from urban development and management. The central government's influence on the day to day affairs of the city, through legislation and

the administrative set up, is too strong and pervasive. In short *the majority of the citizens of the national capital are not in control of their own destiny.*

The sharing of powers and different perceptions and understanding of the local problems *between the GoI and Delhi government* goes right to the heart of the *environmental problem*. This is the reason why this report devotes so much space to the issues arising from urban growth management and its related institutions. Concern for the environment and environmental health is, however, a thread that runs right through the report.

Radical change and reform is urgently required; even then Delhi in 2021 might not be a "*City beautiful*" chiselled in stone.

1.2.2 Urban development overtaken by Uncontrolled Growth

Delhi has been growing at about 1,000 persons per day (350,000 per annum) for a number of years. Approx. 225,000 of these results from Delhi's own growth (14 million growing at 1.6% per annum) with the balance coming from in-migration. Assuming 100,000 of the growth is absorbed in the existing fabric of the city, serviced land is needed to settle 250,000 per annum; 500 ha at a gross density of 500 persons per ha or 1000 ha at a moderate density of 250 persons per ha.

Release of land for providing housing with the requisite on and off-site infrastructure services like water supply, drainage, roads plus social infrastructure such as clinics, hospitals, schools, police and fire stations etc. has not matched this growth. As a result service infrastructure has failed to provide the city with a healthy environment.

1.2.3 Water and Wastes (Liquid and Solid) a Threat to the Environment

- Water borne and waste related disease outbreaks occur annually;
- Less than 40 percent of liquid waste is treated;

- Solid waste management is grossly inefficient, labour productivity at 0.15 tonnes per sweeper per day is low, there are no transfer stations and the capacity of the existing and formally identified landfill sites is critically low.; and
- Solid wastes and street sweepings find their way into drains, waterways and sewers; flooding is a regular occurrence in the monsoon season.

1.2.4 Air and Noise Environment a Threat to Health

Incidence of respiratory diseases in Delhi is 12 times the national average, and 30% of Delhi's population suffers from respiratory disorders.

Only 30% of the residential colonies of Delhi have a noise level within internationally prescribed limits. Almost 20% of the residential colonies are exposed to excessive levels of day and night noise pollution.

(Source: CSE 5th Annual Citizen Reports, 1999)

Air pollution comes from 4 main sources:

- a) Vehicular discharge 67%
- b) Thermal Plants 13%
- c) Industrial Activity 12%
- d) Domestic Combustion 8%

(Source: CPCB, Delhi)

1.2.5 Institutional Situation

At present, administrative control of the institutions and authorities responsible for the governance of Delhi is split between GoI and GNCTD. The results of the existing multiplicity of policy making authorities and lack of an orderly line of control can be seen from the table 1.2.5

1.2.6 Delhi Beyond 2000 – Business As Usual?

In the year 2000, all the trends in the relevant data, *forecast deterioration in the environment and deterioration in the quality of life.* The "**Business as Usual**" scenario is littered with thoughts of gloom and despondency. The *present system of governance is failing the vast majority of the citizens.*

Table 1.2.5: Multiplicity of Policy Making Authorities and Implementing Agencies - a Complexity of Governance

Issue	Concerned Agencies	Result
Provision of serviced plots for housing to accommodate growth	DDA, MoUD, DoLD, GNCTD, MCD, NDMC, DJB, DVB, Private Sector.	Lack of enough houses / plots, growth of unauthorised colonies, growth of JJCs, spread out colonies with problems in infrastructure provision.
Journey to work and transportation	MoRlys, CPWD, PWD, GNCTD, DoTr, DTC, MCD, NDMC, Private Sector	Lack of adequate mass transportation capacity and routes, resulting in growth of personalised vehicles with resultant problems of traffic congestion, air and noise pollution etc.
Environmental Pollution	CPCB, DPCC, DoEd, GNCTD, DoTr, MCD, NDMC, DJB, Transport Operators	Land, water, air and noise pollution, environmental health problems, etc.
Improving Habitat for Urban Poor	MCD, NDMC, DDA, MoUD, DoUD, GNCTD, other public agencies owning land like Rlys, I & FC	Slum up-gradation or relocation programme cannot pick up momentum.

2. Delhi 21 - The Vision

In 2021, Delhi will be a well-managed, clean and dynamic world city serving its citizens, the Nation and the World.

Delhi has to embark on a hard and difficult journey to fulfil this vision that must be achieved during the lifetime of the present generation; for the benefit of its own and the next.

The journey of change

All the foregoing implies that Delhi governance has to move off on a journey of change.

It is the purpose of this report to charter the course.

3. Chartering the Course of Change

3.1 Strategic Objectives

The dominant objectives can be classified under the following headings:-

- Planned Urban Development according to plans.
- Reduced service deficiencies and urban poverty alleviation
- Developed community awareness and trust in government

3.1.1 Planned Urban Development according to plans

The preparation of policies and programmes, which aim to improve the environment and quality of life cannot be developed on a sectoral basis. They should emerge from an overall analysis of the system and synergies for actions in right directions.

In other words the formulation of a policy response requires acceptance of the present reality and an understanding of the issues and problems that have led to it. All the analysis points to the need for a radical change in policies.

Radical change will require:

- “thinking the unthinkable”, eg. a reduction in the influence of the Central Ministries coupled with a total rethink of the size and future role of DDA and MCD; and
- adopting policies which;
 - (i) optimises existing assets and financial flows;
 - (ii) create a “climate of opportunity”, which will allow the energy of the “people” to be spent in helping themselves;
 - (iii) confine government agencies to doing those things which “people” cannot do themselves;

Throughout the world “people” have demonstrated one thing they can do, and that is, build their own shelters.

- (iv) Involve “people” at all levels of the planning and decision making process;
- (v) Introduce flexibility, transparency and accountability into the political and bureaucratic structure.

3.1.2 Reducing Service Deficiencies and Urban Poverty Alleviation

12.4% or 1.7 million persons have calorie deficiencies in their daily diet and 30% or 4.2 million persons have little or virtually no formal infrastructure (i.e. they suffer from non-food poverty). In total approximately 6 million of Delhi citizens are living in poverty or deprived conditions of one form or another; 3.5 million in JJ's and 2.5 million in service deficient areas.

Unfortunately, unless urban management practices change, most of today's population growth will soon be living in tomorrow's deficient areas.

This study acknowledges that jhuggies and unserved settlements are part of the urban scene in Indian towns and cities. The slum residents support the urban economy through their labour market contribution and informal production activities. For these reasons the study recommends an upgrading and improvement approach as a matter of policy.

It should also be borne in mind that it could take 5 years to prepare programs, change the institutions and ‘tool up’ to address growth. In this time the population of the city will have grown by almost 2 million people. It is necessary to have effective institutions in place, which can cope with this problem and catch-up with the deficiencies – and growth - over, (say), a 20-year period.

To cater for *present deficiencies and future growth*, affecting 6 and 8 million respectively, implies developing new service infrastructure and upgrading programs capable of serving 700,000 persons per annum over the next 20 years.

Two parallel programs will be required:

- (a) addressing service deficient settlements
- (b) addressing the problem of future growth

Implementation strategies should consider, in ideal conditions, the option of using public/private sector partnerships; incorporating the interests of community associations, CBO's, developers and landowners.

3.1.3 Development of Community Awareness and Trust in Government

At the present time the poor and unserved communities are exploited and used as political pawns. Despite promises and well meaning policies little has been

achieved. As things stand, the number of people living in unserved settlements is growing. They will not be silent sufferers forever.

Public awareness and trust in government requires that:

- (a) everyone, i.e. politicians, bureaucrats, planners and engineers etc. and the public, understand their role in the development process; and
- (b) promises will be kept.

This report recommends new approaches to the challenges of urban development. If accepted, it could be used as a basis for setting the agenda for seminars, focus groups, CBO's, and community meetings; its findings should be available to everyone.

4. Fulfilling the Vision

4.1 Strategic Actions

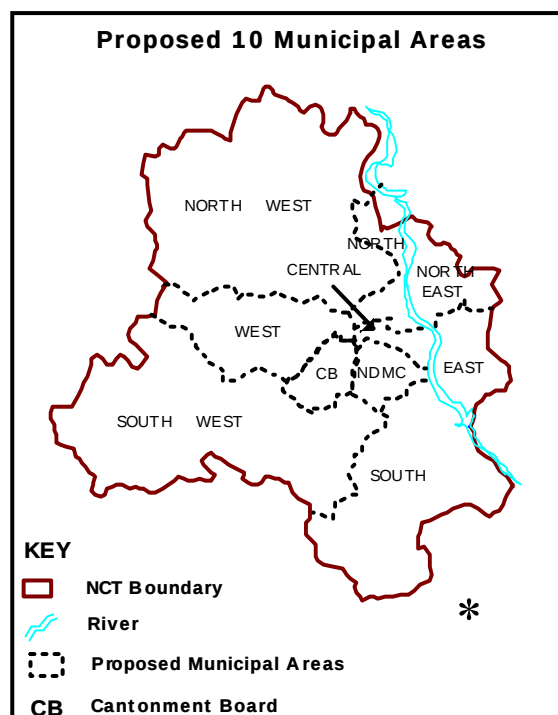
It is in this context that following strategic actions are required to be taken up

- Institutional restructuring to make it responsive to change
- Better urban development and land management
- Resource mobilisation and cost recovery of services
- Provision of infrastructure, utility services and corridors of movement;
- Efficient and sustained operation and maintenance.

4.2 Institutional Restructuring and Making it Responsive

4.2.1 Recommendations for Re-structured Institutions

- MCD and DDA, the two most important agencies impacting on the environment of Delhi, be brought under the administrative control of the GNCTD;
- It is generally accepted that the MCD has to be split and the GNCTD has set up a committee on September 8, 2000, with wide Terms of Reference to make specific recommendations on the subject. Earliest implementation of the findings of this committee would greatly help in the success of Delhi 21;
- DDA re-structured with the transfer of the development unit to an autonomous joint sector Development Corporation and the Planning unit to serve as a servicing body to the proposed *Metropolitan Planning Committee (MPC)* required under the 74th Constitutional Amendment Act;
- Strengthening of the *planning, programming and coordination* capabilities of the Urban Development Department, GNCTD;
- Strengthening of the overall *economic, financial, planning, programming and budgeting* capability in GNCTD to effectively cope with the responsibilities of
- serving a city of 22 million people in 2021;
- Ensuring planning, coordination and administrative control linkages between the Metropolitan Planning Committee and operating agencies like DPCC, DJB, DVB, DTC, etc.;
- Establish *environment cells* in all relevant agencies providing and managing industrial and urban development and infrastructure services, by training existing staff with required skills. These cells should activate internal actions in respective agencies on the basis of environment management policy that will be adopted. They should also be responsible to educate all concerned staff in the agencies for taking actions and basing their decisions on environmental considerations;
- Provide a *Public Participation Window (PPW)* in DoE/DPCC; and
- Create and Finance a Delhi Environment Fund Facility (*DEFF*).
- Set up an *Environmental Health Mission* constituting of major sector officers from the Department of Health, GNCTD, and staff from MCD and Center for Environmental Health.



(k) Until the Delhi Urban Metropolitan Transport Authority (DUMTA) is established, set up a *Unifying Metropolitan Transport Mechanism* with supportive teams for –

- (i) Policy and Planning
- (ii) Public Transport
- (iii) Traffic Management
- (iv) Infrastructure and Development
- (v) Enforcement.

It is acknowledged that these fundamental changes are political in nature and their acceptability and implementation will take some time to process. In the mean time it is necessary to commence the process of change by instituting a number of interim measures which are outlined below and detailed in Section V, City Governance.

4.2.2 Understanding the rhythm and interests of politics

This is self-explanatory. Political interests can be used to assist development.

4.3 Improving Urban Development and Land Management

Urban development offers tremendous opportunities and financial gains to landowners and developers. *In a situation where the public sector enjoys large land holdings there is a chance to make profits which can be made available to finance services to the weaker sections of society.* This is possible in the situation in Delhi.

Agencies whose remit is to address growth need to be capable of:

- planning ahead (Social, physical and financial);
- preparing design briefs for physical off-site and social infrastructure;
- harnessing the energies and drive of the private sector by: entering into partnership agreements with land owners, private sector developers and other interests and letting developers take the lead;
- providing an enabling environment in which plot owners can erect their

shelters and structures, with or without developers' assistance;

- handing over completed infrastructure to the O & M agencies, (designed and built to good appropriate standards);
- working with citizen groups and representatives of the people throughout the whole process;
- making profits from land development and land management and using for social benefits; especially the urban poor; and
- developing an open and transparent active land and property market.

4.4 Resource Development: Financial and Personnel

Buoyancy in the financial revenues available to the key agencies is retarded by an inability to improve on what can be done within the existing financial structures and current arrangements.

Principal financial statistics for the fiscal year 1999-2000 of the GNCTD and the two local bodies are summarised in the following table:

(Rs. Million)

Items	GNCTD	MCD	NDMC
Revenue Receipts	46,036	14,701	5,908
(of which tax revenue)	(36,832)	(8,200)	(707)
Capital Receipts	15,353	Not Available	246
Total Receipts	61,389	14,701	6,154
Revenue Expenditure	38,172	16,701	5,570
Capital Expenditure	27,238	Not Available	557
Total Expenditure	65,410	16,701	6,127
Net Surplus / (Deficit)	(4,021)	(2,000)	27

(Source: Revised Estimates for 1999-2000 of GNCTD, MCD, NDMC)

4.4.1 Observations:

- Despite consistent surpluses in its revenue account, the GNCTD has not

been able to capitalise on the growth of economic activities. A falling ratio of tax buoyancy in certain taxes is a matter of concern.

- MCD did not service its debt. Following the recommendation of the DFC, GNCTD consolidated the past loans as of April 1996 of Rs.5.16 billion (including accumulated interest) into a single loan, which is now recovered out of the yearly assigned share of taxes over a 20 year period.
- NDMC's main source of income is profit from electricity. With any reallocation of electricity supply responsibility in its area, NDMC would find it difficult to finance its other responsibilities. Despite surpluses NDMC has stopped servicing GNCTD debt from the financial year since 1997-98.

4.4.2 Financial Status of other key Public Sector Agencies in Delhi

Delhi Transport Corporation, Delhi Vidyut Board and Delhi Jal Board: The revenue and capital account of all the three organisations are in a dismal state. As per the Delhi Fiscal Study carried out by NIPFP their combined losses in 1996-97 amounted to Rs. 27 billion.

DJB's tariffs are low; costs appear to be unduly inflated to support a huge labour force; carry huge debts; resulting in consistent deficits over the year.

MCD has a total employment of 1,08,000 out of which 44,000 are sweepers. Out of the total monthly wage bill of Rs. 830 million, 500 million are spent on these sweepers.

Delhi Pollution Control Committee (DPCC): Assessment and collection of water cess are both erratic and low. Based on the cess rates set nationally in 1992, the cess assessed in 1999-2000 was Rs. 13.6 million as against Rs. 45.2 million in the previous year.

Delhi Development Authority (DDA) : The total (provisional) receipts under all heads in 1998-99 were Rs. 39.9 billion. The major utilisation out of this was on the development of land (32.8%) followed by the cost of administration (32.1%) and

construction of houses and shops (20.1%). Annual accounts have been audited only up to the year 1996-97.

Despite the foregoing Delhi is regarded as a relatively rich city. To the extent that there are barriers to mobilising financial resources, they are mainly of an institutional and policy nature, rather than economic.

Clearly there is need of reform. None of the agencies are realising their resource potential though all are capable of generating more revenue and reducing costs. The need for managerial and policy change is well known.

This report recommends that a Task Force be set up to produce and suggest implementation arrangements for Revenue Improvement Action Plans (RIAP) within the existing financial structures and current arrangements.

4.4.3 Personnel and Staffing Resources

Rationalisation and redeployment of staff matching with the existing and new tasks will have to be carried out to ensure better productivity, responsibility and accountability. This may imply downsizing and restructuring for which suitable plans will have to be prepared and decisively implemented. Selected tasks and functions should also be contracted out for private sector participation (PSP) where possible.

4.5 Provision of Infrastructure Services and Transport Corridors

It is important for the officers working on the Perspective Plan, Structure Plans and Local Plans to review and iterate their proposals on a regular basis with their counterparts in the water supply, drainage, solid waste management, transport and other utility sectors. Ideally these sectors should have a representative in the planning offices.

In this way it should be possible to *plan, finance and construct trunk infrastructure and develop transportation corridors, in*

parallel with the secondary and territory infrastructure, which is required for the new area development and upgradation programs.

4.6 Operation and Maintenance (O & M)

At the present time many agencies involved in the operation and maintenance of municipal services appear to be *overstaffed and also have poor middle management and cumbersome procedures*, operating with unbalanced and inefficient labour/equipment ratios. The *street sweeping and solid waste collection and disposal systems in particular need urgent review and overhaul*, as difficulties in this sector impact adversely on the drainage and sewerage systems.

The agencies involved in O & M, with MCD and DJB in particular, will need to:

- down-size, over a period of time, the numbers directly employed;
- prepare design briefs, set targets and enter into partnership agreements with the private sector, in order to increase efficiency;
- adopt modern business management approaches and commercial accounting systems;
- be provided with adequate financial resource and trained personnel;
- improve personnel management and general management systems.
- reduce leakages impacting efficiency and financial resources.

5. The Challenge

Despite stating at the start of this introduction that the most critical environmental issue facing the city is concerned with the governance of the NCT, institutional recommendations have been kept to the end. This has been done deliberately. It is considered that there is a need to introduce the actors to a new way of thinking about the environment and urban development. The challenge lies in carrying out the required institutional reforms.

**WILL TODAY'S ACTORS BE ABLE TO HAND OVER TO THE NEXT
GENERATION A WELL-MANAGED, CLEAN AND DYNAMIC WORLD CITY
SERVING ITS CITIZENS, THE NATION AND THE WORLD?**

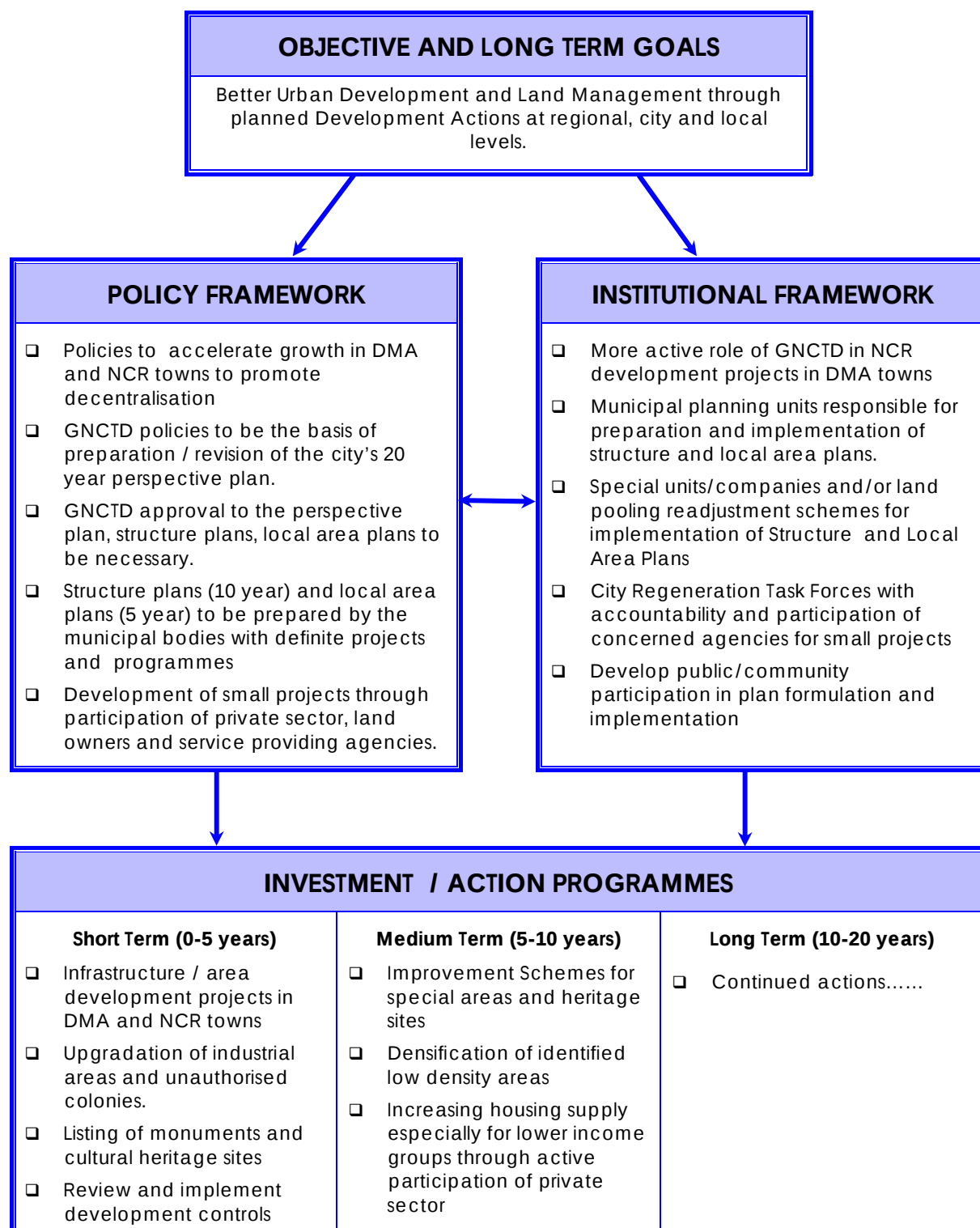
SECTION II

Urban Development Planning and Land Management

Chapters – 6 to 8

URBAN DEVELOPMENT PLANNING AND LAND MANAGEMENT

Summary Sheet



6. Strategic Planning

6.1 Co-ordinated Planning for City, Metropolitan Area and NCR

6.1.1 Learning from the Past

In the past, a Regional Plan for the National Capital Region (NCR) was prepared by NCRPB giving regional development strategies plus a Master Plan for the National Capital Territory of Delhi (NCTD) by DDA showing broadly the land use and transportation corridors, both with a 20 year planning horizon, have been prepared. The plans were to guide and influence investment decisions and development programmes. They took into consideration the strategic needs of the region and relationships between the metropolitan city and its neighbouring ring towns.

At the micro-level, however, both the plans have had little positive influence on the lives and settlements of the citizens of Delhi. The NCR Plan could not achieve much, as effective tools for implementation and funding arrangements were not enough. Equally, the Master Plan for NCT did not have clear policies or strategies for implementation by the agencies involved. Nor were the funding arrangements included.

The NCR Plan and NCT Master Plan are both under revision. The opportunity should now be taken to review the existing procedures, policies and goals and to adopt a new approach to urban development planning.

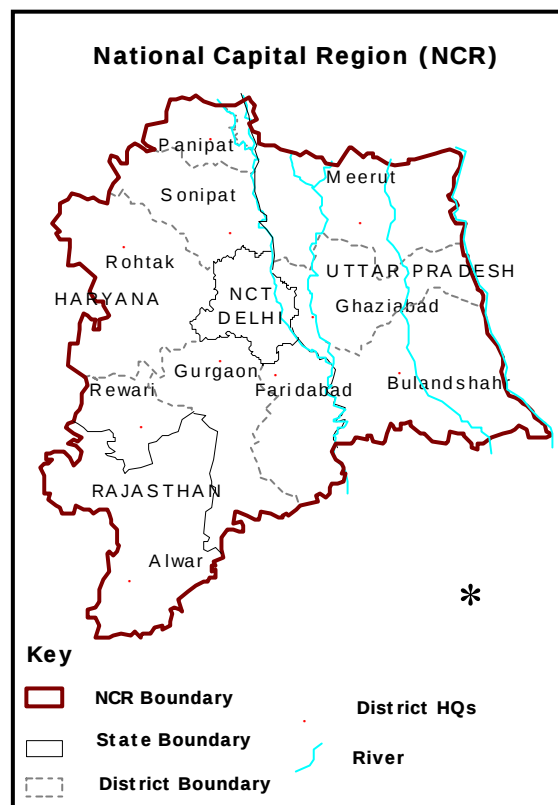
6.1.2 Modifying the Planning Process

The modified approach requires physical planning to be regarded as a continuous process responding to the evolving needs of the community and market place. The approach requires that the concepts of monitoring, and feedback are incorporated into the planning process as well as consideration of funding arrangements for implementation.

When physical planning is thought of in this way and linked to economic planning and budgeting, the physical plans come alive. They can then be thought of as being part of an enabling framework which guides and assists the human endeavour and activities taking place at the local level.

In short:

- Physical plans should be seen as part of a process which aims to improve the quality of life for everyone; and
- Planners, while visionaries as well as decision-makers, must also have their feet on the ground and come to regard themselves as being at the cutting edge of urban development.



Source: Delhi 1999 – A Fact Sheet NCRPB

6.1.3 Development Planning for NCR and NCT

There are different implications for different approaches for development planning. Table 6.1.3 indicates that a modest growth approach with certain limits / controls on the economic and development activities has to be adopted. Planning at this level,

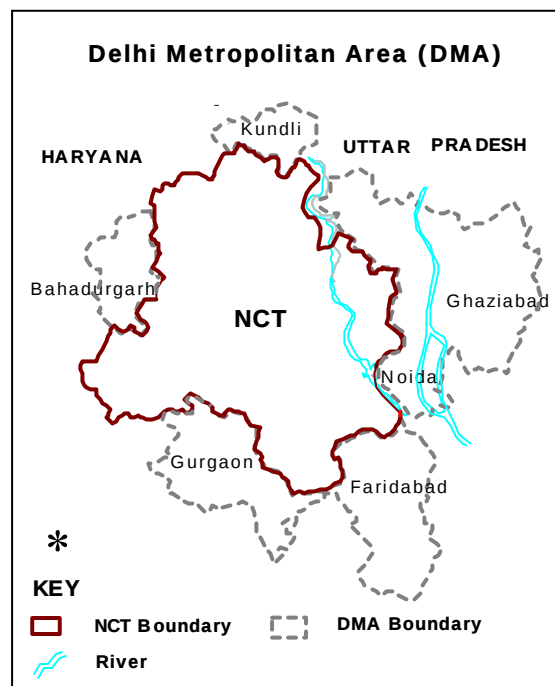
undertaken by the NCRPB, requires consultations between the GNCTD and the respective state Governments.

The NCRPB should distinguish between; (i) towns in the DMA that may be regarded as satellite or dormitory towns; and (ii) towns in the wider region, which would be more self-contained. The role that each town could play in the development of the region should be defined together with:

- Land use, industry, markets, institutes, other employment locations with housing policy statements;
- Guidelines to indicate how infrastructure could be financed, law and order preserved and the quality of life improved;
- A clear definition of the boundaries of rural areas and green belts together with the type of development that can be permitted in these areas; and
- Relation to the NCT and other towns in the region, etc.

It is necessary also to consider the requirements of NCT area and the surrounding DMA towns together. In particular, proposals for industrial estates, solid waste disposal sites, locations of whole sale markets, transport terminals etc. These will have to be proposed in the NCR planning as strategic inputs of development, considering the region as a whole. Plans should identify the strategic programs, projects and investments that will be required and necessary to stimulate the private sector.

A statement of sources and application of funds, should also be given for the public sector projects which are to be implemented in the short term (0-5 years). The statement needs to be reviewed and revised on an annual basis.



