GOVERNMENT OF UTTAR PRADESH

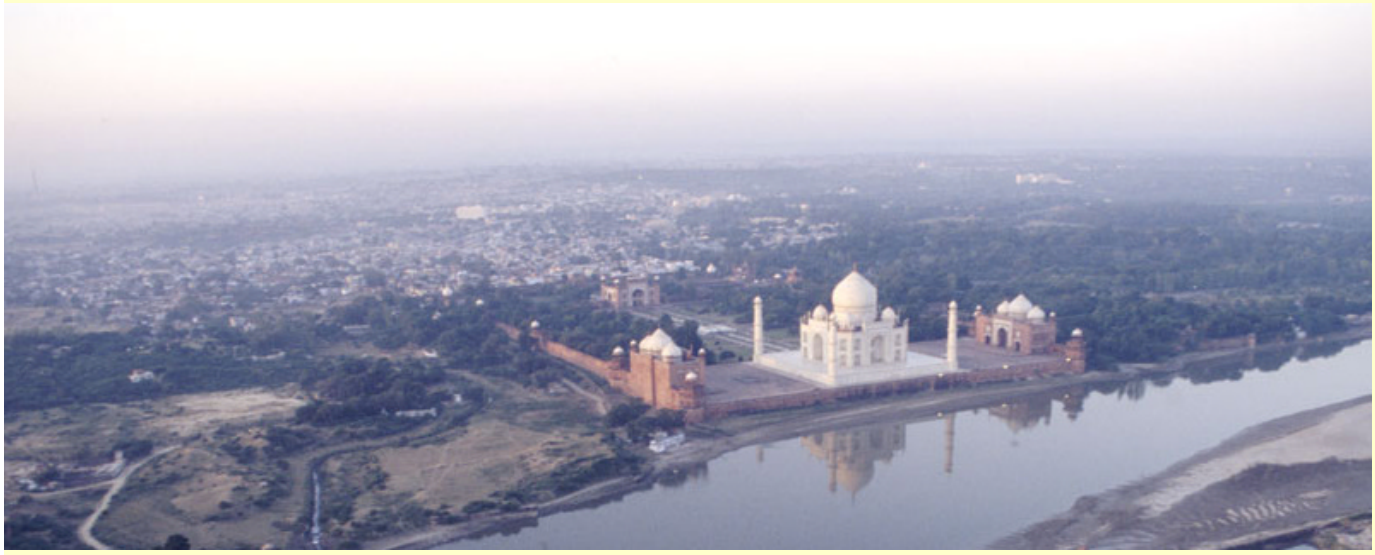
Urban Development Department

AGRA NAGAR NIGAM

JNNURM

Final Report

August 2006



CITY DEVELOPMENT PLAN (CDP)
AGRA

MDP Consultants (P) Ltd. (ISO 9001-2000)
(a member of DHV Group, the Netherlands)

in association with

Allianz Securities Limited

Final Report
City Development Plan (CDP)
Agra

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ABBREVIATIONS:

ANN	:	Agra Nagar Nigam
ADA	:	Agra Development Authority
DUDA	:	District Urban Development Agency
JNNURM	:	Jawaharlal Nehru National Urban Renewal Mission
MoUD	:	Ministry of Urban Development
MoUEPA	:	Ministry of Urban Employment & Poverty Alleviation
GoI	:	Government of India
CDP	:	City Development Plan
NH	:	National Highway
SH	:	State Highway
STP	:	Sewage Treatment Plant
HH	:	Household
TCPO	:	Town and Country Planning Organization
RWAs	:	Resident Welfare Associations
NGOs	:	Non-Government Organizations
CIP	:	City Investment Plan
ASI	:	Archaeological Survey of India
MT	:	Metric Ton
mld	:	million litres per day
Ha	:	Hectares
Lpcd	:	Litres per capita per day

ACKNOWLEDGEMENT

MDP Consultants Pvt. Limited, (a member of DHV, the Netherlands) in association with Allianz Securities Limited acknowledges the valuable guidance, assistance and help extended to our team members from time to time and is indeed grateful to the following individuals, departments and organization without which we would not have been able to complete the assignment successfully.

1. Shri. A.K. Verma, Principal Secretary (Urban Development)
2. Shri. S.P.Singh, Special Secretary(Urban Development)
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14. Shri. Amar Nath Srivastav, E. E. Jal Sansthan
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26. Dr. D. Saha, I.C CPCB
27. Shri Rajendra Kumar Verma, Employee, State Bank of India, Agra
28. Shri Ravi Singh, Architect & Farmer

Chapter 1
Introduction

1.1 BACKGROUND

The population of India is 1027 million with approximately 28% or 285 million living in urban centers and it is expected that the share of urban population will increase to about 40% of total population by the year 2021. This is in sharp contrast to only 60 millions (15 percent) who lived in urban areas in 1947 when the country became independent. During the last fifty years the population of the country has grown two and half times, while the urban India has grown by nearly five times. The positive role of urbanization has often been over-shadowed by the deterioration in the physical environment and quality of life in the urban areas caused by widening gap between demand and supply of essential services and infrastructure. It is further associated with many problems, such as high levels of poverty, environmental stress, risks to productivity, high health costs, and lack of access to basic services, such as water supply, sanitation, and housing. The insufficient employment opportunities and inadequate income has also given rise to urban poverty. Hence, the efficient performance of urban economy depends upon availability of infrastructure and basic services such as transport, roads, water supply, sanitation and solid wastes management etc.

Since the level of investments required for these sectors (transport, roads, water supply, sanitation and solid wastes management etc.) is of a very high order it is felt that the national level initiative is required that would bring the Central, State and Urban governments together to ensure proper flow of necessary funds to bring about improvements in these sectors to an acceptable levels in tune with the international standards. The government also recognizes that urban issues require integrated approaches that specifically target the poor, promote economic development, treat cities as a living ecosystem and foster the involvement of private sector and civil society.

Against this background and also considering the incompatibility of our cities with India's growing role in world economy, the Jawaharlal Nehru National Urban Renewal Mission has been launched by the Ministry of Urban Development (MoUD) and the Ministry of Urban Employment and Poverty Alleviation (MoUEPA), Government of India (GoI) on 3 December 2005 with a time frame of seven years (2005-2012).

