

# **BHOPAL**

## **CITY DEVELOPMENT PLAN**

*Jnnurm*

**JAWAHARLAL NEHRU NATIONAL URBAN RENEWAL MISSION**

**BHOPAL MUNICIPAL CORPORATION**

**TECHNICAL SUPPORT**

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## PREFACE

Globalisation and its trends have brought into currency, the notion that urban local bodies ought to adopt some aspects of the work culture of private corporations. This is especially with regard to the maintenance of quality standards.

The exercise done by BMC in formulation of the City Development Plan was unique. This was largely because it adopted a participatory process involving the elected and the administrative wings of the Corporation, as well as citizens of varied interests, and other organisations concerned with the city's growth and development.

In the context of the 74<sup>th</sup> Constitutional Amendment, which gives the urban local bodies more freedom and power in executing their functions, the study has provided BMC invaluable inputs regarding the intricacies of urban governance and finance. Today, when every urban local body is striving to provide its citizens with the best of governance, only those like Bhopal figure where decentralised efforts in improving the city's living environment are clearly visible and are above all other interests. Bhopal an age-old trade centre has been confronted with issues from time to time, which it has used to strengthen itself. The global economic recession has caused diversification of industrial and occupational patterns. It is this context that the Bhopal Municipal Corporation is trying to define its presence in the city. Its strategy is to move from 'tackling issues' to 'not allowing issues to emerge' by means of effective, integrated and phased plans.

With such a long-term goal to be fulfilled and delivered to its citizens by 2021, the City Development planning process warranted a high level of public participation. The overwhelming response to the "City Development Strategy" workshop as well as the zone level and ward level consultative meetings helped chalk out the purpose of the short-term strategic plan as 'To foresee an issueless 2021'.

The City Development Plan for Bhopal deals with a comprehensive, cohesive and concise manner, all the important elements of governance in the form of themes: Urban Growth Management/ Development Planning, Urban Basic Services and Infrastructure, Transportation and Traffic Management, Housing and Slums, Urban Environment, Social Development, Urban Governance and Management and Urban Finance and Management apart from Demographic Trends, Economy Pattern, etc with a long term strategic vision.

It is believed that this effort of the Bhopal Municipal Corporation will bring in a corporate vision to the Institution and a change that the citizens of Bhopal will contribute to, and ultimately benefit from.

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## ABBREVIATIONS, ACCRONYMS AND KEY TERMS

AC	Asbestos Cement
ADB	Asian Development Bank
ASI	Archaeological Survey of India
BDA	Bhopal Development Authority
BDP	Bhopal Development Plan
BDO	Block Development Officer
BHEL	Bharath Heavy Electronic Limited
BMC	Bhopal Municipal Corporation
BMW	Bio Medical Waste
BPL	Below Poverty Line
CAA	Constitutional Amendment Act.
CBD	Central Business District
CDP	City Development Plan
CDS	Community Development Societies
CI	Cast Iron
CIP	City Investment Plan
COD	Chemical Oxygen Demand
CPA	Capital Project Administration
DI	Ductile Iron
DUDA	District Urban Development Authority
EIUS	Environment Improvement of Urban Slums
EWS	Economically Weaker Section
FOB	Foot Over Bridges
GDP	Gross Domestic Product
GI	Galvanised Iron
GOI	Government of India
ha.	Hectare
HIG	High Income Group
JNNURM	Jawaharlal National Urban Renewal Mission
JBIC,	Japan funded "Lake Bhopal Conservation and Management Project
LIG	Lower Income Group
Lcpd	Liters Capita per Day
MANIT	Mulana Azad National Institute of Technology
MC	Municipal Corporation
MGD	Million Gallons per Day
MIC	Mayor-in-Council
MIG	Medal Income Group
MLD	Million Letter Per Day
M.P	Madhya Pradesh
MPHB	Madhya Pradesh Housing Board
MPPCB	Madhya Pradesh Pollution Control Board
MIS	Management Information System
MPTNCP	Madhya Pradesh Town and Country Planning
MS	Mild Still
MSL	Mean See Level
MSW	Municipal Solid Waste
MOS	Marginal Open Space
MoU	Memorandum of Understanding
MPSRTC	Madhya Pradesh State Regional Transport Corporation
MT	Metric Tone
NGOs	Non Governmental Organization



NRW	Non Revenue Water
NTACH	Indian National Trust for Art and Cultural Heritage
PCU	Passenger Car Unit
PHE	Public Health Engineering
PHED	Public Health Engineering Department
PPOUL	Prevention of Pollution of Upper Lake
PPTA	Preliminary Project Technical Assistance
PSC	Public Service Commission
PSP	Public and Semi Public
PWD	Public Work Department
ROW	Right of Way
SC	Schedule Caste
SFC	State Finance Commission
SPM	Suspended Particulate Matter
SPS	Sewage Pumping Station
Sq	Square
ST	Schedule Tribe
STPs	Sewage Treatment Plants
SWM	Solid Waste Management
ULBs	Urban Local Bodies
UPAP	Urban Poverty Alleviation Program
WTP	Water Treatment Plant

## Acronyms

Semi pucca	semi permanent
Pucca	permanent
Rickshaw	3-wheeler motorized vehicle
Nagar sewa	Public buses that run within the city

## Key terms

Human poverty	the lack of essential human capabilities, notably literacy and nutrition
Income poverty	The lack of sufficient income to meet minimum consumption
Patta	Slums notified in Madhya Pradesh Gazette under Madhya Pradesh Patta, Act.
Bawadri	

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## Chapter

**1 Introduction****1.1 Background**

Most of the developing countries are facing problems of rapid urbanization. India's level of urbanization is projected to rise from about 28 per cent in 2001 to 36 per cent by 2026 - when the total urban population could number roughly half a billion. In 2001 there were thirty-five 'million plus' cities, it seems likely that there will be nearly seventy by 2026 and because the urban population is becoming increasingly concentrated, these seventy cities could contain around half of all the country's urban inhabitants. Delhi and Greater Mumbai – will probably each contain thirty million people.

Cities and towns have a vital role in India's socio-economic transformation and change. Apart from their contribution to the country's gross domestic product (GDP), which is currently placed at about 50-55 per cent, and their growing role in the global markets, cities in India are the center-point of innovations and hub of many activities. At the same time, most cities and towns are severely stressed in terms of infrastructure and service availability. In 2001, 50.3 per cent of urban households had no piped water within premises, and 44 per cent of them were devoid of sanitation facilities. Even with a relatively high economic growth registered during the 1990s, 23.6 per cent of the country's urban population continued to be below the poverty line. According to the Census of India 2001, 14.12 per cent of urban population lives in slums, with a significant proportion of it without access to even the most basic services. The inner areas of cities face widespread dereliction, decadence, and neglect, with significant negative economic consequences.

The studies on various human settlement analysis shows that the rapid and

haphazard growth of urban sprawl and increasing population pressure is resulting in deterioration of infrastructure facilities, loss of productive agricultural lands, green open spaces, loss of surface water bodies, depletion of ground water aquifer zones, air pollution, water contamination, health hazards and many micro-climatic changes. Therefore, the environmentally compatible urban planning must begin with a comprehensive look on the use of land. It is in this regard, the development plan or Master Plan of the city generally prepared by T & C P department must be reviewed every 5 to 10 years to take care of the population pressure and provide better quality of life in the city and its environs.

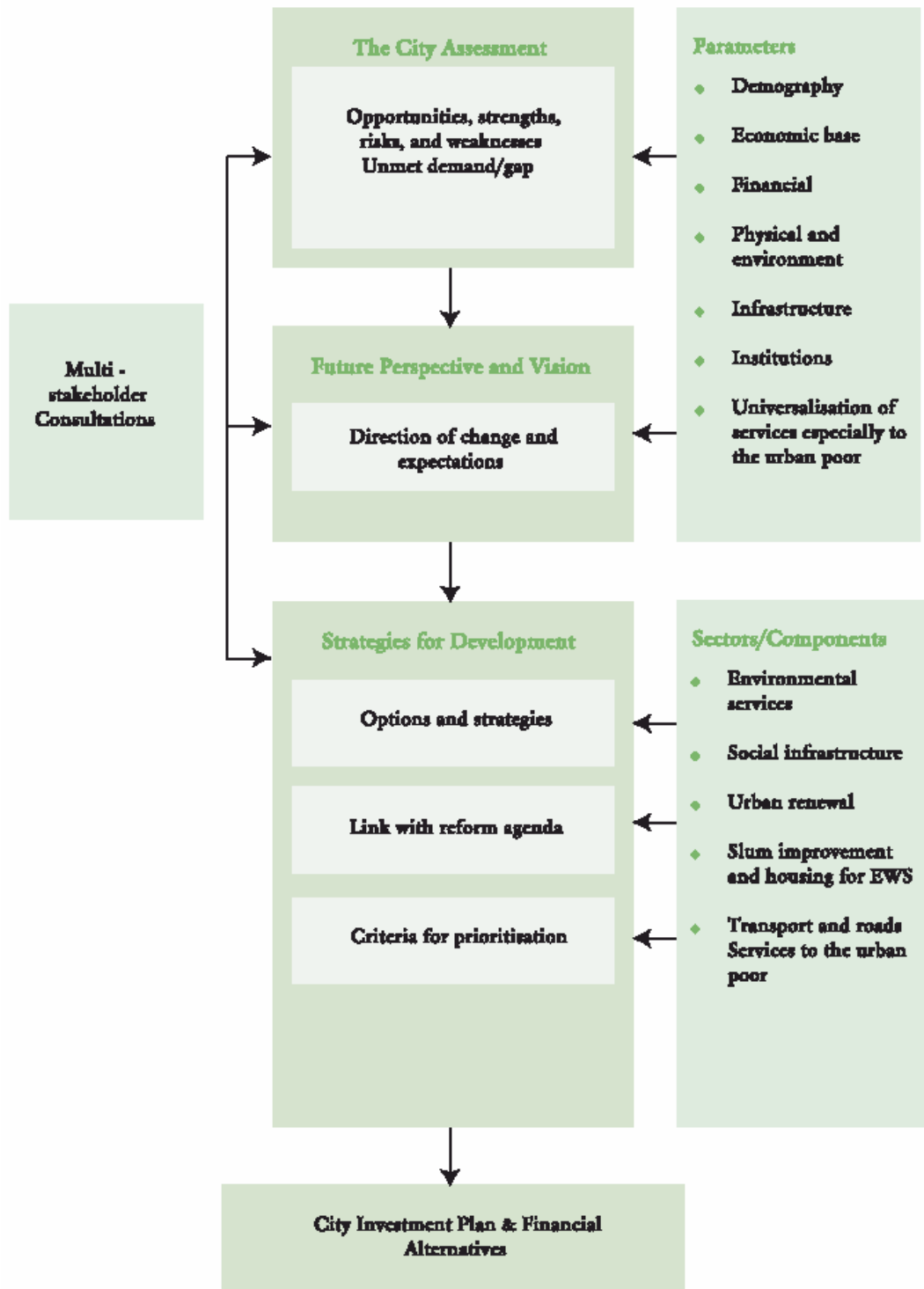
The Master Plan is a legal document specifying the allocation of broad land use in the city for the future development. Such plans propose the new areas for the development as well as extension of urban infrastructure.

In the preparation of an environmentally compatible urban development plan, it is a prerequisite to understand linkages and interactions that exist between different components of the urban environment. Secondly, the data collected on different aspects of the urban environment has to be translated into useful information for the purpose of urban development. Thirdly, there is also a need to aggregate this information according to administrative/ natural and hierarchical units.

**1.2 City Development Planning**

A City Development Plan (CDP) is both a perspective and a vision for the future development of a city. It presents the current stage of the city's development – *where are we now?* It sets out the directions of change – *where do we want to go?* It identifies the thrust areas — *what do we need to address on a priority basis?* It also suggests alternative routes, strategies, and interventions for bringing about the change – *what interventions do we make in order to attain the vision?* It provides a framework and vision within which projects

Illus. 1.1 Process of Formulating a City Development Plan



Source; As Suggested by JNNURM Tool Kit



Needs to be identified and implemented. It establishes a logical and consistent framework for evaluation of investment decisions.

The CDP is anchored on the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) goal of creating economically productive, efficient, equitable and responsive cities. As a step to achieving this goal, the CDP focuses on the development of economic and social infrastructure, strategies that deal specifically with issues affecting the urban poor, strengthening of municipal governments and their financial accounting and budgeting systems and procedures, creation of structures for bringing in accountability and transparency, and elimination of legal and other bottlenecks that have stifled the land and housing markets. It provides a basis for cities to undertake urban sector reforms that help direct investment into city-based infrastructure. Preparation of a CDP is a multi-stage exercise, involving:

**(i) In-depth analysis of the existing situation, covering the demographic, economic, financial, infrastructure, physical, environmental and institutional aspects:** The purpose of this stage is to review and analyse the current status of the city with regard to the state of its development, systems and procedures, as equally its institutional and financial context. This stage is meant to identify the strengths and weaknesses in the city's development and to provide an understanding of what impedes service delivery and management within the existing set-up and what contributes to better service provision. This stage offers an opportunity to bring out the unique features of the city that may distinguish it from other cities.

**(ii) Development of a perspective and a vision of the city:** Using the results of the first stage of analysis combined with consultations with key stakeholders and civil society, this stage is meant to develop a vision for the future development – a shared vision of where the city wants to be in a medium-term perspective. It is a

collective vision of the future direction expressed in terms of expectations and often-even goals, such as “water for all”.

**(iii) Formulating a strategy for bridging the gap between where the city is and where it wishes to go:** It is in this stage that strategies and interventions are identified for attaining the vision and future development perspectives. This stage is used to first identify the options and strategies and second, to evaluate the strategies from the perspective of their contribution to the goals and objectives of the JNNURM. The chosen strategies are translated into programmes and projects in this stage. This is the phase where the city needs to decide which programmes would contribute most to the vision and medium-term perspectives. It is at this stage where criteria are selected, with appropriate consultative processes, for prioritizing the strategies, programmes and projects.

**(iv) Preparing a City Investment Plan (CIP) and a financing strategy:** An investment plan and a financing strategy are an integral part of the CDP. It is an aggregate investment plan indicating, for instance, the cost involved in providing 24/7 water supply from the present level of 10/7; it is not a financial estimate of a project for increasing the capacity of a water plant from 1,00,000 MLD to 1,50,000 MLD. Crucial to this stage is a plan that considers the alternative sources of financing the vision and the accompanying strategy and programmes.

### 1.3 Previous Planning Interventions in Bhopal

The Development Plan prepared by T & C P for Bhopal 1991 (BDP-1991), which was conceived in 1973-75, will remain an important document, as it was the plan for the city, which envisaged the comprehensive urban perspective for the newly formed State Capital.

The next planning intervention in the history of the City Development in Bhopal was Bhopal Development Plan 1991-2005. In the process of preparation of the Bhopal

Development Plan, a national seminar was organized at Bhopal to formulate guidelines for evolving future city pattern. The recommendation of seminar has been incorporated in the BDP 2005 to a desired extent, within the provisions of the M.P. Nagar Tatha Gram Nivesh Adhinyam 1973.

The proposals of BDP 2005 lay emphasis on future city structure; the process of plan implementation through active public participation. The organic growth pattern has been honored, incorporating the committed isolated development in the northern part of the city. For implementation of plan proposals it is preferred that large chunks of land are developed with necessary physical and social infrastructure in priority areas, to ensure desired land supply.

The proposals of BDP 2005 are in form of the modification of the earlier adopted plan i.e. 1975-1991 master plan. It deals with identification of the city in regional context, conceptualizing of parameters of the city development and delineation of a logical frame work for the plan proposals. It also gives details of the development regulations in comprehensive manner and options of plan implementation process, emerging out of local aspirations and past experience.

## 1.4 Approaches to Bhopal City Development Plan

The CDP is the BMC's operating blueprint for achieving greater efficiencies and to deliver the highest possible level of service to the community. As mentioned earlier, the "City Development Plan" under the JNNURM Programme is developed on the basis of extensive consultations and a participatory process that began as early as in July 2005 when the initial guidelines of NURM scheme were being formulated

The CDP focuses on the key issues identified under the JNNURM. This is the first plan of its kind for the city. Through the plan the citizens of Bhopal will share a vision for the future and identify issues in

various sectors a city development in the short, medium and long run. This establishes priorities and investment decisions can be made for the desired future when the next CDP is prepared.

The City Development Plan focuses on the components to which JNNURM will be providing its assistance. The City Development Plan is prepared taking in to view the deficiencies and requirements of the city in terms of Urban Infrastructure and Governance and Basic Services for Urban Poor till 2021. It targets for a sustainable and harmonious development of the city of Bhopal, to be fulfilled by 2021. This will indirectly phase the development period in two stages of seven years each. The first seven years will be focusing upon the utilization of funds under JNNURM as envisaged by JNNURM and expecting the same for next 7 years, which will be subsequently reviewed.

### 1.4.1. Planning Process

The various steps undertaken for the formulation of the Bhopal City Development Plan are discussed below

Step 1: In depth analysis of the existing situation of the city under following sectors

- City Profile
- Demographic and Social Profile
- Economic base of the city.
- Urban Infrastructure and Environment
- Land use
- Housing & Slums
- Inner City
- Urban Heritage
- Organizations, institutional setup and Finance.

Step 2: Identification of the Problems Issues and Potentials regarding the Sectors discussed in previous step consolidating the Problems Issues and Potentials as per

the priorities to the different Sectors. Special priority will be given to the components under JNNURM.

Step 3: Deciding vision for development of the City with the sectoral goals and objectives by taking into consideration the development perspective of the city.

Step 4: Formulating the Strategy for filling up the Sectoral deficiencies as well as meeting the future requirements of the city and correlating it with City investment Plan and Financial Strategy. This will involve enlisting of the projects as per the priorities identified in the step 2 and phasing them in suitably in the plan period.

#### **1.4.2. Plan Formulation through a wide participatory process**

The BMC has been involved in Development of Bhopal and providing the Basic infrastructure facilities as per section 66 of Municipal Corporation Act 1956. For this purpose BMC has been conducting studies to assess the current situation and future demand, to name a few Lee Associates had studied the Traffic and Transportation in 2000, studies of the slums in the city under Slum Networking Project for Urban poor by Ar. Himanshu Parikh, Ahmedabad in 2000. Similar studies for Water Supply, Sewerage, Solid Waste Management and Drainage by consultants of Asian Development Bank (ADB) in 2002. Thus BMC has wide database and deep understanding of the shortcomings and the necessities of the city.

For the formulation of the CDP, the future vision of the city was developed through a **participatory approach by the BMC**, initiated in July 2005. Broadly, BMC has conducted this in following ways:

The preparation specifically for CDP under JNNURM started on July 2005. For the purpose of this first internal meetings were conducted with various departments like Public Works Department (PWD), Health and Sanitation Department, Water Supply, Planning and Development and Garden and Park Department etc. and the 14 zones

of BMC. The Suggestions and proposals from the officers and HOD's of the various departments were compiled and presented for discussions at various levels.

After this exercise at the Zonal level, BMC had conducted meetings with the Municipal Councillors and identified stakeholder's election ward wise. A list of the stakeholders presents in the meeting(s) and importantly the minutes of the above meeting(s) at zonal level have been documented. The documentation included the photography and videography of these deliberations.

The Suggestions and proposals from the officers and HOD's of the various departments were compiled and presented before the Mayor in Council on 01.09.2005.

Responsibilities were assigned to the various zones and departments of BMC for the distribution and collection of questionnaires from the identified stakeholders. Owing the responses found from the various stakeholders in the submission of the duly filled in questionnaire.

The responses to the questionnaires were fed into the software program prepared by the E.D.P. Department of the BMC. The evaluation and analysis of the suggestions in the questionnaires were being carried out to attain the satisfaction level regarding the existing services provided by BMC.

BMC has created an effective database of the detailed existing services to work out the CDP. It will also be helpful to know the present scenario of the different services provided by the corporation, thereby framing intrinsic and concise "City Development Plan".

Though the members of the BMC Council are Corporators and Public representatives, to encourage participatory approach BMC conducted Workshop from 26.12.2005 to 28.12.2005. The workshop was attended by public representatives, technocrats, citizens, government and non-governmental organisations. The details of the workshops and the suggestions are

enclosed in the Annexure. An open house discussion was also initiated by BMC on 03.01.2006. The Outcome i.e. the suggestions of the people were incorporated in the CDP.

Key Stakeholders and Planning Partners:

- *Member of Parliament's, Member of Legislative Assembly's Elected Members of Urban local Body and Other elected representatives*
- *Representatives of Government Departments and Parastatal Agencies from the City*
- *The City's Community Planning Partners comprising of NGO's and CBO's*
- *Corporate Bodies in Industrial, Commerce and Other Sectors*
- *Citizens of Bhopal*

#### 1.4.3 Plan Approval

***The Draft of the CDP was again reviewed by the respective department of the BMC and presented before the BMC Council on 28.01.2006. The council approved the Draft CDP on 28.01.2006 vide resolution 02 (refer Annexure). Therefore the draft of the CDP was sent for approval to the State Level Nodal Agency (SLNA), and it was approved by the SLNA under JNNURM on 28.01.2006 (refer Annexure)***

The plan will be revised regularly and the corporation will prepare annual progress reports on plan implementation including proposed development works. This will be supported by annual departmental community surveys on the services that BMC provides to its citizens.

The plan also propose a Financial Operating Plan for 2006-2012 i.e. for the first seven years based on the long-term financial vision and identify high priority investment requirements. It will also focus on capacity building of the institutional, financial and technical aspects of the

corporation to strengthen urban services' delivery.

#### 1.4.4 Plan Implementation

The implementation of the plan will be successful when the resource allocation decisions are made in a coordinated manner with the other agencies involved. The investment strategies are to achieve the plan's goals

For certain sectors like transport and communication, development of outgrowths etc, which are not under the purview of BMC directly, the strategies under such themes identify other line agencies like BDA, MPPWD, etc., non-profit organizations and citizen groups with whom the corporation will work in a coordinated manner to support an array of activities and services. In such cases the primary responsibility vests with the other agencies, the corporation will take up the secondary responsibility.

#### 1.4.5 Plan Monitoring and Evaluation

Regular monitoring and annual evaluation of plan implementation is an envisaged essential. The corporation perceives that "Seeing is Believing" and hence the concerned officials will regularly monitor the plan implementation by way of site visits. Sets of sustainability indicators are developed under each sector to help constant monitoring of the resultant changes in the social, economic and environmental set up of the city.

While monitoring and evaluation are carried out in concordance, annual evaluation reports will be prepared by each division of the corporation and compiled into an annual progress report of the CDP. This will help ensure consistency within and among the plan themes. The evaluation reports will lead to both plan amendments and improved ability to predict future scenarios. The corporation will strive to find improved means to communicate with its citizens and involve them in planning and decision-making. Progress in this direction has already been achieved through its online communication method.

#### 1.4.6 Plan Review

Plan review will be the final stage of the CDP process that sets agenda for the following CDP. Since the plan period extends for a period of seven years, it is essential that a critical review of the current plan's success and failures with regard to the goals and objectives of the CDP as well as with those of the long term strategic plan is carried out at the end of the seven year plan period. Plan reviews will also be carried out annually based on the extent of implementation evaluated through progress reports.

### 1.5 Report Structure

The report is divided into Five Sections. The sections are divided on the basis of the City Development Planning Process.

- Section I – Introduction.
- Section II – Existing Situation Analysis.
- Section III – Development Perspective and Vision.
- Section IV – Strategy for Development.
- Section V – City Investment Plan and Financing Strategy.

#### Section I: Introduction

Introduces the City Development Plan and the key agencies involved in Plan Preparation, Formulation and Implementation. This Section is divided in to two chapters. First chapter focuses on City Development Planning Process and Approach towards the Bhopal City Development Plan, while the second chapter introduces the Implementing Agency Bhopal Municipal Corporation and other Parastatal Agencies.

#### Section II: Existing Situation Analysis

It has been divided in to 10 Chapters. It analyses the existing situation of the city and elaborates Problems and Issues regarding the following components in the JNNURM with respect to the City profile Demography and Social Profile, Economic Base and Land Use

- Infrastructure and Environment
  - Water Supply
  - Sewerage
  - Solid Waste Management
  - Storm Water Drainage
  - Transportation
  - Air and Water Quality
- Housing and Slum
  - Housing Situation in the city
  - Shelter and Urban Poor (Slums)
  - Basic Services for Urban Poor (Slums)
- Inner City and
- Urban Heritage

#### Section III: Development Perspective and Vision

This Section Deals with the drawing an over all vision of the city and Deciding Sectoral Goals to achieve it. The sectoral goals are further supplemented by aims and objectives of the sector.

#### Section IV: Strategy for Development

This Section Deals Preparation of Strategy for the achieving the Goals, Aims and Objectives. The strategy will involve identification of the projects to meet the goals and objectives within a period of time with City Investment Plan

**Section V: Financial Operating Plan**

This Section Statements regarding the financial position of the Bhopal Municipal Corporation and its ability to undertake the development as per the projects identified by the Development Strategy.



Illus 1.2 News Paper Cuttings



Illus 1.3 Workshop Proceedings on Bhopal City Development Plan





Illus 1.4 News Paper Cuttings



Illus 1.5 News Paper Cuttings





Illus 1.6

News Paper Cuttings

# Municipal Corporation, Bhopal

## READING ROOM SECTION

दिनांक 27 DEC 2005

BHOPAL

Name of Paper \_\_\_\_\_ Place \_\_\_\_\_

Date \_\_\_\_\_ Vol \_\_\_\_\_ No \_\_\_\_\_ Page \_\_\_\_\_ Col \_\_\_\_\_

27 DEC 2005

C/D/No \_\_\_\_\_

Date \_\_\_\_\_ 27 DEC 2005

# विकास के लिए सुझावों का अंबार

## नेशनल अर्बन रिन्यूवल मिशन की बैठक में जनप्रतिनिधियों की राय

भोपाल, 26 दिसंबर नसं: शहर में शापिंग मॉल, फ्लाईओवर, ओवरब्रिज व अंडरब्रिज बनवाए जाएं। चौड़ी सड़कें बनाई जाएं। पार्किंग की उचित व्यवस्था हो। स्ट्रीट लाइट का प्लान बने। सफाई के लिए जिम्मेदारी तय की जाए और कचरा उठाने की व्यवस्था प्रतिदिन हो।

ऐसे देरों सुझाव सोमवार को यहां नेशनल अर्बन रिन्यूवल मिशन पर आयोजित बैठक में विभिन्न जनप्रतिनिधियों ने दिए। महापौर सुनील सूद ने कहा कि इस योजना के तहत हमें 1300 करोड़ रुपए तक मिल सकते हैं। देश के 63 शहरों में इस योजना के लिए रखी गई राशि में से बराबरी का हिस्सा लेने पर यह संभव है। नगर निगम ने अभी तक मिले सुझावों के आधार पर प्राथमिक योजना तैयार की है, जो एक हजार करोड़ रुपए से ज्यादा की है। इसकी विस्तृत रिपोर्ट बना कर राज्य सरकार को पेश की जाएगी। उसके अनुमोदन के बाद ही इसे केंद्र सरकार को भेजा जाएगा। इसके लिए 10 जनवरी 2006 तक शहरी विकास योजना रूप से तैयार करनी है। सांसद लक्ष्मीनारायण शर्मा ने कहा कि पुरानी इमारतों और नजूल की खाली पड़ी जमीन को नगर निगम को आवंटित किया जाना चाहिए। ऋण की अदायगी के लिए भी विस्तृत रूपरेखा तैयार होनी चाहिए। नेता प्रतिपक्ष अशोक पांडे ने कहा कि झुग्गी बस्ती विस्थापन पर रहवासियों के लिए रोजगार की व्यवस्था हानी चाहिए। बैठक में निगम परिषद अध्यक्ष रामदयाल प्रजापति, निगम आयुक्त मनीष सिंह आदि भी मौजूद थे।

एक भी विधायक नहीं पहुंचे: नगर निगम द्वारा सोमवार को नेशनल अर्बन रिन्यूवल मिशन पर सुझाव लेने के लिए आयोजित बैठक बैठक में मात्र एक सांसद लक्ष्मीनारायण शर्मा को छोड़ कर कोई भी सांसद-विधायक नहीं पहुंचे। पार्षदों की उपस्थिति भी कम रही।

### क्या आए सुझाव

- झुग्गी बस्तियों को विस्थापित करने के बजाय उसी जमीन पर मल्टीस्टोरी बना कर रहवासियों को जगह दी जाए। उसकी एक या दो मंजिल का कामशियल उपयोग किया जाए और खाली जमीन भी नगर निगम को मिले, जिससे वह खर्च निकाल सके
- जहां पाइप लाइन नहीं हैं, वहां लाइन डाली जाए। पुरानी पाइप लाइन बदली जाए
- जिन स्थानों पर ओवरहेड या संप टैंक नहीं हैं, वहां उनका निर्माण हो
- खुले नालों को ढंका जाए। नाले-नालियों की मरम्मत हो और उनके निकास की उचित व्यवस्था हो
- सीवेज लाइनों को बदला जाए
- उपनगरों में शमशान घाट व कब्रिस्तान के लिए जमीन आरक्षित की जाए
- कांजी हाउस व स्लाटर हाउस को व्यवस्थित किया जाए
- पुराने शहर में व्यवस्थित सब्जी व मीट मार्केट बने
- बिजली के खंभों व ट्रांसफार्मर व्यवस्थित किए जाएं
- पार्क, स्टेडियम, कम्प्यूनिटी हाल, हाकर्स कान्नर आदि का निर्माण हो
- ग्रामीण क्षेत्र को मुख्य मार्गों से जोड़ा जाए

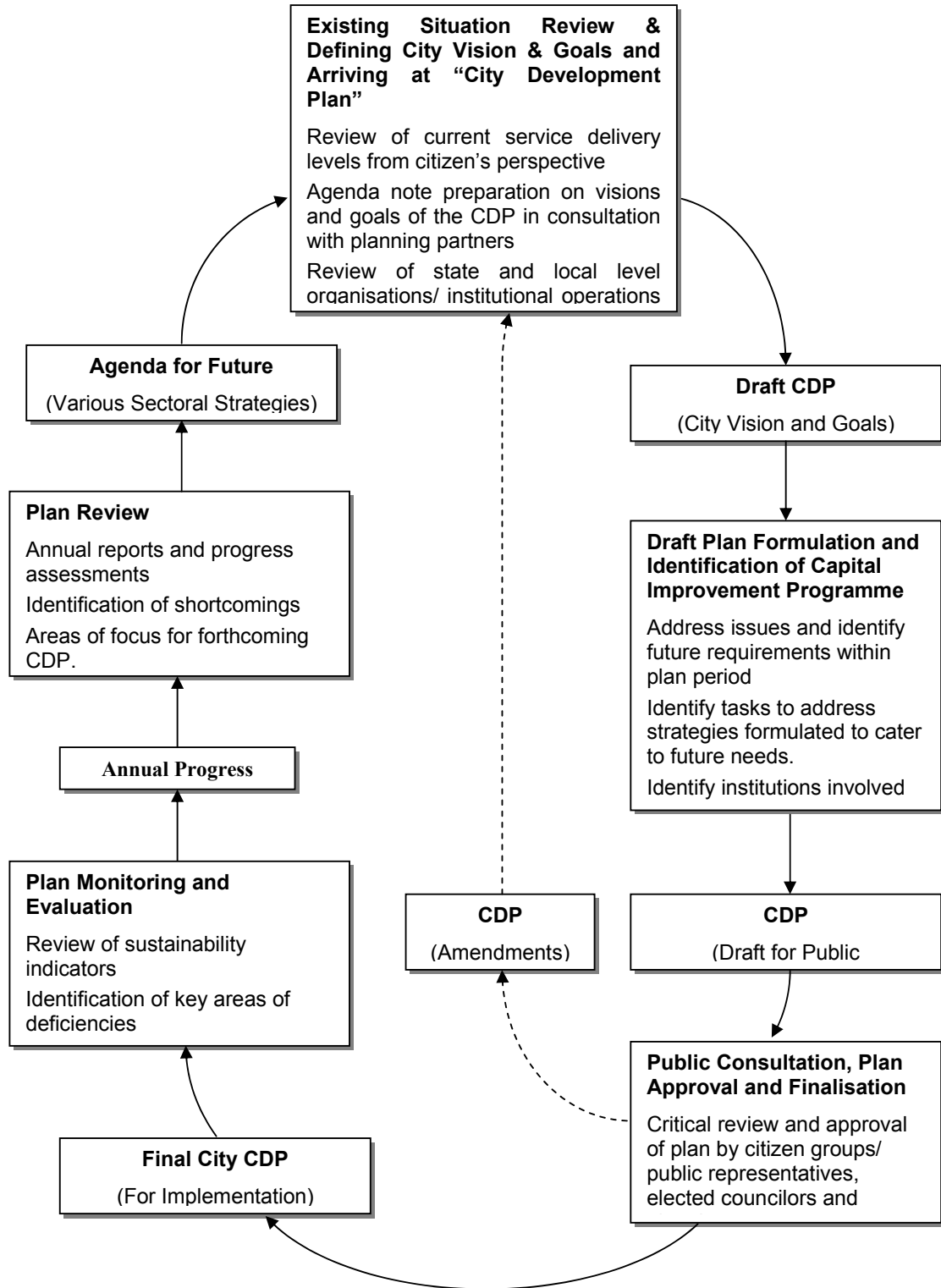


सोमवार को एक होटल में आयोजित बैठक में चर्चा करते जनप्रतिनिधि।

### योजना और पैसे एक नजर में

सड़क सुधार, पार्किंग, फ्लाईओवर, बस टर्मिनल, ट्रांसपोर्ट	357.85 करोड़ रुपए
सीवेज-ड्रेनेज मैनेजमेंट	250 करोड़ रुपए
वाटर मैनेजमेंट	250 करोड़ रुपए
सालिड वेस्ट मैनेजमेंट	20 करोड़ रुपए
खेल मैदान, कम्प्यूनिटी सेंटर	7 करोड़ रुपए
क्वमन हास्टल, ओल्ड ऐज होम, नाइट शेल्टर	8 करोड़ रुपए
पर्यावरण सुधार, सौंदर्यीकरण आदि	12.5 करोड़ रुपए
झुग्गी विस्थापन, सेवा सुधार	123.88 करोड़ रुपए

Illust. 1.7 City Development Plan Preparation



Source: Coimbatore City Development Plan

## Chapter 2 Implementing Agencies

### 2.1. Urban Local Bodies and New Context of Local Government

The 74<sup>th</sup> Constitutional Amendment Act, 1992 has imparted constitutional status to Urban Local Bodies and has assigned appropriate functions to them. The relationship of Urban local bodies with the State Governments with respect to their functions and powers, ensuring of timely and regular elections and arrangements for revenue sharing etc., now have constitutional backing. This is unlike earlier when the Urban local bodies continued to be under the control of state governments especially for their finances. Urban local bodies were made responsible with additional powers to play a key role in the preparation of local development plans and programmes for ensuring social justice as envisaged in the Twelfth Schedule of the Constitution, This is facilitated by Section 243 (W) of the 74<sup>th</sup> Constitutional Amendment Act, 1992.

#### 2.1.2 Functions and Powers

In conformity with the 74<sup>th</sup> CAA, of the Madhya Pradesh Municipal Corporation Act, 1956 and were amended. Now ULB's are entrusted with the functions listed in the Twelfth Schedule of the constitution of the Constitutional Amendment (74<sup>th</sup>) Act, 1992.

#### 2.1.3 Finances and Taxes

The 74<sup>th</sup> CAA also provides for the constitution of a State Finance Commission (SFC) to review the financial position of the municipalities and make recommendations. The first SFC of Madhya Pradesh has already submitted its recommendations to improve the financial position of municipalities. Article 243-X of the Constitution provides the State legislature to authorise a municipality to levy, collect

and appropriate such taxes, duties, tolls and fees in accordance with the procedures subject to limits.

#### Twelfth Schedule (Section 243 W – 74<sup>th</sup> Constitutional Amendment Act)

- ❑ *Urban planning including town planning*
- ❑ *Regulation of land-use and construction of buildings*
- ❑ *Planning for economic and social development*
- ❑ *Roads and bridges*
- ❑ *Water supply for domestic, industrial and commercial purposes*
- ❑ *Public health, sanitation conservancy and solid waste management*
- ❑ *Fire services*
- ❑ *Urban forestry, protection of the environment and promotion of ecological aspects*
- ❑ *Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded*
- ❑ *Slum improvement and up gradation*
- ❑ *Urban poverty alleviation*
- ❑ *Provision for urban amenities and facilities such as parks, gardens and playgrounds*
- ❑ *Promotion of cultural, educational and aesthetic aspects*
- ❑ *Burials and burial grounds; cremations, cremation grounds and electric crematoriums*
- ❑ *Cattle pounds; prevention of cruelty to animals*
- ❑ *Vital statistics including registration of births and deaths*
- ❑ *Public amenities including street lighting, parking lots, bus stops and public conveniences*
- ❑ *Regulation of slaughter houses and tanneries*

Besides these ULB's are also empowered with certain other financial powers.

The 74<sup>th</sup> Constitutional Amendment Act lays specific emphasis on Urban Environment Management and Integration of Rural and Urban Development Plans in any district or metropolitan area.



## 2.2. Bhopal Municipal Corporation- Implementing Agency

### 2.2.1 Municipal Government in Bhopal

"Majlis-e-intezamia" was the name of first municipal body, which came into being in 1907 in the erstwhile Bhopal estate. Up to 1956 the area under Bhopal Municipal limit was very small, but after that few more surrounding villages was added to it. The total area under Bhopal municipal limit reached to 71.23 Sq. Kms by 1975. At present total area under Bhopal Municipal Corporation are 285 Sq. Kms. Initial constitution of Bhopal Municipality was a 20-member committee, headed by a non - Governmental president. The Municipal Board was constituted for the first time in 1952, later on the status of Municipal board was upgraded to municipal council & an IAS officer was appointed as Chief Administrator. In 1983, Bhopal Municipal Council got the status of Municipal Corporation, with total 56 wards. Bhopal constitutes a total of 66 wards at present.

### 2.2.2 Municipal Functions and Structure

Bhopal Municipal Corporation has been assigned many different functions related to the provision of the public services under obligatory and discretionary functions as incorporated in the Madhya Pradesh Municipal Corporation Act, 1956. Provision of urban basic services - Water supply, public health and sanitation, solid waste management - is a part of obligatory functions of urban local body. Moreover, for the growth of city adequate provision of urban services play an important role.

Under Section 68 of the Madhya Pradesh Municipal Corporation Act' 1956, the State Government may entrust to the Corporation, functions in relation to any matter specified in the Schedule or in relation to any other matter to which the executive authority of the State extends or

the functions entrusted by the Central Government to the State Governments<sup>2</sup>

### 2.2.3 Organization Structure

The functioning of Municipal Corporation of Bhopal (BMC) is governed by the Madhya Pradesh Municipal Corporation Act, 1956 and amendments thereto. The organizational set up of BMC comprises of a Political Wing (Deliberative) and Executive Wing. The Deliberative Wing is an elected body of Councilors from different wards in the city and is headed by the Mayor. The Executive Wing is headed by the Commissioner and looks after the day-to-day functioning of the Corporation and assists the Deliberative Wing in the decision making process. The functions are as per table 2.2.

### 2.2.4 Deliberative Wing

The Mayor heads the Deliberative Wing of BMC and overall functioning of the Corporation is governed by the Mayor-in-Council and the Departmental Advisory Committees constituted by the Speaker from among the Councilors other than the members of the Mayor-in-Council<sup>3</sup>

The Corporation shall be bound to perform these functions and act as an agent for the State Government the State Government shall pay any extra cost of administration incurred by the Corporation.

The Mayor-in-Council shall consist of the Mayor and ten members. The Mayor shall be the ex-officio Chairman of the Mayor-in-Council and shall preside over meetings. The Mayor-in-Council may appoint one or more sub-committees from amongst its members and may refer to it any mails pending before it for inquiry and ask for report or opinion.

The provisions contained in the Madhya Pradesh Municipal Corporation Act 1956 regarding the constitution of Mayor-in-Council, election of a Speaker and formation of Advisory Committees are given under section 9. Under Section 18 of the Act, the Mayor and elected Councilors of the Corporation shall elect a Speaker

from the elected Councilors. Under Section 37 of the Act, the Mayor-in-Council shall be constituted by the Mayor from amongst the elected Councilors within 7 days from the date of election of the Speaker.

### 2.2.5 Committees set up by BMC under Mayor-in-Council

As per Section 403 of the Madhya Pradesh Municipal Corporation Act 1956, BMC has appointed an Appeal Committee to look into the appeals against an order passed by the Commissioner or an officer subordinate to the Commissioner.

The Appeals Committee consists of the Mayor and four elected Councilors. Any aggrieved person may appeal against specific order passed by the Commissioner or any Officer within 30 days from the date of such order. The Appeal Committee may for sufficient cause extend the period prescribed for appeal.

When an appeal is made against an order, all proceedings to enforce such order and all prosecutions for breach thereof are suspended pending the decision on the appeal.

### 2.2.6 Decentralization of Municipal Administration

Decentralization of municipal functions and activities through eleven zonal offices and their respective wards committees is a significant achievement of BMC, which has produced encouraging response from citizens as it has made dissemination of information, revenue collection, grievance redressed, etc., simpler and effective.

To ensure efficiency and effectiveness in municipal governance, the whole of city area is organized in fourteen zones, each comprising of 5 - 7 wards. BMC plans to develop all its zonal offices as mini corporations. The system has been designed to decentralize municipal governance in a true sense.

As presented in the Table 4.4 (Annexure IV of chapter 10), the chairperson of wards committee heads the deliberative wing at

the zonal office level, where councilors of wards, which fall in a particular ward, are the members of the committee. These committees for their territorial areas are empowered to:

- i) Sanction up to an amount of Rs. 50,000 for the function of the committee,
- ii) Inspect and supervise any work. Major responsibilities entrusted towards committees are as under:
  - ❑ Construction of new roads and drains
  - ❑ Maintenance of existing roads and drains
  - ❑ Arrangements for water supply and sanitation
  - ❑ Recommendations for all types of licenses
  - ❑ Collection of tax, rent and fees
  - ❑ Programs relating to social
  - ❑ Welfare services and social security schemes.
  - ❑ Removal of encroachments.
  - ❑ Development and maintenance of gardens, public places.
  - ❑ Supervision of primary schools, primary health centers and public distribution systems.
  - ❑ Environmental improvements

To carry out the responsibilities entrusted to it, wards committees are expected to prepare proposals and submit them to the municipal commissioner in the month of October for perusal in the next financial year.

Tab 2.1 Structure of Deliberative Wing of BMC

CITY COUNCIL (Members: Chairman, Mayor, Member of Parliament (2)*, Member of State Legislative Assembly from Bhopal; Municipal Area (5)*, 66 Ward Councilors)		
Appeal Committee	Accounts Committee	Mayor in Council
Mayor	Chairman-1 Chairman-6	Mayor
Councilors-3		Chairman of the following committees- Public work and Environment Water Works, Education, Revenue, Market, Building Permission And Planning Food & civil Supplies, Law & General Administration, Health and Women & Child Development Advisory Committee
		Advisory Committees (Each contains a Chairman and 9 Councilors Housing & Environment, Water Works, Education, Revenue, Market, Planning & Rehabilitation, Food & civil Supplies, Law & General Administration, Health and Women & Child Development Advisory Committee
		Wards Committee (11), 1/ Zone
		Each committee has a chairman and 5-8 Councilors of wards in a zone

Source: Various BMC Office Order, 2001

Tab 2.2 BMC Management Team

Commissioner Office	Department Heads	Other Key Officials	Main Departmental Functions	
	Council Office			
		Office Superintendent	General Administration (46)	
		Public Relation Officer	Public Relation and Protocol (15)	
		Librarian	Libraries under Municipal Corporation	
BMC Head Office				
			General Administration (71)	
			Records Department (12)	
		Stores Officer	Stores (41)	
		Nodal Officer	Poverty Alleviation Department (56)	
		Law Officer	Law Department (20 + 19*)	
		Garden Officer	Garden Department (500)	
			Swimming Pool (52)	
		Public Analyst	Laboratory (19)	
	Accounts Department			
			Account Officer	General Administration (5)
		Chief Cashier	Treasury (27)	
		Accountant	Contingency (24)	
			Establishment (18)	
Revenue Department				
Deputy		Office Superintendent	General Administration (25)	

Commissioner Revenue	Assessment Officer	Assessment Section (78) Zonal Offices (84)*
	Revenue Officer	Market & Rent Section (68) Land & Building Section (14) Encroachment Removal Section (39) Advertisement Section (3)
		Vehicle Tax & Animal Encroachment Section (86)
	Assessment Officer	Tax Collection Section (71)
		Property Tax Collection Section (41)
<b>Health Department</b>		
	Assistant Health Officer	General Administration (43+10+22)
		Disease Prevention & Birth & Death Registration Section (68) Malaria Prevention (137)
		Cleaning of Public Toilets and Drainage Section (240)*
		Sanitation Service Section (2613)* Garbage Collection Section (135)*
	Veterinary Doctor/Meat Inspector	Veterinary Section (64)
<b>Public Works Department</b>		
City Engineer (c) City Engineer (Project)	Dy City Engineers <ul style="list-style-type: none"><li>Colony Cell</li><li>Head Quarters</li></ul>	Gen Admn. (80)
		Planning & Dev. Cell (91) Encroachment Removal Section (57) Survey Design & planning Section (24)
		Building works Maintenance (428+8)
<b>Water works Department</b>		
	Fire & Transport officer	Workshop & Vehicle Maintenance (275)
	<b>Water Works Department</b>	
	Office Superintendent Assistant Engineer Tech.	
City Engineer	City Engineer / Executive Engineer Electrical & Mechanical	Gen Admn (33) Survey & Drawing Section (11)
		Kolar (113)
	Drainage and Sewage Department	Tube well Maintenance (89)
		Public Lighting (36)
		Bilawali Complex (112)
		Water Supply and Maintenance Office (19) Bill Section (64) Supply and Maintenance (218)* Mainline Maintenance (13) Fire Fighting (32)
	Dy. City Engineer	
	Under ground drainage maintenance section*(214)	
	Level pumping station (31)	

Source: BMC Establishment Schedule, 2000 (\*Functions Transferred to Zonal Officer)

## 2.3. Parastatal Agencies

### 2.3.1 Bhopal Development Authority

Until 1973, the city had a 'City Improvement Trust', to assist the Bhopal municipal body in its developmental activities. In 1973, the Improvement Trust was converted to Bhopal Development Authority (BDA) under the Madhya Pradesh Town and Country Planning Act, 1973. Primarily, BDA develops new residential areas. During the early stages of development of such areas, BDA is responsible for developing basic infrastructure. Once a sizable number of plots are sold, the area is formally transferred to BMC, which is then responsible for the maintenance of the infrastructure in the area. BDA transfers the developed Residential areas to BMC for maintenance with all the legal formalities as required under M. P. Nagarpalika (Registration Conditions) Rules 1998 vide rule 12.

Apart from developing residential areas, BDA has taken up a number of development schemes like construction of some major roads, traffic squares etc. The Constitution of the Body of BDA is done by State Government where members are notified as the provisions of the Act, Commissioner BMC is member of the BDA Board in that capacity.

After publication and adoption of the Bhopal Development Plan 2005 u/s 18,19 of Nagar Tatha Gram Nivesh Adhinyam 1973, the main implementing agency BDA has played an important role.

### 2.3.2 Madhya Pradesh Public Works Department

Public Works Department (PWD) deals with the construction and maintenance of buildings, roads, and bridges. Irrigation, flood control works.

### 2.3.3 Madhya Pradesh Pollution Control Board and EPCO

Madhya Pradesh Pollution Control Board has been constituted to implement, supervise and monitoring the activities under Environmental Protection Acts and

Rules framed therein, vests with the Central Pollution Control Board (CPCB), Government of India, and the respective State Pollution Control Boards formed/constituted under its rules. Madhya Pradesh State Pollution Control Board (MPPCB) headquartered in the state capital, Bhopal, carries out its operations through seven regional offices, each located at the divisional headquarters.

The main function of the regional offices is to monitor the implementation of provisions of various Acts governing pollution control and prevention.

### 2.3.4 Public Health Engineering Department Government of Madhya Pradesh

The Public Health Engineering Department (PHED), a State Government body, is charged with a number of responsibilities in water supply and sanitation. It is a state level body.

### 2.3.5 Madhya Pradesh Housing Board

MPHB functions as per the MP housing development act of 1972. It is mainly involved in the construction of various types of houses (HIG, LIG, MIG, EWS) Shops, Offices and Halls and also developing plots in the city. MPHB functions as per the MP housing development act of 1972. MPHB works in collaboration with BMC for maintenance of services.

### 2.3.6 Madhya Pradesh Town and Country Planning (MPT&CP)

T & CP department in Bhopal was established under MPTNCP act of 1973. The main function of T&CP is to prepare master plans and give permission for development (Colonies) of schemes in accordance with master plan.

### 2.3.7 Capital Project Administration.

The Capital Project Administration (CPA) was constituted to guide the development of capital of Bhopal when it was formed. CPA deals with the construction of Roads Buildings Parks and other infrastructural development work in capital project area of the city



## Chapter

**3** City Profile

The origins of Bhopal city are a little obscure. It is said that Raja Bhoj, the famous Parmar king of Dhar, founded Bhopal City in the 11th century at its present site. Another view is that the original city of Bhojpal (eventually corrupted to Bhopal) was first founded on the banks of Kolar River and then subsequently shifted to its present location. He created the Upper Lake by constructing an earthen dam across the Kolans River. The traces of the original town, however, do not remain.

As per the former view Raja Bhoj, the famous Parmar king of Dhar, founded Bhopal City in the 11th century at its present site. He created the Upper Lake by constructing an earthen dam across the Kolans River. The traces of the original town, however, do not remain.

**3.1 Early Bhopal**

The city was established again and fortified in the 18th century by Dost Mohammed Khan, a chieftain of Aurangazeb, when he was invited by Rani Kamalawati as a protector of her territory. The Lower Lake was created by Nawab Chhote Khan in 1794. The city remained a capital of a feudal state till it was merged in the Indian union in 1948.

Several dynasties have left their mark on the city. The antediluvian remains of the forts built by the Rajputs, Afghans and the Moguls silently speak of the battles, victories and failures of the past era. These icons are testimony to the grandeur of past and provide a marvellous treat to the eyes. Even by seeing the remains of the city one can have the glimpse of different cultures, which existed in the past. Many kings have ruled here and enriched the character of the city. Visiting the city is an immensely fascinating and rewarding experience.

**3.2 Post Independence Bhopal**

In 1956 Bhopal was declared the capital of newly reorganised State of Madhya Pradesh. In the same decade, the Industrial Township of Bharat Heavy Electricals Limited (BHEL) was also established 3 km east of the then city boundary. As a result of these two interventions, Bhopal has witnessed a substantial population growth. Capital Project Township T. T. Nagar was built south of the lakes to support the capital. The military cantonment moved to Bairagarh area to the west of the old city.

In the decade 1971-1981, the city boundary was increased to bring BHEL Township and Bairagarh within the Bhopal Municipal Corporation limits. The wards increased from 39 to 56. The new wards added were 1-5 and 47-56 while some older wards were subdivided. In 1994, the number of wards in the city increased to 66 though the city boundary remained the same. Bhopal has not grown as a single city but as discreet townships, with sparse outgrowth in between, as follows:

The old city and its periphery.

- BHEL Township.
- Capital Project (T. T. Nagar).
- Bairagarh.
- New out growth.

Today Bhopal has blossomed into a city, which in spite of being modern upholds the patrician mark of its bygone rulers. The city provides a fascinating blend of scenic beauty with its lakes, parks, temples, mosques, gardens, museums, statues and buildings.

The comprehensive study for Bhopal Urban Area has been initiated by Bhopal Municipal Corporation. The study is being carried forward with continuous technical advice and guidance support of the Government of India, Ministry of Urban Employment and Poverty Alleviation and Ministry of Urban Development.

Bhopal is one of the fastest growing cities in the country. As per 2001 census, the population of Bhopal district is 18.38 lakhs out of which 14.35 lakhs live in Bhopal city, in 66 wards, covering a gross area of 285 sq. km. including the lakes and hills. This makes it a low-density city of 50 persons per hectare gross and 63 persons net if the lake area of 38 sq. km. is deducted. Even if the areas of steep hills are discounted, the density on habitable land remains low at 80 persons per hectare. Essentially Bhopal is a city of inhabited pockets with open areas and natural barriers in between.

Bhopal district is almost 80% urbanized with most people living in the city of Bhopal. As the principal city of the region, it serves all towns and districts around, the nearest large city of Indore being about 180 km. to west.

Bhopal, the lake capital city of Madhya Pradesh, is continuously losing its grace and beauty under the growing pressure of up-gradation and densification of activities. The Basic infrastructure & transport scenario of Bhopal is in jeopardy as a natural outcome. This one may not realize apparently, as the problems are currently concentrated in a sparse manner. The potential and beauty of the city is getting lost amidst increasing services related problems. The crisis, chaos and risk of commuting as prevalent in other major urban centers of India, do exist in Bhopal. The situation is likely to be further grim in the coming years. There is urgent need to address the issue of urban transport as an important component to shape urban development and provide quality transport service to the community in the city.

*Bhopal, the second largest city of Madhya Pradesh was made capital of state in 1956. It is the administrative and political nerve centre of the state. Nestled in beautiful surrounding of lakes and hills, it's surrounded by forests and poor agricultural land.*

<b>City at Glance</b>	
<b>Area of the city</b>	<b>:285.00 Sq Km</b>
<b>Population</b>	<b>:14, 33,351</b>
<b>Population Density</b>	<b>:50 pph</b>
<b>% of the State</b>	<b>:2.57%</b>
<b>Population</b>	
<b>Sex Ratio</b>	<b>:890</b>
<b>% of Slum</b>	<b>:31.0 %</b>
<b>Population</b>	
<b>No of Wards</b>	<b>:66</b>
<b>No of Zones</b>	<b>:14</b>
<b>Average Rainfall</b>	<b>:1200mm</b>
<b>Water Supply</b>	<b>:234.3 MLD</b>
<b>Solid Waste generated</b>	<b>:550 T per day</b>
<b>Height above MSL</b>	<b>:Height varying from 460 to 625 MSL.</b>
<b>Wind Direction</b>	<b>:Westerly and south –westerly.</b>
<b>Drainage pattern</b>	<b>:Three main valleys provide the natural drainage</b>
<b>Physical features</b>	<b>:Hilly terrain sloping towards north and southeast</b>
<b>Mineral Resources</b>	<b>:There are no known, minerals</b>
<b>Soil Profile</b>	<b>:Hard red soils with rocky outcrops and black cotton soil having depth ranging between 4' to 10'.</b>

### 3.3. Location and Linkages

Bhopal is located on hilly terrain within the Malwa Plateau (23 16'N, 77 22'E). National Highway 12 (Beora – Jabalpur road), which links the city to many large cities in the north – west and the south – east. State Highways connect Indore and Sagar. The city is connected by the broad gauge railway line to Nagpur, Chennai, Delhi and

Mumbai. The city is also served by regular air services to Mumbai, Delhi and Indore.

### 3.4. Physical and Geographical Character

#### 3.3.1 Physical Features

Hillocks of different altitudes are situated along the southwest and northwest parts of the urban area, forming a continuous belt from the Singacholi up to the Vindhyachal range, to an elevation of 625 meters. The general ground level is between 460 and 500 meters along the city. The unusual topography has always provided unique attraction to the city.

There are 14 water bodies in and around Bhopal includes the two large lakes Upper and Lower lake in the east.

T.T. Nagar and its extension being developed on the southern side are separated by the old city by Upper Lake and Lower Lake.

BHEL Township is separated from the new town as well as the old city by the railway.

#### 3.3.2 Topography

Bhopal city nestles in a hilly terrain, which slopes towards north and southeast. Hillocks of different altitudes are situated along the southwest and northwest portion of the city, these hillocks from a continuous belt from Singarcholi up to Vindhyachal range. The height of Singarcholi near Lalghati is 625 M., which is maximum in this area. The general ground level is however, nearly 460 M. along the southeastern and northeastern portion of the city. The remarkable topography of the city provides enchanting and panoramic views of the city and of natural scenic beauty. There are immense possibilities for landscaping and water front Development for recreation. However, hills and lakes are at present a great disadvantage in some respects.

It is unsuitable for continuous Urban Development.

It creates physical barriers owing which interlinks between various parts of the city are often inconvenient and circuitous.

Large portion of city areas and New Bhopal are separated by hillocks and lakes, which act as barrier in social and cultural integration of these parts. The present city stands segregated distinctly in three parts. The T.T. Nagar and its extensions being developed on the Southern side is separated by the old city by two lakes- Upper Lake and Lower Lake, B.H.E.L. town is separated from the new township as well as the old city by Railway line. The future plan of the city must provide and improve physical links between these parts so as to encourage social and cultural integration of these townships.

#### Conspicuous Land Form

The hillocks could be classified in the following three orders depending upon their altitude. This would facilitate to identify the areas suitable for development.

1st order – Singarcholi (Manwa Bhand), Lalghati, Idgah, and Fategarh situated to the North of Upper Lake.

2nd order – Shamla, Dharampuri and Arera Hills situated south-east of Upper Lake.

3rd order – M.A.C.T. Char-Imli, Shahpura, Kotra Sultanabad and other hillock adjoining south –east of Upper lake.

The area to the East is comparatively plain without any significant landforms and gradually sloping towards northeast and forming the bowl shape land form. The areas to southeast beyond Shapura hill are gradually sloping towards Misrod.

#### Hill Ridges Plateaus

Bhopal with its unique physiography presents a picturesque setting extensive control of the skyline formation is

envisaged. The ridges and hilltops or plateaus requiring visual aesthetic and conservation consideration are listed below:

- ❑ Shamla Hill Ridge.
- ❑ Arera Hill Ridge.
- ❑ Char Imli Hill Ridge.
- ❑ Idgah Hill Ridge.
- ❑ Singar Choli Hill Ridge.
- ❑ Baghsewania, Laharpur, Amarawad Khurd Ridge.
- ❑ Singhpur Sewania Gond Hill Ridge.
- ❑ Sewania Gond Hill Ridge.
- ❑ Premapura-Dharamपुर Hill Ridge.
- ❑ Chhawani Hill Ridge.
- ❑ Hill configuration around the Kaliasote and the Kerwa.

All slopes of more than 8 degree and above needs to be prohibited for any construction or development on such slopes. They need to be extensively planted to stop soil erosion.

### Geology and Soil

The geological formations underlying the Bhopal area – at the eastern edge of the Malwa Plateau – are largely red sandstone strata, with the depth of the rock varying according to the slopes. The top portions of the hillocks generally consist of hard red soil, mixed with basaltic boulders. Black cotton soil is seen at various depths from 1 to 3.0m

### 3.3.3 Climatic Conditions

The city enjoys a moderate climate. Normally temperature ranges between 50°F and 104°F although highest temperature occasionally rises to 110°F. In such moderate climate, residential areas can be developed at higher densities as three to four storied buildings can be constructed without causing discomfort to the occupants.

The rainy season lasts from mid June to September, the winter from November to February, and summer from March to June. October sees the transition from rainy to the winter season. The average annual

rainfall is round 1200 mm, falling predominantly during July and August. The average number of rainy days is approximately 40.

### Wind Direction

Winds are predominant from the west and southwest during the monsoon. The presence of the lakes and hillocks create numerous and varying microclimates.

## 3.5 Natural Drainage

The natural drainage of the city is provided by three main streams, which are of course, joined by small nallahs and rivulets. On the northeastern side, the drainage is provided by river Halali and on the southeastern side, it is provided by Kaliyasote River. Both these rivers, drains out in Betwa, Halali near Vidisha and Kaliyasote near Bhoipur. On the southwestern side, the drainage is provided by various small nallahs, which drain out in Kolar River, which ultimately joins river Narmada.

The drainage water of old city including wastewater of straw products and cotton Mills is carried away by a Nallah, which joins river Halali, which is a perennial river. The water of this river is being used for irrigation purposes and very little discharge meets river Betwa near Vidisha. Moreover, the meeting point is on the down streamside of water works for Vidisha town. River Kaliyasote, which provides drainage on the southeastern side, joins Betwa near Bhojpur in Raisen District. There is hardly any possibility of utilization of this water on the way for irrigation purposes as passes through a hilly terrain. The water polluting industries located on this side will discharge supply to Vidisha. The Development of Mandideep Industrial growth Centre and its extensions need to be strictly controlled in respect of industries to be permitted in this area to avoid water pollution.

For the purpose of landscape studies, the natural drainage of Bhopal can be

classified mainly in three categories viz. Dendritic (tree like branching), Basil and parallel pattern. These are the major landscape indicators revealing the biophysical phenomenon of the area. Broadly speaking the Dendritic pattern occurs in the southern part of the city this area is, therefore, favorable for birds, animals and life. All activities related with this element should be located in this area. The (part) Basil pattern occurs near Chhola and southeastern side of the city near BHEL. The area near Chhola has more potential for intensive agriculture owing to availability of fine soil and sub soil water. This is the result of basil drainage pattern. The area near BHEL contains relatively less rich soil. It can, therefore, be used for general agricultural activities or City Park. The area suitable for birds, animals and plant life will require further studies in respect of soil, texture, structure, drainage order, vegetation etc. to work out detailed operation plan.

Industries proposed to be located on this side should be non-polluting type or it will have to be ensured that industrial water is fully treated before discharging the same in Kaliyasote, so that it does not cause pollution of Betwa, the source of water supply to Vidisha, a growing town of the Region.

### 3.6 Regional Setting and Growth Pattern

Planning for Bhopal, which is one of the most beautiful million plus city, cannot be limited within its planning area. The developments taking place in the State Capital are considerably influenced by the socio-economic linkages, which are continuously changing and evolving in secondary and tertiary settlements system around Bhopal. Agricultural, forest, mineral and other produce supported by the State Capital Region, population holding capacity of the natural resource base of the sub-region, national transport network and accessibility levels obtaining in the region and the sub-region, are some of the

important factors which have to be taken cognizance of, in defining the role of Bhopal, in its regional and sub-regional context.