Source: MPD (1981-2001)

6.1.4 Development Planning for NCT and DMA towns

The development programmes in DMA towns, which may have a direct relevance for the NCT, need to be carefully planned, funded and monitored, especially those programmes concerning their daily interaction, where suitable transportation arrangements will be critical. An exercise, previously carried out by the Government of India in mid-1980's concerning the location of offices and institutions in Delhi and DMA towns, should be updated and linked to the policy and programmes formulated and adopted by GNCTD. Location and/or relocation possibilities of major job generators like whole sale markets, institutions, industries etc. in the DMA towns need to be examined by NCRPB in consultation with GNCTD. Needed infrastructure for such activities will have to be planned and developed in a participatory manner. For this purpose special committees consisting of GNCTD, NCRPB and respective State Governments be constituted. Such committees can then oversee the planning and implementation aspects for stepping up the development of DMA towns.

THE KEY ISSUES	ALTERNATIVES			
	NO GROWTH APPROACH	LIMITED GROWTH APPROACH	CONTROLLED GROWTH APPROACH	HIGH GROWTH APPROACH
COMPATIBILITY WITH REGIONAL PLANNING FRAMEWORK	Incompatibility with regional policy, which envisages some limited development for meeting national, regional and local needs	Basic approach compatible with underlying aims and policies of regional planning framework, subject to available options being used for meeting local needs	Generally consistent with national urbanisation policies although diverging from regional planning framework because of higher level of growth and associated net in-migration	Incompatible with national and regional policy, would encourage /facilitate net in-migration and undermine basic policies for concentration of development in growth areas
POTENTIAL ENVIRONMENTAL IMPACT	No further development, possible degradation of many areas, growth of slums on public lands, and pressures for shifting present economic activities outside to help environmental improvements	Expansion of developed area and/or densification of low-density areas, some limited small-scale commercial & residential development could be allowed if considered desirable, taking precautions for environmental impact & measures for improvement in 'may be degraded soon' areas.	May involve development of some agricultural and other available land, which might not be environmentally desirable. More options for employment growth, with potential problems and opportunities for urban environments.	Involves significant further development of agricultural belt and densification of all developed area promoting rapid degradation of environment due to congestion, traffic, growth of slums etc.
OPTIONS FOR MEETING LOCAL NEEDS	Offers no scope to meet shelter needs especially of JJ clusters, non-conforming industrial areas other city activities, which will have to be shifted outside NCT. Inflexible employment policies would allow little scope for accommodation needs.	Offers reasonable scope in overall terms for meeting shelter and other needs subject to implementation considerations. Some limited employment growth to meet local requirements could be allowed.	Provides more opportunities for meeting shelter and employment needs through release of additional land, although this discretion could be taken up by wider pressure for development, making it difficult to control later.	Affords most discretion for meeting local needs within a growth framework.
IMPLICATIONS FOR TRANSPORT PROBLEMS	Minimises impact on transport problems, although these are likely to increase due to other factors influencing trips	Problem created could be minimised through policy and infrastructure developments within the financial constraints	Problems made marginally worse than with the Limited Growth Approach.	Problems made worse than with Limited Growth Approach
IMPLICATIONS FOR PUBLIC SERVICES	Impact on public services minimised, although resources might not be available for meeting existing shortfalls. Possible under-utilisation of committed infrastructure.	Existing standards of provision of social commitments and some further and community facilities and utilities could be maintained, with possibly some scope for improvements with present investments.	Existing standards for social and community facilities and utilities could be maintained, with some scope for improvements with present commitments and some investments. Additional areas comparatively costly to service, with potential localised problems.	Unlikely that even existing standards for social and community facilities and utilities could be maintained. Potential localised difficulties in providing infrastructure.
IMPLEMENTATION AND UNCERTAINTY	Requires revocation of commitments offers no flexibility and does not provide a workable planning framework.	Provides workable planning framework, requires specific measures to meet shelter needs within options provided. Longer-term flexibility provided by not being over-committed.	Provides added short-term flexibility for resolving local issues within a growth framework but in longer term requires release of agricultural lands to provide flexibility.	Difficult to protect agricultural belt/ green areas if needed for development. Over-committed if economic growth does not occur as anticipated resulting in uncontrolled growth.

Broadly acceptable approach

Marginally acceptable approach

Unacceptable approach

Table 6.1.3 Evaluation of alternative strategies for

7. Planning and Development Process at NCT level

7.1 Four level process

It is proposed to adopt a four level approach by modifying the present practices. This can be done immediately without any changes to the existing legislation. Ultimately, amendments in terminology to the various acts on planning may be made. The four levels are:

- (a) Perspective, Strategic or Concept Plan (for 20 years) for NCT. This is similar to the present Master Plan with a modified policy based approach with strong policy inputs based on NCR Plan regional strategies and GNCTD policies on city based issues;
- (b) Structure Plans and Zonal plans for 10 years for municipal areas in NCT. (The present Zonal Plans but based on the policy approach);
- (c) Local level or sub-zonal Plans for selected areas in the context of structure plans (The same as present but with policies); and
- (d) Design briefs for development of selected priority areas i.e. ;
 - (i) Growth areas, through public private sector co-operation;
 - (ii) Land pooling schemes;
 - (iii) Redevelopment areas through partnerships with CBO's etc.;
 - (iv) Upgradation areas.

7.2 Perspective or Strategic Plan (for 20 years) for NCT

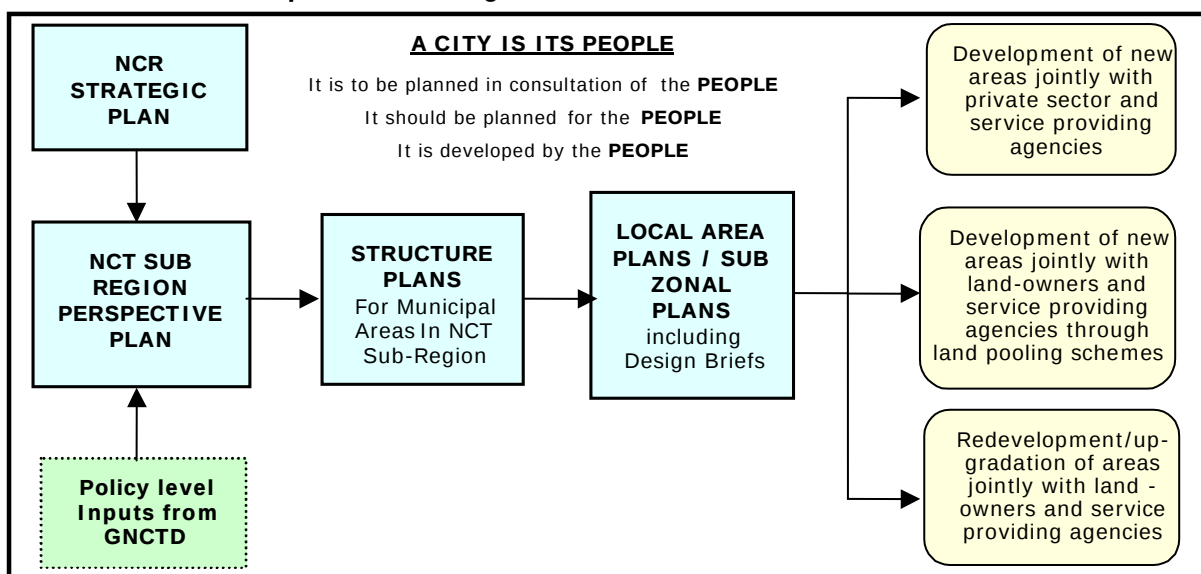
At the NCT level, initially the DDA and eventually municipalities (in the context of 74th constitutional amendment), can be responsible for the preparation of this plan in the context of the NCR plan. The policy resolutions of the GNCTD on various issues such as Industrial, Office and other job location, Housing, Traffic and Transportation, Environmental Management, infrastructure etc. should be the basis for the proposals included in this plan. Respective infrastructure agencies and policy-making units of GNCTD need to be fully associated and involved in this task. This perspective plan will then provide a background for the preparation of structure plans of municipal bodies and agencies, and assist in their budgetary exercises. The NCT Plan and related outputs should also provide guidelines for the preparation of municipal level (zonal, sub-zonal plans) and redevelopment plans for specific areas.

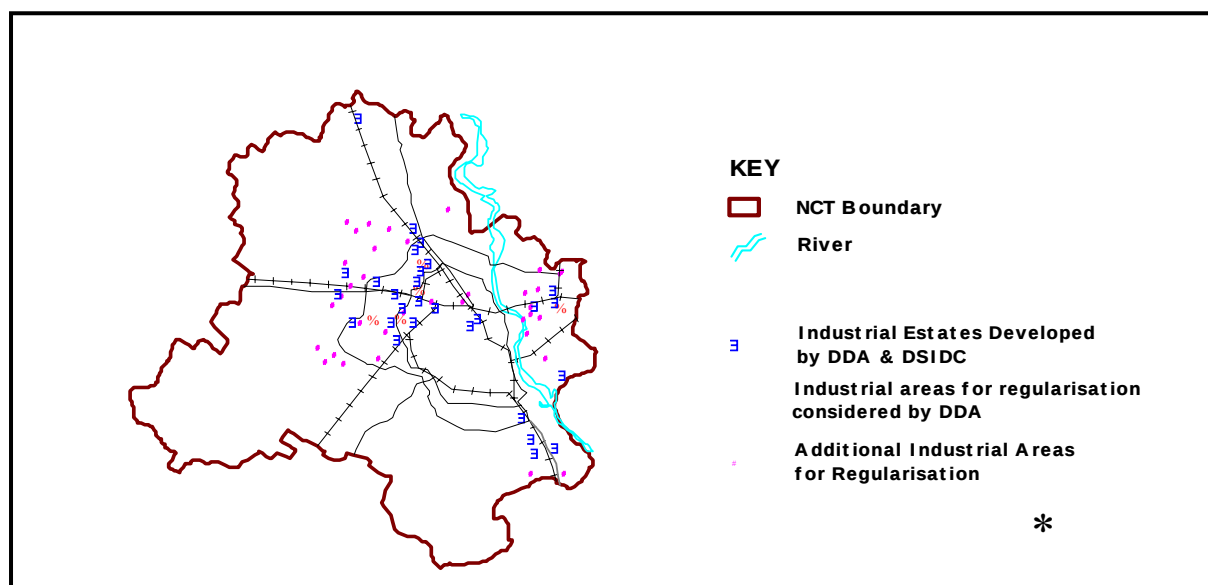
7.2.1 Policies as Basis for Planning of NCT Area

(a) The Industrial Location Policy

Existing Situation: Today Delhi has over 1.37 lakh industrial units (1.26 lakh in 1996

The Urban Development Planning Process





as per the data in Industries Department). The majority of these are in non-conforming zones. They are a major component of Delhi's economy with Rs.2,524 crores invested with an annual production worth Rs.6,310 crores. They provide employment to a large workforce of 7.31 lakhs (average 9 workers per unit) with 30% having less than 4 workers. They use municipal and other services, pay commercial rates and keep Delhi City, as an engine of growth running to its capacity. Many have been in existence for almost 30 years. However, they face closure or relocation because many are located in areas that do not conform to the Master Plan 2001. The present situation is one of uncertainty, resulting in a loss of confidence and productivity.

There is no doubt that strict action should be taken in regard to industries that pollute and are dangerous, but policies in the industrial sectors should not be made by land use or planning agencies acting on their own. They should be formulated by the environmental management and industrial / economic planning agencies and then introduced into the land use and urban management programmes. It should also be realised that policies can incorporate "carrots" as well as "sticks".

Industrial Location Policies should include:

- Compulsory registration of all industrial units with the Industries Department of GNCTD and the development of a database showing industrial unit location and/or expansion. Applications for new units or expansion should be accompanied by an Environmental Clearance Certificate;
- High tech, high skill industrial units (including training) to be encouraged;
- Household / cottage units may be regularised / permitted within prescribed norms, to take care of changes in industrial products, and processing;
- Some of the units in non-conforming zones as per MPD 2001 may be allowed to remain, providing they take anti-pollution measures;
- No hazardous units to be allowed;
- "One window" approach to be strengthened for processing cases relating to industrial development and made effective;
- Industrial department to be strengthened by adequate training in environmental matters and for registration of units, building the data base, processing applications for environmental considerations etc; and
- Special efforts for promoting industrial units in NCR and DMA to be introduced.

Regularisation and problems of non-conforming industrial units in Delhi

	Types of industrial units	Number of Units (approx)
(a)	Units in conforming zones	25,000
(b)	Units in 15 areas proposed for regularisation	12,000
(c)	Units in 40 other selected areas with similar characteristics that may be considered for regularisation if non-polluting and satisfy conditions	12,000
(d)	Units in local commercial areas which can be regularised without much difficulty	5,000
(e)	Units working as single hand, like cottage industry considered as allowable household units as per Master Plan regulations with revised norms as recommended in the policy	25,000
(f)	Units from present non-conforming zones which have applied for space in new Industrial estate being developed by DSIDC at Bawana and considered eligible	16,000
	Total of (a) to (f) above	95,000
(g)	Remaining units scattered in various places which either should find place in regular industrial zones in Delhi or shift outside into industrial areas in DMA or NCR towns (126218 – 95000)	31,218

Note:- Time limit for relocation should be strictly enforced.

Surveys indicate that industrial units are willing to contribute for infrastructure development

sector units of Gol) need to be permitted.

(b) Job Location Policies (Offices/ Trade etc.)

A selective approach (in the context of international and national importance) is necessary in allowing expansion and locations of new offices, trade and institutional activities. These have linkages with other sector activities and housing development and for the overall economy of NCTD.

- Compulsory registration of all offices, trading activities and similar establishments
- No new such establishments be allowed without the approval prescribed authority under the GNCTD
- No major expansion of existing offices and Institutes that cause major addition to employment, traffic and transportation needs
- Only such small units based on high tech, high skill employment to be permitted
- Only such units which conform to environmental standards (especially wholesale trade and medical/chemical users etc.) and in conformity with plan provisions to be allowed
- Existing establishments not conforming with above requirements to be regularised if steps are taken within a prescribed period
- Small office expansion needs of GNCTD or Gol (but not Institutes or public/joint

(c) Housing Policies

The Delhi Development Authority is frequently referred to as the major provider of formal housing in Delhi. A review of the facts and numbers, however, refutes this contention.

DDA was formed in 1957. In the ensuing 43 years, Delhi's population has grown, from less than 3 million to approximately 14 million. In this period the entire EWS to HIG categories together have grown by 5.5 million and the poverty group has also grown by another 5.5 million, totaling to 11 million. 2 million additional households have formed.

According to DDA's Annual Administrative Report 1998/99 and other publications the total number of houses constructed by DDA upto 31 March 1998 were 2,58,230 units, and 2.4 lacs in resettlement colonies. Houses in progress were 21,760 units. In addition DDA also allotted plots for group housing and co-operative societies which have together added 5.25 lacs houses. Thus, a total of one million of households have been provided under various DDA schemes. All this implies that the Private Sector, (formal and informal both) have built approximately over 1 million units. A study conducted by the Socio-Economic Research Foundation, New Delhi in 1998

showed that 2,77,253 units of accommodation were vacant in 1997 and this number is expected to rise to 342,000 in 2002. If there had been a housing policy in place, this situation could have been reviewed and suitable steps taken to correct the problem.

Any revision of current thinking should acknowledge that the developers, builders and property owners in the Private Sector can build at a faster rate than the Public Sector; about six times as fast. The Housing Policy should reflect this.

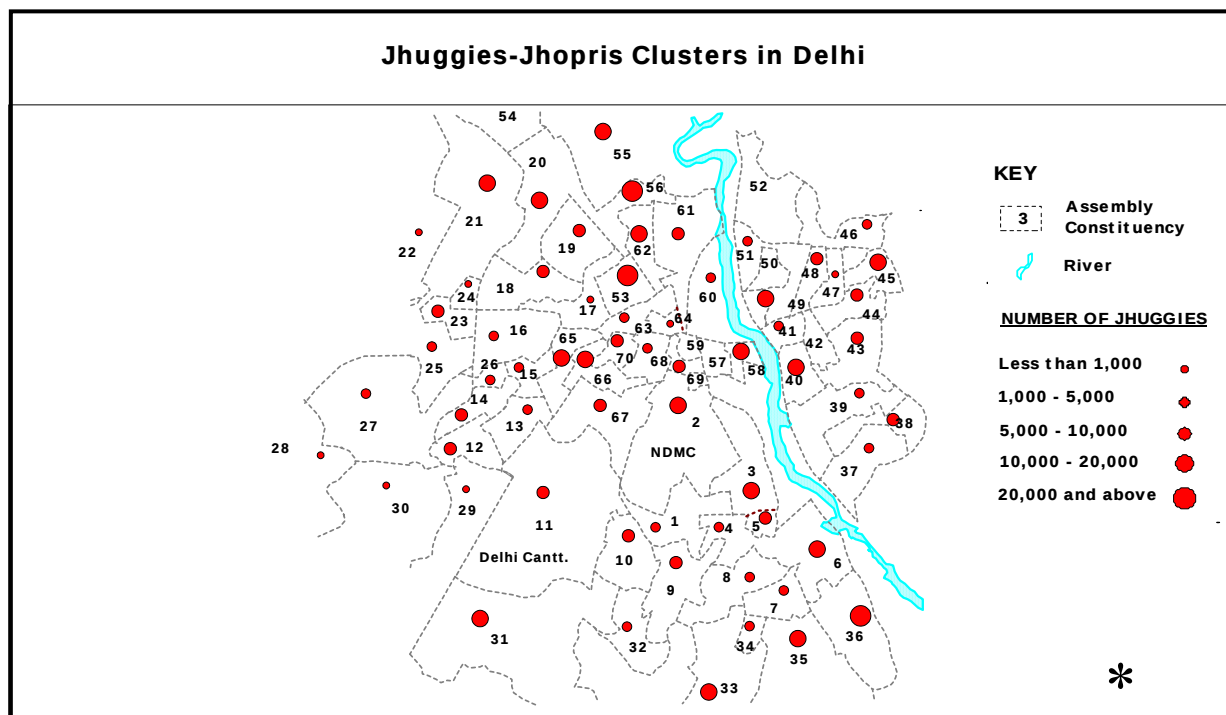
Housing Policy should:

- give guidelines on ways and means of reducing the numbers of vacant units; i.e. optimise the existing assets; and
- provide a framework in which the Private Sector can legally and efficiently operate by :
 - (a) encouraging the formation of Public/Private/Co-operative Sector Partnerships with the brief to:
 - (i) open up and service new areas; and
 - (ii) upgrade slums and unserved settlements.

- (b) encourage Community Participation
- (c) complement the proposed new approach and planning ideas;
- (d) promote, assist and build capacity in finance mobilisation and mortgage insurance service;
- (e) review the impediments caused by :
 - (i) the Rent Control Act, which seriously affects property tax revenue and rental housing; and
 - (ii) leasehold interests;
- (f) encourage the development of vacant land by revising taxation policies;
- (g) promote an open and transparent active land and property market.

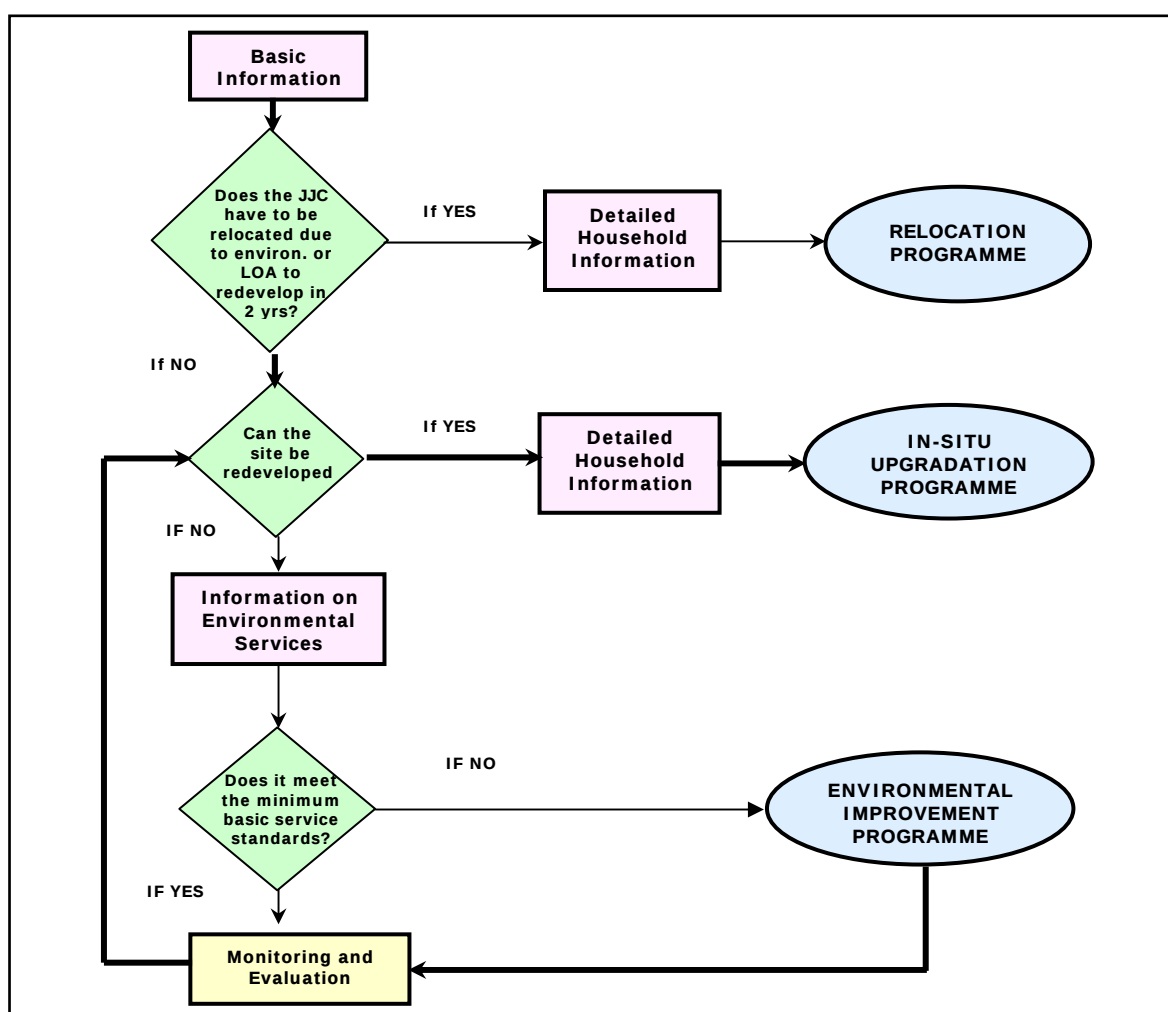
Policies for Jhuggies-Jhopris Clusters and Unserved Settlements

This study acknowledges that Jhuggies and unserved Settlements are part of the urban scene in Indian towns and cities. The slum residents support the urban economy through their labour market contribution and informal production activities. For these reasons the study recommends an upgrading and improvement approach as a matter of policy.



Source: Slum Winq MCD-Design and Planning Cell

Decision Making Process for Slum Improvement Programme



It is also felt that:

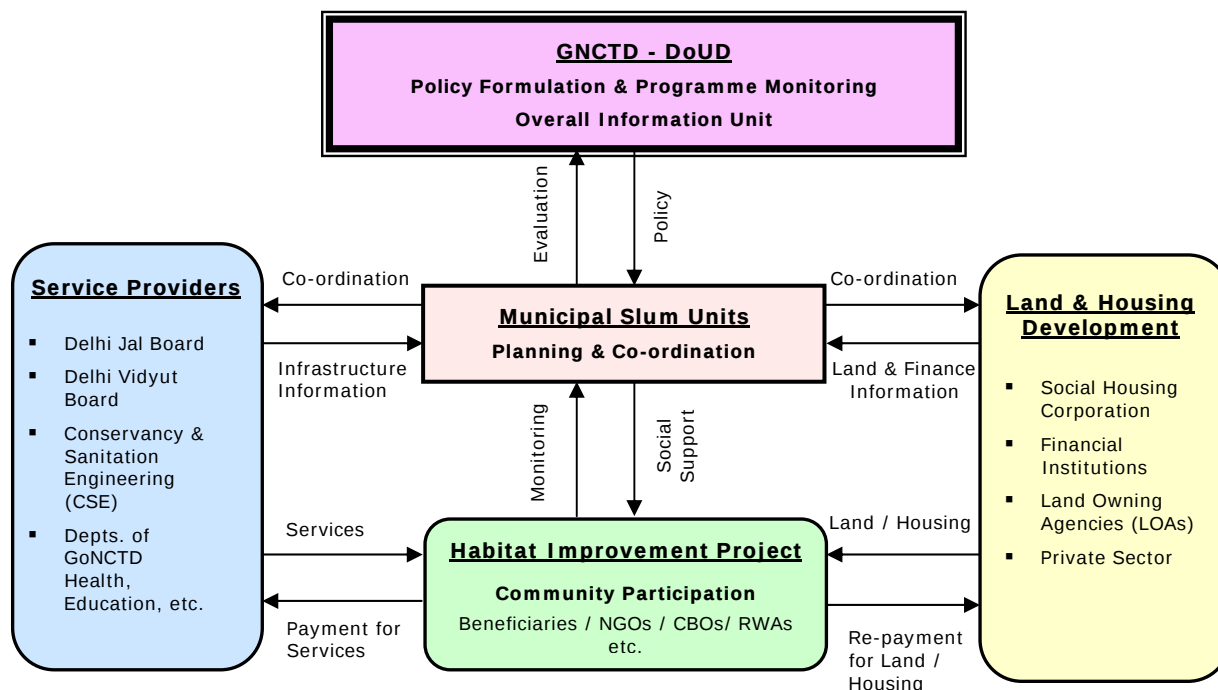
- the growth and proliferation of JJC's can be reduced by providing a continuous supply of affordable serviced land, linked to public transport, and located near to industrial and other employment opportunities.
- relocation should be kept to the absolute minimum but some relocation may be necessary to:
 - (i) Provide land needed for civic amenity purposes, and considered essential for the overall benefit of the city;
 - (ii) Provide land for development of commercial activities, where profits can be generated to facilitate the resettlement of affected families; and

Reduce excessively high population densities. The following matters should also be covered:

- Families which volunteer to relocate, or are required to relocate, should be offered larger plots or housing in new development areas with loan assistance; and
- Transferable and saleable title should be assured at the beginning and granted eventually to the allottees provided with housing units or plots, whether leasehold or freehold in upgraded JJC's provided they have paid any development costs which may have been levied;
- The relocation sites should be planned development providing necessary amenities as part of the project
- Cost recovery is essential to reduce the in-migration economic attraction of the city

Habitat Improvement for the Urban Poor

Agencies, Responsibilities and Project Formulation and Implementation Process



In preparing the upgrading / relocation programmes for slums and JJ clusters, community consultations must be undertaken.

(d) **Redevelopment strategies for degraded areas**

Many areas in Delhi, have shown signs of decay and have become ready for renewal. A number of old villages engulfed by development and older colonies have degenerated and are lacking many basic services. The so-called urban villages have become congested with commercial and high density residential properties. There are inadequate road widths, parking places or other amenities such as solid waste collection and drainage. Parts of the Walled City, market complexes and their surroundings look degraded and suffer from traffic congestion and lack of amenities. In addition, a number of unauthorised colonies and JJ clusters, some Dairy colonies which were developed to accommodate cattle stables and many industrial areas that are being treated as non-conforming are neglected and thus fall into this category.