As the cities are prime drivers of economic growth and need to become the focus of good governance, the Mission also provides an incentive to the selected cities/ urban centers to undertake institutional, structural and fiscal reforms that are necessary for improved and sustainable service delivery systems address poverty and enhance local economic performance.

To achieve the goal of creating economically productive, efficient and responsive cities the main focus of the Mission is:

FOCUS OF JNNURM

- **improving and augmenting the economic and social infrastructure of cities,**
- **ensuring the basic services to the urban poor including security of tenure at affordable prices,**
- **initiating wide – ranging urban sector reforms whose primary aim is to eliminate legal, institutional and financial constraints that have impeded investment in urban infrastructure and services, and**
- **strengthening municipal governments and their functioning in accordance with the provisions of the 74thCostitutional Amendment Act, 1992**

It is in this context the Consultancy assignment for the preparation of City Development Plan (CDP) for the Agra city identified under the Mission in the State of Uttar Pradesh has been entrusted to MDP Consultants (P) Ltd. in association with Allianz Securities Ltd. The CDP for Agra City is being prepared vide work Order No. 25-EE(S)/0-07 dated April17, 200 and the Agreement signed on 5th May 2006 with Agra Nagar Nigam (ANN).

1.2 OBJECTIVES OF THE JNNURM

To encourage reforms and fast track planned development of the cities and efficiency in urban infrastructure and urban services delivery mechanisms and accountability of ULBs / parastatal agencies towards citizens the following objectives have been framed out:

- Focused attention to the integrated development of infrastructure services covered under the Mission,
- Establishment of linkages between asset-creation and its management through a slew of reforms for long-term project sustainability,
- Ensuring adequate funds to meet the deficiencies in urban infrastructural services,
- Planned development of identified cities including peri-urban areas, out growths and urban corridors leading to dispersed urbanization,
- Scale-up delivery of civic amenities and provision of utilities with emphasis on universal access to the urban poor,
- Special focus on urban renewal programme for the old city areas to reduce congestion, and
- Provision of basic services to the urban poor including security of tenure at affordable prices, improved housing, water supply and sanitation, and ensuring delivery of other existing universal services of the government for education, health and social security.

1.3 SELECTION OF AGRA CITY

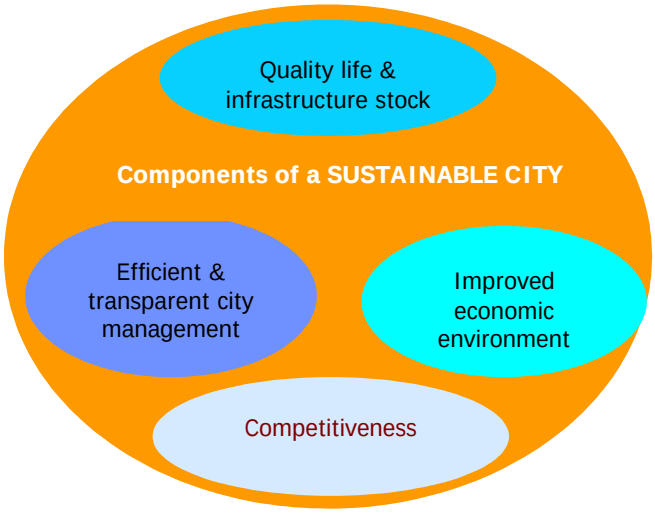
As per the selection criteria of JNNURM towns, Agra comes under category B as million plus city and has also importance of being a world-class architectural heritage site. Hence considering its population size and tourism potential, Agra is one of the 7 cities of Uttar Pradesh selected under JNNURM.

1.4 CONCEPT AND PRINCIPLES OF CITY DEVELOPMENT PLAN

A CDP is a planning process and a vision for future development of the city, which builds and improves the partnership of stakeholder groups to ensure good governance. It also encourages the people to think about the development of their city thereby defining the development strategies that give an impetus to the economic growth and poverty reduction.

It presents the current stage of the city's development and sets out the directions of change. It also identifies the thrust areas, suggests alternative strategies and interventions for bringing about the change and also provides a framework projects need to be identified and implemented on priority basis. It establishes a logical and consistent framework for evaluation of investment decisions.

The principle of CDP is to develop a sustainable city with quality life & infrastructure stock, improved economic environment and competitiveness of Agra city in terms of specific areas of industry & services sector with efficient & transparent city management.



1.5 OBJECTIVES OF THE ASSIGNMENT

The following objectives have been framed to achieve the goal of City Development Plan:

- To identify the challenges of the city
- To prepare a perspective and set Vision for the future development of the city
- To focus on the development of economic and social infrastructure
- To suggest policies and programmes that specifically address the issues of urban poor.
- To assist the State government to undertake urban sector reforms, which will facilitate flow of investments into city based infrastructure.
- To strengthen the municipal governments their financial management and accounting processes, thereby promoting transparency in their functioning etc.

1.6 SCOPE OF WORK

The City Development Plan for Agra sets out the spatial framework for the city within the context of the JNNURM. Under the JNNURM scheme, cities have to achieve;

- Access to minimum level of services
- Framework for planning and execution of action programme
- Double entry accounting, budgeting and financial management
- Transparency and Governance

The above foremost tasks to achieve and translate it to developmental outputs in the form of projects, programme and implementation process which intend to cover the following;

- *Formulate a term based action programmes*
- *Identify and prepare project proposals in accordance with JNNURM Guidelines*
- *Draw up a timeline for implementing the urban sector reforms.*
- *Improving and augmenting the economic and social infrastructure*
- *Ensuring basic services*
- *Initiating wide-ranging urban sector reforms whose primary aim is to eliminate legal, Institutional and financial constraints that have impeded investment in urban infrastructure and services; and*