The employment opportunities offered by the state capital as well as similar opportunities which can be pre-empted through various fiscal policy measures for economic development in various nearby cities and sub-cities viz. Sehore, Vidisha, Hoshangabad and Itarsi around the mother city, Bhopal would determine the future distribution of population in and around Bhopal.

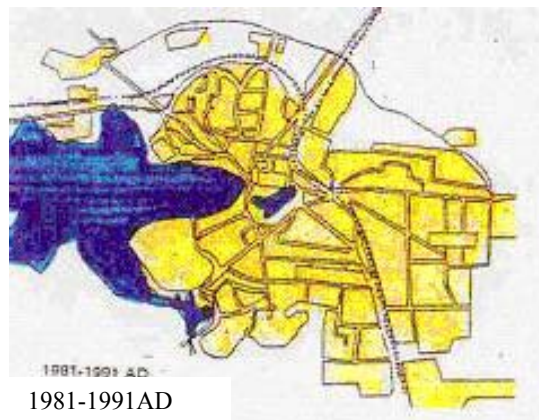
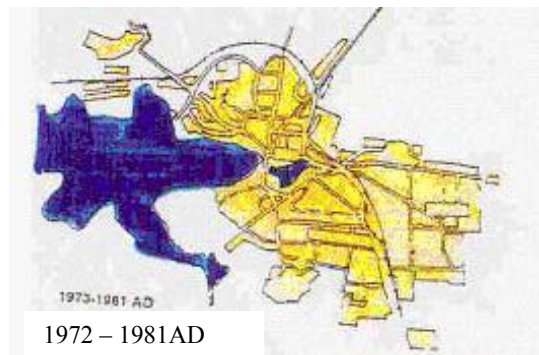
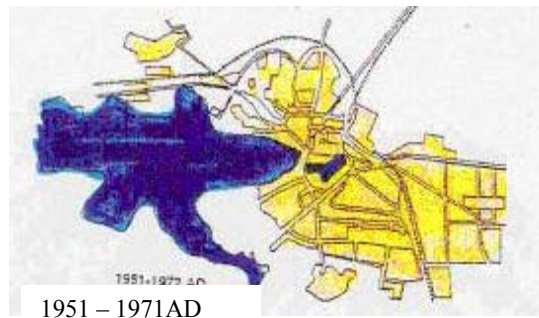
Bhopal being the State Capital is growing relatively at a rapid pace and is likely to promote increasing urbanization in and around it. The regional and sub-regional infrastructure will have to be strengthened to support increased urban productivity in manufacturing and supporting services. Bhopal which is growing at a rapid pace due to increasing migration not only from within the State but also from neighbouring seven states, calls for more pragmatic policies to absorb the population flow in a balanced manner. In the large context and longer perspective, development policies will have to consider the role of secondary cities and sub-cities described above to support the economic growth-taking place in the State Capital Region. It may be necessary to channelize the growth into other neighbouring cities and sub-cities to maintain the quality of life in the mother city, as well as in the region, as a long-term measure.

#### Growth Pattern

From the table it is evident that maximum growth has taken place in the southeast direction along the Hoshangabad Road. The level land, ease of transportation and nearness to Habibganj Railway station are major factors responsible for the southward growth of the city. It is to be noted that vast expense of the Upper Lake could not encourage the Westward growth of the city.



**Illust 3.1. Growth of the city and direction of growth Sprawl period and area**



**Tab 3.1. Growth of the city in different direction from center:**

Direction	Growth in Km.
North	4.5
Northeast	4
East	8
Southeast	10
South	6
Southwest	5
West	1
Northwest	6

*Source; Bhopal Development Plan 2005*

## Chapter 4 Demographic and Social Profile

Bhopal is the second largest city in the State with a population in 2001 of 14,33,875. Upon reorganization of State's in 1956, Bhopal emerged as the capital of Madhya Pradesh, which was the starting point of the phenomenal change in its demographic trend.

### 4.1. Population Growth Trends

During 1951-61 the population growth was nearly 120%. In the decade of 1971-81, the establishment of Mandideep industrial area coupled with heavy commercialization, and expansion of Government services further gave impetus to the population, which recorded a phenomenal 74.35% decadal growth. Thereafter also the population continued to grow rapidly before declining to approx. 34.92% during 1991-2001. There is a clear indication that unusually high growth is now stabilizing and the rate will further slow down in the following decades particularly because the area base has significantly widened.

**Tab 4.1 Urban Populations and Decadal Growth Rate (%)**

Year	Population (in lakhs)	Period	Decadal Growth Rate
1941	0.75		
1951	1.02	1941-1951	36.02
1961	2.22	1951-1961	117.87
1971	3.84	1961-1971	72.62
1981	6.71	1971-1981	74.35
1991	10.62	1981-1991	58.38
2001	14.33	1991-2001	34.92

*Source; LEE Report*

The growth in the population seems to be significantly attributable to mainly natural growth and Migration. The sample households have lived in the city for the more than 10 year and those that have

moved neighbourhood have moved from another part of the city.

**Tab 4.2 Composition of Population Growth**

Composition	Composition of Growth			
	Population Increase during			
	1981-91	% Of total	1991 - 2001	% of total
Natural Increase	307095	45.75	264020	24.85
In – migration	84657	12.51	126980	14.59
Total Increase	391753		391000	

*Source; LEE Report*

Movements are more prevalent amongst high and middle-income families. These families are more likely to have moved from another urban area and whilst more poor families than rich move from rural areas, the poor too are more likely to have moved from an urban area.

### 4.2 Urbanization & Migration

Bhopal city is the most urbanized districts of the state. As per 2001 census, 80.53% of the district population lives in urban areas, predominantly, in the city. In between 1901 to 1921, the urbanization declined as a result of plague outbreaks. The urban population then rose steadily from its low 30.4% in 1921 to 43.3% in 1951. In 1956, Bhopal was made the state capital and, in the same decade, the industrial township of BHEL was established. This led to substantial population-increase and by 1961 the urbanization of the district rose to 61.6%. In subsequent decades, rate of urbanization seems to be eventually stabilizing at about 80%.

**Tab 4.3 Urbanization of Bhopal District**

YEAR	% URBAN TO TOTAL POP.
1901	40.80
1911	34.20
1921	30.40
1931	35.20

1941	39.10
1951	43.30
1961	61.60
1971	68.60
1981	74.90
1991	78.80
2001	80.53

Sources: Census of India 1971 to 1991-Town Directory of Madhya Pradesh. Census' 2001(Provisional)

### Land Population ratio

The share of population of various parts of the city has shown distinct characteristics. As the city growth outwards the share of population of the old area to the over all city have reduced drastically. For example, the population share of the main city was 70% during 1970s, which has now reduced to only 40%. The main gainer of the population is the area named as: Neori (19.30%), Misrod (16.14%) and BHEL extension (16.97%),

### Population Projection

The population projections for the Bhopal Planning Area up to the year 2011 were made on the basis of different standard statistical procedures. The projected population is presented in Table- It can be noticed that presently the Bhopal planning area is estimated to have 16.76 lakhs population and will be 21.21 lakhs in 2011 and 25.54 in 2021. nearly in next 15 years population of Bhopal will increase by about more than 1.5 times.

Population Year	Pop. (In lakhs)	Average Decadal Growth-rate (%)
1981	6.71	74.81
1991	10.62	58.38
2001	14.33	34.92
2005 (Estimated)	16.76	
2011 (Projected)	21.21	
2021 (Projected)	25.54	

Source; Integrated Urban Development in Madhya Pradesh (IUDMP) Draft Final Report

## 4.3. Population Density

### Density in planned & Unplanned Area

1. Over Habitable areas only (excluding areas under water body, forest, steep contours)
2. Planned Areas basically comprises New Bhopal and other areas that have come up in a planned fashion.
3. Unplanned Areas include Old Bhopal, Jhuggis, and colonies that have grown up haphazardly.
4. Special Areas include Cantonment, Universities, Airport and Industrial Areas.
5. Net density in unplanned areas = 619 persons / hectare

The residential density and employment-densities are:

Total population/residential land= 410 persons/ Ha.

Commercial emp./comm. Area =391 emp./Ha.

Industrial emp./Indus. area = 119 emp./Ha.

PSP emp. / PSP area = 188 emp./Ha.

These figures are indicators of the intensities in which land is being used by the three sectors of employment: commercial, industrial and public-semi public activities

**Tab 4.5 Density Patterns (Gross Densities) Over Different Areas.**

Development status	Zone Area (Ha)	Habitable Area (Ha)	Developed Area without roads (Ha)	Population	Gross Density pph	Net density pph
Planned Area	8388	7604	3518	717755	86	204
Unplanned Area	2659	2344	1302	805978	303	619
Special Area	6502	4608	2130	190722	29	90
Rural area	54611	44335	2138	265664	5	124
Grand Total	72160	58890	9087	1980119	27	218

Source; Census of India



### 4.4. Literacy

The comparative figure suggests that excluding the population below 7 years of age, Bhopal lacks behind Indore in terms of total literacy. However, the higher education and specialized education scenario is much better in Bhopal city with a large number of academic and research intuition of national repute present in Bhopal.

**Tab 4.6 Literacy**

	Persons	Male	Female
Gwalior	68.34	75.24	60.30
Indore	81.47	87.90	74.36
Bhopal	69.12	74.36	63.28

*Source: Censuses of India M.P, 2001*

In terms of spoken language nearly 64% of population speaks in Hindi, 20% of population speaks in Urdu, 6% population speaks in Marathi. The rest of the population speaks in various languages such as Sindhi, Punjabi, and Malayalam etc. Bhopal is literacy centre for different language.

### 4.5. Age Structure of the Population

According to census of India, about 14.5% of Bhopal population is in 0-6 year of age. The percentage share of each age group is shown in the following table. From the table it can be observed that about two fifth of population of Bhopal are children in the age group of 0-14 year. The working age population group (15-45 years) is about 54 percent.

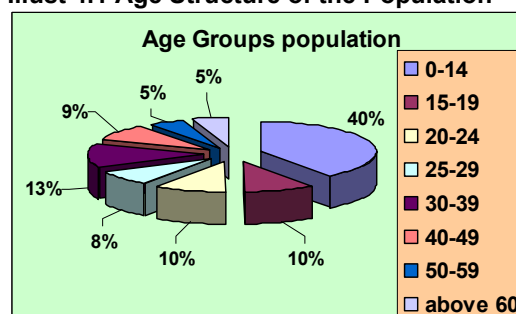
**Tab 4.7 Age structure of the Population**

Age group	Percentage	Cumulative Percentage
0-14	39.7	39.7
15-19	9.9	49.7
20-24	10.1	59.8
25-29	8.4	68.2
30-39	12.9	81.1
40-49	9.0	90.1
50-59	4.9	95.0

Above 60	4.97	100
Total	100	

*Source; Census of India*

**Illust 4.1 Age Structure of the Population**

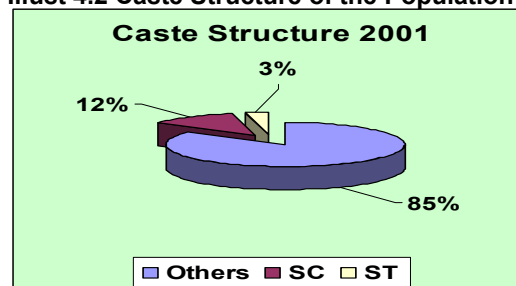


*Source; Census of India*

### 4.6. Social Structure

The city has shown a continuous growth in the female population. According to 2001 Census, the city had 898 females per 1,000 males which is almost equal to the State average (Urban) of 912 females per 1,000 population, but it is lower than the other class I cities of the Region which have not been subjected to sudden migration and are socially more stabilized. A lower female ratio indicates difficult housing situation prevailing in the city. The migrant worker has a tendency to leave his family behind unless he is hopeful of obtaining a house within his rent paying capacity. Increased rate of housing supply will certainly improve social and cultural life of the city, which is essential for creative and productive life.

**Illust 4.2 Caste Structure of the Population**



*Source; Census of India*

12% of the population belongs to Scheduled Caste while 3% of the population belongs to Scheduled Tribe.

Tab 4.8 Caste Structure of the Population

Caste Structure 2001	
Caste	Population In Lakhs
Others	12.34
SC	1.80
ST	0.43
Total	15.42

Source; Census of India

## 4.7. Conclusion

- The population Growth in Bhopal is average; it was very high during 1981-1991. The growth registered in 2001 was low due to Population migrating outside the BMC boundaries for employment, housing and social purpose and hence the population growth within the city is decreasing.
- Re-organization of the state by formation of New State Chattisgarh is also one of the reasons in declining Growth Rate.
- 14% of the Growth of population is from the migration, mainly due to the industrial development in the nearby industrial area of Mandideep and Pilukhedi. Also due to educational establishments at all levels.
- Characteristics of Immigrants:
  - Bhopal city has been attracting a high numbers of migrants since the 1960 due to growing employment opportunities.
  - Many poor from rural and tribal areas, who are not able to secure livelihoods, come to city every year and for period of 8 months to work on construction sites.
  - Migration of population from within the state as well as from other state has been one of the major factors responsible for the growth of the population due to flourishing trade and commerce that the city initially attracts the people from wide area.

Chapter

# 5 Economic Base

Besides being the capital of the state, Bhopal has vast hinterland spread over six districts. Since the nearest large city is Indore, is about 180 km away, Bhopal serves a large geographical area and it has expanded not as a single city but as a discrete townships of the old city and its periphery, BHEL township; T.T Capital Township: Bairagarh (Location of army cantonment); and other new areas.

There are two industrial estates in close proximity: Mandideep with 32 large and 252 small and medium enterprises; and the newly developing Pilukhedi with 6 large and 3 small and medium sized enterprises. Dominant sectors are engineering, textiles and pharmaceuticals including names such as Fujitsu, Proctor & Gamble and GEI Hamon.

The service sector is becoming increasingly important provides the majority of employment in Bhopal. Banks and insurance companies number about 200, Hotels and restaurants 36, hospitals 100, educational institution over 1500 and shops 32,212.

As with many cities, in recent years Bhopal has seen has the decline of traditional industries, especially the engineering support and component manufactures that originally grew up around the Bharat Heavy Electricals Limited (BHEL). BHEL was set up in the 1960's and was the largest public sector engineering company in India, attracting additional investment and providing a large source of employment in Bhopal. The business survey reports that one of the main reasons for closure and sickness of small and medium scale industrial units in Bhopal is over-reliance on BHEL.

The sectors that reported to be growing fast in Bhopal are housing, banking and

insurance and education. The state economic development policy proposes Bhopal to be developed as a center for education. There is a concentration of educational establishments at all levels and a large number of schools, training institutions and colleges have been established in the last few years.

The business community survey covered businesses from 4 identified groups: industries outside the urban area, industry within the urban area, private sector services and public sector services.

## 5.1. Occupational Pattern

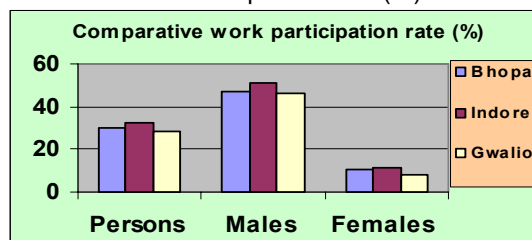
Bhopal is essentially an administrative city with large number of population is engaged in various state and central government organizations. It can be observed from **Tab 5.2** that Bhopal has slightly higher work participation rate as compared to Gwalior but it is lower than Indore. It may be noted that Indore is the main business hub of Madhya Pradesh. So far as the total employment is concerned Bhopal has 39% of working population is engaged in informal sector. Considering the work force participation of 30% large section of population is dependent on informal employment. In Bhopal most of the households have regular income. This is important indicator as it suggests that the population have steady consumption rate.

Tab 5.1 Work Participation Rate (%)

	Persons	Males	Females
<b>Bhopal</b>	<b>29.6</b>	<b>46.9</b>	<b>10.3</b>
<b>Indore</b>	<b>32.2</b>	<b>51.2</b>	<b>11.2</b>
<b>Gwalior</b>	<b>28.7</b>	<b>46.1</b>	<b>8.4</b>

**Source; Census of India**

Illust. 5.1 Work Participation Rate (%)



**Source; Census of India**

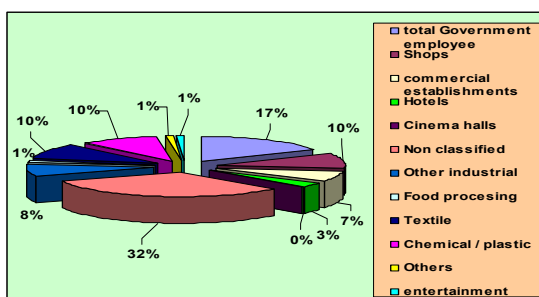
In terms of occupational type most of the work force belongs to service class and a significant number of populations is salaried under various heads. Bhopal being an administrative city and center of political activities there are large number of central and state government employees. This class of population enjoys reasonably good purchasing power. Distribution of government employees is shown in the table below. It may be noted that in addition the private enterprises in the city comprise a significant number of employees.

Tab 5.2 Distributions of Government Employees 2002

Gazettes Officials		Non Gazettes Officials		Total
Grade 1	Grade 2	Grade 3	Grade 4	
1640	2691	27271	6819	38421

Source; Census of India

Illust 5.2 Distributions of Employment Type



Source; Census of India

Major industrial area in Bhopal includes BHEL, Govindpura industrial area, and service industries in old town, new market and M.P Nagar area. The growth of industrial activities in the city is in its initial phase.

The social economic survey revealed key employment data, including number of income earners per household, employment in formal and informal sectors by the type of skills. A summary of key data is shown in Table

Tab 5.3 Income Earners

Income Earners						
	EWS	LIG	MIG	HIG	All	All Cities Average
Of which Formal %	56	76	88	95	79	61
Of which Informal %	44	24	12	5	21	39
% HHs with main Income earner female	<b>8.4</b>	6.3	6.4	2.1	6.3	5.2
% HHs with main Income earner in Informal Sector	47	18	15	9	23	38

Source; District Administration

Tab 5.4 Income Earners by Income Group

	EWS	LIG	MIG	HIG	All	All Cities Average
Household size	5.2	5.9	5.9	6.5	5.8	6.3
No. of persons of working age	2.8	3.9	4.1	4.7	3.8	4.0

Source; District Administration

It was observed that among the main income earners of all households nearly 78.7% were engaged in clerical / sales/ services, 10.2% in non-classified activities, 10% occupied professional/ managerial positional category. The highest proportion of all groups is in the clerical, sales and service sector; whilst the next highest proportion is the HIG earner in the professional and managerial sector. Out of the total income earners involved in non-classified activities majority (70.2%) belonged to the low income and economically weaker section.

The survey data reveal that across all income groups 23.3% households reported

that the main income earner was in informal employment. Among the EWS nearly 47% were in informal employment compared with only 9.0% amongst the HIG households. A further analysis reveals that the intermediate poor and the core poor households had around 45% of the main income earners who were in informal employment.

Only 6.3% households had main income earners who were females and out of them 18.8% belonged to BPL households. Only 1% of all the surveyed households had income earners below the age of 14 years. Among the child labourers 20.2% and 34.7% belonged to transitional and intermediate poor households respectively.

## 5.2 Employment

The number of units and employment sizes in small-scale industries in Bhopal District compiled by time period are given in the **Tab 5.2**.

**Tab 5.5 Employment in Industries**

Year	Total Units	Total Employment
1988-89	489	1193
1989-90	971	2396
1990-91	1431	3501
1991-92	1826	4516
1992-93	2226	5636
1993-94	2614	6548
1994-95	3052	7765
1995-96	3465	9112
1996-97	3871	10150
1997-98	4301	11306
1998-99	4510	12068

*Source; Comprehensive Traffic and Transportation Study in Bhopal Urban Area*

## 5.3. Income Profile

The mean household income varies considerably across the different income groups and so also the expenditure pattern (shown in Table). The average household income among all income groups is Rs

6065 per month while the average household income of BPL families is Rs 1931 per month. Total monthly expenditure ranges from 65.8% of total income for HIG households to 95.9% for BPL households. Core poor household expenditure exceeds monthly income by 18%. The data shows that the EWS, LIG households had an expenditure of more than 50% on food, rising to over two-thirds of monthly expenditure amongst core poor households. Expenditure on education was observed to highest (20.4) among the HIG gradually declining to 8.2% for the EWS households. It may be noted that the expenditure on water was highest between the LIG and Core poor households (2.3%) with a citywide average of 1.8% across all income groups. Expenditure on solid waste /garbage collection was observed to be very low among all the households.

**Tab 5.6 Income Expenditure**

Average Income % Exp	Income Group				Avg.
	HIG	MIG	LIG	EWS	
Total Monthly Income (Rs)	16101	7813	4024	1763	6065
Total Monthly Exp (Rs)	10595. (100)	6335.9 (100)	3563.6 (100)	1689.4 (100)	4761.9 (100)
Food	4331.7 40.9%	2957.2 46.7%	1910.1 53.6%	1025.8 60.7%	2287.0 48.0%
Education	2161.3 20.4%	977.1 15.4%	454.7 12.8%	138.6 8.2%	740.4 15.6%
Electricity	699.4 6.6%	424.8 6.7%	268.8 7.5%	116.2 6.9%	328.99 6.9%
Water	142.2 1.3%	122.9 1.9%	82.8 2.3%	24.1 1.4%	86.40 1.8%
Garbage Collection	30.1 0.3%	1418 0.2%	4.2 0.1	0.5 0.0%	9.4 0.2%

*Source; District Administration*

**Tab 5.7 Income Expenditure**

Average income % Exp.	Poor Category			
	TP	IP	CP	BPL
Total Monthly Income (Rs)	2947	2028	1117	1931
Total Monthly Exp (Rs)	2694.9 (100)	1915.4 (100)	1322.7 (100)	1852.5 (100)

Food	1590 59.0%	1202.6 62.8%	885.0 66.9%	1168.9 63.1%
Education	293.7 10.9%	180.8 9.4%	121.9 9.2%	174.5 9.4%
Electricity	173.1 6.4%	145.1 7.6%	119.1 9.0%	142.4 7.7%
Water	48.9 1.8%	26.0 1.4%	30.4 2.3%	26.4 1.4%
Garbage Collection	1.8 0.1%	1.8 0.1%	1.3 0.1%	1.8 0.1%

**Source; District Administration**

A monthly saving was a more common phenomenon amongst the HIG and MIG households while only 39% EWS and 13% LIG households reported making savings every month. Nearly 20% of the EWS and BPL households had taken loan from informal sources. Loan from formal financial institution was found to be highest among the MIG (14.7%) households with a city average of 9.3%.

#### 5.4. Conclusion

- The economic base of Bhopal City mainly depends on Industrial Sector, while the service sector is becoming increasingly important which provides the majority of employment in Bhopal because it being capital of state.
- The sectors that reported to be growing fast in Bhopal are housing, banking & insurance and education.
- The work force participation rate is 29.6%, which is more than Gwalior while less than commercial capital of state Indore.
- 39% of the income earners are engaged in the informal sector, which is a sizable amount at the same time 23% of the households, have its main income earner in informal sector.
- The Average Household income in the all income groups of the city is Rs. 6065 per month while in case of BPL families it is Rs.1931 per month.
- The average monthly expenditure of the Poor category households is more than Household Income (118% in Core Poor)

while it is lowest in case of HIG with 65% of the Income.

- It is a noticeable fact that the expenditure on water was highest between the LIG and Core poor households (2.3%) with a citywide average of 1.8% across all income groups.



## Chapter

# 6 Land Use

## 6.1. Land Use Classification

In the Development Plan 1994-2005 various land use classification categories were industries, commerce, residences, schools, roads etc. in order to comprehend the quantum of land utilization for various uses, their functional Interrelationship, environmental problems etc.

1. Residential
2. Commercial
3. Industrial
4. Public-Semi-Public And Utilities
5. Recreational
6. Transportation
7. Agriculture
8. Wasteland
9. Forest
10. Water Bodies

## 6.2. Existing Land Use 2005

The Bhopal Development Plan 2005 was planned for projected population of 25 lakhs. The Population of Bhopal was not grown up to the expected growth. Today it is estimated that in 2005 Bhopal has population of approximately 17 lakhs population. The implementation of the development plan 2005 has been assessed by field observations. The BDP envisaged around 17500 ha of developed area till 2005 but the actual developed area in the 2005 was 10400.

**Tab 6.1 Status of Bhopal Planning Area 2005**

Tab 6.1 Bhopal Planning Area 1994		
SR NO		AREA IN HA.
1	DEVELOPED AREA	10400
2	UNDEVELOPED AREA	49706
	TOTAL PLANNING AREA	60106

*Source; Field Observations*

### 6.2.1 Residential

The development plan (1994 -2005) envisaged 8190.00 Ha. of land for residential development which includes area around the city. Nearly 59% of the area proposed was utilized under the same use. Some of the areas like Gehukheda Sankhedi Katara Navibaagh and outer areas of all the zones are not developed.

### 6.2.2 Commercial

Development plan 1995-2005 envisaged land utilisation rate for commercial use as 0.4 Hectare per thousand person. The land, which was reserved for commercial use, was 650 Hectare distributed under different categories according to the requirement of planning units out of this total 60 percent land of commercial use has been developed.

### 6.2.3 Industrial

A close appraisal of land use distribution of Development Plan 1994-2005 indicates that except the industrial use proposed along Bhopal Diwanganj road and on the other side of the railway line in village Sajidabad, Maholi and Bhanpur, the other areas proposed for industrial activities in addition to the existing have come up. This forms 75 percent of the total land proposed under the industrial use, while the 25 percent industrial land could not be developed due to non-availability of concession for industrial development from the concerned Depts.

### 6.2.4 Public and Semi Public

The plan 1994-2005 envisaged 10% percent land for PSP purposes. The review of the plan indicates that out of 1746 Hectares land reserved for this use 1250 hectares land developed under the PSP.

The land for PSP use which could not be developed and still available for development [includes areas on Arera Hills and PSP uses in all the ten Planning units have scope of (development for this purpose.

### 6.2.5 Transportation

Most of the proposed roads in South Bhopal have been developed except few, which could not be developed due to topographical configurations and site conditions.

### 6.2.6 Recreational

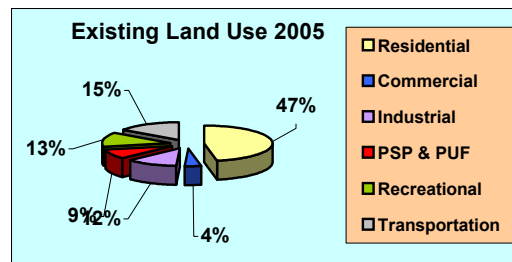
The recreational use, which was envisaged in 1994-2005 plan, was of the order of 17 percent of the total purposed land for city development. From the study of the recreational development under the heading lake front development an city parks. It is evaluated that lake front and city park development is of the order of 50 percent of the total proposed area. Areas, which could not be developed as city parks, are near Lalghati junction, near Aish Bagh Stadium, opposite to Vidhan Sabha, adjacent to western Side of Regional College, western [slope of MACT hillock and area around the PHE treatment unit in PU4 near Sai-Baba Mandir.

Tab 6.2 Existing Land Use 2005 and Proposed Land Use under BDP 2005

S N	Category	Existi ng Dev. Area 05 in ha	05 %	Prop osed Dev. 2005 Area in ha.	%
1	Residential	4980	47	8190	46.48
2	Commercial	410	4	650	3.71
3	PSP and PUF	1250	12	1746	9.96
4	Industrial	900	9	1389	7.93
5	Transportation	1350	15	2600	14.85
6	Recreational	1600	13	2925	16.71
	Total	10400		17500	

**Source : Bhopal Development Plan 2005.**

Illust 6.1 Existing Land Use 1994



Source; As Per Assessment

### 6.3. Conclusion

- There is Lack of Land Use control measures especially in the central area.
- As the BDP 2005 conceived for 25 lakhs population the development Plan doesn't needs review till 2115.
- The level of implementation as envisaged in 1994-2005 Development Plan is 60%
- Except in the case of commercial areas there is 60% implementation, which is due o dense commercial areas, 75% each in Industrial and PSP areas.
- Majority of the roads proposed less than 1974-91 Development Plan were been developed except few roads.
- Growth in the Housing Sector and city level infrastructure is not meeting the pace of population growth.
- City level infrastructure such as Roads, Water Supply and Sewerage lacks in the potentially growing Areas.
- In the absence of affordable housing options there are around 198 un authorized colonies in the BMC area. There is a need to review the planning and development. So as to curb the tendency to opt for un authorized colonies.
- There is lack of coordination between agencies related to the land development

## Chapter

## 7

## Infrastructure &amp; Environment

Bhopal City is been projected as a “*Global Environment City*” due to its rich natural legacy. Bhopal City needs major investments in Water Supply, Sewerage, Solid Waste Management and Drainage to reach the Specified Global Standard. The initial initiative in this direction is proposed to be taken using the JNNURM.

### 7.1. Water Supply

#### 7.1.1 Background

A piped water supply system for the city was first developed in the 1940's for the old city area, which was augmented and expanded to suit demand. The upper lake was the main source of water with a potential yield of 85.5MLD until a major augmentation (135MLD) took place in 1989 with the development of Kolar dam.

However, expansion of the distribution system did not match supply or demand. The BMC submitted a proposal to the state government for distribution system improvements in 1989 at an estimated revised cost of US\$ 6.38 million (1992). The project is yet to be taken up after appropriate funding arrangement by the BMC.

Ground water is also used as a supplementary source and supplies about 22.5 MLD through 550 motorized tube wells. In addition, there are several privately owned hand pumps, which supplement water requirement.

Tab 7.1 Treated Water Available from Various Sources

S N	Source	Distance From City (km)	Abstraction of Raw Water (MLD)	Remarks
1	Upper Lake	Within City limit	85.5	Rain dependent

				source Generally sustainable
2	Kolar dam	30	135	Rain fed sustainable source
3	Local Groundwater	Within City limit	22.5	Over extraction – not sustainable

Source; Bhopal development Plan 2005

A further augmentation of water production by 198 MLD from Kolar dam is implemented by BMC to meet the projected water demand for 2021 at an estimated cost of US\$ 22 million. The funding arrangement for this project is being arranged. The augmentation is expected to be completed by 2007.

#### 7.1.2 Water Resources

##### Upper lake supply

The raw water from Upper Lake is abstracted for municipal supply at 7 different points around the lake and pumped to 7 independent water treatment plants of total capacity 85.5 MLD capacity. All the treatment plants are conventional rapid sand filters and are commissioned in between 1945 and 1965 and their efficiency have considerably reduced. Although the total installed capacity is 85.5 MLD, the actual production is limited to 81 MLD. The equipment and structures of these water treatment plants require thorough improvement. BHEL, Railways, and M. E.S also extract raw water from the lake.

##### Kolar Dam Supply

The raw water from Kolar dam is pumped to the treatment plant by 2 nos, 36 km long 1450mm dia. Pipes. After treatment in a 154 MLD capacity treatment plant, the water is then pumped to the service reservoirs. The treatment plant was commissioned in 1990 and due to a reduction in efficiency is presently only producing about 135 MLD of treated water. Some of the equipments require improvement.

The Water taken from the sluice of both Irrigation and domestic use, this water is good for agriculture, but for domestic use it needs treatment to be taken up to the CPHE manual level. In this process Lots of chemicals such as Pottasium Permagnate, Hydrated Lime and Alum are required, increasing the cost of the treatment. This exercise has to be carried out due to the maganese and iron compositions in any man made dam due to anaerobic decomposition. The cost can be reduced with capital investment in constructing a multilevel intake.

### Ground Water Supply

Ground water is also used currently as a supplementary source and the supply is about 22.5MLD from 42 dug wells, 541 tube wells and 1295 hand pumps. The majority of this supply is from the dug wells as the deep tube wells in the rocky strata are not very successful. In addition there are many private tube wells for which data is not available though, again the supply from these is also modest in limited areas.

### 7.1.3 Distribution system

BMC area is divided into 66 wards with about 255,000 households of which 5000 communities stand posts. About 67% of the city populations presently have access to the piped water supply system. The remainder depends on water from dug wells or hand pumps and some times tanker supply. Although sufficient water is produced in the treatment plants to satisfy the prescribed per capita supply rate, supply is only for 2-3 hours daily at low pressure. In addition, 4000 connections are given to commercial and industrial establishments.

There is no proper water supply arrangement in the gas affected areas where the under ground water is also contaminated and is not potable.

The existing water supply distribution system in old city areas is not being supported with adequate storage facilities

resulting in low-pressure supply at the consumer end.

The existing water distribution system has become undersize as a result of increased population density and Municipal area over a period of last years.

There are no means of accurately measuring the actual volume of water that is produced, distribute and supplied to the consumers, water harvested, treated, imported, exported, stored and consumed. Proper metering is a pre-requisite for the management of any water supply system. Without reliable metering, the water supply managers will have little control over the losses in the system since they will be unable to identify and quantify them.

With the completion of the on going augmentation scheme of 198 MLD from the Kolar dam source the water production capacity of Bhopal will be 438 MLD which could satisfy the demand of the city till 2027 with per capita supply rate of 135 liter per day with a minimum losses of 15%. Even at present, with a water production capacity of 240 MLD a 135 liter per capita supply rate could be achieved if the losses were restricted to 20% and water production efficiency is maximized through proper O&M and water supply management.

The quantity of water supplied to Bhopal theoretically meets the present demand. However in reality the average water supply is only around 88 lpcd due to various reasons, which are following:

Although the total supply from the WTPs around Upper Lake and Kolar system is 85.5 MLD and 135 MLD respectively, the actual production is significantly lower than that. This is particularly the case with the WTPs in Upper Lake System, which were commissioned between 1945 and 1975, their efficiency have considerably reduced. Similarly the RWPS and CWPS are very old and most of the machinery like pumps, motors, equipments and civil structures of these WTPs, RWPS and CWPS require thorough rehabilitation/replacement. There

are no flow measurement devices to assess the total water production.

As estimated in PPTA report, the Non Revenue Water (NRW) for the city is around 64% out of which at least 25% is the physical loss in the form of leakages. The transmission and distribution system laid within about 50 years is about 800 Km. long and spread over in most of the core area and parts of newly developed areas. The water distribution network has been strengthened from time to time by BMC as per requirement, thereafter, commensurate with the augmentation schemes undertaken and the development of the city. The distribution system is a mix of old and new pipes and laid in unplanned manner. The distribution system consists of all types of pipes like CI, DI, GI, PSC, AC and MS pipes. The valves, joints and fittings at various junctions are leaking very badly. The air valves at most of the locations are not functional and thus damages the pipeline on the weak joints, hence cause more leakages. At many places, seepage of ground water in the leaking pipes contaminates the water supply, especially in the areas where there is no underground sewerage and the pipes cross the open drains, soak pits, septic tanks.

The peripheral area of the city served largely by dug well supply and do not have extensive distribution systems nor is the quantity always adequate. These areas face scarcity in particularly dry summers. Pipe networks have not yet reached on the city periphery and many new colonies on Airport Road, Hoshangabad Road, Raisen road Berasia Road, Kolar Road and Vidisha Road have developed. Expansion of distribution network for these areas is required.

There are approximately 70 ESR and 90 GSR and sumps in the city with a total capacity of about 100 MLD. Considering the present demand of 220 MLD, the storage (almost 50% of daily demand) provided for the present supply seems to be sufficient. Additional storage in form of service reservoirs is required to be

constructed to the peripheral areas where expansion of distribution network is required.

### Public stand post and Unaccounted for water

With 67% water supply coverage, 33% of the population is dependent on Public Stand Posts. The number of beneficiaries per public stand post is about 95, which are twice the EUIS recommendations. The stand posts are un-metered and major source of wastage. In addition there is significant leakage in the pipelines on which there is no systematic recording and control for prompt detection and repair. In addition to all the above BMC estimates at least 25,000 illegal connections in the distribution system.

### Operation and Maintenance

The operation and maintenance of the treatment plants and distribution system is undertaken by the BMC with engineering staff deputed from PHED. There is about 1500 staff including 75 of engineering cadre, provided under the BMC for operation and maintenance of the head works and distribution system. The present annual cost of operation and maintenance is shown in table below.

S.N	Cost Head	Cost per annum (Rs./million)
1	Leak and other repairs	25.00
2	Chemicals	12.50
3	Energy	210.00
4	Staff salary and Administration	100
	<b>Total cost of operation and maintenance</b>	<b>347.50</b>
<i>Source; Bhopal Municipal Corporation</i>		



## 7.2 Sewerage

### 7.2.1 Background

Bhopal does not have a planned and full-fledged sewerage system. A large area of the city, has no sewage network, either internal or trunk, and the raw sewage or septic tank outflows are discharged into open drains which flow into the watercourses. Ultimately most of the sewage flows into the upper lake and into the nallahs, which eventually flow into the Patra, Halali, and Betwa River.

### 7.2.2 Existing Sewage System

Bhopal Municipal Corporation (BMC) area has about 210 Km of non-contiguous underground sewers in different catchments, and covers about 28-30% of city population. In the remaining areas of the city, large section of population discharge wastewater into open drains.

BMC area has about 210km of non-contiguous underground sewer in three different catchments, with treatment facility of 80 MLD including the BHEL industrial areas.

- Bairagarh Area – 16km sewer with 2 pumping stations and one 4.5 MLD capacity Oxidation Pond.
- Old Bhopal Area – 24 km sewer line with 5 pumping stations discharging sewage to Patra nallah and STP's in Bhoj Wet Land Project.
- New Bhopal Area – 108 km sewer with 6 pumping stations and one 4.5 MLD capacity Oxidation Pond and 13.5 MLD STP.
- Bhoj Wet Land Project – 61.7 km sewer with 11 pumping stations and 5 STP's of 58 MLD capacities.

Theoretically Sewage generated till date in the Bhopal city is around 118 MLD and around 39MLD (30%) of sewage waste is

collected through existing sewerage system and taken to 80 MLD STP and treated.

Rest of the city is either disposes sewage in septic tanks or people in informal housing opt for open defecation. Many of the septic tanks are in dilapidated condition; the top slabs and pipes are broken. No cleaning of septic tanks has been carried out in many years and as a result direct raw sewage flows into nearby drains. Many of the septic tanks do not have soak pits hence septic tank overflows into the near by storm water drain. Many of septic tanks need cleaning. BMC have mobile vacuum suction and sewer jetting machine for maintenance of the septic tanks, manholes and sewers, but these are inadequate to cater to the needs of entire city. A large number of households of Slum areas still use dry latrines or resort to open defecations.

Due to the inadequacy of sanitation facilities, the city is susceptible to environmental and public health risks. Providing a comprehensive sewerage system for the entire city including the Slum areas can minimize this.

The immediate need to provide a complete sewerage system to city is because most of the lakes such as Upper Lake, lower lake, Shahpura Lake, Motia Tank, Siddiqui Hussain & Munsii Hussian, Kaliyasut Reservoir, Halali dam catchments (patra nala), Char Imli Pond, Landiya Talab etc. situated in the heart of city and almost entire catchments of these lakes is occupied by the human settlements and receiving untreated/raw sewage through no. of sewage fed drains. The anthropogenic pressure and inflow of raw sewage in these lakes have made the lake water quality to highly deteriorated condition.

The most important of these lakes, the Upper and Lower lakes are together called as the Bhoj Wetland. The Upper Lake was constructed in the 11th century and has a catchments area of 361 sq km and water-spread area of 31 sq km. the Lower Lake

was created downstream of the Upper Lake in the late 18th century. It has a small catchments area of 9.60 sq km and a water-spread of 1.29 sq km. Out of these two lakes Upper Lake is one of the major water supply source for the city. The Upper Lake remained the only major source of potable water till the water augmentation scheme of Kolar came into existence. Still Upper Lake water is being supplied as potable water to the 40% population of the city. Till 1947 the water quality of the Upper Lake remained so good that potable water was supplied without any treatment. However, the developmental activities and expansion of city exerted anthropogenic pressure in the last five decades that resulted in lake water quality deterioration, which were rightly attended by Bhoj Wetland Project. The project has been implemented to intercept nallahs carrying sewage and to prevent their discharge into the upper and lower lake.

### 7.2.3. Bairagarh Area

The Bairagarh area has a sewer network of 16.22 km length laid by PHE department, the diameters varying from 150mm to 900mm, with sewage pump houses at Sehore Naka and Laukheri and a 4.5 Oxidation pond at Gandhi Nagar. This sewer network has been upgraded and connected to the newly laid sewer system under the Bhoj Wetland Project.

### 7.2.4 Old Bhopal Area (Area covered under the PPOUL Scheme)

The Old Bhopal area has a sewer network of 23.5 km length laid under the "Prevention of Pollution Of Upper Lake" scheme with diameters varying from 150mm to 1200mm. This system is almost 30 years old and currently not functioning properly. This network has sewage pump houses at Khanuguan, Ahemdabad, Fateghar, Bhojpura and Ginnori. The outfall of this network is in the Patra Nala and a sewage treatment plant at 'Maholi Dhamkheda' constructed under the Bhoj

Wetland Project. Renovation of these old Sewage Pumping Stations have also been done under the Bhoj Wetland Project. No records of the complete sewer network in the Old City area are currently available.

### 7.2.5 New Capital Project Area

The sewerage system of new Bhopal capital area is almost 40 year old. The New Bhopal area has a sewer network of 108 Km length with diameter varying from 150 mm to 900 mm. Initially the network had sewage pumping house at Banganga, Mata Mandir, SAF, Habibganj Shahpura and Kotra with an Existing Oxidation Pond at Bawadi Kallan. Some existing sewer of this network, which is in the catchments area of Upper Lake, has been trapped and covered under the Bhoj Wetland Project. The Kotra and Banganga SPS were renovated and augmented and SAF SPH had been eliminated from the network during the Bhoj Wetland Project. Right now the entire system of New Capital Area consists of two Sewage Treatment Plants namely Bio filter Plant at Mata Mandir and Oxidation Pond at Bawadi Kallan with four Sewage Pumping Stations at 1250 quarters, Old Shapura/E-6, New Shahpura/Manisha Market and Habibganj.

This system has several limitations, the manholes and sewers are choked or damaged at number of places and require major repairs. Out fall sewer from Kotra to Manisha Market Pumping station is damaged at many places, large portion of outfall sewer has been encroached by slum dwellers along the Panchsheel Nala. Sewage from Kotra, Aradhana Nagar, and Vaishali Nagar etc is discharged in the "Shahpura Lake" due to non-functioning of this out fall sewer, there by polluting the lake.

The Bio filter Plant at Mata Mandir is not functioning properly, it receives sewage from south TT Nagar (ward33) by gravity main and ¼ area of 1250 quarters (Tulsi Nagar) by pumping. It was observed during visit of Bio filter Plant that the treated sewage effluent is discharged into the near

by drain which also carries sewage from other areas, which results in mixing of treated effluent and raw sewage. The drain terminates in “Shahpura Lake” causing pollution of the lake.

The embankments and sewage channels (Inlet and Outlet) of the Treatment Plant at Bawdi Kalan of Oxidation Ponds are severely damaged. The force main at the entry of the treatment plant is also severely damaged. General condition of the Sewage Treatment plant is not satisfactory. Silt and sludge are deposited in the ponds, weeds is growing in the ponds and the plant at present is non functional.

Habibganj Sewage Pumping Station, which pumps the sewage to Old Shahpura/E6 Pumping Station, has not been functioning properly as sewage does not reach the pumping station due to broken and choked lines. Currently the entire sewage flow into storm water drains.

Old Shahpura/E6 and New Shahpura/ Manisha Market Sewage Pumping Station have common force main for pumping sewage to Bawdi Kalan STP, under this arrangement only one plant could be operated at a time.

The sewerage installations of New Capital Project Area are as follows:

- Sewage Pumping Station, Habibganj (9.08 MLD)
- Sewage Pumping Station, 1250 Quarters, Tulsi Nagar (2.27 MLD)
- Sewage Pumping Station, Old Shahpura/E-6 (13.62 MLD)
- Sewage Pumping Station, New Shahpura/ Manisha Market (13.62 MLD)
- Bio-filter Plant, Mata Mandir (4.54 MLD)
- Sewage Treatment Plant, Bawdi Kalan (13.62 MLD)

Tab 7.4 Detail of Sewage Pumping Station at Manisha Market Shahpura		
S N	Description	
1	Year of Construction	1979
2	Capacity	3 MGD
3	Intake Source	Intake source of this SPH is mainly from 1100 Quarters. Outfall sewer, which carries the sewage of partly area of Kotra, Aradhana Nagar, Vaishali Nagar etc., is also the intake source of this SPS.
4	Pumping to	Bawdi Kallan STP
5	Final Discharge for Treatment	Bawdi Kallan STP
6	Detail of Pump House Boundary	L=58.0 m, W=58.0m
7	Pump Numbers and Capacity	2 No's Pumps of 110 & 2 No's Pumps of 220 HP installed in year 1979. All the Pumps are Kirlosker make. 1 Dewatering pump of 3 HP & one submersible pump set of 3 HP.
8	Detail of Sump	D=6.50m & Dia= (15.50-9.5)=6.0 m
9	Detail of Dry Well	D=11.60m & Dia=8.80 m
10	Detail of CI Sluice Valve	8 no's of 250 mm dia & 600mm dia 1no's
11	Non Return Valve	2 no's of 250 mm dia each.
12	Transformer	400 KV 2 no's. one is out of order.
13	Chain Pulley Block	1 no
<b>Source; Urban Environment Improvement Project ADB</b>		

Tab 7.5 Detail of Sewage Pumping Station at Asha Nikaten, Old Shahapura		
S.N.	Description	
1	Year of Construction	1964
2	Capacity	3 MGD
3	Intake Source	Intake source of this SPH are mainly from Arera Colony E1-E5 plus pumping sewage from Habibganj SPS.
4	Pumping to	Bawdi Kallan STP
5	Final Discharge for Treatment	Bawdi Kallan STP
6	Detail of Pump House Building	L=13.10 m, W=5.60m & H=8.25m
7	Pump Numbers and Capacity	4 No's Pumps of 180,60 & 50 HP installed in year
		1964 except the 170 HP Pump which was installed in year 1999 .2 no. of dewatering pumps of 3 HP each. All the Pumps are Kirlosker make except the 50 HP Pump, which is of Jyoti make.
8	Detail of Sump	4 no's of each of D=6.60m & Dia=13.40 m
9	Detail of Dry Well	D=6.70m & Dia=3.50 m
10	Detail of CI Sluice Valve	For Suction- 6 no's of 300 mm dia & 2 no's of 200 mm dia , For Delivery- 250mm dia 4 no's & 450mm dia 1no
11	Non Return Valve	4Nos.of 250 mm each & 1 no.450 mm dia
12	Transformer	1 No.
13	Chain Pulley Block	1 No.
<b>Source; Urban Environment Improvement Project ADB</b>		

Tab 7.6 Detail of Sewage Pumping Station at Habibganj		
S N	Description	
1	Year of Construction	1964
2	Capacity	2 MGD
3	Intake Source	Intake source of this SPH are mainly from 3/4 area of 1250 Quarters, 1464 Quarters, New Market, 74 Banglow etc
4	Pumping to	Old Shahpura/E6 SPS
5	Final Discharge for Treatment	Bawdi Kallan STP
6	Detail of Pump House Building	L=23.05 m, W=9.2m & H=8.5m
7	Pump Numbers and Capacity	3 No's Pumps of 85,60 & 50 HP installed in year 1964. 80 & 60 HP Pumps are Kirlosker make and make of 50 HP Pump is Jyoti make.
8	Detail of Sump	3 no's of each of D=6.2m & Dia=11.90 m
9	Detail of Dry Well	D=6.2m & Dia =11.20 m
10	Detail of CI Sluice Valve	For Suction- 6 no's of 150 mm dia, For Delivery- 200mm dia 3 no's & 400mm dia 1no's
11	Non Return Valve	3Nos.of 200 mm each
12	Transformer	1 no
13	Chain Pulley Block	1 no
<b>Source; Urban Environment Improvement Project ADB</b>		

Tab 7.7 Detail of Bio Filter Plant at Mata Mandir		
S N	Description	
1	Year of Construction	1954 by Hindustan Construction Company, Bombay
2	Capacity	1 MGD
3	Intake Source	Ward No. 33 (South TT Nagar) and 1/4 <sup>th</sup> part of Tulsi Nagar area through 1250 Pumping.
4	Final Disposal of treated effluent	Near by Drain which is the catchment's of third lake (Shahpura Lake)
5	Detail of Pump House Building	L=9.6 m, W=8.57m & H=4.27m
6	Pump Numbers and Capacity	4+1 Nos. Non clog Pumps of 10 HP each
7	Size of Clarigester	40 feet Dia and total depth of 26 feet
8	Size of Clarifier	35 feet dia and depth of 14 feet
9	Size of Tricking Filter	60 feet dia and depth of 7.5 feet
10	Out let for Sludge Bed	150 mm dia CI pipeline
11	Size and No of Sludge Bed	5 Nos. of 25 x 28 sqft each
12	Detail of Sump	D=2 m, L=9.6 m & W=1.5m
13	Detail of CI Sluice Valve	100 mm dia 12 no's, 150mm dia 3 no's, 200mm dia 4no's & 300mm dia 1no's
14	Non Return Valve	5 Nos. of 100 mm each
15	Delivery/ Suction of Pump	100 mm dia
<b>Source; Urban Environment Improvement Project ADB</b>		

Tab 7.8 Detail of Bawdi Kalan STP		
S N	Description	
1	Capacity	3 MGD
2	Total Area of plant in Ha.	26 Ha
3	Intake Source	Old Shahpura SPS & Manisha Market SPS are the main intake source of this STP.
4	Type of Treatment	Oxidation Ponds
5	No. of Ponds	8 Nos.
6	Size of Ponds	100.61mX50.3 m with appx. depth 1.5m each
<b>Source; Urban Environment Improvement Project ADB</b>		

## 7.2.6 Area covered under the Bhoj Wet Land Project

This was conceived to stop pollution of lakes caused by sewage flows into the Upper and lower Lakes through city drains. A large part of city area comprising 23 municipal wards (ward no. 1 to 7, 23, 25 to 30, 34, 37&38) and aprox. 20% population with aprox. 18 % area of total city is covered under the project. It is learnt that the sewerage system commissioned under Bhoj Wetland project is adequate to cater only dry weather flow and during monsoon these nallahs discharge into Upper Lake, thereby polluting it.

Tab 7.3 Existing Gravity Mains the Bhoj Wetland Project		
S. No.	Location	Length in Km
1	Gandhi Nagar Network	
	Bairaghar Area (Shehore Naka, Lahukhedi, Vijay	19.935
	Koe-Fiza, Ahemedabad etc.	3.685
	Khanoo Gaon	1.190
	Tilak Nagar, CTO	9.291
2	Maholi Network	
	T.T. Nagar	3.911
	Malviya Nagar	3.231
	Jahangirabad	4.686
	PHQ, MVM	1.368
	Professor colony	3.306
	Vardhman Park	2.282



	TTTI, Ravindra Nagar	2.100
3	Kotra Network	
	Prempura	2.234
	Kotra, PNT	2.005
	Nehru Nagar	2.559
Total		61.783
<b>Source; Urban Environment Improvement Project ADB</b>		

Three independent sewer networks Gandhi Nagar, Maholi and Kotra have been completed under the project, each has pumping stations, collection system and sewage treatment plants (STPs). Approx.62 Km of gravity sewer, 23.54 Km of force main, 8 Sewage Pumping Stations with 4 Sewage Treatment Plants have been constructed. Renovation of some old Sewage Pumping Stations has also been done under the Bhoj Wetland Project.

The sewerage installations of Bhoj Wetland project are as follows:

- Sewage Pumping Station, Fatehgarh
- Sewage Pumping Station, Garam Gaddha
- Sewage Pumping Station, Vardhman Park
- Sewage Pumping Station, MLB
- Sewage Pumping Station, Ginnori
- Sewage Pumping Station, Patra
- Sewage Pumping Station, New Kotra
- Sewage Pumping Station, Ahmedabad
- Sewage Pumping Station, Khanu Gaon I & II
- Sewage Pumping Station, Lau Khedi
- Sewage Pumping Station, Behata Gaon
- Sewage Pumping Station, Indira Nagar
- Sewage Pumping Station, Sehore Naka
- Sewage Pumping Station, Tilak Nagar
- Sewage Treatment Plant , Badwai (16.67 MLD)
- Sewage Treatment Plant , Gondar Mau (2.32 MLD)
- Sewage Treatment Plant , Gandhi Nagar (4.0 MLD)
- Sewage Treatment Plant , Maholi (25.0 MLD)

- Sewage Treatment Plant, Kotra Singhpur (10.0 MLD)

### 7.2.7 Area Served by Septic Tanks

Septic Tanks are the most common system for sewage disposal in the city. In the Areas not served by the gravity sewer network, large section of population discharge wastewater into septic tanks, soak pits or open drains. The development of city in a piecemeal manner in the form of colonies of various agencies and cooperative societies have prompted these individual entities to have their own sewer systems in the form of septic tanks and soak pits either in isolation or individual capacity or in collective groups. If it is in collective groups, such as housing societies, colonies, institutional or commercial establishments, they have formed an internal sewage system with septic tank at the end. Overflow from septic tank flows either to an adjoining city sewer or to open drains or nallahs where there is no city sewer is available.

## 7.3 Solid Waste Management

**Healthy city”** is a living, breathing, growing, changing complex organism. It is a place where its citizens recognize the physical, mental, social and spiritual nature of health and work together to create conditions that promote healthy living.

The exact quantity and characteristic of waste produce in Bhopal is not known, but the BMC reports that 550T/day of solid waste is generated in the urban area. Most waste dumped on open land or outside the containers. The BMC reports that 60% of the city area is cleaned and swept daily, 30% twice per week and 10% fortnightly. At present municipal waste is crudely dumped at the Bhanpur village trenching ground, at about road and during the rainy season 16km from the city. There is no proper access most of the refuse vehicles do not reach the disposal site.

**Tab 7.9 Characteristics of Solid Waste in Bhopal**

S N	Name of the Test	Site-I Jehangirabad (Resi/Coml)	Site-II Fatehgarh (Resi)	Site-III Bairagarh (Sabji Mandi)
<b>PHYSICAL</b>				
1	Compostable material	28%	63%	72%
2	Paper	2.9%	16%	6%
3	Plastics	2.9%	10%	6%
4	Glass & Ceramics	2.4%	1.2%	Nil
5	Earth, Stones, Bricks	30%	10%	7%
6	Moisture Content	25%	46%	58%
7	Volatile Substances	36%	44%	53%
8	Non Volatile Substances	64%	56%	47%
<b>CHEMICAL</b>				
9	Carbon Content	26%	27%	29%
10	Total Nitrogen	0.8%	0.65%	0.7%
11	pH	6.0	6.2	6.4
12	Potassium (K <sub>2</sub> O)	0.41%	0.48%	0.68%
13	Phosphorus (P <sub>2</sub> O <sub>5</sub> )	0.7%	0.65%	0.45%
14	HCV in Kcal/Kg	1252	1024	821
15	C/N Ratio	32.5	41.5	41.4

Source; Integrated Urban Development in Madhya Pradesh, Bhopal ADB

### 7.3.1 MSW Collection Mechanism

For efficient waste collection management system the city is divided into 14 Zone, the work relating to primary collection of waste has been decentralized at the zone level where is supervised by health officers with the assistance of ward level inspectors/Daroga, Sanitary super-wiser. The primary collection involves waste disposal by households and commercial and institutional places. 70 percent of waste is generated from the households and is disposed by households either on streets

society bins or organized collection points in the deferent parts of the city.

There are 1720 sweepers in 66 wards for sweeping work. The time of sweeping is 7.00 am to 11.00 am afternoon 2.30pm to 5.30 sweeper is provided wheel barrow, 1 long broom an punzar, they have been given specified sweeping area called beat, which they clean and collect the garbage in the wheel barrows and take it to the waste storage sites commonly known as collection points.

**Tab 7.10 Zone Wise Distribution of Solid Waste management Staff**

S N	Staff	Total Staff	Zones			
			1	2	3	4
1	Chief Health Officer	A.N.				
2	Health office/Zonal Officer	2	1	1	1	1
3	Chief Sanitary Inspectors	3	1			
4	Sanitary Inspectors	17	1	3	1	1
5	Sanitary Supervisor	23	1	1	1	5
6	Jamdars	26	0	4	3	0
7	Ward supervisor	17	3	2	1	1
8	Safai Karamchari	1625	89	171	120	185
9	Driver	55	5	8	3	4
S N	Staff	Zones				
		5	6	7	8	9
1	Chief Health Officer					
2	Health office/Zonal Officer	1	2	2	2	2
3	Chief Sanitary Inspectors		1			
4	Sanitary Inspectors	1	1	1	1	
5	Sanitary Supervisor	2	3	1	1	2
6	Jamdars	2	-	5	3	2
7	Ward supervisor	2	3	0	0	1

8	Safai Karamchari	150	114	181	97	104
9	Driver	5	6	5	4	7
S N	Staff	Zones				
		10	11	12	13	14
	Chief Health Officer					
1	Health office/Zonal Officer	2	2	1	2	2
2	Chief Sanitary Inspectors	1				
3	Sanitary Inspectors	1	3	1	1	1
4	Sanitary Supervisor	1	2	1	-	2
5	Jamdars	1	3	0	2	1
6	Ward supervisor	2	0	1	1	0
7	Safai Karamchari	85	116	52	66	97
8	Driver	2	2	1	2	1

Source; Integrated Urban Development in Madhya Pradesh, Bhopal ADB

### 7.3.2 MSW Transportation Mechanism:

BMC has 77 fleets of vehicles for collecting and transporting waste from collection points to the disposal site. Each of the vehicles is allotted specific area for collection and transportation to Bhanpur site. The collection vehicles attend collection point daily and the other location as per the schedule or as per the directions of Health officers.

Tab 7.11 Vehicles Available

Trucks	32	Tipper (with 4 dumpers)	01
Refuge Compactor	11	Sewer Cleaning Vehicle	03
Dumpers	9	Trolleys	12
Auto Rickshaw	11	Tractor Trolley	04
JCB	02	Mini Refuge Compactor	02
Loader	01	Crane	01

Source; Integrated Urban Development in Madhya Pradesh, Bhopal ADB

Frequency of Truck twice a day: work force Avg. RC 3 nos., Mini Truck 4 nos., Mini RC 2 nos., Big Truck 4 nos, DP 2 nos, Average lifting and transportation waste to Bhanpur landfill site is 320 to 340 M.T/d.

BHEL: (4) Trucks. (2) Private Builder Trucks Private Sector Trucks

### 7.3.3 MSW Disposal Mechanisms:

Waste collected from city is disposed at Bhanpura trenching ground existing landfill site that is 15 km away from New Bhopal. Almost 230 to 280 trips are made to land fill site by 77 Vehicles ever day.

The disposal site at Bhanpur also has a waste processing plant which has been commission and run by M.P. Agro state organization installed capacity of Bio fertilizer is 100MT/day of composting.

### 7.3.4 Bio Medical waste:

The Bio Medical Waste generated from Govt. and Private Hospitals and regulated at source and collected in different bags as per BMW rules. BMW wastes are collected in 223 hospitals/ Nursing Home and Transported in close vehicles to Private all India Nursing Home Association (Bhopal Incinerators Ltd. Govindpura). The Plant is installed at Govindpura Industrial area Bhopal.

Govt. Hamidya Hospital, Gas Rahat Super Hospital (Vidisha Bypass road), Chirayu and Hajela Nursing home also have their own Incinerator system. The total generation BMW wastes about 4 to 5 T /day which are being treated as per the BMW rules.

### 7.3.5. Issues:

- No primary collection waste. In absence of adequate facility of primary collection of waste, the waste ultimately lands up on the streets, lanes or back side of houses. People residing in low class or slums dispose the wastes on the street as and when generated, there is no

system of door to door collection of waste nor is there any facility of community bins. The primary collection time is largely through streets sweeping.

- ❑ Unpaved and open collection site
- ❑ No waste segregation done. Currently no waste segregation is done by BMC and only 20% of wastes are processed (Composting process).
- ❑ Unscientific disposal technique the method of disposal is not scientific as per MSW rules 2000 for disposal of next 30 years.

#### 7.4. Storm Water Drainage

The natural drainage of storm water is reasonably good in Bhopal. In old Bhopal areas, the drainage is provided mainly by Patra nallah which receives flow from number of small channels running across the city, like Gaji Khan ka nallah, Ashoka Garden nallah, Jinsi nallah, Maholi ka nallah, mahamai Bagh ka nallah, kale Bhairon ka nallah etc. Patra nallah after collecting the stormwater from these channels discharges it to the Islamnagar river 18 km from Bhopal, which finally flows in to the Halali river. Large portion of the city in the central region discharges storm runoff to Upper Lake and Lower lake. The entire network of Patra nallah is about 50 kms.

In the New Bhopal area the drainage is provided mainly by katsi nallah, which flows for about 8 km before meeting Shahpura Lake.

Three Major Streams drain Storm Water from Bhopal. On northeastern side River Halali carries the drainage and on southeastern side River Kaliasote carries it, both these rivers drain to the river Betwa. In the southwestern side the drainage is carried by many small nallahs, which ultimately drain in to Kolar River.

The Rainfall of Bhopal is of medium intensity (1200mm average per annum) and with the entire natural advantages there is no severity of inundation in city areas that may affect the public life and business seriously.

In view of above, the need for major investment in storm water drainage in Bhopal is not a priority.

**Tab 7.12 Minimum Cross Section at Various Areas**

S. No	Particular's	Discharge in Cumecs	Velocity in m/ see	Area in Sq.m
1	At MANIT SQ	16.96	4.85	3.49
2	Mid Way	23.86	4.85	4.91
3	At Kolar Triangle	29.90	4.85	6.16

*Source; Integrated Urban Development in Madhya Pradesh, Bhopal ADB*

#### 7.5. Transportation

Bhopal is best strategically located city in Madhya Pradesh It is connected to other cities in the state and country by Railways as well as Roads. The City is connected by broad gauge railway lines to almost all the major cities like Delhi, Mumbai, Chennai and Nagpur.

##### 7.5.1 Road System

###### Regional Roads

The major regional Road network comprises of NH 12 connecting Hosangabad and Narsingarh and a number of State Highways linking Indore, Sagar, and Jabalpur.