It is necessary that the perspective and structure plans identify all such areas and specific policies are prepared for their improvement so that the living environment of Delhi, as a whole, is improved. Some general suggestions as policy measures are given below:

- (i) The Redevelopment plans should be prepared in a more transparent manner in consultation with local communities for each area.
- (ii) Mixed land use may be allowed provided the activities are not incongruent to each other or create environmental nuisance for other users, such as noise and air pollution, etc.
- (iii) Community centers for senior citizens, especially from middle and lower income groups. These are to offer them opportunities to come together and spend their time in a better environment and space.
- (iv) Regular lines of street prescribed to have minimum standard road widths to cater for traffic, drainage, solid waste collection sites and parking requirements, etc.

- (v) Concessions to be offered in the form TDR, FAR, marginal distances if parking is provided inside premises or land is made available for widening of roads or provision of lacking amenities such as, open spaces or other public use.
- (vi) Development Charges to be levied on taking up large-scale redevelopment benefiting the residents in a substantial way.
- (vii) Open or low-density areas in the nearby localities to be used for provision of lacking amenities in redevelopment areas.

(e) Preservation of Green Belt and Open Areas

Suitable policies will have to be adopted for protection of the Green Belt. The belt can provide vegetables, flowers and such other products giving employment to the rural population as well as needed products for the city. The green belt can also accommodate forest cover and such other users that can process the waste for composting and other suitable activities. It is necessary to take care that these activities will not affect the rural character of the belt. Past developments in the name of Lal Dora Zones must be avoided except for the genuine permissible needs of the village. Policies should provide that all open spaces and their use is protected from encroachment by any kind of development activity.

(f) Protection of Village Abadis

The old rural hamlets and their residents need to be protected from the onslaught of aggressive and exploitative commercial pressure of urban growth. The same time genuine needs of the local villagers need to be allowed as for the villages in the Green Belt. Urban villages in side the developed area which have become commercial centers can be redeveloped after protecting the original small abadi. The surroundings can be treated as congested area and suitably replanned as suggested in (d) above.

(g) Review of Development and Building Controls

The development and building controls need to be reviewed and simplified. Provision must be made for on plot car parking, related to the number and size of the dwelling units. Construction on stilts needs to be encouraged to provide space for children and the aged, and vehicle parking.

(h) Monuments and Cultural Heritage Buildings

Delhi has numerous historic buildings and sites. Unfortunately many have been engulfed by the rapid development of the city and are being neglected or damaged due to weathering or through pilferage. Some work for the protection of prominent buildings is going on but many others remain neglected. It is necessary to take steps in collaboration with the private sector and interested communities to protect such buildings and their surroundings. The following steps are suggested:

- Identify, survey map and list all monuments and cultural heritage sites and buildings; classify them as being of archaeological, historic, architectural or cultural interest and grade them as listed buildings, in the two categories as below:

Category I - Sites and buildings of exceptional global, national, religious and cultural importance, requiring preservation and conservation;

Category II - Other important sites and buildings requiring conservation.

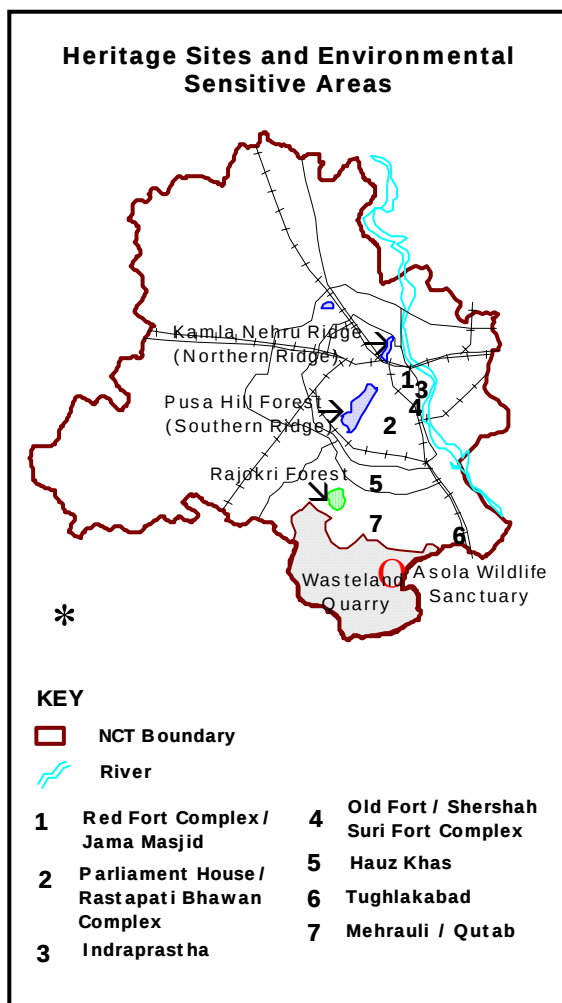
- Set out in a clear and concise manner, (a) the responsibilities of the Archaeological Departments and (b) the funding sources; and
- Prepare guidelines for the involvement of the Private Sector and interested community groups, NGOs etc.

(i) Environmentally Sensitive Sites

The following ecologically and environmentally sensitive sites need to be specially examined and suitable provisions made in the Perspective Plan and the

Structure Plans. These include areas such as:

- Yamuna river bed;
- the Asola wild life sanctuary;
- Rajokri protected forest;
- Pusa Hill and Kamala Nehru Ridge;
- District Deer Park, and
- Lodi Gardens.



(j) **Effective Public Participation in Perspective Planning Process**

Consultative procedures need to be established for involving professionals, and decision makers (MPs, MLAs) and the public at large in the preparation of the Perspective Plan, at city level. Wide publicity for inviting suggestions in the preparation and finalisation of the plan should be encouraged.

7.2.2 **Finalisation of Perspective Plan for NCT**

The Perspective Plan would be finalised by the Metropolitan Planning Committee taking into consideration all the aspects mentioned above and recommended policies. The plan formulation would be made only after consultation with NCRP Board and also with the various wings of, and subject to, the approval of GNCTD.

7.3 **Municipal Level Structure Plans - 10 years Planning Horizon**

7.3.1 **Municipal Structure Plans**

The proposals for institutional restructuring envisage the MCD being split into eight municipalities. This will provide for ten units of local Governments when the NDMC and the Delhi Cantonment Board are included. The new planning cells in these new municipal bodies could be formed from existing DDA and municipal staff.

Each municipal planning cell would be required to prepare structure plans with a ten year planning horizon. The plans would outline in more detail the land use and infrastructure provisions with proposed development projects and programmes. They would also provide a basis for the annual budgeting process.

Amongst other things the structure plans would:

- Identify sites for priority actions, particularly for new development, upgrading and redevelopment; and
- Provide guidelines and planning parameters for the proposed land use, building densities, etc.

Each municipality will have different priorities according to its location in the NCT area. For example municipalities abutting the rural area may have to absorb more newly forming or relocated families than the inner municipalities, where the main problems may be concerned with upgrading JJC's or service deficient areas. The work of the planning cells, at every level, should always include guidelines and

supporting policy documents that can influence and guide the next level down.

7.3.2 Effective Public / Community Participation

Participation in Structure Plans, Programme Formulation and Implementation

Adopting the following approach would ensure transparency and public participation.

- Meetings to discuss plans at zonal, ward and neighbourhood levels.
- Formal and frequent discussions in meetings at higher level with involvement of the local Councillors, MLAs, and MPs.
- Progress reports and relevant documents should be circulated for introducing transparency for advancement of the projects.
- Summary recommendations should be published for public information.

7.4 Local Areas, Zonal Plans and Programmes

7.4.1 Local Level Planning

Three different approaches for selected area developments

These can be handled in a manner similar to that described for municipal plans and programmes.

The local level planning and development for 5 years for the selected priority areas should be undertaken through the municipal bodies with required support of experts, consultants and, if needed, with the help of DDA.

It is also important that all the concerned sectoral agencies are involved in this process. The plans and programmes for 5

years should be formulated with full commitments and identified budget provisions, which can then be utilised for formulation of the annual plans and annual budgets.

Different approaches can be adopted for preparing layout plans and development of selected new areas, as follows:

- (i) Jointly with the private sector and service providing agencies by forming joint sector companies from the planning stage for programming and implementation.
- (ii) Jointly with land-owners and service sector agencies by undertaking land pooling and readjustment schemes.
- (iii) With property owners and service providing agencies.

It will take some time to introduce the new approach and the institutions required should respond to the unfolding situation.

7.4.2 Effective Community and Public Participation

Participation in local planning and development programming

- (a) Discussion procedures should be introduced at the operational levels. (slums, wards, communities, industrial estates urban/old villages).
- (b) Formation of Resident Associations should be encouraged.
- (c) Active agencies should have frequent interaction with NGO's, and CBO's in their respective fields.
- (d) A formal framework for consultation should be introduced
- (e) Specific programmes should be discussed with enlisted representatives of concerned agencies.

8. Plan Implementation

8.1 Procedures

The implementation of structure plans and local area plans will have to follow a new procedure of involving local communities, landowners, and private or public companies. Land pooling and readjustment techniques can be used in some areas or private companies could be invited to undertake detailed planning and implementation on the basis of design briefs.

8.2 Design Briefs for Development Projects and Private Sector Participation

Development projects will be identified in the planning process and could cover a number of possibilities, e.g. a new school or clinic or an all weather road. The top of the list however should always relate to issues arising from **housing demand and service deficiencies**.

Program and project identification recommendations should always be accompanied by a **design brief** which sets out the background leading to programme or project identification together with the planning parameters needed to be followed in the project design and procurement phase.

8.3 Special Units for Implementation of Selected Projects

8.3.1 Preparation for implementation

After the necessary approval of the programmes and projects has been granted, the **design briefs** should be forwarded to the implementation agency. In the case of new area development and upgradation projects this would, for the next few years or so, have to undertaken by specially constituted units. These special units would be staffed by secondments from DDA and MCD and given the task of implementing the identified programmes

and projects in accordance with the outlines given in the **design brief**.

Such projects could be formulated by the Joint Sector Development Corporation or through independent consultants. The implementation could then be through joint sector or private sector on BOT, BOLT, BOOM basis.

8.3.2 Approach for New Area Development Projects

Special units given the task of developing new areas or upgrading residential or industrial settlements would then proceed as follows:

- Advertise, seeking expressions of interest from landowners, developers and builders prepared to enter into a partnership agreement with the implementing agency, and form a development company.
- Choose a preferred group of partners and negotiate an agreement which should incorporate the following principles:
 - (i) Establish a development company and agree the equity contributions to be provided by each party. The Public Sector and land owners equity could be the assessed land values, plus some capital, developer and building sectors interests would be asked to provide capital, bonds or guarantees;
 - (ii) Specify the developer as the lead partner;
 - (iii) Undertake a marketing analysis, refine the design brief, discuss any changes with the planning agency representatives and obtain an Environmental Clearance Certificate;
 - (iv) Prepare specifications and infrastructure designs (to conform to the utility authority requirements), cost estimates based on market rates and review the marketing and cost recovery implications;
 - (v) Seek bids, or have the work carried out by the developers;

- (vi) Lease / sell the plots, construct buildings provide documents and commence cost recovery; and
- (vii) Make arrangements for operation and maintenance.

There are many more points of detail which can be developed if needed with the help of consultants.

8.3.3 Approach for Upgradation Projects for Existing Developed Areas

Similar agreements are recommended for the upgrading programmes. In this case the agreements and associated development company would include the residents association. CBOs and NGOs could also be involved as shareholders or as non-executive directors.

8.3.3 Need for Technical Assistance

The existing agencies have little experience of implementing projects in the manner set out above. The legal agreements will have to be carefully drafted and a step by step “learning by doing” process should be adopted.

One or two pilot sites should be chosen in the first instance. Technical assistance

would be needed. A successful outcome from the initial projects would lead to a rapidly expanding program.

8.4 City Regeneration Task Forces

A new approach for small projects. Certain small and service deficient areas have a number of different problems e.g. dairy colonies, industrial clusters, and low-income areas with a mixed land use.

Upgrading areas of this sort does involve a number of agencies like Animal Husbandry, DJB, DVB, DDA, MCD and Revenue Department etc. In the past, despite the availability of financial resources upgrading programs have faulted because of lack of leadership and co-ordination. Problems of this sort can be dealt with by:

- Forming a special purpose unit;
- Appointing a specific person to be accountable and take the lead and have a team of officers with delegated powers from the concerned agencies;
- Forming Public / Private Sector Partnerships and proceeding in the manner described above for upgrading JJs and unserved settlements or such other projects.

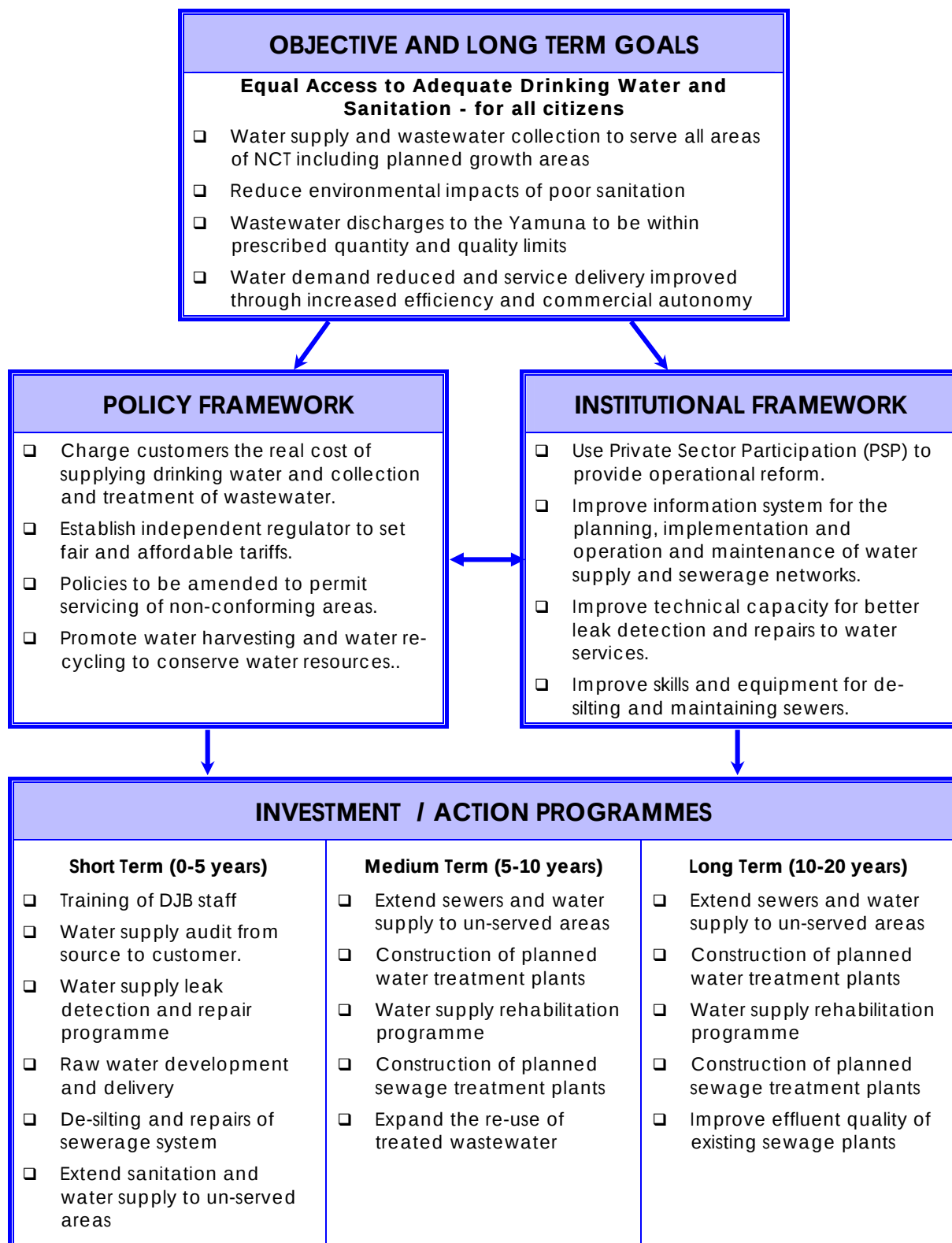
SECTION III

Environmental Infrastructure

Chapter 9

WATER MANAGEMENT

Summary Sheet



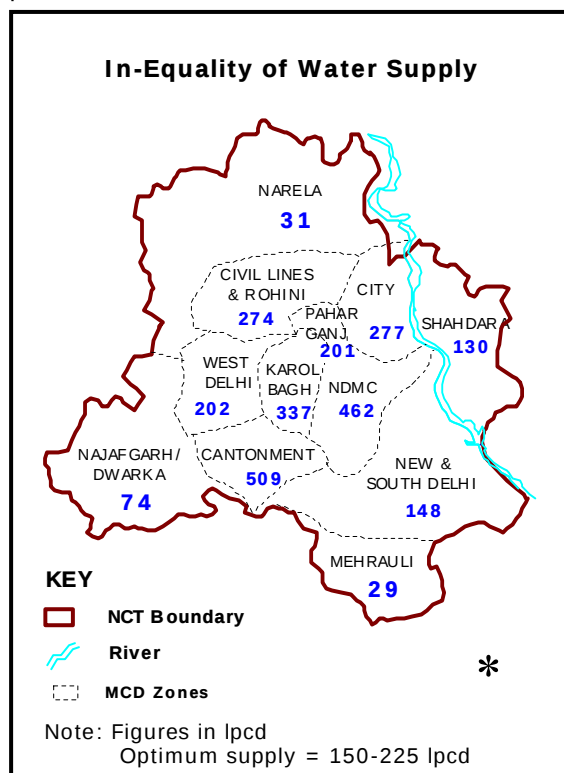
9. Water Management

9.1 Water Supply

9.1.1 Present Deficiencies

Based on the estimated 2000 population, and design demand, the quantity of raw water treated and distributed in Delhi should at present be adequate. However, there is in-equity in the supply of water. Some areas receive quantities of water far in excess of design norms while 10% of the population has no piped water supply and 30% has grossly inadequate access to safe drinking water. It is estimated, also, that over 40% of water distributed is un-accounted for or lost through leaking pipes.

As a result of rapid urban development that has out-stripped expectations, much of which has been un-planned or un-controlled, the water supply infrastructure has failed to match demand. As a consequence, households and businesses have had to resort to exploiting ground water resources that in places have become depleted or saline. Many areas have to rely on water tankers, particularly the urban poor.



Source: Delhi 1999 – A Fact Sheet NCRPB

9.1.2 Objectives and Long Term Goals

The authorities not only have the task of planning and catching-up on the back log of a deficient service but also have to make provision for future growth. Losses have to be reduced to financially manageable levels. Production and supply of potable water has to be increased and made more efficient. The Delhi Jal Board (DJB) has to be more commercially orientated and the customer (households, businesses, industry) have to be prepared to pay for the “real cost” of supply. At present only about 35% of the costs are collected.

The Long Term Goal is to:

- Provide all citizens in the NCT equal access to an adequate quantity of potable water within the available natural water resources.

To achieve this long term goal the objectives will require:

- Greatly improved efficiency in operation and maintenance of the water supply system.
- Reduction of un-accounted for water to less than 20% of water supplied.
- Providing a 24 hour piped water supply.
- Water harvesting and wastewater re-use to reduce the demand on treated piped water for non-essential use.
- Progressive development of water sources and treatment facilities.
- Systematic expansion of the water distribution network to all un-served urban areas.
- Coordinated planning and development of the water sector for future urban growth.

9.1.3 Policy Framework

To achieve these objectives, policies will have to be adopted by the government departments and endorsed by the public in general. In strategic planning for the

future growth of the city very careful consideration must be given to future sources, availability of water and access to the public. To date, DJB has been restrained from investment due to the low rates charged to customers for the supply of water and the legal constraint imposed on providing infrastructure services to unauthorised colonies. This has to be corrected.

The government policies must cover the issues of:

- The Delhi Jal Board to have autonomy to raise water supply tariffs to become financially self-sufficient
- The establishment of an independent regulator to ensure service delivery targets are met and to set fair and affordable rates in consultation with consumer associations
- Water supply tariffs to cover the cost of treatment, distribution and operations
- Urban development to be planned in conjunction with water availability
- Monitoring and controlling the extraction of ground water
- Groundwater extraction license fees and water cess to reflect cost to the environment
- Promotion of water harvesting and re-use at household and institutional level

Permitting DJB to raise tariffs, but controlled by an independent regulator, will give confidence to investors and allow management to plan and operate in a stable environment providing long term sustainability, on a non-political basis.

Many of these issues have been discussed for many years, but need the government and political will to enforce them.

9.1.4 Institutional Framework

It is clear that the DJB has been unable to keep pace with the rapid urbanisation of the city and has not been sufficiently equipped with either the appropriate technical skills or the equipment for implementing, operating and maintaining

an efficient and responsive water supply undertaking.

The DJB has to be more commercially orientated, with improved information systems for analysing operational and delivery performance, with corresponding better financial management.

To undertake the policy changes the institutional framework will require:

- Expansion of Private Sector Participation (PSP) to increase efficiency through incentive and performance management.
- Improved public relations, information and transparency of operations
- Consumer involvement at all levels from planning to implementation.
- Development of low-cost water supply schemes through community partnerships.

The encouragement of PSP financing and higher cost recovery will free scarce public funds for other important social investments, in particular, poverty alleviation and slum improvement programmes. The DJB is already using PSP in the construction and operation of water treatment plants. The next step would be to extend the private sector involvement to include operation and maintenance of a discrete distribution system and supply to customers, in the same way as the NDMC or Delhi Cantonment Board operate as bulk operators.

Expanding the water supply coverage also helps poverty alleviation by allowing consumers to switch from high cost alternative supplies, such as from private tankers, to piped services.

9.1.5 Investment and Action Programme

With 40% of the present population of Delhi without an adequate piped water supply, large investments are required to make up the deficiencies, even before starting to address the issue of growth. An accelerated programme of investment is needed in order to arrest the present decline in service provision and to address

the new water supply demand from the new urban developments that will be built to serve the additional 80,000 households which are forming annually.

Water Demand Increase

The raw water demand in the next 20 years is predicted to climb from the present 2,700 to 4,700 mld., an increase of 75%, in order to cater for both the present deficiencies and future predicted population growth.

Sources of the raw water will be from:

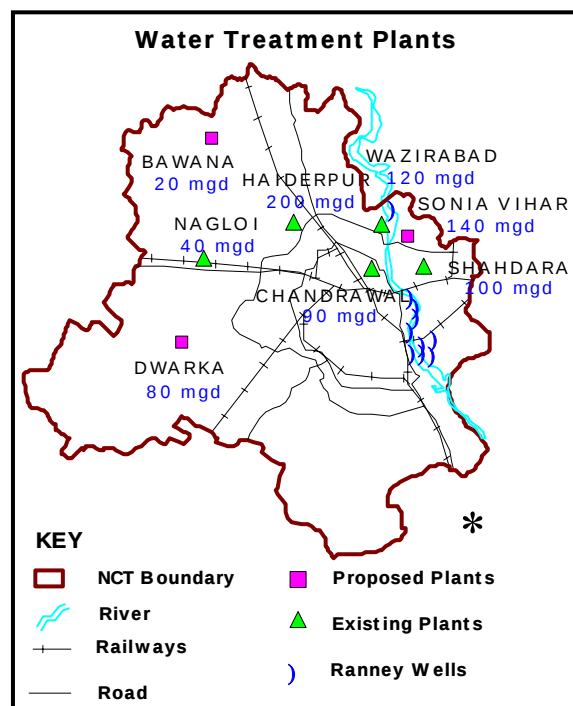
- Teri Dam – 730 MLD
- Leakage reduction in the carrier from Munak to Haiderpur - 720 MLD
- Additional water from BBMB – 180 MLD

Long term sources may include:

- Renukal Dam (Giri River, HP) 1,250 MLD
- Kishau Dam (Tons River, UP) 1,690 MLD
- Lakhawar Dam (Tons River) - 610 MLD

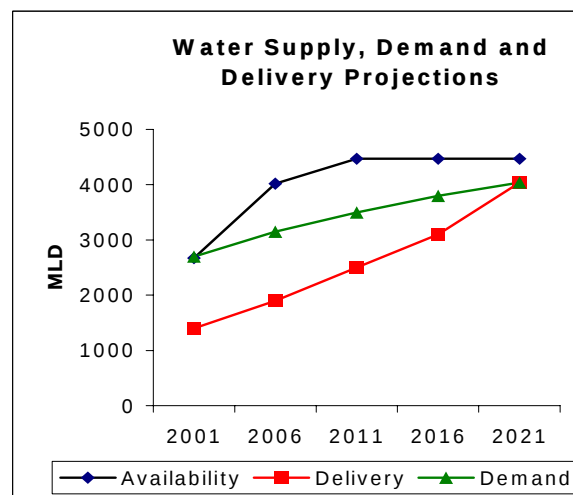
However, raw water supply to Delhi may be restricted to only 720 MLD in compliance with the agreement of May 1994 by the five riparian states.

Further exploitation of the Yamuna River basin is also possible, however, care must be taken to avoid contamination from pollution from the river due to excessive draw down.



Source: Delhi 1999 – A Fact Sheet, NCRPB

Water treatment plants are planned or are under construction to increase the supply of water for distribution to approximately 4,450 MLD. by 2010. Thus, a further treatment capacity of 250 MLD. (50 MGD), with corresponding raw water sources, would need to be developed to satisfy water supply demand in 2021.



Existing Losses - Future Supply

Much of the future demand would be satisfied if the water losses in raw water transmission and treated supply can be drastically reduced. There needs to be a water audit of the whole water supply system, from source to consumer. Bulk water meters in distribution districts need to be installed and the system properly analysed and controlled to provide more equity in supply.

Water Conservation

Methods of water re-use and conservation require to be investigated further. This should include the re-use of treated wastewater for irrigation of horticulture thus allowing a sustainable level of groundwater to be used for domestic use. Rainwater harvesting and storage by householders and institutions should be encouraged for non-drinking purposes.

Investments

Table 9.1.5 indicates the major investment requirements at base 2000 prices.