- *Preparation of Detailed Project Report*

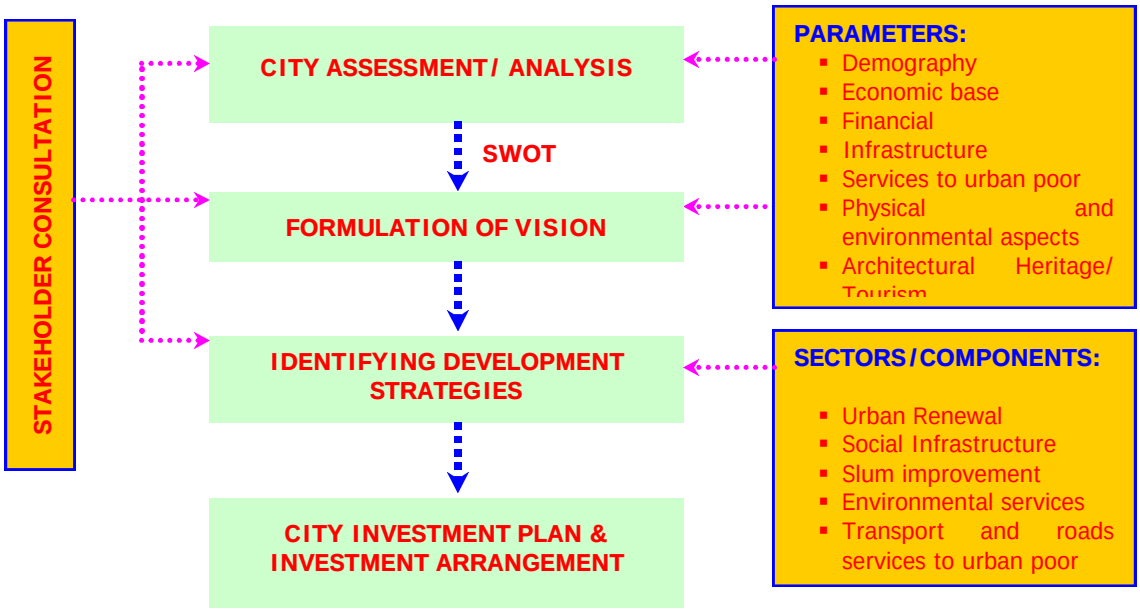
- Identification of major infrastructure projects includes the improvisation of urban transport systems, road network, construction of elevated roads, improvement of water supply system, sewerage and sanitation etc.
- Under sub-mission of JNNURM Urban Renewal i.e redevelopment of inner (old) city areas which would include items like widening of narrow streets, shifting of industrial/commercial establishments from non-conforming to `conforming' areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/drainage/solid waste disposal systems, etc.
- Renovation of historical monuments and other heritage buildings
- Strategic and policies to enhance funds for next 25 years is required to be worked out with 5 year update. It needs to propose an implementation plan for based on priorities and availability of resources, capital investment plan and operating system.

1.7 CITY DEVELOPMENT PLAN PROCESS

Within the framework of JNNURM, the City Development Plan for Agra City is required to be prepared indicating policies, programmes & projects. Strategies of meeting funds, integrated development of infrastructure. The main thrust of the mission has been on Urban Infrastructure and Governance focusing on minimum basic services relating to water supply, wastewater disposal, solid waste management, road network, etc.

1.7.1 APPROACH

Based on our understanding of scope of work and objectives the approach for preparation of City Development Plan is diagrammatically presented below:



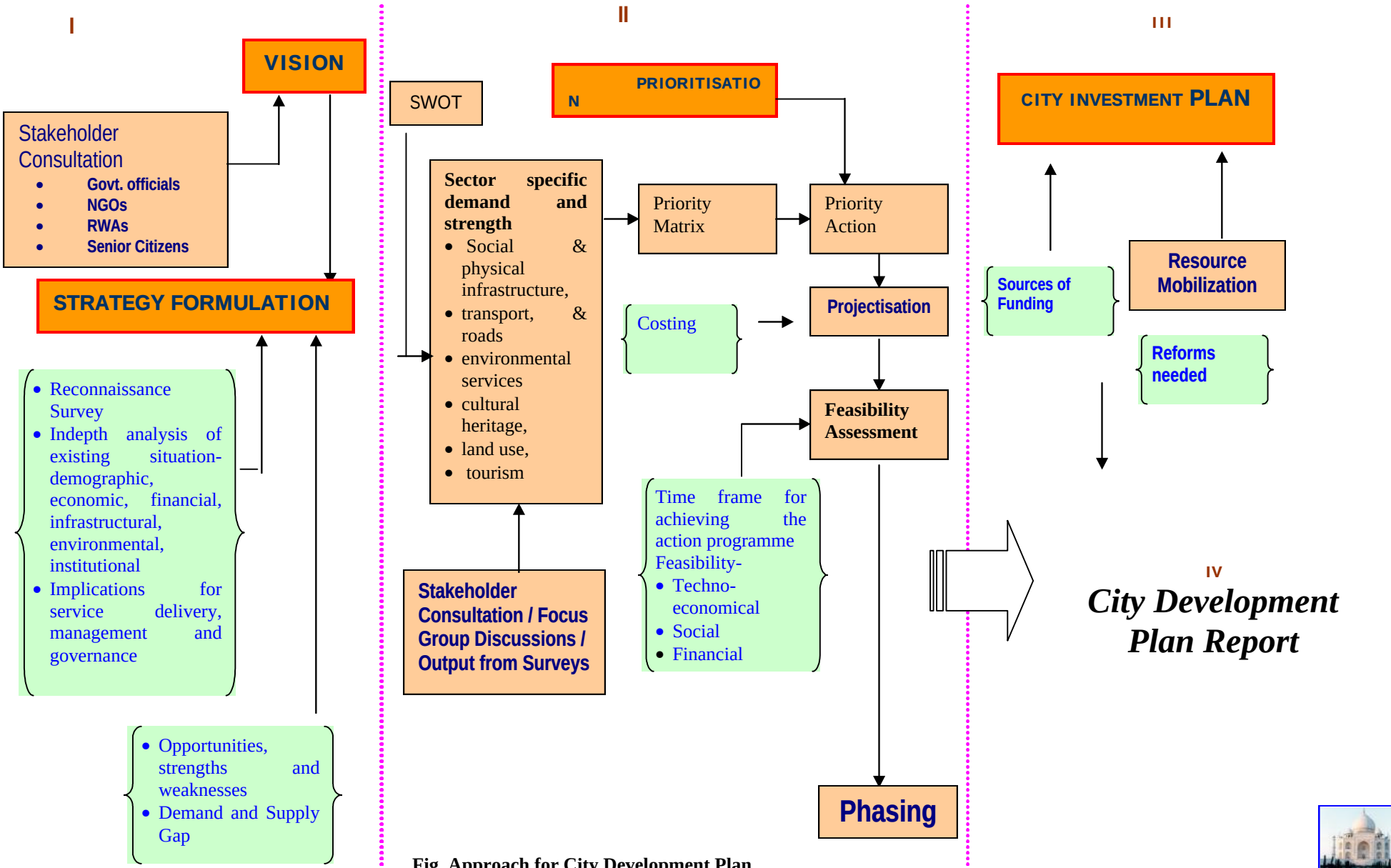


Fig. Approach for City Development Plan

Keeping in view the project objectives, the scope of work could be segregated into four parts. Part -1 deals with city assessment & data analysis of the infrastructure/ services, demography, slum population, Governance & Management and city finance & resources.

