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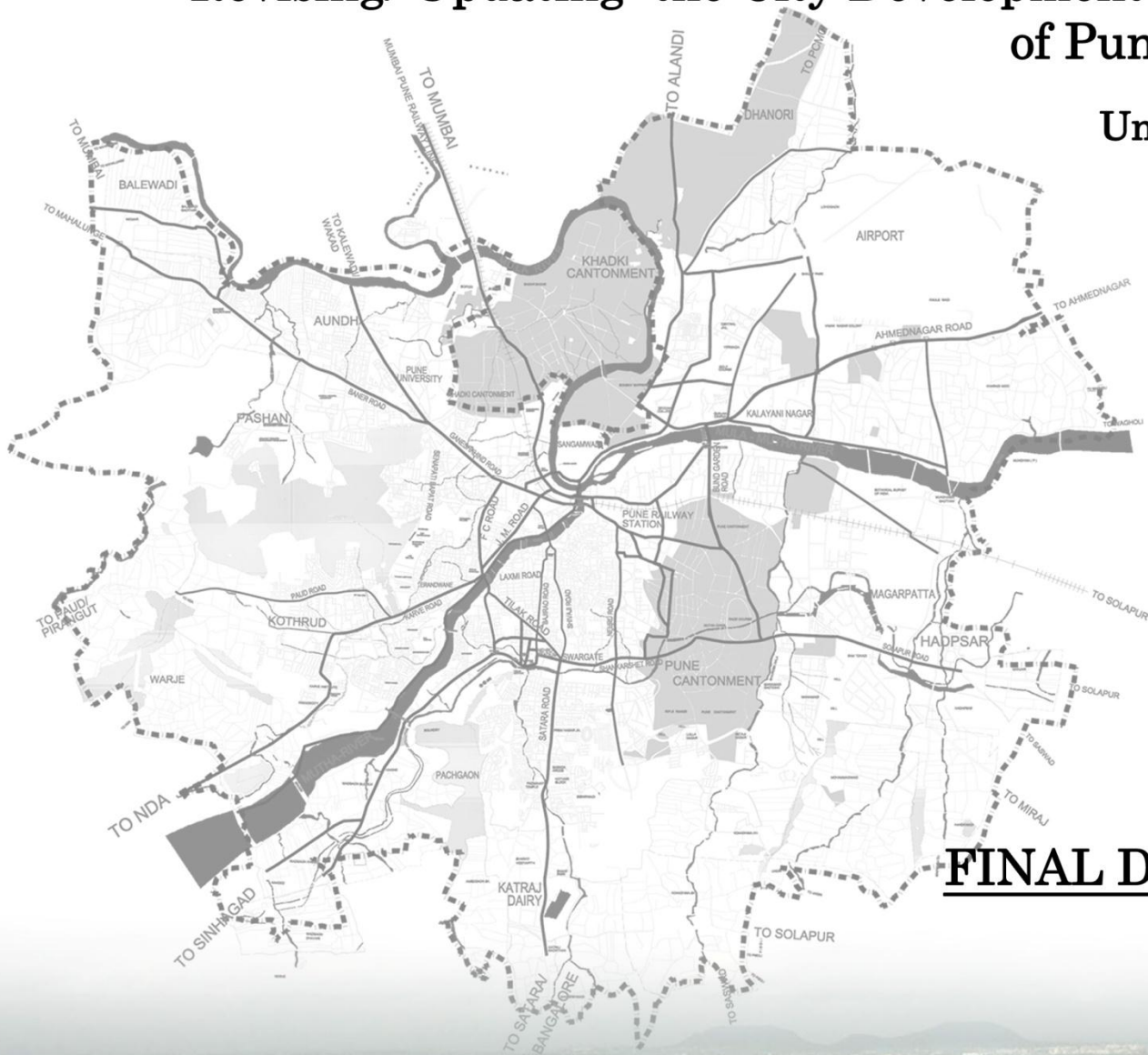
HISTORICAL

HOSPITALITY

SERVICE INDUSTRY

Revising/ Updating the City Development Plan (CDP) of Pune City-2041

Under JNNURM



FINAL DRAFT CDP (Volume I)

2012





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Abbreviations

AAI	: Airport Authority of India
ASCI	: Administrative Staff College of India
BPMC	: Bombay Provincial Municipal Corporation
BPO	: Buisness Process Outsourcing
BRC	: Bulk Refuse Carrier
BRTS	: Bus Rapid Transit System
BSUP	: Basic Services for Urban Poor
CAA	: Constitutional Amendment Act
CAGR	: Compounded Annual Growth Rate
CBO	: Community Based Organisation
CDP	: City Development Plan
CIP	: Capital Investment Plan
CLSC	: State Level Steering Committee
CMP	: Comprehensive Mobility Plan
CSP	: City Sanitation Plan
DC	: Development Control
DEO	: District Education Officer
DMIC	: Delhi Mumbai Industrial Corridor
DP	: Development Plan
DPR	: Detailed Project Report
ESR	: Environmental Sensitivity Report
EWS	: Economically Weaker Section
FOP	: Financial Operating Plan
FSI/ FAR	: Floor Space Index / Floor Area Ratio
GIS	: Geographical Information System
GoI	: Government of India
GoM	: Government of Maharashtra
GPS	: Geographical Positioning System
GW	: Ground Water
Ha	: Hectare
HCMTR	: High Capacity Mass Transport Route
HDH	: High Density Housing
IT/ ITeS	: Information Technology/ Information Technology enabled Services
ITS	: Intermediate Transport System
JnNURM	: Jawaharlal Nehru National Urban Renewal Mission
LIG	: Low Income Group
LPCD	: Liter per Capita per Day
KCB	: Khadki Cantonment Board



km	: Kilo Meter (Unit)
LED	: Light Emitting Diode
m	: Meter (Unit)
MHADA	: Maharashtra Housing and Area Development Authority (MHADA)
MIS	: Management Information System
MLA	: Member of Legislative Assembly
MLD	: Million Liter per Day
MMRDA	: Mumbai Metropolitan Region Development Authority
MoUD	: Ministry of Urban Development
MP	: Member of Parliament
MPCB	: Maharashtra Pollution Control Board
MR&TP	: Maharashtra Regional and Town Planning
MSBSHES	: Maharashtra State Board of Secondary and Higher Secondary Education
MSRDC	: Maharashtra State Road Development Corporation Ltd.
NGO	: Non-Governmental Organization
MTDC	: Maharashtra Tourism Development Corporation
NH	: National highway
NHAI	: National Highway Authority of India
NMAM	: National Municipal Accounting Manual
NRCP	: National River Conservation Plan
NRW	: Non-Revenue Water
OHT	: Over Head Tank
O&M	: Operation & Management
PCB	: Pune Cantonment Board
PCMC	: Pimpri Chinchwad Municipal Corporation
PCMT	: Pimpri-Chinchwad Municipal Transport
PHED	: Public Health Engineering Department
PMC	: Pune Municipal Corporation
PMPML	: Pune Mahanagar Pariwahan Mahamandal Ltd.
PMR	: Pune Metropolitan Region
PMRDA	: Pune Metropolitan Region Development Authority
PMT	: Pune Municipal Transport
pph	: Persons per Hectare
PPP	: Public Private Partnership
PS	: Pumping Station
PWD	: Public Works Department
QPR	: Quarterly Progress Report
RAY	: Rajiv Awas Yojana
RoB	: Road over Bridge



Rs	: Rupees (Indian Currency)
RTO	: Regional Transport Office
SEZ	: Special Economic Zone
SH	: State Highway
SLB	: Service Level Benchmark
Sq.km	: Square Kilometer (Unit)
SRA	: Slum Rehabilitation Authority
STP	: Sewage Treatment Plant
SWaCH	: Solid Waste (Collection and Handling) Cooperative
SWM	: Solid Waste Management
SWOT	: Strengths, Weaknesses, Oppertunities and Threats
TCPD	: Town and Country Planning Department
TMC	: Thousand Million Cubic Feet
TPD	: Tonne per Day
TDR	: Transfer of Development Rights
UFW	: Unaccounted For Water
UIG	: Urban Infrastructure and Governance
ULB	: Urban Local Body
ULC Act	: Urban Land Ceiling Act
UDPFI	: Urban Development Plan Formulation and Implementation
VSPL	: Voyants Solutions Pvt. Ltd.
VRS	: Voluntary Retirement Scheme
WPR	: Work Participation Rate
WTP	: Water Treatment Plant



1 PROJECT BACKGROUND

1.1 BACKGROUND OF THE STUDY

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was conceptualized in 2005-06 with a number of urban reforms highlighting the importance of City Development Plans for the selected mission cities. These were short-term initiatives focusing on 6-7 years plans and strategies, to translate the the aspirations of the stakeholders into the vision of the city and to achieve the vision for the city strategies and projects are outlined. The core aim of the JNNURM is to:

1. Translate investments into effective service delivery outcomes
2. Introduce strong governance systems and
3. Make the cities financially sustainable.

The City Development Plan (CDP) is both a planning process and a product which promotes partnership among the various stakeholders in a city- the city government, the private business sector, civil society, academic and national government agencies- to jointly analyze growth issues, develop a vision for the future, formulate development strategies, design programmes, prioritize projects, mobilize resources, implement, monitor and evaluate implementation.

The preparation of a City Development Plan can be understood as a consultative process where the municipality and parastatal agencies responsible for provision of services and overall development of the city play a pivotal role. The firms and institutions are required to work in partnership and close collaboration with municipal and other related institutions such as the Water Supply and Sewerage Boards, Development Authorities, together with other key stakeholders, civil society groups, and non-governmental organizations. The CDP is anchored on the following principles of a sustainable city as envisaged by World Bank:

- Livability - what can be done to ensure a healthy and dignified standard of living for the city's residents?
- Competitiveness - how can the cities be more competitive in the global economy?
- Bankability - how can the cities be more sustainable?
- Good Governance - how can a city's management be improved? How can accountability, integrity, and transparency be made an integral part of city's management.

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) gave an opportunity to the rapidly growing city of Pune, to improve its urban, economic and social infrastructure. City Development Plan (CDP) 2006-12 was prepared and approved for the city of Pune in 2006 as a prerequisite for availing financial assistance under JNNURM.



Figure 1-1: Principles suggested by World Bank for Sustainable Cities

1.2 NEED FOR REVISING PUNE CDP

The Government of India has selected Pune, a metropolis, as a “Category B” city, for assistance under JNNURM (Source: <http://JnNURM.nic.in/wp-content/uploads/2011/01/UIGOverview.pdf>). The revision of CDP has been carried out in accordance with the JNNURM guidelines to consider the city needs in an integrated and participatory manner and subsequently prioritize projects. The purpose of a Revised City Development Plan is to support Pune Municipal Corporation to generate and provide a strategic framework for city development actions and work towards achieving their long-term vision by 2041, guided by a shared and collective vision and aimed at delivering sustainable development accompanied with poverty reduction, thereby, helping Pune city, in achieving an environmentally sustainable and self-sufficient status.

Pune city has grasped numerous changes since the CDP’s approval by the Ministry of Urban Development, Gol in 2006 with regards to new infrastructure projects and implementation of reforms which have been undertaken in the last 5-6 years (list of reforms implemented under JNNURM is given in *Annexure-I*). Under JNNURM, the city has taken initiatives such as construction of Bus Rapid Transit System (BRTS), road widening and subways, river improvement, construction of Sewage Treatment Plants (STP), remodeling of storm-water drains, augmenting water supply and development of waste management facilities, under BSUP rehabilitation of slums under environmentally sensitive locations have been addressed under 1st Phase of JNNURM.

The City Development Plan (2006-12) had proposed for Pune city to meet the Capital Investment by 2011-12 of a total of 33 numbers of projects with a total cost of Rs. 6643.32 Crore (2005-06 prices) to address the infrastructure gaps and city priorities, out of which 11 projects got the sanction of Rs.1534.04



Crore under the Urban Infrastructure & Governance (UIG), sub-mission to JNNURM in the Road/ BRTS, STPs, River Improvement and Storm Water Drainage sectors. Out of the total 11 sanctioned projects, 4 projects have been physically completed i.e. BRT Pilot, Subway on Westerly Bypass at Banner Junction, Approach road to Sangamwadi Bridge and Augmentation and Upgradation of Sewage Treatment Plants and Pumping Stations the Other projects are underway and likely to be completed by December 2012 to December 2013. The total Additional Central Assistance (ACA) committed against the approved projects is Rs.767.02 Crore (87%) has been released till date. PMC also received the share of Rs. 268.54 Crore from GoM. In terms of reforms, significant progress is noted, where all of the commitments have been achieved. By the end of the last Year (2011-12), it is noted that 100% of the Mandatory reforms at the ULB level and significant number of activities for the optional reforms have been completed (Source: QPR-August 2012).Therefore, it is needless to say that the previous City Development Plan under JNNURM does not intend to limit itself to financing infrastructure, but has taken substantial efforts collectively to integrate a number of other measures with the urban development process.

At the end of the sixth year, it is inspiring to see the city with improved quality of life and infrastructure within its boundaries. There has been immense improvement in the urban reforms, governance and administrative structure of the ULB.

In the recent past, Pune has been a favored destination for most high technology industries and for varied educational openings, and has consequently witnessed a significant in-migration. Coupling with this fast urban growth and increasing population from 4.8 Lakhs in 1951 to 31.15 lakhs in 2011, there is an issue of grave concern of environmental degradation in which the growth of the city is linked with hyper-enhancing urban activities thereby; a substantial need for improvements in urban infrastructure is envisaged.

The dynamic nature of the cities insists on the City Development Plan to be a progressive document requiring updation, keeping in view the developments in the field of Infrastructure and Governance as well as the growth in the population and the levels of development in the city. This has led to the preparation of the revised City Development Plan (CDP) of Pune city with a long term vision for next 29 years that is 2041.

Taking the reference of the office memorandum published by the MoUD, Gol on September 22, 2011, besides the focus on the key aspects like planning for Urban Agglomeration or Metropolitan area, comprehensive and inclusive planning, Inter-Sectoral and Intra-Sectoral linkages, issues like environment planning and sustainable development services level benchmarks and Information Technology intervention may also be considered while preparing the CDP. The revising/ updation of the CDP for the city of Pune will be done in the light of this memorandum and the JNNURM guidelines provided for the formulation of the city development plans. Thus, the focus areas and the methodology to be followed will be in coherence with the JNNURM guide lines.

Owing to the progress in the development processes that the city of Pune has made viz. effectuating almost all the mandatory and optional reforms and service level benchmarks, this revised CDP will be prepared with a special consideration on the environment planning and sustainable development. The document will also discuss the 'service delivery levels' achieved after the approval and implementation of projects, under JNNURM that were recommended in the CDP 2006-12.

Therefore, it is pertinent to revise the City Development Plan to subjugate the pressures on environment

and infrastructures consequently providing an update of the investment plan under the jurisdiction of the Urban Local Body that is Pune Municipal Corporation.

1.3 SCOPE OF WORK

The scope of work for revised CDP Pune covers the following:

- Preparation of city development strategies as an upshot of a structured consultative process. The process will enable elected representatives, key staff of PMC departments, parastatal agencies and other institutions, policy makers and the citizens to participate and plan for spatial, social and economic development of Pune City.
- Present both a vision of a desired future perspective for the city and the Urban Local Body's (ULB) strategic framework of sectoral plans translated into actions that define on how the ULB, together with other stakeholders, intends to work towards achieving their long-term vision by 2041.
- Scale up existing urban development and poverty alleviation schemes within a comprehensive and coherent strategic planning framework in order to ensure optimal benefit from available resources for the citizens of Pune city.
- Generate specific priority actions and projects that can be the basis for mobilizing funding from diverse sources.

1.4 OBJECTIVES OF THE STUDY

The objectives of the revised CDP Pune are:

- Detailed study of existing CDP (2006-12) of Pune city.
- Prepare a shelf of short, medium and long term projects (upto 2041) for the city of Pune.
- Formulate strategies and identify the investment for the priority sectors.
- Update the investment plan based on actual capital costs that are now available
- Update the CDP for initiatives undertaken by PMC.
- Update the financing plan based on latest financial results and the funds availability and cost in the financial markets assist Corporation in getting various reimbursement and other financial arrangements.
- Identify innovative funding sources & leverage the potential for Public Private Partnerships (PPP).
- Suggest an Implementation Action Plan, with focus on PPP projects.

1.5 OUTCOME OF THE STUDY

The expected outcomes of the revised CDP Pune are:

- Universal access to a minimum level of services.
- Establishment of city-wide framework for planning and governance.
- Modern, transparent budgeting, accounting, and financial management system at municipal levels.



- Financial sustainability for municipalities and other service delivery institutions.
- Transparency and accountability in urban service delivery and management.
- A strong focus towards environment and sustainable development.

1.6 COVERAGE OF THE STUDY AREA

The Revised City Development Plan is formulated for Pune Municipal Corporation that covers a total area of 243.84 Sq. km with a total population of 3,115,431 in 2011.

Table 1-1: Study Area

S.No	Name Of Town	Area (Sq. Km)	Population (2011)
1	Pune Municipal Corporation	243.84 Sq. Km	3,115,431

Source: Pune Municipal Corporation

1.7 METHODOLOGY

The preparation of the CDP has been done while considering the 'Minutes of the meeting held on 13/7/2012 to consider various aspects of CDP toolkit', which mentions that the CDP should be in line with other plans and documents prepared by the ULB, hence the document has referenced the plans which were shared by the PMC. The CDP has taken reference of the Development Plan (DP-1987), in the absence of the new DP, due to its being in the draft stage and has not been shared; for the long term population projections and other infrastructure projections consultation is done with the stakeholders. The previous CDP(2006) document has also been referred. Preparation of revised CDP was divided into five stages. The detailed step wise methodology has been highlighted in the following section:

Phase I: Inception Stage

The purpose of this stage was to review and analyze the current status and unique features of the city with regard to the state of its development, systems and procedures, as equally its institutional and financial context. This stage involved the following activities:

- **Activity 1: Preliminary Meeting, Data Collection and Review**

Task 1: Preliminary Meeting with PMC officials

The assignment commenced with the preliminary meeting with the officials of PMC to understand their requirements from this assignment. Following activities were undertaken

- Introductory meeting with the Municipal Commissioner, Heads of Departments, Corporators, representatives of ongoing urban programmes, etc.
- Preliminary list of key stakeholders that need to be involved in the planning process, etc. was prepared.
- Identification of line departments and key stakeholders for urban service delivery and development such as PHED, PWD, local Chamber of Commerce, NGOs, CBOs, etc.
- Base Maps were procured.

Task 2: Reconnaissance survey and data collection

Introductory meeting with the key stakeholders and procurement of base maps were undertaken, which

was followed by reconnaissance survey and initial data collection process, in which following activities were taken up:

- Field reconnaissance was conducted to determine growth patterns of the city, characteristics of the slums and environmentally sensitive areas etc.
- Obtained base maps and available secondary data on the city's demography, development plan, reports prepared under past and current urban development programmes, PMC annual budget reports, other PMC reports giving status of service delivery and other relevant documents on heritage listing, data on slums and urban poor, government policy documents, etc.
- **Activity 2: Stakeholder consultation and Kick off Workshop**

Task 1: Pre-workshop stakeholder consultation and formation of City Level Steering Committee (CLSC)

At this stage, an exhaustive list of stakeholders was prepared. These groups were categorized as primary and secondary stakeholders. Sample of stakeholders were selected for preliminary consultation. Discussions and consultations were carried out. On the basis of the stakeholder list and preliminary consultation, the members of CLSC were identified. The CLSC was finalized with the help of PMC. The list of CLSC is given in chapter 8.

Task 2: Kick-off workshop

A kick-off workshop to familiarize the stakeholders with the purpose, process and expected outcomes of the CDP was organized with the PMC support which strived to generate enthusiasm, understanding and commitment to the CDP. The details of the workshop proceedings and outcome are provided in the Volume-II of City Development Plan.

On the basis of pre-workshop consultation and Kick-off workshop discussion, key areas were listed and focus areas were identified.

- **Activity 3: Preliminary Situational Analysis**

Preliminary analysis was done based on secondary data collection, stakeholder consultations and kick-off workshop. The analysis and assessment includes:

- Regional Setting, Administrative Boundary, Demography, Economy, Urban Growth, Landuse change, Bio-physical environment etc.
- Urban Basic Services: water supply, sanitation, municipal solid waste, drainage, roads/urban transport, urban environment, health and education, fire services, etc.
- Institutional Arrangements of key stakeholders and their roles & responsibilities in city planning with reference to delivery and management of urban basic services
- Financial framework of key stakeholder agencies involved in service delivery and O&M.

Phase II: Sectoral assessment and City Profile

- **Activity 4: Sectoral Assessment and City Profile**

In this stage a detailed analysis is carried out for key sectors - infrastructure, housing, environment, economy, governance, finance etc. Besides, special focus is given to the following sectors:

- Level of Basic services
- Environmental sustainability
- Heritage conservation and tourism
- Transport study with emphasis on low cost public transport and livelihoods
- Access to housing, employment and social and environmental services by the poor
- Urban governance and service delivery systems

To undertake the study, Voyants Solutions Pvt. Ltd. (VSPL) interacted with various stakeholder groups (meetings, workshops, focus group discussions, etc.) and reviewed relevant publications, reports, GOs, resolutions, procedures, laws etc. and analyse the current situation in each of the key sectors. Methodology adopted for each sector is discussed in the following section:

Task 1: City Economy and Social Development

The study and analysis is divided into three sections. The first section involves status assessment of demography, social base, economic base and trade & commerce. The second section identifies the problems and issues through SWOT analysis. The third section aims at population projection exercise.

Task 2: Physical Planning and Growth Management

The study and analysis is divided into three sections. The First section assesses the status of Physical Growth, Landuse Trends, Planning Efforts, Planning Guidelines and Development Control Regulations. The Second Section aims to highlight the direction of Growth. The third section aim at the problems and issues related to Land Development.

Task 3: Urban Infrastructure and Services

The study and analysis include the problems, issues and SWOT analysis of the basic Infrastructure and services in the city. The section is divided into two parts, first section aims at Physical Infrastructure viz.

- Water Supply
- Sewerage and Sanitation
- Solid Waste Management
- Street Lights
- Storm Water Drainage
- Fire Services

Second section aims at Social Infrastructure viz.

- Education
- Health
- Parks
- Recreational area

Task 4: Urban Environment

The study and analysis is divided into three sections. The first section assesses the city's environment and its components with the help of environmental parameters, and existing environmental status. Followed

by problems and issues identification related to these sensitive zones in the third section.

Task 5: Heritage and Tourism

The study and analysis is divided into two stages. First stage involves a tourism resource inventory and tourist infrastructure assessment, including a SWOT analysis to derive at projects.

Task 6: Road and Transport Infrastructure

Transport infrastructure forms the backbone of any economy and plays an important role in the development of a region. The objective of studying the transport sector is to analyse and understand the role of public transportation in the present scenario of the city and its surrounding as well as to understand the existing potentials, strengths, weaknesses and constraints of the transport sector.

Task 7: Housing, Slums and Urban Poverty

This study is divided into three parts. First part, aims to assess the housing conditions and existing housing stock and identify demand- supply gap. Housing characteristics and access to urban services are also assessed. Second part aims to analyse existing status of slums in the city which includes existing slum population and growth trends and access to basic urban services. Next section attempts to analyse various on-going slum improvement programmes in the city. Last section discusses SWOT analysis and conclude with problems and issues.

Task 8: Institutional Setup and Urban Governance

The study and analysis is divided into three parts. First section aims to find roles and functions of institutions, identification of institutions involved in service delivery. Second section analyse the urban governance reforms implemented and the existing situation. Third section aims at Problems and Issues.

Task 9: PMC Finance

The study and analysis is divided into two parts. First section aims at the assessment of financial statements of PMC that is revenue and capital account. Second section aims at the analysis of the current system's performance and reforms undertaken, followed by Issues and Problems.

The findings from the sector analysis will be used to prepare the Sector Analysis and City Profile consisting of the assessment of the existing situation in all the sectors identified, emerging issues, SWOT analysis and projections of the present gaps and future requirements.

Phase III: Development of city vision and sector goals and strategies

▪ Activity 5 : Benchmark study

At this stage benchmark study was taken up for all the sectors including infrastructure development, urban reform, environment improvement etc. The study will help in strategy building process.

▪ Activity 6: Pre-workshop Stakeholder Consultation

Sector assessment done in the preceding stage was discussed with different stakeholders at individual level or in groups. Discussion was initiated on strategies, priorities and major actions that were required to move towards the vision. Findings from the consultation process will further substantiate the sector assessment and analysis. The Consultants continued to work in consultation with the local counterparts

to develop sector strategies in consonance with the city vision and sector goals.

- **Activity 7: Workshop**

Workshops were organised where city profile was presented and city priorities were finalized, after discussing the key issues identified in the preceding stages.

- **Activity 8: Identification and detailing of projects**

On the basis of the consultant's understanding and the best practices and the outcome of discussions with the stakeholders, issues identified, prospective growth scenario and strategies suggested; projects were identified.

Phase IV: Development of strategies and priority actions

- **Activity 9: Evaluation of strategies/ projects**

The strategies were evaluated from the perspective of their contribution to achieve the sector vision and goals. Criteria were developed for prioritizing the strategies, programs and projects in consultation with the Steering Group and other stake holders.

- **Activity 10: Workshop**

Workshops were organised where strategies and projects were presented to discuss the viability or feasibility of the projects which were proposed in the Revised CDP of Pune- 2041.

Phase V: Preparing a Capital Investment Plan (CIP), financing strategy and CDP

- **Activity 11: Preparation of Draft CDP**

Last stage of the CDP is to formulate the Capital Investment Plan (CIP) and Financial Operating Plan (FOP). CIP laid out the cost and revenue estimates of all the priority projects in short term, medium term and long term phases. The preparation of the CIP is a reiterative process requiring adjustments to individual projects as well as changes in scheduling to make the whole package work financially. Then financial operating plan and project cash flows were worked out for each project on the basis of sustainable financial situation up to 2041. The Consultants determined types and sources of financing for priority projects from internal resources, state and central governments, and through public-private partnerships.

- **Activity 12: Fourth workshop on Draft CDP**

A fourth workshop will be organized, involving all the stakeholders, who have been part of the revised CDP preparation process. The workshop will seek an approval of the Revised City Development Plan- 2041 from the stakeholder group present and agree on procedures for performance monitoring.

- **Activity 13: Finalization of Draft CDP**

The suggestions and comments shall be incorporated in the draft CDP which shall be finalized and submitted to the PMC.

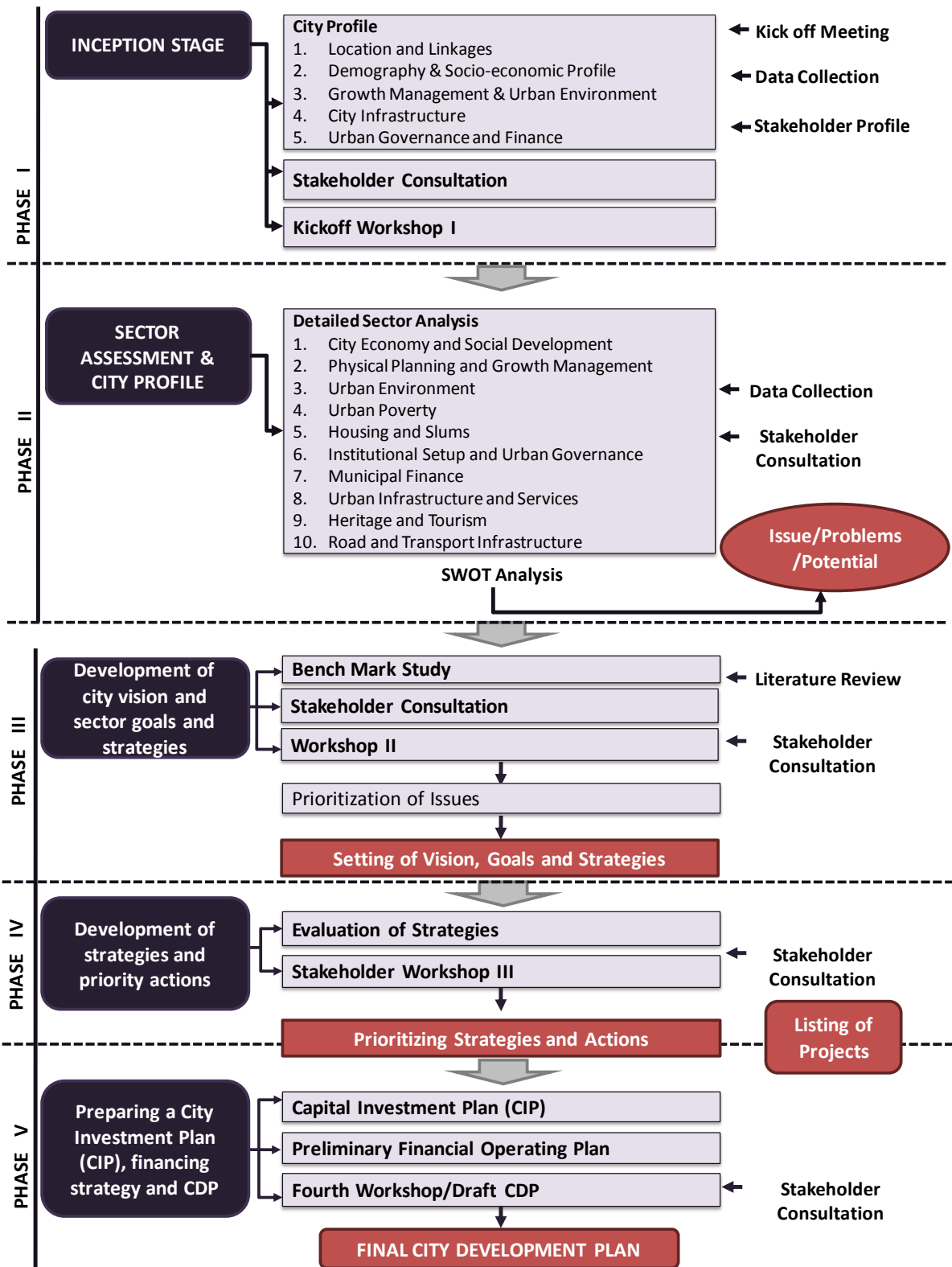


Figure 1-2: Methodology



2 REGIONAL SETTING & OVERVIEW OF PUNE CITY

2.1 INTRODUCTION

Pune has emerged as a prominent location for manufacturing industries, and has now been recognized as the information technology hub and education hub of the country. The city is spread over an area of 243.84 Sq.Km with a population of over 3 million. The rapid growth of the city has transformed from its character as Pensioner's city to Educational – Administrative Center and now to a bustling economic center. The city is famous as the *Oxford of the East* and *the cultural capital* of Maharashtra. Pune is also one of the most renowned places among tourists coming to Maharashtra. The educational institutions, presence of a number of industries and branches of virtually every array have made Pune a prosperous city.

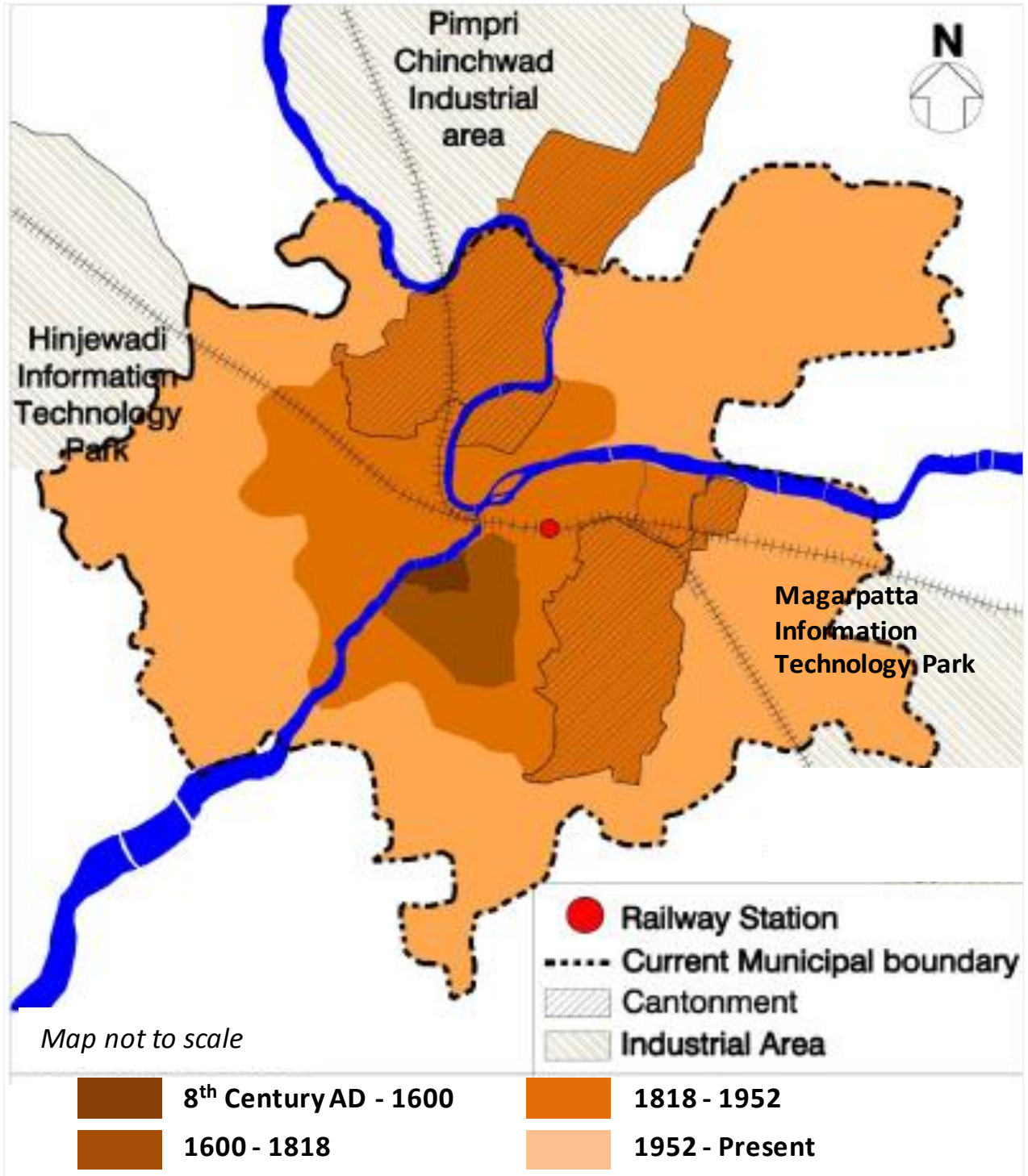
2.1.1 Chronological Development of Pune City

1600: Pune city started from a small agriculture settlement called "Punnakka". Later the settlement had grown to a small village called as *Kasbe Pune* or *Punavadi*. The whole region was located on the border, surrounded by the Mughals, Qutubshahi kingdom and Adilshahi kingdom. The settlement regenerated due to constant plundering and wars.

1600-1818: Entire region was gifted as a "Jagir" to Shahji Bhonsle eventually, his son Shivaji founded the Maratha kingdom. It was made the administrative capital of Maratha Power by the Peshwas. Peshwas established various "Peths" which were the self-sufficient urban settlement units (sectors).

1818-1952: British came and developed new areas to the north of the old city, on the opposite bank of the river. They also established military cantonment to the east & north of the city. Many academic and research institutes like Pune College of Engineering were established during this period. The Kirloskar Group was the first to bring industry to Pune by setting up Kirloskar Oil Engines Ltd. in 1945 at Kirkee in Pune. The Pune Municipality was established in 1950.

1952-Present: City grew rapidly due to establishment of various industrial areas-mainly Pimri-Chinchwad Industrial Township. Industrial development started in the 1950s and '60s in Hadapsar, Bhosari, Pimpri, and Parvati. Telco started operations in 1961, which gave boost to the automobile sector. In 1961, the Panshet and Khadakwasla dams broke and their waters flooded the city, destroying most of the older sections of town. Consequently, by 1966, the city had expanded in all directions. In 1990, Pune began to attract foreign capital. The maximum growth came after the IT boom & two major IT parks- Hinjewadi and Magarpatta. In 1998, work on the six-lane Mumbai-Pune expressway began; the expressway was completed in 2001. In 2008, the Commonwealth Youth Games took place in Pune, which encouraged additional development in the north-west region of the city. The city gradually changed into a dynamic place of academic, cultural and economic importance. Pune is today acknowledged as an IT hub, educational hub and cultural capital of Maharashtra.

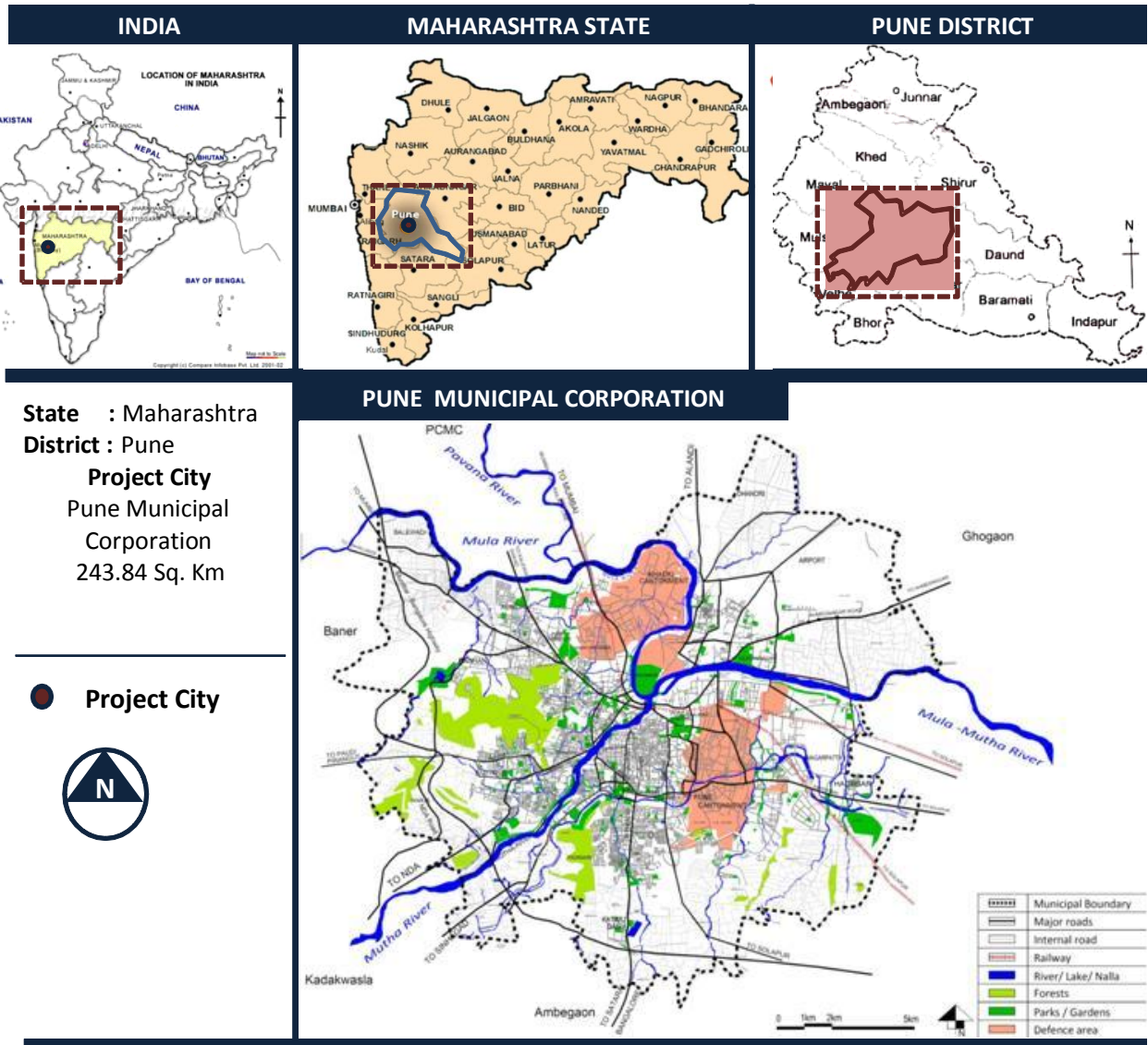


Map No. 2-1: Chronological Growth of Pune City

Source: *Queen of the Deccan* by Jaymala Diddie; Samita Gupta

2.1.2 Geographical Location

Pune city is located in Pune District in the western region in Maharashtra state between 18° 32' North latitude and 72° 51' East longitudes. It is at an altitude of 560 m above mean sea level. The city is bounded by Thane district to the north-west, Raigad district to the west, Satara district to the south, Solapur district to the south-east and Ahmednagar district to the north and north-east.



Map No. 2-2: Geographical location of Pune city

Source: Google maps and Pune Municipal Corporation

2.1.3 Physiography and Landform

2.1.3.1 Physiography & Topography

Pune is situated near the western margin of the Deccan plateau. It is approximately 50 Kms on the leeward side of the Sahyadri or the Western Ghats. The Konkan plain or the west coast is located at 100 kms. The area falls in Deccan Trap Basalts of Cretaceous-Eocene age. The flow of rivers here is deeply incised into the basalt or sometimes into late Quaternary alluvium, which occurs in patches. The rocky out-crops present are mostly of Basalt that are mostly use for construction and roads.

Pune city is surrounded by hills on the east and the south. The southern boundary of the urban area is along the Sinhagad-Katraj-Dive ghat range. The Vetil hill (800 m) is the highest point within the city, whereas the Sinhagad fort (1400 m) is the highest point at the fringe areas of the city. Details of physical features at city level are discussed in Urban Environment section (Chapter-9) of the report.

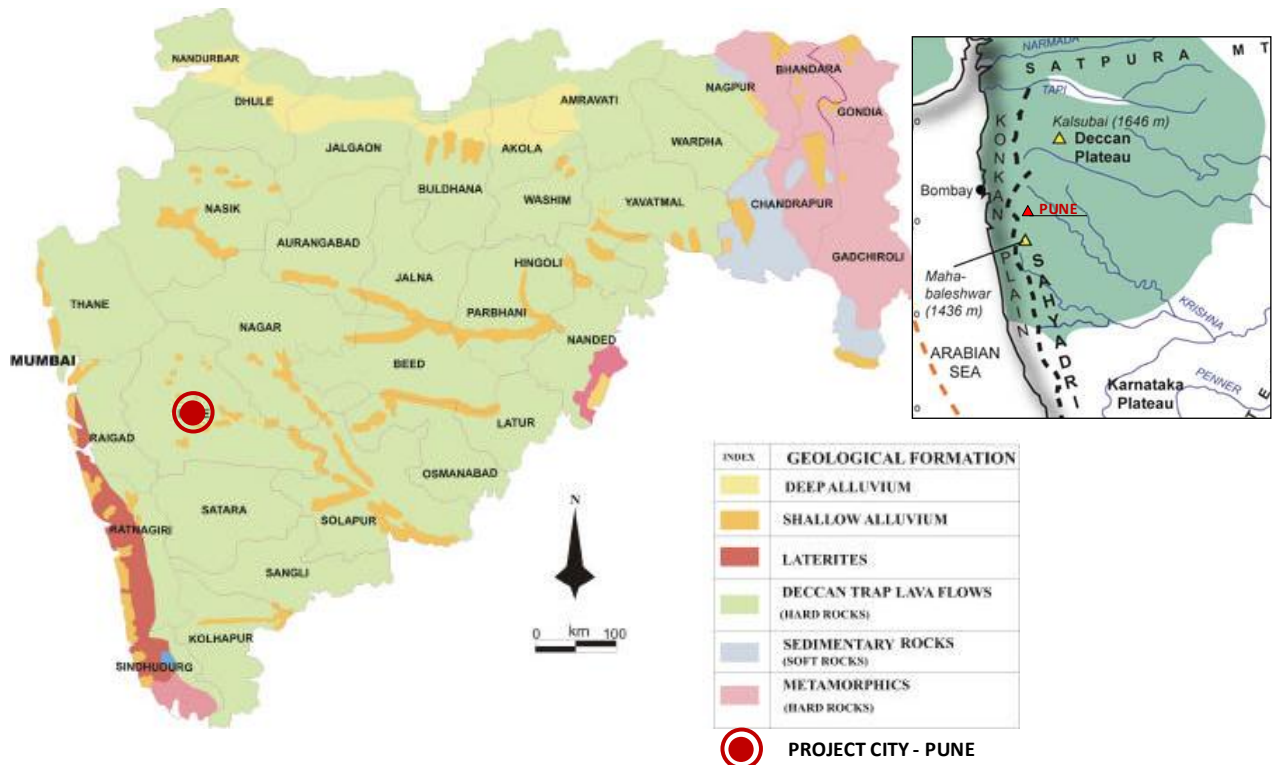


Figure 2-1: Geological Map of Maharashtra (Inset Map: Pune Location in Deccan Trap Province of India)

Source: Geological Survey of India

2.1.3.2 Hydrology and Natural Drainage

The city is served by Mutha and Mula rivers. These rivers finally drain into River Bhima, to the East of Pune. Thus, hydrologically, Pune is located in North Bhima River Basin. The rivers have dams located in the upstream of the watershed. The Mutha River has the Khadakwasala dam that is located approximately 10 km from the city. This is the major source of water supply to Pune city and the cantonment areas. The Mula River originates from the Mulshi dam that is located approximately 50 km upstream of the region.

The general topography is conducive with its alternative ridges and valleys which culminate in the formation of independent watersheds, sloping towards Mutha and Mula rivers. These rivers are principal carriers of flood waters. There are 23 watersheds in the Pune city limits, each of which has one or more primary drains in the form of natural drains discharging into the river.

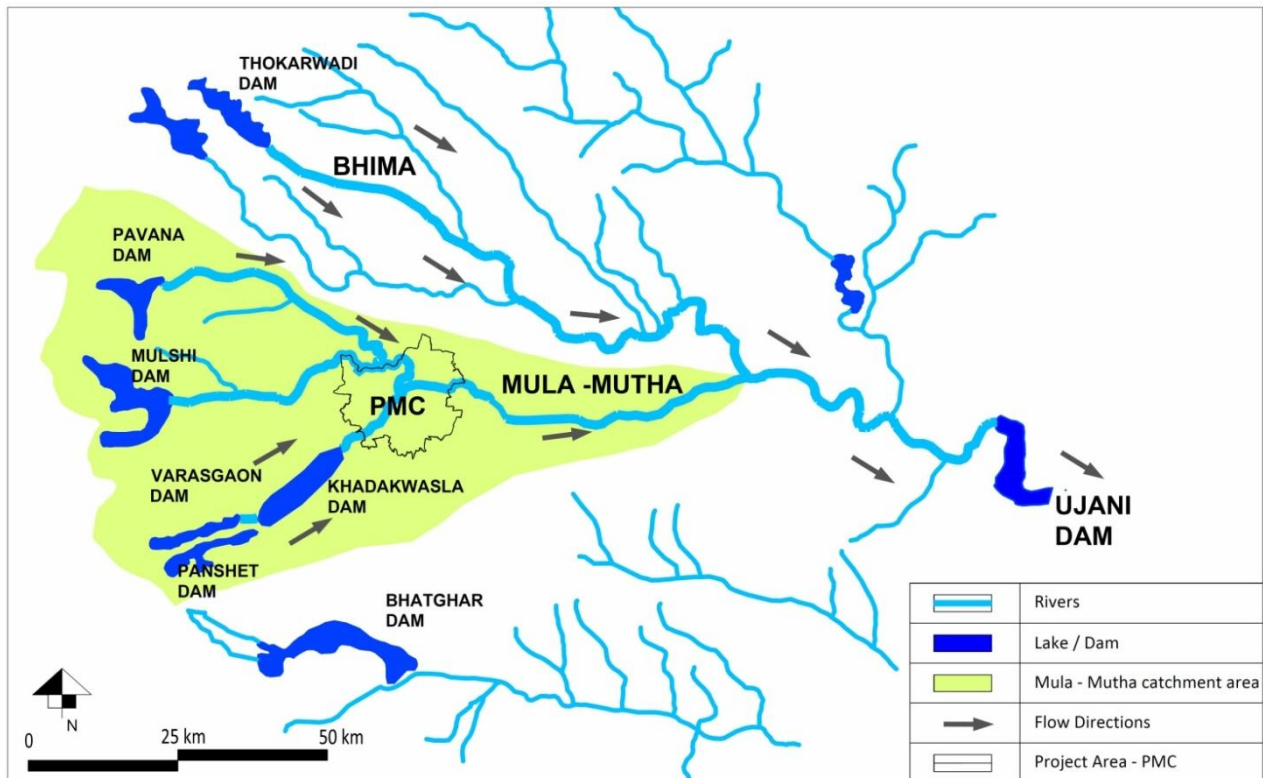


Figure 2-2: Pune Location in North Bhima River Basin

Source: Sustainable City planning (2008-2010)

2.1.4 Climate

Pune has a tropical wet and dry climate, with three distinct seasons- summer, rains and mild winter. The height above sea level and the leeward location with reference to the Western Ghats have made the city climate moderate and salubrious.

The warmest month in Pune is April. Even during the hottest months, the nights are usually cool due to Pune's high altitude. The evening sea breeze from west and north-west keeps the city summer night temperature within the limits of comfort levels. The monsoon lasts from June to October, with moderate rainfall and temperatures. The winter sets in November and lasts till mid-February, whereas the summer slowly starts in March and lasts till mid-June.

2.1.4.1 Temperature

Pune has an average temperatures ranging between 20°C to 30°C. Typical summer months are from March to May, with maximum temperatures ranging from 35°C to 38°C. The monsoon lasts from June to October, with moderate temperatures ranging from 25°C to 27°C. Mild winter begins in November; the daytime temperature hovers around 29°C while night temperature is below 13°C for most of December and January, often dropping to 5°C to 6°C.

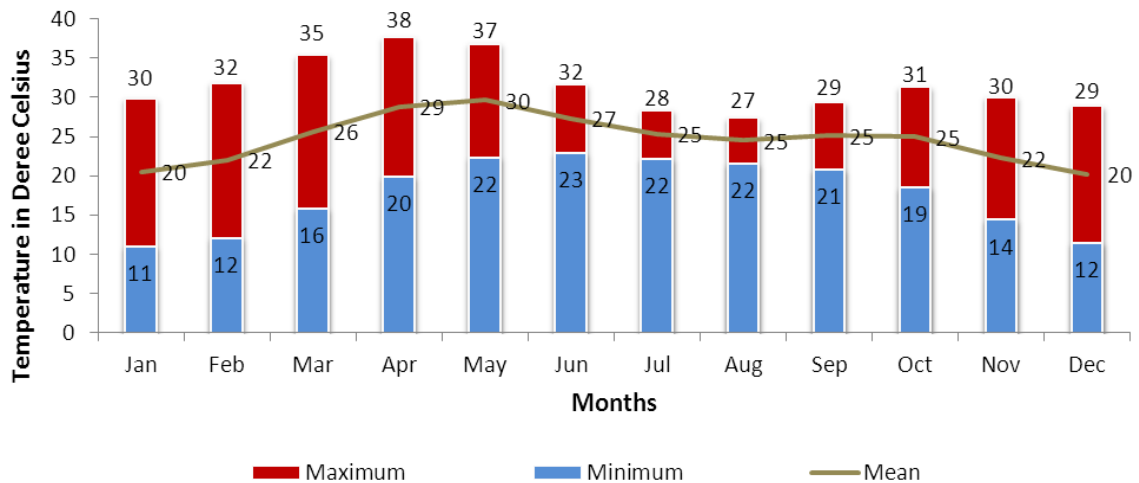


Figure 2-3: Mean Temperature of Pune (Source: IMD-Pune)

2.1.4.2 Rainfall

The city receives an annual rainfall of 722 mm (28.4 inches) between June and September as the result of southwest monsoon. July is the wettest month of the year.

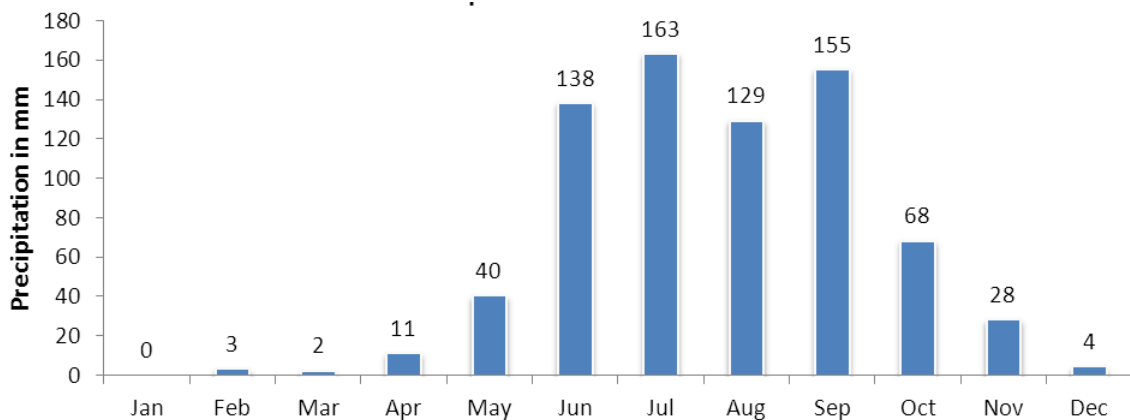


Figure 2-4: Mean Precipitation of Pune (Source: IMD-Pune)

2.1.5 Linkages & Connectivity

Pune city is well-connected to most of the important metropolitans in India like Mumbai, Hyderabad, Bangalore, Delhi, Kolkata and Chennai and to all major cities and town of the state of Maharashtra.

2.1.5.1 Road Connectivity

The city is located at the confluence of the National Highways viz.

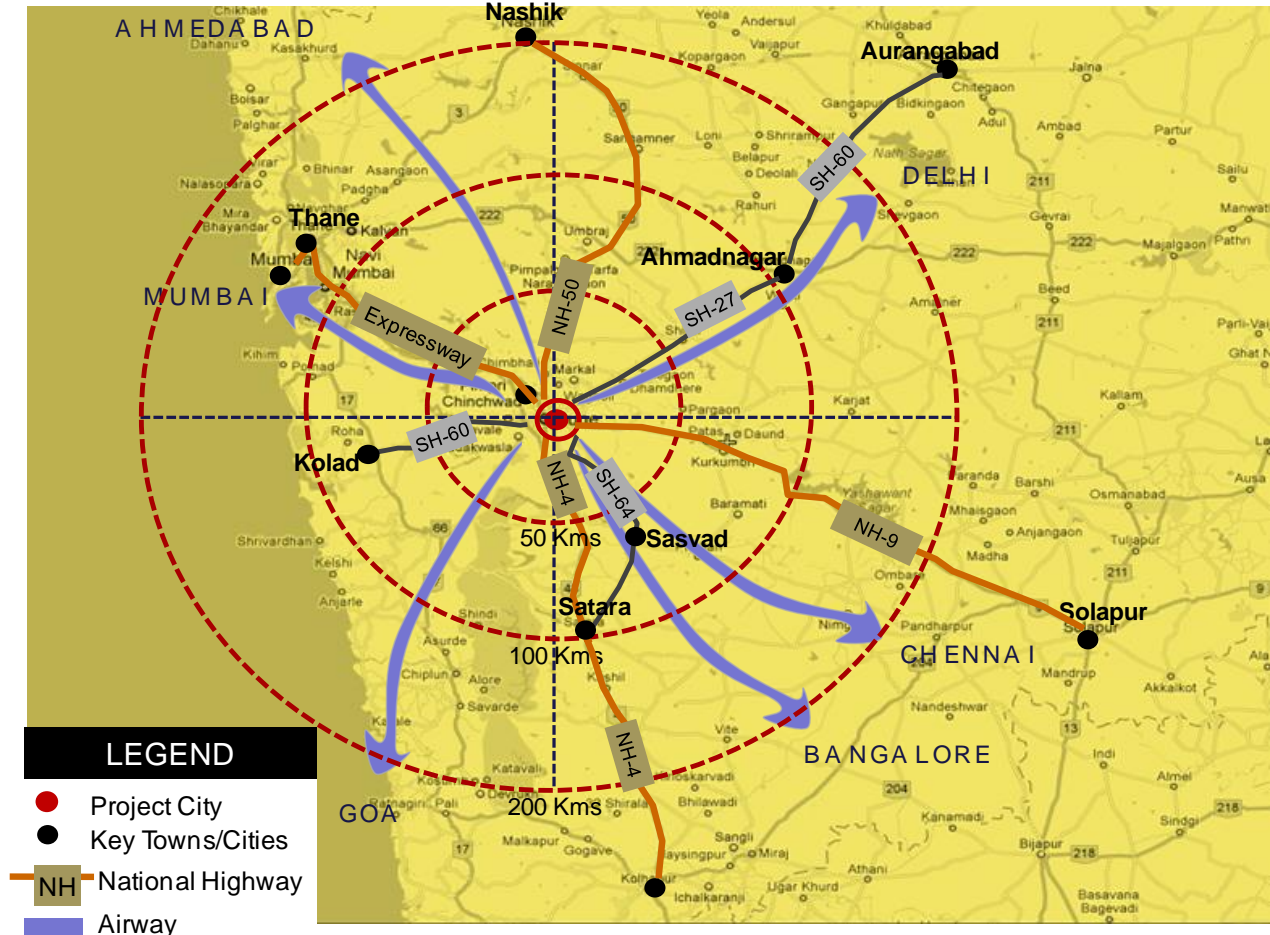
- NH-4 leading to Mumbai in the north and Bangalore in the south
- NH-50 to Nasik
- NH-9 to Solapur

State Highways:

- SH-27 connects to Ahmednagar
- SH-60 to Kolad

- SH-64 to Sasvad
- SH-57 to Pirangut

Maharashtra district road MDR-60 connects Pune to Mulshi. In addition, the westerly bypass connects the Pune- Satara Road (NH-4) in the south to Mumbai-Pune (NH-4) in the North. PMC is internally well-connected through an extensive road network comprising 11 major intercity roads.



Map No. 2-3: Pune Linkage and Connectivity

Source: Google Map

Table 2-1: Distance from major towns and cities

Sl. No.	Town/ Cities	Distance From Pune (KM)
1	Satara	100
2	Ahmadnagar	105
3	Mumbai	163
4	Nashik	202
5	Solapur	243
6	Bangalore	835
7	Delhi	1417

Source: Google Map, 2010

2.1.5.2 Rail Connectivity

Pune has two main railway stations namely, Pune Junction and Shivajinagar Station; most trains halt at Pune Junction. Pune suburban trains run from Pune Junction to the industrial towns of Khadki, Pimpri,



and Chinchwad etc.

2.1.5.3 Air Connectivity

The city has an international airport at Lohegaon operated by the Airport Authority of India. It shares its runways with the neighboring Indian Air Force base. Apart from daily domestic flights to all major Indian cities, this airport serves two international direct flights to Singapore and Dubai. The airport handled 28.14 lakh passengers during 2010-11 (financial year) as against 22.57 lakh in 2009-10 as per Airport Authority of India (AAI) i.e. an increase of 24.64% if compared to 2009-10.

2.1.6 Administrative Set Up

Pune city is the divisional headquarter of Western Maharashtra i.e. the Pune Division and headquarter of the district. Administratively, Pune District is divided into 14 Taluka, 13 Panchayat Samitis (Blocks), and 2 Municipal Corporations, 11 Municipal Councils, 3 Cantonment Boards and 1,844 villages as given below:

Table 2-2: Administrative Divisions of Pune District

Sl. No.	Taluka			No. of Villages	No. of Towns/Cities	Name of Municipal Corporation	Name of Municipal Council	Name of Cantonment Board
	Name	Area sq.Km	Headquarter					
1	Pune City	184	Pune	0	3	Pune		i) Pune ii) Khadki
2	Khed	1400	Rajgurunagar	186	3		Alandi	
3	Ambegaon	1,043	Ambegaon	143	1			
4	Junnar	1,385	Junnar	181	1		Junnar	
5	Shirur	1,557	Shirur	117	1		Shirur	
6	Daund	1,290	Daund	103	1		Daund	
7	Indapur	1468	Indapur	143	1		Indapur	
8	Baramati	1,337	Baramati	117	1		Baramat	
9	Purandhar	1,104	Sasvad	107	3		i) Sasvad ii) Jejuri	
10	Haveli	1,337	Pune	102	3	Pimpri Chinchwad		Dehu Road
11	Bhor	892	Bhor	195	1		Bhor	
12	Velhe	497	Velhe	128				
13	Mulshi	1039	Paud	141	1			
14	Maval	1,131	Wadgaon	181	5		i) Talegaon-Dabhade ii) Lonavala	
		15664		1844	25	2	11	3

Source: Census of India, 2001 & 2011

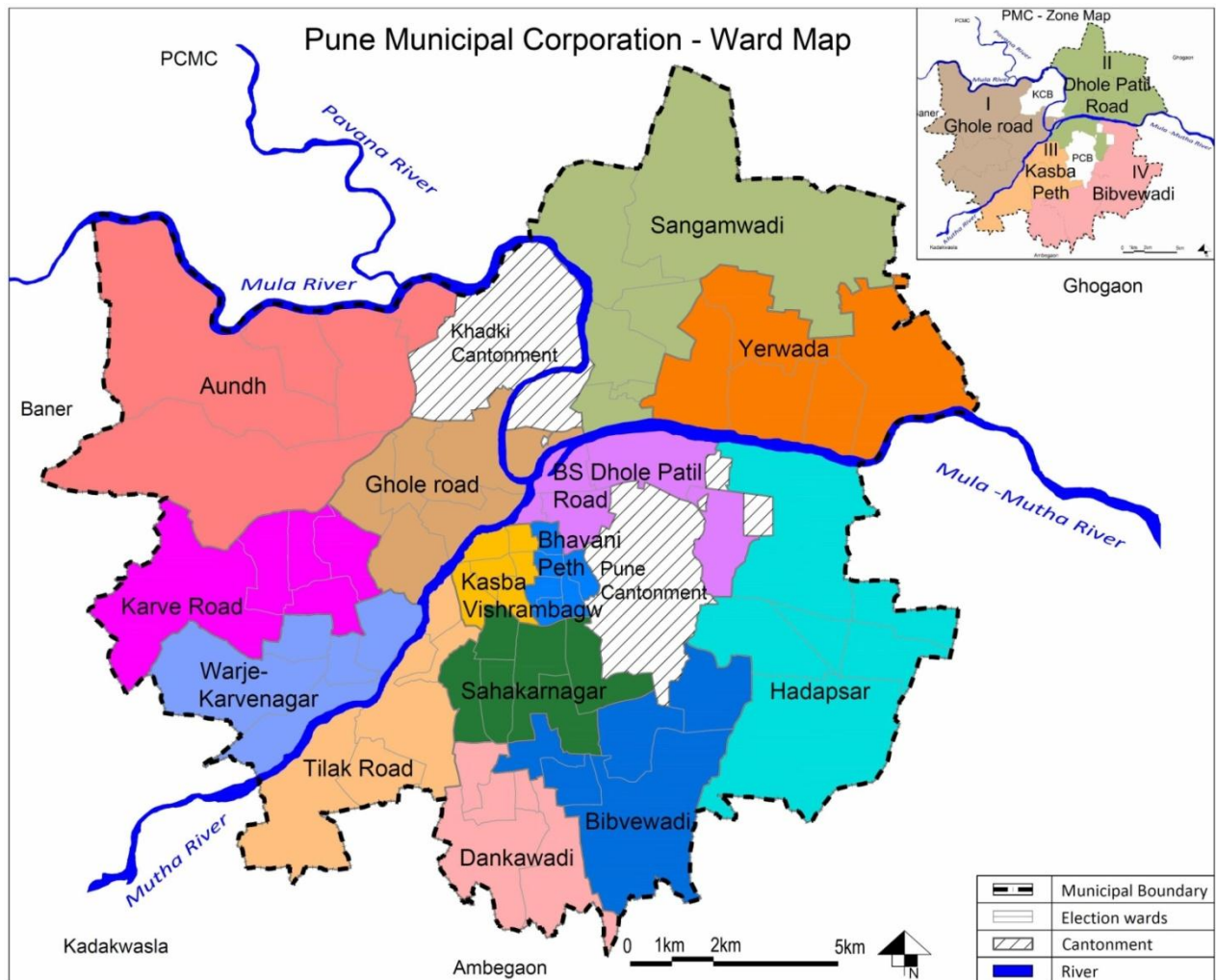
2.1.7 Project Area- Pune Municipal Corporation

Pune Municipal Corporation (PMC) was established in 1950 under Bombay Provisional Municipal Corporation Act (BMPC) Act, 1949. The total area under Pune Municipal Corporation jurisdiction in 1951 was 125 Sq. km with a population of around 4.8 lakhs while in 2011, it covers a total area of 243.84 Sq. km with a population size of 3.11 million. Pune city is divided into 4 main zones and further sub-divided into 14 administrative wards as given below. Pune city administration of 14 wards is further divided into 76 'prabhags' classified into two groups namely 'A' and 'B' with a total number of 152 councilors (corporator) seats as per 2012 data.

Table 2-3: Zone-wise distribution - Study Area

SL. NO.	ZONE 1	SL. NO.	ZONE 3
1	Aundh	8	Bhavani Peth
2	Ghole Road	9	Kasba-Vishram
3	kothrud (Karve Road) (Karve Road)	10	Sahakarnagar
4	WarjeKarve Road	11	Tilak Road
ZONE 2		ZONE 4	
5	Dholepatil Road	12	Bibvewadi
6	Nagar road	13	Dhankawadi
7	Sangamwadi	14	Hadapsar

Source: Pune Municipal Corporation



Map No. 2-4: Ward Map - Pune Municipal Corporation (Inset Map – PMC Zone Map)

Source: Pune Municipal Corporation

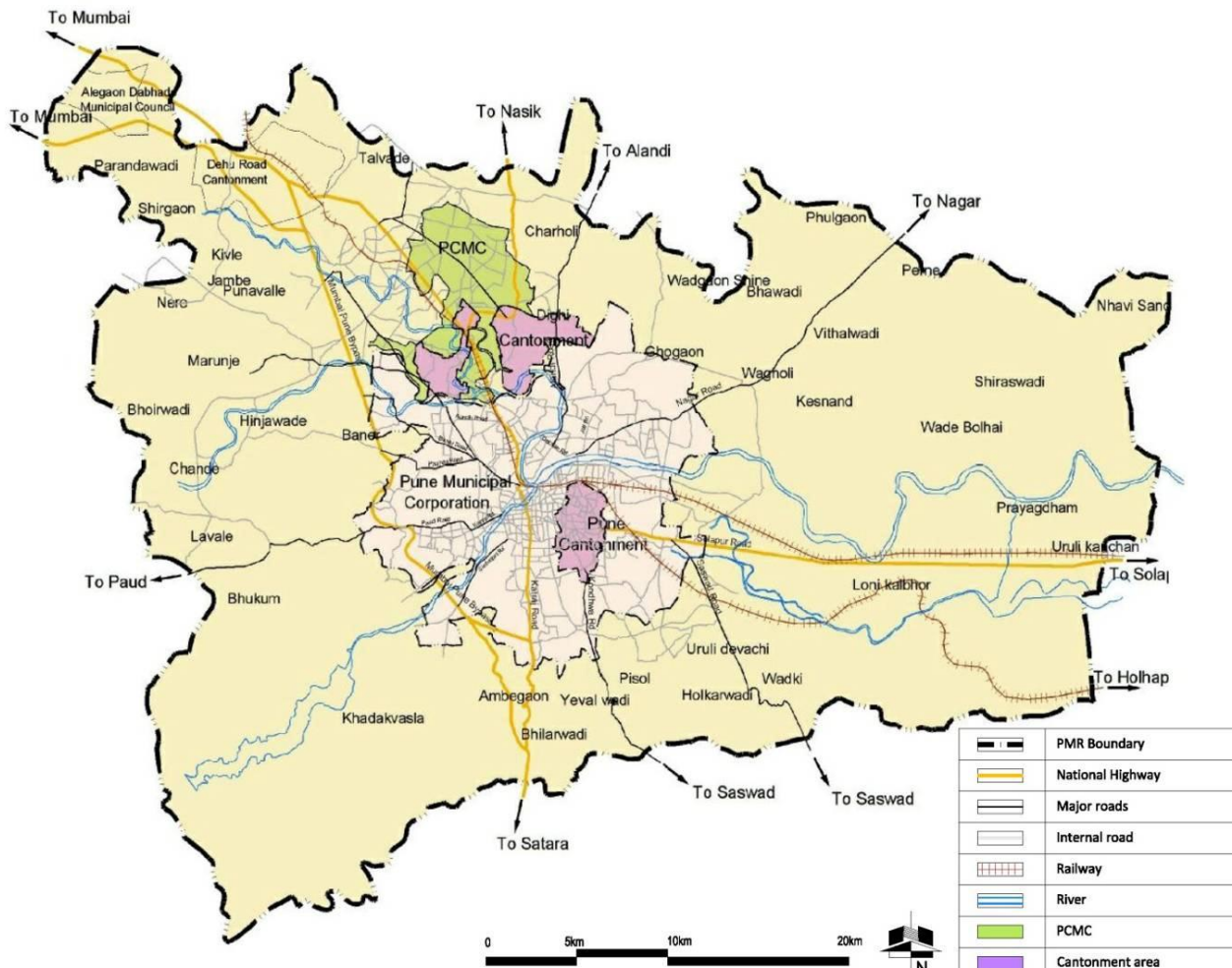
2.1.8 Pune Metropolitan Region (PMR)

Urban development in PMC is greatly interlinked and supported by its surrounding agglomerations. Considering this, boundaries of Pune Metropolitan Region (PMR) were defined in early 1967. Spread out over an area of approximately 1,340 Sq.Km in Haveli Taluk of Pune District. PMR consists of the following:

- Pune Municipal Corporation (PMC),
- Pimpri Chinchwad Municipal Corporation (PCMC),

- Pune Cantonment (PC),
- Khadki Cantonment (KC)
- Dehu Road Cantonment Board and
- Around 100 other census towns and villages.

The Pune Metropolitan Region and its connectivity network with different administration area are shown in the map below:



Map No. 2-5: Metropolitan Region

Source: Google maps and Pune Municipal Corporation

2.2 DEMOGRAPHIC PROFILE OF THE CITY

2.2.1 Population Growth Trend and Spatial Distribution of Population

2.2.1.1 Decadal population

The population of Pune city as per provisional figures of Census India, 2011 is more than 3 million. There is a growth of more than six times in the city's population in the last 60 years, from 0.48 million in 1951 to 3.11 million in 2011; this is attributed to the advanced economic activities. The decadal population and growth rate are given in the following table 2-4:



Table 2-4: Decadal Population Growth of PMC-

Year	Population total	Decadal change	Decadal growth rate
1951	488,419	-	-
1961	606,777	118,358	24.23%
1971	856,105	249,328	41.09%
1981	1,203,363	347,258	40.56%
1991	1,691,430	488,067	40.56%
2001	2,538,473	847,043	50.08%
2011	3,115,431	576,958	22.73%

Source: Census of India & Provisional figures of Census India, 2011

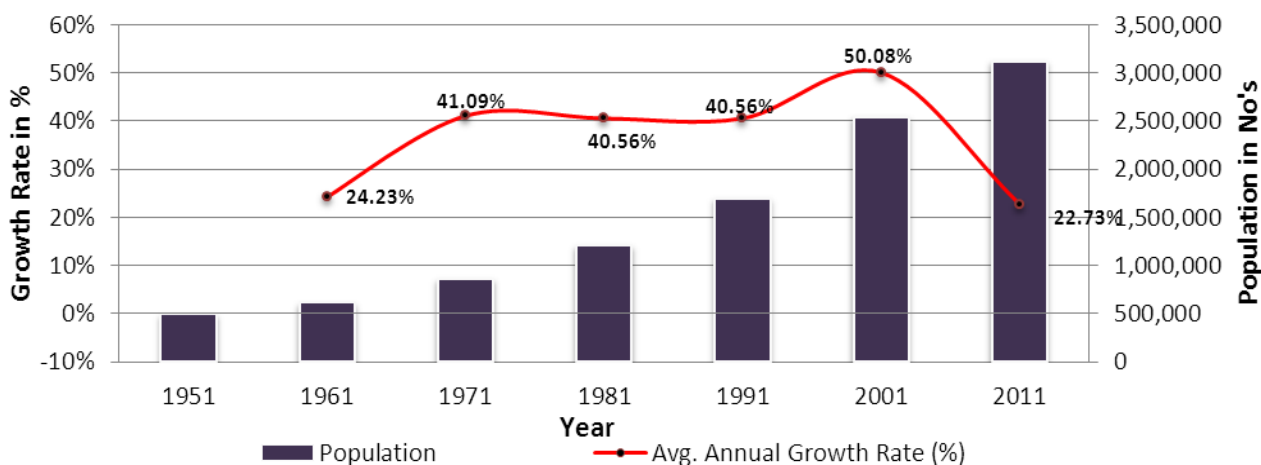


Figure 2-5: Demographic growth trend of Pune city from 1951-2011

Source: Census of India & Provisional figures of Census India, 2011

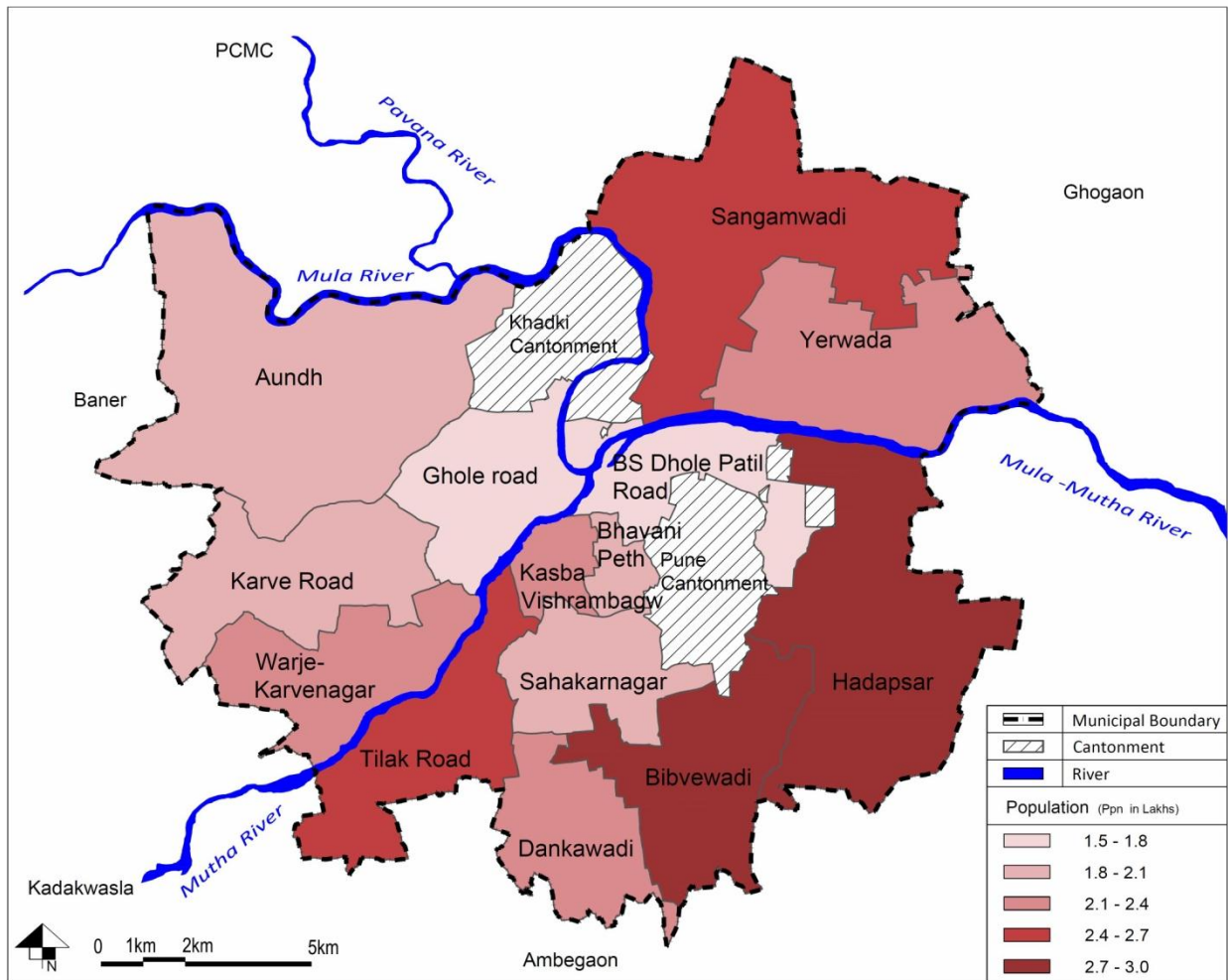
The graph of demographic growth trend of Pune city (PMC) is showing steep decline from 50.08% decadal growth rate in 1991-2001 to 22.73% decadal growth rate in 2001-11 which may be due to the development of Pimpri-Chinchwad Municipal corporation (PCMC) as an industrial center; Pimpri-Chinchwad may be considered as an emerging counter magnet to Pune city.

The average decadal growth rate from 1951 to 2011 is 36.54%. Rapid growth of the city is mainly attributed to industrialization of PMC/PCMC after 1960 and expansion of information technology (IT) industry in the last decade. Given this trend and the strong economic activity in the Pune region, Pune is bound to attract a lot of migrants.

2.2.1.2 Population Distribution

The spatial distribution of population has been examined, based on the ward population. PMC has 14 wards with an average ward population of 1, 92,642, varying from 1, 00,059 in BS Dhole Patil road Ward to 2,51,100 in Bibvewadi Ward. The ward-wise population distribution of PMC is shown in the Map No. 2-6.

Hadapsar and Bibvewadi located in the Southeast part of the city have the highest distribution of population which can be mainly attributed due to the establishment of IT townships in the area.



Map No. 2-6: Ward wise Population Distribution

Source: Provisional figures of Census India, 2011

2.2.2 Population Density

The overall livability of a place is dependent on the population density of that place, in case of Pune as per the provisional figures of Census India, 2011; the population density is 12,777 persons/ Sq.Km (approx. 127 pph). The average population density of Pune city being on the lower side of the permissible limits of the UDPFI guidelines for metropolitan cities; it is also the lowest when compared to other mega cities like Bangalore, Hyderabad, Ahmedabad and Chennai as given in figure below.

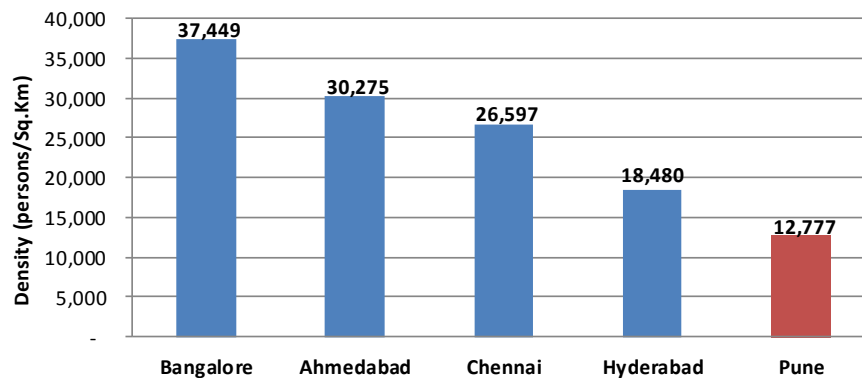


Figure 2-6: Comparative Population Density -2011 (Source: Provisional figures of Census India, 2011)

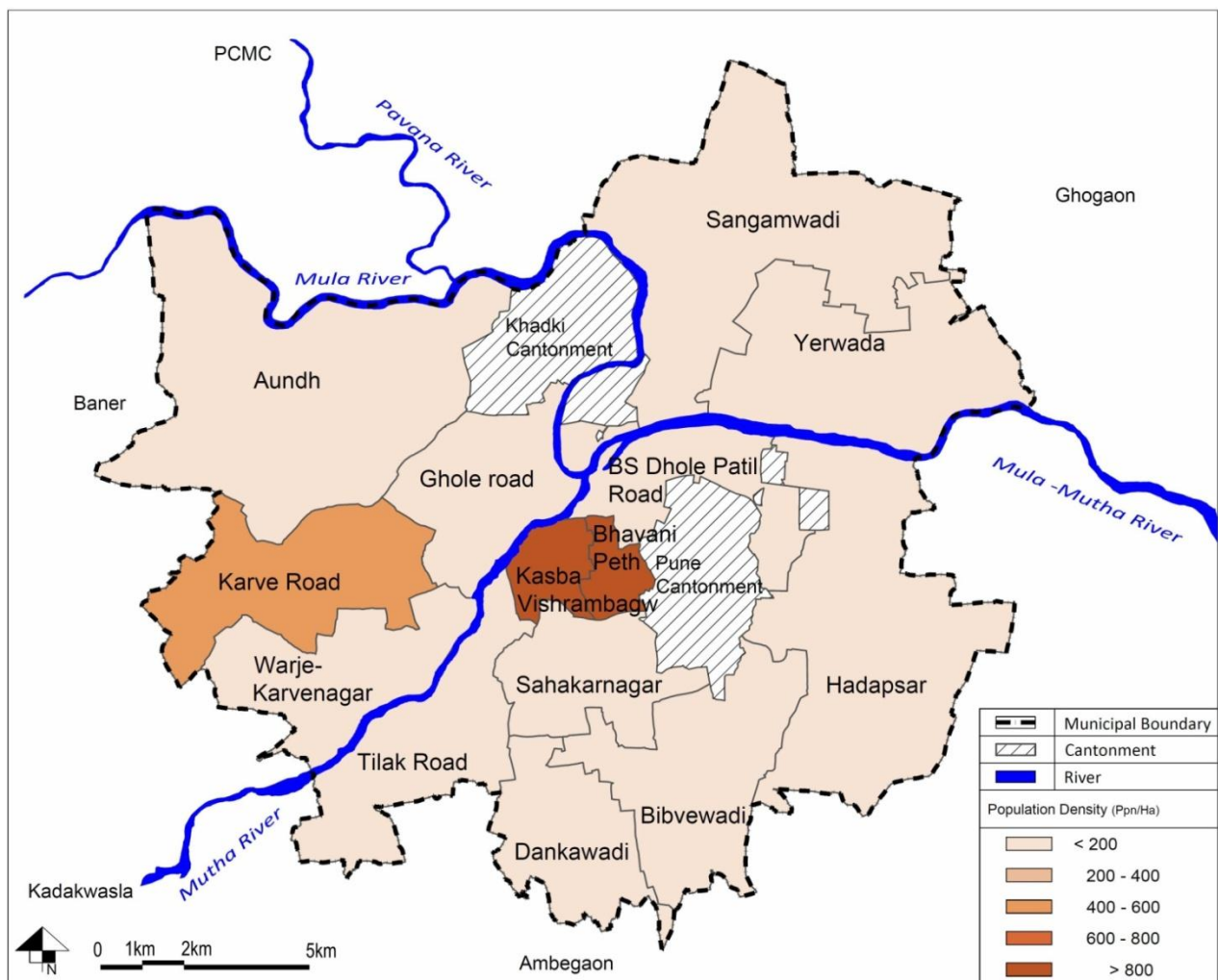


The population density over the years has increased manifold from 3,907 persons per Sq.Km (39 pph) in 1951 to 12,777 persons per Sq.Km (approx. 127pph) in 2011. From the table below, it is evident that the population density from 1951 to 2011 is gradually increasing except in 2001 which was 10,410 sq.Km. (104 pph); this is mainly due to addition of 23 villages within the PMC area. Following table shows the decadal change of density within PMC jurisdiction.

Table 2-5: Population Density of PMC

Year	Population total	Area (sq.km)	Density (persons per sq.km)
1951	488,419	125.00	3,907
1961	606,777	125.00	4,854
1971	856,105	138.76	6,170
1981	1,203,363	146.00	8,242
1991	1,691,430	146.00	11,585
2001	2,538,473	243.84	10,410
2011	3,115,431	243.84	12,777

Source: Census of India 2001 & Provisional figures of Census India, 2011 and Development Plan of Pune



Map No. 2-7: Ward-wise Density of PMC

Source: Provisional figures of Census India, 2011

The average population densities in the core city wards are higher than the density in the wards on the



periphery. Predominantly, the wards forming the locus of the city viz. Kasba Vishram Bagh and Bhavani Peth wards comprising the highest population densities that is 445 and 661 respectively, this overcrowding is the consequence of being the old historic city with specialized and intense trade and commerce activities being taken up; the overcrowding indicated by the densities call for decongestion of these areas.

The analysis of population densities indicates increase in the population densities in all the wards. The average ward population is 2,22,848, varying from 1,55,307 in Dhole Patil Ward to 2,95,667 in Bibwewadi Ward. Increase in population densities are also observed in the peripheral wards especially in Warje Karve Nagar where the density has increased from 77 pph in 2001 to 153 pph in 2011.

Table 2-6: Ward-wise Population Distribution and Population Densities (2001-2011)

Ward	Area (Ha)	Population 2011	Density - 2011 (persons/Hectare)	Comparison with UDPFI Norms (125-175 Persons/Ha)
Aundh	4075	180264	44	Below the standard
Bhavani Peth	290	191787	661	Above the Standard
Bibwewadi	1835	295667	161	within the standard
Dhankvadi	1084	236621	218	Above the Standard
Dholepatil	1464	155307	106	Below the standard
Gholeroad	1275	171756	135	within the standard
Hadapsar	2478	280215	113	Below the standard
Kasba Vishram Bagh	500	222684	445	Above the Standard
Kothrud (Karve Road)	1626	209046	129	within the standard
Yerwada	2910	238434	82	Below the standard
Sahkar Nagar	920	203321	221	Above the Standard
Sangam Wadi	2935	261307	89	Below the standard
Tilak Road	1471	240740	164	within the standard
Warje Karve Nagar	1521	232725	153	within the standard

Source: Provisional figures of Census India, 2011 and City Development Plan of Pune

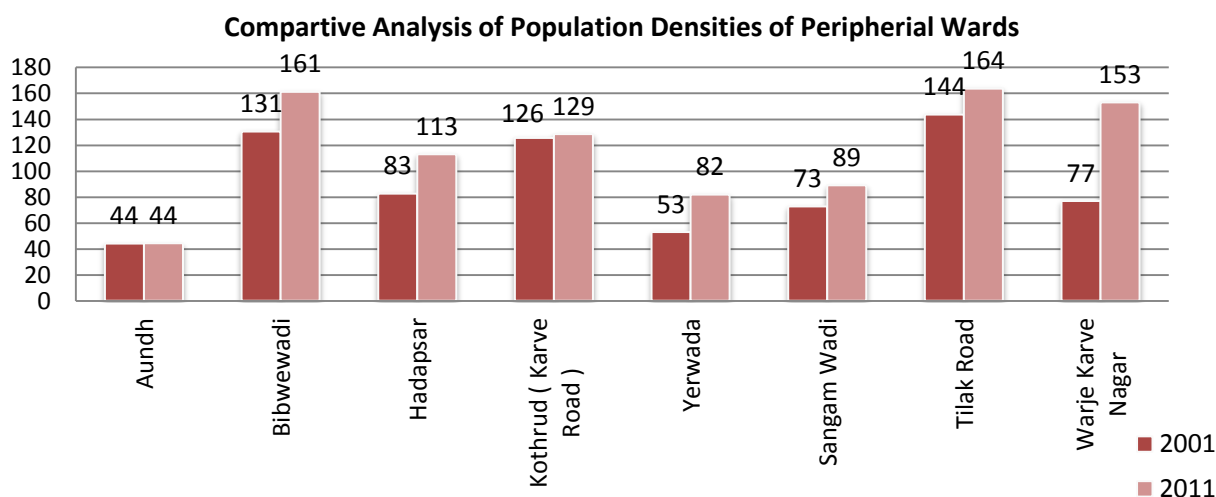


Figure 2-7: Comparative Analysis of Population Densities of Peripheral Wards

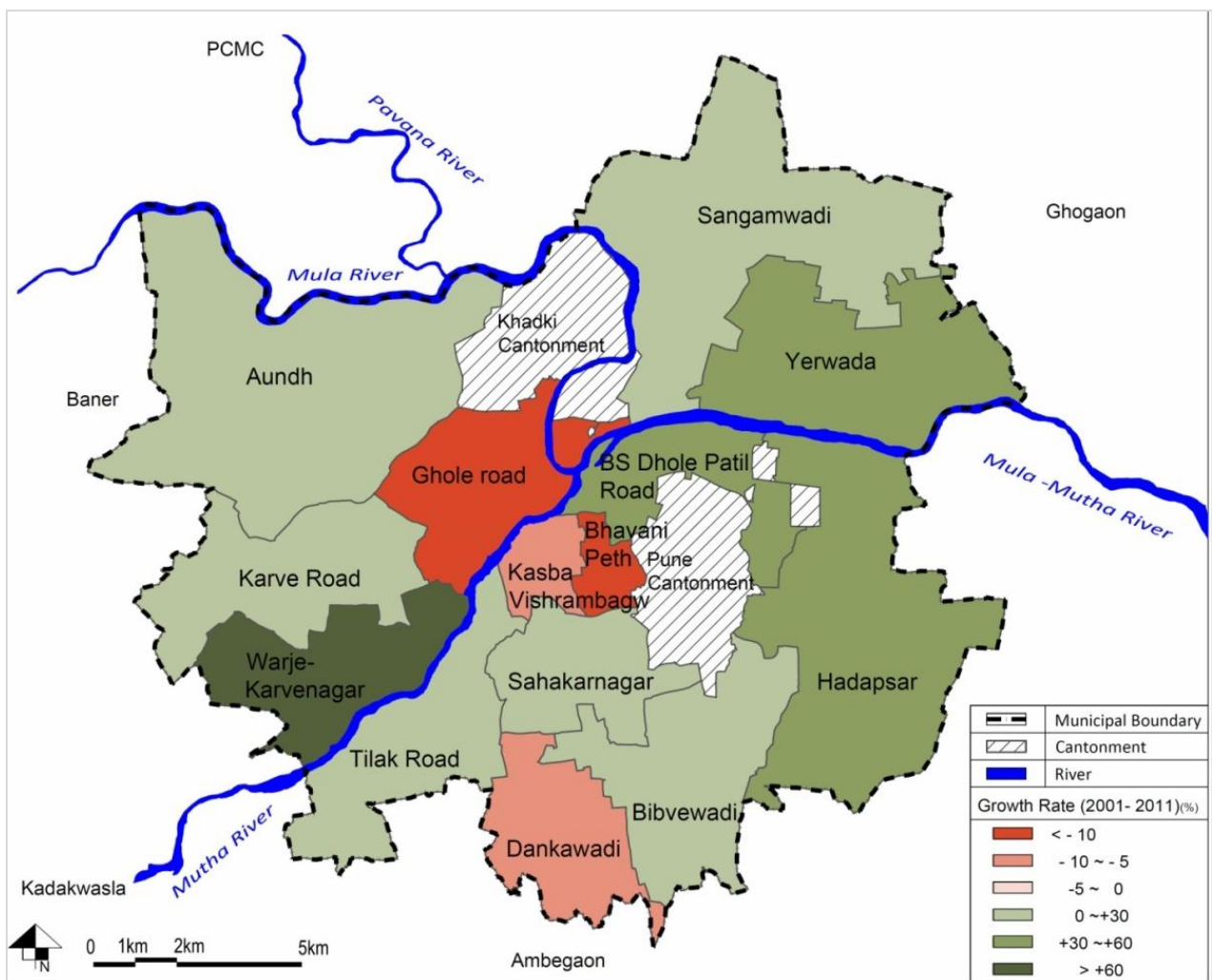
Source: Provisional figures of Census India, 2011, ESR and Census of India 2001

The growth rate in the core part of the city is about 2 – 2.5% per year and the annual growth rate in

peripheral wards is about 4.4%. The high density is the function of land prices and ease of accessibility to work place and availability of basic services. Population density of Karve road is high due to overcrowding with more than 100 housing projects. The population growth is witnessed in the fringe areas of the city, especially in the Southwest direction due to the affordability of land at cheaper prices. The driving force for growth is mainly the development of IT industry. The peripheral growth has resulted into the increased residential areas and area under transportation network and facilities.

2.2.2.1 Population growth rate

Understanding the spatial distribution of population and population density gives an existing situation but to understand the change in population growth over a period of time spatial distribution of population growth rate is essential. Following map shows the growth rate of population at ward level for the decade 2001 – 2011.



Map No. 2-8: Ward-wise Decadal growth rate (2001 – 2011)

Source: Census of India 2001 & Provisional figures of Census India, 2011

The decadal growth rate in the core of the city is negative due to congestion and increased land value. Over the decade the population of Warje karve road has increased to almost double, which is mainly due to the increase in residential projects; followed by wards to the eastern side i.e. Hadapsar, BS Dhole Patil Road and Yerwada which is mainly due to the growth of IT industry in this direction.



2.2.2.2 Migration

Factually, the city of Pune has developed as the counter magnet of Mumbai, the administrative capital of Maharashtra state and business capital of India. Mumbai being overcrowded with high cost of living made Pune, a better place of living in the eyes of people aspiring for better opportunities in all spheres of life, all over the country, which lead to increased migration in the city. Thus, the growth of Pune has been contributed by multiple factors in addition to its natural growth and extension of jurisdiction. It is one of the most preferred destinations for job, education, healthcare treatment, real estate investment and ultimately leading to a better quality of life. Enormous economic opportunities, health and education facilities in the city act as major propellant factors for city’s growth.

As per the study conducted by Gokhale Institute of Politics and Economics, the in-migrated population of Pune urban agglomeration has increased from 3.1 Lakhs in 1991 to 7.4 Lakhs migrants in 2001 accounting to 13% and 20% of the total population, of which the composition of state migrants is 73% and 65% percent respectively. The migrated population for Pune city has increased from 3.7 Lakhs in 2001 to 6.6 Lakhs migrants in 2011 (the projected in-migration of 2011 as per the Gokhale Demographic Study) accounting to 14% and 21% of the total population. The annual average migration and annual migration growth rate of PMC is shown in figure below.

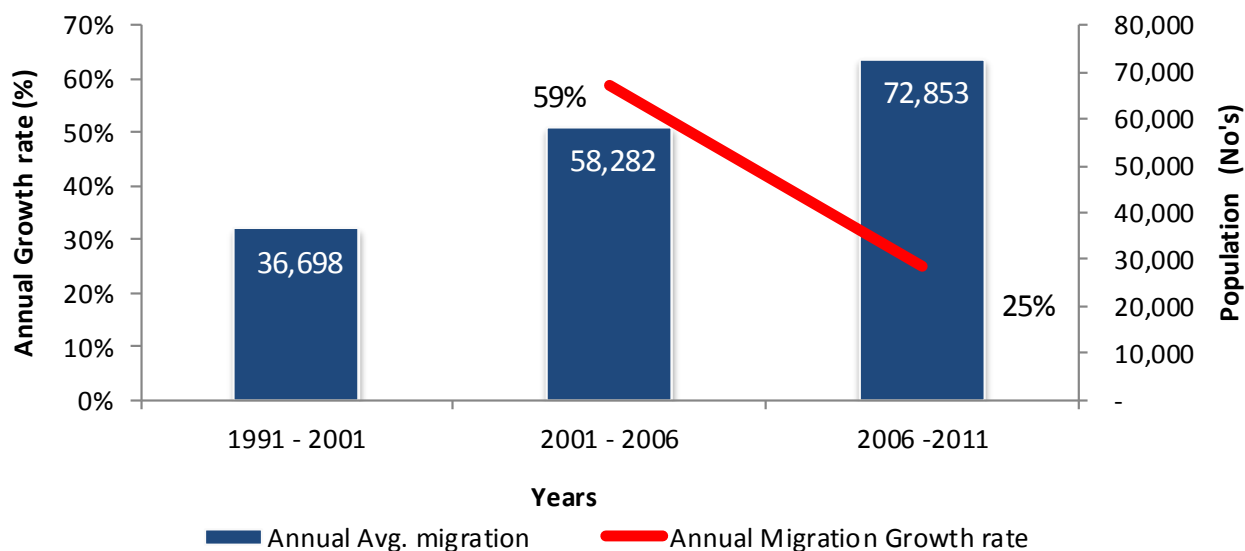


Figure 2-8: Annual Average Migration and Growth Rate

Source: Gokhale Institute of Politics and Economics

The figure above shows that from 2001-2006 to 2006 –2011 quinquennial, there is a fall in migration rate, elucidating that in-migration to Pune was very high during 2001 – 2006. The decreased in-migration rate in 2006 -2011 is due to the new developments in PMR which attracts a huge population; however this may not be static when the present and future developments are considered.

The states of Andhra Pradesh and Karnataka account for one third of inter- state migrants, while those from northern states account for another 20%. The proportion of migrants from Uttar Pradesh/ Bihar is increasing but still is at a lower rate. The past trends imply that the migration is mainly due to economic opportunities and education.

2.2.3 Other Demographic Indicators

2.2.3.1 Sex Ratio

One of the basic demographic characteristics of the population is the sex composition. Sex ratio is defined as “the number of females per 1000 males”. In any study of population, analysis of sex composition plays a vital role. The sex composition of population is affected by differentials in mortality conditions of males and females, sex selective migration and sex ratio at birth.

As per provisional figures 2011, Census of India, the Sex ratio of PMC is 945 females per thousand males which is higher than the district, state and national level figures with an improvement from 921 females per 1000 males in 2001 to 945 females per 1000 males in 2011 as given below.

The ward-wise sex ratio of Pune shows that the highest sex ratio with more than 1000 is found in Ghole Road ward and Bhavani ward while the lowest is found in Yerwada ward with 905 persons per 1000 males in 2011.

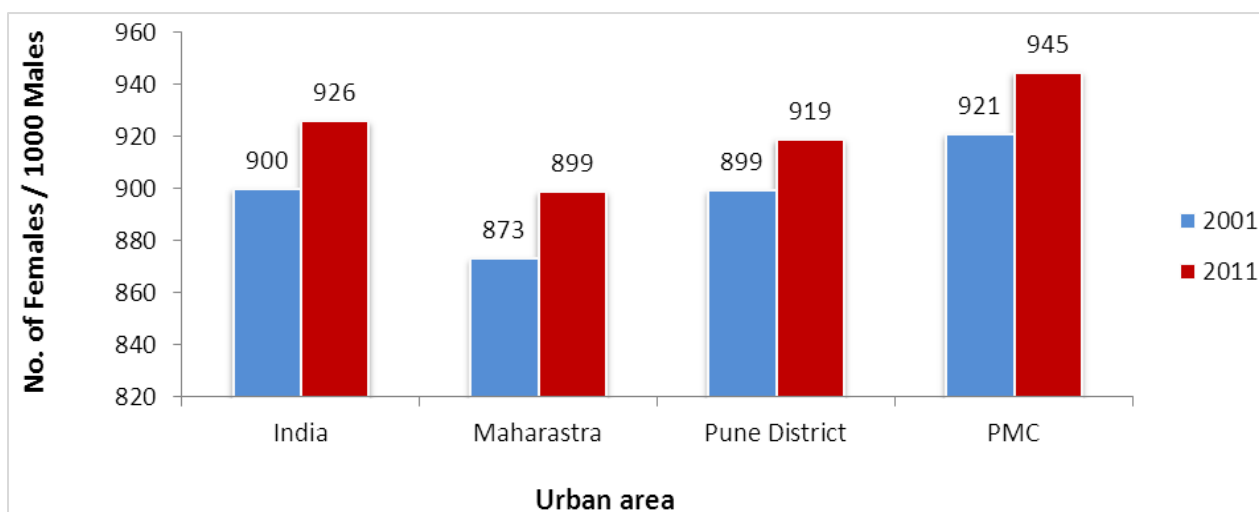


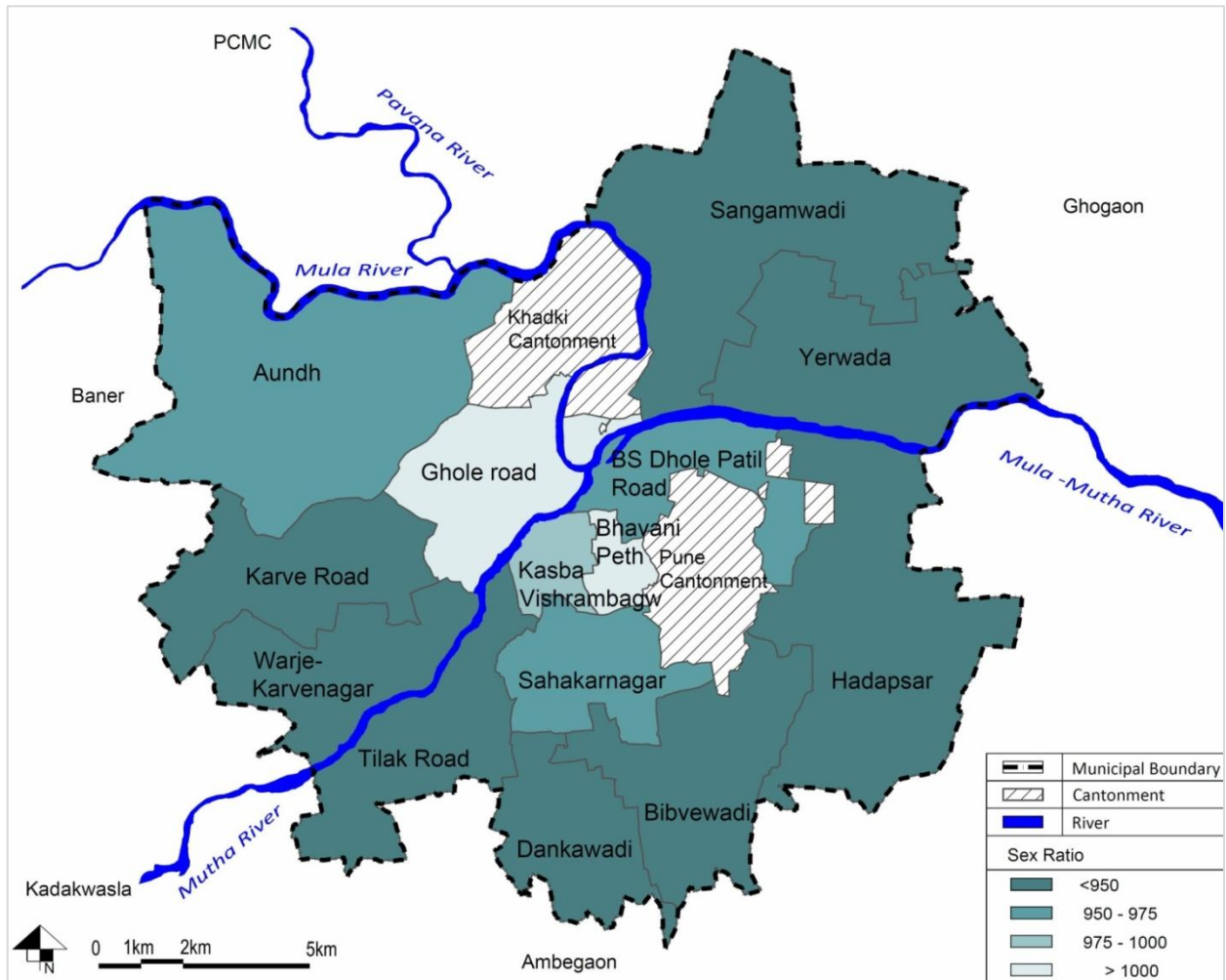
Figure 2-9: Sex Ratio of Total Population (Source: Provisional figures 2011, Census of India,)

Total children (0-6 age group) in Pune city are 324,572 accounts to 10% of the total population. Out of the total age group 0-6 population, 52.73% accounts for male population while 47.27% accounts for female population. Child sex ratio of girls is 896 per 1000 boys. The sex ratio of 0-6 age group shows steep decline from 945 to 896 in 2011 census provisional figures. This decline is indicating demand for keeping a check on this aspect so as to maintain balance.

Table 2-7: Population Details of Age Group 0-6

Indicators	Population	(%)
Population Total (Age Group 0-6)	3,24,572	10% of total population
Male population	171,152	52.73%
Female Population	153,420	47.27%
Sex Ratio for 0-6 age group	896	-

Source: Provisional figures of Census India, 2011



Map No. 2-9: Ward-wise Sex ratio of PMC

Source: Provisional figures 2011 Census of India

2.2.3.2 Literacy Rate

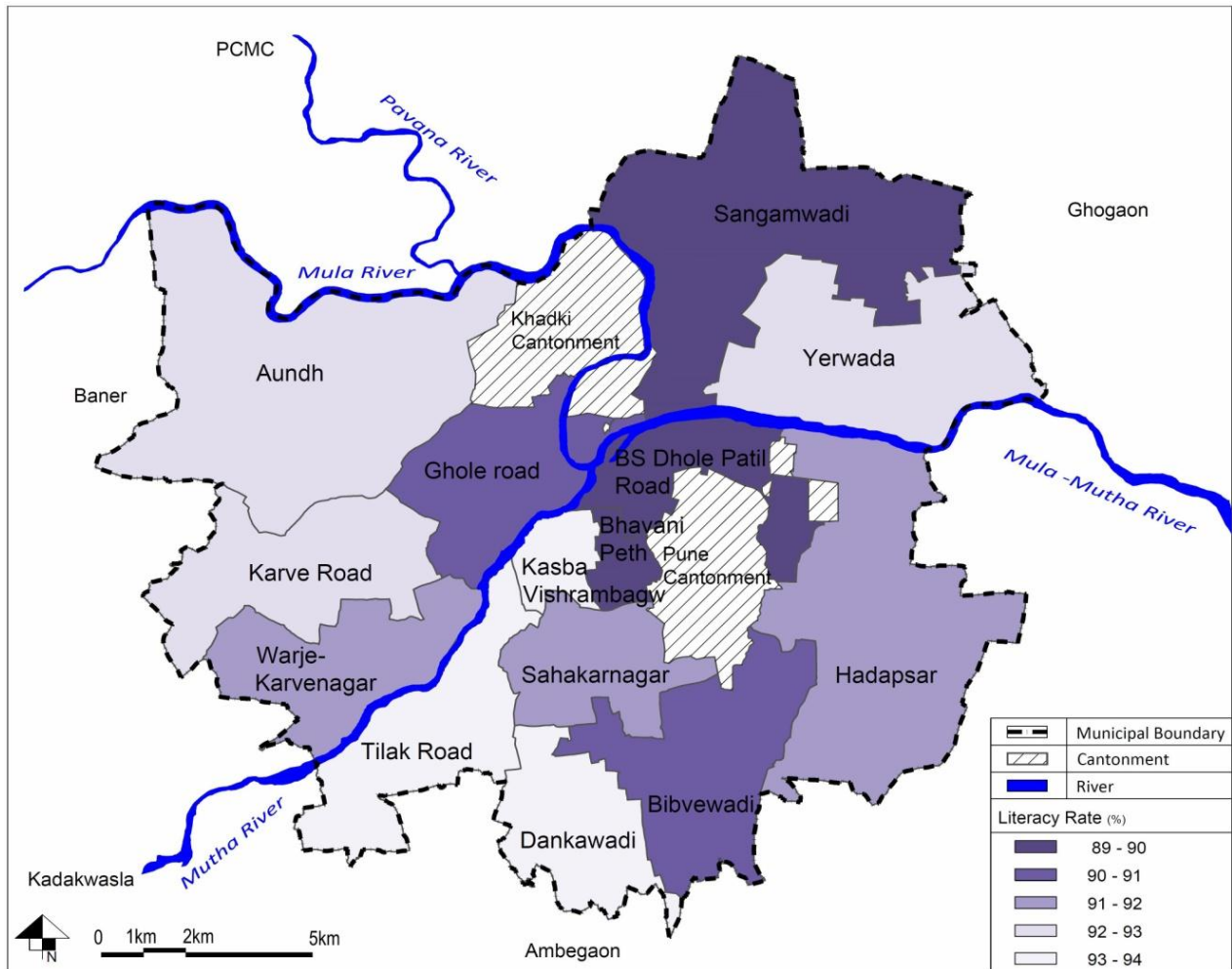
Literacy rate reflects the socio- economic development of any region. Pune city has the highest literacy rate of 91.61% when compared to the district, state and urban India literacy rate. The high literacy rate can be attributed to Pune city being one of the leading centers of higher education in the country.

Table 2-8: Comparative Literacy Rate

Urban area	Literacy rate (%)
Urban India	80.73
Maharashtra	82.91
Pune District	87.19
PMC	91.61

Source: Provisional figures of Census India, 2011

The literacy rate of Pune city has increase from 77% in 2001 to 91.61% in 2011 Census. Males have a higher literacy rate at 95.13% compared to 87.91% for females. However, the gap between literacy rates for males and females has narrowed, compared to that prevailing in 2001. The highest literacy rate is in Dankawadi ward with 94% while the lowest is found in Dhole Patil ward with 89%.



Map No. 2-10: Ward-wise Literacy rate of PMC

(Source: Provisional figures of Census India, 2011)

Table 2-9: Literacy Rate in Pune city (2001-2011)

Description	2001 Census		2011 Census	
	Literates	%	Literates	%
Total Literates	19,56,956	77.0	2,556,743	91.61
Male Literates	10,79,575	81.4	1,361,257	95.13
Female Literates	8,77,381	72.2	1,195,486	87.91

Source: Census of India, 2001 & Provisional figures of Census India, 2011

2.2.3.3 Scheduled Caste (SC) & Scheduled Tribe (ST) Population

Schedule Caste and Schedule Tribe population are two main determinants of social composition of any city in India, since, these being marginalized in the society from the ancient times but soon after independence the Indian government is taking initiatives to uplift and bring the people these groups at par with the society and hence the needs of this section of society should be taken into account in any development project to ensure inclusive and holistic development.

In Pune city, the Scheduled caste contributes 9.59% of the total population while the Scheduled tribe contributes a minimal of 0.78% of the total population in year 2001. The minority population of PMC i.e. the scheduled caste and scheduled tribe populations of 2001 census are provided, since the census data 2011 under this head, is yet not published.



Table 2-10: Scheduled Caste & Scheduled Tribe Population in Pune city (2001)

Description	Scheduled Caste		Scheduled Tribe	
	Total	%	Total	%
Total Population	2,98,841	9.59%	24,442	0.78%
Male Population	1,52,258	9.50%	12,840	0.80%
Female Population	1,46,583	9.69%	11,602	0.77%

Source: Census of India, 2001

2.3 ECONOMIC PROFILE OF THE CITY

2.3.1 Economic Base

2.3.1.1 Industrial Scenario

Traditionally, the city is known for its agriculture and agro businesses. In the beginning, for several years, primary sector activities, predominantly, agriculture has been the mainstay of Pune's economy. However, in the past few years, the city has emerged as the seat of secondary and tertiary activities while acquiring the status of being one of the major business centers in Maharashtra. Today, Pune city and its region are one of the most attractive investment hubs of the state this factor is reinforced by its falling under the DMIC project influence area. PMC and PMR together are serving as base for various large and small units operating in sectors like auto components, engineering, IT/ITeS, BPO, biotechnology, pharmaceuticals and food processing.

2.3.1.2 Regional Industrial Growth : Large Scale Enterprises

The emergence of industries in Pune city began in early 1960s with a greater inflow of mechanical engineering industries. City's proximity to Mumbai, good climate and availability of land and efficient human capital made it a destination for large firms like Tata Motors (TELCO then), Buckau Wolf (Thyssen Krupp now), KSB Pumps, Hindustan Antibiotics and several others. Today, Pune has a diverse industrial population besides being one of the most important automotive hubs in the country, with some domestic and international auto manufacturing giants.

The city also boasts of hundreds of large IT companies. According to the Indo-German Chamber of Commerce, it is the single largest hub for German companies from the last 60 years with over 225 German companies having their business set up their in Pune.

The earlier concept of 'Industries' has been changed to 'Enterprises'; Enterprises have been classified broadly into two categories:

- i. Manufacturing,
- ii. Services.