Table 9.1.5: Water Supply – Major Investments for Short, Medium and Long Term

Programme	Investment (Rs Million)	Comments
SHORT TERM (2001 – 2006)		
Technical Assistance to DJB including capacity building for better system management.	50	Preparation of short term investment programme including water audit with location and condition surveys.
Leak detection and network rehabilitation programme	1,200	DJB unit to be strengthened to accelerate rehabilitation work
Expansion of trunk / distribution network to un-served and growth areas	2,600	Planned in relation to water availability from treatment plants
630 mld (140 MGD) Sonia Vihar Water Treatment Plant including transmission mains	4,200	Finalisation of design. Raw water to be from Tehri Dam
Ranney Wells 450 mld. (100 MGD) including transmission mains	200	Deep aquifer wells in the Yamuna flood plain within the existing resource
Raw water parallel conduit from Munak to Haiderpur	5,800	Water losses reduced and quality preserved if closed or piped
Sub-Total	14,080	(US\$ 320 million)
MEDIUM TERM (2007 – 2011)		
Design consultancy to DJB	20	Preparation of medium term investment programme including continuation of condition surveys.
Leak detection and network rehabilitation programme	800	DJB unit to be strengthened to accelerate rehabilitation work
Expansion of trunk / distribution network to un-served and growth areas	3,600	Planned in relation to water availability from treatment plants
180 mld (40 MGD) Okhla Water Treatment Plant	2,800	Pending agreement on availability of raw water
270 mld (60 MGD) Dwarka Water Treatment Plant	4,200	Subject to availability of raw water
Sub-Total	11,420	(US\$ 260 million)
LONG TERM (2012 – 2021)		
Design consultancy to DJB	20	Preparation of long term investment programme.
Leak detection and network rehabilitation programme	1,400	DJB unit to be strengthened to accelerate rehabilitation work
Expansion of trunk / distribution network to un-served and growth areas	7,200	Planned in relation to water availability from treatment plants
Yamuna water sharing from Renukal Dam, Kishau Dam, and Lakkhawar Dam Investment may be required after 2010	20,000	Long lead in period and require extensive planning for development and water sharing agreements.
Sub-Total	28,620	(US\$ 650 million)
TOTAL (indicative cost in Rs million)	54,120	(Approx. US\$ 1230 million)

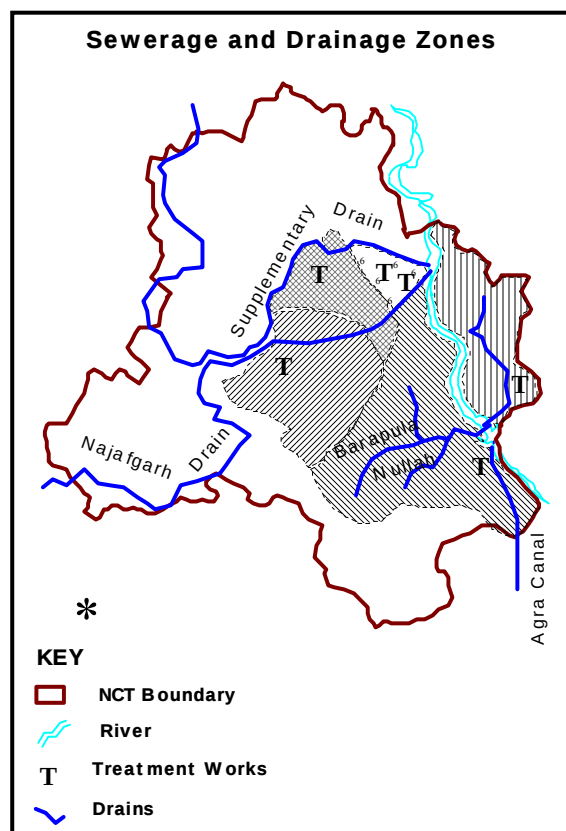
Source: DJB / DUEIIP

9.2 Wastewater Management

9.2.1 Present Deficiencies

About 45% of the total population currently have no sewerage service. In many of these communities, especially those which are in-unauthorised colonies and of the urban poor, human waste is disposed of using individual or communal on-site sanitation or open defecation. Wastewater is disposed of to the ground, to open channels or direct to the surface water drains, which ultimately either discharge to the Yamuna or transport the wastewater for irrigation, generally, outside the city.

The problem is made worse by the poor condition of the sewerage system, where many sewers are blocked with large quantities of silt or have collapsed and the sewage diverted to the surface drainage network. As a result most of the sewage treatment plants (STPs) are operating below design capacity and the stormwater drains act as surrogate sewers causing extensive pollution in the river, with the associated environmental and public health impacts.



9.2.2 Objectives and Long Term Goals

The authorities not only have the task of planning and catching-up on the deficiency of appropriate sanitation or sewerage in the city but also planning and providing infrastructure for future urbanisation within the NCT.

The Long Term Goals must be to ensure:

- equal access to appropriate sanitation and drainage - for all
- the environmental and health impacts of poor sanitation are greatly reduced
- the Yamuna river meets its prescribed quality classification, and
- protection of the city from flooding

To achieve these long term goals will require the objectives of :

- providing systematic repair and preventative maintenance of the sewerage and drainage networks
- investment in better solid waste management (see following section)
- expanding the existing wastewater collection to serve all areas and planning for growth
- upgrading and constructing sewage treatment plants
- providing local wastewater treatment where primary sewers are not available
- providing appropriate sanitation where sewerage is not practical
- urban planning to provide public spaces for peak flood water retention
- on-channel storage on main drains to attenuate flood flows.

9.2.3 Policy Framework

To achieve these objectives, future policies will have to include :

- the Delhi Jal Board to have autonomy to raise sewerage tariffs to become financially self-sufficient
- the establishment of an independent regulator to ensure service delivery targets are met and to set fair and

affordable rates in consultation with consumer associations

- sewerage tariffs to cover the cost of sewage collection, treatment and operations
- ensuring properties are connected to the sewerage network where provided
- promoting environmental health awareness and good hygiene practices especially to the urban poor.

9.2.4 Institutional Framework

It is clear that the DJB has been unable to keep pace with the rapid urbanisation of the city. Much of this is due to the legal constraint imposed on providing infrastructure services to un-authorised colonies. But also, the DJB has not been sufficiently equipped with either the appropriate technical skills or equipment for implementing, operating and maintaining an efficient and responsive sewerage undertaking.

To meet these challenges the institutional framework will require:

- expansion of Private Sector Participation (PSP) to increase efficiency through incentive and performance management
- computer aided design and management information systems for planning
- better information on condition and operation for maintenance of the sewerage systems
- appropriate equipment and training for de-silting and renovating sewers
- improved public relations, information and transparency of operations
- consumer involvement at all levels from planning to implementation
- encouragement of NGOs to facilitate on-site sanitation of un-sewered areas
- provision of appropriate sanitation facilities through community partnerships

The encouragement of PSP financing and higher cost recovery will free scarce public funds for other important social investments, in particular, poverty alleviation and slum improvement programmes. A first step for PSP might be to encourage private developers to provide their own sewerage and treatment facilities, which they would operate and maintain.

However, the drainage and sewerage authorities have also been hampered by the poor collection and indiscriminate disposal of solid waste within the city. Much of the waste generated daily finds its way into the sewers and drains, causing blockages. For improvements in the sewerage and drainage systems to be effective, it is an essential requisite that the municipal authorities also make improvements in their solid waste management operations.

9.2.5 Investment and Action Programme

A long term goal is to ensure that the Yamuna river achieves its status as a Class B river, with bathing water standards. For this a number of existing sewage treatment plants will need to be up-graded.

However, the priority must be to ensure that the wastewater collection system is first expanded to cover the maximum practical area of the city and is properly operated and maintained.

With 45% of the present population of Delhi without adequate sewerage or sanitation facilities, there is desperate need to reverse this situation. However, it is essential that any expansion of the sewerage system is planned and undertaken in conjunction with the expansion of the water supply network. Sewers need a reliable water supply system for effective operation. Even so, experience has shown that sewer design must make provision for regular and easy access for inspection and de-silting for which costs, funds must be allocated in the operation and maintenance budget.

The following table 9.2.5 indicates major investment requirements at base 2000 prices:

Table 9.2.5: Wastewater – Major Investments for Short, Medium and Long Term

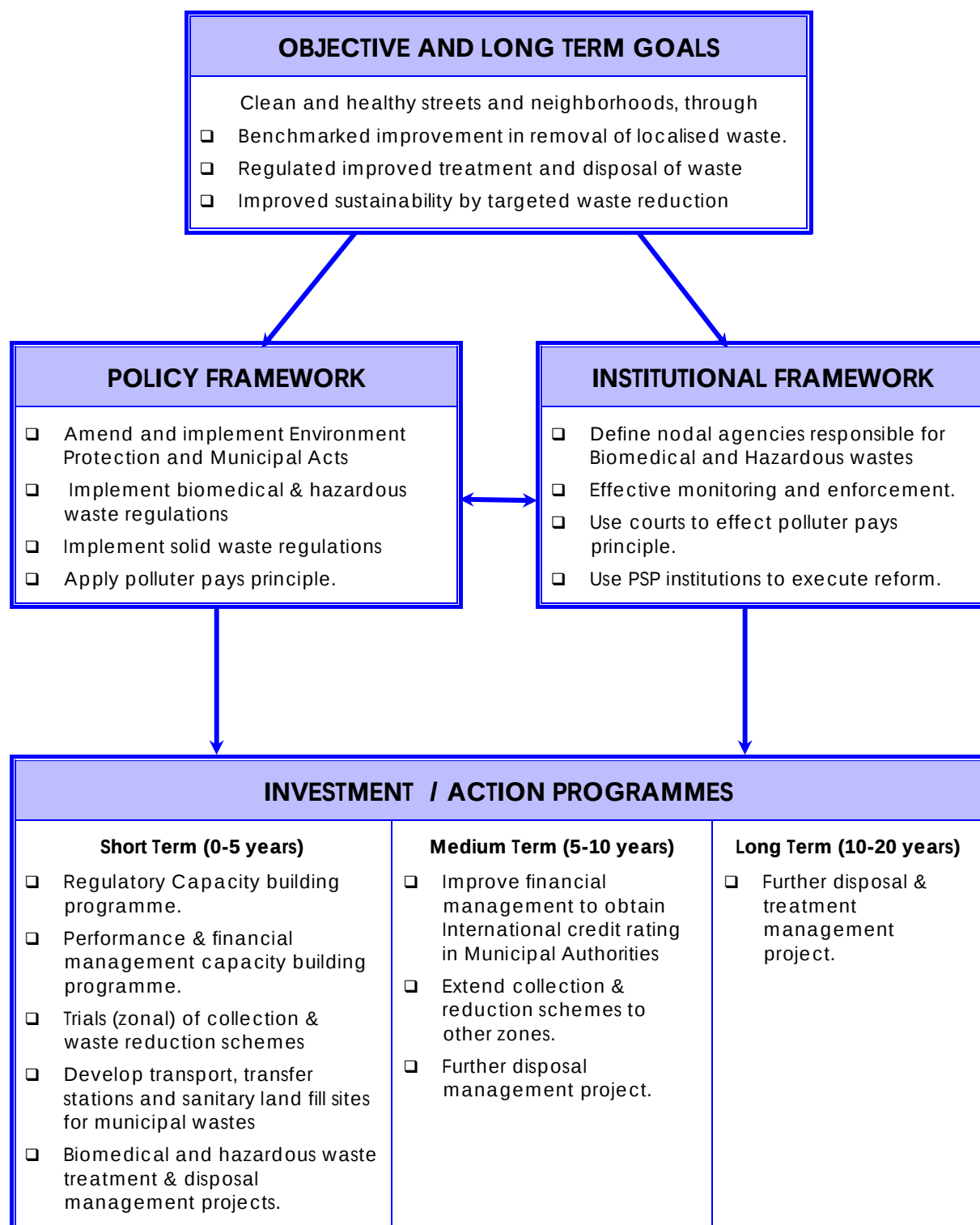
Programme	Investment (Rs Million)	Comments
Short Term (2001 – 2006)		
Technical Assistance to DJB including capacity building for better system management.	50	Preparation of short term investment programme including location and condition survey of existing sewerage.
De-silt and renovate existing sewerage system	4,500	Proposals made to Yamuna Action Plan for funding trunk sewers
Facilitate on-site sanitation / community toilets to urban poor	750	Planned as part of the Environmental Improvements to Urban Poor Program
Expand sewerage system to connect un-served areas	1700	Planned in relation to water supply and existing STP capacity
Trans-Yamuna STP 250 mld. (55 MGD)	2,700	Existing STP at full capacity.
Okhla STP 155 mld. (35 MGD)	1,650	
<i>Sub-Total</i>	<i>11,350</i>	<i>(US\$ 260 million)</i>
Medium Term (2007 – 2011)		
Design consultancy to DJB	20	Preparation of medium term investment programme including continuation of condition surveys.
Facilitate on-site sanitation / community toilets to urban poor	650	Planned as part of the Environmental Improvements to Urban Poor Program
Expand sewerage system to connect un-served areas	1,400	Planned in relation to water supply and existing STP capacity
Keshopur STP 295 mld (65 MGD)	3,200	
Rithala STP 250 mld (55MGD)	1,600	
Coronation Pillar STP 90 mld (20MGD)	980	
Additional sewage treatment for urban growth areas 400 mld (90 MGD)	4,800	Developed in conjunction with water supply expansion and urbanisation
<i>Sub-Total</i>	<i>12,650</i>	<i>(US\$ 295 million)</i>
Long Term (2012 – 2021)		
Design consultancy to DJB	20	Preparation of long term investment programme.
Expand sewerage system to connect un-served areas	2,400	Planned in relation to water supply and existing STP capacity
Up-grade existing STPs to satisfy Yamuna classification and as source of raw water	9,880	Introduction of tertiary treatment and expansion of effluent re-use
Additional sewage treatment for urban growth areas 800 mld (180 MGD)	9,600	Developed in conjunction with water supply expansion and urbanisation
On-channel storage and flood control gates on main drains	100	Long term requirement to cater for increased urban run-off
<i>Sub-Total</i>	<i>22,000</i>	<i>(US\$ 500 million)</i>
TOTAL (indicative cost in Rs million)	46,000	(Approx US\$ 1,065 million)

Source: DJB / DUEIIP

Chapter - 10

SOLID WASTE MANAGEMENT

Summary Sheet



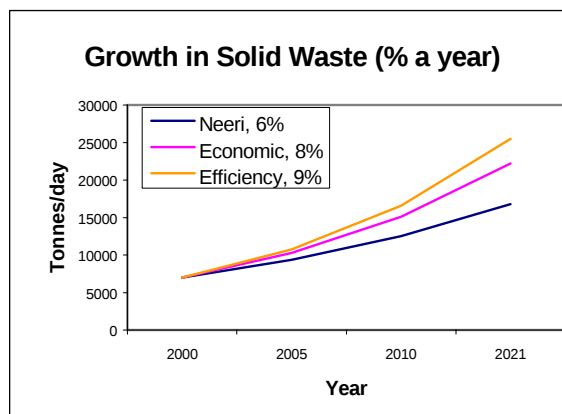
10. Solid Waste Management

10.1 Goals and Long Term Objectives

10.1.1 Clean, Healthy Streets and Neighbourhoods

Cleaner cities attract people and investment. Cleanliness is an indicator of good urban management. Poor solid waste management practices affect the health and amenity of cities in several ways:

- by transmitting disease to residents and waste workers
- by clogging drains and sewers
- through contaminated leaching
- through visual and smell impacts.



The present municipal waste production in the NCTD is approximately 7,000 tonnes per day. Growth assumptions in the Box above, of 6%, 8% (economic growth plus 2%) or adding 1% for collection efficiency, will result in a major expansion of waste. Thus, the quantity of waste produced in 2021 would be between 17,000 and 25,000 tonnes per day. Even if it was possible to provide the maximum reduction of waste through composting and incineration there would still be a minimum 20% residue of 4,000-5,000 tonnes per day that would have to be landfilled in 2021.

10.1.2 Benchmarked Improvement in Collection

Who says a locality is clean? Ultimately it is the residents. This demands a contract or charter between the responsible public

authority and citizens. A charter requires policing. This may be done by a service level agreement for a collection and transport service be it public or commercialised.

Benchmarking is a way to monitor and evaluate service levels. It may be done by comparison to best practice elsewhere in India or, within Delhi, between competing zones. Competition in quality and incentives for good performance might increase service standards.

10.1.3 Regulated Improvement in Treatment and Disposal

Transfer, treatment and disposal of waste are big business. High profits may be made by short-cutting adequate standards by either the public or private sector. Ensuring against this requires effective regulations of accepted and constantly improving standards. A powerful and accountable regulator will ensure good practice in the bulk downstream business of waste management. It must ensure best economic practice to minimise environmental damage from:

- water and air contamination
- unsightly developments
- transport inefficiency.

Enforced and time-bound improvements in collection efficiency and treatment / disposal practices will reduce the risks of health damage and ensure better amenities for a growing Delhi.

10.1.4 Disposal in Sanitary Landfill

Incineration is expensive (Rs 3000/tonne compared to about Rs 300/tonne for sanitary landfill). Nowhere in the world has large scale composting proved economic and is dependable on a ready market for the product. So, the scope for waste reduction is limited. Landfill is the only economic option for the foreseeable future. Thus, even assuming moderate waste minimisation can be achieved, planning must allow for the disposal of at least

15,000 tonnes of municipal waste per day by 2021. During the next 20 years this would require over 800 Ha (2,000 acres) of land. There is no shortage of land in public ownership but there are competing uses for that land. A solution might require the co-operation or joint development of municipal refuse disposal sites outside the NCTD with DMA towns.

10.1.5 Improved Sustainability

Cleanliness must be paid for. Residents are willing to pay for private cleaners and better standards. Waste, which is costly to manage, must be reduced as much as is economical through waste recycling and minimisation.

Waste Minimisation

- Use of cloth and paper bags, not plastic
- Large plot holders to have small compost pits in their own landscaped areas
- Segregating wastes in the house with the municipality to provide separate containers for recycleable waste
- Separate collection from large generators of organic wastes, like mandis, sent for composting. Combustible wastes from timber markets or industries sent to 'waste to power' generating centres

There are great opportunities for India to pioneer waste minimisation programmes. It should develop waste management businesses that can compete with other international contractors globally.

10.2 Policy Framework

10.2.1 Develop and Apply the Existing Laws

There is no shortage of legislation governing solid waste management. These are:

- biomedical waste regulations (see below)
- hazardous waste regulations (see below)
- draft solid waste regulations (revised).

Legislation must support phased improvements towards nationally accepted targets. The laws need to be enforced. Today that enforcer is the Supreme Court because there is a vacuum in environmental enforcement. Tomorrow an effective environmental regulator must

ensure that targeted improvements are achieved.

Apply Polluter Pays Principle

The policy – 'making polluters pay' needs to be enlarged. All polluters should have the prime obligation to take care of their own waste. This may be applied in two phases:

- by extending the obligation to all commercial waste generators, and subsequently
- by making residents pay the full costs of service.

Making the polluter pay may be by applying adequate charges for a public service or by enforcing the minimisation or management of their own waste. Either policy requires strict limitation of fly-tipping (illegal dumping). Laws against fly tipping must be developed and more stringently enforced.

10.2.2 Separate Environmental Regulatory and Service Delivery Functions

Environmental regulation must be separated from the executive functions of solid waste management. The Municipal Authorities are the key responsible agencies for municipal waste. But others who are also responsible under existing legislation are:

- commercial sector (public and private), but only in the management of their hazardous wastes
- bio-medical sector, but only in the disposal of clinical waste.

The new regulatory policy would cover both these enterprises as well as the municipal bodies. The solid waste regulations would require periodic amendment, and enforcement, to enable constantly improving standards in solid waste management.

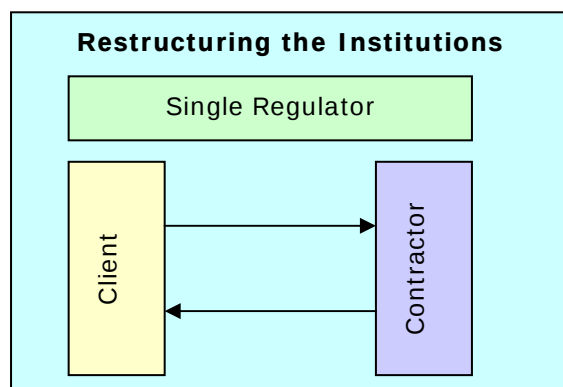
10.3 Institutional Framework

10.3.1 Effective Monitoring and Enforcement

Solid waste management needs effective environmental monitoring and a strong

regulator. For this the DPCC would need to be strengthened and properly resourced.

It would be able to view all waste management as an integrated whole. It should also be active in persuasion to achieve improved levels of waste pollution abatement. In addition it would have the powers to take legal action against either or both the contractor and the client for causing environmental pollution or poor management.



Thus, the municipal authorities would require strong managerial capacities to manage and control the private operators.

10.3.2 Use the Legal System to Effect Polluter Pays Principle

The wide gap between a persuasive policy of achieving objectives and the use of constitutional legal remedies must be bridged. An effective environment agency for Delhi that polices the provisions of the Environment Protection Act would have the power to fine polluters (subject to judicial appeal) and to itself initiate court proceedings.

10.3.3 Use PSP Institutions to Execute Reform

Private Sector Participation (PSP) must be used as an agent for change. There is solid evidence that PSP may achieve substantial cost savings with improved quality of service. PSP does not mean privatising solid waste management. PSP will mean using "Third Sector" organisations such as CBOs and NGOs as well as the commercial sector. Such initiatives as exist in Chennai, Bangalore and other cities may serve as models. Public private partnerships (PPPs)

are internationally used to build and operate large downstream reduction and disposal facilities. Contracting out to the commercial or "third" sector is better advanced elsewhere in India.

All these PSP possibilities may secure capital finance and better management. They are not however a free lunch. The capacities of local bodies to manage service contracts must be created. They are the clients for any likely PSP initiative. They, as clients, must be enabled to negotiate toughly and manage expertly with their contractors who they will pay. Advantages from developing those skills may make them better managers of in-house operations.

10.4 Bio-medical Waste

10.4.1 Overview

It is assessed that the biomedical waste generation is around 20-25 tonnes per day of which much finds its way into municipal receptacles and is disposed of along with municipal waste. This leads to health hazards for municipal workers and rag pickers with environmental impacts.

Biomedical Rules (Handling Management) 1998 have been notified by Govt. of India. As per these rules, all Institutions generating biomedical wastes have to take steps to ensure that such wastes are handled without any adverse effect on human health and environment.

Most of the large hospitals in Delhi have provided incineration facilities and in some cases autoclaving facilities but these facilities are close to residential areas and are potential environmental hazards. However, medium and small hospitals and nursing homes have not provided such facilities.

10.4.2 Objectives and Long Term Goals

The Long Term Goal is to protect the environment and the health of the general public by proper disposal of bio-medical waste.

The fundamental objectives of the project are to improve the separation, collection treatment and disposal of bio-medical wastes. The key objectives are:

- To require units generating biomedical waste to separate bio-medical contaminated waste at source for collection and external treatment.
- Development of the appropriate treatment and disposal sites.
- Provide awareness and training to the concerned staff and the operators.

10.4.3 Policy Framework

All the bio-medical waste generators are required to conform to relevant regulations. It is their responsibility to store and transport and dispose of the waste.

10.4.4 Institutional Framework

There are a large number of small clinics and private hospitals in the NCT that do not have the capacity to set up and operate individual treatment facilities. The Department of Health Services or the municipal authorities could license private contractors to set up treatment facilities on a BOT basis. GNCTD or the municipal authority could provide the appropriate land. The user would pay the user charges. The municipal authority or the DoHS would manage the contract and the DPCC would monitor and regulate the activities.

10.5 Hazardous Solid Waste

10.5.1 Overview

There is no up to date inventory or detailed study of hazardous waste generated by industry in the NCT. Most of the industrial units in Delhi are small scale units and much of the hazardous solid waste will be in the form of sludge from CETP's and individual ETP's. The biggest problem are small scale pickling units, electroplating and anodising and dyeing units and vehicle service stations. According to a rough estimate the quantum of waste could be as high as 30,000 tonnes/year or about 100 tonnes/day. This quantity could be reduced through waste re-processing enforced

through a strong monitoring and regulating process with appropriate charging for treatment and disposal of the waste generated.

10.5.2 Objectives and Long Term Goals

The long term goal is the protection of the environment and public health from the illegal disposal of toxic and hazardous industrial waste.

The fundamental objectives are to:

- Ensure that all industrial units that use hazardous materials and chemicals dispose of their waste in a properly controlled manner
- Reduce the quantity of wastes that has to be disposed of through long term containment
- Improve environmental performance of industrial units in regard to the management of hazardous solid wastes.

10.5.3 Policy Framework

All industrial units are required to conform to hazardous waste (Management and handling) Rules 1989. It is their responsibility to store, transport and dispose of the hazardous waste. The polluters are fully responsible for management of hazardous wastes. However, most of the industrial units are too small to organise the management of their wastes effectively.

The Honorable Supreme Court has directed that major polluting industries should be re-located out of the NCT. However, the GNCTD has appealed to this directive on the grounds of the financial hardship that would be imposed on small industrial units.

The GNCTD through the DSIDC is constructing a number of CETPs for treating industrial effluents but there is no facility for treating or disposing of sludges produced, which might be toxic or hazardous. Waste disposal facilities should also be provided in order to prevent the illegal dumping of dangerous wastes.

10.5.4 Institutional Framework

It is the responsibility of the DPCC to monitor the collection and disposal of hazardous waste. The DPCC can also remove operating licenses and close industrial units that do not comply with the environmental regulations.

An inventory of hazardous waste production should be developed from the register of industries to be prepared by the Department of Industry.

Following the preparation of the inventory, the municipal authorities or the DSIDC should, through the licensing of a private contractor in a PSP contract, develop the system of collection and disposal facilities for hazardous wastes. For this an amendment would be required in the Municipal Act to transfer the management responsibility. The land would be provided by the GNCTD or the municipal authority, the monitoring and regulation would be under the supervision of the DPCC.

Each industry producing hazardous wastes would be charged an appropriate rate dependent on the volume and toxicity of the waste produced. The charge rates should be set at levels that not only cover the cost of site operation and long term maintenance but also act as incentives to encourage waste minimisation through on-site treatment facilities to reduce the quantity of wastes needing long term containment.

10.6 Investment Programme

10.6.1 Municipal Waste

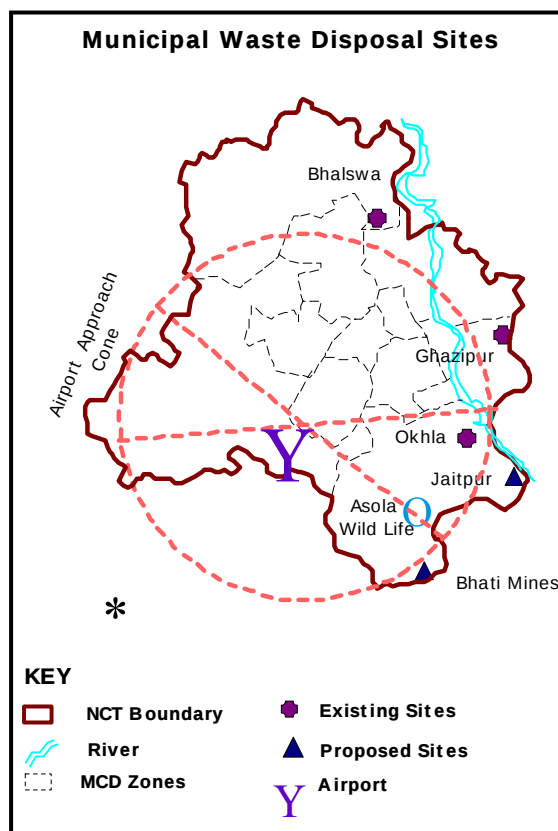
Successful improvement in solid waste management in Delhi requires investment in both upstream and downstream activities. Upstream improvements in collection efficiency will inevitably lead to greater quantities of waste deliveries downstream. Downstream changes in reduction and disposal may act as a key to spread change upstream.

The investment programme will force these synergies. It is also designed to be a catalyst for changes in policy and

management practices. These are far more important than investment outputs for the long term sustainability of the sector.

In the **municipal waste** stream, investment will begin in providing landfill for the irreducible minimum of disposal. Two large landfill sites need to be commissioned within the next 5 years.

A parallel investment will “roll out” proven collection and reduction methods across all MCD zones. In the immediate term three large zones should be improved using different approaches.



10.6.2 Bio-medical and Hazardous Wastes

For both bio-medical and industrial hazardous waste, centralised treatment / disposal facilities need to be developed within the next 3 years through PSP contracting.

10.6.3 Investment Costs

Table 10.6.3 provides an indication of projected costs for solid waste management development at base 2000 prices.