Part-2 deals with formulation of vision after conducting the SWOT analysis. The stakeholder's consultations, workshop is an important component of this stage. Part-3 deals with the development strategy and identification of priority actions, consensus building around a common understanding of the city's problems and priorities. The identified strategies will be prioritized and the projects will be identified for Agra city. The projects identified for Agra will be for the various sectors- urban renewal, infrastructure, slum improvement, environmental services, transport and road services etc. there will be regular consultations with the various stakeholders for finalization of the identified projects. Part-4, deals with identification of feasible option in terms of its technical and financial and deals with methods to translate financial inputs to developmental outputs in the form of budgeting and its implementation.

1.8 CONSULTATION PROCESS

Stakeholders Consultation is being an integral part of this project. These consultations were undertaken on regular basis with the underlying premise to sensitize the local populace about the project and cull out information (issues, opinion, needs and aspirations) from various strata of the society related to formularizing the city development plan for Agra. The stakeholders identified were:

Primary stakeholders are the project beneficiaries. The beneficiaries included local population of the project area including the urban poor group, Citizen Group, RWA's, traders' associations, civil society organizations, citizen organizations etc.

Secondary stakeholders will include the government, line ministry and project staff, implementing agencies, local governments, civil society organizations, private sector firms and other development agencies. The officials of Agra Nagar Nigam, development agencies such as Agra Development Authority (ADA) line departments such as DUDA, U.P. Jal Nigam, Transport Authority, Tourism and ASI etc will be the stakeholders to be consulted.

The consultation process has been taken place at two levels:

- Consultation with primary and secondary stakeholders
- Stakeholder workshops

Stakeholders were involved through formal and informal discussions and focus group discussions. The main aim of the consultations was :

- To assess the issues, potentials of the city
- Levels of urban services/infrastructure
- Areas, which need immediate improvement etc.
- Formulation of city vision
- Identification of development strategies
- Decision-making processes in terms of project identification
- Prioritization of projects

1.9 PROJECT FOCUS AND BENEFITS

At the end of the mission period the cities are expected to achieve the modern transparent budgeting and accounting. All residents should have access to a basic level of urban services including the urban poor. E-governance applications should have been introduced in core

PROJECT FOCUS AND BENEFITS

- **Access to a basic level of urban services to all**
- **Modern transparent budgeting and accounting system**
- **E-governance in core functions of ULBs**
- **Improvement in systems of governance**
- **Empowerment in poor urban communities**

functions of ULBs. Cities should also promote social development and improve systems of governance and empowerment in poor urban communities.

1.10 STRUCTURE OF THE REPORT

The Report contains sixteen (16) Chapters.

Chapter-1 is intended as Introduction which present the background, objectives and process of city development plan for Agra City.

Chapter-2 City Profile traces the historical importance /evolution of the city, regional setting and physical features including geo-hydrological aspects.

Chapter-3 tries to describe the Demography which includes trend of population Growth, Density, Sex Ratio, Literacy Rate and the population projections. This chapter also tries to provide the percentage of slum population in over all city population and the population below the poverty line (BPL).

Chapter-4 highlights the Economic Base of the city including the employment and occupational pattern, cities profile in trade and commerce and manufacturing. It also reviews the changes in employment pattern over the period.

Chapter-5 illustrates the Heritage and Tourism which has been the major characteristics of the city. This chapter tries to highlights the importance of conservation of heritage in the city and brings it to as a major attraction for visiting tourist. Importance of tourism in Agra has been discussed at length which includes tourist destination (both known and lesser known), arrivals, available accommodation and issues related to available tourist supported infrastructure and duration of stay of tourist in Agra.

Chapter-6 reviews the existing Infrastructure facilities which include Water Supply system, sewerage system, storm water drainage, solid waste management, road & transportation etc.

Chapter-7 highlights the Physical and Environmental aspects of the city wherein describing about the existing and proposed land use, policy guidelines as per the Master Plan 2021. it also covers the analysis of the inner/core city area and the various types of impacts of environment including the air, noise and water.

Chapter-8, Basic Services for Urban Poor highlights the slum population in the city with infrastructure services and housing available for the urban poor.

Chapter-9, Financial Profile of the city tries to assess the revenue structure of the Nagar Nigam including revenue receipt, expenditure in various heads, capital receipt & expenditure. It has been tried to assess the expenditure on improving the infrastructure of the city.

Chapter-10 review the Governance, Institutional Framework and Reforms which includes the study and assessment of existing institutional responsibilities, functional overlapping, status of e-governance system and status of implementation of 74th Amendment Act. This chapter also briefly highlights the status of reform under taken and role of private sector potential for formation of PPP.

Chapter-11, attempts to highlights the Problems, Issues and SWOT Analysis and findings and conclusions are summarized from various sectoral issues, problems from the preceding chapters which has been discussed.

Chapter-12 briefly describes the Stakeholders Consultation and Priority Matrix to help in deriving a consensus along with the stakeholders firming the process and agreeing upon a structured programme to take up the work of the CDP. Based on various consultations, the priority Matrix has been developed.

Chapter-13 outlines the Strategic Agenda and Vision. This chapter is based on the assessment of available infrastructure, deficiency and shortfall and outcome of the stakeholders' consultation in deriving a consensus for firming the process and agreeing upon a structured programme to take up the work of the CDP on priority basis. The basic strategic agenda has been frame to provide access to minimum basic services to the resident as well as the tourist visiting the city

Chapter-14 formulates sector wise Development Strategy and Governance Framework to achieve over all vision of the City Development Plan. Tourism in Agra being a major economic sector, the plan focuses on improving the tourism supported infrastructure including basic facilities like toilet and information kiosk and beautification of surrounding monuments.