The manufacturing and services categories of enterprises have been classified into large enterprises and micro, small and medium enterprises (MSME) based on their investments in plant & machinery for manufacturing enterprises and on equipment in case of enterprises providing or rendering services. Pune region has the highest number of large scale enterprises units and also the largest number of employment as compared to other region of the state of Maharashtra as given below:

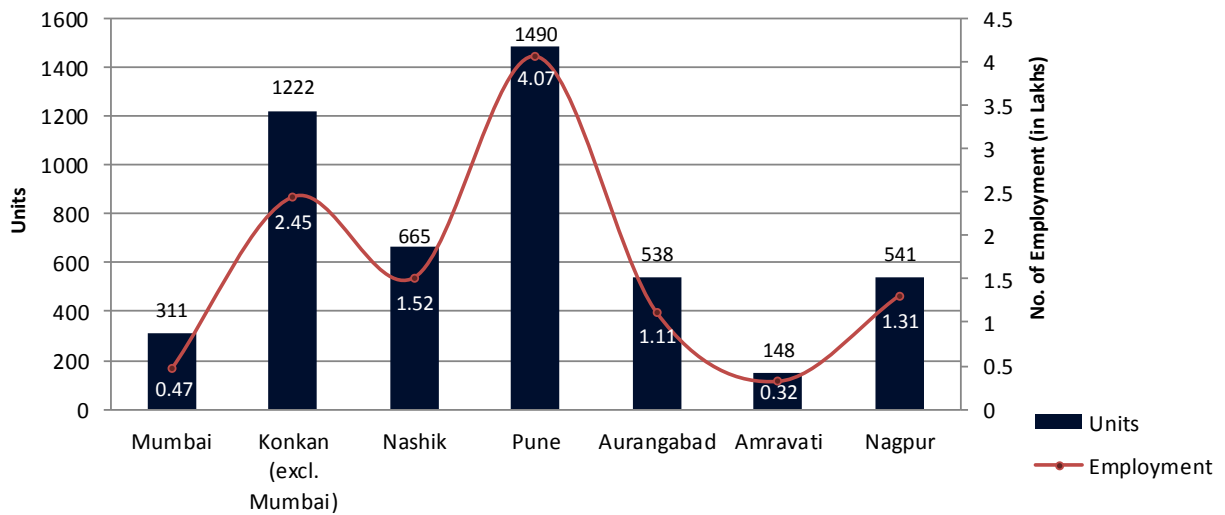
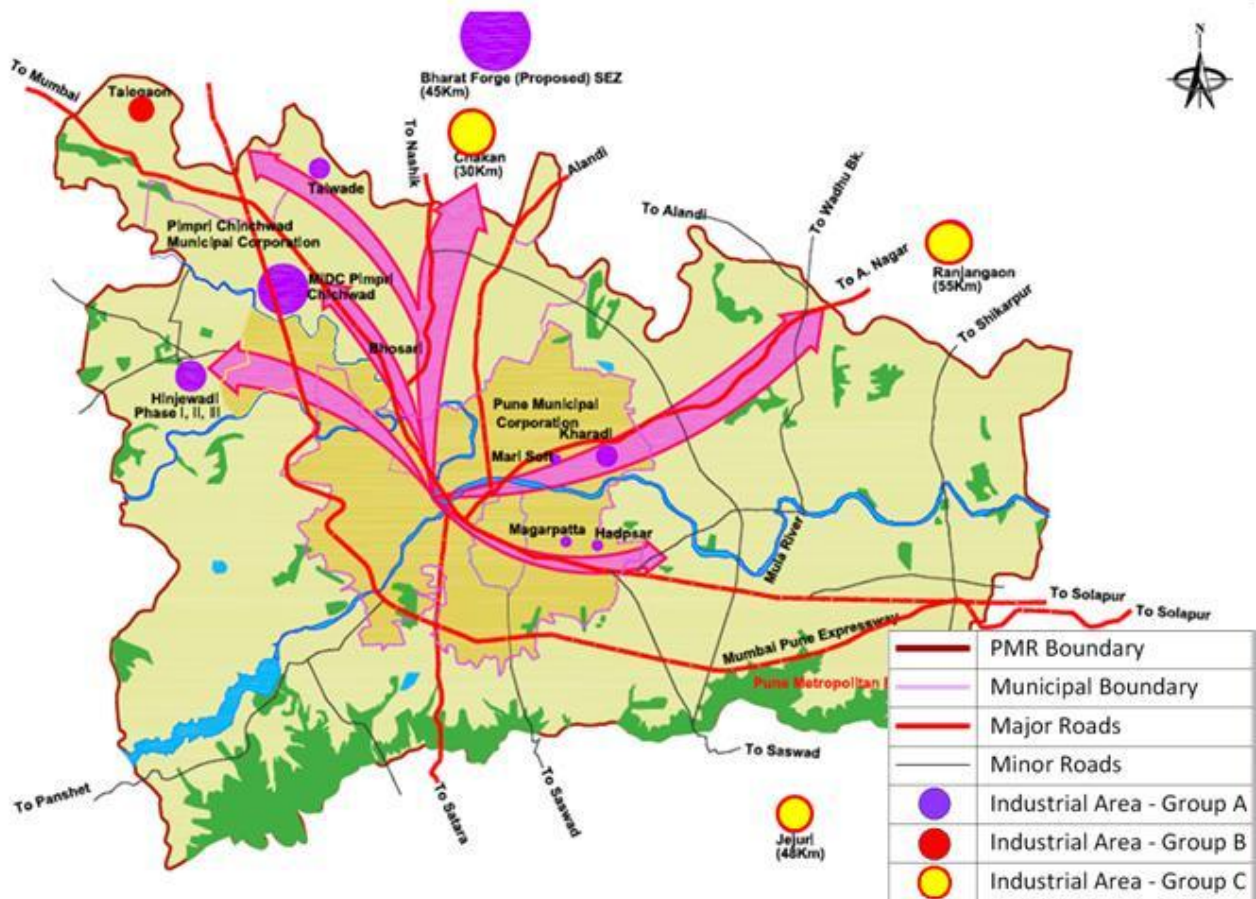


Figure 2-10: Comparative Large Scale Enterprises
Source: Economic Survey of Maharashtra (2011-2012)



Map No. 2-11: Pune Metropolitan Region Industries
Source: Comprehensive Mobility Plan, 2008

Over the years, the large scale industries in Pune region have shown an increasing trend in the number of units (except during 2009 and 2010) and number of employment. Though there has been a decline in the number of units during the year 2009 (665 units) and 2010 (766 units), a positive growth is evident again in 2011 (1490 units). The following table gives the details of large scale enterprises of Pune region:



Table 2-11: Yearly trend of Large Scale Enterprises – Pune Region

Years	Units	Employment
2007	1,982	345,146
2008	2,227	403,623
2009	665	230,681
2010	766	247,621
2011	1,490	407,000

Source: Economic Survey of Maharashtra

The growth of PMC is driven by various industrial segments. Presently, except Kharadi Knowledge Park, which is located within PMC limits, all other industries are located outside PMC in PMR or close to PMR towards North-West, North and North-East. Pimpri Chinchwad Municipal Corporation houses a majority of the industrial developments.

Table 2-12: Major Industries in PMR

Industries	Completion Status	Area (Ha)	Zoning (PSI)	Distance from Pune (Km)	Sector
Pimpri Chinchwad MIDC	100%	1,225	A	18	Auto, Auto components
Rajiv Gandhi InfoTech Park Hinjewadi Phase I	100%	87	A	15	IT, ITES
Rajiv Gandhi InfoTech Park Hinjewadi Phase II	80%	218	A	16	BT
Rajiv Gandhi InfoTech Park Hinjewadi Phase III (SEZ)	0% Land Acquisition in Process	350	A	16	IT, ITES
Rajiv Gandhi InfoTech Park Hinjewadi Phase IV	Proposed	400	A	16	IT, ITES
Kharadi Knowledge Park	100%	27	A	PMC	Software
Talawade InfoTech Park	60%	75	A	18	IT
Talegaon Floriculture Park	NA	-	B	37	Floriculture
Ranjangaon Industrial Area	40%	925	C	55	White Goods
Chakan Industrial Area	40%	258	C	30	Auto, Auto Components
Talawade InfoTech Park	NA	118	C	48	Mixed Profile
Talegaon Floriculture Park	Proposed	1,800	-	40	Auto, Auto Components

Source: Comprehensive Mobility Plan, 2008

Package Scheme of Incentives for Industries: This scheme offers concessions on electricity and stamp duty and octroi refunds to the Industries. Under the Package Scheme of Incentives (2001), the entitled manufacturing industries receive several benefits depending on their area of operation, for this purpose different areas in Maharashtra state have been classified into different zones A, B, C, D and D+, where A indicates a high level of industrial development and D+ reflects very low level of the same.

For the purpose of the 2007 Scheme, the classification of the areas of the State shall be as indicated below:

- i. Group A: comprising the developed areas, viz. Mumbai Metropolitan Region (MMR) and Pune Metropolitan Region (PMR).
- ii. Group B: comprising the areas where some development has taken place.



- iii. Group C: comprising the areas, which are less developed than those covered under Group B.
- iv. Group D: comprising the lesser-developed areas of the State not covered under Group A/ Group B/ Group C.
- v. Group D+: comprising those least developed areas not covered under Group A/Group B/Group C/Group D

2.3.1.3 Micro, Small, Medium Scale Enterprises (MSMEs)

Micro, Small & Medium Enterprises (MSMEs) Development Act, 2006 was enacted with effect from 2nd October, 2006. The State Government has already simplified the registration procedure. The comparative regional growth of MSMEs shows that Pune region has the highest number of units and also the highest number of employment in the state, as given below:

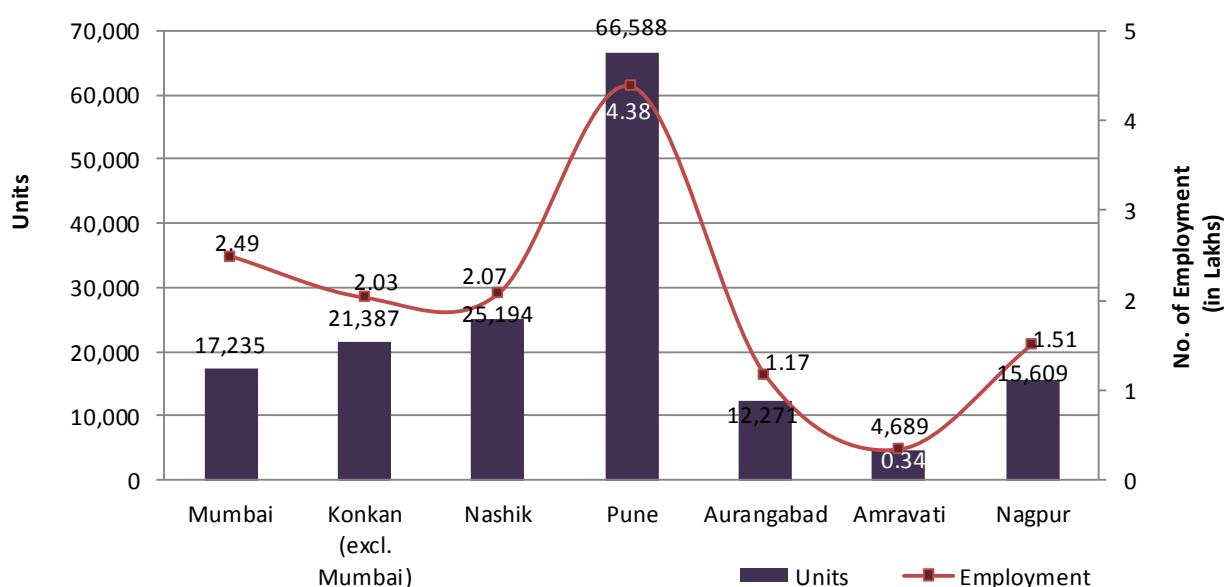


Figure 2-11: Comparative Micro, Small & Medium Enterprises (MSMEs)

Source: Economic Survey of Maharashtra (2011-2012)

During the last five years, there has been an increase in the number of units established i.e. about 66,588 units and creation of over 4,38,000 employments in 2011; this trend indicates the spurt in economic activity in recent years in and around Pune. The following table gives the details of large scale enterprises of Pune region:

Table 2-13: Yearly growth of Micro, Small, Medium Enterprises (MSMEs) – Pune Region

Years	Units	Employment
2007	72,634	362,684
2008	79,296	420,382
2009	56,663	301,098
2010	75,106	373,331
2011	66,588	438,000

Source: Economic Survey of Maharashtra

Number of non-ancillary units or the MSMEs has increased over the period. An increase in the involvement of domestic R&D institutions as suppliers of knowhow over the period has been observed through surveys and secondary information. Though Pune city is known for its large manufacturing



enterprises, but in recent period a spurt in the number of repairing and service industries has also been observed.

2.3.1.4 Industrial Growth - PMC

Eventually, the city's economic character has changed itself from primary to secondary and tertiary, in the existing scenario the city is serving more as a service center than as manufacturing or production center. The main growth drivers of economy of Pune are discussed in the next section.

Pune has major segments of industries in large scale sector and small scale sector. In the large scale sector, industries like manufacturing textiles, pharmaceuticals, biscuits and chocolates, electrical and electronic goods, diesel engines, machine tools, automobiles, paper and its products, etc. are established in and around Pune. In the small-scale segment units, manufacturing clothes, toys, leather products, dyeing and printing, soap and pharmaceuticals, sports goods, etc. The recent industrial growth is seen in a radius of 60-65 kms from the main city of Pune.

Table 2-14: Industrial Growth of PMC

Year	No of Industrial Units	Investment (Crore)	Annual Turnover	No. of Workers
1972	1,473	129.00	200.00	75,000
1978	2,515	406.84	687.66	1,11,965
1985	4,529	1,592.65	2,749.32	1,48,470
1990	6,766	3,203.84	5,445.42	1,97,830
1995	7,500	4,000.00	7,000.00	2,30,000

Source: www.capitalmarket.com

The industrial scenario in Pune shows that there has been an increase in growth from 1972 to 1995. It has shown that there has been a gain of 5 times in the number of industrial units from 1473 in 1972 to 7500 in 1995. The investment has also shown a tremendous escalation from Rs. 129 crore to Rs. 4000 crore. The number of workers has also shown an upsurge from 75000 in 1972 to 2, 30,000 in 1995. There is no latest information about the growth of industrial at city level.

- **Automobile and Auto components Industry:**

In 1946, Kirloskar Oil Engine Ltd set up the first industry in Pune. In 1957, PMC set up an industrial township at Hadapsar followed by Maharashtra Industrial Development Corporation (MIDC) which established an industrial estate of engineering-ancillary industries on 4000 acres of land at Bhosari in 1960. In mid-sixties, Pune reached its peak in economy and boasted with the reputation as *the Detroit of India*.

From 1970 to 1990, the government policies inclined towards industrial concentration by encouraging smaller units which triggers the industrial opportunities provided by Telco, Bajaj Auto and Bajaj Tempo, as a consequence, the percentage of in-migration rose rapidly. In addition, various international players like General Motors and Volkswagen are also present in Pune. Ultimately, the city became one of the top investment destinations for automobile and auto components makers.



Plate 2-1: IT Park - Magarpatta



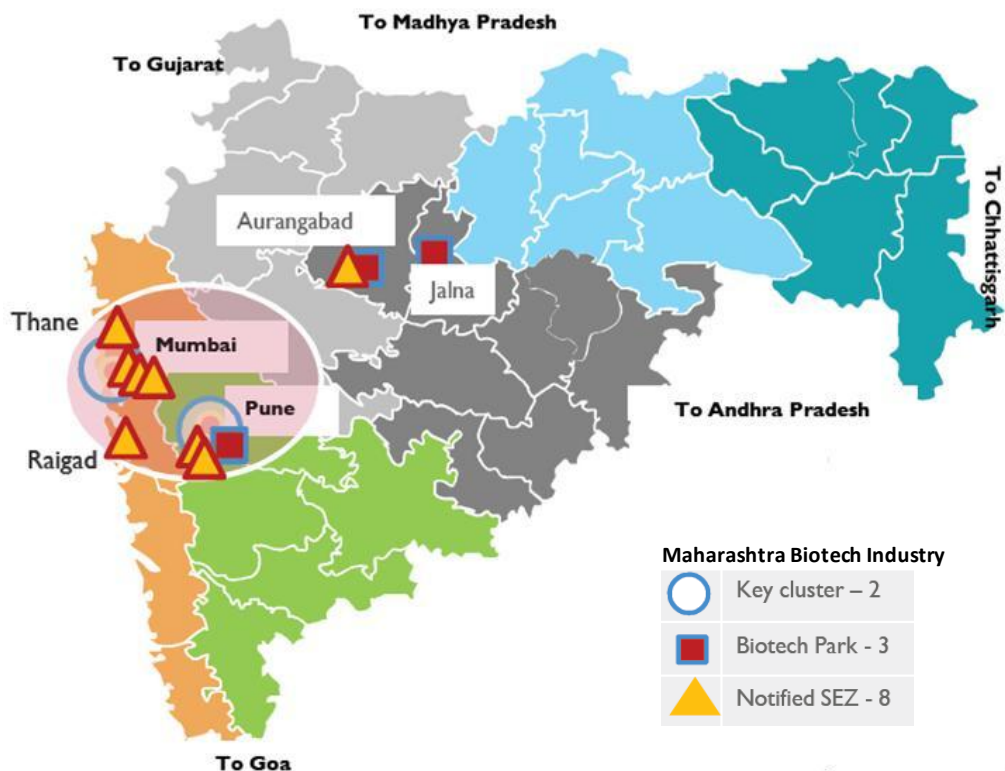
Plate 2-2: MIDC Area

- **Food Processing Industry:**

Pune is famous for its food processing industry and the demand-supply dynamics in the region is favorable for this industry. The food processing units in the city operate in various segments like milk and milk products, fruit and vegetable processed products, bakeries, ready-to-eat foods etc. Pune's proximity to urban markets such as Mumbai, Nashik and Nagpur has aided the food processing sector to flourish.

- **Biotechnology Industry:**

Maharashtra is the top contributor with 35.04% share of the total Biotech revenue of India. Mumbai and Pune are the two major clusters for Biotechnology. Pune contributes 13% of Maharashtra biotech revenues and 6% of overall India Biotech Industry.



Map No. 2-12: Biotechnology Cluster in Maharashtra

Source: IBEF



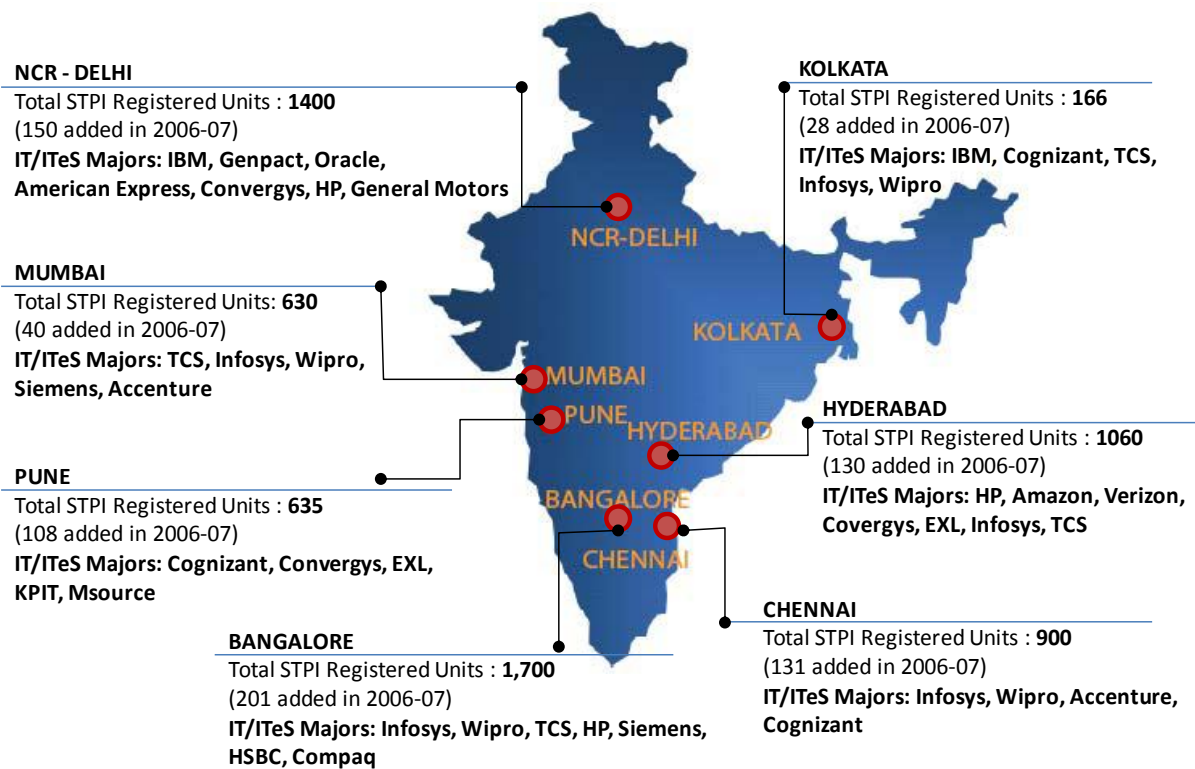
• **IT Industry:**

Pune witnessed the change of economy through the new economic policies which reflects the expansion of Information Technology sectors in late nineties. Large scales IT parks are established at Hingewadi, Talawade, Kharadi and Hadapsar in 1999, Infotech Park was set up at Hingewadi - IT city.

Later, many IT parks have sprung up in the city to keep pace with the growing software industry and to encourage new IT companies to set up their base in Pune. With an addition of educational facilities, many leading software companies like Infosys, Wipro, IBM, Satyam, Accenture and some foreign players established in Pune as they considered the city as best destination for IT establishment.

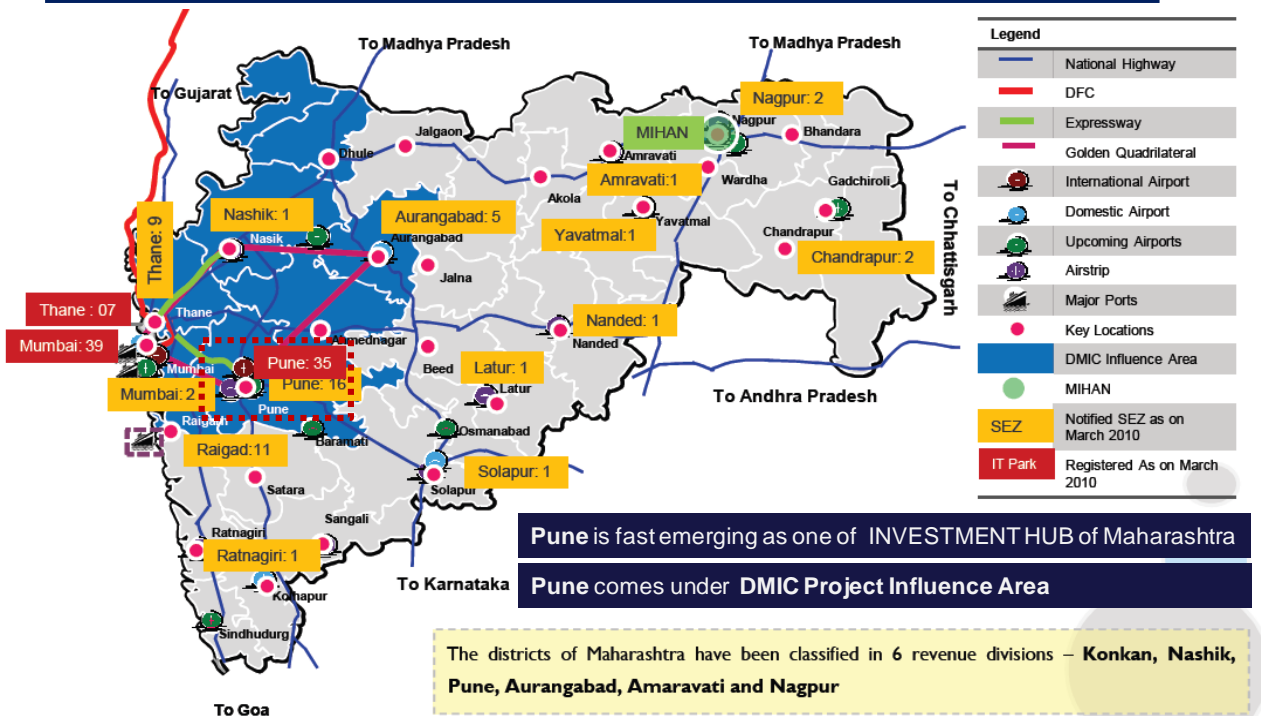
Pune has a total of 635 STPI registered units (2006-07) with Cognizant, Convergys, KPIT, EXL, Msource as the major IT/ ITeS players, this ranks Pune as 6th in India as the major established IT/ITeS hub. Pune city being privileged in having better infrastructure facilities attracts investors from all over the world. Although in the recent past all the manufacturing industries have been shifted out of the PMC boundary, yet the number of IT/ITeS units is increasing; 108 numbers of units have been added in 2006-07.

Referring to a study done by IBEF after 2006-07, when compared to other cities that have emerged as major centers of registered STPI units Pune has acquired fifth position, with Bangalore, NCR-Delhi, Hyderabad and Chennai being the top four and Mumbai and Kolkata lagging behind in this aspect, as shown in map below.



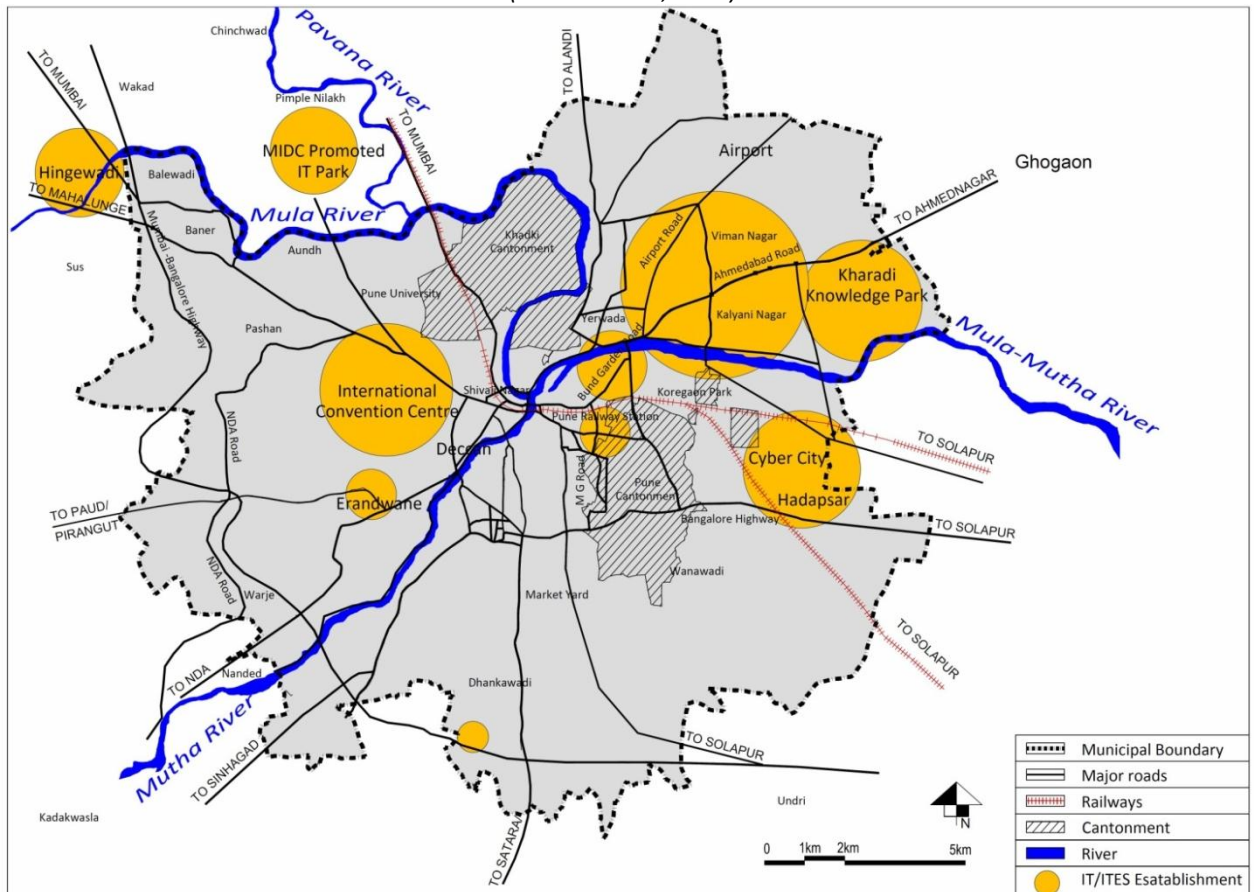
Map No. 2-13: Established IT/ITeS Hubs in India
(Source: IBEF)

The study done by MIDC in 2010, confirms that Pune city with its region is the most preferred investment destination after Mumbai in the state, having 35 registered IT Parks (2010) and 16 notified Special Economic Zones (SEZ).



Map No. 2-14: Investment Region in Maharashtra

(Source: MIDC, 2010)



Map No. 2-15: IT/ITES Establishment in Pune

(Source: MIDC, 2010)

- **Education centre:**

With more than hundreds of educational institutes and nine universities, Pune was rightly called as *the Oxford of the East*. Pune with its prestigious institutes attracts students from all over the world. In 1854, Pune laid the foundation as an educational centre by establishing the College of Engineering, which is the third oldest engineering college in Asia. The social and political activist Bal Gangadhar Tilak with several local citizens founded the Deccan Education Society in 1884; that laid path for Fergusson College in 1885.

After independence, numerous institutes were established; some of the reputed institutes are Pune University, National Defence Academy, Film and Television Institute of India, National Film Archives, Armed Forces Medical College, National Chemical Laboratory, Indian Institute of Science Education and Research (IISER), National Institute of Construction Management and Research (NICMAR). With large number of prestigious institutes and universities, Pune is regarded as a pioneer educational hub of India.

2.3.1.5 Tourism

Pune is one of the most renowned places among tourists to Maharashtra. The city is associated with prestigious educational institutions like Fergusson College, Symbiosis, FTII and a large number of engineering colleges, which is why it is also known as the University Town. Pune is also the cultural capital of the state and national center of Marathi speaking people. The spectacular historical monuments from the Maratha period and many places of tourist interest add richness to this city of diversity. The list below shows the different types of tourist places base on the nature of tourism. The detail analysis of Tourism and Heritage are given in Chapter 10.



Plate 2-3: Shinde Chaatri



Plate 2-4: Mahatma Phule Museum



Plate 2-5: Aga Khan Palace

Table 2-15: Tourist Places in and around Pune

Historical & Cultural	Nature & Wildlife	Religious	Adventure & Entertainment
Aga Khan Palace	Bund Garden	Chatushrunji Mata Temple	Panshet Water Park
Shaniwar Wada	Mulshi Lake & Dam	Osho Ashram	Tulsi Baug
David Synagogue	Pashan Lake	Parvati Hill Temples	
Dehu	Saras Garden	St. Mary's Church	

Historical & Cultural	Nature & Wildlife	Religious	Adventure & Entertainment
Mahatma Phule Museum	Vishram Bagh Wada		
Pataleshwar Caves	Katraj Snake Park		
Raj Dinakar Kelkar Museum	Katraj Lake		
Shinde's Chhatri			
Tribal Museum			

Source: Maharashtra Tourism Development Corporation (MTDC), Pune

2.3.1.6 Trade and commerce

Wholesale and retail trade and commerce flourishes in Pune as one of the important part of the daily activities of the city's population. The city serves as the regional wholesale market for food grains and other commodities and also for agricultural produce such as green peas, wheat, rice, pulses, oilseeds, maize, etc., which are cultivated in the rural hinterland. Pune also functions as a distributing centre for agricultural implements, fertilizers, drugs and medicines, iron and steel, cement and minerals, petroleum products and forest products such as timber, and readymade garments and textiles

Currently, Central Business District (CBD) comprises areas of Camp (MG Road, East Road), Swargate, Laxmi Road (Tilak Road, Bajirao Road), Kalyani Nagar, Shivajinagar, Wakad Wadi, Deccan, FC Road, JM Road, and Ahmednagar Road. Main commercial activities observed in these areas are corporate offices/ headquarters for manufacturing and service units, business process outsourcing centres, call centres, banking, insurance, retail trading, shopping malls, entertainment, cinema theatres, health services, educational institutions, hotels and restaurants etc.

There are as a total of 38,640 commercial establishments giving employment to 231,973 numbers in Pune. The details of each category of establishment are given below:

Table 2-16: Details of Commercial Establishments

Category	Number	Number of Employees	Employees %
Shops	11718	28866	12%
commercial	22925	193557	83%
Hotels	3967	9237	4%
Theatres	30	313	0%
Total	38640	231973	100%

Source: Pune Municipal Corporation ESR-2005



Plate 2-6: Mariplex Mall, Kalyani Nagar



Plate 2-7: Commercial Area in Core City



Plate 2-8: Informal Activities at core area



Plate 2-9: Informal activities

2.3.1.7 Regional Plans

The Pune Metropolitan Region was established in 1967 for an area of 1340 Sq.Km in Haveli taluka and comprises of Pune city, Pimprichinchwad, three cantonments Pune, Khadki and Dehu cantonments, and close to 100 other census towns and villages. A Regional Planning board was constituted for preparations of a Regional Plan. The first Regional Plan 1970-1991 was sanctioned by the Government and came into force into force in May 1976. A new Regional Plan 1990-2011 was approved by the Government in 1997, and is still valid.

The state government has asked its town planning department to revise the regional plan (RP) for the Pune Metropolitan Region (PMR), by next year.

2.3.1.8 Future Growth, Impact factors: DMIC Influence Area –Pune Region

In Maharashtra, 18% of the area is within the DMIC influence area. The alignment of Dedicated Freight Corridors (DFC) passes through Dahanu Road, Virar, Vasai Road, Diva and terminates at the Jawaharlal Nehru Port in Navi Mumbai.

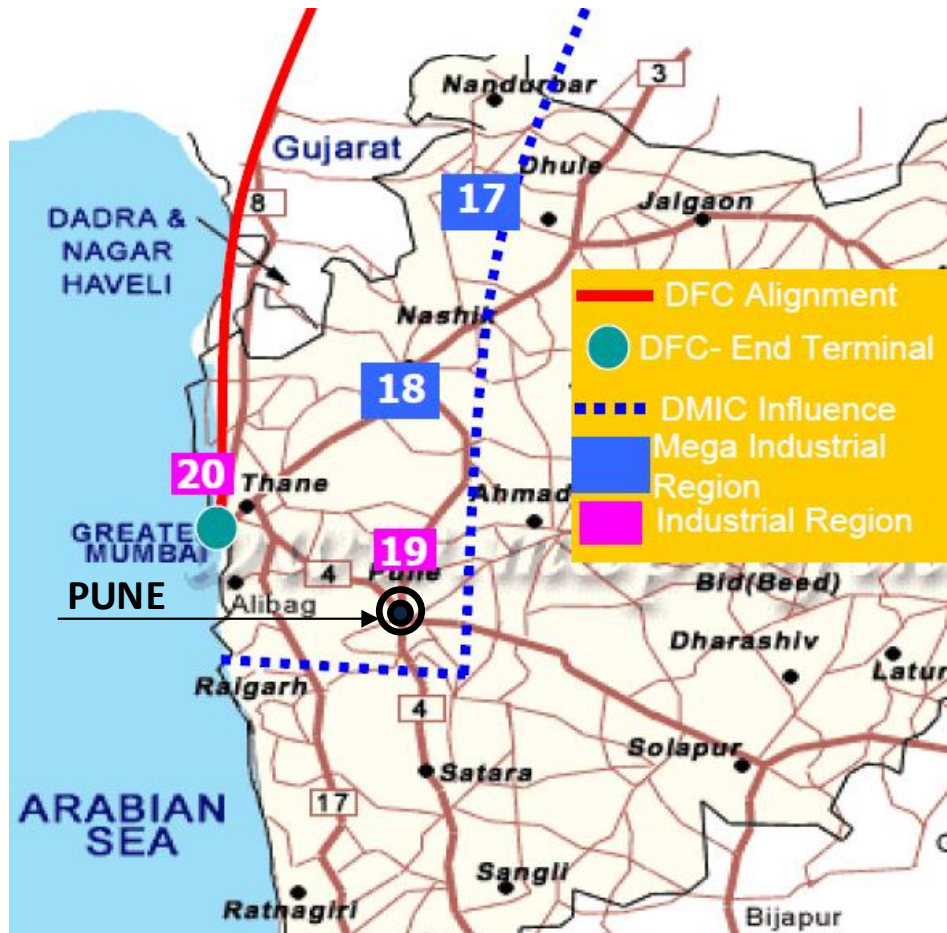
Based on the strengths of specific regions in the influence area, four development nodes have been identified in the influence area of DMIC. These include two investment regions and two industrial areas. Proposed project components of the nodes are given below:

- Node No.17: Dhule-Nardhana Investment Region
- Node No.18: Igatpuri-Nashik-Sinnar Investment Region
- **Node No.19: Pune-Khed Industrial Area**
- Node No.20: Industrial Area with Greenfield Port at Dighi

Pune comes under the Proposed Development Node No. 19 which is the Pune-Khed Industrial Area. The Proposed DMIC influence area will have a significant impact on the growth of Pune City. The city's growth will be influenced by the following major proposed components under the Node No. 19:

- **Export-oriented Industrial Units/ SEZ:** This region has the potential for Engineering, Automobile, and Electronics & Information Technology.
- **Augmentation of Existing Industrial Estates:** As part of development of the existing industrial areas, augmentations of two industrial areas near Pune (Chakan and Khed) are considered for implementation under DMIC.

- Integrated Agro/Food Processing Zone:** To take advantage of inherent strengths of the region for Grapes and Wine Production in Pune district, it is envisaged that an Integrated Agro/Food Processing Zone with horticulture market will be developed as part of the Pune-Khed Industrial Area.



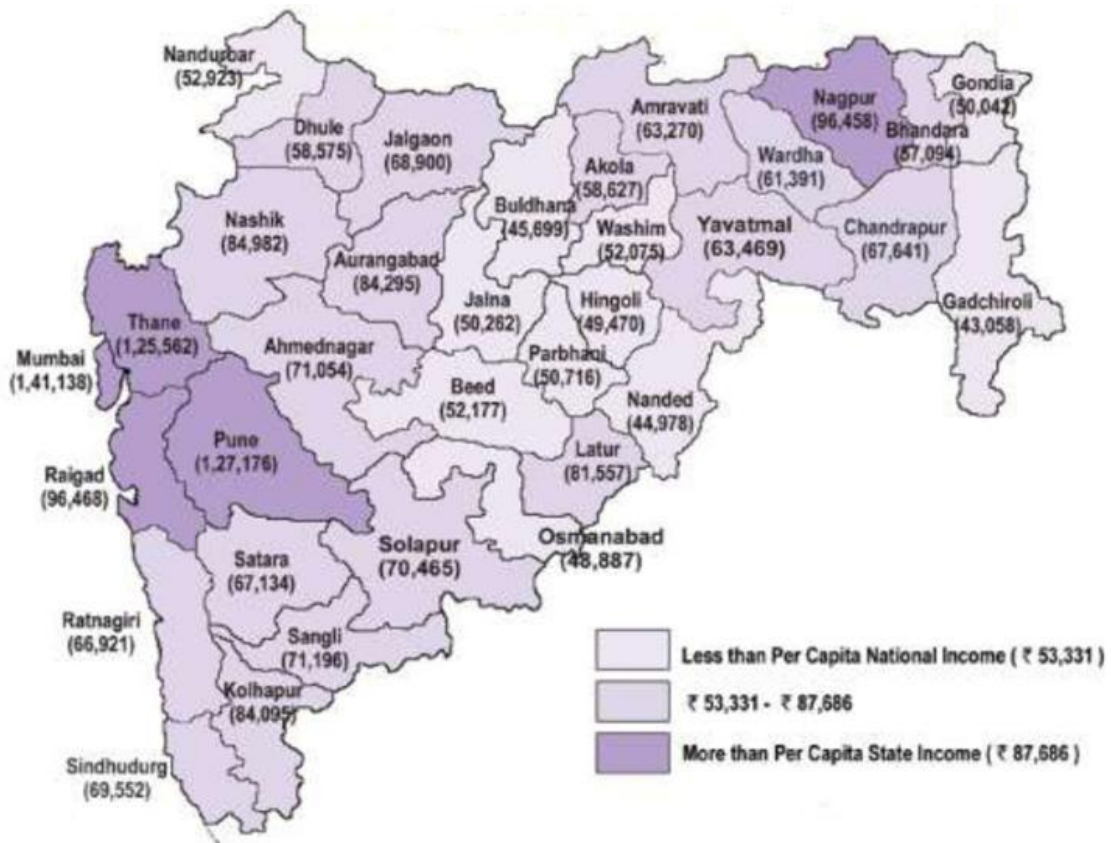
Map No. 2-16: Proposed Development Nodes in DMIC-Maharashtra

- Knowledge Hub/Skill Development Centre:** To support the engineering, automobile, wine production/ agro-processing sectors, a Knowledge Hub/skill up gradation center is proposed to be developed with integrated infrastructure facilities.
- Integrated Logistics Hub:** Pune-Khed Region will also include development of Integrated Logistics Hub with multi-modal logistics infrastructure and value added services.
- Integrated Township:** This region would be provided with integrated township with residential, institutional, commercial and leisure/recreation infrastructure which could be dovetailed to requirements of specific investor groups/ countries.
- Development of Pune International Airport:** It is envisaged that DMIC will take into consideration the development plan being prepared for Pune International Airport and facilitate provision of requisite funding for viable implementation.
- Feeder Road Links:** Development of feeder road linkages connecting the identified industrial area with NHDP, Hinterlands, inter alia, includes following development proposals:

- Provision of connectivity to NH-50 (Pune- Nashik/Sinnar), NH-4 (Chennai) and NH-9 (Hyderabad/Vijayawada).
 - Widening and Strengthening of NH-50 to four-lane dual carriageway.
 - Augmentation of Pune-Ahmed Nagar Link.
 - Development of requisite grade separators/flyovers/interchanges and underpasses along the National Highways/ State Highways and access roads for uninterrupted freight and passenger movement to the region would also be included in the development of feeder links.
- **Feeder Rail Links:**
- A high speed rail link is already available between Mumbai and Pune
 - It is further recommended that Vasai Road-Karjat-Pune BG Link be upgraded to the standards of Dedicated Freight Corridor so as to enable movement of double stacked high speed container trains between JN Port, Pune and to cater to other traffic to/from Ahmedabad and Delhi side. These developments are expected to contribute enormous benefits to the Port / Hinterland Traffic from Pune Region.

2.3.1.9 Per Capita Income

As per the Chamber of Commerce study, 2010, Pune region has the GDP growth of \$23 billion with a growth rate of 15% and the per capita growth of 6%. The district wise per capita income shows that Pune district has the second highest per capita income with Rs.127,176 after Mumbai with Rs. 141,138.



Map No. 2-17: District Wise Per-capita Income (2010 – 2011)

Source: Economic Survey Report of Maharashtra



Pune city is rank 6th in the top 10 wealthiest cities in India. Pune city is the second highest in the state of Maharashtra after Mumbai. The major sectors contributing to the city's growing economy are industry, education, tourism and culture. The average per capita incomes of all the top cities/ towns are given below:

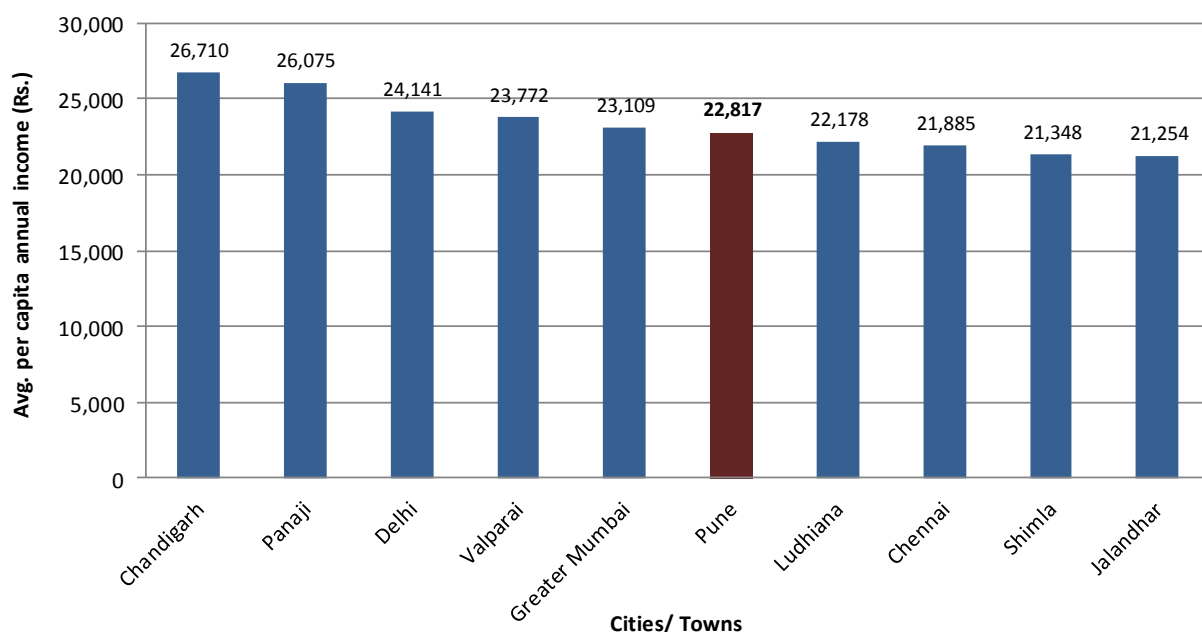


Figure 2-12: Top 10 wealthiest cities/ towns in India

Source: Karve Institute of Social Service Report- 2008 -2009

As per ESR Report, 2010-11, the per capita income in Pune was Rs 35,500 in 2004-05 which went up to Rs 60,000 in 2010-11.

2.3.2 Work Force Participation Rate (WPR)

The percentage proportion of dependant population is indicated by the parameter of work participation rate of any city. The work force participation rate as per the Census 2001 (main and marginal workers) in PMC is 34.08%, which is 2.20% more as compared to 31.88% in 1991. The WPR of PMC is higher than the national level but lower than the state level. The table below shows that the comparative work participation rate:

Table 2-17: Comparative Work Participation Rate

Particulars	Total workers	Male workers	Female workers	WPR (%)
Urban India	92,278,654	76,175,323	16,103,331	32.25%
Maharashtra	41,173,351	26,852,095	14,321,256	42%
Pune District	1,438,597	1,151,812	286,785	34.25%
PMC	865,150	677,814	187,336	34.08%

Source: Census of India, 2001

Of the total working population (865,150), 93.77% is classified as main workers while the marginal workers contribute 6.23%. The main and marginal workers are further classified into four categories and their distribution is given below.

Table 2-18: Workforce Classification – Pune, 2001

SL.No.	Occupation Category	Population	% of total working population
	Main Workers	811,291	93.77%



SL.No.	Occupation Category	Population	% of total working population
1	Cultivators	4,717	0.58%
2	Agriculture Laborers	5,529	0.68%
3	Household Industry Workers	25,430	3.13%
4	Other	775,615	95.60%
Marginal Workers		53,859	6.23%
1	Cultivators	455	0.84%
2	Agriculture Laborers	2,237	4.15%
3	Household Industry Workers	5,860	10.88%
4	Other	45,307	84.12%
Total Working Population (Main + Marginal)		865,150	34.08%
Non Workers		1,673,323	65.92%

Source: Census of India, 2001

The data indicates that, in Pune city majority of workers are in the others category which by definition has more of the tertiary sector workers. The gender-wise classification of PMC work participation shows that the female participation rate (22%) is comparatively very low with that of the male workers (78%), as shown in the figure below:

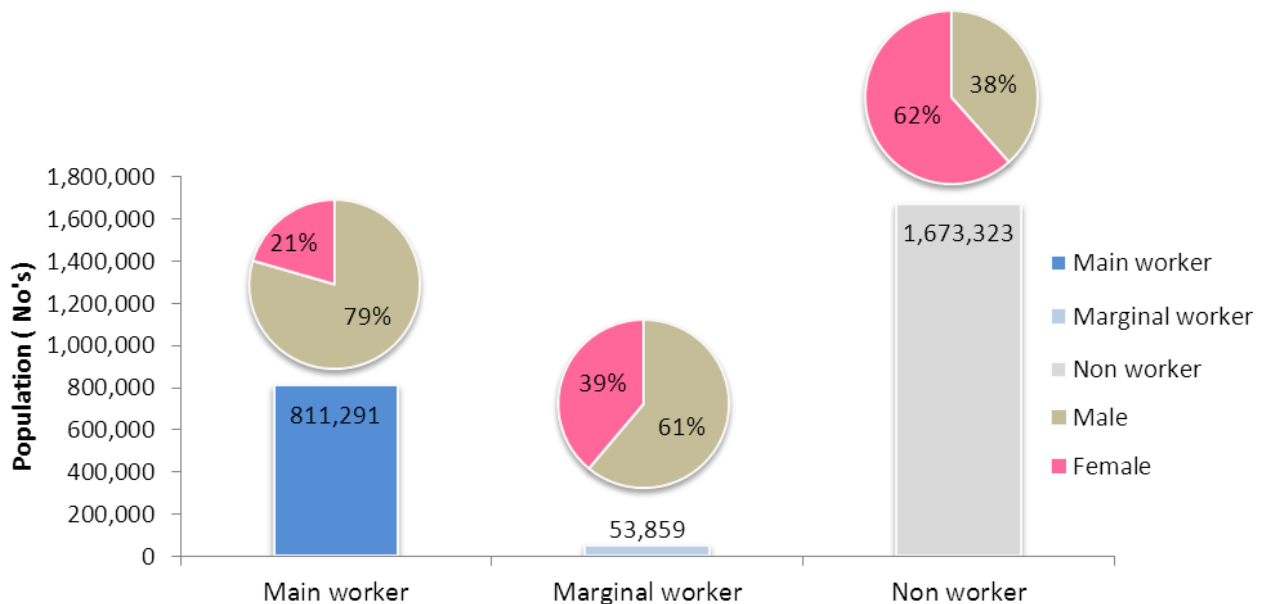


Figure 2-13: Gender-wise work participation

Source: Census of India, 2001

Out of the total population 32% belongs to the tertiary sector that is the service sector, occupying the second major share of PMC population. The occupational structure classification of PMC is given in the following figure2-14.

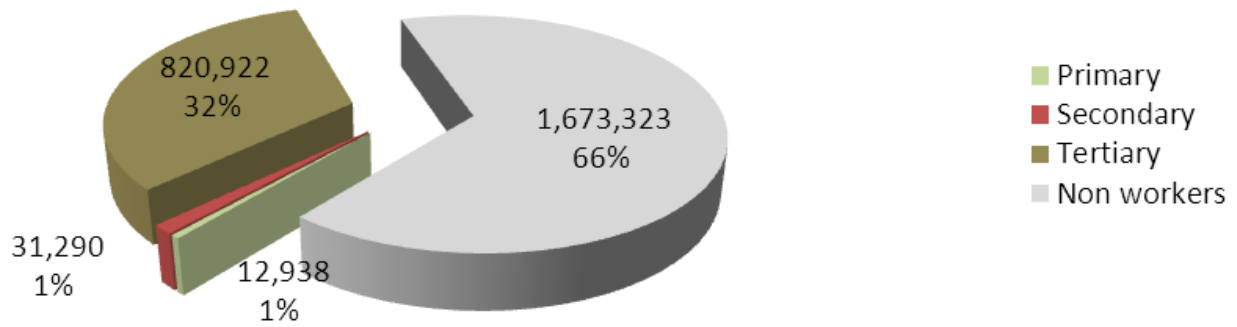


Figure 2-14: Occupational Classification (%)

Source: Census of India, 2001

The figure below shows that in case of primary sector, predominantly, engaged in agriculture and secondary sector that is engaged in industrial manufacturing and production, the gender composition is almost equal in both the sector while in tertiary sector i.e. trade-commerce and services the males working population is dominating the sector with 80% share, as shown below:

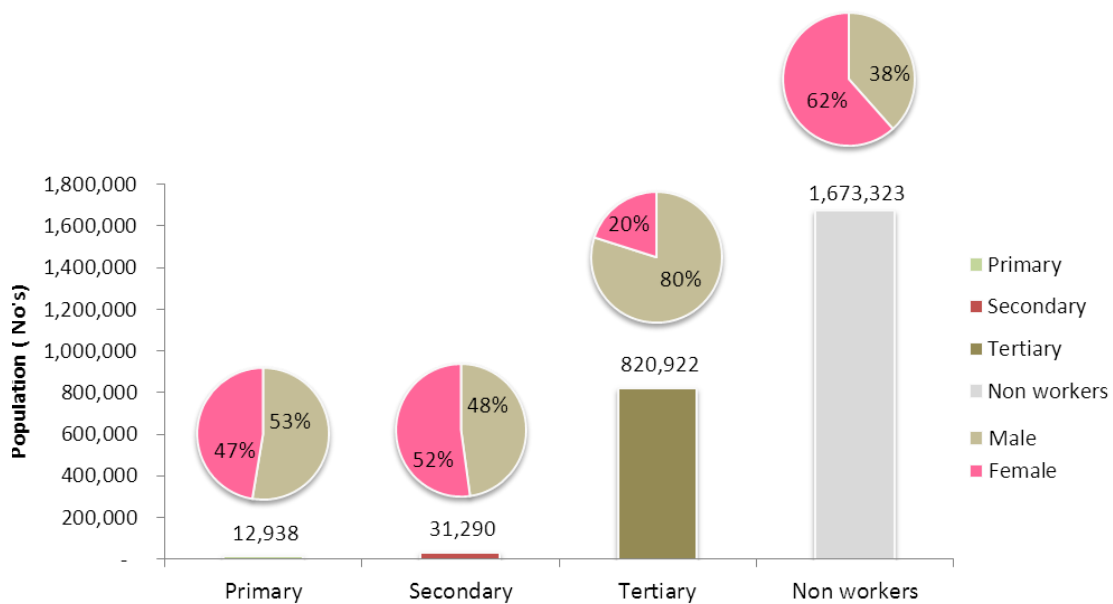


Figure 2-15: Gender-wise Occupational Classification

Source: Census of India, 2001

2.4 POPULATION PROJECTIONS

Population growth of any place not only depends upon natural increase but also on in-migration. In addition to Pune's rapid socio-economic development that has had a significant impact on the urbanization in the city, future growth is governed to a large extent by the development patterns in the city and Pune Metropolitan Region (PMR). The extent of in-migration in Pune city is mainly the impact of the key projects that are influencing socio-economic development in the city and peri-urban areas; the significant projects acting as catalysts to the city's growth are listed below:

- Pune International Airport (Northeast Pune);



- Mumbai –Pune Expressway;
- Information Technology (IT) townships of Magarpatta city, Amonora in Hadapsar (West Pune) and Rajiv Gandhi Infotech Park in Hingewadi (East Pune);
- Development of real estate’s township Megapolis and Blue Ridge in Hingewadi;
- DMIC i.e. Delhi - Mumbai Infrastructure Corridor (Northwest Pune);
- Bus Rapid Transit System (BRTS) in city;
- Municipal boundaries are liable to increase in coming years.

The population of PMC has been projected up to the horizon year 2041 taking into consideration the decadal population trend of Census of India and provisional figures of Census from 1951 to 2011. The population is projected using five statistical methods viz. Linear Trend Method, Arithmetic Progression Method, Incremental Increase Method, Geometric Progression Method and Exponential Method.

The projection by linear trend method, arithmetic progression method and incremental increase method may not suit for a competitive city like Pune. Geometric progression method may be an alternative for a competitive city but considering major development such as DMIC and its impact on Pune, the projection should be high. Exponential method shows the consideration of all future plans for development which is ideal and is given as alternative-I. For a realistic approach the average of Geometric and Exponential method could be considered as alternative-II. Following table shows the population projection of Pune city for the horizon of 2041 using the five methods mentioned above.

Table 2-19: Population Projection

Year	Census Population	Linear Trend Method	Arithmetic Progression Method	Incremental Increase Method	Geometric Progression Method	Exponential Method ALT- I		Average of D & E ALT- II	
						(E)	Decadal growth	(D+E)/2	Decadal growth
		(A)	(B)	(C)	(D)	(E)			
1951	4,88,419								
1961	6,06,777								24.23%
1971	8,56,105								41.09%
1981	12,03,363								40.56%
1991	16,91,430								40.56%
2001	25,38,473								50.08%
2011	31,15,431								22.73%
2021		32,97,107	35,53,266	36,44,986	42,53,870	44,87,573	44.04%	43,70,721	40.29%
2031		37,46,384	39,91,102	41,74,542	58,08,316	62,11,404	38.41%	60,09,860	37.50%
2041		41,95,661	44,28,937	47,04,097	79,30,788	85,97,417	38.41%	82,64,102	37.51%

Source: Census of India, Provisional Census and VSPL Projections

The average decadal population growth rate in past 6 decades is 36.54 %. There is a fluctuation in population growth rate since 1951 which is consequence of jurisdiction changes. The graph below shows the projected population of study area by different methods.

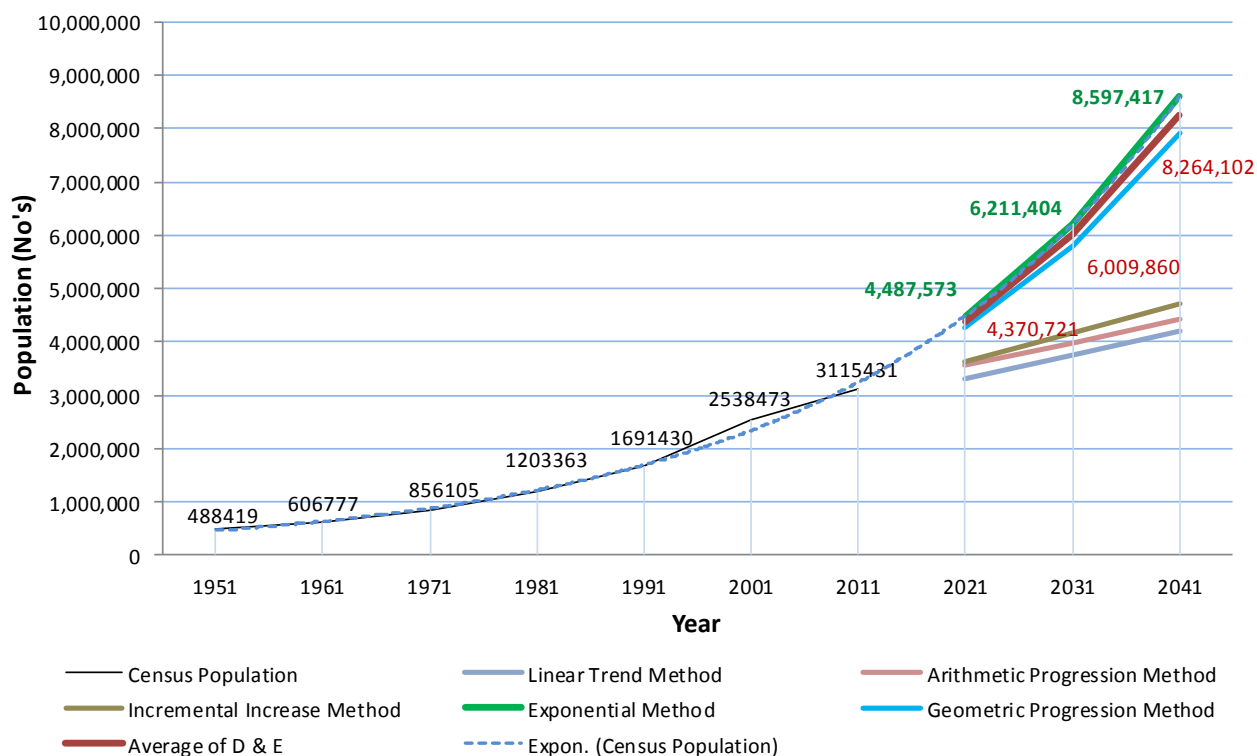


Figure 2-16: Population Projection

Source: Census of India, Provisional Census and VSPL Projections

The exponential method has been considered to project the population for the target year 2041, as the trend curve of this the most corresponding curve to the Census population curve of past years and the figures virtually matches with the population data available with census. The population projected for Pune City for the years 2021, 2031 and 2041 is 4,487,573, 6,211,404 and 8,597,417 respectively.

2.4.1 Need for Stabilization of population growth

The city’s growth in terms of population has been projected which will be reflected as the demand for land, housing and basic infrastructure facilities which has its own limitations. City having limited resources and topographic restrictions cannot be out-stretched infinitely, which means that its growth needs to be stabilized and brought down to natural trend based growth instead of a high in-migration based exponential growth.

Presently, Pune city has its water supply from Khadakwasla Dam, which has a carrying capacity of approximately 29 TMC and PMC can receiving a maximum of 14 TMC from this source. As per the population projections the water supply demand in 2021 will be 12.37 TMC, in 2031 it will be 17.07 TMC and in 2041 it will be 23.55 TMC; this implies that after 2021 PMC has to take water from some other source. With reference to the proposal made in ‘Bhama Asked water supply scheme’ for water supply, additional water supply will be taken from ‘Bhama Asked reservoir’ but this will also be sufficient for meeting the water supply demands for the population projected till 2031. Hence, there is a need to identify and assess water sources and simultaneously the population growth should be decelerated by identifying and developing counter magnets for the city like Pimpri-Chinchwad and Khed.

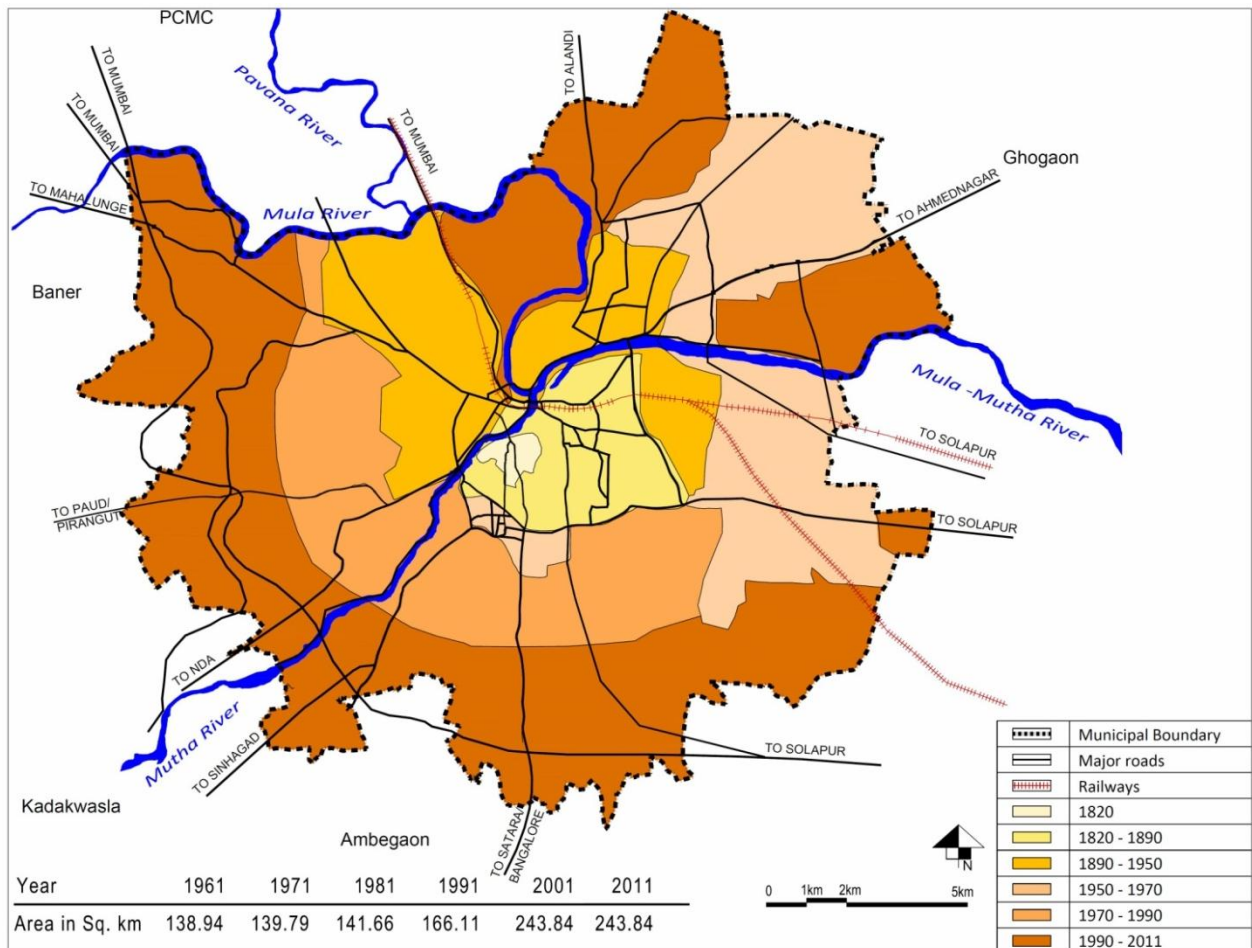


2.5 URBAN GROWTH AND LAND USE

2.5.1 Spatial Growth Pattern

From a small area around Kasba Peth, Pune has grown radically; in 1958, small pockets of land in parts of the villages of Katraj, Dhankavadi, Lohagaon, Dapodi, etc. were added increasing the area within jurisdiction of PMC. In 2001, 23 villages were added to Pune city. As a result, PMC area increased to 243.84 Sq.Km.

Over the years PMC has grown in the pattern of concentric rings. The driving forces for growth are primarily the development of IT industry in addition to the economic boom in the automobile sector which forms a major portion of the industries in and around Pune. The peripheral growth has resulted into the increased residential areas and area under transportation network and facilities. Pune's population has increased by 5 to 6 times in the last fifty years and the increase has been very rapid from 1981. The ever increasing pressure of population has led to the growth of the adjoining suburbs and the city has expanded outwards filling in spaces between it and the suburbs. The urban sprawl has taken place in all directions but more significantly in the eastern, southern and south-western directions. Significant changes in land use are evident in the eastern part of the city.



Map No. 2-18: Chronological Development of Pune from 1820 -2011

Source: Town Planning Department, Pune- 2011



The chronological development of PMC is given below:

Table 2-20: Chronological Development of Pune

Year	Total Area (Sq Km)	Area Added (Sq. Km)	Name of Areas added
1857	7.74	-	South Shankarsheth road to Ambila road, North East Right bank of Mutha river, East- Welesly road to new Modikana near Nagzari
1889	9.86	2.12	Area between Shankarsheth road, Satara Road and Golibar Maidan
1890	18.04	8.17	Erandwana and Bhamburda villages
1931	18.79	0.75	Parvathi Gaothan and area till Hingne
1935	19.05	0.26	Chaturshringi Area
1958	138.98	119.93	Inclusion of 18 villages
1975	138.05	(-)0.848	Exclusion of some part
1981	146.95	7.33	Inclusion of Sutarwadi
1983	146.11	0.0149	Inclusion of survey no. 79 of Ghorpadi
1997	243.84	97.73	Inclusion of 23 villages

Source: SEA Report 2010; City Sanitation plan 2012, PMC

The Central Business District (CBD) of Pune is the high density zone with major land use under residential and commercial activities. The old city is congested with its narrow roads and lack of open spaces. Majority of the middle and high income groups are inhabited on the peripheral areas i.e. on the first belt area. Industrial developments are mostly found in pockets and belts along the radial roads entering the city. The fringe area i.e. the peripheral second belt was recently merged with PMC, which have been developed as an unorganized urban sprawl with residential, industrial and local commercial users. The existing road systems having inadequate widths are connecting all the above components. The railway lines are on the Northern side. The rivers flowing in three directions have a water front of 20 kms.

The future growth of PMC will be mainly governed by existing transport corridors, existing and future industrial developments in and around PMC and the expansion of central business district (CBD). Spatial growth of PMC will take place towards employment nodes; in areas which are closer to these nodes and areas which give immediate connectivity to these nodes.

2.5.2 Land utilization and land use

2.5.2.1 Land Utilization

The first town planning scheme was prepared for Shivaji Nagar in 1918 and a Master plan was prepared in 1952 for the Poona city. The first Development Plan (DP), for PMC was prepared in 1966 (10 year horizon till 1976) in accordance with the new legislation that is the Maharashtra Town and Country Planning Act, 1966. Revision was made in 1982 which was sanctioned by the GoM in 1987. The second DP was prepared for horizon of 20 year (to be valid till 2007) for PMC area of 138.36 sq. km. In 2001, PMC jurisdiction was extended by merging 23 neighboring villages (in parts) and DP was exclusively prepared for this fringe area for a horizon of 20 years (valid till 2021). The combined percentage distribution for various land utilization categories is presented in the following Figure 2-17 .

From the figure 2-17, it is evident that the developed area is almost 70 % of the total land utilization leaving only 30 % for ecological resources. The percentage of green area and forest adds together to 20%. Distribution of land utilization as per 1987 DP and 2001 DP is given in the table below.

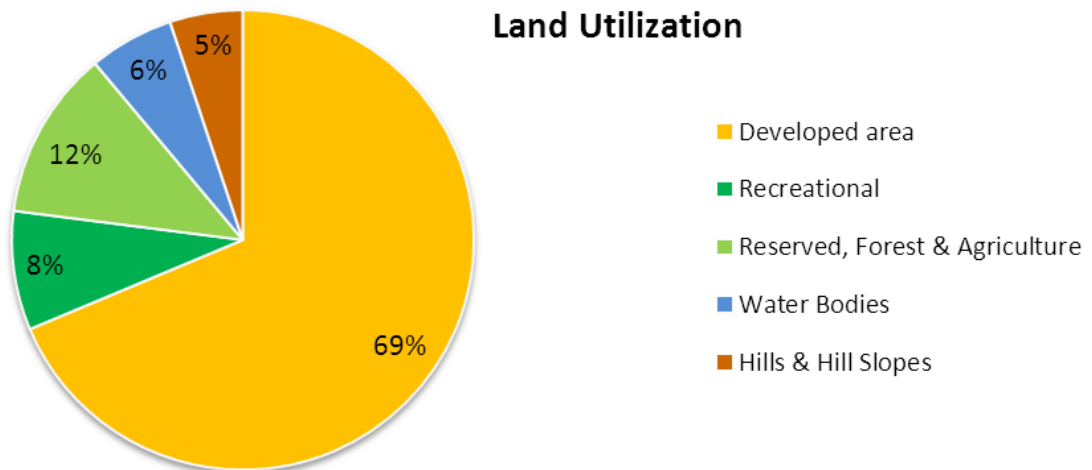


Figure 2-17: Land Utilization - PMC (1987 DP +2001 DP)

Source: DP 1987; City sanitation plan, PMC

Table 2-21: Land Utilization of PMC

Land Utilization	Area in sq.Km 1987 DP	Percentage 1987	Area in sq.Km. 2001	Percentage % 2001
Developed area	98.79	71.40%	167.41	68.66%
Recreational	12.73	9.20%	20.4	8.37%
Reserved, Forest & Agriculture	2.35	1.70%	29.05	11.91%
Water Bodies	12.04	8.70%	14.52	5.95%
Hills & Hill Slopes	12.45	9.00%	12.45	5.11%
Total	138.36	100.00%	243.84	100.0%

Source: DP 1987; City sanitation plan, PMC

2.5.2.2 Existing Landuse

The development plan 2001 is specially made for the newly added fringe area into Pune Municipal Corporation area. As per 1987 Development plan, the percentage composition of residential is 50.58 Sq.Km i.e. 37% of the total land use and in 2001 DP, the residential land use has increased to 50%. Considering the growing demand of housing, the newly added areas have been utilized for residential use. Following chart and table shows the landuse classification of PMC as per development plan 2001.

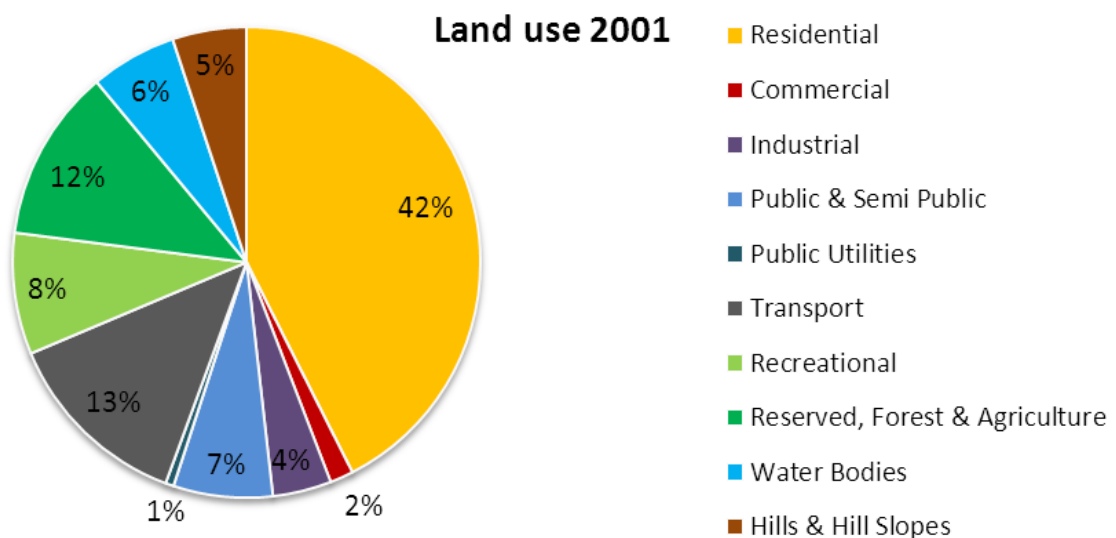


Figure 2-18: Land use Distribution – Pune City

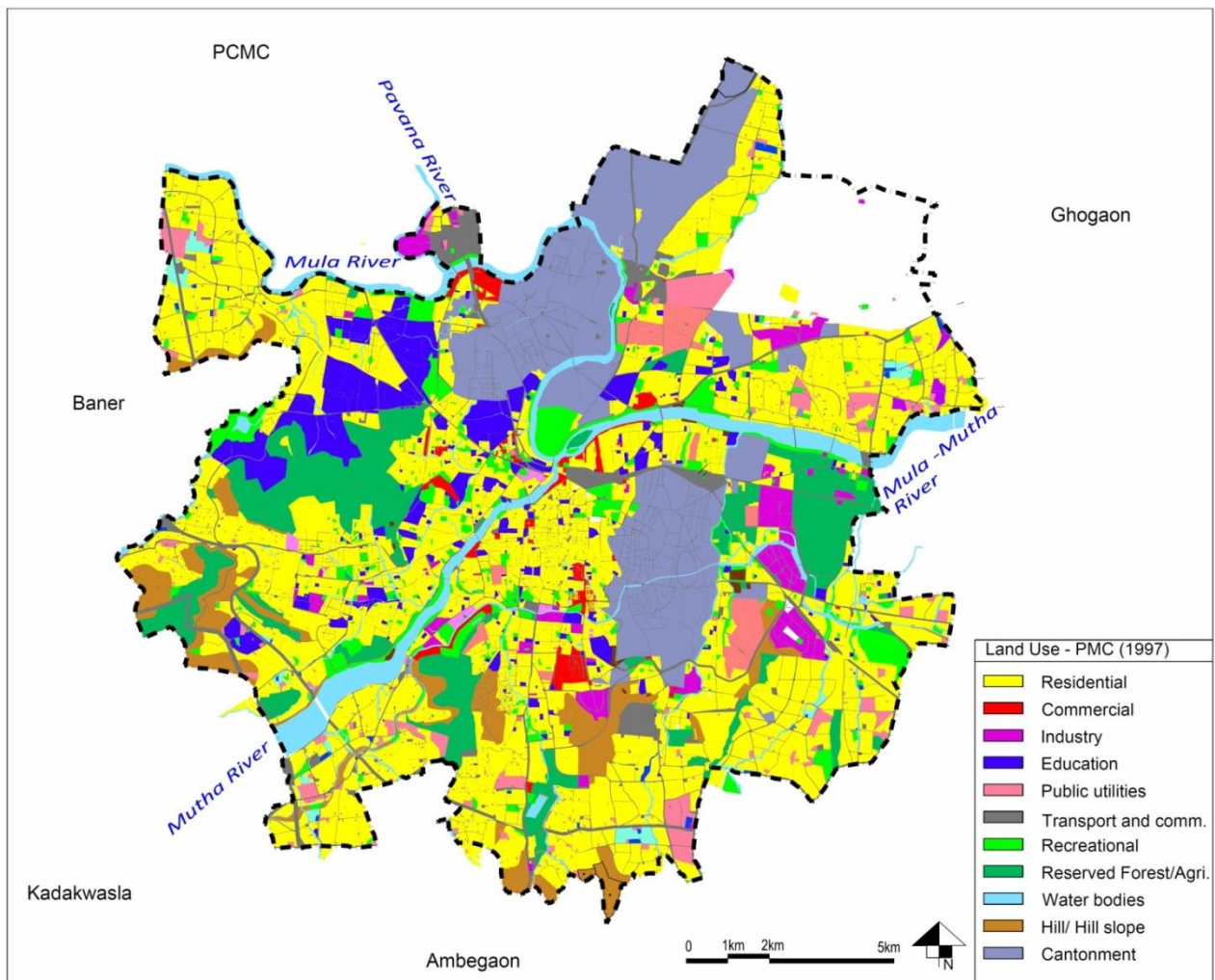
Source: DP 1987; City sanitation plan, PMC

Table 2-22: Land use Distribution as per Development Plan

Land use	Area in sq.Km 1987 DP	Percentage 1987	Area in sq.Km. 2001	Percentage % 2001
Residential	50.58	36.56%	103.74	42.55%
Commercial	2.35	1.70%	3.93	1.61%
Industrial	7.26	5.25%	9.88	4.05%
Public & Semi Public	15.22	11.00%	16.67	6.84%
Public Utilities	1.38	1.00%	1.38	0.57%
Transport	22	15.90%	31.81	13.05%
Recreational	12.73	9.20%	20.4	8.37%
Reserved, Forest & Agriculture	2.35	1.70%	29.05	11.91%
Water Bodies	12.04	8.70%	14.52	5.95%
Hills & Hill Slopes	12.45	9.00%	12.45	5.11%
Total	138.36	100.00%	243.83	100.00%

Source: DP 1987; Pune City Sanitation Plan, 2011

The combined land use pattern shows that around 43% of the area is under residential zone, 2% is under commercial zone, 4% under industrial zone and 16% under public/semipublic and recreational use. The area under transport has reduced to only 13% which is low in comparison to other metropolitan cities where it ranges from 16-25%.



Map No. 2-19: Land use map of PMC

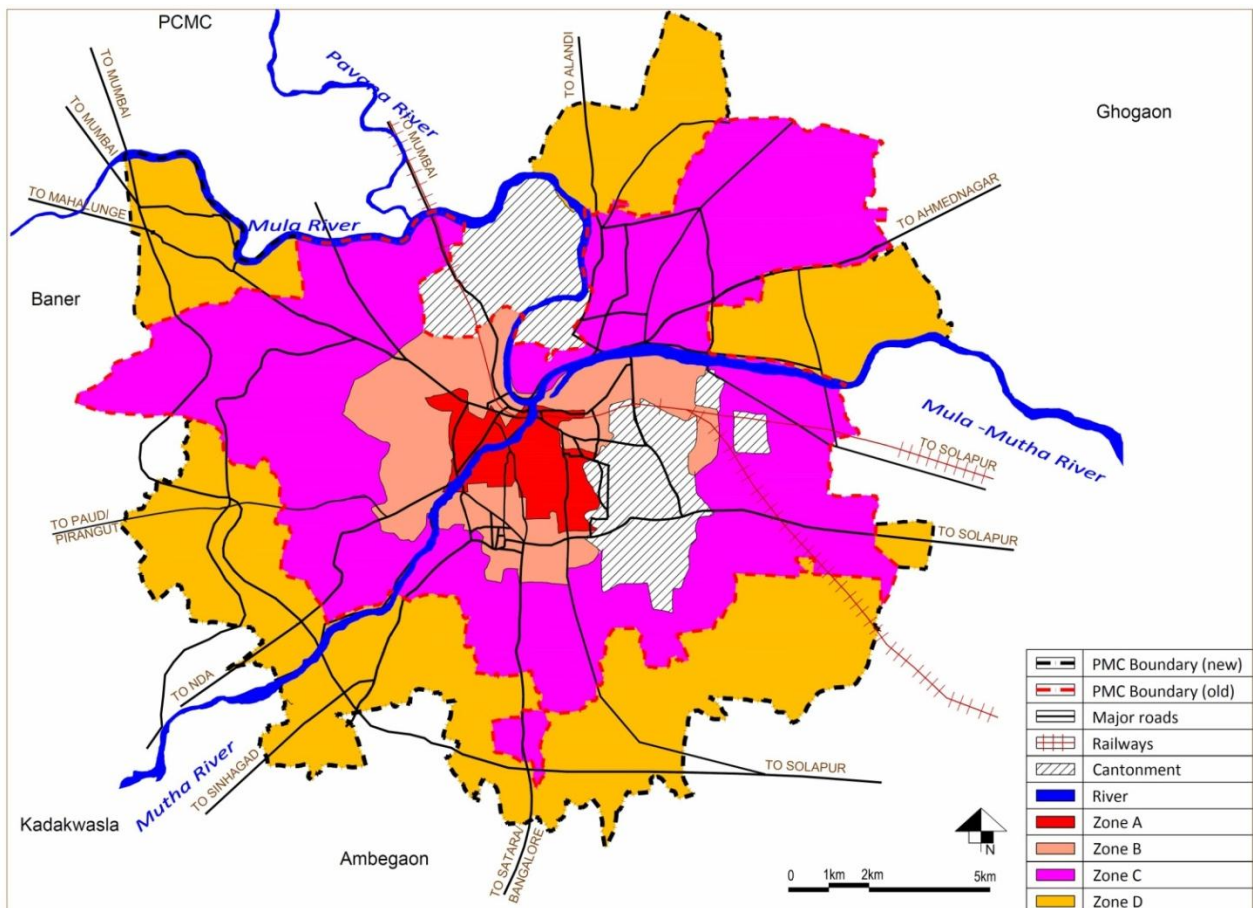
Source: Pune Municipal Corporation (PMC)

The 1987 DP was implemented up to 30% only. Though statistics for the ground situation for changed land use is not available, from field surveys and discussion with PMC officials, it is observed that a lot of land use changes have taken place from the defined zones, especially for commercial areas. Old city wards are overcrowded with commercial establishments and the same is the case with areas along transport corridors. A number of IT offices in residential areas have also come up since IT industry is permitted in residential zones.

2.5.3 Transfer of Development Rights (TDR) in Pune

Transfer of Development Rights (TDR) is a certificate from the Municipal Corporation that the owner of a property gets where his/her property (either part or whole) is reserved for the purpose of public utilities such as road, garden, school etc. The rights/ certificate, which is equivalent to the reserved portion, is obtained by the owner on surrendering his property to the Municipal Corporation. These rights/ certificate can then be sold to builders who use it for additional construction on their property. Currently in Pune, additional construction of upto 40% of the plot area is allowed through purchase of TDR and a further 20% is allowed through purchase of slum TDR. Slum TDR is generated through redevelopment of slums.

PMC area is divided into three different Zones based on TDR , they are: Inner ring as Zone-A, Middle ring as Zone-B, Outer middle ring as Zone- C and Outermost or the outskirts as Zone-D.



Map No. 2-20: TDR Zones in Pune

Source: Mashal (NGO), 2009

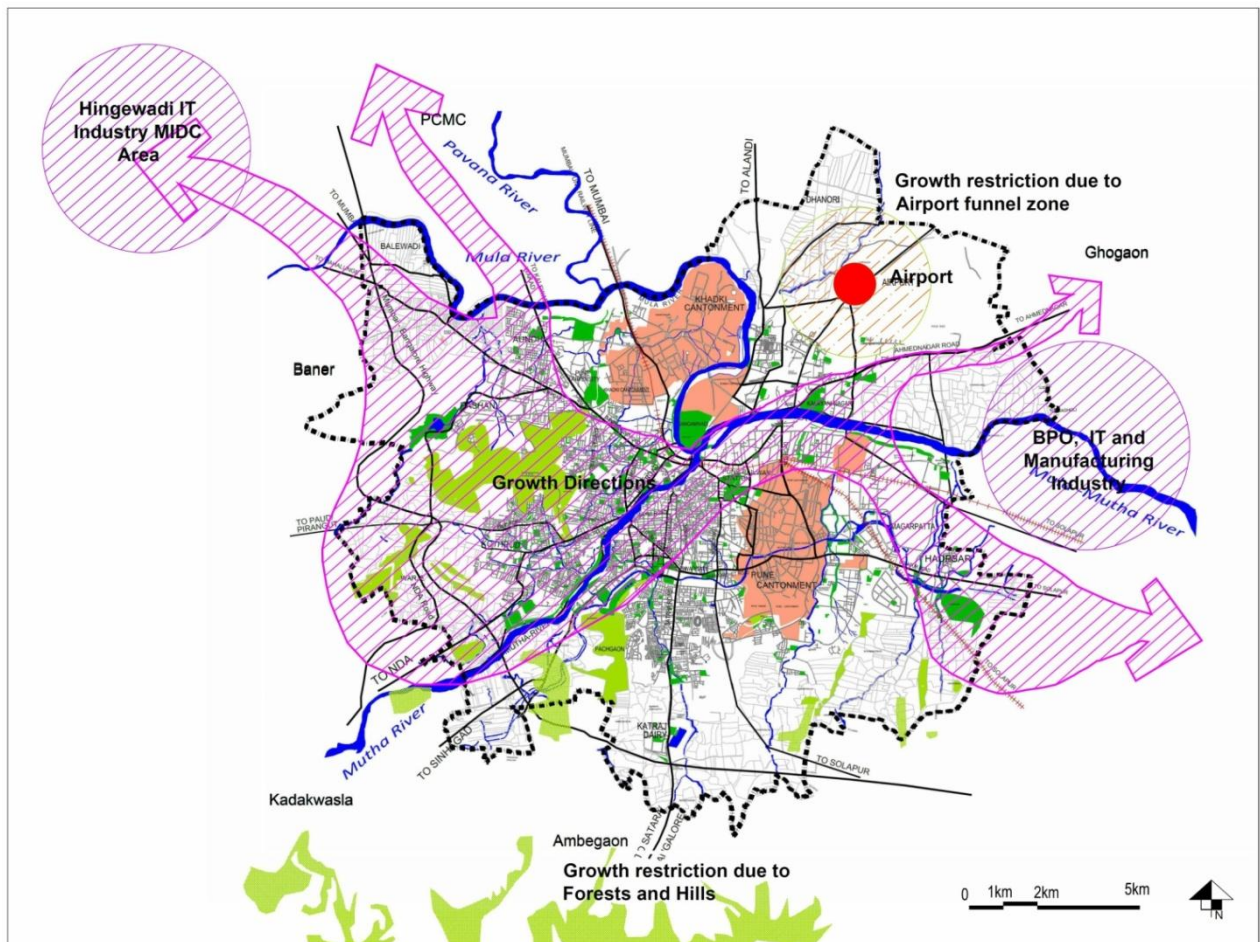
Zone-A consist of the old PMC limits with total area of 5.37 Sq.Km. The total area of Zone-B is 28.30 Sq.Km. While the total area of Zone-C is 112.25 Sq.Km. within the old PMC limit is Zone-C. All 23 villages in new PMC area are yet to be designated a zone name that is of total area 98.04 Sq.Km. TDR generated in Zone-A can be transferred in Zone-B or Zone-C. In congested areas like Zone-A, TDR cannot be used. Similarly, TDR generated in Zone-C cannot be shifted inwards like Zone-B or Zone-A.

86% of the TDR in Pune’s market has been utilized and 14% is the balance. This TDR can be utilised into the suburbs of the city, the land available into the areas where large land parcel having bigger plot sizes can be utilised along with the FSI allotted for that particular plots. 40% of total land which is reserved for residential use in DP has a potential that can absorb the TDR generated.

Due to extensive utilization of TDR, piece meal development has been observed in Pune. TDR is a very dynamic tool and thus there should be proper guidelines for utilizing it.

2.5.4 Future Growth Directions

The growth direction of PMC is envisaged towards the present growth along Hinjewadi, PCMC and Hadapsar. The growth are triggered mainly by IT industry in Hinjewadi, automobile industry in PCMC and BPO, IT and manufacturing industry in Hadapsar.



Map No. 2-21: Future Growth Direction of PMC

Source: Primary survey and Comprehensive Mobility Plan, 2008

The growth corridors mainly pass through North, West and East direction. Southern side of PMC contains



hilly area where growth is not favorable.

There is restriction of growth in the Northeast due to the presence of Airport funnel area. Pune city also has its own limitation for growth; having Pimpri-chinchwad on its north-west direction with some part of the boundary almost touching each other restricts spatial growth of city in this direction.

2.6 SWOT ANALYSIS

STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
<ul style="list-style-type: none"> ▪ Pune has emerged as a prominent location for manufacturing industries, Information Technology and education of the country. ▪ Pune city is well-connected to most of the important metropolitan cities in India like Mumbai, Hyderabad, Bangalore, Delhi, Kolkata and Chennai and to all major cities and town of the state of Maharashtra. ▪ Pune attracts a lot of migrants from other cities hence it has rich human capital. ▪ As per provisional reports of Census India, 2011, the Sex ratio of PMC is 945 which are higher than its district, state and national level figures. ▪ The female literacy rate of PMC has reduced from 72.2% in 2001 to 87.91% in 2011, showing enhancement in female literacy. ▪ The overall literacy rate of Pune city (91.61%) is higher than the national and state average. ▪ Presently, Pune is one of the main investment hubs of the state. ▪ The city has rich heritage and natural landscape with increasing tourism. ▪ Pune serves as regional whole sale market for food grains. ▪ Pune is most sought after destinations for living due to its better quality of life. ▪ Pune's core city has a good 	<ul style="list-style-type: none"> ▪ Rapid urbanization, population growth, growing economy and industry of the region have placed an enormous strain on the city's infrastructure. ▪ The dynamic process of population growth is beyond the control of the authorities. ▪ 66% of non-workers, depicting dependency. ▪ The composition of non-working population of female is 62%. ▪ The residential development .of the city is not catching up the pace with the rapid economic development in the city and region. 	<ul style="list-style-type: none"> ▪ Pune Municipal area comes under the PMR area which has a number of economic opportunities coming up. ▪ Pune comes in the DMIC influence zone which can be catalyst in the city's economic growth. ▪ The proximity of Pune City to Delhi Mumbai Industrial corridor Project will have a potential of integration with other urban nodes in the region. ▪ DMIC influence on Pune will also further increase the growing demand of services ▪ DMIC as a mean to leverage support infrastructure for industrial growth in the region will have a major positive impact on Pune city. ▪ DMIC will increase ample human resource availability and hence requirement for creation of job opportunities. ▪ Due to its strategic location and favorable climate, the city can be developed as the center point for all business transit. ▪ As compared with other peer cities, Pune has the lowest density in the last decade which 	<ul style="list-style-type: none"> ▪ Pune city is seeing a lot of focus on urbanization and economic development. This, in turn, will increase the pressure on the current physical and transport infrastructure. It also hugely impacts on the local environment which can act as a threat to the image of Pune as one of the most livable cities. ▪ If counter magnets are not developed simultaneously then Pune city may have to face overcrowding. ▪ Industrial development along the growth corridors eg. Pune – Ahmednagar highway will lead to further population spill-over. ▪ Resistance of Land acquisition as being under the influence zone of DMIC ▪ The migrant population involved in the IT, industrial and real estate sectors is likely to increase the demand for housing, particularly for EWS/low income groups (LIG) and need for basic amenities. If housing for these groups is not planned, slums are likely to



STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
<p>traditional character which has a potential to be conserved and re-stored.</p>		<p>indicates land availability, except in the core old city.</p> <ul style="list-style-type: none"> ▪ There is strong inflow of talent as Pune is an IT hub and pioneer educational hub of India. ▪ Pune comes under the DMIC Project Influence area which will enhance its connectivity to major urban centers and proximity to industries. ▪ Pune has potential for heritage tourism. ▪ Due to high economic growth in the city and region there is lot of potential for investment in Pune's real estate. ▪ 40% of total land which is reserved for residential use in DP has a potential that can absorb the TDR generated. ▪ This TDR can be utilized into the suburbs of the city, the land available into the areas where large land parcel having bigger plot sizes are available. ▪ TDR can be utilized for slum re-development. 	<p>increase.</p> <ul style="list-style-type: none"> ▪ There is a fall in 0-6 years sex ratio in last decade which is a negative indicator for balanced social development. ▪ The urban sprawl has taken place significantly in the eastern, southern and south-western directions, which may be an encroachment on the hills. ▪ The percentage of recreational areas has reduced from 9.2% in 1987 DP to 7.4% in 2001 DP. ▪ Piece meal development is observed in the new development.

2.7 KEY FINDINGS

- Pune has a very pleasant climate. Even in summer, nights are usually cool due to high altitude.
- The city is well connected to all major cities and town of the state and also has connectivity to all major metropolitan cities of India.
- Pune Municipal area comes under the DMIC influence area which will have a major impact on the rapid growth of the city.
- Due to strong economic activities in the city and region, Pune is inevitably attracting a lot of migrants. It is also observed that during the last decade, 21% of the total population is contributed due to in-migration.
- Hadapsar and Bibvewadi which lies in the Southwest are the most populous wards of PMC.
- The literacy rate of Pune city (91.61%) is higher than the national and state average which can be



attributed to Pune city being one of the leading centers of higher education in the country

- Spatial growth of PMC will take place towards employment nodes and in areas which are closer to these nodes.
- The urban sprawl has taken place significantly in the eastern, southern and south-western directions.
- Residential development is getting concentrated near the IT industries.

2.8 ISSUES

- There is a fall in 0-6 years sex ratio in last decade which is a negative indicator for social development.
- The city has hills on southern side, restricting its growth in that direction.
- In-migration of Pune city has increased from 3.7 Lakhs in 2001 to 6.6 Lakhs migrants in 2011 purporting 14% and 21% of the total population, putting pressure on the infrastructure of the city. Better employment opportunities will further accentuate the in-migration.
- The migrant population is likely to increase the demand for housing, particularly for EWS/low income groups (LIG), if housing for these groups is not planned, slums are likely to increase.
- Population density has increased from 10405.28 persons/ Sq.Km in 2001 to 12,777 persons/ Sq.Km in 2011. Population densities especially in the core areas are very high.
- The population projected for Pune city by 2041 is 8.59 million which will be more than double the existing population.
- Due to immense potential of DMIC Project, and increasing focus on economic and real estate development the city's built profile might change in haphazard way if not timely tackled.
- Due to extensive utilization of TDR, piece meal development has been observed in Pune.
- The percentage of recreational area has reduced from 9.2% in 1987 DP to 7.4% in 2001 DP.
- When compared to 1987 DP, the 2001 DP shows an increase of 14% in residential use favoring the growing demand of housing.
- The existing regional plan was drafted in 1990. The ground situation has changed drastically since then.
- The first Metropolitan Plan had recognized that development was spilling into the peripheral villages and had provided that low-density development with an FSI of 0.5 may be permitted in these villages. But, these areas which were included in the regional plan as No Development zones got excluded from the purview of the ULC Act as being not developed by virtue of their zoning for agricultural or allied purpose. However, these agricultural plots were purchased with impunity and some gram panchayats willingly gave building permissions to the owners of these plots. As a result, a cluster of illegally constructed buildings without proper layouts arose in these areas.
- With the IT sector growing over the last few years, more and more industries are coming to Pune. This has resulted in a rise in population which in turn has led to more construction projects coming up. Lack of proper planning increases encroachments on hill tops and slopes and illegal constructions on agricultural land. The population pressure due to increasing migration in PMR has led to the haphazard development and varied infrastructure growth and has a major impact on the growth of Pune City
- Absence of implementation body; Pune Metropolitan Development Authority (PMRDA) is not yet



functional. Any changes in the regional plan would depend on the PMRDA so that the regional plan can be implemented.

2.9 STRATEGIES / RECOMMENDATIONS

- Pune city can be one of the first cities to not only plan but also implement integrated urban development. It can focus upon landuse-transport-infrastructure integration. It can initiate the density mapping along the major roads and in critical wards and plan for the physical and transport infrastructure accordingly. These details can also help in deciding for the best of road/public transport for the city and also curtail on encroachments/illegal development in the future.
- The city's micro-climate is hugely supported by the surrounding hills/ physical features. Looking at the current land use pattern and the reducing area under forests/agriculture, the city needs to drive a pro-environment development framework towards development.
- The city can focus upon affordable housing and bachelors accommodation with basic amenities by looking at the current growth of migrant population.
- In order to make TDR a successful tool, wards must be ranked priority wise for utilization of TDR based on existing infrastructure, property values and plot sizes. Transfer Development Rights (TDR) can be utilized for new developments.
- The Corporation can look at the option of declaring the city core area as special planning area and try to conserve the existing heritage and limit on density pressures, land use change, increase in F.S.I/FAR and parking on streets. The authority can also formulate an independent traffic management plan for it.
- Formulation and implementation of urban land management policy and look at implementation monitoring for the Development plan. If required the development plan can be relooked at with a fresh perspective.



3 HOUSING AND SLUMS

3.1 HOUSING SCENARIO

3.1.1 Introduction

Cities attract a great number of in-migrants; this poor immigrant population is homeless who are forced to live in slums predominantly located in marginal areas having substandard living. Slums are the first stopping point for poor immigrants belonging to lower strata; as these provide the low cost and the only affordable housing whereby, enabling such immigrants to eventually get absorbed into urban society. Squatting is mostly believed to be encroachment of government land. Squatters are viewed as families unable to afford housing through rent or ownership in the private formal housing market or through the housing agency as per their preferred location, and who can usually only afford to rent rooms and shacks.

Slums, being the place of residence for low-income employees, who are vital for city's life as they make the city moving, in many different ways. Hence, this section of the revised city development plan of Pune will deal with the problems and issues related to slums and slum dwellers that need to be addressed, in the light of JNNURM guide lines.

Jawaharlal Nehru National Urban Renewal Mission (JNNURM) launched in 2005, formulated by the Government of India has two sub missions:

- a) Infrastructure & Governance
- b) Basic Services to Urban Poor (BSUP)

The first sub mission addresses the requirements of infrastructure gap of the cities and revamping the provision of citizen services. Primarily, the mission aims at funding through grants a priority list of detailed projects of the city that would help it achieve realization of its vision.

The second sub mission focuses on provision of basic services to urban poor. These fundamentally are housing, water supply, drainage, storm water drains, solid waste management, street lighting, community toilets and community halls. Having recognized the need to extend the provision of basic services to all strata of population the scheme propounds initiatives that would evolve sustainable programs and projects.

3.1.2 Housing Typology

The study of prevalent housing typology of a city is an important aspect to understand the traditional and upcoming housing technology and architectural style of that place. The old city areas of Pune forming the core city part have Wadas as the predominant style of housing. Being historically developed the old city has primarily mixed land use areas, where city's major trade-commerce activities take place, along with residential use. It is evident from the glorious history and the development that has taken place in the previous decades that the in-migration to the city is ever increasing. This has led to an increase in demand for housing for all sections of society. The demand for higher and upper/ middle income groups is normally being met by the private builders. Lack of affordable housing for the lower income has led to the growth of slums all over the city.



Pune has three prominent systems of housing such as Traditional, Planned and Un-Planned:

Table 3-1: Existing Housing Systems and Sub-Systems in Pune

Category	Type of Housing
Traditional Housing	Wadas
	Chawls
Formal/Planned Housing	Public Housing
	Plotted Bungalows
	Apartments/ Group Housing
	Rental Housing
	Townships
In Formal/Un-Planned Housing	Slums
	Squatter Settlements
	Unauthorized Settlements

Source: Household Survey, Mashal, 2009

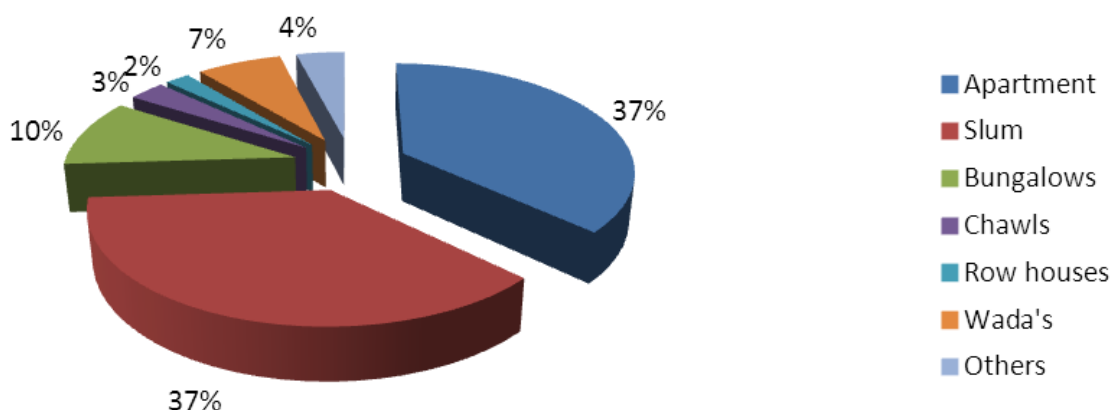


Figure 3-1: Housing Typology

Source: Household survey, Mashal, 2009

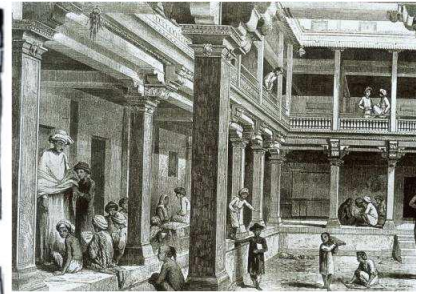
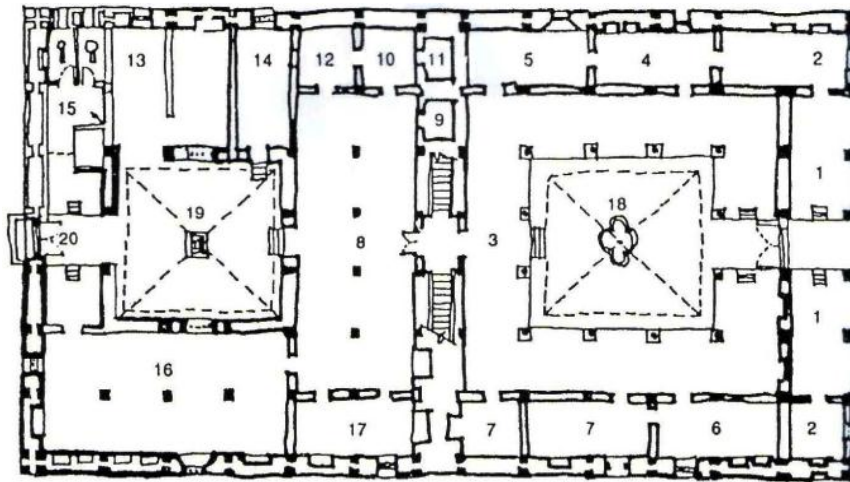
3.1.2.1 System 1: Traditional Housing

The core city area relating to the historic background of the city has traditional housing system known as Wada(s), these are basic ingredients of the early settlements. The core city still endows the traditional characteristic of the city which is clearly visible in the streetscapes and built environment, wherein the typical character of the old town can be seen like Peth areas, Camp, Mandai, Deccan Gymkhana etc. These areas are the commercial hub (C.B.D.) of the city.

• Wadas

As discussed in the previous paragraph historically the residential buildings were known as Wada(s), which in due course of time became the historical architecture character of the city. These buildings were made up of locally available materials including stones and bricks made up of mud; limestone has also been used in the construction of these Wada(s). The walls were load bearing with mixed style of construction technology that is trabeated style as well as arched openings. Presently, most of the Wadas are in dilapidated condition, requiring redevelopment. Most of the Wadas are more than 100 years old and some of the owners of these Wada(s) have renovated their residents with new construction materials, like tiles and R.C.C. roofs etc.

The wadas are occupied by the owners as well as the tenants since long.



- | | |
|-----------------------------------|---------------------------------------|
| 1 Osari (Verandah) | 11 Tijori (Treasury) |
| 2 Dewadi (Guard Room) | 12 Pothichi Kholi (Manuscript Room) |
| 3 Sadrecha Sopa (Formal Verandah) | 13 Gotha (Cow Shed) |
| 4 Kacheri (Office) | 14 Balantinichi Kholi (Delivery Room) |
| 5 Khalbatkhana (Negotiation Room) | 15 Nahani/Sandas (Bath/Toilet) |
| 6 Baithak (Reception) | 16 Swayampakghar (Kitchen) |
| 7 Dalan (Living Room) | 17 Kothar (Store) |
| 8 Majghar (Middle Room) | 18 Karanja (Fountain) |
| 9 Balad (Grain Store) | 19 Tulshi Vrindavan (Shrine) |
| 10 Devghar (Prayer Room) | 20 Rear Entry |

Plate 3-1: Typical Plan and view of Wada

Source: Household survey, Mashal, 2009

- **Chawls**

Chawls are also private housing often up to 4 stories with about 10 to 20 kholis, which are rooms meant for single household, each kholi has single room for all purposes with a kitchenette, kholis on same floor share a common block of latrines, each block containing typically 4 to 5 latrines. These are built on modern construct technology and being the cheaper option are preferred by the people belonging to the low income group.

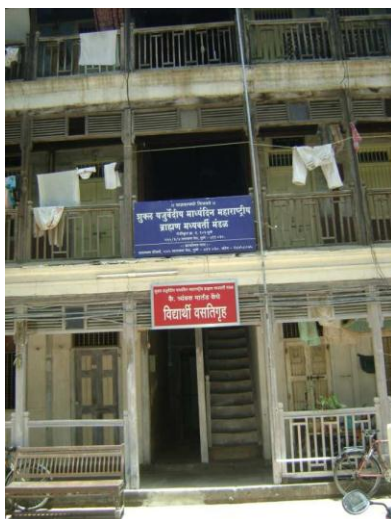


Plate 3-2: View of Chawls

Source: Household survey, Mashal, 2009

3.1.2.2 System 2: Planned Housing

- **Public Housing – MHADA**

MHADA (Maharashtra Housing and Area Development Authority) is the Statutory Authority at state level for providing public housing, with emphasis on providing dwelling units for economically weaker sections (EWS) and low income groups of the society. MHADA is having limited land reservations causing hardship, as this results in scarcity of land parcels to construct housing for weaker sections as well as LIG, MIG housing schemes. Thus, the DP should have land reservation for MHADA to ensure supply of land for construction of small and affordable houses.

MHADA has completed 27 schemes, accommodating 16,909 households, accounting to total area of 167.49 ha. Total 167.49 ha area is distributed over PMC and PCMC boundaries. Presently, there are no vacant lands available with MHADA while land acquisition is under process for 4 land parcels in Pune.

Table 3-2: MHADA Schemes in Pune

Category	Number
No. of Schemes	27
No. of Tenements	16,909
Area covered by MHADA schemes	167.49 Ha.
Future Schemes	4

Source: MHADA, Pune



Plate 3-3 View of Public Housing in Pune

- **Rental Housing**

The boom in IT sector in the city is mainly responsible for the rapid growth in the real estate market of Pune, which has become noticeable from 2007 onwards. The population of in-migrants coming for the purpose of employment or education has boosted the rental market in the city. Majority of rental housing is concentrated in eastern and western part of the city. The shortage of affordable housing and advent of real estate developers are making the residential rental market to touch the sky, which in turn is again unaffordable to the common people Pune's rental real estate market can be divided into three broad categories such as organized rental market, serviced apartments and unorganized rental market.

There are certain registered private organizations and companies who are providing rental housing units to their employees. This facility is limited to a section of people working in the organizations having the capacity to provide accommodation facilities to their employees.

Another type of rental housing provided by private sector is a serviced apartment, which is a type of furnished, self-contained apartment designed for short-term stays, having all the daily use facilities.

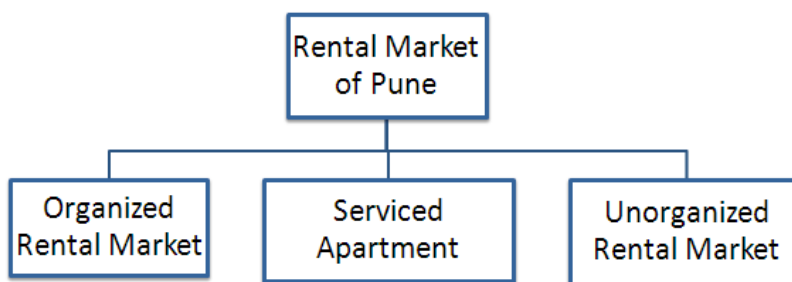


Figure 3-2: Flow Chart showing Types of Rental Market in Pune

Source: Household survey, Mashal, 2009



Plate 3-4: Serviced Apartment in Kalyani Nagar



Plate 3-5: Serviced Apartment in Koregaon Park

• Townships

The demand for housing has partially been met by the townships in the city. Under Maharashtra Township Policy, 2005, the city is having a number of upcoming township projects; these are benefitted by foreign direct investment in subsidized way. However, the non-availability of large chunks of land parcels with minimum size of 100 acres, as directed by the Maharashtra Township Policy puts limitation for developing township and thereby bounds the developers and builders to have these townships in the fringe areas of the city or outside the PMC boundaries. Considering the growth and development of the town it is proposed by the authorities to include certain identified areas within the corporation boundary in the times to come. Till date around 25 townships are registered to come up in Pune, out of which six of these townships have already started taking shape in Pune. Most of the townships have high-rise buildings.

Table 3-3: Details of Townships - Pune

Sr. No.	Township	Developer	Location	Area (Acre)	No. of Units	Project Status
1	Megapolis	Pegasus	Hinjewadi, Phase III, Rajiv Gandhi Infotech Park, Pune	150	5800	Phase I
2	Amanora	City Corporation Ltd.	Hadapsar, Opposite Magarpatta City, Pune	400	15000	Under Construction

Sr. No.	Township	Developer	Location	Area (Acre)	No. of Units	Project Status
3	Blue Ridge	Paranjape Schemes	Hinjewadi, Rajiv Gandhi Infotech Park - Phase-I, Pune	138	1100	Phase I
4	Nanded City	Magarpatta Township Development and Construction Company Ltd.	Sinhgadh Road Khadakwasla, Pune	700	5000	Phase I
5	Magarpatta city	Magarpatta Township Development and Construction Company Ltd.	Hadapsar, Pune	430	350	Phase IV
6	Oxford Golf and Country Club	Oxford Properties	Wanowrie, Pune	1300	350	Phase I

Source: Source: Household survey, Mashal, 2009



Plate 3-6: Amanora Township at Hadapsar



Plate 3-7: Laburnum Park Township at Magarpatta City

3.1.2.3 System 3: Un-Planned Housing

Pune attracts a great number of in-migrants. Poor immigrant population is homeless who are forced to live in slums predominantly located in marginal areas having substandard living conditions. The dwellers in Pune's 564 slums generally enjoy a better standard of living than in other cities of India like Delhi, Bangalore etc. by having access to water supply, streetlights, schools and primary health care. However, the overall service delivery has not kept pace with slum resident's growing needs. The details of slums and urban poor are explained in the next section.

Squatting is mostly believed to be encroachment of government land. Squatters are viewed as families unable to afford housing through rent or ownership in the private formal housing market or through the housing agency as per their preferred location, and who can usually only afford to get rental accommodation in squatters and shacks.

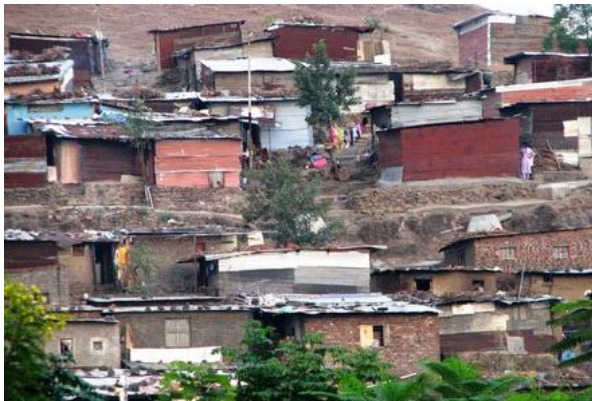


Plate 3-8: Slum in Pune



Plate 3-9: Slum Re-development Project by SRA

3.1.3 Housing Stock

The average household size of PMC in comparison with the district, state and nation are shown in figure below. The household size of PMC is the lowest depicting predominance of nuclear families, this gets confirmed with the fact that 65% of the PMC populations are below 35 years; this also indicates the prevalence of single migrants for employment and student population in the city.

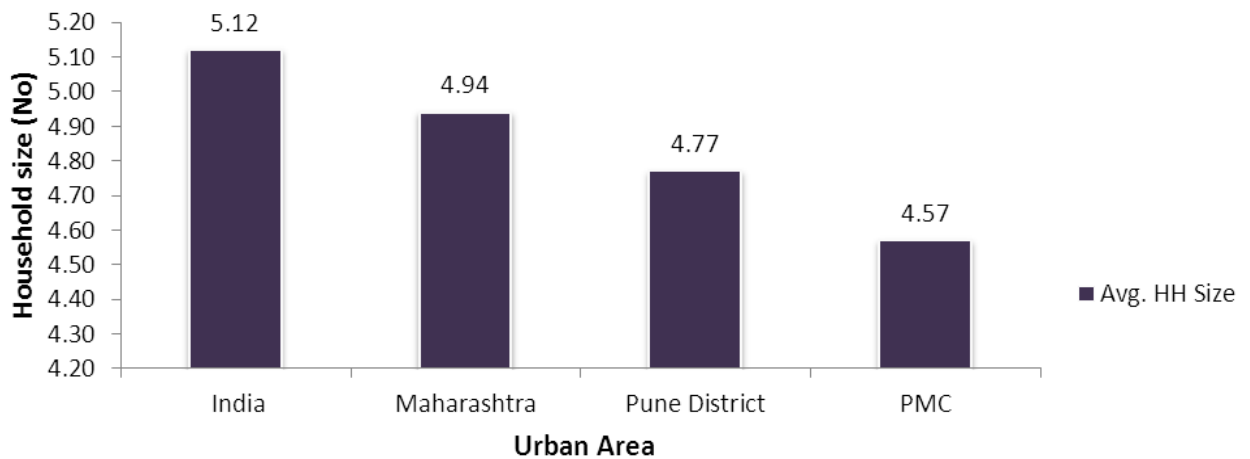


Figure 3-3: Average Household Size of PMC

Source: Census of India, 2001

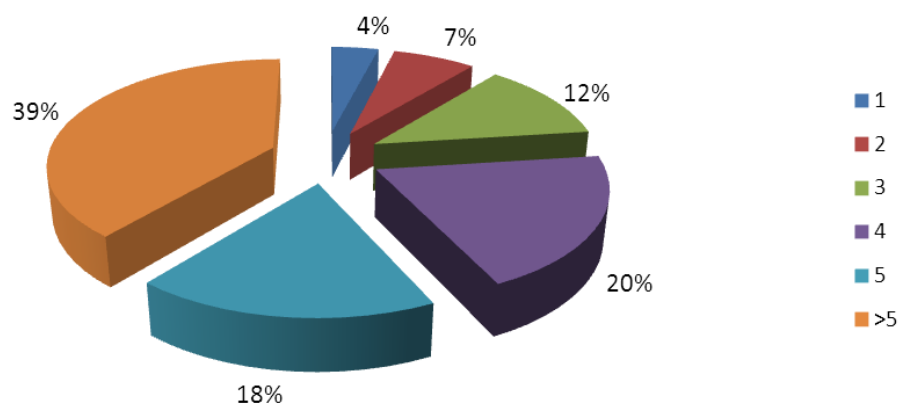


Figure 3-4: Household Size Distribution

Source: Household survey, Mashal

As per Census 2001, the average household size of PMC is 4.57 which show the presence of large number of nuclear families. The average household size of PMC as per 2009 survey by Mashal is 4.74 which are more than the 2001 census. 39% of the households within the boundary of PMC have more than 5 members which show a congested habitat. The reason for the congestion is attributed to the high cost of units which leads in the formation of slum. Nearly 40% of the Pune population lives in slums.

3.1.4 Housing Distribution by Occupancy

As detailed in next section related to slums, a dire need of residential housing stock is observed throughout the city, despite the fact that, there is a good share of vacant properties as per census 2001, accounting to 18% which is much higher than state average of 12%. This could be attributed to the restrictive Rent Control Act provisions as well as the property tax assessment system for rental properties which discourage the owners from letting their properties for rental purpose. Another reason for the vacant stock can be the number of dilapidated houses which may be the Wada's in the old city; the newly constructed houses that are unsold due to the owner's expectation for rise in housing prices, may also have contributed to the vacant houses.