###### Roads within the City

The total road length of the city is 1020 km of which 66% is managed by BMC. The other agencies involved in construction and maintenance of the city roads are BDA, PWD, BHEL and CPA.

The city is distinctly divided into two parts, the old city housing most of the trading and commercial activities and the newly developed area with mainly administrative, institutional and residential activities. The road network in the old city area, with very limited scope of road widening, mainly suffers from very high volume of traffic, heterogeneous traffic mix, and high degree of pedestrian movement and on – street parking. The average traffic volume around bus stand is 80,000 PCU to 85,000 PCU along Hamidia road and Aishbagh Road. The presence of Bhopal railway station and bus stand in the area adds more problems.

To alleviate the problems of old city and some specific commercial centers like New Market, Bittan Market, No 10 Market etc, traffic engineering and management measures mainly in the form of traffic circulation and Parking plans are already in various stages of implementation. There is restriction on movement of goods vehicles in main city between 9 AM and 9 PM, but in absence of any organized and adequate truck parking facilities, the roads suffers from major bottlenecks at specific locations.

### Present Status of Roads

Most of the proposed roads in South Bhopal have been developed except, few which could not be developed due to topographical configurations and site conditions. These roads are:

- Road from village Chunabhatti to Bhadbhada
- Road from Asha Niketan to the proposed Ring Road along Bhopal-Itarsi Railway line.
- Ring Road from Obedullahganj road to Bhopal Bilkisganj road in north Bhopal:
- Road from Obedullahganj to Raisen Road
- Road from near Pulbogda to Ring Road in northern direction.
- Road along Bhopal Delhi railway line from ring road to Pulbogada.
- Ring road from Retghat to Karbala along to lake (Lake drive road).

- Road from Karod kala to Narela Shankari via Bhanpur.
- Road from Regiment gate to Chhola road.
- The other sector roads within planning unit's remains to be developed as per development plan proposals.

Under the transportation land use category grade crossing and terminal centers for road transport, which were supposed to be implemented, are yet to be developed.

### Intersections:

- i) There remain many poorly designed intersections along major arterial corridors coupled with inadequate machinery for its management and control even after a few intersections developed and improved by BMC.
- ii) To have the specific details pertaining to problems of intersections we would like to draw attention on following main locations:

#### Bus stand Chauraha

- Unorganised entry and exit to Bus terminal (private).
- No facilities for pedestrians and IPT (Auto Rickshaw).
- High intensity of traffic

#### Royal market Intersection

- High intensity of traffic (over 1500 PCU in peak hour)
- Considerable heavy vehicle movement, no matching geometrics
- Available ROW restricted due to encroachments
- Inappropriate signal phasing
- No pedestrian facilities.

#### Bhopal Talkies Intersection.

- High traffic intensity
- Heavy vehicle turning movements
- No Channelisation, inappropriately designed traffic islands
- Unsafe turning of vehicles at the intersection
- No pedestrian facilities for safe crossing at intersection



**Rang Mahal Intersection**

- o No chanalisation to guide traffic Inadequate and inappropriate traffic signal system
- o No pedestrian facilities
- o High traffic intensity
- o High pedestrian traffic
- o Most accident-prone location in the city

**New market intersection**

- o This five legged intersection carries high intensity of traffic
- o The present intersection geometric does not allow smooth flow of traffic
- o High pedestrian traffic and no pedestrian facilities have resulted in pedestrian vehicle conflict due to which safety of pedestrians is at stake
- o Presently traffic at the intersection is controlled by rotary and the staggerness and acute angles of approaches make the rotary ineffective

**Thana Talayial Intersection**

- o Carries high vehicular traffic and has control of fixed time signal
- o High periodic pedestrian traffic due to presence of Hospital at the intersection and no pedestrian facilities,
- o The approach to Bus stand, Railway station and Old Bhopal City.

**Tab 7.13 Existing CW and ROW**

S N	Name of Corridor / Road	Extg. C/W	Extg. ROW
1	Kamla Park - Polytechnic - Roshanpura - New Market - Board Office - Habibganj Naka - University		
	a) Kamla Park - Polytechnic	4L/F/NC W	20
	B) Polytechnic - Roshanpura	4L/F/NC W	30
	C) Roshanpura - New Market	4L/F/CW	30
	D) New Market - Board Office	6L/F/CW	40
	E) Board Office - Habibganj Naka	4L/NF/C W	60
	F) Habibganj Naka - University	4L/NF/C W	80

2	<b>Roshanpura-Polytechnic - Firdos Park</b>	<b>0.90 Kms</b>	
	Habibganj Naka	1.30 Kms	
	a) Board Office - Subhash Nagar	4L/NF/C W	80
3	b) Subhash Nagar - Khushipura	4L/NF/N CW	80
	Subhash Nagar	1.30 Kms	
	<b>VIP road - Lalghati - Bairagarh (Sant Hirdaram Nagar)</b>		
	a) VIP road - Lalghati	4L/F/CW	25
4	b) Lalghati - Bairagarh	4L/F/CW	80
	Junctions	8 Nos	
	Fly - Over	NIL	
5	<b>University - Misrod - Mandideep</b>		
	a) University - Misrod	4L/NF/C W	80
	b) Misrod - Mandideep	4L/NF/N CW	80
	Junctions	8 Nos	
6	Fly - Over	NIL	
	<b>Board Office - Chetek Bridge - BHEL Main Road - Outer Ring Road</b>		
	a) Board Office - Chetek Bridge	4L/F/CW	80
	b) Chetek Bridge -BHEL - Main Road	4L/NF/C W	80
	c) BHEL - Main Road - Outer Ring Road	1L/NF/N CW	80
	Junctions	13 Nos	
8	Fly - Over	NIL	
	<b>Khushipura (Eastern side of Railway station) - Outer Ring Road</b>	<b>NO Road</b>	<b>40</b>
	a) Jail Road - Old Jail	4L/NF/C W	80
	b) Old Jail - Jahangirabad	4L/NF/N CW	80
	c) Jahangirabad - Lily Talkies	4L/F/NC W	60
	d) Lily Talkies - Thana Talaiya	4L/F/CW	20
	e) Thana Talaiya - Bharat Talkies	3L/F/NC W	20
	e) Alpana Tiraha - Hamidia Rd	4L/F/NC W	30
	Junctions	21 Nos	
	Fly - Over -	1 Nos	
Nadra Bus Stand	0.60 Kms		
8	<b>Jahangirabad -</b>		

	<b>Roshanpura - Jawahar Chauk - Bhadbhada Bridge</b>		
	a) Jahangirabad - Roshanpura	4L/F/NC W	50
	b) Roshanpura - Jawahar Chauk	4L/F/CW	60
	c) Jawahar Chauk - Bhadbhada Bridge	2L/NF/N CW	60
	Junctions	11 Nos	
	Fly - Over / Under Bridge	1 Nos	
	Rang Mahal		
<b>9</b>	Bharat Talkies - Pulbogda - Raisen Rd - Piplani - Ratnagiri - Anand Nagar - Outer Ring Road		
	a) Bharat Talkies - Pulbogda	2L/NF/N CW	30
	b) Pulbogda - Raisen Rd - Piplani - Ratnagiri	4L/NF/C W	40
	c) Ratnagiri - Anand Nagar - Outer Ring Road	4L/F/CW	80
	Junctions	20 Nos	
	Fly - Over / Under Bridge	1 Nos	
<b>10</b>	Ashbaugh Level crossing	<b>0.70 Kms</b>	
	a) New Market - Mata mandir - MANIT	4L/NF/N CW	60
	b) MANIT - Kolar Tiraha - Bittan Market	4L/F/CW	60
	c) Bittan Market - 10 No Market - Habibganj Naka	4L/NF/C W	60
	Junctions	16 Nos	
	Fly - Over / Under Bridge	NIL	
<b>11</b>	<b>Kolar Tiraha - Nayapura</b>	<b>2L/NF/N CW</b>	<b>40</b>
	Junctions	10 Nos	
	Fly - Over / Under Bridge		
<b>Note: * preferred ROW Value in Brackets is absolute minimum ROW</b>			

Source; Integrated Urban Development in Madhya Pradesh, Bhopal ADB

### Network Characteristics and Traffic Flow Variations

The significant network characteristics in the study area are:

#### Right of Way

The average right of way observed in the primary network is 21 m. around 33% of the

network has a right of way more than 30 m signifying possibility of capacity augmentation at various stretches.

#### Carriage Way

The average carriageway width observed in the primary network is 9 meters. Roads with a carriageway width of more than 12 m are Main Roads 1, 2 and 3, BHEL Main Road, VIP Road and few others. It was seen that links falling on a continuous corridor do not have similar carriageway widths thus creating intermittent bottlenecks.

#### Median

The network characteristics of the Study Area show that 83% of the network is without a median. Though around 28% of the network has more than 8 meters wide carriageway widths, only 17% of the network has median. None of the regional roads have divided carriageway configuration.

#### Service Road

The facility of service roads in order to separate the local and the through traffic for an area is existing only with 7% of the network i.e., for 28 km only and they are mostly observed to be non-functioning due to encroachment by informal sectors and parking.

#### Street Lights

Only 55% of the network has the provision of streetlights. Street Lights, where existing are also found to be non-functioning to a large extent.

Bhopal Municipal Corporation is maintaining about 28000 Nos. Street Lighting poles with assistance of MPSEB through their distribution centers having 40-Watt Tube fixtures, 150 Wt. And 250 Wt. Sodium vapour fittings at various main roads, small lane, Residential Colonies, and Limited Nos. of High mast lighting systems at Intersection, squares of main roads of city. The annual expenditure on street light network is increasing annually.

Bhopal Municipal has incurred expenses of about Rs. 4.0 Cores in 2004 – 2005.

Within the Municipal Area, New Bhopal i.e. areas of TT Nagar and Arera Colony has the maximum length (61-Km) of the network. The density of the network per sq. km (3.24 Km/ Sq. Km) area is high in Old Bhopal followed by South and South West Bhopal (1.70 Km./ Sq. Km). Areas outside the Municipal Corporation have the least road density of 0.31 Sq. Km.

In spite of a dense road network, the study area has been experiencing acute traffic congestion and its associated problems. Some of the outstanding problems relating to the road network are:

- I. Absence of functional hierarchy of road network as a result of which there is a inter-mixing of local traffic with long distance traffic from Sagar road, Obedullaganj road etc. apart from overloading of some of the major roads like Hamedia Road joining bus stand to railway station, Lalghati to royal market to Kamla park Road, chhola road etc.
- II. Absence of corridor development without which there is lot of congestion, inter mixing of traffic, slow movement, poor road safety, and delays.
- III. Absence of enough road lengths of various Right of ways in a hierarchy constituting of the arterial, sub arterial, collector and access roads.
- IV. Narrow road network with restricted capacity particularly in the central area results in congestion and loss of productivity.
- V. Absence of development controls along the major arterial routes results in proliferation of commercial activities which is affecting the level of service of the travel corridor
- VI. Absence of access control measures particularly along arterial roads resulting in poor speeds and safety problems.

- VII. Absence of control on encroachment of activities along roads, particularly in the central area, resulting in loss of capacity for traffic and pedestrian movement.

### 7.5.2 Parking

It is an established fact that the private motor vehicles in urban areas are found moving on the network for only twenty percent of the time and for the remaining eighty percent time they are parked either at residences or at work places or in commercial areas. The parking commercial areas becomes critical because heavy concentration of activities and limited space available for parking. At present there are mainly three places where parking problem is growing rapidly. These are Old Bhopal mainly along Bharat Talkies Road, Hamidia Road and Sultania Road; New Market and M. P. Nagar. In addition to these, there are number of small commercial centres where the situation is becoming critical such as 10 No. Market, Bitton Market, Bairagarh etc.

The present plan gives parking management schemes for Old Bhopal, New Market, MP Nagar, 10 No. Market and Bitton market. These recommendations are based on the estimated parking demand and physical inventory of the area to identify off-street and on-street parking locations. Parking management Plan is supplemented with internal traffic circulation pattern.

#### Old Bhopal

Low parking supply and heavy parking demand conditions characterizes the central area. Present parking management plan has been evolved based on existing parking demand, availability of parking supply and proposed traffic circulation pattern.

#### Parking Issues

Parking is a serious issue in the study area and its management needs topmost

priority. Some of the significant problems associated with parking are:

- i) Parking demand is high in central area primarily due to concentrated commercial activities
- ii) There is an absence of adequate off-street parking facilities as a result of which parkers are forced to park their vehicles on the streets
- iii) On-street parking phenomena reduce the effective road width available for movement of traffic. The parking intensity in new market and at Bus stand area

There is an absence of a comprehensive parking policy for the study area, involving components such as organisation of circulation system and on-street parking, identification of possible off-street parking sites, intensive utilisation of existing parking areas including air rights exploitation, levy of parking fee, municipalisation of parking spaces, parking norms & standards and travel demand management measures.

### 7.5.3 Public Transport

#### Airport

Bhopal Airport is situated in the northwest side of the city in Bairagarh. It has been placed strategically on Narsingarh Road, presumably to ensure availability of uninterrupted air space in low-density zones.

The terminal has two Runways. The main runway is 12/30(6700 ft. in length) from where all the flights take off and land except by Flying Club, which uses Runway 06/24 (6000 ft. in length). The passenger handling capacity has been designed for accommodating a peak hour demand of 130 arriving and 130 departing passengers. Evidently, the facilities such as for seating, departure and arrival hall, waiting space and parking space are sufficient.

#### Railways

There are two main rail terminals in the study area. The main Bhopal Railway station situated in the old Bhopal area has 71 through and 11 originating or destining trains daily. Situated on the main railway network, it is well connected with Delhi, Mumbai, Pune, Hyderabad, Chennai, Bangalore and Kerela. Another broad-gauge line connects Bhopal with Indore, Ahmedabad, Kandla and other Industrial and trading centers in western India.

Bhopal Railway Station has a total area of 56,521 sq. m. The total area under circulation is 9600 sq. m., which is 17% of total area. The station has two foot over bridges (FOB) and sufficient parking space for private vehicles. The area under parking is 4204-sq. m. (7.5% of the total area). Besides this, there is provision of pre-paid auto stand on the side of Platform No. 1. Regarding the facilities and amenities provided at the terminal, the total area under waiting hall is not up to the standards, (total existing area being 772 sq m as against the requirement of 1464sq.m.). The station has two main accesses, one from Alpana Tiraha towards Platform no 4 and other from Bharat talkies fly over towards Platform no 1. However due to availability of public transport at Alpana Tiraha, most of the passengers are entering the terminal from Platform No 4 entrance, thereby congesting the road section between Alpana Tiraha and station entry with heavy pedestrian movements.

Habibganj Railway Station is a newly developed railway station on the south axis of the town. It is located adjacent to NH-12 in between Board office Chauraha and Habibganj Naka. The station is adequately connected to all major corridors with wider Arterial and Sub-Arterial roads. The terminal at present accounts for fifteen through trains and one originating and destining train daily. However, it has great potential to grow as main terminal for Bhopal considering the fast development on the southern direction. With the growth of commuter traffic, which is more rail dependent, this station is expected to gain further significance in the coming years.

Habibganj Railway station has been developed on an area of 75,591-sq. m. The terminal serves only passengers and no goods are handled over here. The total area under circulation is 5000-sq. m., which is 6.6 % of the total area. For private vehicle parking, a total of 1424 sq m. has been provided. Besides a pre-paid auto service is also available. The terminal has one foot over bridge (FOB), which is under-utilised for the majority portion of a day, at present. Amongst the available facilities, the waiting hall is just 49-sq. m. as against the requirement of 314 sq m of area. There is no provision of waiting rooms. There is mini-bus service outside the terminal complex, on the NH-12 route, serving most of the parts of the city.

The present Railway Station on account of its location & associated activities has become an area of congestion. All the roads approaching the railway station are encroached by shopkeepers, hawkers and parked vehicles. Some of the major problems are:

- Unorganised parking at gate at platform no. 6.
- Private and Mini local Bus Stand and Parking of these buses on roads creates traffic jam.
- Improper circulation facilities with the station complex
- Lack of interchange facilities

### **Bus**

The main inter city bus terminal is the Nadra Bus Terminal which is located on Cholla road. Most of the routes leading to this terminal witness high-density land use, which is primarily commercial and public/semi-public by type, inviting high volume of local traffic as well. The use of these roads by regional buses further congests the roads leading to traffic related problems on these stretches, which have little scope of widening.

The Nadra Bus Terminal has a total area of 3,758 Sq m Out of the total area, 956 sq m. i.e. 25% of its area is used for circulation of

buses and 1807 sq. m. (48%) of area is used for the parking of buses. The remaining area of 460 sq m (8%) is under waiting halls, shelters and other facilities.

Besides Nadra Bus Terminal, there is a MPSRTC terminal on Main Road No.2 and a terminal for private buses near Jawahar Chowk. These terminals are serving very small percentage of total travel demand of passengers.

Some of the major problems associated with the Bus Terminals are:

- Roads leading to Bus Terminals like Narda Bus Stand are narrow and encroached by shopkeepers and parked vehicles.
- Road side encroachments exists on approach roads
- Inadequate facilities within the Bus Terminals in terms of bays, idle parking administrative area, boarding and alighting platforms and circulation
- Total lack of terminal planning principles and design criteria in the development and operation of terminal complexes shows the poorly designed and operated bus terminal (Narda Private Bus Stand side).

### **7.5.4 Access to Public Transport**

To cater for the intra-city travel demand the public transport comprises of minibuses and tempos. In terms of capacity, road space utilization and environmental degradation the tempos, mainly operating from the urban fringes to city core, have been found to be quite insufficient. Moreover the quality of service provided by minibuses and tempos is poor with no arrival / departure schedules and request stops anywhere on the route. Even with this service quality, the minibuses and tempos cater nearly 31% and 12% of the intra-city travel demands by mechanical modes.

Both minibuses and tempos do not have any organized terminal facilities. The intercity bus terminal at Narda in the old city acts as a major node for the inter-city



operation. Other terminals in the city are MPRTC terminal on main road no – 2 and private bus terminal at Jawhar chowk; both these terminals cater to a very small share of passenger demands. Narda terminal on Cholla Road with area of 3758 sq. mt. Handle the maximum passenger traffic. Besides the inadequacy of space, lack of any development control and strict enforcement measures make the situation within and outside the terminal chaotic.

The route characteristics of the existing Public Transportation System exhibit the following salient features:

- The average number of stops on any route is around 23. Out of the total stops around one-fourth are request stops. The above phenomenon leads to one stop after every two minutes.
- The average journey time on the routes is 1hr and 25 minutes. The journey time ranges from 1 hr 5 minuets to 2 hr 15 minutes. The average running time on routes is only 45 minutes. It ranges from 37 to 69 minutes. The average delay at the stops thus works out to be around 37 minutes.
- The number of passengers per trip on a route is around 46. The average number of passengers on board at a time is 14. The average number of passengers boarding and alighting at a stop is approximately 3.
- The average number of passengers observed to be standing on the stops is 14.
- The average length of a route in the city is around 27 Km.
- Start and end points of the routes are mainly concentrated towards western and southern side.
- All routes are observed to be passing through the old city area, signifying the same to be the predominant commuter base and interchange point.
- The average journey speed of the route is 19kmph where as the running speed is 35kmph.
- Route 2 (Bharat Nagar to Gandhi Nagar) (2hr 17min) followed by Route 3

(Bharat Nagar to Nariyal Kheda) (1hr 46 min) has the maximum journey time.

- Route 1 (Trilinga to Bhanpur) was observed to have the maximum delay at stops (55%) followed by the Route 11 (Bharat Nagar to Gandhi Nagar) (51%) at both the scheduled and the request stops.
- The maximum number of commuters is observed on Route 2 and routes 1 were 73 and 60 respectively.
- The maximum numbers of request stops were observed on Route 2 (Bharat Nagar to Gandhi Nagar).
- The maximum route length is of Route 2 (Bharat Nagar to Gandhi Nagar) (38 Km) followed by Route 1 (Trilinga to Bhanpur) (37Km).

## 7.5.5 Goods Transport

### Freight Terminals

The goods terminals/yards in the city are Krishi Upaj Mandi Samiti at Laxmiganj, Azad Market in the Central area, Bairagarh goods terminal, Gandhi Nagar goods terminal and Kaji-Camp at Berasia road. Besides this the goods transaction take place at Nishantpura Railway yard, Bhopal Railway Station and Mandideep Railway yard. The transaction is mainly by Tractor-Trolley and Trucks. The goods arrival (and the traffic to these Mandis) is not uniform for whole year but peaks in the months of March to May and October to December considered to be the 'Season Months'.

The Krishi Upaj Mandi Samiti is located in Laxmiganj on the stretch between Pul Bogda and Bharat Talkies, spreading over an area of 17.91 acres and experiences a heavy congestion both inside and around the Mandi during the peak frequency hours. The location of the mandi itself is causing problems in its own operations as well as traffic movement; the time taken by trolleys and trucks from Karond Chauraha to mandis is substantially high because of the congested roads in the city, thereby causing impedance to other vehicles on the roads as well.

In the Azad market, Bairagarh and Gandhi Nagar Mandi spaces as such are not organized with transactions taking place along the streets only.

However, being aware of the problem of space and location of the existing mandis, development of new market yard of 130 acres land near the village Karod Kala is under progress, out of which development of 27 acres has already been done.

Besides these yards, goods transactions are taking place at railway yards also which includes yards at Nishantpura, Bhopal Main Station and Mandideep.

More emphasis needs to be stressed towards planning of freight movement in the city. There is no organized truck terminal facility in the Study Area. Generally within the study area trucks are parked in Bairagarh, Gandhi Nagar, Khaji Khera, Subhash Nagar, Nishatpura besides the old city areas. The principal function of truck terminals is to provide convenient transshipment of goods between heavy commercial vehicles used for regional movement and light commercial vehicles or such other modes of transport used for local distribution. Providing truck terminals becomes necessary to restraint the trucks from moving in the urban areas. Their locations should therefore be away from high-density core areas and should be located along the bypasses of the city.

## 7.6. Environment

One of the critical and most immediate problems faced by rapidly growing cities in developing countries is the health impact of urban environmental pollution. The reasons being air pollution inadequate water, sanitation, drainage, solid waste services and urban and industrial waste management.

Bhopal Attracted world attention as the site of Bhopal Gas Tragedy, possibly the worlds worst environmental and industrial disaster. Today after two decades its should be possible to exploit the mindshare it has of

international community and re-position it as a global model of best environmental practice and symbol of 21<sup>st</sup> century environmental conciousness.

Bhopal City is is been projected as a “**Global Environment City**” due to its rich natural legacy. There is need for major investments in environmental upgradation of the city by way of preservation of lakes Development of Green Areas and Heritage Sites.

### 7.6.1 Air

Bhopal is the second largest city in the state of Madhya Pradesh with a population in 2001 of 14, 33,875. Upon re-organization of the states in 1956, Bhopal became the capital of Madhya Pradesh, which was the starting point of the phenomenal change in its demographic trend. During 1951-61, the population growth was nearly 120%. Thereafter, the population continued to grow rapidly before declining to 35% during 1991-2001.

#### Air Quality

Along with the urban development especially during the last two-decade there is phenomenal increase in traffic load in the city, which is one of the major causes of pollution in the city. Consequently, MPPCB started conducting ambient levels w.r.t. Suspended Particulate Matter (SPM), Sulphur Dioxide (SO<sub>2</sub>) and Nitrogen Oxides (NO<sub>2</sub>) at various locations in the city. The air quality status of Bhopal as per assessment done during 1990-95 is given in **Tab 7.14** below.

**Tab 7.14 Air Quality Status**

Year	Sulphur dioxide (ug/cum)		
	Min.	Ave.	Max.
1990	BDL	16.5	49.3
1991	3.5	9.8	33.1
1992	4.3	10.1	25.1
1993	2.2	8.5	28.7

1994	2.0	10.7	23.8
1995	6.7	12.0	28.2
Year	Nitrogen oxides (ug/cum)		
	Min.	Ave.	Max.
1990	4.5	25.2	69.6
1991	2.8	7.8	67.1
1992	5.9	13.6	56.8
1993	1.5	10.9	21.8
1994	2.3	15.1	27.3
1995	11.0	19.2	37.3
Year	Suspended Particulate Matter (ug/cum)		
	Min.	Ave.	Max.
1990	52	280.5	1455
1991	57	213.3	1325
1992	31	260.0	954
1993	1	227.0	923
1994	NA	NA	NA
1995	48.0	207.0	498
Note: Data is of 8 hour average BDL: Below detection limit NA: Not available			
*During this period average values of SPM, SO <sub>2</sub> and NO <sub>2</sub> were found to be within the prescribed standards (Table). However, the maximum levels of SPM were found to be higher than the standard.			

Source: The Citizens Fifth Report (part-II: Statistically Data Base. Center for Science and Environment. Edited by Anil Agrawal)

Tab 7.15 Air Quality in Different Uses

Area	Category	Concentration of pollutants (ug/cum)			
		SPM	SO <sub>2</sub>	NO <sub>2</sub>	CO
A	Industrial & Mixed use	500	120	120	5000
B	Residential & Rural	200	80	80	2000
C	Sensitive	100	30	30	1000

Source: The Citizens Fifth Report (part-II: Statistically Data Base. Center for Science and Environment. Edited by Anil Agrawal)

The above limits should not exceed 95% of the time.

A study on traffic density and the diurnal variation in ambient air quality of Bhopal revealed that traffic density was the highest near Bharat Talkies so as the pollution level. The diurnal variations of SPM were

found to be corresponding with the traffic volume over the lapse of time during the day. The four hourly average SPM levels during 9-12 hours, 13-17 hours and 17-21 hours were 2200, 2045 and 2086 ug/cum, respectively. NO<sub>x</sub> levels also showed a diurnal variation, characteristic of tropical countries. The levels of NO<sub>x</sub> could be detected only after the noon, which increased steadily during afternoon and became a plateau in the evening. The SO<sub>2</sub> levels were generally low. Though the ambient levels of Carbon Mono-oxide could not be detected, a large number of vehicles emitting greater than 5% of Carbon Mono-oxide and higher than 7000 ppm of hydrocarbons were detected, the levels being much higher than the standards.

The constant increase of traffic load in the city calls for taking appropriate measures for constant monitoring of emission from vehicles and penal action against polluting vehicles to reduce automobile pollution in the city which otherwise may rise.

### 7.6.2 Water:

With the process of urbanization the settlements on waterfront grew as urban centers these water bodies turn into toxic streams and store. Rivers, which passes through the city of Bhopal, has virtually turned into Nallah Carrying the entire untreated domestic and industrial wastewater of Bhopal City. The water component in the city can be seen as;

- **Ground Water Quality**
- **Surface Water**

#### Ground Water Quality

The ground water quality in the close proximity of the sewage fed drains has also been assessed. The results indicate that ground water aquifer is charge with chemicals and microbial contaminants.

Although ground water fetched through bore-wells and hand pumps is being used as potable water without any treatment. But ground water charged with sewage is polluted and found unhealthy to the human consumption. The open drains not only recedes untreated sewage but also a good place of solid waste dumping which increases BOD and COD levels after decomposition of bio degradable solid waste.

The excess of cattle, pets and other domestic animals right up to drains make the situation both unhygienic. Normally, sewage is free from pathogenic bacteria, but decomposition of solid waste within the drains provides the opportunity to flourish pathogens together with non-pathogenic organisms. The presence of nematodes and helminthes group of parasitic animals may not be ignored as fecal matter and prey for these animals, which is available in the system. The fractured sand stone, rocks provides cracked and crevices to tripled down sewage flow in the way in the deeper ground strata. The anaerobic bacteria find favourable condition into flourish in the underground aquifer. The presence of fecal coli-from in underground water is clear indication of sewage contamination. The change in chemical composition in ground water such as nitrate, phosphate, sulphates also indicate the external loading of in ground water, which is mainly caused due to percolation of surface water. During rainy season, the strata is fully charged and water pressure is also increased which accelerate percolation and thereby contamination.

#### **Environmental Problems associated with the different water resources:**

- ❑ Ground Water Contamination
- ❑ Chemical pollution
- ❑ Microbial Contamination
- ❑ Affecting Human Health due to Waterborne Diseases

#### **Surface Water Quality**

Bhopal is embedded with 18 water bodies of diverse sizes, located in and around the city. However people are more familiar with only 5-6 water bodies because of their proximity to the city dwellers. Some irrigation reservoirs such as Hathaikher, Kaliasote, Kerwa and Laharpur were earlier located in the outskirts of city but have now become an integral part of the city due to expansion of city in all the directions. With rapid urbanization and consequent changes in the demographic structure especially during second half of last century all these water bodies have become subjected to various environmental problems. This resulted in deterioration of water quality through inflow of sewage, solid waste dumping, flourishing growth of invasive aquatic plants and depletion of bio-diversity and other anthropogenic activities. The historical pond of Siddiqui Hussain has become abandoned due to siltation and excessive growth of terrestrial and aquatic plants. A part of this pond has been illegally refilled for construction of residential houses. There are four abandoned stone quarries in the out skirts of the city near Neelbad and Ayodhya nagar, which has been onverted in to small ponds. These ponds receive spring water and maintaining water level round the year. Demkheda village pond is being used by the villagers/residents for water supply, Nistar and other secondary purposes besides recreational use.

#### **Upper Lake**

The Upper Lake came into existence on construction of an earthen dam across the River Kolans at the location of present day Kamla Park, by Raja Bhoj in the 11th Century. The catchments of upper lake are extended in 361-km<sup>2</sup> areas, while water spread area is restricted to 31 km<sup>2</sup>. The upper lake remained the only major source of potable water till the water augmentation scheme of Kolar came into existence. Still Upper Lake water is being supplied as potable water to the 40% population of the city. Till 1947 the water quality of the Upper Lake remained so good that potable water was supplied without any treatment.

However, the developmental activities and expansion of city exerted anthropogenic pressure in the last three-decades that resulted in water quality deterioration, which has been rightly attended by Bhoj Wetland Project.

**Lower Lake**

The Lower Lake was created after construction of an earthen Dam known as Pul Pukhta by Nawab Chhote Khan, the Minister of Nawab Hayath Mohammad Khan in 1794. This lake is situated in the heart of the city and almost entire catchments are occupied by human settlements. Compared to the Upper Lake, it has a small catchments area of 9.60 km<sup>2</sup> and submergence area of 1.29 km<sup>2</sup>. Although Lower Lake water was never used as potable water but water quality of the lake remained suitable for the secondary use. The increasing anthropogenic pressure and inflow of untreated sewage in the lake brought the lake water quality to highly eutrophic condition.

The conservation and management of these two lakes has been done under the JBIC, Japan funded “Lake Bhopal Conservation and Management Project” popularly known as Bhoj Wetland Project. This has not only increased water storage capacity of the lake but also recovered the past glory of the lake.

**Kolar Dam**

After Upper Lake, it is one of the important water resources for the potable water supply to the people of Bhopal. This dam is located in Sehore District 32 km away from Bhopal and contributes about 47-50% of the total potable water supply for the city dwellers. This reservoir is constructed during the year 1991 across the River Kolar, a tributary of the River Betwa, which has water-spread area of 462.20 km<sup>2</sup> and large catchments to support water inflow in the reservoir. Initially purpose of the constructing reservoir was to provide water for irrigation to the farmers of the

downstream but looking after potable water demand of the Bhopal, the reservoir is supporting to water augmentation scheme for the Bhopal. Besides providing potable water, this reservoir is discharging water for irrigation for which it was initially aimed. The reservoir is also an important source of fish production.

Since this reservoir is located away from human habitation, there is no direct impact of pollution but siltation due to soil erosion in the catchments area need to be controlled. Although part of the catchments of the reservoir of trees, a significant portion of the catchments is prone soil erosion.

**Pollution of Inland water Resources**

- ❑ Water Quality Deterioration
- ❑ Nutrient Loading and Eutrophication
- ❑ Excessive Growth of macrophytic vegetation
- ❑ Depletion of fisheries
- ❑ Siltation
- ❑ Fowl odour
- ❑ Loss of aquatic biodiversity

**Ambient Quality Deterioration**

- ❑ Carbonization of atmospheric air
- ❑ Spreading of diseases
- ❑ Fowl odour
- ❑ Release of obnoxious gases
- ❑ Emission of green house gases

Tab 7.16 Surface Water Bodies in and around Bhopal City				
S N	Name of water body	Spread Area (in ha)	Present Use	Ecological Status
1	Upper lake	3100	Water supply and recreation	Mesotrophic and part of the lake is Eutrophic
2	Lower lake	129	Raw water supply recreation	Advance stage of Eutrophic



3	Shahpur a lake	96	Recreation	Advance stage of Eutrophic
4	Motia Tank	1.89	Recreation	Advance stage of Eutrophic
5	Siddiqui Hussain Tank	1.0	Recreation	Bog lake
6	Munshi Hussain Khan Tank	1.2	Recreation	Eutrophic
7	Lendiya Pond	1.5	Recreation	Advance stage of Eutrophic
8	Sarangani Lake	4.2	Recreation	Advance stage of Eutrophic
9	Kaliasote Reservoir	126	Irrigation	Mesotrophic
10	Laharpur Reservoir	350	Irrigation	Advance stage of Eutrophic
11	Hataikhe da Reservoir	113	Irrigation	Mesotrophic
12	Halali Reservoir	1625	Irrigation	Mesotrophic
13	Kerwa Reservoir	524	Irrigation	Mesotrophic
14	Kolar Reservoir	2850	Potable water supply & Irrigation	Mesotrophic
15	Char Imli Pond	1.2	Recreation	Eutrophic
16	Ayodhya Nagar Abandon stone Quarry ponds (4Nos.)	6.0	Recreation	Eutrophic
17	Damkheda village pond	2.4	Potable water Recreation	Mesotrophic
18	Neelbad Abandon Stone Quarry Pond	4.5	Recreation	Mesotrophic

Source; Bhopal Development Plan, 2005.

### 7.6.3 Green Cover

Bhopal city nestles in a hilly terrain, bodies that slope towards north and southeast and 18 surface water bodies. Hillocks of different altitudes are situated along the southwest and northwest portion of the city.

Out of the Total Planning Area of 60106 Ha, 10400 Ha is been already developed till 2005. The lakes and water bodies share around 3800 Ha of Land out of the present planning area, which is almost as close as 25% of the developed area. There are 18 water bodies in and around Bhopal includes the two large lakes Upper and Lower lake in the east. Large area is covered under hillranges with ridges and valleys.

All slopes of more than 8 degree and above needs to be prohibited for any construction or development on such slopes. They need to be extensively planted to stop soil erosion.

The recreational use, which was envisaged in 1994-2005 plans, was of the order of 17 percent of the total purposed land for city development. From the study of the recreational development under the heading lake front development and city parks. It is evaluated that lakefront and city park development is of the order of 50 percent of the total proposed area. Areas, which could not be developed as city parks, are near Lalghati junction, near Aish Bagh Stadium, opposite to Vidhan Sabha, adjacent to western Side of Regional College, western [slope of MACT hillock and area around the PHE treatment unit in PU4 near Sai-Baba Mandir.

The remarkable topography of the city provides enchanting and panoramic views of the city and of natural scenic beauty. There are immense possibilities for landscaping and water front Development for recreation.

## 7.7. CONCLUSIONS

### 7.7.1 Water Supply

- With present water sources city manages to produce only 240 MLD of water with a meager 20% of losses it should theoretically give 135LPCD supply but with lack of efficiency in the production at source, large amount (64%) of Non Revenue Water (NRW) and only 50% storage capacity available than demand has made the actual water supply of 88 LPCD
- Only 67% of the Population has access to piped water supply that too for short period of 2-3 hrs in the day hence extension of the piped distribution system is a need.
- Rest of the population is dependent upon the Community Stand posts but the number of beneficiaries per community stand post (5000 Nos.) is 95, which is double the EIUS recommendations.
- There is substantial waste of water in stand posts, supply network and about 25,000 illegal connections.
- Water auditing is one of the major issue meters are not installed neither at the source to know the actual water production nor at the consumer end to evaluate the consumption.
- The Narmada Water Supply Scheme is under implementation is creation of new source to meet the future water demand. But it doesn't take into consideration the distribution network; hence a major investment in the distribution network is need.

### 7.7.2 Sewerage

- The Bhopal City due to its terrain constraint is very difficult to be serviced by Gravity Sewer Network due to very high pumping costs.

- Only 28-30% of the households are connected to sewer systems rest of all the households discharge their sanitary waste in to Open Drains.
- Rest of major Amount Sewage generated is disposed off in Septic Tanks and ultimately discharged in Nallahs. While the large no of Urban poor opts for open defecation leading to environmental degradation.
- Only 39MLD out of 118MLD, sewage generated is collected through 30% of population connected to Sewer System,
- As only 39MLD sewage is been collected and treated in total 80 MLD capacities STP available making it under utilized due to inadequate sewage network
- The majority of existing sewage networks old and dilapidated.

### 7.7.3 Solid Waste Management

- Poor Collection efficiency as; only 60% of the solid waste generated is collected.
  - Due to poor primary collection
  - Lack of Synchronization of Collection, storage and transportation of Solid Waste.
- No waste segregation done. Currently no waste segregation is done by BMC and only 20% of wastes are processed (Composting process).
- Traditional method of treatment of dumping at landfill sites is used.
- There is no sufficient Biomedical waste Disposal Facility.

### 7.7.4 Storm Water Drainage.

- The different Nallahs and Rivers in the different areas in the city carry the Storm water in the Bhopal City.

- ❑ There is no place, which faces severe inundation in the rains.
- ❑ But many roads in the city lack in the storm water drains.

### 7.7.5 Transportation

- ❑ The Urban area has many missing links, which affect the mobility of the city in terms of circulation and traffic flow.
- ❑ Narrow road network with restricted capacity particularly in the central area results in congestion and loss of productivity. Many of the roads though have large right of way their efficiency is not fully utilized due to incomplete road sections.
  - Only 28% of the network has more than 8m carriage way
  - It was seen that links falling on a continuous corridor do not have similar carriageway widths thus creating intermittent bottlenecks.
  - 83% of the road network doesn't have medians, which affect the flow.
  - Only 7% of the network has the facility of service roads to segregate through traffic and local traffic.
  - Only 55% of the network has facility of Street lights
  - Large number of roads with large traffic flow lack in the facilities such as footpaths and signages, which is a threat to road safety.
- ❑ The mobility of the traffic is also retarded due to the numerous junctions with high traffic intensity, Heavy vehicle turning movements and lack of channelisation of the traffic.

- ❑ Parking is a major issue in the city of Bhopal because of high demand of parking due to concentrated commercial activities in the central area
  - On street parking reduces the effective road width available for the movement of traffic
- ❑ Regional transport network has the bus terminals in the densely developed areas causing traffic congestion. The transport terminals lack in the facilities.
- ❑ There is no organized truck terminal facility in the Study Area. Generally within the study area trucks are parked in Bairagarh, Gandhi Nagar, Khaji Khera, Subhash Nagar, Nishatpura besides the old city areas.

### 7.7.6 Air

- ❑ Air quality of Bhopal revealed that traffic density was the highest near Bharat Talkies so as the pollution level.
- ❑ The constant increase of traffic load in the city calls for taking appropriate measures for constant monitoring of emission from vehicles and penal action against polluting vehicles to reduce automobile pollution in the city which otherwise may rise.

### 7.7.7 Water

- ❑ The ground water near the sewage fed drains and open drains carrying sewage is found to be contaminated by fecal coliform, which is not healthy for consumption.
- ❑ Dumping of Solid Waste in the Open drains increases the BOD and COD of the water as well as makes it breeding ground for pathogenic bacteria's further leading to contamination of ground water.
- ❑ Solid waste dumping in the Surface water bodies leads to growth of invasive aquatic plant, which harms to the biodiversity.

- Ponds are been abandoned due to siltation and growth of terrestrial and aquatic plants.
- The development activity and expansion of the city leading to discharge of waste water in the upper and lower lakes, which is a serious threat to these water bodies.

Chapter

8

# Housing And Slums

Housing makes significant visual impact on the overall appearance of the city and its urban form. Housing configuration can make or mar the total city image and its social and cultural life.

## 8.1. Housing Situation in Bhopal

### 8.1.1. Housing Shortage

Housing shortage at present it estimated as about 1.2 lakh units taking into consideration the poorly sheltered informal sector in jhuggies, squatter settlements, families sharing accommodation and old dilapidated houses requiring replacement during the plan period up to 2012. Adding additional housing requirement to the tune of 3.2 lakh units to the present housing back log, efforts shall have to be mobilized to generate the housing stock as under:-

**Tab 8.1 Housing Shortages and Requirement**

Year	Housing shortage (Dwelling Units)	Additional Housing need (DU's)	Overall (DU's)
1	2	3	4
1995	1,20,000	50,000	1,70,000
2001	-	1,20,000	1,20,000
2005	-	1,50,000	1,50,000
<b>Total</b>	<b>1,20,000</b>	<b>3,20,000</b>	<b>4,40,000</b>

**Note:** The population of Bhopal Planning area, as per 1991 census was 10.62 lakhs.

*Source; Bhopal Development Plan 2005*

The number of households existing as per 1991 census was 1,19,755. The average family size works out to 5.45 persons per household. The number of house holds,

distributed by number of room, as per census 1991 is as given below:-

- One Room 31.01%
- Two Room 31.80%
- Three Room 16.73%
- Four Room 7.89%
- Five Room 2.69%
- Six Room and above 2.45%

### 8.1.2. Household Profile

According to the G.O.I. official definition of income groups<sup>1</sup>, Bhopal has 13.2% HIG households, 26.7% MIG households, 34.7% LIG households and 25.3% EWS households, it has 15.2 BPL households.

The average households size in Bhopal as indicated by the households survey was 5.8. The HIG households recorded the highest average households size at 6.5 followed by the MIG households (5.9) LIG (5.9) and the EWS households (5.2). The poorest families have larger households. The average household size of the BPL households was 7.2, whilst the core poor had the highest household size at 8.1 with the intermediate poor at 7.2 and the transitional poor at 6.5.

The average number of adult (aged 18 and above) among all households surveyed is 3.9 and that of children (aged less than 18) is 1.9. The number of dependent children relative to adults is highest amongst the poor households. The average number of adults in HIG households was recorded to the highest at 4.9 and lowest for EWS households (2.9). The average number of children was found to be highest among the EWS households (2.2) and lowest among the HIG households (1.6). Among the poor households, the transitional poor had the highest number of adults (4.1) while the core poor households had the highest number of children (4.1).

The 2001 Census has recorded that the city has relatively low literacy rate at 69% including a rate of 74% literacy amongst males but only 63% amongst females.



The pattern, which has emerged since the establishment of the State Capital, includes around 20% ownership housing and 80% Govt. housing. Ownership housing is mainly seen in terms of plotted development and more recently in terms of residential flats.

More than 65% of all households surveyed stated that they have been living in the same neighborhood for the last 10 years. A similar pattern has also been observed among the poor households wherein more than 80% of the core poor and intermediate households have not moved out from their present neighborhood in the last 10 years. The proportion of households (18%) who have moved within the last 5-year had moved from another part of the same city. All of the core poor households who had moved had moved from another part of Bhopal.

The survey data revealed a higher proportion of low income families who reported owning their plot of land; that is 39.2% of HIG, 43.2% of MIG, 58.5% of LIG and 80.3% of the EWS households owned their plot of land.

It is evident that amongst the HIG / MIG households around 25% had a freehold title. It was observed that nearly 25% of LIG and 35% of EWS households had been given 'pattas' by the government (i.e.17.5% of total population).

An average of 21.4% of households revealed that they had no legal right to where they lived. This ranged from 10% of HIG households to 34% of EWS households. 42.5% households lived in rented accommodation. Significantly, 78.7% of the EWS households and 82.5% of BPL households owned their houses.

Informal sector housing is witnessed mostly in the shape of jhuggi settlements involving more than 1,25,000 families some of them occupying strategic locations and critical drainage basin.

**Tab 8.2 Housing Shortages and Requirement**

Household Profile	
Av HH Size	5.79
Mean HH Income (Rs/mth)	6065
BPL Pop (% HH)	15.2
No legal Tenure (%HH)	21.4
No in-house water (%HH)	33.0
No piped water (%HH)	4.3
No private toilet (%HH)	18.6
Flooding problem (%HH)	41.2
No paved road (%HH)	22.3
Public transport > 1 km	11.1
Source; Integrated Urban Development in Madhya Pradesh for Bhopal, ADB	

## 8.2. Urban Poverty

- a.) **Relative poverty:** Relative poverty is a poverty measure based on a poor standard of living or a low income relative to the rest of society.
- b.) **Absolute Poverty:** Absolute poverty is a level of poverty at which certain minimum standards - for example nutrition, health & shelter cannot be met. The term "Absolute poverty" is perhaps slightly misleading, since there is no "absolute" standard that defines absolute poverty: the level of income necessary for these minimum standards is often referred to as the **poverty line** which various institutions and individuals define differently.
- c.) **Housing Poverty:** Individuals and households who lack safe, secure and healthy living environment with basic infrastructure such as piped water and adequate provision of sewerage, sanitation, drainage and removal of household waste.

Households are considered poor when the resources that they command are insufficient, to enable them to consume sufficient goods and services for reasonable minimum level of welfare.

### 8.2.1 Defining Poverty Line

The first concept of Poverty Line came in 1962. Poverty Line is not constant; it varies from country to country and time to time. Goods and Services i.e. consumption, whether purchased, gifts or self-produced, is converted in monetary terms to define the Poverty Line. The nutritional intake requirement is considered as constant i.e. 2250 calories / day (average). The average median income in squatters is considered as Rs. 600 / capita / month.

### 8.2.2. Indicators of Poverty

Besides monetary income, other aspects related to the living conditions, are important to include in defining poverty. There are 7 non-economic parameters to assess poverty:

- 1) *Roof*
- 2) *Floor*
- 3) *Water*
- 4) *Sanitation*
- 5) *Education level*
- 6) *Type of employment*
- 7) *Status of children in life*

Weightage & scores are assigned to each of these parameters to assess the level of poverty. Higher the score more is the deprivation. Out of all these parameters 4 are directly related to Housing.

### 8.3. Slums in Bhopal

It is well known that a large percentage of population in any Indian city belongs to the lowest economic strata i.e. economically weaker section. Majority of this urban poor Population belongs to people who have migrated from the nearby rural areas in search of work, employment. Due to the dwindling land resources and increase in the population the land holding of any family in the rural region is no longer able to support the entire family. This encourages the exodus of rural population

to the nearby city. Most poor immigrants to the city can find access to shelter only by squatting on public or private land. These squatters over the period of time continue to come and settle on this land thus creating a neighborhood, more generally called as a SLUM.

But in the format of Housing development, the above vital factors for creating harmonious symbiotic and self sustainable communities at optimal location are generally ignored and in fact in many cases no provision of habitat is made for such population in the planning of housing development. This deficiency in the formal planning leads to development of **Slums and Squatter Settlements** to assimilate such population.

The concept of slums and its definition vary from country to country depending upon the socioeconomic conditions of each society. The term slum (squatter) describes a wide range of low-income settlements or poor living conditions. Slum (Squatter) at its simplest is a heavily populated area characterized by substandard housing and squatter.

**Tab 8.3 Slum Population over Period of Time**

YEAR	CITY POP	SLUM POP	% SLUM	SLUM GR %
1,961	222,948	9000		
1,971	384,859	19,050	4.9	111.7
1,981	671,018	41,763	6.2	119.2
1,991	1,062,771	250,000	23.5	498.6
2,001	1,564,351	480,000	30.7	92

Source: Census of India 1971 to 1991-Town Directory of Madhya Pradesh & 1975 Bhopal Development Plan.

Population of Bhopal shows similar characteristics of growth as the district. As per census figures, the population declined in the first two decades of the century mainly because of plague outbreaks. It then increased moderately until 1951 when it shot up substantially by 117.9% from 1951 to 1961, when the city became the capital

and with the establishment of BHEL. From 1961 to 1991 population has continued to grow, though decadal growth rate has reduced to 35%(1991-2001). The trend of diminishing decadal growth was artificially distorted between 1961 to 1981 simply because the Municipal boundary increased.

Census Town Directory of 1981, showed 26 slum pockets with a population of 41,763. In 1991, the directory showed 166 authorised (with pattas) and unauthorised (without pattas) slum pockets with a population of 250,000.

**Tab 8.4 Slum Population over Period of Time**

S.No.	Zone No.	Ward No.	Name of the Slum	Household	Population	BPL Families
1	1	1	Gandhi Nagar	700	3500	450
2	1	1	Sector 2	100	500	40
3	1	1	Nai Basti	1300	6500	800
4	1	1	Sector 5	400	2000	300
5	1	1	Sector 1	350	1750	150
6	1	1	Sector II	250	1250	200
7	1	1	Vikas Nagar ( Gandhi Nagar )	500	2500	400
8	1	1	School Sector , Gandhi Nagar	340	1700	150
9	1	1	Abbas Nagar	1200	6000	700
10	1	1	Shivaji Ward (Gandhi Nagar )	800	4000	100
11	1	1	Ambedkar Basti	272	1360	125
12	1	1	Godarmau	160	800	70
13	1	1	Gond Basti (Gandhi Nagar )	300	1500	275
14	1	1	Taigaur Ward ( Gandhi Nagar )	200	1000	25
15	1	1	Arjun Ward ( Gandhi Nagar )	1500	7500	100
16	1	1	Pipalner	70	350	40
17	1	1	Singarcholi	150	750	70
18	1	1	Halalpura	350	1750	70
19	1	1	Nayapura Lalghati	95	475	30
20	1	1	Mahaveer Nagar	250	1250	100
21	1	2	Baba Saheb Ambedkar Basti	200	1000	125
22	1	2	Nai Basti (Bhensakheri)	450	2250	150
23	1	2	Budakheda	175	875	175
24	1	2	Vorwan	30	150	30
25	1	2	Kumharpura	600	3000	100
26	1	2	Laukhadi	150	750	130
27	1	2	Harijan Basti (Camp no. 12)	75	375	15
28	1	2	Camp No. 12	350	1750	200
29	1	2	Bhensa Kheri	200	1000	60
30	1	2	Baragad Kala	300	1500	200
31	1	3	Mochi Mohalla	152	930	142

32	1	3	Dhibi Ghat	1000	8000	
33	1	3	Haijan Basti	333	1833	4
34	1	3	C.R.P Jhuggi	400	1800	360
35	1	4	Rahul Nagar	300	1800	300
36	1	4	Indra Nagar	950	5000	700
37	1	4	Sihore Naka	208	750	185
38	1	4	Dhor Bazar Machli Market	230	1500	184
39	1	4	Van Tree	833	4800	500
40	1	4	Manjhi Nagar	32	160	20
41	1	4	Rajenda Nagar	600	2500	300
42	1	4	Sanjay Nagar	600	3500	360
43	1	4	Behata Gaon	700	3500	420
44	1	4	Old Dairy Form	300	1500	200
45	1	4	Harijan Colony	200	1000	150
46	2	5	Ekta Nagar	25	150	20
47	2	5	Khanu Gaon	1500	10000	800
48	2	5	R.T.O Jhuggi	25	150	75
49	2	6	Sajida Nagar	1800	10000	700
50	2	8	Model Ground	800	6000	500
51	2	8	Bag Munsii Khan	2000	10000	500
52	2	8	Payega ( Noor Mahal )	160	2000	100
53	2	9	State Bank Ke Pas Ki Jhuggi	200	1000	50
54	2	9	Mahesh Nagar Ki Jhuggi	200	1000	50
55	2	9	Filter Plant Ki Jhuggi	40	200	12
56	2	9	P.N.B. Colony Ki Jhuggi	39	200	12
57	2	9	Police Line Ki jhuggi	350	2000	88
58	2	9	Bajpai Nagar Ki Jhuggi	300	1500	
59	2	9	T.B. Hosital Ke Samne Ki Jhuggi	39	250	6
60	2	9	Bharat Mata Nagar Ki Jhuggi	1300	6500	520
61	2	10	Mazdoor Nagar	1050	5000	263
62	2	10	Ahirpura	60	300	15
63	2	10	Ravidas Pura	47	285	4
64	2	10	Lendiya Talab ki Jhuggi	80	450	20
65	2	10	Kumharpura	450	1600	113
66	2	10	Sharma Colony	500	1500	
67	2	13	R.T.O Bala Kshetra	180	900	72
68	2	13	Putli Ghar Nale Ke Pas Ki Jhuggi	200	100	80
69	2	13	Bag Mufti Saheb Ki Jhuggi	500	2500	125
70	2	13	Indira Nagar	350	1750	88

71	2	13	Kabit Pura	800	4000	200
72	3	16	Lodhi Samaj Mandir Chhetra	70	350	70
73	3	16	Rajgari Colony Chhola	532	2660	532
74	3	16	Chandanji Ki Bawadi	49	245	49
75	3	16	J.P. Nagar	1230	6150	0
76	3	16	Indira Saheta Nagar	150	750	150
77	3	16	Chokse Nagar	81	405	81
78	3	16	Vishram Ghat	354	1770	250
79	3	15	Aarif Nagar	1223	6115	1100
80	3	15	New Arif Nagar	1230	6350	1230
81	3	15	Kenchi Chhola Mata Ki Madia	835	4175	722
82	3	15	Ghhola Kenchi New Belar	965	4825	668
83	3	15	Atanl Ayub Nagar	960	4800	960
84	3	15	Shakit Nagar	335	1675	335
85	3	14	Ram Mandir	850	4250	510
86	3	14	Congras Nagar	827	4135	827
87	3	12	Krishna Colony	440	2200	440
88	3	12	Shobha Ram ki	186	930	186
89	3	12	Jamal Pura	226	1130	226
90	3	12	Basod Best	328	1640	295
91	3	12	Nishat Pura	734	3670	
92	3	11	Barela Gaon	1593	7965	1593
93	3	11	Sanjay Nagar	5595	27975	4775
94	3	11	Durga Nagar	240	1200	240
95	3	11	Harijan Basti Nariyal khera	128	640	128
96	3	11	Narial Kheda Gaon	35	175	175
97	4	17	Gangaur Ki Bavri	240	2000	0
98	4	17	Bafna Colony	110	1000	20/40
99	4	17	Guru Nanak Colonyn	80	750	20
100	4	17	New Kabadkhana	30	250	0
101	4	17	Fatma Nagar	60	600	60
102	4	17	Ibrahim Khan Ki Bavdi	24	150	24
103	4	18	Foota Makbara	70	800	30
104	4	18	Ekta Nagar	180	1450	0
105	4	18	Adalat Ke Pas Agrawal Dharmshala Ke Piche	121	1400	71
106	4	18	Devli Ka Bagh	290	3000	84
107	4	18	Subash Nagar	782	8000	200
108	4	18	Irani Pada	143	1600	24



109	4	20	Mominpura	28	300	0
110	4	20	Ahirpura	55	550	0
111	4	20	Kolipura	80	900	13
112	4	20	Fakirpura	90	1100	0
113	5	27	Bangaga	5000	15000	4000
114	5	27	Kacha Bangla	100	300	90
115	5	34	Shitla Nagar	115	575	60
116	5	26	Pratap Nagar	3000	12000	2400
117	5	26	Sanjay Nagar	55	320	50
118	5	26	Hasnat Nagar	3200	13000	2880
119	5	34	Roshan Pura	3000	15000	2900
120	5	27	Dharam Puri	350	2000	320
121	5	24	Saidia School Area	1500	9000	100
122	5	25	Bhoipura	1000	6000	100
123	5	25	Bhagwan Sahaymarg	500	3000	150
124	5	24	Islam Pura	1280	7680	50
125	5	24	Cheha Kodi Ka Mandir (Koli Pura)	850	5100	50
126	5	24	Kanjar Pura	60	360	0
127	6	30	Ambedkar Nagar	1350	1000	600
128	6	30	Aaradhan Nagar	350	1500	55
129	6	30	Nehru Nagar	800	1400	66
130	6	30	Sudama Nagar	1200	2500	26
131	6	30	Bijasen Nagar	300	1250	65
132	6	29	Navgrah mandir	45	225	6
133	6	29	Valmiki nagar	122	583	26
134	6	29	Sanjay Nagar	92	460	13
135	6	29	Rajeev nagar	245	1225	73
136	6	29	Naya Basera	655	3275	180
137	6	29	Kotra Gaon	547	2735	72
138	6	29	Ganga Nagar	175	875	32
139	6	31	Rahul Nagar	1065	5225	675
140	6	31	Barkhedi Kala	263	1315	153
141	6	31	Barkhedi Khai	147	635	57
142	6	31	Sevaniya God	520	2640	326
143	6	31	Near Bhadbhada	114	570	84
144	6	31	Bapu Nagar	252	1160	172
145	6	31	Suraj Nagar	295	1475	255
146	6	31	Bajara Basanti(Nehru Nagar)	124	625	90
147	6	28	Bheel Kheda	91	455	11

148	6	28	Prem Pura	239	1195	28
149	6	28	Visan Khedi	98	491	9
150	6	28	Gora gaon	141	705	12
151	7	35	Patrakar Colony	70	400	70
152	7	35	Vallabh Nagar	1000	5500	1000
153	7	35	Vallabh Nagar no 2	550	3000	550
154	7	35	Om Nagar No 2	400	2500	395
155	7	35	Om Nagar no 3	300	1600	300
156	7	35	Bhim Nagar	3500	20000	3500
157	7	36	Chamarpura	147	889	25
158	7	36	Jhada Colony	283	1971	260
159	7	37	Dhobighat Batlapura	75	562	20
160	7	37	Kumharpura	160	1120	160
161	7	37	Yadavpura	270	1890	250
162	7	38	Shramdan road	275	1650	7
163	7	38	Maslakh Lane	125	870	10
164	7	38	Mata mohalla	735	4410	25
165	7	38	Jawavit Line	310	1860	0
166	7	38	Patra Lane Filter	125	750	0
167	7	43	Hammal Colony	915	5490	25
168	7	43	Harijan Basti ,Bapu Colony	315	1575	35
169	7	44	Kumharpura	1625	9750	35
170	7	44	Pavandipura	1250	7500	250
171	7	44	Hanumanpura	32	224	2
172	7	44	Govind Dal Mill Ke pas	15	70	0
173	8	45	Ravidas Pura	350	1750	100
174	8	45	Afzal Colony	520	2600	156
175	8	45	Rajeev Nagar	600	3000	510
176	8	45	Nehru Nagar Press Colony	120	600	90
177	8	45	Durga Nagar	160	800	80
178	8	45	Arjun Nagar	600	3000	450
179	8	45	Ajad Nagar pul bogda	210	1300	190
180	8	46	Moti Nagar	550	2750	165
181	8	46	Acharya Narendra dev Nagar	1800	9050	1080
182	8	46	Padmanabh Nagar	45	225	40
183	8	46	Bihari Mohalla	650	3250	580
184	8	46	Sudama Nagar	1400	7500	1120
185	8	46	Boundry ke under ki jhuggi	855	4275	640
186	8	46	Arjun Nagar	340	1800	304

187	8	46	Govindpura a Sector	125	700	100
188	8	47	121 Ki Line Shivaji Nagar Jhuggi	64	320	0
189	8	47	123 Ki Line Shivaji Nagar	54	270	23
190	8	47	125 Ki Line Shivaji Nagar	51	255	0
191	8	47	Ankur Nagar	297	1485	267
192	8	47	Railway Line Ke Pas	68	340	68
193	8	47	Shanti Nagar	86	430	27
194	8	64	Punjabi Bag M.P.E.B.	35	175	14
195	8	64	Durgadham Basti	265	1325	180
196	8	64	Dashmesh Nagar	425	2125	115
197	8	64	Aazad Nagar	260	1300	195
198	8	64	Roop Nagar	914	4570	706
199	8	64	Ashok Nagar Nala Shed No 1	32	160	0
200	8	64	Sethi Nagar	176	880	125
201	9	32	Shiv Nagar	450	2250	163
202	9	48	Ishwar Nagar	100	500	50
203	9	48	Arjun Nagar	1700	8500	600
204	9	48	Siddheswari Nagar	86	430	66
205	9	48	Priyadarshini Nagar	2000	10000	600
206	9	48	Ashok Nagar	120	60	84
207	9	48	Rishi Nagar	385	1925	85
208	9	48	Durga Nagar	370	1850	155
209	9	49	Jyotba Fule Nagar	200	1000	150
210	9	49	Seva Sadan	1500	7500	1350
211	9	49	Kolar colony slum area	2900	14500	870
212	9	49	Durga Nagar	457	2285	86
213	9	49	8 Dukan Ke piche ki jhuggi	117	585	35
214	9	49	Shyam Nagar	1800	9000	545
215	9	49	Chuna Bhatti Gaon	365	1825	209
216	9	49	52 Quarter ke piche ki jhuggi	213	1065	170
217	10	56	Shanti Niketan	100	500	15
218	10	56	Kalash Nagar	400	2000	0
219	10	56	Rachna Nagar	40	200	0
220	10	56	Vikas Nagar	2000	10000	1200
221	10	56	Gautam Nagar	50	250	20
222	10	55	Shakti Nagar	110	550	30
223	10	55	Gandhi Nagar	400	2000	156
224	10	55	Ekta Nagar	125	625	100
225	10	54	Amravat Khurd Gram	80	400	15

226	10	54	Laharpur Gram	150	750	30
227	10	54	Ravidas Nagar	60	300	60
228	10	54	Baghmugalia Nai Basti	6000	30000	250
229	10	54	Barkhera Pathani	700	3500	275
230	10	54	Pipliya Pende Khan	1000	5000	130
231	10	54	Panchpeer Nagar	285	1425	125
232	10	54	Padmanam Nagar	450	2250	200
233	10	56	Gautam Nagar	103	515	15
234	10	57	Anna Nagar	2100	10500	1800
235	10	58	Purana Nagar	400	2000	358
236	10	56	Kashturba Nagar	25	12	10
237	10	56	Gas Rahat Janta Quarters	800	4000	200
238	11	59	Jai Hind Nagar	250	1250	150
239	11	59	Indra Nagar	200	1000	10
240	11	59	Rajeev Nagar	100	500	5
241	11	59	Church Barkhera	125	625	20
242	11	60	Shiv Nagar	2000	10000	300
243	11	60	Vallabh Nagar	50	250	10
244	11	60	Khajuri Kalan Harijan Basti	75	375	10
245	11	60	Khajuri Sunpura	700	3500	100
246	11	60	Khajuri Kalan Guthan	60	300	30
247	11	60	Khajuri Khurd	50	300	20
248	11	60	Jabranpura	30	150	20
249	11	60	Bijli Nagar	400	1600	100
250	11	60	Bijli Nagar Harijan Basti	64	320	7
251	11	60	Jawahar Nagar	15	75	0
252	11	61	24 Quarter	60	300	10
253	11	61	40 Quarter	900	4500	100
254	11	61	50 Quarter	600	3000	300
255	11	61	60 Quarter	1700	8500	100
256	11	61	100 Quarter	1000	5000	200
257	11	61	Chnadmari	600	3000	240
258	11	61	Nehru Nagar	150	750	50
259	11	61	Ratnagiri	175	900	60
260	11	62	Pathar ka Sinchai vibhag	700	3500	70
261	11	62	Aalam Nagar	286	1500	125
262	11	62	Kokta Basti	7	35	7
263	11	62	Daulatpur	250	1250	40
264	11	62	Banjara Basti	80	400	50

265	11	62	Anantpura	60	300	0
266	11	62	Purana Hataikhera	25	125	5
267	11	62	Durgesh Nagar	50	250	10
268	11	62	Aanand Nagar	1500	7500	0
269	11	62	Gadiya Basti	1000	5000	0
270	11	62	Bal Vihar	800	4000	0
271	11	62	Aanand Nagar Harijan Basti	50	250	0
272	11	62	Aanand Nagar Marathi Mohalla	600	3000	0
273	11	62	Rawat Basti	200	1000	100
274	11	62	Shanti Nagar	300	1500	50
275	11	63	Rajeev Nagar	125	625	75
276	11	63	Nehru Nagar Kreshar Basti	300	1500	50
277	11	63	Narela Shankari Harijan Basti	500	2500	200
278	11	63	Narela Shankari	1500	7500	100
279	11	63	Gautam Nagar	265	1003	200
280	11	63	Aadarsh Nagar	500	2500	50
281	11	63	Jheel Nagar	1100	5500	110
282	11	63	Arjun Nagar	400	1600	150
283	11	63	Harijan Basti Nizamuddin	44	220	0
284	12	65	Atal Nehru Nagar	700	3500	650
285	12	65	Gram Malikhedi	100	500	7
286	12	65	Gram Maholi	60	300	15
287	12	65	Dam Khera	75	375	45
288	12	65	Kolua Kalan	400	2000	30
289	12	65	Gram Karariya	100	500	50
290	12	65	Gram Semra Kalan	90	450	35
291	12	65	Gram Khejda Baramad	200	1000	120
292	12	65	Irani Basti Bhanpur	70	324	50
293	12	66	Gram Naya Badwai	40	200	0
294	12	66	Chandbadi Jhuggi kshetra	247	1272	56
295	12	66	Gram Rasla Kheri	54	270	30
296	12	66	Gram Navi Bagh	241	1200	32
297	12	66	Karond Rusalli	122	611	34
298	12	66	Gram Palasiya	300	1500	3
299	12	66	Gram Badwai	400	2000	0
300	12	66	Gondipura	450	2250	50
301	12	66	Nayapura	200	1000	150
302	12	66	Newri	200	1000	0
303	12	66	Chola Railway Line	300	1500	300



304	12	66	Prem Nagar Jhuggi	170	850	50
305	12	66	Annu Nagar	350	1750	310
306	12	66	Timber Market Jhuggi Area	150	750	130
307	12	66	Shanker Nagar	300	1500	300
308	12	66	Udiya Basti	125	600	125
309	12	66	Goya Basti	180	910	30
310	12	66	Peepal Chauraha	115	587	25
311	12	66	Siddhi visthapit colony Shanti Nagar	50	260	5
312	12	64	Gram Bhanpur	70	350	20
313	13	39	Over brij	30	150	10
314	13	39	Capdha mil ki chaal	400	2000	250
315	13	39	Cappital ka Picha	Nil	Nil	0
316	13	39	Dubal phatak	15	75	5
317	13	39	Harijan Basti (Camp no. 12)	300	1500	40
318	13	40	Koluvara gaw	100	500	10
319	13	40	Hinotia kuchiyana gaw	1200	6000	500
320	13	40	Vijay Nagar Jhuggiyan	800	4000	600
321	13	40	Rajeev Nagar	300	1500	60
322	13	40	Khusi Pura Gaon	200	1000	80
323	13	40	Samkra Kaln Gaon	300	1500	20
324	13	41	Bismillah Colony	360	1800	5
325	13	41	Kammu Ka Bag	300	1500	10
326	13	41	Bag Umrao Dulha	200	1000	30
327	13	41	Pushpa Nagar	190	950	10
328	13	41	Bag Umrao Dulha Railway Line	50	500	4
329	13	41	Indira Nagar	100	500	5
330	13	42	Ahmed Ali Colony	270	1350	10
331	13	42	Afkar Colony	160	800	5
332	13	42	Bag Farhat Afza	400	2000	8
333	13	42	Guru Nanak Pura	200	1000	15
334	13	42	Morarji Nagar	300	1500	15
335	13	42	Vikas Colony	150	750	10
336	13	42	Soniya Colony	260	1300	15
337	13	42	Bag Dilkusha	250	1250	16
338	13	42	Aishbagh Janta Colony	150	750	10
339	13	42	Jagannath Colony	200	1000	15
340	13	42	A.B. Sector Aukaf Colony	100	1000	8
341	13	42	Jawahar Colony	260	1300	5

342	13	42	Najul Colony	150	750	12
343	13	42	Hata Sikandar kula Khan	200	1000	10
344	13	42	Hata Mankasha	150	750	7
345	14	51	Sanjay Nagar	125	687	81
346	14	51	Gautam Nagar	235	1300	165
347	14	51	Meera Nagar	190	1046	38
348	14	52	P.C.Nagar	649	3581	519
349	14	52	Rahul Nagar	175	962	140
350	14	52	Shahpura	1000	5500	295
351	14	52	Gulab Nagar	135	742	82
352	14	52	Sabji form	155	252	90
353	14	52	Lakshman Nagar	160	879	60
354	14	52	Ishwar Nagar	1609	8849	1449
355	14	52	Ajay Nagar	335	1842	167
356	14	52	Janta Colony	350	1925	125
357	14	52	Saraswati Nagar	250	1375	125
358	14	52	Baba Nagar	444	2442	90
359	14	52	Indra Nagar	1835	10093	1101
360	14	52	Sai baba Nagar	1650	9075	1000
361	14	53	Durga Nagar Jaat Kheri	65	500	0
362	14	53	Gautam Nagar	525	2890	157
363	14	53	Suresh Nagar	49	250	6
364	14	53	Durga Nagar khand	1056	5808	317
365	14	53	Sanjay Nagar	155	775	77
366	14	53	Deepak Nagar	26	143	0
367	14	53	Ganesh Nagar	85	467	8
368	14	53	Aam Nagar	215	1182	25
369	14	53	Bhavani Nagar Jaat kheri	275	1350	5
370	14	53	Shakti Nagar	500	2750	398
371	14	53	Bag Sevaniya	75	412	3
372	14	53	Om Nagar	308	1694	184
373	14	53	Bag Sevaniya	1995	10972	1396
374	14	53	Vishwakarma Nagar	300	1650	30
375	14	53	Sanjay Nagar	63	395	10
376	14	53	Ahmadpur Mazar	96	504	76
377	14	53	Adarsh Nagar	235	1296	0
378	14	53	Gandhi Mohalla	125	689	94
379	14	53	Bag Mugaliya	430	2317	336
380	14	53	Jaat kheri	125	690	0

			<b>Total</b>	<b>183989</b>	<b>936066</b>	<b>86708</b>
<b>Source; Bhopal Municipal Corporation</b>						

However, the team of experts from Ahmedabad who surveyed the slums in 2000 realised some shortcomings with census data and quoted the 1991 slum population to be around 2.5 lacs, which converts to a decadal growth of 510%, which is still massive.