Chapter -15 Project Identification and Phasing, the chapter outlines the identified project based on the JNNURM guidelines which has been divided into two parts- Submission-1 and Submission-2. Submission-1 attempts to bring project under Urban infrastructure and Governance and the Submission- 2 brings the projects for basic services to the Urban Poor.

Chapter-16 Costing and City Investment Plan has been prepared an investment plan including the financing strategy. The chapter includes, the project description, implementing agencies and revenue streams.

Chapter 2
City Profile

2.1 EVOLUTION

Agra city is of historic importance, which is amply evident from the numerous historical monuments in and around the city. The Hindu epic Mahabharata refers to it as 'Agraban', part of Brij Bhoomi, the homeland of Lord Krishna. The earliest recorded history of Agra, is its establishment by a local king in 1475. The city was the capital seat of Mughals in ancient times. The heritage of the city is linked with the Mughal dynasty but numerous other rulers also contributed to the rich past of this city. Agra was founded by Sikandar Lodi in the 16th century. It grew into an important power centre under the Delhi Sultan Sikandar Lodi and he shifted his capital from Delhi in 1504. Babar also stayed in Agra for some time and introduced the concept of square Persian-styled gardens. Emperor Akbar built Agra fort and Jehangir did the beautification with gardens and palaces. The city has a proud possession of "Taj Mahal" as one of the seven wonders of the world, now declared as World Heritage Site. The post-Mughal era of Agra saw the rule of Jats, Marathas and finally the British taking over the city. In addition to its historic importance, Agra is a main center of political, economic, commercial and cultural activities.

The origin and growth of Agra can be traced to several hundred years, which witnessed a series of historical events leading to its present form, structure, character, culture and economy. The growth of Agra started with the imperial favour, as a seat of emperor of India. In the process of development the city started influencing over the vast region and became the regional capital, which initiated its growth during the British and post independence period.

Legend has it that Agra was founded during the region of Ugrasen, grandfather of Lord Krishna. The existence of Agra city was accounted for in 1080 A.D., by Khawaja M,S.Salman, a poet, as a flourishing city with a string fortress built amidst river and lake hills. This was ruined by the invader Muhammad Gazni in 1080 A.D., which reduced Agra to a small town. Agra continued as a village until the core of the present city, was laid by Raja Badal Singh around 1475 A.D.

Sikandar Lodhi Period (1488-1517 A.D.)

Sikandar Lodhi captured Agra in 1492 and made it his capitol. The city was rebuilt and expanded into a trade and intellectual center, though the most of the township was on the left bank of the river, the Badalgarh Fort, however stood on the right bank. Besides the fort, he also erected a Baradari near Sikandara. The city was captured by Babur in 1526 A.D., from Ibrahim Lodhi, the last of the Lodhi dynasty.

Babur's Period (1526-1530 A.D.)

Babur, the founder of the Mughal dynasty, patronized Agra as his capital in 1526. During this time too, the city extended only the left bank of river yamuna and largely consisted of a string of gardens and pleasure pavilions line along the river. Valuable information in this regard, is yielded by his own memoirs in "Babarnama".

Humayun Period (1530-1555 A.D.)

Humayun Period saw very little change in the extent of Babur`s city. Two notable buildings came along the left bank of yamuna, Humayun Mosque and Gyarah Siddi Kachpura. The Afghan population in Hindustan resisted mughal rule, with Sher Shah recapturing Agra from 1540-1555. The next phase of notable growth and expansion came about in Akbar`s period, when the nucleus of the present city actually took shape, after recapturing the Agra. From here Agra grew throughout most of the mughal period.

Akbar Period (1556-1605 A.D.)

Akbar rebuilt a much larger and more magnificent red sandstone fort at the site of Badalgarh Fort in year 1565. The topographically elevated site by the river was highly defensible. It is roughly semicircular in shape stretching half a mile along the river. The seventy feet high walls along with bastions, battlements, towers and massive gates, housed palaces, mosque, houses of officials, gardens and market squares.

His Agra developed around the fort on the west bank of yamuna and was the nucleus of the 16th and 17th century mughal city. The pattern of development was very much like a small semi circular ring encircling the fort towards its North west, west and south west while the eastern side fronted onto the yamuna. A web of bazaars all radiating from the fort, adjoining a ring road can be discerned even in the present layout of Agra. This seems to be the oldest part of the city on the west bank, as we know it today. The population of Agra during Akbar`s time was about two lakhs and the accounts of Ralph Fitch, who visited Agra in 1585 A.D., give some idea of the city as it must have been at the time- “Agra is a very great city and populous, built with stone, having fair and large streets with river running by it. The road to Fatehpur Sikri was also constructed during this period.

Jahangir Period (1605-1627 A.D.)

Jahangiri`s Period saw gradual expansion of Akbar`s city; however no significant additions seem to have been made at this time. Valuable source of information about this period is the memoirs of the emperor himself-“Tuzuk-I-Jahangiri”- the translation used this research is by Henery Beveridge and Alexander Rogers. A lot of significant structures have been added to the city during this time, though no great expansion of the overall urban fabric seems to have taken place.

Shahjahan Period (1627-1658 A.D.)

Shahjahan`s reign was perhaps the most glorious for the Mughal capital, after which it underwent a slow decline, the imperial favor having shifted to Delhi instead. It was during the time of Shahjahan that suburbs of Tajganj, Lohamandi and Shahganj were added to the city. Tajganj was the direct result of the building of Taj Mahal, as it housed the craftsmen the craftsmen who worked on it.

Shahjahan was a prolific builder and besides the Taj itself, he added a huge number of other smaller edifices to the city. “Travels in the Mughal Empire” by Francois Bernier, a French traveler who visited India from 1656 to 1665, provides some very clear and therefore valuable account of the city at that time.

The city area, on one side of the river was seven sq. km, having seven km in length and one km in breadth. On the eastern bank, it covered 2.5 sq. km. All houses faced the river side, he nobles mansions were located nearest the fort and fronting onto the river, and a number of structure were added on to the fort, some replacing the earlier Akbar`s edifices.