Table 10.6.3: Indicative Costs for Solid Waste Management Investments (at 2000 base prices)

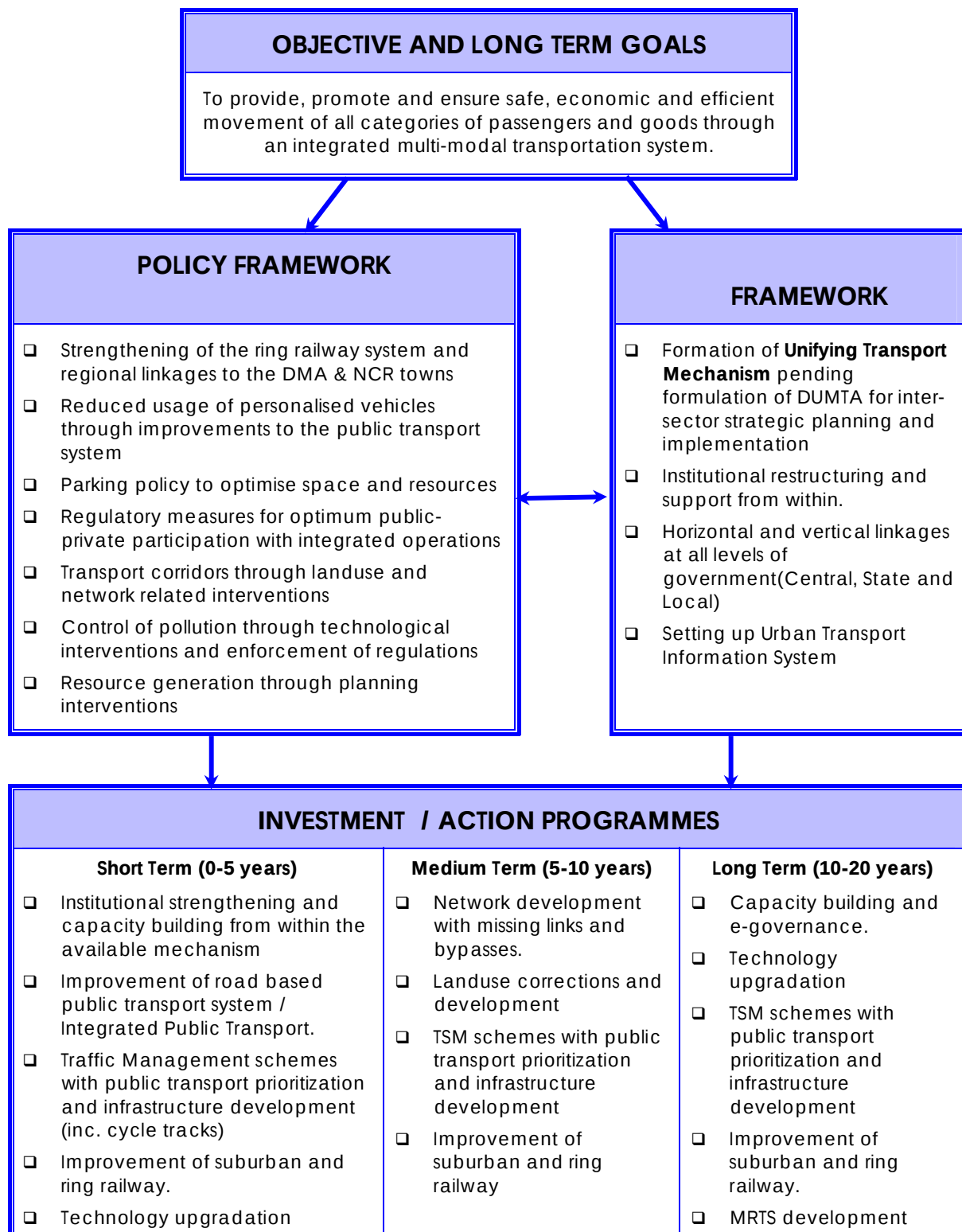
Programme	Investment (Rs million)	Outcomes
Short Term (0-5 Years)		
Performance & financial management systems (Technical Assistance) Concentrating on PSP Building management & public information systems	20	Long term resource management improvement within short term targets International credit rating for MCD
Trials of collection & waste reduction of municipal waste In 3 trial zones Pioneering in Delhi 3 proven approaches Giving experience for the future programme	From existing resources	Public demonstration of improvements Test results of performance & financial management Comparison between options
Minimum bulk disposal & treatment of municipal waste Using zero public cost waste reduction where appropriate Development of new landfill capacity to the north & south of city Providing better main haulage to disposal sites using transfer stations	2,955 1,240	Platform to reduce fly tipping Learning by doing major project management Comparison between institutional options
Development of centralised treatment of Bio-medical waste through PSP	20	Facilities provided for smaller clinics and hospitals. Existing incinerators in large hospitals could be decommissioned at end of life.
Development of centralised treatment of Hazardous waste through PSP	50	Inventory required to determine facility and size requirements
Sub-total	4,285	(US\$ 95 million)
Medium Term (5-10 Years)		
Roll-out new collection & reduction schemes	2000	Serve all Delhi including non-MCD areas Secure unit cost savings
Further disposal site development	2,500	Competition on sites gives cost savings
Sub-total	4,500	(US\$ 100 million)
Long Term (10-20 Years)		
Collection & reduction schemes expanded	2000	Serve all Delhi including non-MCD areas as city expands Secure unit cost savings
Further disposal site development	7,000	Competition gives cost savings
Sub-total	9,000	(US\$ 200 million)
TOTAL (indicative cost in Rs million)	17,785	(Approx. US\$ 395 million)

Source: MCD/DUEIIP

Chapter 11

TRAFFIC AND TRANSPORTATION

Summary Sheet



11. Traffic and Transportation

11.1 Overview

During the last four decades a number of in-depth traffic and transportation planning studies have been undertaken for metropolitan Delhi and the National Capital Region. The findings of these studies inter alia led to the recently launched Delhi Metro Rail Project. All the studies have stressed the need to strengthen the institutional set up and to plan, implement, co-ordinate, fund and monitor an integrated urban transport system. A draft bill to enable the establishment of a unified metropolitan transport authority is under consideration by the GNCTD. A high powered road safety and traffic engineering committee is functioning under the chairmanship of the Chief Secretary of GNCTD.

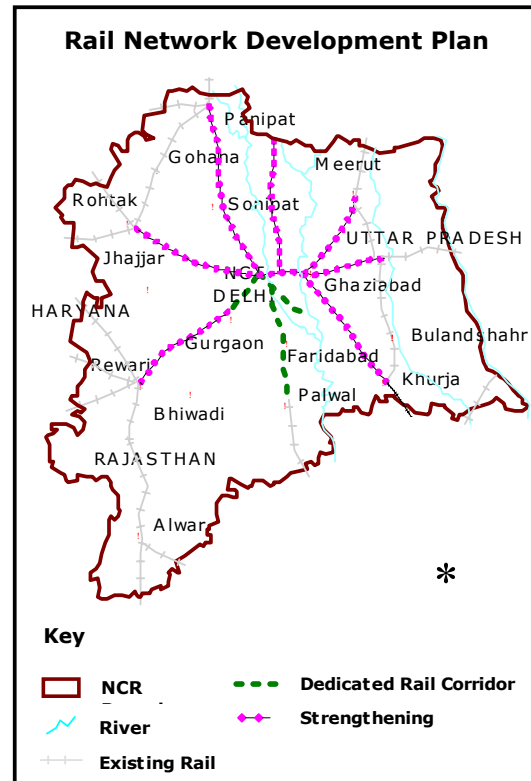
Fundamentally, the factors causing deterioration in the transport system of metropolitan Delhi are, multi-agency planning and implementation, inter-agency interests and conflicts, lack of a strong will to improve the public transport system, lack of land use-transport integration, and, above all, a non-existent public transport culture. In the context of Delhi 21, the objective and long term goal is to provide, promote and ensure, safe, economic and efficient movement of all categories of passengers and goods, in an environment friendly manner, through an integrated multi-modal transportation system.

11.2 Policy Framework

11.2.1 Regional Transport Linkages

The solution to Delhi's transport problems does not only lie just in the NCT. It also depends on the linkages to DMA towns, in particular, and to the NCR towns in general. Though suburban trains are already in operation between Delhi and its neighbouring towns, the service is inadequate, unreliable and inconvenient

due to the lack of feeder services from trip-end points.



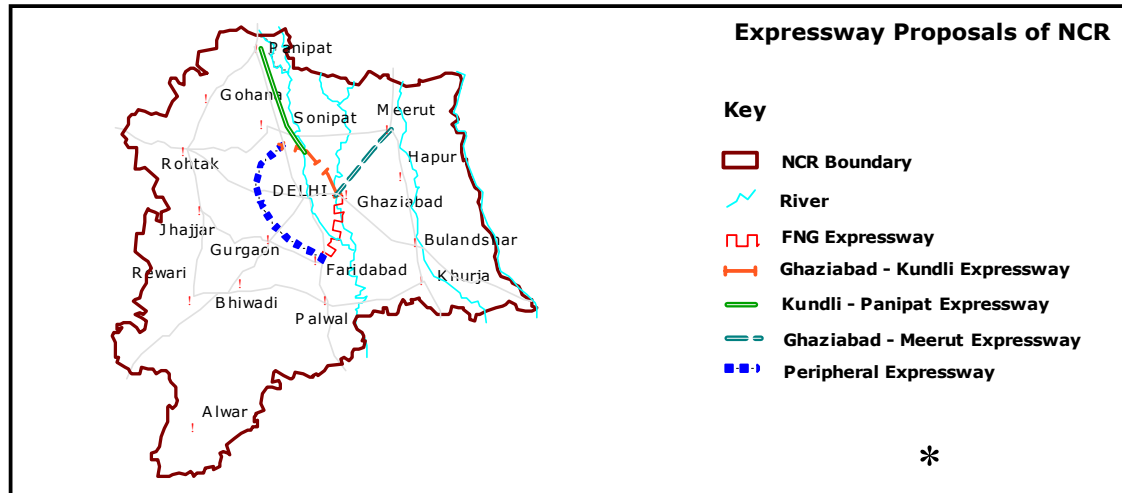
Source: Delhi 1999 – A Fact Sheet NCRPB

The cost of strengthening the regional linkages should be shared by the beneficiary states (Uttar Pradesh and Haryana) and agreed with the Ministry of Railways. It has also been agreed that efforts should be made to explore the possibilities of Special Purpose Vehicles (SPV) for use on certain schemes through an innovative finance mechanism. It has also been proposed that the Bhiwadi - Rewari - Gurgaon railway line could be implemented on a BOT basis involving the NCRPB, at the project development as well as implementation stage.

The NCRPB proposed six expressways but none have been developed. Real estate formed the core-subsidising element in the financing plan for the FNG expressway but a formal decision to proceed has yet to be taken at Government level. For the Ghaziabad-Meerut and Panipat-Kundli-

Ghaziabad expressways, feasibility studies for certain sections are in progress. The peripheral expressway on the western side

of the city, which will act as an urban bypass, is being planned for implementation on a BOOT basis.



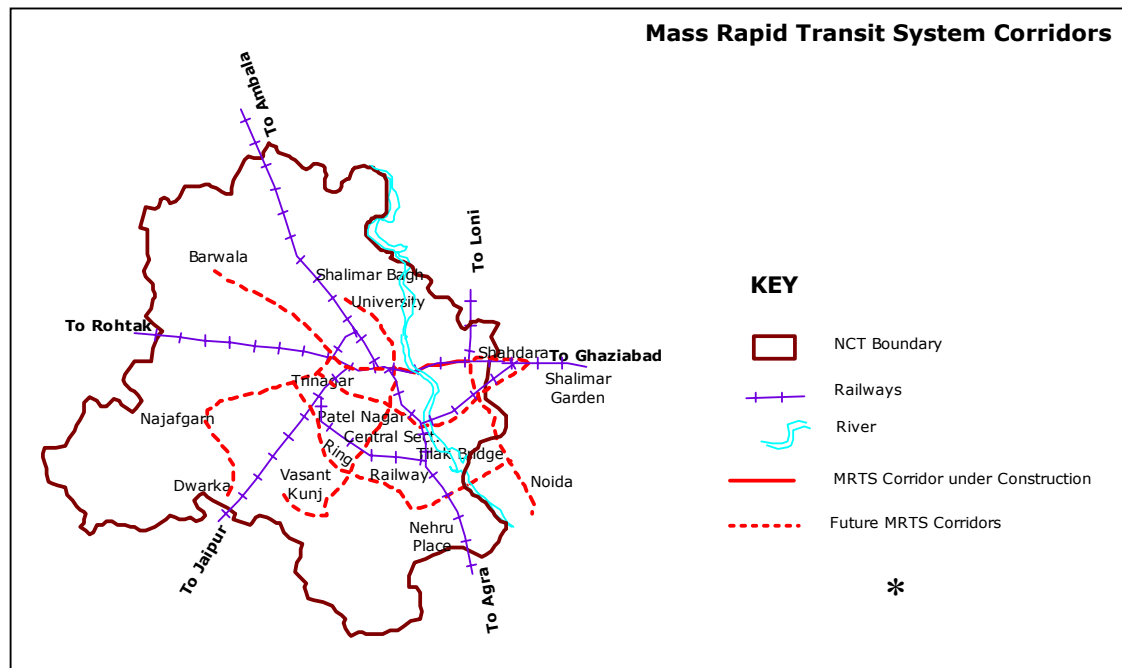
11.2.2 Ring Railway

The ring rail, which was expected to carry 12% of the commuter load, at present carries less than 1%, with only 12 services. The main hurdles are limited capacity especially in the northern portion of the ring, inadequate feeder services, commuter inconvenience and lack of integration with radial lines. A preliminary survey indicated that there was virtually no scope for improving the capacity of northern portion of the ring (between Tilak Bridge and New Delhi station) but it would be possible to

augment the capacity in the southern ring. The strengthening project (98 kms out of 144 kms of ring railway and radials within NCT) will facilitate operation of Electric Multiple Units (EMU) with frequent services in peak hours.

11.2.3 Delhi Metro Rail Project

The first decisive step to introduce an MRTS was taken after the feasibility study was completed in 1990. It recommended a rail-based system, comprising of a network of underground, elevated and surface



corridors aggregating to nearly 200 Km to meet the travel demand of 2005 and beyond. Construction commenced in 1997. (See map of MRTS corridors). It was estimated that after the completion of the first phase about 1.95 million commuter trips would be removed from the roads. The benefits would include a reduction in journey time, savings in fuel and man-hours and resultant reduction of atmospheric pollution and accident rates.

11.2.4 Road-Based Public Transport System

The absence of proper traffic planning and infrastructure facilities for private buses plus the lack of control in their operation, coupled with poor service quality of DTC, due to paucity of funds and inadequate support from Government in the past, has contributed significantly to the decline in the city bus service.

The present road based system suffers from lengthy zigzag and overlapping destination oriented routes, improper distribution of buses, disorganised private sector operation with little or no control, inadequate supply of buses, poor spatial coverage and a lack of priority to public transport.

However, DTC has recently set itself the objective of providing a well co-ordinated, integrated, adequate, efficient, economic and environment friendly world class transport service on sound business principles for all categories of travellers. This has been based on the pattern of London Transport, and has initiated action to privatise bus operations changing its role from a provider to a regulatory body. In parallel it is to set up a dedicated IT department to promote e-governance in the Corporation.

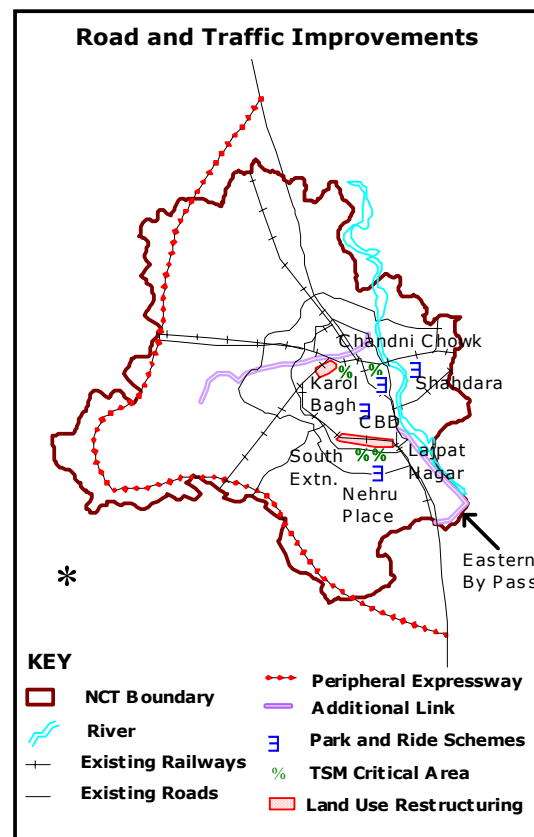
11.2.4 Interrelationship of Transportation and Land Use

An emerging issue in Delhi is property development by various agencies without reference to land use and environmental impacts. A number of land use and activity related decisions in contravention of the

MPD 2001 have generated traffic congestion at critical locations. Suggestions have been made from time to time to restructure land use by relocating inter alia district centers along the high capacity MRTS and Ring Railway. It is essential that strategic transport planning be based on open-ended plans with in-built flexibility in land utilisation and development intensity with respect to environmental and traffic impacts.

11.2.5 Road and Traffic Improvements

Delhi has a massive program involving road and intersection improvements. At a number of critical designated locations, construction of grade-separated facilities is oriented to meet predominantly the needs of cars rather than buses. Also, there is practically no dedicated infrastructure development for non-motorised vehicles. Proposals related to cycle tracks as stipulated in the MPD 2001, are yet to be fully implemented.



There are a number of missing links in the arterial road system of the city. Predominant missing links are the Sarita Vihar-Jamia Millia-Maharani Bagh (SJM) Bypass along the western edge of the Yamuna river, and the peripheral expressway. Comprehensive road network proposals for congested and central areas (by NDMC and Department of Transport Department) to improve traffic operations have been pending for implementation for over two decades. Options to provide road links as alternatives to planned schemes should be explored further with emphasis on environmental issues.

11.3 Traffic Management

11.3.1 Traffic Engineering and Improvement Schemes

There is a need to strengthen the technical capability of agencies to facilitate the preparation of traffic engineering and improvement schemes. The inherent deficiencies in traffic management in metropolitan Delhi are the absence of a clearly defined road hierarchy, lack of access control, inadequate traffic design and road equipment, and above all, the lack of road user discipline.

Some area-wide traffic management schemes have been commissioned in places such as Connaught Circus and India Gate. Based on the experience of SCOOT (Split Cycle Off-Set Optimisation Technique), implemented by Delhi Traffic Police for 50 intersections in New Delhi area with Central Computer Centre at Teen Murti, similar other areas with critical problems should also be covered with such systems. At a number of locations, pedestrian subways are not being used optimally due to poor siting and poor maintenance, actions are necessary to improve their utilisation

11.3.2 Parking

Increasing parking demand together with limited parking supply and absence of a parking policy is an impediment to the smooth flow of traffic, especially in and

around major commercial areas/activity centers. With the basic objective of reducing the parking demand (especially for personalised vehicles), parking pricing is a major tool for environmental improvement. Moreover, provision of 'Park and Ride' facilities, additional parking supply in critical areas with optimal private sector participation, employers participation in transport demand management, and stringent controls in zoned areas are key policy issues.

11.3.3 Enforcement

The traffic police have the difficult responsibility of managing and controlling traffic flow. Difficulties are made worse due to lack of co-ordination from local and road maintenance agencies. Local expertise is required to facilitate formulation of low cost and viable area-wide traffic management schemes. Vehicle pollution control from can be assisted through technological advances and strict enforcement of regulations.

11.3.4 Transport System for Special Areas

Preparation of a strategic action plan is needed for special areas and specialised markets to determine a framework for functional optimisation and relocation. Car-free zones with support from non-motorised vehicles and environment friendly medium capacity transport modes, like battery operated buses, should be established with the provision of parking at the periphery. To conserve the historic character of the walled city, pedestrian zones should be reinstated. Entry of vehicles for the servicing of shops and establishments would only be permitted outside certain entry timings, at night, for example, between 8pm and 8am.

11.3.5 Urban Transport Information System

For a scientific approach in planning for long term and short term measures it is necessary to have a database which will have to be continuously updated, this has been a long felt need. In the age of

information technology a centralised unit should be established in the transport department which should collate and update data information in various aspects of traffic and transportation. Facilities should be provided to make this data available to users through electronic media. Considerable amount of data (such as vehicle registration, traffic volume, trip information, parking, truck movements, public transport, pollution levels, norms and actions, traffic management and related information etc.) is available in various agencies and R & D establishments in this field in the Transport Department can form a base for further work. Various agencies and departments of GNCTD should be able to maintain and use this information system.

11.3.6 Institutional Framework

In order to ensure systematic and scientific development, management and operation of an integrated multi-modal transport system in the NCT, an institutional framework is a basic prerequisite. The focus will be on:

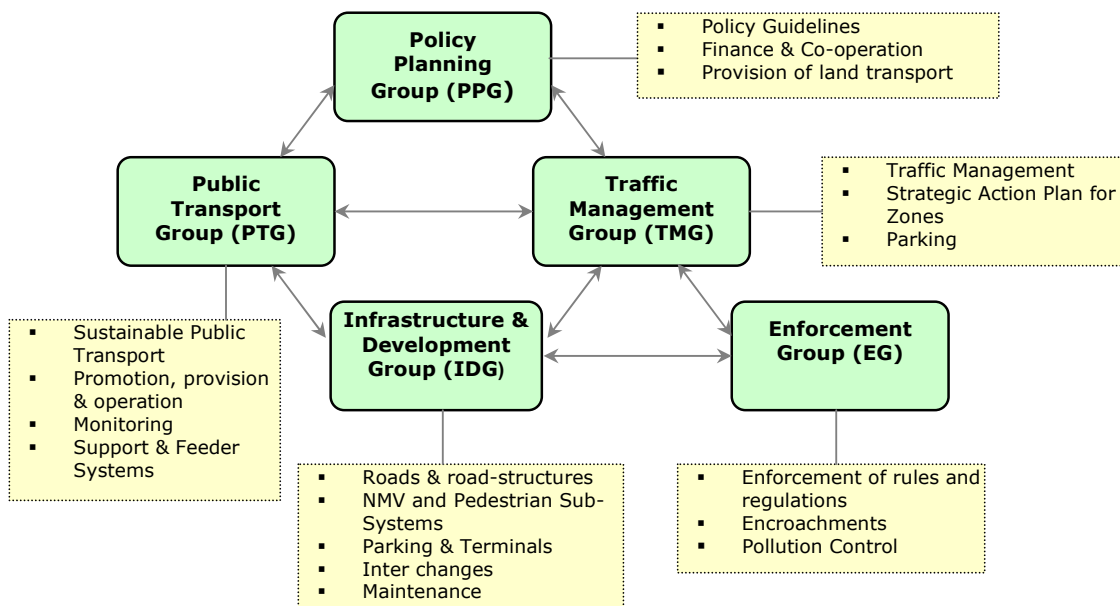
- Institutional strengthening and capacity building from within the available mechanism
- Horizontal and vertical linkages at all levels of government (Central, State and Local)
- Setting up an Urban Transport Information System.

11.4 Action Plan

11.4.1 Institutional Mechanism

Pending establishment of Delhi Unified Metropolitan Transport Authority (DUMTA), an arrangement to strengthen the institutional mechanism by drawing expertise/resources from existing agencies is suggested. A proposed institutional set up, to discharge functions of centralised strategic planning and decentralised implementation, is presented in figure below. It is suggested that the unifying metropolitan transport mechanism should consist of five groups with clearly defined roles.

PROPOSED UNIFYING TRANSPORT MECHANISM



Policy and Planning Group

A Policy and Planning Group (PPG) should be established to function specifically at the level of NCT to plan and co-ordinate with agencies at the level of DMA. This group should also take into consideration, the guidelines set out by overall spatial planning for the city by the proposed Metropolitan Planning Committee (MPC). This group should also ensure community participation. To be effective this group should be chaired by the CM (GNCTD). The main functions of this group are:

- To set out goals and formulate policy guidelines to facilitate preparation of a Strategic Transport Plan (STP) for the NCT and a multi-modal plan for linkages with the DMA / NCR.
- To co-ordinate activities of various groups / agencies at the plan formulation stage.
- To regulate allocation of funds to different agencies for co-ordinated development.
- To ensure provision of land with focus on identification, reservation and protection for development of transport related projects.

Information based innovative pricing strategies for transport with adequate legal backing should be formulated, and based on real costs. As part of the policy planning function an independent mechanism, on the pattern of Delhi Electricity Regulatory Commission, should be installed to appropriately price all items of transport, parking and accessibility. In this context there is a need to determine **pricing of all public and IPT modes on sound economic, system operation and performance basis.** The fares and tariffs, determined by the proposed independent mechanism, should be implemented in the entire DMA sub region. Any subsidies, should be contained and minimised and provided only to economically deserving groups.

Public Transport Group

Following the requirements of the STP, the Public Transport Group (PTG) will be

responsible to prepare an action program to achieve a sustainable and balanced public transport system and optimum multi-modal transport mix. The main agencies in this group will be Indian Railways, DMRC, DTC and private operators and Transport Department of GNCTD. Each agency will ensure provision of services, operation and management and maintenance of the system. The overall and contextual responsibility of each agency in the PTG is clearly defined ensuring functional independence.

Traffic Management Group

The Traffic Management Group (TMG) will prepare traffic management strategic action plans with emphasis on movement of people and goods. Area level traffic management schemes with active participation from peoples' group should be prepared for implementation according to time bound programmes.

Infrastructure Development Group:

The Infrastructure Development Group (IDG) will comprise of professional advisors and engineering experts from agencies namely the PWD, MCD, NDMC, DDA, Cantonment Board etc. This group will streamline construction and maintenance practices and formulate project based schemes with latest technological and management interventions. The activities of this group will be based, among other localised schemes, on the strategic transport plan.

Enforcement Group

The proposed Enforcement Group (EG) will have professional advisors, concerned officers from local bodies in addition to the traffic police and local residents and will evolve strategic action plans to ensure smooth and safe flow of all modes of traffic.

11.4.2 Actions

The action plan for different components of transport system is presented in the Table 11.4.2 and the relationships of different groups are shown in Figure above.