In 2000, the surveyors prepared a revised list from the Collectorate and BMC list of slum settlements with wards and map locations. This list used for the Slum Networking Project has 266 slums in the year 2000 with the total population of 468,606 persons and 78,101 households (assuming 6 persons per family as against the city average of 5.37). The Census of India 2001 registered slum population of 480,000. The most recent survey conducted by BMC, in Nov 2005 reports 384 slums.

Census figures of slum populations are available from 1981. Estimates of slum populations for years 1961 and 1971 were derived from supporting documents of 1975 Bhopal Development Plan. These figures show that up to 1981, the decadal slum growth was around 110%, just a little higher than the national average. It appears that adverse migration effects of the events from 1951 to 1961 were over. From 1981 to 1991, slum population went up by a massive 857%, an increase far larger than in any other city of this scale in the country. In the same decade, in 1984, 'Patta' Act, giving leasehold tenure to slum dwellers, was announced which, prima facie, appears to be the reason for the jump. Analysis of the data, however, reveals a different picture.

### 8.3.1 Characteristics of Slums

#### Location and Terrain

A large number of slums are on, or close to,

nallah or riverbanks. Many slums have steep slopes, rock outcrops and high water table. This would imply high infrastructure development cost on the account of cut and fill, difficult access, rock excavations and de-watering. The positive side is that the slopes are favourable for good drainage, storm and sewerage. Some of the slums on flatter terrain have black cotton soils, which again imply extra development cost.

#### Density and Open Space

The slums are of low to medium density. In almost every slum, the perimeter of the slum was found to be very dense whereas in the interiors, there were open spaces. The city periphery and old village slums (Gandhinagar, Khanugaon) were of lower density of 50-100 dwellings per hectare. A visual comparison would put inner city slums (e.g. Banganga) and those around industrial areas (Satnami Nagar) at higher densities of 150-200 persons per hectare. There are discrepancies between the numbers of dwellings gauged from the survey and the official lists. This may be due to the nature of definition and identification of the slums and families as per the requirement of each list.

#### Nature of Housing

The slums have a mixture of housing – from pucca (in areas such as Banganga), semi-pucca (where there is brick masonry with mud plaster) to kutcha mud houses and small shacks made of wood/bamboo slats and plastic sheet. Structures for housing are single storied, one to two room houses averaging an area of 300–400 square feet. The quality of housing stock depends on a combination of factors such as the age of settlement, level of tenure security, infrastructure provisions and funding from sources such as Bhopal gas relief fund. The impact of pattas was very clear in Banganga where pucca houses

were built in the flood prone nallah basin just to hold on to the legal patta given there.

### Infrastructure

It was interesting to note that in almost all the slums visited, there was high to very high demand for better infrastructure and that the people were willing to contribute towards the costs subject to conditions of installments, security of tenure and assurance of implementation.

**Roads:** Most slums have reasonably good access roads on the periphery, largely asphalt. In the internal areas of the slums there are largely concrete, stone paved, WBM and kutcha roads. The older settlements, particularly those in and around the old city as well as those authorised, have better road coverage whereas the newer, rural, peripheral and unauthorised slums have kutcha roads. Some of the internal paving is done either by the residents themselves or provided by the corporator. The problem with existing slum roads in Bhopal, particularly concrete and asphalt, is that the other services are not there. This means that when internal water supply, sewerage, drainage and lighting are introduced, there would be an infructuous cost of dismantling the existing roads and making them good afterwards.

**Water:** Most slums have access to water, except in the case of Gandhi Nagar, where water taps (provided by a local charity) are few and far in between and getting water is difficult. In some slums, though people complained of inadequate water, its timing and pressure, there was no issue of access. The worst water problems were in the slums on hills (Idgah) because of pressure, remote slums (Gandhinagar) where the municipal network has not yet reached, and north of the old city (Kechi Chola) where the terminal pressures are low and part supply is from dug wells. The problem common in most slums is that the water is available at points on the perimeter main lines and people have to carry water

to the internal areas in buckets, often in steep terrain and through kutcha lanes.

**Sanitation – Toilets, drains and sewerage:** Toilets and drainage are clearly problems in every slum. Less than 5% of the households have access to some toilet facility within the community. While some of the slums were serviced by Sulabh complexes, the residents displayed a reluctance to use them, particularly the women. Issues raised in this regard were:

- Maintenance of the Sulabh
- Distance of the facility from the slum
- Eve-teasing in the vicinity of the Sulabh, which was brought up by both the men as well as the women.

It seems that the twin pit latrine scheme of the government has not been accepted in most slums. There was only one slum in which 25% of the families had the twin pits with septic tanks. Whilst space for the tanks was cited as a major reason for the rejection of the scheme, there appeared to be sufficient open spaces within slums to accommodate individual latrines if not the tanks. Typically, discharge from individual toilets is either into open drains or septic tanks/soak pits all eventually draining into nallahs. In one slum, there were dry latrines, cleaned by sweepers once a month.

Defecation was in more than 80% of the cases in the open.

There is a network of small open drains, typically kutcha, which carry wastewater into the main nallah within each slum. There were often complaints of the discharge entering houses on the drain path. No effluence undergoes any form of treatment.

In the slums observed, although the number of individual toilets was low, there was space and demand for individual toilets in most places.

**Garbage:** There is little or no access to solid waste management services provided by the municipal maintenance systems. Slums typically located in the middle of housing colonies, e.g. the group of slums on link road no. 2, have access to dustbins on the main road; these are not used by the residents in the interiors of the slums. There is no system of collection from within the slums. Garbage is generally thrown into the nallah, which the residents recognise as one of the reasons for choking, overflowing etc.

**Electricity:** While most patta holders could take the benefit of the single batti connection, metered electricity in slums, which did exist, is now a thing of the past. The residents complained of receiving very large bills, which were possibly due to the use of heaters in winter etc., and therefore non-payment. Electricity is “hooked” from the overhead lines. The current system of legalising these connections is collection based on the number of electric points in the house. The average electricity bill per month paid by the residents is Rs. 35-40 per month though some families pay much higher.

## 8.4. Earlier Public Interventions of Slum Improvements

- ❑ PATTA (Pattadhruiti Adhikaron Ka Pradan Kiya Jana)
- ❑ District Urban Development Authority

### 8.4.1 THE ‘PATTA’ ACT, 1984 and 1998

The Madhya Pradesh Nagariya Kshetron Ke Bhoomihin Vyakti (Pattadhruiti Adhikaron Ka Pradan Kiya Jana) Adhiniyam, 1984, popularly known as the ‘Patta’ Act was introduced to grant leasehold rights to the landless persons occupying urban lands. The Act was amended in 1998 under Rajiv Gandhi Aashray Abhiyan to extend the cut off date of eligibility to 31st May 1998. In addition,

the plot areas were revised for different categories of cities (1000 to 600 square feet) and lease rent per square feet per year for 10 years was introduced at the rate of Rs. 1.00 for Nagar Panchayats, Rs. 1.50 for other towns and Rs. 2.00 for Rajbhogi cities (Bhopal, Indore, Jabalpur, Gwalior and Raipur). The most important amendment in the Act was to introduce the Mohalla Samitis with the intent to empower the community in the planning and management of the development and social welfare. Under the ‘Patta’ Act, three categories of pattas are given, category ‘ka’ (A) for the registration of disputed cases, category ‘kha’ (B) for permanent lease of 30 years and category ‘gha’ (C) for temporary lease of 1 year.

### 8.4.2 CDS and the Role of DUDA (District Urban Development Authority)

District Urban Development Authority (DUDA) under the Urban Poverty Alleviation Program (UPAP) of the Central Government has created community Development Societies (CDS). The CDS structure does not cover all the slums in Bhopal. Amongst the 20 slums covered the tally reads as below.

**Table 8.5 State of CDS in Survey Slums**

State of CDS	No.
Active CDS	5
RCVs and CDS chairperson but nothing in-between	3
No CDS	12
Active women leadership but not a CDS / Mahila Mandal	2

*Source: Slum Networking of Bhopal for Government of Madhya Pradesh*

The CDS is seen by most residents as a sort of government program from which one can access money. The thrust has been more on the formation of thrift and credit groups rather than on empowering the CDS. The role and reach of DUDA in slums in Bhopal is linked to the implementation of community schemes. One observed that while their identity vis-à-

vis the CDS chairperson or woman community leader was established, there was no contact with the larger community. In addition, they have not covered the entire city. While it is not expected or anticipated that there be a contact with every household, it needs to be recognized that DUDA is a “scheme implementer” rather than a community development wing of the government.

#### 8.4.3 Slum Networking of Bhopal

It was proposed that Bhopal Municipal Corporation has taken Slum Networking of Bhopal with the clear and limited objectives as follows:

Transform the physical infrastructure, particularly water and environmental sanitation, of the slum matrix of Bhopal city.

Strengthen the city level service infrastructure and improve its environment, to the extent possible, to support the interventions within slums.

Facilitate the grassroots community participation in the spirit of the 74th Amendment to the Constitution through appropriate legal, financial and organisational framework.

## 8.5 CONCLUSIONS

### 8.5.1. Housing

- There is about 25% shortage in housing supply in Bhopal City. The majority of housing shortage is for urban poor.
- 21% of the household in the City doesn't have legal tenure, while 15% of the households have got Patta from Government of Madhya Pradesh.
- 60% of the households belong to LIG and EWS, and BPL Category. (LIG 35%, EWS 25% with 15% BPL).
- The 2001 Census has recorded that the city has relatively low literacy rate at 69%

### 8.5.2. Slums

- A large number of slums are on, or close to, nallah or riverbanks. Many slums have steep slopes, rock outcrops and high water table.
- 35% of the population in Bhopal is living in the slums
- There was tremendous growth of Slum Population in 1981-1991.
- The city periphery and old village slums (Gandhinagar, Khanugaon) were of lower density of 50-100 dwellings per hectare. A visual comparison would put inner city slums (e.g. Banganga) and those around industrial areas (Satnami Nagar) at higher densities of 150-200 persons per hectare.
- Majority of Houses in the slum are either Semi-pucca or Kutcha in nature, Pucca structures can be seen of the plots given under patta.
- Slums in the inner City area have Concrete or paved streets.
- Most of the slums don't have access to the sufficient water supply especially those on hills or remote areas where municipal lines are not been extended.
- 80% of the slums in Bhopal lack in access to the toilets.
- There is no access to Solid Waste management in Slums
- Literacy levels in slums as compared to the Indore City (76 % and 56% percent respectively, as against 86% percent and 74% for the Indore city).
- There are lots of Government interventions been implemented towards betterment of the slum community but they lacked integrated approach.



## Chapter

# 9 Inner City

## 9.1 Background

The origins of Bhopal city are a little obscure. It is said that Raja Bhoj, the famous Parmar king of Dhar, founded Bhopal City in the 11th century at its present site. Another view is that the original city of Bhojpal (eventually corrupted to Bhopal) was first founded on the banks of Kolar River and then subsequently shifted to its present location. He created the Upper Lake by constructing an earthen dam across the Kolans River. The traces of the original town, however, do not remain.

The city was established again and fortified in the 18th century by Dost Mohammed Khan, a chieftain of Aurangazeb, when he was invited by Rani Kamalawati as a protector of her territory. The Lower Lake was created by Nawab Chhote Khan in 1794. The city remained a capital of a feudal state till it was merged in the Indian union in 1948.

In 1956 Bhopal was declared the capital of newly reorganised State of Madhya Pradesh. In the same decade, the Industrial Township of Bharat Heavy Electricals Limited (BHEL) was also established 3 km east of the then city boundary. As a result of these two interventions, Bhopal has witnessed a substantial population growth. Capital Project Township T. T. Nagar was built south of the lakes to support the capital. The military cantonment moved to Bairagarh area to the west of the old city.

In the decade 1971-1981, the city boundary was increased to bring BHEL Township and Bairagarh within the Bhopal Municipal Corporation limits. The wards increased from 39 to 56. The new wards added were 1-5 and 47-56 while some older wards were subdivided. In 1994, the number of

wards in the city increased to 66 though the city boundary remained the same. Bhopal has not grown as a single city but as discreet townships, with sparse outgrowth in between, as follows:

The old city and its periphery.

- BHEL Township.
- Capital Project (T. T. Nagar).
- Bairagarh.
- New out growth.

## 9.2 Existing Core Area

The existing core of the city and its surrounding is the hub of all activities and is the most congested area. It has maximum population pressure, maximum intensity of building and movement of traffic and services. The old CBD has gradually expanded its activities.

- The central area has the uniform skyline and forms an introvert residential neighbourhood.
- It mainly comprises of mixed land use i.e. commercial over residential.
- The central market is a vibrant area with the road around C.B.D. areas carrying palette of people.
- The central Market is the multi functional regional market catering to the wider area than just the city.
- The area is the most inefficient and congested part of city in terms of density intensity of buildings and movement of traffic because of rapid socio-economic and physical change.
- The change has been taken place without conformation of building byelaws and norms in master plan.

## 9.3 Present Situation of Inner City

The problem of Parking of vehicles on the crowded Roads, streets, shopping areas of the Old Bhopal has become more acute in the last five years, with liberalization of economy resulting in larger number of vehicles being registered every year. The increase in the per capita income of the

Indian household, easier finance options and the competitive and aggressive marketing of the automobile companies have resulted in tremendous increase of vehicles in city especially in the last five years.

It is an established fact that the private motor vehicles in urban areas are found moving on the network for only twenty percent of the time and for the remaining eighty percent time they are parked either at residences or at work places or in commercial areas. The parking in the old Bhopal commercial areas has become critical because of heavy concentration of activities, narrow road widths, and encroachments on roads, non-motorized traffic and limited space available for parking.

In spite of the decentralization of the commercial centers to the outskirts of the city, the old city portion is still the commercial heart and hub of the city thereby facing acute parking problems.

To overcome this parking problem identification of Parking lots where parking structures can be constructed has been a priority for the BMC but due to the age old planning system of these core areas, such spaces are hard to found. The only solution left is to provide construct Parking lots/ Parking buildings in place of old worn out structures which have been abandoned or have lost their usefulness in general to the city as a whole and in particular to the area in which they are located.

In the history of every City there comes a time when Revitalization of City as a whole or in parts becomes essential due to the growth pattern, rapid expansion and economic development to keep pace with the fast changing scenario. The structures/areas planned long back keeping in mind the existing situation at that times seems out of place in the changing city structure and are at the verge of losing its usefulness to the cause for which they were planned.”

“It therefore becomes essential to redefine and revitalize these age-old city structures in terms of its usefulness. Most of this age old structures have served their full life term and in absence of maintenance in bad shape. Constructing the parking buildings in place of such structures will serve the dual purpose of revitalizing such structures and at the same time overcoming the problem of parking and traffic congestion.

**Tab 91. List of Obsolete Structures (land of these smutches to be reused)**

SI No.	Name of building	Location of building	Approx area (sqm)
1	Janki pharmacy block	Opposite Anpoorna building of BMC	190
2	Stationary block	Opposite Anpoorna	260
3	Block no. 72/1	Opposite Iqbal maidan	305
4	Nagrik Aapoorti Bank	Opposite Iqbal maidan	445
5	Hakim Sultan Building	Kotwali road	275
6	Section office PWD	Next to anpoorna building	250
7	Humayun manzil Surrounding building	Next to Nagik Bank	1950
8	Central store	Opposite Sadar manzil	1600
9	Govt. press.	Thrahimpura	2632
10	Parking Complex	Old sabiji mandi moti majed road	627
Source; Bhopal Municipal Corporation, Madhya Pradesh			

## Chapter

**10 Urban Heritage**

Urban image of the city is a collective visual appearance contributed by natural and man made elements, like Jumerati Gate, Kamala Park, Raj Bhawan, Chowk area, Jama Masjid, Moti Masjid, and Gauhar Mahal etc.

**10.1 Evaluation of Cultural Heritage Bhopal:**

Bhopal has its beginning in the rock shelters lived-in and painted by man during prehistory, 11th century architectural remains by Bhoja Devathe Parmara king of Malwa and fortresses and forts built by the tribal Gond chieftains, yet 18th century architecture by the Afghan Dost Mohammad Khan can be firmly established as the early beginning of the modern town as we see it today.

Located on the edge of Vindhyan Ranges the natural hills, lakes, springs and forests formed the bases of its development into a city of gardens with flowing, cascading, and bubbling and falling waters. Secure in its thick, stone, circumnavigator, defense wall the State was ruled by Begums for four consecutive generations establishing unique architectural, social, economic and cultural heritage. The uniqueness also comes from the fact that they were followers of Islam and were devout Muslims ruling from behind veils if necessary.

**10.1.1 Identification And Confirmation of Features, Areas, Zones, Precincts And Buildings Of Heritage Importance:**

An inventory of the heritage buildings of cultural, historical, socio-economical and architectural values was taken up by

1NTACH (Indian National Trust for Art and Cultural Heritage) in 1984 resulting in a document of more than 281 buildings divided in four grades based on the respective values of each building. Second exercise in updating of the listing was conducted by INTACH in 2004 and several monuments were found missing although several others found place in the listing. Based on the listing the important features, areas, zones, precincts and buildings of heritage and historical importance can be divided into the six distinct geographical regions:

- The unique feature of Bhopal is its large lake (30.72 sq km) called Bara Talab. Legendary Bhoja Deva (1010-1053 CR) who finds mentioned for his hydraulic engineering in the ancient treatises constructed the lake, making it one of the rare monuments of ancient India (not protected) in use today. The fort encompasses the Gond Queen Kamalapati's palace (protected by the Archaeological Survey of India ASI), Kamla park, Hammam, Sheetal Das Bagiya, Faiz Bahadur's Dargah etc. within its defense walls. A large gate announced entry into the old fort. The fort that stretched northeast southwest. The two bastions mark the southern end of the fort near Hammam and the northern end near Retghat.
- Fatehgarh Fort or citadel, was added by the 18th century CE Afghan ruler Dost Mohammad Khan on the west bank of Bara Talab in 1722 and named it after his beloved wife Fateh Bibi. Fatehgarh Fort's first stone was laid by Qazi Mohammad Moazzam of Raisen, who was a revered scholar. The unconquered fort was the scene of a siege in 1812-13 laid by the Maratha armies of Nagpur and Gwalior and the Pindarics. Tombs (protected by the State Archaeology) with 'Bangladar roofs' of indigenous technology of 18th century, unmatched massive square bastions, early 19th century fresco painted palaces, late 19th century Alabaster mosque, Jama

mosque by the Hindu wife of the 2nd Nawab in sandstone trabecated technology, palaces and gates as some of the fine examples of French influence on Indian architecture, gold painted palaces, char-baghs with flowing water and fountains and scented plants and uniquely Indian open maidans all fall within this geographical area.

- The Shehr-e-Khas was a square fortified city of gridiron pattern with Jama Mosque of early 19th century at its center. Recommended by Bhoja Deva as one of the ideal city plans in India's ancient Shastras on town planning by him called Samrangcimitmthara. This 18th century town was entered by seven gates named after seven days of the week. The processional gates have all been demolished as also most of the heritage houses within. What however remains is the morphology of the town, its street lines, open spaces, some havelies (which are of immense heritage value), individual houses, chowks, temples, mosques, wells, some old trees, health centers, occupationally specific streets, the commercial hubbub, some tongas, food tradition, jewellery market, and several non-tangible traditions.
- Shahjahanabad by Shah Jahan Begum (1870-1901) was a well planned, well laid out fortified extension to the existing fortified town of Bhopal. This well-defined heritage area has all the features of the feminine ruler associated with it. Built around cascading waters of three descending tanks, the area is an aesthetic delight with palaces, grounds, mosques, markets, gates, Bara Bagh with all its cenotaphs etc. all built with materials of most delicate intricacy and designs. This is one of the rare examples in India where expansion was being planned at such a large scale by indigenous engineers and architects. The area is still not encroached upon in a major way although the building stock is in a decadent and damaged state.
- Jehangirabad, was extension by Nawab Jehangir Mohammad Khan (1837-1844) for the unruly Afghan troupes and contained palaces, gardens, grounds, barracks, alabaster cenotaphs, aqueduct, Minto Hall, Lal Kothi (present day Government house), several gardens such as Ash Bagh, Bagh Umrao Dulha with a 5th century pillar, Farhat Bagh, bodies etc.
- In conformation with the tradition of the Nawabs of Bhopal the last Begum Sultan Jehan (1901-1921) built her own palace complex in Ahmedabad area named after her late husband. Designed by Austrian architect Heinz in Art Deco style the area had esplanade, venues, botanical gardens, Kothies. Cottages, out houses, palaces, yacht clubs etc. in atypical of the style that was so much in vogue at that time in Europe. Circular grills, railings, terraced gardens with - circular ends, porches with circular roofs with diamond windows of non-standard dimensions were all part of the vocabulary of the early modern Art-Deco style that still has fan-clubs across the world and who hold world congresses in appreciation of the style. The area can be defined as Heritage Zone.

# Chapter 11 Organization, Institutional Setup & Finance

## 11.1 Bhopal Municipal Corporation Institutional Framework

### 11.1.1 Introduction

In order to enable the urban local bodies “to perform effectively as vibrant democratic units of self government”, the 74th Constitutional Amendment was introduced in the Parliament and it became an Act in December 1992. This Act is a great reform act in the political context as well as in the administrative and financial aspects concerning the urban local bodies in India.

The 1992 amendments aim at empowerment of local bodies by requiring the state governments to;

- Establish an adequately represented electoral base at local levels with a fixed tenure of five years, and a provision for holding elections within six months in the event of premature dissolution of local councils;
- Set up mechanisms for consolidating and coordinating planning and development initiatives and actions of municipalities; and
- Consider expanding the role of municipalities, and correspondingly strengthen their fiscal jurisdiction and power and authority.

Madhya Pradesh has been the leader in terms of progress on the front of decentralisation. Since the Amendment in 1992, the State passed the conformity legislation in 1993, conducted three rounds of elections to local governments and has been one of the first states to constitute and implement the recommendations of the SFCs (1996 and 200).

In July, 1957, the State Government enacted the following legislation, replacing

the diverse legislations<sup>1</sup> in operation in different parts of the state:

- The Madhya Pradesh Municipalities Act, 1961
- The Madhya Pradesh Municipal Corporation Act, 1956

The Constitutional amendment Act, 1992, gives local bodies a constitutional status, assigns them a large number of functions (**Annexure -1**), ensures them stability, provides a suitable framework to function with greater freedom and also makes institutional arrangements for devolution of larger financial resources. To meet the constitutional requirements and aspirations, the Madhya Pradesh government made necessary amendments in the existing legislations relating to local bodies in the state.

### 11.1.2 Institutions and Organisation

Urban management in India is facing new challenges in the form of large concentrations of population in urban areas, opening of the economy and the resultant demand for quality services, growing number of urban poor, inadequate financial resources and complexities of urban situations, given to which urban management has also extended beyond the sole responsibility of the municipal corporations. There are other organizations that are responsible for urban management like urban development authorities, special purpose boards and corporations, and the State Government department controlling

<sup>1</sup> *The following Acts were in operation earlier to the formation of new state of Madhya Pradesh and were also continued in operation till their replacement by new legislations.*

- *The Central Provinces and Bare Municipalities Act, 1922, as amended between 1927 and 1956, applicable to Mahakoshal region*
- *The Bhopal Municipal Corporation Act, 1948*
- *The Madhyabharat Municipalities Act, 1954*
- *The Vindhya Pradesh State Municipal Act, 1954*
- *The Madhyabharat Municipal Corporation Act, 1954*
- *The Bhopal State Municipal Act, 1955*



the affairs of urban development. As a result of these agencies and the definite roles assigned to them in overall urban management, the municipal corporation is required to closely work with and share the responsibility of urban management with them.

Besides Bhopal Municipal Corporation other agencies involved in urban management and development in Madhya Pradesh (and in Bhopal) are:

### **Urban Administration and Development Department**

With the enactment of the 74th Constitution Amendment Act, major urban related tasks have been transferred to Local Bodies. The Government of Madhya Pradesh (GoMP) through its Urban Administration & Development Department (UADD) is responsible for overseeing urban sector reforms, in terms of capital investment in basic infrastructure for the Urban Local Bodies (ULB's). The UADD is also responsible for implementation of various public welfare schemes sponsored by the Central and State Governments. Some such schemes include Conversion of Dry Latrine Program, Swarna Jayanti Urban Employment Scheme, National Slum Development Program, Social Security Group Insurance Scheme, Janashri Insurance Scheme etc. These schemes are implemented through the District Urban Development Agency.

Being the parent organization of Municipal Corporations, UADD monitors the functioning of all municipal corporations in the state.

### **Town and Country Planning Department**

The activities of Town and Country Planning Department (TCPD) are guided by the provisions of the Madhya Pradesh Nagar Tatha Gram Nivesh Niyam, 1973 (the Rules). The State Government, as per provisions of the Rules declares a region including major urban areas and its surrounding settlements as a planning area, and orders the preparation of a development plan for the region.

The implementation responsibility of the development plan proposals vests with the Bhopal Municipal Corporation and the Bhopal Development Authority within their respective jurisdictions. Enforcement of development control regulations and other guidelines vests with BMC for areas within its territorial jurisdictions and with T&CPD in the rest of the planning area. However, in case of large commercial and residential developments within BMC, a "no objection certificate" from T&CPD is mandatory for sanctioning building plans.

### **Bhopal Development Authority, Capital Project Administration and Lake Conservation Authority.**

The Madhya Pradesh Nagar Tatha Gram Nivesh Niyam 1973 (the Act) provides for formation of development authorities in the State. The primary objective of BDA is the implementation of the development plan prepared by the T&CPD for Bhopal planning area, which includes the area under the jurisdiction of the Municipal Corporation of Bhopal (BMC) and surrounding villages.

Two other agencies proactively dedicated for the development of Bhopal city. Special Capital Project Administration and Bhopal Lake Conservation Authority plays a vital role in the city infrastructure development.

### **Public Health Engineering Department**

PHED has been given the responsibility of planning, design and construction of the water supply, sewerage and drainage projects of the municipal corporations (MC) since 1995. Under this arrangement, the financial and administrative sanction for a project comes from the PHED. The assets, however, have to be transferred to the MC on completion for operation and maintenance. Though, the PHED staff's works under tile functional control of the MC, their administrative control remains with the PHED. There is therefore duality here and accountability is blurred



### Madhya Pradesh Housing Board

Madhya Pradesh Housing Board (MPHB) falls under the administrative and functional control of the Housing and Environment Department of GoMP. The operations of the Board are governed by the provisions of the Madhya Pradesh Housing Board Act, 1972.

Although MPHB is a semi-governmental organization, GoMP rules and regulations pertaining to establishment and administrative matters are applicable to it. The Bhopal office of MPHB is actively involved in construction of housing colonies and other government buildings like schools and buildings, as deposit works.

### Madhya Pradesh Pollution Control Board and EPCO

Implementation, supervision and monitoring activities pertaining to Central Pollution Control Acts and Rules vests with the Central Pollution Control Board (CPCB), Government of India, and the respective State Pollution Control Boards formed/constituted under its rules. Madhya Pradesh State Pollution Control Board (MPPCB) headquartered in the state capital, Bhopal, carries out its operations through seven regional offices, each located at the divisional headquarters.

The main function of the regional offices is to monitor the implementation of provisions of various Acts governing pollution control and prevention.

#### 11.1.3. Area of Fragmentation

The major reform to local administration in India resulted with the 74th Constitutional Amendment Act in 1992, restoring local self-governments in the form of mandatory elections, and delegation of functions and finances articulated by SFC. But, functional decentralisation will remain on paper, if a corresponding and commensurate financial devolution is not made to different territorial governments.

Beyond the creation of the democratically elected bodies at the level of municipalities,

the progress on decentralization needs to increase the pace further.

- No worthwhile decentralization of powers and responsibilities had occurred or is in sight. There exists no evidence that powers and responsibilities of local governments have, in de-facto terms, been expanded in accordance with Schedule XII. Far more disconcerting fact is the absence of clarity in respect of the functions of local governments.<sup>2</sup>
- Although the state governments have enacted the conformity legislations incorporating the provisions of the Constitutional amendments, the formulation of rules and byelaws to put those provisions into effect has lagged behind.
- It is not clear if the recommendations of the finance commission of states have been acted upon, and if these have led to any improvement in the finances of local governments.

### MC and UDA/ TCPD/ HB

The MC-UDA relationship is such that the MC often remains ignorant or casually informed of new area development till such time when construction has started, and the time comes for obtaining various clearances like water supply, SWM, drainage linkages access roads, etc. Often, the MCs are denied the benefit of raising property taxes since the new properties are in the peri-urban area, even though extended services are provided by the MCs for which service charges are being received. More importantly, the T&CP make many planning decisions and recommendations, which are not

<sup>2</sup> *Except in a highly aggregative manner, no commonly accepted or nationwide approach emerges from the reports of the SFCs. The SFCs have formulated the fiscal package for local bodies without having access to a clear statement on what the functional jurisdiction of local bodies is or will be for the period of their recommendations. Thus, the recommended package does not relate to the functions that the local bodies may perform over this period.*

acceptable to the MC, or which the MC feels is inimical to the future growth / development of the city. A similar relationship exists between MC and HB. Handing over-taking over of assets between the MC and the UDA or HB remains a problem. The obvious remedy lies in making the MC the sole planning authority, as envisaged under the 74<sup>th</sup> CAA, through which the MC will grant all planning permissions with a charge only after it has satisfied itself about its current and future responsibilities. This is a major governance issue.

At present, together with the city corporations, there are state agencies also operating in the same urban space, independently of the ULB. These are the Urban Development Authority State Housing Board, the Town and Country Planning Department, etc. Similarly there are central government agencies. The activities of all these agencies impact on the same or the peripheral urban space, which affect the spatial pattern and future growth direction. The corporations only have an operational relationship with these agencies with no control or influence over the outcomes of their activities. The eventual responsibility for civic services ultimately devolves to the city authority.

The functional jurisdictions of these agencies vis-à-vis the Municipal Corporations in respect of the main civic services are shown in **Tab 11.1**.

**Tab 11-1: Agency responsibilities for City Services in Bhopal**

1	Water	PHED	PHED	PHED / MC
2	Sanitation & Sewerage On – Site	PHED MC / UDA/ HB/NGOs	PHED MC/ UDA/ HB/ NGO's	PHED / MC Households
3	Solid Waste	MC	MC	MC
4	Roads/ Bridges National State Local	GoI/GoMP (PWD)/MC / UDA/ HB	GoI/GoMP (PWD)/ GoMP (PWD)/ MC/ UDA/	GoI/ GoMP (PWD) MC/ UDA/ HB

			HB	
5	Drainage	PHED/ MC/ UDA	PHED/ MC/ UDA	PHED/ MC/ UDA
6	Slum Improvement	MC/ DUDA	MC/ DUDA	MC/ DUDA
7	City Planning	T & CP	UDA/ HB	MC (UDA/ HB)
8	Environment	MPPCB/ EPCO	MPPCB / EPCO	MPPCB/ MC
9	Public health	MC	MC	MC

There are two dimensions of the real situation. In **Table 1-1**, it should be noted that MC-PHED and MC-UDA relationships are the most intractable.

**MC and PHED**

PHED has been given the responsibility of planning, design and construction of the water supply, sewerage and drainage projects of the municipal corporations (MC) since 1995. Under this arrangement, the financial and administrative sanction for a project comes from the PHED. The assets, however, have to be transferred to the MC on completion for operation and maintenance. Though, the PHED staff's works under tile functional control of the MC, their administrative control remains with the PHED. There is therefore duality here and accountability is blurred. Secondly, in many cases, taking over of the assets created has not been completed; the MC complains of lack of resources, and lack of details etc. and the PHED staff complain of the continuing responsibility of forced maintenance out of their limited resources. In a few cases, the optimum

S	Sector	Plannin g and Design	Const ructio n	Operati on and mainte nance
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capacity and the quality of delivery of the services have decreased due to inadequate maintenance.

Clearly, the current arrangement between the MC and PHED is not working and it is unlikely to improve in the coming years. At state level, both the UADD and PHED are aware of the situation, but neither is willing to grapple with the issue.

### 11.1.4 Overview: Bhopal Municipal Corporation

#### Illust 11.1 Bhopal Municipal Corporation



"Majlis-e-intezamia" was the name of first municipal body, which came into being in 1907 in the erstwhile Bhopal estate. Up to 1956 the area under Bhopal Municipal limit was very small, but after that few more surrounding villages were added to it. The total area under Bhopal municipal limit reached to 71.23 Sq. Kms by 1975. At present total area under Bhopal Municipal Corporation is 285 Sq. Kms. Initial constitution of Bhopal Municipality was a 20-member committee, headed by a non - Governmental president. The Municipal Board was constituted for the first time in 1952, later on the status of Municipal board was upgraded to municipal council & an IAS officer was appointed as Chief Administrator. In 1983, Bhopal Municipal Council got the status of Municipal Corporation, with total 56 wards. Bhopal constitutes a total of 69 wards at present.

#### 11.1.4a Organisation Structure

The functioning of Municipal Corporation of Bhopal (BMC) is governed by the Madhya Pradesh Municipal Corporation Act, 1956 and amendments thereto. The organisational set up of BMC comprises of a Political Wing (Deliberative) and Executive Wing. The Deliberative Wing is an elected body of Councilors from different wards in the city and is headed by the Mayor. The Executive Wing is headed by the Commissioner and looks after the day-to-day functioning of the Corporation and

assists the Deliberative Wing in the decision making process.

#### Deliberative Wing

The Deliberative Wing of BMC is headed by the Mayor and overall functioning of the Corporation is governed by the Mayor-in-Council and the Departmental Advisory Committees constituted by the Speaker from amongst the Councilors other than the members of the Mayor-in-Council.<sup>3</sup>

The provisions contained in the Madhya Pradesh Municipal Corporation Act 1956 regarding the constitution of Mayor-in-Council, election of a Speaker and formation of Advisory Committees are given under section 9. Under Section 18 of the Act, the Mayor and elected Councilors of the Corporation shall elect a Speaker from the elected Councilors. Under Section 37 of the Act, the Mayor-in-Council shall be constituted by the Mayor from amongst the elected Councilors within 7 days from the date of election of the Speaker.

#### Committees set up by BMC under Mayor-in-Council

As per Section 403 of the Madhya Pradesh Municipal Corporation Act 1956, BMC has appointed an Appeal Committee to look into the appeals against an order passed by the Commissioner or an officer subordinate to the Commissioner.

The Appeals Committee consists of the Mayor and four elected Councilors. Any aggrieved person may appeal against any order passed by the Commissioner or any Officer within 30 days from the date of such order. The Appeal Committee may for sufficient cause extend the period prescribed for appeal.

When an appeal is made against an order, all proceedings to enforce such order and

<sup>3</sup> *The Mayor-in-Council shall consist of the Mayor and ten members. The Mayor shall be the ex-officio Chairman of the Mayor-in-Council and shall preside over meetings. The Mayor-in-Council may appoint one or more sub-committees from amongst its members and may refer to it any matter pending before it for inquiry and ask for report or opinion.*

all prosecutions for breach thereof are suspended pending the decision on the appeal.

### Ward Committees

According to Section 48-A of the Madhya Pradesh Municipal Corporation Act, the Ward Committees shall be constituted within 30 days from the date of election of the Speaker.

Every elected Councilor representing a ward within the territorial area of a Wards Committee and two persons residing within the territorial area of such Committee shall be nominated as members by the Mayor. The persons shall be nominated on the recommendation of the Chairman of the Wards Committee and such persons shall not have voting rights in the meetings.

The State Government has prescribed the duties, powers and the procedure for conducting the business of Wards Committees. These rules are summarised in the **Annexure-4**.

### Functional Review of MiC and General Body

After civic elections, the Mayor-in-Council was constituted by the Mayor in June 2005 as per Section 37 of the Act. Similarly, the Speaker has constituted the following Advisory Committees to advise in the affairs of the department concerned.

- ❑ Housing, Environment and Public Works Department
- ❑ Water works Department
- ❑ Health and Medical Department
- ❑ Market Department
- ❑ Education department
- ❑ Women and Child Welfare Department
- ❑ Food and Civil Supplies Department
- ❑ Rehabilitation and Employment Department
- ❑ Revenue Department
- ❑ Law and General Administration Department

The member of the Mayor-in-Council have been made Member-in-Charge of each of the above departments and he is expected to convene the meeting of the Advisory

Committee of the department concerned at least once in every two months and preside over such meetings.

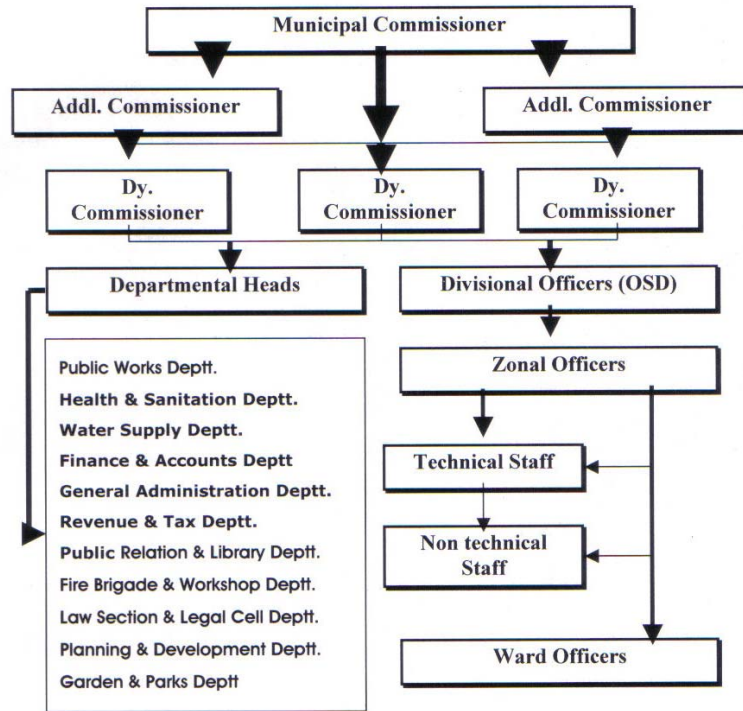
It is expected that the departmental proposals regarding the expenditure and developmental works shall be first discussed in the Advisory Committee and if approved, subsequently put to Mayor-in-Council or to other sanctioning authorities for sanction.

The organisation structure of the Deliberative Wing of BMC is presented in the enclosed **Tab 11.2**

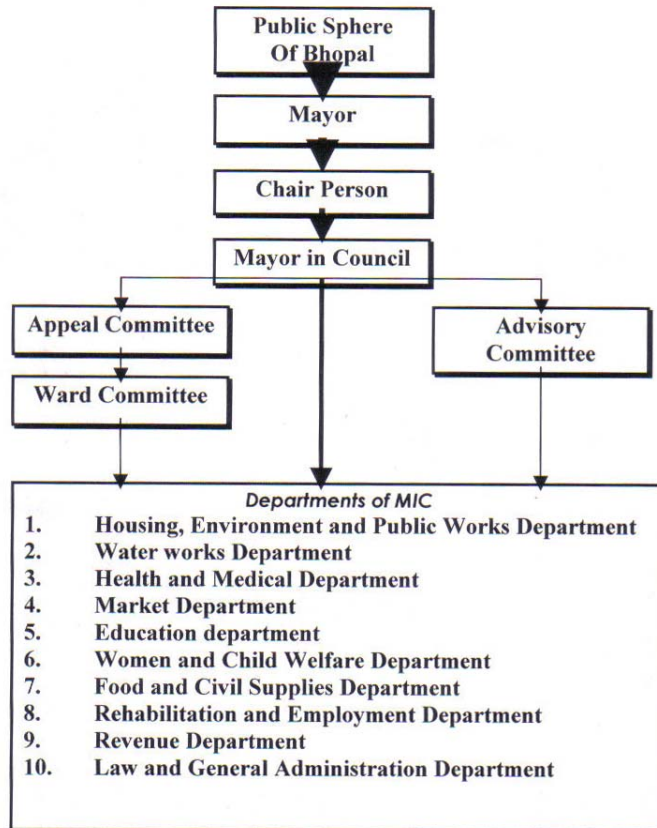
- However, it seems that the meetings of the Advisory Committees are not held regularly and many times expenditure proposals up to Rs.10 lakh are directly sanctioned by the Mayor-in-Council. There appears to be lack of proper coordination between the two wings, which may be because of the composition of the Mayor-in-Council, and General Body as different parties rule these bodies. Under such conditions, the Advisory Committees are not functioning effectively and could not contribute much in decision-making process.
- In view of this, there may be a tendency of undertaking proposals costing more than Rs.10 lakh in parts, for avoiding the submission of proposal to the General Body for sanction. In the process, the BMC may spend more as the cost of executing the work in stages is likely to be higher.
- There is no mechanism for monitoring the progress of capital works or other expenditure sanctioned by the Mayor-in-Council.



Illust.11.2 The organisation structure of the Deliberative Wing of BMC



Illust.11.3 The organisation structure of the Executive Wing of BMC



### 1.1.4b Executive Wing

The Municipal Commissioner is the administrative head of the executive wing. According to Section 69 of the Madhya Pradesh Municipal Corporation Act, the entire executive power for the purpose of carrying out the provisions of the Act vests in Commissioner and he shall also:

- Perform all the duties imposed or conferred upon him by the Act
- Prescribe the duties and exercise supervision and control over the acts and proceedings of all municipal officers and servants and subject to the rules or bye laws for the time being in force, dispose of all questions relating to the services of the said officers and servants and their pay, privileges and allowances.
- Take immediate action on occurrence of any accident or unforeseen event and report it to the Deliberative Wing of the Corporation and the costs if any, of such action and not covered by the current budget provision.

The various Departments under Municipal Commissioner have been divided amongst 2 Additional Municipal Commissioners. This deputation of power has been done under Sec 45 of the M.P.M Co Act. There are three Deputy Municipal Commissioners who are in charge of the central city functions of Finance, Engineering and the city planner deputed from the town planning department holds the central position as a coordinator to the front line administrative staff.

The implementation of the decentralisation process is in progress and there is no clarity regarding the role of the Central and Divisional offices and the functions and powers. The organisation structure of the executive wing is presented in the enclosed

#### Functions of the Central Office

The operations of the BMC are organised on functional basis headed by the Commissioner to whom the departmental heads at Central Office and Zonal Officers

report. The functions of the Central Office are as under;

- Policy formulation
- Planning
- Direction, control and co-ordination of activities of the zones and other departments

The departments of BMC and their functions are detailed in **Annexure- 6**:

### 11.1.4c Zonal Offices

For the purpose of better administration and delivery of services to the public, the area within the BMC is divided in to 14 zones. The Zonal Officer, who reports directly to the Municipal Commissioner, heads the Zonal Office. The officers that assist the Zonal Officer in the day-to-day operations are;

- Officiating Engineer – Public Works
- Officiating Engineer – Water Supply
- Chief Health Inspector
- Senior Tax Collector
- Office Superintendent / Accounts Clerk

For effective functioning of Zonal Offices, the functions and the powers of the Commissioner are to the Zonal Officers in three stages (**See Annexure-5**).

The decentralisation process is introduced in December 2001 and it is in transitory phase. It will require some time to streamline the functioning of the Zonal Offices and for providing adequate infrastructure, staff etc.

#### Functions of the Zonal Offices

The Zonal Offices will perform the following functions:

- Health and Sanitation
- Water Supply
- Property Tax assessments and Collection of taxes
- Lighting (Only Supervision)
- General Administration



### 11.1.4c Municipal Financial Powers

According to **G.O.No. 24-F-1-65-05-XVIII-3 dated 14<sup>th</sup> July, 2005**; the powers and functions of the Mayor-in-Council are as under:

**Tab 11-2 Financial Powers**

S No	Authority	Cities with more than 3 lakh Population	Cities with less than 3 lakh Population
1	Municipal Commissioner	Up to Rs. 10 lakh	Up to Rs.2 lakh
2	Mayor	Exceeding Rs.10 lakh but not above Rs.25 lakh	Exceeding Rs.2 lakh but not above Rs 10 lakh.
4	Mayor-in-Council	Exceeding Rs.25 lakh but not above Rs.1Crore	Exceeding Rs.10 lakh but not above Rs 25 lakh.
3	Corporation	Exceeding Rs.1 Crore	Exceeding Rs.25 lakh

Source: G.O.No. 24-F-1-65-05-XVIII-3 dated 14<sup>th</sup> July, 2005

The financial powers described above shall be exercised only subject to the following conditions:

- There should be budget provisions in the sanctioned budget and the amount available in the relevant budget head for the work concerned.
- In the technical cases, there should be the technical obtained in the manner prescribed in these rules.
- Such works which are of the policy nature or relevant to the whole city,

irrespective amount of expenses likely to be incurred therein, the prior approval of the council shall have to be obtained.

- The prior approval of the Corporation or the Council, as the case may be, shall have to be obtained for giving any grant or reward to any institution or person (excepting the employees).
- In the proposal for construction work in any ward, the recommendation/concurrence of the concerned ward councillor (if the office of the ward councillor in the concerned is not vacant), Mayor/Commissioner/Local member of Legislative Assembly/Local Member of Parliament, shall be necessary.
- The tender shall be invited for construction work or purchase in accordance with the provisions of Works Manual and the recommendation of the Tender Committee prescribed in these rules shall be obtained thereon.
- Where the amount of expenditure exceed rupees one thousand and does not exceed rupees ten thousand, it shall be necessary to call at least three quotations and it shall be necessary for the sanctioning authority to ensure that the rate which is being sanctioned is not more than the prevailing market rate.
- Provided that, prior to giving sanction, it shall be necessary for that sanctioning authority to ensure that the provision for the concerned expenditure exists in the budget.
- Provided further that the rate so sanctioned as per the quotation so called, shall be limited to the concerned work and shall not be used for any other work.
- Each authority shall give information to the authority senior to him within 15 days of the expenditure, exceeding fifty percent or more, of the maximum financial power vested in him.
- In case of exercise of the financial powers by the Mayor-in-Council or the President-in-Council, as the case may be, information in all relevant cases shall be submitted in the next meeting of the council.
- A proper communication system is necessary between the functional head

at Central Office and the staff looking after the relevant function in the Zonal Office.

- It is necessary to establish a proper Management Information System (MIS) between Central Office and Zonal Offices.

### 11.1.5 Key Observations and Issues

Key observations regarding municipal structure and functions are based upon discussions with a wide range of municipal authorities and elected councilors and secondary information available in the Corporation in the form of registers.

The observations with regard to structure and functioning of the deliberative wing and overall organization of the executive wing of the corporation are discussed under this section. The issues and program design elements with regard to functional departments of the executive wing are elaborated in the next section, based on a review of organization, systems and procedures of key functional departments.

#### Issues of Deliberative Wing

Key issues identified with regard to structure and functioning of the deliberative wing are:

- Inadequate co-ordination between Mayor-in-Council, Advisory Committees/General Body and Wards Committees;
- Inappropriate representation in the MIC constituted by the Mayor – includes members from the political party that have majority representation from opposition party in the General Body. This has resulted in occasions where there has been no consensus among the General Body and MIC regarding city-wide development projects aimed at improving delivery of civic services; and
- No adequate administrative and financial power given to the Wards Committees. Besides which there is also inadequate deployment of staff to the zonal offices making it difficult for

the effective project identification and budget preparation.

#### Issues of Executive Wing

This section discusses key issues regarding the overall structure of the executive wing and its functioning. A detailed assessment of issues with regard to the organization, systems and procedures and associated issues and program design elements for key functions of the Corporation are presented in the following section.

The key issues regarding the structure and functioning of the executive wing are:

- Several senior level posts lying vacant, many resulting from retirements, yet to be filled with appropriately qualified/experienced personnel;
- Very large span of control of the Municipal Commissioner – almost all departmental and sectional heads report directly to the Commissioner, thereby hampering effective supervision and control over overall functioning of the Corporation;
- Ad hoc arrangements made to address vacancies in key posts, resulting in loading individuals with additional functions of varied nature;
- Piecemeal efforts towards decentralization process due to lack of appropriate quality and quantity of manpower and inadequate financial resources for establishing the Zonal offices – decentralization not based on a clear reorganization plan;
- Designation of Zonal heads and HODs of town planning, traffic management, accounts and audits, etc needs strict regulations regarding the cadre qualification.
- Inadequate co-ordination between various departments – especially the assessment section to revenue section, town planning section to assessment section, water supply department to revenue section; etc
- Absence of a feedback and monitoring system with regard to capital expenditure proposals sanctioned by the competent authorities;

- Inadequate staff and infrastructure at Zonal office to execute decentralized functions; and
- Absence of an effective system/plan for communication of day-to-day transactions, between Zonal offices and central office.

#### **Observations Regarding Creation of Zonal Offices**

- The Executive Engineers and Assistant Engineers belonging to Water Supply or Public Works Department have been posted at the Zonal Offices and are functioning as Zonal Officers.
- The Zonal Offices do not possess the adequate authority, neither are they equipped with required infrastructural and skill-set support. In the absence of adequate power and manpower with requisite skills and experience, the decentralisation of activities may not yield the expected results.
- Officers at Zonal level are mere dispenser of higher-level authority orders. They don't possess adequate financial and execution powers.

#### **Key Financial Autonomy Issues**

The limitations of Municipal Corporation is coming more and more to light against the background of inadequacy of finances for serving the needs of growing urban communities, though finance is not the only factor accounting for their unsatisfactory performance. With the present level of revenue and expenditure, even obligatory functions are being inadequately performed. Municipal services and amenities are chronically short of basic requirements. With the present level of funds at their disposal, BMC is incapable of meeting, leaving alone expanding, and existing facilities in their charge. Ugliness is the dominant external characteristic of the city.

- Fiscal autonomy largely depends upon the extent to which own resources are raised by the local bodies. It is a fact that level of resources that can be raised locally is restricted by narrow economic base of local areas.

- Although the reluctance of local bodies to tax people and poor administrative capacity at the local level also account for the poor financial position of local bodies.
- SFC has examined that local bodies still have own resources, which can be facilitated by policy level changes.
- In a federal set-up some restrictions are inevitable.
- A highly decentralised tax system may distort the allocation of mobile resources or factors of production and stand in the way of creation of a domestic common market.
- Since self-effort to raise resources may be one of the criteria for determining devolution of resources from the state government to local bodies, the SFC has made efforts to collect such data from local bodies and also ascertain reasons for poor performance on this front.

#### **11.1.6 Strategic Elements for Program Design**

Some of the specific programs that BMC may have to undertake to address the issues identified above are:

##### **Strategies for Deliberative Wing**

- The role of the Information Cell should be strengthened under the Right to Information clause in the Municipal Act to the extent that no other platform for the information dissemination is required. This cell should be the hub of all the latest and chronological information. This cell should be designed to hoard sufficient data in the relevant formats. The initiative has already been taken by the Corporation to put the information on their website; and
- Establishing an appropriate and effective organizational set-up at the zonal office level, to support the Wards Committees in planning, decision-making and implementation of developmental works.

### Strategies for Executive Wing

- ❑ Regrouping of activities on functional basis in order to reduce the number of persons directly reporting to the Commissioner and establishing reportability through Deputy Municipal Commissioners and other departmental heads;
- ❑ Filling vacancies, especially at senior levels, with appropriately qualified personnel through fresh recruitment or by promoting experienced internal staff with appropriate training;
- ❑ Establishing a comprehensive municipal management information system (MMIS) that facilitates communication between Zonal offices and the central office, the MMIS needs to facilitate maintenance and management of functions related to all departments of the Corporation;
- ❑ Establishing full-fledged, well-equipped Head and Zonal offices and ensuring right sizing of staff at these offices based on a plan for executing the functions delegated to them.
- ❑ To appoint officials of the cadre of Deputy or Assistant Municipal Commissioners as Zonal Officers in the Zonal offices.

## 11.2 Bhopal Municipal Corporation Governance Overview

In order to translate new policies and paradigm into practice, a framework of the objectives is to be prepared.<sup>4</sup> It should clearly spell out economic, environmental, financial, social, constitutional and political objectives. With the ongoing economic liberalisation and devolution of power to

<sup>4</sup> *In the past, the solution to urban ills was often seen to lie in preventing further urban expansion. Now, the answer is thought to be greater investment in cities. The problem is not urbanisation itself but more the inability of some cities to afford the necessary infrastructure to keep pace with the rate of population change and increase in construction as income rise. Many now argue that with adequate public and private investment and improved urban management, most cities should be able to improve their local environment and reduce their contribution to global environment degradation.*

local bodies, gone are the days of armchair professionals. Their insulation from the general masses and the political system may be catastrophic in the changing environment, where participatory decision-making is becoming institutionalised. Among the professionals, who require expertise exercised with integrity, skills are necessary to strike a balance between the political process and service delivery.

Bhopal Municipal governance is bound with the objective of better functioning, efficient and effective service delivery to the inhabitants of Bhopal City, especially to the disadvantage sections of the society as envisages in the recent policies and Good governance global agenda.

### 11.2.1 Local conditions

The settlement pattern of the city mainly consists of five settlements Upper Lake, Old Bhopal, Lower Lake, BHEL area and the new developments at the fringe of Municipal limits. The percentage of population that commutes to work every day is 7 to 10% of the total. Bhopal being an administrative centre and capital of the state also enjoys potential for diverse economic and cultural development. Owing to the opportunities of the city location and available infrastructure as compared to other in the state many firms have been established in the last few years but the traditional small-scale industries are not getting the required boost in the corporation area. The local society although remarked as progressive in certain fields, actually not getting a favorable environment of flushing in the region.

### Local Public life, Organisations and Media

Although as general perception local people of Bhopal are satisfied with the things going in the country in general, contradictorily many of them were quit dissatisfied with the, way things are going in Bhopal city. A very common conclusion can be drawn on the question of how things in the local community in five years from now would be, the answers were mostly

much better and a few exclaimed no change.

Regarding Social tension between people in the community the most prominent reason quoted are the; Differences in ethnicity and regionalism, Differences in religious beliefs, Differences in income, Differences in political opinions, Differences between residential areas, Differences between long-time residents & those who moved here recently

Generally people trust each other, but they don't respect and observe legal rules (such as Traffic or tax regulations). Despite of small conflicts and agitation in and around, the city could not be judged as hostile. But in the past few years the trust within the people has decreased and so as the trust in local government. The power of civic organisation as always remained out of the city development scenario.

The last few years have witnessed a crucial deficiency of drinking water in various parts of the city especially in summers, this issues was a major concern of the people of Bhopal. Last year there had been many public demonstrations. There are cases in which the local government decisions have been challenged in the court of law by the local residents and groups in the city. On the contrary the influence of the local residents on the decision making of the local government is absent to a greater extent.