Heights of building varied from three to four stories. There was also an important market called Nakhas for animals like horses, camels, oxen and all kinds of merchandise. An octagonal (Muthamman chowk) existed between Delhi gate of the Redfort and Jama Masjid. It had canals and fountains, pathways, shops of stone masonary with cusped arches on all sides.

Aurangzeb Period (1658-1701 A.D.)

The focus shifted from the time of Aurangzeb and the later Mughals who succeeded him, to Delhi, the new imperial capital. However Agra continued to grow and occupied a much larger area than before. Travernier`s travels in India, translated from the original French edition by V.Ball, is a valuable source of historical evidence of this period. It was after Aurangzeb, the dominance of Mughal Empire started declining and most of the 18th century Agra was under Jat dominion.

Colonial Period (1803-1947 A.D.)

The colonial period saw further expansion of the city. In 1803 Agra was formally under the British. Not only were the outlying peripheral areas were developed, but also large chunks of the mughal city were rebuilt upon. The continuous mughal urban fabric of the time of the later mughals became dissected and criss crossed by the intrusion of colonial development.

The chowk was destroyed in 1871-73 when the railway track was laid out and the Agra fort railway station was founded on its site and Agra became an important railway junction. The civil lines towards the north, the introduction of the railways, factory area lining the river towards the north east and the cantonment to the south with its golf course and racing ground, were the major additions during this time.

The surviving mughal city now existed in only isolated with a girdle of colonial development. Thus, Akbarabad, Tajganj, Shahganj, Lohamandi and Gokulpura from distinct patches of mughal urban fabric within a colonial encirclement, a number of new roads like Lawerence, Gwalior, taj and Mall road were built during this period.

The 19th century construction work also included the strand road connecting Taj Mahal and Redfort, as a famine relief measure in 1838. The present day Shahjahan Park was a relief public works undertaking in 1879.

Carlleyle Report (1871)

The most Valuable work, however, is an A.S.I report compiled by A.C.L Carlleyle, the then assistant archaeologist. Carlleyle records the location, condition historical background and physical configuration of almost all the monuments and historic structure of the time. The report also attempts to reconstruct the history and growth of the city on the basis of the material evidence that the author could collect and excavate, notably the remains of the city wall and its 16 gates. According to Carlleyle, the city covered an area of 12 sq. miles. The extent of the city, reconstructed on the basis of Carlleyle`s report has been included in this section.

Post Colonial to Present Day

The Post Colonial growth, that has largely taken place in the immediate aftermath of partition, is extremely haphazard and amorphous, it consist largely of the mushrooming of a huge number of refugee colonies all around the colonial city, the central commercial and office

functions still being located within Mughal and the colonial enclaves, thus causing considerable stress to these, specially to the old Mughal areas.

2.2 REGIONAL SETTING

Being centrally located on the national map, Agra forms an important regional urban center. All traffic weather by rail or road going south invariably passes through Agra thus making it a major transport node at the regional level as well as at the national level. This has also led to an extremely rapid and haphazard growth pattern .

The city of Agra is situated on the Western Bank of river Yamuna on National Highway (N.H-2) at about 200 Kms from Delhi in the state of Uttar Pradesh. Agra is geographically located at 27°12' North latitudes and 78°12' East longitudes. It has an extremely strategic location on the confluence of three distinct geo-physical regions namely the plain of Uttar Pradesh, the plateau of Madhya Pradesh and the desert of Rajasthan. The city also falls in the center of the four-culture areas- Braj, Bundelkhand, Rajputana and western U.P. Both these factors have played significant roles in shaping the life and history of the city.

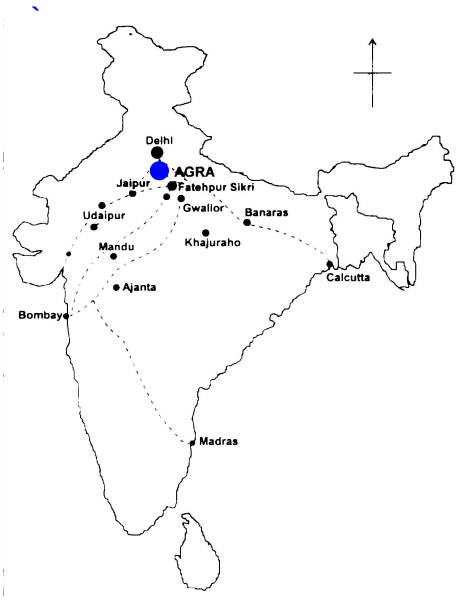


Fig 2.1 Location of Agra in India

Fig 2.2 Regional setting of Agra city

2.3 PHYSICAL CHARACTERISTICS

The river Yamuna enters the city from the north-east corner, flows towards south for some distance and then turns towards east. The general slope is from west to east in CIS-Yamuna area on the right bank of the river Yamuna.

The climate of Agra city is extreme and tropical. During summer season the maximum temperature of the city rises to 47^0C and drops down to minimum of 3^0C during winter season. The city receives moderate to high rainfall with an average yearly rainfall of about 686mm. The ground levels at Agra vary from RL 150 m to 170m. The strata consist of mainly sandy soil. The sub-soil water level is generally 6 to 8m below ground level.

The HFL of Agra City is 154.76m at Jawahar Bridge. The city stretches for about 9.0 kms along the Yamuna river. The major part of the city is on the Western side of Yamuna and has grown beyond the river on the eastern side and is called the Trans Yamuna area while the original part is called as CIS Yamuna.

2.4 KEY FEATURES

Agra is ranked amongst the most outstanding historic cities in the world and certainly best known tourist destinations in India. The city boasts three World Heritage Sites namely – the Taj Mahal, Fatehpur Sikri & Agra Fort and innumerable other monuments of national and indeed international importance.

The population of the city as per Census 2001 is 12,17,534 inhabiting an area of 141.0 sqkm. The city is divided into 80 wards (Map 1). For a city with million plus population that has grown at more than 25% in last thirty years, the infrastructure

development has failed to keep pace with population growth. The city of Agra has several such deficiencies and there is a need to make substantial improvement in basic infrastructure prevailing in the city to raise the standard of health, sanitation, urban environment keeping pace with rapid urbanization and growing population. The importance of Agra city as a leading tourist destination has to be kept in view while designing the system to make the city beautiful, attractive to the tourists visiting the city.