Table 11.4.2 Traffic and Transportation Action Plan

Components	Short Term	Medium Term	Long Term
Regional linkages	• Update study on integrated system and co-ordination • Improvement of EMU services to DMA towns with development of feeder service from stations • Pricing of personalised vehicles entering Delhi through fuel or licence taxation	• Development of FNG and peripheral expressway around Delhi • Land-use structuring with special reference to transport activities to ensure corridor concept	• Development of rail connections as per NCR plans and capacity augmentation • Development of expressways as per NCR plan
Ring rail	• Improvement of service using southern portion of the ring • Feeder service for stations to be improved by mass transport / IPT modes • Improvement of passenger facilities	• Capacity augmentations in weak links • Integration with regional linkages through interchange points • Integration with MRTS and other mass transit modes	• Land-use correction ensuring corridor concept for optimal utilisation of the system (Revision of Master Plan can take care of this)
Road based public transport system	• Improve DTC service with augmentation of own fleet as well as powers to acquire private buses through amendment required in STA Act • Strict control of operation of private buses • Improvement of service to DMA / NCR towns • Dynamic route planning with optimal public-private involvement for integration with rail based system • Freeze number of contract carriages and regulate their function	• Private buses to be clubbed under 6 or 7 companies to operate in each zone • DTC to act as a regulatory body for controlling all bus operations through routing, scheduling and allocation of buses • Introduction of vehicle tracking system through GIS/GPS • Replacement of old polluting buses by environment friendly convenient buses	• Linking of all depot and terminal functions through e-governance for optimisation in operation and maintenance • Ticketing system through Smart Card or other suitable mechanism
Intermediate public transport system	• Identification of areas, routes and parking facilities for mini buses, battery buses and phat-phats to operate as feeder services • Routing and operation of shared high capacity auto-rickshaws • Identification of areas and routes for operation of cycle-rickshaws	• To continue actions so that operations become complimentary and supplementary to public transport system	• To continue actions so that operations become complimentary and supplementary to public transport system
Green modes (cycles and pedestrians)	• Identification of exclusive cycle tracks and 'green routes' and implement • Provision of adequate pedestrian facilities along and across the roads at priority locations	• To continue actions for safety and least interaction with vehicular traffic	• To continue actions for safety and least interaction with vehicular traffic

Components	Short Term	Medium Term	Long Term
Personalised vehicles	• Strict parking regulation and pricing • Employer's role in providing transport	• Introduction of area licensing schemes	• Actions to continue to reduce vehicles on roads
Parking and terminals	• Establishment of differential parking norms and guidelines based on public transport service • Appropriate pricing with respect to real cost to discourage usage of personalised vehicles • On street parking in critical areas should be banned and on street parking in residential areas to be priced	• New developments and regularisation of illegal activities to be approved through traffic impact assessment • Encourage private parking facilities and terminals in specific areas on BOO basis • Provision of parking facilities in critically deficient areas with introduction of 'Park and Ride' systems	• Actions to continue to reduce parking demand • Discounting FAR/Ground coverage in area level computations
Road network	• Establishment of hierarchy of roads and capacity augmentation • Bus priority measures along selected corridors through traffic engineering and management • Improvement of roads having modal choice in favour of public transport as priority	• Construction of missing links /additional links and demarcation of routes for trucks, cycles and cycle rickshaws • Construction of flyovers to be seen in the light of movement of more passengers rather than vehicles • Bus priority measures along selected corridors to continue	• Construction of missing links / additional links • Development of city gate concept and provision of suitable interchanges
Traffic Engineering and Management / TSM	• Exclusive bus ways to be provided along selected corridors • Review and modification of norms, standards and designs to take care all movement types • Preparation of traffic management schemes to optimally utilise the total network through area specific / zonal plans and its integration with total system • Prepare proper signalisation, signage and marking plans • Provide better monitoring, regulation and enforcement	• Implementation of TSM schemes to optimally utilize the total network through area specific/zonal plans and its integration with total system	• Exclusive bus ways to be provided along selected corridors expanded
Environment	• Strengthen the public transport system • Enforcement of strict regulatory measures for pollution control	• Modification of norms and standards for pollution levels • Control of polluting vehicles through usage of cleaner fuels and technological interventions	• Actions to continue with strict enforcement measures

11.4.3 Priority Projects and Investment:

identified and presented in the following table 11.4.3 along with broad estimates for phase-wise investments.

Based on the action plans on various components the priority projects have been

Table 11.4.3 Traffic and Transportation Investments

No.	Priority Projects	Investment in Million Rs.		
		0 –5 Years	5 –10 Years	10 –20 Years
1	Construction of Delhi MRTS : Phase I * Phase II **	80000		170000
2	Revitalisation of Ring Railway \$	9000		
3	Construction of FNG Expressway(56 kms) in NCR		11000	
4	Strengthening of rail network within NCR @	5450	5450	10900
5	Urban Roads: -Construction of Eastern (SJM) Bypass -Construction of Peripheral Expressway -Construction of missing links -Construction of additional link along drains -Construction of five cycle tracks-Pilot Project -Traffic Engineering and Management Schemes including flyovers under construction -Provision of dedicated bus ways (200 kms) including pedestrian facilities	600 100 1500 1000	2500 19000 500 4000 1500 1500	500 2000 1500 1500
6	Improvement of public transport system and modernisation including replacement of buses (initially 1000), usage of IT for operation, depots, terminals and passenger facilities	2500	500	500
7	Construction of parking lots in critical areas, mechanisation of pricing and management of existing parking lots	200	200	200
8	Park and Ride systems	50	50	50
9	Traffic improvement in Walled City area	100	100	100
	TOTAL (indicative cost in Rs million)	100500	36300	196250
	TOTAL @@	6050	29850	6350
	Equivalent US\$ million	135	660	140

Source: DMRC, Northern Railway, NCRPB, DUAC

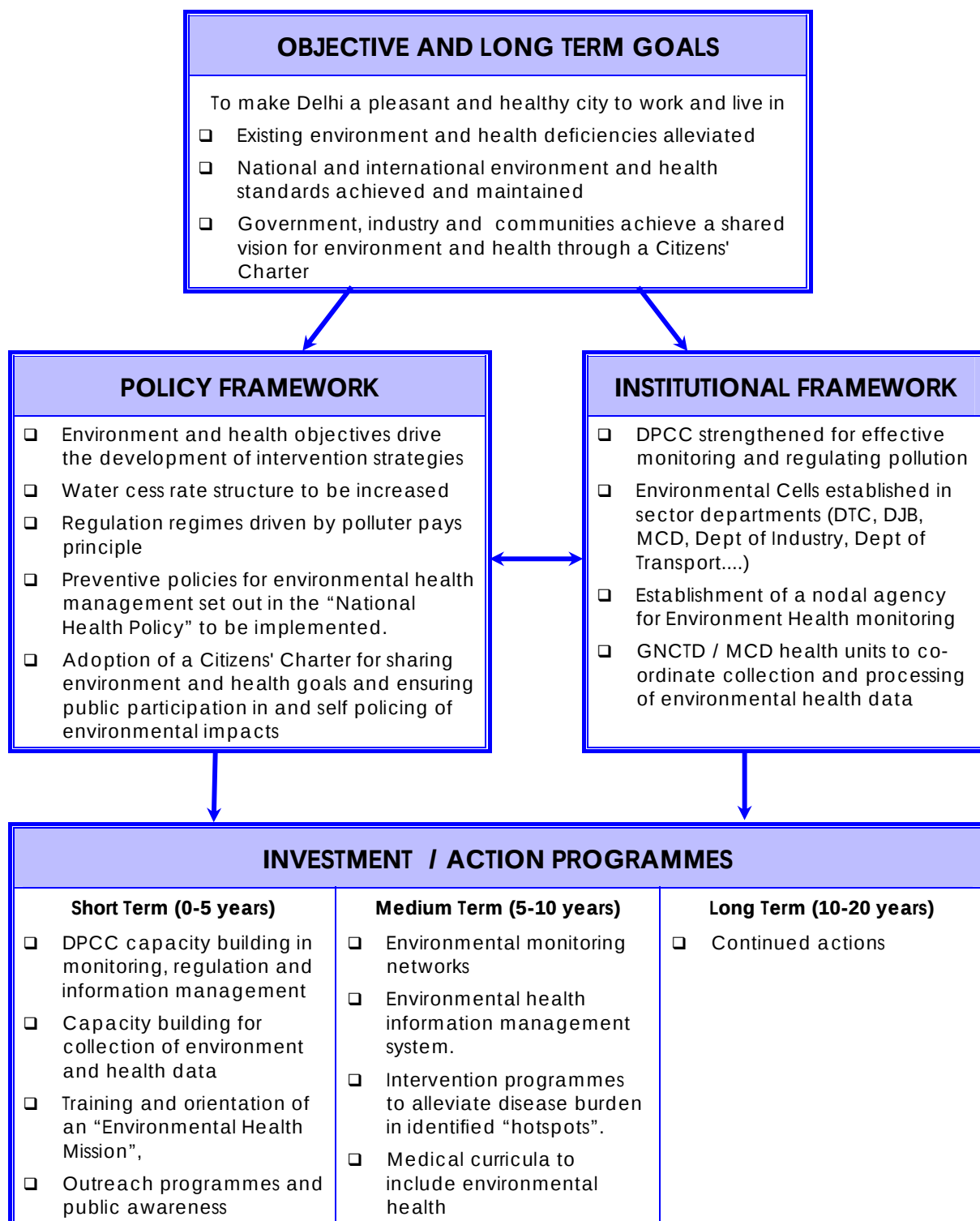
Notes :

- * Share of GNCTD is 15%
- ** Share of GNCTD yet to be decided
- \$ Share of GNCTD to be one third of the total amount
- @ Cost of rolling stock excluded. Cost sharing yet to be decided
- @@ Excluding railway projects and projects outside NCTD

SECTION IV

Managing the Environment and Environmental Health

Chapters 12 & 13 **MANAGING THE ENVIRONMENT AND** **ENVIRONMENTAL HEALTH** **Summary Sheet**



12. Environmental Management

A considerable amount of information exists on the causes and consequences of environmental degradation in Delhi. However, a strategic, integrated and co-ordinated institutional approach is not in place to address these issues. There is a clear lack of focus both in terms of policy, priorities and intervention.

The purpose of this environmental management framework is to define a systematic approach to:

- ensuring that the existing deficiencies are alleviated;
- managing future economic and employment growth and continued urbanisation to achieve positive effects on the environment and public health;
- setting an environmental management framework that will deliver and maintain national environment and health standards in the medium term (5-10 years) moving to international compliance in the longer term.

To achieve these aims, government, industry and communities must develop and achieve a shared vision for Delhi through an integrated environmental regime. This will operate to produce a win-win situation where the four strands of sustainable development (economic development, social progress, environmental protection and resource minimisation) are in harmony. It will produce a climate where Delhi takes its place in the international community as a bankable, competitive and liveable city.

Without an integrated strategy with matched investment to improve environmental infrastructure, services and management, the current problems will be compounded by growth resulting in:

- exposure to increasing degradation and greater health risks;
- reduced economic productivity and increasingly unreliable services;
- increased financial costs for maintaining even minimum levels of infrastructure and services;

- increased resource consumption.

Furthermore, the vision of Delhi as a sustainable city will be unachievable. In terms of economic and environmental justice, each of these factors will have a disproportionate negative impact on the poor.

12.1 Policy Framework

In order to achieve an integrated regime of environmental management there must be a common policy framework, shared across the Delhi government, from which the actors responsible for delivering environmental performance can derive a common purpose. The following framework is proposed:

- Delhi government ensures that sectoral environment and health objectives are at the heart of financial and resource planning, development initiatives, intervention strategies and performance monitoring;
- development agencies ensure that environment and health objectives inform planning for economic growth, urban and infrastructure development, land use and transportation;
- regulating bodies ensure that enforcement regimes are driven by the polluter pays principle with an increasing emphasis towards operator responsibility and self regulation within clear management standards;
- agencies ensure that pricing regimes for the distribution, utilisation and disposal of resources reflect the full costs of their use;
- Delhi wide institutions maximise the leverage of national and international funding to assist in delivering state of the art environmental planning and management;
- Delhi citizens take an increasing role in the setting and self policing of environment and public health impacts.

This policy framework is proposed as a means of ensuring a shared agenda and vision for environmental management in Delhi that will result in realistic and

prioritised development programmes, sustainable resource use, deliverable environment and environmental health improvements and efficient performance management.

The success of a shared suite of environmental policies will rely on efficient and co-ordinated institutional performance.

12.2 Institutional Framework

The delivery of the policies and programmes that will address the current deficits and achieve long term and sustainable improvements in environmental performance is the core business of those institutions responsible for Delhi's urban planning, infrastructure development, environmental services, regulation and resource distribution. To achieve the required turnaround in environmental performance and the quality of life in Delhi, concerted efforts will be required by all with responsibility to build new ways of working for the benefit of all.

The primary environmental institutional objectives are seen as being that:

- each of the Delhi urban and environmental institutions must develop methods for setting and monitoring long term objectives and standards for Delhi's environment and public health that not only embody specific sectoral targets but have commonality and resonance in other linked and associated bodies and programmes;
- Delhi government departments and responsible national bodies must derive common and integrated policies, priorities and actions to address environment and health issues;
- environmental agencies must ensure the effective regulation of industry, transport and local bodies;
- environmental bodies must develop tools and processes to deliver meaningful information regarding the problems and trends in the Delhi environment to decision makers and the public to ensure the continual review of policy and performance in environmental management;
- all responsible institutions should develop joint work in environmental

management to a common set of standards, derived through public participation.

These institutional development objectives will require investment in the capacity not only of the institutions themselves, their resources and management, but also in the mechanisms for joint working and cross sectoral co-operation.

This approach is based on the need for a co-ordinated understanding as to how resources like water, air, land, are obtained, used and reused, wasted or disposed off. Resource management lies at the heart of environmental management.

Experiences elsewhere suggests that for an urban environmental strategy to be effective, environmental concerns cannot be separated from an analysis of the operation and management of the urban economy.

To begin the adoption of this framework there are three initial requirements:

- Generate ownership of Delhi 21, not in one department or agency alone but across Delhi government as a whole.
- To focus on actions that are socially and politically acceptable, and financially supportable.
- To combine "top-down" and "bottom-up" approaches.

The responsibility for environment protection and abatement of pollution is not a duty of one department alone. It is not the task of the Government alone. It is an obligation on all. Government departments and agencies, public authorities, industry, non-governmental organisations and community based organizations each have a fundamental role to play. Hence the need for integration at all levels.

12.3 Implementing the Institutional Framework

As the main issue at stake for the environment of Delhi is poor institutional performance, it follows that institutional strengthening is a prerequisite for environmental improvement. As stated earlier, Delhi at present has no

environmental policy, although it has an industrial policy, an urban policy (as expressed through DDA) and a draft slum policy. This lack of an environmental policy has robbed Delhi of an opportunity to develop and grow as one of the world's great cities. The process of institutional reform and development outlined in Part E implies the need for the mainstreaming of environmental issues in the government of Delhi. There is a clear need for a system of central, GNTCD co-ordinated, effort in planning, financing and resource management for the Delhi environment.

12.3.1 Cabinet Committee of Delhi Government

One means to achieve this would be through interim arrangements within GNTCD, (possibly involving the setting up of a Cabinet Committee and a Project Management and Co-ordination Unit with Delhi wide institutional membership) prior to the wholesale reform of Delhi governance. These issues are dealt with fully in Part E. In addition, reform of specific institutions will also be necessary in order for specific sectoral and discrete management functions to be performed adequately.

12.3.2 Department of Environment, (DoE), GNTCD

Delhi 21 strongly recommends that the DoE be strengthened to take on specific environmental management functions. It is proposed that the DoE be responsible for policy formulation and overseeing the implementation of actions in the following areas:

- Environmental planning and management
- Environment and industry
- Community participation
- Natural resource management
- Environment and transport
- Public awareness

These issues require an advanced level of co-ordination across all government departments, not centralised control; it is

this context that DoE is recommended to act.

12.3.3 Delhi Pollution Control Committee (DPCC)

The DPCC will similarly require a great deal of attention if it is to perform to a standard anywhere near that required for a major city such as Delhi. Specifically this institution should perform within its statutory remit in order to deliver:

- Planning and review for DoE
- Information management
- Regulation and enforcement
- Monitoring and data analysis
- Training outreach and support,
- Appeal procedures

These issues require an advanced level of management capability and co-ordination across the DoE; it is in this context that DPCC is recommended to act. The creation of one single regulating body for issues relating to environmental impact assessment, permitting, environmental management and performance aftercare is an essential ingredient in ensuring sound environmental management in Delhi.

However, a key element of the proposed components for both DoE and DPCC is the training of the existing staff. It is proposed that a rapid review of resource capacity in both the institutions is conducted early to identify specific skill gaps. This should be followed by need-based targeted training.

12.3.4 Other Departments of GNTCD

Although DoE and DPCC are the key institutions who should be engaged in environmental management in Delhi, the remit of environmental protection rests with all concerned departments for effective implementation of the environmental protection policy framework. The establishment of an environmental cell in government departments engaged in developmental work would facilitate communications, allow better co-ordination of activities between DoE/DPCC and the concerned departments, will lead to sharing of burdens and responsibilities and will help

to bring environment management in the right perspective in governmental work.

12.3.5 Sectoral Issues

In addition to the institutional frameworks *per se*, there will be need for co-ordinated environmental management in the sectoral areas of:

- **Land use planning and management:** where land is valued as a vital resource for Delhi, and long term planning for its allocation and use must be integrated with regional planning for resource supply, solid waste removal and sanitation. Residential and employment land allocations must be informed by air quality and noise considerations. The co-ordination of communications by road or mass transit systems will be additionally essential.
- **Solid waste management:** where the requirements for adequate transfer and disposal sites for municipal, hazardous and bio-medical waste must be integrated with the broad regional; planning policies and land allocations.
- **Wastewater / sanitation:** where the necessary infrastructure developments are planned and co-ordinated to both long term supply needs and to sustainable resource management objectives and to long term environmental protection standards.
- **Water and energy supply:** where supply costs fully reflect the external additionalities and costs of the entire supply chain. Emissions and effluent discharges are brought in line with prescribed limits and standards are met.
- **Air quality:** where targets for air pollution are set in sustainable and deliverable terms and the development of emission standards for industry, road transport and energy generation are informed by affordable and acceptable technologies.
- **Traffic and transportation:** where transport planning reflects the needs of travel demand and the management of transport units for mass transit with no undue environmental cost.
- **Noise:** where targets for noise reduction are set in deliverable terms

and the standards for residential areas can be achieved.

- **Disaster management:** where off-site emergency planning and contingencies for natural disasters help in raising the level of management readiness and do not detract from the sustainable development of land for employment and residential areas.

12.3.6 Environment Pollution (Prevention and Control) Authority (EPPCA)

In 1998, the MoEF/GoI by order constituted an Authority known as the Environment Pollution (Prevention and Control) Authority (EPPCA) for the National Capital Region to exercise certain duties "for protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution".

The EPPCA was first notified in for two years, and its life was further extended to another two years in January 2000. The Authority is empowered to take action on its own accord, or on the basis of complaints or on issues referred to it by the Central Government.

The matters it is empowered to deal with relate entirely to the functions of the DPCC and its very existence indicates a substantive lack of prowess in environmental management and regulation in Delhi. If this body is not reconstituted in 2002 to cover Delhi area it would be a clear indicator of the success of environmental management in Delhi.

12.4 Resource Mobilisation

12.4.1 General Principles

The funding mechanisms for initiatives identified in this strategy are based on the concepts of responsible financial management, value for money, and efficient resource pricing. Involved departments, institutes and organisations will be encouraged to finance O & M costs for implementing the ongoing initiative through: productivity gains, efficiency improvements, recovering full cost of

environmental services and incorporating polluters pay principle.

12.4.2 Potential Funding Sources

Resource mobilisation is the key to enabling implementation of policy. The following issues have to be addressed and may offer potential sources of funding.

Responsibility of operational departments to sell their activities

Government is not an everlasting source of funds. Spending departments will increasingly have to rely on generating funds to support their activities, (e.g. the supply of consultancy services or laboratory services to industry)

Funding operation and maintenance

Private sector involvement (from full privatisation to contracting out certain service and O & M activities), may have efficiency gains greater than increased costs, especially if in the process a saleable commodity is created.

Public Private Partnerships

The role of the private sector through partnerships and other forms of financing should be pursued where appropriate. The use of public funds in service development and capital investment should be tested against the principles of Compare, Challenge and Compete in order to ascertain the correct balance in the private/public funding mix.

'Earmarked funds'

It is necessary to introduce 'earmarked funds' so that, for example, funds generated by enforcing development controls can be used to improve that function. Fees for development planning assessments could also be earmarked for ambient emission.

Polluter pays principles

Allowing certain kinds of developments creates a high risk for the environment with higher costs to the monitoring and control agencies. This should be reflected in the charging system.

The user charges principle

This needs to be applied in a manner that has a minimal effect on those least able to afford it, and targets those with ability to pay. Consent to release charges, water cess and potential air cess could be earmarked to fund emission monitoring.

Subsidies

Subsidies and cross-subsidies are perfectly acceptable if they are open, fair, affordable and society has agreed that they are required. This, in conjunction with the user pays principle, may allow discounts in charges for registered organisations with a high social content in their activities.

Enforcement and fines

There is a case for establishing specific courts for rapid enforcement of standard fines, to allow confiscation of assets of offenders. 'Spot fines' may also have potential.

Investment

Funding for capital projects would require involvement of private sector and financial institutions while implementation of pilot projects will seek funding from external agencies like DFID, ADB, UNDP, JBIC or World Bank, etc.

The mobilisation of resources through investment is essential; without improving value for money in capital investment and operation and maintenance investors will invest elsewhere.

Delhi Environmental Fund Facility

This fund is proposed as a means to help local bodies and industries to implement such projects as waste minimisation or pollution prevention and control initiatives. Part of possible external assistance from agencies such as the World Bank, OECF, etc. could be credited to this fund. Also a part of the water cess and the proposed air cess may be diverted to this fund. One of the purposes would be to channel selected environmental funding through the DEFF so that a more effective, planned and equitable distribution of expenditure could be achieved. DEFF is intended to be a non-

lapsable revolving fund. It is not intended to supplement the budgetary resources of the DoE/DPCC, nor is it intended to be an emergency source of funds.

Government and International Aid

GNCTD and GoI have at the center of policy the need to create employment through strong economic growth. Government has to create the enabling framework to attract inward investment and persuade domestic wealth holders to take the risks of expansion and diversification. This includes creating a better physical environment in

which commerce and industry must operate.

12.5 Action Programme

The successful improvement of the Delhi environment will be dependent on a long term action programme that is designed to deliver a shared environmental vision and sustainable performance. The table 12.5 below presents a summary, in priority order of those specific actions that will develop and implement the proposed vision for environmental management in Delhi 2021.

Table. 12.5 Priority actions for environmental management capacity building

Recipient	Objectives	Components	Outcomes
Short term 0-5years			
DDA, MCD, NDMC, DJB, DTC	Capacity building for integrated, cross departmental plans, programmes and budgets	GNCTD co-ordination body set-up; Departments set up environment cells;	Co-ordinated environment interventions to common objectives and targets
DPCC	Capacity building for effective environmental regulation	MIS development laboratory services, staff training	Appropriate control of polluting processes and operators
DDA, MCD, NDMC, DJB, DVB, DTC	Capacity building for collection of meaningful environment and health data	MIS development, staff development	Information on environment and trends supplied to policy makers
DDA, MCD, NDMC, DJB, DVB, DTC	Development of information systems	Equipment procurement and commissioning, staff training	Delivery of meaningful environmental information to decision makers and citizens
Delhi Government	Citizens' Charter development	Public awareness raising and participation Developing responsiveness in public authorities.	Public participation in target setting and review
Medium term 5 -10 years			
DPCC	Development of automated environmental monitoring networks	Equipment procurement and commissioning, staff training	Efficient and verifiable data to inform information production
DDA, MCD, NDMC, DJB, DVB, DTC	Development of integrated environmental information management systems	Equipment procurement and commissioning, staff training	Common data and information sets to inform and policy making and review and public information
DPCC	Development of integrated environmental GIS	Equipment procurement and commissioning, staff training	Common tools for planning, infrastructure development and resource management

The cycle of objective setting, policy development, intervention, monitoring and review for environmental management is an essential and missing ingredient in Delhi governance. This proposed scheme of objectives, policy and institutional

frameworks with necessary investment will serve to work towards sustainable development for Delhi, turn round environmental decline and address the otherwise inevitable consequences of economic and population growth.

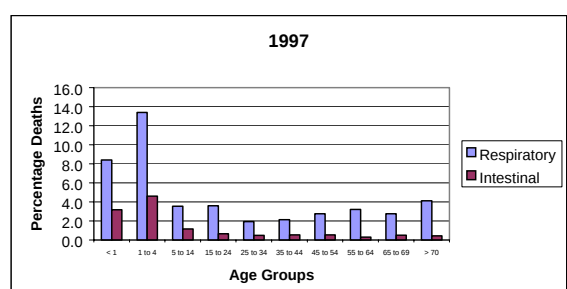
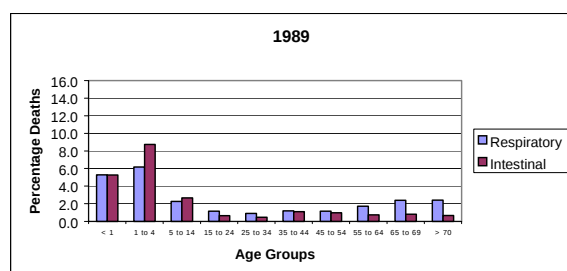
13. Environmental Health

13.1 Introduction

There is an urgent need to emphasise preventive approaches along with curative approaches in the management of health in Delhi. The city is facing a serious double burden of disease.

Sickness from water and vector-borne diseases re-occur annually. Meantime, there is evidence of increased exposure to toxic pollutants (particulates, pesticides, lead and other toxic metals) in the environment and a rising incidence of respiratory infections, cancer, heart problems, lead poisoning and other conditions.

Deaths due to intestinal infections and respiratory causes in Delhi 1989-1997



Source: Department of Health and Family Welfare, GNCTD

There is widespread agreement on the need to improve Delhi Government's capacity in environmental health management and monitoring under the guidance of a nodal agency to give far greater attention to preventive strategies. Effective environmental management requires the following:

- Realistic long-term and short-term goals

- Identification of health 'hotspots' and effective intervention therein (Environmental health profile of Delhi)
- Prioritisation of health management efforts
- Effective and focused implementation
- Review and reassessment of policy objectives

13.2 Objectives and Long Term Goals

Long term goals for environmental health can be expressed in two ways:

- To meet internationally accepted standards for ambient air pollution and key diseases as prescribed by the World Health Organisation. In the short term, pollution in the city should be reduced to at least meet national standards.
- To ensure universal access to safe, adequate basic services essential for health including housing, water supply, sanitation and household fuels.

In the short term there is a need to achieve institutional objectives that will make it possible to realise long-term (20 year) goals for disease prevention.

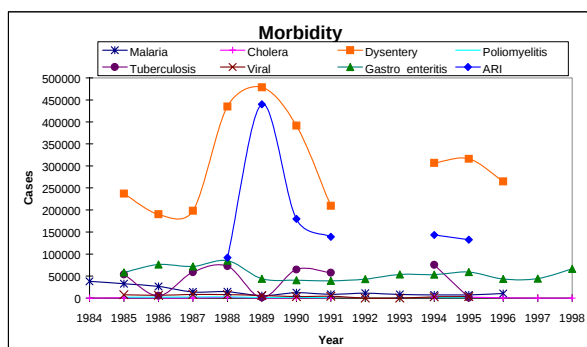
These institutional goals should relate to the development of a nodal agency to take lead responsibility for the co-ordination of environmental health management and monitoring functions.

Environmental Health Profile of Delhi

One of the objectives of environmental health management and monitoring in Delhi is to develop and maintain an environmental health profile that would identify areas that are critical in terms of environmental impacts on human health and those where improving health is a critical priority.

It is intended to provide information on spatial distribution of health "hotspots" and vulnerable populations (children, old people and low income groups) based on 'spatial' data on morbidity in Delhi.

The quality of morbidity data available for Delhi is inadequate. It is based on hospital returns resulting in gross under estimation of the scale of environmental health problems. The data produced does not reflect geographical variations in sickness across the capital and therefore cannot be used to identify environmental health hotspots. It is irregularly collected and variable and, as a result, of little value in planning or city management purposes.