The role of civic organisations and local residents is limited in the decision making process of the local government, an increasing trend of the big business house and local private entrepreneurs is felt with the inception of the programme by BMC as Jankarya by Jan-bhagidari with external financial support from many interested business associations specially banks in the beautification of the city.

A limited number of occasions can be identified in which a civil organisation participated in the preparation of a decision of local government, but certainly there are provisions in the book of rules of the Municipal Corporation by which through

membership in a committee or subcommittee of the local government can be made. Recent cases has briefed that Municipal Corporation is now taking steps forward to consult the experts of the respective fields and make the projects more implementation oriented.

The Municipal Corporation also gives assistance in terms of financial or in kind support for civic societies working in the field of social and city level issues. But a clear symbiotic relationship lacks in the process as civic societies are neither asked and nor they are bothered of their role in any type of decision making in the government. This is clear from the fact that despite of the efforts of the corporation and media in the city there could not be done much with the privatisation or rendering of services to an external agency.

There are newspapers that, from time to time, give some coverage of public affairs in your municipal corporation, which include coverage from regional to national level news.

The medium of communication of majority of the city was claimed to be Hindi and so the Hindi news papers are more prominent in the city to name some is Dainik Bhaskar, nai Duniya, Dainik Jagran, Nav Bahrat etc, beside these many a evening news paper is also very famous in the region named Sandhya Prakas. A local news paper published in the city which regularly deals with city affairs is Swadesh and Rajshree.

The news papers regularly publish the updates of the projects and programme of the local government and also the arguments and counter arguments of the councilors in the local assembly.<sup>5</sup>

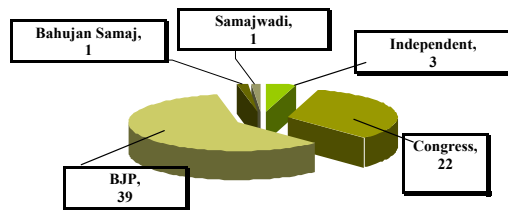
<sup>5</sup> *In the view of the local representatives, now a days the influence of media cannot be ignored as it has become the part and parcel of the city governance [Media is been used for both the purpose, but the increasing role of media in decision making of local government cannot be ruled out completely, as a matter of fact Bhopal has a glorious history in terms of Journalism, as electronic media has entered our life the flash news of every single second from every walk of life is accessible by the common providing a*



### Political structure and composition

BMC has 66 elected members. The BJP is the dominant party with a clear majority of 39 councilors, 22 councilors are Congress and the remaining five are independent candidates. In Bhopal, however, the Mayor represents the minority Congress party. The detailed composition of the council is as follows:

**Illust 11.4 Detailed composition of Council**



While the mayor is from Congress, the chair of the MiC who is elected from the majority of councilors is, not surprisingly, from the BJP. Given the fact that the ruling party at State level is BJP, the MiC chairman's position and role in BMC is rather more prominent than might ordinarily be expected. The BJP group in council is viewed by Congress members as having the upper hand in municipal politics given their close links with the State government, in spite of the fact that Congress members are affiliated to the national government which is viewed as a rather distant linkage. The result of these complex dynamics, where the mayor commands neither a majority of members nor control over the MiC leadership, is a situation where all key decisions first require consultation with BJP members to gain quorum. This, in turn, means the process of achieving consensus is somewhat more protracted in BMC than elsewhere, although the result is a high level of political transparency.

*better platform to the voice of the residents of the city and many a times canvases a real picture of what is happening, where, when and why, the sad part of the story is, the use of media by few influential individuals for their personal benefits in the name of public welfare which actually remarks the authenticity of the facts as 'questionable?']*

In Bhopal, although there are multi-level dynamics between the majority party, MiC members and State government on the one hand, and Congress and the mayor on the other, there tends to be consensus on most development matters. The council has recently taken some tough decisions with regard to improving revenue mobilisation including swift action on tax defaulters as well as publicising the names of specific defaulters. There has been much less consensus, however, on the issue of raising water tariffs. The previous council agreed to increase water charges from Rs 60 to Rs 150 but the present council has lowered these back to Rs 60. Although the council accepts the MoU signed by the previous council for the ADB loan, it appears not to be addressing the repayment very aggressively. This is mainly because councilors feel that while they can take credit for the implementation of the project, the repayment issues will largely fall on subsequent councils. There have been instances when the city-state dynamics have worked in favour of reform decisions. The MiC, for example, decided to introduce a surcharge of Rs 1 per litre of petrol to raise additional revenue for road maintenance. The proposal was initially rejected by the BJP opposition council but later approved after the intervention of the State government.

### 11.2.2 Recent Institutional Reforms

#### Municipal Accounting and budgeting

The Bhopal Municipal Corporation has initiated the process of Conversion of Single Entry System into Double Entry System w.e.f. 01/04/2005.

Earlier the accounts of the Corporation were maintained on Single Entry System. The Accounts department was not computerized and the accounts were maintained manually. Since 1st April 2005, the following procedure has been adopted :

- The Budget of the Corporation has been designed with the consultation of HOD's and they have been made responsible to manage the affairs in



accordance with the Budget provisions proposed by them.

- Expenditure has been booked against the Budget provision and budget control mechanism has been initiated.
- Monitoring of Income of the Corporation in terms of Taxes and fees has become possible through Budget.

Since, the process has been initiated on “In house Computerization” basis, the capacity building of the Staff of the Corporation was a great challenge.

To provide the training for Conversion of Accounting system and Computerization thereof to the staff of the Corporation a Computer training centre has been established.

### Revenue Reforms

The Corporation has already initiated the Computerization of the Revenue system. Particularly the Property Tax and Water Rate data base and the billing thereof were automated. Survey of the Properties is being started ward wise and the same is under progress. The task of delivery of the bills is also entrusted to a private courier firm for timely supply of bills to consumers/parties.

The Revenue System is also in the process of linkage with the accounting system and this target is yet to be achieved by the Corporation.

In brief, it may be concluded that the Corporation has initiated the process of Conversion of prevailing Accounting System into Accrual Based Double Entry Accounting System. And the target may be achieved in 3 years i.e. in the year 2007-08.

### Municipal Decision-making

The cooperation from civil organisation and voluntary cooperation from residents in launching a program / project had never been that promising to the local government, in-fact the decisions of the local government are received with a bit of animosity rather than being supportive.

Powerful vested groups in the society have incredible influence on the decision making of the local government on the other hand the ordinary citizens play a role of uninvolved critics. With the recent efforts under city consultation process have been initiated with the surveys conducted by municipal officials and local representatives in the respective wards *[The problems are collected from each ward in a prescribed format by the ward officers on regular basis. A new initiative of organizing Jan-sampark Abihyan has been under taken for the same purpose, it is proclaimed in the GO's of the authority BMC that the case will be looked upon, discussed and shall be solved in a week time]*, but the decision making process is quite slow *[Very often the representatives of the local government emerge from their long meetings without having reached a decision]* and the solution to even generic nature as Water supply, sanitation and solid waste management were not resolved in many a cases except few.

Generally speaking, the implementation part of decisions made by the local government is not very successful until and unless it is supported by the higher level government, one of the reasons could be the existence of partiality in the dealings with individual representatives

The process of decision making generally takes a long path through various pipe lines as;

- Preparatory work undertaken by the Mayor's Office.
- Pre-Consultation with authorities as the National Health and Safety Commission, the Land Registry Office, or ministries.
- The deliberation of the committees of the municipal council
- When the Mayor develops an opinion on the matter.
- Discussions and negotiations between the councilors.
- Discussions and negotiations with the people directly affected by the decision.
- The debate on the floor of the municipal council monthly Outstanding.

### Municipal Policy Making

The mandatory sessions of the council is to meet every month, the year 2004 Bhopal council had a total of 18 sessions of which 6 were extraordinary. But the acts revealed by most officials of BMC is it was a general trend that the session of the assembly ended , suspended or cancelled because of lack of quorum. The reasons of several decisions postponed at almost every session were;

- Lack of information, the councilors deem the proposal was insufficiently prepared
- Lack of time
- Some councilors try to prevent the adoption of a proposal through postponing the decision
- No agreement is reached in the assembly
- Some councilors or factions need more time to develop a firm opinion on the matter

Recently with the recommendations of SFC and financial and technical assistance from Asian development Bank, HUDCO, and ICLIE, local government have taken initiatives to prepare program, regulation, or action plan for basic services delivery, public sanitation and environmental protection programme. The corporation still lacks long term economic development, investment plan for the city. The general programme of the Corporation includes Programme on public education and health, Sports and cultural activities in the city. An action plan for traffic and transportation is also prepared by the external agency (LASA). The work of Computerisation is under process and the web site is likely to be launched in the near future for facilitating and informing citizens about the activities of the corporation.

The administrative cost of local government office is regularly reviewed by the council and provisions are taken in to account for reducing it gradually. More recently a FOP for the infrastructure development in the city is under taken in the preparatory report formulated for the sanction of funding from

ADB<sup>6</sup> for the projects under different heads. Every three months the review of the functional and financial status of the Municipal Corporation is done by the head of the UADD Bhopal in presence of the departmental heads of BMC and concerned Dept. The corporation has also make up mind to privatize or contract out functions for the better service delivery to the citizens. Expression of interest for certain functions as computerization and data base management have been invited by the BMC. But the degree of privatisation is low as stated by the respondents as for many local hindrances in the system itself. The respondents believe that the privatisation initiatives by BMC yet not very promising in terms of reducing the number of local government employees infact many of them felt in most cases this is the reason for not achieving the objectives of privatisation of municipal services.

Inability of councilor to set priorities regarding different types of issues is an issue; the reasons include the conflict within different groups of councilors and with municipal administration, given the present resources the unclear responsibilities assigned to the Municipal Corporation by the central and state are many that to, with restrictions of standards and norms imposed. The discretion of Municipal authorities in determining local development policies is little, the reason being lack of capacity in the Managerial and technical front, but the municipal restructuring is also not very easy.

### 11.2.3 Bhopal Municipal Governance Status

Objectives of good governance are to ensure that "political, social and economic priorities are based on broad consensus in society and that the poorest and the most vulnerable are heard in decision making

<sup>6</sup> [ADB grants 1500 cr aid to MP Jul 9, 2004 ...](#)"The ADB has approved the developmental projects at Indore, Bhopal, Gwalior, Ratlam and Bhopal and Ujjain," Malayya told reporters here. ... Economic Times, India -

over the allocation of development resources. The section in particular reviews the status of Bhopal Municipal Governance on the basis of certain parameters and indicators.<sup>7</sup>

### Effectiveness

The functioning of the city depends to a large extent on the effectiveness of the local government and the quality and cost of services it provides. The financial resources available at Bhopal are 54% as the property tax<sup>8</sup> and the government transfers constitute another half of the total revenue. The over all revenue has increased by 16.4% as compared to the expenditure by 11.3% in the year 2002-2003, showing a better financial performance.

The recent collection and balance between the sources of income provides an indication on the viability, independence and control over resources of the local government, and thus its effectiveness.

<sup>7</sup> *Effectiveness: Major source of Income, Predictability of transfers in local govt. Budget, Published performance delivery standards, Consumer satisfaction Survey, Existence of vision statement.*

*Equity: Citizen's Charter: Right of access to basic services, % of Women Councilors, Pro-poor pricing policies for water, Incentives for informal businesses.*

*Participation: Elected Council, Elected Mayor, Voter turnout and voter participation by Sexs, Public forum, Civic Associations per 10,000 population.*

*Accountability: Formal Publication (of contracts/tenders, budgets & accounts), Control by higher levels of Government, Codes of conduct, Facility for citizen complaints, Anti-corruption Commission, Disclosure of income/ assets, Independent audit*

<sup>8</sup> **Property tax includes consolidated tax and other cess recently accommodated with as general tax.**

Predictability of transfers to the budget as effective tool for planning and implementation of institutional development or project planning and implementation lacks in the Bhopal Municipal Corporation. Moreover, is set on the criteria of arithmetic projections in the previous account heads by 10% increase every year. This imparts foul confidence of higher level of government in local government and consequently regular support for local development.

The corporation does not have published performance delivery standards, mechanism that is required for the efficient delivery of key services. The presence of standards and benchmark is a first step towards realizing the delivery of services.

It may also point to:

- Increased confidence of local population in the local government;
- Adherence of the government to equitable distribution of services;
- Popular public participation and influence over its administration.

On the same lines BMC also lacks frequent consumer satisfaction survey, infact few survey held up till now are done by outside development agencies. It becomes difficult to understand willingness of the local administration to receive critical feedback from the local population and also the willingness to modify existing systems for working with the local population, which is likely to enable them to be more effective. By asking for feedback from Local Population, the Administration is holding itself accountable to the people.

BMC's process of formulating a vision statement implies a first step commitment of the local authority towards welfare and aspirations of its people. In principle, the vision statement exemplifies all the components of good governance like accountability, efficiency, equity, participation and security. A vision statement articulated in a participatory manner increases its accountability and ownership.

## Equity

Mandated number of women councilors in BMC council indicates the gender equity in representation of women involved in municipal government decision-making processes as fundamental to promoting more equitable policies, plans and projects. It also indicates:

- Participation: Equal participation of the women is a fundamental human right.
- Accountability: Representation of women in the local government to improve the responsiveness of decision-making processes on specific women issues.
- Effectiveness: Policies, plans and projects to be more effective if the priorities of both men and women are equally and equitably addressed.

Recent reforms and interventions of Pro-poor pricing policies (Under process) for Urban Infrastructure services signifies commitment and measures undertaken by BMC for equitable distribution of basic services (water as the key service) to its entire people commensurate with their economical conditions, especially the poorer sections.

Hawker zones in the various city locations for informal businesses shows the efforts of government in providing equal opportunities for informal businesses for the economic welfare of society. It may also work towards reducing corrupt practices in the government benefiting from such informal vending and provide security of employment to a large section of society.

## Participation

Elected Council<sup>9</sup> indicates that the local population has had a role in identifying the personnel most suitable for governing the city as part of the council and therefore signified civil society participation.

<sup>9</sup> An elected council is more likely to make decisions that are more representative of the wishes of the local population

Elected Mayor indicates involvement/participation of the local population in decision-making.

- Effectiveness: The decisions of an Elected Mayor are more likely to be representative of the wishes of the local population, and hence the government is likely to be more effective
- Accountability: An elected Mayor is more likely to be accountable to the population that he/she represents, than a nominated Mayor.

The lower voter turnout and voter participation by sex in the Municipal corporation election (2004) indicates lack of interest and involvement of the public in local government. Low participation in representative democracy may, however, be balanced by higher levels of participatory democracy. It may also indicate:

- Equity: women's inability to participate equally in formal elections. If disaggregated by income levels, it may also indicate the meaningfulness of voting to the urban poor.
- Effectiveness: strength of local government's development mandate; perceived relevance of elections results for affecting the quality of life in cities
- Accountability: at the extreme, indicator may suggest that elected officials are not accountable to the population.

The existence of People's forum indicates the availability of informal or formal mechanisms for the public to express their views and share their issues with peers.

The vibrancy of associational life in a city, with larger numbers indicates greater vibrancy. Organized groups are vital for effective participation. It may also indicate:

- Equity: larger numbers indicate the existence of organizations representing the urban poor, women, minorities or other normally excluded groups.
- Accountability: civic organizations help ensure the accountability of local government, through the mobilization of people behind the issues that affect them;

- Effectiveness: the existence of many civic associations also facilitate the formation of partnerships for the delivery and/or maintenance of services
- Security: civic associations can foster a sense of community that can reduce the individual member's vulnerability to crime and corruption and act as a social safety net

### Accountability

The open flow of information is vital for good urban governance. Bhopal Municipal Corporation has made provisions for formal publication of information regarding contracts and budgets indicate the willingness of the local authority to be transparent in its activities and accountable for its decisions. It also indicates a greater confidence of people in the local government and integrity of auditing and monitoring. It may also indicate:

- Participation: willingness to involve the public in setting/debating budget priorities and in the evaluation of its procurement processes
- Equity and Effectiveness: publication of financial information to encourage participation in decision-making can not only help eliminate opportunities for corruption, but helps to ensure that scarce development resources are used most equitably and effectively.

Control by higher levels of Government to close local authorities or remove councilors at its discretion, councilors are likely to be more accountable upwards rather than downwards to their citizens. It may also indicate:

- Less effectiveness: possibly because the local authority does not have sufficient autonomy and resources to act, but also possibly because the local authority has not proved capable of carrying out its responsibilities
- Less Participation: if accountability is oriented upwards, a local authority may

not feel it necessary or worthwhile to promote local participation in decision-making;

BMC's published code of conduct signifies the government's commitment towards integrity of its officials. It may also motivate and enhance the behavior of its official and help reduce corruption.

Facility for citizen complaints in public grievances cell indicates Bhopal Municipal Government's responsiveness towards integrity of officials and shows the willingness of the government to be responsive for the welfare of its citizens.

Disclosure of income/ assets by the official and elected represented of the Municipal corporation is made as a provision in the rule of law, but for the unforeseen reasons never been practiced. Which imparts the accountability of the decision-makers in the government and their genuine interest in the welfare of the local people as questionable?

A regular independent audit made in the corporation after the adoption of double accounting system indicates the accountability of the local government towards its taxpayers and transparency in providing resources for development projects.

## 11.3 Urban Governance Issues and Strategies

Having the overview of the Municipal Governance, Structure, Procedures and Practices involved certain major issues are identified and respective Strategies can be formulated to design and implement programme and projects under JNNURM.



**Table 11-3 Urban Governance and Institutional Strengthening Strategies**

Issues	Strategies	Programme/ Projects	Responsible Agency	Implementing Agency
Though preparation of development plans has been included in the functions of MC, adequate policy reforms and operational support at state and local level has not been realized	<p>Policy interventions especially at state level to include planning powers to the Corporations.</p> <p>MCs need to have a technical arm strengthened to prepare and implement development plans which requires cadre revisions</p>		GoMP	GoMP/BMC
Coordination and rationalisation of inter-institutional relationship has to be effected for better result between the municipal authorities and Parastatal Bodies	Clear demarcation of roles and functions between BMC and Parastatal Bodies so that there is no overlapping of the executive powers.		GoMP	GoMP
Planning capacity, human resource development, financial management are not developed, which results in operating inefficiencies;	MC's may be facilitated with the formulating of Planning Cell, Cadre revisions to improve human resources which should be a part of comprehensive capacity building plan of MC	Review of managerial, Technical gaps in BMC and strengthening project development and management mechanisms.	GoMP/BMC	BMC
		Formulating E-Governance Programme	GoI/GoMP	BMC
		Incentives to promote private participation and NGO in service delivery	BMC	BMC

		Awareness programme for private entrepreneurs regarding city administration and urban basic services.	BMC	BMC
		Awareness programme for Bhopal municipal officials regarding efficient working hours and responsiveness.	GoMP/BMC	NGO's/ Planning and management institutions.
Adoption of modern technologies and procedures will help MC to take up physical development in an integrated manner;	GIS Survey and detailed Structural plans for city basic services and asset inventory.	Training and capacity building programme for employees of BMC to adopt modern tools and techniques.	GoMP/BMC	BMC /Planning Institutions
Poverty alleviation not being an obligatory function of Corporations, MC is not adequately equipped to contribute effectively in the various central/state programmes for the poor. Stumbling blocks being lack of data, convergence with other agencies and community participation;	A dedicated department for slum upgradation with adequate staff and financial support is required.  Need assessment of personnel at different levels arising from new investment, method of recruitment and placement; subsequent restructuring if necessary.	Project inputs from social planning agencies with proactive involvement of NGO's and CBO's	GoMP/BMC	Social Planning Institutes
The city is more used to design and implement location-specific repair, maintenance and improvement works, rather than city-wide integrated systems development planning and execution;	Formulating a city Vision as shared perception of all stake holders of the city in order to get timely support from all quarters.	Formulation of a city Development strategies plan for Bhopal with detailed CIP and FOP	BMC	BMC
Absence of a relevant HRD programme.	Functional reorganization/ restructuring and delegation of powers to the departments is necessary to enable them to perform better.	Restructuring of existing organisational setup.	GoMP/BMC	BMC

Summing up, all the salutary recommendations as well as the constitutional amendment clearly favours an unbundling of administration through decentralisation and is the very essence of good governance which enables the people to share in the development decisions as their own doing. While it is all very well to delineate the elements of good governance, there appears to be a looming chasm between the percept and the practice.

The present changes in the political and administrative reforms have helped BMC in strengthening of the Functions, Finances for the Functions and Functionaries to a greater extent. This is reflected in the impact of institutional development, services and finances of BMC. Although examined with an increasing trends the activities under institutional development still has not achieved the satisfactory levels. The recent Financial and other reforms of restructuring and reorganizing suggest an overall shift in the traditional mind set of the Government and the Governed.

The decentralisation initiatives envisaged in the CAA in context to BMC can be concluded as, though local self government in Bhopal has deep regards to the objectives laid under the agenda and few reforms are taken in the direction they shall be rated as average, though the state may have higher index in comparison to the others. There is a wide scope an unmistakable opportunity for BMC to fundamentally rethink on how they function and how they intend to develop their localities. The Document intends to formulate Short term, Middle term and Long term strategies in institutionalising better functioning and services to city residents especially urban poor.

## Chapter

## 12

Problems  
and Issues

## 12.1 Water Supply

## 12.1.1 Problems and Issues

- Though the actual water source is sufficient in today's context the capacity of water treatment is inefficient to produce the treated water as per the water demand.
- If ever the source is able to produce the required water demand there is no adequate storage facility of water produced, which is half the water demand per day.
- The sources have the capacity to reach the demand but the water supply network is inadequate to cover the whole city.
- Each community Stand post serves about 95 persons which is more than serviceability suggested by EIU/S
- The present water supply Network is highly inefficient due to Leakages, Dilapidated Network
- There is no accountability of water produced at source and Treatment Plants as well as the water consumed at consumer connections.

## 12.2 Sewerage

## 12.2.1 Problems and Issues

- The terrain and physiography of the city is a constraint toward

development of an efficient sewerage network. The sewerage network needs lots of pumping facilities to take it to STP's

- The present sewerage network serves only 30% of the city rest of the entire sewer generated is either directly flows in to the open drains and nallahs or disposed in Septic Tanks where the effluent flows in the open drains and nallahs in the absence of Soak pits.
- The sewage treated in the STP's is only half the capacity because the existing network can only collect that much.
- The existing sewerage network is worn out and dilapidated condition further decreasing its efficiency.

12.3 Solid Waste  
Management

## 12.3.1 Problems and Issues

- The efficiency of the Solid Waste collection mechanism is low, where 60% of the Solid Waste generated is collected and disposed.
- The Solid Waste Management Mechanism lacks Primary collection and Storage
- The mechanism also lacks in the synchronisation between the collection storage and transportation of Solid Waste Management
- The Waste is not at all segregated as Organic and Other Wastes.

- The Municipal Corporation doesn't have Biomedical waste Disposal System.

## 12.4 Storm Water Drainage

### 12.4.1 Problems and Issues

- Most of the roads in the city don't have drainage.
- The existing primary and secondary drains need to be desilted to improve their capacity
- The major nallahs and rivers, which carry storm water discharge, need to be desilted and cleaned. Increasing their cross section will improve their capacity.

## 12.5 Transportation

### 12.5.1 Problems and Issues

- Bhopal City has many missing links, which affect the mobility of the city in terms of circulation and traffic flow.
- The different hirarcheal roads have carriage way less than the traffic volume they carry. Their capacity needs to be improved by developing full cross section, adding medians wherever necessary, which will also eradicate bottle necks and make the traffic flow smooth and fast.
- The inadequate road facilities such as service roads, footpaths, streetlights, signages etc. are threat to the road safety.
- The mobility of the traffic is also retarded due to the numerous junction with high traffic intensity, Heavy vehicle turning movements

and lack of channelisation of the traffic.

- The inner city area which serves as commercial center seriously face parking problem, with the carriage way being utilised as parking reducing the capacity and ultimately increasing traffic congestion.
- Regional transport network has the bus terminals in the densely developed areas causing traffic congestion. The transport terminals lack in the facilities.
- Some of the Transport corridors have a heavy flow, which can be seen as need for Mass Rapid Transport System.
- There is no organized truck terminal facility in the Study Area. Generally within the BMC area trucks are parked in Bairagarh, Gandhi Nagar, Khaji Khera, Subhash Nagar, Nishatpura besides the old city areas.

## 12.6 Environment

### 12.6.1 Problems and Issues

- Air quality of Bhopal revealed that at places where traffic density was the highest so as the pollution level.
- The constant increase of traffic load in the city calls for taking appropriate measures for constant monitoring of emission from vehicles and penal action against polluting vehicles to reduce automobile pollution in the city which otherwise may rise.
- The ground water near the sewage fed drains and open drains carrying sewage is found to



be contaminated by fecal coliform, which is not healthy for consumption.

- The development activity and expansion of the city leading to discharge of waste water in the upper and lower lakes, which is a serious threat to these water bodies.
- The green cover in the city is though as per the needs but the need to be improved and some new greens has to be developed to address to the environmental pollution situation.

## 12.7 Inner City Area

### 12.7.1 Problems and Issues

- The inner city areas have very narrow streets they are been encroached by street activities and the parking facilities.
- The inner city lacks in parking areas

## 12.8 Urban Heritage

### 12.8.1 Problems and Issues

- Bhopal is rich with many historically important heritage structures, which represent the social and cultural ethics of the city, which need special attention.
- Conservation, adaptive reuse and improvement of the structures are a need.

## 12.9 Slums

### 12.9.1 Problems and Issues

- There is about 25% shortage in housing supply in Bhopal City. The majority of housing shortage is for urban poor.

- 75% of the households belong to LIG and EWS, and BPL Category. (LIG 35%, EWS 25% while EWS 15%).
- 35% of the population and about 125000 households live in slums notified by Madhya Pradesh Slum (Improvement and Clearance) Act. 1956.
- Though all the Slums have access to water but they depend upon Community Stand posts but the number of beneficiaries per community stand post (5000 Nos.) is 95, which is double the EIUS recommendations
- The majority of slums in the City lack in basic infrastructure such as sanitation and solid waste management.
- Limited slums have paved roads and community hall.
- There are lots of Government interventions been implemented towards betterment of the slum community but they lacked integrated approach.

## 12.10 Strengths of City

- Strategically located with both major Rail and Road connectivity.
- Being State Capital invites important investment, is on high priority of government and is in the thick of activities
- Industries and other economic activities improving the economic base of the city.
- The city is house some of the eminent institutes of National Repute such as Maulana Azad National Institute of Technology,

Law Academy and other Professional institutes.

- Tourism if addressed in proper manner can be an advantage to the city.
- The city is rich with natural gifts like Lakes (around 14 lakes), which have good potential for the development of recreational facilities as well as environment protection.
- The topography and landscape improve the amenity value of the city.

### **12.11 Weakness of City**

- Bhopal lags behind many other cities in the State and Country in terms of total literacy. However, the higher education and specialized education scenario is much better in Bhopal city with a large number of academic and research institutions of national repute present in Bhopal.
- Though Strategically located lacks Air connectivity
- Poor basic infrastructure especially Water, Sanitation, Roads and power.
- Poor local transport increasing the commuting time and low serviceability
- Congestion in old Bhopal Area and unhygienic conditions.
- 75% of the population in LIG and EWS Category, while 35% of the population living in slums, lacks social development.
- Higher rate of taxation, which is damaging economic prospects.

## Chapter 13 Vision and Goals

### 13.1 Vision of City



Bhopal city founded by Raja Bhoj-The Parmar King in 11 century on the banks of Kolhan River. Upper Lake was created by construction of dam on Kolhan River. The city was ruled by Nawabs in 18<sup>th</sup> century, they fortified it and gave it a new shape with Islamic Architecture.

It became capital of Madhya Pradesh in 1956. Today Bhopal has blossomed into a city, which in spite of being modern upholds the patrician mark of its bygone rulers. The city provides a fascinating blend of scenic beauty with its lakes, parks, temples, mosques, gardens, museums, statues and buildings.



Urban image of the city is a collective visual appearance contributed by natural and man made elements, like Jumerati Gate, Kamala Park, Raj Bhawan, Chowk area, Jama Masjid, Moti Masjid, and Gauhar Mahal etc.

Bhopal inspite of being State capital with possession of rich heritage, scenic beauty is facing some problems of inadequate infrastructure and majority of population living in sub-standard conditions. There is a threat to the environmental condition and scenic beauty in the City of Lakes. JNNURM has provided the opportunity to the citizens of Bhopal to decide the future of their city. Bhopal Municipal Corporation being the representative of the citizens had taken this opportunity to formulate the City Development Plan to achieve the Vision for the city.

The long term vision conceived by the BMC for Bhopal City -

*Bhopal with its rich cultural heritage shall transform in to a Modern Capital supplemented by better urban lifestyle, better environment and physical social and economic upliftment of Urban Poor*

**The initiative under Jawaharlal Nehru Urban Renewal Mission will provide a**

**platform for the city to achieve this long term vision.**

The long term vision of making Bhopal a modern urban city is perceived to be achieved by first creating a desired level of infrastructure which will then be used in coming years as a platform to take a quantum leap to achieve the status of a world class city.

It is therefore perceived to focus towards following elements for the development of Bhopal City -

- ❑ Physical Sustainability
- ❑ Improved Mobility
- ❑ Slum Free Bhopal
- ❑ Eco friendly City
- ❑ City Beautiful

The elements of achieving the vision can be elaborated as;

**Physical Sustainability**

- ❑ Water for all
- ❑ Safe Sewage Disposal
- ❑ Solid Waste Management

**Improved Mobility**

- ❑ Proper Road Network
- ❑ Bridges and Flyovers
- ❑ Access to Public Transport
- ❑ Road Safety

**Slum Free Bhopal**

- ❑ Housing for Urban Poor

- ❑ Minimum basic Services to Urban poor

**Eco Friendly City**

- ❑ Conservation of Lakes
- ❑ Green and Clean Bhopal

**City Beautiful**

- ❑ Conservation of its rich Cultural and Built Heritage.

## 13.2. Goals

### 13.2.1 Water Supply

*The year 2011 sees a water demand of about 265.0 MLD for about 20.0 lakh persons at 135 LPCD. The year 2021 sees a water demand of about 345.0 MLD for about 25.50 lakh persons at 135 LPCD, an ultimate capacity of 415.9 MLD and storage capacity of 200 million by the year 2039.*

S.N	DESCRIPTION	2005	2010	2015	2020
1	Water supply liters per capita per day Average – net supply - LPCD	80	120	125	135
2	Transmission and distribution losses	40	20	20	20
3	% Population Covered	67	80	100	100
4	% Area covered	70	100	100	100
5	Total supply / storage capacity	198/86	265/120	345/170	345/170
6	No. of hours of supply	45min per day	24 hr.	24 hr.	24 hr.
7	Total water supply from surface sources / Treatment capacity	198/198	265/265	345/345	345/345

### 13.2.2 Sewerage

*The year 2021 sees a wastewater generation of nearly 275 MLD by about 25.5 lakh persons through 100% population and area coverage (to be achieved by 2009). For the year 2021, an ultimate treatment capacity of 275 MLD is envisaged. The sewerage line network will be extend to a length of about 500 km.*

S. N	DESCRIPTION	2005	2010	2015	2020
1	% Population Covered	30	70	80	90
2	% Area covered	30	60	90	90
3	% of sewage treated	20	80	80	90



### 13.2.3 Storm Water

***By the year 2021 a total storm water drain network of about 90 % of the road network in that year***

S.N	DESCRIPTION	2005	2010	2015	2020
1	% of Roads having storm water drain	30	60	70	90
2	% Area covered	40	80	85	95

### 13.2.4 Solid Waste Management

***The year 2021 envisages a comprehensive and sustained solid waste management system with modern and scientific answers to collection, transportation and disposal of about 1550 MT/Day of solid waste and bio-medical waste.***

S.N	DESCRIPTION	2005	2010	2015	2020
1	Total Waste generated per day	600	910	1230	1550
2	% waste collected to generated	60	80	90	95
3	% of waste processed	15	90	90	100
4	Total Vehicle Capacity / total waste generated	0.7	1.0	1.0	1.0
5	Trips / vehicle	2	3	4	4

### 13.2.5 Transport System

*The year 2021 envisages 90% "all weather roads and a total road length of 1800 km is expected to cover the entire area and population of the Corporation by 2011*

*The year 2021 envisages full section road development and intersections developments of about 60% road length with an effective traffic management and efficient public transport systems and introduction of metro, elevated roads and fly-overs as also on the major corridors of the city by 2021*

S.N	DESCRIPTION	2005	2010	2015	2020
1	Road density	31.0	32.00	33.00	35.00
2	Per capita road length	0.75m	0.8m	0.85m	0.9m
3	Paved road to Total road length	60%	80%	90%	99%
4	% area under roads	14	16	17	18
5	% of roads having street lighting	70	75	80	90

### 13.2.6 Slum Rehabilitation and Basic Services to Urban poor

*The year 2012 envisages Bhopal as a "zero slum city" with rehabilitation and relocation of as many as 25000 slum dwelling units in a phased manner*

S.N	DESCRIPTION	Housing units/ colonies for Urban Poor			
		2005	2010	2015	2020
1	No. Of Households Requiring Infrastructure Development	50000	25000	00	00
2	No. Of Households Requiring New Houses	25000	10000	00	00
3	No. Of Households Requiring Plotted Development	25000	10000	00	00
4	No Of Illegal Colonies Requiring Infrastructure Upgradation	198	100	00	00

### 13.2.7 Urban Environment

*The year 2021 envisages a "Clean and Environment Friendly Bhopal" with environment status reports being prepared each year to check the levels of pollution in the city.*

### 13.2.8 Urban Heritage

*A well-maintained historic urban center and an historic town to attract the tourism activity, by the end of horizon year 2012.*

## 13.2. Existing State of Infrastructure

State of the Infrastructure		
<b>Water</b>		
Water availability	Installed Capacity (mgd)	243
	Released / daily (mgd)	243
Source of water supply	With city limits	108
	10 – 50 sq.km	135
	> 100 k.m	
Water coverage	Per Capita supply (lpcd)	80
	Supply duration (hrs.)	2-3
<b>Wastewater Disposal</b>		
	Wastewater generated daily (mld)	118.00
	Disposal (underground sewerage) capacity (mld)	39.0
	Present operating capacity (mld)	80.00
	Households connected to underground sewerage %	30%
<b>Solid Waste</b>		
	Waste generated daily (tonnes/day)	600
	Collection daily (tonnes/day)	420
<b>Storm water Drainage</b>		
	Annual Rainfall	1200MM
	Length of storm water drains (kms)	68kms
<b>Roads and road Transport</b>		
	Municipal roads (kms)	1020
	State – level roads (kms)	
<b>Public transport</b>	Buses (numbers)	6640
	Bus capacity/ passengers	30/50
	Private registered vehicles	484239
<b>Street Lighting</b>		
	Number	28000
	Area coverage %	55%

## Chapter 14 City Investment Plan; Strategies and Action Plan

### 14.1 City Investment Plan

The existing situation analysis on the state of infrastructure under the sub mission for urban infrastructure and governance and the existing housing condition of the urban poor under the sub mission for basic services for urban poor has provided broader perspective towards formulating the sectoral goals based on vision perceived for the city development.

The gap between the existing condition and the conceived sectoral goals has been identified which was the basis for project identification under the Jawaharlal Nehru National Urban Renewal Mission. Thus the sectoral deficiencies are to be rectified phase wise for the period of 7 years from 2005-06 to 2011-2012.

### 4.2 Urban Planning and Growth Management - Strategies & Action Plan

Urban growth management strategies shall take into account the environmental concerns developing of late in the city. The strategies are to facilitate a balanced growth with an efficient urban form devoid of congestion and conflicting land uses.

#### 14.1.1 Rapid and Rational Implementation of Development Plan

Implementation of the development plan lies in the finalization of the Town Planning Schemes covering the corporation area as well as the Planning area. In these, regularization drives for illegal non-conflicting changes in land use and demolition drive for illegal non-confirming land uses shall be taken up.

#### 14.1.2 Development Restrictions in Specific Areas

Restriction of development in specific areas shall be taken up by finalizing TP schemes with provisions for open/ green spaces acting as buffer zones. This is also to create an efficient urban form and for decongestion of the CBD, wherein many confirming activities are to be shifted to an alternate location.

#### 14.1.3 Decentralized Planning and Increased Citizen's Involvement in the Development Planning Process

Public participation and consultation at neighbourhood level regarding land use and growth patterns shall create social benefits and avoid non-conforming land uses. Increased citizens' involvement in the development planning process shall be pursued actively to achieve the above-mentioned social benefits.

#### 14.1.4 Improved Co-ordination Between Various Sanctioning and Implementing Agencies.

Non-conforming land uses and major non-aligned sections towards the periphery of the corporation shall be corrected with improved co-ordination between the implementing agencies, BMC BDA and TCP necessary changes shall be incorporated in the development plan.

#### 14.1.5 Optimum Use of Municipal Land and Inviting Private Sector to Act Work with the Public Sector

The land and real estate owned by the corporation in the city shall be utilized for commercial development either by itself or through leasing out to private users. This shall help to mobilize financial resources for implementation of the BMC's Capital Improvement plan as proposed city development plan

The Revision of Bhopal Development Plan for the year 2021 is in final stage at prepublication is expected to be approved in about 3 month

### Action Plan/ Tasks

- ❑ Implementation of development plan to cover the entire city and its outgrowth with town planning schemes
- ❑ Discouraging excessive urban sprawl by establishing appropriate building and density regulations for selected areas
- ❑ Establish green belts and buffer zones
- ❑ Development of geographical information systems
- ❑ Implementation of major road, missing links and utilizing the complete section of the road.

### Institutions

- ❑ T&CP
- ❑ Bhopal Municipal Corporation

- ❑ Development of geographical information systems
- ❑ Implementation of major road alignment

### Institutions

- ❑ Bhopal Municipal Corporation
- ❑ Bhopal Urban Development Authority
- ❑ Town planning department
- ❑ Private Builders and colonisers
- ❑ Citizens' groups

### Operating Plan (Urban Growth Management/ Development Planning)

#### Strategies

- ❑ Rapid and rational implementation of development plan
- ❑ Development restrictions in specific areas
- ❑ Decentralized planning and increased citizens' involvement in development planning process
- ❑ Improved co-ordination between various sanctioning and implementing agencies of the development plan
- ❑ Optimum use of municipal land and inviting private sector to act coherently in the development work with the public sector

#### Action Plan/ Tasks

- ❑ Discouraging excessive urban sprawl by establishing appropriate building and density regulations for selected areas
- ❑ Establish green belts and buffer zones

### 14.3 Urban Renewal Strategies & Action Plan

The strategies are in accordance with the conclusions drawn in the Inner city and present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the preparation of City Development Plan.

#### 14.2.1 Strategy

Revitalization of inner City as a whole or in parts becomes essential due to the growth pattern, rapid expansion, and economic development, Congestion and over crowding. Presently the population density of the CBD area is much higher than the overall city population density. This also affects the infrastructural services laid at the time of initial development and upgraded from time to time in unplanned manner. Thus this area required a Renewal Plan to develop this area in accordance to the total city development plan.

- **Planned infrastructural Development.**

Capacity augmentation of existing water & sewer lines and laying of new sewer & storm water lines.

- **Strengthening of road surface and traffic management.**

- **Redefine and revitalize age-old city structures**

Most of the age old structures have served their full life term and in absence of maintenance fund which due to various constrains are always on squeeze are in bad shape and also the spaces are presently underutilized.

#### 14.2.2 Identification of Project for JNNURM

Bhopal Municipal Corporation have already started execution of some of the project with Private Public Participation like Multistoried parking building at Moti Masjid Road near old sabji mandi etc. However the projects identified under JNNURM are meant to provide improved environmental condition by the end of horizon year 2011.

#### 14.2.3 Executing Institutions

Bhopal Municipal Corporation

#### 14.2.4 Operation Plan/ Tasks

- Development of all internal Roads width Less than 6.0 mts of the city area such as Itwara, Budhwara etc. including storm water and sewer line.
- Development of full section of main roads like road from Alpna talkies to Jama Masjid including Cement concrete top, new storm water line, footpath etc.
- Development of junctions of Old Bhopal area like Bus Stand, Alpena Talkige junction etc.
- Shifting of existing Dairy from Bhawari, Malikhedi, Natu Barkheda and Kokta situated in dense populated area to the outskirts area of the city.
- Construction of Administrative Block of Bhopal Municipal Corporation at Arera Hills, presently it is situated in densely populated area in old city having acute parking problem.
- Development of Covered multistoried parking at identified locations in the old city area on the land vacated after dismantling the age-old structures presently not in use.



<b>Tab 14.1 URBAN RENEWAL</b>		
<b>S.N</b>	<b>WORKS</b>	<b>AMOUNT IN CRORES</b>
	<b>ROADS, TRANSPORT AND DRAIN WORK.</b>	
1	All internal Roads width Less than 6.0 mts, total area of road 400000 sq.mt.@ Rs. 750 per sq.mt	30.00
2	Roads width more than 6.0 mts up to 18 mts, total area of road 140000 sq.mt.@ Rs. 950 per sq.mt	13.30
3	Laying of storm water line, sewer line etc.40000 mts @ 1500 per R.Mt	6.00
4	Laying New Storm water Line at the existing internal roads at Kotwali area.	5.00
5	Development of Dairy to Shift the existing Dairy from Bhawari, Malikhedi, Natu Barkheda and Kokta.	3.00
6	Development of Commercial complex at the land of mandi at Pul Bogda.	20.00
7	Construction of New Administrative Block of BMC	15.00
	<b>GRAND TOTAL</b>	<b>92.30</b>

## 14.4 Water Supply - Strategies & Action Plan

### 14.3.1 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the preparation of City Development Plan.

#### □ Water Supply Planning

While the current works shall focus on the existing supply network augmentation at source and at distribution end. The entire system shall be augmented and structured in a planned and sustainable way to serve the city in long term.

#### □ Water Auditing

Water auditing is the best practice to reduce the system losses and make the entire supply of water accountable. This involves leak detection studies apart from studies on the quality and quantity of water drawl at the consumer end and explores ways and means for effective water supply systems.

#### □ Water Supply Operation and Maintenance

At present, the BMC PHED wing is managing the O & M of water supply system. To improve the O & M facilities steps would be taken to involve experienced private companies, which will be solely responsible for the O & M of the system, based on an agreed annual fee. These contracts shall be continued added with inbuilt incentives for improved performance.

#### □ Institutional Strengthening and Capacity Building

The members of the hydraulic department shall undergo training in project planning, implementation, monitoring and evaluation. The significance of people's participation in water conservation shall also be realized.

### The Goal

*The year 2011 sees a water demand of about 265.0 MLD for about 20.0 lakh persons at 135 LPCD. The year 2021 sees a water demand of about 345.0 MLD for about 25.50 lakh persons at 135 LPCD, an ultimate capacity of 415.9 MLD and storage capacity of 200 million by the year 2039.*

### 14.3.2 Institutions

Bhopal Municipal Corporation

### 14.3.3 Sustainability Indicators

- Present Gross supply
- Gross supply after execution of Narmada scheme
- T&D losses and unaccounted for water
- Treatment capacity to total supply
- Storage capacity to total supply
- Distribution network to total road length
- Number of house service connections to total property tax assessments
- % of water availability from alternate sources (Present)

### 14.3.4 Identification of Project for JNNURM

Bhopal Municipal Corporation have started execution on the Narmada scheme with ADB assistance, which is planned to fulfill the water demand for the projected population growth for the horizon year 2039. However the projects identified under JNNURM are meant to provide increased capacity through alternative and cheaper water sources and harness them to the fullest advantage.

### 14.3.5 Executing Institutions

Bhopal Municipal Corporation

<b>Tab 14.2 WATER SUPPLY</b>		
<b>S N</b>	<b>Work</b>	<b>Cost in Cr.</b>
1	Rehabilitation of Existing Pumping Stations around Upper Lake. (As per cost estimate submitted in DDR)	4.78
2	Rehabilitation of Existing Water treatment Plants around Upper Lake. (As per cost estimate submitted in DDR)	2.75
3	Providing Electromagnetic flow meters at RWPS, CWPS, WTPs, and Major Service reservoirs. (approx. 65 locations)	2.90
4	Consumer metering of total 218113 connection	10.0
5	Leak detection and repairs in trunk and distribution mains of size 300 mm and above.	1.50
6	Renewal of Existing GI Service connections with MDPE 1,00,510 nos.	5.92
7	Rehabilitation of existing distribution network of 800 Km.	8.28
8	Expansion of distribution network in a length of about 1000 Km.	250.0
9	Development of additional storage in the form of service reservoirs of total capacity around 8.0 MG	15.44
10	Rehabilitation Remaining Existing Pumping Stations around Upper Lake.	0.50
11	Construction of multi level intake at Kolar dam to reduce chemical consumption due to magnese problem in raw water.	2.0
	Sub Total	299.63
	Add 5% Physical Contingency on Above	14.98
	TOTAL	314.61
12	Water supply scheme from Narmada river	300.0
	<b>TOTAL COST</b>	<b>614.61</b>
Out of the above works the following components would be executed under the UWSEIMP, Project funded by ADB.		
<b>S N</b>	<b>Work</b>	<b>Block Cost in Cr.</b>
1	Rehabilitation of Existing Pumping Stations around Upper Lake. (As per cost estimate submitted in DDR)	4.78
2	Rehabilitation of Existing Water treatment Plants around Upper Lake. (As per cost estimate submitted in DDR)	2.75
3	Providing Electromagnetic flow meters at RWPS, CWPS, WTPs. (approx. 65 locations)	2.90

4	Consumer metering of total 100510 connection	10.05
5	Leak detection and repairs in trunk and distribution mains of size 300 mm and above.	1.50
6	Rehabilitation of existing distribution network of 800 Km.	8.28
7	Expansion of distribution network (100 mm-450 mm) in a length of about 190 Km.	26.74
8	Development of additional storage in the form of service reservoirs of total capacity around 3.0 MG	5.79
9	Rehabilitation Remaining Existing Pumping Stations around Upper Lake.	0.50
	<b>Total Cost (In Lakh rupees)</b>	<b>63.29</b>
3	Total cost of the work	<b>614.61</b>
4	Total Amount from ADB	<b>64.29</b>
	<b>Total fund requirement for BMC Under JNNURM</b>	<b>550.32</b>

#### 14.3.6 Operating Plan (Water Supply)

- An inventory of possible leaks and sources of unaccounted for water followed by water auditing every three years (a technical team from within the hydraulics department shall take up the task).
- Rehabilitation of Existing Pumping Stations and Water treatment Plants around Upper Lake.
- Providing Electromagnetic flow meters at RWPS, CWPS, WTPs, and Major Service reservoirs. (approx. 65 locations)
- As per 2001 census the average number of persons per household in Bhopal is 5.3. The number of households with the same ratio is projected to increase to 218113 in 2024. Thus the consumer metering of total 218113 connections (Existing 100510 domestic consumer connections, 417603 proposed domestic connections) The quantification of proposed domestic connections is done on the basis of existing nos. of house holds which is around 2.8 Lakhs, out of which around 1,00,510 are existing registered consumers as per BMC estimate.
- Leak detection and repairs in trunk and distribution mains of size 300 mm and above. It is assumed that leak detection and repair works in pipes of diameter less than 300 mm shall be carried out in the regular operation and maintenance works of BMC.
- Almost 80% of leakages in the distribution network generally occur through service connections, since the entire existing house connections in Bhopal are done with GI pipes, there is a heavy leakage level associated with it. Hence it is advised to replace existing GI service connections with MDPE service connections, replacing the defective ferrules with CI saddle/flash gun metal ferrule including supply of CI saddle/GM ferrule.
- Rehabilitation of existing distribution network of 800 Km.
- 185 MLD Water supplying scheme from Narmada river near Hashangabad.
- Expansion of distribution network in a length of about 2150 Km. In the absence of the Latest City Master Plan for Bhopal city prepared by Town & Country Planning Department the Master Plan 1995-2005 has been taken as the basis of assessing the requirement of distribution network. In view of this, we have presumed that the area within the Municipal limits of

Bhopal will be 288 sqKm and density of population will increase in developing peripheral areas. Distribution network will need to be expanded in the areas, which do not have piped water supply. An average length of distribution network required per sq. Km. area has been worked out and applied pro-rata to the area where such network is to be developed. The survey work for entire area need to be taken up. The actual quantification for network to be developed only after completion of the survey work.

- Laying of water supply network in approx 30Sq.Km of area around Union Carbide on priority since the ground water of this area is polluted / contaminated and not portable.
- Development of additional storage in the form of service reservoirs of total capacity around 8.0 MG. (40% of total daily demand of 2024=  $82 \times 0.4 = 33$  MG minus the existing storage of 25 MG)
- Though the water supply of Bhopal is from Upper lake and Kolar Dam no meet the future demands of water supply, water from Narmada river Hoshangabad will be brought to Bhopal the total target of project is 185 MLD and the cost of Project is 300 Crore.

## 14.5 Sewerage - Strategies & Action Plan

### 14.4.1 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development Plan. Presently since only 30% household are connected to the sewer system the strategies would focus upon planning for connecting the remaining percentage of household to the sewer system.

#### □ **Augmentation and Rehabilitation of the System**

The present sewerage system caters to 30% of the city area only. Extension of the capacity of the existing sewerage network system and treatment plants becomes necessary to cater to the needs of 2011 and 2021. This shall also involve revitalization of the sewerage network in the city area.

The areas, which required major rehabilitation or additional works are covered under this component, are mainly New Capital Project Area, Bhoj Wet Land Project Area and Prevention of Population of Upper Lake Scheme Area.

The main wards covered are from no.9 to 22, 24, and 39 to 44 i.e. total 21 no. of wards are proposed to be covered under the priority areas to be served by sewerage system.

Sewerage Zone -I, Zone -VII - Areas where improvements and expansion of water supply network, community water supply or sewerage systems are planned for but are not anticipated to occur sooner than three to four years. This time frame is indicating that economic and other conditions and growth patterns may demand extension of public services within the foreseeable

future. Public facilities in these areas will be required extension by the municipality. Thus such areas are considered under this component (future service area), which needs public facilities in near future.

Some works such as sewer and house service connections of Bhoj Wetland drainage zones have been left out in the scheme due to non availability of funds, construction difficulties and expiration of duration of the scheme. In absence of the proper sewerage system in the areas, such as Khanugaon, Jehangirabad area, Idgah Hills, Professor Colony, Dhobhi Ghat, Ahemdabad Saheed Nagar, Garamgadda slum and nearby area, Rajeev Gandhi slum in kotra etc and the areas which are served through septic tanks such as Nehru Nagar, Police line, Kamla Nagar, Vaishali Nagar and some portion of Kotra area are ill served

The Kotra, Bawdi Kalan and Banganga SPS were renovated and augmented and SAF SPH in the New Capital project area. Manisha Market, Habibganj Sewage Pumping Station is to be repaired,

#### □ **Effective Operation & Maintenance**

The Bio filter Plant at Mata Mandir is not functioning properly. It receives sewage from south TT Nagar (ward33) by gravity main and by pumping.. BMC shall continue to operate and maintain all the STPs by its own. For the purpose, capacity building measures are deemed necessary for improved performance.

#### □ **System Maintenance Plan**

A system maintenance plan involving the components of routine, corrective and preventive maintenance shall be prepared apart from an inventory of the entire system to aid the preparation of a Geographical Information System of the city.

#### □ **Awareness Campaign on Recycling/ Re Use**

With modern systems available for treating the waste water on the economical basis and recycling it, especially in private



colonies, big hotels, hospitals, commercial and institutional establishments, this practice can pay dividends. Where ever septic tank overflows are discharged into drains or sewer lines, the same can be diverted for recycling since, septic tank overflows have low BOD and suspended solids, recycling of waste water can be a very viable option in such areas. The recycled water can be used for parks, gardens, horticulture, floor washing, toilet flushing, road and parking lot washing etc. In some of the areas, even the treated waste water from municipal sewage treatment plants can be further treated at economical cost safely to supply water for agriculture, parks, gardens, road and floor washing, toilet flushing in big commercial and institutional establishments etc. This will entail a direct saving to the consumer of water and a direct saving to the municipality, which continuously struggles to find or locate new sources of water to meet the growing demands of the city population.

The above can be done through public education and awareness. This can be practiced in any type of development new or old, where ever the need is and the space permits. This has to be thought of and put in practice.

### The Goal

***The year 2021 sees a wastewater generation of nearly 275 MLD by about 25.5 lakh persons through 100% population and area coverage (to be achieved by 2009). For the year 2021, an ultimate treatment capacity of 275 MLD is envisaged. The sewerage line network will be extend to a length of about 500 km.***

### 14.4.2 Institutions

Bhopal Municipal Corporation

### 14.4.3 Identification of Project for JNNURM

The projects identified under JNNURM are meant to cover total population for the horizon year 2021 and to provide 100% area of the city connectivity to the main sewer system.

### 14.4.4 Sustainability Indicators

- Total sewerage generation
- Total area served to total area
- Total population served to total population
- Sewer network length to total road length.
- Treatment capacity to total sewerage generated
- Number of sewer connections to total water connections

### 14.4.5 Action Plan/ Tasks

- Extension, augmentation and rehabilitation of existing systems in an efficient manner
- An inventory of locations of spills, leaks and mixing areas of storm water with solid waste.
- Mapping and creation of Geographical Information System
- Regularization drive to be taken up as also an awareness campaign on getting a sewerage connection.
- Operation & maintenance plan for all the actors involved

### 14.4.6 Operating Plan (Sewerage Systems)

All shortcomings and deficiencies in the collection, transportation and treatment of sewage contribute ultimately to the environmental deterioration in Bhopal.

Large amount of untreated wastewater is flowing or is being pumped into the storm water drains and Nallahs.

Key findings and shortcomings are described for each main contributor related to sewage production and collection, i.e.:

- ❑ Un Sewered areas with/without piped water supply
- ❑ Sewered areas with/without piped water supply
- ❑ Other shortcomings.

#### **Un Sewered Areas**

Laying of pipe line network branches as well as mains in the unsewered areas of Rajeev Gandhi slum at Kotra, slum along the Panchsheel Nala, unsewered portion of Khanugoan, Garam Gadda, E-6, E-7, E-8, E-9, extension of E-8 area, Sahid Nagar, dhobhi Ghat at MLB, Jehangirabad area and unsewered areas of old and new city etc.,

#### **Sewered Areas**

All sewered areas reportedly have piped water supply.

#### **A) Sewers not connected to overall system**

The colonies in which internal sewer network is laid by BDA/Housing Board or by private colonizers like NRI colony are connected by Septic Tanks. The over flow from septic tanks is to be connected to the overall existing sewer system.

#### **B) Sewers interconnected to storm water system**

Some areas of Ahemdabad, Koe-e-fiza connected to Shirin Nalla, outfall sewer of New Capital Project Area are interconnection with storm water drain to be connected to main sewer line. Laying of pipe line and connections of Balance work of Bhoj wet land Project.

#### **C) Deficiencies at STPs and SPSs Sewage Pumping Station at Manisa**

#### **Market Shahpura, Asha Nikaten, Old Shahpura**

Civil work repairing and 220 HP pump motor pump repair/replacement work, as no pump is replaced from its installation.

#### **Bio Filter Plant at Mata Mandir**

Cleaning of Clarigester and Clarifier. Repair work of Trickling Filter. Construction of boundary wall and repair / cleaning work of Sludge bed (Civil Work). Repair of pumps, motors and control panel of pump house. Providing and fixing I section and chain pulley block, moving trolley and replacement of sluice valve. Providing and fixing M.S. angle iron mash/screen for inlet chamber. Replacement of Non Return Valves. Replacement of all sluice valves of 100 mm dia. Valves, pumps etc are to be replacement and maintenance

#### **Bawdi Kalan STP**

Civil work, Renovation of Grit Chamber, Inlet Channels, Stone Pitching of lagoons, out let Channels etc.

<b>Tab 14.3 SEWERAGE</b>					
<b>Rehabilitation Works of Existing System</b>					
<b>1</b>	<b>Sewer Lines</b> : assuming 40% of existing lines requires rehabilitation work due to non functioning i.e. 40 km length requires major repair work				
S. No.	Dia of pipe	Length in m	Per mtr. Rate for Replacement and Repair Work		Amount
1	150	20000	,@ 560/- per mtr		11,200,000
2	200	10000	,@ 790/- per mtr		7,900,000
3	250	5000	,@ 890/- per mtr		4,450,000
4	300-500	5000	,@ 2500/- per mtr		12,500,000
			<b>Total</b>		<b>3.60 Cr</b>
<b>2</b>	<b>Sewerage Treatment Plant</b>				
S. No.	Name of STP	Existing Capacity	Required Capacity	Cost per MGD	Amount
1	Badwai kala	3 mgd	8 mgd	10,625,000	85,000,000
2	Mata mandir	1 mgd	1mgd	3,000,000	3,000,000
				<b>Total</b>	<b>8.80 Cr</b>
<b>3</b>	<b>Sewerage Pumping Stations</b>				
S. No	Work to be done				Amount
1	Pump replacement				2,400,000
2	Pannels				1,800,000
3	Transformer				900,000
4	Cabling				500,000
5	Civil work				5,000,000
				<b>Total</b>	<b>1.06 Cr</b>
<b>4</b>	<b>Existing Out fall sewer</b>	( 5.0 km length) For Panchsheel Nala			
S. No.	Dia of Pipe	Length in m	Per mtr. Rate for Replacement and Repair Work		Amount
1	500	5000	,@1500/- per mtr		7,500,000
2	700	5000	,@2500/- per mtr		12,500,000
			<b>Total</b>		<b>2.0 Cr</b>
<b>5</b>	<b>Nala Diversion work for depolluting Shahpura lake (Nala coming to grain from Shahpura area )</b>				
S. No.	Dia of pipe	Total Length in m	Per mtr. Rate for Replacement and Repair Work		Amount
1	450	1000	@2000/- per mtr		2,000,000
2	450	1000	Civil work		200,000
			<b>Total</b>		<b>0.22 Cr</b>
<b>6</b>	<b>New sewer lines in areas such as Arera colony E-6 to E-8, Extention of E-8 etc. New 40 km of sewer is required to serve these areas.</b>				
S. N.	Dia of pipe	Length in m	Per mtr Rate for Replacement and Repair Work		Amount
1	150	15000	,@ 560/- per mtr		8,400,000

2	200	15000	,@ 790/- per mtr	11,850,000
3	250	5000	,@ 890/- per mtr	4,450,000
4	300-500	3000	,@ 2500/- per mtr	7,500,000
5	600-800	2000	,@ 5000/- per mtr	10,000,000
<b>Total</b>				<b>3.22 Cr</b>
<b>7</b>	<b>New Sewage Pumping Stations</b>			
<b>S. N.</b>	<b>No. of Pumping Station required</b>	<b>Cost per Pumping Station</b>		<b>Amount</b>
	2	5,000,000		10,000,000
<b>Total</b>				<b>1.0 Cr</b>
<b>8</b>	<b>Force Main</b>			
<b>S. N.</b>	<b>Dia of pipe</b>	<b>Length in m</b>	<b>Per mtr. Rate for Replacement and Repair Work</b>	<b>Amount</b>
1	300	2500	,@ /- 2210per mtr	5,525,000
2	300	2000	,@ 2210- per mtr	4,420,000
<b>Total</b>				<b>0.99 Cr</b>
<b>Total cost for Rehabilitation and New Sewer Works for New Capital Project area</b>				<b>208,995,000</b>
<b>SAY</b>				<b>20.89 Cr.</b>

**Tab 14.4 For Other Areas Sewer Zone I to Zone VII.**

S. N.	Zone No	Location	Important Areas & Identified/ Proposed Work	Rate	Amount	Total Cost
1	Zone I	South Side	Mendore, Khushalpura, Sewania Gond, Administrative Blocks and other areas along the Badh Badha road. (Approx area covered 4.82 sq.Km.)			
			51.2 Km* of 150-200 mm dia laterals	750	38,400,000	85,650,000
			4.5 Km of 300-500 mm dia Mains	2500	11,250,000	
			1.4 Km of 700 -800 mm dia trunk main	5000	7,000,000	
			0.7 Km of 1000 mm dia trunk	7500	5,250,000	
			one no. of STP of 7.6 MLD*	2500000	23,750,000	
2	Zone II	South Side	Shahpura, Tilak Nagar, Gulmohar, Bawadi kalan, Trilinga, Chunabhatti, Arera Colony Ext., Gautam Nagar, Rachna Nagar, Kasturaba Nagar, Kailash Nagar. etc (App. area covered 17 S.km)			
			181.30 Km* of 150-200 mm dia	750	135,975,000	277,975,000

			laterals			
			13 Km of 300-500 mm dia Mains	2500	19,000,000	
			8 Km of 700 -800 mm dia trunk main	5000	40,000,000	
			2 Km of 1000 mm dia trunk	7500	15,000,000	
			one no. of STP of 27.20 MLD*	2500000	68,000,000	
3	Zone III	South East Side	Saket Nagar, Surendra Palace, Bagh Mugalia, Bagh Sewania, Misrod, M.P. Housing Board, Katara Hills, Bhairanpur etc. (Approx area covered 20 sq.km.)			
			213.30 Km* of 150-200 mm dia laterals	750	159,975,000	366,225,000
			14.6 Km of 300-500 mm dia Mains	2500	36,500,000	
			4.0 Km of 700-800 mm dia trunk main	5000	20,000,000	
			9.3 Km of 1000 mm dia trunk	7500	69,750,000	
			one no. of STP of 32 MLD*	2500000	80,000,000	
4	Zone IV	East Side	Gopal Nagar, Avodhpuri, Khajuri Kalan, Barkheda Patani, Amravat Khurd, etc.(Approx area covered 15.14 sq.km.)			
			161.60 Km* of 150-200 mm dia laterals	750	121,200,000	
			11.30 Km of 300-500 mm dia Mains	2500	28,250,000	231,200,000
			1.7Km of 800 mm dia trunk	5000	8,500,000	
5	Zone V	North East Side	Ayodha Nagar, Narela Sankri, Kalwa, Ashok Garden, Govind Pura Industrial Area, Bharat Nagar, Nizamudin, Indra Puri, Sonagirri, Anand Nagar, Patel Nagar, Kokta, Laxmi Nagar, Shakti Nagar, Prakash Nagar, Raj Homes, Akansha Nagar, Kamveer Nagar etc. (Approx area covered 24.56 sq.km.)			
			262 Km* of 150-200 mm dia laterals	750	196,500,000	
			20 Km of 300-500 mm dia Mains	2500	50,000,000	
			4 Km of 800 mm dia trunk main	5000	20,000,000	425,250,000
			8 Km of 1000 -1200 mm dia trunk	7500	60,000,000	
			one no. of STP of 39.50 MLD*	2500000	98,750,000	

6	Zone VI	North Side	Karond Kalan, Kamala Nagar, Nishad Pura, Sabri Colony, Kalyan Nagar, Narayan Nagar, Janta Nagar, Shiv Nagar, Chola, Mechanic Nagar, Firdosh Nagar, Shree Nagar Naya Pura, Central Jail Area, Newri Village, Badwai etc. (Approx area covered 15.9 sq.km.)			
			169.60 Km* of 150-200 mm dia laterals	750	127,200,000	
			6.1 Km of 300-500 mm dia Mains	2500	15,250,000	219,950,000
			2.7 Km of 800mm dia trunk	5000	13,500,000	
			one no. of STP of 25.60 MLD*	2500000	64,000,000	
7	Zone VII	North West Side	Piplaner Village, Gandhi Nagar, Tariq Malik Nagar, Gondi Pura, Sun city etc. (Approx area covered 6.44 sq.km.)			
			68.80 Km* of 150-200 mm dia laterals	750	51,600,000	
			4.70 Km of 300-500 mm dia Mains	2500	11,750,000	96,225,000
			1.4Km of 800 mm dia trunk main	5000	7,000,000	
			one no. of STP of 10.30 MLD*	2500000	8,750,000	
				<b>Total</b>		<b>1,702,475,00</b>
			Price Contingencies @ 5% for miscellaneous items such as Pumping Stations, Pumping Mains etc. if required and other contingencies.			85,123,750
				<b>Grand Total</b>		<b>1,787,598,750</b>
				<b>Say</b>		<b>178.7 Cr.</b>
1			<b>Note</b> *Out of 103.86 Sq. Km areas, it is considered that approximately 20% area will be developed in residential colonies with internal sewerage system connected to septic tanks, by private local colonizers or developers. Localized treatment plants with recycling of water can be suggested and promoted in these colonies through education / community awareness program by BMC authorities or any other agencies for such areas. Therefore, 20% length of laterals and 20% capacity of STP will be reducing in the above table while preparing block cost estimation for these areas.			
2			The total projected population of Bhopal Municipal Area of 288.85 Sq Km is 38.14 lacs (as per Graphical Method) for the Horizon Year 2039. The density of Zone I to Zone VII would be taken as 200 persons per hectare for calculating the quantities for these seven Zones.			