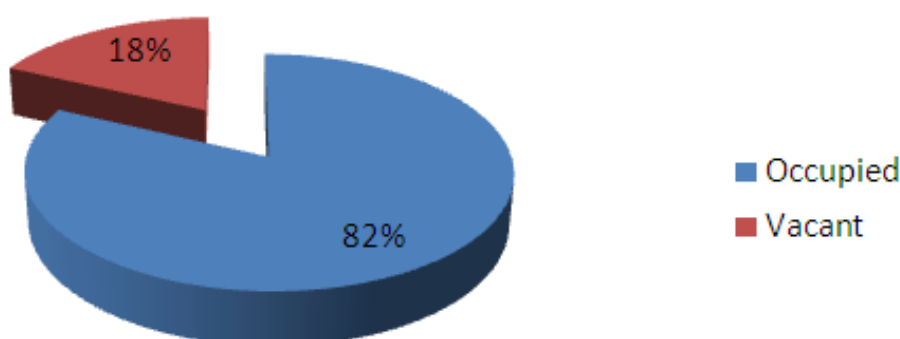


Figure 3-5: Distribution of Houses Based on Occupancy Status

Source: Household Assets and Amenities, H-series table, Census 2001

3.1.5 Housing Distribution by Use

Referring to the census of India data 2001, the city has 82 percent that is 509819 number of census houses being in residential use and 65951 as shops and offices, the detail is shown in the table below.

Table 3-4: Housing Distribution by Use

Category	Number
Census Houses	7,63,133
Occupied Houses	6,25,336
Residential Houses	5,09,819
Residential cum Commercial	8,810
Shops / Offices	65,951
School	1,615
Hotel, Lodge, Guest house	3,318
Hospital	3,603
Factory, Workshop	10,265
Place of worship	2,935
Other non residential	19,650

Source: Household Assets and Amenities, H-series table, Census 2001

3.1.6 Number of Dwelling Rooms

Data regarding number of dwelling rooms helps us in finding the affordability of the people in a city. 19% of the population can afford only one and two room units which is mostly the only option for EWS. 46% of the population can afford 1-BHK unit mostly preferred by LIG. About 20% of the households can afford 2-BHK, usually occupied by MIG and 15% of the people belong to HIG which can afford dwelling units with 5 and above rooms.

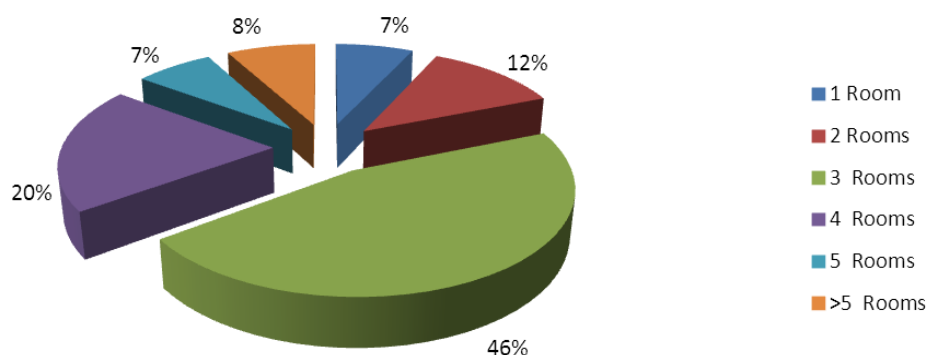


Figure 3-6: Distribution of Houses based on Dwelling Rooms

Source: Household survey, Mashal

3.1.7 Housing Condition

The Census of India, 2001 indicates that the housing condition can be assessed based on the structure of the houses in terms of material used and durability. District and city wise comparison indicate a similar scenario. The housing condition data for 2011 is not readily available with PMC.

3.1.7.1 Housing Condition on the basis of Livability

The Census houses are categorized into Good¹, Livable² and Dilapidated³ condition. 69% of total households have an access to good quality of housing. Core city area being old in terms of construction technology used and materials used with lack of maintenance has a number of dilapidated houses, which are mainly the Wadas and chawls, since these are the oldest form of buildings in the town. The dilapidated houses in the city are approximately 2% of total census houses in 2001.

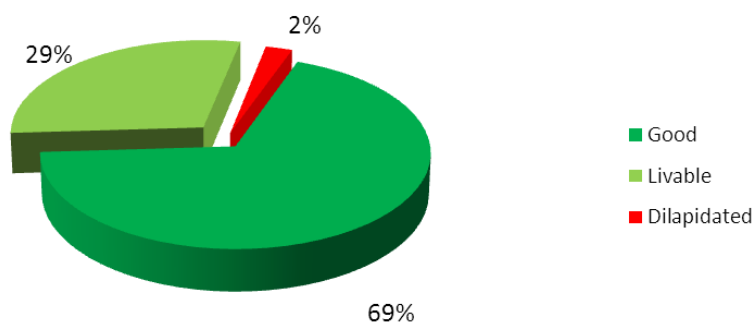


Figure 3-7: Distribution of Houses Based on Livability Condition

Source: Census of India 2001; Household survey 2009, Mashal

¹ Those houses which do not require any repairs and in good condition may be considered as 'Good' (Census of India)

² Those houses which require minor repairs may be considered as 'Livable' (Census of India)

³ Those houses which are showing signs of decay or those breaking down and require major repairs or those houses decayed or ruined and are far from being in conditions that can be restored or repaired may be considered as 'Dilapidated' (Census of India)



3.1.7.2 Housing Condition on the basis of Structural Condition

Taking an account of the census 2001 data and Household Survey 2009 by MASHAL, the Percentage of Pucca houses in the city have come down from 87% in 2001 to 60% in 2009 whereas the percentage of semi kutcha is 14%. The 26% of Kutcha houses made of temporary materials are mostly found in slums.

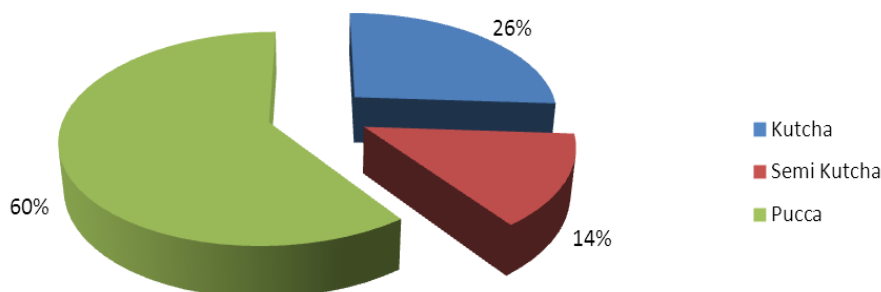


Figure 3-8: Distribution of Houses Based on Structure Condition
 Source: Census of India 2001 and Household survey 2009, Mashal

3.1.8 Access to Basic service

Of the total houses, maximum houses have individual water connections; however, 25% of the households have only shared connections. The details of all the basic services for slums are given in the next section.

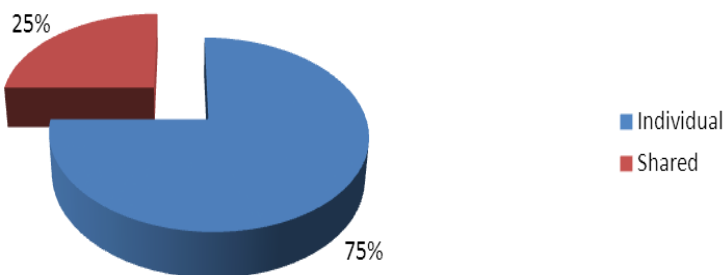


Figure 3-9: Distribution of Houses Based on Water Connection
 Source: Household survey 2009, Mashal

3.1.9 Household distribution by Tenure

The Census 2001 data states that about 67% of households are owned, followed by about 29% which are rented, this indicates that Pune city’s housing is oriented by the end users not the government authorities, since a small share of about 4% is contributed by others i.e. for Public housing of government officials.

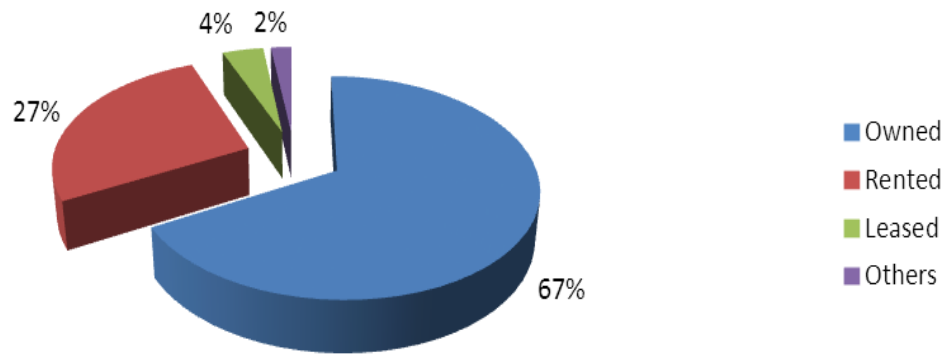


Figure 3-10: Distribution of Houses Based on Tenure Status

Source: Census of India 2001; Household survey, Mashal, 2009

3.1.10 Location Attractiveness Index of Pune for Housing

A comparative study of different locations within Pune shows Hinjewadi as having an edge over other locations. This is due to its potential for future infrastructure development along with commercial development, which in turn would lead to new employment opportunities.

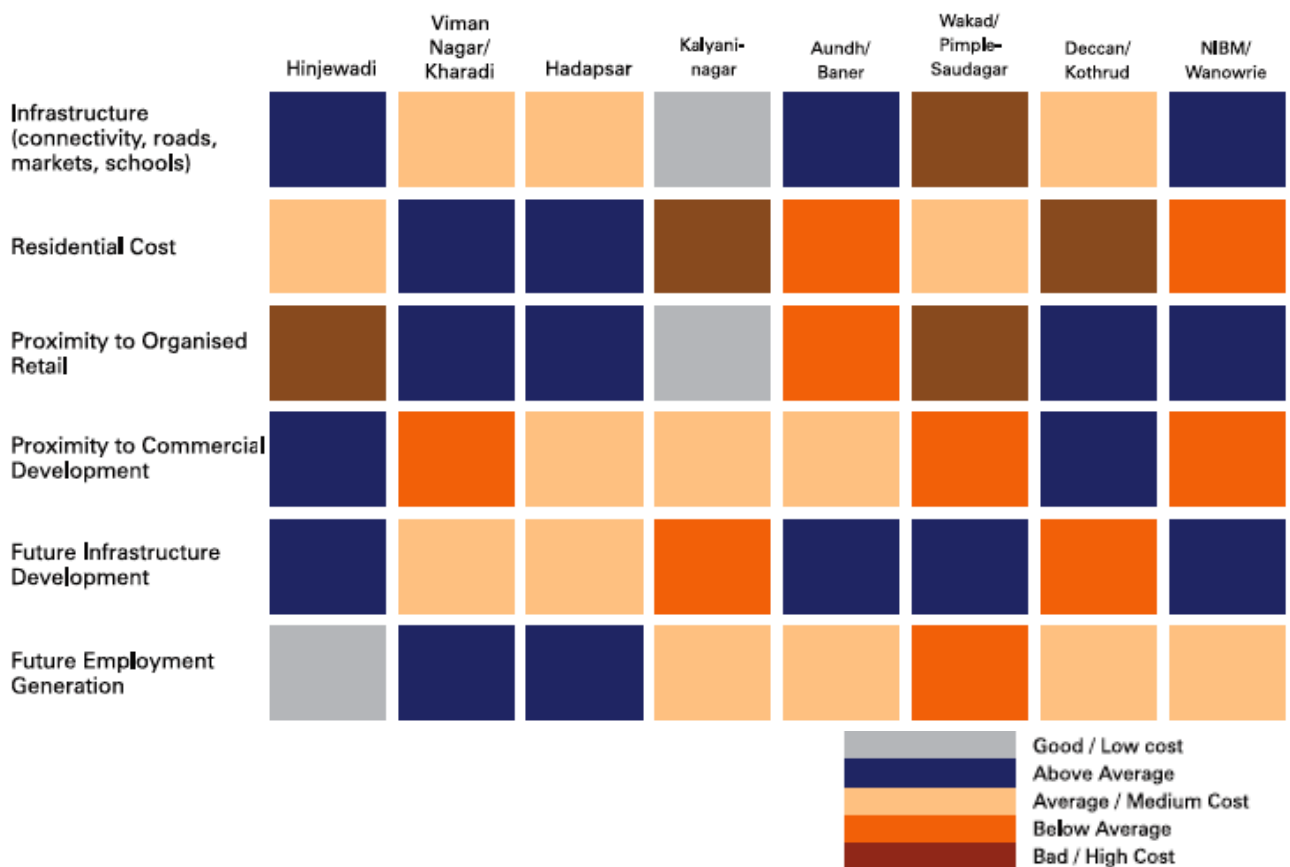


Figure 3-11: Matrix Showing Location Attractiveness of Pune

Source: ICICI Property Services, Pune Residential Real Estate Overview, 2011

3.1.11 Status of CIP Proposed under Previous CDP 2006-12

In previous CDP, the study of overall housing and the sub systems in Pune is missing. There was no mention about the housing typology and characteristics of the housing in Pune. Thus, no demand



assessment was done for the affordable housing in the previous CDP. Also, there were no strategies mentioned for increasing the housing supply.

3.1.12 SWOT Analysis

STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
<ul style="list-style-type: none"> ▪ 1,42,231 houses are in surplus in 2011 which shows a possibility of getting converted to the usable housing stock. ▪ 98% of the housing stock is in good and livable condition and 60% of the stock is pucca. ▪ Pune's core city has a good traditional character which has a potential to be conserved and re-stored. 	<ul style="list-style-type: none"> ▪ Importance of traditional housing is decreasing. ▪ IT development in the city is not matching the rapid residential development. ▪ 18% of the houses in Pune are vacant and are not contributing to the housing stock. ▪ 40% of the housing stock is not pucca. ▪ Housing development is getting concentrated near the IT industries. ▪ MHADA is having limited land reservations causing hardship. 	<ul style="list-style-type: none"> ▪ Due to the growth of IT industries, there is lot of investment in Pune's real estate. ▪ Growth of housing in PMC is envisaged towards employment nodes. 	<ul style="list-style-type: none"> ▪ Most of the traditional houses are losing their structural stability. ▪ Rental rates are not affordable to the common people. ▪ Newly constructed houses are unsold due to the owner's expectation for rise in housing prices.

3.1.13 Sector Wise Issues and Strategies - Housing

ASPECTS	ISSUES/ KEY FINDINGS	STRATEGIES AND POTENTIALS
Housing Typology	<ul style="list-style-type: none"> ▪ Importance of traditional housing is decreasing ▪ Traditional housing is losing structural stability. ▪ MHADA is having limited land reservations causing hardship. ▪ Maharashtra township policy states that 10% of total floor area shall be built up of size 40 sq.mt. which will serve to LIG class, however 10% is too less. ▪ Rental housing is not affordable for common people ▪ With increased migrants for education and employment to the city, demand for rental housing is high. ▪ 18% of the houses in Pune are vacant despite of acute housing shortage. ▪ 2% of total housing stock is in dilapidated condition and 40% is not pucca. ▪ 19% of the population can afford only one and two room units which is mostly the only option for EWS. 	<ul style="list-style-type: none"> ▪ Development Plan prepared for the core city area shall be implemented for the old city which shall give guidelines for the new buildings to be in harmony with the traditional buildings. ▪ Traditional housing should be repaired and its structural stability shall be enhanced. ▪ Land reservation for MHADA in DP should be increased to ensure supply of land for construction of affordable housing. ▪ Private housing layouts should be checked at the time of construction so as to ensure that all the amenities are provided as shown in plan. ▪ Minimum floor area for LIG under the Maharashtra township policy should be raised. If slums are on tenable land then they shall be re-developed. ▪ Affordable rental options shall be provided for common people. TDR shall be utilized for this purpose.



ASPECTS	ISSUES/ KEY FINDINGS	STRATEGIES AND POTENTIALS
Location Attractiveness Index	<ul style="list-style-type: none"> ▪ Hinjewadi is the most attractive location. 	<ul style="list-style-type: none"> ▪ Instead of concentrating on few areas like Hinjewadi, all the locations within the city have to be made attractive which will help in lessening speculation. ▪ For this purpose, infrastructure has to be developed in other areas of the city and better employment generation facilities to be provided.

3.2 SLUMS AND AFFORDABLE HOUSING

3.2.1 Definition of slums

Slums and deprivation are rather a comparative situation which may differ from place to place and depends too much on the prevailing economic conditions of the country or the state. Thus, for defining or declaring an area or locality as slum there are acts, bills and declarations provided at international, national and state levels. The definition of slum which Pune follows is the one provided by Maharashtra Slum Areas Act, 1971.

Under Maharashtra Slum Areas (Improvement, Clearance and Redevelopment) Act, 1971 a slum is defined as:

- (a) any area is or may be a source of danger to the health, safety or convenience of the public of that area or of its neighborhood, by reason of the area having inadequate or no basic amenities, or being in sanitary, squalid, overcrowded or otherwise; or
- (b) The buildings in any area, used or intended to be used for human habitation are
 - (i) in any respect, unfit for human habitation; or
 - (ii) by reasons of dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light or sanitation facilities or any combination of these factors, detrimental to the health, safety or convenience of the public of that area, the Competent Authority may, by notification in the Official Gazette, declare such area to be a slum area. Such declaration shall also be published in such other manner (as will give due publicity to the declaration in the area) as may be prescribed.

When a settlement is recognized by the local municipality as one where living conditions are below a specified standard, it is 'declared' under the Maharashtra Slum Improvement Act (1971) as 'slum dwelling'.

3.2.2 Slums in Pune City

Being a vibrant city, with multiple variants of economic activities taking place at different levels, Pune attracts thousands of immigrants from different parts of not only the state but also the country. Most of them fall in the category of lower strata forming the poor or low income group, who are forced to live in slums or slum like conditions due to poor affordability. The slums are spread over the length and breadth of the city. With regards to slums, the City Sanitation plan (CSP 2012, Pune) gives the total number as 564 with 353 declared or notified and 211 undeclared or not notified.

The slum population in Pune city is huge; more than 1.2 million people can be classified as slum dwellers.

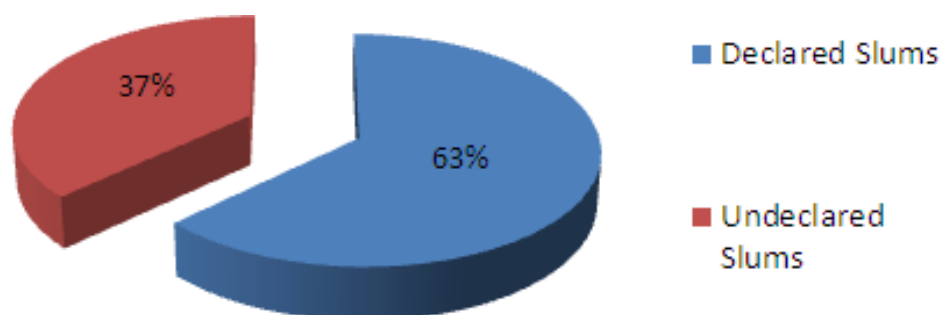


Figure 3-12: Slums – Pune City

Source: CSP – 2012

3.2.3 Growth of Slums in Pune

The growth of slums in Pune city is phenomenal; from a share of 15% of the total population in 1961, it has raised up to approximately 40% in the year 2001, the reason to such a significant increase is indubitably the steadily sturdy economic base of the city and inabilities of the Local Authorities to provide adequate supply of developed land at affordable prices to enable the generation of sufficient housing stock. It is observed that 40.56% of the total population is residing in slum settlements. Over the years, there has been considerable growth in slum population as evident from the table below. With the growth trends it is evident that almost half of Pune’s population will be in slums over the next 10 years, unless the PMC acts fast as a facilitator.

Table 3-5: Growth of total population and slum population in PMC area

SN	Year	Total Population	Slum Population	% of Slum Population to Total Population
1	1921	1,33,000	NA	NA
2	1931	1,62,000	NA	NA
3	1941	2,38,000	NA	NA
4	1951	4,81,000	38,500	8.00
5	1961	6,06,777	92,101	15.18
6	1971	8,56,105	2,39,701	28.00
7	1981	12,03,363	3,77,000	31.33
8	1991	16,91,430	5,69,000	33.64
9	2001	25,38,473	10,25,000	40.38
10	2009	Not Available	1,259,216	40.56

Source: Census of India, ESR 2004-05 and Mashal, 2009

The average annual growth rate of slum population is higher than the total population average annual growth rate (Source: Census of India; Slum Dept., PMC and Housing study for Pune Municipal Corporation 2009, MASHAL).

As per the CSP 2012 data, the total population living in slums is 10,25,000 in the year 2001, also, referring to a study done in 2009 by an NGO named MASHAL, the slum population in Pune touched a figure of 12,59,216 accommodating in a total number of 564 slums, acquiring an area of 525 hectare which calculates to a density of 2398.5 persons per hectare. The density in slums (person/Sq.km) is more than six times that of the overall density prevailing in the rest of the city (Source: CSP 2012). Comparing with the density standards for metropolitan areas, given in the Urban Development Plans Formulation and



Implementation (UDPFI) guidelines of 125 to 150 persons per hectare, the density of slums is excessively high, demanding to be redressed immediately. The total number of BPL families in the city is around 9441, which is 1.02% of the total population of the city.

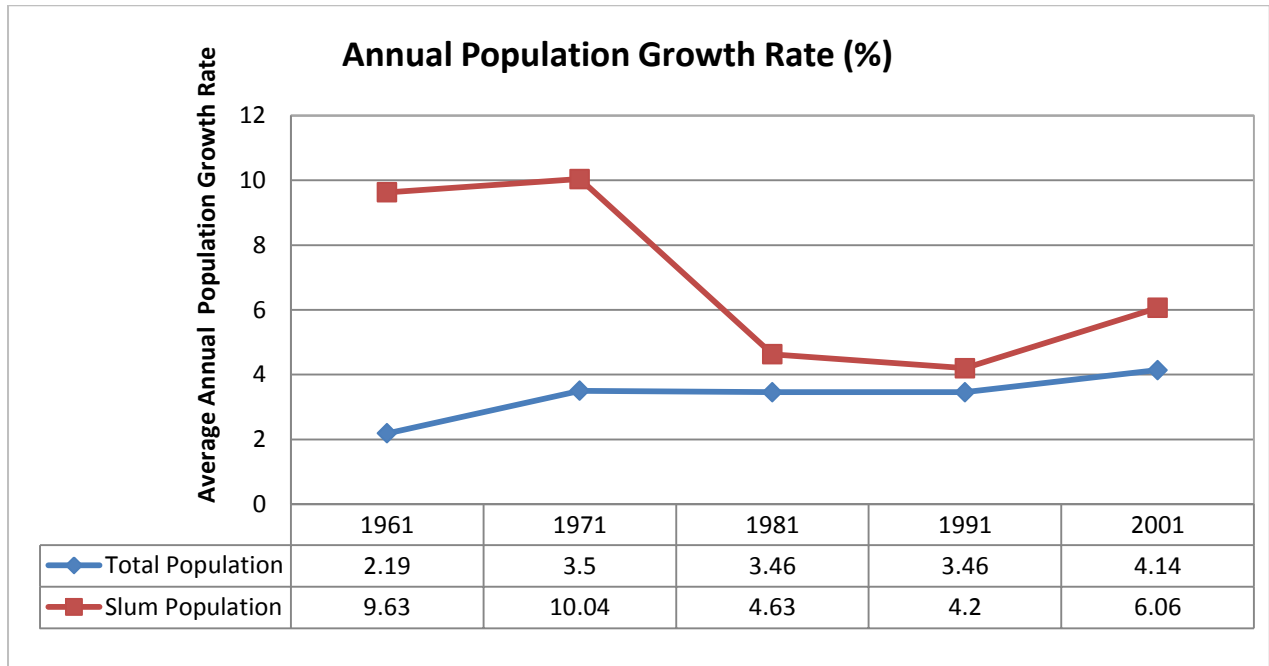


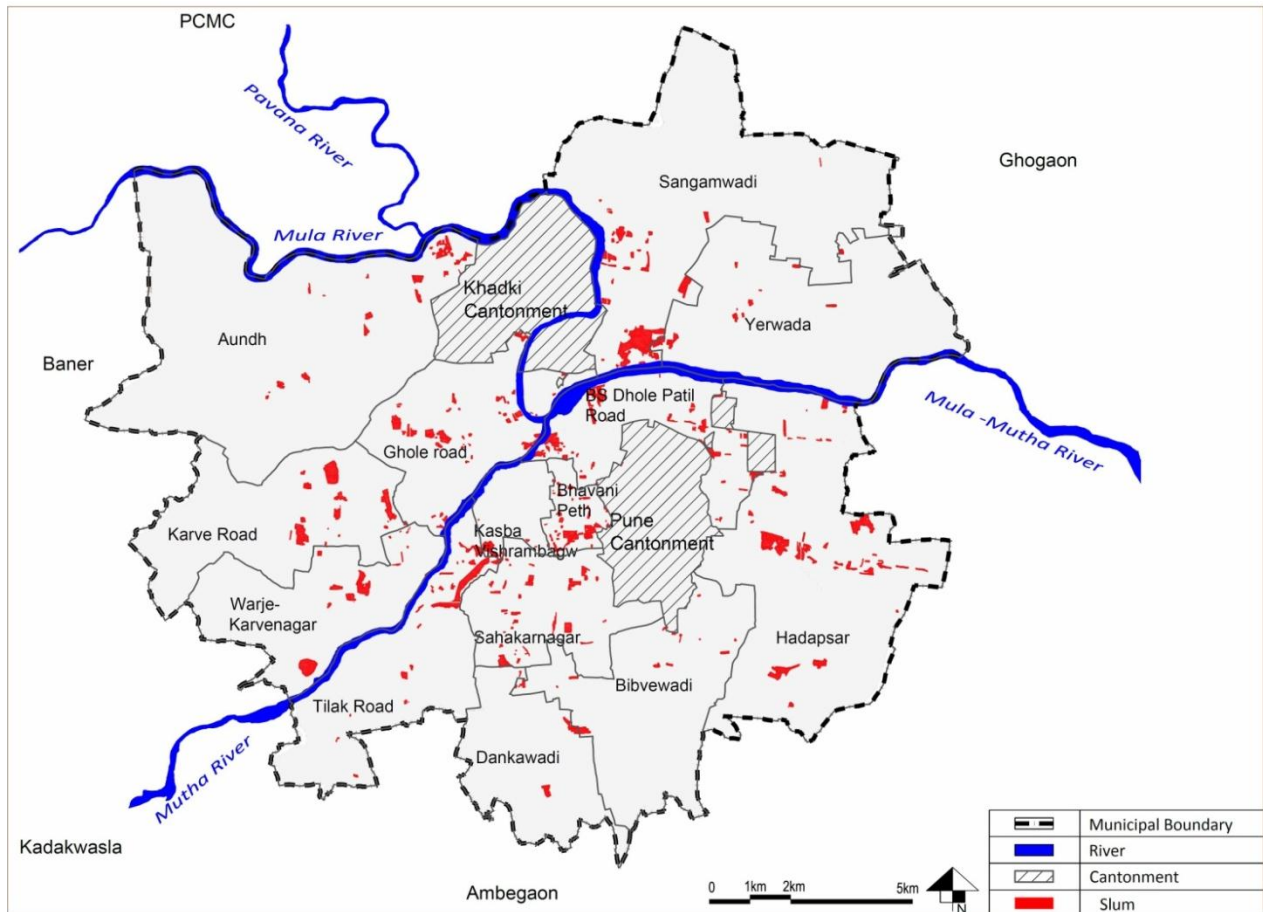
Figure 3-13: Annual Average Population Growth rate of Slum

(Source: Census of India, CSP 2012 and Housing study for Pune Municipal Corporation 2009, MASHAL NGO)

3.2.4 Declaration of Slums

If a slum has been declared, its existence is considered to be officially recognized by the local government. Undeclared slums, regardless of their conditions, are not considered eligible for basic service provision. This approach is problematic for a number of reasons like undeclared slums suffer from an extremely degraded local environment due to lack of service provision and in the case of declared slums, a slum is likely to grow physically around the original declared portion of slum. Furthermore, many slums prefer to remain undeclared as they can live on a larger footprint free of cost.

In Pune city, only 353 slums acquired the privilege of being declared as slums proclaiming that 27% of the city's population resides in declared slums and they occupy only 4% of the total city area. (Source: CSP 2012 and Housing study for Pune Municipal Corporation 2009, MASHAL). However on the basis of consultation with various stakeholders, it has been revealed that not only 353 slums have better provision of the basic services by PMC but also the rest non-declared slums are being served by the corporation. Tilak Road ward and Karve Road ward have maximum number of declared slum i.e. about 13% and 12% respectively.



Map No. 3-1: Location of Slums in Pune

Source: PMC, Slum Atlas Mashal NGO, 2009

3.2.5 Slums typology on the basis of location

Taking the reference of Household Survey by MASHAL (2009) and Slum Atlas by MASHAL (2009), on the basis of location the slums in Pune city fall in three categories:

3.2.5.1 Slums located in the Core city area

Near about two centuries back in 18th century, the occurrence of settlements for the poor people took place in the areas which comprise the core of Pune city, today; these settlements turned to slums and gathered more and more number of dwellers with the passage of time.

3.2.5.2 Slums located on the Periphery of the Core City Area

As the city grew in size the settlements with poor population also grew and the growth of such settlements took place outside the areas that contain the core city area in the existing scenario, but have good employment opportunities along with availability of vacant land like near the railway station, near Parvati hills, along Mutha River etc. Most of the slum dwellers in these areas are migrants who have come to Pune for employment and the old natives of Pune like the ones that are in the core city areas.

3.2.5.3 Slums located in the City suburbs

With the fast development and advent of industries in the city, growth of slum settlements came in as a package deal, but these factors led to growth of slums near the industrial and IT / ITes growth centers like

Hadapsar, Kirkee, Pashan etc. these mushroomed mainly on the easily available government owned vacant land parcels.

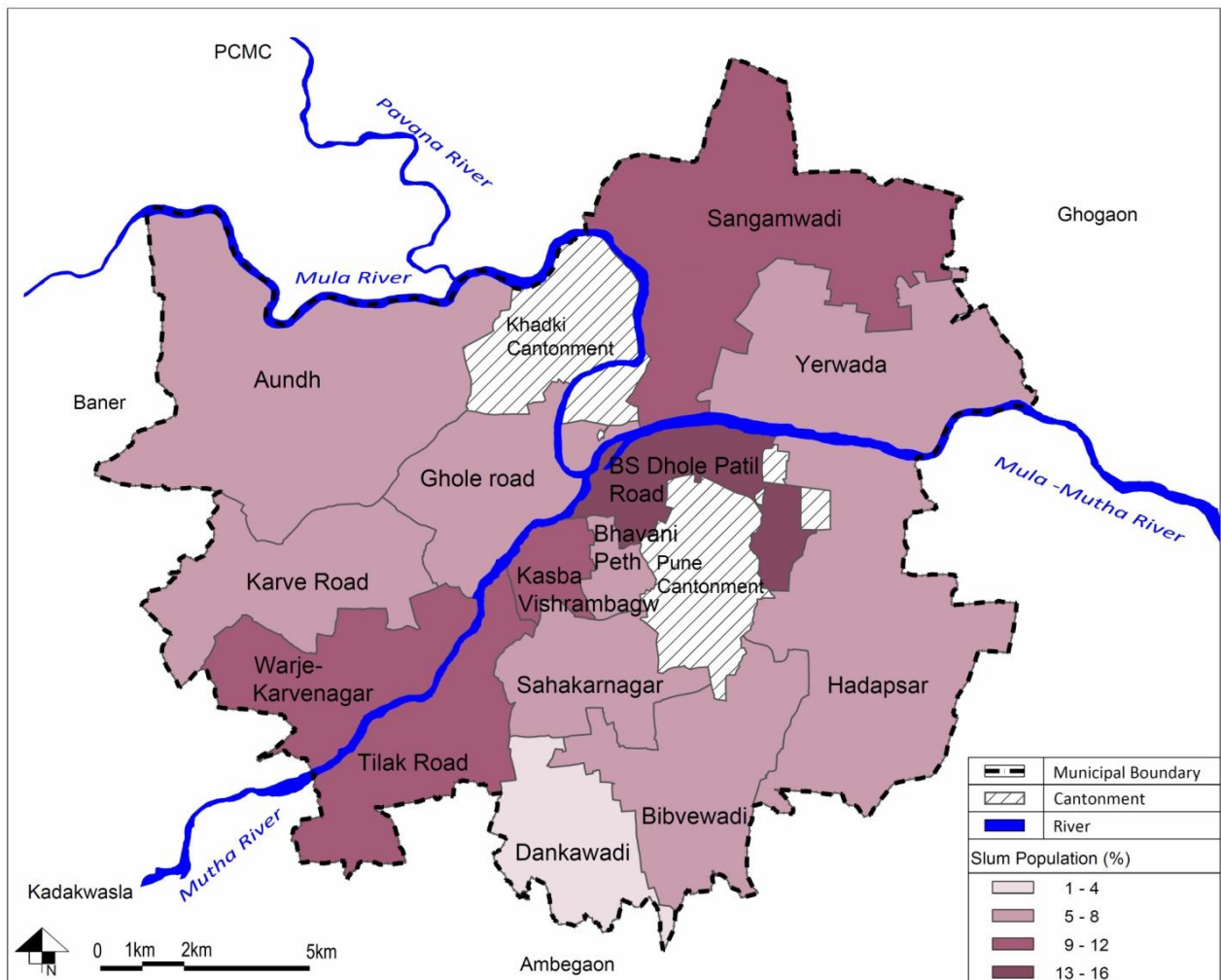
3.2.6 Characteristics of Slums in Pune (Ward-wise)

The dwellers in Pune’s 564 slums generally enjoy a better standard of living than in other cities of India like Delhi, Bangalore etc. by having access to water supply, streetlights, schools and primary health care. However, the overall service delivery has not kept pace with slum resident’s growing needs.

3.2.6.1 Slum Population (Ward Wise)

The number of slums in each ward varies depending upon many factors like employment opportunities, vacant land etc. At present the Dhole Patil Road ward shows the maximum percentage of slum population i.e. 13% followed by Sangamwadi i.e. 11%. The least number of slum populations is found in Dhanakawadi ward with 1% followed by Yerwada, Ghole Road, Bibvewadi and Bhawanipeth wards with 5%.

The total area occupied by the slums in Pune is approx 660.63 hectares. Yerwada has the highest slum area amongst all the wards, i.e. 156.85 hectares.



Map No. 3-2: Ward-wise slum population

Source: Mashal, 2009



Table 3-6: Ward-wise analysis of Slums in Pune City

Sl.No	Wards	Area of the Ward (Ha.)	Ward Wise Population	Area under slum (Ha.)	Population of Slum	Number of Slums	Declared Slums	No. of Slum Structures	Density (Tenement /Ha)	Density (Population /Ha)
1	Aundh	4075	180264	27.3	41475	34	20	8682	304	1518
2	Kothrud	1626	209046	47.5	81045	23	12	12887	341	1703
3	Ghole Road	1275	171756	44.9	84405	50	31	16881	376	1880
4	Warje, Karve Nagar	1521	232725	43.3	52245	27	11	10449	241	1206
5	Dhole Patil Road	1464	155307	51.2	72040	62	25	16417	281	1407
6	Hadapsar	2478	280215	71.9	84465	56	19	16893	245	1174
7	Nagar Road	2910	238434	20.4	29775	13	7	5955	292	1459
8	Sangam Wadi	2935	261307	85.9	116390	53	19	23278	271	1353
9	Bhawani Peth	290	191787	29.4	60615	62	38	12123	412	2058
10	Kasba Vishrambaug Wada	500	222684	49.4	8880	12	3	1776	359	1797
11	Sahakar Nagar	920	203321	33.4	70900	27	21	14180	424	2122
12	Tilak Road	1471	240740	54.22	83595	42	20	16719	308	1542
13	Bibvewadi	1835	295667	7.8	15725	11	8	3145	399	1997
14	Dhanakawadi	1084	236621	2.3	5260	5	4	1052	444	2217

Source: Slum Atlas, Pune, 2009

3.2.6.2 Household Size

The slum survey done by MASHAL in 2009 has different findings than that of the Census 2001 data; according to MASHAL survey, as shown in figure below the maximum number of households that is approximately 56% have size between 6-8 people and the average household size that is observed after analysing the MASHAL survey data is 5.4 in the slums whereas the average household size for the city as analysed by the census of India in 2001 is 4.57.

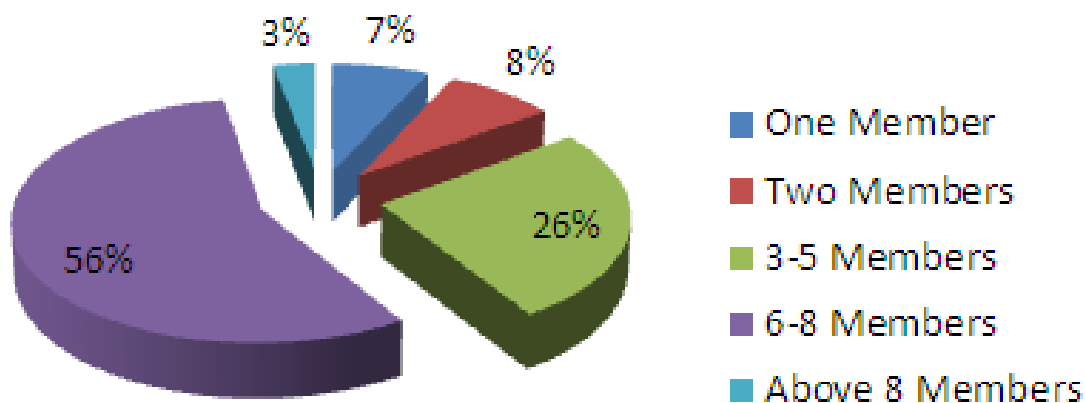


Figure 3-14: Household Size Distribution

Source: Primary Survey by Mashal, 2009

3.2.6.3 Average Monthly Income

This data is also taken from the survey by MASHAL, 2009 revealing that hardly 35 % households surveyed

have a monthly income more than Rupees five thousand whereby around 65% of households have an income which touches rupees five thousand per month. This income data clearly shows the poor affordability of the slum dwellers and justifies the persistent growth of slums in all terms that spatially as well as in population.

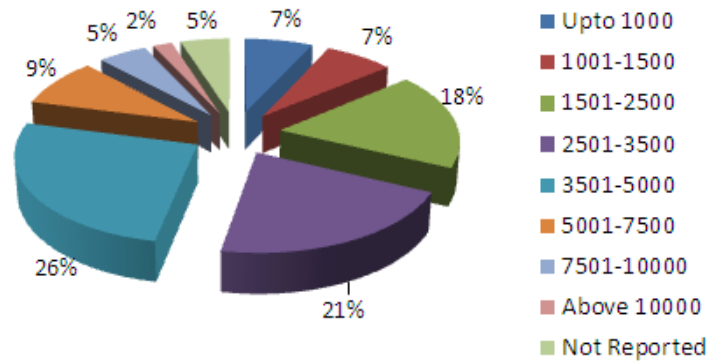


Figure 3-15: Monthly Income Distribution

Source: Primary Survey by Mashal, 2009

3.2.6.4 Number of Dwelling Rooms

The maximum number of families i.e. 61% stays in a single room in most of the slums with unhealthy living conditions. With 56% of the people having 6-8 household size, the occupants are currently living in cramped environment.

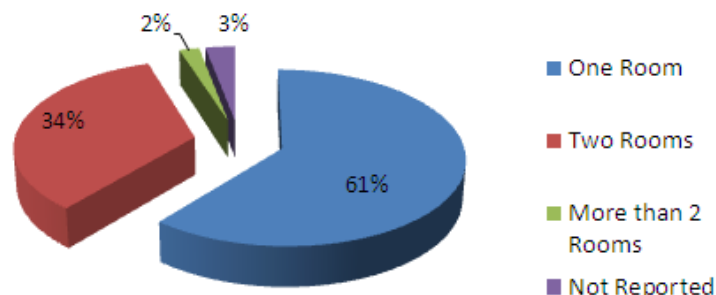


Figure 3-16: Monthly Income Distribution

Source: Primary Survey by Mashal, 2009

3.2.6.5 Carpet Area

The high density settlements of slums in Pune is a consequence of maximum numbers of tenements with as less as an area below 10 Sq.mt. with average carpet area of each tenement is about 14.66 Sq.mt. Average household size in slums is 5.4 which calculates to an average carpet area per person is 2.76 Sq.mt .

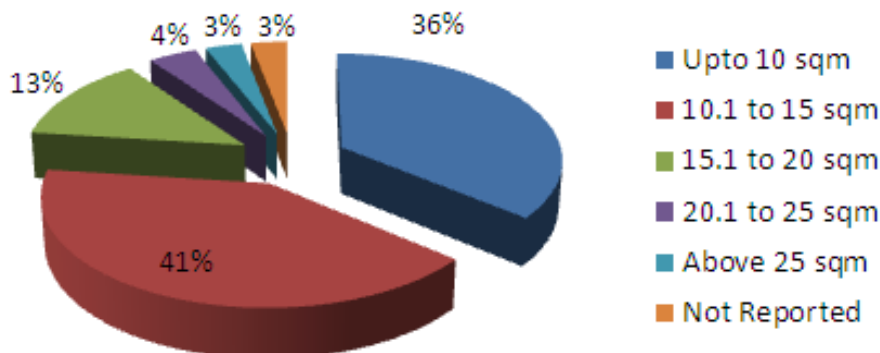


Figure 3-17: Area Occupied by DUs

Source: Primary Survey by Mashal, 2009

3.2.6.6 Housing Condition

In the slums 49% of the dwelling units are in kutcha category having GI sheets as basic building material being used for the roofs, along with temporary building materials like mud, bamboo, iron sheets, jute mats are used for the walls. In semi pucca structures brick wall is used and roofs are generally made of tile or iron sheets. Structures with R.C.C. roofs and cement mortar brick walls are only 33 percent, which are categorized as pucca housing.

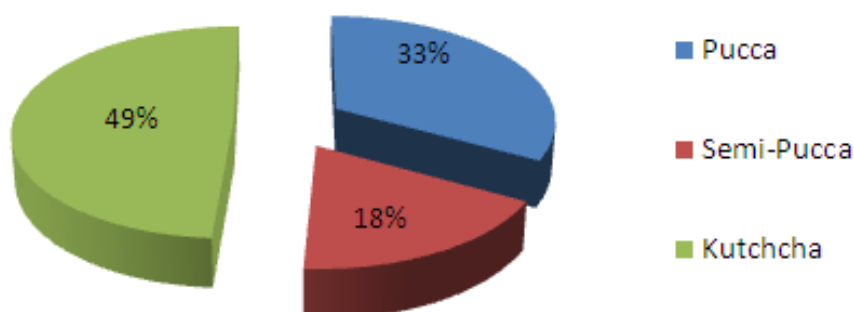


Figure 3-18: Household distribution by Housing Condition

Source: Primary Survey by Mashal, 2009

3.2.6.7 Access to Basic Services

Most of the slum households either have direct access to services or access them through community or common facilities. 58% households are having individual water supply and rest 42 % are having access to common water supply facilities. Mostly settlements are having common toilet blocks.

3.2.7 Land Ownership

Slums have encroached public as well as private land. They are largely located on the land judged unsuitable or unattractive for real estate development. Out of 564 slums, 124 slums are located on non-private land (21.99%) and 440 slums are located on the Private Land (78.01%). The break-up of non-private slums is as follows:

Table 3-7: Land Ownership of Slums

Sl.No.	Particulars	No. of Slums (No.)	No. of Slums (%)
A.	Slum Pockets located on Non-Private land		
1.	PMC	10	1.77%
2.	MHADA	3	0.53%
3.	State Government	66	11.7%
4.	Central Government		
	Railway	28	4.96%
	Defence	5	0.89%
5.	PMC + State Government	5	0.89%
6.	Private + State Government	7	1.24%
	Total Slum Pockets located on Non-Private land	124	21.99%
B.	Slum Pockets located on Private Land	440	78.01%
	Grand Total (A + B)	564	100.00%

Source: Primary Survey by Mashal, 2009

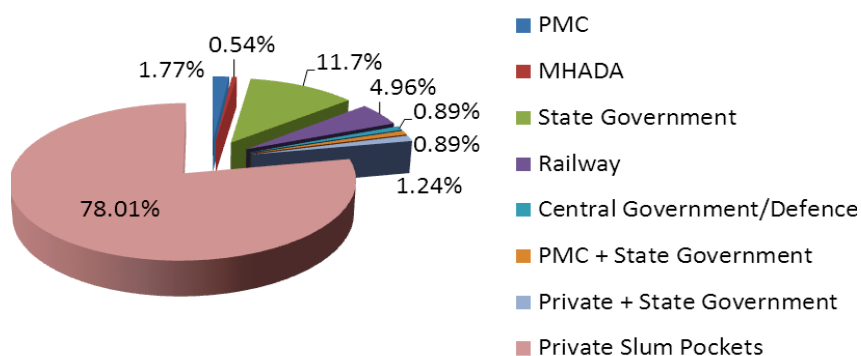


Figure 3-19: Land Ownership of Slums

Source: Primary Survey by Mashal, 2009

3.2.8 Basic Services in Slums

Table 3-8: Availability of Basic Services in Slums

Sl. No.	Wards	Number of Slums	Population of Slum	Density (Tenement/Ha.)	Range of Coverage of latrine Facility in slum areas (%)	% of satisfaction about other infrastructure of sample survey in general wards as per citizen satisfaction			Average satisfaction about infrastructure (%)
						Water Supply	Drainage	Transport facility-Bus	
1	Aundh	34	41475	304	51-75	61.6	91	68	73
2	Kothrud	23	81045	341	>75	67.9	96	67	77
3	Ghole Road	50	84405	376	51-75	72.8	98	59	77
4	Warje, Karve Nagar	27	52245	241	>75	62.3	89	47	66
5	Dhole Patil Road	62	72040	281	>75	64.1	99	64	76
6	Hadapsar	56	84465	245	51-75	62.9	84	74	73
7	Nagar Road	13	29775	292	<50	80.3	85	72	84
8	Sangam Wadi	53	116390	271	51-75	66.0	79	78	74
9	Bhawani Peth	62	60615	412	<50	74.9	90	61	75
10	Kasba Vishrambag Wada	12	8880	359	<50	73.9	85	69	76
11	Sahakar Nagar	27	70900	424	51-75	64.7	89	76	77
12	Tilak Road	42	83595	308	>75	62.1	93	67	74
13	Bibvewadi	11	15725	399	51-75	65.1	89	66	73
14	Dhanakawadi	5	5260	444	>75	69.4	72	68	69

Source: MASHAL, 2009

From the above table it can be seen that the slums in the growth direction of the city are having better basic services. The slums with most satisfied population are located in Ward No. 7 Nagar Road. This may be because of the reason that these are located in the growth direction, where employment



opportunities are upcoming and the nearness to airport and Ranjangaon industrial area, also, State Highway no. 27 passes through the ward. Dhanakawadi comprises of population which is the least satisfied, as far as basic services are concerned. This is because it is away from the growth direction of the city. The growth is restricted due to presence of forest and hills. Slums in the growth direction i.e. towards Hingewadi and Hadapsar enjoy better facilities. Slums in the old core of Pune like Kasba Vishrambaug Peth, Bhavani Peth have high densities and infrastructure in these areas is stressed. There is very less or no scope of future development here.

3.2.9 Projects and Schemes for slum improvement

3.2.9.1 Slum Rehabilitation Authority (SRA):

GoM has created SRA to develop housing stock and improve the infrastructure at a faster pace, covering Pune Corporation and PCMC area including areas of MIDC. Due to the dimensions of spatial deprivation, a special designated state agency was created in 1995 the Slum Rehabilitation Agency (SRA) to coordinate the Slum Rehabilitation Scheme (SRS). The Slum Rehabilitation Scheme is a state level policy designed to recognize the rights of any slum dweller who can prove residence in the city of Pune as of the 1st of January, 1995 to participate in the SRS. The SRS process starts with the initiative of a real estate developer or an NGO that can prove the individual agreements of at least 70% of eligible slum dwellers then the SRA will recognize this organization as the developer (HIO, 2010). The SRS policy works by giving incentives to developers. City is divided in four zones for the purpose of determining the ratio of free houses to sale component.

Highlights of SRA:

- Slum dwellers residing in slums prior to 1st January 1995 and who continue to reside there are eligible for rehabilitation.
- Each eligible slum dwelling family is entitled to get a tenement free of cost with a carpet area of 25 sqm including a multipurpose room, kitchen space, bath and water closet.
- Slum dweller with a commercial occupation gets a shop with an area not exceeding the area prior to redevelopment or 25 sqm whichever is less.
- Each unit is provided with a parking space for one two wheeler and two cycles.
- The tenement is co-jointly presented to the slum dweller with his spouse.
- One society office of 12 sqm is provided for the slum dwellers free of cost.
- Schemes with an area more than 10,000 sqm shall be provided with one balwadi, one social center and one women's welfare center providing an area of 25 sqm each.
- An amount of Rs. 20,000 per tenement is deposited with the SRA by the developer towards maintenance deposit for the slum dweller's housing society.
- During the construction of SRS, slum dwellers are shifted in temporary transit camp.

Table 3-9: Slum Area and Sale Area

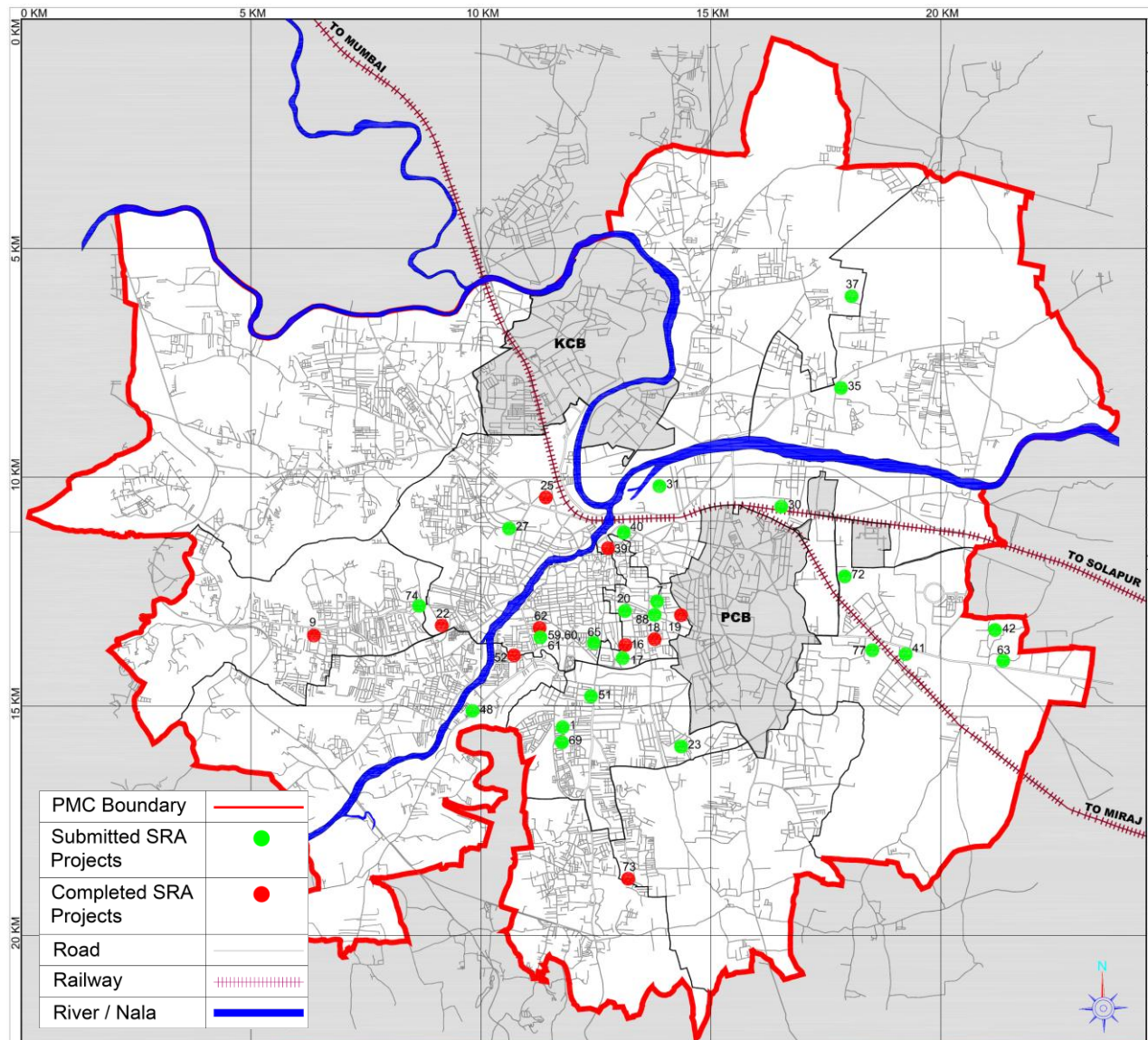
Sl.No.	Particulars	Free Sale Component (FSI)
1	Main city and congested area	1.00 : 2.00



Sl.No.	Particulars	Free Sale Component (FSI)
2	Near congested area	1.00 : 2.50
3	Within old PMC area	1.00 : 3.00
4	Newly added 23 fully villages and five partly villages	Yet not finalized

Source: MASHAL, 2009

In this scheme 2.5 FSI is given on original plot. But if maximum people have to benefit from such schemes then more than 2.5 FSI for such area is needed. This extra FSI has given by corporation in TDR.



Map No. 3-3: Location of Sanctioned and Completed Schemes of SRA, PMC

Source: Slum Atlas, Pune, 2009

SRS proposals from 134 slums (PMC-132, PCMC-2) have been filed with the SRA Pune so far, which involve 44,235 slum dwellers. Construction work has been completed in 10 SRA schemes with 2,195 tenements, 35 SRA schemes are in progress, which will add another 11,270 tenements in less than a year. Total area under these 35 sanctioned schemes is 2, 82,256.12 Sq.m.

Table 3-10: SRA Projects in PMC

Sl.No.	Particulars	Number of Schemes	No. of Households
1	Total slum pockets in PMC area	564	2,33,188
2	Total submitted schemes to SRA	134	44,235
3	Total Sanctioned Schemes	35	11,270
4	Total Completed Schemes	10	2,195

Source: PMC

3.2.9.2 Slum Redevelopment Scheme (SRD):

It is basically a Redevelopment Scheme where rehabilitation must be done in situ. These schemes are adopted when a slum is located on a tenable land and is in compliance with the city level land use. Tenement density of 500 DU/Ha and FSI maximum upto 2.5 is considered for such schemes. One of the factor differentiating SRD schemes from SRA schemes is that there is no provision of TDR in these schemes. Also there is no provision of Balwadi or welfare center under such schemes. The carpet area of 25 sqm is provided free of cost to the slum dwellers as in case of SRA.

A total of 23 schemes have been sanctioned till 2009. Construction work has been completed in 17 SRD schemes with 887 tenements covering an area of 35,695.11 Sq.m. Six SRD schemes are in progress, which will add another 1610 tenements covering an area of 65,217.54 Sq.m.

Table 3-11: Schemes for Rehabilitation

Sl.No.	Particulars	Number of Schemes
1	Total rehabilitated schemes	66
2	Sanctioned schemes	35
3	Building plans sanctioned	13
4	Work started	14

Source: PMC



Plate 3-10: Housing for slums under construction at Hadapsar

3.2.9.3 Common Toilet Scheme for Slum Dwellers:

A total of 2,500 toilets were constructed around two to three decades back in Pune city, to facilitate the population with households having no toilet facilities. Due to the negligence of the users and the authorities the toilets were not maintained creating unhealthy and unhygienic conditions all over the



area, resulting in the spread of diseases. Consequently the concept of Sulabh Shauchalayas was brought into implementation in 1992, so to provide Toilet facilities to all.

Table 3-12: Schemes for Rehabilitation

Sl.No.	Stage	Year	Blocks	Seats
1	I	2000 - 01	220	3438
2	II	2001 - 02	198	3520
3	III	2002 - 03	125	2200
4	IV	2003 - 04	100	1300
5	V	2004 - 05	68	900
6	VI	2005 - 06	62	1000
	Total		773	12358

Source: PMC

3.2.9.4 Urinals in Public Places:

To maintain the sanitary conditions in the city urinals are being installed by MAVIN, till date 150 fiber urinals for men and 27 fiber urinals for women have been installed.

3.2.9.5 Lok Awas Yojna:

The Corporation is in the process of building about 2000 houses for the low income groups. Under this scheme, the backward class is given a subsidy of INR 11,000 as the National program and an additional INR 9,000 as social work donation. In order to recognize their identity and to provide slum improvement scheme to real beneficiaries, PMC has started the Photo Pass scheme in which photo passes are issued to slum dwellers as identification proof. Photo passes are issued to slum dwellers as identification proofs. In order to get a photo pass, a slum dweller should be residing in a particular area since 1.1.95 (Source: CSP-2012, Pune).

3.2.9.6 Valmiki- Ambedkar Awas Yojna:

Under this scheme, the Central and the State Government have contributed equal amounts for the rehabilitation of backward class slum dwellers. The slum dwellers, whose name appears in the vote list of 1.1.1995, still staying in slums and below the poverty line have been offered an INR 50, 000/- subsidy for maximum 25 Sq.mt house in metro cities.

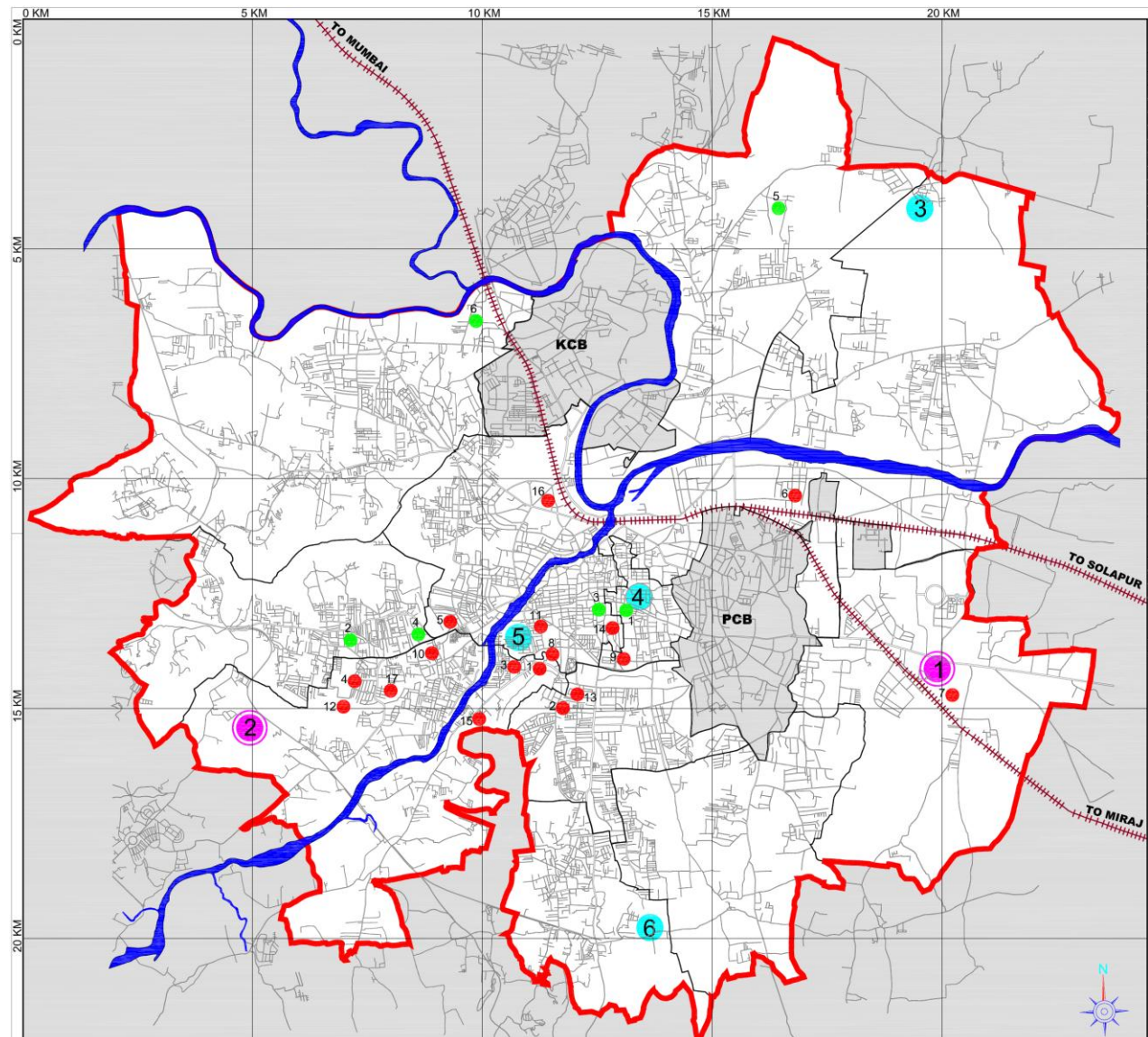
3.2.9.7 Basic Services for Urban Poor – Environment Friendly in-situ Homes:

Under BSUP Project of Jawaharlal Nehru National Urban Renewal Mission (JNNURM), in-situ concrete homes are being provided for people staying in slums. In cooperation with the benefited people, schemes have been started in Gandhinagar, Jayprakashnagar and Nagpurchowl at Yerwada. 270sq.ft livable concrete house for people in slums have been provided. To make these houses environment friendly, solar water heater, rainwater harvesting system, vermicomposting unit for disposal of degraded waste and tree plantation activities have been carried out. The uniqueness of the project is the involvement of local people in these projects. To increase the area under green cover like tree plantation to retain the moisture in soil, water conservation; solar heaters for clean environment, vermicomposting of waste are activities that will make the society environment friendly (Source: ESR 2010-11, PMC).

As per Slum Atlas, Pune, 2009; there are two BSUP sites in PMC as shown in the map above. One is located at Hadapsar and other is located at Warje. Both of these are relocation sites and 29 slums had to



be shifted here with 18,217 families.



Locations of BSUP/SRA/T2-6 Schemes			
Sr. No.	Location	Type	Legend
1.	Hadapsar	BSUP	●
2.	Warje	BSUP	
3.	Lohgaon S.No. 203	T2-6	●
4.	Bhavani Peth, S.No. 786	SRA	
5.	Rajendranagar, S.No. 1004/1005	SRA	
6.	Katraj, S.No. 10	T2-6	
Slums to be shifted to above sites No. of slums to be shifted - 29 No. of families to be shifted - 18,217			

PMC Boundary	—
Submitted SRD Projects	●
Completed SRD Projects	●
Road	—
Railway	
River / Nala	—

Map No. 3-4: Location of Sanctioned and Completed Schemes of SRD/ T2-6 / BSUP

Source: Slum Atlas, Pune, 2009

BSUP schemes are sanctioned in the year 2006. The norm for size of rehab tenement was 25 Sq.M. built up (including balcony) at that time but after the approval of BSUP schemes within a short time span,



Central and State government declared minimum required size of rehab tenement criteria with 25 Sq.M. Carpet Area. This means increase in DU size of about 35 to 40 Sq.Ft. than the previous sanctioned one. Carpet area standardization has already made slum dwellers aware and they are not ready to participate in any such scheme with previous type smaller area tenement. Moreover SRA scheme model offers 25 Sq.M. carpet area FREE OF COST so BSUP schemes are always compared with small size tenement and moreover 10% contributions to Municipal Corporation. Thus slum dwellers are hesitant to participate in BSUP schemes.

BSUP -1 (BSUP Re-location Project): While the BSUP guidelines underline the importance of insitu housing for slum dwellers, some of the slums cannot be rehabilitated in-situ and are required to be relocated on account of unsafe locations, ecological and environmental concerns like their location on the land abutting Nala, river bed, hill, garden, land reserved for road widening, footpath etc.. Such lands are called as 'un-tenable lands'. The relocation projects under BSUP include the construction of multi storied buildings at Hadapsar and Warje in Pune. The land reserved for Economically Weaker Section in the Development Plan of the city is used for this purpose. In all 3752 tenements are being built – 1344 tenements at Warje and 2408 tenements at Hadapsar.

BSUP -2 (In-situ Incremental Housing Project): The In-situ incremental housing model has multiple advantages for the slum dwellers as they remain in the same location, preserving their social fabric as well as livelihood arrangements. Areas like Yerwada and Taljai having large number of slum pockets and wherein about 60-70% houses were already permanent structures as the slum dwellers had already invested in housing were identified for the project. In all 4000 such houses are being built in 25 slums of Yerwada and Taljai.

Table 3-13: Updated list of BSUP Projects in PMC

Sr.No.	Land Details	No. of DUs	Status
Ongoing BSUP Sites			
1	Hadapsar BSUP	2408	Work in Progress
2	Warje BSUP	1344	Work in Progress
3	Parvati BSUP	112	Court Stay
	Sub Total	3864	Completion of 2500 by march 2012
Ongoing Rehabilitation (Relocation) Sites under Private Model			
4	S.No.10 Katraj	906	More than 50% complete
5	S.No.203 Lohgaon	1437	More than 50% complete
6	F.PI.No. 1004 Parvati	592	More than 50% complete
7	CTS. No. 786+787 (P)	328	More than 50% complete
	Sub Total	3263	Completion of 2000 by March 2012
Proposed Rehabilitation Sites			
8	S.No. 37 Kondhwa	745	Submitted to SRA for approval
9	S.No. 30/1/1 Hingne Karvenagar	485	EWS land applied for MHADA NOC
10	S.No.45 Dhanorie	3500	Ready for Submission
11	S.No. Hadapsar	800	Submitted to SRA for Approval
12	Kothrud / Parvati / Hadapsar	3871	
	Sub Total	9401	
	Total Targetted no. of dwelling units	16528	

Source: Revised Proposal for Sanctioned BSUP Schemes for Pune, Hadapsar Project, 2012

As per the list of sanctioned Schemes of BSUP in PMC provided by BSUP in 2012; a total of 12 schemes have been sanctioned till 2012. Out of these 12 schemes, 3 are ongoing BSUP sites which will be



providing affordable housing to 3864 DUs. Constructions of 2500 dwelling units have been completed by March 2012. Four schemes are ongoing relocation sites which will provide affordable housing to 3263 dwelling units. Constructions of 2000 dwelling units have been completed by March 2012. Five schemes are proposed rehabilitation sites which are expected to provide 9401 dwelling units. So the total number of dwelling units that will be provided by BSUP are estimated to be 16,528.

3.2.9.8 Rajiv Gandhi Awas Yojana (RAY):

RAY announced by the Honorable President of India on 4th June, 2009 for the slum dwellers and the urban poor aims at "Slum Free Cities". Under this Yojana, Pune city has been covered and the task of detailed survey of all the slums of Pune is ongoing.

3.2.9.9 Subsidy for different Classes:

Government has taken an initiative to provide a facility for different classes also these categories need special attention for their overall development as these facilities have different grant of funds from state government.

Table 3-14: Showing details of subsidy for different classes

Sl.No.	Type	Percentage
1	Specified Castes	50%
2	Backward class	30%
3	Other backward classes (O.B.C., B.C. etc.)	20%
4	Physically and mentally handicapped people	5%

Source: MASHAL, 2009

Already 2.48 ha of land in Hadapsar have been allotted for the rehabilitation of the 1164 houses that will come under this scheme. Also, an amount of Rs.5.02 Crore has been allotted. The slum dwellers residing along the railway lines, roads under widening projects and below flood levels near rivers will be shifted under this scheme to Hadapsar.

3.2.10 NGO Initiatives

- **Centre for Environment Education, Sakal Foundation and Janwani** are the NGOs that are actively involved with PMC in generating awareness among the citizens regarding sanitation, keeping the city clean and green by planting more trees.
- **Shelter Associates** has done an extensive survey of 211 slums to create slum census to facilitate the local body to improve the quality of life of slum dwellers in Pune.
- **Urban Community Department (UCD)** of the Pune Municipal Corporation and **Maharashtra Social Action and Housing League (MASHAL)** in collaboration with **Cooperative Housing Foundation (CHF)** worked on a project called 'Utthan', which is designed to collect and collate information on the physical and socio-economic status of Pune's urban slums and its inhabitants. By mapping spatial and socio-economic data onto a Geographic Information System (GIS), such as data about immunizations, health insurance and clinics, so that the municipality can make well informed decisions about the services needed by those living in the slums.
- Together, **CHF and MASHAL** have trained over 100 municipal government staff and some 4,800



Resident Community Volunteers (RCVs) on how to conduct and update community-based surveys, develop schematic representations of community profiles, and plan and implement projects through participatory principles. After the process of aggregating information and integrating it into municipal operations, the Utthan project will use the information to identify and prioritize slum community needs for service delivery. CHF and MASHAL will collaborate with the municipal government to develop procurement and implementation processes which will ensure slum communities receive the services as planned.

- **CHF and Mahila Milan (MM)** work with the local government to complete on-site upgrading (housing and basic services) of seven slums in Pune, and mobilize four other slum communities to relocate to alternative housing sites. MM (with overall strategic and management support from **Society for the Promotion of Area Resource Centers (SPARC)** and CHF began community consultations in seven slums to develop the design and implementation plans to upgrade four slum communities in Pune through a collaborative process with residents.
- **SNDT/KKPKP** in partnership with **CHF** is working with the Department of Continuing and Adult Education and Extension Work at one of India's oldest universities for women. SNDT, to help integrate Pune's many 'waste pickers'. KKPKP, a trade union of scrap collectors, and its subsidiary organizations established to improve the livelihoods and working conditions of this crucial segment of the urban poor. KKPKP is focusing on establishing a sustainable health care system for these very low-income individuals, providing access to better equipment and practices, and improving their livelihoods by setting up scarp shops to segregate and sell waste at higher rates.
- **KKPKP** with the support of **CHF** has set up, operate and improve the management of scrap shops where waste collectors can bring their recyclables for sale. The scrap shops are set up in coordination with the local government who provides the land and thereby provides a legitimate market place for this informal sector.

3.2.11 Status of CIP Proposed under Previous CDP 2006-12

The table below highlights the key projects that have been proposed under the JNNURM CDP, 2006-12 and the amount approved under the JNNURM funding. Total investment proposed for urban poor/slums sector was Rs.789.30 Crores. The previous City Development Plan proposed the priority capital investment for slum rehabilitation, Upgradation of infrastructure and land acquisition for slums.

Table 3-15: Summary of CIP for Urban Poor/Slums till 2011-12 (as per CDP 2006-12) approved under JNNURM

Sector/ Component		Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Balance DPR to be Prepared (Rs. Crore)
Urban Poor/Slums		789.30	522.41	266.89	-	266.89
1	Slum Improvement- Rehabilitation/Housing	517.50				
2	Slum Improvement- Infrastructure	129.00				
3	Slum Improvement (SRA)- Infrastructure	129.00				
4	Slum Improvement (Non SRA)- Land Acquisition	13.80				

Source: CDP Pune, 2006-12 & Pune Municipal Corporation



SRS proposals from 134 slums (PMC-132, PCMC-2) have been filed with the SRA Pune so far, which involve 44,235 slum dwellers. Construction work has been completed in 10 SRA schemes with 2,195 tenements, 35 SRA schemes are in progress, which will add another 11,270 tenements in less than a year. Total area under these 35 sanctioned schemes is 2, 82,256.12 Sq.M.

A total of 12 schemes have been sanctioned till 2012 under BSUP. Out of these 12 schemes, 3 are ongoing BSUP sites which will be providing affordable housing to 3864 DUs. Constructions of 2500 dwelling units have been completed by March 2012. Four schemes are ongoing relocation sites which will provide affordable housing to 3263 dwelling units. Constructions of 2000 dwelling units have been completed by March 2012. Five schemes are proposed rehabilitation sites which are expected to provide 9401 dwelling units. So the total numbers of dwelling units that will be provided by BSUP are estimated to be 16,528.

3.2.12 SWOT Analysis - Slums

STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
<ul style="list-style-type: none"> ▪ The dwellers in Pune's 564 slums generally enjoy a better standard of living than in other cities of India like Delhi, Bangalore etc. ▪ The slum dwellers hold a legal tenure for their house but no tenure for the land. They are quasi or semi legal and nobody can evict them. ▪ SRA is a specially designated State agency which was created in 1995 to coordinate the Slum Rehabilitation Schemes (SRS). ▪ Substantial initiatives have been taken up by the State Government and NGOs for slums in Pune. 	<ul style="list-style-type: none"> ▪ Growth rate of the slum population is higher than growth rate of the overall population in last decade. ▪ Approximately 40% of Pune population resides in slums and spread over 10% of city. Thus, the density in slums is approximately 2,399 persons per hectare which is too high. ▪ MHADA's role is limited to monitoring and funding. ▪ No adequate Housing supply by Government Agencies. ▪ Lack of coordination between organizations and various schemes, poor monitoring of schemes. ▪ Housing finance is moreover unaffordable to slum dwellers due to heavy stamp duties and other contingency charges. ▪ Most of the slum dwellers do not have secure housing tenure due to which they are debarred from local government's services. ▪ 211 slums are undeclared or not notified, in which approximately 27% of the total slum population resides. ▪ Non-declared slums were only considered under NSDP scheme and not any other scheme. ▪ Due to the overlapping in beneficiary selection criteria in some schemes, some 	<ul style="list-style-type: none"> ▪ Access to secure land tenure, improved shelters, access to basic infrastructure and employment generation through slum resettlement and redevelopment schemes. ▪ Opportunity to get legal tenure to their house. ▪ Slum dwellers can participate in SRA and can build their own shelters thus generating employment opportunity for themselves. ▪ The same land which was under slums can now be designed efficiently to have common spaces to celebrate festivals and other events with more number of DUs. 	<ul style="list-style-type: none"> ▪ As per projections in 2021 more than 50% population will be residing in slums if no adequate housing provisions are made. ▪ A number of slums are located on environmentally sensitive areas and disaster prone areas. ▪ Increasing land values and construction cost is making housing unaffordable leading to increasing slums in the city. ▪ Slum dwellers are not united and there is fierce competition for increasing areas of their dwellings as well as earning livelihoods. ▪ Given the quasi legal tenure once the dwelling is demolished they will be left with no legal right what so ever and will have to accept whatever they are given.



STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
	<p>settlements get benefit more than two times.</p> <ul style="list-style-type: none"> Community participation is not taken into consideration in any of the scheme in implementation process. Due to semi legal tenure, getting consent of the landlord to make any improvements becomes necessary. 		

Source: Findings of MASHAL, 2009

3.2.13 Sector-Wise Issues & Strategies – Slums

ASPECTS	ISSUES	STRATEGIES AND POTENTIALS
Growth of Slums in Pune	<ul style="list-style-type: none"> As per projections, in 2021 more than 50% population will be residing in slums if no adequate housing provisions are made. Density in slums is approximately 2,399 persons per hectare which is too high. 	<ul style="list-style-type: none"> Housing stock should be provided by public sector at affordable prices to EWS and LIG as per the population projections for the next 3 decades by dividing into phases. The new slums pockets should be designed as prescribed by SRA i.e. 500 DUs/Ha.
Location of Slums	<ul style="list-style-type: none"> Most of the new slums are coming on the unchecked land in periphery. A rapid growth of slum settlements observed in Yerwada, due to availability of large chunk of vacant land owned by state government. Many slums are located on environmentally sensitive areas and disaster prone areas. Slum dwellers many a times do not occupy houses provided by government as they are away from their work centers. 	<ul style="list-style-type: none"> There should be proper check and control by the government over vacant lands and at the same time, people squatting on such lands should be provided affordable housing options. Slums located in the most environmentally sensitive and disaster prone areas should be given priority in the provision of housing. Slums which will be resettled should be placed within a distance of 1.5km preferably; so that the slum dwellers do not lose their livelihood. Resettled slums should be connected to other areas of the city by public transport.
Declaration of slums	<ul style="list-style-type: none"> 211 slums are undeclared or not notified, in which approximately 27% of the total slum population resides. Non-declared slums were only considered under NSDP scheme and not any other scheme. 	<ul style="list-style-type: none"> All the slums should be officially declared as slums by the authorities so that the left over slums can also get the benefits of the schemes of the government. The slum boundaries should be updated timely so that there is no duplication of slums. Slums which have been upgraded or resettled or redeveloped should be deleted from the list of slums.
Role of Public Sector	<ul style="list-style-type: none"> MHADA's role is limited to monitoring and funding. No adequate housing supply by Government Agencies. Lack of coordination between organizations and various schemes, poor monitoring of schemes. Increasing land values and 	<ul style="list-style-type: none"> MHADA's role should be increased. They should be responsible for implementation as well. Single window concept should be adopted for better management. Strengthen the public sector by allotting Government lands so that they can have a land bank readily available for social housing.



ASPECTS	ISSUES	STRATEGIES AND POTENTIALS
	<p>construction cost is making housing unaffordable leading to increasing slums in the city.</p> <ul style="list-style-type: none"> Schemes are more politically motivated hence leads to only physical development & not wholesome socio-economic & physical development. 	<ul style="list-style-type: none"> Deserving social institutions could be granted TDR at nominal price to encourage strengthening supply of Rental housing, accommodation for working bachelors and students. Target should be set by planning authority to aim at least 15% of the TDR annually entering into market so that the other overall development of land reservations, slums and roads will take place simultaneously. Upcoming Housing schemes should have mandatory provision for the housing of the low income groups which may be kept as public property and rented out to the population who does not have the purchasing power for housing. New schemes should be prepared considering the socio-economic profile of the slum dwellers.
Beneficiary Selection	<ul style="list-style-type: none"> Due to the overlapping in beneficiary selection criteria in some schemes, some settlements get benefit more than two times. 	<ul style="list-style-type: none"> There should be a transparent and non-biased approach for beneficiary selection to avoid conflicts.
Characteristics of slums	<ul style="list-style-type: none"> 56% of the households have household size 6-8. 79% slum dwellers have monthly income ranging between Rs. 1000-5000. 33% houses are pucca 	<ul style="list-style-type: none"> Slum dwellers should be sensitized about the small family size through workshops and other measures. Employment opportunities should be generated along with the provision of housing. If slum is located on a high value land then commercial use can be created on the land providing employment to the slum dwellers. Slums should be categorized on the basis of structural condition. If a slum has more number of pucca houses with appropriate road width, then in that slum only infrastructure can be upgraded.
Community Participation	<ul style="list-style-type: none"> Community participation is not taken into consideration in any of the scheme in implementation process. 	<ul style="list-style-type: none"> On the basis of community/ people's preferences the schemes for up-gradation of slum like in-situ; resettlement etc. should be taken up. New settlements have to be designed based upon the needs of the communities only then they will be accepted by people any the will never squat again.

3.3 VISION STATEMENT

"Slum free city with Inclusive and affordable Housing for all"

3.3.1 Recommendations

As per the Rajiv Awas Yojana (RAY), the Government should take, a two stepped approach for slums viz.

restricting further growth of slums and improving the quality of life of the existing slums.

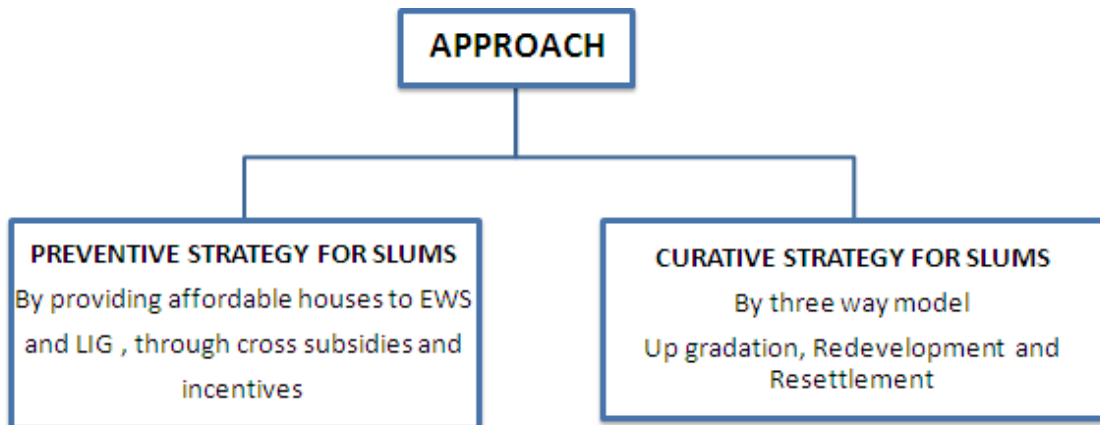


Figure 3-20: Approach for making a city Slum Free

Source: Rajiv Awas Yojana, Gol

3.3.1.1 Preventive Strategy for Slums

The aim of this strategy is to prevent new slums from coming up within the city. For this, the public sector will have to accumulate new land for housing, assess the housing need for every decade and supply new housing stock for the estimated need. Thus, if the people from EWS and LIG sections of the society are provided with affordable housing options, there will be no new slums coming up.

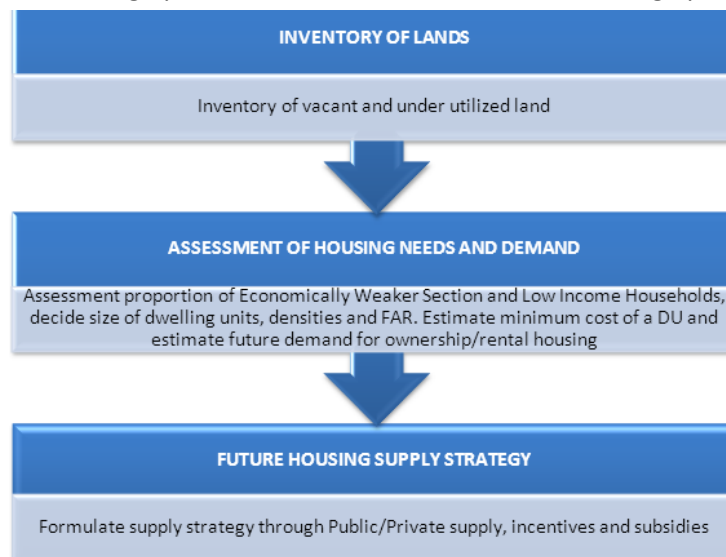


Figure 3-21: Preventive Strategy for Slums

Source: Rajiv Awas Yojana

3.3.1.2 Curative Strategy for Slums

In this method, the living conditions of existing slum dwellers are upgraded based on various factors. For this a comprehensive GIS based mapping shall be done showing boundaries of slums.

As there are large numbers of slums in the city, there is a need to prioritise slums for housing/services investment. The poorest and the most disadvantaged slums must get priority for upgrading/ redevelopment/ resettlement. The poorest and most vulnerable groups with least access to basic services/infrastructure falling into the lowest category get preference for upgrading. Non-tenable sites must also be identified, as these will have to be relocated.

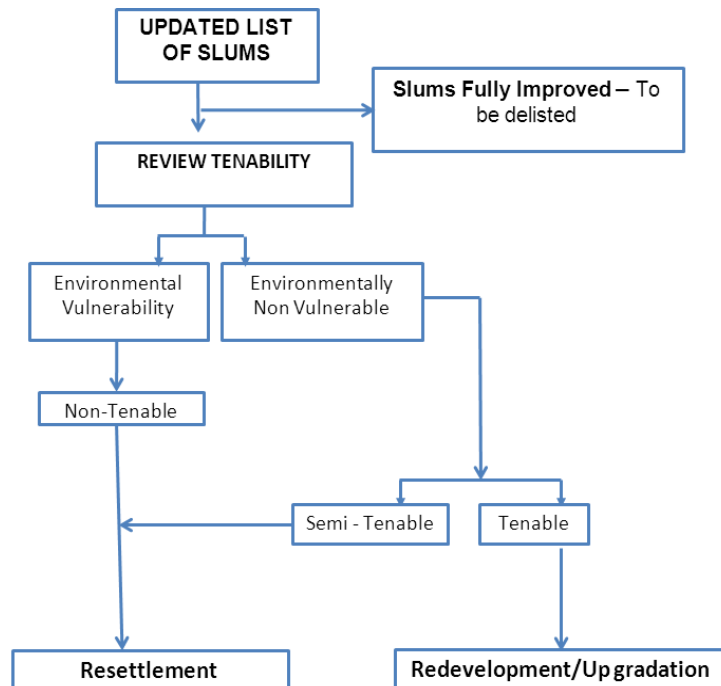


Figure 3-22: Mode of Tackling a Slum based on the Tenability Analysis

Source: Rajiv Awas Yojana

Option 1: In-Situ Upgradation (Rehabilitation)

This method is opted when the slums are located on tenable land and slum has a good layout with desired open spaces with appropriate road widths and accesses. In such case, the housing density in the existing layout is within the limits. In such a condition, only upgradation of services and dwelling units may be required. This may involve a mixture of provision or upgrading of service and infrastructure levels, incremental housing improvements or selective replacement of kutchcha houses. This is best and most affordable option for the government as there is no need of new land and it does not involve construction of dwelling units. Also this is best for the slum dwellers as they do not have to shift to other place which will help in saving their current means of livelihood.

Option 2: In-Situ Redevelopment

This method is exercised when the slum is located on a tenable land but the existing densities are above desirable densities and there are no proper open spaces and accesses to the slum. This may involve redevelopment of whole site to provide more living space and improved environmental conditions such as those in high density areas.

Table 3-16: No. of Houses to be redeveloped or upgraded

Paticulars	No. of HHs	No. of HHs
Total no. of households in slums	2,33,188	
no of HH to be either upgraded or redeveloped	1,70,983	
% of HH to be upgraded	40%	68,393
% of HH to be redeveloped	60%	1,02,590

Source: Household Survey, MASHAL, 2009

As per the primary survey conducted by MASHAL; 1,70,983 households are needed to be either redeveloped or upgraded.

Land Sharing:

78% of the slum pockets (440 in number) are located on the Private Land. Land sharing can be a good model for development of such slums. It is an approach which can be a resolution of slum eviction conflicts. Slum dwellers faced with imminent eviction can get organized and bargain successfully for a share of the land they currently occupy, and landlords – usually after protracted negotiations – have agreed to sell or lease them the land.

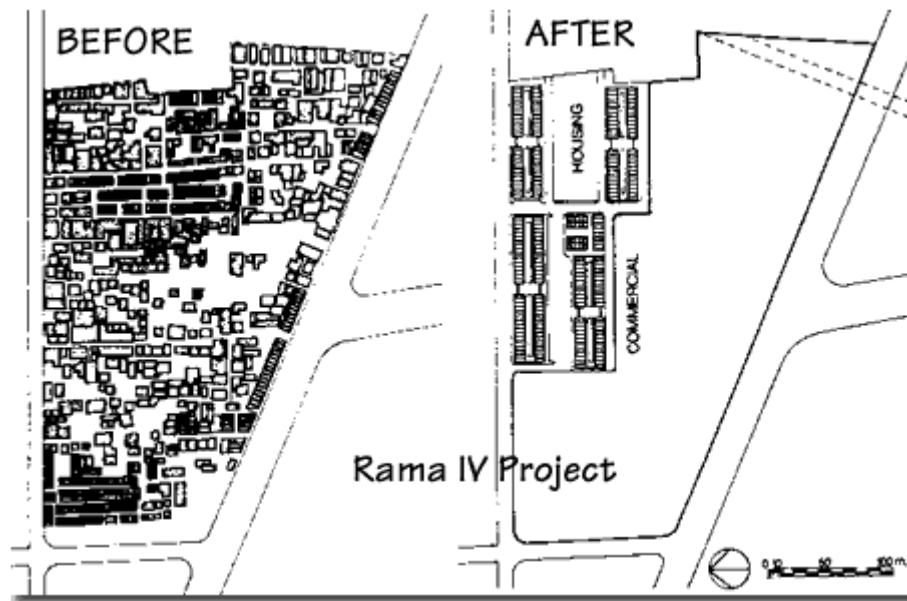


Figure 3-23: Land Sharing in Bangkok

Source: Rajiv Awasth Yojana

The five basic requisites of land sharing are:

- Community organization: Negotiations for land sharing require that slum dwellers organize to counter the threat of eviction.
- A land sharing agreement: This requires a binding agreement to partition the land. Usually the land parcel with the best development potential is allocated to the landlord.
- Densification: Rehousing the community in a smaller area requires increased residential densities.
- Reconstruction: The increase in density and the need to clear part of the site usually necessitates the reconstruction of houses.
- Capital investment: Reconstruction requires capital from the domestic savings of the residents or loans from outside sources.

Land sharing is increasingly viable in the following situations:

- The lower the development pressure.
- The better the cooperation of the landlord.
- The more legitimate is the occupation of the land by the slum dwellers.
- The earlier the stage in the eviction process.
- The stronger the community leadership.
- The stronger the support from outside agencies.



- The lower the existing residential density.
- The smaller the existing size of houses.
- The lower the value of existing houses.
- The higher the ability to pay for housing.
- The better the access to sources of housing finance.

Option 3: Re-Settlement

This method is exercised when the slum is located on untenable land or if located on the tenable land then the land is not reserved for residential land use (semi tenable). This method is a last resort where there is no alternative but to resettle. Care has to be taken that the slum should be preferably located within a distance of 1.5 km from the previous location so that the slum dwellers do not lose their jobs. Also, new sites should be properly connected by public transport to rest of the city.

Table 3-17: No. of Houses to be resettled

Paticulars	No. of HHs
Total number of households falling under riverbed / river banks / high flood level affecting line of Mutha river	5,142
Total no. of HHs falling under nallahs and canals	19,670
Total no. of HH on hilltop hill slopes (Parvati Hill)	11,604
Total no. of slum HH on state & central govt. lands	25,789
Total no. of slum households to be resettled	62,205

Source: Household Survey, MASHAL, 2009

Table 3-18: Land Requirement for slum resettlement

Paticulars	Area in Sq.M.	Area in Ha.
Rehabilitation Area	15,55,125	156
Land Required	5,18,375	52

Source: Household Survey, MASHAL, 2009

As per the primary survey conducted by MASHAL, 62,205 households are needed to be resettled and the land required for them is 52 Ha.

3.3.1.3 Community Participation

Involving community in the slum improvement measures is very important for a successful intervention. If communities are involved then they will not oppose resettlement or redevelopment. This is an opportunity to sensitize and educate the slum dwellers. Also slum dwellers knows their requirements the best, thus it is important to have community's participation so that new settlement will be acceptable to them. Communities can be involved in slum mapping which is not just a technical exercise but creates opportunities for slums to know each other.

3.4 AFFORDABLE HOUSING

3.4.1 Concept of Affordability

Affordability is generally viewed as a ratio of price/rent of housing to income of household. The ratio differs for different income groups. Lower income groups can afford to pay much less proportion of their



income for housing than that of higher income groups.

There is another category of urban poor which is also (or ought to be) a part of government's inclusive policy of providing Affordable Housing for all namely BPL (Below Poverty Line). This category needs to be considered separately and not as part of EWS. The affordability level of households in this category would be not more than 5 per cent of the income. The income categories and affordability levels thus can be defined as follows:-

Table 3-19: Affordability Levels and Income Categories

Sl.No.	Income Category (Rs.)	Affordability to pay EMI/Rent (% of Income)	Affordability to Pay Cost of House (multiple of Annual Income)
1	BPL <= 2690	5	2
2	EWS 2690 - 3300	20	3
3	LIG 3301 - 7300	30	4
4	MIG 7301 - 14500	40	5

Source: Dr Kiran Wadhwa, Affordable Housing for Urban Poor, National Resource Centre, SPA, 2009

Taking the income classification of different income groups as defined by the Government of India, the affordability levels would be as follows;

Table 3-20: Affordability Levels and Income Categories

Sl.No.	Income Category (Rs.)	Affordability to pay EMI/Rent (% of Income)	Affordability to Pay Cost of House (multiple of Annual Income)
1	BPL <= 2690	<= 134	<=64500
2	EWS 2690 - 3300	538 - 660	96840 - 118800
3	LIG 3301 - 7300	990 - 2190	158448 - 350400
4	MIG 7301 - 14500	2920 - 5800	438000 - 870000

Source: Dr Kiran Wadhwa, Affordable Housing for Urban Poor, National Resource Centre, SPA, 2009

It is obvious that not all the households in each category would be concentrating at the upper end of the spectrum. Affordability levels of most of the poor would be much lower than what is being communicated by the figures in Table 3. It is also quite evident, that at current prices these cannot fetch much of a house in most urban areas. It is important to define the lower limits for each income category also in order to plan for provisioning of all for lowest of income group in each category.

3.5 AFFORDABLE HOUSING DEMAND ASSESSMENT

The population that is living in slums implies the lack of affordable housing in the city, adding to the responsibility of the local government to provide affordable housing to the slum dwellers. The demand forecasting for this purpose is to be done by considering the ever increasing economic growth, employment opportunities and the rise in land and property market, since all these factors make the city attractive for the immigrants, which is clearly visible in the graph of slum population growth.

Consequently, to calculate the demand for affordable housing the percentage of population that is living in slums is considered over the last few decades, which has been taken as the basis to find out the affordable housing demand till the target year.



Table 3-21: Census Population for the slums in Pune

Year	Population	Decadal Growth Rate
1961	92101	
1971	239701	160%
1981	377000	57%
1991	569000	51%
2001	1,025,000	80%
2009 (MASHAL Study)	1,259,216	23%

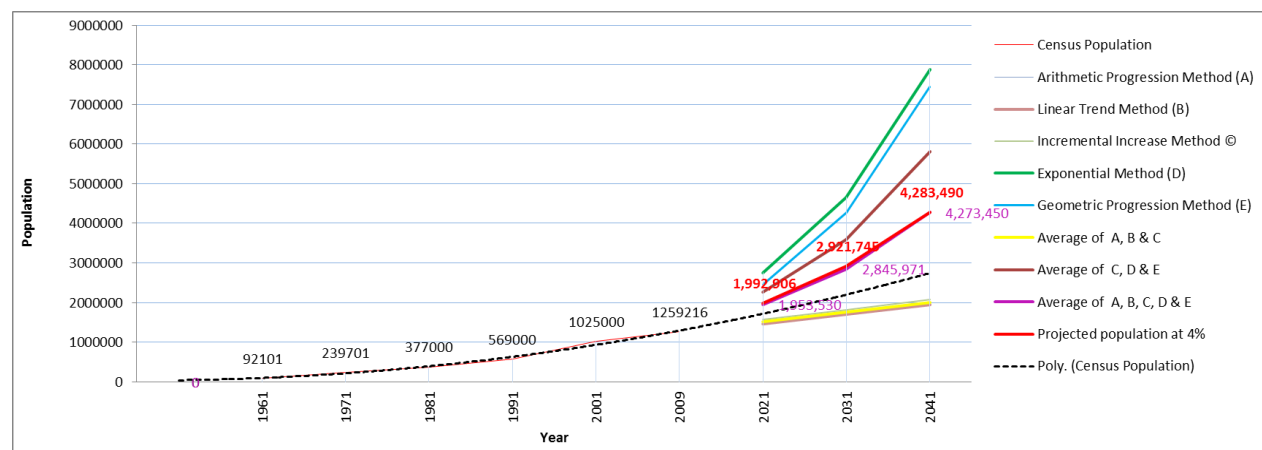


Figure 3-24: Graph showing population projections for affordable housing by different statistical methods

Table 3-22: Population projected for finding the affordable housing demand for Pune City

Horizon Year	Total projected Population for City	Projected Slum Population	% of Slum to Total Population
2021	4,487,573	1,992,906	44.41%
2031	6,211,404	2,921,745	47.04%
2041	8,597,417	4,283,490	49.82%

The population which is likely to be in need of affordable housing has been projected by using different statistical methods with different combinations so as to get the most corresponding curve to the trend line of the previous decades slum population; it is observed that average of five different statistical methods viz. Arithmetic Progression method, Linear Trend Method, Incremental Increase Method, Geometrical progression Method and Exponential method gives the most corresponding curve, which is slightly on the higher side, to the existing slum population trend graph, giving a decadal growth rate of 45 percent to 55 percent, as shown in the figure below. Whereas the population projected by incremental increase method and Geometric progression methods is giving much higher percentage growth of the slum population around 60 percent to 75 percent decadal growth rates, which seems to be unlikely since the city is attracting migrants which belong not only to the lower class rather to all the social strata, and as a theory the affordability of people also changes over the time period. But the fact that the market prices of land and real estate property are continuously increasing, that tends to increase the demand for affordable housing, indicating the population that is likely to demand for affordable housing on a higher side of the trend, which is why the slum population projected by the linear trend method, Arithmetic method and Incremental increase methods, which ranges between 10 percent to 17 percent decadal growth rates, have not been considered for future demand projection of affordable housing.



4 PHYSICAL INFRASTRUCTURE

4.1 INTRODUCTION

The sustainability and quality of life in any urban center is closely linked to the quantity and quality of basic infrastructure facilities that support it.

This chapter incorporates the existing status of services and physical Infrastructure in the city of Pune. The major sectors covered include the following:

- Water supply
- Sewerage
- Solid Waste Management
- Storm Water Drainage
- Traffic and Transportation
- Street Lighting
- Fire Fighting

4.2 WATER SUPPLY

Table 4-1: Existing Water Supply in Pune City: Overview

Source and Type of water	Rivers	Mula, Mutha, Pavna	Natural
	Dams	Khadakwasla, Panshet, Warasgaon, Temghar	Natural
	Lakes	Pashan lake, Katraj lake	Natural
	Ground water	399 dug wells, 4,820 bore wells.	Man made
Storage capacity of different sources	Dam	Storage Capacity (Thousand Million Cubic Feet)	
	Panshet	10.64	
	Varasgaon	12.81	
	Temghar	03.71	
	Khadakwasla	01.96	
	TOTAL	29.12	
Water coverage	Number of water Distribution Zones	48	
	Coverage of water supply Tap connections (in %)	94.19	
	Per capita average water supply (in LPCD)	194	
	Water losses	Transmission and distribution losses (in %)	25

Source: City Sanitation Plan of Pune, 2012

4.2.1 Source of Water Supply

4.2.1.1 Surface Water

The surface water is the prime source of water supply in Pune city which include rivers Mula and Mutha, Dams Khadakwasla, Panshet, Warasgaon and Temghar dams and lakes Pashan and Katraj. Khadakwasla

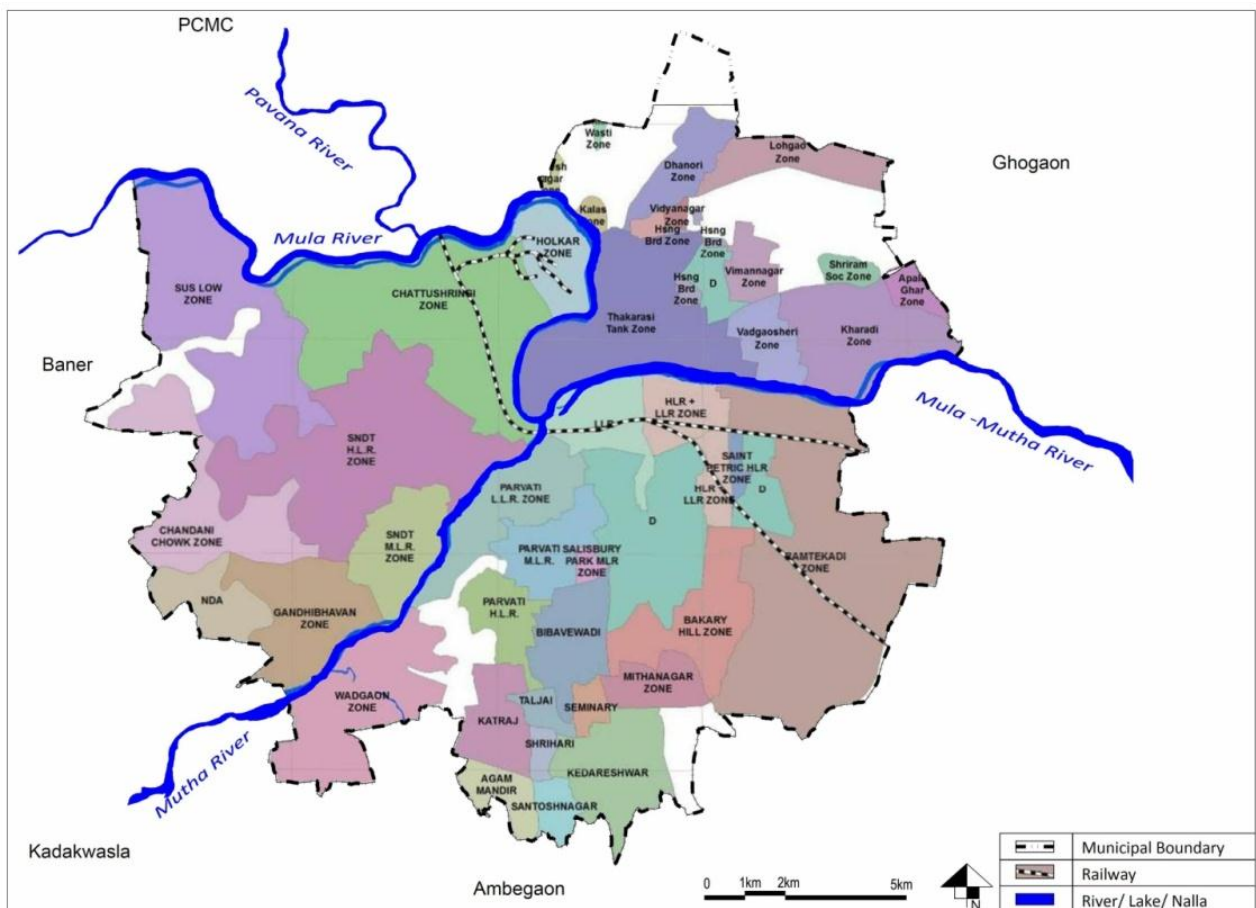
dam is located at a distance of 20 Kms from the city, in North-West direction on Mutha River. Panshet, Warasgaon and Temghar dams are located on the upstream of the Mutha River.

4.2.1.2 Ground Water

Ground water is also another important source for meeting the water supply demand of Pune. There are around 399 dug wells and 4,820 bore wells. Depth of bore wells in Pune city is of approximately 10.5-13.0 meters. Pre-monsoon level of ground water table is 6.2 meters while after monsoon it becomes 4 meters.

4.2.2 Primary Storage, Treatment, Transmission and Distribution

The water extracted from the surface and subsurface sources like intake wells, infiltration wells and bore wells is treated in the Water Treatment Plants (WTPs). At treatment plant, the raw water is made potable up to the standards of safe drinking water by pre-chlorination, primary treatment and filtration. Quality control is assured through laboratory testing at the WTPs.



Map No. 4-1: Water Supply Distribution Zones
(Source: Water Supply Sewerage Department Pune)

Presently, there are 9 Water Treatment Plants under Pune Municipal Corporation (PMC). Table below shows the status of water treatment plants, areas and population served by treatment plants, method of treatment and their current installed capacity. The current treatment capacity available in PMC is 1,318 MLD and water purified in these plants is 1,123 MLD.



Table 4-2: Detail of Water Treatment Plants

Sl.No.	Name of Water Treatment Plant (WTP)	Installed Capacity (MLD)	Areas Served	Population	Treatment Method	Current Treatment (MLD)	Quantity required MLD (@210 lpcd)
1	Parvati	537	Old town, Sahakar road, Swargate, Indiranagar, Chatusringi	1234000	Conventional	460	259.14
2	Cantonment All	380	Cantt., Solapur road, Kondhva, Kharadi, Thackeray hill, Wanowri	882000	Conventional	380	185.22
3	Vadgaon	125	Vadgaon, Katraj, Balajinagar, Kedareshwar, Aagam Mandir	405000	Conventional	84	85.05
4	Warje	100	Warje, Kothrud, Gandhibhavan, Chandni chowk, Sus, Pashan, Baner, Balewadi	404000	Conventional	94	84.84
5	Warje Augmentaton	86				75	
6	Holkar Old	20	Vidyanagar, Tingrenagar, Vimannagar, Dhanori, Kalas, Maske vasti, Lohgaon	190000	Conventional	14	39.9
7	Holkar New	20				14	
8	New Holkar Completion	20			Non -Conventional (tube Shelter)	19	0
9	wagholi	30		13 Villages Scheme		23	
						1,123	654

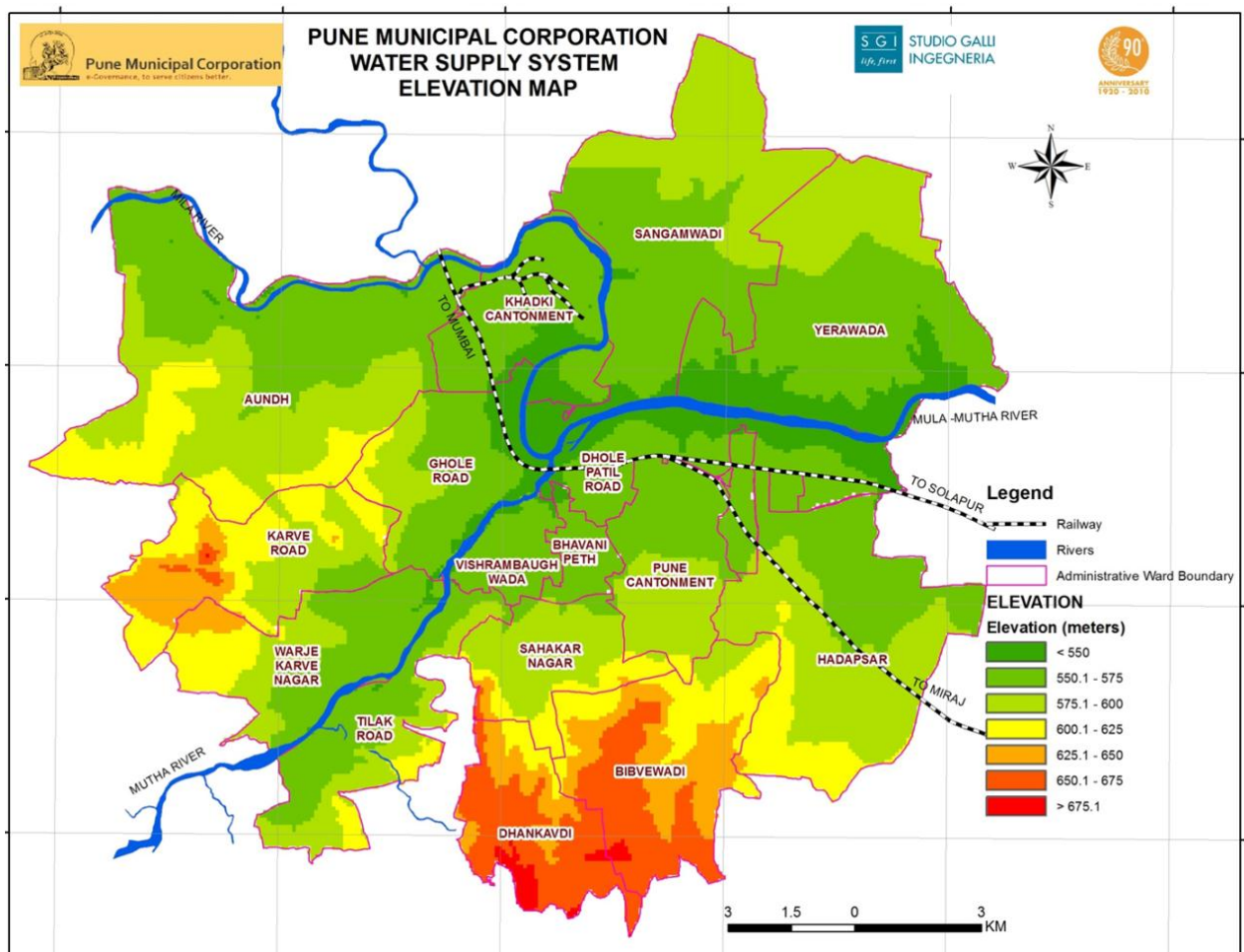
(Source: Water supply and sewerage Department, PMC)



The table also indicates that all the 9 treatment plants have adequate capacity required for the population that is being served by each of the treatment plants, considering average water supply of 210 lpcd. Hence, in the existing scenario there is no need of enhancing the water treatment Capacity of any of the 9 treatment plants, however, Parvati treatment plant and Cantonment treatment plant being older than 40 years and 120 years respectively need to be refurbished.

In Pune city, recently in the year 2012, water supply distribution system has been divided into 48 zones on the basis of reservoirs and topography. Each zone has its specified service area. Presently, there are 58 storage reservoirs in the city having a total capacity of 463 ML that is 41 percent of the total water supply which is on the higher side as per normative standard of 33 percent of total water supply that is approximately 374 ML.

The treated water is then transmitted from Water Works to Water Distribution Zones (48) as given in the map below, located in different parts of the city via 24 km transmission pipelines. At water distribution stations, the water is further treated through chlorination and chlorinated water is supplied to the consumers. The treated water is distributed from various Water Distribution Stations via distribution pipelines during supply hours.

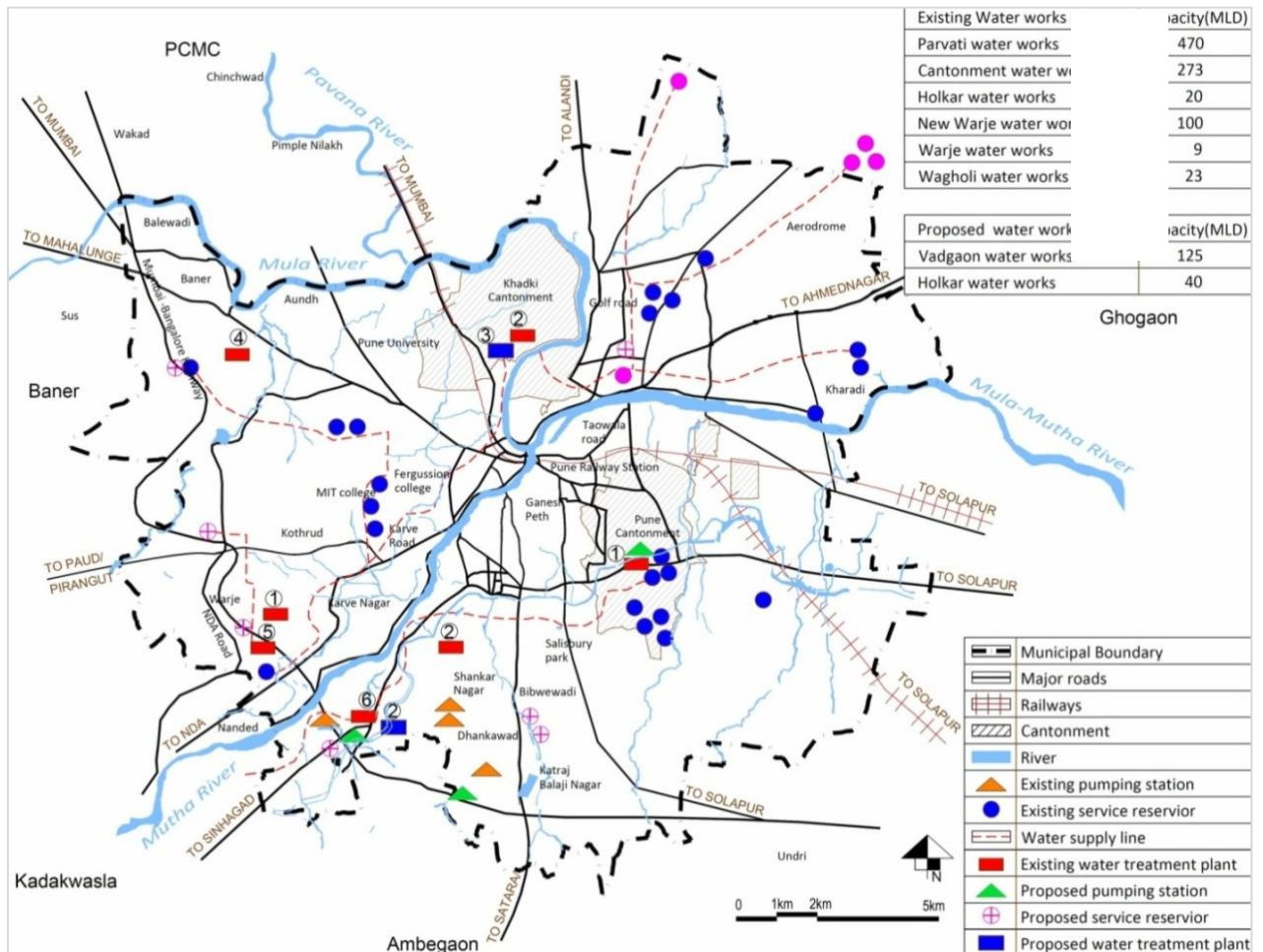


Map No. 4-2: Elevation Map Pune

Source: Water Supply and Sewerage Department

There is an issue of inequitable water supply throughout the city since the city has undulating topography as depicted in the map. The study of the map below clarifies that the in areas towards the southern part

of the city especially Sahkar Nagar, Dhankwadi, Bibvewadi, Balaji Nagar and Katraj, water has to be pumped because of higher elevation, varying from 600 m to 700 m. Despite water being supplied to the higher elevated areas through mechanical pumping the supply continuity is less which varies from 4-6 hours per day. Water supply in the areas located at lower elevations such as Dholepatil road, Bhawani Peth, Ghole Road is distributed through gravity and the continuity of water supply is as much as 20 hours per day. Water is supplied through a network of pipes consisting of different diameters. The lowest diameter size of pipe is 80 mm and highest diameter is 1600mm.



Map No. 4-3: Existing and Proposed Water Supply Distribution System - PMC

4.2.3 Coverage of Water Supply and Existing Situation

As per provisional figures of Census India, 2011, the total population of the Pune city is approximately 3.1 million and PMC supplies 1,123 MLD. The existing water distributions of the city have been discussed below:

Table 4-3: Detailed Water Supply Distribution in Pune City

Sl.No.	Aspect	Quantity (MLD)
1	Total water supply	1,123
2	Losses 25% + 5 % NRW	337
3	Total water supplied to (city + villages + PCB+ KCB) (1-2)	786
4	Bulk water to Gram Panchayat + Ammunition Factory	24
5	Water supply to city + PCB + KCB (3-4)	762
6	Water supply to PCB + KCB	30
7	Assumption for Net water supply to city (5-6)	732

Source: City Sanitation Plan of Pune, 2012



4.2.3.1 Coverage

Total coverage of water connections in Pune city is 94% which indicates 6% of the households do not have water supply connections. Approximately 6900 properties are served through the tankers.

Table 4-4: Coverage of Water Supply Connections

Sl.No.	Description	Numbers	Percentage
1	Properties served through water connections	937938	94.19
2	Total properties without water connection	57793	5.81
3	Properties served through tankers	6900	0.69

Source: City Sanitation Plan of Pune, 2012

4.2.3.2 Per Capita Water Supply and Continuity of water

Referring to the City Sanitation Plan (2012) of Pune, average per capita water supply in city is 194 LPCD, which is more than the suggested standard of UDPFI guidelines of 135 LPCD. Per capita water supply varies from 138 LPCD to 238 LPCD. Continuity of water supply is also unequal in all wards. On an average city received 6 hours water supply. Yerwada and Dhanakwadi constitute the fringe areas of the city and are underprivileged in terms of provision of water supply, which is evident from the table below; which indicates that in Yerwada continuity of water is as less as 2 hours per day and in the areas of Dhankwadi ward viz. Tilak road, Sahkaar Nagar and Hadpsar areas it is only 4 hours per day. Some areas in Yerwada ward are located at a relatively higher elevation, where water is supplied from 'Cantonment water works' which is sited on relatively lower elevation than Yerwada ward thus, resulting in poor continuity of water in Yerwada ward, besides this, the water supply pipelines are running through undulating terrain of the city thereby increasing the transmission losses. The ward 'Dhole Patil Road' gets the continuity of water as much as 20 hours per day which is highest in the city because this ward is located in the central part of the city, at the lowest elevation of the city, making the water flow by gravity in addition to being located near the 'Parvati water works' which reduces the transmission losses.