Source: Department of Health and Family Welfare, GNCTD

13.3 Policy Framework

Based on the National Health Policy, certain guidelines on preventive health for Delhi may be indicated as follows

- industrial and urban development plans in consultation with the Central and State authorities.
- Regulation of emissions and pollution of air and water through legal measures, if necessary.
- Strengthening municipal authorities to identify and tackle local environmental health problems; establish a chain of sanitary cum epidemiological stations at the 'localised' level to plan and provide preventive services.
- Development of a health management information system to provide timely warnings against emerging health problems and for monitoring and evaluation ongoing health problems. (This would eventually be used in association with the proposed DPCC environmental monitoring data / MIS.)
- Health education and public awareness backed by appropriate communication strategies.

13.4 Institutional Framework

Government Health services in Delhi are at present fragmented, being managed by a number of agencies that work for the most part in isolation from each other. While these institutions recognise that the health of the population is determined largely by the environmental and development conditions within the state, they do not play any effective role in environmental and developmental decision-making for health promotion in the state.

Government departments and institutions need more co-ordinated efforts to exchange and manage information through a nodal agency at the GNCTD level that facilitates policy implementation and evaluation.

Environmental health is a multi-sectoral discipline and as such does not have an obvious institutional home. While it has a close link to curative health services it is also concerned with the consequences of urban environmental pollution (e.g. air pollution from transport, industrial pollution) and with the delivery and regulation of essential services such as water supply, sanitation and solid waste management.

In the course of this work, certain ongoing exercises and initiatives in environmental health were taken note of. These include: i) MCD's programme to enhance the control of communicable diseases in the capital as set out in the document 'Prevent 2000: Action Plan for Prevention of Epidemics in Delhi.'; ii) Environmental Prevention and Control Authority, and its remit is to solve the air pollution problem in the National Capital Region (NCR); iii) The World Bank funded IPP8 programme undertaken by the MCD incorporating an MIS for public health data; and iv) Environmental Health Committee established by the Ministry of Environmental and Forests (MoEF) in 1998 to recommend a nationwide environmental health research agenda.

It is the intention in the proposed institutional framework to build on these initiatives and optimise their efforts to an extent that the role of the nodal agency becomes even more facilitative.

13.5 Implementing the Institutional Framework

13.5.1 An Environmental Health Mission

Having considered various alternatives, it is generally agreed that the role of the nodal agency for this purpose can be performed by a 'Mission' at the GNCTD level, analogous to GoI Missions in some sectors.

More specifically, the Environmental Health Mission would be an interim body charged with achieving certain operational goals – not only doing research but implementing action plans. It could outsource some of its tasks (such as laboratory work) and would have close working relationships with government agencies, institutions and NGOs. Its location would need to be at a very senior level so that it could co-ordinate the work of other agencies and link to city management processes.

13.5.2 Objectives of an Environmental Health Mission

In the immediate to short term (0 – 2 years):

- Develop and update annually an environmental health profile of Delhi including relevant environmental, morbidity and mortality data disaggregated by ward or zone
- Identify specific links between local environmental factors and health, and locate 'hotspots'
- Recommend priorities for action to resolve environmental health problems

In the short term (0 – 5 years):

- Develop and co-ordinate an environmental health strategy for the capital

- Ensure that environmental health concerns receive due attention in the setting of priorities for government investment and action in the capital.

13.5.3 Composition of Mission

The mission could be structured to incorporate varied technical and managerial expertise. The mission structure could include a 'mission core' consisting of senior officials from the Departments of Health, Environment and Urban Development, Municipal Corporation of Delhi and Center for Occupational and Environmental Health who have influence at senior level and can enable collaboration with a wide range of government and non-government agencies.

The mission should also include a separate technical committee comprising of a multi-disciplinary team of professionals from fields such as epidemiology, environmental toxicology, environment and social sciences, public health and urban development. The mission would need a mechanism for continuous servicing in terms of inflow of data from governmental agencies such as the State Health Intelligence Bureau as well as non-governmental institutions.

13.6 Risks of Implementation

The success of the environmental health mission would lie in a number of factors such as bureaucratic initiative and support from the relevant experts and professionals.

Funding would also need to be assured. To date, preventive policies outlined in the National Health Policy have not been seriously adopted in Delhi, highlighting the need for political will if any recommendations arising from the Delhi 21 are to be followed.

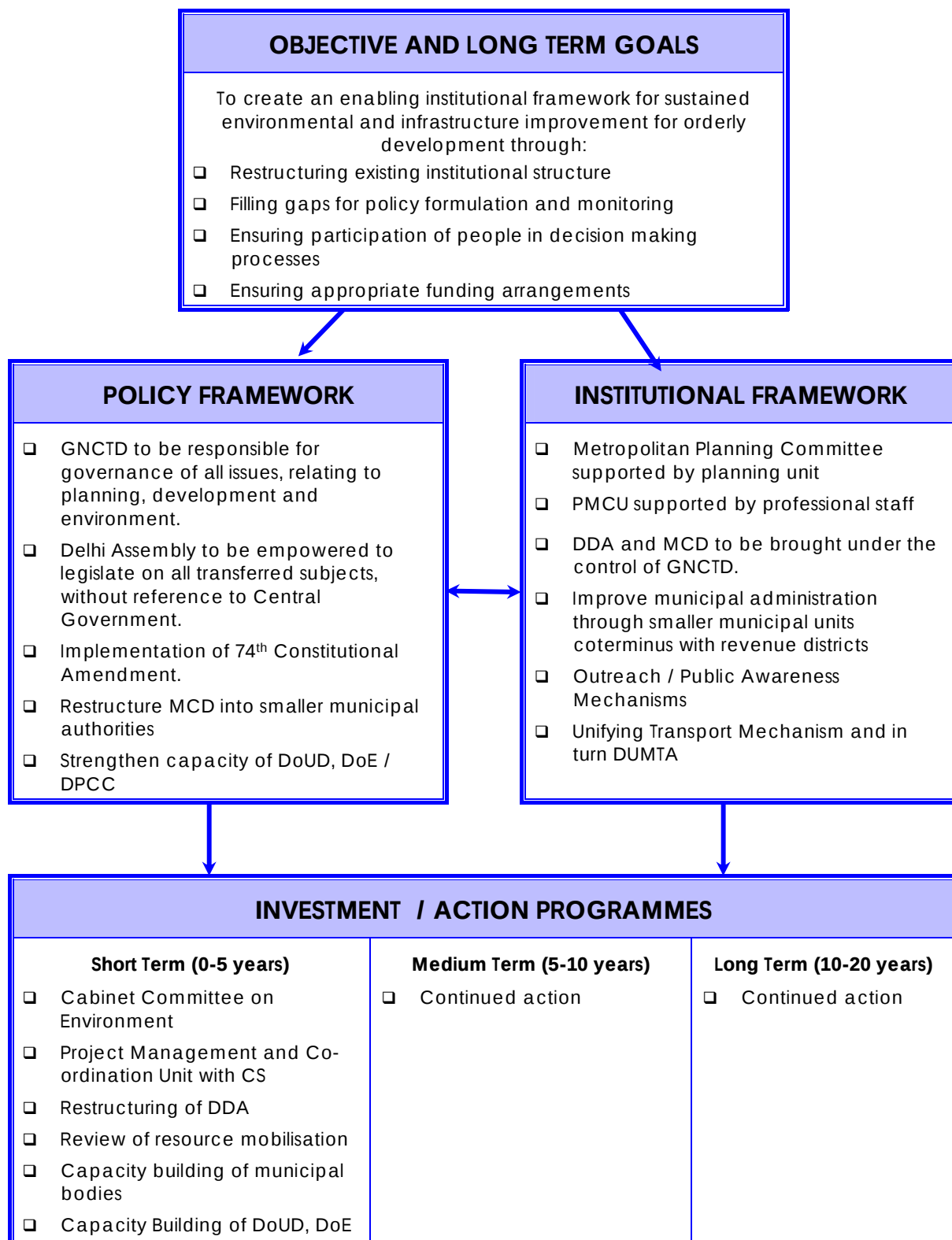
SECTION V

City Governance

Chapters – 14 to 19

CITY GOVERNANCE

Summary Sheet



14. Good City Governance

14.1 Context

Despite the fact that planning and development have been going on in Delhi for the last four decades, the planning approaches and the investment decisions have not always dealt with the resulting environmental impacts. There has been no vision beyond infrastructure to deal with environmental problems *per se*. Removing these planning weaknesses, in fact, reforming the planning process itself, and not repeating the past mistakes or reinforcing them through current practices should initiate a reform process.

The environment, urban planning and management in Delhi will continue to suffer from the current disabilities, and will not cope with future prospects unless a number of fundamental and drastic changes are made in its governmental structure. Short-term recommendations in this regard are given below.

14.2 Room for Improvement

Given the current backlog and future demand for infrastructure services, using the accepted criteria of Good City Governance (see Box), there is room for improvement in Delhi. The supply side approach of providing better infrastructure accompanied by more effective asset management will provide the necessary foundation for developing an environmentally sustainable city. Capacity

building, process reforms, getting institutions right, getting prices right, etc. from the outset. To this extent, decisions on the future of the MCD and the DDA, and the consequent changes in the GNCTD itself (by way of applicability of the 74th Constitutional Amendment) and installation of the Project Management Co-ordination Unit, etc. should not be delayed. But, this will not be sufficient unless sustainable institutional arrangements are also made simultaneously, and in some cases ahead of the infrastructure services.

As recommended earlier, action is required at the policy and the governmental levels. Attracting national and international funding will also necessitate positioning institutional reforms

Good City Governance

Urban governance has been defined as “an efficient and effective response to urban problems by democratically elected and accountable local governments working in partnership with civil society.”(UNCHS) The basic elements in this definition are

- Efficient and Effective- getting things done right, and getting right things done, making optimal use of resources
- Democratically elected- participation in the decision-making process; rule of law
- Accountable- decision makers are responsible for results of their decisions
- Partnership- commitment of the stakeholders
- Civil society- the community and the private sector

15. Administrative Control of GNCTD on Development Activities

15.1 Need for Integration and Strengthening

Just as DJB, DVB, DTC and DPCC are under the administrative control of the GNCTD, the two most important urban and environmental agencies viz. the MCD and the DDA should also be brought under the administrative control of the GNCTD. It has already been mentioned earlier how the duality of control and separation of the lines of control and reporting have been creating problems of integrated and comprehensive sustainable development in Delhi. The Urban Development Department (UDD) of the GNCTD should be responsible for these two organisations, for which the managerial capacity of that department may have to be increased. The UDD should be responsible for resource mobilisation, resource allocation, prioritisation, and implementation in the Urban Development Sector. The planning department should also be suitably strengthen for integrating planning function covering social economic and physical planning aspects in an integrated manner for stepping up the development process in a more effective manner

15.1.1 Municipal Bodies

There is a proposal to split the MCD into eight municipalities to be coterminous with the revenue districts of the GNCTD. If and when this becomes a reality, it is expected that it will set in motion the processes of (a) the convergence of the local administration between the municipalities and the revenue districts; (b) decentralisation and delegation of powers and functions; (c) providing a new basis for the applicability of the 74th Constitutional Amendment (Article 243-W); and, (d) bring increased pressure and logic to rationalise the 15 planning zones of the DDA to be more meaningfully related to the revenue districts and the proposed municipalities.

15.1.2 Delhi Development Authority (DDA)

DDA has been engaged both in planning and development functions. The compulsions and the imperatives of the development functions inevitably predominate, and the planning function (structural / strategic) invariably suffers. The DDA would be brought under the GNCTD, and be divided whereby (a) the physical planning function gets located in the GNCTD as a servicing unit for the Metropolitan Planning Committee as required in the 74th Constitutional Amendment Act (Article 243-ZE); and (b) the development function corporatised into a joint-sector company with private sector participation to continue with the investment programme.

15.1.3 Metropolitan Planning Committee as required by 74th Amendment

With the above re-structuring, the GNCTD can refashion the whole process of planning and development for the entire NCT area (which by 2021 will be fully urbanised with a population of about 22-25 million) in a two-level approach. Whereby, (a) the top metropolitan level will be dealing with medium-to-long term strategic and structure planning, programming, budgeting, monitoring and evaluation, and, (b) the newly created municipalities, with Ward Committees as provided in the 74th Constitutional Amendment Act (Article 243-S), providing the lower level for local planning, development, operations and maintenance.

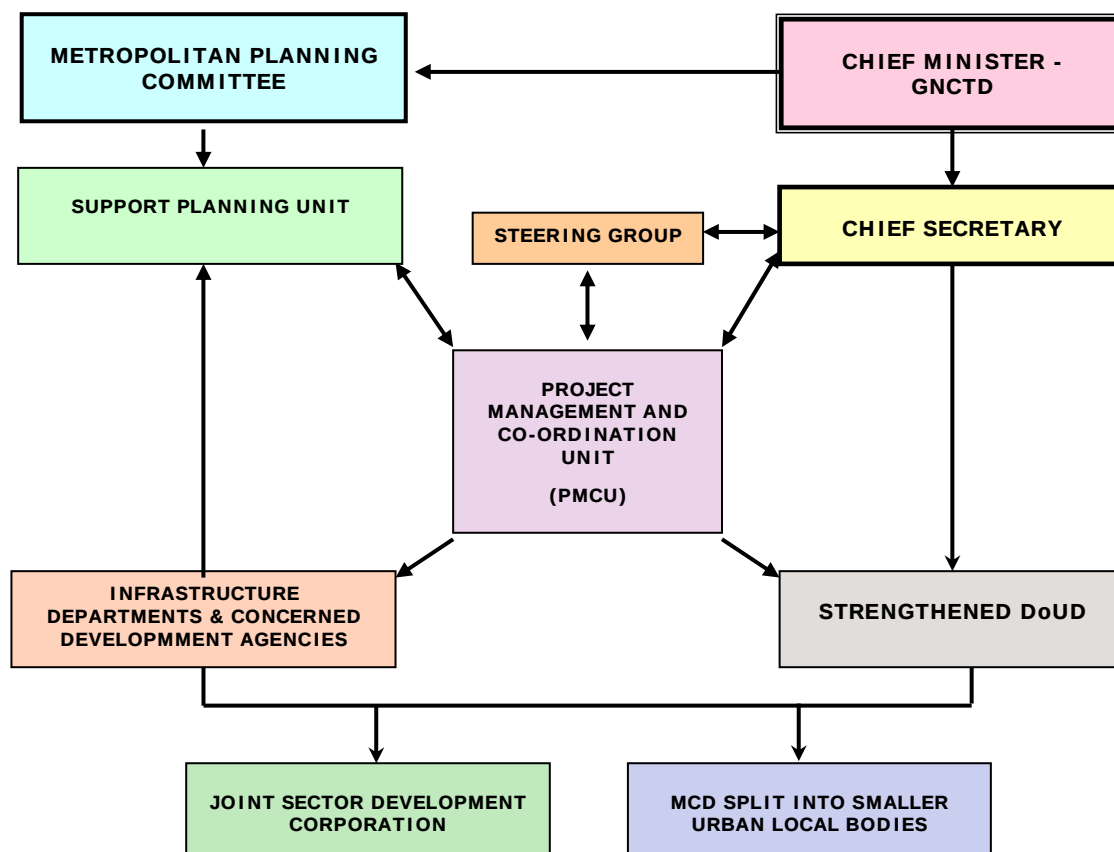
One linkage for development will be between the proposed joint-sector development company, the Metropolitan Planning Committee, and the local bodies, with links to relevant agencies like the DPCC, DJB, DVB, DTC, etc. In order to provide professional services to the Metropolitan Planning Committee / GNCTD,

the services of the proposed erstwhile Physical Planning Unit of the DDA may be made available as recommended above.

The organisational character of the proposed joint-sector development company or the PMCU and their composition are not being suggested, as these details can be developed in due

course. It is their position in the management structure, which is being stressed. The powers, functions and the composition of the Metropolitan Planning Committee are given in the Constitution itself (Article 243-ZE). A chart showing the proposed changes is given below.

Proposed Changes in Urban Development Governance in Delhi



15.2 Partnership

15.2.1 Role of the Private and the Public Sectors

The role of the private sector in Delhi can be seen in two ways: public-private partnership (PPP) and direct private sector participation (PSP). The need and justification for an increasing role for the private sector are no longer in question. The areas where and how the private sector can be efficient and effective in political, social and economic sense in a given situation is an issue which has to be pragmatically settled in a situation-specific manner.

The understanding reached in the course of this project would indicate that areas like water supply, sewerage, waste management (including waste recycling and reuse), water cess billing and collection on a wider scale, obtaining laboratory facilities, training and outreach programmes, community level actions etc. are potentially amenable to PPP and PSP, provided the policy and regulatory framework is available, transparent, stable and equitable.

15.2.2 Role of Civil Society

Good City governance also implies the participation of the civil society. There is no

single formula or behavioural code for participation. It is a doing and learning process. Institutionalising the participatory process will come only through the process itself. At the same time, it is important to understand that participation is not

- (a) *getting people to do labour on a government-run community development project,*
- (b) *asking people their opinion of an already prepared programme and then making minor adjustments to the programme (public hearing approach), or*
- (c) *merely asking people to pay part of the cost.*

The approach is not intended to be restricted to the government sector alone. However, experience elsewhere shows,

when the government sector is ready to change and allow others to comprehend their system of governance, there will be less risk and fear for the different sectors to work together.

This might include local communities undertaking service provision within their areas, either directly or through contracts with other providers. Under this scenario, the role of the utility might be one of bulk provider and technical support.

This ***transformation has to take place at all levels of government*** so as to re-institutionalise the focal energy of the government towards openly working with the ever-changing economies, businesses, NGOs, CBOs, professional bodies, experts, academia, etc.

16. Changes Required

16.1 Immediate Actions

It is well understood that the fundamental changes are political in nature and their acceptability and implementation will take some time through discussions and processing. Therefore, the process of moving forward should be expedited by adopting measures suggested in the following paragraphs.

16.1.1 Environmental Policy for Delhi

Frame and adopt an Environmental Policy for Delhi.

16.1.2 Cabinet Committee on Environment and Infrastructure

Constitute the Cabinet Committee on Environment and Infrastructure for Delhi 21 to be headed by the Chief Minister and consisting of the Ministers of Environment, Industry, Transport, Urban Development, Planning and Finance.

16.1.3 Rules of Business

Rules of Business may be strengthened to ensure that no development project (beyond a certain size) gets financial or administrative approval without environmental clearance.

16.1.4 Monitoring Delhi 21

Project Management and Co-ordinating Unit (PMCU) should be established to be responsible for the implementation of Delhi 21 recommendations and taking all other related actions for moving the process forward.

16.1.5 Establishment of Environmental Cells

The remit of environmental protection and improvement rests with other concerned departments and agencies viz. Industry, Transport, Urban Development, PWD, Health, DDA, MCD, NDMC, DJB, DTC, DVB. Establishment of environmental cells in all such agencies having personnel from among the existing staff with relevant

training will facilitate and strengthen the working of the DoE and DPCC. These cells should activate internal actions in respective agencies on the basis of environment management policy that will be adopted. They should also be responsible to educate all concerned in the agencies for taking actions and based their decisions on environmental considerations.

16.1.6 Unifying Metropolitan Transport Mechanism with Support Teams

Pending the establishment of Delhi Urban Metropolitan Transport Authority (DUMTA) set up a *Unifying Metropolitan Transport Mechanism with supportive teams* for –

- (i) Policy and Planning
- (ii) Public Transport
- (iii) Traffic Management
- (iv) Infrastructure and Development, and
- (v) Enforcement - to initiate various actions.

16.1.7 Citizens' Charter

DoE/DPCC should prepare a Citizens' Charter (see Box below). Similarly, other departments and agencies may also prepare their own Citizens' Charter depending on the kind and ranges of

Citizens' Charter

A Citizens' Charter is a statement from a public authority on what people can expect from the service providers in quantitative and qualitative terms. The people also have an opportunity, in the process, to interact with the public authorities, know the reasons for failure, when things might improve, and what improvements may take place in future.

services they provide, subject to internal consistency among them.

16.1.8 Public Participation Window (PPW)

DoE/DPCC should provide a Public Participation Window for community-level local environmental management through CBOs and NGOs. Interactions with the Trade Unions, Industry Associations, Professionals etc. wherever and whenever

necessary, may also be through this Window.

Public Participation Window (PPW)

The PPW would be a social development cell, coordinating the community development and public awareness activities of the DoE / GNCTD. It would focus, on issues relating to the more vulnerable sections of the society like low-income groups and women. Also trade unions and other groups who may be in need of greater enfranchisement, entitlement and welfare, within the context of environmental improvement programmes.

16.1.9 Private Sector Participation (PSP) and Public Private Partnership (PPP)

PSP and PPP should form an integral part of the management process. This can be in ways where industry associations are involved in technology upgradation, pilot projects in waste management, awareness building and compliance generation in pollution control among their members, training and orientation, communication and dissemination.

In short, PSP offers access to new technologies, external expertise and potentially, new sources of finance. Private providers are both more autonomous of government and strongly motivated to increase efficiency to raise profits, the gains from which in turn flow back to the consumer.

16.1.10 Independent Regulators

The role of government should move to one of facilitating and enabling, rather than of implementation and provision. Services will be provided through PSP or PPP by institutions that are commercially orientated and autonomous with the aim of

achieving adequate cost recovery levels. The responsibility for setting charging levels and tariffs should move to new independent regulators, providing confidence to stakeholders that pricing and other decisions will be made on a non-political basis.

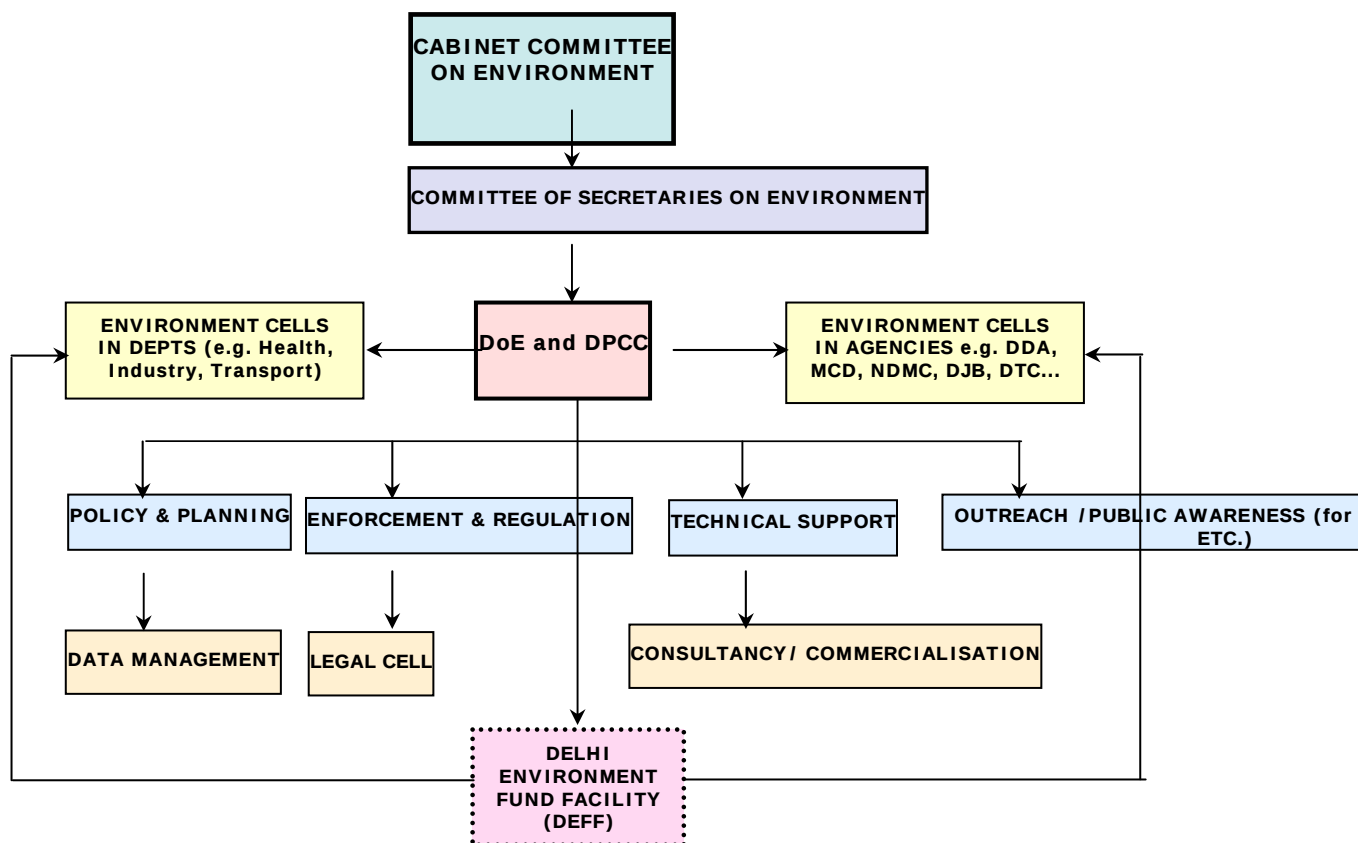
Independence does not mean that regulators are not accountable, but it does mean that the implementation of government policy is undertaken in a manner that is seen to be fair and transparent. The regulator should also have access to legal recourse in order to ensure compliance.

16.2 Funding Interventions

16.2.1 Delhi Environment Fund Facility (DEFF)

Creation of a Delhi Environment Fund Facility (DEFF) whose corpus can be built up from various sources as a revolving, non-lapsable and replenishable fund. However, the fund cannot be used to supplement normal budgetary sources nor as an emergency source of funds. The fund is intended to be used for special purposes, as may be decided by its management committee, as a catalytic or special intervention resource for those activities not usually supported by the departmental budget. Such a Fund would show the overt intention of the Government to support special environmental initiatives. Such a Fund may also act as a leverage for national and international funding.

Chart showing proposed Environmental Management Structure is given below:

PROPOSED ENVIRONMENTAL MANAGEMENT STRUCTURE

17. Financial Management

17.1 Delhi – a Rich Shell with a Poor Core

17.1.1 A Buoyant Economy

Comparatively, Delhi can be said to be a highly productive and rich city in India despite the presence of urban poverty in the city. The economy has benefited from the processes of economic liberalisation with the average income approximately twice the national average. The GNCTD's main tax base, the sales tax, is buoyant reflecting the city's economy. The State has earmarked 9.5 percent of its taxes for a global sharing with its local bodies to supplement their own revenue sources.

17.1.2 Poor Revenue-High Costs

Unfortunately, the local bodies and DJB are financially weak.

MCD has inadequate generation of its own-revenue and with excessive costs, particularly for its establishment. As a result, it has neither undertaken significant capital expenditure works on its own, nor is it in a position to repay loans.

NDMC does have a revenue surplus derived primarily from its function to distribute electricity - all other activities resulting in losses. Despite surpluses, it has decided to suspend repayment of loans to GNCTD since 1997-98.

The DJB has consistent deficit over the years. It does have a significant capital works programme, but due to the weak financial position it is unable to attract new external borrowing for additional works.

A root cause of many of the financial problems is the existing pricing distortions. Focus must be changed from a dependence on government subsidy to a more commercial orientation based on revenue from sales and to gain from the benefits of Private Sector Participation.

17.1.3 Resource Mobilisation

None of these agencies is realising its resource mobilisation potential, though all are capable of generating significantly more revenue and reducing costs. This is the case at the level of management and from within their existing revenue-raising powers, for example from improved collections. The need for management and policy changes to generate additional resources is well known and has been publicly debated. The situation of fiscal weakness stems from a lack of political will to improve institutional performance.

There is considerable scope to increase property tax revenue through periodic property enumeration, improved assessments of owner occupied properties, removal of tax exemptions for properties of central government and embassies, and improved collection.