Tab 14.5 Cost for Sewer Zone 1 and 2						
S. N	Zone No.	Location	Important Areas & Identified/ Proposed Work	Rate	Amount	Total cost( in lacs)
1			Laterals, mains and outfall sewer including brick masonry manholes, road side chambers for property connections and other appurtenances			
			RCC NP2 pipes 150 mm	10000	@750/- per meter	75
			RCC NP2 pipes 200 mm	100000	@1050/- per meter	1050
			RCC NP2 pipes 250 mm	40000	@1185/- per meter	475
			RCC NP2 pipes 300-500 mm	26000	@2500/- per meter	650
			RCC NP2 pipes 600-900 mm	10000	@5000/- per meter	500
			RCC NP2 pipes 1000-1200 mm	4000	@7500/- per meter	300
			SW pipe 150 mm	50000	@700/- per meter	350
						<b>3400</b>
2			Construction of sewage treatment plant (UASB) including staff quarters	75 mld	@2500000/- per mld	1875
3			Construction of sewage pumping station (5 nos.)	2000 m <sup>2</sup>		
4			Supply and laying of 450 mm dia. CI pumping main	5 Km		
5			Supply and installation of 15 nos. 22.5 mld (average) x 50 m H sewage pumps with electrical, substations and power generator	3600 HP		1900
6			Supply and installation of electrical substation for above	2700K W		
7			Supply and installation of diesel power generator	5 Nos.		
8			Procurement of septic tank vacuum cleaning M/c	2 Nos.	@2000000/- per no	40
9			Procurement truck mounted sewer jetting M/c	2 Nos.	@3000000/- per mld	60
10			Construction of Community Toilet Blocks	LS		600
			<b>FOR SEWERAGE</b>	<b>Grand Total</b>		<b>7.875 Cr</b>

**Tab 14.6 Cost Estimation of identified Works under left out portion of Bhoj Wetland Project.**

S.N	Ward No.	Location	Important Areas & Identified/ Proposed Work	Estimated length	Total cost
			<b>Description of Identified work</b>		
1	4		Branch laterals in Bairaghar area	0.8km	800000
2	5		Branch laterals in Ahemdabad , Koe-Fiza area	10 km	10000000
			Branch laterals in Kanoogoan area	4 km	4000000
			Pumping station at NRI colony	1 no.	700000
			Force main from NRI colony to Lalgati circle	1.5 km	1072500
			Branch laterals at 12 Mahal area	0.3 km	300000
			Branch laterals at 4 Banglow	1 km	1000000
3	6		Branch laterals at Garam Gadda Slum area and Sajid nagar area	4km	5000000
4	7		Branch laterals at Saheed Nagar Area	4 km	4000000
			Main line from Hamidiya Hospital to Moti Masid via Sadar Manzil	0.7km	700000
5	9		Laterals in Idgah area	3.8 km	3800000
6	23		Branch laterals at Ginorii area	1km	1000000
			Force main from Ginorii SPS to MLB Circle	2.5 km	5512500
7	26		Laterals in Dhobbi Basti and Professor colony	1.5 km	1500000
			Laying of 500 mm dia sewer pipeline from Express office to Banganga SPS.	0.2 km	140000
8	27		Laterals in Nadir Colony	3 km	3600000
9	29		Laterals in Kotra area	4 km	4000000
			Extention of drain from old kotra SPS to New SPS along Rajeev Gandhi Gandhi basti including laying of 200 mtr of 500mm dia RCC pipeline	0.8 km	1558500
			Laterals in Nehru Nagar area, Policeline, D -sector, Vaishali area etc	6 km	6000000
11	34		New collection chamber at Banganga SPS	1no	160000
12	35		Laterals in Malviya Nagar area, along the slum near MLA Qts.	0.6 km	600000
13	37		Laterals in Jahangirabad Area	2.5 km	2500000
14	43		Laterals in area right side of Ckiklod road from Jinsi Circle	0.5 km	500000
15	44		Laterals in area both side of Ckiklod road from Jinsi Circle near Raj talkies	1.0 km	1000000
<b>Grand Total</b>					<b>59443500</b>
<b>Say</b>					<b>5.95 Cr.</b>

<b>Tab 14.7 Summary of Total Amount Required for Developing a Complete Sewerage System</b>		
<b>S. No.</b>	<b>Description of Work</b>	<b>Total Amount Required in Rs.</b>
1*	Sewerage System for <b>Zone 1 and Zone 2</b>	787,500,000
2	Sewerage System for <b>Left out portion of BWL Project.</b>	59,443,500
3	Rehabilitation of Existing Sewer Network and laying of new sewer lines for <b>New Capital Project Area.</b>	208,995,000
4	Sewerage System for <b>Zone I to Zone VIII.</b>	1,796,786,250
	<b>TOTAL</b>	<b>2,852,724,750</b>
Note: * = The Cost Estimation for Providing Sewerage System for Zone 1 and 2 is Rs.787,500,000/-, while allotted fund or budget for developing a sewerage system for these Zone sunder UWSEIMP are Rs. 400,000,000/- only.		
1	Funds made available under UWSEIP project	<b>400,000,000</b>
2	Funds required to develop Sewerage System for entire Bhopal Municipal Corporation Area for the year 2039	<b>2,852,724,750</b>
3	Balance funds to be procured from other sources (say JNNURM scheme etc.)	<b>2,452,724,750</b>

## 14.6 Storm Water Drainage Strategies & Action Plan

### 14.4.1 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development Plan and on the fact that road side storm water drains are as important as the flood protection scheme for natural drains to reduce operation and maintenance costs as well as preserving the condition of the road surface.

#### □ Drainage Rehabilitation Programme

Under this programme a study shall be taken up to identify the flood spots within the city. This shall be based on the past history of floods and a survey of all the drains in the city and their conditions. Mere cleaning of the drains could eliminate most of the flood spots. In almost all the cases, strengthening of the drains and construction of leading drains will have to be taken up. A desalting exercise has to be taken up in all the natural and open drains. Based on the necessity that arises out of the study, drains are to be remodeled from the origin to the outfall.

#### □ Construction of Roadside Drains

Adequate attention has to be given to the construction / section improvement of roadside storm water drains (both open and closed) to facilitate proper draining of storm water into natural drains and also to maintain proper road surface. It is expected that around 40 km of storm water drains would be necessary by 2011.

#### □ Construction of RCC Wall for Protection of Nallah Side Protection.

RCC retaining wall is to be constructed to stream line the entry and exit of storm water.

#### □ Effective Operation and Maintenance

Once the flood protection scheme is in place, an operation and maintenance plan for the entire system involving the roadside drains, storm water drains natural drains and the river Tapi is necessary and shall be drafted by 2007.

#### The Goal

***By the year 2021 a total storm water drain network of about 90 % of the road network in that year***

### 14.4.2 Institutions

- Bhopal Municipal Corporation

### 14.4.3 Identification of Project for JNNURM

The projects identified under JNNURM are meant to cover 85% of the existing roads including the Old and new City roads for the horizon year 2021.

### 14.4.4 Action Plan

- Extension, Augmentation and rehabilitation of the existing network to match the community needs and desired targets by 2011.
- Coordinated effort with other agencies for completing the flood protection scheme by 2006 and taking up new capital works.
- De-silting of the Nallahs and open roadside drains.
- An inventory of flood spots and areas of mixing areas with sewer lines.
- An operation and maintenance plan for the embankments, sluice regulators etc of the flood protection system and the storm water drain network.

<b>Tab 14.7 STORM WATER DRAINAGE</b>						
<b>S. N</b>	<b>Identificat ion of Drains</b>	<b>Length of Drain Considered</b>	<b>Cross Section of Drains Considered</b>	<b>Identificatio n of Works Considered</b>	<b>Misc. Work Considered such as Cross Drainage Works (Refurbishme nt of old as well as new Works etc)</b>	<b>Total Cost in Rs</b>
1	All drains, spread across the city	Approx 250 km in entire Bhopal	1m x 1m	Deweeding and cleaning of drains.	Lump sum @ 1.40 lacs per km	73500000
2	All secondary drains, spread across the city	Approx 140 km for entire Bhopal	2m at bottom 7 m at top with 2.5 m depth	Deweeding and Cleaning drains	Lump sum @ 2.83 lacs per km	82320000
3	All major drains spread around the city. For entire Bhopal	Approx 75 km	4m at bottom 9 m at top, with 2.5 m depth	Cleaning, deweeding & desilting	Lump sum @ 7.62 lacs per km	102600000
4	All major drains spread around the city. For entire Bhopal	Approx 45 km	6m at bottom 11m at top, with 2.5 m depth	Cleaning, deweeding & desilting	Lump sum @ 11.15 lacs per km	90990000

5	All major drains which are causing floods in the drainage area, mainly the slaughter house Nala, Patra Nala, Saket Nagar Nala and Banganga Nala	Patra Nala 20km	Average 6m at bottom & 11 m at top with 2.5 m depth including 0.5 m FB.	Increasing cross section of entire Nala by 50%		39270000
				lining of entire Nala		18080000
				Repairing boundary walls for 2 km length		700000
				Building boundary wall of 5 km		17500000
		slaughter house Nala 5km	Average 4m at bottom & 9 m at top, with 2.5 m depth including 0.5 m FB.	1) Increasing cross section of entire Nala by 50%		7267500
				2) lining of entire Nala		2635000
	Saket Nagar Nala 5km	Average 2m at bottom & 4m at top, with 2.5 m depth including 0.5 FB.	Increasing cross section of entire Nala by 30%		1896000	



			Lining of entire Nala		1125000
	Banganga Nala 2km	Average width at bottom 4m & top 9m with 2.5 m depth including 0.5 m FB	Lining of entire Nala		1054000
	Panchseel Nala 5km	Average width at bottom 3m & top 8 m with 2.5 m depth including 0.5 m FB.	Lining of entire Nala		2600000
6	Approximately 260 nos. of traps (In concrete)			Approx. 25000	6500000
				TOTAL	448037500
7	General- Cost for Equipments required				
	1) Three no. of Jeep Mounted Excavator			25Lacs	7500000
	2) Two no. regular dozer			35 Lacs	7000000
	3) Two nos. JCB's			20 lacs	4000000
	4) four nos of Dumper Trucks			12 Lacs	4800000
					23300000
				<b>TOTAL</b>	<b>471337500</b>
	<b>Add Extra for Miscellaneous works @ 10%</b>				<b>47133750</b>
	<b>Total Cost</b>				<b>518471250</b>
	<b>Say:</b>				<b>50.0 Crore</b>

#### 14.4.5 Operating Action Plan/ Tasks

- Increasing cross section of existing RCC drains and lining work of old drain.
- Laying of storm water line on the both side of the some of the major roads of the new Bhopal.
- Construction of RCC retaining wall at nalahh sections at mata mandir square

and chunna bhatti and at other locations.

## 14.7 Solid Waste Management Strategies & Action Plan

### 14.6.1 Strategy

New mechanisms of collection and disposal have to be brought in, unless lack of the same develops into an unmanageable issue. While 2021 envisages a solid waste generation of 1550 MT, the immediate task before the corporation would be to identify suitable collection and disposal methods.

#### □ Increasing Collection Efficiency.

Increased efficiency in primary collection of domestic solid waste from households and small commercial establishments, to at least 85% of households in high-density areas, and 60% in the lower density (generally) sub-urban areas, with minimize manual handling.

#### □ Effective Positioning of Solid Waste Collection Facilities

A Geographical Information System shall be developed regarding the existing locations of collection facilities, the characteristics of the neighborhoods being served by each container, the total amount and types of waste being generated, effective walking distance from each neighborhood to the container spot etc. The idea is to come out with the Geographical Positioning System for the containers. This, apart from an effective location will help in optimum usage of containers and upkeep of surroundings.

#### □ Proper Transportation

Improved transportation of waste shall be by appropriate covered vehicles, minimizing manual handling, directly unloading at the landfill site.

#### □ Waste Segregation and Reuse.

Source segregation of solid waste is practiced in the city and shall be effectively increased and materials of value shall be segregated for recycling and income generation. Waste material from demolition sites such as timber, masonry and other

process-able wastes shall be diverted to the transfer stations and reused. In consultation with Community development groups, creation of rag pickers' societies shall be initiated in slums. Based on a survey of process-able and recyclable wastes being generated and the various reuses they can be put to, such societies shall be facilitated in contacting all such units and industries that can reuse them, thereby creating a corporation assisted rehabilitation and employment generation program.

□ Improved and safer working conditions for municipal waste operators.

□ Improved final treatment and disposal of domestic solid waste.

□ Improved management of the process in accordance with the recommendations of the Supreme Court.

### The Goal

*The year 2021 envisages a comprehensive and sustained solid waste management system with modern and scientific answers to collection, transportation and disposal of about 1550 MT/Day of solid waste and bio-medical waste.*

### 14.6.2 Institutions

□ Bhopal Municipal Corporation

□ Private sector.

□ Increased private sector and community participation.

□ For the private sector involved in solid waste management, incentives shall be introduced for improved performance. Awareness campaigns shall be taken up in all slums and through the midi about waste minimization, source segregation, healthy ways of storage at source and reuse. This is aimed at increasing level of community participation

**14.6.3 Identification of Projects for JNNURM**

collection of solid waste within the frame work of MS W Rules - 2000.

Bhopal Municipal Corporation is developing a new site for scientific land filling for the disposal of solid waste collected as per the standards and specifications for the

<b>Tab 14.8 SOLID WASTE MANAGEMENT</b>		
<b>[A - PART]</b>		
<b>S.N</b>	<b>Particular</b>	<b>Cost in Crores</b>
1	Up-gradation of existing land fill site Bhanpura	0.40
2	Collection system requirement	
	1200 Nos of covered container:	
	1. Cum. Of 1000 nos @ 15000 each	1.50
	4.5 Cum. Of 200 nos @ 35000 each	0.70
3	Transportation Management system:	
	(To meet out future requirement for transporting to new land fill site, with optimum cost)	
	(a) 20 no compactors capacity 14 cum.@ 20,00000 each	4.00
	Dumper 18 no placers 4.5 cum. @ 10, 00000 each	1.80
4	Nala Cleaning machine @ 4 nos.	0.50
5	Sewer clening Machines 2 nos. big size of Rs. 12 lakhas each & 4 small machines small size of Rs. 2.5 lakhs each.	0.24
		0.10
6	Fogging Machines 4 nos. of Rs. Lakh each.	0.10
7	Covered body vehicles for slaughter house waste transport to trenching ground. @ 10, 00000 each one nos.	0.10
8	Other equipment	
	(a) Auto Riskshaw total nos. of 66 @ 1,50000 each	0.99
	(b) Wheel barrow nos. 1500 @ 1600 each	2.40
	(c) Trucks mini model nos. 4 nos. @ 3,50000	0.15
9	Transfer point 4 nos.	0.80
	Damper 8 nos. @ 18,00000	1.44
10	Slaughter house (modern)	4.00
<b>Total A</b>		<b>19.22</b>

<b>B- PART</b>		
<b>S.N</b>	<b>Particular</b>	<b>Cost in Crores</b>
11	<b>Land fill management</b>	
	Land requirement for Next 30 years waste generation 200 acrs. (Excluding waste recycling unit)	0.2
	Site selection Base line data, Geotechnical, topographical, Hydrological investigation studies(EIA), Cost of infrastructure development and other arrangements as per MSW rules.	1.15
	2 nos of Bulldozer@ 60, 00000 each	1.20

	2 nos. of compactors @ 25, 00000 each	0.50
	4 nos. of Excavator @ 20, 00000 each	0.80
	4 nos. of Dumper @ 12, 00000 each	0.48
12	Yearly development cost for	
	Next 5 years (Rs. In Cr. 2.50 + 2.75 + 3.02 + 3.32 + 3.65)	15.24
	Liners system/ leach ate collection system, monitoring and soil cover etc. as per MSW rules.	
13	Composing plant capacity 200 T/Day	0.80
14	Incinerator – 5 lakhs 1 no.	0.05
15	Recycling unit of waste material 1 no.	15.00
	<b>Total B</b>	<b>35.22</b>
	<b>Total A + B</b>	<b>54.44</b>
	<b>Note:</b> The Bhopal is one of the project cities under urban water Supply and Environmental Improvement Project (UWSEIP) financed by ADB and a budgeted provision of Rs. 15 crores has been provided under SWM sector. Though the actual distribution would be arrived after detail discussions with ADB officials but tentatively, following distributions of funds could be considered.	
	Provision for ADB finance as	
1	Total cost of the work	54.44
	Total Amount from ADB	
1	Land files site	6.00
2	Equipments	9.00
	Total	<b>15.00</b>
4	<b>Total fund requirement for BMC Under JNNURM (after deduction the ADB financed amount)</b>	<b>39.44</b>

#### 14.6.4 Action Plan

- Maintain and manage the existing system through improved methods of waste collection.
- Preventive maintenance of refuse collection vehicles
- Increase the door-to-door waste collection performance and make the staff accountable and responsible for the same as well as cleanliness and effective use of public spaces.
- Create waste transfer centers at appropriate locations with refuse compactor systems, waste segregator systems and reuse or recycle facilities.
- Scientific disposal methods to be introduced.
- Bio-medical waste treatment plant to be commissioned by 2007
- Introduce private sector participation in O & M of disposal sites.

### 14.6.5 Operating Plan

Increased efficiency in primary collection of domestic solid waste from households and small commercial establishments, to at least 85% of households in high-density areas, and 60% in the lower density (generally) sub-urban areas. Collection efficiencies shall be improved through the provision of appropriate containers (of 1m<sup>3</sup> and 4.5 m<sup>3</sup>, depending on access and population density), using corporation sweepers and local community arrangements to convey domestic waste from household to the containers. With minimize manual handling.

- ❑ Improved transportation of waste shall be by appropriate vehicles, minimizing manual handling. Compactor vehicles empty the waste mechanically from the 1 m<sup>3</sup> containers into the compactors, whereas dumper placer trucks collect the larger 4.5 m<sup>3</sup> containers for direct transport to the landfill site.
- ❑ Improved and safer working conditions for municipal waste operators, through better equipment and material, and more effective procedures.
- ❑ Improved final treatment and disposal of domestic solid waste, by the construction and use of a sanitary landfill, being the least-cost option available for waste disposal.
- ❑ Improved management of the process, through the establishment within the Corporation of a Department of solid Waste and Industrial pollution, in accordance with the recommendations of the Supreme Court.

## 14.8 Transport System (Roads, Bridges, Traffic Management, Parking Lots, Goods and Mass Transport) Strategies and Action Plan

### 14.7.1 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development

The strategies aim at covering the entire area and population of the city with an effective road network by 2011, as well as improving the surface condition of the roads by 2021.

#### □ Augmentation and Asset Rehabilitation.

Upgradation of the existing roads shall be taken up to extend strengthened and enhance the road to its ultimate sections as per the ROW proposed in the Bhopal Development Plan to cater the increasing traffic and reducing the dust and air pollution. The roads would be upgraded to Cement concrete and black top road. The plan shall be taken up in phased manner so as to optimized the cost and serve the different area as per the needs envisaged.

#### □ Widening and Strengthening of Road Structures.

With due consideration to the growing traffic intensity, major roads, corridors and state highways running through the city are to be extended and expanded. This shall involve construction of fly-overs, bridges etc., the works on some of which are already in progress. This shall also involve

removal of encroachments on road margins, shifting of electrical poles, trees etc. and strengthening of road structures with pavements, footpaths and surfaced margins with a provision for storm water lines.

#### □ Construction of New Radial Roads, which are the Missing Links in the Transport Network.

To connect the existing city area to the newly developing outskirts area radial road as proposed in the Bhopal Development plan are being proposed. This will provide for the planned connectivity and proper road alignment to facilitate growth of peripheral areas.

### The Goal

*The year 2021 envisages 90% "all weather roads and a total road length of 1800 km is expected to cover the entire area and population of the Corporation by 2011*

### 14.7.2 Institutions

- Bhopal Municipal Corporation

### 14.7.3 Identification of Projects for JNNURM

- Presently the total length of existing major and other roads is 1020 km. It is proposed to develop following roads to the ultimate section.



Tab 14.9 ROADS AND BRIDGES							
S. N	Name of Corridor Road	Existing C/W	Existing ROW	Proposed ROW	Length	Cost/K M(in lacs)	Total Cost
<b>A</b>	<b>Roads, Intersections (Junctions), Intersections, Flyovers/Grade Separators</b>						
1	<b>Kamla Park - Polytechnic - Roshanpura - New Market - Board Office - Habibganj Naka - University</b>						
	a) Kamla Park - Polytechnic	4L/F/NCW	20	6L/F/CW	0.900	200.00	180.00
	B) Polytechnic - Roshanpura	4L/F/NCW	30	6L/F/CW	0.400	200.00	80.00
	C) Roshanpura - New Market	4L/F/CW	30	6L/F/CW	0.300	200.00	60.00
	D) New Market - Board Office	6L/F/CW	40	6L/F/CW	2.400	200.00	480.00
	E) Board Office - Habibganj Naka	4L/NF/CW	60	6L/F/CW/SR	2.300	200.00	460.00
	F) Habibganj Naka - University	4L/NF/CW	80	6L/F/CW/SR	2.700	200.00	540.00
	<b>Junctions</b>	26 Nos				40.00	1040.00
	<b>Fly - Over</b>						
	Roshanpura-Polytechnic - Firdos Park , Kamala Park	1.2 Kms				1,200.00	1440.00
	Ginnori to Purana Dhobi Ghat	0.6 Kms				1,200.00	720.00
	ITC park to VIP road	0.4 Kms				1,200.00	480.00
2	<b>Board Office - Subhash Nagar - Khushipura (Eastern side of Railway station)</b>						
	a) Board Office - Subhash Nagar	4L/NF/CW	80	6L/F/CW/SR	2.200	200.00	440.00
	b) Subhash	4L/NF/NCW	80	6L/F/CW/	4.000	200.00	800.00

	Nagar - Khushipura			SR			
	<b>Junctions</b>	8 Nos				40.00	320.00
	<b>Fly - Over</b>						
	Subhash Nagar	1.30 Kms				1,200.00	1560.00
3	<b>University - Misrod - Mandideep</b>						
	a) University - Misrod	4L/NF/CW	80	6L/F/CW/ SR	5.200	200.00	1040.00
	b) Misrod - Mandideep	4L/NF/NCW	80	6L/NF/C W/SR	13.00 0	200.00	2600.00
	<b>Junctions</b>	8 Nos				40.00	320.00
4	<b>Board Office - Chetak Bridge - BHEL - Main Road - Outer Ring Road</b>						
	a) Board Office - Chetak Bridge	4L/F/CW	80	6L/F/CW/ SR	0.500	200.00	100.00
	b) Chetak Bridge -BHEL - Main Road	4L/NF/CW	80	6L/F/CW/ NSR	4.500	200.00	900.00
	c) BHEL - Main Road - Outer Ring Road	1L/NF/NCW	80	4L/F/CW/ NSR	7.000	200.00	1400.00
	<b>Junctions</b>	13 Nos				40.00	520.00
5	<b>Khushipura (Eastern side of Railway station) - Outer Ring Road</b>	NO Road	40	4L/F/CW/ NSR	4.500	225.00	1012.50
	<b>Junctions</b>	4 Nos				40.00	160.00
6	<b>Jail Road - Jahangirabad - Lily Talkies - Thana Talaiya - Bharat Talkies - Alpana Tiraha - Hamidia Rd</b>						

	a) Jail Road - Old Jail	4L/NF/CW	80	4L/F/CW/ NSR	0.500	160.00	80.00
	b) Old Jail - Jahangirabad	4L/NF/NCW	80	4L/F/CW/ NSR	0.400	160.00	64.00
	c) Jahangirabad - Lily Talkies	4L/F/NCW	60	4L/F/CW/ NSR	0.400	160.00	64.00
	d) Lily Talkies - Thana Talaiya	4L/F/CW	20	Up - Gradation	0.350	160.00	56.00
	c) Thana Talaiya - Bharat Talkies	3L/F/NCW	20	4L/F/CW/ NSR	0.250	160.00	40.00
	d) Bharat Talkies - Alpana Tiraha	4L/F/NCW	20	4L/F/CW/ NSR	0.400	160.00	64.00
	e) Alpana Tiraha - Hamidia Rd	4L/F/NCW	30	4L/F/CW/ NSR	1.700	160.00	272.00
	<b>Junctions</b>	21 Nos				40.00	840.00
	<b>Fly - Over -</b>	1 Nos					
	Nadra Bus Stand	0.60 Kms				1,200.00	720.00
<b>7</b>	<b>Jahangirabad - Roshanpura - Jawahar Chauk - Bhadbhada Bridge</b>						
	a) Jahangirabad - Roshanpura	4L/F/NCW	50	4L/F/CW/ NSR	0.400	160.00	64.00
	b) Roshanpura - Jawahar Chauk	4L/F/CW	60	4L/F/CW/ NSR	0.450	160.00	72.00
	c) Jawahar Chauk - Bhadbhada Bridge	2L/NF/NCW	60	4L/F/CW/ NSR	2.300	200.00	460.00
	<b>Junctions</b>	11 Nos				40.00	440.00
	<b>Fly - Over / Under Bridge</b>	1 Nos					
	Rang Mahal	0.7				1,200.00	840.00
<b>8</b>	<b>Bharat Talkies - Pulbogda - Raisen Rd - Piplani - Ratnagiri -</b>						

	<b>Anand Nagar - Outer Ring Road</b>						
	a) Bharat Talkies - Pulpogda	2L/NF/NCW	30	4L/F/CW/NSR	1.400	200.00	280.00
	b) Pulpogda - Raisen Rd - Piplani - Ratnagiri	4L/NF/CW	40	4L/F/CW/SR	6.200	75.00	465.00
	<b>Junctions</b>	18 Nos				40.00	720.00
	<b>Fly - Over / Under Bridge</b>	1 Nos					
	Ashbaugh Level crossing	0.70 Kms				1,200.00	840.00
9	<b>New Market - Mata mandir - MANIT - Kolar Tiraha - Bittan Market - 10 No Market - Habibganj Naka</b>						
	a) New Market - Mata mandir	4L/NF/NCW	60	6L/F/CW/NSR	0.350	200.00	70.00
	b) Bittan Market - 10 No Market - 11 no square	4L/NF/CW	60	4L/F/CW/NSR	1.000	75.00	75.00
	<b>Junctions</b>	8 Nos				40.00	320.00
10	<b>Nadra Bus Stand To Bhanpura Chauraha (Chhola Road)</b>						
	a) Nadra Bus Stand To Kabadkhana Junction	4L/NF/NCW	60	4L/F/CW/NSR	0.700	75.00	52.50
	b) Kabadkhana Junction To Bhanpura	2L/NF/NCW	40	4L/F/CW/NSR	4.200	200.00	840.00
	<b>Junctions</b>	5 Nos				40.00	200.00

11	<b>Bhopal Talkies To Karod Chauraha</b>	4L/NF/NCW	60	4L/F/CW/NSR	5.600	75.00	420.00
	<b>Junctions</b>	9 Nos				40.00	360.00
	<b>Fly - Over / Under Bridge</b>	1.2 Kms				1,200.00	840.00
12	<b>Thana Tallaiya - Budhawara - Moti Masjit - Sadar Manzil - Hamidia Hospital - Royal Market - RTO Chauraha - Old Secretriate - Lalghati</b>						
	a) Thana Tallaiya - Budhawara	4L/NF/NCW	30	4L/F/CW/NSR	0.300	75.00	22.50
	b) Budhawara - Moti Masjit	2L/NF/NCW	20	4L/F/CW/NSR	0.500	200.00	100.00
	c) Moti Masjit - Sadar Manzil - Hamidia Hospital - Royal Market	4L/NF/NCW	50	4L/F/CW/NSR	1.100	75.00	82.50
	d) Royal Market - RTO Chauraha - Old Secretriate - Lalghati	4L/NF/CW	50	4L/F/CW/NSR	2.000	75.00	150.00
	<b>Junctions</b>	3 Nos				40.00	120.00
	<b>Fly - Over / Under Bridge</b>						
	a) Near Hamidia Hospital Under Bridge	1 Nos					200.00
	b) @ RTO Chauraha	0.75 Kms				1,200.00	840.00
13	<b>Polytechnic Chauraha - TTTI - Vigyan Bhavan - Shastri Nagar - P &amp; T Colony - Mata Mandir - 5 No Stop - BJP</b>						

	<b>Karyalaya</b>						
	a) Polytechnic Chauraha - TTTI - Vigyan Bhavan - Shastri Nagar	2L/F/NCW	60	4L/F/CW/NSR	3.000	200.00	600.00
	b) Shastri Nagar - P & T Colony - Mata Mandir	4L/F/NCW	80	4L/F/CW/NSR	2.500	75.00	187.50
	c) Mata Mandir - 5 No Stop - BJP Karyalaya	4L/F/NCW	80	4L/F/CW/NSR	4.000	75.00	300.00
	<b>Junctions</b>	14 Nos				40.00	560.00
14	<b>Kamla Park - Budhwara - Itawara - Central Library</b>						
	a) Kamla Park - Budhwara	2L/NF/NCW	30	4L/F/CW/NSR	1.8	200.00	360.00
	b) Budhwara - Itawara	2L/NF/NCW	40	4L/F/CW/NSR	0.5	200.00	100.00
	c) Itawara - Central Library	1L & 2L/NF/NCW	20	4L/F/CW/NSR	0.5	200.00	100.00
	<b>Junctions</b>	6 Nos				40.00	240.00
15	<b>Itawara - Mangalwara - Ghodanikkas - Bus Stand</b>						
	a) Itawara - Mangalwara	4L/NF/CW	30	4L/F/CW/NSR	0.5	75.00	37.50
	b) Mangalwara - Ghodanikkas - Bus Stand	2L/NF/NCW	20	4L/F/CW/NSR	1.8	200.00	360.00
	<b>Junctions</b>	5 Nos				40.00	200.00
16	Link road to Ordital Road (Development of service Road)						



	Habibgang to Misrod	New			7.000	50.00	350.00
	Bhanpur to Anand nagar	New			6.000	50.00	300.00
	J.K.Road Trangle to Ayodhya Nagar	New			2.000	50.00	100.00
	Baragarh to Lalghati (Residential)	New			3.000	50.00	150.00
17	Transport Nagar to Bhanpur link road. ( including development of 300 m. both side of the road )	New		4L	7.000	200.00	1400.00
18	Manuabhan ke Tekri						100.00
					<b>Total</b>		<b>33191.00</b>
					<b>Say</b>		<b>331.91 Cr</b>

#### 14.7.4 Action Plan

- All major roads and important regional corridors within the city limits shall be taken up for up-gradation by 2011
- Increase degree of connectivity to 100 percent.
- Implementation of the proposed traffic circulation system within Central Area and improving connectivity on peripheral areas of the city predominantly in the southern city (Misrod), moderately in the north eastern city (along Vidisha Road) and sparsely on north western (along Narsingharh Road) directions.
- Improvement of the Road in terms of:
  - Expansion to 4-lanes/full section of the roads as per master plan.
  - Major improvement to road geometries.
  - Provision of central verge.
  - Provision of footpaths and provision of guard rails.
  - Pavement strengthening, lane markings and signage
  - Improvement of the Central Area internal road network in terms of improvement of geometries, provision of footpaths, pavement strengthening etc.
  - Construction of ROB/RUB's

#### 14.7.5 Sustainability Indicators

- Road density
- Per capita road length
- Concrete road length/ total road length

The Capital Improvement Programme towards investments in roads & bridges is directed towards improving the intra & inter connectivity of the peripheral areas of the corporation and up-gradation of

major roads to all weather roads by 2011 and 2021, respectively.

#### **14.7.6 Operating Plan (Roads, Bridges & Fly-Overs)**

- ❑ All major roads to be expanded to 4/6-lanes, with full road section and converted to cement concrete / black top roads. Including construction of flyovers, footpath, and storm water drains service road, central verge and other services.
- ❑ Up-gradation and rehabilitation of existing road surface from black top to Cement Concrete including footpath and storm water drains, street lighting etc.
- ❑ Removal of encroachments and resettlement of the same.
- ❑ Re-planning of existing services passing along the existing section of road.
- ❑ Development of Intersections as per the full section development of the road.

## Traffic Management

### 14.7.7 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development Plan, the city had a registered vehicle population increasing at an average annual rate of 8.8 percent. The intra-city public transport system is essentially road based with private minibuses.

The strategies address the issues of traffic management and public transport. Since it is the need of an efficient system rather than any up-gradation or extension, the strategies shall focus upon system re-structuring mechanisms.

#### □ Preparation of Traffic and Transportation Master Plan.

A comprehensive traffic and transportation master plan prepared by LEA is already under existence and the presently undertaken works are also in line with this plan. The plan is a comprehensive effort in identifying all the roads, all such junctions and road-rail crossings that are facing or will face traffic congestion problems. It had also identified spatially, the inadequacy of public parking facilities, pedestrian facilities, road dividers and traffic segregation measures etc. The plan also pointed out the inefficient functioning of the public transport system and had explored measures and options for improving the system to cater to the needs of the population in 2011 and 2021.

#### □ Improvement of parking and pedestrian facilities.

It shall be seen that all new commercial developments adhere to the minimum provision of parking facilities. Apart from

providing public parking spaces on important roads steps shall be initiated to avoid parking at junctions. Footpaths of requisite width, pedestrian crosswalks and subways will be introduced. Vehicular traffic will be banned or limited to only access lanes in certain stretches of the Old Bhopal area, Bus Stand area and railway station areas.

#### □ Traffic Streamlining at Intersections.

Channelisers, traffic islands, traffic signals, dividers, lane separators and traffic police control shall be introduced at all important junctions based on necessity and design. A separate study shall be carried out to suggest improvements in the design and layout of junctions in the city.

#### □ Decongestion of the CBD.

Proposals have been drawn up to decongest the CBD area, in which a mix of commercial and public activities invites a lot of traffic. Options of an alternate site location for the ST bus stand shall be explored. The existing terminal can be utilised as an alighting point. Also, possibilities of shifting certain wholesale activities to new locations are being proposed

### The Goal

***The year 2021 envisages full section road development and intersections developments of about 60% road length with an effective traffic management and efficient public transport systems and introduction of metro, elevated roads and fly-overs as also on the major corridors of the city by 2021***

### 14.7.9 Institutions

- Bhopal Municipal Corporation

**14.7.10 Identification of Projects For JNNURM**

<b>Tab 14.10 PARKING AREA DEVELOPMENT</b>				
<b>S.N</b>	<b>AREA</b>	<b>TYPE OF PARKING</b>	<b>PLOT SIZE</b>	<b>COST IN CRORES</b>
<b>A</b>	<b>NEW BHOPAL</b>			
1	Police Quarters, New Market	Open	10000 Sq. Ft.	0.70
2	Behind Center Point, New Market (Sheetala Nagar)	Open	6000 - 8000 Sq. Ft	0.56
3	Behind Jawahar Bhavan, New Market (Roshanpura)	Open	17 Acre	1.39
4	Behind Hare-Krishna Market at 10 No. Market	Open	2.7 Acre	0.80
5	Opposite 10 no. Market (Multistoried Parking)	Covered	60000 Sq.Ft.	6.00
<b>B</b>	<b>OLD BHOPAL CITY</b>			
1	Old sabji Mandi at Moti masjid	Covered	6300Sq.Ft.	1.35
2	Old Govt. Printing Press, Ibrahimpura	Covered	27000Sq.Ft.	3.15
5	Nagrik Aapoorti Bank, Opposite Iqbal Maidan	Covered	4700 Sq.Ft.	0.23
6	Block no 72/1, Opposite Iqbal Maidan	Covered	3150 Sq.Ft.	0.16
7	Janki Pharmacy block, Opposite Anapoorna building of BMC	Covered	2000 Sq.Ft.	0.10
8	Stationary Block, Opposite Anapoorna building of BMC	Covered	2800 Sq.Ft.	0.14
9	Hakim Sultan Building, Kotwali road	Covered	3000 Sq.Ft.	0.15
10	Section Office PWD, Next to Annapoorna Building	Covered	2800 Sq.Ft.	0.14
11	Humayun Manzil & surrounding buildings, Next to Nagrik bank	Covered	20000 Sq.Ft.	1.00
12	Central Store, Opposite Sadar Manzil	Covered	16500 Sq.Ft.	0.83
			<b>GRAND TOTAL</b>	<b>16.69</b>

<b>Tab 14.11 TRANSPORT NAGAR AT KOTKA</b>		
<b>S.N</b>	<b>WORKS</b>	<b>AMOUNT IN CRORES</b>
1	Transport Nagar Development Balance work of Phase - I	24.00
2	Phase - II of Transport Nagar on PPP basis	
2	Development of transport hub at Kokta (300.0 mts Both side of the Approach Road of Transport Nagar)	2.00
<b>GRAND TOTAL</b>		<b>26.00</b>
<b>BUS TERMINALS</b>		
1	Development of Regional Bus stand at Putli Ghar Bus stand	10.00

2	Renewal of Nadara Bus Stand	1.00
<b>GRAND TOTAL</b>		<b>11.00</b>
<b>MASS TRANSPORT</b>		
1	Development of Mass transport system - Metro Rail on PPP basis	3.00
2	Development of water surface mass transport system on PPP Basis (Kamla Park to Sant hirdaram Nagar)	5.00
<b>GRAND TOTAL</b>		<b>8.00</b>

#### 14.11 Action Plan/Tasks

- ❑ Implementation of the medium measures suggested in the Traffic and transportation master plan for 2021.
- ❑ Identification of locations for provision of parking facilities.
- ❑ Alternate site location for the central Sarvety bus Stand.
- ❑ Traffic signs to be converted by modern elements such as thermo plastic paint, retro-reflective boards, gantry signage, countdown clocks etc.
- ❑ Lane separators on major roads to segregate traffic and improvised junctions to streamline traffic flow.
- ❑ Provision of adequate footpaths and pedestrian ways.
- ❑ Awareness programme on implementation of TP schemes, traffic regulations and civic sense.
- ❑ Regular maintenance and energy management so as to cut down on the O & M expenses on street lighting
- ❑ Bus Terminal at Nadara is to be renovated and all the required facilities like public toilet, waiting area, luggage room etc are to be constructed.
- ❑ Regional bus stand with required amenities is proposed at Putili Ghar Bus stand.
- ❑ Construction of Balance work of phase - I of the Transport Nagar at Kotka. This is planned to have all the required Amenities like Commercial area, Hammal resting area and all the other Infrastructural development work like Roads, External electrification, Water supply, Drainage, Parking for Trucks and services like Public toilet, STP etc.

#### 14.12 Operating Plan

- ❑ Construction of New parking facilities in the old Bhopal area on the land of the old aged structure covered multistoried parking on PPP basis, also in the New Bhopal area on the land, which is under utilized presently.

## 14.9 Housing for Urban Poor and Slum Rehabilitation

### 14.8.1 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development Plan. It has been observed that maximum slums in the city are either along major transport corridors or water bodies or on govt. land.

The strategies for slum improvement are focused on making Bhopal a 'SLUMLESS CITY' by 2012. This is proposed to be achieved by providing a sustainable and economical housing options to the slum dwellers under various relocation and rehabilitation program's. The housing strategies for the Urban poor are focused on facilitating the proper land use ,providing a marketable and legal title to the land owner and providing all infrastructural services for a environmentally sustainable living place .

#### ❑ Slum Existing Condition Survey

Preparation of existing detail inventory of the level of various services availability in the slums, on the basis of which various rehabilitation program's shall be taken up to achieve the goal of Slum less Bhopal.

#### ❑ Rehabilitation of Slums

Construction of housing units in the identified slums either in situ or relocated to the identified new locations with all Infrastructure services are proposed.

#### ❑ Infrastructural Development Works

Development of the deficient portion of the Physical Infrastructures in all those slums, which are identified in the study.

#### ❑ Community development and social infrastructure.

Development of educational and health center and training program's to maintain the created infrastructure and services

#### ❑ Regularization of illegal colonies and unauthorized layouts.

The various unauthorized and Illegal settlements that have come up in different part of the city particularly in the fringe areas due to various reasons such as complexity in Govt. norms and regulations, tendency of land owners to dispose off there land coming in the various schemes, etc. The corporation intends to regularize only those settlements / illegal colonies where violations are in the limits prescribed by the Govt. by levying of an impact fee after which the land use for the specified areas shall be made legal and adequate infrastructure shall be provided.

#### The Goal

*The year 2012 envisages Bhopal as a "zero slum city" with rehabilitation and relocation of as many as 25000 slum dwelling units in a phased manner*

### 14.8.2 Institutions

- ❑ Bhopal Municipal Corporation

### 14.8.3 Sustainability Indicators

- ❑ Occupancy rate
- ❑ Vacancy rate
- ❑ Number of slums along water bodies and transport corridors/ total number of slums.
- ❑ Number of slum dwelling units relocated/ rehabilitated



**14.8.4 Identification of Projects for JNNURM**

<b>SUB MISSION ON BASIC SERVICES TO THE URBAN POOR</b>			
<b>Tab 14.12 SLUM REHABILITATION/RELOCATION AND SLUM AREA IMPROVEMENT</b>			
<b>S.N</b>	<b>ACTIVITY</b>	<b>NOS. OF DEWELLING UNITS</b>	<b>COST IN CRORES</b>
1	HOUSES FOR SLUM DEWELLERS & URBAN POORS	25000 Nos @ Rs. 100000.0 per unit	250.00
		<b>TOTAL</b>	<b>250.00</b>
2	INTEGRATED DEVELOPMENT OF PLOTS FOR SLUM DEWELLERS AND URBAN POOR	25000 Nos @ Rs. 20000.0 per Household in various part of the city	50.00
		<b>TOTAL</b>	<b>50.00</b>
3	SLUM IMPROVEMENT AND REHILIBATATION PROJECTS	50000 Nos @ Rs. 15000.0 per Household in various part of the city	75.00
		<b>TOTAL</b>	<b>75.00</b>
4	DEVELOPMENT OF INFRASTRUCTURE IN ILLEGAL COLONIES		210
		<b>TOTAL</b>	<b>210.00</b>
5	CONSTRUCTION OF COMMUNITY TOILETS	10 Seater 30Nos. @ Rs.1200000 .0 per Toilet in various part of the city	3.6
6	CONSTRUCTION OF INDIVISUAL TOILETS	25000Nos. @ Rs.3000 .0 per Toilet in various part of the city	7.5
		<b>TOTAL</b>	<b>11.10</b>
		<b>GRAND TOTAL</b>	<b>596.10</b>

**14.8.4 Action Plan/ Tasks (Slums)**

- ❑ Relocation of Slums in the city.
- ❑ Slum Rehabilitation Programme
- ❑ Awareness Campaign in Slum

**14.8.5 Operating Plan (Housing & Slums)**

- ❑ Ground + 2 structure EWS housing schemes to be introduced on the identified land for relocating the slum with all required basic infrastructure like Drinking water supply, sewer and storm water network, solid waste disposal, electrification, community center, primary health center etc.

- ❑ Development of the deficient portion of the Physical Infrastructures like Drinking water supply, sewer and storm water network, solid waste disposal, electrification, community center, primary health center etc. in all those slums, which are identified in the study.

- ❑ Development Infrastructures like Drinking water supply, sewer and storm water network, solid waste disposal, electrification, community center, primary health center etc. for plotted development to rehabilitate the urban poor and illegal colonies.

## 14.10 Environment -Strategies & Action Plan

### 14.9.1 Strategy

The strategies are in accordance with the conclusions drawn in the present infrastructure analysis carried out earlier in the report and as per the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development Plan. Since there is no effective monitoring of the pollution levels of the city, the strategies shall address the same and help the corporation in maintaining an effective database of the environmental conditions of the city.

#### □ Analysis of Pollution Level.

Preparation of existing detail inventory of the level of air & water pollution of the city at various locations.

#### □ Action plan for cleaning of important water bodies in the city.

On the basis of analysis, the action plan will be formulated for all the water bodies in the city to check the pollution levels and measures towards the maintenance and revitalization shall be suggested. The plan shall also explore various options of maintenance; like developing recreational activities etc. based on the plan.

#### □ Improving Condition of Existing Parks and Development of Regional Park & City Park in the City.

The execution plan will be formulated for developing all the city level parks and regional parks.

#### □ Effective monitoring of water bodies and quality control.

The corporation shall initiate a dialogue between various agencies including MPPCB, to collect and maintain data on

important parameters of water bodies like BOD, COD, species present, extent of silt, sewerage outfalls, industrial discharges etc. on a regular basis. This forms an important aspect of monitoring the quality of water bodies.

#### □ Integrated Transportation Planning.

Since a high concentration of pollutants is observed at junctions and in the form of SPM along roads, it is imperative to integrate air pollution mitigation measures with those of traffic improvement.

#### □ Regulatory Framework.

In line with the powers vested by the 74th Constitutional Amendment Act on ULBs to maintain the environment of the city, bylaws shall be drafted in coordination with MPPCB to control air and water pollution in the city.

### The Goal

*The year 2021 envisages a "Clean and Environment Friendly Bhopal" with environment status reports being prepared each year to check the levels of pollution in the city.*

### 14.9.2 Institutions

- Bhopal Municipal Corporation

### 14.9.3 Identification Of Projects For JNNURM

<b>Tab 14.13 ENVIRONMENTAL UPGRADEMENT, CITY BEAUTIFICATION AND URBAN FORESTRY</b>		
<b>S. N</b>	<b>AREA</b>	<b>COST IN CR.</b>
1	Lake conservation	10.00
2	Redevelopment of Kamla, park, Vardhman park, Kilol, park, Yadgare Shahjahani park, Neelum park, Naunihal park, Ekant park, Chinar park, Nandan Knan park, Mayure Park, etc.	12.00
3	Development of colony parks in the different colonies of the city including construction of boundary wall, soil filling and construction of paved walking track.200@100000	2.00
4	Development of Regional Park at Kolar road	20.00
5	Plantation at North Slopes of Shamla Hills, Southern slopes of Fatehgarh Hills, North Slopes of Arera Hills and South Slopes of Arera Hills, Kamla Park Area	4.00
6	Development of Hawkers market at 30 locations, weakly market at 10 location Air conditioned Meat market at 14 zones	20.15
<b>GRAND TOTAL</b>		<b>68.15</b>

#### 14.9.4 Action Plan/ Tasks

- ❑ Preparation of action plans for control of water and air pollution in the city
- ❑ Small scale polluting industrial
- ❑ Units to be moved out of the city

- ❑ Effective transportation planning to avoid congestion on roads and road margins to be properly paved.
- ❑ Conservation of water bodies.
- ❑ Mixed land use to be accepted to reduce unnecessary movement of vehicles
- ❑ Development and regeneration of city parks and Regional parks.
- ❑ Green belt provision and plantation of trees

#### 14.9.5 Operating Plan

- ❑ Development of colony parks of the city on PPP basis in the different colonies of the city including construction of boundary wall, soil filling and construction of paved walking track including water connection to the park. After construction and development the park will be manage by the resident of the colony.
- ❑ Plantation at North Slopes of Shamla Hills, Southern slopes of Fatehgarh Hills, North Slopes of Arera Hills and South Slopes of Arera Hills, Kamla Park Area also at Institutional Lands belonging to Educational institutions, Industrial premises, Central and State Govt. premises and other Public lands. Community Wastelands, Road side margins – state/National Highway, roads, Degraded hillock and reserve forest near city.
- ❑ Redevelopment of Kamla, park, Vardhman park, Kilol, park, Karishma Park, Yadgare Shahjahani park, Neelum park, Naunihal park, Ekant park, Chinar park, Nandan park etc. including construction of boundary wall / Fencing, re-plantation, development of lawns and landscaping work, walking path ways, construction and installation of fountains, sculptures, garden lighting etc.

- There are 18 water bodies in the city, Upper lake, Lower lake, Shahpura lake, Motia Tank, Siddiqui Hussain Tank, Munshi Hussain Khan Tank, Lendiya pond etc are to be conserved by constructing bund fencing, strengthening of bunds, constructing walkway over it, plugging of waste water line (Diversion and connection of these line are taken in sewer works), conducting clean environment programmes, keeping waste collection containers at suitable locations, Closing the common passages.
- Development of hawkers zone and meat market at various identified places.
- To maintain the ecological balance of Bhopal City, forest Department has proposed to develop three forest areas in Bhopal. The areas are as follows:
  - **Van Vihar** : Declared as National Park in 1983 and spreaded in 445 Hect. land wound Upper lake has emerged as nahnal shelter for wild life. It is equally attract tourist as in year 2005 around 241,172 visitor visited Van Vihar.
  - **Bio diversity Herbal Park Mendors** : 10 Km. from the city, spreaded in 395 Hect. is developed as Hearbal park. The estimated cost of development is Rs. 120 lacs.
  - **Khajuri Forest on Raisen Hoshangabad Bypass Road** : The protected land of 238.7 Hect. and revenue forest land of 732.610 hect ( total 1001.310 Hect) land is under threat due to expansion of city. The land has the potential to be conserved as forest land for conservation of ground water. An amount of Rs. 64.0 lacs has sanctioned for year 2005-2006 to be developed as carbon sink area.

### 14.11 Urban Heritage -Goals, Objective of Development, Strategies & Action Plan

#### The Goal

*A well-maintained historic urban center and an historic town to attract the tourism activity, by the end of horizon year 2012.*

#### 14.10.1 Objectives of Development of the Identified Areas Leading Towards Underlying Principles and Approaches of Planning Strategy and Policies.

All towns and urban centers strive to provide their citizens with basic needs: adequate shelter, transport, work opportunities and a decent quality of life. Historic urban centers offer ambience with a special capacity to enrich the lives of their residents. A well-maintained historic urban center has many advantages for its citizens. It is intimate and human in scale and often rich in diverse activities. An historic town is a multi-functional organism with residential, social, political, cultural and economical activities.

- The unique features of any historic towns can be recognized under the following principles :-
- The historic town consists of a complex interdependent network of crafts and skills that provides livelihoods in multiple ways and is difficult to replicate in any new development. Therefore these areas should be viewed as Economic Opportunity and not a liability. Conservation of inner-cities and historic areas as (from the examples of countries that have adopted conservation as a erate policy) resulted in economic revival. In terms

of Bhopal the bullion trade, handicrafts (embroidery, silver jewellery etc.) are centered in Sher-e-Khas. An in-depth survey is required to identify area specific skills and strengths and development/conservation plans need to address their needs and growth.

- 
- The historic towns are socially and culturally more alive and have provided civilization quality to India that is unique and exclusive giving it unity in its diversity. Having evolved over centuries it has resolved to a large extend the differences in religious, political, economic and cultural beliefs of the people. Conservation has resulted in better socially integrated individuals leading to lessening of crimes, riots and other social ills. The generative forces in any historic towns are cultural and the town is alive with non-tangible cultural assets. Bhopal like other historical towns has distinct social and cultural manifestations in the food, dress, recreation etc. and forms the non-tangible and living heritage of the place. Non-tangible by its very nature is fragile and is dependent on both patronage and built/open spaces hence any insensitive development causes ir-repairable damage to them and therefore needs to be addressed in the development plan. Building controls favoring conservation, asked on detailed studies and a blueprint for action is an urgent need and should form part of the planning proposal.
- Since the historic towns consist of Historic Layering it gives a sense of rooted ness to people resulting in a more committed citizen. It also dispels anxiety in individuals leading to better recognition of differences and is less hegemonic. Integrating historic areas into the development plan is a well worked out process where UNESCO has laid down several guidelines. Since India is a signatory to the UNESCO as well as other Charters for

the protection of its Heritage, it would be in order to know the guidelines and to implement them.

- Historic towns have greater Sustainability than a new development because it was based on evolutionary processes and was in tune with the micro-environment of the region of its location. Low on energy consumption, the planning assured: comfortable living conditions. Several studies show that older buildings have better air circulation, insulation, water preservation and its compact planning provided Sustainability even in terms of conservation of human energy. Any intervention to the existing infrastructure should precede proper documentation of the existing as the existing contains knowledge system that is still not completely known to us. Proper documentation and research of sewage systems, water system, and town planning of the historic architecture and town is of high importance and should be an integral part of planning process. Salvage Archaeology' (archaeological assessment of construction excavations in identified historical areas and zones) is a norm in several countries and there is every reason to follow the example in Indian situation.
- One of the biggest regressive trends since independence has been in the field of our town and country planning. Today our towns and cities are overcrowded, polluted, chaotic, unplanned centers that are hostile to women, children, and old and handicapped. They are unaesthetic and unappealing visually marked with either undesirable slums or harsh concrete jungles. Historic towns on the other hand are Aesthetically and Environmentally appealing and pleasing leading to the Tourism Potential of a place. A good Conservation plan brings tourism benefits automatically as has been shown in several towns of Rajasthan, Goa and Kerala. Regulations for

preserving the historic character of the built heritage and conservation of its architecture, policy on traffic, transport, road surface, electric wiring, sewage, surface drainage, solid waste disposal, baodies, wells, open space and parking in the historic area of the city. Regulations for new constructions, open spaces, plantation, pedestrian facilities, streetscape's, street furniture etc. are another area to be included into the planning process.

#### 14.10.2 Strategy

Strategies can be summed up broadly into areas mentioned below:

1. Study and Documentation of the Historical/Heritage resulting in an inventory that should be published and marked in map of the area, complete with its location, ward No., ownership, status, photographs, description, historical and heritage significance, age etc.
  - Buildings of heritage/historic value
  - Drainage and Water systems such as fountains, tanks, well etc.
  - Streetscapes and culturally homogenous areas
  - Crafts, skills and craftsmen of traditional crafts
  - Open spaces and gardens including type of existing trees and plants
2. Dividing the identified buildings, areas etc. and to Provide Legal back-up with Regulations and Bye-laws to the identified buildings after dividing them into
  - Heritage Zone
  - Heritage Areas
  - Heritage Group of Buildings



- Heritage Site
  - Heritage Precincts
  - Heritage Monument/Building
3. Formulation of Specific Projects for the Conservation, Restoration, Preservation, Reconstruction of the identified Areas, Zones etc. with the idea of revitalizing the City centers. Demolition of historical/heritage building or buildings should be done only under special conditions and law. Encroachments should be dealt with firmly. This should be done with extensive and intensive consultation with the people and peoples groups including technical, political groups etc. giving space for people to participate in more ways than one. Industrial houses, Funding organizations, interested individual (including Non-Resident Indians) should be approached for providing part funding for the projects.
  4. The care and maintenance of heritage must be entrusted to the local community, for which Public Awareness programs, Heritage Walks, Workshops, Educational programs must find place in the Heritage Management Plan. A nodal agency that acts as an interface between the people. Municipal Corporation, government and technical and financial matter should be identified to implement the Management Plan.
  5. Signage, public notices, road furniture, display boards, billboards, etc. should be designed to supplement the ambience of the historic/heritage area.
  6. Promotion of traditional cultural expressions and art should be given importance and special spaces, programs and facilities should be provided for the growth of such activities.
- 14.10.3 Action Plan**
1. Conservation of 'Royal Ensemble' to be declared as a special protected area with program for its development. The development plan has to conform to the conservation norms set by UNESCO. This would include documentation of the historic buildings in the specified area marked in plan. Detailed conservation plan based on the study and recommendations of Conservation architect, structural engineer, sanitary engineer, art historian and other experts. The conservation plan would include conservation, restoration, signage, regulations, interpretation, electrification and awareness program of the buildings, open spaces, water system (including fountains, tanks, wells etc.), ghats, facades, gates and all the components that combine to form the historical/ heritage character of the area.
  2. Documentation, Detailed study and Heritage Conservation of the three historical cascading tanks at Shahjehanabad area of Bhopal including the cleaning, conservation, reconstruction, removal of encroachments, etc. of the identified area including buildings, tanks, temples, mosques, roads, open spaces, schools and all other components that fall within the identified area and are of heritage/historical value or are required to enhance and develop the historical/heritage value of the area. Experts would be required for the formulation and execution of the Project and its Heritage Management Plan. Extensive consultation with the people and their participation including fund raising from other sources would form part of the Heritage Conservation Plan.
  3. Development of public spaces in the Art Deco area of Ahmedabad. Plantation of Botanical garden, restoration of boundary walls etc. forms part of the proposal. Individuals can be motivated to restore their heritage buildings and conservation and heritage experts can suggest adaptive reuse of some of them.

4. Bhopal at one time had 72 baghs and have been mentioned by nineteenth century visitors to the town as the beautifying factor of the town. After independence nearly all of these beautiful gardens are destroyed. Reconstruction of some of them would restore the character of the town and would heal the wounded sentiments of the people.
5. Inner city development. This needs greater study and streets, lanes, lacadcs, mosques, temples and individual houses can be included in the development project. Waste disposal, signage, roads, road furniture, and water drainage, underground electrical cabling would go a long way in restoring the damaged character of the inner city. Revitalization plans would also include transportation, parking, vehicle planning.
6. Other similar projects emerging out of study and

**14.10.4 Institutions**

- Bhopal Municipal Corporation & Archeology Department

**14.10.5 Identification of Projects for JNNURM**

1	Conservation of Royal Ensemble, Fatehgarh Fort or citadel, fort near Hammam and the northern end near Rctghat, Shehr-e-Khas etc include conservation, restoration, signage, regulations, interpretation, electrification and awareness program of the buildings, open spaces, water system (including fountains, tanks, wells etc.	50.00
<b>GRAND TOTAL</b>		<b>50.0</b>

**14.10.6 Operating Plan**

Reconstruction of damage part of the structure, restoration of damaged parts, waterproofing, re-plastering, and repairing and replacement of doors and windows, redevelopment of gardens and lawns, repainting, fencing the boundaries of the structure etc.

## 14.12 Special Projects - Strategies & Action Plan

### 14.11.1 Strategies & Action Plan

The strategies are in accordance with the conclusions drawn from the suggestions of the citizens, elected representatives and the other stakeholders involved in the entire City Development Plan.

### 14.11.2 Working Women Hostel

Due to this rapid industrialization and fast increase in trade and commerce etc. there is growing trend of migrated population coming from the nearby cities and also from far of other cities for jobs etc. The male population and highly placed females also normally does not face the accommodation problem, but the middle level and below level, single female staff working in this Companies / Industries faces acute problem for want of a secure and good premises for residential purpose. Many of this female employees are forced to travel daily from near by areas due to lack of such accommodation thereby creating financial burden and hardship on them. To cater to the problem of providing a secure and good accommodation to the single women working in the city.

### 14.11.3 Night Shelter

Bhopal being a capital city lot of rural population floats in for short duration of stay. In order to facilitate their stay. Economical stay options are employed in the form of night shelters. The facilities provided in such shelter houses are in this manner that the user get a secure stay in the city.

### 14.11.4 Sports Complex

The development of Infra structural facilities, services and amenities like Health, Education, SPORTS etc have not

developed as per the growing needs of the city. Indore and Bhopal together applied for hosting the National Game 2011, At present there is only one Stadium and ground 'Nehru Stadium' which fulfills the criteria laid down by sports ministry for different sports. The City hosts of many National and International Players in all categories of sports but the growth of new talent is seriously hampered by the lack of Sports Infrastructure. Some individual Sports associations have tried to create some facilities for the particular sports but it is drastically inadequate to fulfill the growing needs of the city. In the absence of Sports Facilities in the City the up coming talent generally migrate to the bigger cities like Delhi and Bombay thereby straining the Infrastructure available there.

It is very important to develop National Standard Sports Infra structural Facilities in the city so that the migration of sports persons to other cities can be stopped. Also creation of any Sports infrastructure greatly helps in diverting the minds of growing youngsters to more creative fields of sports thus enabling them to grow with an healthy mind and body.