Table 4-5: Ward-wise Per Capita Supply and Continuity of Water

Sl.No.	Ward Name	Per Capita Water Supply (LPCD)	Continuity of water (Hour)
1	Aundh	149	5
2	Warje Karve Road	166	6
3	Kothurd	192	7
4	Ghole Road	139	7
5	Yerwada	200	2
6	Sangamwadi	219	4
7	Dholepatil Road	219	20
8	Kasba Vishram	260	5
9	Bhavani Peth	358	8
10	Sahakar Nagar	222	4
11	Tilak Road	157	4
12	Hadapsar	140	4
13	Bibewadi	157	5
14	Dhankwadi	138	4
	Average	194	6

Source: Water Supply and Sewerage Department, 2012

4.2.3.3 Extent of Metering Connections and Non-Revenue Water (NRW)

The extent of water metering is only 29.71%, as compared to the Service Level Benchmark (SLB) indicator

of 100%. This indicates the need to take steps for improving the water metering in the city. The transmission losses account for 25% to 30% (Source: Service level bench mark study, PMC, 2010) of the total water supply against the standard of 20%. The transmission losses are not only due to old and defunct water supply network and poor management rather due to the undulating terrain of the city.

4.2.3.4 Water Charges

Water charges for Domestic use were introduced from April, 2000. These user charges were linked with the Property and according to the property type water tax was collected. Previously, due to faulty metering there were problems like non-working of meter and preparation of faulty bills, thereby, water charges were collected on the basis of some fixed rate, based on quota system of property, without considering the property type and actual number of users in that particular property. Presently, the water charges are more dependent on the property, thus, based on the property type the usage of the water vary, hence, the water charges are linked with the Property tax, this reform has raised the collection efficiency of PMC for water charges to 90.93 percent making it more than the service level bench mark of 90 percent. Details of water charges in PMC are tabulated below:

Table 4-6: Water Charges in PMC

Sl.No.	Domestic Property Taxable Amount (Rs)	Water Charges (Rs)
1	1-1000	900
2	1001-3000	1000
3	3001-5000	1100
4	5001 onward	25 percent or 2500 whichever is minimum

Source: <http://www.indiaurbanportal.in/bestpractices/bestpractices42/bestpractices420.pdf>

4.2.4 Service level Benchmark

The Government of India has made it compulsory for all the towns receiving grants from it, to study and declare where they stand in the prescribed benchmarks for the services. The different service level benchmarks for the water supply service and the status of the city of Pune as studied in 2010 by the Municipal Corporation are discussed below.

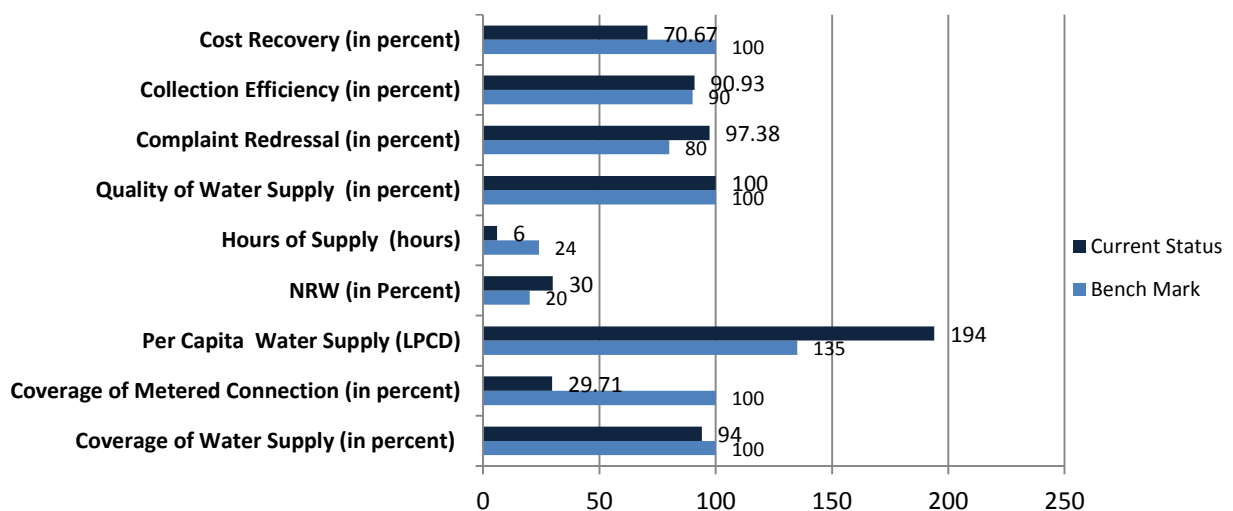


Figure 4-1: Status with respect to Service Level Bench Marks
(Source: Water Supply and Sewerage Department, PMC, 2010)



With respect to the service level benchmark, the description of overall service provision under water supply are discussed on the basis of each bench mark. In terms of coverage about 95 percent of the households have access to the piped water supply system through taps. The areas which are not covered are the newly developing fringe areas, undeclared slums and far-flung areas.

The per capita, average water supply in the city is as high as 194 LPCD against the standard of 135 LPCD and it ranges from 138 LPCD to 300 LPCD. The city also provides water to the nearby villages like Sus, Fursungi, Manjari, Sadesatara Nali etc.

A total of 30% connections are metered out of which almost all the commercial connections are metered (Source: Water supply and Sewerage Department).

Figure above indicates that the transmission losses and NRW account for 30% of the total water supply against the standard of 20% and resulting in low water pressure. Old and defunct water supply network along with undulating terrain are responsible for transmission losses and NRW.

Water supply is intermittent; typically, water is supplied twice a day. The duration varies from 2 to 20 hours, both in the morning and evening. Except for high level areas in the city and in fringe areas, supply pressures are reasonably high.

Efficiency of collection of water charges is 90.93 percent exceeding the bench mark provided. Except metered connections, water tax is included in the property tax, based on Annual Rental Value (ARV). Recently, PMC has launched a tax payment scheme i.e. penalty for delay in payment.

Cost recovery is 70 percent which is below the prescribed norm. For better annual operating revenue recovery, water supply rate needs to be equitable.

In case of other performance indicators with respect to the service level bench marks PMC water supply services are up to the mark viz. quality of water which is 100% and complaint redressal is 97% as against the standard of 80%.

4.2.5 Major Issues

As per the secondary data analysis and primary survey consultations, it was observed that although the average per capita water supply (194 LPCD) in Pune city is more than the national standard of 135 LPCD (UDPFI guidelines) yet there are certain issues with regards to the water supply system in Pune municipal area which needs to be addressed and are listed below:

- *Cantonment water work commissioned 1893 and Parvati water work is commissioned 1969 which are 120 and 43 years old so there is the need to replacement and augmentation of these water works*
- **System losses and unaccounted for water:** It is estimated that transmission and distribution losses account for 25 to 30 percent of the total supply due to old and defunct water supply network; resulting in water leakage and reduced water pressure (Source: Service level Bench Mark Study PMC 2010).
- **Inequitable distribution of water:** Per capita water supply and duration of supply is not equitable. The water supply in the core city area is about 18 to 24 hours a day while in the peripheral areas especially in north-east part of Pune city is between 4 to 8 hours and per capita water supply also vary from 138 to 358 LPCD (Source: Pune Municipal Corporation).



- It is observed that in added areas the supply is limited, due to inadequate storage and pressure and location of these areas at the tail end of the distribution system where the feeder mains prove to be of inadequate capacity.
- **Metering connection:** The coverage of metered connection is only 29.71% (Source: Service level Bench Mark Study PMC 2010). This has an adverse implication of low revenue collection for the water supply department. High number of unmetered water connections has further led to non-judicious use of water.

4.2.6 Water Supply Projects

PMC proposes to undertake the following steps to improve the water supply in the city. The list of ongoing and project pipeline are given below.

4.2.6.1 Ongoing Projects

Equitable water supply scheme for the city (24X7 water supply scheme Pune)

Pune equitable water supply scheme is under way, the draft of the Detailed Project Report has been prepared of which the finalization followed by implementation is yet to be taken up. SGS consultants are appointed for preparation of the scheme. The scheme will include, working on the network analysis, take corrective measures like detecting leaks, carry out system rehabilitation and a water audit, see the flow measurement, ensure systems' re-engineering and suggest cost-effective measures to meet the city's water demand for the next 30 years. Estimated project cost is approximately 1800 to 2000 Crore.

Aims of the Project

- Identify and minimize water losses
- Establish an equitable distribution of water
- Promote sustainable development
- Provide a fair way to allocate costs
- Improve system energy efficiency
- Improve customer service level
- Implement best management practices

Progress

- Carryout hydraulic analysis of 33 water supply zones out of 48 zones of the existing water supply distribution network.
- Preparation of 133 DMA's out of 225 possible DMA's
- Finalization of report regarding 100% meterization across the city.

Other Projects

- ✓ Laying closed conduit of 2500 mm dia from Khadakwasla dam to Cantonment water works en-route Parvati water-works to avoid uptake from open canal.
- ✓ Construction of 200 MLD water treatment plant at Warje water-works.
- ✓ Laying of closed conduit of 1600 mm dia from Khadakwasla dam to Warje water-works.



4.2.6.2 Project in pipe line

- ✓ Construction of 500 MLD water treatment plant at Parvati water-works.
- ✓ Construction of 300 MLD water treatment plant at cantonment water works
- ✓ Construction of 250 MLD water treatment plant at Vadgaon water-works.
- ✓ Implementation of equitable water supply scheme.
- ✓ Construction of water supply scheme for Bhama Ashkad Dam
- ✓ Construction of jackwell on the upstream of Khadakwasla dam

4.2.7 Status of CIP Proposed under Previous CDP 2006-12

The table below highlights the key projects that have been proposed under the JNNURM CDP, 2006-12 and the amount approved under the JNNURM funding. Total investment proposed for water supply sector was Rs.488.5 Crores. The previous City Development Plan proposed the priority capital investment for refurbishment and augmentation of the distribution network, source development, storage capacity and provision of treatment facilities.

Table 4-7: Summary of CIP for Water Supply till 2011-12 (as per CDP 2006-12)

Sector/ Component		Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Balance DPR to be Prepared (Rs. Crore)
Water Supply		488.50	-	488.50	-	488.50
1	Source Development/ Intake augmentation	165.50		165.50		
2	Pipeline – new	46.26		46.26		
4	Elevated Service Reservoirs	61.18		61.18		
5	Treatment Facilities	166.56		166.56		
6	System Refurbishment/ Replacement	49.00		49.00		

Source: CDP Pune, 2006-12 & Pune Municipal Corporation

Despite the proposals being made for improvement in entire water supply system, none of the project got approval under JNNURM, therefore in water supply sector, there is no improvement taken up under JNNURM, however, the Municipal Corporation has improved its collection efficiency thereby improving the storage capacity and has enhanced the capacity of treatment plant using their own funds; this has resulted in achieving the service level bench marks. Nevertheless, after adopting the reforms the corporation has achieved 70% cost recovery which is one of the biggest achievements made in this sector.

4.2.8 Strategies and goals Proposed in previous CDP

Key Issues In previous CDP	Goal for Development in previous CDP	Current Status /Issues
<ul style="list-style-type: none"> • It is estimated that about 30% of water is lost in distribution, thus reducing the net per capita supply to 182 LPCD. • Equitable distribution is an issue that has to be addressed by refurbishing the old distribution network and covering the newly added areas. • Of the total operation and maintenance 	<ul style="list-style-type: none"> • Adequacy, reliability and accessibility to core municipal services for all citizens with PMC as the prime service provider. 	<ul style="list-style-type: none"> • Water losses account for 25-30%. • Water supply is not equitably distributed. • 100% cost recovery in water supply is



Key Issues In previous CDP	Goal for Development in previous CDP	Current Status /Issues
<p>cost of water supply, energy cost is considerably high (about 60%). Hence, an energy audit needs to be conducted for all pumping stations and corrective measures should be implemented to reduce the cost.</p> <ul style="list-style-type: none"> While the water supply levels are reasonably good, the system coverage in terms of house service connections is poor at just 21% of total property tax assessments. PMC should move towards providing 100% house service connections and metered supply to all houses. 		<p>achieved.</p> <ul style="list-style-type: none"> Extend of metering connection which is only 29% coverage.

4.2.9 Water supply demand and Gap

Water demand is normally classified as domestic water demand and non-domestic water demand. Domestic water demand covers the use of water for drinking, washing, bathing, flushing etc. Non-domestic water demand includes the water demand for industries and other uses. Water demand is necessarily assessed for 100% satisfaction of the consumers. Although in existing scenario and up till 2031, adequate water supply is there conforming to the CPHEEO standards, but to cater the target year population, augmentation of entire water supply system is needed.

In case of Pune water demand has been calculated on the basis of CPHEEO Manual at the following rates;

- Net Domestic Supply at consumer's end = 150 LPCD
- Provision for Non-Domestic supply = 30 LPCD
- Losses in the system at 15 percent = 30 LPCD
- Total gross Supply = 210 LPCD

Table 4-8: Future Water Requirements

Year	Projected population PMC	Projected population Pune Cantonment	Total Population	Water Requirement (MLD)
2011	3115431	79965	3195396	671
2021	4487573	87962	4575535	960
2031	6211404	95959	6307363	1324
2041	8597417	103956	8701373	1827

Source: VSPL Calculations, 2012

- Existing water requirement =671 MLD
- Assumed Net water supply (as per PMC) = 786 MLD, so there is no gap in case of water supply
- Future requirement for the year of 2041= 1827 MLD
- Existing install capacity of water treatment plants =1318 which is sufficient till 2031
- Future requirement for the year of 2031-2041= 1827-1318=509 MLD



4.2.10 SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> ✓ Availability of reliable water sources till 2031 ✓ Adequacy of Potable water ✓ Adequate coverage of water supply ✓ Water flows by gravity from Source to treatment plant. ✓ Uninterrupted power supply ('Express Feeders' for all WTPs) 	<ul style="list-style-type: none"> ✓ Water losses 25-30% ✓ Only 29% coverage of metered connection. ✓ 6 % of population is not connected with water supply network. ✓ Low efficiency in collection of water supply charges. ✓ Water supply is not equitable. ✓ No telescopic tariff for water consumption. ✓ Lack of awareness regarding water conservation among the citizens. ✓ Lack of alternative sources of water after 2031.
Opportunities	Threats
<ul style="list-style-type: none"> ✓ 100% metering will lead to 100% collection of water taxes thereby increasing the revenue income of Municipal Corporation. ✓ Improvements to water supply and pressure are required in some areas of the city, predominantly the outer areas, specially the north-eastern areas. Opportunity to avail funding through the JNNURM. ✓ Opportunity of availing 24X7 water supply should be tapped under JNNURM ✓ Private sector participation in service delivery 	<ul style="list-style-type: none"> ✓ Threat of scarcity of potable water to cater the projected population after 2031. ✓ Undulating topography resulting in the problem of low water pressure in some areas. ✓ NRW ✓ Lack of interest for willingness to pay.

4.2.11 Vision Statement

To ensure safe, potable, reliable, equitable, affordable water for all with sustainable water sources.

4.2.12 Goals

- Equitable distribution of water supply in all areas.
- Ensuring 24X7 pressurized water supply in all areas.
- To increase the level of ground water.
- Strengthening of storm water system for drinking purposes.
- Minimizing the transmission and distribution losses.
- 100 percent coverage of metered connection.
- 100 percent cost recovery of water supply on Telescopic tariff Basis

4.2.13 Strategies /Priority action

- Identification and assessment of water sources to fulfill the future requirement of water supply in the city
- Decentralization of water supply system in term of storage capacity, coverage of population availability of water sources. Formation of water supply zones as per suggested by Equitable water supply scheme for Pune City
- Construction of new water treatment plants



- Improvement of storage capacity
- Provision of city wide rainwater harvesting system and ground water recharging system
- Reduce the operation and maintenance through Water audit, Energy audit & Financial reforms and increase the cost recovery of water supply.
- Introduction of telescopic tariff after the implementation of 100 percent metering system
- Introduction of Public private partnership for operation and Maintenance of water supply system

4.3 SEWERAGE AND SANITATION

Sanitation has become a yardstick of socio-cultural development of a city. As a result of rapidly expanding populations, haphazard development, urban Sprawl, and inadequate or poorly designed and malfunctioning sewage treatment facilities, in urban areas untreated sewage is often discharged into rivers. This practice has serious repercussions to human health, river aquatic system, ecosystem and the already fragile economies. Consequently, there is an urgent need to increase wastewater treatment in the urban areas, which is presently far below the required levels. Improved sanitation results in improvement of health, reduction in child mortality/morbidity, improved water quality, environment and economic growth of a city. Although in case of Pune city, the coverage of sewer network is good but because of untreated wastewater (29%) Mula and Mutha River is getting polluted.

Table 4-9: Existing Sewerage System in Pune City

Waste water disposal	Total Sewage generation	744 MLD
	Sewer Network Coverage	97.6%
	Number of Sewage Treatment Plants and Pumping Station	9
	Collection efficiency of sewerage network	73.35%
	Coverage of toilets	97.36%
	Percentage of recycle and reuse water	7%
	Number of Community toilets	466
	Number of Pay and Use toilets	770

Source: City Sanitation Plan of Pune, 2012

4.3.1 Sewerage Network

Sewerage system in Pune was laid in the late 1915, which covered core central areas of Pune. In 1997, the total main sewer length in all administrative zones was approximately 146.83 km, while currently it is 1260.6 km in length. Presently, Pune city is equipped with well-designed and regularly maintained underground sewerage system. Stoneware pipes are used for upto 300mm dia sizes and RCC Hume pipes varying in diameter from 300 mm to 1200 mm for sub-mains/mains/outfall sewers.

PMC has a decentralized system for sewerage. Pune Municipal Corporation divided whole sewerage system in 17 sewage districts. Sewerage districts are divided on the basis of following considerations.

- Topography
- Alignment of natural Drainage channels
- Alignment and diameter of existing trunk and outfall of all sewers
- Location and Capacity of existing sewerage treatment plants
- Availability of land for augmentation of existing sewage treatment plan



- Available sites and their sizes for the new sewage treatment plants

Each district has a specified area of service. These zones are different from the administrative wards.

All developed areas in the city are provided with sewer collection network and sewage is collected and pumped through nine pumping stations located at different places. The collection efficiency of sewerage network is estimated to be 73.35% against 100% of Service Level Benchmark (SLB) standard.

4.3.2 Sewage Generation

The major source of sewage is from domestic, commercial, industrial and institutional areas within the city. Domestic sewage consists of human wastes, paper and vegetable matter. This type of waste is organic because it consists of compounds of carbon and can be broken down by micro-organisms into simpler compounds, which are stable and not liable to cause a nuisance. Besides domestic sewage there is industrial waste. Many industrial wastes are also organic in composition and can be treated by micro-organisms in the same way as domestic sewage. This type of treatment is called biological treatment and the strength of the sewage is measured in terms of Biochemical Oxygen Demand (BOD). This is a measure of the amount of oxygen used by the micro-organisms in breaking down the sewage into stable compounds.

PMC supplies 1,123 MLD of water out of which 20-25% is unaccounted due to leakage, thefts, infiltration losses (CSP, 2012) while the quantity of water actually supplied is 786 MLD i.e. 80% goes as sewage, which comes to about 629 MLD. In addition to this around 115 MLD is generated from other sources. The total sewage generated in the city is 744 MLD. The detail of sewage generation is given below:

Table 4-10: Detail of Sewage Generation

Aspect	Quantity (MLD)
Total water supply	1,123
Losses in water supply + 20	337
Assumption for Net water supply	786
Sewage generation approximately	629
Other sewage generated	115
Total sewage generation	744

Source: Pune Municipal Corporation, 2012

4.3.3 Sewage Treatment

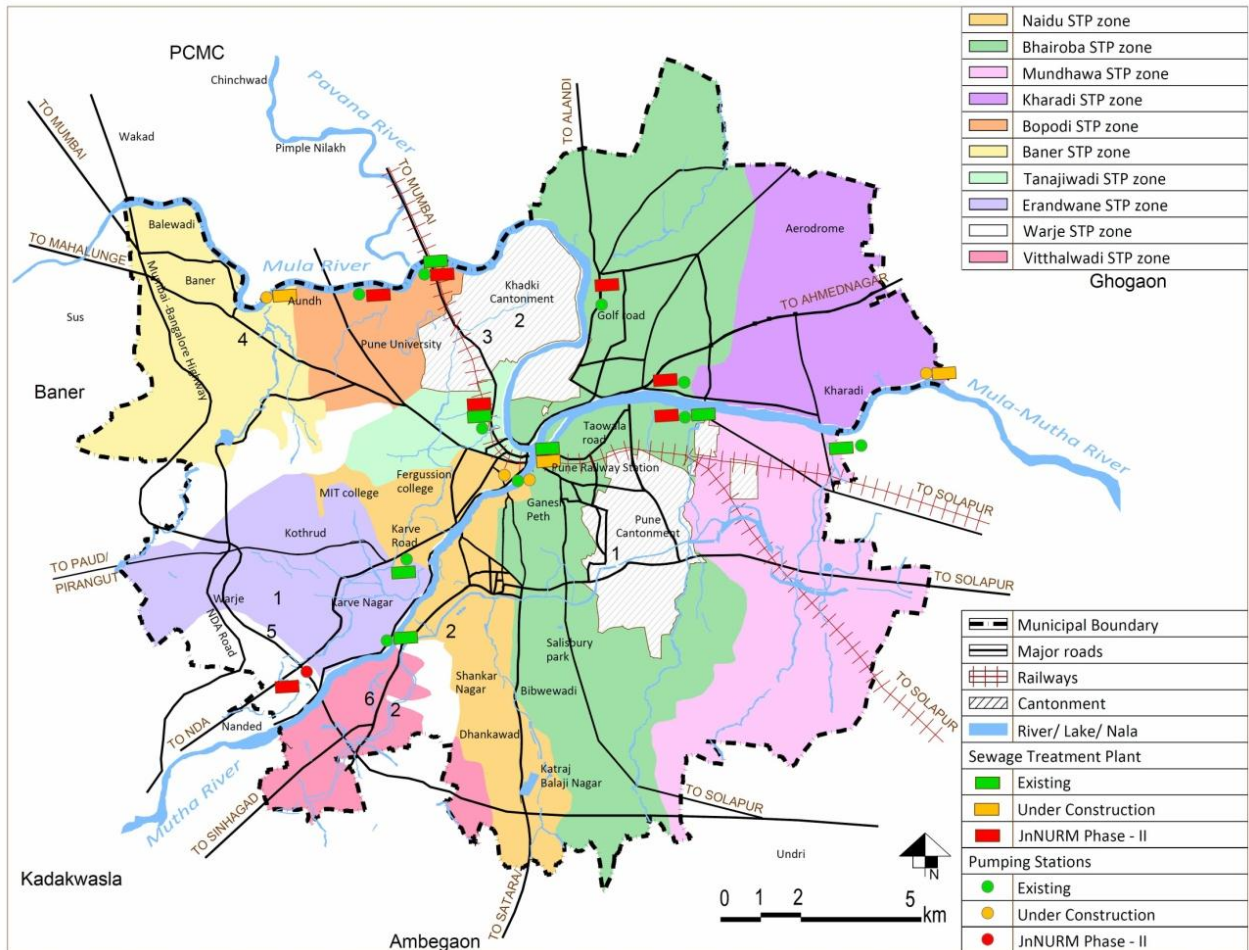
Presently, Pune city has a total of 9 Sewage Treatment Plants (STP) which are located at various parts of the city. Total sewage generation is approximately 744 MLD, while the total treatment capacity as given in table below is 527 MLD. It indicates that 29% of sewage remains untreated. Details of location, treatment capacity and method of treatment adopted are tabulated below:

Table 4-11: Capacity and Method of Treatment of STPs

SN	Name	Capacity in MLD	Method of Treatment
1	Bhairoba	130	Activated sludge process
2	Erandwane	50	Modified activated sludge process
3	Tanajiwadi	17	Biotech with extended aeration
4	Bopadi	18	Extend aeration process
5	Naidu	90	Activated sludge process
6	Mundwa	45	Sequential batch reactor process
7	Vitthalwadi	32	Activated sludge process
8	Naidu	115	Activated sludge process

SN	Name	Capacity in MLD	Method of Treatment
9	Baner	30	Sequential batch reactor process
	Total	527	

Source: City Sanitation Plan of Pune, 2012 & Water Supply and Sewerage Department PMC



Map No. 4-4: Existing Sewerage Zones – PMC

4.3.4 Waste water Recycle and Reuse

Currently, re-used water is not given much importance since there will be a huge investment involved in treating the water. The quantity of wastewater generated in Pune City is around 744 MLD. Out of this, approximately around 527 MLD is treated in the treatment plants. Remaining wastewater is being let into the streams thereby contaminating it. Presently, 40 MLD treated wastewater from Bahiroba STP is being recycled and use for irrigation and other secondary uses as per flow meter records. As per the City Sanitation Plan, only 5.38% of wastewater is recycled, as against the SLB standard of 20%. The project such as Garden, Nallas, and River Improvement Scheme could be undertaken for maximum reuse and recycle of waste water.

4.3.5 Service Level Benchmark (SLB)

The level of service provided by the City's wastewater treatment and collection is good as compare to national and state SLB standards. As per service level benchmark, coverage of sewer network is approximately 97% which is satisfactory, and in addition the collection efficiency of sewerage is 73.35%

against the standard of 100%. Treatment capacity adequacy is 71% which indicates that 29% of wastewater is still untreated and disposed into various streams in the city, resulting in water pollution. Current practice of recycling and reuse is only around 6% below the standard of 20%. The efficiency in complaints redressal is almost 100%, which is above the SLB standard. Revenue collection efficiency of PMC is 68% which is also below the normative standard of 90%. The cost recovery in wastewater management is falling short of the SLB standards. The cost recovery is only 76.05%, whereas the expected level is 100%.

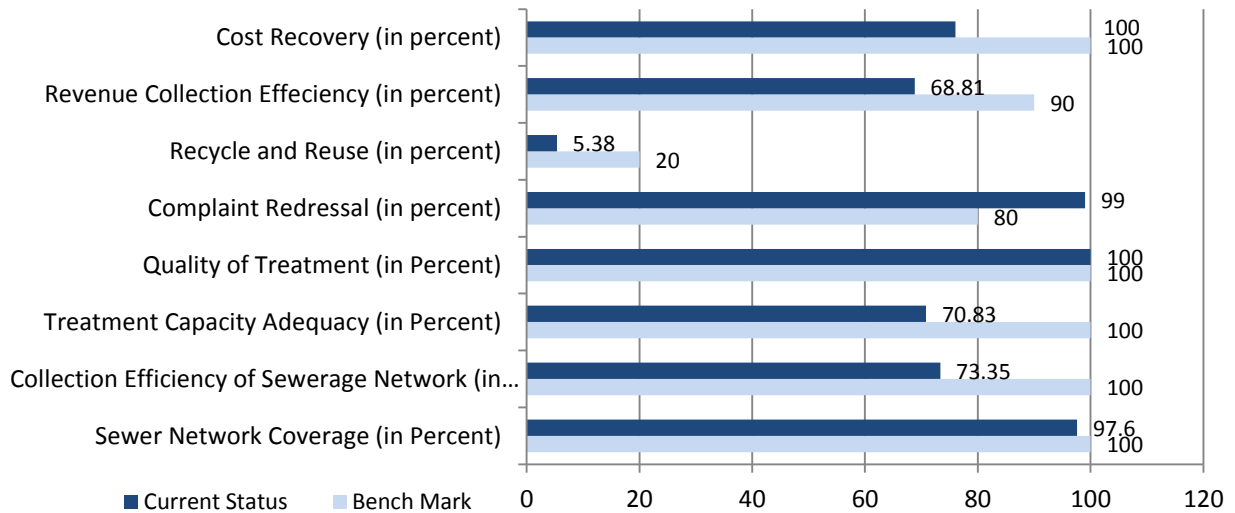


Figure 4-2: Sewerage System Current status and Service Level Bench Marking

4.3.6 Toilet Facilities

As per City Sanitation Plan of Pune, 2012, total number of households in the city is 916,886 out of which 786,011 (85.72%) households have individual toilet facilities. 157,390 households use community, group and pay and use toilets. There are around 770 pay and use public toilets and 466 community toilets in the city.

4.3.7 Major Issues

- As per analysis and observations, 97% of the developed area has access to sewerage network however; the collection efficiency of sewerage network is approximately 73% which further leads to polluting the environment.
- Almost 29% of the total sewage generated is released into the rivers untreated which leads to high levels of water pollution leading to prevalence of water-borne diseases.
- Currently, the percentage of recycled and reused water is only 6%
- Revenue collection efficiency of PMC is only 68%
- 100% cost recovery against the standard of 100%.

4.3.8 Ongoing projects

Under the National River Conservation Program sewerage scheme has been proposed and DPR has been submitted to the state and central govt. for the approval. Details of proposed works under NRCP are discussed following:



- ✓ Collection system in Balewadi area (43 Kms)
- ✓ Trunk mains & Conveyance mains (12 Nos., 46.03 Kms)
- ✓ STP's for 100% treatment of sewage generated by city upto year 2044
- ✓ Financial provision for 2024 – 10 STP's, 383 MLD
- ✓ Up-gradation of 2 Intermediate Pumping stations
- ✓ Capacity Building of Municipal Staff and awareness Program

4.3.9 Demand and Gap

In order to identify suitable projects for efficient sewerage system for the horizon period of 20 years, the water demand and sewage generation has been estimated based on the projected population. Taking sewage generation at 80% of total water supply, the future sewage generation is given in the table below.

Table 4-12: Sewage Generation - 2041

Year	Projected population	Projected population for Cantonment	Total Population	Water Requirement (MLD)	Sewage Generation (MLD)
2011	3115431	79965	3195396	671.0*	536.8
2021	4487573	87962	4575535	960.9	768.7
2031	6211404	95959	6307363	1324.5	1059.6
2041	8597417	103956	8701373	1827.3	1461.8

Source: VSPL, Calculations

*Existing water supply is 786MLD which is higher against the standard of CPHEO

- Existing Sewage Generation = 744 MLD
- Treatment Capacity= 744-527 MLD
- Gap = 217 MLD
- Future Requirement = 1461+217 MLD = 1678 MLD
- Gap=1678-527MLD=1151 MLD

4.3.10 Strategies and Goals proposed in previous CDP

Key Issues In previous CDP	Goal for Development in previous CDP	Current Status /Issues
<ul style="list-style-type: none"> • Though the current coverage in terms of road length is 54%, it is observed that 90% of the developed area has access to underground covering about 80% of the population. But this gap needs to be covered as and when development takes place in the added areas. • Almost one-third of the total sewage generated remains untreated and is disposed-off into the Mula-Mutha River. Thus, the river water gets polluted and this leads to water-borne diseases. • Though at the current level of water losses, the shortage in sewage treatment capacity is 	<ul style="list-style-type: none"> • Adequacy, reliability and accessibility to core municipal services for all citizens with PMC as the prime service provider 	<ul style="list-style-type: none"> • Achieved 97% coverage of Sewerage network and the total network length of 1,260 km (70% coverage in term of road length) • Achieved 73% collection efficiency • Achieved approximately 71% adequacy in sewage treatment remaining 29% untreated sewage still disposed into Mula-Mutha river • 6% wastewater is only



Key Issues In previous CDP	Goal for Development in previous CDP	Current Status /Issues
only 239 MLD, assuming PMC would be able to minimize losses at 15% of supply, the gap would be only 143 MLD.		recycled or reused

4.3.11 Status of CIP Proposed under Previous CDP 2006-12

The previous CDP 2006-12, proposed investment of Rs. 803.9 crore for sewerage and sanitation that includes the sewer network improvement, construction of Sewage Treatment Plants, pumping stations and improvement of public conveniences. Out of the total estimated investment of Rs. 803.9 crore, Rs. 86.13 crore was sanctioned under JNNURM for construction of Sewage Treatment Plants and pumping stations. Details of projects and total investments on the basis of CDP 2006-12 are tabulated below:

Table 4-13: Summary of CIP for Sewerage till 2011-12 (as per CDP 2006-12) approved under JNNURM

Sector/ Component	Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Remarks	Balance DPR to be Prepared (Rs. Crore)
Sewerage & Sanitation	803.90	86.13	717.77	232.30		485.47
1 Sewer Network	376.28		376.28			
2 STP & PS	388.84	86.13	302.71	232.30	Submitted to JNNURM	
3 Public Conveniences	38.78		38.78			

Source: Pune Municipal Corporation & CDP Pune 2006-07

Referring to the table below, as an impact of the projects proposed in the previous CDP and their successful implementation, it has improved the capacity of sewage treatment from 305 MLD in 2006 to 527 MLD in existing scenario; however, there is a gap of 217 MLD sewage not collected and left untreated, which was proposed in the previous CDP but not approved under JNNURM phase –I. However, under NRCP (National River conservation program) proposal for 10 STP's having total capacity of 383 MLD is there.

The service level of sewage treatment capacity has been slightly improved from 68% in 2006 to 70% in existing situation. Other service levels in this sector cannot be assessed since these were not discussed in previous CDP (2). PMC has also taken the initiative to increase the total length of sewer from 54% of total road network as given in previous CDP (2006-12) to 63% of total road network.

Table 4-14: Status and Progress of Projects for Sewerage Sanctioned under JNNURM

SN	Location	Capacity (MLD)	Sanctioned Cost (Rs. Crore)	Current Status
A. Sewerage Treatment Plants				
1.	Baner	30	9.84	COMPLETED
2.	Mundhwa	45	13.87	COMPLETED
3.	Kharadi	40	12.58	COMPLETED
4.	Naidu	115	23	COMPLETED
5.	Vittalwadi	32	10.67	COMPLETED
B. Pumping Stations and Rising Main				
6.	Kasba Rising Main (1575 RM)		5.55	COMPLETED
7.	Kasba P. Station	112	2.45	COMPLETED
8.	Topkhana R. Main (2250 RM)		4.95	COMPLETED



SN	Location	Capacity (MLD)	Sanctioned Cost (Rs. Crore)	Current Status
A. Sewage Treatment Plants				
9.	Topkhana P. Station	92	3.25	COMPLETED
	Sub-Total B	204	16.19	
	GRAND TOTAL		86.13	

Source: Pune Municipal Corporation, 2012

4.3.12 SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> ✓ 97% coverage of sewerage network ✓ Favorable natural slope ✓ 100% quality of treated sewage as per standards ✓ 99% complaint redressal 	<ul style="list-style-type: none"> ✓ 29% of untreated sewage ✓ Lack of sewerage network in newly added areas ✓ Lack of sewerage system in undeclared slums ✓ Lack of recycling and reuse facilities of wastewater
Opportunities	Threats
<ul style="list-style-type: none"> ✓ Reuse of treated wastewater and use for secondary purposes ✓ Web based Grievances Redressal System. ✓ Construction of Additional Sewage Treatment Plants ✓ Private sector can monitor sewage/ effluent treatment ✓ Financial resource generation from sewage (selling of sludge to farmers) 	<ul style="list-style-type: none"> ✓ Untreated sewage mixed in river Mula and Mutha which are resulting water pollution

4.3.13 Vision Statement

“To provide universal access to affordable sanitation and ensure ecologically sound management of waste water providing public health protection”.

4.3.14 Goals

- Achieve 100% collection efficiency of sewage
- Maintain high quality treatment at cost-effective rate
- Achieve adequacy of waste water treatment up to service level benchmark
- Achieve 100% capacity of recycling and reuse for agricultural activities and other secondary purposes
- Achieve 100% waste water revenue collection
- Response to customer complains within 24 hours.

4.3.15 Strategies /Priority action

- To connect all the households to sewerage system
- Provision of city wide sewerage network system
- Improvement of conveyance system to increase the adequacy
- Increase the treatment capacity of existing treatment plants to achieve the adequacy in treatment
- Introduction of sewerage charges
- Capacity building of PMC staff.
- Encourage pay and use category of public convenience with community involvement in the maintenance of the same



4.4 SOLID WASTE MANAGEMENT

Municipal solid waste constitutes mainly residential and commercial waste generated within the jurisdiction of municipality in either solid or semi-solid form excluding industrial hazardous wastes but including treated biomedical wastes. Pune Municipal Corporation is responsible for collection, scientific segregation, transportation, processing and disposal of waste generated within its jurisdiction. PMC is also responsible for estimation and analysis of waste, waste minimization, public awareness and enforcement and resource management.

4.4.1 Quantity of Waste Generated

The quantity of waste generated ranges from 1,300 to 1,400 MT per day calculated to 400-450 grams per capita per day, based on provisional figures of Census India, 2011 Pune population of 3,115,431. The Municipal Waste is broadly characterized as Dry Waste and wet Waste. The Strategic Action Plan Report for Pune (2006) regarding solid waste Management states that approximately 60-65 percent waste is wet waste, 10-15 percent dry waste and 10 percent is other type of waste.

Table 4-15: Per Day Generation of Waste

SN	Source of Generation	Quantity (MT)	% of total
1	HH/ Domestic	950	69.1
2	Street sweeping & drain cleaning	140	10.2
3	Hotels & Restaurants	150	10.9
4	Market/ commercial area	50	3.6
5	Hospital, Clinics	-	0.0
6	Construction / demolition Waste	75	5.5
7	Industrial Waste (non-hazardous)	-	0.0
8	Fruit, vegetable, fish, meat market waste	7.5	0.5
9	Bio-medical waste	1.8	0.1
	Total	1,374	100.0

Source: Pune Municipal Corporation, Solid Waste Department 2012

The table above indicates that the maximum share of waste that is 69.1% comes from households followed by waste generated from hotels and restaurants (10.9%) and street sweeping and drain cleaning (10.2%). The bio-medical waste is 0.1 percent and Construction and Demolition Waste is 5 percent.

4.4.2 Constituents of Municipal Waste

Constituents of Municipal Solid Waste are classified in terms of Bio-degradable, Recyclable and inert compositions. The organic waste which is bio-degradable, accounting to 33% is the highest among all the constituents of the waste generated per day in the city, this is due to the fact that the maximum generation of waste is from domestic activities. Rest of the 25% of the waste is composed of inert material, while 6% is paper waste; rest has smaller share of other waste material which is recyclable. Although plastics contribute to only 7% of the total waste in Pune, the problem of disposal of plastics is grave due to their non-degradable characteristic and high visibility in the waste streams. This information may be used for identifying the potential usage of various waste components for decentralized treatments or recycle and reuse. The figure shows the percentage share of different types of waste generated in the city.

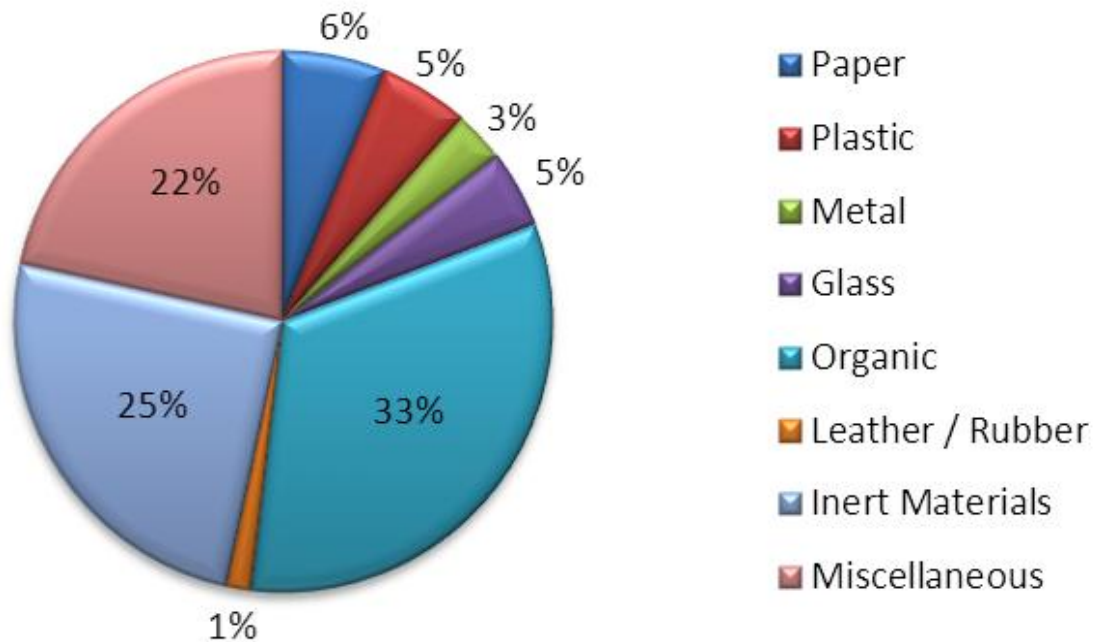


Figure 4-3: Constituents of Municipal Waste

(Source: Solid Waste Management Department, Pune Municipal Corporation)



Plate 4-1: Community bin for waste collection



Plate 4-2: Wrong practice of disposal of waste into drains

4.4.3 Waste Segregation

4.4.3.1 Domestic Waste

PMC has implemented solid waste segregation system for dry and wet waste to some extent in the city. In order to enforce segregation of MSW PMC has directed all the residents to segregate the wastes generated in households into WHITE and GREEN containers/buckets designated for DRY and WET waste respectively. Household and commercial waste is segregated as dry and wet waste.

Approximately 50% of waste is segregated at source varying from, 20% of collected waste segregated at source to 65% of waste segregated at source, being practiced in different wards. About 42% of the properties in PMC boundary practice segregation. Segregation is also practiced at community bins and public bins. As per primary survey and consultation with various NGOs it is found that lack of public awareness and lack of MSW infrastructure are causing less segregation at source level. There is a low



level of awareness amongst the people about the benefits of segregation. This has resulted in poor implementation of segregation at source levels. In some of the wards the waste collecting systems are deficient in terms of infrastructure needed to collect and store segregated wastes. This leads to a disinterest amongst citizens to segregate waste. In group housing societies, around 30% of the waste collected is segregated at source, while in bungalows 47% of waste is segregated at source. Slums and Chawls practice around 32% of segregation of waste at source. This implies that there is lack of awareness and willingness amongst the citizens regarding segregation of waste

4.4.3.2 Hotel Waste

Hotel waste is segregated into three different categories as, bio-degradable waste, non-biodegradable recyclable waste and non-recyclable waste. Commercial establishments like hotels, wedding halls etc. contribute to waste segregation more than the residential units. All the hotels and restaurants in Pune are instructed to practice segregation at source. Around 85% of waste is segregated by these hotels and restaurants.

4.4.4 Collection of Waste

The waste collection efficiency of municipality is 100%; which is collected from door to door for 52% of households and rest of the waste is collected from the community bins and containers. There are 7 garbage collection centers, 412 compactor buckets and 936 containers placed in various parts of the city. The average spacing of dust bins is 500 m (Source: PMC).

4.4.5 Primary Collection

4.4.5.1 Door-to-door Waste Collection

Solid Waste (Collection and Handling) Cooperative (SWACH), a PMC initiative is a registered society of rag pickers with a total strength of 5,500 members. Out of these 1,963 members are involved in door-to-door collection of waste. SWACH covered approximately 300000 households including all 14 administrative wards. 52.7% of the household is covered for door-to-door collection of waste.

Several group housing societies and residential complexes in the city practice their own waste collection system by hiring private sweepers. Waste is segregated either at source or by the locally hired sweepers. Finally, the segregated waste is collected by Ghanta Trucks.

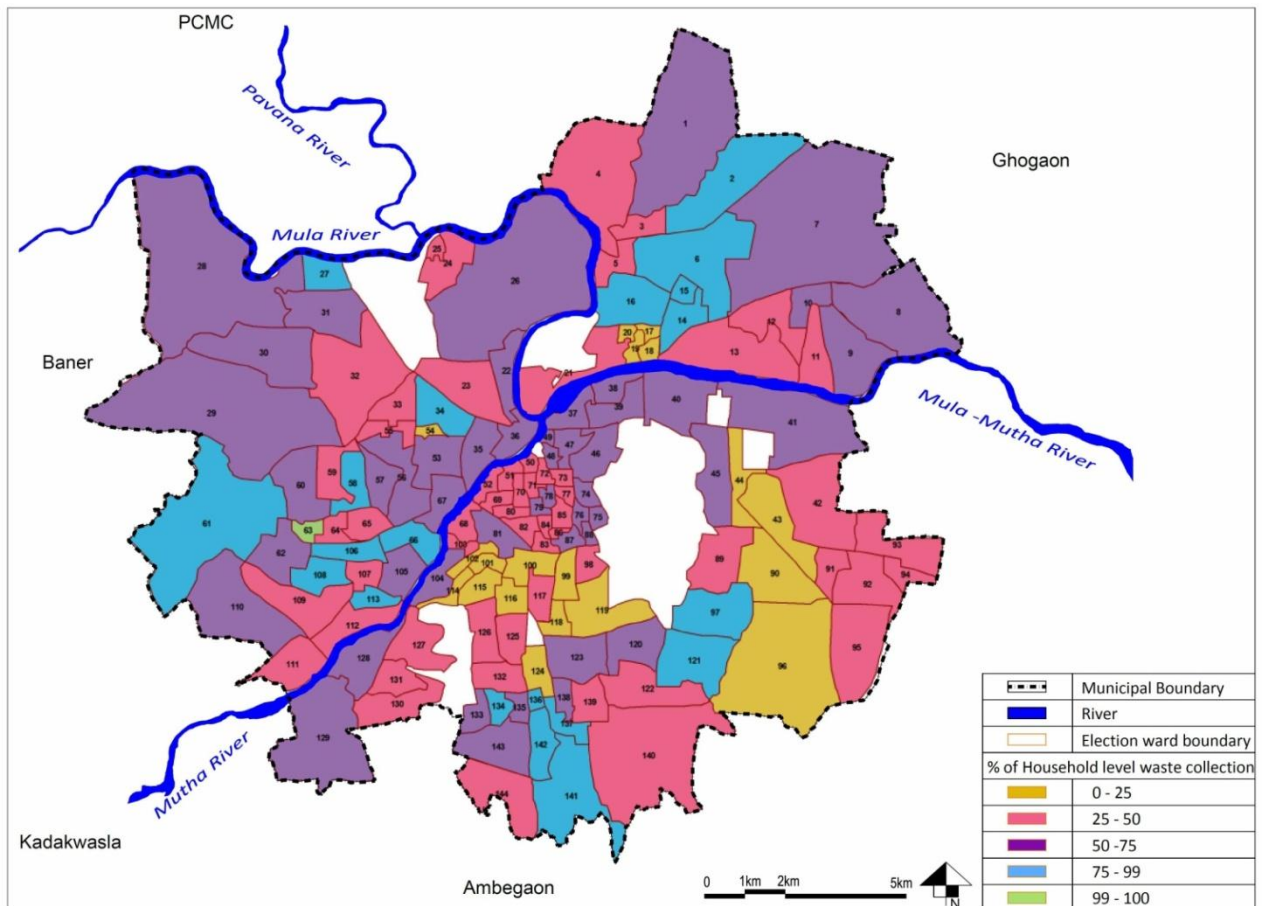
PMC has deployed 90 Ghanta Trucks (for door-to-door collection) and 23 Hotel Trucks (for collection of waste from 1,349 hotels) for collection of waste. The Ghanta Trucks collect about 95,000 kg/ day of wet waste every day. The table 4-16 shows ward-wise numbers of Ghanta Trucks assigned for collection of waste.

Table 4-16: Ward Wise Number of Ghanta Trucks

SN	Name of Ward Office	No. of Ghanta Truck
1	Aundh	5
2	Ghole road	6
3	Nagar road	7
4	Dholepatil road	5
5	Warje Karvenagar	8
6	kothrud (Karve Road)	8
7	Sangamwadi	12
8	Sahakar Nagar	6

SN	Name of Ward Office	No. of Ghanta Truck
9	Dhankawadi	3
10	Bibwewadi	3
11	Tilak road	9
12	Bhavani peth	8
13	Kasba vishram	6
14	Hadapsar	4
Total		90

Source: City Sanitation Plan of Pune, 2012



Map No. 4-5: SWM: Household Level Collection PMC

(Source: Pune Municipal Corporation)

The Hotel Trucks collect about 124,370 kg of wet waste every day. The table below shows ward-wise collection of waste by Hotel Trucks.

Table 4-17: Ward Wise Collection of Waste by Hotel Trucks

SN	Name of Ward Office	Trips	No. of Hotel	Weight of Wet Waste (in Kg)
1	Aundh	2	72	9,700
2	Ghole road	3	215	22,200
3	Nagar road	2	116	9,700
4	Dhole patil road	3	171	18,400
5	Warje karvenagar	1	84	7,200
6	kothrud (Karve Road)	2	110	11,200
7	Sangamwadi	1	20	7,200
8	Sahakar Nagar	2	94	5,200
9	Dhankawadi	1	90	4,000



SN	Name of Ward Office	Trips	No. of Hotel	Weight of Wet Waste (in Kg)
10	Bibwewadi	1	45	3,700
11	Tilak road	1	42	6,130
12	Bhavani peth	2	108	5,840
13	Kasba vishram	1	130	6,400
14	Hadapsar	1	52	7,500
	TOTAL	23	1,349	124,370

Source: City Sanitation Plan of Pune, 2012

4.4.5.2 Containers and Compactor Buckets

For the areas that are not covered under door-to-door collection service, containers and compactor buckets are placed all over the city. There are a total of 936 containers and 412 compactor buckets in the city. The ward-wise distribution of these containers and compactor buckets are shown in the table below:

Table 4-18: Ward-wise details of Containers and Compactor Buckets

SN	Name of Ward Office	Containers	Compactor Buckets
1	Aundh	66	31
2	Ghole road	120	21
3	Nagar road	25	0
4	Dholepatil road	62	18
5	Warje karvenagar	115	46
6	kothrud (Karve Road)	42	12
7	Sangamwadi	33	0
8	Sahakar nagar	39	18
9	Dhankawadi	74	20
10	Bibwewadi	81	135
11	Tilak road	55	6
12	Bhavani Peth	59	37
13	Kasba Vishram	104	33
14	Hadapsar	61	35
	TOTAL	936	412

Source: City Sanitation Plan of Pune, 2012

4.4.6 Transportation of Waste

The transportation of waste is done through Bulk Refuse Carriers (BRC), compactors, dumper placers, Ghanta trucks and hotel trucks. Dumper placers, hotel trucks and Ghanta trucks are deployed in all the 14 wards in addition to BRC and compactors in some of the wards. Transportation of waste from Katraj ramp and Hadapsar ramp area is done through BRC, while in Vegetable market area, it is done through dumper placer. The table below shows details of ward-wise number of vehicles being used every day for waste transportation.

Table 4-19: Ward Wise Deployment of Vehicles for Waste Transportation

SN	Name of Ward Office	Dumper Placer	B R C	Hotel Truck	Compactor	Ghanta Truck
1	Aundh	4	7	2	1	5
2	kothrud (Karve Road)	3	3	2	0	8
3	Ghole road	4	4	3	2	6
4	Nagar road	3	3	2	0	7
5	Warje karvenagar	4	4	1	1	8
6	Dholepatil road	6	4	3	1	5
7	Kasba vishram	9	2	1	2	6



SN	Name of Ward Office	Dumper Placer	B R C	Hotel Truck	Compactor	Ghanta Truck
8	Sangamwadi	4	4	1	0	12
9	Dhankawadi	3	0	1	0	3
10	Hadapsar	4	0	1	4	4
11	Bhavani peth	8	0	2	0	8
12	Tilak road	5	0	1	2	9
13	Bibwewadi	4	0	1	2	3
14	Sahakar nagar	6	0	2	2	6
15	Katraj ramp	0	6	0	0	0
16	Hadapsar ramp	0	13	0	0	0
17	Vegetable market	1	0	0	0	0
	TOTAL	68	50	23	17	90

Source: City Sanitation Plan of Pune, 2012

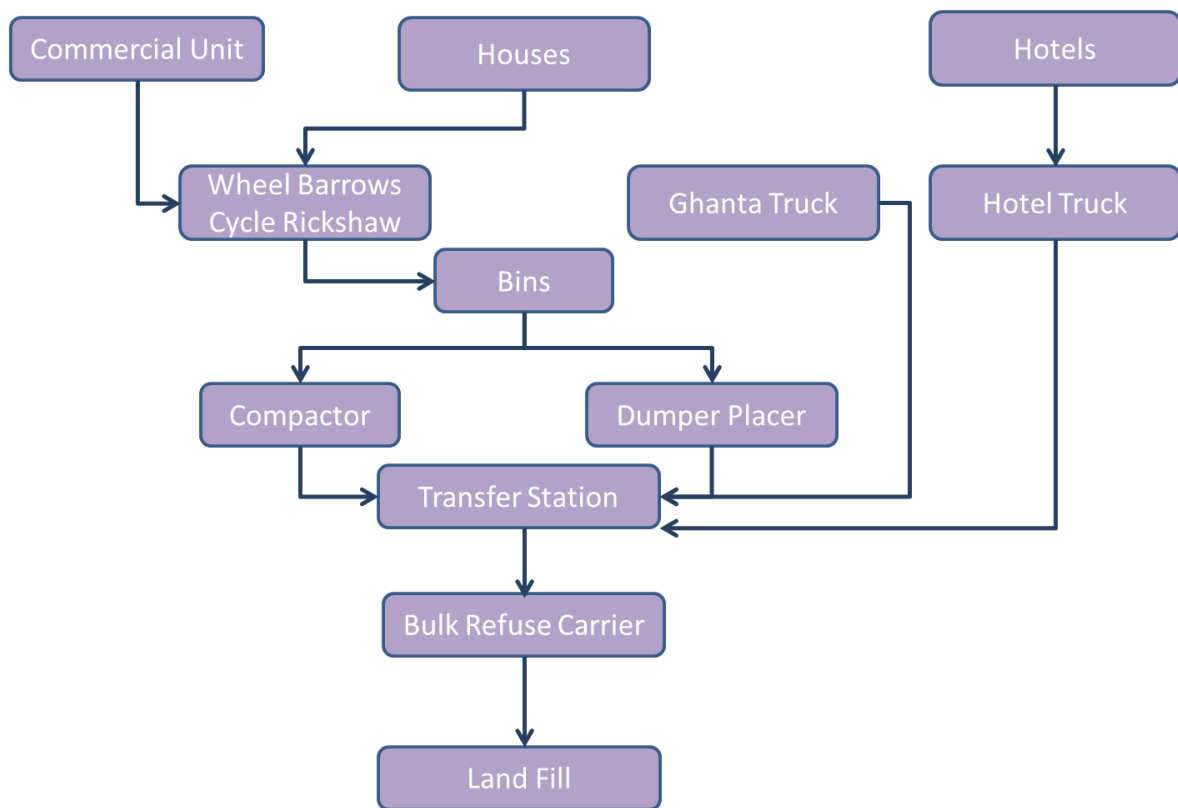


Figure 4-4: Solid Waste Collection and Transportation System Pune

4.4.7 Processing and Disposal of Waste

The Pune Municipal Corporation has adopted the decentralized system of waste Processing. These processing methods predominantly include both Vermi-culture and Biogas generation practices. After 2010 Pune Municipal Corporation Developed the Hanjer Bio-tech Plant having the capacity of 1000 TPD which located in Urli at the distance of 20 km from City . Hanjer Bio tech plant is Capable to handle the mixed garbage. Below figure showing the method of processing of Hanjer plant.

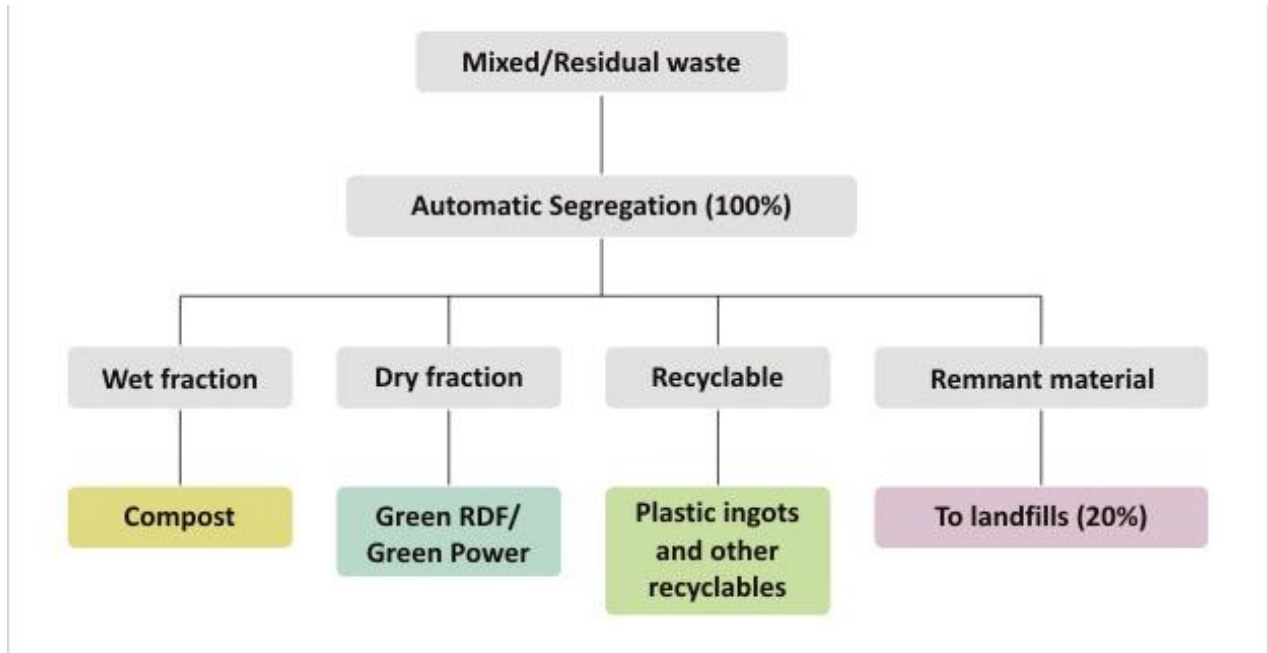


Figure 4-5: Method of Processing of Hanjer Plant in Pune

Apart from Hanjer Bio-tech plant ,3 composting plant and 12 bio gas plant located in different location of the city. Detail of Different Vermi-compost and Bio-gas treatment plant given below:

Table 4-20: solid waste Processing Plants

Sr. No.	Name of the Plant and Method	Location	Capacity
1	Hanjer Bio-Tech (Composting, RDF, Pallets and Bio-fuel)	Urali and Fursrungi	1000 TPD
2	Ajinkya Bio-fert (Vermi-composting)	Hadpsar	200 TPD
3	Disha Waste Mangement (Vermi-composting)	Ramtekdi Industrial Estate	100 TPD
4	Bio-Gas and Mechanical Compost (Electricity and Compost)	14 Decentralized Plant	60 TPD
5	Rochem Separation Systems (electercity)	Ram tekadi Hadapsar	700 TPD

(Source: Presentation Mayor Conference; India Municipal Vision 2020, 6th June 2012)

The PMC promotes the use of vermi-composting at community levels by introducing the need for having a vermi-composting pit for newly developing areas. The Development Control Regulations of the Pune area have a requirement for mandatory provision of vermi-composting pits in order to obtain the No Objection Certificate (NOC) from the Health Department of PMC.

In Pune, lot of initiatives has been taken at household as well as society level for wet waste processing. Vermicomposting is a predominant way that many societies have followed to take care of the wet waste generated in their premises. It is also implemented at various religious places where large amount of biodegradable waste gets collected daily. It is also implemented at some schools. Biomethanation projects have also been implemented having the capacity of 58 TPD.

Table 4-21: Biomethanation Plants location and Capacity

Sr. No	Location of Biomethanation Plants	Capacity of Plant
1	Aundh Ramp	5 TPD
2	Maharashtra Board Yerwada	5 TPD
3	Sangamwadi	5 TPD
4	Peshwe Park	5 TPD
5	Ram Tekdi	5 TPD

Sr. No	Location of Biomethanation Plants	Capacity of Plant
6	Katraj Ramp	5 TPD
7	Karvenagar	5 TPD
8	Aagakhan palace amenity place	5 TPD
9	Karve Road ward office	5 TPD
10	Hadapsar Ramp	5 TPD
11	Uppar Indira Nagar	5 TPD
12	Ghole Road Ramp	3 TPD

Source: Presentation Mayor Conference; India Municipal Vision 2020, 6th June 2012

4.4.8 Disposal

The waste is collected from all the collection points and brought to the ramps of the transfer stations by Dumper placers. Some recovery of recyclables by formal and informal sector also takes place at transfer stations. Two of the transfer stations have weighing facility and one of them has computerized system for records. The waste from the transfer stations is sent to the disposal site by Compactors and Bulk Refuse Carriers.

The PMC is disposing off the MSW collected at an abandoned stone quarry of around 163 acres at Uruli Devachi which is located 20 km away from the city. A part of the disposal site was remediated with liner system. The waste dumped is spread using bulldozers and EM (Effective Microorganism) solution is sprayed over the waste at disposal site to enhance degradation of the biodegradable waste disposed. At the disposal site rag pickers also work to retrieve resources from the waste. The waste disposed at the site by the BRCs is spread by using bull dozers and excavators. There are 2 to 3 bull dozers and 2 excavators used at the site on a routine basis.



Plate 4-3: Hanjer Bio-tech Plant (Uruli)



Plate 4-4: Ajinkya Biofert (Hadapsar)



Plate 4-5: Disha Waste Management Plant



Plate 4-6: Katraj Bi-gas Plant

4.4.8.1 Bio-medical Waste

Biomedical Waste (Management and Handling) Rules 1998 makes it mandatory to all hospitals and dispensaries to segregate the biomedical waste from other solid waste and to set up an effective collection, treatment and disposal infrastructure for managing the waste. Presently, Pune Municipal Corporation has provided biomedical waste disposal facility through M/s Pasco Environmental Solutions Pvt. Ltd. Bio-medical waste in the city, from hospitals and clinics, is collected by eight biomedical waste collection vans. This facility serves 550 nursing homes, 141 pathology laboratories, 11 blood banks, 1048 clinics and also the area 10 km away from PMC limit. Biomedical waste is being disposed by incinerators. Figure below shows the process of bio-medical waste.

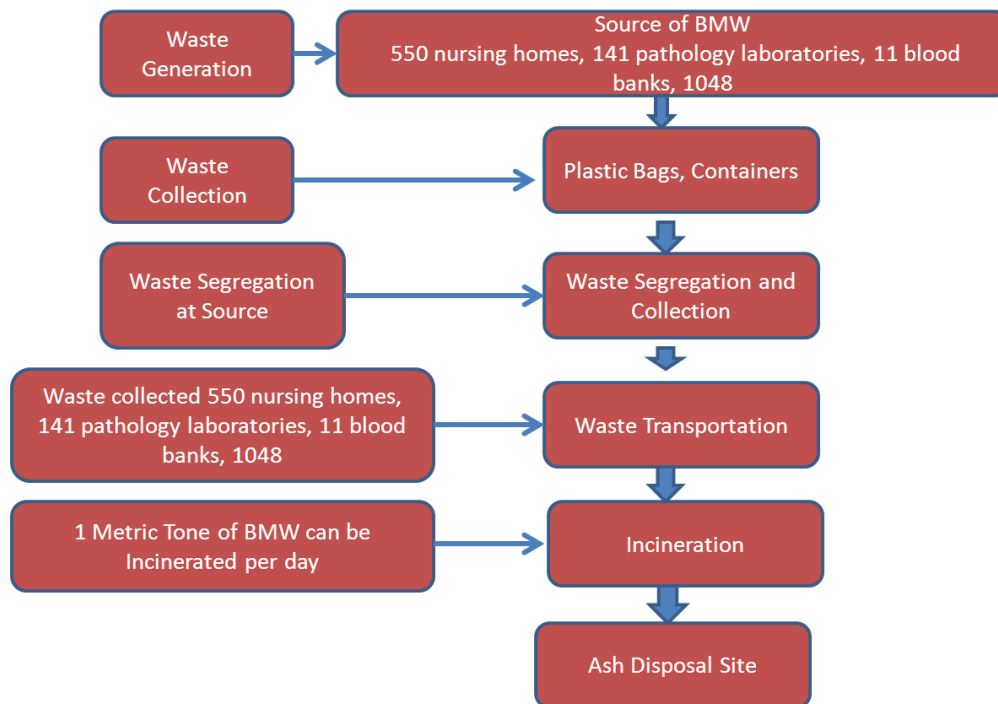


Figure 4-6: Flow Diagram of BMW Solid Waste Management

4.4.8.2 C&D Waste

As per the MSW Rules, the C&D waste mainly comprising of inert waste and is not supposed to be dumped along with the MSW. In the absence of any other source of disposal, the C&D waste currently being generated is used for filling up low lying areas. The environment status report of the PMC recently admitted that illegal dumping of construction rubble in the riverbeds and hills continued in the city. About 100 tonnes of debris, which includes concrete, bricks, cement plaster and iron, is generated in Pune every day. As per Solid waste Department of PMC 8 acres of open land reserve in the Yeolewadi village, around 20 km from the city, to set up a modern construction and demolition (C&D) waste processing plant, with a 100 tonnes per day (TPD) capacity.

4.4.8.3 E-Waste

Pune is emerging as It hub and educational center of india and contribute 10 percent of the total e-waste in region . The MPCB report had pointed out that the total Waste Electrical and Electronic Equipment (WEE) in Maharashtra amounts to 20,270.6 tonnes, out of which Pune contributes 2,584.21 tonnes and Pimpri Chinchwad area contributes 1,032.37 tonnes. The MPCB report says that the



obsolescence rate of cellphones in the city is two years, computers five years, TVs fifteen years and refrigerators seventeen years. This means, cellphones sold in Pune today will be e-waste only after two years. It is not a surprise that the Central Pollution Control Board has identified Pune as one of the top 10 cities generating e-waste.

According to the MPCB study, there are no metal extractors in Pune and Pimpri Chinchwad region. In Pune, Pimpri Chinchwad region, Primary and Secondary E-waste generators exist. Very limited dismantling is observed, while the major quantities of e-waste is collected and transported to MMR. There is no organized mechanism for collection, transportation and disposal of WEEE/ E-Waste in MMR, Pune, and Pimpri Chinchwad region. No mechanism exists in the state to monitor and track its inventory, collection, transportation and disposal

4.4.9 Ongoing Project

Construction of a 700 TPD capacity waste to energy plant is in progress. The plant will work based on the technology of gasification/pyrolysis. It is expected that the plant will generate a total of 10 MW per hour of electricity.

4.4.10 NGOs Initiative

4.4.10.1 SWACH

SWaCH came into existence in 2007 and became operational in 2008. It is the institutional outcome of the door to door waste collection initiative of the KKPKP. The initiative brought together two interests - that of rag pickers/waste collector's interest in improving their livelihood and municipality's interest in sustainable solid waste management. A pilot implemented by the KKPKP and the Project for the Empowerment of rag pickers /waste collectors, SNDT Women's University in 2005 enabled 1500 waste collectors to become service providers. This considerably improved their conditions of work and upgraded their livelihoods. They effectively bridged the gap between the household and the municipal waste collection service. Presently, 1900 SWaCH members' service 3, 00,000 households in 14 wards of Pune City. These services include Door to Door Collection of segregated waste, creation and maintenance of compost pits, housekeeping, running and maintenance of biogas plants.

4.4.10.2 Janwani

Janwani conducted an on-the-ground survey between May- July 2009 across various wards in Pune viz. Aundh, Warje-Karvenagar, Karve Road, Hadapsar, Yerwada and Ghole Road. The survey was conducted with the help of students. The aim of the survey was to assess the spread and impact of the practice of requiring compost pits in housing societies constructed post 2000. A total of 570 housing societies (approx. 20,000 individual households) were surveyed for this study. Of these 570 societies, a total of 296 societies have compost pits in place, and in 220 of these societies pits are actually operational. Thus just under 40% of the post 2000 societies had functional compost pits and are sending less waste outside their premises, whereas about 60% of post 2000 societies either do not have a pit or do not use the one they have and rely on the PMC to take away all their garbage including wet/organic waste. This has increased the daily solid waste burden for the PMC. Based on the survey done by Janwani, PMC issued notices to the defaulting societies for not doing composting. Janwani is involved in a discussion with the authorities to provide a sustainable solution on this matter. In order to ensure that the in situ compost pit practice properly implemented and the benefits are realized.



4.4.11 Best Practice Models – PMC Initiative

Construction of a 700 TPD capacity waste to energy plant is in progress. The plant will work based on the technology of gasification/pyrolysis. It is expected that the plant will generate a total of 10 MW per hour of electricity.

PMC has implemented two projects in two different areas in the city. These initiatives got success proving that these models are to be used as replicable models. Acknowledging the success, revised CDP proposal should be recommended at city level projects based on these models. The details of these practices are as given below:

4.4.11.1 ‘Garbage Free Katraj’ Model

PMC along with the support and expertise of institutes like MITCON, MCCIA, Kirloskar Cummins, Plastic Manufacturers Association, Janwani, Kagad, Kach Patra Panchayat and Rotary Club has implemented the project in March 2011. Two voluntary social workers are trained to create awareness about garbage segregation at source and to make people aware about the benefits of the project. They are responsible to handle 150-200 households out of 8,600 households in the Katraj ward. Independent mechanisms have been adopted to collect and transport wet waste to the bio gas plant near the Katraj Snake Park.

4.4.11.2 ‘Electricity Generation’ through Wet Waste Generated in Hotels in kothrud (Karve Road) Area

The kothrud (Karve Road) Ward office of PMC collects 5 MTD of wet waste from hotels and transports it through hotel trucks to the processing plant at Bavdhan, twice a day. The waste is converted to biogas, which through generators lights up 112 street lights on main and ancillary roads in the Bavdhan area.

The project is implemented by a private company. PMC pays for the electricity generated. It is expected that if the hotel waste from entire kothrud (Karve Road) area is collected in this manner, the electricity generated could be utilized to light all streetlights in kothrud (Karve Road) ward.

4.4.12 Service Level Benchmark

Service level benchmark study shows that the efficiency of collection of waste as well as extent of scientific disposal of waste is 100%. It is interesting to note that the extent of waste recovery and efficiency in redressal of customer complaints is more than the state level benchmark. Extent of segregation of waste is only 27.96% against the benchmark of 100%; while the household level coverage of SWM services is 52.7%.

Table 4-22: Service Level Benchmark for SWM

SN	Performance Indicator	Expected (%)	2010 Status (%)
1	Household level coverage of solid waste management services	100	52.70
2	Efficiency of collection of municipal solid waste	100	100.00
3	Extent of segregation of municipal solid waste	100	27.96
4	Extent of municipal solid waste recovered	80	85.00
5	Extent of scientific disposal of municipal solid waste	100	100.00
6	Extent of cost recovery in solid waste management services	100	60.88
7	Efficiency in collection of solid waste management charges	90	67.00
8	Efficiency in redressal of customer complaints	80	84.74

Source: Pune Municipal Corporation



4.4.13 Issues

- Door-to-door collection of waste is only 52.7% which needs to be targeted for 100% in future.
- Extent of segregation of waste is 27.96% only that needs special attention.
- There is no Mechanism for disposal of C&D processing waste. Construction waste is Directly dumped in low lying area or along the river.
- Absence of scientific disposal and Treatment of e-waste
- Practices of disposing waste into storm water drains are observed. Public awareness needs to be created.
- Lack of awareness

4.4.14 Future Generation of Waste

India has undergone rapid urbanization, which changed material consumption patterns, and increased the per capita waste generation rate. Since 2011, India underwent unprecedented economic growth and the urban per capita waste generation increased from 400 grams/day to 500 grams/day at a decadal per capita waste generation growth rate of 14.6%.

Presently Pune Municipal Corporation generated 1374 tone waste per day. Per capita per day waste generation is 441 gram. Future solid waste generation for pune city is Projected on the basis of existing per capita generation with annually increase of 1.4 percent growth rate for metropolitan cities in india. Year wise generation of Municipal solid waste is tabulated below:

Table 4-23: Future Generation of Solid Waste

Year	Population (No,s)	Waste Generation (Tons)
2011	3,115,431	1,374
2021	4,487,573	2,277
2031	6,211,404	3,625
2041	8,597,417	5,771

Source: VSPL Calculations

4.4.15 Strategies and goals Proposed in previous CDP

Key Issues in previous CDP	Goal for Development in previous CDP	Current Status /Issues / Achievements
<ul style="list-style-type: none"> ▪ Integration of solid waste collection by covering all wards through door-to-door collection ▪ As rag pickers are collecting and segregating waste, it will be beneficial if PMC develops the wholesale scrap market and explores provision for facilities in each ward for waste segregation. ▪ Promotion of civic education 	<ul style="list-style-type: none"> ▪ Adequacy, reliability and accessibility to core municipal services for all citizens with PMC as the prime service provider ▪ Source segregation and door-to-door collection, effective transportation and environmentally safe disposal 	<ul style="list-style-type: none"> ▪ Door to Door Collection 50% only ▪ Collection efficiency 100% ▪ No open Dumping ▪ 100% scientific disposal since 2010 ▪ Nagar Ratna Puraskar under JNNURM for city sanitation and cleanliness ▪ Successful pilot project- “Nirmal Katraj, Dekhne Katraj” (Zero garbage Ward) ▪ In process of acquiring ISO certificate for primary and secondary collection



4.4.16 Status of CIP Proposed under Previous CDP 2006-12

The table below sets out the projects that have been proposed under previous CDP to be approved under JNNURM. Total investment proposed for solid waste management sector was Rs.98.78 crore. As per Pune Municipal Corporation, the financial amount has not yet been approved under JNNURM; despite funds not been approved by JnNURM the corporation with the help of NGOs and community participation has taken initiatives to manage the solid waste in the city, with these initiatives the corporation has successfully written the story of 'Zero waste model' being practiced as pilot project named 'Nirmal Katraj, Dekhne Katraj' at Katraj and has achieved waste collection efficiency of 100% of the door to door collection which is now 52%. The city has also begged the award of 'Nagar Ratna Puraskar' under JnNURM for city sanitation and cleanliness status.

Table 4-24: Summary of CIP for Solid Waste Management till 2011-12 (as per CDP 2006-12)

Sector/ Component		Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Balance DPR to be Prepared (Rs. Crore)
SWM		98.78	-	98.78	-	98.78
1	Vehicles, Hand Carts, etc.	18.50				
2	Disposal Site	17.29				
3	Land Fill Infrastructure	56.49				
4	Composting Plant	6.49				

Source: Pune Municipal Corporation & CDP Pune 2006-07

4.4.17 SWOT Analysis

Strength	Weakness
<ul style="list-style-type: none"> ✓ Waste collection efficiency of PMC is 100%. ✓ PMC has successfully implemented two 'best practices' as models, which can be replicated at city level. ✓ Active participation of NGOs in SWM (SWACH, JANVANI) ✓ PMC's successful initiatives for 'zero waste areas' using energy generation Plant, Composting Plant and Bio-Gas Plant 	<ul style="list-style-type: none"> ✓ Door-to-door collection of waste is only 52.7%. ✓ Extent of segregation of waste is low i.e. only 27.96%. ✓ Lack of awareness in citizens regarding Solid waste dumping ✓ Waste collection system in all wards provided by public and private sector is not systematize ✓ The condition of some waste collection vehicles is poor
Opportunity	Threat
<ul style="list-style-type: none"> ✓ Enormous quantity of waste generation is supportive to implement PPP for overall management. ✓ Waste with a market value can be reused through recycling centers or separated adequately through "Buy Back Center". ✓ Opportunity to actively integrate the population in lucrative secondary material occupation 	<ul style="list-style-type: none"> ✓ Environment and health hazard ✓ In case of poor SWM threat of epidemics like Swine flu is high. ✓ Rise in expenditure may not be compensated by collection

4.4.18 Vision Statement

"To provide most cost effective and efficient solid waste collection and disposal service while providing maximum practical protection to environment with Zero waste city".

4.4.19 Goals

- ✓ 100 percent door to door collection
- ✓ Waste Minimization
- ✓ Segregation of waste at source
- ✓ Recycle and reuse of waste
- ✓ Respect for the People who are providing this service to the society”

4.4.20 Strategies for Development

- ✓ Introduce private sector and NGOs participation in waste management to make the door to door collection more efficient
- ✓ Use less packing material
- ✓ Introduction of recycled packing material
- ✓ Introduce “bring your own bag day” to encourage shoppers to bring their own bags and reduce excessive use of plastic bags
- ✓ Provide community recycle bins
- ✓ Vermi-composting should be Monitored and regularly checked by Municipal Corporation in housing societies and townships
- ✓ Development of community composting system where organic waste is deposited and composting activities can be undertaken
- ✓ C&D waste to be used for roads and building material
- ✓ Introduction of garbage bag charges
- ✓ Introduction of waste recycling awareness training
- ✓ Improvement in waste transportation facilities
- ✓ Health initiatives for waste pickers.
- ✓ Develop independent processing facility for e-waste
- ✓ Introduction of new technology like Autoclaving , hydroclaving , Microwaving for the treatment of BMW waste
- ✓ Awareness generation for reduce, recycle and reuse
- ✓ Provide incentives for recycling.
- ✓ Identification and sanctioning of land for scientific landfill and garbage processing to cater to future needs.

4.5 DRAINAGE

Pune city is situated near the foothills of the Western Ghat and surrounded by hills on the southern side.

The topography of the town is conducive to formation of alternative ridges and valleys. The city is divided into 23 basins or watersheds. Each basin comprises of network of natural drains discharging storm water into Mutha and Mula rivers. The topography of the city is supportive to the natural drainage system upto the extent that even after the presence of 31 water-logging spots the water drains out within 1 or 2 hours. The natural direction of slope of the city is from South-West and South-East to East. (Map no. 4.1 for reference).



Plate 4-7: Water Logging near Railway Station (during rain)



Plate 4-8: Choked drain due to disposal of waste

4.5.1 Water Bodies

Mula and Mutha are the main rivers of Pune and the confluence of these rivers is called as Mula-Mutha River. The Mutha right bank canal passes through the city area, from Dhayari to Hadapsar. This canal has a branch of about 8 km long, starting from Express Garden to Manjri farm.

Table 4-25: Length of Rivers in PMC Area (Natural Drains)

SN	Name	Description	Length (km)
1	Mutha River	Dhayari to Sangamwadi	10.40
2	Mula River	Balewadi to Sangamwadi	22.37
3	Mula-Mutha River	Sangamwadi to Kharadi	11.75
4	Ram River	Paud Road to Mula River	9.40
		Total Length	53.92

Source: City Sanitation Plan of Pune, 2012

There are three important lakes in Pune city. The total area under these lakes is 88.4 ha. The details of these lakes are as tabulated below:

Table 4-26: Lakes in PMC Area

SN	Name of Lake	Basin	Nallah	Area (Ha)
1	Pashan Lake	Bavdhan	Ram Nadi	62.60
2	Katraj Lake	Parvati	Ambill Odha	7.20
3	Snake Park Lake	Parvati	Ambill Odha	18.60

Source: City Sanitation Plan of Pune, 2012

4.5.2 Primary Drainage Channels and Coverage

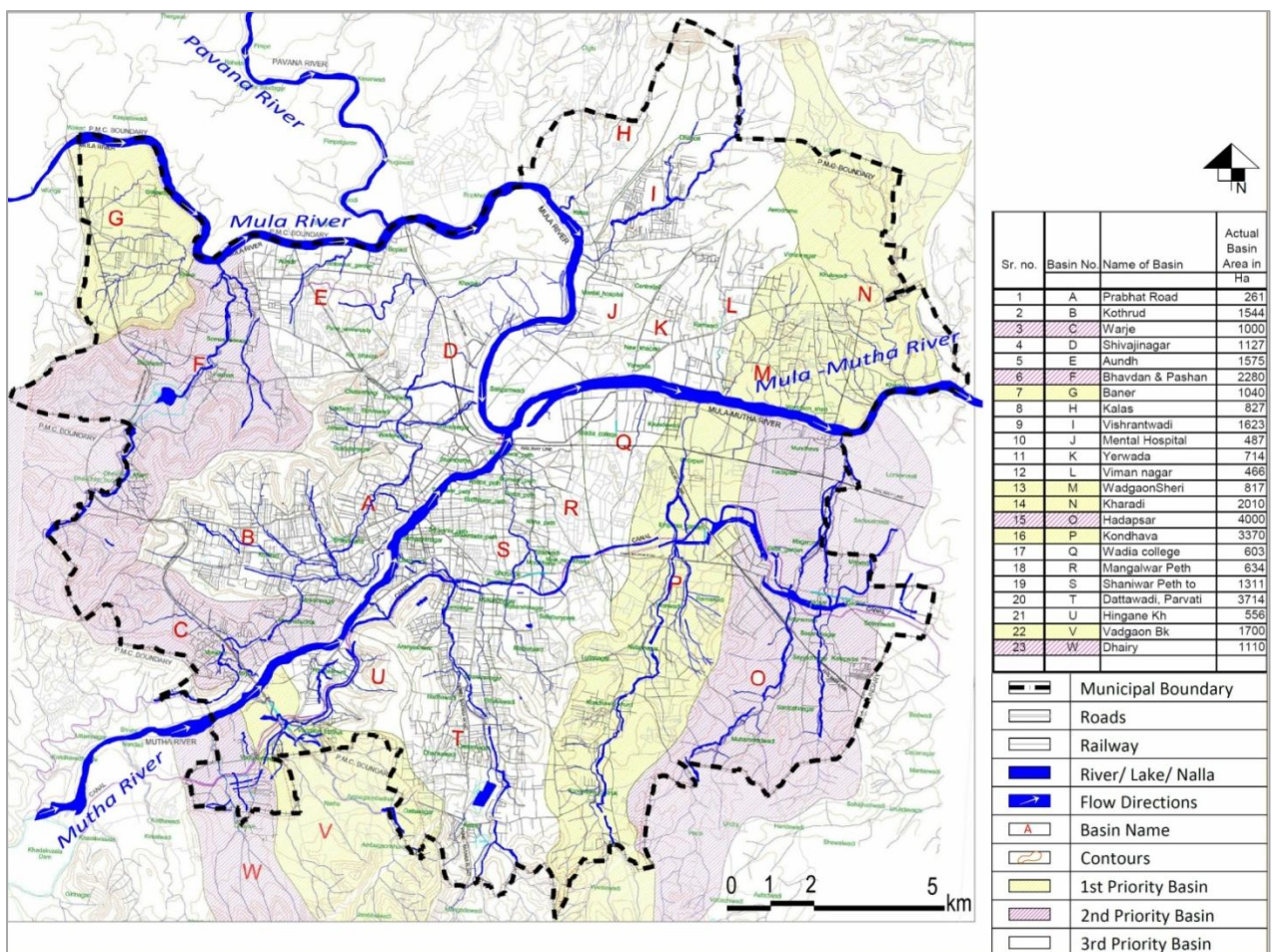
The primary drainage channels are essentially natural nallas and their tributaries. These are present in all the 23 basins in the city as shown in the map below. There are a total of 228 nallahs with total length of



3,82,633 M under the drainage channels. Total number of cross drainage works (C.D. works) in the city is 608 and the number of inadequate C.D. works is 379. The encroached nallah length in the city is 26250 M (26.25 Km). Proposed road side drain length for the city is 10,96,442 M (1096.44 Km).

At a city level, the total length of drains is 382.63 km; while the total length of the road is around 1,922 km. This indicates that the coverage of drainage with respect to the road length is around 20%, whereas as per the National Service Level Benchmarks (SLB) it should be 150%. Thus there is a deficit of 130% of coverage of drainage with respect to road length. This may be one of the causes of recurring water logging incidences thereby damaging the roads during monsoon.

The cross drainage works are provided at road crossings. The total no. of cross drainage works in the city is 608 out of which 379 have been found to be inadequate to carry the load during rains and flood like situations. Hence refurbishment or augmentation of 379 cross drainage works needs to be taken up.



Map No. 4-6: Drainage Basin - Pune City



Table 4-27: List of Primary Drainage Channels and their Coverage

Basin Code	Name of Basin Area	Actual Basin Area (Ha.)	Area of Planning and Designing (Ha.)	No. of Nallahs including tributaries	Length of Nallahs (mtr)	Total C.D. works (no.)	Inadequate C.D. works (no.)	Encroached Nallah Length (mtr)	Proposed road side Drain length (mtr)
A	Prabhat Road	216	261	2	1696	7	3		21200
B	Kothrud	1544	1544	7	17910	49	28		127800
C	Warje	1000	1000	16	18416	17	13	1168	35100
D	Shivaji Nagar	1127	1127	5	8455	23	4		89707
E	Aundh	1575	1575	5	9556	6	5	2416	42090
F	Bavdhan & Pashan	2280	2280	24	43378	22	12	2997	76900
G	Baner	1040	1040	19	20964	32	27	1444	16800
H	Kalas	827	227	4	5759	6	4	100	6689
I	Vishrantiwada	1623	1473	12	24043	28	26	390	44670
J	Mental Hospital	487	487	3	1683	5	3	498	21700
K	Yerwada	714	714	3	4368	5	4	1736	34080
L	Viman Nagar	466	466	4	7755	8	6	135	11550
M	Wadgaon Sheri	817	817	14	15874	32	28	3007	30170
N	Kharadi	2010	2010	11	13784	20	14	957	27047
O	Hadapsar	4000	3450	31	51703	53	32	4565	93615
P	Kondhwa	3370	2870	27	46288	95	73	1713	112000
Q	Wadiya College	603	273	2	4980	14	12		15234
R	Mangalwar Peth	634	324	2	5156	17	14	392	24750
S	Shaniwar Peth	1311	1176	5	12492	45	14	1044	89272
T	Dattawadi	3714	3514	20	34080	82	32	3333	117433
U	Hingane Khurd	556	556	3	6328	19	13	76	18766
V	Wadgaon Bk	1700	1700	4	20378	12	4	205	18069
W	Dhayari	1110	1110	5	7587	11	8	74	21800
	Total	32724	29994	228	382633	608	379	26250	1096442

Source: www.punecorporation.org, September 2012 and VSPL calculations



The drainage system network in the municipal area has limited coverage, with closed roadside drain network available for selected and major roads. The existing percentage of road drainage network is only 44 percent. Increasing paved areas and development is causing water to flow on the roads causing damage to road surface and putting additional load on the existing road side drains along main roads. Absence of integrated network is resulting in the rainwater being carried by roads pathways etc. towards the nearest natural drain causing flooding on the road. Rapid urbanization has significantly changed the nature of drainage areas in all watersheds.

The open grounds have nearly vanished, and the paved area is substantially increased. This has resulted in increased flood volumes for the same rainfall event. The demand for land has increased, which has affected the natural drains. The widths have been reduced at many places. This has seriously affected the carrying capacity of many a drain. The development along the nallas has not taken place in a scientific and planned manner. This has resulted in emergence of areas which are prone to flooding, even with moderate rainfall intensities. This is especially true in fringe areas, which have been recently added to Municipal Corporation. These areas were of rural character with little or no control on development activities.

The uncontrolled development of “urban poor localities”, have generally happened near nallas. The drainage channels have become vulnerable to deposition of wastes of all kinds, mainly waste water and solid waste. This has resulted in higher silt load, reduction in carrying capacity and difficulties in maintenance. In the earlier years, the network of roadside drains was present in limited areas. The coverage has increased in last four years especially after severe floods of 2005. However, this is still not adequate to cover all roads. The RCC pipes are being used for roadside drains, with storm inlet chambers at regular intervals. At present, there is no separate tax on storm water drainage component. The activities of “Drainage Department” include domestic sewerage, as well as storm water drainage components.

4.5.3 Ongoing Project

Under JNNURM funding, out of 23 basins, 4 basins works are under progress. The project works covers about 16 kms nallah length on 6 major nallahs in the city. The sanctioned cost is 25.86 crores.

The major works done include:

- Nallah channelization
- Construction of compound wall with fencing along nallah bank

4.5.4 Service Level Benchmarking and Gaps in Storm Water Drainage

Rapid urbanization is exerting tremendous pressure on the natural drains, with a number of them having disappeared or encroached upon. The survey carried out during the preparation of master plan shows that 18 percent of the surveyed natural drains in the city have been encroached upon.

Table 4-28: SWD and SLB at a glance

Si.No.	Performance Indicator	Expected Status (%)	Current Status (%)
1	Coverage	216	261
2	Indicator of water logging	1544	1544

The total existing network coverage of storm water drainage in the city is 55 percent as against 100 percent requirement in SLB. This shows that to meet the SLB standard immediate steps need to be taken

to improve the system of storm water drains in the city.

4.5.5 Status of CIP Proposed under Previous CDP 2006-12

The table below sets out the project that have been proposed under previous CDP 2006-12 and amount approved under JNNURM. Total investment proposed for storm water drainage sector was Rs. 715.14 Crore. The amount approved under JNNURM is Rs.399.67 Crore. PMC has submitted an additional Detailed Project Report (DPR) of Rs.495 Crore to MMRDA.

As per the latest records available regarding the approved projects under JNNURM-I, these have been sanctioned to PMC after December' 2011, for this reason the project implementation has yet to take place and the impact of these projects on the service levels cannot be assessed. Under the sanctioned projects work of 4- basins at Banner, Wadgaon BK, Wadgaon Sheri and Kharadi has been taken up along with the works of cross drainage, nalla channelization, retaining wall and lying of storm water line is in progress and 50% of the physical works have been completed.

The coverage of drainage network has improved from 44% as given in the previous CDP to 55% in existing scenario.

Table 4-29: Summary of CIP for Drainage till 2011-12 (as per CDP 2006-12) approved under JNNURM

Sector/ Component	Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Remarks	Balance DPR to be Prepared (Rs. Crore)
Storm Water Drainage	715.14	399.67	315.47	495.00	DPR submitted to MMRDA	-
1 De-silting & Strengthening of Primary Drains	2.50					
2 Upgradation (from pucca open to pucca closed drain)	66.82					
3 New pucca open drains	132.54					
4 New pucca closed drains	513.28					

Source: Pune Municipal Corporation & CDP Pune 2006-07

4.5.6 Future Demand and Supply Gaps

As per the service level benchmark study, 55% of the city is covered under drainage network against the desired 100%. Around 52% of the area faces the problem of water logging in rainy season.

Table 4-30: Service Level Benchmark for Drainage in PMC

SN	Performance Indicator	Expected Status (%)	Current Status (%)
1	Coverage	100	55
2	Incidence of water logging	0	52

Source: City Sanitation Plan of Pune, 2012

4.5.7 SWOT Analysis

Strength	Weakness
<ul style="list-style-type: none"> ✓ The topography of the city is supportive to the natural flow of rain water ✓ River Mula and Mutha passing through the city available for disposal of storm water drainage 	<ul style="list-style-type: none"> ✓ The coverage of network is very less being only 55% ✓ The present system cannot sustain heavy rains in short period.



Strength	Weakness
<ul style="list-style-type: none"> ✓ Old city areas has storm water drains ✓ Eco housing policy provide tax rebate for rainwater harvesting 	<ul style="list-style-type: none"> ✓ No separate tax or charges for Drainage system ✓ Dumping of garbage in storm water drains ✓ Mixing of untreated sewage in natural drains ✓ Absence of drainage network along the slums
Opportunity	Threat
<ul style="list-style-type: none"> ✓ Promoting rain water harvesting ✓ Developing 23 basins for effective SWD ✓ Opportunity to treat the storm water and use it as potable water ✓ Opportunity to utilize natural drains for natural recreation 	<ul style="list-style-type: none"> ✓ Flooding and Water logging ✓ Huge investment required for development of 23 basin ✓ Slum located near the natural drains

4.5.8 Major Findings and Issues

- The topography of the city is supportive to the natural drainage system.
- Present drainage system cannot sustain the changing monsoon pattern i.e. heavy rains in short period.
- Low network coverage (55%) of storm water drainage.
- Wrong practice of disposal of waste by citizens into drains leading to choking of some of the drains.
- Out of 608 city development works studied, 379 have been found to be inadequate to carry the designed floods.
- Increasing paved areas and development is causing water to flow on the roads, causing damage to road surface and putting additional load on the existing road side drains along main roads.
- Absence of integrated network resulting in the rainwater being carried by roads, pathways etc. towards the nearest natural drain causing flooding on the road.
- Rapid urbanization has significantly changed the nature of drainage areas in all watersheds. The open grounds have nearly vanished, and the paved area is substantially increased. This has resulted in increased flood volumes for the same rainfall event.
- The demand for land has increased, which has affected the natural drains. The widths have been reduced at many places. This has seriously affected the carrying capacity of many a drain.
- The development along the nallas has not taken place in a scientific and planned manner. This has resulted in emergence of areas which are prone to flooding, even with moderate rainfall intensities.
- At present, there is no separate tax on storm water drainage component. The activities of “Drainage Department” include domestic sewerage, as well as storm water drainage components.

4.5.9 Vision

“To develop and maintain comprehensive water shed and Storm water infrastructure system to protect health and safety, to enhance the quality of life to preserve and improve the environment”.

4.5.10 Goals

- To protect and enhance the functions of natural drainage features
- Prevention of soil erosion along the natural drains
- To make city free of water logging areas



- 100 percent coverage of drainage network
- Storm water to be treated and reused

4.5.11 Strategies

- Protection and preservation of natural drainage basins
- Beautification of natural drains
- Provision of penalty for encroachment and dumping of waste in drains at community and individual level
- Basin development for all 23 drainage basins
- Construction, Remodeling and rehabilitation of storm water drains and road side drains
- Removing Silting

4.6 ROAD AND TRANSPORTATION

Roads and transportation constitute the main entities of efficient working of any urban area, to ensure the standards in these facilities the Indian government has formulated the National Urban Transport policy which after looking into the prominent problems viz. free flow of traffic, travel time and cost, accident rate and pollution, related to roads and transportation with the objective to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities (source: National Urban Transport Policy-2006). In the light of this policy Pune Municipal Corporation has formulated its Comprehensive Mobility plan (CMP-2008), which has already been taken up for implementing some projects proposed in it. The facilitation and management of roads and transportation in Pune is at present done by a multiplicity of agencies/departments like Municipal Corporation, PWD, NHAI, State Highways, RTO, Railways, Interstate bus operators, PMPML Board etc. No single agency is solely accountable for providing transport services as well as transport infrastructure resulting in overlapping functions, functional and spatial fragmentation. Pune Municipal Corporation is responsible for maintenance, construction of road network (city roads) and traffic management. To perform its role and responsibilities in a better way in this sector PMC has got a number of studies done in the past; harmonized with the stake holder consultations done for the preparation of this report and conforming to the instructions provided for JnNURM phase – 2 guidelines through the minutes of the meeting held for the same purpose this chapter is written while considering the recommendations and project proposals of the CMP- 2008 of Pune, in which the forecasts and proposals have been made till 2030 which has already received approval from the authorities.

4.6.1 Connectivity

Pune is one of the most important administrative centers as well as educational and cultural capital of Maharashtra. The city is well connected with the state capital and surrounding district headquarters through roads and railway networks. Pune is connected to Mumbai by NH-4 as well by a new expressway, railways and airways. NH-50 connects Pune to Nashik, NH-9 to Solapur and NH-4 to Kolhapur.

4.6.2 Road Network

As per the Road Department of PMC, the road network covers around 1,922 Km. The National Highway

Authority of India (NHAI) maintains the National Highways, PWD and State Highways while, PMC are responsible for developing, operating and maintaining the city road infrastructure. Out of 1,922 km, 1,872 km road are municipal roads and 50 km roads are coming under national highway, state highway and PWD roads. The road network in the city is divided into different categories based on the types of surface. It is found that majority of the roads in the city i.e. 71% are having Tar Road surface. Of the remaining roads, 3 % are having concrete surface, 16% WBM surface and 10% earthen surface.

Table 4-31: Types of Roads and Length

SN	Type of Road	Length of road (km)	Percentage (%)
A.	Municipal Roads		
1.	Concrete	57	3
2.	Tar roads	1,330	71
3.	W.B.M	295	16
4.	Gravel and earthen	190	10
Total Length of Road		1,872	
B.	Other Roads (National Highway, State Highway, P.W.D roads)	50	
Total		1,922	

Source: Pune Municipal Corporation, Road Department 2012

4.6.3 Road Pattern and Hierarchy

The road network in the city is primarily radial and rectilinear/ circumferential. The central core area of the city has network consisting of commonly 2-lane undivided roads that can broadly be marked as grid iron pattern, showing high density of roads (Refer map below). The passage of rivers Mula, Mutha and Mulla-Mutha creates geographical division of the city into three segments and the position of the old city at the centre of these three segments led to a number of missing links in connections between different ends of these three segments. The intra-city traffic moving between these three segments has to invariably pass through the congested central core which also houses the Railway station and the Central Bus Terminal. As per the land use study 13.05% (Source: DP cell, and CSP-2012, PMC) of the total land is under transportation, of the entire road length only about 25 percent in the city has a road width greater than 24 m and majority of them are the highways .

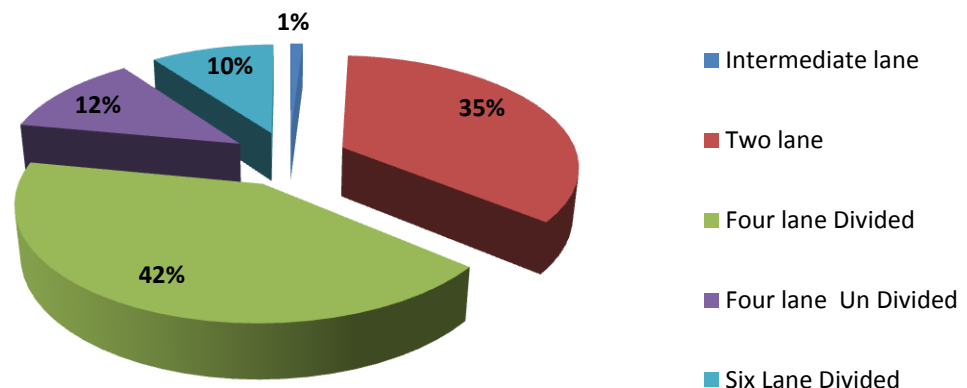
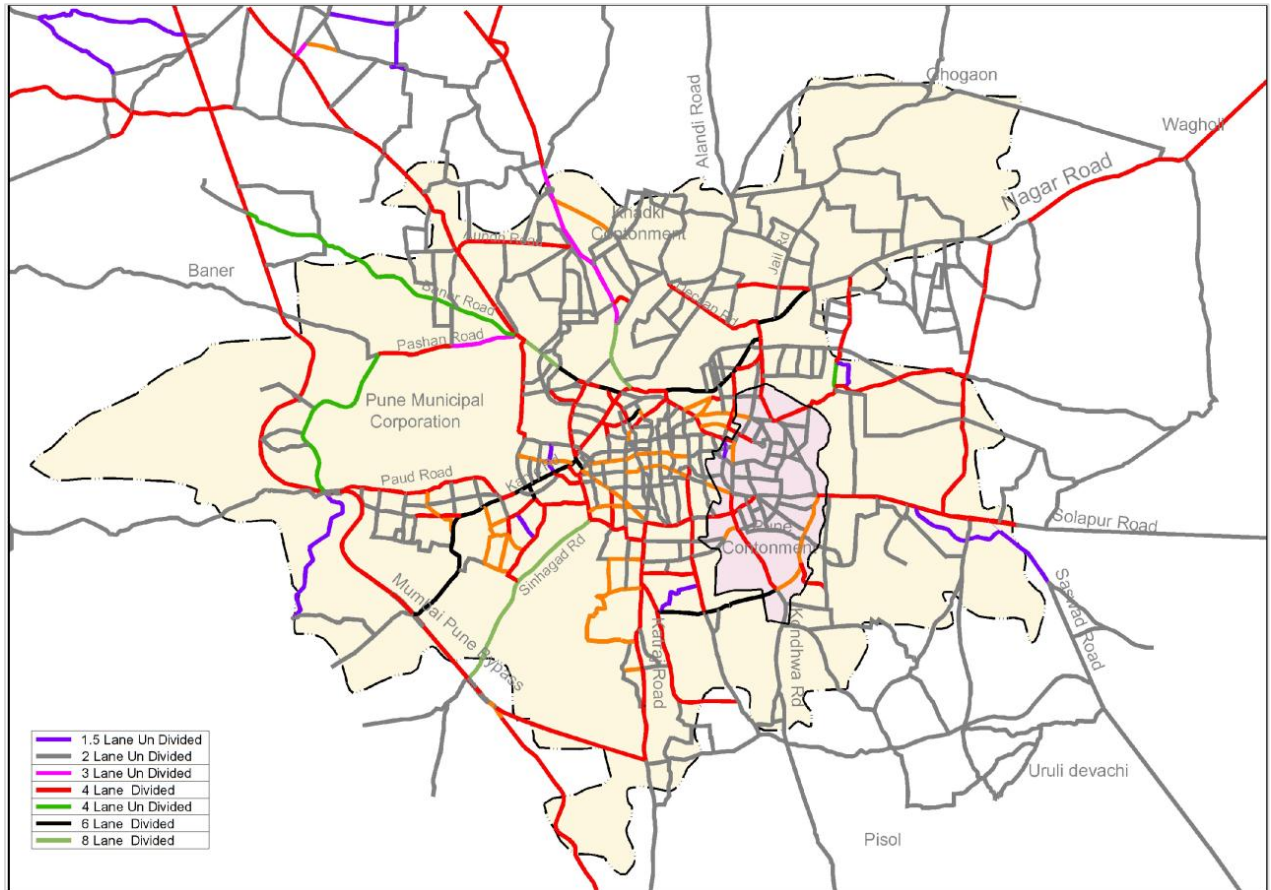


Figure 4-7: Type of Roads

(Source: Comprehensive Mobility Plan for Pune City)

Laxmi Road, Tulsi Road, Tilak Road, Shivaji Road, ThorleBajirao Road and Jangali Maharaj Road in core city and Ambedkar Road and Karve Road on fringe area are the most congested roads due to highly specialized commercial and other administrative activities. The intensive developments on both sides of the roads consents no possibility of widening the roads.



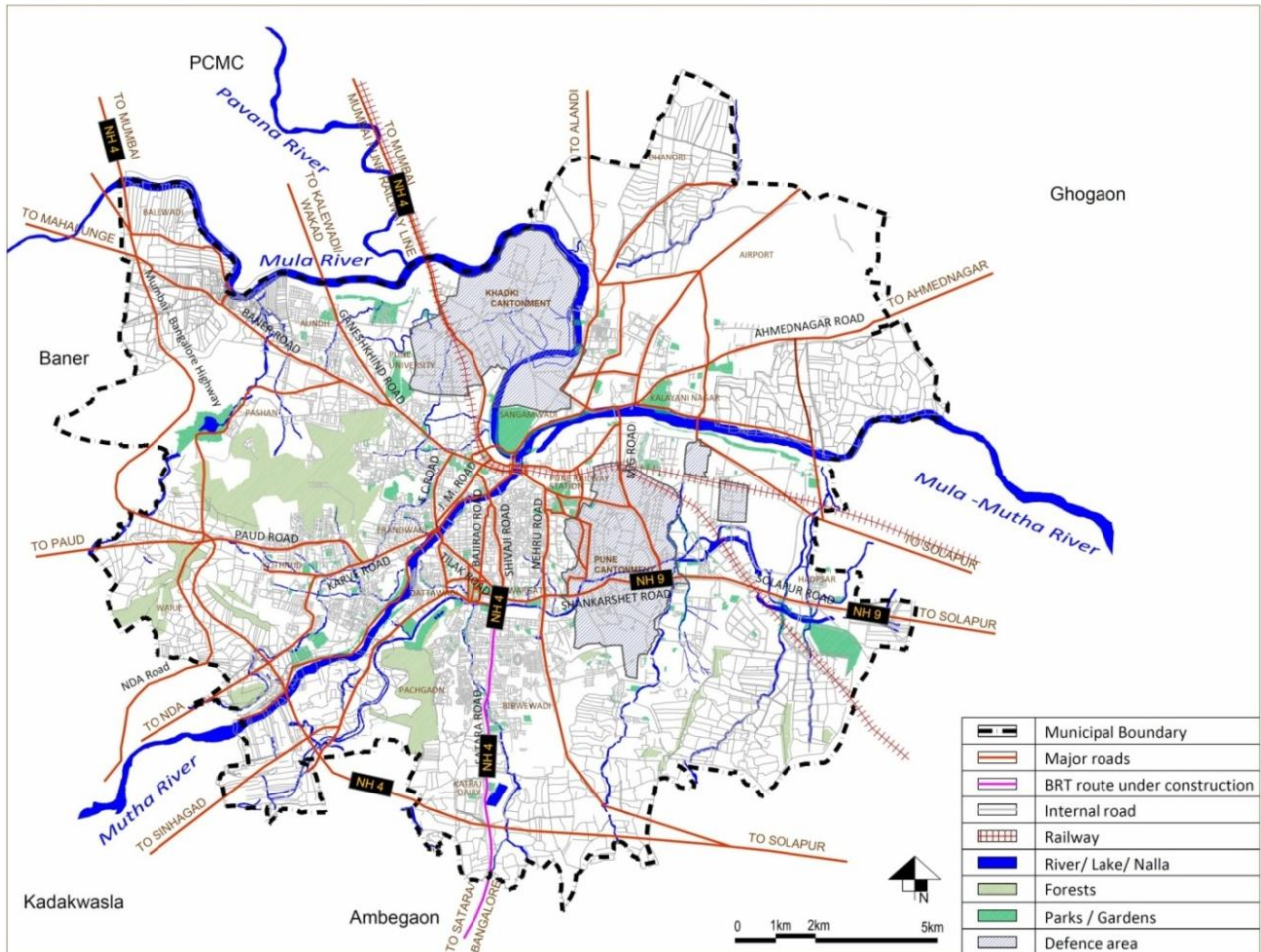
Map No. 4-7: Road Inventory Map

(Source: Comprehensive Mobility Plan for Pune City)

The radial roads in the Pune city include the University Road, Mumbai –Pune NH-4, Alandi Road, Pune Nagar Road, Sholapur Road, Singhad Road and Mundwa Road.

The circumferential/ rectilinear arterial roads are Jangli Maharaj road, Maharshi Karve road, Kothrud road, Chiplunkar road, SenapatiBapat road, Ghokale road, Fergusson road, Jawaharlal Nehru road, Laxmi road, Bajirao road, Tilak road, LalBahadurShastri road and Sankar Seth road.

As per Comprehensive Mobility Plan for Pune city, 42% of the roads in Pune city are four lanes divided and 35% roads constituted with two lanes. In addition to four lanes and two lanes 10% roads are six lanes, 1% road intermediate lane and 12% roads are four lanes undivided.



Map No. 4-8: Existing Major Road Network
(Source: Comprehensive Mobility Plan for Pune City)

4.6.4 Road Condition

91% of the roads in the city are surfaced; the road widths in the central areas of the city are much lesser at 8-12 m with high density with concentration of residential population and commercial and institutional activities on both sides. The major roads in central areas are Laxmi Road, Tilak Road, Shivaji Road, Mahatma Phule Road and all these roads are comprised of highly specialized commercial activities. Because of limited width, two-wheeler and three-wheeler are the common and preferred mode of transportation in these narrow streets. Encroachment, concentration of informal activities and high pedestrian population is also high on the roads in core area which are reducing the effective, usable road width. Road condition of outer roads especially with BRTS routes are good because these roads are newly constructed and designed with cycle track, pedestrian crossing and are equipped with other street furniture.

4.6.5 Status of Roads Proposed under Development Plan, 1987

Status of the roads proposed under the Development Plan of PMC in the year 1987 is as follows:

Table 4-32: Status of roads under the Development Plan, 1987

No	Road Width in meters	Total of Proposed Roads under DP	Length in km (Developed)	Length in km (Un-developed)	Percentage
1	7.5	444.00	435.20	8.8	1.98%
2	9	361.97	331.58	30.39	8.39%



No	Road Width in meters	Total of Proposed Roads under DP	Length in km (Developed)	Length in km (Un-developed)	Percentage
3	12	419.10	335.28	83.82	20.00%
4	15	54.00	43.20	10.80	20.00%
5	18	244.85	150.48	94.37	38.55%
6	20	70.50	56.40	14.10	20.00%
7	24	160.72	80.56	80.16	49.87%
8	30	109.97	60.34	49.63	45.13%
9	36	79.60	63.68	15.92	20.00%
10	40	17.50	14.00	3.50	20.00%
11	42	5.50	4.40	1.10	20.00%
12	45	2.50	2.00	0.50	20.00%
13	60	94.50	75.60	18.90	20.00%
	Total	2064.72	1652.72	412.00	19.95%

Source: ESR 2011-12, PMC

The table above shows that 20% of the roads are undeveloped even after 25 years. The width of the roads proposed in the DP-1987 ranges between 7.5 M – 60 M. The percentage of proposed roads above 24 M width is 22.7%.

4.6.6 Transport System

4.6.6.1 Vehicular Growth and Composition

Over the years, the total number of vehicles on Pune’s roads has increased with almost 10% annual growth in vehicular traffic (Source: RTO, Pune). In the last four years, the average number of vehicles added every year is over 1.34 lakh. The year 2006-07 saw the maximum increase with the registration of over 1.57 lakh (Source RTO office Pune) new vehicles. The data on growth trend of vehicles show that personalized modes such as two wheelers and cars are growing at a much higher rate. Pune rapid population growth increase travel demand and population pressure, which in turn leads to spatial expansion of urban areas and increased journey lengths. Parallel growth in city economies and personal income leads to increased travel demand, increased cars and two wheelers ownership. Increase in ownership of two wheeler and cars works as a catalyst for air quality deterioration, road congestion and reduced journey speeds, wastage of scarce fuels, besides sub optimal utilization of infrastructure and other resources.

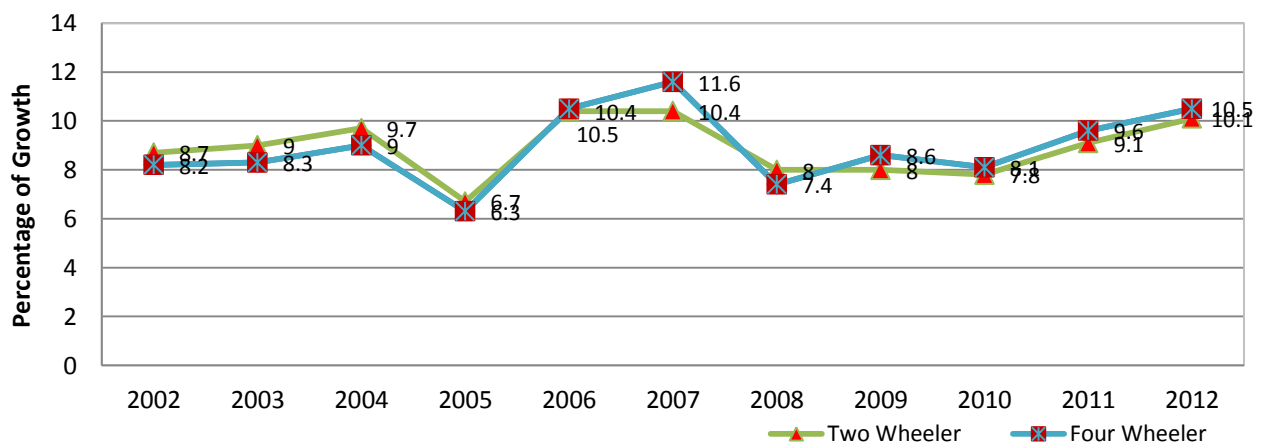


Figure 4-8: Vehicular Growth 2001-12
(Source: Regional Transport Office Pune, 2012)

With the increasing commercial, industrial, institutional activities, there has been a considerable increase in travel demand over the years in Pune. Traffic in Pune city is characterized by significant presence of both inter and intra city traffic. The growth in mechanized vehicles was around 10 percent per annum as given in in Figure 4-8. 73% of motorized vehicles are contributed by Motor Cycle, Scooter and Mopeds. Once considered a city of bicycles, Pune is now definitely a city of motorized two-wheelers. The number of two-wheelers in the city has more than doubled in the last 10 years. Out of 23 lakh vehicles in the city, 16 lakh are two-wheelers (RTO 2012). Figure 4-9 is below showing the percentage of registered vehicles in 2012. Of the vehicles in the city, the current number of cars and jeeps are 3, 77,961 (17%). Nearly 775 new vehicles are registered in Pune RTO in a day which adds to the traffic in the city.

The growth of private vehicles has resulted in an increased number of vehicles on the streets of Pune increasing traffic densities, congestion, vehicle emissions and associated problems on road. Poor public transport system is a major reason due to which people in Pune are forced to use private vehicles.

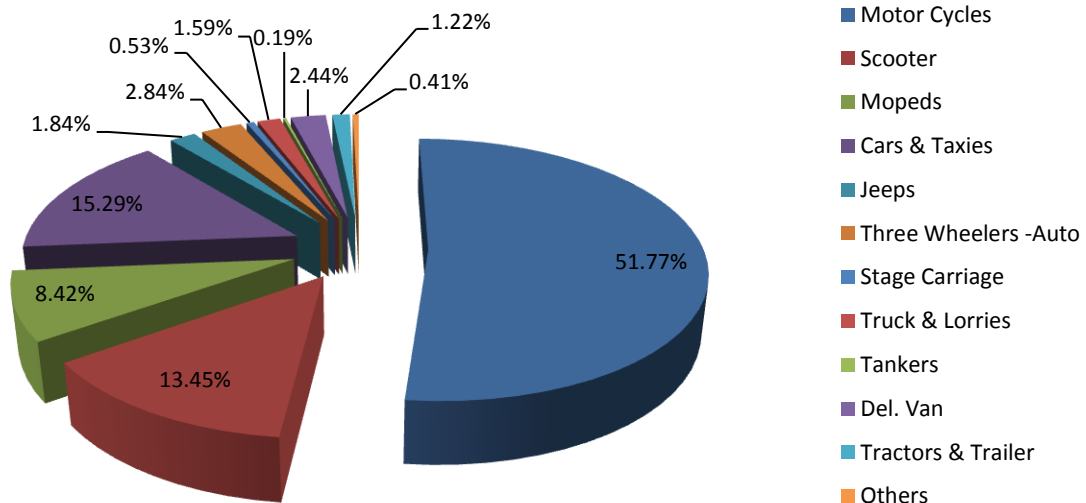


Figure 4-9: Vehicular Composition 2011-12
(Source: Regional Transport Office Pune, 2012)

4.6.6.2 Traffic Congestion

Given the congruence of lesser road widths and high personal modes, it is clear that congestion would be a direct consequence. Table 6.28 below shows the volume capacity ratio and average speed of major corridors /link, and out of 26 corridor volume capacity ratio 18 corridors are exceed 1 indicating congestion on these stretches. Highest volume capacity ratio (2.1) is found in NH-4, Jangli Maharaj Road and Ganesh Khind Road. Congestion indicator on other major intersections is also greater than 1.5 (against the standard of 0.8 for the free flow of traffic movement. The average speed of vehicles in Pune city varies between 23 kilometer per hour to 13 kilometer per hours in peak hours, with clear start –stop and obstructed flow on many corridors. High volume capacity ratio in various corridors in Pune involves queuing, slower speeds and increased travel times, which impose costs on the economy and generate multiple impacts on urban regions and their inhabitants. Congestion also has a range of indirect impacts including the marginal environmental and resource impacts of congestion, impacts on quality of life, stress, and safety as well as impacts on non-vehicular road space users such as the users of sidewalks and road frontage properties.