Table 2.1: Salient Features Of Agra

City	Agra
District	Agra
Area	141.0 sq. km
Altitude	169m (height above sea level)
Latitude	27° -10'N
Longitude	78° - 02' E
Population	1275134 (as per Census 2001)
Connectivity	Air: Nearest airport is Agra Road: Delhi (200 km); Lucknow (378 km); Mathura (56 km)
Regional significance	It is one of the most important tourist destinations with the proud possession of "Taj Mahal" as one of the seven wonders of the world. Agra has a rich historical background, which is amptly evident from the numerous historical monuments in and around the city.

2.5 AGRA MASTER PLAN

Agra Master Plan 2021 envisages an urban area of the order of 20,000 ha which has been subdivided into various landuses as given in the table. It is also estimated the housing shortage for the plan period of the order of 2.5 lakh. The important policy decisions relevant for the purpose of preparation of CDP are as under:

- Industries
  - Non-pollutant industries be allowed to function in the city. 292 coal based industrial units be closed.
  - Industries related to software technology and information technology be promoted
  - Other polluting industries in the city be considered to be relocated

- Tourism
  - Proper access be provided for the monuments and the places of heritage value.
  - A barrage be constructed downstream of Taj so that Yamuna river retains water and the river is used for the recreational purposes
  - Area north of Taj Mahal across the river be developed as a National Park so that it attracts the tourists
  - In order to attract tourists international Golf course and stadium be constructed
  - Land measuring about 175 ha on Fatehabad marg be used for tourism related recreational activities
  - Agra be connected internationally by setting up an international airport
  - Taj ganj area near Taj Mahal be developed and beautified so that this can be a centre of handicraft and cottage industry for the tourist

- TTZ area
  - Industrial units falling in this area be relocated in a phased manner
  - Parks and river development be undertaken as apart of tourism attraction
  - River Yamuna should be made pollution free by establishing treatment plants
  - Traffic and transportation
  - A ring road is proposed in order to by-pass the Agra city and avoid congestion in the city area
  - Where ever necessary underground/multi-storied parking be proposed to meet the parking requirements
  - On the out-skirts of the city transport nagars are proposed on the Mathura road, Gwalior road and Kanpur road

- Water Supply
  - In order to reduce the water losses during distribution network needs to be improved and worn out/rusted pipes needs to be replaced
  - Proper water harvesting techniques be adopted for ground water conservation and recharge

- Sewerage and Drainage
  - Sewer lines be laid in a planned manner so that the sewer is properly collected and disposed
  - The sewer flowing in drains be treated at suitable locations and the treated sewer be allowed to fall downstream of Yamuna
  - Sufficient number of sewerage treatment plants be constructed

- As far as possible on both the sides of open drain three metres of strip be reserved for tree plantation

- Solid Waste Management
  - A plan be prepared for solid waste management and disposal.
  - Proper arrangement be made for collection and disposal of solid waste
  - Arrangement be made for instruments, vehicles, machines and manpower for the disposal of solid waste.

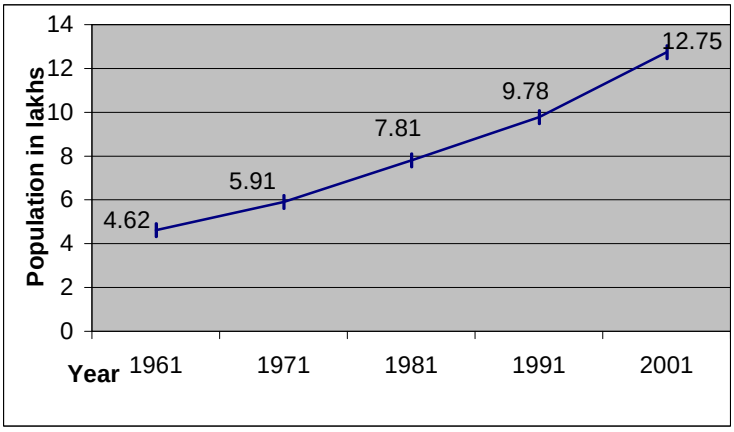
- Rain Water Harvesting
  - Natural ponds be preserved.
  - The land surrounding the natural ponds be used for recreational purposes.

Chapter 3
Demography

3.1 POPULATION GROWTH

The population of Agra city is 12.75 lakhs as per Census 2001 with a decadal growth rate of 30.37 per cent. During the post-independence period commerce showed a phenomenal increase with the associated industrial development and establishment of industrial estate, which resulted in the increase of city population.

Fig 3.1 Population growth-Agra



Source: Census of India, 2001

In last four decades, the decadal growth rate was maximum of 32.15 per cent during 1971-81 (Table 3.1). The increase in the Nagar Nigam limits in the year 1981 attributed to the increase in population and high growth rate.

As per Census 2001, the total number of wards in the city is 80. The ward wise population is given in *Annexure 3.1*. The 80 wards of Nagar Nigam for revenue collection purpose are reorganized into 8 revenue wards (Map 2). Now Agra Nagar Nigam is in the process of further delimiting the wards into 90 for election purposes.

Table 3.1: Population and Growth Rate-Agra

Year	Population (lakhs)	Growth Rate (%)
1961	4.62	-
1971	5.91	27.92
1981	7.81	32.15
1991	9.78	25.22
2001	12.75	30.37
Population projection (estimated)		
2006	14.93	
2011	17.53	
2016	19.88	
2021	22.69	

Source: Census of India, 2001

The population projection for the year 2021 has been taken as 22.69 lakhs. The population projection for the years 2011, 2016 and 2021 has been calculated by various methods:

Arithmetical Progression Method, Geometrical Progression Method and Method of Varying Increment or Incremental Increase Method. The details of these methods is given in *Annexure 3.2.*

3.2 COMPOSITION OF GROWTH

It has been observed that the population of the city has increased at different growth rates. In 1981 the Nagar Nigam area has extended from 61.80 sqkm to 141.0 sqkm. The population increased during 1971-81shows 72.93 per cent natural increase and about 27.07 per cent in-migration, which show about 27.92 per cent total increase.