### 14.11.5 Convention Center & Exhibition Ground

Bhopal is the capital of the State, lot of development in Industrial and Educational sector is taking place. At present there is no auditorium hall to host any international or National level meet of capacity 2000 or more.

### 14.11.6 Projects Identified Under JNNURM

Tab 14.14 SPECIAL PROJECTS		
S. N	AREA	COS T IN CR.
1	Construction of working women hostel in New Bhopal and BHEL area of 120 beds	8.00
2	Construction of Night	1.0

	shelters for 40 beds	
3	Construction and development of marriage hall 2 nos	2.0
4	Renovation and reconstruction of sheds constructed for Gas Victim in to community halls.	2.0
5	Renovation of ashbag stadium, Development of Babyali ground, Arif Nagar Ground.	8.0
6	development of Zonal Play field Including Ground development and fencing 14 @ 20 Lacs	2.8
7	Construction of Stadium Complex at BHEL area	10.0
8	Renewal of Commercial complex at M.P.Nagar, New Market, Fish Market, Ibhariam Pura, New Kabad Khana.	29.7
9	Convention center at Hujur including Training center and Accommodation, Exhibition area and Open air amphitheater For various Cultural and social activities.	20.0
10	Development of Exhibition Ground at Jamuri maidan.	5.0
	<b>GRAND TOTAL</b>	<b>88.55</b>

Tab 14.15 SUMMARY OF PROJECTS IDENTIFIED FOR JNNURM & ITS PHASING									
S.N	ACTIVITIES	COST IN CRORES	ESTI MATE D EXPE NDIT URE IN 2005-2006	ESTIM ATED EXPE NDITU RE IN 2006-2007	ESTIM ATED EXPE NDITU RE IN 2007-2008	ESTIM ATED EXPE NDITU RE IN 2008-2009	ESTIM ATED EXPEN DITUR E IN 2009-2010	ESTIM ATED EXPE NDITU RE IN 2010-2011	ESTIM ATED EXPEN DITUR E IN 2011-2012
<b>A</b>	<b>SUB MISSION FOR URBAN INFRASTRUCTURE AND GOVERNANCE</b>								
1	URBAN RENEWAL	100.30		10.00	18.00	15.00	15.00	15.00	27.30
2	WATER SUPPLY	550.00	2	100.00	100.00	100.00	100.00	90.00	58.00
3	SEWERAGE	245.27		41.00	50.00	43.00	40.00	40.00	31.27
4	SOLID WASTE MANAGEMENT	39.52		8.00	10.00	8.00	6.00	7.52	
5	DRAINS / STORM WATER DRAINS	50.00		10.00	10.00	10.00	10.00	10.00	
6	<b>URBAN TRANSPORT</b>								
a	ROADS AND BRIDGES	331.91		34.00	68.00	50.00	47.00	51.27	81.64
b	TRUCK TERMINALS / TRANSPORT NAGAR	26.00	8.00	18.00					
c	BUS TERMINALS	11.00	1.00	10.00					
d	MASS TRANSPORT SYSTEM	8.00			2.00	2.00	2.00	2.00	
e	PARKING LOTS	16.69		5.00	4.00	7.69			
7	<b>ENVIROINMENTAL UPGRADATION, BEAUTIFICATION, CITY AND URBAN FORESTRY</b>								
a	PRESERVATION OF WATER BODIES	2.00		0.50	1.00	0.50			
b	DEVELOPMENT OF REGIONAL PARK	20.00		4.00	7.00	7.00	2.00		
c	COLONY PARKS	2.00		0.50	1.00	0.50			
d	UPGRADATION OF CITY PARKS	12.00		2.00	4.00	4.00	2.00		
e	URBAN FORESTRY	4.00		0.50	2.00	1.50			
8	<b>HERITAGE STRUCTURES</b>	50.00		1.00	3.00	3.00	2.00	1.00	
9	<b>SPECIAL PROJECTS</b>								
a	WORKING WOMEN HOSTEL	8.00		2.00	2.00	4.00			
b	NIGHT SHELTERS	1.00		0.50	0.50				
c	MARRIAGE HALL	2.00		0.50	1.00	0.50			
d	COMMUNITY HALL	2.00		0.50	1.00	0.50			
e	SPORTS COMPLEX & PLAY GROUND	20.80		3.00	5.00	5.00	5.00	2.80	
f	CONVENTION CENTER AND EXIBITION GROUND	25.00		5.00	5.00	5.00	5.00	5.00	
g	RENUWAL OF COMMERCIAL CENTER	29.75		12.00	12.00	5.75			
<b>B</b>	<b>SUB MISSION ON BASIC SERVICES TO THE URBAN POOR</b>								
1	INTEGRATED DEVELOPMENT OF SLUMS	75.00		10	15	20	20	10.00	
2	SLUM IMPROVEMENT AND REHILBATION PROJECTS	50.00		10	10	10	10	10.00	
3	HOUSES FOR SLUM DEWELLERS & URBAN POORS	250.00		25	40	40	25	70.00	50.00
4	INFRASTRUCTURE DEV. IN ILLEAGLE COLONIES	210.00		20	20	50	40	40.00	40.00
5	COMMUNITY AND INDIVISUAL TOILETS	11.20		3	2	1	2	1.41	1.79
	<b>TOTAL</b>	<b>2153.44</b>	<b>11.00</b>	<b>345.00</b>	<b>400.50</b>	<b>400.94</b>	<b>336.00</b>	<b>360.00</b>	<b>300.00</b>

## Chapter

**15** Reforms & Capacity Building**15.1 Agenda**

The thrust of the JNNURM is to ensure improvement in urban governance and service delivery so that ULBs becomes financially sound and sustainable for undertaking new programmes. It is also envisaged that, with the charter of reforms that are followed by the State governments and ULBs, a stage will be set for PPPs. The agenda of reforms is given in the section below. The National Steering Group (NSG) may add additional reforms to identified reforms. A Memorandum of Agreement (MoA) between States /ULBs /Parastatal agencies and the Government of India, a prerequisite for accessing the Central assistance, would spell out specific milestones to be achieved for each item of reform. All mandatory and optional reforms shall be completed within the Mission period.

The thrust of the JNNURM is to ensure improvement in Urban Governance and service delivery so that ULBs becomes financially sound and sustainable for undertaking new programs. The agenda of reforms specified in JNNURM is given in the following section . A Memorandum of Agreement (MoA) between States /ULBs /Parastatal agencies and the Government of India which is a prerequisite for accessing the Central assistance would spell out specific milestones to be achieved for each item of reform.

It is envisaged in the JNNURM that all mandatory and optional reforms shall be completed within the Mission period.

**Initiatives taken by BMC**

Bhopal with a population of 1.43 million in 2001 is the capital and second largest city of Madhya Pradesh (MP) state. Realizing that Bhopal's growing size required significantly greater expenditure on services and amenities in 1999 the BMC began its initiative to strengthen its revenue base. In 2001-02 BMC earned an income of only Rs. 127.96 crore. In response to the pressure on its finances and with a aim to increase investment in infrastructure. BMC has undertaken sustained measures to strengthen its revenue-base. The property tax, shop rent charge, trade licensing, budgeting, and accounting systems were computerized and improved. The BMC also prepared an inventory of its existing assets and designed strategies for their optimal use. The BMC introduced self-assessment of property tax by citizens. To strengthen its revenue collection, the BMC reorganized the revenue department separating Survey and Assessment. Billing and Collection, and vigilance functions, introduced cash collection counters and decentralized many revenue operations to zonal offices. The municipal corporation set up a master data bank and compared information available from voters lists, the state electricity board, the shops and establishment department, and title registration to identify assets non-assessed for property tax. illegal water connections, under-assessment of property tax and non-payment of rents for municipal assets.

As a result of these measures, total revenue increased from Rs 127.96 crore during 2001-02 to Rs. 160 crore during 2004-05. At the same time, revenue from the city's own sources (property tax, water tax, trade and licenses etc.) increased from Rs. 44 crore to Rs 54 crore. *Consequently, the BMC has been able to double its expenditure on service provision.*



## Reforms undertaken by BMC till to date

### 15.2 GIS Application

The modern accrual-based double entry systems of accounting have already been partially introduced in BMC and the system will be fully operational in the next financial year.

#### 15.2.1 E-Governance Applications in BMC

##### Aim

Development of transparent public services using Information technology with ultimate aim of paper less governance.

##### Objective

1. Development of relevant software's for various services provided by the Bhopal Municipal Corporation.
2. Development of GIS based services for Bhopal Municipal corporation
3. Integration of the Various services through the GIS and MIS

**Tab 15.1 Present statuses of various E-governance applications are following**

S.N.	Services using E-governance applications	Details
a.	Property Tax	Demand Register/ Billing/ Payment Collection
b.	Water Tax	-----same as above-----
c.	Licenses Rent	-----same as above-----
d.	Birth and Death	Issuance Birth and Death Certificate
e.	Accrual Based Accounting System	Budget Management and Implementation of Double Entry Accounting System
f.	Building Permission	Issuance of Certificate
		1. Inward and outward of application
		2. fee calculation / refusal letter
		3. registration of Engineers / architect
g	Scanning and indexing of documents	1. Section maps of building
		2. Colony layouts
		3. lease land documents
		4. Colonizer / builder. registration documents
		5. employee records
h	Social securities pension schemes	To beneficiaries destitution of poison timely and regularly application in working
l	Connectivity	To develop the wireless connective between head quarter and zonal offices work under progress by CMC limited.
j	Call centre	For public complaint and suggestion call centre at BMC in working from last 8 months

The work of GIS application for Bhopal city have already been awarded, which will includes the complete GIS, related operation for BMC.

### **Salient features of pilot project of GIS**

#### **(a) Objectives**

- Estimation of Property Tax
- Land Use/land Cover of each property

#### **(b) Study Area**

- 1 ward.
- 1 sq. K.M.
- 24 linear K.M.
- 17 residential colonies.
- Total 2500 properties

#### **(c) Method**

- ETS Survey
- Data Collection
- Linking of data with map

#### **( d) Application Software**

- Arc view
- AutoCAD
- Map object
- Customize application is developed using visual basic & map object
- Oracle

#### **( e ) Application Of The Digital Map**

- Water
- Electricity
- Basic Facility
- Tracking
- Garbage Dumping
- Setting up hospital, School, Police Stations, and Fire Stations etc.
- Shortest Path
- Socio- Economic Analysis
- Town & Country Planning

#### **( f ) Municipal GIS Software**

- User Friendly
- Buffer Analysis
- Property Assessment
- Road Widening
- Print Map
- Selection By Attribute

As specified in JNNURM User charges will be levied in consultation with the various stakeholders to achieve the objective of collecting full cost of operation and maintenance is recovered in seven years. After completion of Narmada scheme project for water supply it is proposed to install meters at every outlet .

There is already provision kept in the budget of BMC for basic services to Urban poor which now will be supplemented to meet the requirement of JNNURM.

Some of the scheme for Slum rehabilitation is already underway under the VAMBAY scheme of GoI wherein the security of tenure are being provided to the Slum dwellers and site and services developed. The other reforms spelled out in JNNURM will also be taken up on priority basis as they already are in the agenda of BMC in pursuit of its aim to provide the Slum dwellers and urban poor a sustainable and environmentally hygienic living conditions.

### **Mandatory Reforms at the State Level as Spelled in JNNURM**

- (a) Implementation of decentralisation measures as envisaged in 74th Constitutional Amendment Act. The State should ensure meaningful association and engagement of ULBs in planning the function of parastatal agencies as well as the delivery of services to the citizens.
- (b) Repeal of ULCRA.
- (c) Reform of Rent Control Laws balancing the interests of landlords and tenants.
- (d) Rationalisation of Stamp Duty to bring it down to no more than 5 per cent within next seven years.
- (e) Enactment of the Public Disclosure Law to ensure preparation of medium-term fiscal plan of ULBs and parastatal agencies and release of quarterly performance information to all stakeholders.
- (f) Enactment of the Community Participation Law to institutionalise citizen's participation and introduce the concept of the Area Sabha in urban areas.
- (g) Assigning or associating elected ULBs with "city planning function". Over a period of seven years, transferring all special agencies that deliver civic services in urban areas to ULBs and creating accountability platforms for all urban civic service providers in transition.

*Note: In respect of people oriented schemes relating to water supply and sanitation, the under-mentioned State level mandatory reforms may be taken as optional reforms:*

- a) Repeal of Urban Land Ceiling and Regulation Act*
- b) Reform of Rent Control Act*

### **Optional Reforms (common to States, ULBs and Parastatal Agencies) as spelled in JNNURM**

The following optional reforms are expected to be undertaken by ULBs, parastatal agencies and State governments:

- (a) Revision of bye-laws to streamline the approval process for construction of buildings, development of site etc.
- (b) Simplification of legal and procedural frameworks for conversion of land from agricultural to non-agricultural purposes.
- (c) Introduction of Property Title Certification System in ULBs.
- (d) Earmarking at least 20-25 per cent of developed land in all housing projects (both public and private agencies) for EWS and LIG category with a system of cross subsidisation.

- (e) Introduction of computerized process of registration of land and property.
- (f) Revision of byelaws to make rain-water harvesting mandatory in all buildings and adoption of water conservation measures.
- (g) Byelaws for reuse of recycled water.
- (h) Administrative reforms i.e. reduction in establishment costs by adopting the Voluntary Retirement Scheme (VRS), not filling posts falling vacant due to retirement etc., and achieving specified milestones in this regard.
- (i) Structural reforms.
- (j) Encouraging PPP.

### **Timeline for Implementing the Urban Reform Agenda -Annexure**

## 15.3 Capacity Building

### 15.3.1 Direction to Planning

A city needs to start with a basic vision of itself, about the direction in which it would like to go. What is it that the city would like to be known for? What are its strengths? How should it attract quality people to its fold? These questions may yield different answers from the different places for each place has its own culture, its own behavioral pattern and it is keeping that in mind any strategy should be devised. Some places may find their potential in trade and commerce or financial services and some may find it in education, health, science, technology and research, others in tourism or cultural activities, a salubrious climate and natural beauty and yet some in heavy industry. Cities need to align themselves along those strengths. And these strengths are retained and advocated through appropriate Capacity Building programme.

### 15.3.2 Bhopal Municipal Corporation

BMC, as entrusted body to carry out the National Urban Renewal Mission, needs to build on its organizational capacity. Training and Capacity Building are functions along with the other initiatives taken by the GoMP.

Bhopal Municipal Corporation has a range of functions related to the provision of the public services under obligatory and discretionary functions as incorporated in the Madhya Pradesh Municipal Corporation Act, 1956 (**Refer chapter of Governance.**). Like functioning and the problems identified for any other ULB, BMC also has its functional hazards as following:

### 15.3.3 The Stumbling Blocks

To identify the prevalent trends and the scope of reforms, multi levels of authority at BMC were interviewed. It was observed after the dialogue that not only the intervention was required in the training and capacity building field but there also was a need to restructure and reengineer the hierarchies and job responsibilities. Following were the encumbrances identified by the various officials at BMC. There was unanimous view that Madhya Pradesh far ahead in incorporating the reforms, which off-shot from the 73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendment Act. But there still is need of further strengthen the efforts that have been initiated.

#### **Hindrances in smooth functioning of the department**

Urban governance and functioning at BMC today is characterized by

- Fragmentation of responsibility,
- Incomplete devolution of functions and Funds to the elected bodies and ULBs,
- Multi-locality offices and no proper infrastructural provision for the BMC staff.
- Unwillingness to progress towards municipal autonomy,
- Adherence to outmoded methods
- Lack of appropriate HR Department and policy.
- Absence of suitable training policy and technical Upgradation programs.
- No knowledge imparting of the rules and regulation or refreshers.
- No structured induction or orientation program.

The concerns are further listed as following as per the feedback given by BMC employees,  
**Tab 15.2**

<b>Tab 15.2 Departmental Concerns</b>
<b>There is no holistic frame in which the activities of all the functional bodies are converged for a common ultimate goal. The activities of the local bodies and the various associate and special bodies overlap, which result in dissipation of scarce resources and contradiction of action.</b>
<b>Large number of meetings, low participation, minimally effective decisions.</b>
<b>Lack of formal training policy.</b>
<b>Lack of Personnel with appropriate background and aptitude</b>
<b>Inadequate skill sets of personnel already deployed</b>
<b>Lack of appropriate institutional framework to handle the programme</b>
<b>Coordination and rationalization of inter-institutional relationship has to be effected for better result between the municipal authorities and Parastatal Bodies.</b>
<b>There are inconsistencies and inadequacies in the urban legal frame work e.g. municipal laws, town and country planning law, district planning law, etc.</b>
<b>The powers, functions and authority given to the Mayors, Mayor-in-Council and the local bodies as a whole are not adequately defined.</b>
<b>Planning capacity, human resource development, financial management are not developed, as a result of which these are operating inefficient.</b>
<b>There is no rigid implementation mechanism to execute the devised programmes.</b>
<b>The city is not fully equipped in terms of human and physical resources to take up Planning Actions in an integrated manner.</b>
<b>The city is more used to design and implement location-specific repair, maintenance and improvement works, rather than city-wide integrated systems development planning and execution.</b>
<b>Modernization and upgrading of systems and procedures in city management through equipment, skill-enhancement and application, and updating of manuals and codes (e.g. GIS and MIS) have not been carried out to meet the current and emerging challenges Functional reorganization of and delegation of powers to the departments in the city is necessary to enable them to perform better (e.g. a relevant HRD programme).</b>
<b>Basic elements of improved financial management (e.g. asset register. Double -Entry system in accounting, billing and collection, etc.) have to be initiated.</b>
<b>The annoyance and resistance is much stronger at the places where nominees were not informed about the programs and their utility.</b>
<b>BMC lack in-house capacity to handle urban issues. Suitable training programs are required to combat this.</b>
<b>No forum available to support professional development of urban managers in the state.</b>
<b>There is no systematic approach to chalk out departmental reforms.</b>



Experience shows that functional autonomy becomes a reality only when it is accompanied by financial independence. State governments, therefore, need to strengthen the autonomous functioning of the BMC like any other ULB through positive measures, and in particular, ensure their financial self-reliance.

In a country that ranks among the highest in terms of scientific and technological talent, where Information Technology and Business Management schools mushroom around every corner of even the smallest towns and where even a librarian must have some specialized training of his field, there is no systematic education for Governance and Administration. The average administrator is selected from a variety specialization and left to learn the complexities of public Administration.

## **15.4 The Training Perspective**

After years of neglect, the development of human resource at the ULB level has suddenly become a matter of concern, not just for senior administrators but for policy-makers, international donors and development agencies as well. Local governments need capacity-building to be effective. Unless local governments are given unambiguous administrative, fiscal and political devolution, no organization would be able to perform to expectations.

In the contemporary rapidly changing socio-political environment, the importance of training needs no reiteration. The importance is gaining momentum due to rapidly changing economic, political and developmental scenario. Training as a process enables individuals to cope with the pace and magnitude of changes, take initiatives and provide leadership to developmental activities and helps them to adapt themselves to the changing needs of the society. Training, therefore, constitutes an integral part of all Human Resource Development efforts. Timely and need based training with emphasis on 'doing' rather than 'knowing', increases productivity and organizational effectiveness.

In the present scenario, training probably requires more serious attention than ever before because functionaries working at the cutting edge level (elected members and functionaries) are the ultimate provider of goods and services to the people. Thus, enhancing performance at this level is of critical importance to ensure optimum utilization of scarce financial and material resources. Since there is cost associated with training, any ill-directed training may be futile and may lead to wastage of time and resources.

### **15.4.1 Training Effectiveness**

The training as a concept has a hoary past. It is as old as Plato's Republic. But during last decades due to changed environment of society and state, the concept and understanding of training has undergone a tremendous change. Now the ULBs have changed their characteristics and functions to a large extent. Therefore trainers and training institutions catering to them must aim to train, keeping the changed priorities and perspectives in mind. Besides this the secondary function or the obligatory duty is also to be carried out viz: to influence the government departments / organizations to value the spirit and essence of the same.

### 15.4.2 Training Problems and Present Situation

Following is the comprehensive update on the training problems and present situation:

Tab 15.3 Action Plan With Verifiable Indicators	
Problems	Present Situation
Organizational structure and Internal coordination	Horizontal and vertical information flow lacking; Pyramidal structure of Authority; True management interaction Lacking;
Procedures and internal management	Manuals and procedures not updated regularly; Refresher trainings are often taken lightly; Municipal Information system not developed; Old permanent staff are least bothered of the changes and the new staff capable is not recruited regularly;
Staff capacities	Knowledge, Skills and application not present in the new changing context. Employee's are less adaptable to the changes in the procedures;
External – inter Agency coordination	Better Understanding and knowledge of other relevant institutions is untouched; Dimensions of interrelationship not fully understood; Areas of cooperation and concerns not identified adequately;
Non – realization of Revenue Potential	Lack of records, facts and asset registers update; Continuation of leakage, Under-assessment, Under billing and oversight;
Civil society Interface	No experience (except one or two instances); Efficiently discouraged many a times;
Lack of Experience, Interest or Pro-activity in Local economic development	Have no history of such activity; Need felt but approach and action not taken and if taken it is too slow in the name of culpability to other Departmental Procedures;

### 15.4.3 Training for Civil Servants.

In the light of above, the emphasis of training is now placed in enabling civil servants to play a role of catalytic agent for sustainable development. Their role has to be a “**facilitator**” rather than a “**provider**”. Therefore inclusion of methods and approach, which can tailor the attitude, and behavior of civil servants in training activities is demand of the day.

The training-function will be created and fully integrated with organizations with responsibility encompassing all activities aimed at improving performance and effectiveness. The training-

function would advise managements in formulation of on training priorities. The training-managers of training function will be involved in the identification of training and development needs, necessitated by the administrative reforms. They will also be involved in establishing forward and backward linkages in the training process i.e. Pre and post-training issues. A conducive training climate where self-development is encouraged needs to be thought of while framing a training policy.

Training in the Indian context has been looked upon more as a cosmetic exercise. It is only very recently that human resource development is beginning to be given its rightful place. The promotion of systematic training in every government department is a mammoth task requiring the total commitment of all those involved in the training function. We have to recognize that training is not a *mundane activity, which can carry on with utter disregard to the organizational environment around it.*

**Illust. 15.1 Simple Model of Training Process**

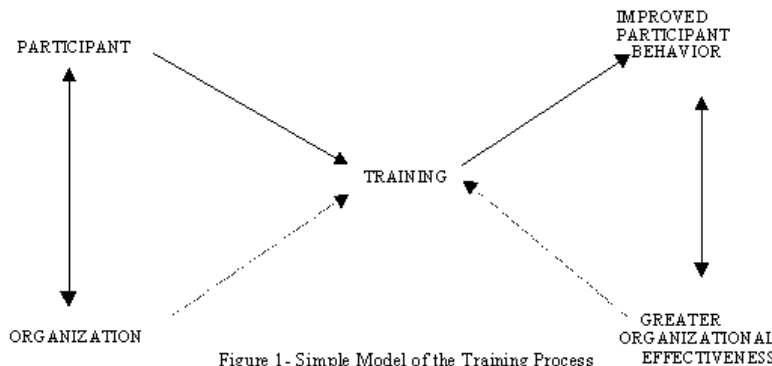


Figure 1 - Simple Model of the Training Process

With the exception of Tamil Nadu, Maharashtra and Madhya Pradesh, no other state has formulated its own Reform and Training Policy. Consequently, the imperatives of these changes have yet to percolate down among the multitude of departments and agencies at the state level and much less to the regional or district levels. In almost all the states not even one half of the departments/agencies have any continuing arrangements for administrative improvements or provisions for training their employees.

**Illust. 15.2 Elaborate Model of Training Process**

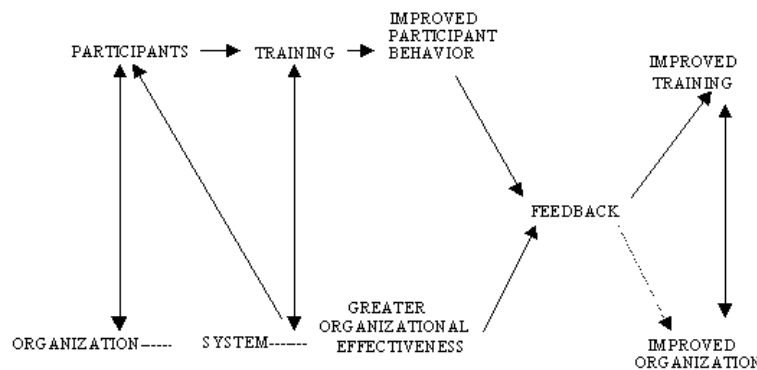


Figure 2 - Elaborated Model of the Training Process

#### 15.4.4 Role of Voluntary Agencies in Training

The voluntary agencies and the other organizations of civic society are vigorously coming forward to address some of the critical and important elements in administrative reform and capacity building. However, it is recognized by the government that there is a need to create an enabling environment so that their participation in the development process is further enhanced.

The National Training Policy (**Annexure: 1**) provides the framework for the development of the human resources of the government. The policy, inter-alias, emphasizes the need for training to be given to all employees so as to increase the professionalization of the civil services at all levels.

High priority is attached by the government to the training and management development of higher civil services by providing opportunities for the development of professional skills and general management abilities across the departmental/organizational boundaries. The aim is to create an adequate pool from which to draw personnel for the senior management levels of Government.

Capacity building in urban institutions is one area, which is much talked about but has been relatively neglected in terms of action. The restructuring of the roles of the elected ULBs has to initially come about in the form of partnerships with the parastatals, which have been handling a variety of services. The public service element needs to be made more professional and accountable to the people. Adoption of modern accounting systems, improved practices of budgeting and planning, effective use of wards committees and other means of peoples' participation, and programme assistance should be put to use for improving urban governance. Capacity building is required for developing communication and inter-personal skills among the people responsible for providing for the needs of the urban poor, for improving the level of services and satisfaction of the beneficiaries, and for providing coordinated services from a number of line agencies.

#### *Good urban management without adequate capacity is a misconception*

Training and development efforts are no longer viewed as peripheral to departmental goals. The human resources are treated as assets rather than as costs and training is seen in the government as an investment in future organizational capabilities. A two-pronged approach is suggested for the same, Firstly, to build capacity for making the administration and the public institutions more responsive and, secondly to empower the citizens to create sustained pressure for change.

The capacity building is not seen in isolation. The capacity building efforts are to be accompanied with administrative reforms. Administrative reforms efforts aim at:

- (a) Improvement of delivery system; and
- (b) Image building/correction of the public systems.

The overall goal of the Capacity Building in Public Administration Programme will contribute significantly to the above objectives.

Capacity Building needs to focus on the entire stakeholder department to cover areas of policy facilitation, system of restructuring, organization development, and training and knowledge management. It is required for good government which will bring efficiency and effectiveness of services and for "good governance" to deal with the empowering of more and more stakeholders and bringing in transparency and accountability in the various systems of delivery for city services.

## 15.5 Recommendation & Implementation Strategy

Before taking action on any recommended strategies there are certain issues that need to be resolved. Unless the department has answers to these no programme undertaken to build the capacities would be effective in principle.

There is a need to conduct an extensive research programme to analyze the present setup. The authority at the highest level needs to ask and review the following issues:

- ❑ Is the present organizational structure ready to implement any development or training strategy?
- ❑ Are the roles and responsibilities made clear at all the levels of hierarchy, are the deliverables clear to employees in order to carry out their functions effectively?
- ❑ Is there any relevant pre-requisite for technical post or any provision of acquiring the skill if need be?
- ❑ Are Manuals and technical instruction guidelines in place and made available to relevant people?
- ❑ Is there any vision, a long term plan for the department apart from the short term plan made for the fiscal purpose?
- ❑ In the absence of a long term plan, how do the officials plan to achieve a holistic implementation of the already floated developmental exercises?
- ❑ Are the Discretionary and Obligatory Duties of the Corporation clearly formulated and defined?
- ❑ Has the Act been amended to suit the present setup and requirement?
- ❑ Can the department make provisions for a fixed tenure of the key officials so that the initiatives taken at the particular level does not suffer?

Unless there are answers to these issues it is in principal not possible to deliver an effective training and capacity building programme.

It is very strongly recommended to undertake an in-depth organizational research to study the various vertical and horizontal levels of hierarchy. To chalk and design the roles and responsibilities at each level to enable the smooth transition of power when need comes. It would enable each employee to understand his/her role in clearer terms and carry out the responsibilities efficiently.

It would be the second phase, which would address the issue of training and capacity building. For smooth functioning and efficient execution of the assigned tasks any department would like to undertake training programmes in the following areas:

1. Technical Skills
2. Upgradation of existing skills
3. Knowledge of Reforms and Innovations

4. Behavioral Skills
5. Employee Development
6. Success Stories and Best Practices
7. Miscellaneous

In past there has been an assortment of training programmes that has taken place for the municipal personnel as follows:

<b>Tab 15.4 List of Training Programs for Municipal Personnel</b>
<b>Training Module on 'Land Management'.</b>
<b>Training Module on 'Water Supply Management'.</b>
<b>Training Module on 'Public health'.</b>
<b>Training Module on 'Vital Statistics including Registration of Birth and Death'.</b>
<b>Training Module on 'Environment Management'.</b>
<b>Training Module on 'Solid Waste Management'.</b>
<b>Training Module on 'Urban Planning and Development'.</b>
<b>Training Module on 'Roads &amp; Bridges Construction'.</b>
<b>Training Module on 'Fire Services'.</b>
<b>Training Module on 'Urban Poverty Alleviation'.</b>
<b>Training Module on 'Urban Transportation'.</b>
<b>Training Module on 'Community Participation'.</b>
<b>Training Module on 'Provision of Urban Amenities and facilities such as Parks, Gardens, and playgrounds'.</b>
<b>Training Module on 'Slum Improvement and Upgradation'.</b>
<b>Training Module on 'Municipal Finance and Resource Mobilization'.</b>

These programmes can also be broadly classified into the above mentioned categories. But it is apparent from this list that sufficient efforts have not been made and there is a need to make more concerted efforts in the field of training and development to arrive at more sustainable gains from it.

The training evaluation report of these programs further sums up to the fact that these training have not achieved the desired results and require efforts to obtain significant and sustained knowledge gain. As identified by most of the Corporation Employees, there are no clear guidelines available for carrying out such programmes and there is no mechanism available to nominate the employees for the same. These factors reiterate that fundamental need at BMC is in-depth study of the Organizational Structure and 'Capacity Mapping' at all the levels.



## 15.6 Action Plan

Following are the steps that should be taken extensively at the department:

### 15.6.1 HR Initiatives

- Prepare an organization chart based on personnel functions and assign appropriately qualified personnel to identified posts.
- Establish an HR Department/agency
- Formulate an HR policy incorporating key HR elements (rewards, incentives, training and career planning)
- Determine the areas of capacity building and training for the staff.

### 15.6.2 Formation of a FOCUS Group

A team of selected personnel would be constituted that will facilitate the process of training and capacity building. As it is not possible for the department to implement the training strategy without the professional help in the area and at the same time any outside agency would not be able to do justice unless the programme is developed jointly by a professional along with an internal department resource who has a detailed insight to the department.

### 15.6.3 Review of Training Needs

A comprehensive exercise with the selected personnel would be undertaken to assess the training needs of the persons directly connected with the planning process. This stocktaking will develop a training strategy in consultation with other states carrying the similar range of activities hence facilitating the knowledge sharing and management.

The training strategy will develop profile of participants, training design and training modules.

### 15.6.4 Training Manual

A Training Manual is a set of guide lines, and instructions elaborating systems, procedures, processes, and techniques required to be applied in planning, formulating, implementing, and reviewing departmental training and development interventions by the organization. In government departments also there is a need to develop training manual to provide direction for formulating departmental training policy, implementation strategies, and programmes of action.

### 15.6.5 Training plan

The need for a training plan is to meet the short-term/long-term requirements of an organization for improving the performance of valuable human resources at all levels. To be successful, training programmes should not be created in isolation, but structured in line with goals and the development plans of the individual/ organization. The training and development plan must be an integrated system of the HR development process and must be monitored periodically to measure progress.

### 15.6.6 Workshop with Resource Persons

A team of resource persons will be constituted to develop resource and learning material for the training modules

### 15.6.7 Training of Trainers

A critical mass of trainer will be developed at multi-levels. This group will in turn take care of the training down the line.

### 15.6.8 Conducting Training

Depending on the number of trainers a series of training of trainers programme will be conducted. The time frame of the same can be mutually decided by concerned personnel.

### 15.6.9 Periodic Review

A team of experts and selected beneficiaries will conduct a mid-term review.

### 15.6.10 Training Reinforcement & Continuity

Ideally, training should have reference to earlier programmes and build on them. Trainees learn more when training is encapsulated and repeated with well-defined objectives concise and yet comprehensive.

The other training and capacity building activities can be undertaken as per the Training process flow given in the chart and the action plan as listed:

Tab 15.5 Broad Training Process Flow			
Action Plan	Indicators of Achievement	Assessment of Indicators	Assumption (Risk)
<b>I. BROAD OBJECTIVES</b> Capacity development through training.			
<b>II. IMMEDIATE OBJECTIVES</b> <b>2.1 To identify training needs</b> <input type="checkbox"/> To introduce systematic training to identify training needs of identified target group <input type="checkbox"/> To develop training strategy as per the need	✓ Systematic approach introduced in identifying training needs by trainers while designing and implementing training. ✓ Recommendation/suggestion made by the participants and feed in to the development of training strategy.	✓ Formation of Steering Group at the Project level ✓ Field trip organized to assess the training need ✓ Steering Group approves of the training strategy ✓ Knowledge and skills are reflected in the course organized by the trainer.	<ul style="list-style-type: none"> <li>• The Project understand impact of TOT will be slow.</li> <li>• The field level functionaries are able to articulate their actual needs to make the project successful</li> </ul>

<p><b>III. MODULE DEVELOPMENT</b>  <input type="checkbox"/> To develop training modules on identified and agreed competence requirement at, Block and District level</p>	<p>✓Development of modules on identified needs for capacity building</p>	<p>✓ Assessment of quality of modules on the basis of contents and processes by Project partners</p>	<ul style="list-style-type: none"> <li>• Priority given by the Project.</li> <li>• Effective networking amongst Project partners.</li> <li>• Project partners take training as a serious business.</li> </ul>
<p><b>IV. PILOT TESTING</b>                  To test the training module and its effectiveness</p>	<p>✓Course conducted for testing training modules</p>	<p>✓ Incorporation of Feedback from participants for improved quality</p>	<ul style="list-style-type: none"> <li>• Timely release of the fund for module development</li> <li>• Availability of professionals</li> </ul>
<p><b>V. TRAINING OF TRAINERS</b>                  To develop critical mass of trainer at block/sector level</p>	<ul style="list-style-type: none"> <li>✓ Selection of Trainers</li> <li>✓ Collaborative development of training and resources amongst Trainers.</li> </ul>	<p>✓ Identified trainers undergoes training</p>	<ul style="list-style-type: none"> <li>• Willingness to learn</li> <li>• Selection of trainer</li> <li>• Trained Trainers remained in post.</li> <li>• Trainers get opportunity to demonstrate their learned behavior</li> </ul>
<p><b>VI. TRAINING</b>                  To conduct and facilitate training at various levels</p>	<p>✓Trainers conduct courses for identified client at various levels</p>	<p>✓ Number of courses conducted and number of people trained</p>	<ul style="list-style-type: none"> <li>• Availability of trainees</li> <li>• Project able to sustain the focus and momentum of training</li> </ul>

Illust. 15.3 Training Detail

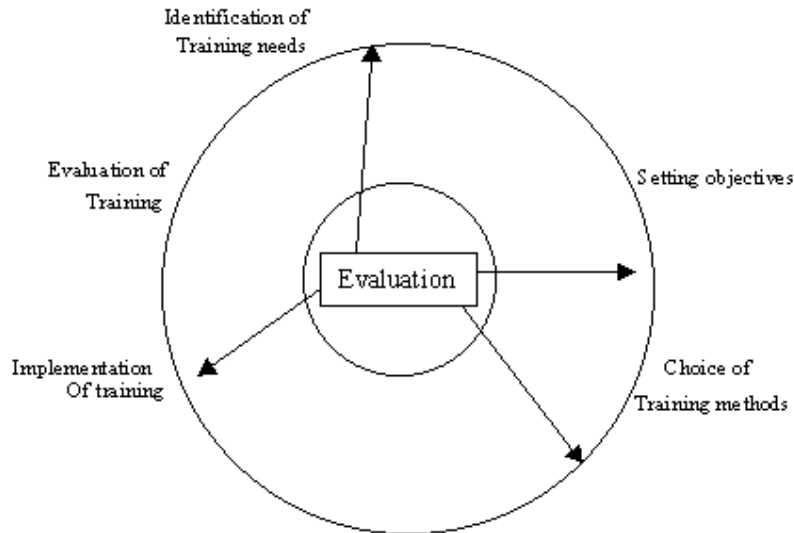


Figure 3 – The Training Cycle

The development of human resource at the local level has seldom gone beyond nominating a few officers for programmes being conducted by various training institutes and understandably as it has not produced any tangible changes in the working of ULBs anywhere. This is because although the trainers there may have the expertise and training material required, they lack in insider's perspective and seldom have a stake in the development of the organization as a whole.

Training may help to upgrade skills and knowledge and sensitize people but it cannot build capacities among organizational chaos. True change flows from true empowerment of the worker and that comes from arming him with the information to take the right decisions.

A fundamental change is needed in finding solution as every level and to devise the holistic policies and strategies with a very clear emphasis on all-round Human Development. Identifying the impediments, and devising the relevant strategies to combat them through identifying the individual capacities and training & building upon them is the key answer in place of delivering off the shelf ready made programs. As the person is empowered to his/her full capacity the difference between the mere policy maker and the person who can deliver.

There is an acute need at BMC to focus on strategic capacity building initiatives that would require an emphasis on assessing the skills and knowledge necessary to determine needs, seek solutions, process information and change priorities, the emphasis of human resource development should be much wider than individual training courses. This document seeks to present the road map to achieve the all-round development, realistic and sustainable optimal use of the resources to fulfill the State and Society expectations by executing their entrusted jobs effectively. To achieve the sustained implementation of a programme to recruit, train, motivate and develop a local work force to become more efficient, dedicated and effective members of the public service.

## 15.7 E-Governance Applications

### 15.7.1 Aim

Development of transparent public services using Information technology with a Ultimate aim of paper less governance

### 15.7.2 Objective

4. Development of relevant software's for various services provided by the Bhopal Municipal Corporation.
5. Development of GIS based services for Bhopal Municipal corporation
6. Integration of the Various services through the GIS and MIS
7. Training and Capacity Building for employees of Bhopal Municipal Corporation
8. Providing transparent, effective implementation of the policies and project of Bhopal Municipal Corporation

**Tab 15.6 Present status of various E-governance applications are following**

S.N.	Services using E-governance Applications	Details
a.	Property Tax	Demand Register/ Billing/ Payment Collection
b.	Water Tax	-----Same as above-----
c.	Licenses Rent	-----Same as above-----
d.	Birth and Death	Issuance Birth and Death Certificate
e.	Accrual Based Accounting System	Budget Management and Implementation of Double Entry Accounting System
f.	Building Permission	Issuance of Certificate
		1. Inward and outward of application
		2. Fee calculation / refusal letter
g.	Scanning and indexing of documents	3. Registration of Engineers / architect
		1. Section maps of building
		2. Colony layouts
		3. Lease land documents
		4. Colonizer / builder. Registration Documents
	5. Employee records	
h.	Social securities pension schemes	To beneficiaries destitution of poison timely and regularly application in working
i.	Connectivity	To develop the wireless connective between head quarter and zonal offices work under progress by CMC limited.
j.	Call Centre	For public complaint and suggestion call center at BMC in working from last 8 months

**( 1) Application Of The Digital Map**

- Water
- Electricity
- Basic Facility
- Tracking
- Garbage Dumping
- Setting up hospital, School, Police Stations, and Fire Stations etc.
- Shortest Path
- Socio- Economic Analysis
- Town & Country Planning

**( 2) Municipal GIS Software**

- User Friendly
- Buffer Analysis
- Property Assessment
- Road Widening
- Print Map
- Selection By Attribute

**15.7.3 Details of proposed GIS project****Aim**

To develop a digital city map, which will have geo-referenced information and processes required for efficient working of Municipal Corporation

**□ Objectives**

- Creation of GIS data base on minimum 1:1000 scale
- Data collection and survey
- Area wise individual property survey
- Development of customized GIS application
- Implementation and training
- Installation of necessary Hardware
- Interconnectivity of services and data transaction between Zonal offices and various departments of the BMC

**□ Coverage**

- Property Tax
- Road network
- Water connection and Billing
- Building permission and connection to property tax
- Land information system
- Ward wise information
- Waste management
- Business licensing
- Sewerage Network
- General Public services

**□ Proof of Concept**

- Pilot project initiated
- Ward No. 56 was selected as sample ward
- Project completed in 2 months



□ **Process**

- Tenders were invited
- Minimum qualification of CMM level 3
- 10 Companies submitted there offer
- 7 companies were Qualified
- Extensive evaluation of technical offer
- 5 companies short listed on the basis of technical proposal
- 3 companies short listed on the basis of highest marks obtained
- NCC Softech, Haderabad is selected for GIS project
- Cost of GIS project 1.28 cr.
- Time period of project 1 year

□ **Method**

- Procurement of Satellite image
- ETS survey I
- Internal individual property survey
- Data collection
- Linking of data with of map
- Development of customized GIS software
- Training and implementation

□ **Technology Solution**

- ESRI technology
- Oracle 9i Spatial
- Map object
- Application and Database server of Dell
- Linux and windows environment

□ **Application of Digital Map**

- Property identification
- Property tax calculation and verification
- Water tax calculation
- Electricity consumption
- Basic facility
- Socio - economic analysis
- Town and country planning
- Further improvement and integration with GIS is proposed.
- MIS for remaining services is planned with GIS
- Training is started with the collaboration with M.P. Khadi Gram Udyog Nigam (Govt. of M.P. undertaking)
- Network between the HO and Zonal Offices is being implemented by CMC with 7 year maintenance.
- LAN at HO and Zonal Offices is being planned.
- Scanning and Indexing of Building Permission document and Colony cell layouts already completed. The integration of same with GIS is being planned.
- Services of IIPS – DAVV being taken for providing Consultancy in IT related matters. This is to be formally started by signing a MoU.

□ **Methodology**

1. Appointment of formal Consultant.
2. Implementation of LAN at HO and Zonal Office.
3. Systematic implementation of different software already developed with required hardware
4. Start of GIS project.
5. Integration of various software (MIS) with GIS.
6. Appointment / Engagement of IT professionals for BMC
7. Training to BMC employees for various services.
8. Maintenance activity under the guidance of Consultant.

## Municipal Fiscal Assessment

### Municipal Finance Overview.

Local governments have been assigned a range of functions related to the provision of the public services. They strive to meet the costs of constructing and maintaining urban facilities and services. Revenues must be raised to cover capital investments and recurrent-revenue expenditures, as well as employee's salaries and debt services. The raised revenues must be utilized to attain the needs of the public as well enhance the development of the city as a whole. The Section reviews the finances of Bhopal Municipal Corporation. Review of finances includes the income and expenditure of the Corporation to ascertain the trends and the major sources and uses of funds. The finances are reviewed based on the annual account of the accounting period 2000-01 to 2004-2005. It includes sectoral contribution, growth rates and per capita levels of the different items of income and expenditures. In addition to this, certain key financial indicators have been analysed to assess the financial performance of the corporation.

### Structure of Municipal Finances

Section 132 of Madhya Pradesh Municipal Corporations Act, 1956, mandates the Urban Local Bodies (ULB's) to levy and collect following taxes: Property Tax; Water Tax (for connection taken from the water pipeline); General Sanitation Surcharge/Tax; General Lighting Tax; General Fire Tax; and Other Local Bodies Tax, approved by the State Government and notified in the Official Gazette.

As elsewhere in India, in Madhya Pradesh property tax is levied under the, M.P. Municipal Corporation Act, 1956 (Section 135) at the rate not less than 6% and not more than 10% of the annual letting value (ARV) of a building or land. In 1991, a new method of levying property tax was introduced [MP Municipality (Determination of Annual Letting Value of Buildings/Land) Rules, 1997] under which all ULB's were required to switch to a zonal area-linked system involving self-assessment of annual rental value (ARV) by the assesses. For this, the Bhopal municipal corporation area was classified in 14 zones on the basis of, as far as possible, similar locations of the buildings and lands situated therein. These were then classified based on quality of construction, use of property and location. The ULB's were authorized to fix separate rates according to the zone-wise classification.

Amongst, the main exemptions are, places for public worship; places used for charitable purposes; places exclusively used for educational purposes and hostels not established for profit; and the properties belonging to the central and state government's, Minimum and maximum rates for taxation are prescribed i.e. not less than 6% and not more than 10% of the rateable value (section 135). The different slab rates and the corresponding range of ARV's are given in Table below

**Table 0-1: Property Tax - Slab Rate and Rateable Value BMC**

Property Tax Rates	Rateable Value (Rs.)
Exempted Properties	Up to 6000
Properties up to First slab of 6%	6001 – 12000
Properties under 2 <sup>nd</sup> slab of 8%	12001 – 20000
Properties under 3 <sup>rd</sup> slab of 10%	20000 – Above

Source: Bhopal municipal corporation, Revenue Dept; 2005.

#### Consolidated and Other Taxes

In addition to the Property Tax, a consolidated tax for conservancy, sanitation, lighting and fire tax is levied. Introduced in 1998-99 all over the state, this tax is levied at a fixed annual rate and is collected along with property tax. Currently an annual charge of Rs.180 plus a varying percentage of property tax is collected from those who pay the property tax. The exempted properties are charged Rs.180 only (**Table 1-2**).

**Table 0-2: Consolidated and other Tax Rates (Rs. / Years) BMC**

Name of Tax	Prevalent Tax Rates
Consolidated (Samekit Kar) Tax	
Properties exempted from Tax or AVR below Rs. 6000	Rs. 180 / Year
Other than exempted Properties	Rs. 180 + (3 / 4 / 5 ) 10% of Property tax as below
Normal Water Cess	10 % of PT
Sanitation Tax	} 3 / 4 / 5 or 3.33 % of P Tax
Lighting tax & Fire Tax	6.6.7} of PT
Service Charge – Central Govt. Properties	33.33 % or 50 % or 75 % of Total PT
Education	1% of AVR
City Development Cess	2.5% - 5% of AVR

Source: Revenue department BMC

As per census 2001 the population of BMC is 1437354. Out of total 278487 of census house holds 152320 houses are listed with BMC. The response to the self-assessment initiative introduced in 1997-98 has been encouraging. Up to March, 2004 over 96000 households have submitted the self assessment forms. As a result, the demand registers are incomplete and actual yearly demands are un-ascertainable.

However, the income from property tax has shown an increasing trend over the last five years. The collections have increased to Rs. 1265.10 lakh in 2004-05 from Rs.752.92 lakh in 2000-01. The trend has been achieved by effective implementation of the self assessment procedure and increased coverage of properties.

#### 16.3.3 Water Charge

Bhopal Municipal Corporation (BMC) has a multi-facet water supply tariff, for metered and un-metered connection(s), divided in three broad categories; domestic, non-domestic and industrial. Last revised in April 2002, a flat rate water tariff is applicable either based on volumetric consumption and/or a fixed monthly charge. Even though few metered connection exist but the billing is done at flat rate. The income from water tax has shown an increasing trend over the last five years; Rs. 1261.50 lakh in 2004-05 from Rs. 1067.07 lakh in 2000-01. This can be enhanced

further by increasing coverage of households and effective implementation of the assessment and collection procedures.

### **License Fees and Charges**

Section 366 of the Municipal Corporation Act, 1956 provides for the levy and collection of fees. These are quasi-taxes in term of their imposition and include ground rent, building license fees, trade license fees, water connection fees and fees for market, bus stands etc. The rates are fixed by the ULB's, subject to the limits set by the state government. Other charges include those for private works, burial and cremation, birth and death-certificates, sale of forms, auction and sale proceed of sludge, manure, produce of gardens etc. The other non-tax income has shown an increasing trend over the years, up from Rs 94181 lakh in 2004-05 to Rs 811.43 lakh in 2000-01.

### **Own Property**

Income from own property mainly consists of rents for land and shopping complexes. In view of the insufficient data, return from individual property could not be ascertained. The percentage of income from property to the total own sources of income for the year 2004-05 was RS.395.71 lakh (3.78%) which has increased gradually from Rs. 332.66 lakh (4.23%) in 2000-01.

### **Tax Sharing and Compensation**

A significant portion of the revenue expenses are met through devolution or transfers from government. These include compensation and assigned revenue (octroi compensation, stamp duty etc); state finance commission grant; subsidy for maintenance of transferred water supply systems, etc. In this regard it is significant to mention that compared to the State Finance Commission's recommended share of 3.663% of state's tax and non-tax revenue to the ULB's, the government has agreed to share only 0.514%. The transfers under SFC commenced only from 1998-99. The amount of transfer under this head amounted to RS.434.45 lakh (as per UADD). The transfer under octroi compensation which was Rs. 2282.29 lakh in 2001-02 increased by more than 14% to Rs.2873.13 lakh in 2004-05.

### **Other Taxes, Rentals and Fees**

The taxes, fees, rentals etc levied by the BMC are:

- Taxes: Export tax on products e.g. liquor, electrical goods, iron, furniture, petroleum etc; Colony/City Development Cess; Advertisement Tax based on per square meter per year; Show tax; Building material tax;
- Rentals: Shops / buildings/ Land; Premium on shops; Builder's Promoters scheme; Auctions and transfer of property; Teh Bazari (Market fees).
- Fees: License fee on shops / hotels; Building construction fees; Colony development fees; Supervision charges; Cattle registration fees; Stray cattle fees; Slaughter house fees; Ration card; Water tankers; Parking; Swimming pool charge.

The quantum of collection under this head which was about Rs 565.23 lakh in 2001-02 and has decreased to Rs. 348.02 lakh in 2004-05. .

The Municipal Accounts code of Government of Madhya Pradesh prescribes the organization of the municipal fund in to three broad categories of General Account, capital Account and Debt & Suspense (or Extraordinary) Account. Data collected from the annual accounts of the BMC have been compiled and analyzed under these three categories. For the purpose of municipal fiscal

assessment, financial data pertaining to the last five years (2000-01 to 2004-05) have been compiled in an abstract format.<sup>10</sup>

**Table 0-3 Summary of Bhopal municipal finances.**

Head of Account	2000- 01	2001- 02	2002- 03	2003 - 04	2004- 05
	<b>Rs. Lakh</b>				
<b>Opening Balance</b>	<sup>11</sup>	<b>1,527.71</b>	<b>1,604.71</b>	<b>1,500.52</b>	<b>1,539.67</b>
Total- Revenue Income					
	7,869.41	7,716.36	8,192.69	9,359.51	10,462.24
Total- Revenue Expenditure					
	6,014.29	6,842.69	7,643.20	7,614.70	9,138.99
Operating Surplus (Revenue Account)	1,855.12	873.67	549.49	1,744.81	1,323.25
Total- Capital Income					
	635.89	392.52	890.80	505.93	2,686.16
Total - Capital Expenditure					
	1,096.96	1,325.18	1,395.13	2,372.64	4,512.92
Operating Surplus (Capital Account)	(461.07)	(932.66)	(504.33)	(1,866.71)	(1,826.76)
Total- Suspense Income					
	1,222.04	1,318.50	1,301.21	1,579.59	1,709.74
Total- Suspense Expenditure					
	1,088.38	1,182.51	1,450.56	1,418.54	1,465.05
Operating Surplus (Extraordinary Account)	133.66	135.99	(149.35)	161.05	244.69
<b>Closing Balance</b>		<b>1,527.71</b>	<b>1,604.71</b>	<b>1,500.52</b>	<b>1,539.67</b>
					<b>1,280.85</b>

**Note:** Figures in parentheses indicates a deficit

Source: BMC and analysis.

The abstract form of municipal annual accounts, indicating actual transaction amounts, sectoral contributions and growth trends is presented in Appendix A1.

### Revenue Account

The Revenue Account comprises of recurring items of income and expenditure. These are essentially all financial transactions related to the day-to-day operations of the municipality. Table 5.3 summarizes the status of the Revenue Account. Bhopal Municipal Corporation has maintained a reasonably good revenue account status during the last three years 1999-00 to 2001-02.

<sup>1</sup> The municipality has not yet finalized the annual accounts for FY 2005-06 and has provided only revised estimates for the year 2005-06. Considering that the revised estimates are generally very high compared to the actual figures, financial data for four years have been used for the analyses.



**Table 0-4 Revenue Account status.**

Head of Account	2000- 01	2001- 02	2002- 03	2003 - 04	2004- 05
	Rs. Lakh				
<b>Revenue Income</b>					
Tax- Own Sources	1,470.89	1,776.41	1,823.06	2,091.82	1,967.10
Assigned Revenues	3,108.46	2,716.09	3,146.43	3,351.04	5,024.87
Non Tax- Own Sources	811.43	905.38	847.82	917.25	941.81
Revenue Grants	1,355.83	950.98	912.00	1,442.13	1,304.16
Water and Sewerage Account	1,122.80	1,367.50	1,463.38	1,557.27	1,224.30
Total- Revenue Income	7,869.41	7,716.36	8,192.69	9,359.51	10,462.24
<b>Revenue Expenditure</b>					
Establishment	2,729.81	2,735.97	2,579.41	3,299.86	3,298.85
Operation & Maintenance	1,082.95	1,533.51	2,127.15	1,882.44	2,682.56
Water and Sewerage Account	2,158.85	2,573.21	2,936.64	2,432.40	3,157.58
Debt Servicing	42.68	-	-	-	-
Total- Revenue Expenditure	6,014.29	6,842.69	7,643.20	7,614.70	9,138.99
Operating Surplus (Revenue Account)	1,855.12	873.67	549.49	1,744.81	1,323.25

**Source:** BMC and analysis.

#### Revenue Income

The revenue income of BMC has increased from Rs. 7869.41 lakh in 2000-01 to Rs. 10462.24 lakh in 2004-05 – a CAGR of about 5.9 per cent. Revenue income consists of the following major sources:

**Own Sources/Tax.** This item head comprises of income primarily sourced from consolidated property tax (general purpose tax, water tax, lighting tax and sanitation tax) and cess on education and city development. On an average, through the assessment period, own source/tax income constitutes 21.02 per cent of the BMC's revenue income, with consolidated property tax constituting about 3.95 per cent of the revenue income. BMC levies a consolidated property tax of 6 per cent of the Annual Rateable Value (ARV). Income from the aforesaid sources is showing an increasing trend over the assessment period with a CAGR of 20 per cent.

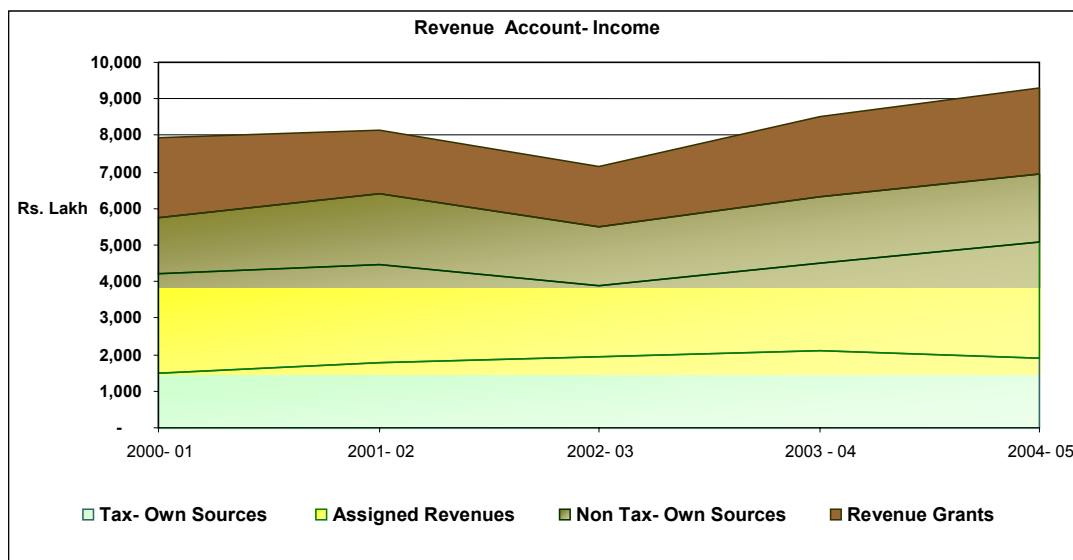
**Own Sources/Non Tax.** This item head comprises of income from municipal properties, fees on municipal services (building permission, etc.), user charges (water and sewerage tariffs) and income from special services (educational and medical). On an average, through the assessment period, own source/non tax income constitutes 10.24 per cent of the total revenue income. Income through non-tax own sources of the BMC has grown over the assessment period at a CAGR of 3.02 per cent.

**Assigned Revenues.** This item head comprises of income from Government of Madhya Pradesh (GoMP)/State transfers of municipal income collected by the state line department. The income items include surcharge on stamp duty, entertainment tax, motor vehicle tax, and other transfers. Collection of entertainment tax has been discontinued for the last three years. The amounts of funds transferred to the BMC under this head has fluctuated largely during the assessment period, indicating irregular transfers. Assigned revenue constitutes about 39.39 per

cent of the BMC's total revenue income of which only octroi compensation is 25.14% and has grown at a CAGR of about 10.08 per cent over the assessment period.

**Revenue Grants and Contribution.** This item mainly comprises of SFC grants, special establishment grants and other special grants that the State Government may transfer from time-to-time to the BMC. In case of Bhopal, Grant for water supply and sanitation and SFC grant are the significant grant and it accounts for an average of about 8 and 4 per cent respectively of the total revenue income over the assessment period. Income under this head has grown at a CAGR of about 8.22 per cent over the assessment period.

**Figure 0-1 Growth trends for Bhopal Revenue Account Income.**



### Revenue Expenditure

The revenue expenditure of BMC has grown at a CAGR of 8.73 per cent during the assessment period, higher than the growth in revenue income (5.9 per cent). This explains the fiscal status of the BMC and has resulted in an operating deficit over the assessment period. Revenue expenditure comprises broadly of three categories of expenditure – establishment, operation and maintenance and debt servicing.

**Establishment.** This head comprises expenditure on pay and allowances of elected representatives, salary and other operational expenses related to general administration and revenue collection, pension and gratuity payouts and provident fund contributions. The annual expenditure under this head is to the tune of about Rs. 3298.85 lakh (2004-05) accounting for about 40 per cent of the revenue expenditure.

**Water Supply.** Expenditure on water supply comprises salaries of all relevant staff and operating expenditure incurred largely on electricity charges and purchase of chemicals for water treatment.

Water Supply expenditure accounts for about 35.68 per cent of the total revenue expenditure and significant amount to electricity charges comprises of 23.10 per cent of the total revenue

expenditure. However the water supply account does not detail the other major component of deputed staff salaries from the PHED which adds to the water production cost in the city.<sup>12</sup>

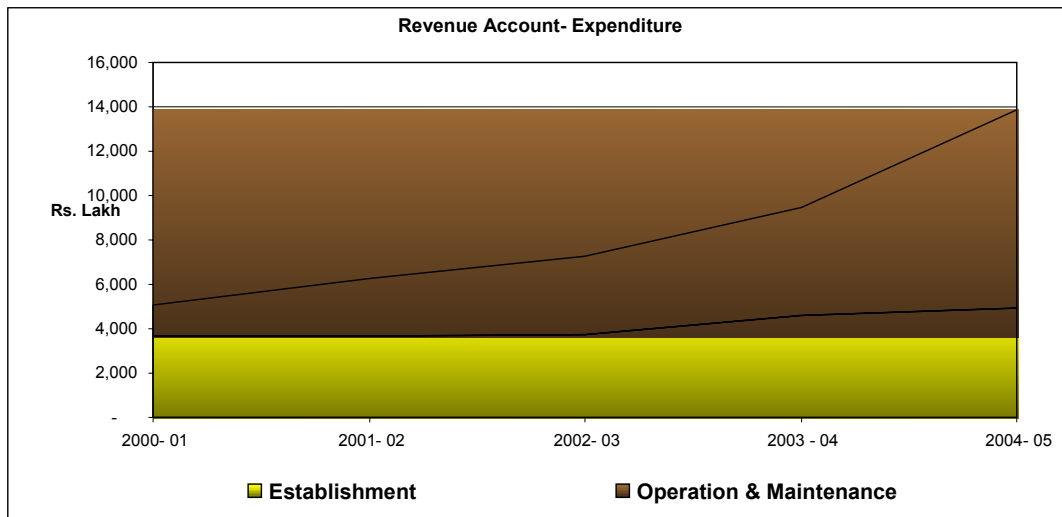
**Solid Waste Management.** This is the single largest expenditure head in the municipal fund, account for an average of over 24 per cent of the revenue expenditure over the assessment period. This head covers expenditure incurred in conservancy operations of the BMC, including salaries of supervisory and field staff and operation and maintenance of a fleet of vehicles for solid waste collection and transportation. On an average, over 70 per cent of expenditure under this head is attributed to salary expenses. Expenditure under this head has increased at a CAGR of about 3.5 per cent over the assessment period.

**Street Lighting.** Street Lighting accounts for about 5 per cent of the revenue expenditure and comprises primarily of expenditure on electricity charges and replacement of lighting fixtures.

**Other Services and Miscellaneous Expenditure Heads.** Expenditure on other services accounts for less than 1 per cent of the revenue expenditure – public health (medical) 0.66 per cent and other services 0.16 per cent. Bhopal BMC has not incurred any expenditure on education services over the assessment period.

**Debt Servicing.** This item head comprises interest payments on external borrowings. According to the financial data available with BMC, there has been no debt servicing during the assessment period.<sup>13</sup> In the absence of data regarding borrowings, it is not possible to ascertain whether the municipality is defaulting on debt servicing or whether there is not commitment.

**Figure0-2 Growth trends for Bhopal Revenue Account Expenditure**



Cap

**3** PHED has been given the responsibility of planning, design and construction of the water supply, sewerage and drainage projects of the municipal corporations (MC), since 1995. Under an arrangement, the financial and administrative sanction for a project comes from the PHED. The assets, however, have to be transferred to the MC on completion for operation and maintenance. Though, the PHED staff works under the functional control of the MC, their administrative control remains with the PHED.