Table 4-33: Volume Capacity Ratio of Roads

No	Road Name	Volume Capacity Ratio
1	NH4	2.3
2	Nashik Road	1.3
3	Solapur Road	1.7
4	Ahmed Nagar Road	1.8
5	Yerawada to Visharwadi Road	1.2
6	Airport / Jail Road	0.9
7	Saswad Road	1.8
8	Kondhwa Road	0.7
9	Sinhagad Road	0.9
10	Paud Road	1.2
11	Pashan Road	1.2
12	Ganesh Khind Road	2.1
13	Old Mumbai Pune Road	1.5
14	Yerawadi to Bhairabanala Road	1.2
15	Satara Road	1.8
16	Bibewadi Road	0.9
17	Mundhwa Bypass	1.3
18	Jangali Maharaj Road	2.1
19	Karve Road	1.2
20	Alandi Road	1.1
21	Baner Road	1.3
22	Bhairoba Magarpatta Road	1.0
23	Nehru Road	1.2
24	Bajirao Road	0.9
25	Visharwadi - Dhanuri Road	0.9
26	LalBhagadur Road	0.9

Source: Comprehensive Mobility Plan for Pune City

UNDER JnNURM phase-1, road improvement works have been done. The major road stretches improved include the following :

Airport to Ramvadi road , Sancheti hospital to Vidya Peth road , Balewadi to westerly by- pass ,Baji Rao Road , Shivaji Road , FC road , Nehru road , FC road , Deccan college to Bombay sparsh road , Airport to Gujan Takies to Tata guard room, Karve road – Khandoji Baba Chowk to Warje Flyover , Karve Flyover to karve statue , Baner Road University to Green Park Hotel , Sangam wadi to Sadalbaba Via Defense land , Yerwada to Decan College , Kalyani Nagar Junction to Alandi Road ,Hotel green park to Balewadi stadium crossing Westerly by-pass , Karve road to Karve statue , Singhad road and Paud raod are covered under JnNURM .

After the road improvement, the traffic movement is free flowing whereby increase in per km speed and decrease in travel time has been observed and VC ratio decreased on these roads, for better management of traffic, some of the roads like JM Road, FC Road , have been declared as a one way, this has also contributed to increase in per km speed and the increase in capacity of the road in one direction has brought the VC ratio down. However, these measures are for traffic management but are not the permanent solution to the problem of congestion, moreover due to one way traffic flow the traffic moves through the inner roads and riders have to take longer routes, which adds to pollution, more fuel consumption and more wear-tear of vehicles.



4.6.6.3 Road accidents

Road accidents have become a matter of great concern to all. The numbers of accidents on the roads of Pune and the resulting casualties have been on the rise in the last decade. In the year of 2010, 417 people died in traffic accidents in Pune. The figure Below indicates that in year 2007 the highest number of accidents took place of which the number of Fatal accidents was 458 and grievous accidents was 531, as per the records, there is slight decrease from 450 to 399 (fatal accidents) and 531 to 468 in (grievous accidents) in the year of 2010 which is due to fact that after 2007 various road improvements and BRTS project have been implemented under JnNURM which reduce the travel time and resulting less number of accidents. As per consultation with traffic police department a high number of accidents involve two-wheeler riders.

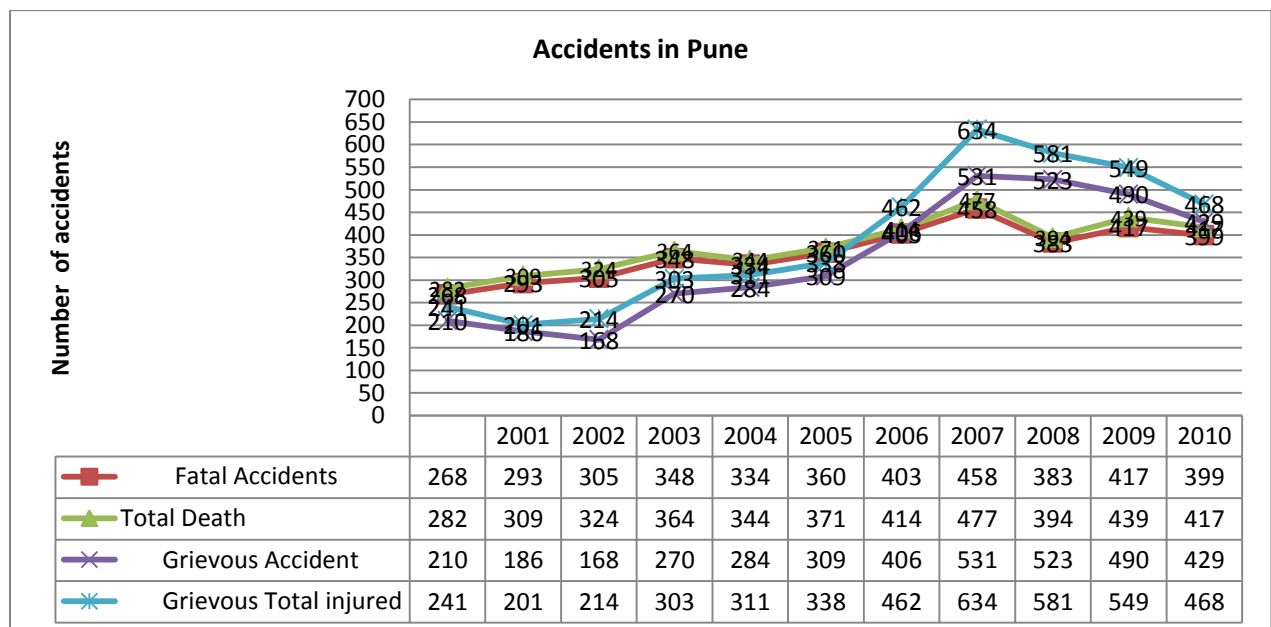


Figure 4-10: Road Accident in pune

Source: <http://punetrafficpolice.gov.in/index.php/en/statistics/accident-statistics.html>

4.6.7 Public Transport

4.6.7.1 Bus Service

An efficient public transport, apart from reducing pollution and traffic also ensures lesser accidents and better health of the commuters. Pune Mahanagar Parivahan Mahamandal Ltd. (PMPML) is the service provider of the public transport system of Pune. PMPML has about 1,745 buses in operation, including around 327 buses hired from private operators. Detail and type of buses are tabulated below:

Table 4-34: Type and Number of Buses

Sl. N	Type of Buses / Vehicle	Number of Vehicle
1	Leyland	727 (Including 10 Volvo Buses)
2	Tata	691 (Including 10 Star Buses)
	Total	1418
	Euro Norms	
1	Euro 1 Diesel	201
2	Euro 2 Diesel	352



Sl. N	Type of Buses / Vehicle	Number of Vehicle
3	Euro 3 Diesel	495
4	Euro 3 CNG	85
5	Euro 4 CNG	285
	Total	1418
	Hire Buses	
1	Ley Land	114
2	Tata	213
	Total	327

Source: PMPML Pune, 2012

According to JnNURM guidelines for provision of buses 40 buses per lakh population are required, a city of the size of Pune, with a population of around 45 lakhs including Pimpri Chinchwad, should have about 2,500 buses. In spite of these shortcomings, PMPML is carrying around 10 lakh commuters every day (Source: Karve Institute report 2010-11).

Table 4-35: Characteristics of Public Transport

S. No.	Year	Fleet Size	Buses on road PMPML + Hire	No. of Routes	Total Route length	Average Daily Passengers	Avg. age of fleet
1	2007-08	631.14	768+165	283	18.4	807511	6
2	2008-09	631.14	817+258	304	17.5	971250	6
3	2009-10	631.14	949+333	323	17.6	1172424	5
4	2010-11	631.14	916+308	334	17.9	1236176	7

Source: PMPML Pune, 2012

Presently, PMPML operates 334 intercity routes with average route length of 18 kms. The present PMPML fleet is plagued with overage buses resulting in inefficiency in operation and economic loss. The average age of Fleets is 7 years. As per PMPML records, 12.3 lakh passenger are daily travelling in PMPML buses. Bus fares are charged on the basis of km travelled, and range from the minimum fare of 5 Rs for 0- 2 kms to 11 Rs for a journey of 10 kms.

In addition to local bus services, there are number of inter-city buses offering services between Pune and other major cities such as Bombay, Bangalore, Nagpur and Hyderabad. A number of different standards of bus services are on offer, ranging from express air conditioned buses to stopping service.

4.6.7.2 Local Trains

There are 17 pairs of trains between Pune and Lonavla, and three pairs of trains up to Talegaon in service currently. The services are run with four rakes, with nine compartments each. However, with a considerable increase in the number of commuters, the demand for increasing the frequency of trains has also become stronger. The commuters have been demanding that the number of compartments should be increased from nine to 12 per train.

4.6.8 Intermediate Public Transport

The autos are the predominant and cheapest mode of public transport catering to the needs of population by providing good mobility within the city. As of 2012, about 65,592 three wheelers are running on the streets of Pune. They provide better connectivity to the city core which has a narrow road



network. Many people prefer them to local bus service due to lesser wait time and near point to point service. Auto rickshaws tend to serve areas with poor bus service provision and offer a relatively cheap source of transport; for example, they are used to transport groups of children to school. Six-seater autos are becoming increasingly popular, however, are causing higher level of pollution. According to Pune Traffic Control Branch, three wheelers wait for commuters at 500 designated stands on the streets.

4.6.9 Non-Motorized Transport (NMT)

Historically, Pune was known as the "cycle city of India", however cycling has decreased in popularity as the ownership and use of motorized two-wheelers has increased. Due to the significant slum population and student population there is a significant continued usage of bicycles in Pune. From House hold survey analysis it was observed about 28% of trips are made by cycles. But in most of the roads there is no segregation for the cycle traffic from the motorized traffic causing potential unsafe conditions.

About 11% of the total trips in the city are made by cycles in the form of Non-Motorized Transport. However, on most of the roads there is no segregation for the cycle traffic from the motorized traffic causing potential unsafe conditions. Footpaths of major roads as well as narrow streets of the dense urban core are encroached by hawkers and vendors. In many cases these activities have spread on the carriageway reducing its effective width. Pedestrians and senior citizens are forced to walk on the carriageway which is not safe.

The summary sheet of the existing Cycle Track Network under NMT in the city and the project wise details are provided in the tables below:

Table 4-36: Road Wise Detail of Cycle Tracks

S. No	Name of the Road	Total Length (km) RHS	Total Length (km) LHS
1	Sancheti Hospital to University Chowk	2.89	2.89
2	Hotel Green Park to Balewadi	4.75	4.75
3	Airport Junction to Vishrantiwadi Chowk	2.23	2.23
4	Kalyani Nagar Junction to Alandi Road	2.43	2.43
5	Sancheti Hospital to Govt. Poultry Farm Road	2.25	2.25
6	Yerwada to Deccan College	0.83	0.83
7	Deccan college to Bombay Sappers	0.89	0.89
8	Nagar Road-Ramwadi to New PMC limit	5.2	5.98
9	Bombay Sappers to Vishrantiwadi	3.45	3.45
10	Lakshmi Mandir to Dandekar Bridge and Dandekar Bridge to Manikbaug (Upto Dhayari Pahat)	4.76	4.66
11	Airport Road – Gujan Talkies to Tata Guard Room	2.23	2.23
12	Sangamwadi to Sadalbaba Road	1.46	1.46
13	New Alandi Road – R & D Gate – Pune PMC limit	2.57	2.57
14	Khandujibabachowk to paudphata flyover	2.15	2.15
15	Paudphata flyover to Karve statue	1.00	1.00
16	Karve statue to Warje road octroinaka	2.45	2.45
17	Warje old octroinaka to Warje Flyover	0.90	0.90
18	Paud Road	4.03	4.03
	Total	46.47	47.15

Source: Cycle Tracks in Pune City, PMC, January 2012

The total road length in Pune is 1922 Km and the total length of cycle tracks along the road is just 47 Km

on an average (2.45%) which is very less. After the implementation of BRTS 118 km cycle track has been developed to promote the NMT.

4.6.10 Foot Paths

Footpaths of major roads as well as narrow streets of the dense urban core are encroached by hawkers and vendors. In many cases these activities have spread on the carriageway reducing its effective width.

Pedestrians are forced to walk on the carriageway which is not safe. Road surfaces are deteriorated by spillage of water and garbage by fruit/ vegetable/ food stalls. On some roads (e.g. near Pune Station) illegal squatters/ slums have sprung up on the footpaths. From the road inventory, it is observed that about 50% of roads do not have foot paths on both sides.

4.6.11 Bus Stand or Depot

There are seven bus depots or bus stands in Pune city situated at various locations:

- Swargate (Intercity)
- N.T. Wadi (Shivaji Nagar) Depot
- Kothurd Depot
- Katraj Depot
- Hadapsar Depot
- M. Yard Depot
- Pune Station Bus Terminal (Intercity)
- Mahatma Gandhi Bus Terminal

Swargate bus stand which is located in the southern part of the city along Satara road and Pune station bus stand which is located in the central part of the city near railway station are the two major intercity bus stands catering to the intercity traffic with origin and destination other than Pune.

4.6.12 Parking

4.6.12.1 On street Parking

Table 4-37: Summary of on-street Parking

S. No	Name of the Road	No. of Vehicles Parked (12 Hrs)					Total
		Two Wheeler	Car / Van	Auto	Bus	Truck / LCV	
1	Bajirao Road	632	251	7	0	4	894
2	FC road	1809	1530	506	0	0	3845
3	Godgil Street	643	159	94	0	25	921
4	Jhmagli Maharaj Road	1316	534	184	5	5	2044
5	Karve Road	738	227	31	0	12	1008
6	Kelkar Road	920	260	89	0	13	1282
7	Kumtekar Road	1333	407	186	3	2	1931
8	LB Satri Road	1413	576	372	71	136	2568
9	Tilak Road	1359	7272	66	7	0	1694

Source: CMP, PMC, 2008

Truck/LCV parking is observed on LB Sastri Road and Godgil Street. Maximum parking is observed on FC road, with 3,845 vehicles in 12 hours the least amount of parked vehicles was found on Baji Rao road

among the survey locations.

Composition of Parked Vehicles

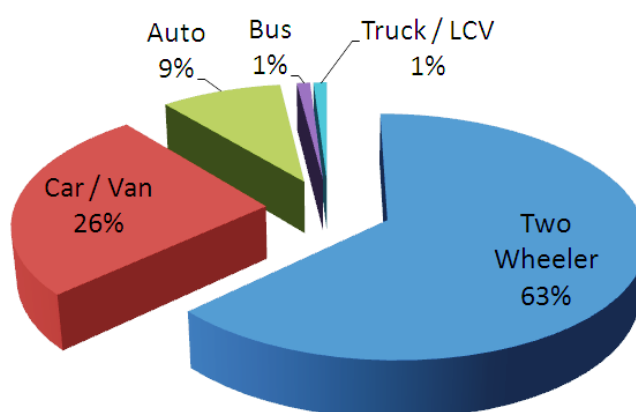


Figure 4-11: Average Composition of Parked vehicles

(Source: CMP, PMC, 2008)

Two-wheelers shared the majority of the total vehicles parked, which share 63% of the total vehicles followed by Car / Van. Thus it can be seen that 89% of the vehicles parked on the streets are private vehicles.

4.6.12.2 Off street Parking

Car parking is significant at PMC Gate 2, Pune station, Hamalwada and Mandai. Maximum off street parking is observed at PMC, accounting about vehicles 1567 in 12 hours and least off street parking is observed at Pune Station.

Table 4-38: Summary of Parked Roads

S. No	Name of the Road	No. of Vehicles Parked (12 Hrs)				
		Two Wheeler	Car / Van	Auto	Cycle	Total
1	FC College	110	654	22	23	809
2	Hamalwada	412	297	21	50	780
3	Jhangli Maharaj Road	95	460	29	10	594
4	Mandai	363	456	6	0	825
5	Mandai 1	93	381	22	11	507
6	PMC Back Gate	22	1124	68	353	1567
7	PMC Gate 1	150	795	0	7	952
8	PMC Gate 2	465	558	0	0	1023
9	Pune Station	434	59	0	0	492
10	Pune station 1	0	1307	0	0	1307
11	Swargate	0	812	39	16	867

Source: CMP, PMC, 2008

Composition of Parked Vehicles

Two-wheelers shared the majority of the total vehicles parked, which shared 65% of the total vehicles. Cars and auto shared 25% and 3% respectively; Cycles shared 7% of the Total vehicle parked.

Pune Municipal Corporation has taken a projects of 9 Parking lots at Pune Station Moledina Hall, K. Satish Dhodiba Mandai, Misal Mandai, Hutatma babu Ganu Mandai, Nariyan Peth Hamalwada, Sambhaji Udyan, Rajshree Sahu Bus Terminal, Rajeev Gandhi Zoological Park and Katraj, Juna Naka.

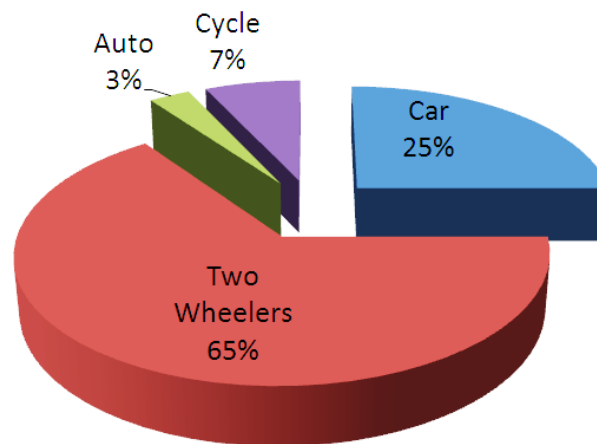


Figure 4-12: Average Composition of Parked vehicles (Off Street)
(Source: CMP, PMC, 2008)

4.6.13 Major Issues

- Inadequate capacity of roads and heterogeneous traffic has increased congestion leading to low operating speeds, delays and environmental pollution.
- Inadequacy of public transport for over a decade has led to emergence of auto-rickshaws as a public transport mode. Increase in personalized vehicles has also been observed.
- Haphazard vehicular movement due to poor sense of driving, insufficient parking facilities and inadequate enforcement has compounded traffic problems.
- The margins of major roads and the footpaths are encroached upon in several sections for a variety of purposes including informal activities.
- There is an absence of a safe and comprehensive system of pathways exposing pedestrians to risks. It also creates pedestrian-vehicular conflict zones in almost all stretches of arterial and sub-arterial roads.



Plate 4-9: On-Street Parking near Laxmi Road



Plate 4-10: Traffic congestion near Dagdu Seth Temple



4.6.14 Status of CIP Proposed under Previous CDP 2006-12

The total investment proposed under the transportation and traffic management sector in Pune CDP 2006-12 proposed was Rs. 2,248.34 crore. Previous CDP suggested increase in the carrying capacity through road widening and also to improve riding quality through strengthening of existing roads to cater to the missing links and developing areas by providing efficient, safe and accessible mass transportation system for entire region. For achieving the above strategies road upgrading, new road formation, road widening and strengthening, utility corridors and shifting for major roads, RoBs, flyovers, public transport /BRTS and HCMTR had been proposed. Out of the total amount proposed, Rs. 1,072.70 crore has been approved under JNNURM. BRTS and Road improvements are the main projects which are sanctioned under JnNURM.

Table 4-39: Summary of CIP for Traffic & Transportation till 2011-12 (as per CDP 2006-12)

Sector/ Component	Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Remarks	Balance DPR to be Prepared (Rs. Crore)
Transportation & Traffic Management	2,248.34	1,072.70	1,175.64	122.00		1,053.64
1 Roads Upgradation	195.48	1,058.83	526.31			
2 Roads New Formation	327.78					
3 Roads Widening & Strengthening	315.00					
4 Utility Corridors & Shifting for Major Roads	646.88					
5 Public Transport/ Improvements/ BRTS	100.00			42.00	DPR to be submitted to JNNURM	
6 HCMTR/ IRDP	243.92		243.92			
7 ROB/Flyover/Bridges	179.28	13.87	165.41	80.00	Parnakuti&Juna Bazaar FOs submitted to MMRDA	
8 Land Acquisition for Road Improvements	200.00		200.00			
9 Traffic Management / Junction Improvement	40.00		40.00			

Source: Pune Municipal Corporation & CDP Pune 2006-07

Table 4-40: Details of Sanctioned Projects under JNNURM

SN	Project	Revised Sanctioned Cost (Rs. Crore)	Tender Awarded Amount (Rs. Crore)	Amount Utilized till now (Rs. Crore)	% of expenditure incurred against tendered Amount
1	Pilot BRT	103.14	135.03	132.42	Completed
2	CYG BRT	434.22	436.73	360.54	82.55
3	BRTS Phase I	476.62	489.05	467.04	95.50
4	Nagar Rd. Subway	6.61	8.83	7.81	88.45
5	Baner Road Subway	7.26	7.9	7.76	Completed
6	Sangamwadi Approach Road	7.82	9.51	8.26	Completed
7	New Alandi Road	37.03	37.36	24.26	64.93
	Grand Total	1072.7	1124.41	1008.09	89.65

Source: Pune Municipal Corporation, 2012



Pune Municipal Corporation successfully completed 3 projects under Road & Transportation sector i.e. Pune Pilot BRTS, Baner Sub-way and New Alandi road. Pune Pilot BRTS project has improved the quality of road in term of facilities provided by cyclist, pedestrian, private motor vehicles and buses. BRTS project also improve the PMPML proformance, increase the ridership, reduce the accidents and save the travel time. After the completion of of subway on westerly by-pass at Baner junction traffic congestion and travel time reduce considerably. The subway has enabled to smooth traffic flow of traffic in all directions with traffic signals. Sangamwadi Bridge approach road increase the acessbility between Defence areas, Yerwada, Shivajinagar and Airport.

4.6.15 Strategies and Goals Proposed in Previous CDP

Key Issues In previous CDP	Goal for Development in previous CDP	Current Status /Issues / Achievements
<ul style="list-style-type: none"> ✓ Absence of functional hierarchy of road network results in inter-mixing of local and regional traffic. ✓ Narrow roads in the central and core areas of the city with restricted capacity add to congestion problems. ✓ Inadequate grade separation leads to travel delays and threatens road safety. ✓ Poor road surface quality and absence of appropriate safety and visibility enhancement parameters like signage, markings, Channel Islands, street name boards and other street furniture constitute an important problem. ✓ Only 40% of the roads have footpaths and most of the existing ones are encroached upon by informal activities and street hawkers. ✓ There is an absence of access control measures and other such traffic management measures on the arterial roads. ✓ The public transport system is inadequate. ✓ Parking demands are largely unmet owing to a lack of organized on-street parking facilities. ✓ The problem of lack of civic sense towards traffic and poor travel behavior is compounded by the lack of coordination among agencies involved in planning and providing for traffic and transportation. 	<ul style="list-style-type: none"> ✓ Road widening, dedicated bus lanes, cycle tracks and improvement of the public transport system in the short run; exploring the possibility of BRTS and MRTS in the long run 	<ul style="list-style-type: none"> ✓ In old areas and the villages within the Municipal boundary the roads are narrow ✓ High Vehicular Growth ✓ From the previous CDP potential projects Like Improvement of road and transportation has come up but due to lack of feeder transportation in the inner areas optimum utilization of these services have not taken place ✓ People preference is own Vehicles specially two wheeler ✓ Lack of pedestrian Facilities

4.6.16 Previous studies and polices

4.6.16.1 Comprehensive Transport policy For PMR

Vision

- ✓ Develop Operate and availability of Environment friendly, economic, safe and socially acceptable transport to all citizens.



- ✓ To create and manage Pune's integrated urban transport system, which makes available to its inhabitants convenient, comfortable, affordable, efficient, safe and environment friendly transport system, which allows congestion free movement of traffic including bus, goods, pedestrian, cyclists and other modes of transports.
- ✓ All these is anticipated with effective patterns of land use along with equitable development of the city, boost the economic activity and support social development of its people and put them on the path to sustainability.
- ✓ In other words, , "Establish fast, comfortable, economic, and personalized vehicle-competitive mass transit systems (MTS) that will serve the mobility needs of all segments of Pune's population, even current owners of personalized vehicles".
- ✓ It is necessary to quantify the vision in terms of reduction of the number of personalized transport on roads during peak hours and improvements in the various indices such as, walkability, safety, public transport and intermediate public transport. The aim would be to improve the number of pedestrian infrastructure vis-à-vis the total length of roads, reduce accidents, and improve the number of PT/IPT per lakh of population (the aim should be to make available the requisite number of buses per lakh population as per CIRT norms).

Recommendations

Policy recommended that every traffic and land use policy decision should be in consonance with this overarching principle.

In the end Pune must be a city that is people-friendly, not vehicle-friendly.

Public Transport

- ✓ Improve the existing bus system
- ✓ Start the transition to the next generation bus based public transport system
- ✓ BRTS should be designed and Built to attract every Class of commuter
- ✓ Public transport should be subsidized
- ✓ Dedicated lanes for Buses

NMT

- ✓ Making walking and cycling safe and convenient for pedestrians and cyclists; and
- ✓ Encouraging more and more people to walk and/or bicycle (instead of using their auto vehicles).

Parking

- ✓ TDM Measures
- ✓ Control parking Zones
- ✓ Multi-Storey Parking and BOT Financing

Fuels

- ✓ Use of Alternative Fuels Like LPG , CNG



Other Recommendations

- ✓ Provision of by-passes to reduce the outer traffic movement
- ✓ Capacity building for traffic police
- ✓ Establishment of intelligent public transport system

The vision given in the Transport Policy is to provide environmental friendly, economic, safe and socially acceptable transport to all citizens by means of creating and managing Pune's integrated urban transport system. This will make available to its inhabitants a convenient, comfortable, affordable, efficient, safe, and environment friendly transport system, which allows congestion free movement of traffic including bus, goods, pedestrian, cyclists and other modes of transports.

4.6.16.2 Comprehensive Mobility Plan

The Comprehensive City Mobility Plan addresses traffic growth of all modes of transportation and suggests a direction for the multi-modal transport system in Pune. The Comprehensive Mobility plan proposes various traffic and Transportation projects costing Rs.22,700 Crore. CMP also covers ring road development, BRTS, Mono rails, PMPML, and Development of other link.

Recommendations

- ✓ CMP seeks to Move People, Not Vehicles
- ✓ 60% of total Investment is for public /mass transport system
- ✓ In the first phase , focus should be on traffic management
- ✓ Augmenting BRT, Public transport must in first Phase

Road Safety

- ✓ Make all traffic sign retro-reflective
- ✓ Traffic marking on all roads
- ✓ Ensure adequate Street lighting in roads
- ✓ Implement traffic management measures near railway station and the Swargate area
- ✓ Carry out junction improvements for road safety

Parking Management

- ✓ Strategic Parking Plazas are required
- ✓ Parking plaza must discourage commercial /use
- ✓ It should facilitate public transport/NMT
- ✓ Parking Plaza should improve traffic circulation
- ✓ Consider implementing congestion charges

Non-Motorized Transport

- ✓ Footpath to promote walking for short trip
- ✓ Footpath should be at 1.5m wide
- ✓ Design must discourage two-wheeler from using them

- ✓ Pedestrian zebra-crossing must be clearly marked near traffic signals
- ✓ Footpaths at busy intersection should have hand rail

Although the Comprehensive Mobility Plan considered public transit, footpath and road improvements but there are a gap in identification of projects on provision of cycling path.

4.6.16.3 Bus Rapid Transit System (BRTS), Pune

The main goal of urban transport policy; to provide mobility to people, not vehicles in conformation with this, public transport system is the most effective means of moving people. As compared to other modes of public transport like Metro, Tram, Monorail, BRTS is the most cost effective and fast to implement mode of public transport and thus it is the most preferred option.

The basic components of BTRS are: dedicated bus lanes, Intelligent transport system (ITS) including buses equipped with Geographical Positioning System (GPS) and auto ticketing systems, low floor buses and properly designed footpaths, cycle tracks along the transport corridor, pedestrian facilities, automatic and synchronized signalization on intersections throughout the BRT route, for implementing the concept of 'Park and Ride' parking should be provided with the bus stops and feeder transport system to cater the internal roads.

BRT buses are fitted with GPS which enables real time information to be transmitted to each bus shelter so that a commuter always knows when the next bus will arrive. Simple to understand maps are displayed so that using the bus becomes easy even for a first time user. BRT should also have off-bus ticketing, just like for trains, so that commuters can buy tickets at the bus-shelter before boarding the bus.

Pune is the Pioneer to introduce the first BRTS in India with a Pilot Project named Swargate-Katraj-Hadpsar, BRTS in 2006 The project consists of 16.5 kms of bus lanes along the Pune Satara Road using air conditioned, low-floor more than 500 Volvo B7RLE buses. BRTS route is comprised of 27 bus stops, 29 Junctions and 6 terminals which are presented in detail in below figure. The pilot BRTS connects 6 terminals and major activity areas specially Hadpsar, Magarpatta , Swargate , Cantt area , Bibvewadi , Balajinagar and Katraj with each other.

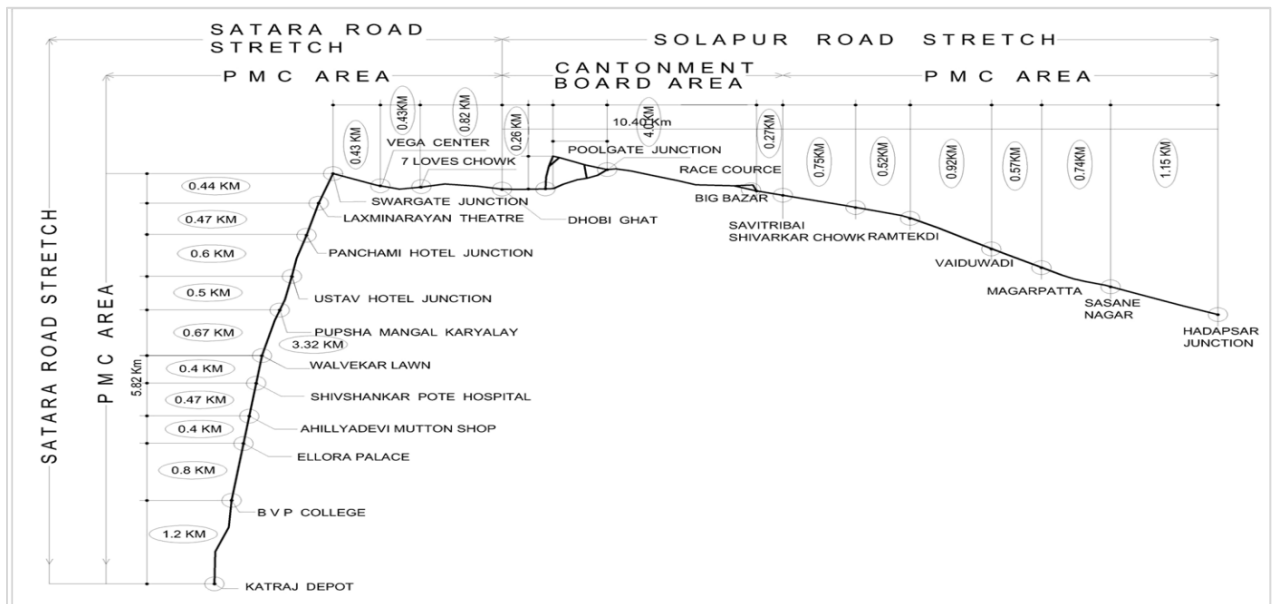


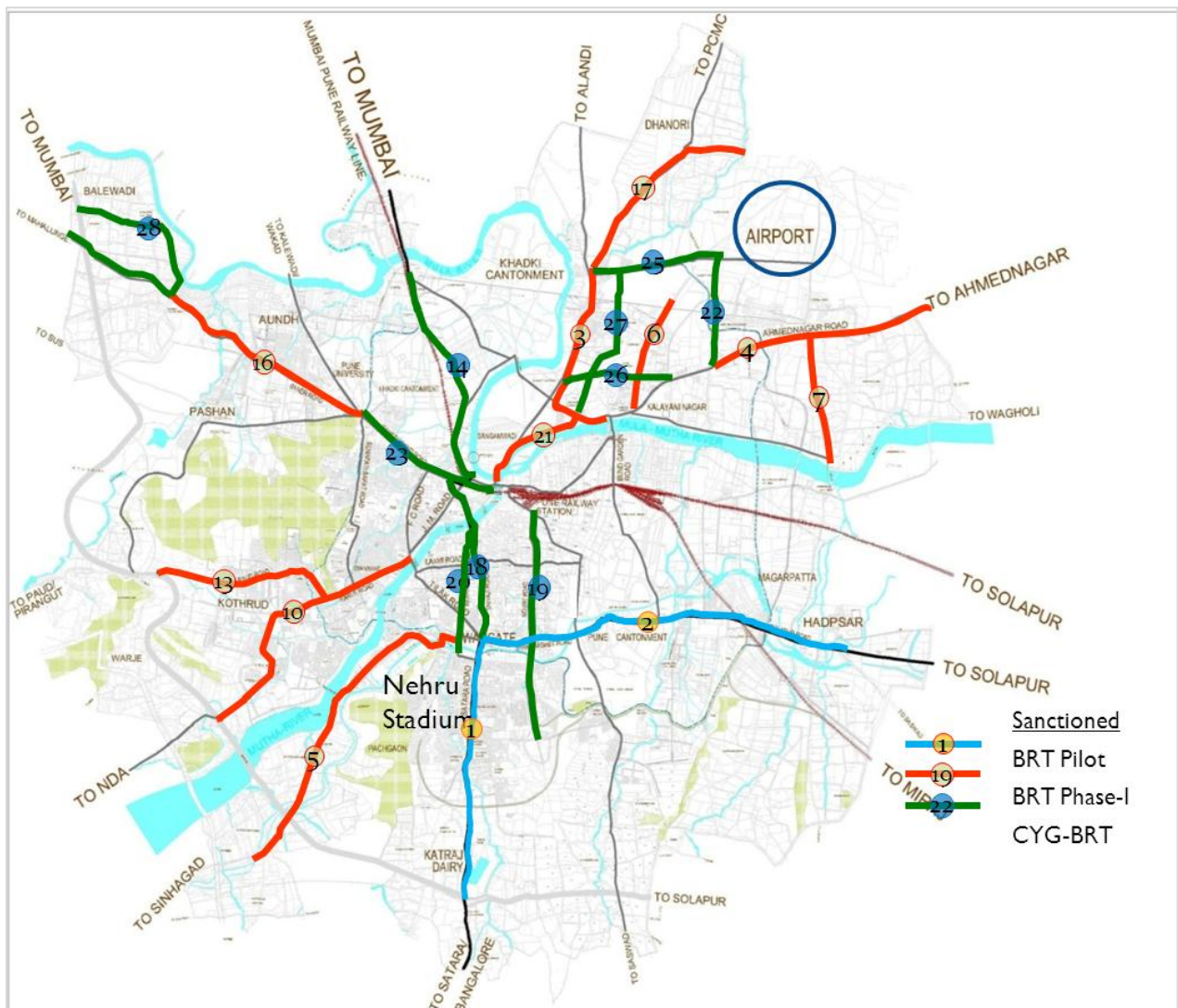
Figure 4-13: Pilot BRTS Network with Bus stops Location



Table 4-41: Pilot BRTS Characteristics

Details	Swargate- Katraj	Swargate- Hadapsar	Total
Length (km)	6	11	17.0
No. of Bus stops	12	15	27
Junctions	13	16	29
Terminals	4	2	6

Apart from Pilot Project approximately 101 km additional BRTS network sanctioned under JnNURM. The BRTS system for Pune is a system with a mix of dedicated and non-dedicated BRT lanes depending upon the availability of right of Way, of the total 118.25 km proposed network.



Map No. 4-9: BRTS Route

Initially BRTS in Pune proved highly effective in improving the overall traffic and transport conditions; the travel times on the stretches where BRTS was implemented reduced and common public was benefitted to the fullest. The BRTS proved to be one of the highlights of Pune for the 2008 Commonwealth games which it successfully hosted, with the support of PMC and PMPML. This initial success of BRTS in Pune opened up the avenues for BRTS within the country. Some of the positive impacts discussed below;

- BRTS improved the road design, Visual appeal in Pune which not only imparted lane discipline but

also segregated slow and fast moving vehicles. BRTS also systemized and synchronized the signal whereby reducing the stopping time at signals and increasing the security of the pedestrian in term of signal controlled and safe on Junctions.

- Dedicated lanes increased the frequency & reliability of all buses plying on the routes. This has resulted in ability to deploy more buses on these routes, due to rise in number of passengers leading to rise in revenue collected per day. PMPML made a profit of 2500 Rs per day/bus on this route. (Source : PMPML Traffic Planning dept 2009)
- Due to BRTS the length of cycle tracks, foot paths and area under green cover have increased in city which not only improved the facilities of pedestrian but also improved the city environment.
- Introduction of low floor air conditioned buses increased the number of passenger and made the trip more comfortable.
- BRTS also helped to reduce the accidents due to reduction in travel time.

Though the BRTS in the initial phase was a huge success, there are some areas where it could improve to do even better:

- The system adopted for providing BRTS was along the median, in which Bus Shelters are provided at the median of the road; non-availability of grade separated pedestrian facility at some locations makes the crossing of the road for passengers after alighting or before Boarding was a big hassle, hence the provision of foot over bridges/ Over Head walkways or underground pedestrians to be made.
- The BRTS already uses an Information system for displaying advertisement messages transmitted via satellite; this system could be used to show current status of the bus in terms of timing and location as well as the status of buses available from the next stop.
- Boarding the bus is a big hassle for elderly and handicapped Passengers, so the height of the bus boarding platform and bus stop should be aligned thereby facilitating the passengers.
- Since, the lane remains unused for most of the time, the frequency of buses on these routes should be increased to optimally utilize the dedicated lanes, so as to extend the benefits of BRTS.
- NMT and feeder system should be developed to cater the inner roads.
- The with provision of on ground or underground parking lots to ensure 'Park and Ride' should be made.
- Hub and Spoke system should be implemented for optimal utilization of BRTS.
- Presently in city 101 km mixed and unmixed BRTS system is sanctioned under JnNURM, out of 101 km network 57 percent non-dedicated network.

4.6.16.4 Metro Rail

The Metro Rail Project emphasized that there is a low Public Transport Support in the area and an increase in use of Private Vehicles. The result from a Home Interview Survey indicates a Public Transport share of 13% while the desirable level should be at least 50%. This level could be achieved only by



developing an efficient mass transit system based on transport technologies providing high carrying capacity. DPR has been prepared by Delhi Metro Rail Corporation. The project is divided in four phases:

First phase

The two routes that have been identified for the first phase are:

- ✓ Chinchwad - Pimpri - Swargate, via Agriculture college (16.5 kms, elevated/underground from Range Hills)
- ✓ Vanaz - Ramwadi, via Deccan Gymkhana, Yerwada (14.9 kms, elevated)

Second phase

Second phase of the project will contain two lines and the extension of first phase:

- ✓ ASI to Hinjawadi via Aundh (18 kms elevated)
- ✓ Deccan Gymkhana to Bund Garden Via Swargate and Race Course (11 kms underground)
- ✓ Extension of lines from Pimpri-Chinchwad to Nigdi and Swargate to Katraj (11.5 kms elevated)
- ✓ Extension of lines from Aundh to Hinjawadi and Ramwadi to Kharadi Naka (13 kms elevated)
- ✓ Extension of lines from Ramwadi to Viman Nagar Airport (elevated)

Third phase

Third phase will complete the project at once and it will contain the following line:

- ✓ Agriculture college - Warje via JM road and Karve road (9 km elevated)
- ✓ Extension from Bund Garden to Vishrantwadi (underground)
- ✓ Extension from Race Course to Hadapsar (Elevated)
- ✓ Link from Bhosari to Moshi to link with Moshi-Chakan-new Pune international airport metro line. (Elevated)

Of the six metro routes proposed in Pune, the Vanaz-Ramwadi- Chandannagar route would be taken up first. The route, which will cost Rs 2,593 crore, will have 15 stations including one leading to the Pune railway station. Of the Rs 2,593 crore to be spent on the Vanaz-Ramwadi and Chandannagar route, the State and Centre would contribute 40% of the cost (20% each) and PMC will have to raise another 10%. As per the State plans, the remaining 50% will either be raised through loans or by offering the project on a build-operate-transfer or public-private partnership basis. The other proposed route to be taken up in the first phase is a 17-kms route from Swargate to Pimpri-Chinchwad at a cost of Rs 5,391 crore. Four other routes - Shivajinagar to Hinjewadi, Deccan to Bund Garden, and Swargate to Katraj and Pimpri-Chinchwad to Nigdi (collectively 44 kms) have been proposed in the second phase.

4.6.16.5 Pune Outer Ring Road

The traffic in and around Pune City has been increasing at high rate due to industrial and other socio-economic development in and around Pune City. As a result, roads radiating from the city in all directions were required to be widened to 4 lane/ 6 lanes. However, the vehicles which are coming from one direction and proceeding to other directions pass through Pune City, thereby, creating traffic problems. Such passing traffic, if diverted through road network outside the city limits, it will solve/decongest the traffic problem in intra-city. In absence of such peripheral connections, the load of external floating traffic is ever increasing on the intra city road network.

To avoid the traffic congestion in Pune, an Outer Ring Road is proposed for the city. The Pimpri-Chinchwad Municipal Corporation (PCMC) and Pune Municipal Corporation (PMC) are responsible to make necessary provision for this plan. The total length of road is 160 KM. The total cost will be Rs 10,408.00 crore.

This project will be completed in four phases:

- Phase 1: TheurPhata (On NH 9) - Kesnand - Wagholi - Bhavdi - Tulapur - Alandi - Kalegaon - Chimbli (On NH 50)
- Phase 2: Chimbli (On NH 50) - Moe - Nighoje - Sangurde - Shelarwadi - NH 4 - Shirgaon - Chandkhed - Pachne - Pimpoli - Rihe - Ghotawde - Pirangut.
- Phase 3: Pirangut - Urwade - MuthaBhuli - Sangrun - Nigde - Khamgaon - Ghera - Sinhagad - Kalyan - Kondanpur - Sriramnagar - NH 4.
- Phase 4: NH 4 - Gogalwadi - Patharwadi - Bhivri - Kanifnath - TheurPhata (On NH 9)

4.6.17 HCMTR (High Capacity Mass Transit Route)

As per Santioned Development Plan 1987 for achieving the rapid movement of traffic and cater the future needs of rapid urbanization high capacity mass transit route have been proposed. The Total length of proposed route is approximately 34 km and width is vary from 24 to 30 km. some section of HCMTR are existing roads , while some sections are proposed. As per the consulation with PMC officials the main problem of implemetaion of HCMTR is land aquisition. As per the DP and CMP HCMTR is proposed for entirely used for public transport puposes and as per CMP it is also assumed that HCMTR system can carry pphd of 15000 -25000 with Monorail type system.

4.6.18 Strategies for Development

The Comprehensive Mobility plan (CMP) as its name advocates, is a document which gives all the measures that should be taken up to improve the traffic and transport condition in Pune city, hence it is recommended that any project which is taken up without being the part of CMP should first be analyzed with respect to the recommendations of the CMP and then implemented and if it is not included in CMP or is not in coherence with the CMP then necessary changes be made either in the Project or in the CMP to make both compatible with each other.

4.6.19 Vision Statement

“To provide a safe, efficient and cost effective multimodal transportation system that is accessible to all residents and visitors, protects environment, promotes economic development and is compatible with and supportive of the city’s future land use plan”.

4.6.19.1 Public Transport system

- ✓ Public transport should serve the needs of urban poor and should be affordable
- ✓ Increase the public transport modes coverage and quality including the expansion and improvement of bus system
 - Increasing the Fleet capacity



- Establishment of newer and higher quality bus system to cater the need of all sections
- Implementing higher quality bus system specially in outer corridors
- Strengthening the passenger information system
- ✓ Introduction of new Modes of public transport such as Metro-rail , Light Rail Transport System (LRTS) and Monorail System – Special Projects
- ✓ Feeder service system of buses should be proposed to the metro-lines.
- ✓ Cycle track (including parking for cycles) with in radius of 1.5 km of metro line should be worked out and proposed.
- ✓ Discouraging private modes through higher cost: Initial operations and parking ,congestion pricing, lower right of way
- ✓ Feeder services for metro rail.

4.6.19.2 Non-Motorized transport and pedestrian facilities

- ✓ Safety concern of cyclist and pedestrian has to be addressed by encouraging the construction of segregated right of way for bicycle and pedestrian.
- ✓ Continuity of cycle track should be maintained
- ✓ Introduction of rental based cycles (Rent-a-Cycle Scheme)
- ✓ Provision of cycle parking specially at metro stations
- ✓ Restoration of footpath
- ✓ Barricading of footpath –foot path opening only the strategic location to regulate the pedestrian movement, to improve traffic safety and pedestrian safety also.
- ✓ Pedestrian walkover and subway –to be provided at high pedestrian link and Zones

4.6.19.3 Traffic management

- ✓ Establishment of central area review and improvement system
- ✓ Preparation of local area traffic management plans
- ✓ Education campaign to educate the passenger to encourage the use of public transport and road safety measure
- ✓ Introduction of congestion charges

4.6.19.4 Road network

- ✓ Implementation of Special projects Like Tunnels , High Capacity Mass Transport Road (HCMTR) and Flyovers as per CMP
- ✓ Junction improvements
- ✓ Pavement Marking and Signage to be installed at appropriate locations
- ✓ Priority to given signage near schools



- ✓ Retro-reflective signage

4.6.20 SWOT Analysis

Strength	Weakness
<ul style="list-style-type: none"> ✓ Strong linkages and connectivity with other part of the country by Air , Road and rail ✓ ROW availed in outer areas for the widening ✓ Pune is coming under DMIC Influence Zone 	<ul style="list-style-type: none"> ✓ Area under circulation below the normative standard (10-12percent) ✓ Radial and rectilinear pattern leads congestion in core areas ✓ Encroachment along the road side creating the problem of traffic congestion ✓ High volume capacity ratio in all Major roads ✓ Road network is not up to the mark in newly added areas ✓ Lack of pedestrian facilities ✓ High rate of accidents ✓ Lack of traffic sense among the citizens ✓ Non availability and poor condition of foot path ✓ Poor and inefficient public transport system
Opportunity	Threat
<ul style="list-style-type: none"> ✓ Reliable and efficient public transport system can increase the high percentage of shift two wheeler to public transport ✓ Opportunity to develop HCMTR by proposing the internal ring road ✓ Opportunity to implement highly investment projects BoT basis 	<ul style="list-style-type: none"> ✓ High growth rate of two wheeler leads congestion and pollution



5 SOCIAL INFRASTRUCTURE

5.1 INTRODUCTION

Development of social infrastructure comprising of education, health and medical care and recreational facilities is instrumental in contributing to substantial improvements in human resource development which will initiate and accelerate socio-economic and cultural development. Physical quality of life and human well-being are pivotal on the enhanced availability of these social services. These services are key to overall increased productivity. Thereby, the quality of social infrastructure is reflective of the condition of a given city.

5.2 EDUCATIONAL FACILITIES

Education entails the development pattern of any city, exhibiting the quantum of urbanization, through its literacy levels and exposure to different education facilities; owing to the quantitative and qualitative attributes of the educational facilities, metaphorically the city of Pune is known as **'the Oxford of the East'** with more than a hundred educational institutes and nine universities catering at various levels and multiple number of professional and non-professional courses. Facilities in most colleges are sparse. The span of educational facilities is from Anganwadis/ Pre-primary, primary schools to Universities of International levels, which are provided by a host of agencies, ranging from the state government and local government to the agencies aided by the state government as well as private institutions.

The Pune Municipal Corporation is the monitoring authority for all the government schools within its boundaries. As its obligatory service, the PMC provides educational facilities to around 4,52,000 students through schools and colleges within the PMC boundaries.

Table 5-1: Total Number and Type of Schools

Sl.N	Type of school	Government	PMC	Private aided	Private Un-aided	Total
1	1 st to 4 th Standard	0	40	72	68	180
2	1 st to 5/6/7 th standard	5	230	80	140	455
3	1st to 10/12th standard	0	0	2	21	23
4	5 th to 10/12 th standard	0	5	98	24	127
5	8 th to 10/12 th	0	14	38	60	112
	Total	5	289	290	313	897

Source : Socio Economic Survey of Pune City: 2008-2009, Karve Institute of Social Service, B.D.Karve Research and Consultancy Cell

From the above table it can be concluded that PMC runs 289 numbers of schools while, 603 are private schools in the city, accounting to more than double than the municipal run schools. The student-teacher ratio in primary schools is 30:1 whereas for secondary schools it is 54:1 (Source: Shikshan Mandal, PMC budget 2010-11). As per consultation with slum dweller and on the basis of primary survey it is observed that educational facilities and supporting infrastructure is not adequate.



5.3 HIGHER EDUCATION

Soon after Indian independence, the establishment of the University of Pune took place in 1948; whereby affiliating only 18 colleges with the university by 1949, having an enrollment of more than 8000 students. Since then, the advancement in this segment has been taking place contributing to 46 graduate departments, 269 affiliated colleges, 11 colleges exclusively for girls and 129 recognized research institutions, with enrollments of 1,70,000 students for both the undergraduate and graduate courses in different subjects, taking place vigorously since 2004.

A number of institutions of national pride viz. Armed Forces Medical College (1948), National Defense Academy (1949), National Chemical Laboratory (1950) and Film and Television Institute of India (1960) were also established in Pune.

Apart from Pune University, there are 7 more universities, including deemed universities, namely Deccan College Post Graduate and Research Institute (1821), Tilak Maharashtra Vidyapeeth (1921), Gokhale Institute of Politics & Economics (1930), Symbiosis International Education Centre (1971), Bharati Vidyapeeth (1996), Defense Institute of Advanced Technology, Dr. D.Y. Patil Vidyapeeth offer a wide range of courses in various fields. Symbiosis Society in Pune has 34 academic institutions and 14 campuses in and around the city. It hosts over 45,000 Indian and International students on campus and over 1, 00, 000 students off campus.

Availability of research opportunities in the fields of archival history, politics, economics and culture in institutes such as the Deccan College, the Bhandarkar Oriental Research Institute (1917), the Gokhale Institute of Politics and Economics (1930), National Chemical Laboratory (NCL), National Institute of Virology (NIV), and Karve Institute of Social Service (1964), also contributes to the embellishment of this sector in Pune.

5.4 HEALTH FACILITIES

Prestigious health facilities in Pune city date back to 1885, wherein the municipality owned three dispensaries and also paid an annual grant of Rs.12,000 to Davis Sassoon Infirm Asylum. Since then, advancements were noticed, in the year 1861 the Sassoon Hospital was established, in addition to this setting up of seven allopathic dispensaries and one Ayurveda dispensary subsequently led the municipality to own eight dispensaries by the year 1936. In the existing scenario the PMC runs about 50 hospitals and municipal clinics spread over the city. There are also 528 private hospitals and 19 family welfare centers registered with the PMC.

5.5 RECREATIONAL AND OTHER FACILITIES

Pune city is a unique blend of culture and modernity. The fast moving city which is influenced by technological advancement and industrial development, still places due importance to culture and tradition. One finds that even though the mall and multiplex culture has set in, people, young and old still visit theaters to watch Marathi plays. The young generation will watch an English movie and with same enthusiasm volunteer during the yearly Ganeshotsav or Janmashtami celebrations. Recreation and entertainment are given importance in the hectic lives by one and all in the city.



Community Halls

The community halls used for exhibitions such as art and craft exhibitions, seminars and conferences, cultural events like dance and music shows, school annual day programmes, etc. Some of the popular community halls/auditoriums in the city of Pune are Nehru Memorial Hall, Tilak Smarak Mandir, Yeshwantrao Chavhan Natya Gruha, Bharat Natya Sanshodhan Mandir, Bal Gandharva Rang Mandir, etc.

Museum

The historic linkage of Pune city also bestows it to boast of a number of prominent museums including the Raja Dinkar Kelkar Museum, Mahatma Phule Museum, Dr. Babasaheb Ambedkar Museum and the Pune Tribal Museum, a rail exhibited with a meter-gauge train at the College of Military Engineering also having an archive and an equipment museum adds pride.

In the proximity to Pune city a magnificent railway museum is also coming up at Lonavala which is hardly at a distance of 60 km (37 mi) away from the city on the Mumbai railway line.

Theater

Pune is in the forefront when it comes to cinema, art and theatre. There are a total of 145 natyagruhas, single screen theatres and multiplexes in the city. Some of the single screen theatres like Alka talkies, Mangala, Gunjan Cinema, Rahul Talkies, Neelayam, West End, Alankar talkies, etc are well known theatres.

Multiplexes are the new age cinema halls. Here people can watch a movie, shop, eat and socialize. Inox, E Square, City Pride is some of the popular multiplexes in the city.

The people of the city, young and old alike are also fond of watching plays or dramas, especially Marathi plays. These are showcased at Bal Gandharva Rang Mandir, Yeshwantrao Chavhan Natya Gruha and Bharatnatya mandir.

Park and open Spaces

In the interest of the citizens and environmental sustainability 111 numbers of public gardens have been developed. The details of this part have been discussed in chapter dealing with urban Environment.

The Kamala Nehru Park, Sambhaji Park, Shahu Udyan, Peshwe Park, Saras Baug, Empress Garden, and Bund Garden. The Pune-Okayama Friendship Garden, now renamed Pu La Deshpande Udyan, is a re-creation of the Korakuen Garden in Okayama, Japan are important and famous public garden in Pune.

5.6 MAJOR ISSUES

- ✓ A spatial disparity is observed in the educational facilities with most of the primary, secondary and higher secondary schools in the city located in and around the central zone.
- ✓ Educational facilities in the slum localities of the city are also inadequate.
- ✓ As per stakeholder Consultation, the existing Municipal Schools needs to be upgraded to improve Educational Quality; there was also a requirement of play grounds/ halls in Municipal schools.



5.7 STRATEGIES FOR DEVELOPMENT

- ✓ Emphasis on pre-primary education and good quality primary education for all, especially for the residents of slum localities.
- ✓ Ensuring a minimum level of learning through enhancement of opportunities towards access to literacy programs.
- ✓ Professional and vocational colleges to be given importance for setting up employment development resources through education and training programs.
- ✓ Ensuring education of the handicapped and development of self-supporting employment opportunities for them.
- ✓ Reduction of health risks and practices leading to chronic and infectious diseases through effective implementation of sanitary programs, combined with regular inspection of food joints by the Food and Civil Supplies Department.
- ✓ Awareness on pre and post-natal care, and unhealthy practices leading to still births and infant mortality shall be created through door-to-door education campaigns.
- ✓ Reduction of environmental threats and hazards to health through an integrated approach by various concerned organizations and departments towards enhancement of the environment of the city.
- ✓ Provision for green belts in future development plan
- ✓ Encourage tree plantation among residents.
- ✓ Private sector to maintain existing parks/ gardens
- ✓ Beautification of community level open spaces
- ✓ Preservation & development of water bodies & lakes
- ✓ New Health centers, Recreational clubs, Socio- cultural facilities to be developed in the city for increasing population as per UDPFI guidelines.

5.8 SWOT ANALYSIS

Strengths	Weakness
<ul style="list-style-type: none"> ✓ Pune city is a destination of student from all over India and Known as “ OXFORD OF THE EAST” ✓ Presence of large number of Universities including deemed Universities ✓ Existence of World Class Multispecialty Hospitals 	<ul style="list-style-type: none"> ✓ Spatiality disparity in educational facilities ✓ Inadequate educational and health facilities and supporting Infrastructure in slums
Opportunities	Threats
<ul style="list-style-type: none"> ✓ City has already been recognized as an education center thereby it can further be enhance to become a world class preferred destination in this field 	<ul style="list-style-type: none"> ✓ Presence of an enormous number of educational and health related facilities attract lot of floating population which is an additional burden on Physical Infrastructure



6 URBAN ENVIRONMENT

6.1 INTRODUCTION

The galloping process of industrialization, urbanization and globalization has brought mounting environmental problems including climate change, water shortage and pollution, hazardous waste, smog, loss of bio-diversity and desertification that pose severe challenges to sustainable development. Environmental considerations are assuming greater importance in the urban planning processes of an increasing number of governments around the world.

Pune city, now home to more than 3.1 million populations and growing at a rapid pace, is increasingly at the forefront of the most pressing environmental challenges which require governments, public and private organizations and individuals to take a fresh perspective at how economic and social activities can best be organized in the existing urban environment.

This chapter takes a closer look at the existing environmental status of various components and to identify the activities and causes for its deterioration and has made an attempt for preparing a basis for preparation of Environmentally Sustainable City Development Plan 2041 for Pune City on the basis of baseline information gathered with regard to resources, environment quality and services.

6.2 NATURAL ENVIRONMENT BASELINE

6.2.1 Physical Features

Pune city is situated on the banks of two rivers, Mutha and Mula, with their confluence towards the north-east. The geomorphological setting of the city shows a backdrop of hills on the south and south western sides, with steeper slopes and rocky red soils. The lower elevations and comparatively shallower slopes towards the north eastern sides show presence of rich fertile black cotton soil. The dendritic hydrology pattern based on the monsoon is predominant giving rise to a network of seasonal streams and river flowing through alternating valleys and ridges. Such a setting has given rise to a moderate climate with annual rainfall of 700mm.

6.2.2 Geology

The city is underlain by basaltic lava flows of upper cretaceous eocene age associated with basic intrusive. The soil texture contains alluvial deposits of sand, gravels, fine silts and clays along the bank of the rivers. The thickness of this type of soil varies from 8 to 18 meters. The soil texture of the remaining city is made of silicates, phyllosilicates and okenite group with basalts containing dykes and laterites.

6.2.3 Hills & Forests Resources

Pune is situated in close proximity (50kms) on the biodiversity of Sahyadri Hills also known as the Western Ghats. As per the landuse distribution of Pune city, the total area covered under hills and hill slopes is 1245 ha i.e. 5.10% of the total land. The 11 major hills in the city are listed in Table 6-1.

Table 6-1: List of Major Hills – Pune City

Sl.No.	Name of Hills
1	Parvati Hill
2	ARAI and Malwadi Hill
3	Fergusson College Hill
4	Vetal Hill
5	Ram Hill
6	Baner Hill.
7	Taljai Hill
8	Chaturshringi Hill
9	Law College Hill
10	Katraj Hill
11	Kirkitwadi Hill

Source: Environmental Status Report (ESR), 2010- 2011

The total area under reserved, forest and agriculture as per the landuse distribution of Pune city is 2905 ha which 11.91% of the total area is. The Hills environment in the city is subject to intense pressure due to development and encroachment. The mounting concrete structures due to these developments have resulted in the loss of green covers on the hills which are a resultant of the increasing climate change.

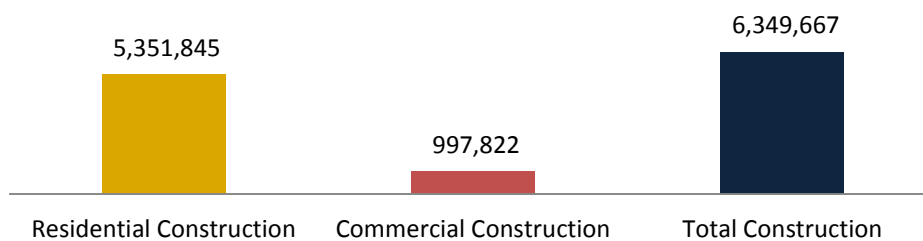


Figure 6-1: Construction in Pune – 2010 to 2011

Source: TOI, July 2012

The State government allows 4% construction in the proposed bio-diversity park in the 23 villages merged in the PMC. Further, permitting 4% construction in Biodiversity Park will increase construction footprint. As per the Marshal's Slum Atlas Report, the unauthorized informal houses/ slums have come up on privately-owned lands in hill top hill slope zone with a total of approximately 62,205 households.

Proper protection of the forest is imperative to preserve in order to check the threat of encroachments, wood cutting, garbage dumping and protection from vegetation and soil erosion. To restore the ecology and enrich the green cover on these hills, regeneration, afforestation for biodiversity and protection of these hills is necessary.

6.2.3.1 Urban Forestry Projects under PMC

Under the Joint Forest Management project, protection and conservation measures have been taken on various hillocks/ forest. These projects are being jointly done by Forest Department and Pune Municipal Corporation with the participation of local stakeholders. A total of approximately 1826 Acre (738.96 Ha) of forests/ hillocks lands are under development. 291 acre in Baner, 120 acre in Pashan and 61 acre in Sutarwadi, combining to a total 472 acre (191 Ha) of area is under development. Development work of soil and water conservation, tree plantation and construction of protective wall are also on-going. Plantation activity has also been carried out by Pune Municipal Corporation and other organizations. Pune Municipal Corporation has taken a firm steps to increase green cover of the city.



The Project was approved and in the first phase forest area at Bhamburda, Warje and Pachgaon Parvati will be taken for the development. The work at Bhamburda and Pachgaon Parvati has already started. The development of forest land will be helpful to the urban area by:

- Ground water recharge
- Soil conservation
- Biodiversity conservation
- Regulation in climate
- Carbon sequestering (Pollution Control)

PMC has planned for the various developmental works on the forest land at Bhamburda and Warje. Proposed activities under these projects are the construction of boundary wall for the protection, soil and water conservation structures, creation of water bodies restricted entry areas for the public plantation of the suitable species of the plants, water supply. A joint forest management committee was proposed for the execution of this project.

Table 6-2: List of Projects under Joint Forest Management

Sl.No.	Name of Hillock/ Forest	Area in Acre
1	Bhamburda tekadi	250
2	Pachgaon tekadi	613
3	Varze tekadi	125
4	Ghorpadi	15
5	Wanwadi	110
6	Vadgaon Sheri	8
7	Kondhwa Bk.	361
8	Kondhwa Khurda	60
9	Mohamadwadi	175
10	Kharadi	9
11	Warje	100
	TOTAL	1826

Source: ESR, 2010-2011

6.2.3.2 Biodiversity Park

Pune Municipal Corporation (PMC) had reserved Bio-diversity Parks for restoring the local flora and fauna, to produce carbon sinks and to create awareness about nature conversation. Pune city will be taking 'People's Biodiversity Register' for which Biodiversity Committee will be form. The Biodiversity Park has been proposed to develop in in six different locations as given below.

Table 6-3: Proposed Biodiversity Park in Pune City

Sl.No.	Biodiversity Park	Area (ha)
1	Baner – Pashan Lake	118.08
2	Pashan Panchwati	48.89
3	Sutarwadi	25.02
4	Hadapsar	13.65
5	Mohammadwadi	12.71
6	Kondhwa Budruk	2.89
	Total	221.24

Source: Environment Dept., PMC

The Biodiversity Park once implemented will conserve the native biodiversity and make the public aware of the varied natural heritage and ensure quality life to its people. The proposed Biodiversity Park will have the following impact on the city:

- Biodiversity Park when developed will function as a mini ecosystem having capacity to render all ecological services.
- It will serve as green lungs to Pune city and will have positive impact on amelioration of the local climatic conditions.
- Pune city being in close proximity to the Western Ghats (50 Kms), the proposed parks will ensure space for all important plant communities to ensure protection to important species.
- It will function as an ideal training center for individuals and organizations involved in eco-restoration and conservation programmes.
- Biodiversity Park will be planned as commu
- Biodiversity Park will serve as an ideal nity participatory Programme, providing opportunity to the local community to get involved and have better understanding of the importance of Biodiversity and its conservation. destination for eco-tourism and recreational center.

The Implementation Strategy of the proposed Biodiversity Parks is as follows:

- Construction of the boundary wall for protection
- Soil and moisture conservation work to be carried out
- Plantation using local species
- Developing Interpretation/ Monitoring Center
- Planning pathways and core areas without esthetically destroying natural areas
- Involving the surrounding residents for protection
- Monitoring the biodiversity profile and assessing the changing trends in species diversity of indicator species.

6.2.4 Parks & Gardens

As per data from ESR Report, 2011-2012, the city currently has a total of 115 gardens. 5 Nalla gardens are made under the project of 'Beautification of Nalla'. Road beautification and road side plantation has also been undertaken. These gardens are the main recreational areas for the surrounding neighborhood areas. Theme parks have already been developed in the city as given in table 6-4.



Plate 6-1: Japanese Garden – Sinhgad Road

Table 6-4: List of Theme Gardens under Garden Department - PMC

Sl.No.	Name of Theme Gardens	Location
1	Japanese Garden	Sinhagad Road
2	Garden in mine	Maharshinagar
3	Ayurved Garden	Kondhwa
4	Naksjatra Garden	Erandvane
5	Nalla Park	Sahakarnagar
6	Lake Garden	Model Colony
7	Rose Garden	Sahakarnagar
8	Papilion (butterfly garden)	Aryaneshwar

Source: ESR, 2010-2011

6.2.5 Water Resources

6.2.5.1 Surface Water Body

Pune is crossed by many rivers and streams, which rise near the Sahyadris. The major rivers within the city limits include Mutha River, Mula River and Mula-Mutha River. The total length of Mutha river within the city limits is approximately 10.40 km, Mula River is 22.37km and Mula-Mutha River is 11.75. There are 3 important lakes in the city, they are Pashan Lake (62.60 Ha), Katraj Lake (7.20 Ha) and Snake Park Lake (18.60 Ha).

The prime sources of water supply in Pune city are the surface water sources which include dams i.e. Khadakwasla about 20 kms north-west Panshet, Warasgaon and Temghar dams and lakes i.e. Pashan and Katraj lakes. The 29% untreated sewerage is disposed into the Rivers Mula-Mutha which is highly polluted has threatens the health of the citizens. Pune city is also further divided into 23 basins or watersheds which form the drainage channel of the city. Each basin comprises of network of natural drains discharging storm water into Mutha and Mula rivers. The increase urbanization and encroachment has resulted in increased land and vegetation erosion.



Plate 6-2: Katraj Lake



Plate 6-3: River Improvement works under JNNURM

Watershed development and conservation needs to be carried out along the catchment areas of these existing water resources and the surrounding hills with afforestation and re-forestation. This will result in preventing the run-off, decrease soil erosion and increase the groundwater recharge.

The potential Rainwater Harvesting in the city is currently unexplored. Mapping of aquifers is a critical step to planning rainwater harvesting, which can be effectively implemented through a comprehensive area based approach. Though the PMC has made RWH mandatory for new buildings, there is no

monitoring to check if the system is in place and functioning.

6.2.5.2 Ground Water Body

The ground water in the district occurs under phreatic, semi – confined and confined conditions. Generally the shallower zones down to the depth of 20 to 22 m bgl (below ground level) form the phreatic aquifer. The water bearing zones occurring between the depth 20 and 40 m bgl when weathered or having shear zones yield water under semi-confined condition. The deep confined aquifers generally occur below the depth of 40 m bgl. In Deccan Trap Basalt, the yield of the dug wells in different formations ranges from 30 to 150 lpm/day depending upon the local hydrogeological conditions.

Table 6-5: Nature & Yield Potential of Aquifer in Pune City

Type of Aquifer	Yield Potential	Type of wells suitable
Basalt	Medium	Dugwells and borewells

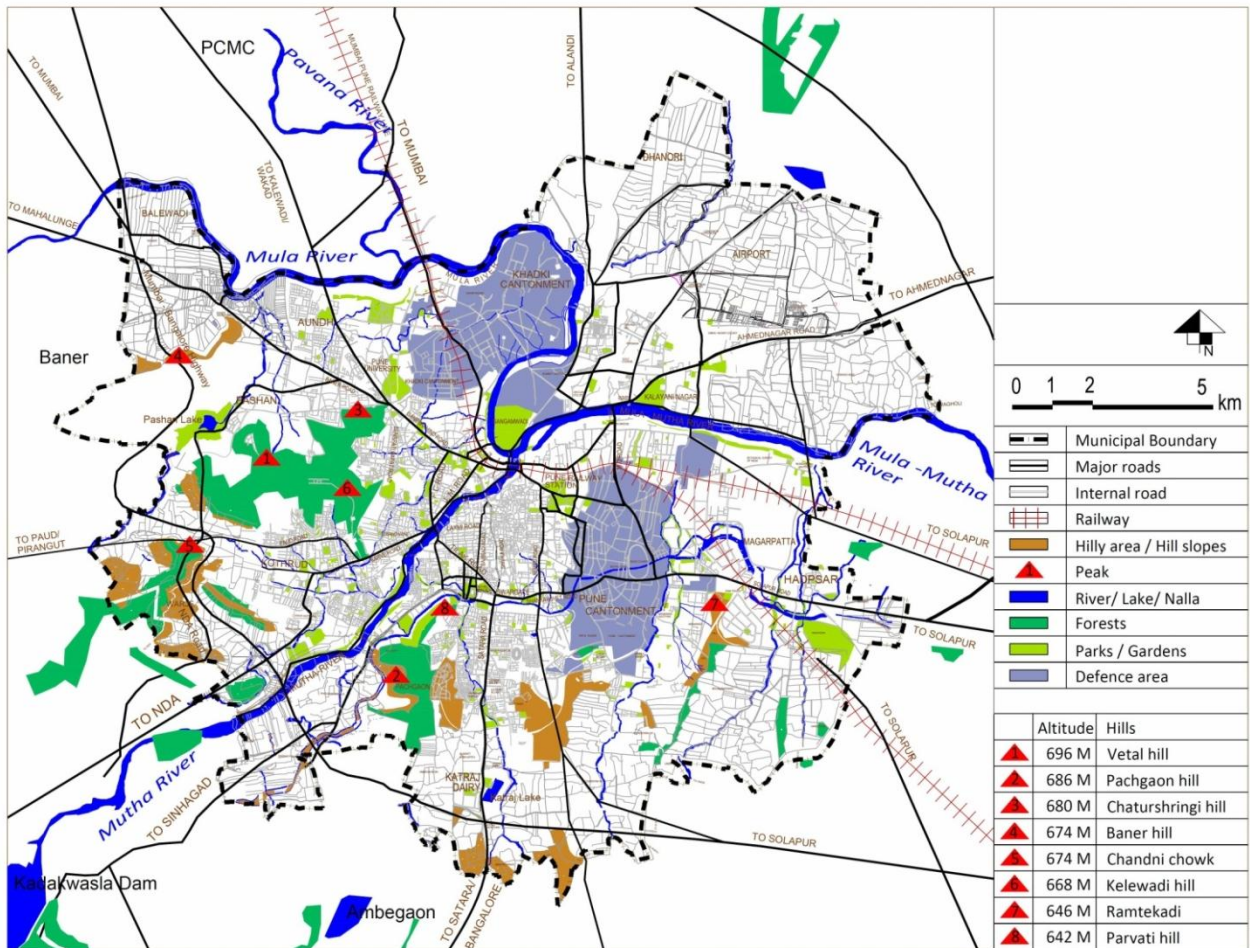
Source: Ground Water Information – Pune District, CGWB, 2009

In Pune city, the groundwater has emerged as an important source to meet the water requirements of various sectors. There are around 399 dug wells & 4820 bore wells. The ground water depth varies from place to place and ranges from 1.0 to 13.0 m. Water level fluctuation in pre- and post-monsoon periods observed was 0.28 to 11.39 m respectively.

According to Groundwater Survey and Development Authority (GSDA) report, groundwater levels in the city have dropped by more than 8.75 meters. Recharging groundwater by recharging the existing 4820 borewells and 399 dug wells through rainwater harvesting can help conjunctive water use in the city.

6.2.6 Flora

The vegetation pattern of the city is conducive almost for all types of tropical species indigenous and exotic both. The city has a tree cover distributed throughout the urban-scape. Approximately 380 species of trees are observed in Pune city. A tree census is being conducted by Pune Municipal Corporation. Approximately 70% of tree census was completed upto June 2011. According to the tree census, 23.33 lakh trees are present in 170 sq.km. area. Katraj and Sinhagad area around Pune city have the maximum forest cover as compared to other forest areas in the city.



Map No. 6-1: Physical feature map of Pune City

6.2.7 Fauna

Pune City has the presence of varied natural habitats such as forests, plantations, grassland, water bodies, rivers, gardens and hills which has contributed to the rich species diversity of fauna. Over the years there has been a change in the native fauna of Pune because of urbanization and introduction of exotic species. Development of the city has resulted in the habitat loss and posed a threat on the faunal community. The current faunal diversity of urban Pune is as given below:

Table 6-6: List of Fauna in Urban Pune

Group	Unit	Pune
Aquatic insects	Family	13
Snails	Species	15
Ants	Genus	12
Butterflies	Species	170
Fishes	Species	110
Amphibians	Species	14
Reptiles	Species	52
Birds	Species	332
Mammals	Species	65

Source: <http://www.ecohousingindia.org>



6.3 URBAN ENVIRONMENT QUALITY

6.3.1 Air Quality

6.3.1.1 Sources and Levels of Air Pollution

The transport, domestic and industrial sectors are the major contributors to the rise in ambient air pollution levels. The prime source of PM10 (particulate matter) is the increasing numbers of vehicles in the city (600-800 vehicles registered per day as per RTO, Transport). This is one of the major concerns for air pollution.

PM10

The comparative analysis of PM10 of various cities as given in figure below denotes that Pune has the second highest emissions with 38,400 tons/year as compared to other cities except in Chennai which has the highest emission of 50,200 tons/year.

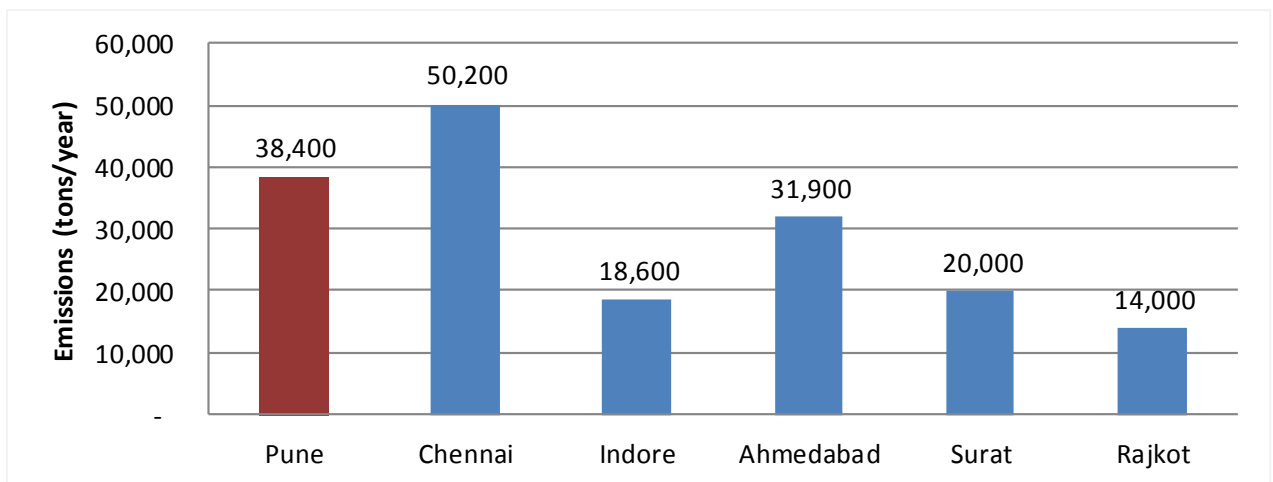
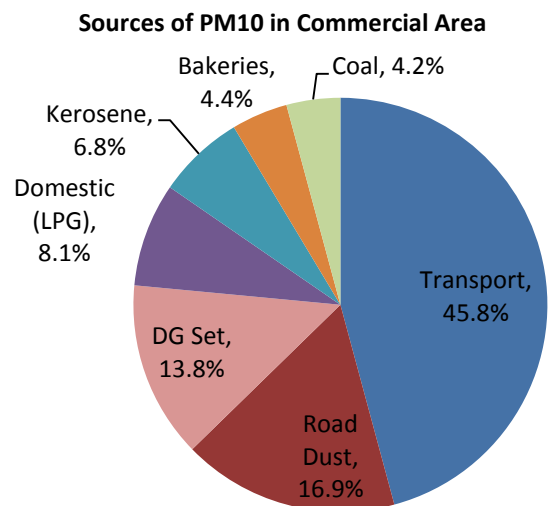
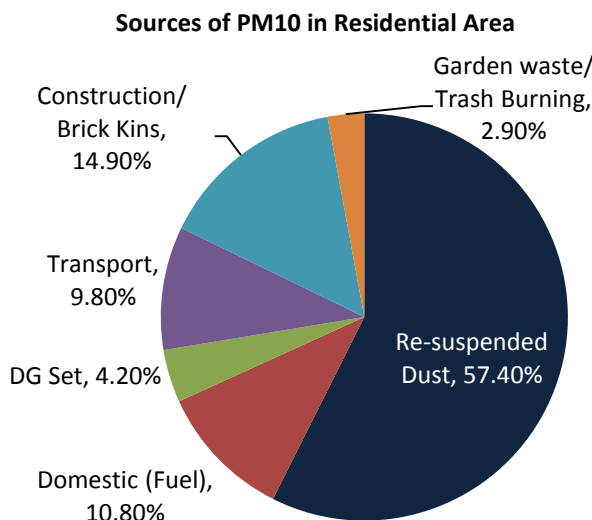


Figure 6-2: Comparative Analysis of PM10 emission (tons/ year) – 2010
 (Source: ESR – Pune, 2011-2012)



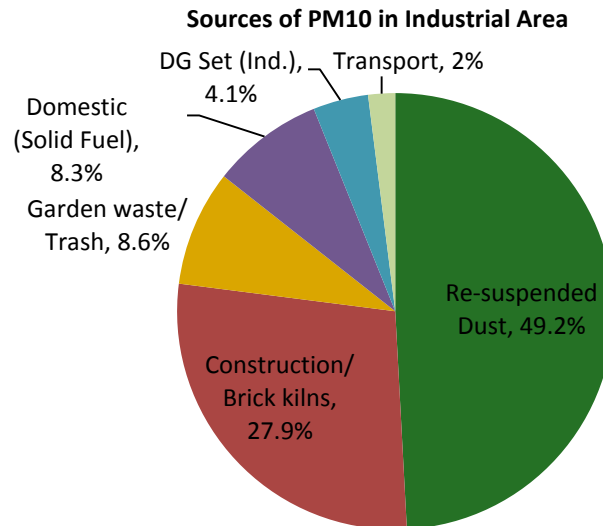


Figure 6-3: Contribution of Sources in PM10 in Residential, Commercial & Industrial areas
(Source: ESR 2011-2012)

As per the recent study conducted by Maharashtra Pollution Control Board (MPCB), Pune has PM10 (Particulate Matter) accounting to $99 \mu\text{g}/\text{m}^3$ which is more than the permissible limit of $60 \mu\text{g}/\text{m}^3$, resulting in increasing incidences of respiratory disease. As per the Environmental Status Report, Pune (2011-2012), it was also found that level of PM10 is high in residential areas because of re-suspended road blown dust particles during the movement of vehicles while in the commercial area the maximum contribution source is from the transport and followed by Road dust and use of DG Set. In the industrial area, the re-suspended dust is the major contributor of PM10 followed by construction/ Brick Kilns.

SO_x

The SO_x levels in 3 different locations in Pune i.e. Navi Peth, Oasis Hotel and Mandai area for the period of 4 years from 2008 to 2011 as per ESR Report (2011-2012) shows that SO_x levels are all below the permissible standard. However, the diesel engines which have more proportion of sulfur oxide have to constantly monitored.

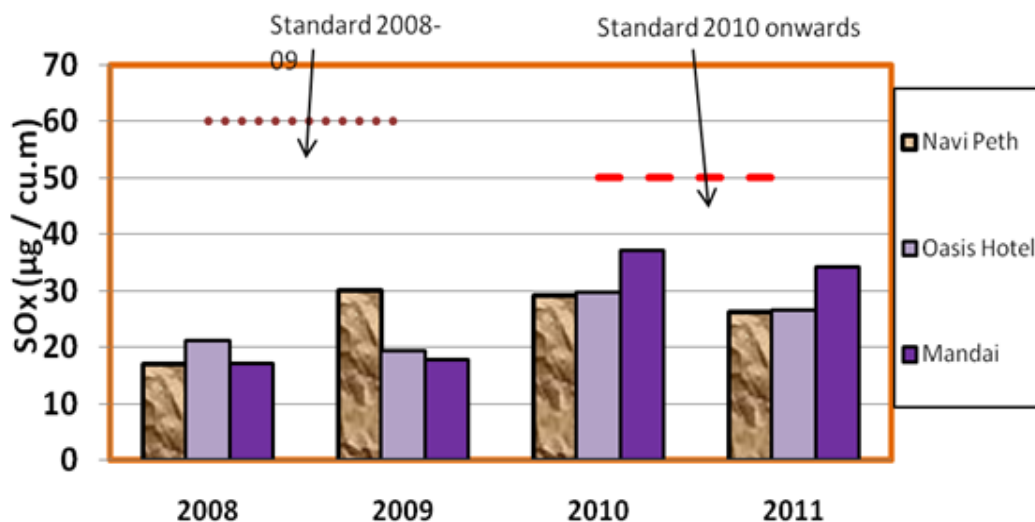


Figure 6-4: Comparative Analysis of SO_x
(Source: ESR 2011-2012)

NOx

The annual average concentrations for NOx exceeded the prescribed limit of 40 µg/m³ in three locations in Pune in the year 2010. Navi Peth area recorded an annual average concentration of the pollutant as 42.69 µg/m³, Oasis NDA Road as 52.55 µg/m³ and Mandai as 66.56 µg/m³ in year 2010. In the year 2011, the NOx levels are seen coming down in all the three locations wherein Navi Peth area is found below the permissible standard.

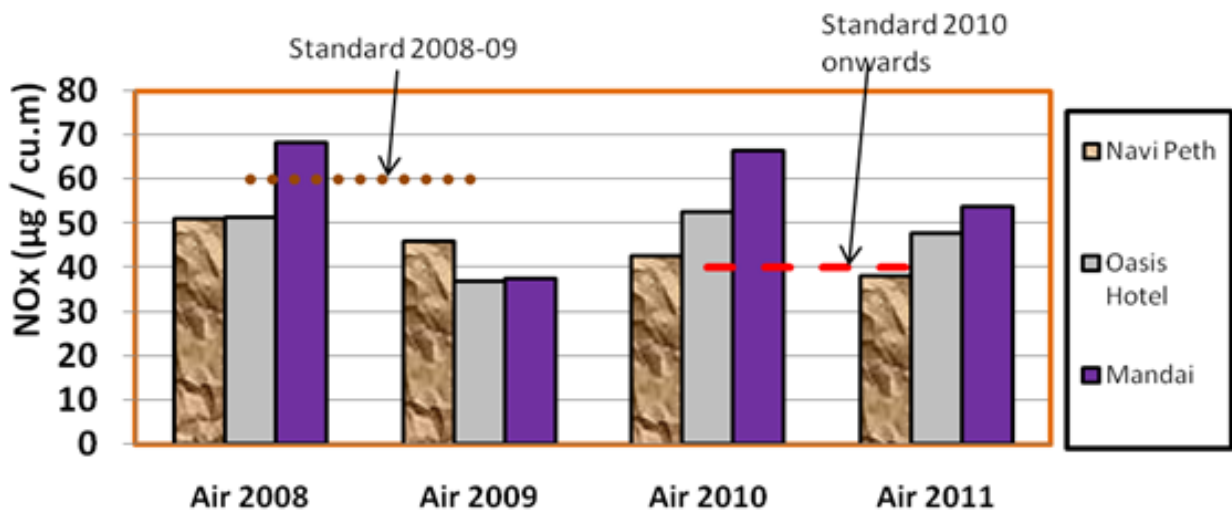


Figure 6-5: Comparative Analysis of NOx
(Source: ESR 2011-2012)

RSPM

The annual average concentrations for RSPM exceeded the prescribed standard of 60 µg/m³ in all locations in the past 4 years as given below. Increasing vehicles and dust pollution generated from residential areas are the major contributors of increasing RSPM in Pune city.

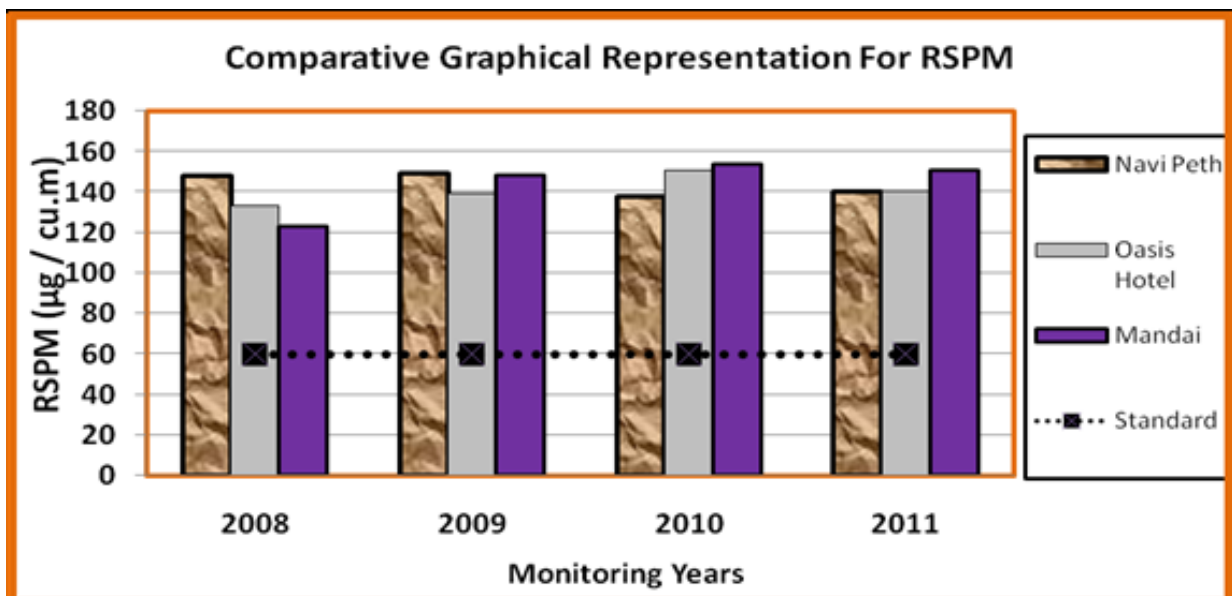


Figure 6-6: Comparative Analysis of RSPM
(Source: ESR 2011-2012)

6.3.2 Water Quality

6.3.2.1 Sources of Water Pollution

According to the Water Supply and Sewerage departments of PMC, only 71% of the total generated sewerage in the city is treated. The remaining 29% is released into the river untreated and leads to high levels of both BOD (Biochemical Oxygen Demand) and COD (Chemical Oxygen Demand). As per the City Sanitation Plan, 2012, a shifting trend was observed during Festivals like Ganesh Utsav celebrations, where mandals/ idols are immersed s at immersion tanks constructed at various places in the city by the PMC.



Plate 6-4: Drainage outfall into the river



Plate 6-5: Choke drains

6.3.2.2 Levels of Water Pollution

PMC carries out periodic monitoring of river water quality and lakes. Water sampling is being carried out weekly at different locations considering the upstream and downstream of river at confluence of rivers, confluences of STP, confluences of nallas and in the two lakes of Pune city.

DO and BOD Levels in Pune Lakes

The DO levels in Pune Lakes i.e. in Pashan and Katraj Lakes over the past 4 years are shown in figure below. The DO level is rising in these two lakes from 2008 to 2011 which shows a positive indication of improvement in the water quality. The BOD levels in Pune lakes also shows a positive results from 2008 to 2011 which is below the permissible limit of 30 mg/lit.

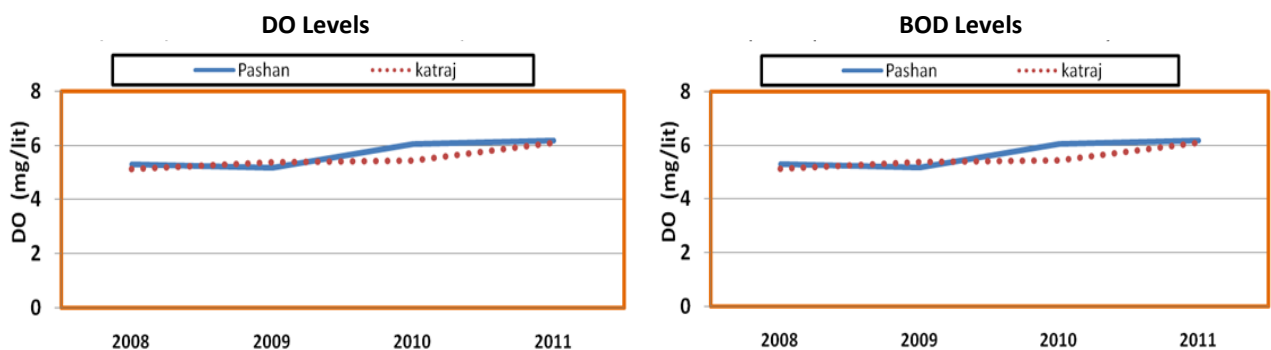


Figure 6-7: Comparative Analysis of DO & BOD in Pune Lakes

(Source: ESR 2011-2012)

DO, BOD & COD levels in Nallahs of Pune city

The comparative analysis of Nallahs in the core area of Pune city shows that over the years the DO levels are highly polluted which is far below the permissible limits of 5mg/l or more. While the BOD levels show an increasing trend from 2008-2011 which shows that the nallahs in the core areas are highly polluted with more than the permissible limit.

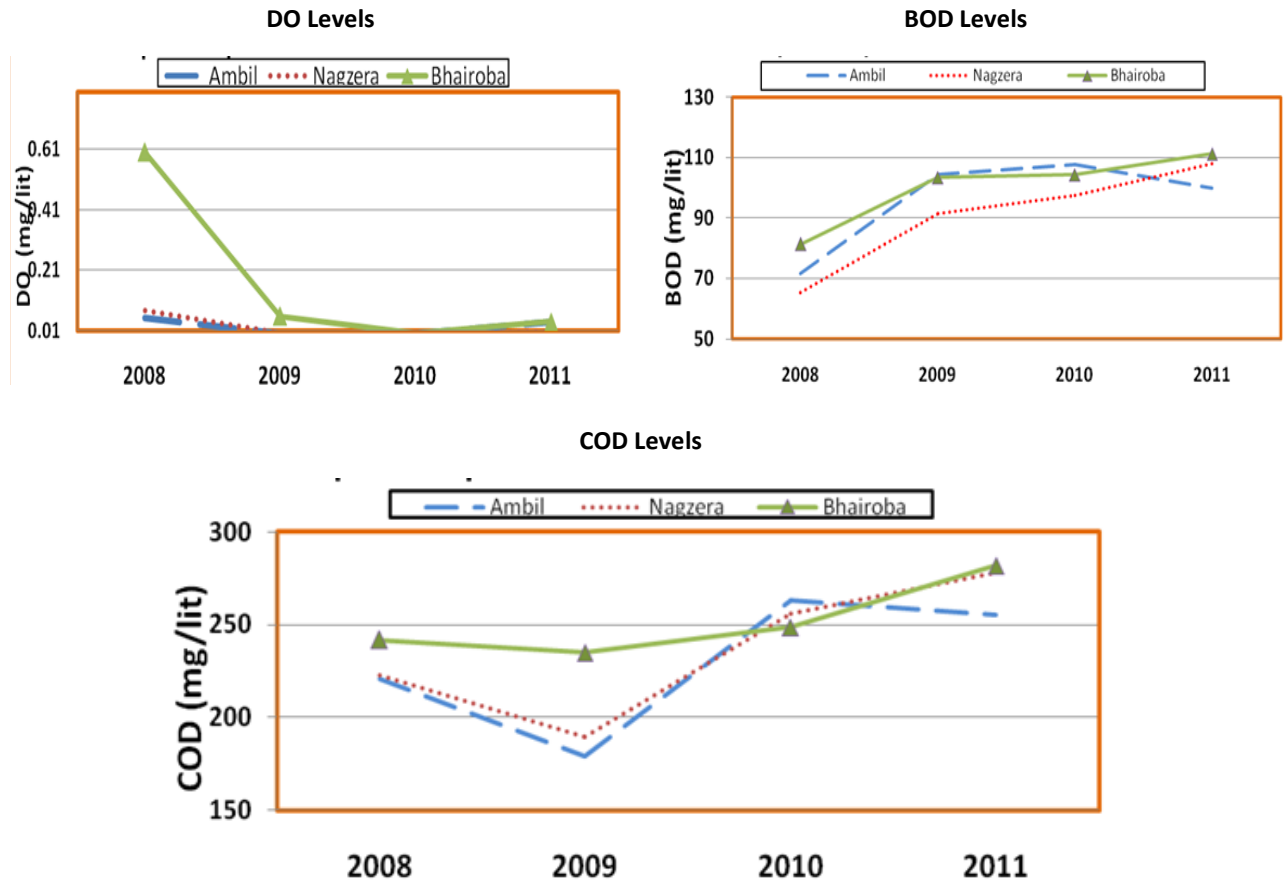


Figure 6-8: Comparative Analysis of DO, BOD and COD levels in Nallahs of Pune City
(Source: ESR 2011-2012)

DO, BOD & COD levels in Rivers of Pune city

The periodic monitoring of river quality along the Mutha river, Mula river and Mula-Mutha river has been conducted with regular monitoring at different locations from the year 2008 to 2011 as given below.

Mutha River

The monitoring locations along Mutha Rivers are conducted at 6 different locations. The DO quality along the Vithalwadi and Mhatre Bridge shows above the standard while all others are much below the standard AIV. While the BOD quality along the locations far exceeds the standard quality AIV which shows that the water is highly polluted due since 29% of the total sewerage are untreated and directly drains into the rivers, however a decreasing trend has been noticed in the recent year 2011.

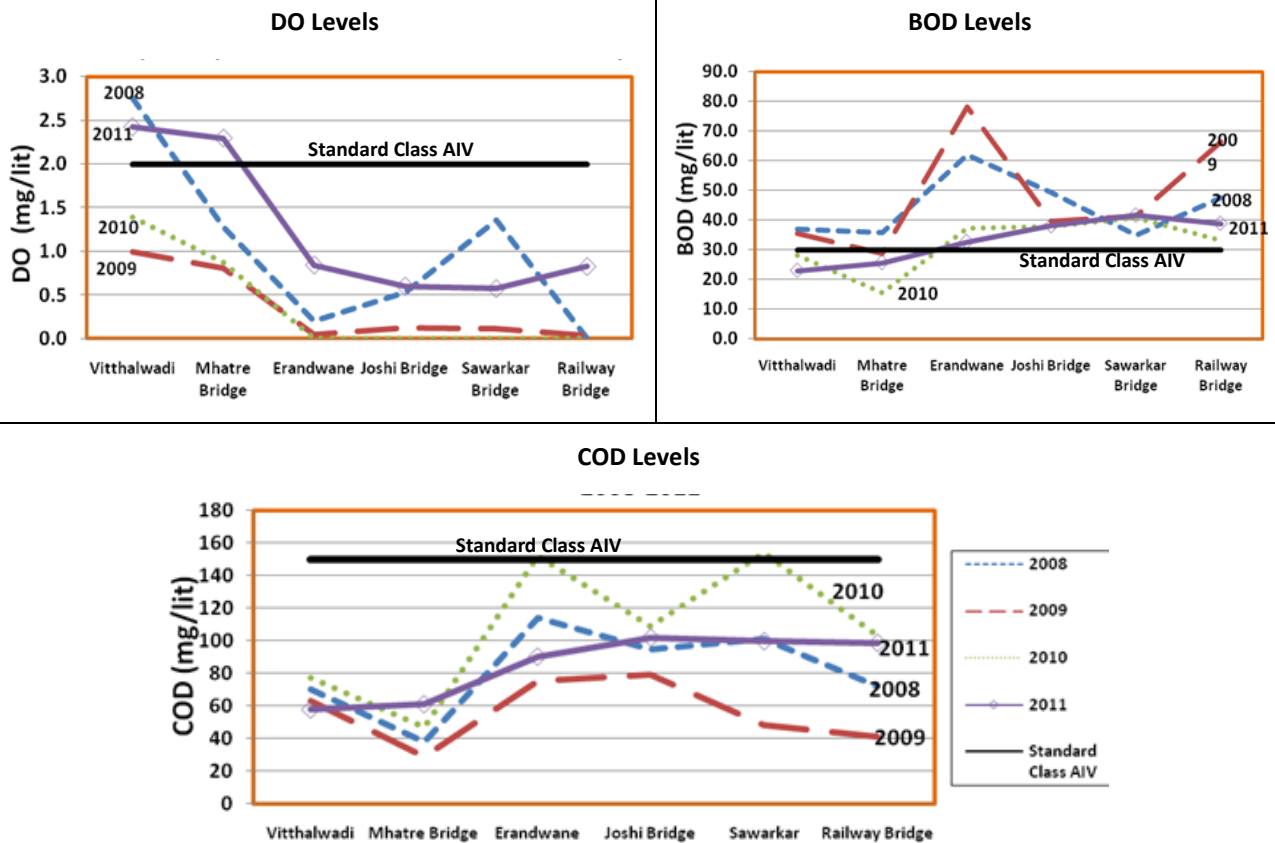
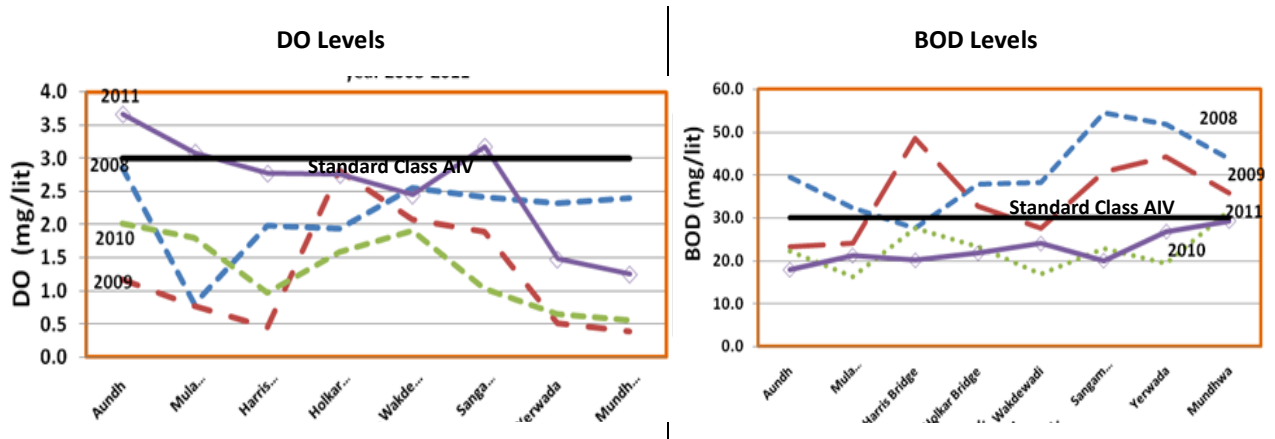


Figure 6-9: Comparative Analysis of DO, BOD and COD levels along Mutha River of Pune City
(Source: ESR 2011-2012)

Mula and Mula-Mutha River

The monitoring locations along Mula and Mula-Mutha River are conducted at 8 different locations. The DO quality along the Mula and Mula-Mutha river shows a decreasing trend which is far below the standard. While the BOD quality along the Mula and Mula-Mutha River far exceeds the standard quality AIV from the year 2008 to 2010 but in recent year in 2011 it has shown a decreasing trend along all the 8 locations which shows that the water quality is improving but requires a constant monitoring.



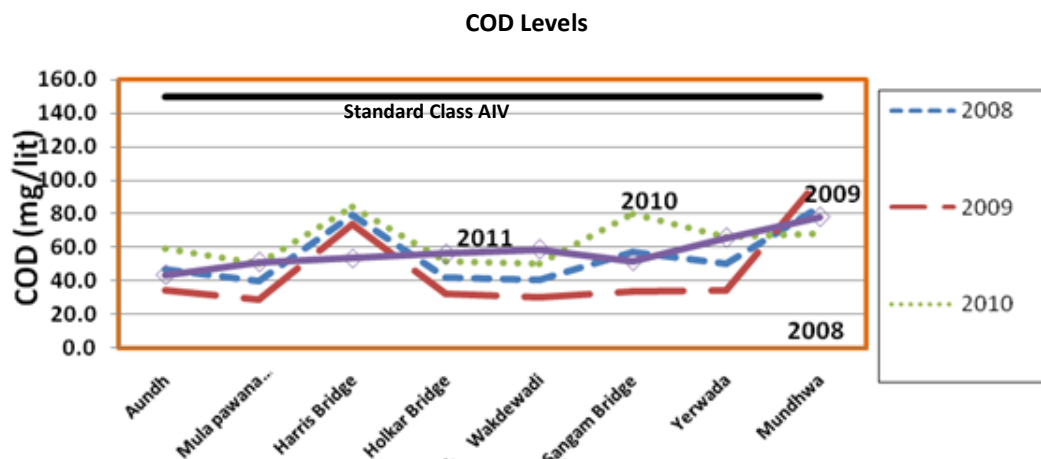


Figure 6-10: Comparative Analysis of DO, BOD and COD levels along Mula and Mula-Mutha River of Pune City
(Source: ESR 2011-2012)

6.3.3 Noise

6.3.3.1 Sources of Noise Pollution

Noise pollution in the city is mainly due to vehicular movement on the road owing to traffic jams and honking, celebration of festivals, construction activities, diesel generating sets, etc.

6.3.3.2 Levels of Noise Pollution

Noise is notified as a pollutant under the Air (Prevention and Control of Pollution) Act. Although stringent permissible noise level regulation has been set by the CPCB, noise levels exceed these limits almost everywhere in the city. Monitoring is also done by CPCB and few private agencies. Noise limits have also been prescribed to the automobile manufacturers, domestic appliances, construction equipment and others.

The noise pollution levels for commercial area in all the monitoring locations were above the permissible limit of 65 dB.

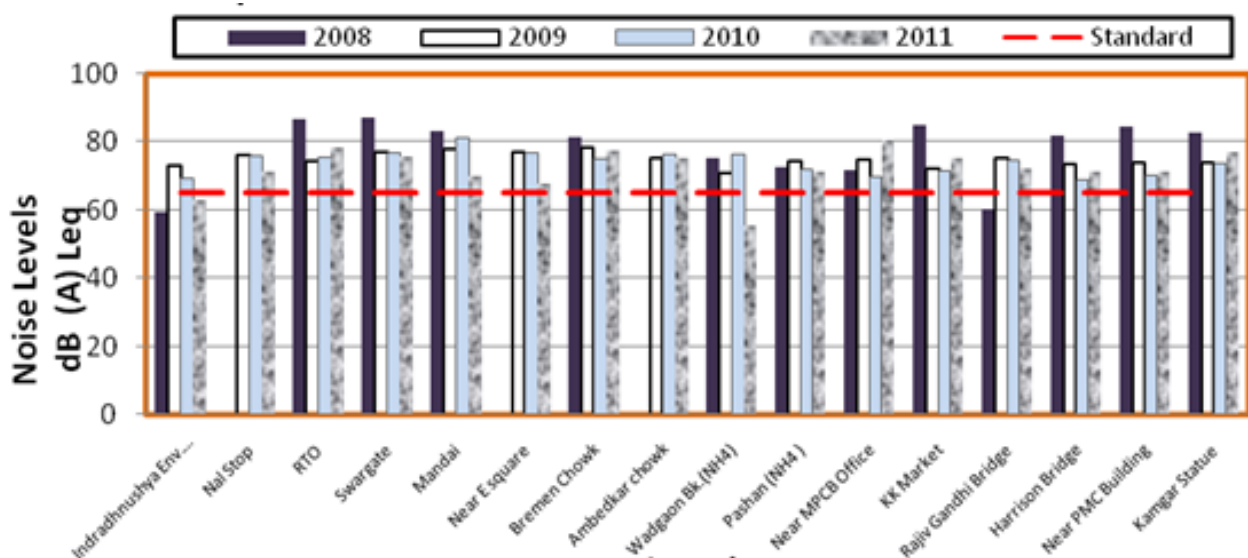


Figure 6-11: Noise Pollution at Commercial Zone – Pune City
(Source: ESR Report – Pune, 2011-2012)

Noise pollution levels for residential area were recorded below the permissible limit of 55 dB in few areas like Erandwane, Katraj Lake and Khadakwasla areas, the reason being these areas on the outskirts of the city area have minimal traffic and more of green cover while others have the maximum noise above the permissible limits.

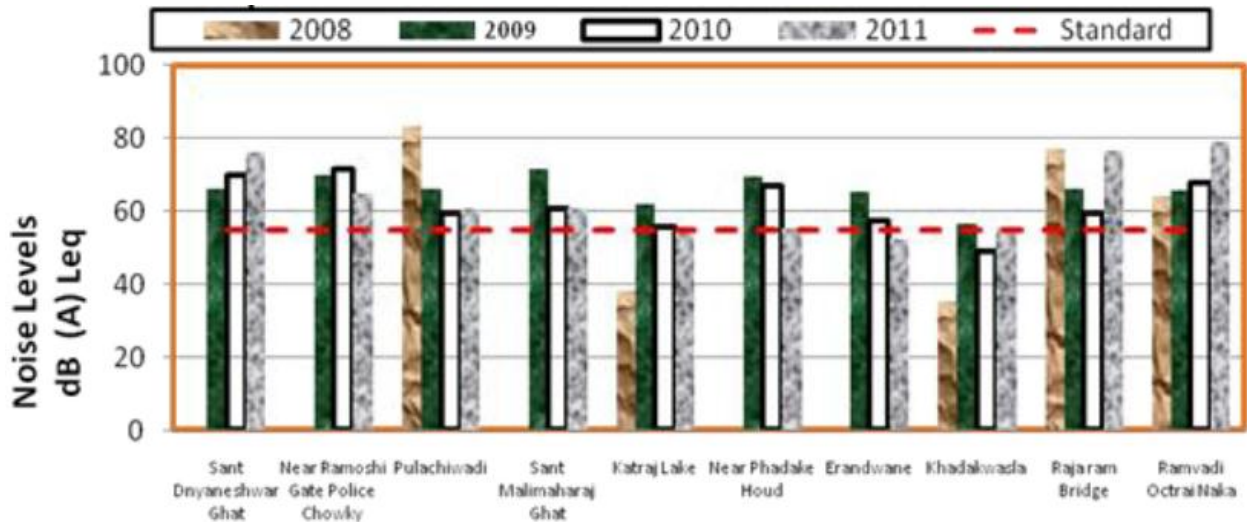


Figure 6-12: Noise Pollution at Residential Zone – Pune City
(Source: ESR, 2011-2012)

The sensitive zones like hospitals, schools and colleges are most susceptible to noise level. Noise pollution levels for sensitive area of various locations in Pune were recorded above the permissible limits of 50dB.

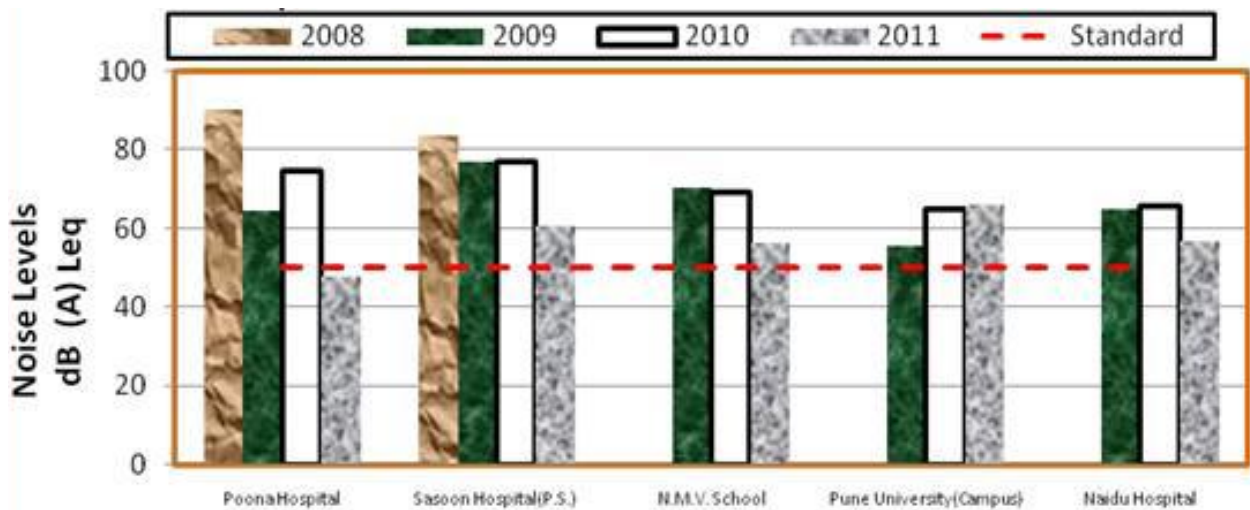


Figure 6-13: Noise Pollution at Sensitive Zone – Pune City
(Source: ESR, 2011-2012)

6.4 ENVIRONMENTAL ISSUES & ABATEMENT MEASURES BY ULB

The impacts on urban environment are perceived at various levels starting from household level, community level, city level and if unchecked, can multiply to issues at regional or national level. This section highlights the environmental issues that need to be addressed to improve the environmental health of Pune city.



6.4.1 Depletion of resources

6.4.1.1 Groundwater

According to the State's Groundwater Survey and Development Agency (GSDA), the average groundwater level for Pune is around 4m but it has gone down further to 3m. As per the sixth Groundwater Assessment, out of Pune region's 263 watersheds (the region draining into a river, river system or other water body), 25 are over-exploited while eight are critical and 40 are semi-critical. Due to excessive use, groundwater level is depleting alarmingly, over-exploited and critical watersheds.

As per the PMC's Environment Status Report 2010-11, the depth of the city's borewells is between 10.5m and 130m. As the PMC supplies only 10% of its water for commercial use, commercial establishments rely on groundwater for the remaining 90%. (Source: Pune Mirror.in dated May 2012)

Given the drought situation in Maharashtra, the State Assembly passed the Maharashtra Groundwater Development & Management Act, 2009 on April 2012 which is awaiting the Governor's nod to become an Act. The provisions of this bill stipulate that digging of the borewells will be allowed only upto 200 ft (60m).

6.4.2 Water Pollution

The surface as well as ground water of the city is contaminated as has been discussed earlier. Water resources in the city are polluted due to disposal of sewerage directly into the surface drains or surface water bodies.

Ground water contamination is essentially due to the problem of solid waste disposal and management. Pune produces large quantity of Municipal Solid Waste (MSW).

6.4.3 Environmental Health

Rapid urbanization of Pune city in the past few years has had its toll on the environment. As per the City Sanitation Report, water pollution is the main source of rise in cases of Typhoid, gastroenteritis, diarrhea, dysentery and jaundice. Water logging due to flash floods and heavy rains has also seen an increase in the leptospirosis cases. Of late, the number of people suffering from Malaria, Chikungunia and dengue are on the rise, especially during the monsoon season. The status of these diseases from 2008-2011 periods is shown in the table below.

Table 6-7: Status of Diseases (2008-2011)

Name of the Disease	2008		2009		2010		2011 (till July)	
	Cases	Death	Cases	Death	Cases	Death	Cases	Death
Gastro	2676	0	3447	0	3041	0	1800	0
Cholera	91	0	31	0	92	0	11	0
Jaundice	252	0	240	0	323	0	231	0
Typhoid	393	0	298	0	298	0	102	0
Diarrhea	958	0	921	0	430	0	147	0
Dysentery	1023	0	967	0	1444	0	606	0
Leptospirosis	0	0	0	0	02	0	0	0
Dengue	28	0	57	4	110	1	9	0
Malaria	104	0	137	0	137	1	73	1
Chicken guinea	0	0	0	0	112	0	23	0

Source: City Sanitation Plan, 2012



As per the CSP Report, the city has also witnessed health crisis due to emergence of new disease- Swine Flu caused by the H1 N1 virus, in the year 2009.

PMC initiative in preventive measures includes:

- Awareness Generation
- Weekly larvicidal activities
- Destruction of acute and chronic breeding spots of mosquitoes
- Survey of 500 households around positive case for detection of suspects
- Spraying of insecticides and fogging activities

6.4.4 Congestion and Encroachment

As per the Slum Atlas of Pune (2009), over 40% of Pune's population lives in slums. However, it is feared that if slums continue to grow at the current pace, almost 50% of the city's population will soon be residing in Pune city. In order to tackle this issue, boundaries defined by the Hill and Hill Slopes department have to be followed rigidly. This, coupled with encroachment of footpaths built for pedestrian use, is a grave issue which requires immediate attention.

There are 3 types of encroachments which are prevalent in Pune city, they are:

1. **Religious places:** The Supreme Court has laid down guidelines for decisions on contentious places of worship and directed the Municipal Commissioner of the city to make a time bound program with the help of citizens and the concerned religious communities to establish the fate of the place of worship. It has laid down 3 categories for places of worship
 - a. places which by virtue of being in existence over a long period of time can be regularized by the Municipal Corporation
 - b. places which should be given an option to shift to another, less problematic location
 - c. places which should be removed by the Municipal Corporation
2. **Commercial places which can be a) temporary or b) permanent:** Hawkers have sprung up all over Pune, causing great inconvenience to the residents. Selling things without license and leaving a trail of garbage which has resulted in noise pollution and also creating traffic problems in narrow lanes. The tapirs which sell foodstuff are also the main reasons for encroachment. Historically, except for bhel and Pani Puri handcarts, roadside eateries are not a part of Pune culture. These handcarts and tapirs mostly attract office employees and students. Vehicles are parked right next to the tapirs (as has been seen on the busy Kamala Nehru Park road, J.M. road etc.) which has led to frequent traffic mishaps.
Hawkers/ tapirs can be temporary or permanent. Some hawkers were regularized in 1989 and granted licenses which have to be renewed every year by the Encroachment Dept. of the PMC. They are required to put up a board or sign indicating what exactly they have license to sell (i.e. a hawker with license to sell bhel, cannot sell cigarettes or gutkha in addition).
3. **Residential Encroachment:** These include extensions of verandahs, gardens or parking lots into footpaths or public spaces, and use of basements sanctioned for parking for other purposes. Removing residential encroachment has been one of the major hurdles if the owners have been present for a long period of time.