17.1.4 Reducing Costs

There is a potential to reduce costs by reducing MCD's solid waste management staff through institutional and management reforms, e.g. voluntary retirement scheme. In addition, a monthly fee for solid waste collection and disposal should be levied on all consumers.

Without its electricity income, NDMC would incur huge revenue deficits. With any reallocation of electricity supply responsibility in its area, NDMC would find it difficult to finance its other responsibilities.

17.1.5 Low Water Tariffs

Water tariffs in Delhi attempt to cross-subsidise among user groups and consumption levels and between the priced and free supply. Water tariffs therefore, serve distributional rather than allocative-efficiency objectives. Delhi Jal Board's own efforts should first be directed to reduce its establishment costs; long term actions on this front lie through institutional and management reforms. The water and

sewerage charges need to be adjusted upward gradually to a level of full cost recovery, and be linked to an appropriate inflation index.

A good tariff policy balances four broad objectives: efficiency in resource allocation; equity; effectiveness (tariffs should be simple and enforceable); and financial viability of service providers. Simultaneously, it is necessary to ensure affordability of services for low-income consumers.

The DJB Act provides no equity base. All commercial utilities should have scope for a mix of loan and equity - the factor to determine this is the financial position of the undertaking. It is therefore desirable to attempt to establish a suitable capital structure for the DJB.

17.2 Strengthening Financial Management

17.2.1 System Accounting

The conclusion from the consideration of the fiscal position of these agencies is that the preparation of capital expenditure programmes for environmental improvements financed by borrowing can only be contemplated if there are parallel action programmes of policy and management leading to financial strengthening.

Local bodies operate on the traditional cash-based system of accounting. There is

general awareness of the limitations of this system and the need to improve the flow of financial information. There is a need to introduce more transparency and follow contemporary accounting standards having been adopted in municipal and parastatal bodies elsewhere in India.

The budget preparation and control exercise is weak. The budget planning should more effectively reflect the strategy, priorities and service outputs. Performance of operational activities and services should relate to the availability of financial and other resources to ensure that expected activities and outputs are being performed as scheduled or provide a basis for its revision.

17.2.2 Polluter to Pay

The water cess rates are set nationally (last set in 1992) with an extremely low rate structure. These need to be related to the conditions prevailing in Delhi. A change in legislation is therefore required to enable the states and union territories to fix their own cess rates. DPCC's assessment and collection of water cess needs an in-depth review.

Larger public outlays on pollution control in Delhi would call for an earmarked revenue source by the GNCTD (e.g. a differential surcharge on sales tax on petroleum fuel graded in terms of their pollution effect) for passing on to the DPCC.

18. Sustained Improvements

18.1 Incremental Charges

The vision period of 20 years should provide the opportunity to make sustained urban and environmental improvements in Delhi in an incremental manner in line with local commitment, resource mobilisation and institutional reforms and capacity building - all of which take time to develop. The same holds true for price and regulatory reforms. Given the acuteness of the situation, however, most of these policy and institutional reforms need to be accomplished in the immediate to medium term in the next 5 to 10 years at the most.

18.2 Co-ordinating Mechanism

Multiplicity of agencies in Delhi has often been identified as an issue. But it is not something unique for Delhi. It is quite feasible that multiple agencies working towards the same objective, *within a given framework*, may achieve the objective in a fashion. Delhi 21 now provides Delhi with a framework. What is required is a visible, responsible, transparent and accountable mechanism at the GNCTD level, which can mediate and resolve conflicts, monitor overlaps and duplications, find gaps and recommend authoritative steps for remedial action in an overall framework. The recommendations made in this 'Delhi 21' should facilitate in establishing this mechanism.

18.3 Building Partnerships

Partnership, stakeholdership and ownership in their myriad ways are the key issues in environmental governance. There is growing awareness in Delhi, though not followed by adequate action, of the need to improve the interaction among governmental organisations, NGOs, CBOs, private sector, etc. There is a clear understanding that for this purpose, partnership and ownership can be created and built around shared values and assumptions, and not simply by allocating

institutional responsibilities, however clearly done.

18.4 Environmental Awareness

While there has been an increase in the awareness of environmental issues in Delhi, raising the level of environmental management (which is an objective of this project) over time, remains an explicit development process. This can be achieved through increased access to, and dissemination of information as well as consultation and communication between all sectors of the society through Information, Communication and Education (ICE). ICE is not a one shot affair, but has to be carried out in successive stages of heightened activities. The potential benefits of ICE are:

- Promoting changes of attitude among target population;
- Promoting a widened spirit of collaboration among the private sector in urban environmental management; and
- Creating better understanding among government agencies (of horizontal and vertical orders)

18.5 Governmental Co-Operation

The preparation of Delhi 21 itself has helped to bring together the various agencies and provide a platform for contact, exchange and co-ordination. The constitution of a Working Group at the GNCTD level with the Chief Secretary as its Chairman, and a National Steering Committee at the Government of India level with the Secretary Ministry of Environment as its Chairman is therefore a welcome sign. It is now to be hoped that similar horizontal relationships to keep the process of institutionalisation on going and to move forward the urban environmental management in the mainstream of development administration in future will be achieved (Committee of Secretaries / Programme Co-ordination and Management Unit).

19. – Taking “Delhi 21” forward

It is recognised that all various measures suggested in this section including those for the improvement of financial management of various agencies are well within the competence of the GNCTD as it is. It can, therefore, be processed, decided and acted upon from within the existing system, if there is political will and bureaucratic initiative acting together. These, therefore, can be achieved in the very short term, to show the Government's intention to move forward the Delhi 21, to achieve the more fundamental policy and institutional reform in the short term (1-5 years).

SECTION VI

Strategic Interventions

The Next Steps

20. Project Interventions

Chapters in Section V on City Governance make several recommendations, which need fundamental changes in the institutions that impact on the environment and quality of life of the citizens of Delhi. Discussions concerning their suitability and implementation will take time. In the meantime, an immediate action programme of institutional changes set out in Section V should be carried out. Especially, the setting up of a Project Management and Co-ordination Unit (PMCU) under the Chief Secretary of GNCTD.

In addition to the Immediate Action - the Institutional changes, there are a number of projects which are listed below which have been identified for implementation in the first 5 years of the programme. The project descriptions are given in outline. If agreement is given to go ahead, it will be necessary, if not already completed, to establish their feasibility and prepare detail design briefs.

The initiatives that have been identified for further consideration have been classified under two headings:

- (a) projects involving capital and recurrent expenditures; and
- (b) programmes for strengthening the information base; organisational change; change management and revenue improvement action plans.

Technical Assistance (local and expatriate) would in many cases be required for design and implementation of the various project components.

20.1 Capital and Recurrent Expenditure Projects

20.1.1 Area Development

For advance servicing of land to cope with growth

Implementation agencies; special and dedicated units staffed by a mix of suitably experienced professionals seconded from DDA and MCD (or the respective municipal authorities) under the guidance of PMCU,

PD, UDD, should initiate suitable area development projects for advance servicing of land to cope with predicted growth. They should take the following steps:

- Identify 2 or 3 sites, where off site infrastructure is available and the site is considered to be "ripe for development";
- Prepare design briefs in association with DDA planners, enter into partnership agreements with the private sector, utility providers and transport operators; and
- Appoint the developer (one of the private sector partners with an equity stake) to take the leading role and implement the agreed programme of work; selling plots and structures in a phased and commercial manner.

20.1.2 Upgradation of Slums (Jhuggies-Jhopris Clusters) and Unserved Areas.

Implementation agency: the proposed social housing corporation and the slum and JJ department (suitably restructured and strengthened). These should plan and accelerate the implementation of the programme by taking the following steps:

- Identify 9 or 10 colonies which need urgent attention and could be upgraded within 2 years of commencing the programme and where residents are willing to co-operate, accept relocation (if necessary), contribute to costs, and form community associations;
- Construction of Transit Camps for accommodation of slum dwellers to be covered in the upgradation programme
- Proceed in the manner described for area development above, only this time, involve community associations and CBO's as partners, to the partnership agreement, and directors on any development companies which may be subsequently formed.

20.1.3 Water Supply

Implementation agency DJB

- Leak detection and rehabilitation programme

- Expansion of trunk and distribution networks to un-served and growth areas
- Water Treatment Plant at Sonia Vihar and associated transmission mains
- Groundwater exploitation – Ranney Wells in Yamuna flood plain
- Raw water conduit from Munak to Haiderpur

20.1.4 Wastewater Management:

Implementation agency DJB

- De-silt and renovate existing sewerage system
- Expand sewerage system to connect un-served areas
- Sewage treatment plant in Trans-Yamuna

20.1.5 Solid Waste Management (Transportation and Disposal)

Implementation agency to start with MCD. When the MCD is split into smaller units, the co-ordination function for transportation of solid waste from transfer stations in the respective municipal areas to the disposal sites and further disposal will have to be looked after by a special unit created for this purpose under the UDD or Directorate of Municipal Administration under the UDD. The tasks should be as follows:

- Necessary restructuring and capacity building of the department for improving the management and contracting of procedures for transportation and disposal;
- Identify and develop 2 sanitary landfill sites incorporating compost plants; one in the north and one in the south of the city;
- Identify sites and provide small and large transfer stations to suit disposal sites and collection districts;
- Reorganisation of the street sweeping and collection systems;
- Pilot Schemes to test out proposals for waste minimisation; recycling; collection; and Private Sector Participation, and;

- Contract out collection, treatment and disposal of hazardous and bio-medical wastes. Treatment and disposal sites to be identified and developed.

20.1.6 Traffic and Transportation

Implementation agency – various.

- MRTS development (GoI / GNCTD-UDD)
- Revitalisation of the Ring Railway (Min of Railways/Ministry of UD / GNCTD)
- Strengthening rail links with NCR (Min. of Railways, Min. of UD / GNCTD/ Beneficiary State Governments)
- Urban road improvement, including cycle and pedestrian facilities (PWD / MCD / NDMC)
- Public Transport system improvements (DTC / MCD / NDMC / PWD)
- Traffic management improvements, parking lots, park and ride, etc. (MCD/NDMC/PWD).
- Four more interstate bus terminals (GNCTD)
- Freight complexes (GNCTD)
- Peripheral Expressways (GNCTD, GoI)
- Further phases of Metro Rail (GNCTD, GoI).

20.2 Institutional Strengthening Programs

20.2.1 Water Supply and Sewerage

Implementing Agency: DJB

Re-structuring and capacity building for improving the management of the water supply and sewerage networks on a commercial basis. Technical assistance to be provided for preparation of short term investment programmes including:

- Water audit with location and condition surveys of water supply networks.
- Water supply leak detection and network rehabilitation programme.
- Location and condition survey of existing sewerage network.
- Training on sewerage de-silting and renovation techniques and equipment.
- Development of MIS/GIS for water supply and sewerage asset management

20.2.2 Habitat Improvements for Urban Poor

Implementing Agency: Slum and JJ Dept., MCD.

Re-structuring and capacity building for improving the coordination of slum environmental improvements and accelerating the programme of in-situ upgrading of JJ clusters. Actions will include:

- The development of an integrated information system on JJ clusters
- Establishment of local / district slum improvement implementation units to be responsible for:
 - (i) Preparation of design briefs and implementation programme
 - (ii) Co-ordination land owners and funding institutions
 - (iii) Co-ordination of service infrastructure providers
 - (iv) Providing community liaison for planning and implementation

20.2.3 Solid Waste Management (Collection)

Implementing Agency: to start with CSE MCD, when the MCD is split into smaller units, the respective departments of those municipal units would continue the incharge of street cleaning and collection of solid waste and transporting to the transfer stations. The tasks for improvement in this sector should be as follows:

- Performance and financial management systems in respect of the internal collections and transportation of the transfer stations.
- Efforts for waste minimisation with community support
- Public Sector Partnerships for door to door collection, etc.
- Building and improving management and public information systems

20.2.4 Environmental Management

Implementing Agency: DoE/DPCC

Capacity building for integrated, cross departmental plans, programmes and budgets with the development of

information systems for effective environmental monitoring and regulation enforcement. The actions would include:

- MIS development, laboratory services and staff training
- Enhancement of water cess collection
- Public awareness raising and participation
- Developing responsiveness in public authorities.

20.2.5 Environmental Health Monitoring

Implementing Agency: Department of Health Services Establishing an Environmental Health Mission as an interim body charged with the following objectives:

- Develop and update annually an environmental health profile of Delhi including relevant environmental, morbidity and mortality data
- Identify specific links between local environmental factors and health
- Recommend priorities for action to resolve environmental health problems
- Develop and co-ordinate an environmental health strategy for the capital
- Ensure that environmental health concerns receive due attention in the setting of priorities for government investment and action in the capital.

20.2.6 Land, Property and Cadastral Records

Implementation agency; a special and dedicated unit set up in the Land / Urban Development offices of GNCTD reinforced by suitably qualified and experienced personnel from MCD and DDA, which would:

- Prepare a report on the condition and extent of the existing records and information base. Identify the gaps and shortcomings.
- Prepare terms of reference for a consultant study which will lead to:
 - (i) The preparation of land and property registers and fiscal cadasters;

- (ii) Digitised maps and records which can be easily and regularly updated as land and property transactions are finalised
- (iii) Establishment of a GIS unit for catering to the mapping needs of all utility services and municipal bodies, and
- (iv) Recommendations and steps to be followed in developing an active and functioning market, in land and property.

20.2.7 Organisational Changes

Implementation Agency; Respective Departments of GNCTD

- MCD – GNCTD has set up a committee to review the structure of working of MCD and the need to split it into smaller municipalities. The committee is to review viability of the proposal and to determine, which functional responsibility should remain with the municipal units and which should be transferred to GNCTD. The recommendations when available should be implemented and further actions
- DDA – a similar joint committee should be set up by GOI and GNCTD to define the modalities for splitting the DDA into a planning unit for assisting Metropolitan Planning Committee and the development an autonomous development corporation for taking up

development projects in Delhi. Suitable further action will have to be initiated as per the recommendations of the committee.

20.2.8 Revenue Improvement Action Plans (RIAP)

To produce and recommend implementation arrangements within existing financial structures and current arrangements.

Implementation agency; a Task Force consisting of technical officers, seconded from relevant entities, to be set up to manage the process, and be located under the Department of Finance or Department of Urban Development, GNCTD. The task force would require:

- Each entity (MCD, NDMC, DJB, etc.) to produce:
 - (i) A RIAP, with targets for revenue performance improvement over a 5 year projection.
 - (ii) An Annual Report reviewing progress against targets, and with an update of the RIAP.
- Monitoring of performance by the task force

Funds for securing Consultancy services may be made available to entities requiring help with the preparation and implementation of their RIAPs.

21. Financial Implications

21.1 Affordability

An attempt has been made to ascertain the additional costs of project interventions, and likely scope for financing them from within the capability of the city itself including cost recovery from the domestic sector. The issues are:

- the size of the funding task ahead;
- identification of funding sources and the sustainability of the project interventions;
- the likely impacts on household affordability and income levels.

As a guide, the average contribution by the domestic sector for these services in 1999 was 6.9% of average household income. Normally 10% of the household income would be the acceptable measure of the limit of affordability for civic services and water and sanitation.

The tentative proposals for major additional projects in the key sectors have been identified. These proposals have been costed and phased over the next 20 years. Estimates of operations and maintenance cost and debt service charges have also been made. The debt recovery assumes funds will need to be repaid over 20 years carrying interest at 14%. These costs have been phased to give a year-wise profile of expenditure necessary to improve the city's environment. Despite being tentative in nature, they give a clear insight in to the scale of the funding problem.

Tables 21.1.(a) & 21.1.(b) summarise the capital expenditure requirements for these proposals and the O&M costs and capital recovery required for self-sustainability over 20 years (at year 2000 base costs):

Table 21.1 (a): Summary of Project Investments

(Rs. million)

	0-5 Years	6-10 Years	11-20 Years	Total	(%)
Investments					
Water Supply	14,080	11,420	28,620	54,120	31%
Waste Water	11,350	12,650	22,000	46,000	26%
Solid Waste Management	4,285	4,500	9,000	17,785	10%
Roads and Traffic Management	6,050	29,850	6,350	42,250	24%
Slum Development	3,446	3,693	7,387	14,526	8%
Total Investments	39,211	62,113	73,357	174,681	100%
Equivalent US \$ (Rs. 46 = \$1)	852	1,350	1,595	3,797	

Note: @ Excludes railway and projects outside NCT

Table 21.1 (b): Summary of Project Investments

(Rs. million)

	0-5 Years	6-10 Years	11-20 Years	Total	(%)
Water Supply	704	571	1,431	2,706	8%
Waste Water	454	506	880	1,840	5%
Solid Waste Management	171	180	360	711	2%
Roads and Traffic Management / @	242	1,194	254	1,690	5%
Slum Development	172	185	369	726	2%
Total O&M Cost	1,744	2,636	3,294	7,674	23%
Capital Recovery	5,921	9,379	11,077	26,377	77%
Total O&M Cost and Capital Recovery	7,665	12,015	14,371	34,051	100%

Note: @ Excludes railway and projects outside NCT

21.2 Funding Patterns and Sensitivity Analysis

The funding patterns will depend on the sectors, financial strength of the implementing agencies, and the potential for beneficiary contributions. In order to make an assessment, some assumptions had to be made.

Contributions by the domestic sector from property taxes, municipal fees and charges and water supply were assumed to be 70% of the income of the two local bodies and the DJB. It has been further assumed that these funds initially rely on contributions by

60% of the city population, 40% contributing nothing for the civic services.

Further, the population has been assumed to rise by 2.5% annually and the contributing population rising from 60% to 80% in the 20th year. The per capita income has been assumed to rise by 2% annually in real terms.

The following table 21.2 (a) explains the present level of per capita contribution to the revenue generation through the three major local institutions. Tables 21.2 (b) & 21.2 (c) summarise the per capita contribution required for sustainable development with associated sensitivity analysis for selective years:

Table 21.2 (a): Per Capita Contribution Analysis

	Total Revenue in 1999-00	Assuming 70 % contributed by Domestic	Average per capita Contribution	Per capita Contribution assuming 60 % paid	Contribution if 60 % paid (as % to income)	Contribution assuming 100 % paid (as % to income)
	Rs. Million	Rs. Million	Rs.	Rs.		
Per Capita Income – 1999: Rs. 27,693						
MCD	14,700	10,290	735	1,225	4.4%	2.7%
NDMC	5,900	4,130	295	492	1.8%	1.1%
DJB	2,258	1,581	113	188	0.7%	0.4%
Total	22,858	16,001	1143	1,905	6.9 %	4.1 %

Table 21.2 (b): Affordability Analysis

Selective Years	2006	2011	2021
O&M and Capital Recovery for the year (Rs. Million) (assuming 70% pertaining to domestic sector)	5,365	13,776	23,835
O&M and Capital Recovery to Investment	13.6%	15.1%	13.7%
Per capita Income - 2% growth in real term (Rs.)	30,575	33,758	41,150%
Per capita contribution required	8.1%	9.5%	9.4%
Present per capita contribution	6.9%	6.9%	6.9%
Increase over present level	1.2%	2.6%	2.5%

Table 21.2 (C): Sensitivity Analysis under Key Variables

Selective Years	2006	2011	2021
Key Variable 1: If Capital investment rises by 10%			
Per capita Income - 2% growth in real term (Rs.)	30,575	33,758	41,150
Per capita contribution required	8.3%	9.9%	9.8%
Increase over present level of 6.9%	1.4%	3.0%	3.0%
Key Variable 2: If Per capita Income rises by 1% in real term			
Per capita Income (Rs.)	29,106	30,590	33,791
Per capita contribution required	8.5%	10.5%	11.4%
Increase over present level of 6.9%	1.6%	3.6%	4.5%
Key Variable 3: If per capita Income remains at the present level			
Per capita Income (Rs.)	27,693	27,693	27,693
Per capita contribution required	8.95	11.5%	13.9%
Increase over present level of 6.9%	2.0%	4.7%	7.0%

The conclusion is clear: the per capita contribution may remain in the range of 8-10% even under the plausible assumption that capital costs might rise by 10% (see Key Variable 1) and is within 10% of average household income considered as the acceptable measure of the limit of affordability.

However, if the city's income fail to increase and is less than 2% the burden on the household will increase to over 11% if increase in per capita income is restricted to 1% (key variable 2) and to 14% if per capita income remains at the present level (key variable 3).

Considering the city's projected economic development over the 20 years this scenario is unlikely to happen. It may, however, happen if more and more low-income households continue to be attracted, and higher income households tend to leave the city. This is a pattern of mobility that has been observed in the evolution of cities in developed countries of North America and Europe where the environment itself was a determining factor in the demographic changes.

While the potential to fund the proposals is there, in order to achieve the objectives of mobilisation of the additional resources largely from within Delhi, changes will be needed. Galbraith's old adage of private affluence in the midst of public squalor is relevant here since *a prosperous city does not mean prosperous governance*.

21.3 Changes for improving finances:

Following in brief are some suggestions.

- Progressive increase in the water and sewerage tariff to the level of the real cost of services.
- Levy of a separate solid waste collection and disposal charge on all beneficiaries of the services; and reduction in staff costs through institutional and management reforms.
- Reform the property tax collection by:
 - (a) survey and coverage of all uncovered areas;
 - (b) review of all disputed cases of assessment;
 - (c) reduction in the present rebate on payment by specific dates to 10% from the present 20%, and levy of penalty if payment is not made by the year end;
 - (d) improve collection efficiency to 80%;
 - (e) removal of exemptions for properties of the Central Government and Embassies.
- Increase the one-time road tax on vehicles, and other vehicle related fees and charges e.g. driving licence and transfer of vehicle fees.
- Earmarked revenue source by the GNCTD, e.g. a differential surcharge on sales tax on petroleum fuel, graded in terms of pollution effects.

The collections from the last two sources need to be added to a separate fund at the

state level, which could be then specifically utilised for improvements in the public transport sector.

21.4 Funding the interventions

It is necessary to think of potential funding sources for various projects that are being recommended for achieving the vision for Delhi as outlined in the beginning. The

buoyancy of the economy of GNCTD as also the possibility of servicing any loans or recovery through user charges etc has been indicated earlier. It is in this context that the internal revenue surplus as well as borrowings can be thought of as a source of funds for all the projects that are being suggested for achieving the vision for Delhi in 2021.

22. Measuring the Success of “Delhi 21”

The journey to 2021 for Delhi with the vision outlined earlier has many dimensions and series of steps. Since situations are dynamic and actors on the scene are also changing, it is always necessary to poise and look back and adjust the steps in order to attain the desired goal.

Intermediate monitoring and evaluations can indicate whether the progress have both been on the right track or changes are necessary. This needs certain criteria for measuring and evaluating the progress achieved through the series of projects and institutional reforms.

Environmental quality often leads to health impacts and distribution impacts may

shape social acceptability. In order to simplify these criteria they may be grouped into the ‘3 E’s and ‘sustainability’.

Equity	distribution impact, affordability, rationality
Efficiency	environmental quality, cost effectiveness
Effectiveness	viability, health impact, social acceptability
Sustainability	long term effectiveness

Some achievement milestones to verify whether the Delhi 21 interventions have been successful are outline in table no. 22.1 on the next page.

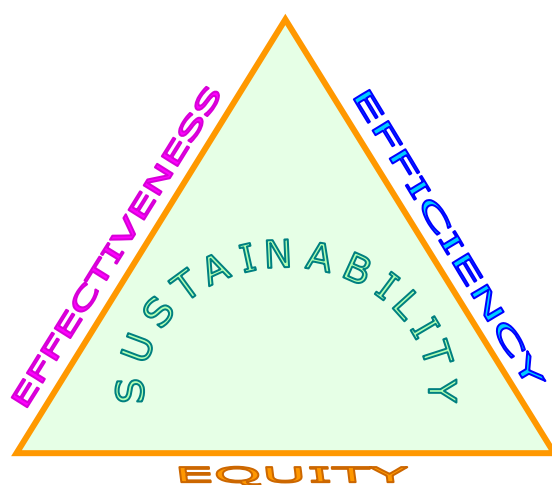


Table No.: 22.1 Indicators for Evaluating the Progress of Delhi 21

Year	Targets	Indicators
2006	▪ GNCTD in control of urban development ▪ Restructuring of GNCTD Depts and Municipalities initiated ▪ Capacity building of municipal and GNCTD departments initiated ▪ Resource mobilisation steps initiated ▪ Project Planning, Monitoring and Co-ordination Unit (PMCU) installed ▪ Equal investments in NCR towns initiated ▪ 100,000 households in JJ clusters provided better habitat ▪ New municipal and hazardous waste disposal sites operational ▪ Rehabilitation of Water supply and sewerage networks in progress	• Public satisfaction about services through opinion polls show positive improvement • Land and property record modernised with reduction in land/property legal disputes • Environmental indicators improved • Property tax collection improved and covers previously unlisted properties ▪ Water supply charges equal to real costs ▪ 40% of slum dwellers (year 2000 level) covered by suitable programmes of upgradation or relocation ▪ City streets and drains are cleaner ▪ Un-accounted for water reduced by 50% ▪ Substantial improvement in Yamuna river water quality
2011	▪ Municipal structure plan framework operational ▪ Rehabilitation of Water supply and sewerage networks completed ▪ Water supply and wastewater treatment facilities increased ▪ Investments made in public transport ▪ City traffic management schemes completed ▪ Road congestion and use of personalised vehicles reduced ▪ A further 150,000 households in JJ clusters provided better habitat ▪ Economy of DMA towns improved	▪ City growth accommodated in planned development and redevelopment areas ▪ Less congestion and densities of old colonies stabilised ▪ Water supply and wastewater networks serving almost 100% ▪ Yamuna river water with bathing quality standard for 90% of year ▪ Less waiting time at signal junctions ▪ Environmental levels and economic growth trends on target ▪ Rapid growth in jobs and population in DMA towns
2016	▪ Integrated mass transportation network fully operational ▪ A further 200,000 households in JJ clusters provided better habitat ▪ Investments in NCR towns completed ▪ DMA and NCR towns are more attractive for employment opportunities ▪ Water recycling and conservation measures operational	▪ Public acceptability of mass transportation and fewer cars and scooters on roads, substantial reduction in waiting time at signalled junctions ▪ Increased flows of commuters to DMA towns from Delhi ▪ Growth in employment and population increasing faster in DMA towns ▪ Ground water levels higher and of good quality
2021	▪ Environmental indicators within international standards ▪ Problems of unauthorised developments and JJ Clusters solved ▪ Various measures in infrastructure services fully operational	City internationally acclaimed for appropriate measures and achievements in environmental and development management

Delhi Urban Environment and Infrastructure Improvement Project

List of Reports

Part I

"Delhi 21"

Supporting Documents

Status Report for Delhi 21

Supplementary Papers

Part II

High Priority Investments Report (Options and Opportunities)

Detail Project Reports

- | | |
|--------------|--|
| Report No. 1 | Water Conservation
Treated Wastewater Recycling Feasibility Study |
| Report No. 2 | Industrial Area Up gradation -
Policy Framework & Guidelines with 3 Case Studies |
| Report No. 3 | Scientific Development of a Landfill site at Bhati Mines,
Feasibility Study and Concept Design |
| Report No. 4 | Integrated Transport & Traffic Management
Future directions |

Part III

Slum Upgrading Programme

(Habitat Improvement Programme for the Urban Poor)

- | | |
|-----------|--|
| Volume I | Policy Framework |
| Volume II | Pre-feasibility Study for a Pilot Project |

Part IV

Outline Technical Assistance