### Capital Account

The Capital Account comprises of income and expenditure, for and on capital works. **Table 1.6** summarizes the capital account of the BMC. It may be noted that the last five years of the assessment period had a net deficit capital account status indicating utilization of revenue account surpluses for capital works, which is a positive trend.

Table 0-5 Capital Account status

Head of Account	2000- 01	2001- 02	2002- 03	2003 - 04	2004- 05	
	Rs. Lakh					
Capital Loans		-	-	165.75	-	1,963.40
Capital Grants and Contribution	635.89	392.52	725.05	505.93	722.76	
Total- Capital Income	635.89	392.52	890.80	505.93	2,686.16	
Total - Capital Expenditure	1,096.96	1,325.18	1,395.13	2,372.64	4,512.92	
<b>Operating Surplus (Capital Account)</b>	<b>(461.07)</b>	<b>(932.66)</b>	<b>(504.33)</b>	<b>(1,866.71)</b>	<b>(1,826.76)</b>	

**Note:** Figures in parentheses indicates a deficit

**Source:** Bhopal BMC and analysis.

**Capital Income.** The sources of capital income comprise largely of grants under state/central government schemes, loans, and own sources including consumer contributions towards one-time connection charges for water and sale of municipal capital assets. The annual accounts statements of Bhopal BMC indicate that the only source of capital income during the assessment period has been through own sources under the head of Specific scheme capital grants and deposit works.<sup>14</sup>

**Capital Expenditure.** Capital expenditure comprises all capital expenditure on creation of infrastructure systems and purchase of plant, equipment and machinery. Most of the capital expenditure incurred during the assessment period has been on roads and storm water drains that to under the head of specific schemes.

### Key Financial Indicators

A set of key financial indicators have been derived using the financial data of BMC for the assessment period. **Table 1-6** presents these indicators. These indicators are used to assess the municipal performance with regards resource mobilization, fund utilization, financial performance and collection efficiencies.

**Resource Mobilization Indicators.** These indicators summarize the performance of the BMC with regards sources of funds. Bhopal BMC derives about 40 per cent of its revenue income from grants and assigned revenues, while own sources account for less than 21 per cent of the revenue income. This indicates reliability on grants for operations.

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*The State Finance Commission devolution made by the State Government takes cognizance of outstanding debt/liability of the urban local bodies (ULB) in Madhya Pradesh. Devolution is made after appropriating ULB dues to financial institutions/lending agencies.*

*The municipal accounts statement does not indicate income from new connection charges – it may have been included as part of revenue income from water charges.*

**Fund Application Indicators.** These indicators are a measure to ascertain the utilization from the municipal fund. About 32.69 per cent of the revenue expenditure is spent on maintenance of municipal services and the rest, 40 per cent, is spent on general administration and revenue collection. However, with regards the nature of expenditure, about 39.71 per cent is incurred on establishment-related heads – salaries, pensions and provident fund contributions – which is very high considering that only about 24 per cent is spent on operation and maintenance of services.

**Overall Financial Performance Indicators.** These indicators are a measure to assess the overall financial performance of the municipality with regards operational performance and effective growth in revenue income and expenditure. The average operating ratio during the assessment period was a healthy 0.85 and the capital utilization ration was also high at 2.09 indicating effective utilization of revenue surpluses in asset creation. The indicators of growth in per capita income and expenditure item heads indicate the effective growth, giving a performance measure relative to the growing population.

**Efficiency Indicators.** These indicators are essentially a measure to assess municipal efficiency with regards revenue base coverage and realization.

Table 0-6 Key financial indicators

Indicators	Value	Unit
<b>A</b>	<b>RESOURCE MOBILISATION</b>	
1	Per Capita Income	730.09
2	Sources of Funds	
a	Share of Own Sources - Taxes in Total Revenue Income	21.02
b	Share of Own Sources - Non-Tax items in Total Revenue Income	25.14
c	Share of Assigned Revenue in Total Revenue Income	12.05
d	Share of Revenue Grants in Total Revenue Income	15.41
3	Growth in Revenue Income	7.56
4	Growth in Own Sources of Revenue Income	8.04
<b>B</b>	<b>FUND APPLICATION</b>	
1	Per Capita Expenditure	531.38
2	Application of Funds	
a	Share of Establishment Expenditure in Total Revenue Expenditure	39.71
b	Share of O&M Expenditure in Total Revenue Expenditure	24.46
c	Functional Allocation of Municipal Expenditure	
	General Administration & Tax Collection	40
	Municipal Services	32.69
	Debt Servicing - Interest Payment	-
d	Share of Establishment Expenditure to Total Revenue Income	69.86
3	Growth in Establishment Expenditure	5.60
4	Growth in O&M Expenditure	27.83
5	Growth in Total Revenue Expenditure	11.28

<b>C PERFORMANCE INDICATORS</b>			
1	Operating Ratio	0.85	Ratio
2	Capital Utilisation Ratio	2.09	Ratio
<b>D EFFICIENCY INDICATORS</b>			
1	Tax Collection Performance		
	a Consolidated Tax	36.00	
	b Property Tax	47.00	%
	c Water Tax	57.00	%
	d Water Charge	61.27	%
2	Cost of Collecting Rs. 1000 of Taxes	302.36	Rs.
3	Property Tax Demand per Assessment	2538.4	Rs. p.a
4	Population per P.T Assessment	16	Persons

**Source:** Bhopal BMC and analysis

### Key Issues

Key issues and conclusions are based on the review and assessment municipal finances and discussions with relevant municipal officials.

**Maintenance and Reporting of Accounts.** The common municipal accounts code is not fully adhered to, especially in cases where new transaction item heads are encountered. Apportionment of revenue and capital items of income and expenditure is not carried out appropriately due to non-clarity in principles of such apportionment at the local level. The liability statement, which is mandatory, is not prepared and updated, and there is no clarity regarding the debt serviced or the outstanding loan. While it is reported that the State Government deducts debt due by the BMC and then transfers funds (SFC devolution), the BMC records do not capture such apportionment. Bhopal Municipal Corporation has intended to execute a common accounting and financial reporting code, updated annually, with interim updates when required, supported with a user manual. Recently under the accounting reforms BMC has computerized the accounting and billing processes and organized training of municipal accounts staff has help in streamlining financial accounting and reporting.

**Revenue Realization.** Taxes and charges are major own sources of revenue income. Being more dynamic in nature and within the control of the BMC, these revenue incomes have potential to contribute more to the municipal fund. Besides low tax rates and charges levied, the actual demand itself is not established. Key issues regarding the above comprise:

Lukewarm response to the self assessment scheme of property tax assessment and declaration;

High reliability on revenue grants for operations – revenue grants contribute about 40 per cent of revenue income;

High average property tax demand per assessment (Rs. 2538.57 per annum) but lower coverage and collection performance;

Unclear status on extent of outstanding taxes and charges collectable.

**Fund Application.** Key issues regarding application from the municipal fund comprise:

Most of the revenue expenditure (60 per cent) is accounted for by establishment item heads, leaving very little for expenditure on operation and maintenance of services;



Absence of information on outstanding debt and non-debt liabilities (dues to service providers like, MPSEB, cess transfers to state government, etc.), as a result of which the actual fiscal position is not ascertainable.

## 17. Investment Sustenance of BMC

The investment sustaining capacity of BMC is assessed based on a financial operating plan (FOP), which is essentially a 7-year forecast of municipal income and expenditure based on certain assumptions. The FOP is worked out for the period 2005-06 to 2011-12 based on the actual finances of BMC during 2000-01 to 2004-05. The assumptions for forecasting income and expenditure are based on base and basis of municipal taxes and BMC's collection efficiencies in case of municipal taxes and charges and past trends subject to nominal growth ceilings in case of other items of income and all items of expenditure.

The FOP is worked out for three scenarios, viz.

**Base Case Scenario**, where the finances are forecast, without considering the estimated CIP investments, based on nominal growth rate assumptions for different items of income and expenditure. Here, the closing balance FY 2011-12 is considered as the indicative cumulative investment sustaining capacity of BMC.

**Full Investment Scenario**, where the full identified CIP investment and associated O&M and debt servicing expenditure as well as associated revenue income are loaded on to the base case scenario FOP to ascertain the financial implications of the identified investment. This scenario gives an estimate of the resource gap at BMC if it were to undertake the full identified CIP investments.

**Sustainable Investment Scenario**, where the identified investment loaded on the full investment scenario is scaled down to ascertain the sustainable investment levels of BMC. The associated additional revenue expenditure and income are also scaled down proportionately. A year-to-year positive closing balance is the criteria used to ascertain investment sustenance capacity.

The following section details out the basic assumptions adopted for forecasting income and expenditure.

### Assumptions for Forecasting Income and Expenditure

The assumptions for forecasting municipal income and expenditure for the three scenarios adopted are primarily based on past trends (5-year average growth trend or 5-year compound annual growth rate - CAGR, whichever is lower), subject to minimum and maximum annual growth rate ceilings.

### Revenue Income

#### ***Municipal Taxes***

The primary tax sources, viz. property tax, water tax/charge and consolidated tax are forecast based on assumptions on the base (number of assessments) and basis (tax demand per assessment) and the collection efficiencies. In addition to the above taxes, provision is also made for estimating income from sewerage tax/charge, subject to implementation of the proposed sewerage scheme.

**(i) Property Tax****Number of Assessments**

In case of property tax, the total number of property tax assessments in 2004-05 as per BMC records adopted as the base. The number of properties in BMC has increased from 76113 to 88534 at a CAGR of 3.07 per cent during 2000-01 to 2004-05. A nominal growth rate of 3 per cent (equivalent to forecast population growth rate of 3.04 per cent during 2001-02 to 2011-12) is adopted for forecasting the number of property tax assessments.

**Tax Demand per Assessment**

The average annual property tax demand per assessment in 2004-05 is Rs. 2246.55. The same demand per assessment is adopted for 2001-02 to 2002-03 and is assumed to be revised once in 5 years by 30 per cent beginning from 2003-04, at a conservative simple growth rate of 6 per cent per annum.

**Collection Efficiency**

The average property tax collection efficiency during 2000-01 to 2004-05 was 32 per cent and 63 per cent of arrears and current tax demands respectively. It is assumed that BMC would gradually increase its tax collection performance to 50 per cent and 85 per cent against arrears and current tax demand respectively as also envisaged in the Reform agenda for JNNURM, 2005.

**(ii) Water Tax/Charges****Number of Assessments**

There are about 1,05,000 registered house service connections in BMC, which accounts for only about more than that of the property tax assessments which is primarily due to the number of Government buildings and notified slum areas which don't come under the property tax limits. In addition, as reported by BMC officials, there are an estimated 25,000 unauthorized house service connections and 1000 bulk connections in the newly developed colonies.

For the base case scenario, it is assumed that the 25,000 unauthorized connections would be regularized in 2006-07, thereby increasing the number of HSCs to 1,30,000. In the absence of additional investment in water supply, the number of water tax / charge assessments is assumed to stagnate at the 2008-09 level. At a nominal regularization fee of Rs. 1,000 per connection, the income from regularization accruing to BMC would be Rs. 250.00 Lakh.

In the full investment scenario, it is assumed that due to augmentation of the water supply network, BMC would cover 85 per cent of the property tax assessments through house service connections (HSCs) in a phased manner by 2007-08.

**Tax Demand per Assessment**

The average monthly water tax demand in 2004-05 is Rs. 2370.99. The same demand per assessment is adopted for 2005-06 to 2011-12 and is assumed to be revised once in 5 years by 30 per cent beginning from 2006-07, at a conservative simple growth rate of 6 per cent per annum.

**Collection Efficiency**

The average water tax collection efficiency during 2000-01 to 2004-05 was 64 per cent and 58 per cent of arrears and current tax demands respectively. It is assumed that BMC would gradually increase its tax collection performance to 50 per cent and 85 per cent against arrears and current tax demand respectively.

### **(iii) Consolidated Tax**

#### **Number of Assessments**

The number of assessments for consolidated tax is the same as that for property tax, and the same is adopted for future years.

#### **Tax Demand per Assessment**

The average annual consolidated tax demand in 2004-05 is Rs. 517.08. The same demand per assessment is adopted for 2005-06 to 2011-12 and is assumed to be revised once in 5 years by 30 per cent beginning from 2005-06, at a conservative simple growth rate of 6 per cent per annum.

#### **Collection Efficiency**

The average consolidated tax collection efficiency during 2000-01 to 2004-05 was 53 per cent and 56 per cent of arrears and current tax demands respectively. It is assumed that BMC would maintain a 50 per cent collection performance against arrears demand and gradually increase its collection performance to 85 per cent against current tax demand.

### **(iv) Sewerage Tax/Charge**

BMC does not levy a sewerage tax/charge currently. Hence this tax is not considered in the base case scenario. However, if the sewerage scheme, envisaged as part of the CIP is implemented, it is assumed that BMC would levy a sewerage charge.

#### **Number of Assessments**

The ultimate number of assessments for sewerage charge, or the number of sewerage connections is assumed at 75 per cent of the total water connections. It is assumed that the 75 per cent coverage will be achieved in three annual phases of 25 per cent each beginning from 2006-07. From FY 2008-09 onward, a proportion of 75 per cent will be maintained.

#### **Tax Demand per Assessment**

An average monthly sewerage tax/charge demand of Rs. 100 per connection from FY 2006-07 is assumed to compute the demand from sewerage tax/charge. The sewerage tax/charge is assumed to be revised by 30 per cent once in five years, beginning from 2007-08, at a conservative simple growth rate of 6 per cent per annum.

#### **Collection Efficiency**

A collection efficiency of 50 per cent of the current demand of sewerage tax/charge is assumed for the second year of the levy of the charge, i.e. 2006-07. From 2007-08 onward, a collection efficiency of 50 per cent and 85 per cent of the arrears and current demands respectively, is assumed.

### **(v) Other Taxes**

Other relatively insignificant taxes like wheel tax, cinema tax, entry tax, etc. are forecast to grow at a nominal rate of 15 per cent per annum, as against a CAGR of 13 per cent. However, based on reports that entry tax is not be levied from FY 2001-02, the income from other taxes is forecast based on the 1999-00 realization.

The CAGR of income from all taxes forecast based on the above assumptions for the period 2005-06 to 2011-12 works out to 10 per cent, against the actual 5-year CAGR of 8 per cent during 2000-01 to 2004-05.

### **Non-Tax Sources**

The non-tax sources of revenue income, viz. municipal own sources, compensation and assigned revenue and revenue grants are forecast purely based on past trends (5-year average growth trend or 5-year compound annual growth rate - CAGR, whichever is lower) subject to minimum and maximum annual growth rate ceilings of 5 per cent and 15 per cent respectively.

The CAGR of income from all non-tax sources forecast based on the above assumptions for the period 2005-06 to 2011-12 works out to 10 per cent, as against the actual 5-year CAGR of 10.88 per cent during 2000-01 to 2004-05.

Based on the above assumptions, the CAGR of the total revenue income works out to 8 per cent as against the actual CAGR of 5.95 per cent during 2000-01 to 2004-05, which is very much on the conservative side.

### **Revenue Expenditure**

Items of revenue expenditure are categorized under the following broad heads, viz.

Establishment expenditure;

Contingency/O&M expenditure;

Employee terminal benefits, pensions, etc.;

Debt servicing;

Additional recurring and debt servicing expenditure due to investment under JNNURM, 2005.

#### **Establishment Expenditure**

The establishment expenditure of BMC has grown at a CAGR of about 5.60 per cent during the last five years. The same growth rate – 10 per cent per annum is assumed for forecasting establishment expenditure.

#### **Contingency/O&M Expenditure**

The expenditure incurred by BMC in operation and maintenance and minor repairs of its infrastructure systems and properties has grown at a CAGR of 39 percent during 2000-01 to 2004-05. This high growth is primarily due to inappropriate booking of expenses by BMC in terms of capital and revenue items. It is likely that some capital expenditure items have been accounted under revenue account. A nominal growth rate of 15 per cent per annum is assumed to forecast operation and maintenance and contingency expenditure.

#### **Employee Terminal Benefits, Pensions, etc.**

In light of the unavailable relevant data Expenditure on employee terminal benefits and pensions has not been considered.

### Debt Servicing

The outstanding debt liability of BMC as on 31st March 2005 was Rs. 4950 Lakh – Rs. 185.53 Lakh from GoMP and Rs. 964Lakh from HUDCO. In the absence of the actual terms of the loans, the repayment schedule is worked out assuming 7-year tenure at an interest rate of 09 per cent per annum. The annuity payable on the outstanding loan thus works out to Rs. 195.00 Lakh payable from 2005-06.

### Clearing of Non-debt Liability

The outstanding non-debt liability of BMC is primarily in the form of power charges due to Madhya Pradesh State Electricity Board (MPSEB). According to information collected from the office of MPSEB in Bhopal, the outstanding power charges due from BMC is to the tune of Rs. 3050 Lakh (March, 2001). But BMC claim that some reconciliation had been carried out based on MPSEB dues to BMC in the form of property tax or octroi compensation and there was no outstanding amount due to MPSEB. Thus this amount is not considered in the forecast of expenditure.

Based on the above assumptions, the CAGR of total revenue expenditure for the period 2005-06 to 2011-12 works out to about 15 per cent, against the actual CAGR of 18.5 per cent during 2000-01 to 2004-05.

### Additional Recurring and Debt Servicing Expenditure due to CIP

#### (i) Additional Recurring Expenditure

The capital investments envisaged as per the CIP are bound to impose additional establishment and O&M expenditure on BMC. Such additional expenditure is estimated based on percentage of capital costs as estimated by the consultants from their experience in other projects. The percentages thus adopted are presented in **Table 0-7**.

**Table 0-7: Basis for Additional Recurring Expenditure due to Envisaged CIP**

Sl.	Sector	Recurring Expenditure as % of Capital Cost
1	Water Supply	3.00
2	Sewerage & Sanitation	2.00
3	Solid Waste Management	8.00
4	Roads	5.00
5	Storm Water Drains	20.00
6	Street Lighting	5.00
7	Fire Services	5.00
8	Others	1.50

#### (ii) Additional Debt Servicing Expenditure

The additional debt servicing ratio due to borrowings for undertaking identified capital investments is worked out based on terms of debt adopted for funding the capital investments.

### Capital Income

#### Grants

BMC receives project-related capital grants from GoMP for specific schemes like provision of basic services and environment improvement in slums, NRY and SJSRY, flood relief, etc. The CAGR of such grants during 2000-01 to 2004-05 was 14.77 per cent. However, a nominal 15 per cent increase is assumed while forecasting receipts in the form of capital grants.

In addition to the above regular capital grants, the FOP has a provision for incorporating special grants for part-funding large capital investments under JNNURM, especially in the Roads, water supply and Sewerage & sanitation sectors. The receipts under such grants, however as estimated in the phasing of investment plan for projects to be taken under JNNURM the specific



yearly receipts from Central government and State are considered in the investment scenarios, but the policy of Gol, GoMP in this regard is not clear.

### Loans

Capital income in the form of loans is forecast based on phased capital investment identified as part of the CIP. It is assumed that regular scheme-based capital grants received by BMC would be used to fund the identified CIP, and BMC would mobilize the balance amount to fund the capital investment through loans or public private partnership (PPP).

The terms of borrowing assumed are – interest at prevailing market rate per annum repayable in 7 years in equal annual installments. Borrowings do not feature in the base case scenario, as the capital investment due to the CIP is not considered. In the other two investment scenarios, the resource gap between phased investment requirement and regular capital grants is assumed to be mobilized through external borrowings.

### Capital Expenditure

The capital expenditure in the base case scenario is assumed to be equivalent to the receipt of capital grants on the basis that all capital receipts would be applied only for capital works.

### Investment Phasing

In the investment case scenarios, the identified CIP capital investment of Rs. 59,193.73 Lakh at 2001-02 prices (refer Chapter-16 Para 16.6) is phased over 7 years in consultation with BMC officials and based on BMC's cash flows. The investment phasing schedule is presented in **Error! Reference source not found.**16.6 (Refer page 183) and the investment figures at current prices, escalated at 6 per cent per annum are induced with the FOP. The total investment at current prices thus works out to Rs. 2513.44 Lakh over a 7-year period from 2005-06 to 2011-12.

### Results of FOP

#### Base Case

The FOP for the base case is worked out without considering the identified CIP investment. The closing balance of BMC by the terminal year of the FOP, i.e. 2011-12 would be Rs. 3862.59 Lakh. This could be considered as an indicative investment sustenance level of BMC, not withstanding additional recurring expenditure that would arise due investment projects proposed to be under taken in JNNURM, 2005.

#### Full Investment Scenario

In the full investment scenario, the entire estimated investment of the CIP is loaded on the FOP as capital expenditure, as per the investment phasing presented in Table 16.6, and the additional recurring and debt servicing expenditure are considered under revenue expenditure.

The closing balance of BMC by the terminal year of the FOP in the full investment scenario would be minus Rs. 58,37.71 Lakh, indicating that BMC would need to generate revenue to the tune of this amount in order to be able to sustain the identified investment of Rs. 2153.44 Lakh (at current prices). Considering 50 per cent capital grant from Gol, and the State share of 20 per cent, the closing balance in 2011-12 would be to the tune of minus Rs. 48.38 Lakh

It needs mention that based on the assumptions adopted, the water account would continue to be a surplus one, while cost recovery in the sewerage account works out to less than 26 per cent. BMC would have to undertake significant reforms in taxation, aimed at full cost-recovery and improve its tax and charges collection efficiency in order to be able to sustain the full identified investment.

#### Sustainable Investment Scenario

The sustainable investment, given the assumptions adopted in forecasting municipal income and expenditure and considering a 50 per cent capital grant from Central Govt and 20 per cent share of Govt of Madhya Pradesh. 48 per cent of the identified investment at current prices with the above investment, BMC would still have a closing balance of Rs. 386.2 Lakh in 2011-12. Table 2.2 presents the indicative sector-wise investment sustenance of BMC. It may be noted that the

water account remains positive throughout the forecast period – in the absence of investment in water supply, the investment sustenance would reduce further.

**Table 0-8: Indicative Investment Sustainable by BMC**

Sl.	Sector	Investment in Rs. Lakh at Current Prices		Sustainable as % of Municipal Share for Identified Investment
		Identified	Sustainable	
1	Water Supply	55000.00	55000	100
2	Sewerage & Sanitation	24527.00	7358.1	30
3	Solid Waste Management	3952.00	3592.00	100
4	Urban Transport	39269.00	6169.00	16
5	Environmental Upgradation.	4000.00	4000.00	100
6	Storm Water Drains	5000.00	5000.00	100
9	Others 15	83596.00	22246.00	26
Total		215344.00	103365.12	

<sup>15</sup> Investment under “others” pertains to capital works undertaken using regular scheme-based capital grants and Identified projects of Urban renewal and basic infrastructure to poor excluding basic infrastructure projects.

**Annexure-1: Details of Bhopal Municipal Accounts**

Head of Account	2000- 01	2001- 02	2002- 03	2003 - 04	<b>2004- 05</b>
	Rs. Lakh				
Opening Balance		1,527.71	1,604.71	1,500.52	1,539.67
<b>REVENUE ACCOUNT</b>					
Revenue Income					
Tax- Own Sources					
Consolidated Tax	152.74	311.22	416.85	477.18	376.22
Property Tax	752.92	967.29	1108.45	1190.27	1242.86
Other Taxes & Charges	565.23	497.90	297.76	424.37	348.02
Tax- Own Sources	1,470.89	1,776.41	1,823.06	2,091.82	1,967.10
Assigned Revenues					
Octroi Compensation	2282.29	2047.36	1751.88	1997.58	2873.13
Pasenger Tax Compensation	133.30	94.16	120.72	90.99	137.40
Cinema Tax	8.70	8.70	10.04	9.75	3.75
Surcharge on Stamp Duty	298.30	180.00	74.73	299.45	393.51
Other Transfers(EFC, TFC)	385.87	385.87	1189.06	953.27	1617.08
Assigned Revenues	3,108.46	2,716.09	3,146.43	3,351.04	5,024.87
Non Tax- Own Sources					
Income from Municipal Properties and Markets	332.66	267.84	242.61	334.86	395.71
License Income (Trade, etc.)	124.14	142.17	35.95	41.63	40.39
Income from Advertising	3.24	2.37	57.19	14.97	126.37
Income from Special Services	0.00	0.00	0.00	0.00	0.00
Income from Fees	331.71	492.20	490.58	498.67	371.05
Miscellaneous Income	19.68	0.80	21.49	27.12	8.29
Non Tax- Own Sources	811.43	905.38	847.82	917.25	941.81
Revenue Grants					
State Finance Commission Grant	376.66	124.66	100.00	396.81	434.45
Water Supply & Sanitation (PHED)	700.73	636.36	543.00	769.15	557.71
Road Repair & Maintenance Grant	278.44	189.96	269.00	276.17	312.00
Other Grants	0.00	0.00	0.00	0.00	0.00
Revenue Grants	1,355.83	950.98	912.00	1,442.13	1,304.16
Water and Sewerage Account					
Water Tax & Charges	1067.07	1337.78	1459.87	1541.43	1221.69
Road Cutting Charges	55.73	29.72	3.51	15.84	2.61
Other Income					
Water and Sewerage Account	1,122.80	1,367.50	1,463.38	1,557.27	1,224.30
Total- Revenue Income	7,869.41	7,716.36	8,192.69	9,359.51	10,462.24
Revenue Expenditure					
Establishment					
Staff Salary and Payments	2537.63	2519.76	2469.96	3089.56	3058.32

General Administration	192.18	216.21	109.45	210.30	240.53
Education/ Training	0.00	0.00	0.00	0.00	0.00
Deduction of Employees GPF	0.00	0.00	0.00	0.00	0.00
Establishment	2,729.81	2,735.97	2,579.41	3,299.86	3,298.85
Operation & Maintenance					
General Expenses	63.19	87.76	89.00	76.82	137.45
Public Works and Roads	155.00	236.20	203.58	120.98	199.83
Public Health and Conservancy (Nalah safai)	606.50	943.34	923.30	1165.57	1402.35
Contractor Payment- Conservancy	0.00	0.00	0.00	0.00	0.00
Street Lighting	206.03	266.21	311.09	366.39	397.83
Education	0.00	0.00	0.00	57.97	184.98
Miscellaneous	52.23	0.00	600.18	94.71	360.12
Operation & Maintenance	1,082.95	1,533.51	2,127.15	1,882.44	2,682.56
Water and Sewerage Account					
Water Staff Salary	219.69	205.45	199.44	246.81	253.22
Water Supply- Maintenance & Repairs	638.27	568.99	757.46	587.80	1011.04
Water Supply- Contractor Payment	-	-	-	-	-
Water Supply- Electricity Charges	1300.89	1798.77	1979.74	1597.79	1893.32
Water Supply- Miscellaneous	-	-	-	-	-
Debt Servicing	-	-	-	-	-
Water and Sewerage Account	2,158.85	2,573.21	2,936.64	2,432.40	3,157.58
Debt Servicing					
Public Works and Roads	42.68	-			
Public Health and Conservancy	-				
Others	-				
Debt Servicing	42.68	-	-	-	-
Total- Revenue Expenditure	6,014.29	6,842.69	7,643.20	7,614.70	9,138.99
Operating Surplus (Revenue Account)	1,855.12	873.67	549.49	1,744.81	1,323.25
CAPITAL ACCOUNT					
Capital Income					
Capital Loans					
Public Works and Roads	-	-	165.75	-	122.88
Water Supply	-	-	-	-	1,840.52
Sewerage & Sanitation	-	-	-	-	
Street Lighting	-	-	-	-	
Public Health & Conservancy	-	-	-	-	
Education	-	-	-	-	
Others	-	-	-	-	

Capital Loans	-	-	165.75	-	1,963.40
Capital Grants and Contribution					
Public Works and Roads	154.66	195.69	597.96	340.64	400.75
Water Supply	93.00			100.00	78.82
Sewerage & Sanitation	0.00	0.00	4.70	29.34	1.90
Education	16.26	77.84	30.06	0.00	0.00
Others	371.97	118.99	92.33	35.95	241.29
Tenth/Eleventh Finance Commission Grants	0.00	0.00	0.00	0.00	0.00
Capital Grants and Contribution	635.89	392.52	725.05	505.93	722.76
Total- Capital Income	635.89	392.52	890.80	505.93	2,686.16
Capital Expenditure					
General	63.77	75.30	75.72	80.33	125.92
Remunerative Schemes	71.83	97.58	162.84	595.85	950.18
Non-Remunerative and Others	0.00	0.00	0.00	0.00	0.00
Public Works and Roads	908.00	887.20	812.94	1477.09	2005.95
Water Supply	3.50	91.05	166.25	99.00	1348.24
Sewerage & Sanitation	0.00		53.44	4.34	0.00
Street Lighting	14.48	13.79	12.57	0.00	16.13
Public Health & Conservancy	0.00	0.00	0.00	0.00	0.00
Education	5.81	85.82	12.83	80.20	0.00
Others	0.00	0.00	0.00	0.00	0.00
Council Works	29.57	74.44	98.54	35.83	66.50
Total - Capital Expenditure	1,096.96	1,325.18	1,395.13	2,372.64	4,512.92
Operating Surplus (Capital Account)	(461.07)	(932.66)	(504.33)	(1,866.71)	(1,826.76)
Extraordinary Account					
Suspense Income					
Bank Deposits (Interst)	200.25	378.26	243.21	310.30	180.41
Tax & Royalty Transfers	0.00	0.25	0.00	0.00	
Cess Transfers	0.00	0.00	0.00	0.00	
Security Deposit Refunds	81.81	138.57	247.64	207.93	246.52
Loans and Advances	371.80	312.77	303.35	429.09	488.21
Legal Payments					
PF and Pension	568.18	488.65	507.01	632.27	794.60
Total- Suspense Income	1,222.04	1,318.50	1,301.21	1,579.59	1,709.74
Suspense Expenditure					
Recoveries Payable to Outsiders	0.00	0.00	0.00	0.00	0.00
Taxes & Royalties	0.00	0.00	0.00	0.00	0.00
Legal Payments	14.06	12.93	16.23	22.82	9.92
Security Deposit	113.15	89.40	131.92	191.92	83.03
Cess	0.00	0.00	0.00	0.00	0.00
Other- Payable	322.18	361.02	536.26	397.30	523.17

PF and Pension	638.99	719.16	766.15	806.50	848.93
Total- Suspense Expenditure	1,088.38	1,182.51	1,450.56	1,418.54	1,465.05
Operating Surplus (Extraordinary Account)	133.66	135.99	(149.35)	161.05	244.69
Closing Balance	1,527.71	1,604.71	1,500.52	1,539.67	1,280.85



**Annexure-2: Income & Expenditure –Sectoral Contribution**

Head of Account	2000- 01	2001- 02	2002- 03	2003 - 04	2004- 05	<b>Average</b>
	Percentage to Total (%)					
<b>REVENUE ACCOUNT</b>						
<u>Revenue Income</u>						
Tax- Own Sources						
Consolidated Tax	1.94	4.03	5.09	5.10	3.60	3.95
Property Tax	9.57	12.54	13.53	12.72	11.88	12.05
Other Taxes & Charges	7.18	6.45	3.63	4.53	3.33	5.03
Tax- Own Sources	18.69	23.02	22.25	22.35	18.80	21.02
Assigned Revenues						
Octroi Compensation	29.00	26.53	21.38	21.34	27.46	25.14
Pasenger Tax Compensation	1.69	1.22	1.47	0.97	1.31	1.33
Cinema Tax	0.11	0.11	0.12	0.10	0.04	0.10
Surcharge on Stamp Duty	3.79	2.33	0.91	3.20	3.76	2.80
Other Transfers(EFC, TFC)	4.90	5.00	14.51	10.19	15.46	10.01
Assigned Revenues	39.50	35.20	38.41	35.80	48.03	39.39
Non Tax- Own Sources						
Income from Municipal Properties and Markets	4.23	3.47	2.96	3.58	3.78	3.60
License Income (Trade, etc.)	1.58	1.84	0.44	0.44	0.39	0.94
Income from Advertising	0.04	0.03	0.70	0.16	1.21	0.43
Income from Special Services	-	-	-	-	-	-
Income from Fees	4.22	6.38	5.99	5.33	3.55	5.09
Miscellaneous Income	0.25	0.01	0.26	0.29	0.08	0.18
Non Tax- Own Sources	10.31	11.73	10.35	9.80	9.00	10.24
Revenue Grants						
State Finance Commission Grant	4.79	1.62	1.22	4.24	4.15	3.20
Water Supply & Sanitation (PHED)	8.90	8.25	6.63	8.22	5.33	7.47
Road Repair & Maintenance Grant	3.54	2.46	3.28	2.95	2.98	3.04
Other Grants	-	-	-	-	-	-
Revenue Grants	17.23	12.32	11.13	15.41	12.47	13.71
Water and Sewerage Account						
Water Tax & Charges	13.56	17.34	17.82	16.47	11.68	15.37

Road Cutting Charges	0.71	0.39	0.04	0.17	0.02	0.27
Other Income	-	-	-	-	-	-
Water and Sewerage Account	14.27	17.72	17.86	16.64	11.70	15.64
Total- Revenue Income	100.00	100.00	100.00	100.00	100.00	100.00
<u>Revenue Expenditure</u>						
Establishment						
Staff Salary and Payments	42.19	36.82	32.32	40.57	33.46	37.07
General Administration	3.20	3.16	1.43	2.76	2.63	2.64
Education/ Training	-	-	-	-	-	-
Deduction of Employees GPF	-	-	-	-	-	-
Establishment	45.39	39.98	33.75	43.34	36.10	39.71
Operation & Maintenance						
General Expenses	1.05	1.28	1.16	1.01	1.50	1.20
Public Works and Roads	2.58	3.45	2.66	1.59	2.19	2.49
Public Health and Conservancy (Nalah safai)	10.08	13.79	12.08	15.31	15.34	13.32
Contractor Payment- Conservancy	-	-	-	-	-	-
Street Lighting	3.43	3.89	4.07	4.81	4.35	4.11
Education	-	-	-	0.76	2.02	0.56
Miscellaneous	0.87	-	7.85	1.24	3.94	2.78
Operation & Maintenance	18.01	22.41	27.83	24.72	29.35	24.46
Water and Sewerage Account						
Water Staff Salary	3.65	3.00	2.61	3.24	2.77	3.06
Water Supply- Maintenance & Repairs	10.61	8.32	9.91	7.72	11.06	9.52
Water Supply- Contractor Payment	-	-	-	-	-	-
Water Supply- Electricity Charges	21.63	26.29	25.90	20.98	20.72	23.10
Water Supply- Miscellaneous	-	-	-	-	-	-
Debt Servicing	-	-	-	-	-	-
Water and Sewerage Account	35.90	37.61	38.42	31.94	34.55	35.68
Debt Servicing						
Public Works and Roads	0.71	-	-	-	-	0.14
Public Health and Conservancy	-	-	-	-	-	-

Others	-	-	-	-	-	-
Debt Servicing	0.71	-	-	-	-	0.14
Total- Revenue Expenditure	100.00	100.00	100.00	100.00	100.00	100.00
<b>CAPITAL ACCOUNT</b>						
<u>Capital Income</u>						
Capital Loans						
Public Works and Roads	-	-	18.61	-	4.57	4.64
Water Supply	-	-	-	-	68.52	13.70
Sewerage & Sanitation	-	-	-	-	-	-
Street Lighting	-	-	-	-	-	-
Public Health & Conservancy	-	-	-	-	-	-
Education	-	-	-	-	-	-
Others	-	-	-	-	-	-
Capital Loans	-	-	18.61	-	73.09	18.34
Capital Grants and Contribution						
Public Works and Roads	24.32	49.85	67.13	67.33	14.92	44.71
Water Supply	14.63	-	-	19.77	2.93	7.47
Sewerage & Sanitation	-	-	0.53	5.80	0.07	1.28
Education	2.56	19.83	3.37	-	-	5.15
Others	58.50	30.31	10.36	7.11	8.98	14.19
Tenth/Eleventh Finance Commission Grants	-	-	-	-	-	-
Capital Grants and Contribution	100.00	100.00	81.39	100.00	26.91	
Total- Capital Income	100.00	100.00	100.00	100.00	100.00	100.00
<u>Capital Expenditure</u>						
General	5.81	5.68	5.43	3.39	2.79	4.62
Remunerative Schemes	6.55	7.36	11.67	25.11	21.05	14.35
Non-Remunerative and Others	-	-	-	-	-	-
Public Works and Roads	82.77	66.95	58.27	62.26	44.45	54.99
Water Supply	0.32	6.87	11.92	4.17	29.88	15.32
Sewerage & Sanitation	-	-	3.83	0.18	-	0.80
Street Lighting	1.32	1.04	0.90	-	0.36	0.72
Public Health & Conservancy	-	-	-	-	-	-

Education	0.53	6.48	0.92	3.38	-	2.26
Others	-	-	-	-	-	-
Council Works	2.70	5.62	7.06	1.51	1.47	3.67
Total - Capital Expenditure	-	-	100.00	100.00	100.00	100.00
Extraordinary Account						
<u>Suspense Income</u>						
Bank Deposits (Interst)	16.39	28.69	18.69	19.64	11.71	16.39
Tax & Royalty Transfers	-	0.02	-	-	-	-
Cess Transfers	-	-	-	-	-	-
Security Deposit Refunds	6.69	10.51	19.03	13.16	4.78	6.69
Loans and Advances	30.42	23.72	23.31	27.16	28.55	30.42
Legal Payments	-	-	-	-	-	-
PF and Pension	46.49	37.06	38.96	40.03	46.47	46.49
Total- Suspense Income	100.00	100.00	100.00	100.00	100.00	100.00
<u>Suspense Expenditure</u>						
Recoveries Payable to Outsiders	-	-	-	-	-	-
Taxes & Royalties	-	-	-	-	-	-
Legal Payments	1.29	1.09	1.12	1.61	0.68	1.29
Security Deposit	10.40	7.56	9.09	13.53	5.67	10.40
Cess	-	-	-	-	-	-
Other- Payable	29.60	30.53	36.97	28.01	35.71	29.60
PF and Pension	58.71	60.82	52.82	56.85	57.95	58.71
Total- Suspense Expenditure	100.00	100.00	100.00	100.00	100.00	100.00

**Annexure-3: Income and Expenditure -Growth Trends**

Head of Account	2000-01	2001- 02	2002- 03	2003 - 04	2004- 05	<b>Average</b>
	Percentage increase over previous year					
REVENUE ACCOUNT						
<u>Revenue Income</u>						
Tax- Own Sources						
Consolidated Tax	--	103.76	33.94	14.47	(21.16)	32.75
Property Tax	--	28.47	14.59	7.38	4.42	13.72
Other Taxes & Charges	--	(11.91)	(40.20)	42.52	(17.99)	(5.22)
Tax- Own Sources	--	20.77	2.63	14.74	(5.96)	8.04
Assigned Revenues						
Octroi Compensation	--	(10.29)	(14.43)	14.02	43.83	14.47
Pasenger Tax Compensation	--	(29.36)	28.21	(24.63)	51.01	6.31
Cinema Tax		--	--	--	--	
Surcharge on Stamp Duty		(39.66)	(58.48)	300.71	31.41	58.49
Other Transfers(EFC, TFC)	--	-	208.15	(19.83)	69.64	64.49
Assigned Revenues	--	(12.62)	15.84	6.50	49.95	14.92
Non Tax- Own Sources						
Income from Municipal Properties and Markets	--	(19.49)	(9.42)	38.02	18.17	6.82
License Income (Trade, etc.)	--	14.52	(74.71)	15.80	(2.98)	(11.84)
Income from Advertising	--	(26.85)	2,313.08	(73.82)	744.15	739.14
Income from Special Services	--	--	--	--	--	
Income from Fees	--	48.38	(0.33)	1.65	(25.59)	6.03
Miscellaneous Income	--	(95.93)	2,586.25	26.20	(69.43)	847.67
Non Tax- Own Sources	--	11.58	(6.36)	8.19	2.68	4.02
Revenue Grants						
State Finance Commission Grant	--	(66.90)	(19.78)	296.81	9.49	54.90
Water Supply & Sanitation (PHED)	--	(9.19)	(14.67)	41.65	(27.49)	(2.42)
Road Repair & Maintenance Grant	--	(31.78)	41.61	2.67	12.97	6.37
Other Grants	--	(31.78)	41.61	2.67	12.97	6.37
Revenue Grants	--	(29.86)	(4.10)	58.13	(9.57)	3.65
Water and Sewerage Account						

Water Tax & Charges	--	25.37	9.13	5.59	(20.74)	4.83
Road Cutting Charges	--	(46.67)	(88.19)	351.28	(83.52)	33.22
Other Income	--	--	--	--	--	
Water and Sewerage Account	--	21.79	7.01	6.42	(21.38)	3.46
Total- Revenue Income	--	(1.94)	6.17	14.24	11.78	7.56
<u>Revenue Expenditure</u>						
Establishment						
Staff Salary and Payments	--	(0.70)	(1.98)	25.09	(1.01)	5.35
General Administration	--	12.50	(49.38)	92.14	14.37	17.41
Education/ Training	--	--	--	--	--	
Deduction of Employees GPF	--	--	--	--	--	
Establishment	--	0.23	(5.72)	27.93	(0.03)	5.60
Operation & Maintenance						
General Expenses	--	38.88	1.41	(13.69)	78.92	26.38
Public Works and Roads	--	52.39	(13.81)	(40.57)	65.18	15.79
Public Health and Conservancy (Nalah safai)	--	55.54	(2.12)	26.24	20.31	24.99
Contractor Payment- Conservancy	--	--	--	--	--	
Street Lighting	--	29.21	16.86	17.78	8.58	18.11
Education	--	--	--	(100.00)	--	(100.00)
Miscellaneous	--	(100.00)	--	(84.22)	280.23	32.00
Operation & Maintenance	--	41.60	38.71	(11.50)	42.50	27.83
Water and Sewerage Account						
Water Staff Salary	--	(6.48)	(2.93)	23.75	2.60	4.24
Water Supply- Maintenance & Repairs	--	(10.85)	33.12	(22.40)	72.00	17.97
Water Supply- Contractor Payment	--	--	--	--	--	
Water Supply- Electricity Charges	--	38.27	10.06	(19.29)	18.50	11.88
Water Supply- Miscellaneous	--	--	--	--	--	
Debt Servicing	--	--	--	--	--	
Water and Sewerage Account	--	19.19	14.12	(17.17)	29.81	11.49
	--	--				
Debt Servicing	--	--				
Public Works and Roads	--	(100.00)	--	--	--	(100.00)



Public Health and Conservancy	--	--	--	--	--	
Others	--	--	--	--	--	
Debt Servicing	--	(100.00)	--	--	--	(100.00)
Total- Revenue Expenditure	--	13.77	11.70	(0.37)	20.02	11.28
Operating Surplus (Revenue Account)	--					
<b>CAPITAL ACCOUNT</b>						
<u>Capital Income</u>						
Capital Loans						
Public Works and Roads	--	--	--	(100.00)	--	(25.00)
Water Supply	--	--	--	--	--	-
Sewerage & Sanitation	--	--	--	--	--	-
Street Lighting	--	--	--	--	--	-
Public Health & Conservancy	--	--	--	--	--	-
Education	--	--	--	--	--	-
Others	--	--	--	--	--	-
Capital Loans	--	--	--	(100.00)	--	(25.00)
Capital Grants and Contribution						
Public Works and Roads	--	26.53	205.56	(43.03)	17.65	51.68
Water Supply	--	(100.00)	--	--	(21.18)	(30.30)
Sewerage & Sanitation	--	--	--	524.26	(93.52)	107.68
Education	--	378.72	(61.38)	(100.00)	--	54.33
Others	--	(68.01)	(22.41)	(61.06)	571.18	104.93
Tenth/Eleventh Finance Commission Grants	--	--	--	--	--	-
Capital Grants and Contribution		(38.27)	84.72	(30.22)	42.86	14.77
Total- Capital Income	--	(38.27)	126.94	(43.20)	430.94	119.10
<u>Capital Expenditure</u>						
General	--	18.08	0.56	6.09	56.75	20.37
Remunerative Schemes	--	35.85	66.88	265.91	59.47	107.03
Non-Remunerative and Others	--	--	--	--	--	
Public Works and Roads	--	(2.29)	(8.37)	81.70	35.80	26.71
Water Supply	--	2,501.43	82.59	(40.45)	1,261.86	951.36
Sewerage & Sanitation	--	--	--	(91.88)	(100.00)	(95.94)
Street Lighting	--				--	

		(4.77)	(8.85)	(100.00)		(37.87)
Public Health & Conservancy	--	--	--	--	--	
Education	--	1,377.11	(85.05)	525.10	(100.00)	429.29
Others	--	--	--	--	--	
Council Works	--	151.74	32.38	(63.64)	85.60	51.52
Total - Capital Expenditure	--	20.80	5.28	70.07	90.21	46.59
Operating Surplus (Capital Account)						
Extraordinary Account						
<u>Suspense Income</u>						
Bank Deposits (Interst)	--	88.89	(35.70)	27.59	(35.47)	11.33
Tax & Royalty Transfers	--	--	(100.00)	--	--	(100.00)
Cess Transfers	--	--	--	--	--	
Security Deposit Refunds	--	69.38	78.71	(16.04)	(60.66)	17.85
Loans and Advances	--	(15.88)	(3.01)	41.45	13.78	9.08
Legal Payments	--	--	--	--	--	-
PF and Pension	--	(14.00)	3.76	24.71	25.67	10.03
Total- Suspense Income	--	7.89	(1.31)	21.39	8.24	9.05
<u>Suspense Expenditure</u>						
Recoveries Payable to Outsiders	--	--	--	--	--	-
Taxes & Royalties	--	--	--	--	--	-
Legal Payments	--	(8.04)	25.52	40.60	(56.53)	0.39
Security Deposit	--	(20.99)	47.56	45.48	(56.74)	3.83
Cess	--	--	--	--	--	-
Other- Payable	--	12.06	48.54	(25.91)	31.68	16.59
PF and Pension	--	12.55	6.53	5.27	5.26	7.40
Total- Suspense Expenditure	--	8.65	22.67	(2.21)	3.28	8.10

**Annexure-4: Financial projections of Income & Expenditure**

Head of Account	2004- 05	2005- 06	2006- 07	2007- 08	2008- 09	2009- 10	2010- 11	2011- 12	
	Existing	Projections Rs. Lakh							
Opening Balance	1539.67	1280.85	1083.56	984.75	1028.77	1268.78	1768.25	2602.85	
I	REVENUE ACCOUNT								
	Revenue Income								
A	Tax- Own Sources								
1	Consolidated Tax	376.22	451.46	541.76	650.11	780.13	936.16	1123.39	1348.06
2	Property Tax	1242.86	1429.29	1643.68	1890.23	2173.77	2499.84	2874.81	3306.03
3	Other Taxes & Charges	348.02	382.82	421.10	463.21	509.54	560.49	616.54	678.19
	Tax- Own Sources	1967.10	2263.58	2606.54	3003.56	3463.44	3996.48	4614.74	5332.29
B	Assigned Revenues								
1	Octroi Compensation	2873.13	3160.44	3476.49	3824.14	4206.55	4627.20	5089.93	5598.92
2	Pasenger Tax Compensation	137.40	144.27	151.48	159.06	167.01	175.36	184.13	193.34
3	Cinema Tax	3.75	3.86	3.98	4.10	4.22	4.35	4.48	4.61
4	Surcharge on Stamp Duty	393.51	424.99	458.99	495.71	535.37	578.20	624.45	674.41
5	Other Transfers	1617.08	1859.64	2138.59	2459.38	2828.28	3252.53	3740.40	4301.46
	Assigned Revenues	5024.87	5593.21	6229.53	6942.38	7741.43	8637.63	9643.39	10772.74
C	Non Tax- Own Sources								
1	Income from Municipal Properties and Markets	395.71	455.07	523.33	601.83	692.10	795.91	915.30	1052.60
2	License Income (Trade, etc.)	40.39	41.60	42.85	44.14	45.46	46.82	48.23	49.67
3	Income from Advertising	126.37	139.01	152.91	168.20	185.02	203.52	223.87	246.26
4	Income from Special Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Income from Fees	371.05	389.60	409.08	429.54	451.01	473.56	497.24	522.10
6	Miscellaneous Income	8.29	9.95	11.94	14.33	17.19	20.63	24.75	29.70

	Non Tax-Own Sources	941.81	1035.23	1140.10	1258.02	1390.78	1540.45	1709.40	1900.34
D	Revenue Grants								
1	State Finance Commission Grant	434.45	456.17	478.98	502.93	528.08	554.48	582.20	611.31
2	Water Supply & Sanitation (PHED Salaries)	557.71	585.60	614.88	645.62	677.90	711.79	747.38	784.75
3	Slum Area Improvement & Development	312.00	321.36	331.00	340.93	351.16	361.69	372.54	383.72
4	Other Grants (including MP/MLA Grants)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Revenue Grants	1304.16	1363.13	1424.86	1489.48	1557.14	1627.97	1702.13	1779.79
E	Water and Sewerage Account								
1	Water Tax & Charges	1221.69	1343.86	1478.24	1626.07	1788.68	1967.54	2164.30	2380.73
2	Road Cutting Charges	2.61	2.74	2.88	3.02	3.17	3.33	3.50	3.67
3	Other Income		0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Water and Sewerage Account	1224.30	1346.60	1481.12	1629.09	1791.85	1970.88	2167.80	2384.40
	Total-Revenue Income	10462.24	11601.74	12882.15	14322.53	15944.63	17773.41	19837.45	22169.56
<u>Revenue Expenditure</u>									
A	Establishment								
1	Staff Salary and Payments	3058.32	3211.24	3371.80	3540.39	3717.41	3903.28	4098.44	4303.36
2	General Administration	240.53	252.56	265.18	278.44	292.37	306.98	322.33	338.45
3	Education/ Training	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Deduction of Employees GPF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Establishment	3298.85	3463.79	3636.98	3818.83	4009.77	4210.26	4420.77	4641.81
B	Operation & Maintenance								
1	General Expenses	137.45	158.07	181.78	209.04	240.40	276.46	317.93	365.62
2	Public Works and Roads	199.83	213.82	228.79	244.80	261.94	280.27	299.89	320.88
3	Public Health and Conservancy (Nalah safai)	1402.35	1472.47	1546.09	1623.40	1704.57	1789.79	1879.28	1973.25
4	Contractor Payment-Conservancy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Street Lighting	397.83	437.61	481.37	529.51	582.46	640.71	704.78	775.26
6	Education	184.98	194.23	203.94	214.14	224.84	236.09	247.89	260.29
7	Miscellaneous	360.12	414.14	476.26	547.70	629.85	724.33	832.98	957.93
	Operation & Maintenance	2682.56	2890.33	3118.23	3368.59	3644.06	3947.65	4282.75	4653.22
C	Water and Sewerage Account								
1	Water Staff Salary	253.22	260.82	268.64	276.70	285.00	293.55	302.36	311.43
2	Water Supply-Maintenance & Repairs	1011.04	1091.92	1179.28	1273.62	1375.51	1485.55	1604.39	1732.74
3	Water Supply-Contractor Payment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Water Supply-Electricity Charges	1893.32	2044.79	2208.37	2385.04	2575.84	2781.91	3004.46	3244.82
5	Water Supply-Miscellaneous (Included in 3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Debt Servicing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Water and Sewerage Account	3157.58	3397.53	3656.29	3935.36	4236.35	4561.01	4911.21	5288.99
D	Debt Servicing								
1	Public Works and Roads		0.00	0.00	0.00	0.00	0.00	0.00	0.00

2	Public Health and Conservancy		0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Others		0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Debt Servicing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total-Revenue Expenditure	9138.99	9751.65	10411.50	11122.78	11890.19	12718.92	13614.74	14584.02
	Operating Surplus (Revenue Account)	1323.25	1850.09	2470.66	3199.75	4054.44	5054.49	6222.71	7585.53
II CAPITAL ACCOUNT									
Capital Income									
A Capital Loans									
1	Public Works and Roads	122.88							
2	Water Supply	1840.52							
3	Sewerage & Sanitation		0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Street Lighting		0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Public Health & Conservancy		0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Education		0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Others		0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Capital Loans	1963.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B Capital Grants and Contribution									
1	Public Works and Roads	400.75	460.86	529.99	609.49	700.91	806.05	926.96	1066.00
2	Water Supply	78.82	82.76	86.90	91.24	95.81	100.60	105.63	110.91
3	Sewerage & Sanitation	1.90	2.00	2.09	2.20	2.31	2.42	2.55	2.67
4	Education	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Others	241.29	277.48	319.11	366.97	422.02	485.32	558.12	641.84
6	Tenth/Eleventh Finance Commission Grants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Capital Grants and Contribution	722.76	823.10	938.09	1069.91	1221.05	1394.39	1593.25	1821.42
	Total-Capital Income	2686.16	2686.16	2686.16	2686.16	2686.16	2686.16	2686.16	2686.16
Capital Expenditure									
1	General	125.92	151.10	181.32	217.59	261.11	313.33	376.00	451.19



2	Remunerative Schemes	950.18	1045.20	1149.72	1264.69	1391.16	1530.27	1683.30	1851.63
3	Non-Remunerative and Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Public Works and Roads	2005.95	2306.84	2652.87	3050.80	3508.42	4034.68	4639.88	5335.87
5	Water Supply	1348.24	1483.06	1631.37	1794.51	1973.96	2171.35	2388.49	2627.34
6	Sewerage & Sanitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Street Lighting	16.13	16.94	17.78	18.67	19.61	20.59	21.62	22.70
8	Public Health & Conservancy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	Education	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Council Works	66.50	73.15	80.47	88.51	97.36	107.10	117.81	129.59
	Total - Capital Expenditure	4512.92	5076.30	5713.53	6434.77	7251.61	8177.32	9227.10	10418.32
	Operating Surplus (Capital Account)	-1826.76	-2390.14	-3027.37	-3748.61	4565.45	5491.16	6540.94	7732.16
III	Extraordinary Account								
	<u>Suspense Income</u>								
	Bank Deposits	180.41	198.45	218.30	240.13	264.14	290.55	319.61	351.57
	Tax & Royalty Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cess Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Security Deposit Refunds	246.52	295.82	354.99	425.99	511.18	613.42	736.10	883.33
	Loans and Advances	488.21	537.03	590.73	649.81	714.79	786.27	864.89	951.38
	Legal Payments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PF and Pension	794.60	874.06	961.47	1057.61	1163.37	1279.71	1407.68	1548.45
	Total-Suspense Income	1709.74	1905.37	2125.49	2373.53	2653.48	2969.95	3328.29	3734.73
	<u>Suspense Expenditure</u>								
	Recoveries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Payable to Outsiders								
	Taxes & Royalties	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Legal Payments	9.92	10.22	10.52	10.84	11.17	11.50	11.84	12.20
	Security Deposit	83.03	85.52	88.09	90.73	93.45	96.25	99.14	102.12
	Cess	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Other-Deposits	523.17	575.49	633.04	696.34	765.97	842.57	926.83	1019.51
	PF and Pension	848.93	891.38	935.95	982.74	1031.88	1083.47	1137.65	1194.53
	Total-Suspense Expenditure	1465.05	1562.60	1667.59	1780.65	1902.47	2033.80	2175.46	2328.36
	Operating Surplus (Extraordinary Account)	244.69	342.76	457.89	592.88	751.02	936.15	1152.83	1406.37
	Closing Balance	1280.85	1083.56	984.75	1028.77	1268.78	1768.25	2602.85	3862.59

## Annexure I

### **NATIONAL TRAINING POLICY**

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#### **Preamble**

Governments have very significant role to play in the development process and promotion of appropriate conditions, which would lend dynamism to the national effort. In a developing country like India both the Central Government and the State Governments would need to ensure that the, administrative machinery is sensitive to the dynamics of development and responsive to the socioeconomic aspirations of its citizens. A conscious policy for the development of human resource available to the Governments would require to be fostered for meeting the challenges of development - social, economic and political. Training is one of the effective and tested tools for performance enhancement, as well as upgradation of knowledge and skills of the personnel. Organizational motivation and morale, as reflected in the attitudes and administrative culture, are rendered relevant and sharply focused through effective training programmes. Sensitivity to emerging political and social concerns, modernity in thinking and re-orientation of administrative systems would require specifically focused training programmes to enable their diffusion throughout the administrative structure.

#### **Training Objective**

Training in Government shall strive to achieve the following objectives: Keeping up-to-date and enhancing professional knowledge and skills needed for better performance of individuals and organizations; Promoting better understanding of professional requirements as well as sensitization to professional, socioeconomic and political environment in which work is done; and Bringing about right attitudinal orientation

#### **Training Concerns**

Social and political ambience is subject to constant change. The Government machinery would have to be continuously attuned to the changing needs. Training programmes for the Civil Services would, therefore, focus on:

1. Responsiveness: to the challenging democratic needs and expectations of the citizens and organizational and technological developments.
2. Commitment: to democratic values and concept of partnership and participative decision making.
3. Awareness: of technological, economic and social developments
4. Accountability: to ensure high performance in every professional field and cost effective methods of delivery.

#### **Training for All**

Training would be imparted to all rungs of the Civil Services starting from the lowest and cutting-edge to the highest in policy making.

For the purpose of appropriate training design, the Civil Services shall be divided into the following three levels:

The lowest level functionaries, that is operative at the cutting edge, who are mostly members of the Group 'D' services and the lower stages of Group 'C' services:

The supervisory levels and the middle management/administrative level; (they are mostly members of the Group 'B' services, but also shade off into higher stages of Group 'C' at one end and the lower stages of Group 'A' at the other); and

Group 'A' services and All India Services comprising the administration/ management level.

Training programmes of functionaries at the cutting edge shall address themselves to functional skill and attitudinal orientation. For the middle level, training shall contribute to enhancement of professional knowledge, understanding and skill as also to widening professional outlook. For the higher Civil Services, besides offering stimuli for expansion of the mental horizon and attainment of professional excellence, training shall also endeavor to sharpen perception of interrelatedness of issues. For the top levels of the higher Civil Services, training shall also be aimed at intellectually and professionally equipping the members for holding positions that involve policy analysis, strategic planning and policy formulation.

### **Framework for Training**

All categories of Civil Servants shall receive:

- (a) Induction training at time of entry into service; and
- (b) In-service training at suitable intervals in their career.

Attendance in training programmes shall be prescribed as a mandatory exercise with possible linkages with career progression.

For organized higher Civil Services, career span-specific training programmes in each progressive decade of service shall be imparted to provide scope for competence building.

In order to improve the effectiveness of personnel at different levels and different sectors, area specific short-term skill upgradation/sensitization programmes shall invariably be formulated by Ministries and Departments and specifically targeted to personnel holding specific jobs.

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Personnel recruited to isolated posts and specialists shall receive training to improve their capabilities of general management outside their chosen area of specialization.

The in-service training programme for Group 'C' & 'D' expected at the time of movement to a higher Group may be provided in situ or through distance learning methods.

Training programmes will be specifically designed to meet the requirements of the target group by the Organization in consultation with the institutions/consultants/experts.

Every Organization shall conduct preparatory exercises like analysis of its goals and objectives, training needs analysis, job analysis, etc. with a view to determining whether the training intervention needs to be preceded, accompanied by or succeeded by one or more non-training interventions. Such an exercise will also enable development of appropriate criteria for measuring individual and organizational performance, an essential pre-requisite for the launching of an effective training programme.

As possession of the right attitude plays a pivotal role in improving the performance levels of individuals, by contributing to formation of commitment in them, training programmes aimed at

creating self awareness as well as team building within the Organization shall be given utmost importance by every Organization

### **Policy Formulation and Coordination**

A National Training Council, headed by the Minister-in-Charge of Personnel shall be set up for advising the Government on India of matters related to training policy, training design and programmes as well as issues concerning their implementation.

The National Training Council shall be assisted by a high powered committee of Directions, headed by Secretary (Personnel) in the Ministry of Personnel, Public Grievances and Pensions. This Committee shall generally oversee operationalisation of the Training Policy. It shall also ensure that Training Plans are actually drawn up by Cadre Controlling authorities, syllabi are prepared and proper planning of training activity takes place through preparation of Perspective Plans, Annual Plans and Triennial Reviews.

### **Nodal Authority**

All organizations will designate training managers at appropriate level to develop and coordinate training programmes and monitor them. The Training Manager shall ensure an integrated approach to training with a view to improve overall performance of the Organization.

### **Training Infrastructure**

All Cadre Controlling Authorities shall endeavor to develop suitable infrastructure for induction and in-service training at the cutting edge and middle levels. Use of distance learning methods and in situ training shall be encouraged. Increasing use shall be made of Non-Government Organizations of training of Civil Servants at lower levels.

Training institutions, experts and resource persons shall be increasingly formed into a network for flexibility in the use of human and material resources.

Training institutions under the Government shall be permitted to diversify their training-related activities to cater to the increasing requirements of organizations and functional groups in and outside the Government so as to enable them attain a large measure of self-reliance.

Utmost care shall be exercised in selecting trainers. Efforts shall be made for evolving systems for identifying trainer- potential.

Department of Personnel and Training shall set up a workable system for evaluation of training institutions, without impinging adversely upon their professional autonomy.

Periodic opportunities for development of knowledge -and skills in relevant areas shall be provided to trainers through training programmes in institutions of excellence.

A Trainer Staffing Scheme shall be operationalisation, whereby Department of Personnel & Training shall maintain panels of trainers and potential trainers identified on the basis of scientific system.

The concept of "once a trainer always a trainer" shall be developed under which expertise developed as a trainer shall be used even after he returns to his line department, either within the Organization or by allowing him to go as resource person to outside institutions.

With a view to promote harmony between participants, training events and trainers, a system for concurrent monitoring shall be operationalised. Similarly, with a view to avoid mismatch between organizational objectives and training objectives, comprehensive evaluatory exercises shall be undertaken after a time lag.

### **Overseas Training**

Overseas training shall be entirely need-based and shall predominately aim at drawing lessons from successful cross-country experiences. Only institutions which are reservoirs of knowledge and database on relevant experiences shall be used.

The practice of funding most of the overseas training programmes through multilateral aid schemes shall be continued. With a view to maximize gains from overseas training, adequate pre-training preparation and post-training follow-up shall be arranged.

### **In House Expertise**

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