The Ward Office and the Encroachment Dept. needs to examine the drawings and take action if

necessary.

6.4.5 Municipal Solid Waste and Environment

Municipal solid waste generation in Pune is among the highest in Indian cities with average 0.400 kg (0.294 - 0.540 kg per person per day) of waste being generated per person per day. Currently, 1300 to 1,400 MT of solid waste is generated per day. The waste was disposed at landfill site located about 20 km away from Pune at Devachi Uruli till the year 2010. Presently, PMC has stopped open dumping and total waste generated is processed scientifically. The extent of segregation of waste is still 27.96% only which needs special attention. Practices of disposing waste into storm water drains are observed. The decomposition of waste also produces leachate. This leachate if not properly treated will get percolated in surrounding groundwater.

About 1360 MT of solid waste generated is scientifically treated at its Hanjer Biotech (1000 TPD) and three other organic wastes composting sites (100 TPD each). Although at present the waste is treated scientifically, there is still some amount of emissions generated in the process. As per the study conducted by TERI, elucidates about 10,131 MT/ year of CH₄ (methane) emissions from Pune's Solid waste disposal.

6.5 CARBON FOOTPRINT OF PUNE CITY

Development of sustainable green cities is the need of today's fast urbanizing world. The ever-growing urbanization threatens escalating of carbon emission due to higher consumption of goods and services. Hence it is crucial that the balance be maintained between the carbon emission and carbon sequestration to achieve sustainability. The following figure gives the daily inflow and outflow of ecosystem in Pune city.

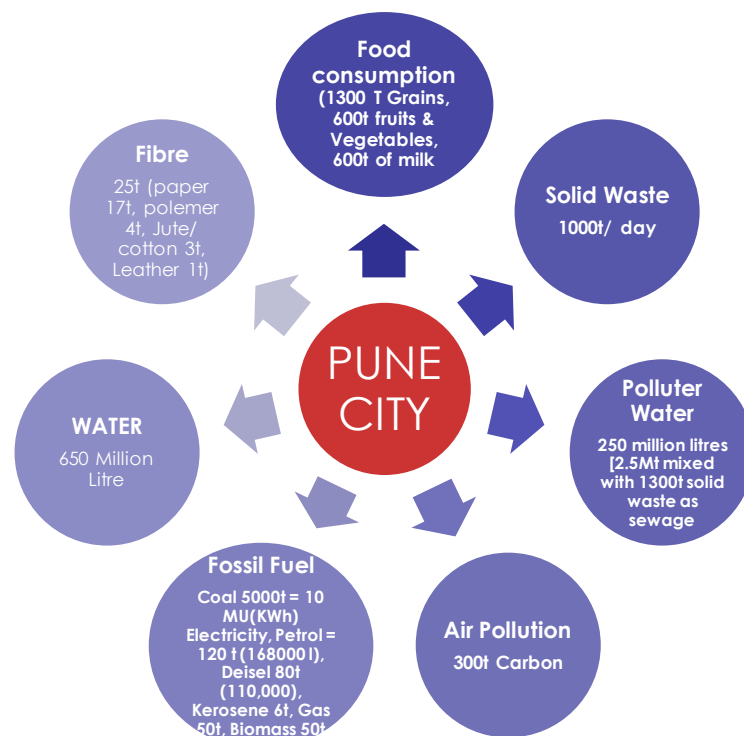


Figure 6-14: Pune City - Ecosystem Daily Flows (Input & Output)

(Source: IURMAN, 2006)

The Pune Municipal Corporation is one of the first municipalities in the country to have undertaken a carbon emissions inventory study for the city. As per the draft report of *TERI study on Carbon Inventory of Pune City*, it was estimated that the city generated about 4,661,064.20 tCO₂e emissions in the year 2010-2011 which is 1.50 tCO₂e emissions per capita.

The maximum emission of CO₂ is from the residential (31.6%) due to consumption of electricity and petroleum, followed by HT electricity then the transport sector. These are the key areas which need to be reduced in the CO₂ emission as given in the following figure below.

The reductions from these sectors are essential to be followed through a monitoring mechanism and the Performance Index. Some of these sectors may be recommended to be implemented through the Carbon Credit Certification.

To reduce Green House Gas (GHG) emissions at the city level, technology improvements should include:

- Public transportation systems and solar streetlights;
- Policies, such as the implementation of building codes and recycling requirements should be constantly monitored.

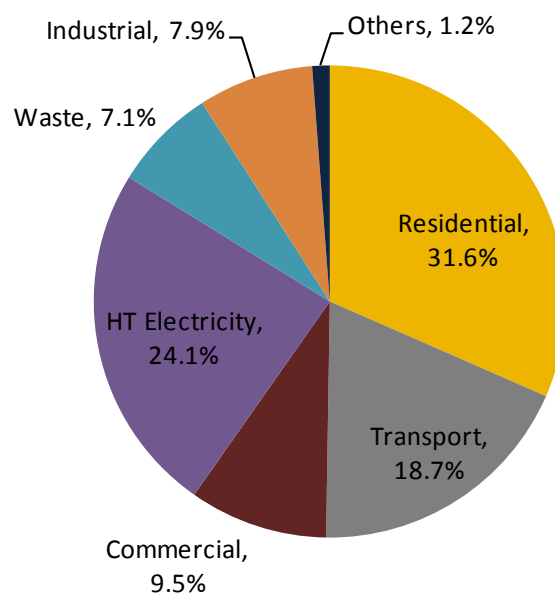


Figure 6-15: Pune city Carbon Emissions –TERI Study (2010-2011)

6.6 BUILDING & ENVIRONMENT

6.6.1 Eco- Housing Concept- Pune City

The total area of the city under the PMC jurisdiction is about 243.84 Sq.km. Assuming that 60% of this area is under residential and allied development, it comes out to about 147 Sq.km. It is thus clear that the PMC has a wider scope & opportunity to implement the various aspects of eco-housing.

PMC gives tax rebates to housing projects having rain water harvesting schemes. It has adopted Eco Housing scheme in which green buildings are promoted. The “Eco-Housing certification programme” was launched by PMC in 2005 with technical assistance from the United States Agency for International Development (USAID), which calls for compliance with set assessment parameters which have been

developed by the Science and Technology Park (STP) — University of Pune, International Institute for Energy Conservation (IIEC) and the Energy Resources Institute (TERI).

In order to encourage developers to adopt eco-friendly techniques under the programme, PMC offers 50% rebate in premium charges incurred from developers while granting building permission. While 25 % rebate is granted while giving building permissions on verifying the documents and site visits, the remaining is given after completion of the project.

The eight focus areas necessary for obtaining the certification includes site planning, environment architecture, energy efficient lighting, solar water heating, eco-friendly building material, water management, waste management and other innovative technologies taken by builders voluntarily. Each of these areas has been assigned points depending on the immediate impact on the environment and its relevance to local conditions. Based on the points achieved, the developer is given an eco-housing rating.



Figure 6-16: Eco Housing Concept in Pune – by TERI

The main aspects of eco-housing, that the PMC has planned to implement, are:

Rainwater	Solar Energy	Recycling of treated	Green Architecture	Ecofriendly building
<ul style="list-style-type: none"> Implemented RWH Developed new rules of RWH in development control regulation 	<ul style="list-style-type: none"> Compulsory to all high rise buildings and star hotels Encourage the use of solar systems for heating purposes on the wider scale 	<ul style="list-style-type: none"> Considered for centrally air conditioned buildings Waste Water Recycling Plant compulsory for townships & building (tenements >150) 	<ul style="list-style-type: none"> Fringe villages PMC - 15% of additional amenity space for layouts above 1 acre. Adopt climate responsive design practices to achieve thermal comfort (NBC) 	<ul style="list-style-type: none"> Promote such aspect conducting seminars and exhibitions Mandatory use of 25% pozzolana material Blended Portland Cement (BPC)



6.7 EXISTING ENVIRONMENTAL REGULATIONS – PUNE CITY

- **Environment Protection Act of 1986** is one such measure taken by Government of India. This act empowers the Central Government to establish authorities with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country.
- As per **Twelfth schedule (Article 243 W) clause 8 of the Constitution of India**, it is mandatory for all Municipal Corporations to protect the environment & promotion of ecological aspects. Thus as a regulatory and controlling authority for the development of the cities, the Municipal Corporations have to play major role in this scenario.
- **The Maharashtra Pollution Control Board (MPCB)** implements a range of environmental legislation in the state of Maharashtra. The MPCB functions under the administrative control of Environment Department of the Government of Maharashtra. It is mainly responsible for:
 - Water (Prevention and Control of Pollution) Act, 1974,
 - Air (Prevention and Control of Pollution) Act, 1981,
 - Water (Cess) Act, 1977
 - Some of the provisions under Environmental (Protection) Act, 1986 and the rules framed under this like:
 - Biomedical Waste (M&H) Rules, 1998,
 - Hazardous Waste (M&H) Rules, 2000,
 - Municipal Solid Waste Rules, 2000 etc.
- The other regulations governing the solid wastes generated in the city are as follows:
 - The Batteries (Management and Handling) Rules, 2001
 - The Recycled Plastics Manufacture and Usage Rules, 1999 (as amended subsequently)
 - The Maharashtra Plastic Carry Bags (Manufacture and Usage) Rules 2006
 - For all the three rules the implementation levels needs to be considerably increased.
 - C&D waste should not be mixed with MSW for disposal. However currently there is no specific provision for its disposal.
 - Similarly for Electronic Waste (E-waste) there is no prevailing regulation and no management guidelines have been specified.

6.8 INITIATIVES/ PROJECTS UNDERTAKEN ON ENVIRONMENT BY URBAN LOCAL BODY (PMC)

6.8.1 Environmental Status Report (ESR):

Pune's annual ESR was produced in response to a provision of the Maharashtra Municipal Corporations and Municipal Councils (Amendment) Act of 1994. It has been credited with reaffirming the need for an environmental assessment tool to help the municipality define its planning priorities. The ESR highlighted the fact that the increase in slums is a major problem that the city will face in the future, leading to considerable growth in population density and massive solid waste generation. The report also called for an equitable distribution of water and made drinking water the highest priority. It emphasized the need

to treat drainage water to make it usable for irrigation. The report suggested policy issues as well, namely the need for the State and municipal governments to attempt to regulate the number of vehicles as a means to check traffic congestion, noise and air pollution.

6.8.2 Energy Conservation:

Pune Municipal Corporation has encouraged the use of Renewable Energy by giving exemption in 5% property tax for Housing Societies that run any one of the projects below and 10% tax exemption for those who implement any two of the projects below:

- 1) Vermicomposting Unit
- 2) Use of Solar Energy
- 3) Rain Water Harvesting.

As per the report of ESR, 2011, it was recorded that in year 2010, 12,003 properties have benefited from the scheme.

6.8.3 Promoting the use of Compressed Natural Gas (CNG):

The Pune Municipal Corporation has introduced the use of environment friendly gas i.e. CNG in public transportation to reduce pollution in the city. According to the latest statistics available with the Regional Transport Office (RTO), around 45,000 rickshaws operate in the city, of which 17,787 run on CNG while another 8,134 run on liquefied petroleum gas (LPG). This makes for 57% of the city's rickshaws running on environment-friendly fuel.

6.8.4 Compensatory Afforestation

PMC has laid down the regulations for compensatory tree plantation which are to be followed while constructing new buildings or any new development. These regulations are based on the area of the plot to be built or developed. To make these regulations readily available to the citizens, PMC has taken the initiative to upload the information on their website.

This compensatory afforestation policy has a gap, which is related to the monitoring of this effort. To make this initiative successful, PMC officials check the trees plantation at the initial stage of construction, but this is not checked later on, after the occupancy of the building; due to this in many cases the plantations are not taken care of after the necessary formalities are over.

6.9 STATUS OF PROJECTS UNDER JNNURM

Restoration and Beautification of Rivers & Lakes in Pune: Projects undertaken includes the following as listed below:

- Bund Garden
- Mundhwa Garden
- Katraj Lake and Pashan Lakes
- Nallah Beautification and Channelization
- Restoration of Mula & Mutha Rivers

Table 6-8: Summary of CIP for Environment till 2011-12 (as per CDP 2006-12)

Sector/ Component		Estimated Investment (Rs. Crore)	Approved under JNNURM (Rs. Crore)	Balance Project Cost (Rs. Crore)	Additional DPRs prepared (Rs. Crore)	Balance DPR to be Prepared (Rs. Crore)
Environment		237.50	-	185.24	-	-
1	River Conservation/ Protection	125.00	197.74	72.74		
2	Parks and Play Grounds	112.50		112.50		

Source: Pune Municipal Corporation & CDP Pune 2006-07



Plate 6-6: Pashan Lake



Plate 6-7: Katraj Lake



Plate 6-8: Mula & Mutha Rivers

6.9.1 Impact Assessment of the Projects under JNNURM

The Pune CDP 2006-2012 very well describe the existing situation of the cities environment; however there is no consideration of as inclusion of new concepts like carbon crediting that solves dual purposes of protection of environment as well as augments revenue base of the ULB.

All the completed and on-going projects under JNNURM i.e. Road improvement/ BRTS, Sewage Treatment Plants, River Improvement and storm Water drainage sectors will have a positive and a negative impact on the existing urban environment e.g. the negative impact would be mostly during the construction period which will result in congestion on the roads, increase in SPM levels and cutting of trees while the positive impact will be with the introduction of Pilot BRTS project , there has been a fuel savings from public transport operations, reduction in air pollution, reduction in traffic congestion, noise

and vibration reduction.

The implanting STPs under JNNURM will also have a major impact on the quality of river water. Presently, the total sewage generated is around 560 MLD against which 382 MLD is being treated and discharged into the river. On completion of the project, the sewage treatment capacity would enhance to 567 MLD which means 100% treatment of sewage generation in the city and consequently, an improved quality of rivers in the city.

6.10 INITIATIVES/ PROJECTS UNDERTAKEN ON ENVIRONMENT BY NGOS

The Non-Governmental Organizations (NGOs) in Pune have been actively involved on the conservation and protection of the city's environment. These NGOs helps in promoting the environmental awareness and conservation of nature. The lists of few of these working on the line of

- **Ecological Society:** The core activity of Ecological society is through environmental research and education. Their main focus area is conducting trainings and environmental awareness programmes for village children at Panshet and Kamshet. The Society have also prepared a project on *Eco-Development of River Fronts of Pune* where it has proposed the following management plan:
 - A mini water treatment plant to be constructed along the banks for every population of 20,000.
 - Allocate space for regeneration of bank and other riparian vegetation, parks, gardens, playgrounds
 - Allocate space for an aquatic bird sanctuary
 - Allocate space for different uses like bathing, washing, cleaning of vehicles, religious rites etc.
- **Pune Tree Watch – Kalpavriksh:** This group has been taking ingenuity on the conservation of environment through tree plantation. Their main conservation effort in Pune includes the following:
 - Preventing illegal tree felling
 - Surveying the trees to be cut
 - Working on the policy level like the Maharashtra (Urban Areas) Protection and Preservation of Trees Act, 1975.
 - Tree plantation programs.
 - Collection of seeds and its distribution at time of our meetings.
 - Media interaction in case of unjust culling of trees.
 - Identifying possible areas for tree plantations like roads, nalas and riversides or barren lands.
 - Creating public awareness about relevant laws and policies among general public through participation in exhibitions, presentations in public programs or just word of mouth.
 - Regular interaction with the concerned authorities.
- **Parisar:** Parisar is a civil organization working on the field of sustainable development. Their main focus is on Urban Heritage Conservation, Natural Environment, Sustainable Agriculture, Urban Planning and Urban Transport. The organization has been actively involved in the major issues of their main focus area and has effectively intervened in any loopholes in policies at the



local, regional and national level.

- **RANWA (Research and Action in Natural Wealth Administration):** This society works on the field of environmental research, education and awareness. They have actively involved in imparting environmental education and awareness to the public and school children in Pune city.
- **Green-Hills Group:** This group has been actively involved in the areas of rainwater harvesting and tree plantation in Pune for the last 10 years in areas of Hanuman Tekdi and Chatushrungi Hills. Supported Forest Department and PMC in planting 4000 trees and started nurturing them on forest department land on ARAI hill near MIT College.
- **Tekdi:** Tekdi Pune is a group of young people working in the common cause in protecting the environment. The group has been actively working on site for the conservation of Law College Tekdi in restoring its environment from a rocky barren land to
- **SWaCH:** An NGO working actively in the field of Solid Waste Management which became operational in 2008. The “SWaCH model” involves creating micro collection and recycling zones for informal workers. In Pune, the city provides health insurance, and the union has designed a wet-dry source separation protocol. The system is based on a minimal form contract, and a standard for calculating service tariffs. Service fees are paid directly by the households to a service provider, and who has the right to separate both the dry recyclables and the organic waste.

Besides the above listed NGOs, the other environmental NGOs actively involved in Pune are given below:

Table 6-9: List of Environmental NGOs in Pune

Sl. No.	Environmental NGOs	Core Activity
1	Vanrai	Environmental Protection, Rural Empowerment & Agriculture development
2	The Agro Horticulture Society of Western India	Garden management and preservation
3	Nisarg Sevak	Tree Plantation at Smriti Udhyan, landfill sites i.e. transformed 5 Acres of a garbage dump in Kothrud into a Green Zone.
4	The Rose Society of Pune	Rose Seed Plantation
5	Poona Women’s Council	Educate and awareness about nature and environment
6	Hirwal	Local environment protection
7	Friends of Bonsai	Bonsai plantation and preservation
8	Vaidak Sanshodhan Sanstha	Conservation of forest and protection
9	Environment Department, Bharti Vidyapeet	Environmental Education and research
10	Greenthumb	Ecological restoration through education and awareness programmes
11	WWF Pune	Environmental conservation through biodiversity conservation and Footprint Reduction
12	Nisarg Pratishthan	Nature and environmental conservation

Source: http://www.punecorporation.org/gardens/About_Us_NGOs.aspx & NGOs consultation & websites

In Pune city, the above listed environmental NGO’s has taken a very important part in conserving and protecting the local environment. These NGOs, in particular, played an important role in raising environmental concerns, developing awareness of environmental issues and promoting sustainable development.



6.11 SWOT ANALYSIS

Strength	Weakness	Opportunity	Threats
<ul style="list-style-type: none"> ▪ Green space in Pune covers hillocks (950 hectares), forest area (2380 hectares) and 115 gardens. ▪ According to Ministry of Environment and Forest (MoEF) guidelines, a city should have 33% green cover of its total area. Total area of Pune city is 243.84 sq.km. out of which 85 sq. km i.e. 35% is under green cover which is more than the given guidelines. ▪ Conservation of rivers, water bodies and natural environment of the city are on the priority list of PMC. 	<ul style="list-style-type: none"> ▪ High level of air and water pollution leading to high occurrence of environment related diseases. ▪ Lack of sufficient sewage treatment plants leading to 29% of sewerage left untreated causing environmental pollution ▪ Degradation River due to increasing pollution ▪ Urbanization & introduction of exotic species has affected the change in the City's Flora & Fauna. 	<ul style="list-style-type: none"> ▪ Potential for development of more parks & green open spaces ▪ Urban Forestry and Plantation Schemes for the city ▪ Pollution abatement trees/ species can be proposed in the Plantation schemes 	<ul style="list-style-type: none"> ▪ Increasing slum population on the hillsides and along water bodies ▪ Increasing number of registered vehicles (600-700) per day ▪ Poor traffic management ▪ Increasing number of illegal hawkers ▪ Highly congested areas vulnerable to disasters like fire

6.12 SECTOR-WISE ISSUES & STRATEGIES

Aspects	Issues	Strategies and Potentials
Green Cover, Hill Environment & Open Spaces	<ul style="list-style-type: none"> ▪ Hill environment is subject to intense pressure due to development and encroachment ▪ In recent years the climate has considerably changed due to exponential rise in the number of concrete structures and the loss of green cover on the hills ▪ Major areas of green cover are scattered and fragmented due to its urban character ▪ Monitoring of 'compensatory tree plantation policy' is insufficient. 	<ul style="list-style-type: none"> ▪ Demarcation and Protection of existing Hills/ Forest & Recreational areas ▪ Urban Forestry and Plantation Schemes for the city to increase green cover within the city ▪ Plantation in dividers to curb dust, pollution and to restore aesthetic looks. ▪ Good potential for development of more parks & green open spaces ▪ Development of urban green corridors to enhance the local climate ▪ Linking of Green corridors, urban green areas & urban wildlife ▪ Map and conserve heritage (old) trees/rare endangered species as well as 'hot-specks' of biodiversity ▪ Develop and implement a Biodiversity Management Plan ▪ Regular monitoring of compensatory tree plantation. ▪ Implementation of Special project like Biodiversity Park at Baner
Rivers/ Water Bodies	<ul style="list-style-type: none"> ▪ The untreated sewerage disposed into the Rivers Mula-Mutha is highly polluted and threatens the health of the citizens. ▪ Slums along the river ▪ Very low natural water flow quantity in river 	<ul style="list-style-type: none"> ▪ Good potential for water recharge ▪ Developed Master plan for Rainwater Harvesting Plan ▪ Potential for eco-tourism ▪ Developed as a recreational activities to attract the local tourist ▪ Developing Green buffer/ corridor



Aspects	Issues	Strategies and Potentials
Air & Noise Quality	<ul style="list-style-type: none"> ▪ Alarming levels of RPM and SPM which are exceeding the permissible levels ▪ Increasing Vehicles per day ▪ Traffic congestion leading to poor air quality ▪ High concentrations of particulates due to poor condition of road 	<ul style="list-style-type: none"> ▪ Regular vehicular checks to keep air pollution levels within prescribed levels ▪ Increase the use of alternate fuels like CNG ▪ Continuous monitoring at various locations within the city at regular intervals. ▪ Planned Plantation in the city areas, choice of air/ noise pollution resistant tree species in order to minimize ambient air/ noise pollution. ▪ Road network must be improved for reducing vehicular emissions
Municipal Solid Waste	<ul style="list-style-type: none"> ▪ More scope for household waste recycling ▪ Segregation of municipal waste is low ▪ Land-fill is principal mode of municipal solid waste management ▪ Absence of leachate collection and treatment, prone to fire hazards, increased air pollution at landfill site ▪ Methane emission is substantial due to land-fill and inefficient segregation and collection ▪ Lack of appropriate system for construction and demolition waste management 	<ul style="list-style-type: none"> ▪ Promote the reduction, reuse and recycling of waste ▪ Promote sustainable construction methods ▪ Well-designed land-fill site with arrangements for leachate collection, prevention of fire hazards and improved air quality ▪ Creation of systems to maintain segregated waste streams ▪ Identify sites at neighbourhood level for preliminary sorting and aggregation of dry recyclables, neighbourhood composting ▪ Identification of appropriate sites for construction and demolition waste ▪ No open dumping ▪ 24 hours waste composition to landfill should be treated with leachate treatment
Water & Sewage	<ul style="list-style-type: none"> ▪ 29% of the sewerage is untreated and disposed into the Rivers Mula-Mutha. 	<ul style="list-style-type: none"> ▪ Stop tree cutting ▪ Water supply pumping using energy efficient ▪ Alternate options to be identified for water supply source as per gravity in north and north-east area of the city ▪ Monitoring of water quality in the river ▪ Sewerage coverage network along slums
Greenhouse Gas Mitigation (GHG)	<ul style="list-style-type: none"> ▪ Pune city is releasing around 4,661,064.20 tCO₂e emissions, mainly contributed by vehicles, power and residential sectors. This quantity if unabated could be a major threat to stabilizing Climate Change. ▪ As per the draft report of TERI study on Carbon Inventory of Pune City, the maximum emission of CO₂ is from the residential (31.6%) due to consumption of electricity and petroleum, followed by HT electricity then the transport sector. These are the key areas which need to be reduced in the CO₂ emission. 	<ul style="list-style-type: none"> ▪ Stringent rules to effectively implement the initiatives already taken by PMC like Eco Housing Concept and preventive measures in abating pollution etc. ▪ The recommendations to be suggested by TERI towards reduction from the sectors are required to be followed through a monitoring mechanism and the Performance Index. Some of the recommendations may be implemented including the Carbon Credit Certification ▪ To reduce GHG emissions at the city level include technology improvements, which includes: <ul style="list-style-type: none"> • public transportation systems and solar streetlights; • policies, such as the implementation of building codes and recycling requirements; and



Aspects	Issues	Strategies and Potentials
		<ul style="list-style-type: none"> • Other voluntary actions, including awareness campaigns and recognition programs. • For sectors, such as transport, it is important to recognize that a combination of interventions is more successful than individual interventions. <ul style="list-style-type: none"> ▪ Monitoring of Environmental Management Plan (EMPs) for various proposed projects in Pune City.

6.12.1 Vision Statement, Goals and Strategies:

“Sustainable and livable city for present and future generations”.

6.12.1.1 Goals:

- To retain, preserve, restore and develop city’s natural resources such as rivers , hills , vegetation air and water quality
- To develop open spaces and green areas and to provide a variety of quality leisure opportunities to residents and visitor
- Resource conservation—maximizing efficiency of water and energy resources

6.12.1.2 Strategies & Priority Action

- Demarcation and Protection of existing Hills/ Forest & Recreational areas
- Urban Forestry and Plantation Schemes for the city to increase green cover within the city
- Plantation in dividers to curb dust, pollution and to restore aesthetic looks. Planned Plantation with a choice of air/ noise pollution resistant tree species in order to minimize ambient air/ noise pollution.
- Regular monitoring of compensatory tree plantation.
- Good potential for development of more parks & green open spaces
- Development of urban green corridors to enhance the local climate and linking of Green corridors, urban green areas & urban wildlife
- Map and conserve heritage (old) trees/rare endangered species as well as ‘hot-specks’ of biodiversity
- Develop and implement a Biodiversity Management Plan
- Implementation of Special projects like Biodiversity Park at Baner/ Pashan lake, Pashan Panchwati, Sutarwadi, Hadpsar, Mohammadwadi, Kondhwa Budruk.
- Developed Master plan for Rainwater Harvesting Plan
- Regular vehicular checks to keep air pollution levels within prescribed levels and continuous monitoring at various locations within the city at regular intervals.
- Increase the use of alternate fuels like CNG
- Road network must be improved for reducing vehicular emissions



- Promote the reduction, reuse and recycling of waste
- Promote sustainable construction methods and identification of appropriate sites for construction and demolition waste
- Identify sites at neighbourhood level for preliminary sorting and aggregation of dry recyclables, neighbourhood composting
- Creation of systems to maintain segregated waste streams
- Well-designed land-fill site with arrangements for leachate collection, prevention of fire hazards and improved air quality
- 24 hours waste composition to landfill should be treated with leachate treatment
- Water supply pumping using energy efficient
- Alternate options to be identified for water supply source as per gravity in north and north-east area of the city
- Monitoring of water quality in the river
- Sewerage coverage network along slums
- Stringent rules and monitoring to effectively implement the initiatives already taken by PMC like Eco Housing Concept and preventive measures in abating pollution etc.
- The recommendations to be suggested by TERI towards reduction from the sectors are required to be followed through a monitoring mechanism and the Performance Index. Some of the recommendations may be implemented including the Carbon Credit Certification
- To reduce GHG emissions at the city level include technology improvements, which includes:
 - public transportation systems and solar streetlights;
 - policies, such as the implementation of building codes and recycling requirements; and
 - Other voluntary actions, including awareness campaigns and recognition programs.
- Monitoring of Environmental Management Plan (EMPs) for various proposed projects in Pune City.



7 DISASTER MANAGEMENT PLAN

7.1 INTRODUCTION

Disaster is an unexpected event due to sudden failure of the system, external threats, internal disturbances, earthquakes, fire and accidents. An efficient communication system is absolutely essential for the success of any disaster management plan. Preventive action would be worked out in consultation with local authorities involving police, fire and hospital department.

There are potential disasters the city might face like Fire, Flood and Earthquakes etc. especially in the congested areas. The dynamics of change in urban settlements due to large scale population has led to the evolution of mixed land use, growth of industries, high population density, increasing poverty and lack in urban basic amenities. There are chances of epidemic due to lack of sewage and solid waste disposal system for the city particularly in slums. These increase losses during disasters. The situation is the same in Pune city.

Pune is served by two major perennial rivers having three dams. The city is in seismic zone III. 40% of the population lives in slums and the city still retain its old structures in the 'old city' parts. The roads are congested, there is an increasing waste material created and terrorism has set foot on the soil of Pune. Recent affliction of 'Swine Flu' has also placed Pune on the map of Biological hazards. Thus, the development has thrown up many challenges and threats have multiplied manifold.

The Integrated Ward Level Disaster Management Plan prepared by PMC has developed and addressed these threats and the effects of disaster resilience.

The Disaster Management Plan of Pune city incorporates the following factors:

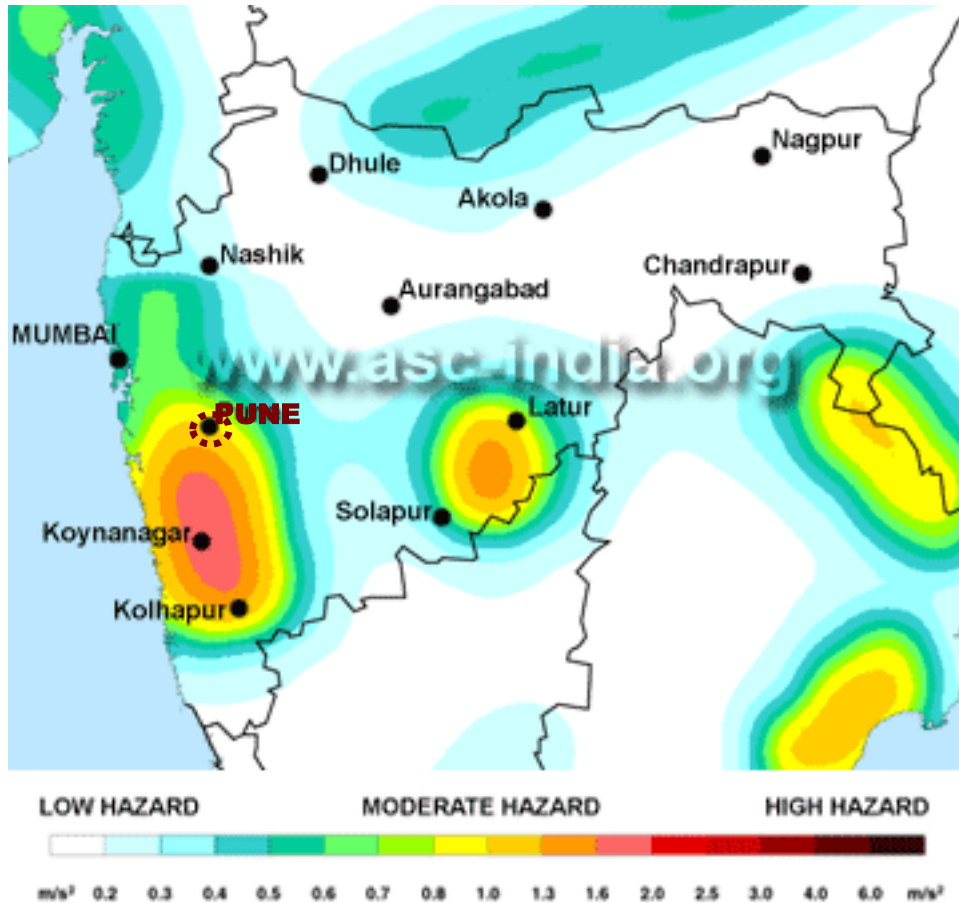
- Ward-wise identification of hazards, vulnerability assessment, capacities and developed the overall risks status.
- Identifying preventive mechanism at all levels for different hazards
- Incorporating mitigation measures to reduce the risk of all hazards
- Strengthening response mechanism by identifying levels of preparedness with action plans which includes the organisational structure, resource management and pre-deployment of resources
- Identifying specific roles and responsibilities and checklists for all departments under PMC and other agencies
- Creation of Command, Control and Communications for ease of operations
- Setting up such procedures that would help speedy recovery.

7.2 POTENTIAL HAZARDS ASSESSMENT OF PUNE CITY

7.2.1 Seismicity

According to the IS 1893 Part I, 2002, the Maharashtra state has been sub-divided into three earthquake damage risk zones. In Pune district, the South-West area of Taluka Bhor and Velhe fall into high damage risk zone, the Zone IV. The remaining part of the district falls under a moderate damage risk zone, the

Zone III. Pune city is located in Zone III of the moderate damage risk zone. This makes Pune vulnerable to earthquakes of the intensity of 7.0 on the Richter scale or grade VIII on the MMI Scale. A major earthquake measuring 6.3 on the Richter scale, took place on the 30th of September 1993, at Killari in Latur District. The tremor of this earthquake was felt in 11 districts surrounding Latur including Pune.

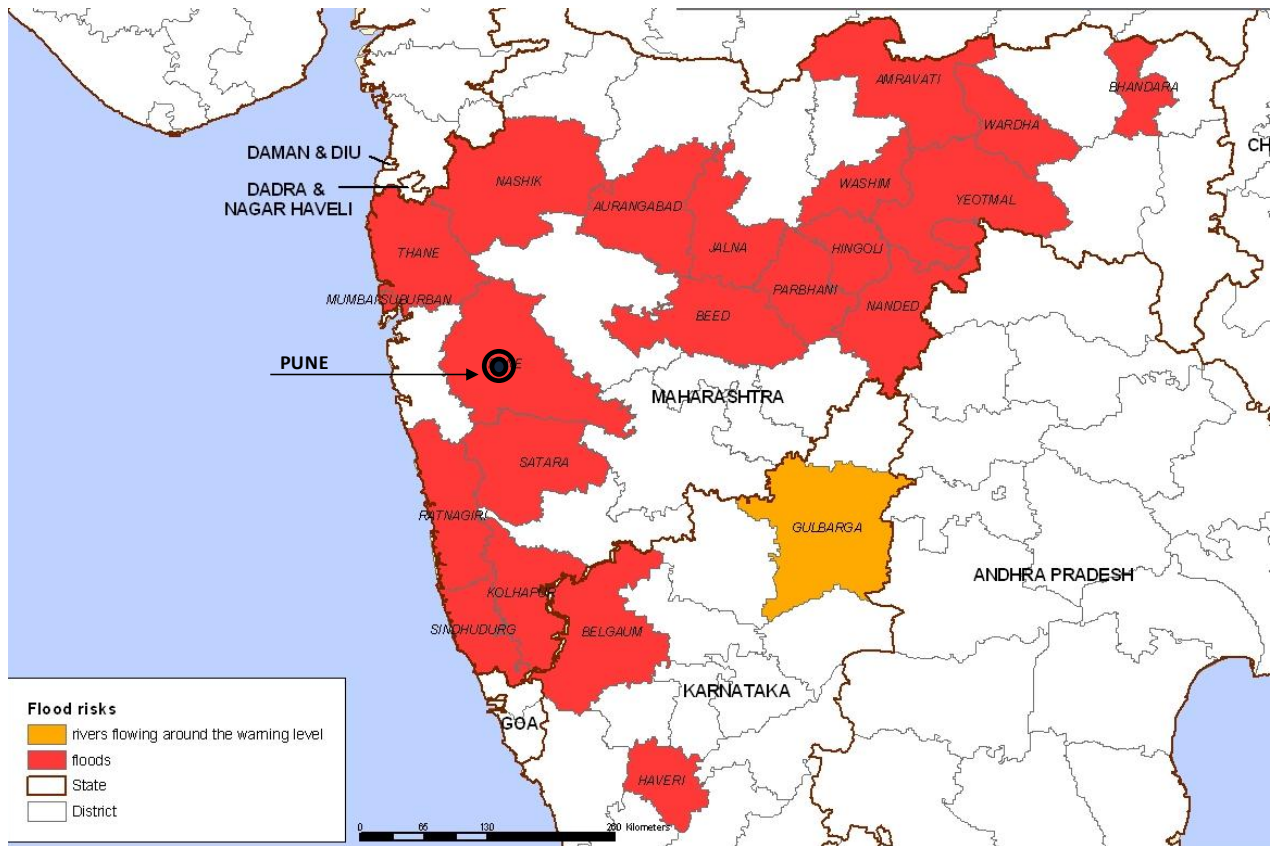


Map No. 7-1: Seismic Zone Map of Maharashtra

7.2.2 Flood Prone Areas

Pune Agglomerated area, specifically Pune city faced the worst floods in its history on 12th July 1961. The floods were caused due to the dam burst at Panshet dam due to heavy rains in the upper watershed region. About 40% area of Pune city was submerged under water for almost 24 hrs. The city had faced heavy losses due to this flood. Pune city was again flooded on 22nd & 23rd August 1997 due to heavy rainfall in the catchments of all the dams near Pune city. All the three dams were filled to their optimum capacity, and thus to prevent the dams from breaking the Irrigation Department had no choice other than releasing water from Khadakwasala dam in the basin of river Mutha. Recently in 2005 July and August, heavy rains resulted in flooding of the Pune's low lying areas.

World Health Organization (WHO) mapping of the Flood Risk Areas in the state of Maharashtra and Karnataka shows that Pune falls in the flood risk zone, as shown in the map below. In Pune city, Anti-Flood measures have been taken only partially, on some sections of rivers Mutha and Mula. Episodes of floods and flash floods have been occurring at regular intervals coupled with urban flooding due to inability of the precipitated water to drain out. Low-laying areas get flooded. The probability of this episode is moderate and intensity is low to moderate.



Map No. 7-2: Flood Risks Map of Maharashtra
(Source: World Health Organization)

7.2.3 Landslide Prone Areas

The increasing population has resulted in the PMC permitting utilization of slope for construction purpose. Also, many unauthorised stone quarrying activities are going unchecked. This may result into overloading of the slopes, run-off mud resulting in exposure of rocks and finally resulting in landslides. This probability is moderate in the coming decade and the intensity would be moderate.

7.2.4 Biological Hazards

As mentioned in the previous chapter, the city has also witnessed health crisis due to emergence of new disease- Swine Flu caused by the H1 N1 virus, in the year 2009. In the recent news report of May 2012, there was again an outbreak of the disease. Many cases of Dengue and Chikungunya fever have been regularly reported in Pune city in the past years. Malaria has a permanent presence in Pune.

7.2.5 Fire

While it is difficult to predict and prevent natural hazards, manmade hazards can be avoided or mitigated through preventive actions. Pune's vulnerability to fire hazard is likely to increase with increasing population density and as the urban fabric becomes denser, chances of fire incidences would also increase. Minor industrial fires and domestic fires as well as cases of electrocution have been happening in Pune. Small incidents of accidents of tankers carrying hazardous materials also occur in the city. Fire and emergency services of Pune are in the process of upgrading their capacities. Notwithstanding that, the fires have been taking a regular toll of life and property in Pune. At present, around 85 fire accidents



occur annually. The city police and fire brigade attend these incidents. The statistics of calls attended by the Fire and Emergency Services:

Table 7-1: Yearly Fire and Emergency Services

Sl.No.	Particulars	2005	2006	2007	2008	2009
1	Fire Calls	640	747	864	887	902
2	Rescue Calls	192	223	223	254	211
3	No. of Gas Leaks	120	157	114	116	108
4	Building Collapse	131	51	55	49	47

Source: Disaster Management Plan of Pune City

The area of the Pune city is 243.84sq.Kms and considering 10 km from the circumference from the border of Pune Municipal Corporation, 35 Fire Brigade centers are required. Currently 10 fire brigade stations are functional and other fire brigade stations at Konwa and Pashan are about to complete. Type (FS-II) Fire brigade stations are required to set up in the remaining 23 places. For the same, Pune Municipal Corporation is required to provide land to build type (FS-II) fire brigade station. Presently, 459 employees are working in fire-fighting team. Water for fire tenders is taken from water-works of PMC. The present system needs to be augmented with more manpower and fire tenders. The National Fire Advisory Committee recommends a water hydrant every 3 km. The Fire Fighting details are given in the Physical Infrastructure Chapter.

7.2.6 Terrorism and Political Violence

Pune, being an industrial and economically important city, it would naturally attract wrath of terrorism. The German Bakery Blast in 2010, as act of terrorism, has opened a new chapter in Pune's statistics of hazards/ disasters. The entire world has become a hotbed of terrorism and though the act does not essentially fall into the category of disasters as yet, the effects of any such acts would be as severe, if not more, to any other disaster resulting from other forms of violence/ accidents.

7.2.7 Road accidents

Pune displays tremendous stress on the roads due to very high traffic densities. Road accidents are quite common in certain densely populated areas as well as astride the highways. Also, rail traffic and the presence of a busy airport and military airfield at Lohagaon are hazardous. As per the statistics compiled by Pune Police, the number of fatalities in road mishaps in the city has once again crossed the 400-mark in one year. In 2011, as many as 417 people died in road mishaps in the city, as against 439 who lost their lives in the year 2010.

7.2.8 Summary of Potential Hazards in the city

Natural Hazards	Man-made Hazards
<ul style="list-style-type: none"> Floods. Earthquakes. Landslides – Pune is surrounded by hills and development on the slopes is a common phenomenon. Biological hazards – epidemics, waste disposal related and food poisoning. 	<ul style="list-style-type: none"> Fire and Industrial Accidents. Road accidents. Violence Related – Terrorism/ Communal Riots Air and rail accidents.

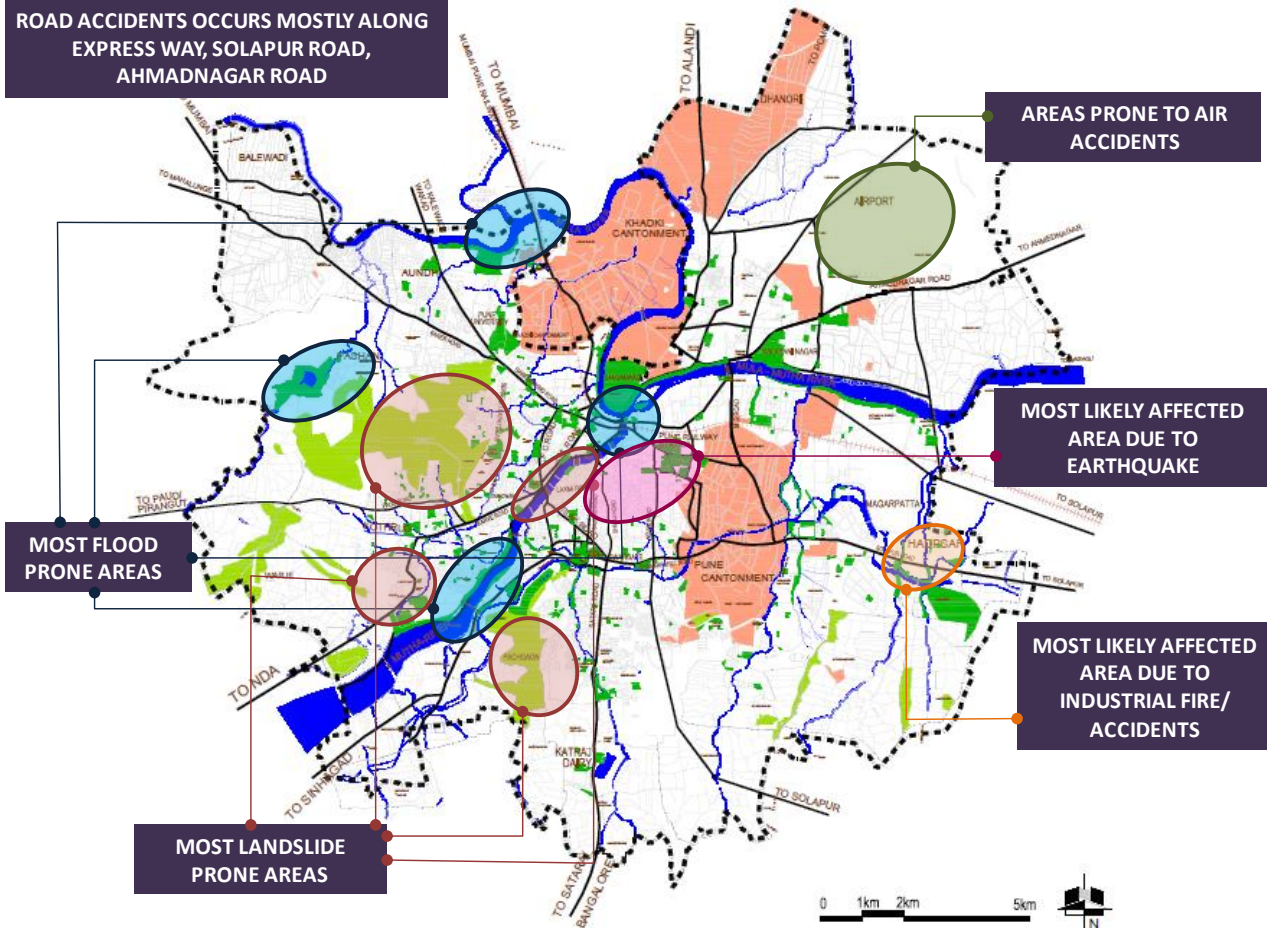


Figure 7-1: Overall Hazard Map of Pune City
(Source: Disaster Management Plan – Pune)

7.3 PREVENTIVE, MITIGATION & PREPAREDNESS MEASURES

7.3.1 Preventive & Mitigation Measures

The city’s risk needs to be reduced by way of building up certain capacities and adopting certain measures. The preventive measures involve passive methods as well as active methods. The passive methods include the surveillance, warning, evacuation regimes while the active methods are like slope restoration, relocation of certain localities, security measures etc. In the mitigation framework, there are certain non-structural measures and some structural measures.

As proposed in the Disaster Management Plan of Pune city, the preventive and mitigation measures to be followed for all types of hazards are:

- A. Different Safe Areas and assembly Points are to be designated where the public can reach in emergency after vacating their houses or places of work during an emergency. Assembly points could be in the closer vicinity of the residential or work premises (like a small plot/ garden/ traffic islands or space outside own building/ factory/ office/ school etc.). The safe areas should be selected at ward Levels where a majority of population of the ward moves during emergencies after collecting at the Assembly Points. Safe areas and assembly points are to be informed to the public. Safe Places for different hazards would be different, keeping in mind the following aspects:



- i. For earthquakes, the safe places have to be in the open and away from building structures. Assembly areas could be the roads adjoining strong buildings.
 - ii. For floods, the safe places have to be outside the 'Red Line' and in buildings that are strong and spacious – like Marriage halls, schools, Colleges and Stadia. Assembly areas could be even on top of a building structure (it may get endangered later, but as immediate measure the upper floors could be used before evacuation).
 - iii. In case of bomb blasts or terrorist attacks, the safe places should be strong houses, at least 500 mtr away from the place of incidence and not in the line of blast/ fire. The assembly areas could be the rooms away from the explosion or behind compound walls.
- B. The rescue and relief inventory are to be kept ready for the population that may get affected by any hazard. The rescue and relief equipment should be kept at each Divisional office and a store be established for the same. The equipment has to be maintained regularly and accounted for.
 - C. Volunteers have to be listed and keep in handy. Volunteers like 'Ganesh Mandals' and other NGOs can be train in rescue and relief operations. The requirement is to have about 50 volunteers for every 500 likely victims. In Pune City, there is an immediate requirement of training
 - D. Revive the siren system instituted by the Civil Defence indicating different notes for different emergencies and practice the same periodically.
 - E. Evacuation routes to be worked out for the movement of the response forces.

7.3.2 Preparedness Measures

- **Awareness:** Improving awareness by placing information boards' at all public places, mock drills regarding prevention, mitigation and response during Fires, Earthquakes, Floods and Terrorist Activities/ Security issues.
- **Training:** The community needs to be trained wherein various training programmes are required to be conducted.
- **Fire & Emergency Services (FES):** The present capacities of the Pune FES are inadequate. As given in the Disaster Management Plan of Pune, the main shortfall is given below and the same should be immediately made up:

Table 7-2: Demand & Gap Analysis for FES

Sl.No.	Type	Required Equipment & Material	Available	Gap
1	Water Tender	45	24	21
2	Water Tanker	45	8	37
3	Advance Rescue Tender	3	2	1
4	Flood Rescue Tender	1	-	1
5	Turn Table Ladder - 70m	1	-	1
	Turn Table Ladder - 40m	1	-	1
6	Hydraulic Platform 70m -1	1	-	1
7	Hydraulic Platform 40m -1	2	1	1
8	Dry chemical powder	1	-	1
9	Foam powder	2	1	1
10	Ambulance	30	8	22



Sl.No.	Type	Required Equipment & Material	Available	Gap
11	Jeep	10	2	8
12	Hydraulic platform portable	12	8	4
13	Breathing apparatus sets (35x12=420)	420	78	342
14	Fire entry suit (35x2=70)	70	6	64
	Total	644	138	506

Source: Disaster Management Plan

- **Creation of Response Team** in close co-ordination with NGOs and volunteers are to be developed.
- **Early Warning & Surveillance System:** CCTVs have to be fixed with monitoring screens at the Police Control Room. CCTVs are required to be fixed at railway stations, bus depots, government offices, major road crossings, public places etc.
- Preparedness in Terms of Pre-planned Administrative Aspects of Hospitals and PHCs upgrades and Contracting of Stores/ Equipment

*The detailed information on disaster prevention, mitigation & preparedness, response mechanism, resource management and incident management are all given in Disaster Management Plan of Pune.

7.4 ISSUES, STRATEGIES & POTENTIAL PROJECT

Sectors	Issues	Strategies & Potential Projects
Seismicity/ Earthquake	<ul style="list-style-type: none"> • Pune is vulnerable to earthquakes of the intensity of 7.0 on the Richter scale • Pune lies very close to the seismically active zone around Koyna Dam, about 100 km south of the city, and has been rated in Zone 4 (on a scale of 2 to 5, with 5 being the most prone to earthquakes) by the India Meteorological Department. 	<ul style="list-style-type: none"> • Earthquake resistant structural norms to be made mandatory as laid down by the Bureau of Indian Standards (BIS) as applicable to the soil and rock structure of the city • Structural design of the buildings would follow guidelines of IS 1893 (Part 1): 2002 'Criteria for Earthquake Resistant Design of Structures: Part 1 General provisions and Buildings' • Survey through independent agencies to identify specific structures which requires any structural treatment, retrofitting or need to be demolished and re-built • Listing and demolish of unauthorised structures • Conducting awareness programmes among the citizens regarding indications of an earthquake and actions to be taken in case of a quake. • Overhead water storage tanks to be structurally design • Sirens and Hooters should be fixed at all the police stations, railway station, Divisional office Buildings, India Security press and schools and colleges
Flood Prone Areas	<ul style="list-style-type: none"> • Pune falls in the flood risk zone • Pune is located at the confluence of the Mula and Mutha rivers. • Low lying areas are susceptible to flooding 	<ul style="list-style-type: none"> • Construction of Anti-flood wall • Riverside to buffer of 100 mtr of area free of any occupation by shops/ other activities and should be converted into municipal gardens. • Plinth level would be kept much above the highest flood



Sectors	Issues	Strategies & Potential Projects
		<p>level ever recorded in last 30 years</p> <ul style="list-style-type: none"> Embankments of the entire stretch of river would be suitably raised above the highest flood level, to prevent flooding
Landslide Prone Areas	<ul style="list-style-type: none"> Unstable slopes are located in few areas of kothrud (Karve Road), Warje, due to highly populated slums 	<ul style="list-style-type: none"> Immediate restoration of slopes by planting suitable shrubs and trees to ensure enhancement of soil holding capacity. Slums that are dangerously located should be shifted out as soon as possible.
Fire Hazard	<ul style="list-style-type: none"> Highly congested areas vulnerable to disasters like fire Major office buildings do not have fire safety measures. The access to slum areas are narrow to pass through any large vehicles 	<ul style="list-style-type: none"> Upgradation of Fire Service Infrastructure like Equipment vehicles 23 Fire Brigade centers are required. For the same, PMC is required to provide land to build type (FS-II) fire brigade station Human resource development Public education and awareness Training institute, fully equipped Control room GIS, GPS, Computerization etc.
Biological Hazard	<ul style="list-style-type: none"> Emerging diseases that impact human or animal (Swine-flu, Malaria, Birds flu, Plague, Smallpox, Anthrax, Foot & Mouth Disease). 	<ul style="list-style-type: none"> Keep check on all unauthorised vendors of food items. Carry out checks of kitchens of all restaurants and hotels. Create more capacity for waste disposal. Undertake periodic cleaning of river channels and do not allow the sewage to flow into river. There is a need to vigorously carry out cleaning of the slums and undertake fumigation and disinfectant sprays.
Anti-terrorism	<ul style="list-style-type: none"> Pune, being an industrial & economically important city, naturally attract the wrath of terrorism. 	<ul style="list-style-type: none"> Fix up CCTVs at all bus stands, railway stations and public offices as well as cinema theatres and Malls. Protecting water reservoirs and filtration plants. Establish chemical check laboratories at each filtration plant.
Accidents	<ul style="list-style-type: none"> High traffic densities. Road accidents are common in densely populated areas as well as astride the highways. Also, rail traffic and the presence of a busy airport and military airfield at Lohagaon are hazardous. 	<ul style="list-style-type: none"> Upgradation and improvement of Infrastructure services in the city

7.5 VISION STATEMENT:

“To make Pune city a safe and secure city from natural and man-made disasters”

7.6 GOALS:

Proactive and reactive integrated disaster management for all communities in the Pune City Municipality, so that the consequences of disasters can be eliminated or reduced through a safe and sustainable environment.

7.7 STRATEGIES & PRIORITY ACTION

Seismicity/ Earthquake

- Survey through independent agencies to identify specific structures which requires any structural treatment, retrofitting or need to be demolished and re-built
- Listing and demolish of unauthorized structures
- Conducting awareness programmes among the citizens regarding indications of an earthquake and actions to be taken in case of a quake.
- Overhead water storage tanks to be structurally design
- Sirens and Hooters should be fixed at all the police stations, railway station, Divisional office Buildings, India Security press and schools and colleges

Flood Prone Areas

- Construction of Anti-flood wall
- Riverside to buffer of 100 mt of area free of any occupation by shops/ other activities and should be converted into municipal gardens.
- Plinth level would be kept much above the highest flood level ever recorded in last 30 years
- Embankments of the entire stretch of river would be suitably raised above the highest flood level, to prevent flooding

Landslide Prone Areas

- Immediate restoration of slopes by planting suitable shrubs and trees to ensure enhancement of soil holding capacity.
- Slums that are dangerously located should be shifted out as soon as possible.
- Up gradation of Fire Service Infrastructure like Equipment vehicles

Fire Hazard

- 23 Fire Brigade centers are required. For the same, PMC is required to provide land to build type (FS-II) fire brigade station
- Human resource development
- Public education and awareness
- Training institute, fully equipped Control room



- GIS, GPS, Computerization etc.

Biological Hazard

- Keep check on all unauthorized vendors of food items.
- Carry out checks of kitchens of all restaurants and hotels. Create more capacity for waste disposal.
- Undertake periodic cleaning of river channels and do not allow the sewage to flow into river.
- There is a need to vigorously carry out cleaning of the slums and undertake fumigation and disinfectant sprays.

Anti-terrorism

- Fix up CCTVs at all bus stands, railway stations and public offices as well as cinema theatres and Malls.



8 HERITAGE & TOURISM

8.1 INTRODUCTION

The preservation of heritage areas with modern development can serve the purpose of business and sustainability.

Historic urban monuments are getting decayed due to the following reasons:-

- Lack of proper policy
- Lack of appropriate legal framework
- Lack of awareness and appreciation towards heritage properties and
- Lack of financial and technical resources

8.2 INVENTORY OF TOURISM/ HERITAGE SITES

Pune, the erstwhile center of the great Maratha hegemony and the 'Oxford of India', is one of the most picturesque civics of the 'Incredible India'. This dynamic city is nestled in the Sahayadri Mountain Ranges at the periphery of the Deccan Plateau where the Mula and Mutha rivers converge. Furnishing as the administrative capital of the Pune District, Pune city boasts of its 1600 years of glorious history and its affluent cultural legacy. Rightly anointed to the status of 'the cultural capital of Maharashtra', the present day Pune is the blooming hub of education, art & culture, industrialization, economy and modernism.





The extravagant historical monuments and palaces illustrating the Maratha, Peshwa and British era, the sublime temples, the majestic edifices, the relics of ancient architecture and the fabulous museums retrieving the ostentatious heritage of this opulent city fascinate its visitors to no extent. Pune, a lofty synthesis of old and new and conventional and contemporary is the vicinity that promises an equally grand future as its legendary past.





The illustrious past of the city has given the region a unique identity. Today Pune has provided for growth in IT sector, automobile manufacturing sector and a place for innovations in science and technology. Pune is considered one of the safer metropolitan cities and is a favorable destination for tourists, both for national and international.

Heritage of the city is comprised of dense city core with traditional housing or the "Wada" and the colonial part with palatial Indo- saracenic style bungalows. Institutional buildings, colonial bungalows and palaces constitute the urban heritage of the city.





The following table gives the inventory of the existing tourist destination in the city of Pune:

Table 8-1: Heritage Inventory of Pune


Tourist Place/ Heritage Area	Tourist Destinations & Description	Infrastructure Facilities						Category
		Shopping	Eating Joints	Toilet	Drinking water	Resting place	Waste bins	
	Shaniwar Wada: The ruins of this erstwhile residence of Peshwas form one of the most picturesque sites in Pune. Built in 1736 by Peshwa Bajirao I, this palace was destroyed by fire in 1827. The premise has fountains, gardens, courtyards, audience halls, offices and the walls of the fort depict scenes from Ramayana and Mahabharata.							Heritage/ Cultural
	Aga Khan Palace: Now the Ba-Bapu memorial, it's a gracious palace amidst well laid out gardens. The palace holds a historical importance since during the 1942 Quit India Movement, Mahatma Gandhi and other leaders were interned here. The memorials of Kasturba Gandhi, wife of Gandhiji, and Mahadeo Desai, secretary to Mahatma Gandhi lies on the ground of the palace							Heritage/ Cultural
	Vishrambaug Wada: It was the luxurious residence of Peshwa Bajirao II, the last Peshwa of Maratha confederacy, in early 17 th century. The 20,000 sq. ft. Wada presently houses a post office on its ground floor, a few other offices of the municipal corporation and a small museum of Maratha artifacts put together by noted Maratha historian, Babasaheb Purandare. This structure is famous for its fine entrance and the balcony with carved woodwork							Heritage/ Cultural
	Saras Baug: It was constructed by Nanasaheb Peshwa and located against the scenic background of Parvati Hills. The garden houses a renowned Ganpati temple constructed in 1774 by Madhav Rao Peshwa. There is a Ganesh Murthi Museum, enclosing large number of Ganesh statues.							Religious

Tourist Place/ Heritage Area	Tourist Destinations & Description	Infrastructure Facilities					Category	
		Shopping	Eating Joints	Toilet	Drinking water	Resting place		Waste bins
	Parvati Hills: Parvati hill is a picturesque spot perched atop Pune city. Parvati Hill Temple, believed to be built during the 17th century, it enshrines the idols of Goddess Parvati, Lord Ganesha, Lord Vishu, Devateshwar and Lord Karthikeya. The Parvati Hill is an ideal location for trekkers. Nearby attractions include Parvati Museum enclosing old manuscripts, rare coins, weapons, the Sati Monument and Vetal Chabutra.							Natural
	Shinde's Chhatra: It is constructed as a memorial of the Maratha noble character Shri Mahadji Shinde. The architectural style of the building is appreciable with its beautiful carvings and intricate craftsmanship following the Vaasthu Hara rules. This is an excellent architectural marvel.							Heritage/ Cultural
	Bund Garden: This is one of the most popular tourist attractions in Pune and is also known as Mahatma Gandhi Udhayan. It is located on the right bank of the Mula-Mutha Rivers and was built by Sir Jamshedji Jeejeebhoy to provide the poor with water during hot months of the summers. Adventure includes boat rides and horse rides.							Natural
	Pataleshwar Cave Temple, a rock cut shrine dating back to 8th century, is historical temple in the middle of Jangli Maharaj Road in Shivaji Nagar Pune. The temple is made out of a single hard stone and the main deity is Pataleshwar. The temple bears massive pillars and constructed with the architectural excellence like that of Elephanta caves in Mumbai. Jangali Maharaj Temple is another temple nearby.							Religious/ Heritage



Tourist Place/ Heritage Area	Tourist Destinations & Description	Infrastructure Facilities					Categor	
		Shopping	Eating Joints	Toilet	Drinking water	Resting place		Waste bins
	Katraj Snake Park: It was established in 1986, situated close to Pune on Pune–Satara Highway at Katraj. The Park houses birds and turtles apart from the reptiles. A zoo and a garden located nearby are also worth visiting.	Yellow	Green	Yellow	Yellow	Green	Green	Natural
	Ashram of Bhagwan Rajneesh (Osho Ashram), 32 acre campus, is in Koregaon Park area of Pune. The ashram is a prime attraction for tourists who are followers of Bhagwan Rajneesh ideologies & preaching. It is a resort for Meditation and Yoga. Regular training programs on spiritual uplift and meditation are conducted in this place.	Green	Yellow	Green	Green	Green	Green	Religious
	St. Mary's Church, an ancient church dating back to 1825, is built by British. This is an elegant structure with a blend of British and Indian architectural styles. The mortal remains of Sir Robert Grant, a renowned writer of religious lyrics and an erstwhile Governor of Mumbai, is placed under the floors of the church.	Pink	Pink	Yellow	Yellow	Green	Green	Religious/ Heritage
	Raj Dinkar Kelkar Museum is located at the Bajirao Road. This museum displays a variety of artifacts which showcases the vastness and diversity of culture of the country and people. The Museum houses many items collected by Dr. D. G. Kelkar. The museum offers unique exhibits like the foot scrubber in the form an elephant-shape, images of Lord Ganesha, and a brass scorpion having a secret lock system, 20th century pottery, paintings of 17th century and carved doors of temples and palaces.	Yellow	Pink	Pink	Yellow	Pink	Yellow	Heritage/ Cultural



Tourist Place/ Heritage Area	Tourist Destinations & Description	Infrastructure Facilities					Category	
		Shopping	Eating Joints	Toilet	Drinking water	Resting place		Waste bins
	<p>University Building: The University Buildings at Ganeshkhind once comprised the official residence of the Governor of Bombay Presidency during the fierce annual monsoons of the coasts. A large building in the Italian Gothic style, it has a 30m high square tower, a swimming pool and manicured lawns.</p>							Heritage/ Education

OFF-SITE & ON-SITE INFRASTRUCTURE	
No Facilities/ Not Present	
Available but Insufficient/ Low quality	
Available with good Quality/ Sufficient	


Heritage & Tourism – Pune City

Heritage of the city is comprised of dense city core


Institutional buildings, colonial bungalows and palaces constitute the urban heritage of the city.

The illustrious past of the city has given the region a unique identity.


- 1 Historical/ Cultural
- 2 Nature/ Wildlife
- 3 Religious




Vishrambaug Wada




Pashan Lake



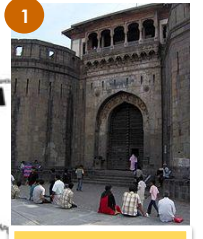
St. Mary's Church




Aga Khan Palace



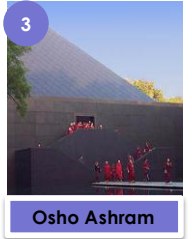
Parvati Hill Temples




Saniwar Wada




University Building




Osho Ashram




Raja Dinkar Kelkar Museum



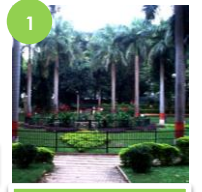
Saras Baug




Katraj Snake Park



Shinde Chhatra



Bund Garden



Pataleswar Cave & Temple

Map No. 8-1: Location of Major Heritage & Important Tourist Places

8.3 TOURISM POLICY OF MAHARASHTRA - 2006

The tourism policy of the State aims at achieving a planned growth in tourism, generating employment, protecting natural & cultural resources in an ecologically sustainable manner and promoting arts & handicrafts of different regions in the State. It has entrusted all commercial & promotional activities to Maharashtra Tourism Development Corporation (MTDC). MTDC is taking initiative in developing Forest tourism.

The State has formulated and adopted a policy for tourism development (1993) in consultation with the representative of the travel trade, travel writers and Central govt. agencies.

The overall atmosphere in the State is conducive for tourism development. Domestic and foreign tourist visiting the State more than doubled during the last decade which indicates growing tourism in the State. In order to have planned efforts for tourism development, GoM approved Tourism Policy 2006 (TP) which became operative from 1st November 2006 for ten years or until substituted by a new policy. The scope of the Tourism Policy included tourism projects in the private sector, State public sector and the cooperative sector. Tourism Policy had provided for a 23 point Action plan to be implemented in the next five years with a long-term vision for 2025.

The main features of the Tourism Policy of 2006 are as under:

- Development of infrastructure at tourist destinations in the State by giving preference to weekend destinations. In addition, strengthening the rail linkage and air connectivity of the important tourist destinations in coordination with concerned Departments and Ministries.
- Strengthening of Bed and Breakfast scheme and Incentive scheme to boost rural tourism.
- Development of cultural tourism, agricultural and wine tourism, pilgrimage circuits and fort circuits.
- Creating awareness among people about the importance of tourism and safety/environmental awareness.
- Formation of a committee by the State Government comprising of Department of Tourism, MTDC and others to play a coordinating role along with organizational review of tourist activities.
- Development of a mechanism for collecting Tourism Survey Statistics in the State. The Company was to tie up with related institutions in the State and collect monthly data.
- Conducting periodic tourism survey and impact analysis of tourism projects.

8.4 EXISTING REGULATIONS/ HERITAGE GUIDELINES AT THE ULB LEVEL AND STATE LEVEL

The draft of heritage regulations to monitor the city's heritage structures was prepared by the Pune Municipal Corporation (PMC) in 1999. The initial count of the heritage-graded structures was around 331 and eight natural sites.

Indian National Trust for Art & Cultural Heritage (INTACH) has formulated the listing format of the heritage regulation; this format is used by documentation experts for documentation of heritage sites and structures all over the country.

The structures of the Pune city were categorized area wise within defined zones and style of architecture. The standard inventory format used by 'INTACH' for documentation where customized for specifics of the city. The listing and inventories format were designed to accommodate information about historical facts, art, architectural style and detailing, materials used and its resources. The chronology of the function and type of use the structure is used for and its ownership status. These factors were also considered to determine the importance of the structure or for grading purposes. The lists of heritage buildings, Heritage precincts, are graded on the basis of Grade I, II and III.

The heritage regulation apply to heritage sites which include those buildings, artifacts, structures, streets, areas and precincts of historic, architectural, aesthetic, cultural or environmental value (referred to as Listed Heritage Buildings/ Listed Heritage Precincts) and those natural feature areas of environmental significance or of scenic beauty including, but not restricted to, sacred groves, hills, hillocks, water bodies (and the areas adjoining the same), open areas, wooded areas, points, walks, rides, bridle paths (hereinafter referred to as 'listed natural feature areas') which shall be listed in notification(s) to be issued by the Government.

INTACH was given a contract of updating the heritage list in 2009. The lists of structures in the 23 new villages in 2010, as well as the updated list of Grade I, Grade II and Grade III structures were submitted in 2011. As per the INTACH inventory of Historic Properties, Pune has a total of 245 heritage-graded structures and natural heritage precincts, out of which 77 heritage structures/ natural heritage are under Grade I, 83 heritage structures are under Grade II and 85 heritage structures are under Grade III.

8.5 TOURIST IN-FLOW

8.5.1 District Tourist In-Flow

Total number of domestic tourist / visitor arrivals in the state of Maharashtra during the period of 1st July 2009 - 30th June 2010 was 11,47,76,687. Out of which the domestic tourist arrival contributes to 98% while the foreign tourist arrival contributes to 2%. Of the total domestic tourist arrival, Mumbai had the highest number of tourist arrival with 25% while the second highest is the district of Ahmednagar with 11% and Pune had the third highest tourist arrival with 8% within the state of Maharashtra. The district-wise domestic tourist arrival is shown in figure 8-1.

Of the total foreign tourist arrival, Mumbai had the highest number with 79% while Pune is the second highest destination favorites for the foreign tourist with 14%. The district-wise foreign tourist arrival is shown in figure 8-2.

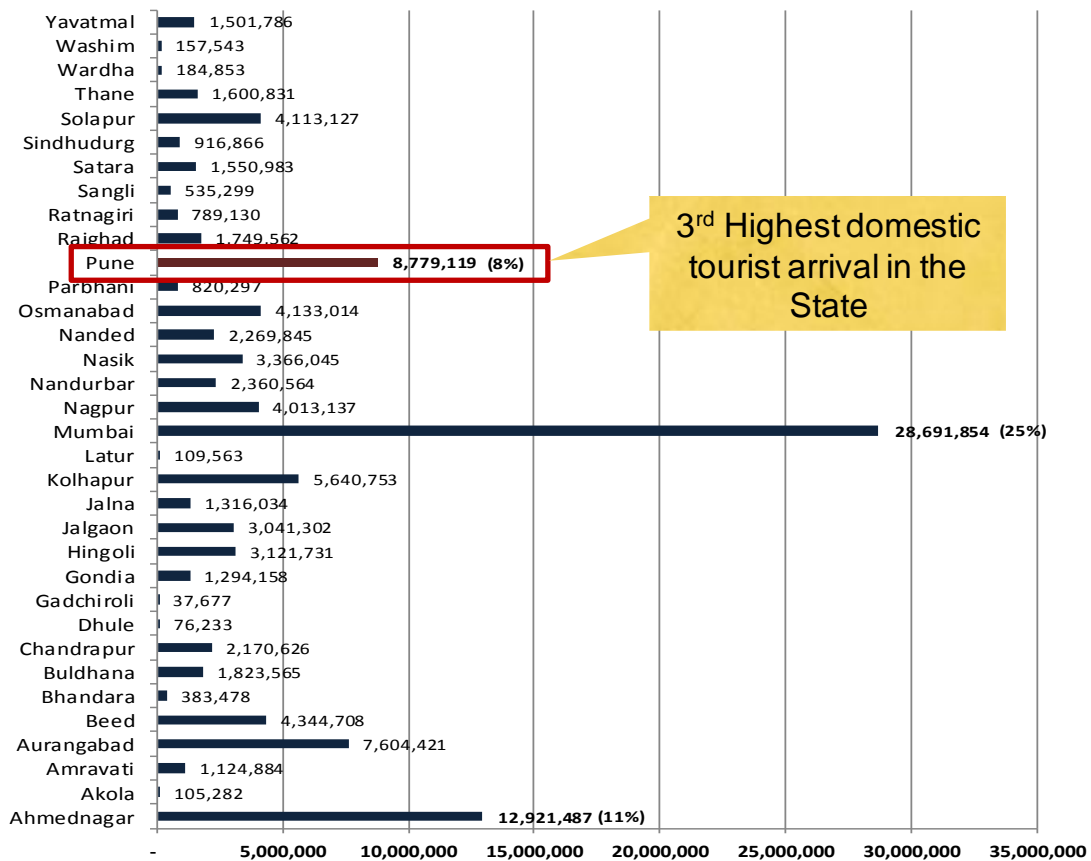


Figure 8-1: District Wise Domestic Visitor Arrival in Maharashtra (July 2009 - June 2010)

(Source: Tourism Survey for State of Maharashtra under Ministry of Tourism, Gol by AC Nielsen ORG-MARG)

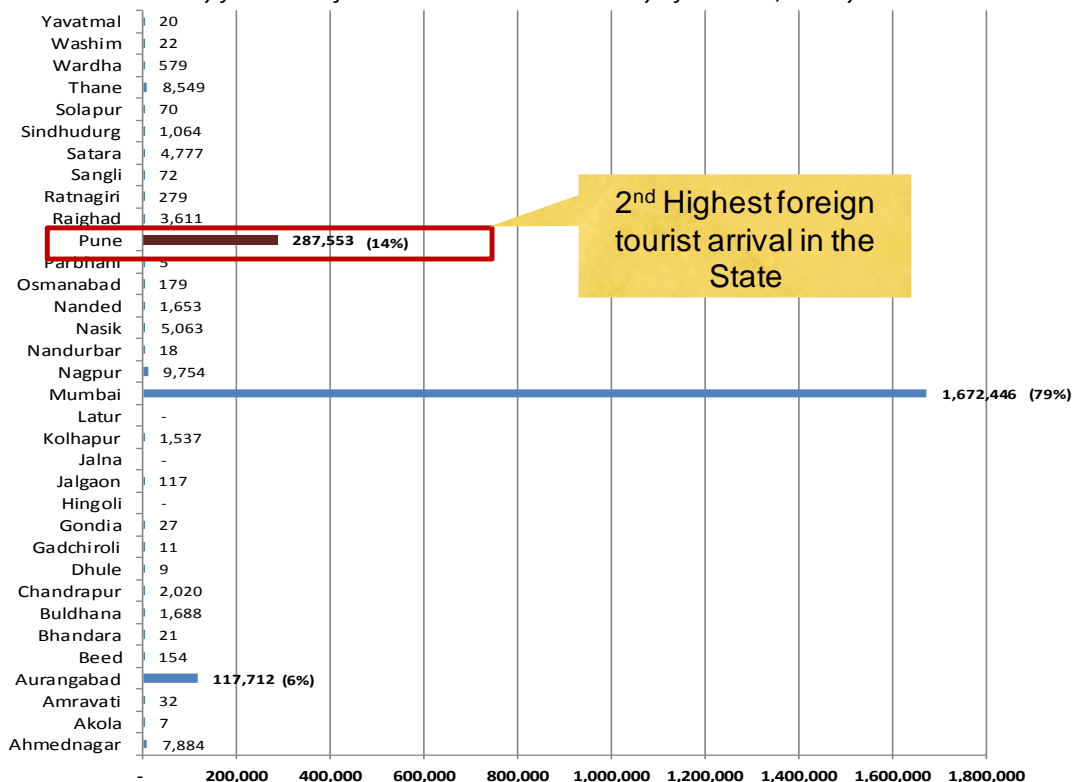


Figure 8-2: District Wise Foreign Visitor Arrival in Maharashtra (July 2009 - June 2010)

Source: Tourism Survey for State of Maharashtra under Ministry of Tourism, Gol by- AC Nielsen ORG-MARG

8.5.2 Pune District Tourist In-Flow

The monthly tourist in-flow of Pune District shows that the maximum tourist arrival is in the month of May with 902,066 and the minimum is in the month of July with 441,951 tourist arrival.

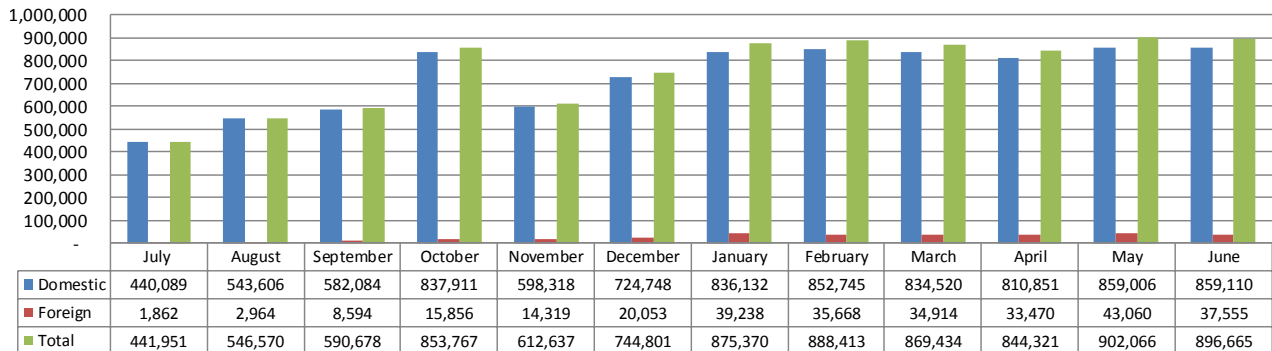


Figure 8-3: Monthly Tourist Visitor Arrival in Pune District (July 2009 - June 2010)

(Source: Tourism Survey for State of Maharashtra under Ministry of Tourism, Gol by AC Nielsen ORG-MARG)

8.6 TOURIST ACCOMMODATION IN PUNE CITY

As per the Report on 'Tourism Survey for State of Maharashtra under Ministry of Tourism, Gol by AC Nielsen ORG-MARG', there are a total of 235 units of accommodation available in the city.

Occupancy Rate and Average Room Rate of Hotels – Pune City

According to the HVS Trends and Opportunities Report 2011, Pune saw both, occupancy levels and average room rates come under pressure from 2009/10 and in 2010/11. With a supply increase of approximately 2,0003 hotel rooms in 2010/11, the city which was largely a Commercial-demand driven market is also developing as a MICE⁴ destination in west India. The city hotels support a total indoor meeting space area of approximately 8,500 square metres. Micro-markets like Hinjewadi, Chakan, Ranjangaon, and Talegaon are the main demand generators for the city hotels. The city is still expected to see a large influx of supply in each micro-market; of this new supply, budget hotels now form a large share that bodes well for the hotel market growth in the identified industrial areas.

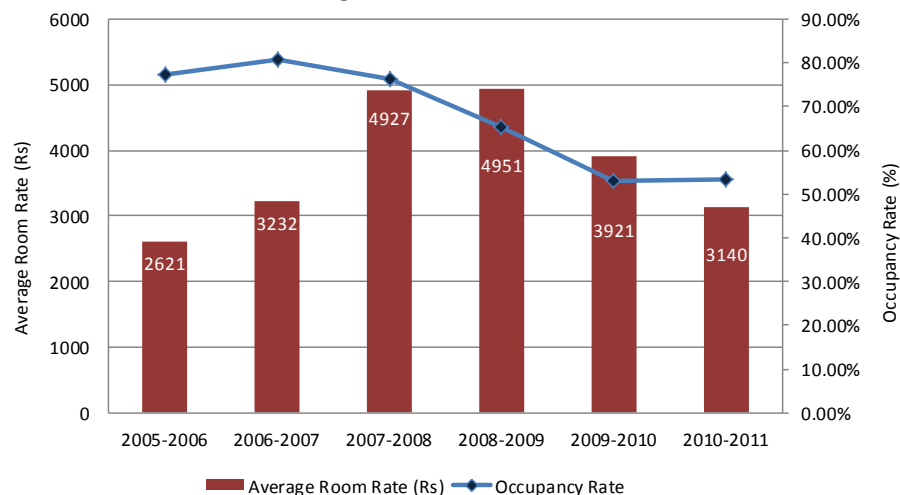


Figure 8-4: Yearly Occupancy Rate and Average Room Rate of Hotels – Pune City

(Source: the HVS Trends and Opportunities Report 2011)

⁴ MICE is an acronym for the Meetings, Incentives, Conventions and Exhibitions tourism segment.

8.7 SUSTAINABLE TOURISM DEVELOPMENT POTENTIAL IN PUNE CITY

- Tourism Infrastructure development/ improvement
- Potential Regional Tourism Circuit – Theme base: Pune is surrounded by tourist places and thus can be further developed as a center for different types of tourism viz. historical tourism and heritage tourism, religious tourism besides serving as a center for medical tourism and educational tourism.
 - Mumbai-Ashtavinayak with Pune halt- Mumbai: It is a pilgrim tour to the eight Ganapati Temples in Maharashtra which can be covered in a duration of 3 days (20 to 110kms of range)
 - Lonavala, Matheran, Nasik, Shirdi, Aurangabad, Pune and Mahabaleshwar
 - Mumbai - Lonavala - Matheran - Nasik - Shirdi - Aurangabad - Ajanta - Ellora - Pune - Ellora - Pune - Mahabaleswar – Mumbai
- Eco-Tourism Potential: The geographical diversity of the region of Pune provides an opportunity for eco-tourism. Its climate and surrounding natural sites made it as the best district for providing ecotourism facilities. Along with many natural ecotourism sites Pune is surrounded by several beautiful lakes like Mulshi, Khadakwasala, Katraj, Bhushi, Valvan, Pashan, Bhougaoon etc. These lakes are the best ecotourism sites of Pune district.

8.8 SWOT ANALYSIS

STRENGTH	WEAKNESS	OPPORTUNITY	THREATS
<ul style="list-style-type: none"> ▪ Pune has immense tourism potentials with its rich cultural, heritage and natural environs ▪ Vibrant landscape, lifestyles and cuisines ▪ As per HVS report, Pune city hotels (base demand) has seen a significant growth (35%) and trends indicate this to get even stronger as the city moves from being a largely commercial driven market to also developing as a Meeting and Conference destination in West India. ▪ Areas such as Hinjewadi, Pimpri Chinchwad, Talegaon and Chakan, Ranjangaon are the main demand generators for the city hotels 	<ul style="list-style-type: none"> ▪ Poor accessibility to many tourist destinations due to basic Infrastructure bottlenecks ▪ Lack of tourist infrastructure & basic amenities at many tourist destinations ▪ Lack of information about tourist destinations ▪ Auto Rickshaws are only mode of public transport. Poor public transport facility. 	<ul style="list-style-type: none"> ▪ Tourism potential unexploited ▪ Development of good transport connectivity ▪ Eco-tourism development 	<ul style="list-style-type: none"> ▪ Aggressive marketing and promotion by competing destinations in neighbouring cities ▪ Environmental degradation of the natural precinct due to pollution

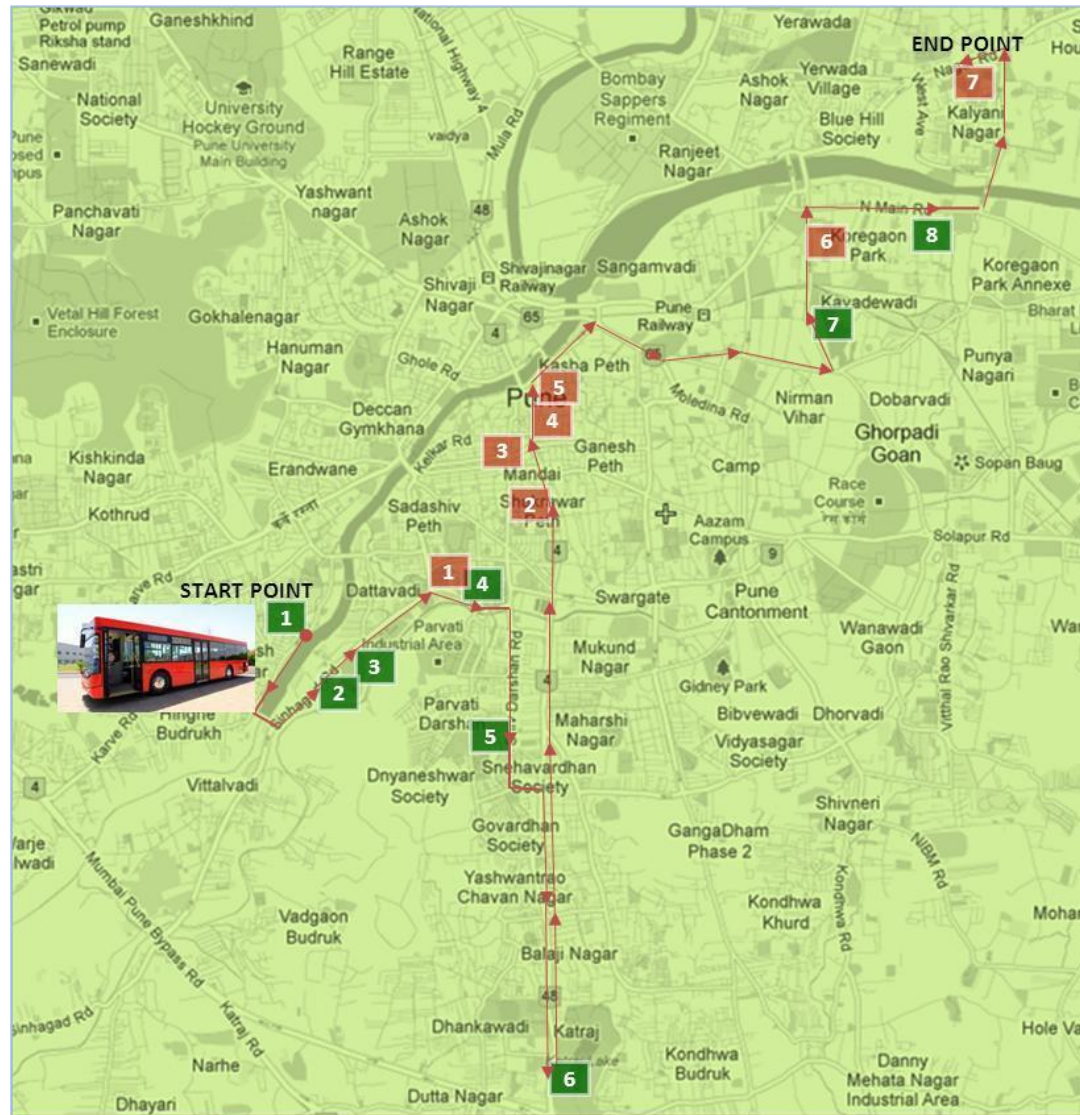
Regional Tourism Potential - Pune

Pune has a potential for regional tourism promotion.
Theme based tourism- circuit can be plan for enhancing the regional tourism
Pune city can act as the center for theme based tourist destination zone

- 1 Religious
- 2 Nature/ Wildlife
- 3 Fun & Entertainment



Map No. 8-2: Regional Tourism Potential Locations – Pune



- 1 Saras Baug
- 2 Raja Dinkar Kelkar Museum
- 3 Vishrambaug Wada
- 4 Lal Mahal
- 5 Shaniwar Wada
- 6 Osho Ashram
- 7 Aga Khan Palace

- 1 Smruti Van
- 2 Mughal Garden
- 3 Japanese Park
- 4 Energy Park
- 5 Butterfly Park
- 6 Rajiv Gandhi Zoological park
- 7 Medicinal Plant Park
- 8 Jogger's Park

→ BUS ROUTE – TOURIST CIRCUIT

Map No. 8-3: Bus Route - Tourist Circuit

8.9 ISSUES & POTENTIALS

S. NO	ASPECTS	ISSUES	POTENTIALS
1	Heritage Resources	<ul style="list-style-type: none"> ▪ There are enormous numbers of heritage structures in Pune City which are under dilapidated condition ▪ Due large no. of floating population the sites face issue of littering etc. 	<ul style="list-style-type: none"> ▪ Conservation and restoration of major heritage structures ▪ Scope to enhance tourist inflow by promoting eco-tourism
2	Supporting Tourist Infrastructure & Urban Renewal	<ul style="list-style-type: none"> ▪ Lack of supporting tourist infrastructure to attract other tourists ▪ Lack of facilities like eating joints and organized retail spaces ▪ Lack of Public transportation ▪ Lack of signage in the city 	<ul style="list-style-type: none"> ▪ Development of organized supporting infrastructure like <ul style="list-style-type: none"> ✓ Quality accommodations ✓ Information Centers ✓ Road and public transportation ✓ Road furniture and signages
3	Tourism & Heritage Promotion	<ul style="list-style-type: none"> ▪ Lack of promotion and packaging of tourist resources 	<ul style="list-style-type: none"> ▪ Promotion of Adventure Tourism ▪ Promotion of eco- tourism ▪ Enhance type of facilities to promote e.g. theme based tourism potential at regional level

8.10 VISION STATEMENT:

"Conservation of Pune's rich heritage and culture, traditional arts & crafts and its natural resources and improve the tourism prospects in order to generate revenue and employment".

8.11 GOALS:

- Restore and conserve the tangible and intangible heritage
- Impart a sense of pride for Pune's character and its significant contributions to the national heritage and history
- Promotion of Eco-tourism
- Promotion of Adventure Tourism
- Identify theme based tourism potential at regional level

8.12 STRATEGIES & PRIORITY ACTION

- Development strategies for heritage tourism, enhanced visitor experience and revenue Generation, and awareness generation.
- Conservation and restoration of all tangible and intangible heritage
- Conservation of the Core areas



- Heritage walk to be proposed in the core areas
- Nallas along the core areas are to be improved and maintained to bring its aesthetic values of the surrounding heritage core areas
- Conservation and protection of Parvati Hills
- Scope to enhance tourist inflow by promoting eco-tourism
- Promotion of Adventure Tourism
- Enhance the tourist Infrastructure – accommodation facilities, Tourist Amenities
- Enhance and promote theme based tourism potential at regional level

9 CITY VISION

The city of Pune is a unique metropolitan with many assets atypical of cities this size throughout the country, with beautiful natural landscape surrounding it, unique terrain and climatic conditions. The Corporation has made efforts to develop parks and gardens and road and transport system, traditional and suburban style neighbourhoods, a bustling core city area with heritage buildings. Pune has a rich history with culturally strong socio-economic fabric which is well pronounced in throughout the city.

Perceiving a vision for a city is a vital aspect since it guides the key stakeholders to orient the city’s development in the direction leading to the fulfilment of the aspirations of the population at large along with improving the quality of life of the citizens. Thus, in the process of preparation of a City Development Plan, vision formulation is one of the key components.

Vision formulation is done largely through the consultation of the key stakeholders, who are the active participants of the CDP process. The stake holders express their views regarding their city as to how they want to perceive their city in future. City Vision is dictated by the aspirations of the citizens which are inspired by the personal perspective aiming at achieving good quality of life for the existing and the future population, it’s a wish list of the stakeholders who are consulted during the CDP process. The final vision statement is the outcome of the consultations done in this regard. A city’s vision statement is supported by the sector visions and is bound by a timeline so as to be persuaded by the concerned body to achieve the vision within its dimensions.

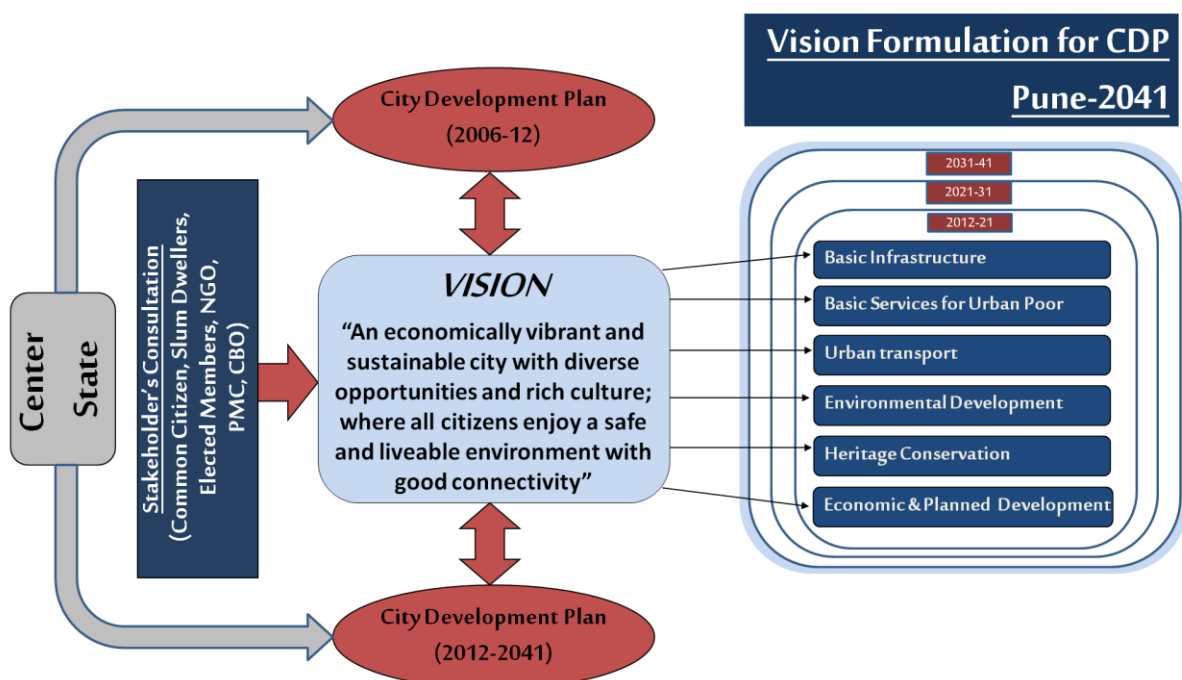


Figure 9-1: Vision Formulation for CDP Pune - 2041

In the CDP, vision is developed through a process which involves inputs from all the stakeholders like common citizens, slum dwellers, elected members, NGOs and CBOs. CDP become a medium to integrate



all the views and inputs to formulate vision for the city. This city vision, which is on a large scale, then filters down to devise the individual sectoral goals. Finally these sectoral goals are the apparatus to achieve the final vision of the city in future.

The process of acquiring a formal Vision for the city of Pune started at the time of conception of the first CDP in 2006 for which the consultations were carried out, in continuation to this during the exercise of Revising/ Updating the CDP for Pune for a target year of 2041 the consultations have been taken up, in which the stakeholders were asked about their perspective regarding the future of the city. Different people furnished the consultants with various answers both in terms of long term visioning and short term visioning. On a broader aspect the stakeholders can be divided into two viz. the more aware and the less aware; the more aware are those who have the knowledge of CDP process and are aware of the previous CDP whereas the ones who do not possess the knowledge of CDP process may be regarded as the less aware. In a city like Pune the NGOs and the elected members form the part of the more aware citizens and their inputs with respect to the City Vision for the Revising / Updating of the CDP for Pune may be considered as the voice of the common man. These stakeholders pointed out that the city vision should be kept the same which has already been formulated in the previous CDP (2006-12). They have a deep concern over changing the city vision after a short time period of hardly six years, since, during this time period the city has achieved a lot in the direction of the perceived vision, yet the journey is on, which clearly reflects that the city vision for this revised CDP has to be the same as that of the previous CDP.

It is important to understand that a city's vision cannot change drastically in a short span of 6 years but the major criteria which plays a major role in the formulation of the vision of a CDP is the bound time line. As already discussed visions can be both short term and long term. Hence in the current exercise the part of vision formulation becomes as important as the previous one. The changes in the vision after a short span of time is usually very nominal if compared to the scale of the vision formulated for a city. A vision which is a very short term can observe a change after the completion of its time period. The change in a short term vision can be the result of achievement or conclusion of a project which was important for the change in the city's scenario. Hence the change in a short term vision is quite possible in a time span of 5-6 years. Usually these short term visions are more related to the different sectoral visions which trickle down from the sectoral goals and objectives.

On a contrary the case of long term vision is the stakeholder's perception far into the future which depicts the final goal or outcome of all the developmental projects carried out in the city in its past. A long term vision mostly works out as the final destination where a city reaches after the completion of its timeline. Hence it is important to note that a city's long term vision cannot keep on changing every brief period of time i.e. of 5-6 years. It becomes necessary for the consultant to keep the current vision in accordance to the previous CDP's vision and any unavoidable changes should be in line with the previous CDP (2006-12).

According to the previous CDP (2006-12) based on the city's strengths, futuristic desires and perspectives, and potential of Pune, the "Punekars" have articulated their vision to be **"An economically vibrant and sustainable city with diverse opportunities and rich culture; where all citizens enjoy a safe and liveable environment with good connectivity"**

The above vision statement forms the base of the vision statement for the current CDP-2041 as even to



the current year the goals and projects which were to be fulfilled and completed are ongoing. Consequently it becomes the responsibility of the consultant to keep the previous CDP's city vision as the foundation of the new CDP-2041. Even the stakeholders are in consensus with the idea of continuation of the previous city as the current CDP's city vision. Hence it is a very valid step to keep the current CDP's - 2041 city visions on the same lines of the the previous CDP's (2006-12) city vision.

10 INSTITUTIONAL FRAMEWORK, MUNICIPAL FINANCE AND URBAN GOVERNANCE

10.1 INTRODUCTION

Pune Municipal Corporation (PMC) was established on 14th February 1950 and has jurisdiction over Pune city administration. These jurisdiction powers are derived by PMC through Bombay Provincial Municipal Corporation (BPMC) Act, 1949. Under these powers and the 74th Constitutional Amendment Act, PMC is obliged to provide basic infrastructure including roads, drainage and sewerage, water supply, street lighting and services covering education, poverty alleviation, slum improvement, urban forestry, environmental protection and conservation, primary health etc. Apart from the PMC, there are other administrative bodies and agencies that provide and govern various services in the city. This chapter lists various agencies involved in urban governance and does a preliminary assessment of the functions of Pune Municipal Corporation. The first section outlines the institutional arrangement of the city and the second section assesses the financial strength of the Corporation. This chapter is discussed under different heads which were referred from BPMC Act, 1949 and the consultations done with the officials during the process of preparation of the city development plan Pune - 2041.

10.2 INSTITUTIONAL SETUP

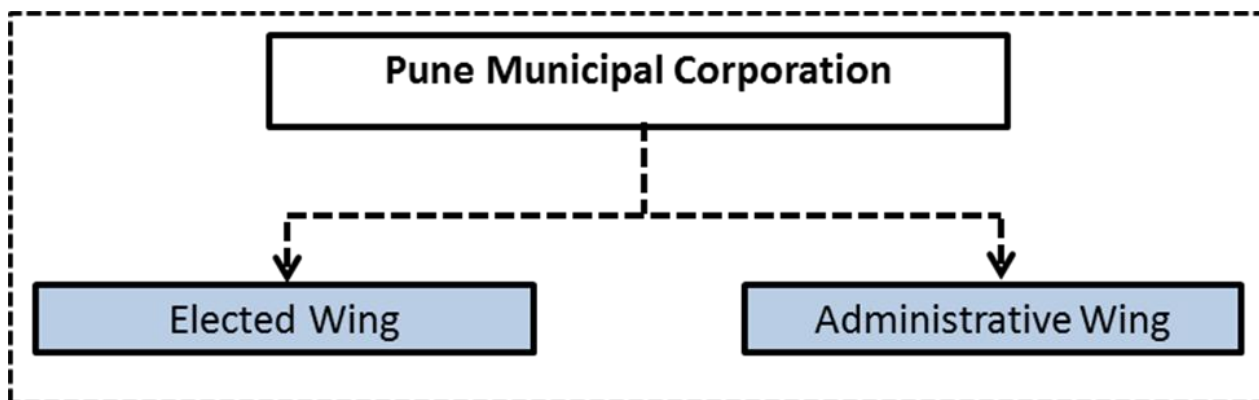


Figure 10-1: Pune City - Organogram of Pune Municipal Corporation

In sync with BPMC Act, 1949, the Pune Municipal Corporation is bifurcated into administrative wing and an elected wing. The administrative wing is headed by Municipal Commissioner which is responsible for mostly the infrastructural and developmental work in the city. Whereas the Elected wing is mostly responsible for the financial deliverance and the approvals for the various developmental works undertaken by the administrative wing of the PMC.

10.2.1 Functions of the Corporation

The BPMC Act defines the scope and extent of responsibilities of the Corporation. The Act has entrusted PMC the responsibility for the maintenance, operation and development of certain public utilities in the city. The services presently being provided by the PMC are classified as obligatory and discretionary services.



10.2.1.1 Obligatory Functions

The BPMC Act has identified a list of mandatory functions/services under Section 63 for which the PMC has to make reasonable and adequate provision. These obligatory functions/services are listed as under:

- 1) Erection of substantial boundary marks of such description and in such positions as shall be approved by the State Government defining the limits or any alteration in the limits of the City; Planning for social and economic development; - Urban forestry, protection of the environment and promotion of ecological aspects
- 2) The watering, scavenging and cleansing of all public streets and places in the City and the removal of all sweepings there from;
- 3) The collection, removal, treatment and disposal of sewage, offensive matter and rubbish and, if so required by the State Government, the preparations of compost manure from such sewage, offensive matter and rubbish
- 4) The construction, maintenance and cleansing of drains and drainage works and of public latrines, water closets, urinals and similar conveniences
- 5) The entertainment of a fire brigade equipped with suitable appliances for extinction of fires and the protection of life and property against fire
- 6) The construction or acquisition and maintenance of public hospitals and dispensaries including hospitals for the isolation and treatment of persons suffering or suspected to be infected with a contagious or infectious disease and carrying out other measure necessary for public medical relief
- 7) The lighting of public streets, municipal markets and public buildings vested in the Corporation
- 8) The maintenance of a municipal office and of all public monuments and open spaces and other property vesting in the Corporation
- 9) The naming or numbering of streets and of public places vesting in the Corporation and the numbering of premises
- 10) The regulation and abatement of offensive and dangerous trades or practices
- 11) The maintenance, change and regulation of places for the disposal of the dead and the provision of new places for the said purpose and disposing of unclaimed dead bodies
- 12) The construction or acquisition and maintenance of public markets and slaughterhouses and the regulation of all markets and slaughter-houses
- 13) The construction or acquisition and maintenance of cattle pounds
- 14) Public vaccination in accordance with the provisions of the Bombay District Vaccination Act, 1892
- 15) Maintaining, aiding and suitably accommodating stocks for primary education
- 16) The reclamation of unhealthy localities, the removal of noxious vegetation and generally the abatement of all nuisances
- 17) The registration of births and deaths
- 18) The construction, maintenance, alteration and improvement of public streets, bridges, subways, culverts, cause-ways and the like
- 19) The removal of obstructions and projections in or upon streets, bridges, and other public places



- 20) The management and maintenance of all municipal water works and the construction or acquisitions of new works necessary for a sufficient supply of water for public and private purposes
- 21) Preventing and checking the spread of dangerous diseases
- 22) The securing or removal of dangerous buildings and places
- 23) The construction and maintenance of residential quarters for the municipal conservancy staff
- 24) Fulfillment of any obligation imposed by or under this Act or any other law for the time being in force
- 25) Subject to adequate provision being made for the matters specified above the provisions of relief to destitute persons in the City in times of famine and scarcity and the establishment and maintenance of relief works in such times.

10.2.1.2 Discretionary Functions

The corporation may, in its discretion, provide from time to time, wholly or partly, for all or any of the functions. The discretionary functions of the Corporation (under section 66 of the BMC Act, 1949) are:

- 1) The Organization, maintenance or management of institutions within or without the City for the care of persons who are infirm, sick or incurable, or for the care and training of blind, deaf, mute or otherwise disabled persons or of handicapped children; - slum improvement and up gradation; - urban poverty alleviation; - cattle pounds and prevention of cruelty to animals; - regulation of tanneries;
- 2) The Organization, maintenance or management of maternity and infant welfare homes or centers;
- 3) The provision of milk to expectant or nursing mothers or infants or school children
- 4) The Organization, maintenance or management of chemical or bacteriological laboratories for the examination or analysis of water, food or drugs, for the detection of diseases or for researches connected with public health
- 5) Swimming pools, public wash houses, bathing places and other institutions designed for the improvement of public health
- 6) Dairies or farms within or without the City for the supply, distribution and processing of milk or milk products for the benefit of the residents of the City
- 7) The construction and maintenance in public streets, or places of drinking fountains for human beings and water troughs for animals
- 8) The planning and maintenance of trees on road sides and elsewhere; providing for parking or halting places or lots for vehicles on any part of any public street or public place which vests in the Corporations
- 9) The provision of music for the people
- 10) The provision of public parks, gardens, play-grounds and recreation grounds
- 11) The holding of exhibitions, PMC Games [athletics or games]
- 12) The regulation of lodging houses, camping grounds and rest houses in the City
- 13) The maintenance of an ambulance service
- 14) The construction, establishment and maintenance of theatres, rest-houses and other public buildings
- 15) The Organization or maintenance, in times of scarcity, of shops or stalls for the sale of necessities of life



- 16) The building or purchase and maintenance of dwellings for municipal officers and servants
- 17) The grant of loans for building purposes to municipal servants on such terms and subject to such conditions as may be prescribed by the Corporation
- 18) Any other measures for the welfare of municipal servants or any class of them
- 19) The purchase of any undertaking for the supply of electric energy or gas or the starting or subsidizing of any such undertaking which any be in the general interest of public
- 20) The construction, purchase, Organization, maintenance or management of light railways, tramways, trackless trams, or motor transport facilities for the conveyance of the public or goods within or without the City
- 21) The furtherance of educational objects other than those mentioned in clause (15) of section 63 and making grants to educational institutions within or without the City
- 22) The establishment and maintenance or the aiding of libraries, museums and art galleries, botanical or zoological collections and the purchase of construction on buildings therefore
- 23) The construction or maintenance of infirmaries or hospitals for animals
- 24) The destruction of birds or animals causing a nuisance, or of vermin, and the confinement or destruction of stray or ownerless dogs
- 25) Contributions towards any public fund raised for the relief of human suffering within the City or for the public welfare
- 26) The preparation or presentation of address to persons of distinction
- 27) The registration of marriages
- 28) The granting of rewards for information which may tend to secure the correct registration of vital statistics
- 29) Paying the salaries and allowances, rent and other charges incidental to the maintenance of the Court of any stipendiary magistrate or any portion of such charges
- 30) The acquisition and maintenance of grazing grounds and the establishment and maintenance of a breeding stud
- 31) Establishing and maintaining a farm or factory for the disposal of sewage
- 32) Supplying, constructing and maintaining, in accordance with the general system approved by the Corporation, receptacles, fittings, pipes and other appliances whatsoever on or for the use of premises for receiving and conducting the sewage thereof into drains under the control of the Corporation
- 33) Granting rewards for information regarding the infringement of any provisions of this Act, or of the rules, by-laws regulations or standing orders
- 34) Laying out whether in areas previously built upon or not, new public streets and acquiring land for the purpose and land required for the construction of buildings or cartilages thereof to about a such street or streets
- 35) The building or purchase and maintenance of suitable dwellings for the poor and working classes, or the grant of loans or other facilities to any person, society, or institution interested in the provision of such dwellings
- 36) The provision of shelter to destitute or homeless persons and any form of poor relief
- 37) The building or purchase and maintenance of sanitary stables, or byres for horses, ponies or cattle used in hackney carriages of carts or for milch-kine



- 38) Survey of buildings or lands
- 39) Measures to meet any calamity affecting the public in the City
- 40) Making contributions to the funds of the local-self Government Institute, Bombay.
- 41) Making any contribution towards any public reception, ceremony or entertainment:
- 42) Provided that, the total expenditure on account of such contributions during any official year shall not exceed rupees twenty-five thousand or such higher amount as the State Government may, from time to time, by notification published in the Official Gazette, specify in this behalf. - with the previous sanction of the State Government and subject to such terms and conditions as the State Government may impose, subscribing to the share capital of any company or co-operative society, with a limited liability, established or to be established for maintaining or settings up a slaughter house, or for providing any other services in the City, useful to the Corporation in carrying out any of the duties imposed upon it by or under this Act or any other law for the time being in force
- 43) Any measure not here in before specifically named, likely to promote public safety, health, convenience or instruction.

10.2.2 Elective wing of PMC

Pune city administration of 14 wards is further divided into 76 'prabhags' classified into two groups namely 'A' and 'B' with a total number of 152 councilors or Nagar sewak or corporator, seats (ref. <http://www.pmcelection.org>). These 152 elected councilors (corporators) and five appointed members comprising the general body are headed by the Mayor. 50% reservation to women is given in these 152 seats across various categories including General Category, Schedule Caste, Scheduled Tribe and Backward Class. The governance is distributed in terms of policy making as a responsibility of the General Body, financial decision making as a responsibility of the Standing Committee and Municipal Commissioner as the Chief Executive of the authority.

Standing Committee is the most powerful body in Pune Municipal Corporation as per the BPMC Act, responsible for all the decisions pertaining to municipal finance matters. The Standing Committee comprises of 16 members out of the 152 elected from the general elections. These 16 members of the standing committee then elect a chairman of the committee for preparation of the civic budget. In the recently held general elections of the Pune Municipal Corporation in February 2012, the parties of general body had submitted their nominations for Standing Committee and also other important committees including the law committee, women and children welfare committee, naming committee, city improvement committee etc. These are the special committees formed in the city by the Corporation for special purposes. The Standing Committee enjoys unlimited financial powers pertaining to municipal finance matters and is subjected to supervision by the state government.

In the elected wing the Mayor is the head of the office and is also subordinated and supported by ward committee. 152 Councilors are elected representatives of 152 electoral wards of the city who are elected every 5 years and the meeting of the councilors is held once in a month. Mayor, the first citizen of the city, is elected by the councilors and holds office for a period of two and a half years. The Mayor presides over the General Body Meetings of the councilors. Along with the General Body there are different committees which work in the city. Wards are represented by the ward committees, whose main function is to approve the cost of works for the wards, incorporate the expenses in the budget etc. Under

the Ward Committee there are area sabhas which are called Prabhag Samiti in Pune. There are 76 Prabhag Samiti in Pune city distributed in its 14 wards. According to BMC, Act 1949 Sec 29A the minimum number of ward committee in a corporation has to be 13 with a population threshold of 24 lakhs. But this can increase to an excess of 25 ward committee with each committee added per 6 lakh population.

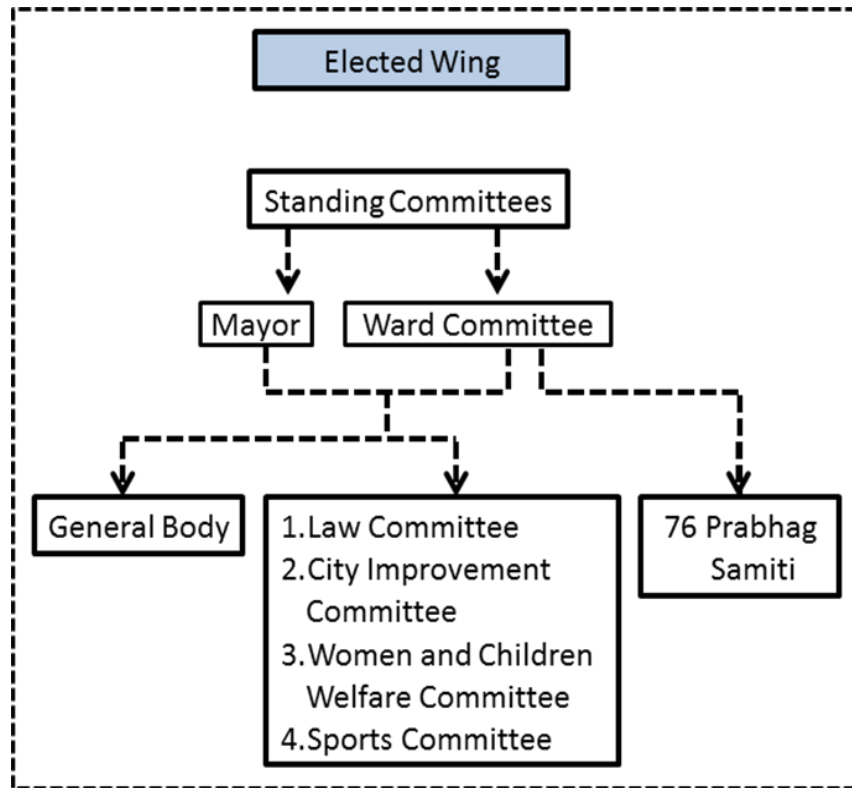


Figure 10-2: Pune City - Organogram of Elected Wing of PMC

The Prabhag Samiti in Pune city is obliged to perform their functions and duties in accordance with the BMC, Act 1949, and Sec 29D. As per the Act their duties are:

- (i) To suggest the priority of schemes and development programmes to be implemented in the area of the Prabhag Samiti and forward the same to the wards committee, for the inclusion in the development plans of the wards committee or the corporation.
- (ii) To suggest the location of street lights, street or community water taps, public wells, public sanitation units and such other public amenities within the area of Prabhag Samiti.
- (iii) To identify the deficiency in the water supply, sewage disposal, public sanitation, storm water management, roads and street lighting arrangements in the area of the Prabhag Samiti and suggest remedial measures.
- (iv) To assist the activities of public health centers in the area of the Prabhag Samiti, especially in prevention of diseases and family welfare and create arrangements to report on the incidences of epidemics and natural calamities
- (v) To remind the Prabhag Samiti members of their obligations to pay Municipal taxes and user charges.

10.2.3 Administrative Wing of PMC

The Administrative wing of the PMC works under the command of Municipal commissioner who is

heading a team of official from Additional commissioner level to Deputy Commissioner and other line of officials who administer their respective domains. The Administrative wing is responsible for all the developmental works in the city, maintenance of infrastructure, collection of taxes, preparation of developmental plans and budgets.

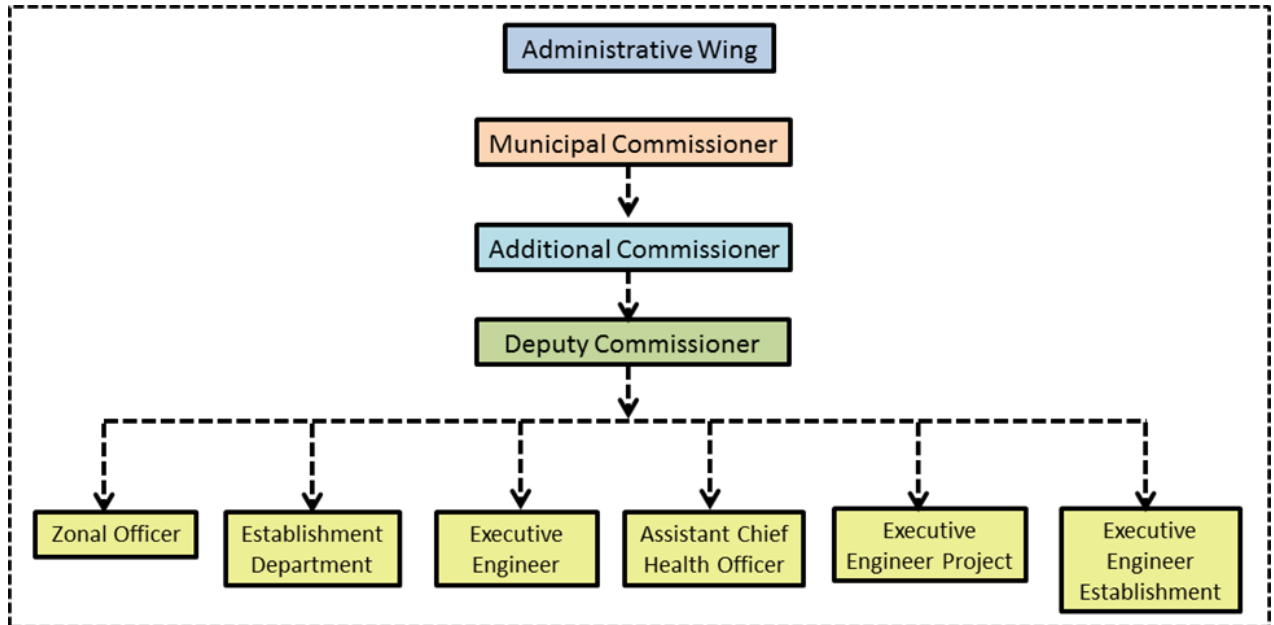


Figure 10-3: Pune City - Organogram of Administrative wing of PMC

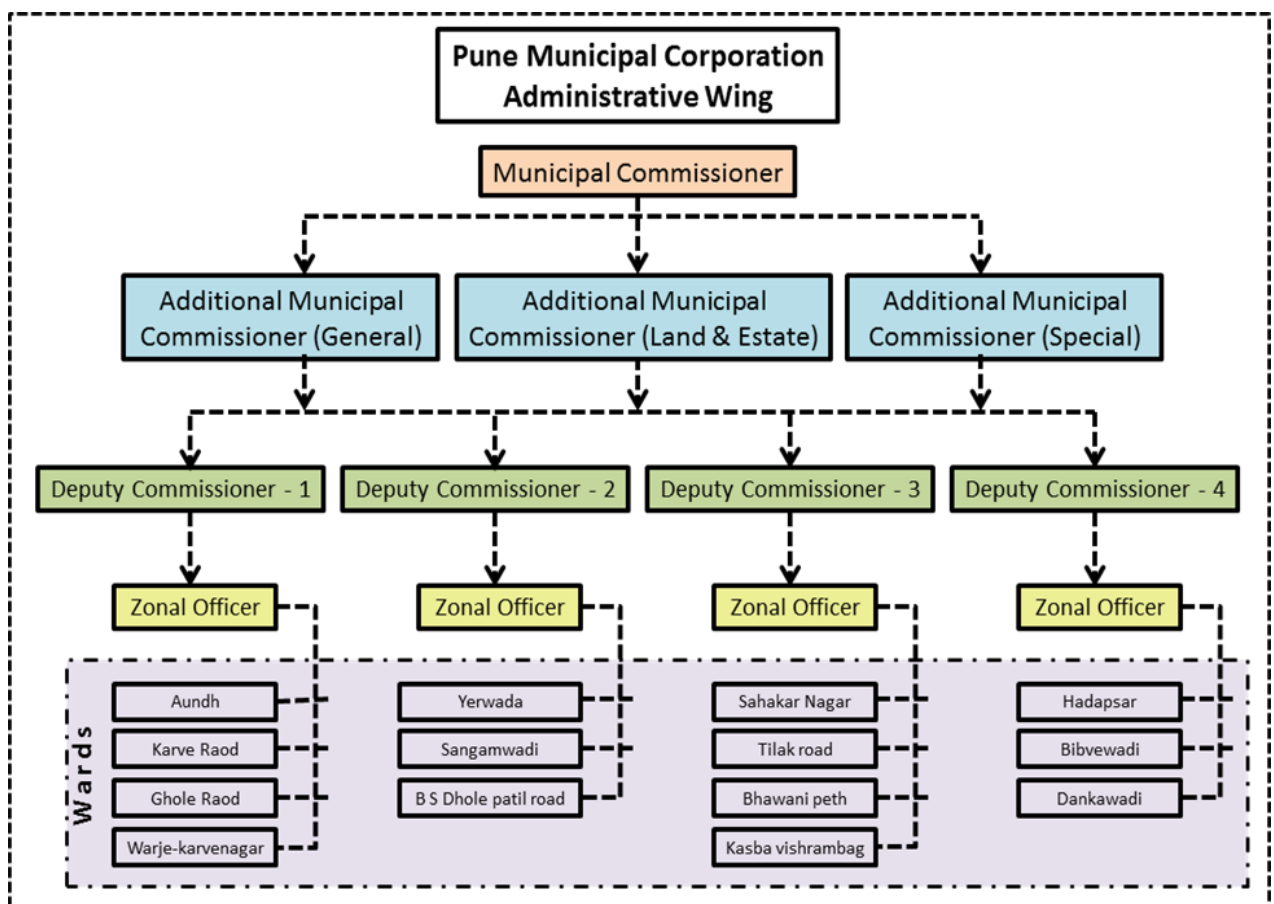


Figure 10-4: Pune City - Organogram of Office of Municipal Commissioner of PMC

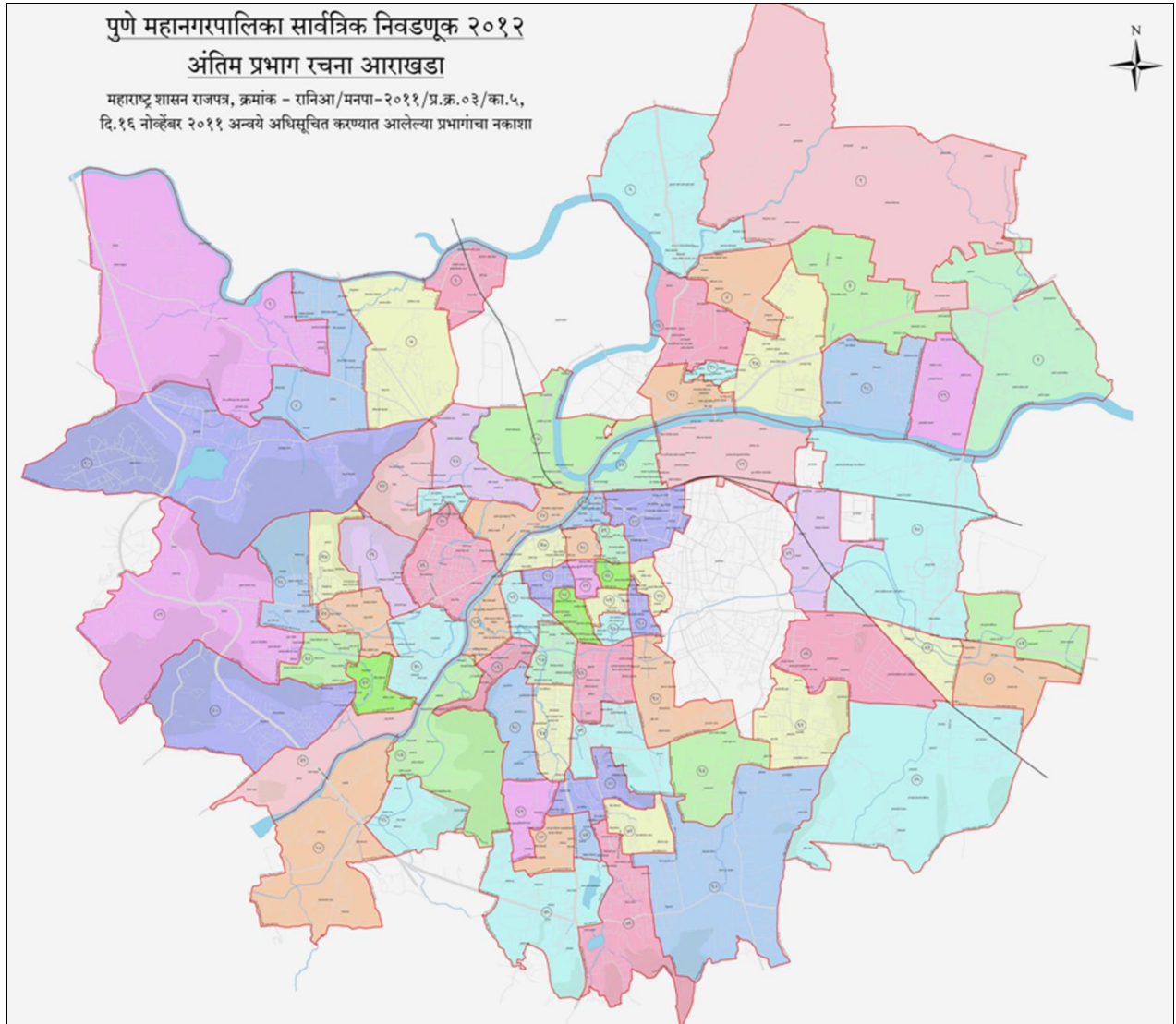


Figure 10-5: Pune City - Electoral Ward Map

Within the Municipal Corporation the Administrative Wing is headed by the Municipal Commissioner who is supported by 3 Additional Commissioner. Under the Additional Commissioner there are 4 Deputy Commissioners who head a number of Zonal Officers in different zones. These Zonal officers along with various officials head the different zones which consists of 3 to 4 ward each.

Municipal Commissioner is the chief authority heading the administration and managing everyday operations and affairs of the municipal corporation. Municipal Commissioner is assisted by number of senior officials responsible for different departments under the corporation and discharge of the respective functions. The Municipal Commissioner derives its powers from provisions vested under the BPMC Act.

Pune is distributed into 4 zones under Deputy Commissioner's authority covering 14 wards (as given in Table 2-1 and refer map in Figure 12-5) and operated through detailed administrative and operational process manuals for various services and infrastructure provision. One more ward called Kondhwa has been proposed to be included in the municipal limit of Pune.

The Deputy Commissioner is subordinated by a line of officers which are heads of different line departments. Along with the Zonal officer there are officials who are the heads of their respective

departments which are namely establishment Department, Executive Engineer of Electrical Department, Assistant chief Health officer of health department, Executive Engineer Projects taking care of Building Permissions and Executive Engineer from Establishment. All these line departments further distributes to lower level junior staffs and to further Grade 3 and 4 staffs along with temporary and contractual staffs.

Pune Municipal Corporation as on 31/03/2012 had total employee strength of 17,628 against the sanctioned posts of 19,374 with total vacant positions of 1,746. These employees are classified from Grade-1 to Grade-4 officers and are distributed as shown in the following table.

Table 10-1: PMC Staff Categories

Officer Grade	Total Posts	Occupied Posts	Vacant Posts
Grade – 1	108	88	20
Grade – 2	411	378	33
Grade – 3	5022	4270	752
Grade – 4	6309	5368	941
Temporary/Contractual Employees	7524	7524	
TOTAL	19,374	17,628	1,746

Source: PMC, HR Dept. 2012

Along with PMC various other agencies and bodies provide services to the Pune city. Brief list of services that are provided to Pune by PMC and other agencies include the following.

Table 10-2: List of services

List of services	
General Administration	Public Works- Roads
Street Lighting	Security
Public Health	Transport Department/Workshop
Accounts and Audit	Water Supply & Sewerage
Municipal Secretary	Development Planning and Building Permission
Education	Law Department
Solid Waste Management	Fire Department
Slum Clearance/Improvement	Urban Community Development
Tax Assessment and Collection	Public Relation Officer
City Development Primary Health	Land and Estate
Octroi	

Source: PMC, 2012

Pune Municipal Corporation is a unique body that has close interaction with adjoining administrative areas viz. Pimpri Chinchwad Municipal Corporation (PCMC), Khadki Cantonment Board (KCB) and Pune Cantonment Board (PCB) and functions along with other stakeholder entities. Following table shows the type of service and the associated authority and allied bodies/entities for other related/ancillary functions within the jurisdiction boundary of PMC. Some of the sectors are also being developed and operated through Public Private Partnership as Pune has been pioneer in several PPP initiatives in India.

Table 10-3: Sector Wise Roles and Responsibilities

Sector	Planning & Design	Implementation	O & M
Land use plan and implementation ⁵	PMC, TCPD	PMC, TCPD	-
Water Supply	PMC	PMC	PMC

⁵ MR&TP Act 1966

Sector	Planning & Design	Implementation	O & M
Sewerage	PMC	PMC	PMC
Roads, Bridges, Flyovers/ RoB /Multilevel Parking	PWD, MSRDC, NHAI, PMC	PWD, MSRDC, NHAI, PMC	PWD, MSRDC, NHAI, PMC
Traffic Control & Management System	Police Dept (Traffic)	Police Dept (Traffic)	Police Dept (Traffic)
Public Transport System	PMPML	PMPML, RTO	PMPML, PMC
Street Lighting	PMC	PMC	PMC
Storm Water Drainage	PMC	PMC	PMC
Solid Waste Management	PMC	PMC	PMC
Parks/ Playgrounds	PMC	PMC	PMC
Slum Development	SRA ⁶ , PMC	SRA, PMC	SRA, PMC
Housing ⁷	MHADA, PMC	MHADA, PMC	MHADA
Air, water & noise pollution Control	PMC, MPCB ⁸	PMC	PMC
River Protection	PMC, MPCB	PMC	PMC
Tourism	MTDC	MTDC	MTDC
Public Health	PMC	PMC	PMC
Education	MSBSHES, PMC, DEO	MSBSHSE, PMC, DEO	MSBSHSE, PMC, DEO

Source: PMC, 2012

10.3 POST PUNE CDP 2006-2012: URBAN REFORM INITIATIVES

Pune is a JNNURM city and is obliged to implement certain mandatory reforms to avail for the funds. JNNURM also prescribes certain optional reforms that the ULB may assess and implement for efficiency and financial independence. It was observed by the previous CDP that implementation levels of mandatory reforms had been fairly good except the reform on transition from single entry accounting system to double entry accrual based accounting system.

Following are the six mandatory reforms to be implemented by the ULB's under JNNURM:

- Adoption of modern accrual-based double-entry system of accounting
- Introduction of a system of e-governance using IT applications such as GIS and MIS for various services provided by the ULB
- Reform of property tax with GIS and achievement of collection efficiency of 85% of the demand by the end of mission
- Levy of reasonable user charges with the objective that the full cost of O&M or recurring cost is collected within the next seven years
- Internal earmarking in budgets for basic services to the urban poor, and
- Provision of basic services to the urban poor including security of tenure at affordable prices

Following are the optional reforms of which the ULB needs to implement at least two reforms, so as to be eligible under the JNNURM:

- It was targeted that by 2006-08 area specific Development Control Rules with regards to FSI

⁶ Maharashtra Slum Area (Improvement, Clearance and Redevelopment) Act, 1971

⁷ Development Control Regulation by PMC

⁸ Water (P& CP) Act-1974, The Air (P&CP) Act-1981

would be introduced and necessary revisions to bye-laws for streamlining the approval process for construction of buildings, development of site etc. would be made.

- It was targeted that 20-25% land would be earmarked for EWS and LIG category of the developed land in all housing projects in form of cross subsidized structure from year 2006-07 onwards. Under this 0.4 FSI shall be handed over to PMC in HDH areas for every 1 FSI consumed.
- Revisions of byelaws for mandatory rain-water harvesting in all buildings and adoption of water conservation measures and byelaws for reuse of recycled water had been already in place
- With respect to Administrative reforms, PMC was exploring options for VRS in departments where it could be implemented during the term of previous CDP along with upgradation of technical skills of its staff through training programs from 2006-07 onwards
- Merger of the transport undertakings viz. PMT and PCMT was proposed as a part of structural change and implemented immediately to improve the service and performance as both these entities served a common area.
- Constitution of PMRDA under the 74th CAA was targeted from 2006-07 onwards
- Promotion of PPP in sectors of solid waste management was proposed for collection and transportation activity in few wards. It had also proposed to extend this activity in areas of Hospital waste management, Citizen Facilitation Centers etc.

Agency empanelled by JNNURM for reform appraisal of Pune Municipal Corporation is ASCI (Administrative Staff College of India) that prepared and submitted the reform appraisal report on 27th April, 2011 to JNNURM, Mission Directorate (MoUD). The status of reform implementation and appraisal has been studied as per the data published by JNNURM on public portal (3/1/2012) for all the three categories (State level reforms, ULB level mandatory reforms, ULB level optional reforms). Last quarterly progress report (QPR) of PMC published for October-2011 to December-2011 and the above state sources have been summarized below for identifying the latest ULB level reform implementation status.

Table 10-4: Mandatory Reforms

SN	ULB Level Mandatory Reform	Status
1.	E-Governance Set-up	Successful completion of the reform achieved in 2009-10 for all the proposed activities under the head
2.	Transition to Double Entry Accounting System	Transition underway and preparation of budget for coming year (2012-13) under progress; however substantial degree of progress made
3.	Property Tax coverage of 85%	Successful achievement of the milestone made in 2008-09 with 99% coverage and 95% collection efficiency
4.	Property Tax collection efficiency of 90%	
5.	100% cost recovery of water supply	Successful in achieving 100% cost recovery. The ULB has targeted to achieve milestone equivalent to developed country for UFW and NRW to levels of 16% and 23% respectively by 2012
6.	100% cost recovery of solid waste services	
7.	Internal earmarking of funds for UP and provision of basic services	All the sub tasks under the reform have been achieved in 2007-08 pertaining to earmarking, allocation, provision, defining etc.

Source: PMC, 2012

Table 10-5: Optional Reforms

SN	ULB Level Optional Reform	Status
1.	Introduction of property title certification system	Successfully achieved in 2007-08
2.	Revision of Building Bye laws - streamlining	All the sub activities including consultation, identification,



SN	ULB Level Optional Reform	Status
	the Approval Process	notification and implementation have been achieved in 2006-07
3.	Revision of Building Bye laws - Mandatory Rainwater Harvesting in all Buildings	All the activities have been achieved in 2006-07 u/s 37 of the MR&TP Act 1966
4.	Earmarking 25% developed land in all housing projects for EWS/LIG	Necessary provisions have been made in the Development Plans
5.	Simplification of Legal and Procedural framework for conversion of agricultural land for non-agricultural purpose	Implementation under progress
6.	Introduction of computerized process of Registration of land and property	Implementation under progress
7.	Byelaws on Reuse of Recycled Water	Provision is made in Development Control Rules. (M 8/28.2-06.12.2007) so as to make STP construction compulsory for townships. Group of 150 tenements or more it is mandatory.
8.	Administrative Reforms	All the proposed administrative reforms have been achieved in the year 2008-09
9.	Structural Reforms	Reforms under this head including realignment of organizational structures, structuring internal judicial system etc. completed in 2008-09
10	Encouraging Public Private Partnership	PPP initiatives have been taken up in the field of e-tendering, kiosks, metro rail, mono rail etc. since 2007-08
	Other initiatives include creation of revolving fund	Currently in progress

Source: PMC, 2012

10.4 MUNICIPAL FINANCE

10.4.1 Introduction

A financially viable Urban Local Body is one that has the financial means and management capacity to support its social and economic development goals for the citizens, and creates a well administered sustainable territorial space. Urban local bodies provide basic civil infrastructure services that include roads, drains, street lighting, water supply, conservancy, solid waste management, public health and education. They also perform certain regulatory functions such as trade licensing, building permissions, land use, encroachments etc. The 74th Constitutional Amendment Act broadened the functional domain to include poverty alleviation, slum improvement, urban forestry and environmental protection. Thus, besides institutions of local self-governance, ULB's have to prepare plans for economic development and social justice. One of the other outcomes of 74th CAA is the empowerment of C&AG's office to undertake audit of ULBs. The CAG is also involved in undertaking a procedural audit of ULBs and this function is handled by the C&AG's local offices which also look after audit of rural local bodies and other agencies such as post, telecommunications, etc. These audits are carried out under section 14 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Services) Act, 1971.

The Pune Municipal Corporation derives its powers to perform discretionary and obligatory functions through Bombay Provincial Municipal Corporation (BPMC) Act, 1949. As per the guidelines of the 74th CAA, Maharashtra State Finance Commission Act was brought in effect on 23rd April 1994, to give effect to its constitutional obligation and to recommend an appropriate framework assigning civic functions to the ULB

through 12th Schedule of the Constitution. The first Commission submitted its reports relating to rural local bodies and urban local bodies in January 1997, and its recommendations covered the period from April 1996 to March 2001. The second SFC was constituted by the Governor on 22nd June, 1999 covering the period from 1st April, 2001 to 31st March, 2006 for which the report was submitted on March 2002.

This chapter exhibits the analysis of municipal finances and the past performance of Pune Municipal Corporation during the last five audited years providing an understanding of financial capacity and overview of pertinent financial issues. Financial analysis for PMC in this section is done based on the Audited Results made available by the Accounts Department for past five years (2006-07 to 2010-11), however currently PMC Accounts Department is in the process of finalizing its Audited Results and shall make them available shortly. The chapter thus shows the analysis of Audited results from 2006-07 to 2009-10 while results for 2010-11 and 2011-12 shall be included shortly. Further analysis has been carried out to understand the trends of income-expenditure (profit and loss) and assets-liabilities (balance sheet) by the ULB under various categories and heads.

10.4.2 Municipal Finance Structure

Financial reporting is an important tool of accountability enabling the policy makers to assess, monitor and regulate the efficiency of the Urban Local Body. Financial reports produced by the Accounts Department enables the decision makers to assess the efficiency, identify financial stop gaps in the performance of the Governing Body. The Municipal Corporation under the 74th CAA is empowered to levy and collect taxes and charges at rates prescribed by the State Government. Past performance analysis helps us to understand the financial performance and evaluate the financial health of the Municipal Corporation, which shall be discussed in subsequent section of the chapter. In the Eleventh Finance Commission report and Guidelines for the Utilization of Local Bodies Grant, the Comptroller and Auditor General of India have constituted a task force to recommend Audit and Budget Formats for ULB's in India. Migration to Double Entry Accrual Based Accounting System is one of the recommendations by 13th Finance Commission to Urban Local Bodies. PMC has successfully achieved complete transition from its single entry accounting system to accrual based double entry accounting system, however currently the finances from 2009-10 onwards are under audit stage subsequent to which financial results shall be available soon in public domain. Double entry accounting system helps in overcoming the irregularities faced in form of reporting faulty entries, classification of incomes and expenses under various heads etc. The Accounts are classified under two major classes of

1. Assets and Liabilities and
2. Income and Expenditure

These statements help in providing a clear picture of the financial health of the municipal body and its standing at a given point of time. Asset and Liability form the balance sheet of the municipal body while the Income and Expenditure statement show the cash flow during the assessment year. Income comprising of Revenue Income and Capital Income while expenditure comprising of Revenue Expenditure and Capital Expenditure. Two entities review the municipal finance and provide necessary approvals over the same that includes the Municipal Commissioner and the Standing Committee. As discussed in the Institutional Framework section the Standing Committee approved budget is implemented. Municipal Commissioner reviews the budget and then forwards it to the Standing Committee for review and update

which is then considered as the final approved budget for implementation. Before the double entry accrual based accounting system the account were classified into two heads i.e. the General Funds and the Water and Sewage Fund which upon transition to double entry has been changed to a consolidated reporting of the Pune Municipal Corporation.

10.4.3 Finances of Pune Municipal Corporation

Financial accounting and reporting are necessary to give a true and transparent picture of performance by the Corporation. Based on the existing financial reporting methods, it is identified that PMC has audited results available for the period from 2006-07 to 2008-09 (3 Years) while results for 2009-10 are to be sent to audit and subsequent years financial data is available through budget sheets. PMC publishes its budget on its website which is publically accessible and is few of the cities that has adopted such practice. Municipal finance under the double entry system involves two functions viz. preparation of the balance sheet and the cash flow statement as discussed earlier. The cash flow statement covers the income detailing receipt of taxes, charges, loans and grants etc. while the expenditure detailing release of funds to the establishments, investments, supplies etc.

In this chapter the actual accounts as provided by the Pune Municipal Corporation have been analyzed through the audited results available for past three years (2006-07 to 2008-09, Trial Balance Sheets prepared for 2009-10 and budgeted data for subsequent years) and unaudited and budgeted data for \of 2010-11 and 2011-12. It should however be understood that budgeted and audited results can only be compared for income-expenditure while the balance sheet cannot be analyzed and only projected. This is one of the limitations to municipal financial analysis hereunder. Certain key financial indicators relating to tax revenue, water charges, non-tax revenues, debt servicing etc. have been analyzed to assess the financial performance of the Corporation which play a significant role in its financial positioning.

10.4.3.1 Tax Rates

Tax Rates as recommended by the Standing Committee for the year 2012-13 have been shown below as compared to the existing rates.

Table 10-6: Theatre Tax shall be levied as per the following schedule

Description		Existing Rate Per Play	Proposed Rate Per Play
A	Movie Theatre		
1	Theatres with up to 500 seating capacity	60	60
2	Theatres with more than 500 seating capacity	100	100
3	Air conditioned Theatre	200	200
4	Marathi Movies	Tax Free	Tax Free
B	Plays/Drams	100	100
C	Circus/Carnival	30	30
D	Tamasha	10	10
E	Music Show / Folk Music in Theatre	200	200
F	Kushti	20	20
G	For shows other than the above	30	30



Table 10-7: Property Tax shall be levied as per the following schedule

	Tax	Annual Ratable Value Slab (Rs.)	Existing Rate (2011-12)	Proposed Rate (2012-13)
A	General Tax	1 to 2,000	14%	14%
		2,001 to 5,000	21 %	21 %
		5,001 to 20,000	30 %	30 %
		More than 20,000	38 %	38 %
B	Fire Cess	On Taxable amount	1.25 %	1.25 %
C	Tree Cess	On Taxable amount	1 %	1 %
D	Conservancy Tax	On Taxable amount	16 %	16 %
E	Water Benefit Tax	On Taxable amount	3 %	3 %
F	Sewerage Benefit	On Taxable amount	6 %	6 %
G	Street Tax	On Taxable amount	8.5 %	8.5 %
H	Education Cess	On Taxable amount	1 %	1 %
J	Special Conservancy Tax	Hotels, restaurants, banquets and hospitals whose annual taxable amount is more than Rs. 5,000 and Rs. 10,000	Hotels, restaurants, banquets, hospitals whose taxable amount is rs. 5,000 or more or rs. 2,000 or 15% whichever is highest	Hotels, restaurants, banquets, hospitals, malls and marts whose taxable amount is rs. 5,000 or more those properties pay rs. 2,000 or 15% or whichever is highest

Table 10-8: Mobile Towers and IT and ITES facilities shall be taxed as per the following table

	Tax	Annual Taxable Amount (Rs.)	Existing rate (2011-12)	Proposed Rate (2012-13)
1.	General Tax	1 to 2,000	14 %	14 %
		2,001 to 5,000	25 %	25 %
		5,001 to 20,000	38 %	38 %
		More than 20,000	50 %	50 %
2.	Fire Cess	On taxable amount	2 %	2 %
3.	Tree Cess	On taxable amount	1 %	1 %
4.	Conservancy Tax	On taxable amount	20 %	20 %
5.	Water Benefit Tax	On taxable amount	5 %	5 %
6.	Sewerage Benefit Tax	on taxable amount	10 %	10 %
7.	Street Tax	On taxable amount	10 %	10 %
8.	Education Cess	On taxable amount	2 %	2 %

Table 10-9: Water Tax

	Tax Name	Existing Rate	Proposed Rate
1	Residential Taxable Amount		
	1 to 1,000	Rs. 900	Rs. 900
	1,001 to 3,000	Rs. 1,000	Rs.1,000
	3,001 to 5,000	Rs. 1,100	Rs. 1,100
	5,001 and above	25% of taxable amount	25% of taxable amount



	Tax Name	Existing Rate	Proposed Rate
		or rs. 2,500 Whichever is lower	or rs. 2,500 Whichever is lower
2	Nonresidential use		
	1to 10,000	Rs. 750	Rs. 750
	10,001 and above	Rs. 2,000	Rs. 2,000
3	Rates applicable to religious places		
	1 to 500	No tax	No tax
	501 to 1,000	Rs. 900	Rs. 900
	1,001 to 3,000	Rs. 1,000	Rs. 1,000
	3,001 to 5,000	Rs. 1,100	Rs. 1,100
	5,001 and above	25% of taxable amount of Rs. 2,500 Whichever is less	25% of taxable amount of Rs. 2,500 Whichever is less
4	Flood affected localities	Rs. 300 one time	Rs. 300 inetine
5	Dhanak wadi, bibwewadi rehabilitation, on behalf of of PMC alum rehab facilitated slums	Rs. 300 one time	Rs. 300 one time
6	Within Pune Municipal Limits		
A	Villages being provided water through water purification		
1	Domestic Use (Independent Connections)	Rs. 1,000 Annual	Rs. 1,000 Annual
2	Domestic Use	Rs. 750 annual	Rs. 750 annual
3	Non Residential (Businesses with independent connections, this rate applicable for such properties)	Rs. 1,500 Annual	Rs. 1,500 Annual
4	Hotels: Within City and Sub-urban Area (Rate applicable for properties without meters)	Rs.600 Per Month	Rs.600 Per Month
5	Old Grampanchayats with existing water supply (Properties registered on Register form 8 with Gram Panchayats)	Rs. 375 Annual of the rate prior to this whichever is higher	Rs. 375 Annual of the rate prior to this whichever is higher
		For properties within PMC limits for which water supply works have not been completed or that are supplied water through water tankers – such properties shall be charged Annual water tax of Rs. 575	For properties within PMC limits for which water supply works have not been completed or that are supplied water through water tankers – such properties shall be charged Annual water tax of Rs. 575

Table 10-10: Matters relating to Mumbai Regional Development Act 1949 clause 140 (A)

Description	Existing Rate (Rs.)	Proposed Rate (Rs.)
For the property owners within the PMC limit shall pay the arrears of property tax and current tax by 1 st April 2012 to 31 st May 2012 irrespective of the property tax bill reaching or not reaching them along with any penalties.	As per the Maharashtra State Government Gazette notification dated 14 th January 2009 and Bombay Municipal Corporation Act 1949 clause 140 (A) – Only for the current fiscal year (per year) and considering the estimated collection, for properties with asking value of general tax less than Rs. 25,000 shall be given a discount of 10% and for those more than Rs. 25001 shall be 5%	As per the Maharashtra State Government Gazette notification dated 14 th January 2009 and Bombay Municipal Corporation Act 1949 clause 140 (A) – Only for the current fiscal year (per year) and considering the estimated collection, for properties with asking value of general tax less than Rs. 25,000 shall be given a discount of 10% and for those more than Rs. 25001 shall be 5%

Table 10-11: For facilities under the Bombay Municipal Corporation Act 1949 Section 140 (b)

Description	Existing Rate Rs.)	Proposed Rate (Rs.)
For properties within the PMC Limits who have: (1) Solar Power Use (2) Water Harvesting System. (3) Who segregate dry and wet solid waste	As per the Extraordinary Gazette of Maharashtra State Government 14 th January 2009 10% Discount shall be offered on Property Taxes for properties following/adopting any of the two systems	As per the Extraordinary Gazette of Maharashtra State Government 14 th January 2009 10% Discount shall be offered on Property Taxes for properties following/adopting any of the two systems

Table 10-12: Tariff for Metered Water

Division	Existing Tariff (Per KL)		Proposed Tariff (Per KL)	
Urban	Residential (With personal or rented connections)	Rs. 3.00	Residential (With personal or rented connections)	Rs. 3.00
	Non-Residential	Rs. 33.00	Non-Residential	Rs. 33.00
Sub-Urban	Residential (With personal or rented connections)	Rs. 3.00	Residential (With personal or rented connections)	Rs. 3.00
	Non-Residential	Rs. 33.00	Non-Residential	Rs. 33.00

10.4.3.2 Income Expenditure Analysis (Profit & Loss)

Income and expenditure can be classified into revenue and capital accounts as shown in the following chart.

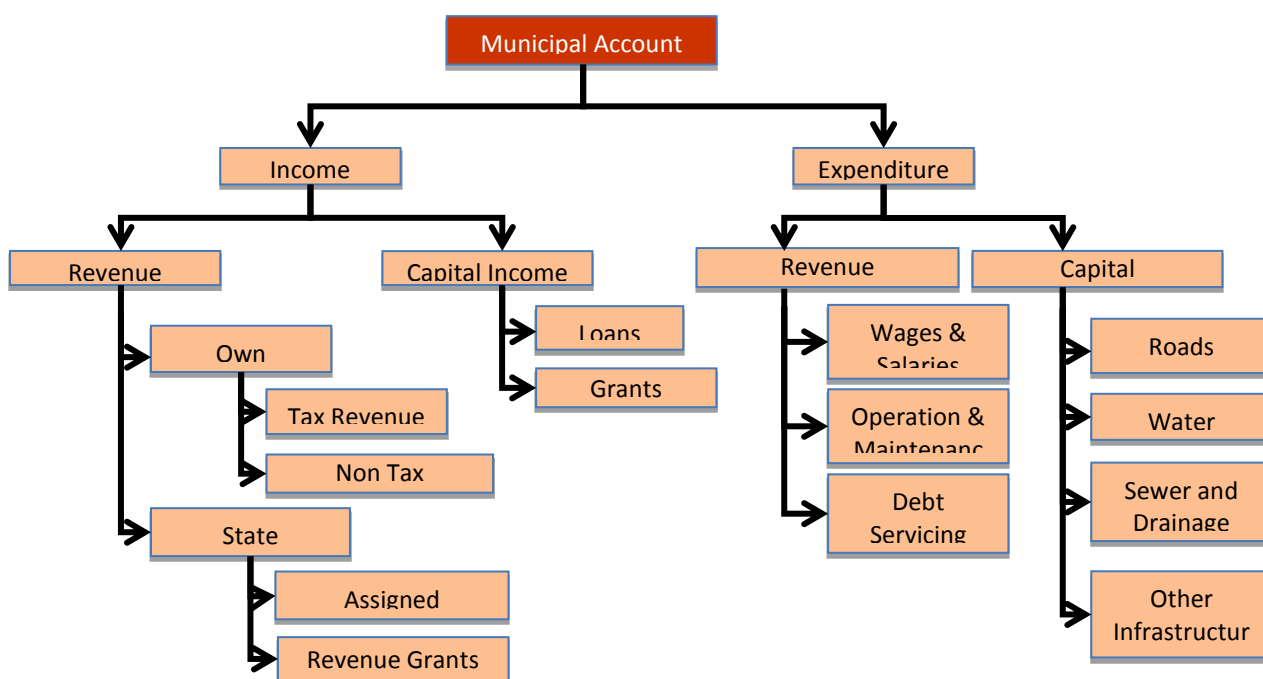


Figure 10-6: Income Expense Classification

As discussed earlier Income can be classified into two categories of Revenue Income and Capital Income. The revenue income is further classified as Own Revenues and State Transfers. This section details the income performance of the PMC. Following table shows the income statement for a period from 2006-07 to 2011-12.

Table 10-13: Income Details for Last 6 Years

INCOME	2006-07 (Actuals) (Rs)	2007-08 (Actuals) (Rs)	2008-09 (Actuals) (Rs)	2009-10 (Trial) (Rs)	2010-11 (Estimated Budget)	2011-12 (Estimated Budget)
Property Tax inc. Sewage & Conservancy	2,016,958,568	2,536,468,642	2,621,808,505	2,838,188,123	4,617,500,000	5,424,000,000
Water Tax	1,126,270,747	1,136,067,973	1,246,870,500	1,128,413,498	2,447,400,000	2,773,000,000
Octroi and Toll	5,422,217,240	6,845,941,388	6,466,555,183	6,328,727,166	9,660,000,000	10,801,000,000
Rental Income from Municipal Properties	84,476,334	190,576,537	118,956,433	281,740,632	286,832,000	326,000,000
Fees and User Charges	1,878,325,889	3,783,614,975	2,878,337,409	3,473,158,597	5,474,347,000	6,468,000,000
Sale of Forms & Publications	65,844,252	71,826,603	138,588,953	255,812,889	550,870,000	766,000,000
Revenue Grants, Contribution & Subsidies Received	637,049,802	3,195,005,701	1,803,873,341	4,512,918,314	5,464,150,000	6,562,000,000



INCOME	2006-07 (Actuals) (Rs)	2007-08 (Actuals) (Rs)	2008-09 (Actuals) (Rs)	2009-10 (Trial) (Rs)	2010-11 (Estimated Budget)	2011-12 (Estimated Budget)
Interest	599,204,794	480,585,645	867,510,963	524,375,069	624,800,000	687,280,000
Other Income	73,090,004	83,528,846	120,474,367	113,606,682	110,955,000	121,000,000
Others Taxes	6,685,352	6,999,428	7,078,160	6,302,770	24,800,000	29,000,000
Total Income	11,910,122,984	18,330,615,741	16,270,053,818	19,463,243,745	29,261,654,000	33,957,280,000
Deficit						
TOTAL	11,910,122,984	18,330,615,741	16,270,053,818	19,463,243,745	29,261,654,000	33,957,280,000

From the above table it is seen that in the Revenue Income side Property Tax has revenue shows a CAGR of 22% while Octroi and Toll have grown at a CAGR of 15%. Tax revenue from water has grown at a CAGR of 20% which means that the revenue indices are strong however there are areas that are contributing to the account deficits. As analyzed in the respective section for water supply, there is a scope of bringing more number of households under metered water coverage and strengthens this revenue. Other Taxes including the Theater Tax have registered a strong CAGR of 34% and Average growth rate of 16%. The Non-Tax Revenue consisting of Fees & User charges, Sale of Forms & Publications, Interest, Rental and other income has shown a growth rate of 25% as compared to the Tax Revenue growth of 17%. Revenue Grants, Contributions and Subsidies forming a part of the capital accounts have grown at an average rate of 19% however the annual growth rates have not been consistent. As reported in the financial statement the corporation has not suffered any deficit in the income for past five years which is appreciable. These income figures however need to be seen in correlation with the Expenditure for the analysis period.

As seen from the table, Octroi and Toll has consistently contributed a share of 55-65% to build the Tax Revenue corpus followed by Property Tax contributing 14-17% while water tax contributes to only 6-9% of the total tax revenue. The graph 10-2 shows the Tax-Revenue vs. Non Tax Revenues.

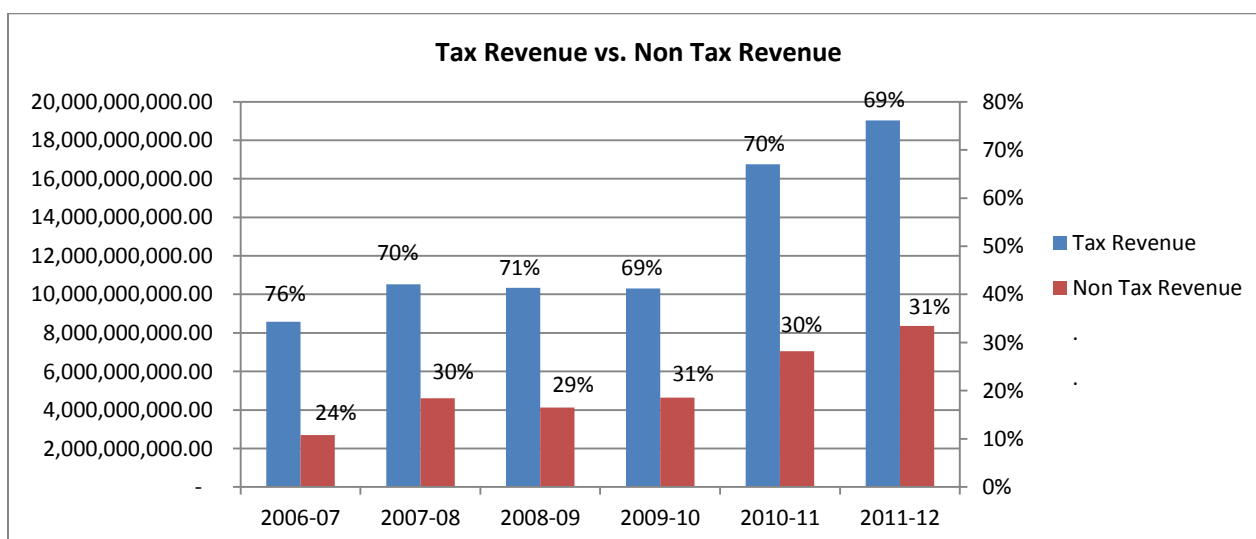


Figure 10-7: Tax vs Non Tax Revenue

The share of Tax-Revenues has been more than the Non-Tax revenue sources, however it is seen that the Non-Tax sources has steadily increased from 20% to 30%.

The graph below shows Revenue income versus Capital income growing at a CAGR of 19% and an exorbitant 59% respectively. As seen Octroi in Tax-Revenues and Fees and User Charges in Non-Tax

Revenue contribute to the major proportion of Revenue Income. The Capital income though not significant but has shown a very strong growth rate which reflects that PMC has aggressively developed its revenue generation capacity that needs to be sustained through strategic actions and reforms; this can also be compared with the gross asset block growth rate. Based on the trend of Income levels it can be said that PMC is has significantly worked in the area of fiscal decentralization, however the income levels cannot be considered as standalone indicators of the decentralization, they need to be seen in comparison with the Revenue Expenditure and Capital Expenditure.

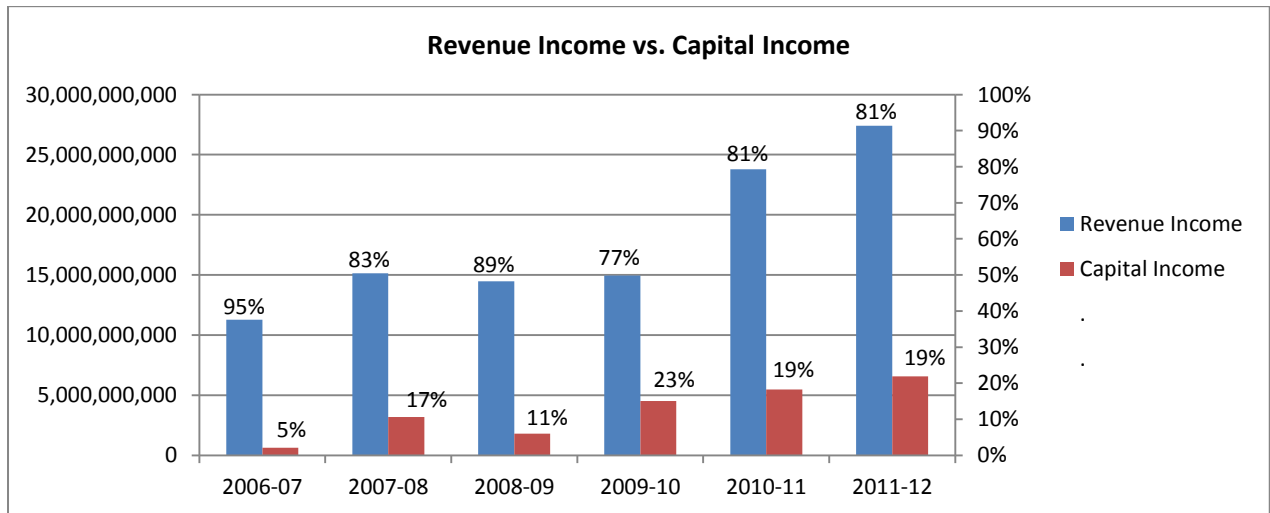


Figure 10-8: Revenue Income vs. Capital Income

The graphs 10-4 show the tax revenue comparison for past 5 years in terms of the amount and their contribution in %age in the total tax revenue corpus. Revenue from Octroi and Toll as discussed earlier has been the major contributor followed by Property Tax.

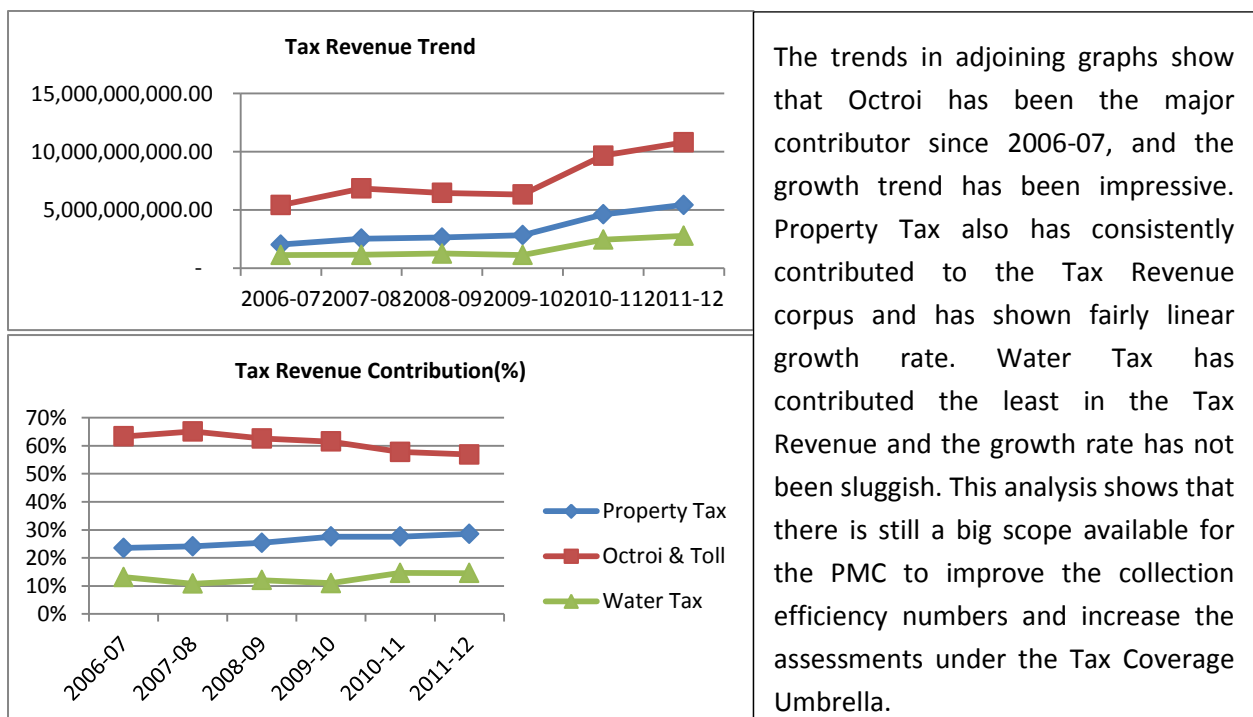
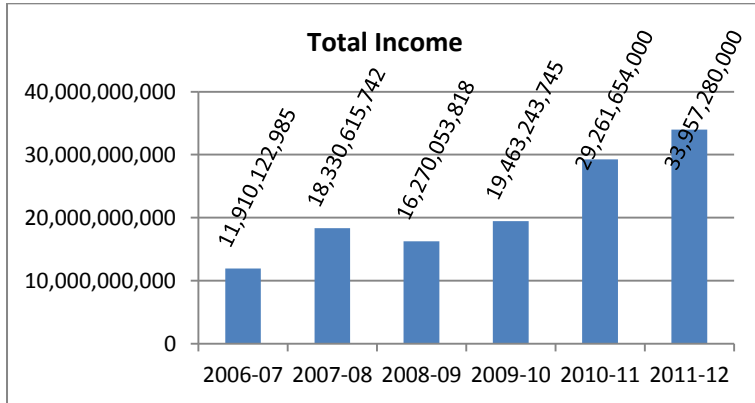


Figure 10-9: Tax Revenue Analysis



Total income growth is seen at a CAGR of 23% with an increasing contribution of revenue income. This indicates that PMC has made appreciable achievement in fiscal decentralization however as discussed earlier, the expenditures need to be assessed to establish the fiscal decentralization capacity of the ULB.

Figure 10-10: Total Income

The resources under revenue expenditure are typically used for expenses under establishment costs, operation & maintenance, repair works etc. while under capital expenditure the resources are used for projects, schemes, programs, fund building etc. Table 10-14 shows the expense statement for past five years (both revenue and capital expenditure accounts).

Table 10-14: Expenses Details

EXPENSES	2006-07 (Actuals) (Rs)	2007-08 (Actuals) (Rs)	2008-09 (Actuals) (Rs)	2009-10 (Trial) (Rs)	2010-11 (Budget Estimate) (Rs)	2011-12 (Budget Estimate) (Rs)
Establishment Expenses	3,145,843,518	3,074,526,876	3,248,944,954	4,067,316,540	5,140,000,000	5,706,000,000
Administrative Expenses	948,006,989	1,179,902,276	1,292,793,808	1,356,669,565	1,973,050,750	2,290,000,000
Operation & Maintenance	390,015,633	499,063,624	513,126,335	718,714,786	814,267,500	946,000,000
Repairs & Maintenance Expenses :- Infrastructure	222,380,472	487,228,783	507,233,955	520,354,829	614,865,000	732,000,000
Repairs & Maintenance :- Civic Amenities	102,014,644	131,145,897	319,207,478	155,835,023	348,100,000	376,000,000
Interest and Finance Charges	95,361,788	90,742,292	91,180,918	79,693,307	329,427,638	376,000,000
Programme Expenses	49,598,249	26,091,183	38,953,411	44,044,505	97,250,000	99,000,000
Revenue Grants, Contribution & Subsidies	886,922,896	897,087,744	1,162,865,329	1,550,296,370	1,744,350,000	2,006,000,000
Miscellaneous Expenses	46,052,444	47,442,085	43,445,841	52,044,411	60,891,961	65,000,000
TOTAL EXPENSES	5,886,196,637	6,433,230,764	7,217,752,034	8,544,969,339	11,122,202,849	12,596,000,000
Surplus Before Appropriation & Depreciation	6,023,926,347	11,897,384,977	9,052,301,783	10,918,274,405	18,139,451,150	21,361,280,000
Appropriations	4,051,389,045	11,369,787,835	8,967,947,843	14,819,577,596	17,783,493,115	20,747,000,000
Depreciation	719,051,480	862,385,379	1,240,830,635	1,599,650,212	1,951,573,259	2,382,000,000
Depreciation on Press P&M						
TOTAL Appropriations and Depreciation	4,770,440,525	12,232,173,214	10,208,778,478	16,419,227,809	19,735,066,375	23,129,000,000
Surplus / (Deficit) After Appropriation & Depreciation	1,253,485,821	(334,788,237)	(1,156,476,695)	(5,500,953,403)	(1,595,615,224)	(1,767,720,000)
TOTAL	11,910,122,984	18,330,615,741	16,270,053,818	19,463,243,745	29,261,654,000	33,957,280,000

As seen from the table 10-14 and the graph 10-11, the Revenue Expenditure has been more than the Capital Expenditure for all the recorded years. The revenue expenditures have grown at a CAGR of 16% while capital expenditures have grown at a CAGR of 18%. Volume of Revenue Expenditure has been high mainly on account of Establishment Costs and Administrative Costs which have grown at a CAGR of 13% and 19% respectively.

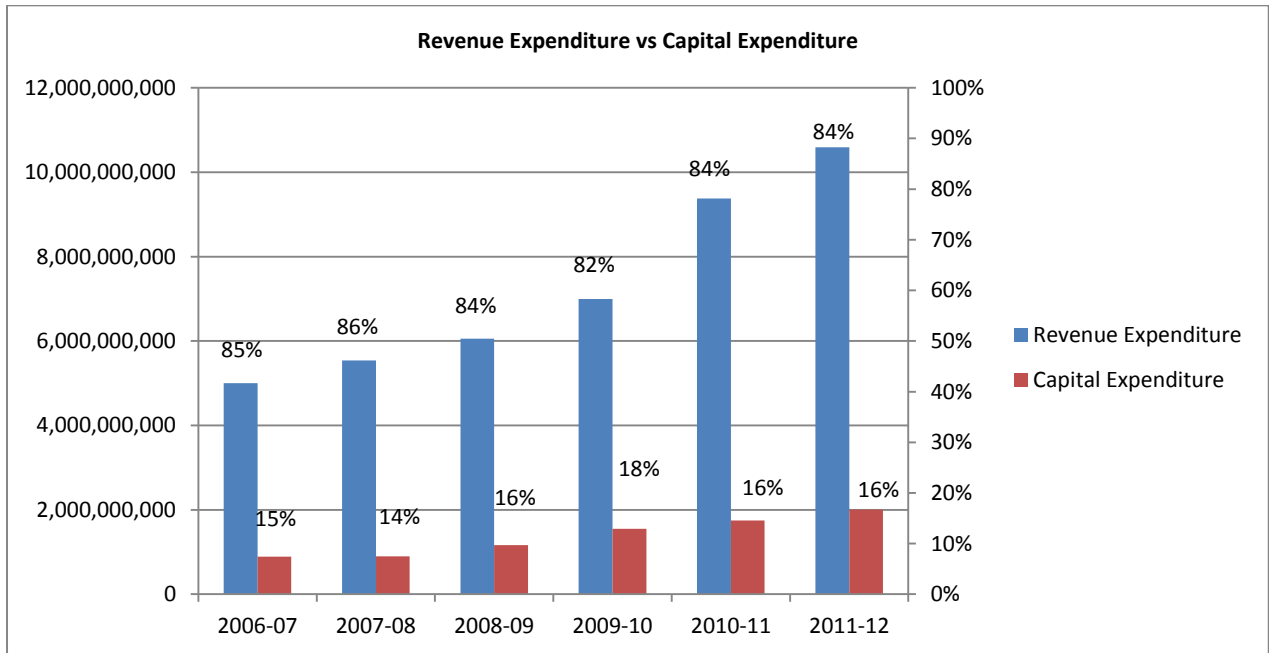
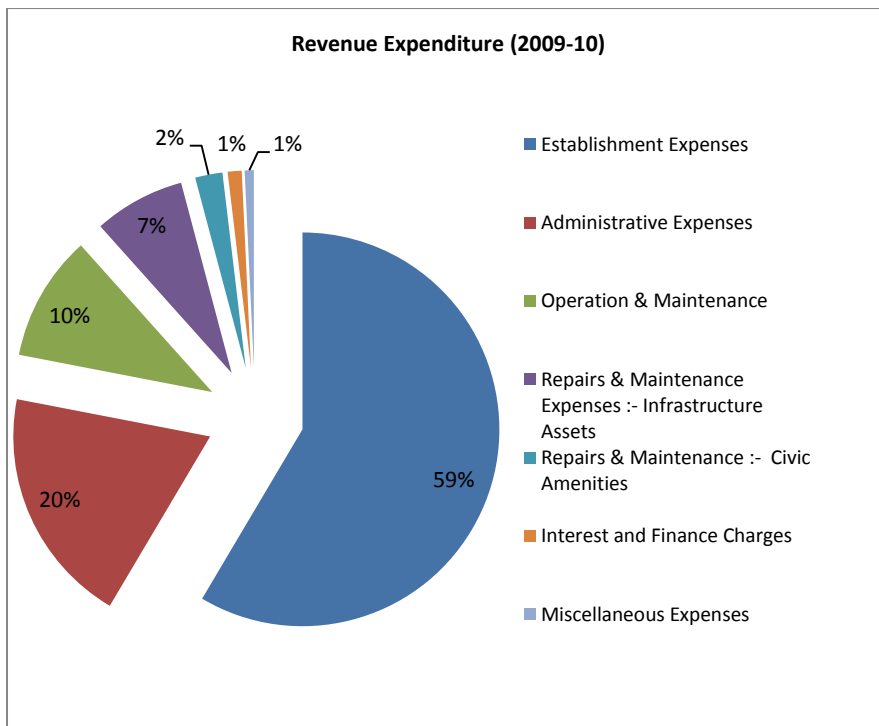


Figure 10-11: Revenue Expenditure vs Capital Expenditure

The figure below shows the break-up of Revenue Expenditure for the last audited year data which shows that the Establishment expense has the maximum share of 59% followed by Administrative expenditure with a share of 20%. Revenue expenditure done on the Repairs and Maintenance is merely 9% which has however grown at a CAGR of 28% but this indicator needs to be seen in comparison with the estimated/budgeted costs which is estimated to be spent up to an efficiency approx. 65%. This needs to improve for the reason that the asset base of immovable property (excluding land) is increasing which demands repairs and maintenance for sustained operations.



The graphs below show trend of Revenue Expenditure. It can be seen that expenditure on Administrative Costs and Establishment Expense composes the major portion of expenditure. Establishment expenses have been fairly growing at a linear rate over the period shown. It is seen that the proportion of all the four major components considered have not been .

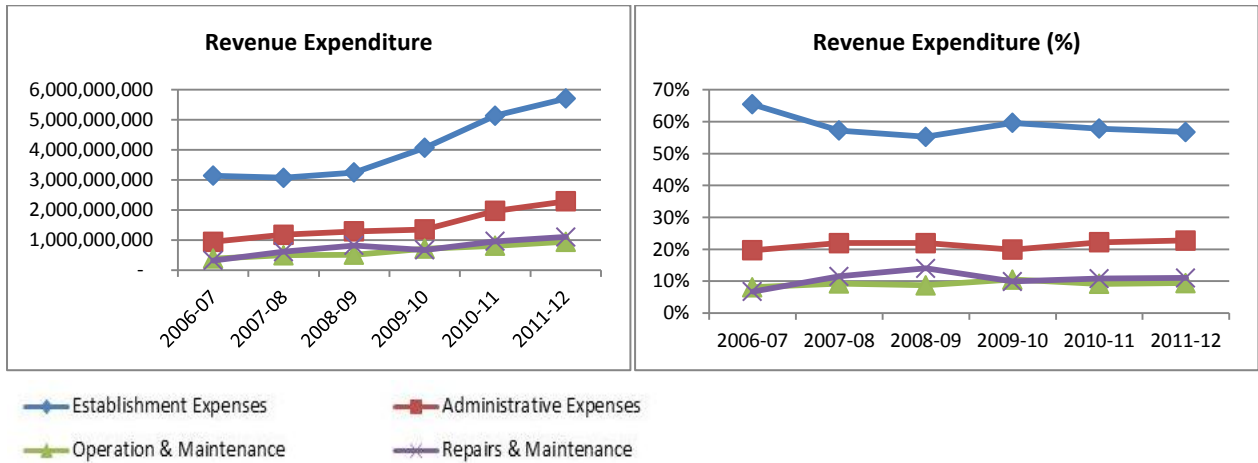


Figure 10-12: Revenue Expenditure

The graph below shows the Total Income compared to the total expenditure. Deficit can be observed years 2007-08 onwards owing mostly to appropriations. However the total income is higher than the total expenditure creating a cash surplus and not pushing the Corporation into a negative leverage situation. However the PMC needs to regulate the appropriations of the funds to avoid the deficit post consideration of depreciation and appropriation of funds.

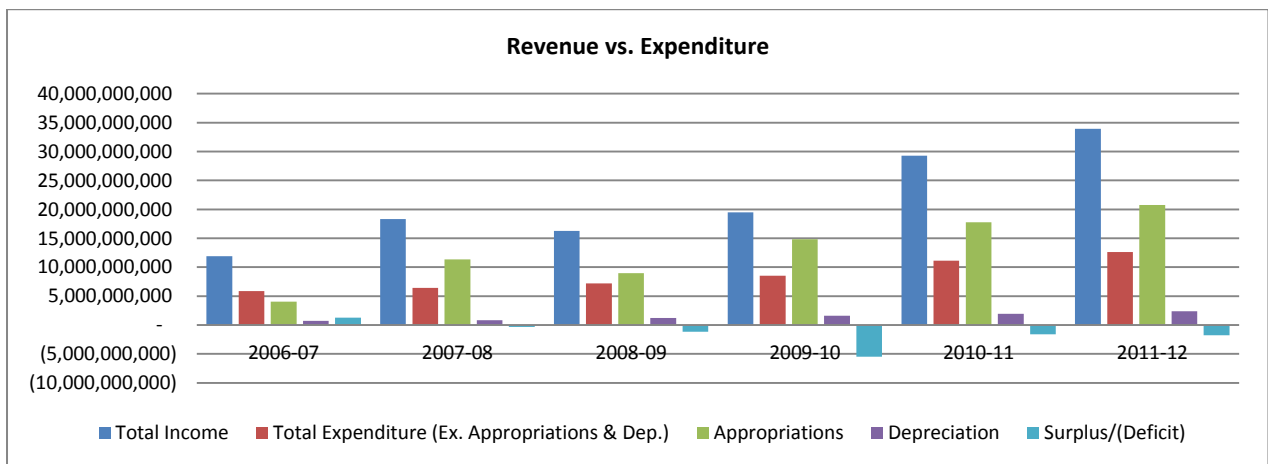
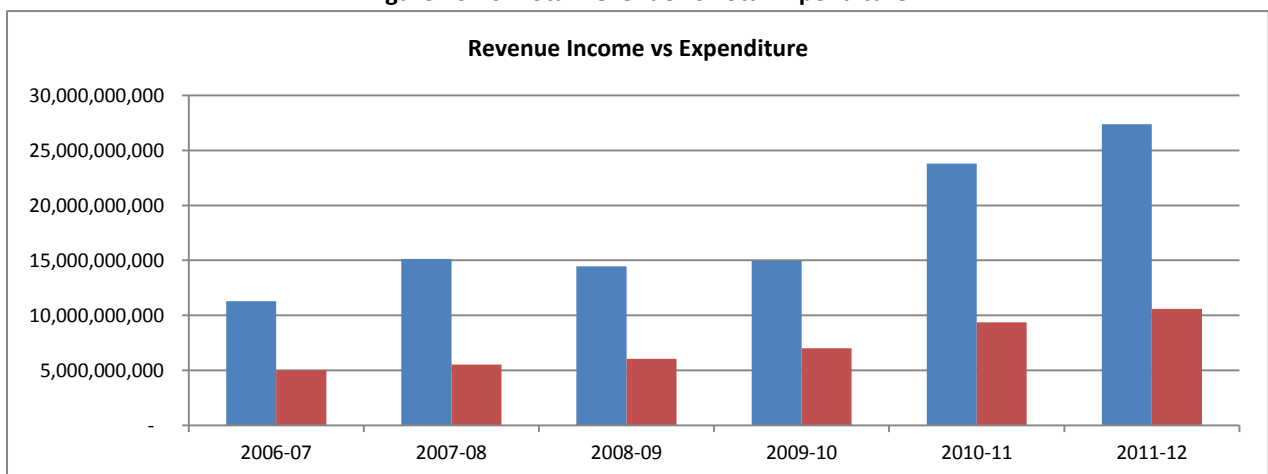


Figure 10-13: Total Revenue vs Total Expenditure



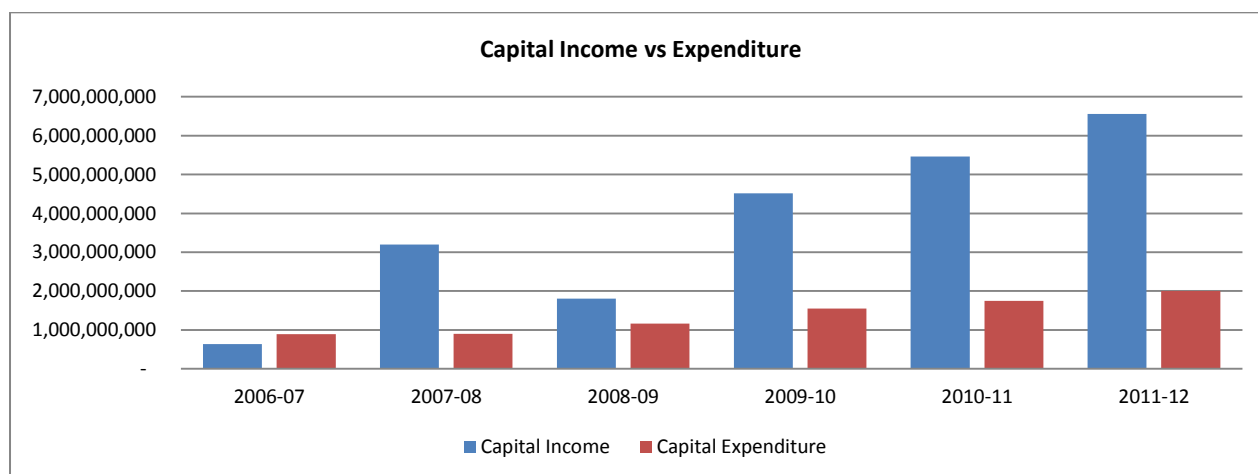


Figure 10-14: Revenue/Capital - Income Expenditure

The Revenue Income is seen to be greater than the Revenue Expenditure for the period under consideration and similarly the Capital Income is found greater than Capital Expenditure than the Capital Income. In case of the Capital Account the higher difference reflects that the funds are idle and underutilized by the corporation during the year meaning that the funds were not completely utilized for the intended works. During the latest trial balance year (2009-10) it can be seen that the capital expenditure is 35% of the capital income.

10.4.3.3 Asset & Liability Analysis (Balance Sheet)

A balance sheet analysis helps to understand the financial health of the corporation and the following table shows the financial performance on asset side of the balance sheet for past five years.

Table 10-15: Assets (4 Years Statement)

ASSETS	2006-07 (Actuals) (Rs)	2007-08 (Actuals) (Rs)	2008-09 (Actuals) (Rs)	2009-10 (Trial) (Rs)
Fixed Assets				
Gross Block	16,253,311,482	22,182,646,046	30,197,175,056	36,791,810,157
Less: Accumulated Deprec.	1,444,842,525	2,307,227,905	3,548,058,541	5,147,708,754
Net Block	14,808,468,956	19,875,418,140	26,649,116,514	31,644,101,402
Depreciation Fund				
Capital Work In Progress	232,687,000	1,061,784,000	396,732,000	687,788,000
Investments	3,625,559,250	6,130,638,690	3,487,196,290	4,791,543,170
Current Assets, Loans and Advances				
Stock In Hand	198,499,339	350,134,685	617,285,437	787,054,747
Sundry Debtors (Receivables)	5,352,191,054	6,537,961,895	7,041,486,678	7,807,339,711
Cash and Bank Balance	949,119,570	1,598,690,719	507,999,786	499,056,451
Loans, Advances and Deposits	1,758,787,468	2,509,408,468	3,050,087,645	3,212,110,023
Income & Expenditure A/c				
Deficit During the year				
TOTAL	26,925,312,640	38,064,036,599	41,749,904,351	49,428,993,505

The Asset Statement shows that the Gross Block has grown at a CAGR of 31% which appears really appreciable but as understood from the capital expenditure trend it can be suggested that the total asset of PMC has a further scope of improvement in terms of creating fixed assets/infrastructure for the city. Capital work in progress has grown at a CAGR of more than 40% which shows that PMC is making efforts

to maximize the utilization of its available capital revenue.

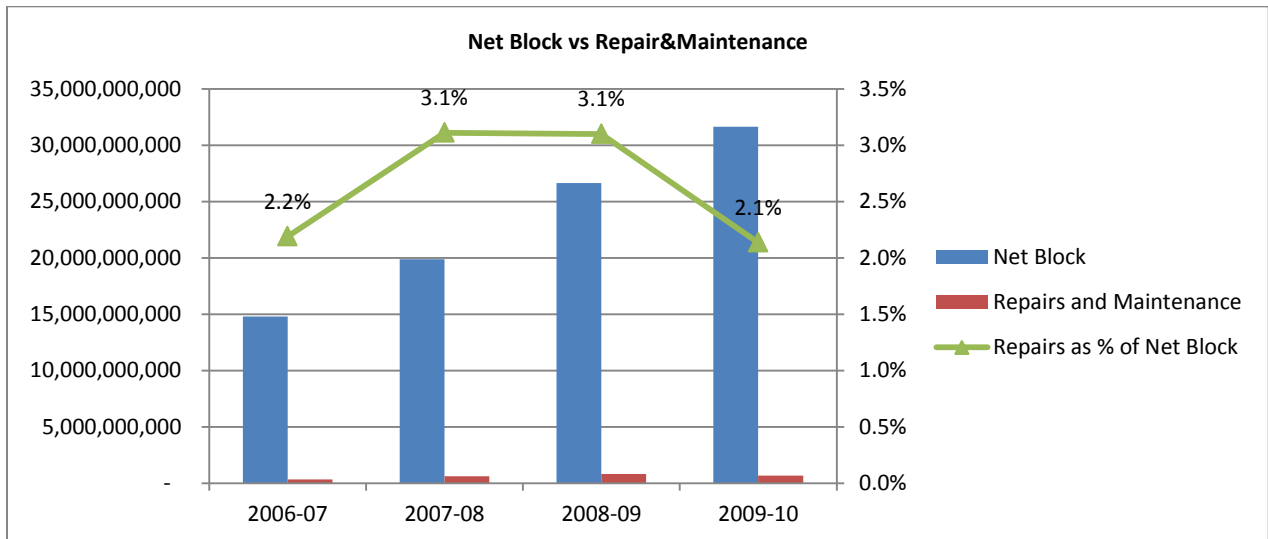


Figure 10-15: Net Block vs Repairs and Maintenance

Repairs and maintenance as mentioned earlier comprise of less than 10% of the total revenue expenditure and when seen in comparison with the Net Asset block range between 2-3% which reflects that PMC needs to dedicate more funds to the maintenance of the available assets.

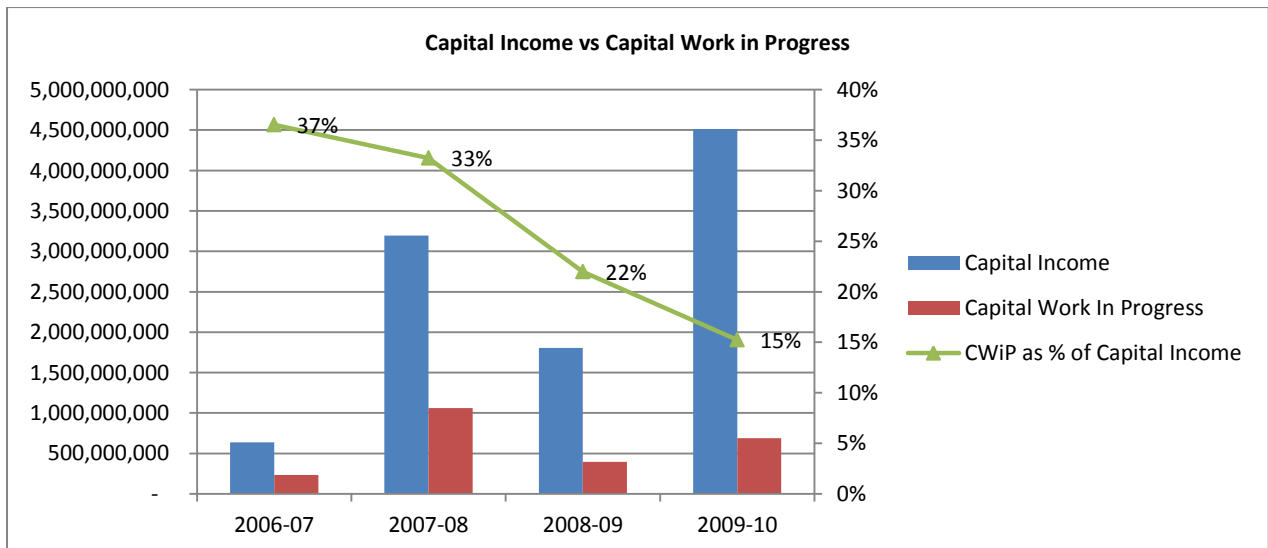


Figure 10-16: Capital Income vs Capital Work in Progress

Based on the capital income analysis and when compared to the capital work in progress it can be seen that the capital work in progress as a percentage of capital income is reducing which reflects the efficiency of PMC in terms of completing target projects within the time frame.

Table 10-16: Liabilities (5 Years Statement)

Liabilities	2006-07 (Actuals) (Rs)	2007-08 (Actuals) (Rs)	2008-09 (Actuals) (Rs)	2009-10 (Trial) (Rs)
Municipal (General) Fund				
Pune Municipal Fund	11,108,877,329	11,108,877,329	11,108,877,329	11,108,877,329
Water & sewerage Fund	5,332,534,956	6,529,733,114	7,584,597,211	9,589,508,871



Liabilities	2006-07 (Actuals) (Rs)	2007-08 (Actuals) (Rs)	2008-09 (Actuals) (Rs)	2009-10 (Trial) (Rs)
		-	-	-
Earmarked (Special) Funds	1,394,749,139	4,148,591,008	13,467,968	2,459,715,740
		-	-	-
Reserves & Surplus		-	-	-
Capital Reserves	3,240,979,511	9,995,801,358	17,338,547,462	23,854,915,449
Excess of I/E -06-07	1,253,485,821	1,253,485,821	1,253,485,821	1,253,485,821
Excess of I/E -07-08	-	(334,788,237)	(334,788,237)	(334,788,237)
Excess of I/E -08-09		-	(1,156,476,695)	(1,156,476,695)
Excess of I/E -09-10			-	(5,500,953,403)
Secured Loans		-	-	-
Loans From Banks and Other FI's	1,119,879,804	1,024,645,366	927,218,388	2,450,876,102
Unsecured Loans		-	-	-
Deposits Received	2,468,297,311	3,120,652,859	3,728,078,896	4,022,839,186
Current Liabilities & Provisions		-	-	-
Accounts Payable	102,185,496	103,504,413	245,220,224	288,618,767
Retirement Benefit Payable	206,020,933	205,231,678	42,698,921	72,760,642
Statutory Deduction Payable Into Govt. Treasury	152,579,164	122,616,238	500,471,601	732,286,066
Payable to State Govt	299,062,940	386,071,437	116,010,114	112,110,311
Share in Octroi payable to other agencies	85,460,175	231,677,562	202,808,733	178,515,571
Salary Payable	161,200,055.58	167,936,648.66	179,686,610.67	296,701,981.99
Total	26,925,312,640	38,064,036,599	41,749,904,351	49,428,993,505

Financial indicators provide a picture of performance over the past and not the required action. As seen in this chapter the analysis has been carried out based on the audited results reported for analysis of the Detailed Income and Expenditure statements 2006-07 to 2009-10. Ratio analysis provides further insight and help in assessing the merit and demerit areas. Operating Ratio is the ratio of revenue expenditure to revenue income and indicates the profitability of the local body's operations. Ideally as per theory this ratio should be less than unity. Capital utilization ratio is another ratio that indicates the performance of the local body in terms of utilization of capital resources. Similar to operating ratio a result of more than unity indicates that the surplus has been utilized for capital works which is a positive performance sign.

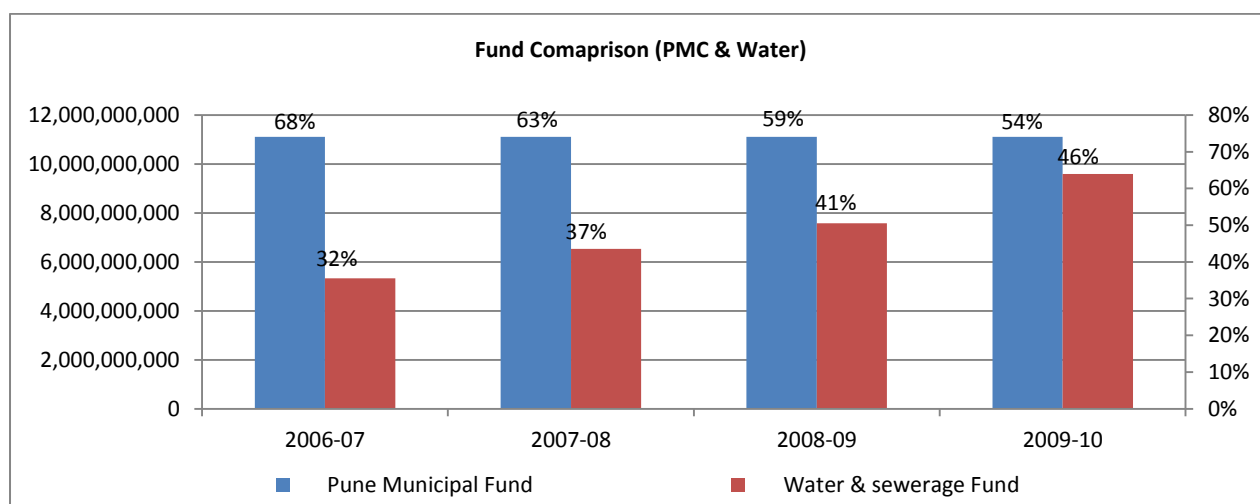


Figure 10-17: Fund Comparison PMC & Water Sewage



Current ratio is the ratio of current assets versus current liabilities. The ratio ideally has to be more than 1 as this indicated that the available assets are put to best use. The current ratio for PMC stands at more than 1 which is attractive to creditors but not appropriate for PMC and it should maximize the utilization of Current Assets to achieve a ratio of 1.

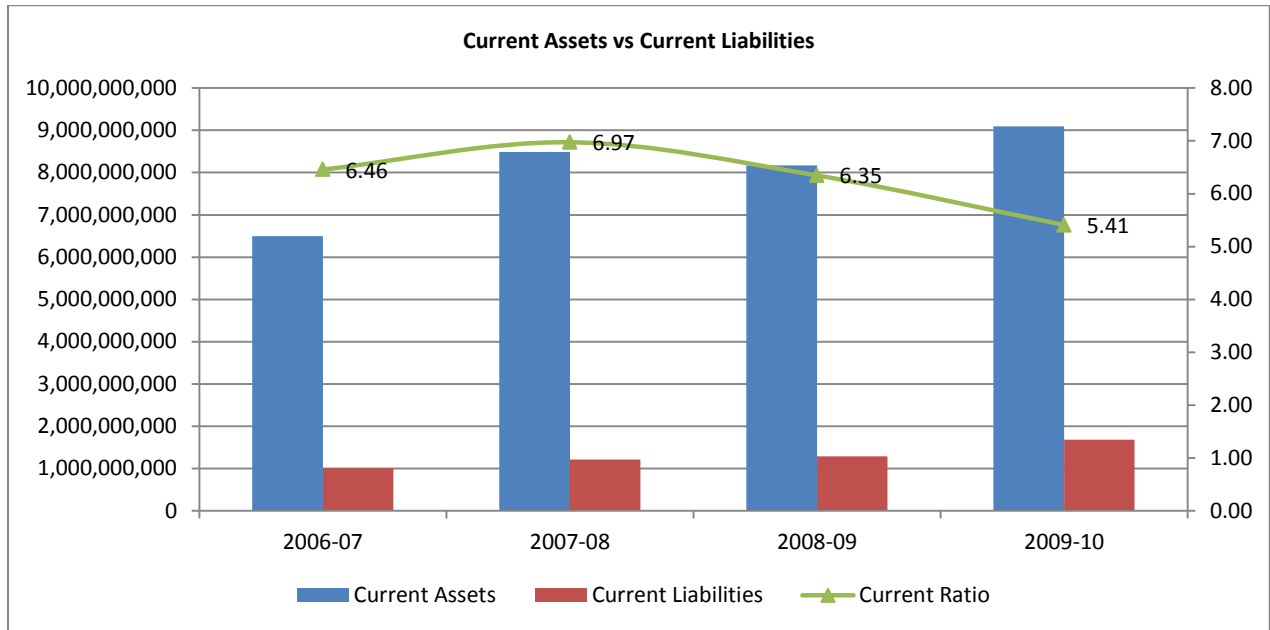


Figure 10-18: Current Assets vs Current Liabilities

Debt to Asset ratio is the ratio that provides information of the assets provided through the debt route. This formula however is very relevant in corporate finance while in Municipal finance the Debt to Asset ratio helps to understand the capacity of PMC to avoid any negative leverage scenario.

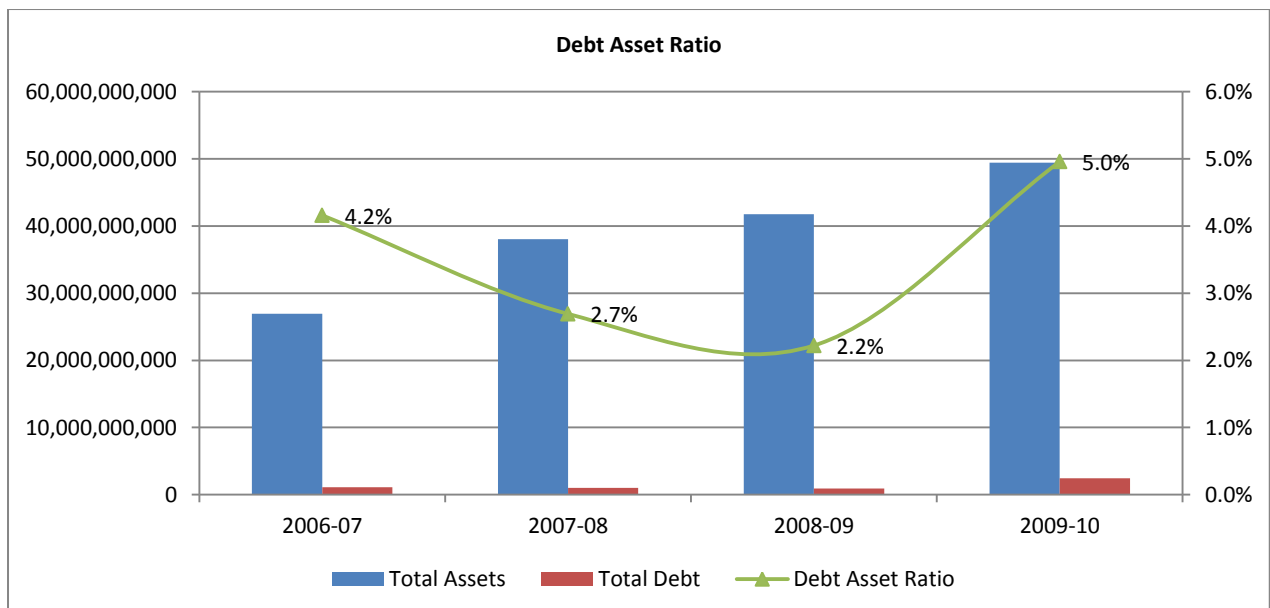


Figure 10-19: Debt Asset Ratio

Comparison of Reserves and Surplus with the Investments shows the potential / capacity of further investment with the PMC. The investments ratio of PMC has dropped. Investments also depend largely on other parameters of cash in hand, working capital requirement, debt repayment schedule etc.

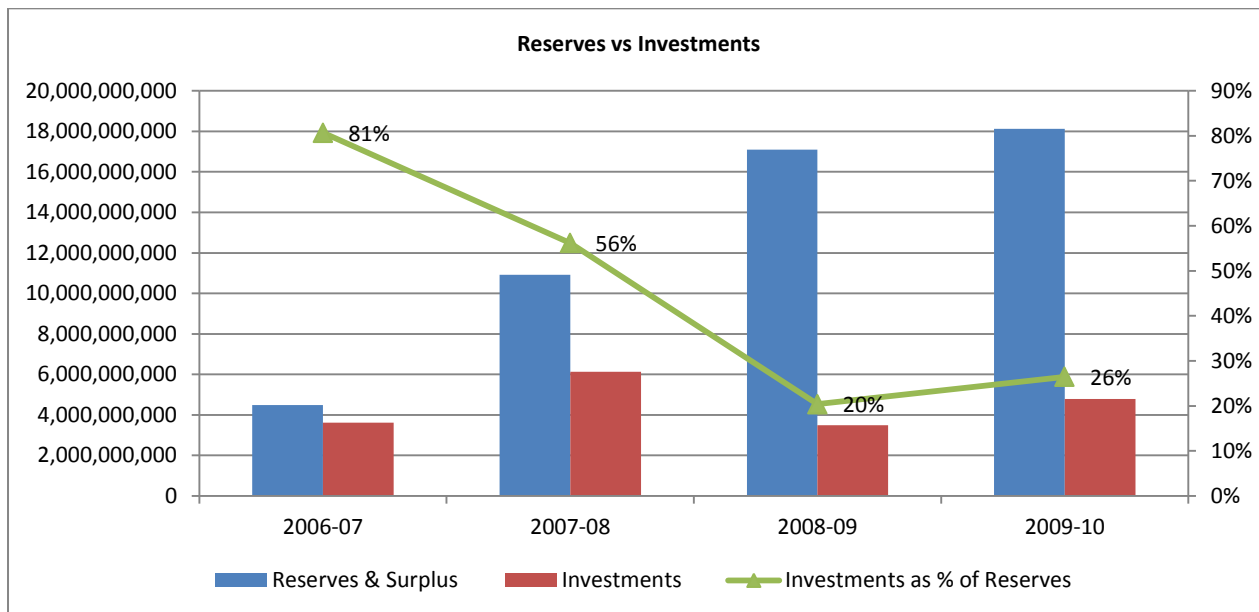


Figure 10-20: Reserves vs Investments

10.5 ISSUES

The population and the area under Pune Municipal Corporation gives the perception of the vast scale of service delivery and responsibilities borne by the PMC which are addressed by the institutional arrangement, the system for deliberation of duties and financial aspects that are discussed briefly in the sections above. Apart from the municipal boundary the city has an indirect burden of service provision to the fringe areas outside it along with the developments coming up in the Pune Metropolitan region. In addition to the challenge of the amplified liabilities, there are few short falls which are observed in the basic working structure of the PMC as described by the BMC Act, 1949, that needs to be addressed and are discussed in this section.

10.5.1 Lack of description of roles and responsibilities of various departments within PMC

According to Section 67 of the BMC Act, 1949, functions of the several municipal authorities are listed down; all the obligatory functions and discretionary functions are properly conferred by this Act, but the exhaustive list of various functions to be performed by different departments is not discussed in the act. Thus this can be made necessary to extensively list down the roles and responsibilities of various departments present in the Corporation, at all level that is the Corporation, Zone, Ward and Prabhag.

If the functions are listed down according to the different departments then it becomes clear for each of them about their functioning. The best use of this can be put to avoid the overlapping of functions of different department and to allocate the funds for the functions listed down in the prescribed department. This also helps in avoiding allocation of fund for the same function in different department which may otherwise lead to the doubling of fund allocation for the same function. As seen in table 9-3 certain functions have multiple departments at the same level of responsibility which creates confusion in terms of drawing clear lines of authority and accountability which brings in the problems of delays, non-satisfactory quality etc.



10.5.2 Lack of interdepartmental integration

It has also been observed that there is a lack in the inter-departmental integration of functions and services. There is an absolute necessity of horizontal integration of various departments present in the corporation. The vertical integration of the departments works well within the respective departments but only at the level it is performed that is at Corporation level, Zonal level, Ward level or the Prabhag level, furthering it, the system is a water tight vertical compartment of the functions performed in the particular department. This compartmentalization of departments leads to lagging horizontal linking between the departments creating gap in the data sharing and discrepancy in the clear cut role of each department. The linear flow of information and data from one department to another gets hampered and even if there is any flow of information, it is not smooth.

10.5.3 Inter-governmental Issues

The wide range and scale of activities in the city and the vast array of services required to maintain the metropolis, inevitably results in multiple tasks, multiple organizations and multiple jurisdictions, which is translated in poor service delivery to the end user and incurs more cost than required.

10.5.4 Lack of a central data platform

Due to the lack of interdepartmental integration, a void is created in the data structuring and data sharing related to existing service levels and future projects to be taken up, among the departments, which obstructs the performance of service delivery by various departments.

10.5.5 Lack of performance monitoring and incentives

There is lack of proper performance monitoring system and incentive policy related to the human resource of the Corporation that leads to overall disinterest in performing the assigned duties by the PMC staff at all levels.

10.5.6 Lack of technological upgradation and capability

The dynamics of technology, demands for upgradation at all levels in PMC on regular basis in terms of upgrading the infrastructure and capacity building of the staff.

10.5.7 Functional Monitoring and Evaluation

After the advent of reforms under JnNURM, PMC has started Quarterly Performance Report of all the projects that were being undertaken and were funded by the mission, but to improve the overall service delivery of the corporation there needs to be a mechanism for regular monitoring and evaluation of all the functions that are taken up by PMC.

Regular monitoring of the bye-laws and development control regulations/ rules which are being implemented at various levels, is also needed.

10.6 RECOMMENDATIONS

Pune being an economically dynamic city needs governance structure that elicit preferences for public services, ensure responsiveness in the provision of such services, provide accessibility to citizens, and

achieve cost savings by adopting an appropriate scale of operation. In metropolitan city of Pune, the concentration of a variety of economic activities, the cosmopolitan composition of population and large-scale migration requires a system of public service provision that not only facilitates economic activities, but also promotes the social interaction and cohesion necessary to facilitate innovation and impart dynamism.

10.6.1 Activity mapping

In principle, there is nothing wrong with concurrent assignment of powers if there is clear demarcation of functional domains. However, there is has no step as yet undertaken the so-called “activity mapping” for municipal departments that would be necessary to identify precisely who is responsible for doing exactly what with sufficient clarity to achieve efficiency and accountability in the provision of urban local services.

It is necessary to prepare an exhaustive list of all the obligatory and discretionary functions of each department which is functioning in the corporation.

For this activity, it becomes the responsibility of the Corporation to segregate the different functions according to the related and responsible department which are otherwise listed in the BPMC Act, 1949 under the same heads in Section 63 and Section 66.

In addition to functional earmarking within the Corporation, there is grave requirement of bringing in clarity of taking up responsibilities in coherence with the Parastatal bodies, hence, to avoid discrepancies each departmental head of PMC should conduct discussions with the parallel agency responsible for the overlapping function to design the authority and accountability matrix and organizational structure with clearly defined roles and responsibilities in form of a charter that helps both the administrative employees and users. As it is known that there exist various charters for the citizens, similar charters should be prepared for the use of PMC employees and employees of the parallel administrative authority.

The answer to the involvement of multiple agencies does not lie in artificially reducing their number. In essence a metropolitan area can rarely be unitary. It has to be inter-governmental where the Corporation and other Parastatal bodies function together. There is a need to evolve appropriate municipal model, with a minimum framework of governance to serve the future multi-municipal pattern of urban growth. Fostering rural urban linkages within the growing metropolitan area is an additional problem and requires developing meaningful strategies.

It is also necessary to ensure that the organizational arrangements do not increase the distance between the people and the government.

10.6.2 Creation of Central Data Bank

To avoid disagreements and overlapping in the data sets, where by increasing the efficiency and accountability of the Corporation along with bringing transparency amongst the departments development of central data pool should be mandatory step to be taken by the Corporation. This will not only create a common platform for all the departments to effectively use it in their day to day functioning but also will be a cost saving tool in the long run.

There is an urgent requirement of up-linking all the departments with each other so that they can



effectively pool their data on a central data base linked to each department. This can further be utilized by all the departments with a very high security clearance so as to avoid misuse of data and data theft.

10.6.3 Up-gradation of technology and its use

At present after the upcoming of e-governance various functions have been computerized and they are carried out effectively. The working, evaluation, allocation of a project is all done using the advanced technology but when it comes to actual tracking of the physical work done on the site, the technology takes a back seat. There is lack of monitoring of the actual work which is done physically on the site. The daily updates of the project have to be updated in the central system at the priority basis so that the actual development of a project is shared to all the departments. This not only keeps a check on the pace of the project so that it meets its stipulated completion time but also adds on to the transparency of the project where a high quality of work is ensured.

10.6.4 Introduction of new technology

Nowadays various new technologies are present which are very helpful in improving the capacity of the corporation of a high quality of governance. The introduction of GIS teamed with SDI (Spatial Data Infrastructure) can lead to a high level of transparency in the governance system. By SDI a central data platform can be created where all the daily functioning of a department can be up-linked to the central data base which can be made ready to share on an inter-departmental level with the high precautionary security clearance. According to this whenever a new update is up-linked to the central data base, then it gives the information about the work to all the departments. This makes all the departments aware of all the work going on at the real site. This will also give the freedom to the other department to have a chance to increase the knowledge base of the other departments. This technology can be used greatly to introduce transparency in the system where everybody will know about the daily works of all the departments.

With the introduction and implementation of e-governance, the corporation should take a step forward in upgrading this technology and expanding its reach to a larger number of people. The capturing of a larger number of people can be efficiently done by mobile based governance or commonly known as m-governance. Here the data is accumulated by SMS (Short Message Service) from different sources. The system can be improvised and embedded in the data base to provide monitoring, tracking and planning of different services. This service can have a large number of implications right from traffic updates, picking up of solid waste disposal bins, cleaning of drains, general complaints, reporting of available workforce for a project on a daily basis, creating awareness and numerous other services. The m-governance has a larger coverage and greater reach because of the large population using mobile and cellular service in a city. This facility can be extensively used by the corporation to update its data pool where even the common citizen can give their contribution to the system. This in longer run will be able to imbibe a sense of responsibility and sense of ownership in the citizens regarding their city and corporation alike.

10.6.5 Performance Evaluation

In order to maintain a high quality of service deliverance it is important for the corporation to periodically evaluate its own performance using a common evaluation scale and reporting structure. The introduction of performance tracking mechanism for the officials is as important as the tracking and monitoring of the

projects and services. The daily update of any official to the central data base will not only increase the interaction between the zonal officers and central head-quarter but also will keep the performance and promptness at its par. The portal will allow the system to keep a check on itself on a performance based index and will automatically keep them responsible and liable due the central vigilance. This performance evaluation should also be coupled with the system of PRP (Performance Related Pay) as already taken up by PSUs (Public Sector Undertaking companies) where the official is awarded for up keeping a high performance and maintaining quality work apart from the normal emoluments. This will not only make them liable for the lower rates of service delivery but also awarding will encourage them for higher efficiency in their performance.

10.6.6 Importance to Critical departments

Apart from the regular departmental up gradation, emphasis should be given to critical departments like Accounts, IT and HR departments. These departments are necessary for the smooth and streamlined functioning of all the other departments in any organization. Regular up-grades and training programs should be introduced especially for these departments so that the quality and standards of these departments are maintained.

10.6.7 Capacity Building and Training programme

From the analysis done so far in all the sectors it is observed that to cater to the needs of ever increasing burden on the PMC and the technological advancements which could be recommended to cope up with these burdens there is need for capacity building and training programmes for the PMC staff at all levels.

10.6.8 Analysis and utilization of data collected By Corporation

There is need of proper analysis of the data already being collected by the corporation on the daily basis. Collection of the information by the corporation for multiple uses should be the aim of the corporation. The proper interpretation of the same data can help in different activities and planning process. For example the corporation collects data about the births and deaths in the city. This data is usually collected to keep the population count of the city. But this data can be utilized by interpreting in various ways as each death is always accompanied by the reason of death. This reason can be due to a specific disease or an accident etc. thus it can be used to find out the prevalence of any disease in the city making the corporation aware before any outbreak and it can take necessary precautions. Also the age attached with the data can help interpret the life expectancy of the city giving it a chance to improve it and better the city in the HDI (Human Development Index) listing.

10.6.9 Timely completion of Financial Reports and Preparation of Audited Results

PMC has successfully migrated to the double entry accounting system however needs improvements in terms of minimization of time consumed for publishing the audited financial results. As it is essential for the corporation to have a justified platform for proposing/estimating the expenses and/or incomes for upcoming budget, the financial analysis of previous years through latest audited results would help the decision making process. To minimize the time consumption for audits, departmental integration strategy as suggested in sections above would be greatly helpful. As PMC already has the technological support available from its technology consultant managing its online administrative portal, the same may be extended over all the departments.

10.7 VISION STATEMENT

“To build an easy to understand, transparent, accountable and self-sustained municipal finance system that safeguards the City's assets, and maintains the public's trust and confidence”.

“To promote a city managed by pro-active institutions and capable staff with increase accountability, overall efficiency and required transparency”

10.8 GOALS

- Improved management – improved budgeting, financial accounting & reporting systems and revenue enhancement to ensure financial sustainability To achieve interdepartmental coordination and cooperation
- Strong community participation to governess
- To achieve 100 percent performance oriented PMC Machinery
- Improved PMC delivery of basic services.

10.9 STRATEGIES

- To increase revenue generation.
- To implement expenditure reduction measures.
- Energy efficiency.
- Fuel consumption and other item where reduction is possible after conducting proper cost audit of all major items of expenditure.
- Controlling the growth of expenditure.
- Leveraging available surpluses / own resources.
- Formation of an regulatory department with in PMC to collect correlate and instruct / finalize the data , functions and time line of different departments of PMC.
- Strong community participation to governess high revenue collection
- Interlinking and sharing of information among different zones and PMC head office
- Training and capacity building of PMC staff
- Regular monitoring and review of the level of services provided by PMC

11 CAPITAL INVESTMENT PLAN

Under the revised CDP for Pune, the investment plans need to be prepared in line with the national, state and ULB level mission and vision. As per the planning commission working group report for urban governance (2012-17) the JNNURM-II shall provide emphasis on areas of water, sanitation, waste management, capacity building and has a long term target looking till 2041. The basic reason for drafting the CIP and subsequent FOP for this long term vision is to align the CDP with this national mission and vision. This CIP tries to integrate the recommendations of the previous CDP and the projects incorporated, the JNNURM (phase-II) mission and vision and the planning commission working group recommendations. As discussed earlier in the CDP the objective of PMC for revising this CDP is to include more innovative concepts, sustainable development alternatives, improved governance, better utilization of existing assets etc.

Looking back the previous City Development Plan for PMC city was prepared in 2005-06. The CDP covered various aspects related to water supply, sewerage and sanitation, solid waste management, traffic and transportation, land use, urban poor and housing, urban environment, education, and health. It identified the capital investment projects to improve the service delivery and enhance the system coverage. Total investment identified in the CDP 2005-06 was Rs. 6643 crores till the year 2012 of which an investment of 6072 was planned for 2011-12. Audited results for the past phase shall be able to show the total fixed asset addition in the PMC accounts. Keeping in mind the projects recommended in the previous CDP and the city need assessment done in this phase shall help in designing a CIP aligned with the objectives of governing bodies as discussed. This CIP shall provide with phased investment planning and a brief analysis of 2005-06 CIP simultaneously trying to carry forward the essential projects from there on.

11.1 CAPITAL INVESTMENT PLAN

This capital investment plan is aimed to be a long term plan that needs to cover the long term visions across sectors and help the ULB plan its resources accordingly. The CIP broadly aims to satisfy the following objectives:

- Identifying the essential projects across sectors served by the ULB
- Phasing and scheduling of investments in a sustainable manner to avoid fiscal deficit scenarios
- Prioritization of needs and capital investment phasing as in input for effective fund management (FOP)

As a well-known fact the CIP provides as a base element for determining the city management and development with respect to the services intended to be delivered over short term, long term and phased plan periods. CIP is a tool that helps the ULB in determine and forecasting several major components of the annual budgets to be planned. The CIP has been formulated in consultation with the various departments of PMC and procedures as prescribed by JnNURM briefly listed as below:

- Discussions with respective heads of the departments in the PMC and identifying the departmental plan and projects needed in short term and long term



- Identifying projects through sectoral analysis for existing situation, past performances, future requirement of the city growth and sustenance requirements
- Approved projects and projects in pipe line by various departments, governing authorities and entities related to PMC (eg. PMPML)
- Discussion with other non-administrative stakeholders in line with the requirement of the CDP guidelines that includes NGO's, Councilors and Corporators, Pune City Residents etc.

11.2 PROJECT IDENTIFICATION, PHASING AND STRATEGIES

11.2.1 Project Identification

As mentioned earlier the project Identification is a consultative and analytical process which involves the drafting of an exhaustive project list. This list is then short-listed based on the situational analysis of basic services and assessment of the municipality. Initially an exhaustive consultation has been carried out with all the involved stake holders of the city for preparing the list of projects.

11.2.2 Project Screening and Prioritization

During second stage of the CIP, the list was evaluated in relation to the service levels, growth trends and future needs of the city. As brought out in respective sections of the CDP, projects have been analyzed to improve the service delivery levels and make efforts to better utilize the existing assets. Based on the list of projects and consultation with the officials & officers of PMC a detailed list of projects to be executed along with the implementation priorities was prepared. The general criteria used in identifying projects were the department's goals of efficient service delivery; prompt customer service, environmental sustainability, and strategic implementation of projects, community benefits, infrastructure maintenance needs, and meeting growing demand.

11.2.3 Estimation of Capital Investments and Project Phasing

For all the projects listed under different heads broad cost estimates have been prepared based on market studies, existing cases across different ULB's, projects already approved and planned, projects estimated by different departments etc. Phasing/ scheduling of investment under different section is done through an iterative process and the basis of the phasing adopted is here under:

- Critically important projects and their priority, putting emphasis on developed areas over future development areas in initial phase
- Efforts to build inter and intra project linkages, such as water supply investments to be complemented by corresponding sewerage/ sanitation improvements etc.
- Size and duration of the projects, including preparation and implementation period
- Project linked service implications, such as installing house connections where supply and distribution capacities have been increased

The City Investment Plan has thus identified the city administration capital needs and prepared a long term phased plan spanning from year 2013-2041. The strategies for long term financial planning in the

CIP provides a basis for PMC to further conduct studies on raising resources through various accessible grants, funds that can be generated from the recommendations of the SFC, revision of tax rates and service charges, efficiencies in collection of taxes and charges, other tax and non-tax source of revenues etc.

The projects have been identified through a demand gap analysis of services in different sectors and projects already identified through detailed engineering studies by the corporation. Projects other than those identified by PMC or derived from stakeholder consultation have been considered to address the core service areas of river conservation, mass transit, environment, heritage and tourism, smart city etc. The CIP thus provides as a guide to estimate asset creation for its population. The phasing of the CIP exhibits the short term and long term requirements of the city and also paves a path for the stakeholders of the city that includes the citizens, investors, planners etc.

11.3 BRIEF ANALYSIS OF PREVIOUS CDP

The previous CDP did an exercise to provide a CIP for a 25 year horizon with an estimated total investment requirement of 6643 crores across various sectors. Majority of the investment was planned in the Roads, traffic and transportation sector (35%) followed by Urban Poor/Slums (13%) followed by Sewerage & Sanitation (11%) and Drainage (10%) for an investment window spanning till 2011-12. The non-core sectors included river conservation, inner city revitalization, heritage restoration etc. with a 21% investment share for the 2011-12 window. It provided for two phase strategy and investment needs which it called as the short term (spanning till 2011-12) and the long term strategy (spanning beyond 2011-12 till 2031).

The CIP presented here also captures the projects recommended by the previous CDP based on their viability, current status, fund availability, priority need, departmental analysis and correlation with the current status of the specific sector. Some of the financial projections done include the growth of revenue receipts by 2.5 times as that of 2005-06 period and increase in revenue through expenditure control measures, revenue improvement measures and reforms, impact of grants etc. thus estimating the investment capacity of PMC to reach 8501 crores, 140% higher than the estimated investment till 2011-12. The actual results can be analyzed subsequent to final audit of the financial results which should be done by the PMC at the end of every audit period. The previous CDP estimates and projection relied highly on the JNNURM funds which however need to be checked during this CDP for their availability and the dependency.

11.4 MULTI YEAR PHASED CAPITAL INVESTMENT PLAN

The Capital Investment Plan has been phased in 3 time frames with an equal period of 10 years plan. Basic reason to do so is that the revised CDP aims for a longer vision till 2041 which makes it imperative to exclude the short term plan. A two stage plan i.e. a plan with short term and long term strategy is unable to capture the investment requirements and viable phasing of projects over a long time frame of 28 years. The CIP and FOP have been prepared by involving following Tasks.

- Appraisal of PMC's priorities for allocation of funds and projects for various infrastructure sectors and non-core sectors in three phases of 10 years each



- Apprising the funding potential based on financial projections
- Preparation of 28 years Financial and Operating Plan (FOP) (2012-41) for the Corporation with a view to identify the financial strength of the same and to support projects.
- Appraising the institutional capabilities of the organization for implementing and maintaining projects
- Examined the prospects of additional resource mobilization from the existing or new sources within the urban area

As assessed in the development of strategies and programs in individual sector studies and based on the demand of services for the population in coming years along with the existing supply, gaps have been identified in the basic service and projects have been aligned. The phasing has been worked out in correlation with the population growth rate which is one of the key factor for identifying service demand levels and supply potential.

The total estimated investment for the period envisaged under the CDP is estimated at Rs 88443.9 including the Special Projects, housing and slum. Basis for such an aggressive investment plan is that Pune is one of the top thirteen cities in India to have a population of more than 4 million in coming few years precisely it shall surpass this limit before 2020 making it essential for the corporation to build its muscle for sustaining such a pressure. Pune is also one of the top 10 GDP contributing cities in India which makes it imperative for the administration to provide better and improved services to the citizens and all other stakeholders.

As disused earlier the basic theme of this revised CDP is constructing a sustainable environment for habitation and build conducive investment climate. Brief summary of investment needs at constant prices is shown in the following table with three phases.

Table 11-1: Capital Investment Plan Summary

	Proposed Projects	Total Cost in Rs. Crores	2012-21 (Rs. Crores)	2021-31 (Rs. Crores)	2031-41 (Rs. Crores)
1	Water Supply Projects	3693.03	3689.09	1.96	1.96
2	Sewerage	673.81	673.81	0	0
3	Drainage	1522.98	1073.01	449.97	0
4	Solid Waste Management	698.04	359.73	142.11	196.19
5	Urban Roads, Traffic and Transportation	13529.68	5564.33	5648.15	2317.20
6	Environment	274.34	216.79	29.6	27.95
7	Heritage Conservation and Tourism	2350.67	1015.42	764	571.25
8	Disaster Management	695.58	216.44	216.93	262.19
9	Institutional frame work, Municipal Finance and Governance	572.5	372.5	200	0
	Total cost without special projects , housing and slums	24010.65346	13181.14545	7452.743364	3376.764646
10	Special Projects	18014	10364	7650	0
11	Housing and Slums	46419.31	13925.79	13925.79	18567.72
	Total cost including special projects , housing and slums	88443.96938	37470.94023	29028.53814	21944.49102



More than 90% of the total investment is planned in Phase-1 spanning from 2013-14 to 2020-21 while remaining has been phased beyond 2021. Majority of the investment is required for housing and slums however this is the consolidated investment requirement through various sources.

The categories have been designed based on consultation and through deliberations with PMC departmental heads and interactions with other officials. The special projects category includes all the projects that are highly capital intensive in nature and require interventions beyond the conventional operational mechanisms of the administration. This category includes projects of Metro Rail, HCMTR. As seen majority of the investment is planned in phase-1 of the CIP before 2021 based on the population growth rates, per capita capital investment requirement (source: India Urbanization Funding Model: McKinsey Research Institute Analysis), basic service demand levels (source: United Nations-Handbook of benchmarks, MoUD, NCAER) etc.

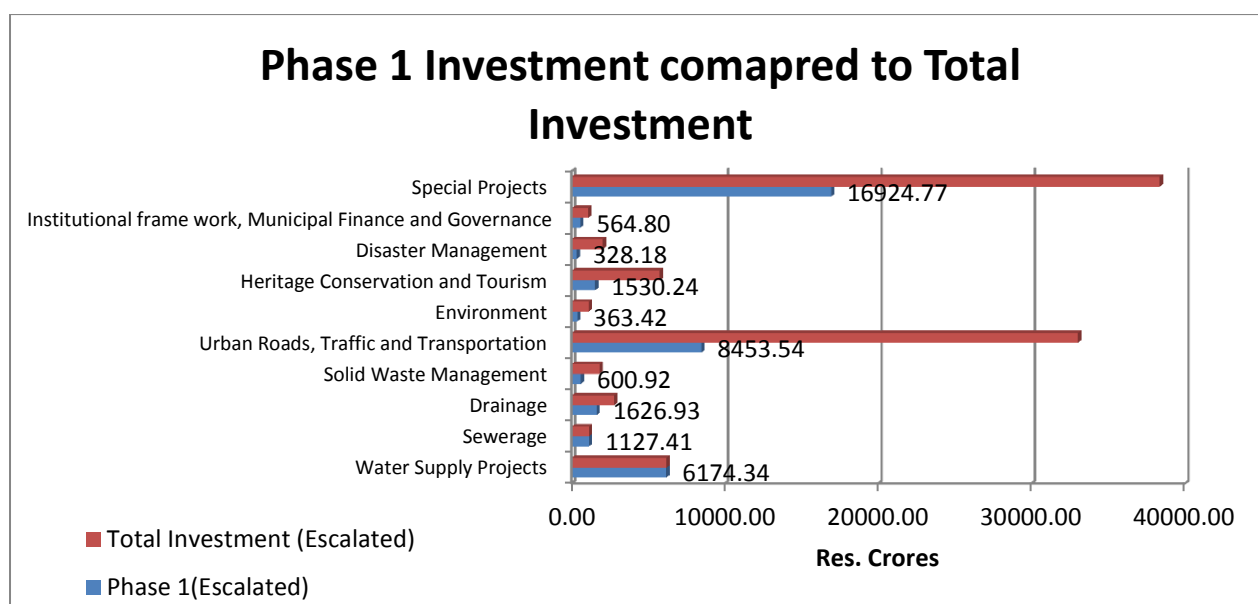


Figure 11-1: Phase-1 investment estimate compared with total investment (escalated)

Certain basic assumptions underlying the CIP investment analysis are as follows:

- Inflation index over base price is estimated at 9.01% based on the last 5 years average inflation index (ref: Directorate of Income Tax -2012, RBI working papers – Measure of core inflation in india, an empirical evaluation: Dr.Janak Raj, Sangita Misra, Inflation Threshold in India an Empirical Evaluation: Deepak Mohanty Et.Al.)
- Normalized inflation after 5th year based on 10 years inflation index average at 5.6% till 2041.
- Year over Year investment phasing in Phase-1 based on annual requirement and sector wise demand gap analysis as per each section of the CDP.

Sector wise investment requirements have been discussed in the subsequent chapter while the implementation strategies have been already detailed in respective section of the CDP for each sector.

Table 11-2: Water Supply Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
1	Water Supply Projects				3,693.04	3,689.10	1.97	1.97
1	Construction of Water Treatment Plant at Parvati water Work	500	MLD	3,963,600	1,981,800,000	1,981,800,000		
2	Construction of Water Treatment Plant in Cantonment Board	300	MLD	5,000,000	1,500,000,000	1,500,000,000		
3	Water Supply Scheme for Bhama Askhad Dam	1	LS		5,429,600,000	5,429,600,000		
4	Construction of water treatment Plant at Wadgaon	250	MLD	6,734,400	1,683,600,000	1,683,600,000		
5	Construction of Reservoirs	140	ML	10,000,000	1,400,000,000	1,400,000,000		
6	Equitable Water Supply Scheme					-		
	Metering Water Supply from Source to Consumer				5,226,300,000	5,226,300,000		
	Rehabilitation of Existing Water Supply Network	327	DMA	50,000,000	16,350,000,000	16,350,000,000		
7	Construction of Tunnel to convey water from parvati water work to cantonment water work	6	KM		3,300,000,000	3,300,000,000		
8	Energy Audit Study for Water Supply		LS		12,000,000	4,000,000	4,000,000	4,000,000
9	Water Conservation and Awareness Program (3 year campaign)	1	LS		47,082,075	15,694,025	15,694,025	15,694,025
					36,930,382,075	36,890,994,025	19,694,025	19,694,025

Total investments on Water Supply projects is estimated at Rs. 3693 Crores at constant prices with majority investment in Phase-1 of Rs.3689 Crores which is almost 99% of the estimated investment. Major investments have been market for equitable metered water supply planned to be invested in Phase-1 followed by construction of reservoirs and water treatment plant.

Investments in Sewerage projects have been estimated at Rs. 673 Crores with major investments in pipe laying and development of STP. Investment on sewerage consists of roughly 2% of the total estimated investment of the CIP with major investments of almost 100% of the total planned investment in Phase-1.

Table 11-3: Sewerage Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
	SEWERAGE				673.81	673.81		
1	Collection System and Trunk Mains							
	Collection System in Baner and Balewadi	33443	M		241,229,724	241,229,724		
	Trunk Sewer and Conveyance Mains	76318	M		1,711,989,671	1,711,989,671		

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
	SEWERAGE	RS. CRORES			673.81	673.81		
	(approx)							
2	Construction of STPs	364	ML		4,586,444,280	4,586,444,280		
	Mundwa							
	Bhairoba Nallah							
	Naidu							
	Vadgaon							
	Warje							
	Tajjiwadi							
	Botanical Garden							
	Dhanori							
	Matsya Bij Kendra							
	Kharadi							
3	Intermediate Pumping Stations				114,056,607	114,056,607		
4	Express Feeder provision				59,879,719	59,879,719		
5	Public Awareness and Participation				24,500,000	24,500,000		
6	Capacity Building Cost							
	Total				6,738,100,000	6,738,100,000	-	-

Investment on drainage projects is estimated to a tune of Rs. 1522 Crores with major investment in construction of new drainage lines i.e. Network Expansion including conversion of drains into pucca drains. This investment has been planned in lines with the road network addition and need to upgrade existing drainage network of the city.

Table 11-4: Drainage Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate	Total Cost	2012-21	2021-31	2031-41
3	DRAINAGE				1,522.98	1,073	450	
1	Improvement of Drainage Basins Phase-1 (Basin S -Shaniwar peth, Basin R- Mangalwar peth, Basin F- Bavdhan Pashan area, Basin O- Hadapsar area, Basin C- Warje)							
	Nalla improvement works	59.20	KM		2,270,300,000	2,270,300,000		
	Improvement /Up-gradation of C.D. work sites	79	Nos		454,300,000	454,300,000		
	Construction of Road side drains	281	KM		2,270,600,000	2,270,600,000		

	Proposed Projects	Quantity	Unit	Unit Rate	Total Cost	2012-21	2021-31	2031-41
3	DRAINAGE				1,522.98	1,073	450	
	Other Miscellaneous works	-	LS		18,500,000	18,500,000		
2	Improvement of Drainage Basin Phase-1a (Basin B –Kothrud,Basin T- Ambil odha,Basin I- Vishrantwadi Dhnori, Basin P- Kondhava and Ghorpadi area, Basin U- Hingane Khurd)					-		
	Nalla improvement works	77.11	KM		2,666,800,000	2,666,800,000		
	Improvement /Up-gradation of C.D. work sites	109	Nos		405,400,000	405,400,000		
	Construction of Road side drains	297	KM		2,262,100,000	2,262,100,000		
	Other miscellaneous works				20,500,000	20,500,000		
3	Improvement of Drainage Basin Phase-2 (Basin A –Prabaht rd area ,Basin D- Shivajinagar,Basin E- Aundh area,Basin H- Kalas area,Basin J- Mental Hospital,Basin K- Yerwada,Basin L – Vimannagar,Basin- Q- Wadia college,Basin-W- Dhayri area)							
	Nalla improvement works	52.10	KM		2,142,400,000		2,142,400,000	
	Improvement /Up-gradation of C.D. work sites	71	Nos		361,600,000	361,600,000		
	Construction of Road side drains	278.67	KM		2,334,800,000		2,334,800,000	
	Other miscellaneous works				22,500,000		22,500,000	
	Total				15,229,800,000	1073010000	449700000	

It is estimated that the total investment requirement for Solid Waste Management projects is Rs. 698 Crores covering the areas of Collection, Transportation and Disposal. It is also proposed that new land fill sites shall be developed and innovative projects for Waste to Energy, Refuse Derived Fuel shall be proposed. Approximately 50% of total investment is planned in Phase-1 of the CIP.

Table 11-5: Solid Waste Management Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost (Rs)	2012-21	2021-31	2031-41
4	SOLID WASTE MANAGEMENT				698.05	359.73	142.11	196.20
1	Construction of Land Fill Site	206	Ha		1,461,160,990	307,579,667	374,442,170	779,139,153
2	Capping of Existing Land fill site urli	25(Approx.)	Ha	2,443,460	690,000,000	690,000,000	-	-
3	Construction of Central Bio Medical Based Treatment Facilities (Including the Facilities of Incineration, Hydro-claving , Autoclaving and Microwaving)	3	No	50,000,000	150,000,000	50,000,000	50,000,000	50,000,000
4	Construction of C&D processing Plant	8.9	No	LS	100,000,000	100,000,000	-	-

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	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost (Rs)	2012-21	2021-31	2031-41
4	SOLID WASTE MANAGEMENT				698.05	359.73	142.11	196.20
5	Construction of e-waste treatment plant	1	No	-	500,000,000	500,000,000	-	-
6	Construction Carcass Plant	2	No	50,000,000	100,000,000	50,000,000	-	50,000,000
7	Improvement of Existing Transfer stations	7	No.	50,000,000	350,000,000	350,000,000	-	-
8	Construction of Waste sorting Stations	400	No.	50,000	20,000,000	20,000,000	-	-
9	Construction of whole sale market for Recyclable waste material	5	Ha	6,000,000	30,000,000	30,000,000	-	-
	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
10	SWM VEHICLES AND EQUIPMENTS			-	-	-	-	-
	Containerized Push Carts for D2D Collection	19587	No.	10,000	195,870,000	44,550,000	63,470,000	87,850,000
	Ghanta Truck for D2D Collection	415	No.	1,300,000	539,500,000	170,300,000	214,500,000	154,700,000
	Push Carts for Street sweeping	31799	No.	10,000	317,990,000	99,680,000	105,440,000	112,870,000
	Litter Bins	113053	No.	5,000	565,265,000	177,195,000	187,435,000	200,635,000
	Closed Containers (3 m3 capacity)	4097	No.	50,000	204,850,000	39,350,000	63,850,000	101,650,000
	Dumper Placers (twin containers of 3 m3)	192	No.	1,500,000	288,000,000	75,000,000	103,500,000	109,500,000
	Closed Containers (4.5 m3 capacity)	4097	No.	65,000	266,305,000	51,155,000	83,005,000	132,145,000
	Dumper Placers (twin containers of 3.8m3)	192	No.	2,000,000	384,000,000	100,000,000	138,000,000	146,000,000
	Street Sweeping Machine for Gradens and Streets	7	No.	2,000,000	14,000,000	14,000,000	-	-
	Sweeping Machine for Arterial Roads	2	No	25,000,000	50,000,000	50,000,000	-	-
11	Improvement of Depot and workshop for SWM				40,000,000	40,000,000		
12	SWM Awareness Program	30	Yearly	5,000,000	150,000,000	75,000,000	37,500,000	37,500,000
13	Construction of Public Toilets for Male and Female as per CSP-2012	7088	Seats	40,000	283,520,000	283,520,000		
14	Improvement of Existing Public Toilets	14000	Seats	20,000	280,000,000	280,000,000		
	Total				6,980,460,990	3,597,329,667	1,421,142,170	1,961,989,153

Urban Roads, Traffic Management and Transportation is one of the critical areas of any ULB which is highly capital intensive in nature and the projects within the

sector are long gestation projects attracting high operation and maintenance costs. The CIP estimates a total investment need of Rs. 13259 Crores with 41 % of the base value investment in Phase-1.

Table 11-6: Urban Roads, Traffic and Transportation Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
5	Urban Roads, Traffic and Transportation				13,529.69	5,564.34	5,648.15	2,317.20
1	Road Widening and Improvement as per DP @10 m width (320 km)	3200000	sqm	4,000	12,800,000,000	6,400,000,000	6,400,000,000	
2	Development of New DP Roads @ 30m width (216 Km)	6480000	sqm	5,500	35,640,000,000	17,820,000,000	17,820,000,000	
3	Construction of flyover , RoBs and Bridges (34 no.)					-	-	
	Engineering College	1 NO, 800-900 m		700,000,000	700,000,000	700,000,000	-	
	Saswad Road	1 NO, 700m		250,000,000	250,000,000	-	-	250,000,000
	Singhad Road-Dhayavi Phata	1 NO, 700m-750m		300,000,000	300,000,000	300,000,000	-	
	Satara Road - Balaji Nagar	1 NO, 1200 m		520,000,000	520,000,000	520,000,000	-	
	Mundwa RoB	1 NO,		200,000,000	200,000,000	-	-	200,000,000
	Sasone Nagar RoB + Flyover	1 NO,900m		510,000,000	510,000,000	510,000,000	-	
	Satara Road Katraj Chowk (under pass)	1 NO		250,000,000	250,000,000	-	-	250,000,000
	Singhad Road -Panmala Chowk	1 NO,600 m		250,000,000	250,000,000	250,000,000	-	
	Satara Road-Padmavati	1 NO		250,000,000	250,000,000	-	250,000,000	
	Lulla Nagar	1 NO, 675 m		200,000,000	200,000,000	200,000,000	-	
	Nagar Road -Kharadi -Mundwa bypass	1 NO, 600m		250,000,000	250,000,000	250,000,000	-	
	Hadapsar RoB	1 NO		250,000,000	250,000,000	-	-	250,000,000
	Mundwa Bridge Connecting River Side and Kahradi Bypass(, 4 lane)	1 NO		200,000,000	200,000,000	200,000,000	-	
	Kalyani Nagar chowk	1 NO		250,000,000	250,000,000	-	250,000,000	
	Gunjan Chowk	1 NO 600m		250,000,000	250,000,000	250,000,000	-	
	Blue Diamond Bridge Widening (4 Lane)	1 NO,600 m		200,000,000	200,000,000	200,000,000	-	
	Mundwa River Bridge (,4 lane)	1 NO, 800m		450,000,000	450,000,000	450,000,000	-	

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	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
5	Urban Roads, Traffic and Transportation				13,529.69	5,564.34	5,648.15	2,317.20
	Tadigutta Chowk	1 NO		250,000,000	250,000,000	-	250,000,000	
	Alandi Road Vishrantwadi Chowk	1 NO, 750 m		300,000,000	300,000,000	300,000,000	-	
	Bopodi Underpass	1 NO, 400m		150,000,000	150,000,000	150,000,000	-	
	Aundh Ward Office Chowk	1 NO,		250,000,000	250,000,000		250,000,000	
	Ambedkar Chowk	1 NO		250,000,000	250,000,000	-	250,000,000	
	S.Number-47, Bapodi-sangvi connecting	1 NO, 120m		160,000,000	160,000,000	160,000,000	-	
	Balewadi -Wakad connecting Road	1 NO, 450m		250,000,000	250,000,000	250,000,000	-	
	Widening of Sus Bridge	1 NO,400m		150,000,000	150,000,000	150,000,000	-	
	Redevelopment of Chandni chowk	1 NO		1,000,000,000	1,000,000,000	-	-	1,000,000,000
	Hingne Shri Shiksan Sanstha Karve Road	1 NO,1200m		420,000,000	420,000,000	420,000,000	-	
	Karve Road -Kothurd (karve Statue)	1 NO,700m		250,000,000	250,000,000	250,000,000	-	
	ARAI	1 NO		250,000,000	250,000,000	-	250,000,000	
	Mhtre Bridge -underpass	1 NO		100,000,000	100,000,000	100,000,000	-	
	Aundh Sangvi Bridge Widening	1 NO		200,000,000	200,000,000	200,000,000	-	
	Dangre bridge widening	1 NO, 200m		100,000,000	100,000,000	100,000,000	-	
	Simla office	1 NO		200,000,000	200,000,000	-	200,000,000	
	Botanical Garden Bridge Aundh Sangvi(100m Span, 4 lane)	1 NO,250 m		100,000,000	100,000,000	100,000,000	-	
4	Construction of Tunnels					-	-	
	Tunnel -1					-	-	
	section-1: Gohkle Nagar to Panchwati Colony	0.8	Section 1, Length in km, average width 30m	1,000,000,000	800,000,000	800,000,000		
	Section-2: Panchwati (Pashan) to Paud Road	1.7	Section 2, Length in km, average width 30m	1,000,000,000	1,700,000,000	1,700,000,000		
	Tunnel -2							
	Taljai Nagar to Wadgaon	0.7	Length in km,	1,000,000,000	700,000,000	700,000,000		

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	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
5	Urban Roads, Traffic and Transportation				13,529.69	5,564.34	5,648.15	2,317.20
			average width 30m					
	Tunnel-3							
	Sahakar Nagar to Singhad Road	1	Length in km, average width 30m	1,000,000,000	1,000,000,000	1,000,000,000		
5	Development of Pedestrian Subway and Skywalk	14	No.			-	-	-
	Gud luck Chowk	1 NO		30,000,000	30,000,000	30,000,000		
	Alka Talkies	1 NO		100,000,000	100,000,000	100,000,000		
	Swargate	1 NO		100,000,000	100,000,000	100,000,000		
	University Road	1 NO		30,000,000	30,000,000	30,000,000		
	Sambhaji Garden	1 NO		50,000,000	50,000,000	50,000,000		
	Laxmi Road- Shanipar chowk	1 NO		200,000,000	200,000,000	200,000,000		
	Wadia College	1 NO		50,000,000	50,000,000	50,000,000		
	MIT College	1 NO		30,000,000	30,000,000	30,000,000		
	Gokhale Institute	1 NO		30,000,000	30,000,000	30,000,000		
	Jehangir Hospital	1 NO		30,000,000	30,000,000	30,000,000		
	Shivajinagar railway station	1 NO		30,000,000	30,000,000	30,000,000		
	BRTS Bus stops at major locations 35	35		30,000,000	1,050,000,000	1,050,000,000		
	Baner Balewadi phata	1 NO		30,000,000	30,000,000	30,000,000		
	PMC Building-Mangala	1 NO		30,000,000	30,000,000	30,000,000		
6	Development and Improvement of Cycle Tracks and Footpath					-	-	
	Improvement of Existing Cycle Track	467500	sqm	1,500	701,250,000	350,625,000	350,625,000	
	Provision of New Cycle Track	970000	sqm	1,500	1,455,000,000	436,500,000	436,500,000	582,000,000
	Provision of Dedicated Cycle Track as per DP	90000	sqm	1,500	135,000,000	67,500,000	67,500,000	
7	Establishment of Intelligent Transport System with central		No.	2,000,000,000	2,000,000,000	1,000,000,000	1,000,000,000	

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	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
5	Urban Roads, Traffic and Transportation				13,529.69	5,564.34	5,648.15	2,317.20
	Control Room (2000 Buses+ 1000 Bus Stops)							
8	Footpath Improvement	1908000	sqm	1,000	1,908,000,000	954,000,000	954,000,000	
9	Improvement of Existing BRTS marketing, redesigning bus stops, auto-ticketing, Provision of LED display board, introduction of GPS system etc	118	KM	2,500,000	393,333,333	393,333,333		
10	Development of new BRTS route	101	KM					
	Katraj Ghat – Hinjewadi Chowk (Bangalore – Mumbai Bypass)	23.5	KM	25,000,000	587,500,000	587,500,000		
	Pashan – Sus Road	6.2	KM	25,000,000	155,000,000	155,000,000		
	Solapur Road Extension	9.3	KM	25,000,000	232,500,000	232,500,000		
	from Hadapsar to Proposed Outer Ring Road	16.7	KM	25,000,000	417,500,000	417,500,000		
	Katraj to Mundhwa Road	8.8	KM	25,000,000	220,000,000	220,000,000		
	(via Kondhwa – Mahammadwadi – Hadapsar – Manjari Road Chowk)	2.5	KM	25,000,000	62,500,000	62,500,000		
	Additional routes to be added in BRTS (Routes of HCMTR)	34	KM	25,000,000	850,000,000	850,000,000		
11	Provision of new buses @ 40 buses per lakh as per JnNURM Guidelines standard	9247	No.	5,500,000	50,858,500,000	8,398,500,000	23,540,000,000	18,920,000,000
12	Construction of Bus Depot	20	No	40,000,000	800,000,000	200,000,000	400,000,000	200,000,000
13	Construction of Bus Terminals	5	No	25,000,000	125,000,000	125,000,000		
14	Construction of Workshops	5	No	40,000,000	200,000,000	200,000,000		
15	Construction of Amenity spaces	8	No	25,000,000	200,000,000	100,000,000	100,000,000	
17	Improvement of existing bus stop	2000	No	500,000	1,000,000,000	500,000,000	500,000,000	
18	Provision of Parking Spaces as per DP	95	No	80,000,000	7,600,000,000	3,040,000,000	3,040,000,000	1,520,000,000
19	Station Area Development Plan	9	No			-	-	
	Shivaji Nagar Station				200,000,000	200,000,000		



	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
5	Urban Roads, Traffic and Transportation				13,529.69	5,564.34	5,648.15	2,317.20
	Pune Railway Station				100,000,000	100,000,000		
	Swargate				120,000,000	120,000,000		
	Hadpsar				60,000,000	60,000,000		
	Mandai				150,000,000	150,000,000		
	Market Yard				30,000,000	30,000,000		
	Nathawadi				50,000,000	50,000,000		
	Gultekdi				50,000,000	50,000,000		
	Dhankawadi				100,000,000	100,000,000		
20	Development of Transfer Station (as per CMP)	4	No	100,000,000	100,000,000	100,000,000		
21	Construction of Transport Nagar (Basic infra for long term lease)	40	Ha	8,645,000	345,800,000	172,900,000	172,900,000	
					135,296,883,333	55,643,358,333	56,481,525,000	23,172,000,000

Housing and Slum up-gradation projects are highly capital intensive and as can be seen from the CIP that majority of the investment is dedicated towards Housing and Slums projects. The fund however would not be flowing from PMC account but at the City level this comprises the highest estimated investment in the CIP.

Table 11-7: Housing and Slum Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
8	Housing and Slums				46,419.32	13,925.79	13,925.79	18,567.73
1	Up-gradation of Existing Dilapidated Houses - Restoration/Retrofitting of the existing houses	68,393	Nos.	400,000	27,357,200,000	8,207,160,000	8,207,160,000	10,942,880,000
2	Redevelopment of Existing Houses - Demolition of houses out of service life and construction of new houses/clearance of slum area and development of houses on the same land. (Including cost of demolition, site development, ancillary development, infrastructure development)	102,590	Nos.	600,000	61,554,000,000	18,466,200,000	18,466,200,000	24,621,600,000
3	Resettlement of Existing Households (Shifting the slum population to new constructed houses)	62,205	Nos.	600,000	37,323,000,000	11,196,900,000	11,196,900,000	14,929,200,000



	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
8	Housing and Slums				46,419.32	13,925.79	13,925.79	18,567.73
	at other location - costs includes construction of houses, site development, infrastructure etc.)							
4	Supply of New Households (Deficit of the Long Term Demand for achievement of Slum Free City) - Household Density - 5.4 For 2041 Population Estimate Horizon	559,960	Nos.	600,000	335,976,088,889	100,792,826,667	100,792,826,667	134,390,435,556
5	Social Development Cost - Including Training, capacity building program and awareness program for slum dwellers, Employment Training etc. (Recurring Expenditure - Annual Disbursement) - Including Cost incurred on Capacity Building of the Administration handling and executing such projects http://mohfw.nic.in/NRHM/Task_grp/Report_of_UHTF_5May2006.pdf	793,148	Nos.	2,500	1,982,870,370	594,861,111	594,861,111	793,148,148
	Total				464,193,159,259	139,257,947,778	139,257,947,778	185,677,263,704

Environment conservation projects have been envisaged in Phase-1 of the CIP with a total estimated investment of Rs. 274 Crores at constant price. Strategies and action plans for environment protection and conservation have been detailed in the relevant section of the CDP while projects based on those strategies have been detailed out in the investment plan table below.

Table 11-8: Environment Conservation Projects and Investment Phasing

Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
Environment				274.34	216.79	29.60	27.95
Development of Biodiversity Park (Plantation , Creation of check dams for soil moisture control , Natural walkways)	917	Ha	1,200,000.00	1,100,400,000.00	1,100,400,000.00		
Construction of Boundry wall for Biodiversity Park	64000	mtrs	12,000	768,000,000	768,000,000		
Preparation of people's biodiversity register for Pune city	30	years		600,000,000	200,000,000	200,000,000	200,000,000
Capacity building for Green Building	1	ANNUAL LS	5,000,000	165,000,000	49,500,000	66,000,000	49,500,000



Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
Environment				274.34	216.79	29.60	27.95
Design and Research Center, Energy Audit, monitoring & implementation, etc.							
Environment Awareness Program	10	Decadal	20,000,000	60,000,000	20,000,000	20,000,000	20,000,000
GIS Mapping of environment sensitive area - Hill slopes, rivers, lakes, forest area, parks, biodiversity parks	30 years	LS		30,000,000	10,000,000	10,000,000	10,000,000
Pilot Study for Carbon Credit certification, etc.	1	For 2013-14	20,000,000	20,000,000	20,000,000		
Total				2,743,400,000	2,167,900,000	296,000,000	279,500,000

Heritage and tourism projects in subsequent investment phasing have been estimated for total investment of 2350.67 Crores with major investment in River Mulla Mutha Nature Tourism and Kasba-Peth Upgradation

Table 11-9: Heritage and Tourism Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
	Heritage Conservation and Tourism				2,350.67	1,015.42	764.00	571.25
1	Mahatma Phule Mandi and Tulshibaug Area Revitalization Project	91	ha	8,700,000	791,700,000	791,700,000	-	-
2	Tambat Ali (Coppersmiths' lane) Conservation and Redevelopment Project	1	KM	100,000,000	100,000,000	100,000,000	-	-
4	Provision of tourist Buses	25	No	2,000,000	450,000,000	135,000,000	135,000,000	180,000,000
5	Audio visual show at Lal Mahal	1	LS	30,000,000	1,000,000,000	500,000,000	500,000,000	-
6	Revitalization of Shaniwar Wada and light and sound show	1	LS	100,000,000	50,000,000	25,000,000	25,000,000	-
7	Restoration of Bhidewada and Museum	1000	Sqm	50,000	30,000,000	30,000,000	-	-
8	Punewadi to Punyanagri exhibition phase-3	1	LS	10,000,000	100,000,000	-	100,000,000	-
9	Heritage walk development including railing footpath and beautification	5	KM	50,000,000	50,000,000	50,000,000	-	-
10	Signage & street scape for old Gaothan in heritage zone	5	KM	10,000,000	10,000,000	10,000,000	-	-
11	Conservation and Restoration of Mahatma	2	sq.km	250,000,000	250,000,000	125,000,000	-	125,000,000

**REVISED CITY DEVELOPMENT PLAN FOR PUNE - 2041,
MAHARASHTRA, UNDER JNNURM**



Pune Municipal Corporation
e-Governance, to serve citizens better.

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
	Heritage Conservation and Tourism				2,350.67	1,015.42	764.00	571.25
	Phule Mandai Pricinct							
12	Structural audit and fire fighting system for heritage structure	150	No	2,500,000	50,000,000	50,000,000	-	-
13	Preparation of various museum - coins, stamps, music , dance etc.	1	LS	100,000,000	500,000,000	500,000,000	-	-
14	Commencement of Freedom Fighter Museum at Nanawada	1	LS	50,000,000	375,000,000	187,500,000	150,000,000	37,500,000
15	Heritage park at Decan College	500	Sqm	10,000	100,000,000	-	100,000,000	-
16	Industrial Museum	1000	Sqm	50,000	50,000,000	50,000,000	-	-
17	Fire fighting machinery museum	1	LS	50,000,000	50,000,000	50,000,000	-	-
18	Microfilming & Municipal achieves museum	1	LS	100,000,000	5,000,000	5,000,000	-	-
19	Trishund to Nageshwar mandir precinct development	1	LS	100,000,000	50,000,000	50,000,000	-	-
20	Heritage house at Vishrambagwada	1	LS	50,000,000	50,000,000	50,000,000	-	-
21	Heritage Village at east of Pune	25000	sqm	20,000	100,000,000	-	-	100,000,000
22	Heritage Village at west of Pune	25000	sqm	20,000	100,000,000	100,000,000	-	-
23	Area development of Mahadji Shinde Chatri,Wanvadi	1	sq.km	250,000,000	50,000,000	50,000,000	-	-
24	Conservation and redevelopment of Bhairoba pumping station	4000	sqm	25,000	50,000,000	-	50,000,000	-
25	Conservation of katraj to shanivar wada water supply scheme	10	km	50,000,000	50,000,000	50,000,000	-	-
26	Development and beautification of Ramtekdi	5	sq.km	20,000,000	50,000,000	50,000,000	-	-
27	Palkhi Vithoba redevelopment heritage campus of intangible heritage at Nanapeth	5000	sqm	10,000	500,000,000	-	-	500,000,000
28	Library of reference books on pune at Vishrambagwada	1	LS	20,000,000	500,000,000	500,000,000	-	-
29	Survey and documentation of all heritage sites in Pune city	500	No	40,000	250,000,000	-	-	250,000,000
30	conservation and restoration of heritage	100	No	10,000,000	100,000,000	100,000,000	-	-

**REVISED CITY DEVELOPMENT PLAN FOR PUNE - 2041,
MAHARASHTRA, UNDER JNNURM**



Pune Municipal Corporation
e-Governance, to serve citizens better.

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
	Heritage Conservation and Tourism				2,350.67	1,015.42	764.00	571.25
	site in new villages							
31	Khadakvasala natural heritage conservation and development	5	sq.km	70,000,000	500,000,000	-	-	500,000,000
32	Conservation and restoration of temple in pune city	150	No	5,000,000	100,000,000	-	-	100,000,000
33	acquisition of heritage properties	5	No	100,000,000	50,000,000	50,000,000	-	-
34	Heritage hotels and adaptive uses	2	No	100,000,000	50,000,000	50,000,000	-	-
35	Conservation and preservation of natural heritage sites i.e. lakes, hills, nallah, garden, grounds	5	No	50,000,000	20,000,000	20,000,000	-	-
36	Providing infrastructure for art/sculpture, open galleries at lake and river side	5	No	50,000,000	20,000,000	20,000,000	-	-
37	Light and sound show at Nanawada	1	No	20,000,000	1,000,000,000	200,000,000	400,000,000	400,000,000
38	Errection of cable car at Peshawe park to Parvati	1	No	500,000,000	350,000,000	100,000,000	100,000,000	150,000,000
39	River Boating , landscaping in Mutha River	10	KM	50,000,000	950,000,000	750,000,000	100,000,000	100,000,000
40	Pune by night for all heritage sites	1	LS	200,000,000	2,250,000,000	500,000,000	750,000,000	1,000,000,000
41	Strengthen of heritage cell/department	1	LS	50,000,000	950,000,000	200,000,000	250,000,000	500,000,000
42	Errection of cable car at Ramtekdi	1	No	100,000,000	1,750,000,000	250,000,000	500,000,000	1,000,000,000
43	Revival of Mula Mutha River –Nature tourism	25	KM		350,000,000	100,000,000	100,000,000	150,000,000
44	Infrastructure Development & construction of historical monuments (Integrated heritage plan)	250	Sq.km	10,000,000	20,000,000	20,000,000	-	-
45	Tourism Marketing	30.0	years	15,000,000	500,000,000	-	500,000,000	-
46	Miniature model of pune city	1	LS	50,000,000	5,640,000,000	2,820,000,000	2,820,000,000	-
47	Museum walk	1	LS	50,000,000	200,000,000	50,000,000	50,000,000	100,000,000
48	Educational institute walk	1	LS	50,000,000	50,000,000	20,000,000	10,000,000	20,000,000
49	Municipal Project Walk	1	LS	50,000,000	100,000,000	100,000,000	-	-
50	Training and awareness program for heritage work	1	LS	50,000,000	20,000,000	20,000,000	-	-
51	Freedom fighter walk	4	KM	5,000,000	75,000,000	75,000,000	-	-

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
	Heritage Conservation and Tourism				2,350.67	1,015.42	764.00	571.25
52	Cycle Tour	15	KM	5,000,000	125,000,000	125,000,000	-	-
53	Garden Tour	25	KM	5,000,000	125,000,000	125,000,000	-	-
	Total				2,500,000,000	1,000,000,000	1,000,000,000	500,000,000

Based on Disaster management strategies discussed in the relevant section of the CDP, projects relating to technological intervention have been envisaged for enabling PMC in mitigating risk hazards. Total investment for Disaster Management projects has been estimated at Rs. 695 Crores .

Table 11-10: Disaster Management Projects and Investment Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
11	DISASTER MANAGEMENT				695.58	216.45	216.94	262.20
1	Establishment of Emergency Operation Centre - in 5 Prabhags consolidated (76/3 + 5 Additional in third phase)	30	No	7,500,000	225,000,000	93,750,000	93,750,000	37,500,000
2	Establishment of Central Control Room for integrated operation of Emergency Operation Centres based on the GOVERNMENT OF INDIA, PLANNING COMMISSION, REPORT OF THE WORKING GROUP ON, DISASTER MANAGEMENT, FOR THE ELEVENTH FIVE YEAR PLAN 2007-12	Centralized Operation	Nos.	550,000,000	550,000,000	550,000,000	-	-
2a	Health & Psycho Support Centre Setting Up of Hazardous Disease and epidemic containment cell in connection with the EOC and other installed systems	1	Nos.	110,000,000	-	-	-	-
2b	Flood Control & Drought Management Setting Up of Flood Control cell in connection with the EOC and other installed systems	1	Nos.	110,000,000	-	-	-	-
2c	CBRN (Chemical Biological Radioactive and Nuclear Industrial Hazard) Mitigation Centre Setting Up of Human Created Disasters (eg. riots, terrorist attacks) cell in connection with the EOC and other installed systems	1	Nos.	110,000,000	-	-	-	-
2d	Earthquake & Natural Disaster Center Setting Up of Earthquake Response cell in connection with the EOC and other installed systems	1	Nos.	110,000,000	-	-	-	-
2e	Setting Up of Central Co-ordination Cell covering other disasters and calamities not covered individually cell in connection with the EOC	1	Nos.	110,000,000	-	-	-	-



	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
11	DISASTER MANAGEMENT				695.58	216.45	216.94	262.20
	and other installed systems NOTE: The cells specified here can change subject to the final DPR preparation and its outcome. These are indicative and may depend on the criticality of the emergency as perceived after detailed studies and analysis.							
3	Advanced Surveillance Systems - CCTV Monitoring System for Corporation Building, Major Junctions, Highly vulnerable sites of land slides, water bodies, dense public places, railway stations, bus-stands etc.	1,108	No	300,000	332,400,000	166,200,000	166,200,000	-
3a	Transportation Terminals - Railway Stations and Bus Stands and Bus Stops	46	-	-	-	-	-	-
3b	Major Road Junctions, Round About (Pune Traffic Police Website)	336	-	-	-	-	-	-
3c	Major Government Buildings (courts, hospitals, divisional offices etc.)	310	-	-	-	-	-	-
3d	Major Public Places and Religious spots	236	-	-	-	-	-	-
3e	Potential sites with vulnerability to natural calamity like land slides, flooding	180	-	-	-	-	-	-
4	Geospatial Location Accountability and Navigation System for Emergency Responders (GLANSER) & One device	12	Nos.	1,100,000	13,200,000	3,960,000	3,960,000	5,280,000
5	Establishment of 23 Fire Stations - infrastructures including, fire extinguishers, ladders, water hose pipes, fire tenders, vehicles for carrying staff and equipments	23	No	180,000,000	4,140,000,000	828,000,000	1,242,000,000	2,070,000,000
6	Procurement of Mobile Communication Vehicles integrated with GPS, GIS and GLASNER and IVRS systems and Operative for 24 Hours to respond multiple hazard situations compatible with the HFA guidelines	2	Nos.	9,000,000	18,000,000	18,000,000	-	-
7	Procurement of Emergency Response Vehicles operative for 24 Hours to respond to multiple hazard situations compatible with the HFA (Hyogo Framework for Action)	10	Nos.	7,500,000	75,000,000	37,500,000	37,500,000	-
8	Flood Response & Rescue System Procurement and Setting Up of Flood Response Center connected with the EOCs along with procurement of Emergency Rescue Boats through water route (subsequent to development of the Mula-Mutha	4	Nos.	15,000,000	60,000,000	-	30,000,000	30,000,000



	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
11	DISASTER MANAGEMENT				695.58	216.45	216.94	262.20
	River for accessibility).							
9	Automatic Weather Warning System Establishment of Community Based Early Warning System Integration of Early Warning System with National Level designated Authority (MHA, EOC, NDMA etc.), State Level Authority (IMD etc.), District EOC etc. for each ward and controlled from each fire station.	30	Nos.	1,800,000	54,000,000	21,600,000	16,200,000	16,200,000
10	Central Data Center and Online Disaster Information System	-	-	-	-	-	-	-
10a	Web Enabled system for access to inventory of resources for various disasters Including setting up of server, licences, system integration with other disaster management and data centers etc.	1	Nos.	30,000,000	30,000,000	15,000,000	15,000,000	-
10b	Establishment of Central Data Center for collection and transmission of information relating to Maps, User Ready Data, Building Plans (Municipal Buildings) etc. - for Vulnerability Assessment, Disaster Preparedness, Dissemination of Information, Development of action modules etc.	2	Nos.	50,000,000	100,000,000	50,000,000	50,000,000	-
11	Capacity Building and Training for Emergency Response for various disasters including but not limited to Earth Quake, Fire Hazard, Safety, Health, Riot, Floods etc. in co-ordination/facilitation with NRDF, Army, Administrative Authority as a part of Priority Action Plan as per Hyogo Framework for PMC Officials, Employees etc.	29	Annual	8,500,000	135,000,000	27,000,000	67,500,000	40,500,000
12	Capacity Building and Training for Emergency Response for various disasters including but not limited to Earth Quake, Fire Hazard, Safety, Health, Riot, Floods etc. in co-ordination/facilitation with NRDF, Army, Administrative Authority as a part of Priority Action Plan as per Hyogo Framework for Schools, Educational Institutes, General Public	29	Annual	10,000,000	135,000,000	27,000,000	67,500,000	40,500,000
13	Mock Drill and Training program and development of annual program under the Hyogo Framework for all the departmental officials etc.	29	Annual	13,600,000	215,738,064	64,721,419	86,295,226	64,721,419
14	Mock Drill and Training program and development of annual program under the Hyogo Framework for all educational institutions, residential colonies etc.	29	Annual	20,000,000	317,261,859	95,178,558	126,904,744	95,178,558
15	Annual Safety Audit and Disaster Mitigation Studies through Creation of a Disaster Recovery Fund under all the departments and (As per	29	Annual	35,000,000	555,208,254	166,562,476	166,562,476	222,083,302



	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
11	DISASTER MANAGEMENT				695.58	216.45	216.94	262.20
	the March 2012 Report, Oct 12 MoM) in all the wards, clusters, prabhags etc. for PMC Buildings, Public Trnspotation, Structures in Public Spaces etc. These safety audits shall cover all the potential disasters impacting specified type of space, building, structure etc.							
	Total				6,955,808,178	2,164,472,453	2,169,372,446	2,621,963,279

As per the mandatory and optional reforms of JNNURM, PMC has successfully achieved migration to double entry accounting system, reporting and record keeping systems, governance mechanisms, grievance redressal systems etc. There is however a need felt in integration of these reforms at implementation level. Projects relating to such issues have been included in the CIP and an estimated investment f Rs. 582 Crores is required during Phase-1 to enable the corporation in upgrading governance and financial management mechanisms.

Table 11-11: Municipal Finance and Governance Projects and Investemnt Phasing

	Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
12	Institutional frame work, Municipal Finance and Governance				572.50	372.50	200.00	-
1	ERP system	LS			30,000,000	30,000,000		
	Server Infrastructure Cost							
	MIS establishment (License Cost , Hospital Management System , Fleet Management System , GIS							
2	Computer infrastructure	LS			120,000,000	120,000,000		
	IT infrastructure, cabling, website, customer care				1,325,000,000	1,325,000,000		
3	DPR for Smart city programme	LS			150,000,000	150,000,000		
4	Smart City Programme - Pilot Project	LS			4,000,000,000	2,000,000,000	2,000,000,000	
	Smart Buildings							
	Smart Governance							
	Smart Transport and mobility							
	Smart Economy							
5	conversion of existing hard data to soft data (from 2001)	LS			100,000,000	100,000,000		
	Total				5,725,000,000	3,725,000,000	2,000,000,000	

Projects that fall separate from the above categories and which are treated in a different manner have been classified as special projects since the

implementation frameworks and the stakeholders involved in such projects differ than those for the projects listed in categories above. Special projects are highly capital intensive projects identified to be critically important by PMC and other stakeholders for Pune City. Total estimated capital investment for special projects is 18,014 Crores which includes Metro Rail Project, HCMTR project and Water System Projects.

Table 11-12: Special Projects and Investment Phasing

Proposed Projects	Quantity	Unit	Unit Rate (Rs)	Total Cost	2012-21	2021-31	2031-41
Special Projects				18,014.00	10,364.00	7,650.00	-
Development of HCMTR with average width of 24-30 m							
Total Length	34	km	700,000,000	23,800,000,000	23,800,000,000		
Development of Metro rail System as suggested by DMRC - Phase 1	31.5	km		79,840,000,000	79,840,000,000		
Corridor 1 (PCMC to Swargate)							
Corridor 2 (Vanaz to Ramwadi)							
Metro Phase -2	45	KM	1,700,000,000	76,500,000,000		76,500,000,000	
				180,140,000,000	103,640,000,000	76,500,000,000	-

11.5 CIP FOR PROPOSED 28 VILLAGES TO BE ADDED TO PMC (TENTATIVE IMMEDIATE REQUIREMENT)

The Pune Municipal Corporation has proposed to include 28 villages from its surrounding areas to be added to its boundaries. The inclusion of these villages will bring an extra burden for the provision of basic infrastructure facilities on the Corporation which will include extra expenditure. Since the data for these villages is not readily available with the authorities, the tentative expenditure based on the block cost which is required with immediate effect is given as below.

	Sector	Total Cost in Rs. Crores
1	Water Supply	70.99
2	Sewerage	240.65
3	Roads	473.57
4	Drainage	360.81
	Total	1146.02

12 FINANCIAL OPERATING PLAN

Financial and Operating Plan (FOP) for PMC provides understand and examines the financial feasibility and sustainability aspect in the context of not only the fiscal management at the urban local bodies (ULB) level, but also the institutional arrangements for state-local, and center-state fiscal transfers, and the fiscal capacities of the state and central governments.

The FoP is essentially a multi-year forecast similar to the CIP period and provides the year over year picture of finances of the ULBs to plan for phased or termed strategy. As very well known that funding under the JNNURM might drastically change and cannot be estimated at this point of time therefore it is assumed that similar grants might be provided by the center and state to sustain the highly capital intensive projects. The FOP deals with the pattern of financing the new investment that considers alternative sources of financing the vision and the accompanying strategy and programs. The past financial data of the PMC is used to assess the performance of PMC under different heads. A spreadsheet FOP model has been customized so as to work out the ultimate investment sustaining capacity of the corporation, based on the FOP assumptions.

The FOP accounts for multiple unprecedented and deep impacting changes like Abolition of Octroi and its comparison with Local Body Tax (As per the LBT Act 2010 – Maharashtra State Government), completion of JNNURM etc. The financial results (audited, unaudited, budgeted) have been analyzed in the Governance and Municipal Finance section of the CDP and has thus been used as a basis to determine past trends in revenue and expenditure and arriving at appropriate growth assumptions for each of the income and expense items. It is essential to understand that based on theoretical and empirical studies a similar growth rate cannot sustain/ cannot be considered for long term plans and thus needs to be normalized based on national indices of CPI published by the competent authority (Directorate of Income Tax, Reserve Bank of India, Ministry of Finance etc.). The FOP helps to assess the investment-sustaining capacity of the Corporation, in order to strategize the funding pattern and sources of fund for sustaining itself and the needs of its citizens. For preparation of this FOP basic assumption of the JNNURM has been continued in absence of any other existing benchmark/sources and the project funding structure comprises of grants either of continued JNNURM framework or substitute source. The reserves/surplus/deficits and operating ratios, debt servicing ratios etc. provide the understanding of operational capacity of the ULB.

Traditional mechanism of working out the revenue and capital account has been adopted with revenue income heads comprising of:

- Tax Revenues – Property Tax, Water Tax (Metered / Fixed), Other Taxes, Local Body Tax vs. Octroi
- Non Tax Sources – Rental from municipal properties, receipts from other services, interest income, Grants, Contribution and Subsidies

While Revenue Expenditure heads comprising of:

- Establishment Expenditure, O&M Expenditure, Administrative Expenditure
- Repairs and Maintenance expenditure of Infrastructure and Civic Amenities
- Debt Servicing and Interest payments, miscellaneous expenses



12.1 BASE LINE PROJECTIONS AND FINANCING ASSUMPTIONS

As discussed earlier the revenue and expenditure need to be assessed based on assumption of income and expenditure from the traditional heads of accounts under municipal finance and new heads of revenue brought in by the CIP. These heads are to be assessed based on the past performance and expected future changes due to change in policy environment, change in laws, change in investment climate, change in need of the city infrastructure etc. The FOP tries to capture these areas and provide for a long term financing strategy. In cases of reserves/surplus the ULB can divert the fund in creation of new assets and offset the debt burden by contributing the same as its share to the scheduled projects in subsequent fiscal year. Subsequent sections essentially provide the basic assumptions and ideas underling the preparation of the FOP (detailed spread sheet is placed at (Annexure -)).

12.1.1 Revenue Assumptions

Following are the assumption relating to the revenue income heads and proposed projects under the CIP that shall accrue income to PMC accounts.

Table 12-1: Revenue Assumptions

Assumptions Underlying Financial Projections				
1	Population			
	Existing Population	The present population of Pune Municipality is 3,115,431		
	Projected Population	Projected Population for 2041 8,597,417		
	Population Projection	Year	Years	Population
		2011		3,115,431
		2015	4	3,566,959
		2021	6	4,369,866
		2031	10	6,129,401
		2041	10	8,597,417
				Growth
				3.44%
				3.44%
				3.44%
				3.44%
				3.44%
2	Property Tax			
	Estimate of Number of Properties	The Number of properties as calculated assuming % of population @ 24%		
	Current Number of Assessments	The present number of property tax assessments is 699000 Nos.		
	Current Collection	The tax collection is around Rs. 54240.00 lakhs.		
	Collection Efficiency	The property tax collection efficiency is 93% with 90% coverage		
	Potential assessments	But there is potential for increasing the number of assessments to 751613 Nos.		
	Target Efficiency	The tax coverage is estimated to be improved to 98% over 5 years window		
	Estimated Collection @ Target Efficiency	The property tax collections can be improved to Rs. 58323 lakhs for current estimate		
	Tax Revision assumption	It is assumed that revision in property tax rates would be carried out @ 15% every 5 years		
3	Water Charges			
	Current Population coverage	Existing coverage of population by PMC 2700000 Nos.		
	Coverage Efficiency	94% Coverage of PMC household		
	Current Demand	Current Water supply requirement 671 MLD		
	Estimated Demand by 2041	Expected to increase up to 1827 MLD		
	Demand Growth	%age Growth 8.0%		
	Property Types	Domestic	19253	Nos.



Assumptions Underlying Financial Projections					
		Commercial	11922	Nos.	Commercial split into Commercial and industrial in the ratio of 80% : 20%
		Industrial / Government	2980	Nos.	
	Water Tariff Revision	It is assumed that the water charges shall be increased by 15% every 5 years			
	Metered Water Connection Coverage	It is assumed that the corporation shall endeavor 100% connections to metered connections in 10 Years window from current level. Shifting Water Charges from Property Tax component to Metered Water Charges (User Charges) in Phase-1			
	Water Revenue Collection Efficiency	100% collection efficiency in 5 Years from current estimate of 85%			
	Revision of Water Tariff	Every 5 Years by 15%			
	Water Revenue Increment	Linear Increment over 5 Years on collection by minimizing loses by 15% over 5 years ⁹			
4	Octroi and Toll vs. Local Body Tax				
	5 Year Growth Rate	Octroi is estimated to grow at a CAGR of 15%			
	Local Body Tax	LBT due to absence of any established precedence is assumed to be maintained at the collection level of Octroi and growing at CAGR and normalized after 5 year window			
	Estimated existing Leakage in Octroi Revenue	20% proposed to be reduced by 3% annually through systemic introduction of LBT And its coverage			
5	Other Tax				
	Assumption for Growth	Income from Other Tax is assumed to increase @ CAGRO of 2.00% per annum. Normalized after 5 years			
6	Sewerage Charges				
	Sewerage Charges	PMC already collecting Sewerage charges as part of property tax. So no separate projection is required and estimated at increased efficiency as PT. Revision of connection charges @ 15% every 5 Years			
7	Solid Waste Management Scheme				
	Solid Waste Generation	It has been estimated that solid waste generation per day by 2041, shall be around 4351 MTs.			
	Bio-Degradable Component	The bio degradable waste out of the same shall be 1/3rd and the manure generation from bio degradable waste would be equal to 1/3rd which works out to 483 MTs			
	Bio-degradable growth rate	The same shall increase @3.44% per annum			
	Waste Management Revenue	The revenue from solid waste disposal shall be Rs. 700 per MT.			
	Revenue Growth	The same shall increase by Rs. 200.00 every 5 years.			
	Scheme Coverage	The number of assets covered by solid waste management scheme shall be equal to 70% of property tax assessments.			
		The income from Solid Waste Management shall accrue to the PPP Operator up to 2038-39 and thereafter to the Municipal Corporation.			
8	Bus Terminals				
	Project Commencement Date	Start Date 01.04.2014			
	Estimated Revenue	The Bus Terminals shall earn rental income of Rs. 200 lakhs per annum.			
	Revenue Escalation	The same shall increase @ 5% per annum			
	Rental Income From Terminal	Besides the Terminals shall comprise shops which shall earn rental income @ 3000 Rs./Month for 250 Shops			
	Rent Escalation	The Rent shall increase @ 5% per annum.			

⁹ IDFC Infrastructure Report 2011 – Policy and Performance for Sustainable Development



Assumptions Underlying Financial Projections		
9	Construction of Transport Nagar (Basic infra for long term lease)	
	Project Commencement Date	01.04.2014
	Rental Income from the shops constructed	The Transport Nagar shall comprise of 1500 shops @ 5000 Rs./Month rental escalating at 5% per annum
10	Other Existing Income	
	It is estimated that the other existing income of the Municipal Council shall grow as below for 6 years	
	Rental Income from Municipal Properties	13% per annum
	Fees and User Charges	3% per annum
	Sale of Forms & Publications	37% per annum
	Interest Income	3% per annum
	Revenue Grants, Contribution & Subsidies Received	19% per annum
	Other Income	11% per annum
	Normalized Revenue Income Growth Rate	5.8% per annum Based on Average GDP growth rate for last 5 years

12.1.2 Expenditure Assumptions

Following are the assumption underlying the expenditure assumption of the FOP calculations.

Table 12-2: Expenditure Assumptions

Assumptions Underlying Financial Projections			
1	Expenditure		
	All expenditure are assumed to increase to increase as under for 5 Years period		
	Expenditure Heads		
		Establishment Expenses	13% per annum
		Administrative Expenses	19% per annum
		Operation & Maintenance	19% per annum
		Repairs & Maintenance Expenses Infrastructure Assets	18% per annum
		Repairs & Maintenance Civic Amenities	8% per annum
		Interest and Finance Charges	14% per annum
		Program Expenses	15% per annum
		Revenue Grants, Contribution & Subsidies	18% per annum
		Miscellaneous Expenses	7% per annum
2	Operation & Maintenance		
	The operation & maintenance of new projects shall be as below		
		Water Supply	3% of Capital Cost
		Sewerage	6% of Capital Cost
		Drainage	5% of Capital Cost
		Solid Waste Management	12% of Capital Cost
		Urban Transportation	3% of Capital Cost
		Housing & Slums	2% of Capital Cost
		Urban Environment	3% of Capital Cost
		Heritage & Tourism	4% of Capital Cost
		Disaster Management	2% of Capital Cost
	Increase in O&M Costs	5.60% per annum after 5th year – Normalized based on 10 years average inflation Index	
3	Interest		
	Interest on loan has been provided based on the sanction rate for each loan. Repayments of loans are based on the repayment schedule of each loan. It is assumed that all new loans shall carry interest rate of 11.2% P.A		
	Loan Term	The new loan shall be repaid over a period of 20 Years with a moratorium of	



Assumptions Underlying Financial Projections					
		5 Years			
5	Funding Pattern :				
	JNNURM Scheme/ Equivalent Grant to offset drastic variation	Central Govt. 50%	State Govt. 20%	PMC + Loan 30%	
6	Depreciation				
	Depreciable Asset Base	70% assets are assumed to be depreciable i.e. 16807.46 Crore of asset base of the CIP is Depreciable (PMC Component)			
		Category	Book Depreciation Rate	Depreciable Asset Value (constant price) of total assets	Weighted Average
		Building / Other Expenses Capitalized	1.63%	11765.22	70%
		Furniture & Fixtures/Office Equipment's	20.00%	1008.45	6%
		Electrical, Electromechanical Components	4.75%	1680.75	10%
		Computers & Software, IT Assets	16.21%	1008.45	6%
		Other Capitalized Costs (PMC Consultancy, IDC, Contingency etc.)	5.22%	1344.60	8%
					4.20%
	Inflation for fixed asset base (70% of the CIP)	15% YoY based on the DSR Assumption			
	Inflation for non-fixed asset base (30% of the CIP covering all the project development costs, contingencies, IDC etc.)	9.01% (Cost inflation indices for last 5 Yr. average)			

ANNEXURE 1: FOP (A TO F)

A. Means of Finance

(Rs. in lakhs)

S.No.	Particulars	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 29	Total
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2026-2027	2031-2032	2036-2037	2040-2041	
1	Water Supply Projects														
	Total Project Cost	36890.99	36890.99	44269.19	51647.39	47958.29	55336.49	51647.39	51647.39	29.54	27.57	29.54	27.57	19.69	376741.10
	TPC - DSR Inflation (Fixed Asset)	25809.91	25809.91	30971.89	36133.87	33552.88	38714.87	36133.87	36133.87	0.00	0.00	0.00	0.00	0.00	263261.08
	TPC - Annual Inflation Index	11081.08	11081.08	13297.30	15513.52	14405.41	16621.63	15513.52	15513.52	29.54	27.57	29.54	27.57	19.69	113480.02
	Add : Price Inflation @ DSR	15.00%	34133.61	39253.65	54170.03	72678.13	77609.86	56692.44	55876.07	59005.13	0.00	0.00	0.00	0.00	449418.92
	Add : Price Inflation @ 5 Yr. Avg	9.01%	13167.85	14354.28	18777.11	23880.42	24172.62	24340.02	23989.52	25332.94	50.94	62.43	87.84	107.66	169380.30
	Total		47301.46	53607.92	72947.15	96558.55	101782.47	81032.46	79865.60	84338.07	50.94	62.43	87.84	107.66	618799.22
	Means of Finance														
	Loan	7095.22	8041.19	10942.07	14483.78	15267.37	12154.87	11979.84	12650.71	7.64	9.37	13.18	16.15	14.34	92819.88
	Grant	33111.02	37525.55	51063.00	67590.98	71247.73	56722.72	55905.92	59036.65	35.66	43.70	61.49	75.36	66.94	433159.45
	Municipality Own Funds	7095.22	8041.19	10942.07	14483.78	15267.37	12154.87	11979.84	12650.71	7.64	9.37	13.18	16.15	14.34	92819.88
	Total		47301.46	53607.92	72947.15	96558.55	101782.47	81032.46	79865.60	84338.07	50.94	62.43	87.84	107.66	618799.22
2	Sewerage														
	Total Project Cost	6738.10	6738.10	8085.72	9433.34	8759.53	10107.15	9433.34	9433.34	0.00	0.00	0.00	0.00	0.00	68728.62
	TPC - DSR Inflation (Fixed Asset)	4699.52	4699.52	5639.42	6579.33	6109.38	7049.28	6579.33	6579.33	0.00	0.00	0.00	0.00	0.00	47935.10
	TPC - Annual Inflation Index	2038.58	2038.58	2446.30	2854.01	2650.15	3057.87	2854.01	2854.01	0.00	0.00	0.00	0.00	0.00	20793.52
	Add : Price Inflation @ DSR	15.00%	6215.12	7147.38	9863.39	13233.38	14131.36	10322.67	10174.03	10743.77	0.00	0.00	0.00	0.00	81831.09
	Add : Price Inflation @ 5 Yr. Avg	9.01%	2422.48	2640.75	3454.41	4393.27	4447.02	4477.82	4413.34	4660.48	0.00	0.00	0.00	0.00	30909.57
	Total		8637.60	9788.13	13317.80	17626.64	18578.38	14800.49	14587.36	15404.26	0.00	0.00	0.00	0.00	112740.66
	Means of Finance														
	Loan	1295.64	1468.22	1997.67	2644.00	2786.76	2220.07	2188.10	2310.64	0.00	0.00	0.00	0.00	0.00	16911.10
	Grant	6046.32	6851.69	9322.46	12338.65	13004.87	10360.34	10211.16	10782.98	0.00	0.00	0.00	0.00	0.00	78918.46
	Municipality Own Funds	1295.64	1468.22	1997.67	2644.00	2786.76	2220.07	2188.10	2310.64	0.00	0.00	0.00	0.00	0.00	16911.10
	Total		8637.60	9788.13	13317.80	17626.64	18578.38	14800.49	14587.36	15404.26	0.00	0.00	0.00	0.00	112740.66
3	Drainage														
	Total Project Cost	10730.10	10730.10	12876.12	15022.14	13949.13	16095.15	15022.14	15022.14	6749.55	6299.58	0.00	0.00	0.00	161193.57
	TPC - DSR Inflation (Fixed Asset)	7483.77	7483.77	8980.52	10477.28	9728.90	11225.66	10477.28	10477.28	4701.06	4387.66	0.00	0.00	0.00	112375.91
	TPC - Annual Inflation Index	3246.33	3246.33	3895.60	4544.86	4220.23	4869.50	4544.86	4544.86	2048.49	1911.92	0.00	0.00	0.00	48817.66
	Add : Price Inflation @ DSR	15.00%	9897.29	11381.88	15706.99	21073.55	22503.54	16438.38	16201.67	17108.96	8106.53	9935.54	0.00	0.00	210075.49
	Add : Price Inflation @ 5 Yr. Avg	9.01%	3857.67	4205.25	5500.97	6996.04	7081.64	7130.69	7028.00	7421.57	3532.43	4329.42	0.00	0.00	83978.72
	Total		12750.77	13899.62	18182.37	23124.03	23406.97	23569.07	23229.68	24530.54	11638.96	14264.95	0.00	0.00	277213.13
	Means of Finance														
	Loan	1912.62	2084.94	2727.35	3468.60	3511.05	3535.36	3484.45	3679.58	1745.84	2139.74	0.00	0.00	0.00	41581.97
	Grant	8925.54	9729.73	12727.66	16186.82	16384.88	16498.35	16260.77	17171.38	8147.27	9985.47	0.00	0.00	0.00	194049.19
	Municipality Own Funds	1912.62	2084.94	2727.35	3468.60	3511.05	3535.36	3484.45	3679.58	1745.84	2139.74	0.00	0.00	0.00	41581.97
	Total		12750.77	13899.62	18182.37	23124.03	23406.97	23569.07	23229.68	24530.54	11638.96	14264.95	0.00	0.00	277213.13
4	Solid Waste Management														
	Total Project Cost	3597.33	3597.33	4316.80	5036.26	4676.53	5395.99	5036.26	5036.26	2131.71	1989.60	2942.98	2746.78	1961.99	75598.77
	TPC - DSR Inflation (Fixed Asset)	2465.63	2465.63	2958.76	3451.88	3205.32	3698.45	3451.88	3451.88	1452.82	1355.97	2020.71	1886.00	1347.14	51779.89
	TPC - Annual Inflation Index	1131.70	1131.70	1358.04	1584.38	1471.21	1697.55	1584.38	1584.38	678.89	633.63	922.27	860.79	614.85	23818.88
	Add : Price Inflation @ DSR	15.00%	3260.80	3749.92	5174.88	6942.97	7414.10	5415.85	5337.86	5636.78	2505.26	3070.50	6008.74	7364.44	126705.57
	Add : Price Inflation @ 5 Yr. Avg	9.01%	1344.82	1465.99	1917.69	2438.88	2468.72	2485.82	2450.02	2587.22	1170.68	1434.81	2742.44	3361.19	55661.79

S.No.	Particulars	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 29	Total
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2026-2027	2031-2032	2036-2037	2040-2041	
	Total	4605.61	5215.90	7092.57	9381.85	9882.82	7901.67	7787.89	8224.01	3675.94	4505.31	8751.17	10725.62	9526.87	182367.36
	Means of Finance														
	Loan	321.88	364.54	495.69	655.69	690.70	552.24	544.29	574.77	159.83	195.89	546.38	669.65	594.81	11148.43
	Grant	1502.12	1701.17	2313.24	3059.89	3223.28	2577.13	2540.02	2682.26	745.87	914.16	2549.75	3125.03	2775.76	52026.02
	Municipality Own Funds incl.	321.88	364.54	495.69	655.69	690.70	552.24	544.29	574.77	159.83	195.89	546.38	669.65	594.81	11148.43
	PPP	2459.73	2785.66	3787.94	5010.58	5278.13	4220.05	4159.29	4392.21	2610.40	3199.37	5108.67	6261.30	5561.50	108044.47
	Total	4605.61	5215.90	7092.57	9381.85	9882.82	7901.67	7787.89	8224.01	3675.94	4505.31	8751.17	10725.62	9526.87	182367.36
5A	Urban Roads, Traffic and Transportation														
	Total Project Cost	56334.96	56334.96	66564.55	77658.64	72111.60	83205.69	77658.64	77658.64	85327.44	78832.08	34758.00	32440.80	23172.00	1483283.86
	TPC - DSR Inflation (Fixed Asset)	38829.32	38829.32	46595.19	54361.05	50478.12	58243.98	54361.05	54361.05	59124.06	55182.45	24330.60	22708.56	16220.40	1035878.10
	TPC - Annual Inflation Index	16641.14	16641.14	19969.37	23297.59	21633.48	24961.71	23297.59	23297.59	25338.88	23649.62	10427.40	9732.24	6951.60	443947.76
	Add : Price Inflation @ DSR	15.00%	51351.78	59054.54	81495.27	109339.49	116758.95	85290.07	84061.89	88769.36	101953.80	124956.76	72348.78	88672.21	2391150.54
	Add : Price Inflation @ 5 Yr. Avg	9.01%	19774.96	21556.69	28198.73	35862.68	36301.49	36552.89	36026.53	38044.01	43694.48	53552.90	31006.62	38002.38	987330.48
	Total	66943.85	72975.49	93995.78	119542.27	121004.95	121842.96	120088.42	126813.37	147139.03	178509.66	103355.39	126674.59	112516.74	3296313.75
	Means of Finance														
	Loan	10041.58	10946.32	14099.37	17931.34	18150.74	18276.44	18013.26	19022.01	22070.85	26776.45	15503.31	19001.19	16877.51	494447.06
	Grant	46860.69	51082.84	65797.05	83679.59	84703.47	85290.07	84061.89	88769.36	102997.32	124956.76	72348.78	88672.21	78761.72	2307419.62
	Municipality Own Funds incl.	10041.58	10946.32	14099.37	17931.34	18150.74	18276.44	18013.26	19022.01	22070.85	26776.45	15503.31	19001.19	16877.51	494447.06
	Total	66943.85	72975.49	93995.78	119542.27	121004.95	121842.96	120088.42	126813.37	147139.03	178509.66	103355.39	126674.59	112516.74	3296313.75
5B	Construction of Transport Nagar (Basic infra for long term lease)														
	Total Project Cost	864.50	864.50	0.00	0.00	0.00	0.00	0.00	0.00	864.50	0.00	0.00	0.00	0.00	3458.00
	TPC - DSR Inflation (Fixed Asset)	35.00	35.00	42.00	49.00	45.50	52.50	49.00	49.00	0.00	0.00	0.00	0.00	0.00	357.00
	TPC - Annual Inflation Index	15.00	15.00	18.00	21.00	19.50	22.50	21.00	21.00	0.00	0.00	0.00	0.00	0.00	153.00
	Add : Price Inflation @ DSR	15.00%	46.29	53.23	73.46	98.56	105.24	76.88	75.77	80.01	0.00	0.00	0.00	0.00	609.44
	Add : Price Inflation @ 5 Yr. Avg	9.01%	17.82	19.43	25.42	32.33	32.72	32.95	32.47	34.29	0.00	0.00	0.00	0.00	227.43
	Total	1027.30	1119.86	0.00	0.00	0.00	0.00	0.00	0.00	1490.75	0.00	0.00	0.00	0.00	5212.14
	Means of Finance														
	Loan														
	Grant														
	Municipality Own Funds														
	PPP	1027.30	1119.86	0.00	0.00	0.00	0.00	0.00	0.00	1490.75	0.00	0.00	0.00	0.00	5212.14
	Total	1027.30	1119.86	0.00	0.00	0.00	0.00	0.00	0.00	1490.75	0.00	0.00	0.00	0.00	5212.14
6	Housing and Slums														
	Total Project Cost	174072.43	174072.43	174072.43	174072.43	174072.43	174072.43	174072.43	174072.43	139257.95	139257.95	185677.26	185677.26	185677.26	4641931.59
	Annual Linear Housing Demand	26438	26438	26438	26438	26438	26438	26438	26438	26438	26438	31726	31726	31726	793148
	TPC - DSR Inflation (Fixed Asset)	121850.70	121850.70	121850.70	121850.70	121850.70	121850.70	121850.70	121850.70	97480.56	97480.56	129974.08	129974.08	129974.08	3249352.11
	TPC - Annual Inflation Index	52221.73	52221.73	52221.73	52221.73	52221.73	52221.73	52221.73	52221.73	41777.38	41777.38	55703.18	55703.18	55703.18	1392579.48
	Add : Price Inflation @ DSR	15.00%	161147.56	185319.69	213117.64	245085.29	281848.08	324125.30	372744.09	428655.70	394363.25	793205.35	2127225.72	4278610.73	53409675.17
	Add : Price Inflation @ 5 Yr. Avg	9.01%	62056.02	67647.27	73742.29	80386.47	87629.29	95524.69	104131.46	113513.71	98993.04	152382.94	312756.81	481435.90	6943304.10
	Total	206853.41	225490.90	245807.63	267954.90	292097.64	254904.46	269179.11	284253.14	240137.05	315339.78	552124.59	725031.18	901596.79	12295077.03
	Means of Finance														
	Loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grant	206853.41	225490.90	245807.63	267954.90	292097.64	254904.46	269179.11	284253.14	240137.05	315339.78	552124.59	725031.18	901596.79	12295077.03
	Municipality Own Funds	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PPP														
	Total	206853.41	225490.90	245807.63	267954.90	292097.64	254904.46	269179.11	284253.14	240137.05	315339.78	552124.59	725031.18	901596.79	12295077.03
7	Environment														

S.No.	Particulars	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 29	Total
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2026-2027	2031-2032	2036-2037	2040-2041	
	Total Project Cost	2167.90	2167.90	2601.48	3035.06	2818.27	3251.85	3035.06	3035.06	444.00	414.40	419.25	391.30	279.50	28730.83
	TPC - DSR Inflation (Fixed Asset)	1447.88	1447.88	1737.46	2027.03	1882.24	2171.82	2027.03	2027.03	210.00	196.00	210.00	196.00	140.00	17988.38
	TPC - Annual Inflation Index	720.02	720.02	864.02	1008.03	936.03	1080.03	1008.03	1008.03	234.00	218.40	209.25	195.30	139.50	10742.45
	Add : Price Inflation @ DSR	15.00%	1665.06	1914.82	2642.45	3545.29	3785.86	5023.55	5391.95	6200.74	738.75	1386.84	2988.67	5610.53	87009.15
	Add : Price Inflation @ 5 Yr. Avg	9.01%	784.89	855.61	1119.24	1423.44	1440.85	1812.32	1843.90	2010.03	508.64	730.77	1077.77	1548.44	29546.21
	Total	2449.96	2770.43	3761.70	4968.73	5226.72	6835.87	7235.84	8210.77	1247.40	2117.61	4066.44	7158.97	8571.01	116555.36
	Means of Finance														
	Loan	367.49	415.57	564.25	745.31	784.01	1025.38	1085.38	1231.62	187.11	317.64	609.97	1073.85	1285.65	17483.30
	Grant	1714.97	1939.30	2633.19	3478.11	3658.70	4785.11	5065.09	5747.54	873.18	1482.33	2846.51	5011.28	5999.71	81588.75
	Municipality Own Funds	367.49	415.57	564.25	745.31	784.01	1025.38	1085.38	1231.62	187.11	317.64	609.97	1073.85	1285.65	17483.30
	Total	2449.96	2770.43	3761.70	4968.73	5226.72	6835.87	7235.84	8210.77	1247.40	2117.61	4066.44	7158.97	8571.01	116555.36
8	Heritage Conservation and Tourism														
	Total Project Cost	10154.20	10154.20	12185.04	14215.88	13200.46	15231.30	14215.88	14215.88	11460.00	10696.00	8568.75	7997.50	5712.50	257126.59
	TPC - DSR Inflation (Fixed Asset)	6315.19	6315.19	7578.23	8841.27	8209.75	9472.79	8841.27	8841.27	7607.25	7100.10	5512.50	5145.00	3675.00	164999.69
	TPC - Annual Inflation Index	3839.01	3839.01	4606.81	5374.61	4990.71	5758.52	5374.61	5374.61	3852.75	3595.90	3056.25	2852.50	2037.50	92126.90
	Add : Price Inflation @ DSR	15.00%	7262.47	8351.84	11525.54	15463.43	16512.73	21911.13	23517.94	27045.63	26761.36	50238.22	78452.64	147276.53	1735996.27
	Add : Price Inflation @ 5 Yr. Avg	9.01%	4184.90	4561.96	5967.60	7589.49	7682.35	9662.92	9831.32	10717.12	8374.67	12031.96	15741.62	22616.10	337720.19
	Total	11447.37	12913.80	17493.13	23052.92	24195.09	31574.05	33349.26	37762.75	35136.04	62270.18	94194.26	169892.64	206802.69	2073716.46
	Means of Finance														
	Loan	1717.11	1937.07	2623.97	3457.94	3629.26	4736.11	5002.39	5664.41	5270.41	9340.53	14129.14	25483.90	31020.40	311057.47
	Grant	8013.16	9039.66	12245.19	16137.04	16936.56	22101.84	23344.48	26433.93	24595.23	43589.12	65935.98	118924.85	144761.88	1451601.52
	Municipality Own Funds	1717.11	1937.07	2623.97	3457.94	3629.26	4736.11	5002.39	5664.41	5270.41	9340.53	14129.14	25483.90	31020.40	311057.47
	Total	11447.37	12913.80	17493.13	23052.92	24195.09	31574.05	33349.26	37762.75	35136.04	62270.18	94194.26	169892.64	206802.69	2073716.46
9	Disaster Management														
	Total Project Cost	2164.47	2164.47	2597.37	3030.26	2813.81	3246.71	3030.26	3030.26	3254.06	3037.12	3932.94	3670.75	2621.96	77177.98
	TPC - DSR Inflation (Fixed Asset)	1248.81	1248.81	1498.57	1748.33	1623.45	1873.21	1748.33	1748.33	1737.34	1621.52	2266.93	2115.80	1511.29	43437.23
	TPC - Annual Inflation Index	915.67	915.67	1098.80	1281.93	1190.37	1373.50	1281.93	1281.93	1516.72	1415.60	1666.02	1554.95	1110.68	33740.75
	Add : Price Inflation @ DSR	15.00%	1436.13	1651.55	2279.14	3057.84	3265.34	4332.85	4650.59	5348.18	6111.75	11473.38	32262.42	60565.16	611188.22
	Add : Price Inflation @ 5 Yr. Avg	9.01%	998.17	1088.10	1423.37	1810.22	1832.36	2304.76	2344.93	2556.20	3296.87	4736.64	8581.03	12328.44	151045.22
	Total	2572.08	2803.83	3667.74	4664.57	4721.65	4754.35	4685.88	4948.29	5611.31	6877.35	11694.89	14333.51	12731.52	203100.72
	Means of Finance														
	Loan	514.42	560.77	733.55	932.91	944.33	950.87	937.18	989.66	1122.26	1375.47	2338.98	2866.70	2546.30	40620.14
	Grant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Municipality Own Funds incl.	2057.67	2243.06	2934.19	3731.66	3777.32	3803.48	3748.71	3958.63	4489.05	5501.88	9355.91	11466.81	10185.22	162480.58
	Total	2572.08	2803.83	3667.74	4664.57	4721.65	4754.35	4685.88	4948.29	5611.31	6877.35	11694.89	14333.51	12731.52	203100.72
10	Institutional frame work, Municipal Finance and Governance														
	Total Project Cost	3725.00	3725.00	4470.00	5215.00	4842.50	5587.50	5215.00	5215.00	3000.00	2800.00	0.00	0.00	0.00	60995.00
	TPC - DSR Inflation (Fixed Asset)	2085.00	2085.00	2502.00	2919.00	2710.50	3127.50	2919.00	2919.00	1800.00	1680.00	0.00	0.00	0.00	35067.00
	TPC - Annual Inflation Index	1640.00	1640.00	1968.00	2296.00	2132.00	2460.00	2296.00	2296.00	1200.00	1120.00	0.00	0.00	0.00	25928.00
	Add : Price Inflation @ DSR	15.00%	2397.75	2757.41	3805.23	5105.35	5451.78	7234.10	7764.60	8929.29	6332.18	11887.19	0.00	0.00	140004.71
	Add : Price Inflation @ 5 Yr. Avg	9.01%	1787.76	1948.84	2549.32	3242.18	3281.85	4127.94	4199.87	4578.28	2608.42	3747.54	0.00	0.00	55732.96
	Total	4426.48	4825.31	6312.09	8027.61	8125.83	8182.10	8064.28	8515.88	5173.21	6340.40	0.00	0.00	0.00	107380.80
	Means of Finance														
	Loan	663.97	723.80	946.81	1204.14	1218.87	1227.32	1209.64	1277.38	775.98	951.06	0.00	0.00	0.00	16107.12
	Grant	3098.54	3377.72	4418.46	5619.32	5688.08	5727.47	5645.00	5961.12	3621.25	4438.28	0.00	0.00	0.00	75166.56
	Municipality Own Funds incl.	663.97	723.80	946.81	1204.14	1218.87	1227.32	1209.64	1277.38	775.98	951.06	0.00	0.00	0.00	16107.12
	Total	4426.48	4825.31	6312.09	8027.61	8125.83	8182.10	8064.28	8515.88	5173.21	6340.40	0.00	0.00	0.00	107380.80

S.No.	Particulars	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 29	Total
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2026-2027	2031-2032	2036-2037	2040-2041	
11A	Special Projects (Municipal)														
	Total Project Cost	31784.00	31784.00	38140.80	44497.60	41319.20	47676.00	44497.60	44497.60	11475.00	10710.00	0.00	0.00	0.00	412171.80
	TPC - DSR Inflation (Fixed Asset)	22248.80	22248.80	26698.56	31148.32	28923.44	33373.20	31148.32	31148.32	8032.50	7497.00	0.00	0.00	0.00	288520.26
	TPC - Annual Inflation Index	9535.20	9535.20	11442.24	13349.28	12395.76	14302.80	13349.28	13349.28	3442.50	3213.00	0.00	0.00	0.00	123651.54
	Add : Price Inflation @ DSR	15.00%	25586.12	29424.04	40605.17	54478.61	58175.37	77194.24	82855.15	95283.42	28257.34	53046.57	0.00	0.00	894497.56
	Add : Price Inflation @ 5 Yr. Avg	9.01%	10394.32	11330.85	14822.11	18850.51	19081.16	24000.43	24418.68	26618.81	7482.92	10750.77	0.00	0.00	235627.90
	Total	37769.50	41172.53	53858.61	68496.49	69334.59	69814.76	68809.43	72662.75	19787.54	24252.04	0.00	0.00	0.00	676615.80
	Means of Finance														
	Loan	3776.95	4117.25	5385.86	6849.65	6933.46	6981.48	6880.94	7266.28	1978.75	2425.20	0.00	0.00	0.00	67661.58
	Grant														
	Municipality Own Funds incl.	33992.55	37055.28	48472.75	61646.84	62401.13	62833.28	61928.48	65396.48	17808.79	21826.83	0.00	0.00	0.00	608954.22
	Total	37769.50	41172.53	53858.61	68496.49	69334.59	69814.76	68809.43	72662.75	19787.54	24252.04	0.00	0.00	0.00	676615.80
11B	Special Projects (PPP)														
	Total Project Cost	79840.00	79840.00	95808.00	111776.00	103792.00	119760.00	111776.00	111776.00	114750.00	107100.00	0.00	0.00	0.00	1694118.00
	TPC - DSR Inflation (Fixed Asset)	55888.00	55888.00	67065.60	78243.20	72654.40	83832.00	78243.20	78243.20	80325.00	74970.00	0.00	0.00	0.00	1185882.60
	TPC - Annual Inflation Index	23952.00	23952.00	28742.40	33532.80	31137.60	35928.00	33532.80	33532.80	34425.00	32130.00	0.00	0.00	0.00	508235.40
	Add : Price Inflation @ DSR	15.00%	64271.20	73911.88	101998.39	136847.85	146133.95	193908.51	208128.47	239347.74	282573.41	530465.66	0.00	0.00	5473502.41
	Add : Price Inflation @ 5 Yr. Avg	9.01%	26110.08	28462.59	37232.49	47351.66	47931.04	60288.03	61338.65	66865.26	74829.18	107507.68	0.00	0.00	1236689.99
	Total	94875.31	103423.58	135290.45	172060.14	174165.41	175371.58	172846.23	182525.62	197875.43	242520.38	0.00	0.00	0.00	3157529.81
	Means of Finance														
	Loan														
	Grant														
	Municipality Own Funds incl.														
	PPP	94875.31	103423.58	135290.45	172060.14	174165.41	175371.58	172846.23	182525.62	197875.43	242520.38	0.00	0.00	0.00	3157529.81
	Total	94875.31	103423.58	135290.45	172060.14	174165.41	175371.58	172846.23	182525.62	197875.43	242520.38	0.00	0.00	0.00	3157529.81

		Multi Year Investment Plan (PMC)														
S.No.	Particulars	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2026-2027	2031-2032	2036-2037	2040-2041	Total	
I	Project Cost															
	Total Project Cost	164287.05	164287.05	196107.07	228791.58	212449.32	245133.83	228791.58	228791.58	123871.30	114806.35	50651.47	47274.71	33767.65	3001748.13	
	Total (Escalated Price)	196444.95	217187.30	286841.00	370433.07	380981.33	366087.73	363544.35	387018.49	226849.96	296000.57	217041.33	322631.70	344682.96	7556758.80	
II	Means of Finance															
	Municipality Own Funds	59465.72	65279.98	85804.14	109969.30	112217.21	110364.55	109184.55	115766.23	52515.51	67059.39	40157.88	57711.54	59977.93	1772991.14	
	Grant	109272.36	121247.66	160520.25	208090.41	214847.57	204063.04	203034.33	216585.21	141015.77	185409.83	143742.51	215808.73	232366.01	4673929.59	
	Loan	27706.87	30659.66	40516.61	52373.37	53916.55	51660.14	51325.48	54667.05	33318.68	43531.35	33140.94	49111.43	52339.02	1109838.07	
	PPP	98362.34	107329.10	139078.38	177070.71	179443.55	179591.63	177005.51	186917.82	201976.58	245719.75	5108.67	6261.30	5561.50	3270786.43	
	Total	294807.29	324516.40	425919.38	547503.79	560424.88	545679.36	540549.87	573936.31	428826.55	541720.31	222150.00	328893.00	350244.46	10827545.22	

B. Total Income & Expenditure Account

(Rs. in lakhs)

S. N	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2036-37	2040-41
I	Revenue Income (Rs. in lakhs)																	
a)	Total Tax Revenues	256,483	297,812	357,773	403,494	432,653	465,642	501,253	548,512	587,137	792,547	838,515	887,149	938,604	1,013,519	1,072,303	1,454,523	1,870,070
	Property Tax	80,569	98,196	119,679	126,620	133,964	141,734	149,955	158,652	167,854	222,515	235,421	249,076	263,522	278,806	294,977	391,036	489,959
	Water Charges	33,321	35,989	44,703	48,284	49,596	52,473	55,516	67,546	71,464	108,947	115,266	121,951	129,024	156,984	166,089	53,202	364,844
	Octroi and Toll	142,291	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Local Body Tax	-	163,319	193,077	228,258	248,742	271,064	295,389	321,897	347,378	460,502	487,211	515,469	545,366	576,997	610,463	809,260	1,013,983
	Others Taxes	302	308	314	332	351	372	393	416	440	584	617	653	691	731	774	1,026	1,285

S. N	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2036-37	2040-41
b)	Total Non-Tax Revenues	86,927	94,702	104,549	117,192	126,901	137,538	149,206	162,016	176,092	233,436	246,976	261,300	276,456	292,490	309,454	410,228	514,005
	<i>Rental Income from Municipal Properties</i>	4,193	4,755	5,392	6,115	6,886	7,753	8,730	9,830	11,069	14,673	15,525	16,425	17,378	18,386	19,452	25,786	32,310
	<i>Fees and User Charges</i>	68,400	70,340	72,334	74,385	78,699	83,264	88,093	93,203	98,608	130,720	138,302	146,323	154,810	163,789	173,289	229,720	287,834
	<i>Sale of Forms & Publications</i>	14,334	19,608	26,823	36,692	41,315	46,521	52,383	58,983	66,415	88,043	93,149	98,552	104,268	110,315	116,714	154,721	193,862
	Total Own Income / Internal Revenues / Self-Generated Income (a+b)	343,410	392,514	462,322	520,686	559,554	603,181	650,459	710,528	763,229	1,025,984	1,085,491	1,148,449	1,215,059	1,306,009	1,381,757	1,864,751	2,384,076
c)	Interest	7,260	7,462	7,670	7,883	8,340	8,824	9,336	9,877	10,450	13,853	14,657	15,507	16,406	17,358	18,364	24,345	30,503
e)	Other Income	1,480	1,637	1,811	2,003	2,119	2,242	2,372	2,510	2,655	3,520	3,724	3,940	4,169	4,411	4,667	6,186	7,751
f)	Income from New Projects	2,400	1,260	1,297	1,362	1,430	1,501	1,576	1,655	1,738	2,218	2,329	2,445	2,567	2,696	2,831	3,613	13,357
	<i>Solid Waste Management</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,966
	<i>Bus Terminal</i>	-	315	305	320	336	352	370	389	408	521	547	574	603	633	665	848	1,031
	<i>Transport Nagar</i>	2,400	945	992	1,042	1,094	1,149	1,206	1,266	1,330	1,697	1,782	1,871	1,965	2,063	2,166	2,764	3,360
A	Total Revenue Income	354,550	402,874	473,100	531,934	571,443	615,748	663,744	724,570	778,072	1,045,575	1,106,201	1,170,342	1,238,202	1,330,473	1,407,619	1,898,894	2,435,687
II	Capital Income (Rs. in lakhs)																	
a)	Grants, Contributions & Subsidies (Projection based on Past Data)	132,669	160,856	208,545	270,352	290,952	285,966	283,534	296,400	224,452	236,120	219,199	242,182	229,624	239,546	207,103	272,825	308,336
	TOTAL INCOME	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	1,281,695	1,325,400	1,412,524	1,467,826	1,570,020	1,614,722	2,171,719	2,744,023

S.N	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2036-37	2039-40
III	Revenue Expenditure (Rs. in lakhs)																	
a)	Establishment Expenses	68,785	75,160	83,818	88,512	93,469	98,703	104,230	110,067	116,231	152,630	161,178	170,204	179,735	189,800	200,429	263,197	327,292
b)	Administrative Expenses	30,958	35,822	42,304	44,673	47,175	49,817	52,607	55,553	58,664	77,035	81,349	85,905	90,715	95,795	101,160	132,840	165,190
c)	Operation & Maintenance	13,484	16,098	19,219	20,296	21,432	22,632	23,900	25,238	26,652	34,998	36,958	39,027	41,213	43,521	45,958	60,350	75,048
d)	Repairs & Maintenance Expenses :- Infrastructure Assets	10,268	12,162	14,404	15,211	16,063	16,962	17,912	18,915	19,975	26,230	27,699	29,250	30,888	32,618	34,444	45,231	56,246
e)	Repairs & Maintenance :- Civic Amenities	4,369	4,709	5,076	5,360	5,660	5,977	6,312	6,665	7,038	9,242	9,760	10,307	10,884	11,493	12,137	15,938	19,819
f)	Interest and Finance Charges	4,872	5,546	6,314	6,667	7,041	7,435	7,851	8,291	8,755	11,497	12,141	12,821	13,539	14,297	15,097	19,825	24,653
g)	Program Expenses	1,305	1,499	1,721	1,817	1,919	2,027	2,140	2,260	2,386	3,134	3,309	3,495	3,690	3,897	4,115	5,404	6,720
h)	Miscellaneous Expenses	746	799	856	917	983	1,053	1,128	1,209	1,295	1,828	1,958	2,098	2,247	2,408	2,580	3,641	4,797
j)	Operation & Maintenance of Additional Projects	5,747	9,318	17,963	28,862	40,125	50,763	61,445	72,097	78,950	112,781	120,845	130,155	138,668	147,189	155,213	197,067	260,382
	<i>Water Supply</i>	1,499	3,197	5,508	8,567	11,791	14,358	16,888	19,560	19,562	19,569	19,571	19,573	19,574	19,576	19,579	19,592	19,604
	<i>Sewerage</i>	547	784	1,628	2,745	3,922	4,860	5,784	6,760	6,760	6,760	6,760	6,760	6,760	6,760	6,760	6,760	6,760
	<i>Drainage</i>	734	1,180	2,401	3,637	4,881	6,108	7,403	8,018	8,450	11,427	12,147	12,781	13,450	13,450	13,450	13,450	28,087
	<i>Solid Waste Management</i>	231	331	687	1,158	1,654	2,050	2,441	2,854	2,969	3,489	3,606	3,740	3,858	3,983	4,376	6,153	7,844
	<i>Urban Transportation</i>	2,121	2,948	5,926	9,713	13,546	17,406	21,211	25,228	29,890	50,848	55,540	60,946	65,702	70,726	74,000	88,837	102,943
	<i>Urban Environment</i>	78	111	230	388	553	770	999	1,259	1,299	1,521	1,581	1,654	1,723	1,801	1,930	2,674	3,638
	<i>Heritage & Tourism</i>	484	691	1,429	2,403	3,425	4,759	6,168	7,763	9,247	17,856	20,209	23,132	25,907	29,071	33,050	56,414	87,255
	<i>Disaster Management</i>	54	76	153	251	351	452	551	655	774	1,311	1,431	1,570	1,692	1,821	2,068	3,187	4,251
	TOTAL	5,747	9,318	17,963	28,862	40,125	50,763	61,445	72,097	78,950	112,781	120,845	130,155	138,668	147,189	155,213	197,067	260,382
l)	Finance Expenses	3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	52,348	53,629	55,410	56,512	57,746	57,782	54,975	59,689
	Revenue Expenditure	158,274	183,106	219,072	246,493	275,047	303,355	332,232	361,940	385,936	511,445	540,212	571,815	603,091	635,724	667,945	849,721	1,063,570
IV	Capital Expenditure																	
a)	Grants, Contribution & Subsidies / Own Fund / Loans	196,445	217,187	286,841	370,433	380,981	366,088	363,544	387,018	226,850	296,001	249,751	292,903	262,708	283,094	217,041	322,632	344,683
	Appropriations	132,623	139,254	146,217	153,528	161,204	169,264	177,727	186,614	203,428	313,142	341,357	372,113	405,640	442,188	482,029	742,002	1,047,781
	Depreciation	22,010	28,044	35,344	44,916	55,669	65,897	75,401	84,858	91,617	106,160	110,877	115,343	119,840	123,982	127,182	135,801	154,256
	Total Expenditure	509,352	567,591	687,474	815,369	872,901	904,604	948,905	1,020,430	907,830	1,226,748	1,242,196	1,352,174	1,391,279	1,484,988	1,494,197	2,050,155	2,610,290
	Surplus Deficit Before Appropriations/Depreciation	132,500	163,438	175,731	185,361	206,367	232,271	251,501	272,011	389,739	474,249	535,437	547,806	602,027	651,201	729,735	999,367	1,335,770
	Surplus Deficit After Depreciation	110,490	135,394	140,387	140,445	150,698	166,374	176,100	187,153	298,123	368,089	424,560	432,463	482,187	527,219	602,554	863,566	1,181,514
	Surplus / (Deficit) for the year	-22,133	-3,860	-5,830	-13,083	-10,506	-2,890	-1,628	540	94,695	54,947	83,204	60,350	76,547	85,031	120,524	121,564	133,733

C. Fixed Assets & Depreciation Statement

(Rs. in lakhs)

Particulars	Dep Rate	Year 1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 28
		2012-13	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2027-2028	2032-2033	2037-2038	2040-2041
Total Assets	4.21%															
Gross Block	-	429,140	463,471	620,627	794,377	1,023,849	1,320,196	1,624,981	1,917,851	2,208,687	2,518,301	2,699,781	3,554,772	4,599,170	5,491,051	6,233,132
Add : Additions	-	34,331	157,156	173,750	229,473	296,346	304,785	292,870	290,835	309,615	181,480	129,722	199,801	126,626	223,705	275,746
Total		463,471	620,627	794,377	1,023,849	1,320,196	1,624,981	1,917,851	2,208,687	2,518,301	2,699,781	2,829,503	3,754,573	4,725,796	5,714,756	6,508,878
Accumulated Depreciation																
Opening Balance	-	0	18,773	40,783	68,826	104,170	149,086	204,756	270,652	346,053	430,911	522,528	1,018,640	1,615,863	2,269,216	2,703,652
Add : Depreciation during the year	-	18,772	22,010	28,044	35,344	44,916	55,669	65,897	75,401	84,858	91,617	94,308	110,877	128,147	140,222	154,256
Closing Balance		18,773	40,783	68,826	104,170	149,086	204,756	270,652	346,053	430,911	522,528	616,835	1,129,517	1,744,010	2,409,437	2,857,908
Closing WDV		444,698	579,844	725,550	919,679	1,171,109	1,420,225	1,647,199	1,862,633	2,087,390	2,177,254	2,212,668	2,625,056	2,981,786	3,305,319	3,650,970
Gross Block		463,471	620,627	794,377	1,023,849	1,320,196	1,624,981	1,917,851	2,208,687	2,518,301	2,699,781	2,829,503	3,754,573	4,725,796	5,714,756	6,508,878
Total Depreciation		18,772	22,010	28,044	35,344	44,916	55,669	65,897	75,401	84,858	91,617	94,308	110,877	128,147	140,222	154,256
Additions		34,331	157,156	173,750	229,473	296,346	304,785	292,870	290,835	309,615	181,480	129,722	199,801	126,626	223,705	275,746
Closing WDV		444,698	579,844	725,550	919,679	1,171,109	1,420,225	1,647,199	1,862,633	2,087,390	2,177,254	2,212,668	2,625,056	2,981,786	3,305,319	3,650,970
Accumulated Depreciation		18,773	40,783	68,826	104,170	149,086	204,756	270,652	346,053	430,911	522,528	616,835	1,129,517	1,744,010	2,409,437	2,857,908

D. Loan and Interest Statement

(Rs. In lakhs)

Particulars		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 28
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2027-2028	2032-2033	2037-2038	2040-2041
Total New Loans	11.20%														
Opening Balance		-	27,707	58,367	98,883	151,257	205,173	256,833	306,312	357,087	383,814	455,296	498,921	470,359	497,962
Add : Additions		27,707	30,660	40,517	52,373	53,917	51,660	51,325	54,667	33,319	23,824	36,742	24,154	42,539	52,339
Total		27,707	58,367	98,883	151,257	205,173	256,833	308,159	360,979	390,406	407,638	492,038	523,075	512,898	550,301
Less : I Repayment		-	-	-	-	-	-	1,847	3,891	6,592	10,084	26,410	36,883	39,690	34,730
Closing Balance		27,707	58,367	98,883	151,257	205,173	256,833	306,312	357,087	383,814	397,554	465,629	486,192	473,209	515,571
Interest	-	3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	45,091	53,629	56,519	55,222	59,689
Total Interest		3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	45,091	53,629	56,519	55,222	59,689
Total Repayment		-	-	-	-	-	-	1,847	3,891	6,592	10,084	26,410	36,883	39,690	34,730
Total Closing Balance		27,707	58,367	98,883	151,257	205,173	256,833	306,312	357,087	383,814	397,554	465,629	486,192	473,209	515,571

E. Borrowing And Investment Capacity

S.No.	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 15	Year 20	Year 25	Year 28
		2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2027-28	2032-33	2037-38	2040-41
I	Debt Service @ 30% of Total Revenue														
a)	Principal Repayment	-	-	-	-	-	-	1,847	3,891	6,592	10,084	26,410	36,883	39,690	34,730
b)	Interest Payment	3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	45,091	53,629	56,519	55,222	59,689
c)	Debt Service (a + b)	3,103	6,537	11,075	16,941	22,979	28,765	36,257	44,103	49,949	55,175	80,039	93,402	94,912	94,419
d)	Total Revenue	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	983,544	1,325,400	1,649,052	2,268,581	2,744,023
e)	Debt Service / Total Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
f)	Debt Service @ 30% of Total Revenue	146,166	169,119	204,493	240,686	258,718	270,514	284,183	306,291	300,757	295,063	397,620	494,716	680,574	823,207
II	Primary Operating Surplus														
a)	Total Revenue	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	983,544	1,325,400	1,649,052	2,268,581	2,744,023
b)	Total Expenditure excluding Int. & Dep	234,553	289,969	334,227	389,220	487,342	539,547	652,130	770,453	817,232	838,707	843,591	1,236,831	1,476,428	1,914,355
c)	TE / TR (Excluding Int. & Dep)	0	1	0	0	1	1	1	1	1	1	1	1	1	1
d)	Primary Operating Surplus	252,666	273,762	347,417	413,067	375,053	362,167	295,147	250,517	185,293	144,837	481,809	412,221	792,153	829,669

S.No.	Particulars	Year 1 2013-14	Year 2 2014-15	Year 3 2015-16	Year 4 2016-17	Year 5 2017-18	Year 6 2018-19	Year 7 2019-20	Year 8 2020-21	Year 9 2021-22	Year 10 2022-23	Year 15 2027-28	Year 20 2032-33	Year 25 2037-38	Year 28 2040-41
	(Total Revenue - Total Exp.) before Debt Servicing														
III	Borrowing Capacity (Lesser of I,II)	146,166	169,119	204,493	240,686	258,718	270,514	284,183	250,517	185,293	144,837	397,620	412,221	680,574	823,207

NPV	2,610,614
Borrowing Capacity	2,610,614
Investment Capacity	26,106,136

F. Key Indicators

(Rs. in lakhs)

S.No	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2027-28	2036-37	2039-40	2040-41
I	Ratios														
a)	Total Earnings / Total Revenue														
	Total Earnings	(22,133)	(3,860)	(5,830)	(13,083)	(10,506)	(2,890)	(1,628)	540	94,695	97,801	83,204	121,564	128,693	133,733
	Total Revenue	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	983,544	1,325,400	2,171,719	2,544,555	2,744,023
	Total Earnings / Total Revenue	-5%	-1%	-1%	-2%	-1%	0%	0%	0%	9%	10%	6%	6%	5%	5%
	Average Earnings Ratio														
b)	Earnings before Dep and Appropriations / Total Revenue														
	Earnings before Dep	132,500	163,438	175,731	185,361	206,367	232,271	251,501	272,011	389,739	413,865	535,437	999,367	1,239,387	1,335,770
	Total Revenue	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	983,544	1,325,400	2,171,719	2,544,555	2,744,023
	Earnings before Dep / Total Revenue	27%	29%	26%	23%	24%	26%	27%	27%	39%	42%	40%	46%	49%	49%
	Average Earnings Before Dep Ratio														
c)	Operating Ratio														
	Revenue Receipts	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	983,544	1,325,400	2,171,719	2,544,555	2,744,023
	Revenue Expenditure (Total Expt. - Depreciation)	250,549	309,485	358,047	407,992	509,352	567,591	687,474	815,369	872,901	904,604	939,550	1,509,967	1,868,336	2,050,155
	Revenue Exp. / Revenue Receipts	51%	55%	53%	51%	59%	63%	73%	80%	87%	92%	71%	70%	73%	75%
	Average Operating Ratio														
d)	Debt Service / Total Revenue														
	Debt Service														
	Interest	3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	45,091	53,629	54,975	57,789	59,689
	Principal	-	-	-	-	-	-	1,847	3,891	6,592	10,084	26,410	40,972	36,025	34,730
	Total	3,103	6,537	11,075	16,941	22,979	28,765	36,257	44,103	49,949	55,175	80,039	95,946	93,814	94,419
	Total Revenue	487,219	563,730	681,644	802,286	862,395	901,714	947,277	1,020,970	1,002,525	983,544	1,325,400	2,171,719	2,544,555	2,744,023
	Debt Service / Total Revenue	1%	1%	2%	2%	3%	3%	4%	4%	5%	6%	6%	4%	4%	3%
	Average Debt Service / Total Revenue														
e)	Debt Service Coverage Ratio														
	Debt Service														
	Interest	3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	45,091	53,629	54,975	57,789	59,689
	Principal	-	-	-	-	-	-	1,847	3,891	6,592	10,084	26,410	40,972	36,025	34,730
	Total	3,103	6,537	11,075	16,941	22,979	28,765	36,257	44,103	49,949	55,175	80,039	95,946	93,814	94,419
	Cash Earnings before Interest														
	Total Earnings	(22,133)	(3,860)	(5,830)	(13,083)	(10,506)	(2,890)	(1,628)	540	94,695	97,801	83,204	121,564	128,693	133,733
	Depreciation	22,010	28,044	35,344	44,916	55,669	65,897	75,401	84,858	91,617	94,308	110,877	135,801	149,515	154,256
	Interest	3,103	6,537	11,075	16,941	22,979	28,765	34,410	40,212	43,356	45,091	53,629	54,975	57,789	59,689
	Total	2,980	30,720	40,589	48,774	68,142	91,772	108,184	125,609	229,668	237,199	247,710	312,339	335,998	347,678
	DSCR	0.96	4.70	3.66	2.88	2.97	3.19	2.98	2.85	4.60	4.30	3.09	3.26	3.58	3.68



ANNEXURE 2: LIST OF IMPLEMENTED REFORMS

Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
I	E-GOVERNANCE APPLICATIONS		
1	2006-07	Appointment of State-level Technology Consultant as State Technology Advisor	Completed
2	2006-07	Preparation of Municipal E-Governance Design Document (MEDD) on the basis of National Design Document as per NMMP	Completed
3	2006-07	Assessment of MEDD against National E-Governance Standards (e.g. Scalability, intra-operability & security standards etc.)	Completed
4	2006-07	Finalization of Municipal E-Governance implementation action plan for the city	Completed
5	2007-08	Undertaking Business process Reengineering (BPR) Prior to migration to e-governance systems	Completed
6	2006-07	Appointment of Software consultant (S)/agency for development, deployment and training	Completed
7	2006-07	Exploring PPP option for different E-Governance services	Completed
8	2007-08	Defining monitorable time table for implementation of each E-governance initiative that is being taken up	Completed
	2007-08	Implementation of EG for Property Tax	Completed
	2007-08	Implementation of EG for Accounting	Completed
	2007-08	Implementation of EG for water supply & Other Utilities	Completed
	2007-08	Implementation of EG for Birth & Death Registration	Completed
	2007-08	Implementation of EG for Citizens' Grievances Monitoring	Completed
	2007-08	Implementation of EG for Personnel Management sys	Completed
	2007-08	Implementation of EG for Procurement of Projects	Completed
	2007-08	Implementation of EG for Monitoring of Projects	Completed
	2007-08	Implementation of EG for Building Plan Approval	Completed
	2007-08	Implementation of EG for Health Programmes	Completed
	2007-08	Implementation of EG for Licenses	Completed
9	2007-08	Ongoing implementation of E-governance initiatives, against monitorable time-table	Completed
10			Completed
	2009-10	i- Geographic Information System (GIS)	Completed
	2007-08	ii- Municipal Area Networking (Man)	Completed
	2006-07	iii- Kiosk	Completed
	2005-06	vi- Web Portal of P.M.C.	Completed
II	ACCOUNTING REFORMS		
1	2005-06	Resolution	Completed
2	2006-07	Appointment of consultants for development of state wide Municipal Financing Accounting Manual	Completed
3	2006-07	Completion and adoption of Municipal Financial Accounting	Completed



Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
		Manual in line with NMAM or otherwise	
4	2005-06	GO/Legislation/Modification of Municipal finance rules for migrating to the double entry accounting system	Completed
5	2006-07	Training of personnel	Completed
6	2005-06	Appointment of field-level-consultant for implementation at city-level	Completed
7	2005-06	Notification of cut-off date for migrating to the double-entry accounting system	Completed
8	2006-07	Re-engineering of business to align with accrual based accounting system (aligning all commercial and financial processes such as procurement revenue collection, payroll, works contracts, etc.)	Completed
9	2007-08	Completion of registers and Valuation of assets and liabilities	Completed
10	2007-08	Drawing up of Opening Balance Sheet (OBS)	Completed
		i- Provisional OBS	Completed
		ii- Adoption of provisional OBS	Completed
		Finalization of OBS	Completed
11	2008-09	Full migration to double entry accounting system	Completed
12	2009-10	Production of financial statements (income-expenditure accounts and balance sheet)	Completed
13	2009-10	Audit of financial statements	Completed
	2007-08	Creation of mechanism for ext. audit	Completed
14	2008-09	Adoption of accounts	Completed
15	2008-09	Preparation of outcome budget	Completed
16	2008-09	Instituting of Internal Audit/control Mechanisms	Completed
17	2008-09	Credit rating of ULB/parastatal (if required)	Completed
18		Any other reform steps being undertaken (please use additional space to specify)	
	2006-07	i- Capacity building of all PMC staff	Completed
	2005-06	ii- Disclosures and public information	Completed
	2008-09	Integration of system with Procurement System	Completed
	2008-09	Integration of system with Works Contract Management System	Completed
	2008-09	Integration of system with Payroll & Wage Payment System	Completed
	2008-09	Integration of System with Stores & Inventory Management System	Completed
	2008-09	Integration of system with Tax Collection System	Completed
III	PROPERTY TAX		
1	2006-07	Enhancing coverage of property tax regime to all properties liable to tax <ul style="list-style-type: none"> • Zone wise rent fixed • Self-Assessment scheme • Computerization of property Tax • Survey work-house to house 	Completed



Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
2	2006-07	Elimination of exemption	Completed
3	Migration to Self-Assessment System of Property Taxation		Completed
	2005-06	a. Setting up a Committee/Team to draft/ amend legislation	Completed
	2006-07	b. Stakeholder consultations	Completed
	2006-07	Self Ass. Sys Migration- Preparation of draft leg	Completed
	2006-07	c. Self Ass. Sys Migration-Enactment and Notification of legislation	Completed
2006-07	d. Self Ass. Sys Migration- Implementation	Completed	
4	Setting up a non- discretionary method for determination of Property Tax (e.g. unit area, etc.)		Completed
	2005-06	a. Setting up a Committee/Team to draft/ amend legislation	Completed
	2006-07	b. Stakeholder consultation	Completed
5	Use of GIS-based property tax system		Completed
	2005-06	a. Selection of appropriate consultant	Completed
	2006-07	b. Preparation of digital property maps for municipality	Completed
	2006-07	c. Verification of digital maps and preparation of complete database of properties	Completed
	2006-07	d. Full migration to GIS system	Completed
6	2007-08	Next revision of guidance values-per year	Completed
7	2007-08	Fix periodicity for version of guidance values	Completed
8	Establish Taxpayer education programme.		Completed
	2006-07	a. Local camps for clarification of doubts and assistance in form filling	Completed
	2006-07	b. Setting up a website for property tax issues/FAQ etc.	Completed
9	2006-07	Establish Dispute resolution mechanism	Completed
10	2006-07	Rewarding and acknowledging honest tax payers	Completed
11	2008-09	Achievement of 85% coverage ratio	Completed
	2007-08	Achievement of 90% collection ratio for current demand	Completed
IV	USER CHARGES		
1	2006-07	The State/ULB must formulate and adopt a policy on user charges which should include proper targeting of subsidies, if any, for all services, ensuring the full realization of O&M cost by the end of the Mission period.	
2	2006-07	Setting up of body for recommending UC structure	Completed
3	Establishment of proper accounting system for each service so as to determine the O&M cost separately.		Completed
	2005-06	(i) Water supply and sewerage	Completed
	2005-06	(ii) Solid waste management	Completed
	2006-07	(iii) Public Transport Service	Completed
	2006-07	(iv) Others	Completed
4		The State/ULB should define service standards and timelines for achieving these	Completed



Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
	2005-06	Achieving new Service Standards (Stds) in WS (lpcd)	Completed
	2005-06	Achieving new service Stds. In WS (hours)	Completed
	2006-07	Achieving new Service Stds, in WS (non-revenue)	Completed
	2005-06	Achieving new Stds. In Sewerage (% Population)	Completed
	2005-06	Achieving new Stds. In Sewerage (% Sewage)	Completed
	2005-06	Achieving new Service Stds. In SWM	Completed
	2005-06	Achieving new Service Stds. In pub. Trans.	Completed
5		The State/ULB should define user charge structure and timelines for achieving the same.	
	2006-07	Achieving new UC structures in WS	Completed
	2006-07	Achieving new UC structures in Sewerage	Completed
	2006-07	Achieving new UC structures SWM	Completed
	2006-07	Achieving new UC structures in Pub. Trans.	Completed
	2006-07	Achieving new UC structures in health services	Completed
6	2009-10	Achieving Volume based tariff & 100% metering*	Completed
	2009-10	Max Target for non-revenue water*	Completed
	2009-10	Max Target for Unaccounted water*	Completed
7	2008-09	Study on quantification & impact of subsidies	Completed
8		Tabling & Approval study on subsidies by municipality	Completed
9		Time table to achieve full recovery of O&M costs from user charges	
	2005-06	i. Water supply	Completed
	2005-06	ii. Sewerage	Completed
	2009-10	iii. Solid waste management	Completed
	2005-06	iv. Achieving of Full Recovery in OM from UC-Public Transport	Completed
V	INTERNAL EARMARKING OF FUNDS FOR SERVICE TO THE URBAN POOR		
1	2005-06	Reform in Accounts & Budget Codes to identify inc/exp for poor	Completed
2	2005-06	Creation of sep. fund in Ac. Sys. for Services to the poor	Completed
3	2006-07	Amend'ts in Ac. Rules for Services of Poor	Completed
4	2006-07	Max. TOTAL Rev. Exp. Target for Service of Poor*(10%)	Completed
5	2006-07	Max. OWN Rev. Exp. Target for Service of Poor*(10%)	Completed
6	2006-07	Max. CAPITAL Rev. Exp. Target for Services of Poor*(10%)	Completed
7	2005-06	Defining criteria for identification of the urban poor	Completed
8	2005-06	Fresh enumeration based on above	Completed
9	2006-07	Define threshold service levels for the urban poor across various services	Completed
10	2006-07	Strategic document which outlines the requirements both physical and financial, timeframes, sources of funding and implementation strategies including community participation, monitor able output indicators for each of the services, including outlining convergences, if any	Completed
11	2007-08	Any other reform steps being undertaken	Completed



Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
		i. Reproductive Child Health programme to 100% BPL families	Completed
		ii. Education to all BPL children of 6-14 years	Completed
		iii. Improvement of housing stock in slums through SRA	Completed
		iv. As per Govt. policy slum dwellers prior to 1-1-1995, are provided with security of tenure, As part of this scheme photo passes and patta are given to slum dwellers	Completed
VI	PROVISION OF BASIC SERVICE FOR UP		
1	2005-06	Survey of Poor HH	Completed
2	2007-08	Database creation for targeting HH level schemes	Completed
3	2007-08	Prioritization of Poor Settlements by participation mtd.	Completed
4	2007-08	Max. achievements of HH level piped WS*	Completed
	2007-08	Max. Achievement of Public Taps (defined hours)*	Completed
	2007-08	Max. Achievement of Public Taps (def, dist from HH)*	Completed
	2007-08	Max. Achievement of Handpumps/Tubewells.	Completed
	2007-08	Max. Achievement of Water Tanker Supply*	Completed
	2007-08	Max Achievement of HH level toilets.*	Completed
	2007-08	Max. Achievement of defined disposal sys for Hhtoilers*	Completed
	2007-08	Max. Achievement of Comm. Toilet Seats*	Completed
	2007-08	Max. Achievement of Avg. dist of ComToi from HH*	Completed
	2007-08	Max. Achievement of def. disp. Sys for Com. Toilets*	Completed
	2007-08	Max. Achievement in Puchha Hsg.*	Completed
2007-08	Max. Achievement in Night Shelters for homeless*	Completed	
5	2007-08	Def. Achievement in street Sweeping	Completed
	2007-08	Def. Achievement in lifting Waste Collection	Completed
	2007-08	Def. Achievement in lifting waste from Com. Bins	Completed
	2007-08	Def. Achievement in HH access to Pucca Roads	Completed
	2007-08	Def. Achievement in Cluster access to Pucca Rds.	Completed
	2007-08	Def. Achievement in HH access to covered SW drains	Completed
	2007-08	Def. Achievement in Street illumination	Completed
	2007-08	Def. Achievement in Anganwadi/ Creche	Completed
	2007-08	Def. Achievement in Community Halls	Completed
	2007-08	Def. Achievement in Preventive Health Care (advisory)	Completed
	2007-08	Def. Achievement in Curative Health care-reliability	Completed
	2007-08	Def. Achievement in Curative Health care distance	Completed
	2007-08	Def. Achievement in Pri. Edu-Enrollment	Completed
	2007-08	Def. Achievement in Pri. Edu-Drop Out	Completed
	2007-08	Def. Achievement in Pri. Edu-distance	Completed
2007-08	Def. Achievement in Micro-Credit Access	Completed	
2007-08	Def. Achievement in Micro-Credit Access	Completed	
6	2007-08	Community Participation in Water Supply	Completed
	2007-08	Community Participation in Sanitation	Completed



Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
	2007-08	Community Participation in SWM	Completed
	2007-08	Community Participation in Roads.	Completed
7	2007-08	Max. Achieved target of UP with secured tenure*	Completed
8	2007-08	Max. Achieved target of Entrepreneurs with tenure*	Completed
		Optional Reforms	
O2		Revision of Build, Byelaws to Streamline Approval Process	
a	2006-07	Consultation with Stakeholders on modification of Byelaws	Completed
b	2006-07	Identification & Finalization of modification in Byelaws to streamline approval	Completed
c	2006-07	Defining Mitigation Measures for Natural Disaster in Byelaws	Completed
d	2006-07	Amend't of exist. Legislat'n to intro new Byelaws ^ Notification	Completed
e	2006-07	Dissemination of New Byelaws through queries	Completed
f	2006-07	City level Public Workshops to address queries	Completed
g	2006-07	Setting MIS Sys linked to all offices having Bearing on Build. Perm	Completed
h	2006-07	Start of approval as per new byelaws	Completed
i	2006-07	Est. of Interactive Citizen Enquiry Sys for Build. Pin. Approval	Completed
j	2006-07	Max. Reduction of Avg. time for Build. Sanction*	Completed
O3	2006-07	Revision of Build. Byelaws for RWH & Water Conservation	Completed
a	2006-07	Final Design of RWH and decision on end use	Completed
b	2006-07	Prep of Drf. Byelaws to reflect Mand. Clauses of RWH	Completed
c	2006-07	Amend. Of Exist. Leg. To intro the new Byelaws & Notification	Completed
d	2006-07	Dissemination of the new set of Build. Byelaws thru Website	Completed
e	2006-07	City level Public Workshops to address queries	Completed
f	2006-07	Start of approval as per new byelaws	Completed
O4	2008-09	Earmark's land for EWS/LIG Hsg. + Sys of Cross Subsy.	Completed
O7	2007-08	Byelaws for Reuse of Recycled Water	
a	2007-08	Final Design and decision on end use of WW Recycling Sys	Completed
b	2007-08	Prep of Drf. Byelaws to reflect Mand. Clauses of WWR Sys	Completed
c	2007-08	Amend. Of Exist. Leg. To intro the new Byelaws & procedures	Completed
d	2007-08	Dissemination of new set of Build. Byelaws thru Website	Completed
e	2007-08	City level Public Workshops to address queries	Completed
f	2007-08	Start of approval as per new byelaws	Completed
O8	2008-09	Admin. Reforms	Completed
aa1	2008-09	Rational'n of HR – Iden. Of loopholes in exist. Staffing	Completed
aa2	2008-09	Rational's of HR – Draft Proposal for changing Staffing Policy	Completed
aa3	2008-09	Rational'n of HR- Drf. Proposal for reforms in Perf. Eval. Sys	Completed
aa4	2008-09	Rational'n of HR- Employee Consultation	Completed
aa5	2008-09	Rational'n of HR - Discussions with various ULB depts.	Completed
aa6	2008-09	Rational'n of HR – Cabinet Approval	Completed
ab1	2008-09	Staff Training – Assessment of training needs	Completed
ab2	2008-09	Staff Training – Finalisation of training curriculum	Completed



Sl.	Year of completion	Commitment as per the MoA for the current financial year	Progress made
ab3	2008-09	Staff Training – Selection of agencies to provide training	Completed
ab4	2008-09	Staff Training – Conducting training	Completed
ab5	2008-09	Staff Training – Training Programmes identified	Completed
ac1	2008-09	Reduct'n in Estab. Exp=Outsourcing of certain functions	Completed
ac2	2008-09	Reduct'n in Estab. Exp – Higher Capacity Utilization	Completed
ac3	2008-09	Reduction in Estab. Exp – Energy Saving	Completed
ad1	2008-09	Continuity of Tenure of Key Personnel – Min. Avg. Tenure of MC	Completed
ae1	2008-09	Management Review System- Periodic Review by Mayor & MC	Completed
ae2	2008-09	Management Review System-Generation of performance report	Completed
b	2008-09	Best Target Staff Deployment*	Completed
c	2008-09	Evolution of details training plan for its staff and frequency of review of plan	Completed
d	2008-09	Least Estab. Exp during mission year*	Completed
e	2008-09	Ensuring stability of tenure for MC and other staff	Completed
O9	2008-09	Structural Reforms	Completed
a	2008-09	Decentralization of Municipal administration and synchronization of internal jurisdictions	Completed
b	2008-09	New Initiatives planned for inter-agency coordination	Completed
c	2008-09	Creation of Cadre of municipal staff for different disciplines	Completed
O10	2007-08	Encouraging PPP	Completed



ANNEXURE 3: LIST OF PARTICIPANTS – KICK-OFF WORKSHOP

Project Implementation Unit

Revising/Updating CDP of Pune City Revised under JNNURM

Chairperson: Hble Municipal Commissioner

Sl	NAME	DESIGNATION & ORGANIZATION	MOB No.	SIGNATURE
1	Mahesh Patil	Commissioner		
2	Narech Zurrure	Adm. Comm. (G/S)		
3	V.G. Kulkarni	Supr. Engr. W.S. Drainage AMC	9689931501	
4	R.T. Shinde	Dy. Comm Land & Est.	9689931056	
5	Pravin Ashnikar	DME (C)	9689931280	
7	Nalawade Savita Sun	Dy. Ac	9689931052	
8	D.P. Mure	DME (slum)	9689931220	
9	D.S. Malwad	JMCE VCD	9689931144	
10	Jayant S. Bhoskar	AMC - T. Lok Ad.	9689931492	
11	S.T. Pardeoli	MOH.	9689932222	
12	Binod D. Girdle	Planning Officer (Munis- pal Commission. Office)	9689931112	
13	Sandip S. Dhole	Asst. Commissioner, DPR	9689931422	
14	Vijay B. Landge	Assistant Commissioner, Whole Town	9689931501	
15	Madhav Deshpande	AMC Bibwevadi	9689931497	
16	Shankar Chatur	AES of Taxes	9403353717	
17	Ganesh Madhukant	Dy Commissioner Zone 4	9689931662	
18	N.N. Barapate	Superintending Engr	9689931351	
19	SAUMYASIB MUKHOPADHYAY	Assistant General Manager	9999963280	
20	श्री. वि. वि. शिंदे	हे. वि. वि. वि. वि. वि.	9689931660	
21	Shange P. L.	Deputy Engineer (Water)	9689931733	
22	Pravil Kawade	CEO Z.P. (Representative)	982433840	
23	Gawade S. A.	AMC - cum - PMC	9689931901	
24	Vasant Patil	A.M.C. Dhankawadi	9689931919	
25	Arun Khilari	AMC Vishnamburadi	9689931253	
26	S. S. Patil	D.B. Kothrud	9689931276	
27	Madhukant Sunil	AMC - cum - PMC	9689931901	
28	Atul Manjusha Idhale	Sr. Legal Advisor	9689931295	
29	Vijay Dalvi	Deputy Commissioner	9689931591	



PUNE MUNICIPAL CORPORATION

Project Implementation Unit

Revising/Updating CRP of Pune City Prepared under JNNURM

Chairperson: Hble Municipal Commissioner

Sl	NAME	DESIGNATION & ORGANIZATION	MOB NO.	Signature
29	Bhosle Mukund	Asst M.C.	9689931754	MKS
30	Gaikwad M.S.	Asst. M.C.	9689931086	MKS
31	Umash maha	" "	9689931495	MKS
32	Dr. Sucheta Karande	Environment Manager Indrakanya	9923124449	Sucheta
33	Mangesh Dighe	Environment Officer	9689931771	MKS
34	Tejaswinee C	ENVISION CONSULTANT	9220772295	Tejaswinee
35	Pranav Praveen	Asst. Manager - VSPL	08860883545	Pranav
36	Vikas Singh	Asst. Manager - V.C.P.L	9541599182	Vikas
37	Vilas Kanade	IT Commissioner, PMC	9689931181	Vilas
38	D P MODY	Principal Consultant (P.M.C). -VSPL	9820295747	D P Mody
39	Mrs Ulka Kalaskar	Chief Accountant	9639951980	Ulka
40	Meenakshi Tyagi	Project Coordinator - VSPL	9810866865	Meenakshi
41	Kedar Nigude	Housing Planner - VSPL	9371057797	Kedar
42	Sandhya Agawal	PIU JNNURM	9833152287	Sandhya
43	Nidhi Chaudhary	PIU JNNURM	8806417000	Nidhi
44	Ashish Agawal	PIU JNNURM	9850970080	Ashish



ANNEXURE 4: SAMPLE OF QUESTIONNAIRE PERFORMA

Name:	Department:
Contact No.	
Date:	Designation:

Part A : Water Supply

A1. What are the main challenges in improving or maintaining water supply in your city?

- Equitable water supply
- Water supply management is under private sector, not under our local control
- Local financial resources are inadequate
- Service in urban poor areas are inadequate
- Percentage of non-revenue water is too high
- Other, please specify _____

Suggestions.....

Part B : Sewerage and Sanitation

B1. What are the main challenges in improving or maintaining Sewerage System in your city?

- Collection efficiency
- Treatment Capacity
- Network Coverage
- Service in urban poor areas are inadequate
- Recycling and reuse of waste water

Other, please specify-----

Suggestions.....

Part C : Drainage

C1. Are there areas in your city that often suffer from water logging or flood like situations?

- Yes
- No



If yes, when was the last severe water logging or flood like situation occurred,

Name the specific areas

For how long and

How serious were the damage?

C2. Is there problem of back flow of waste water from sewer/ drain in any area in your city?

If yes, name the area

C3. What are the main challenges for improving drainage in your city?

Suggestions.....

Part D : Solid Waste Management

D1. Main challenges faced in maintaining or improving solid waste collection:

Comments

Challenges with costs

Challenges with waste management

(Eg. At waste dump sites)

Are there problems with many households living in illegal settlements, to which you are not allowed to provide services or hadedifficulty in collecting waste?

Challenges with collection efficiency



Challenges with public awareness

Challenges with E waste Management

Comments

Suggestions.....

Part F : Road , Traffic and Transport

- F1.** What is the total number of buses running in the town and intercity?
.....
- F2.** What is their Frequency per day?
- F3.** What is the Passenger capacity of varying buses (or bus routes)?
.....
- F4.** How much is the number of incoming and outgoing bus trips per day from the town?
.....
- F5.** How much is the growth of bus traffic annually? (Get at least for past 5-10 years)?
.....
- F6.** What is the total no. of IPT (Auto/ Taxi) running in the town?
.....
- F7.** How much is their annual growth in number? (get at least 5-10 year trend)
.....
- F8.** Accident prone Junctions or routes.
- F9.** Main reasons of accidents in the accident prone areas.
- F10.** Who are the major victims of road accidents eg. Two wheeler commuters, bicycle commuters, foot-travelers etc.
- F11.** Spots / points on the arterial and sub-arterial roads where traffic congestion occurs frequently.
- F12.** Spots/ points on the road network where maximum number of foot travelers movement is observed
- F13.** Areas where maximum number of vehicles is parked on road or parking is a great issue.

Suggestions.....



Part H : Environment

What are the main challenges in improving or maintaining urban environment in your city?

- Ambient Air , water quality and sources
- Carbon emissions
- Land pollution and sources
- Vehicular Growth
- Climate change and urban heat island
- Public awareness

Suggestions.....

Part H : Heritage

What are the main challenges in improving or maintaining heritage areas in your city?

- Maintenance of heritage building
- Private properties
- Lack of separate zoning regulation for different heritage areas (core , Outer)
- Identification of sites
- Population growth
- Public awareness

Suggestions.....

Part H :

H1. For services which are contracted out, please describe the key characteristics of the contracts:

Procurement system (Direct contracting national tender, international tender, etc.)	Type of contract (Management leasing concession, etc.)	Objectives of the contract(s) (operation in maintenance investment, etc.)	Length of contract(s) (in years)
-------------------------------------------------------------------------------------------------	-----------------------------------------------------------------	---------------------------------------------------------------------------------------	----------------------------------------

Water Supply

Sewers/Waste Water
Collection & Treatment



Rain and Flood
Drainage

Household Waste
Collection & Treatment

Urban Public Transport

H2. Have there been important changes over the last 10 years in contracting out infrastructure and service to private enterprises and if so, which one and what is the impact?

Comments

Water Supply

Sewers/Waste Water
Collection & Treatment

Rain and Flood

Drainage

Household Waste

Collection & Treatment

Urban Public Transport

H3. What are the principal methods of financing used in each sector (taxes; tariffs; subsidy; transfers from other levels of government; etc.)? If mixed please specify.

Comments

Water Supply



Sewers/Waste Water
Collection &
Treatment

Rain and Flood
Drainage

Household Waste
Collection &
Treatment

Urban Public
Transport

H4. What mechanism is followed, if any, to provide services to low-income households or those living in informal settlements?

Comments

Water Supply

Sewers/Waste Water
Collection & Treatment

Rain and Flood
Drainage

Household Waste
Collection & Treatment

Urban Public Transport

Part J : Comments

J1. Problems/issues related to city environment and infrastructure (Water Supply, Drainage, Sewerage, Solid Waste Management, Roads, Traffic and transport).

- 1)
- 2)



- 3)
- 4)
- 5)
- 6)

Possible solutions to the problems/ issues stated above or any other service:

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)

J3.	Priority Sector for city development :	Priority number
	▪ Water Supply	
	▪ Drainage	
	▪ Sewerage and Sanitation	
	▪ Solid waste management	
	▪ Traffic and transport	
	▪ Housing	
	▪ Environment	
	▪ Heritage and conservation	

J4. Other problems/ issues in the city that you come across generally:

Please add any comments that you want to make on the delivery of basic public services in your city or local government below:

Signature

Thank you for filling up this Questionnaire.