Table 3.2: Composition of Growth

Year	Population increase during					
	1971-81	% of total	1981-91	% of total	1991-2001	% of total
Natural Increase	4.31	72.93	-	-	-	-
In-migration	1.6	27.07	-	-	-	-
Jurisdictional change	-		-	-	-	-
Total Increase	5.91	100.00	7.81		9.78	

Source: Census of India

3.3 DENSITY

The administrative limits of the Nagar Nigam Agra encompass an area of 141.0 sq. km with a population density of about 9043 persons per sq. km as per 2001 census. A comparison of the gross density of the city clearly indicates an increasing trend from the year 1981 to 2001. The density has shown a sudden decrease because Nagar Nigam area has increased more than two times whereas the population has not increased to that extent. The old city areas where the settlements started flourishing from the Mughal period like Lohamandi, Shahganj are highly congested while the density is lowest in colonial Agra. The large open areas between the fort and the Taj has remained undeveloped because it is the most low-lying area and hence more prone to floods.

Table 3.3: Population Density

Year	Population (lakhs)	Area (sqkm)	Gross Density
1961	4.62	61.80	7476
1971	5.91	61.80	9563
1981	7.81	141.00	5539
1991	9.78	141.00	6936
2001	12.75	141.00	9043

Source: Census of India, 2001

Thus, it can be seen that the density in the mixed land use areas of the Mughal city is the maximum while in the institutional colonial areas it is the minimum. The density in these areas is as high as compared to the other parts of the city.

As the city is divided into 80 wards but the distribution of population is non-uniform in the city. The ward nos. 26, 43, 50 and 66 have high concentration of population whereas the ward nos. 36, 40 and 47 have low population percentage.

3.4 SEX RATIO

The sex ratio measures the extent of prevailing equity between males and females in the project area. As per the Census 2001, the sex ratio in the city is 846 females per thousand males, which is less than the district figure of 898 females per thousand males.

Table 3.4: Sex Ratio

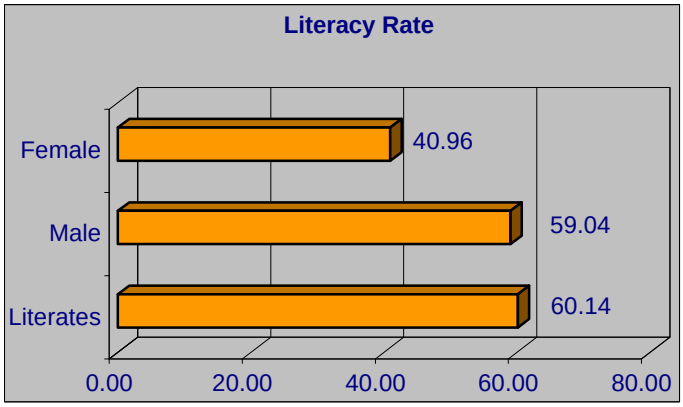
Year	Sex Ratio
1971	829
1981	821
1991	832
2001	846

Source: Census of India, 2001

3.5 LITERACY RATE

As per the Census 2001, the literacy rate in the city is 60.14 per cent, which is less than the literacy rate of the district (64.97per cent). The comparison among the male and female literacy rate shows that the percentage of male literates is quite high (59.04 per cent) in comparison to the percentage of female literates (40.96 per cent).

Fig 3.2 Literacy Rate



Source: Census of India 2001

The social composition of the population shows that the ST population is very less (0.02 per cent) in the city, the maximum population is in the general category.

Table 3.5: Social Composition

Year	SC	ST	Others
2001	21.52	0.02	78.46

Source: Census of India 2001

Chapter 4
Urban Economy

4.1 ECONOMIC BASE

Agra is basically a commercial city. The major part of its industrial activity is in the form of small-scale and house- hold industries. These are mainly located in the old Mughal city particularly Lohamandi, Rakabganj, Kotwali, Tajganj areas. The large-scale units are located in Chatta and Hariparvat areas. The important industries are textile, leather, foundries, diesel engines, generator sets, electrical goods, fans, pipes, C.I, casting, leather goods including shoes, steel rolling, packaging materials, etc. The major handicrafts are marble, leather, carpet, brassware, artistic dari and jewellery crafts.

Commercial Centre

Local Shopping Area

The city being an infertile land and prone to floods so agriculture was practiced only as a subsidiary activity in limited areas. Therefore, industries received an impetus and the proximity to river Yamuna was also an added advantage. The traditional handicrafts flourished, patronized by the Mughal court.

Agra has been a center of traditional handicraft industries from the Mughal times. A number of factors contributed in building this image like the availability of raw materials: leather, stone, cotton threads within the city or the region, marble from makrana, red sandstone from Bharatpur. Also there was less extent of fertile land, this also facilitated the growth and development of industries. Hence employment in agriculture shifted to allied sectors. Besides a massive amount of building activity was going on during the Mughal period and a number of craftsmen were hired to develop local skills. All these factors attributed towards Agra becoming the stronghold of traditional handicraft industries. The history of growth of traditional handicrafts begins with the Mughals.

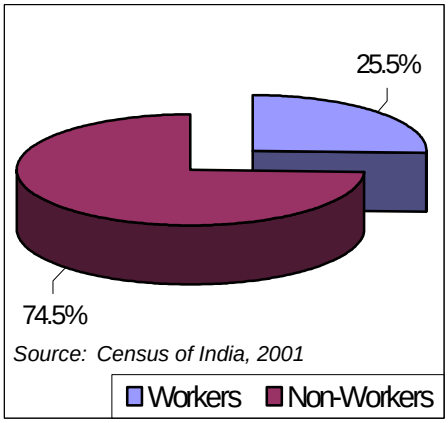
In the British period, the economy had undergone certain changes mainly because of

alteration in trade routes and the railways. But the city of Agra continued to play its role as a regional center. It was famous for zari work, silk weaving, stone inlay.

4.2 EMPLOYMENT

The work force participation rate (WFPR) of the city is 25.5 per cent. The occupational structure of the city shows that the majority of the population is engaged in tertiary sector (88.68 per cent) and minimum in primary sector 3.50 per cent.

Fig 4.1: Workforce Participation



Source: Census of India, 2001

a) OCCUPATIONAL PATTERN

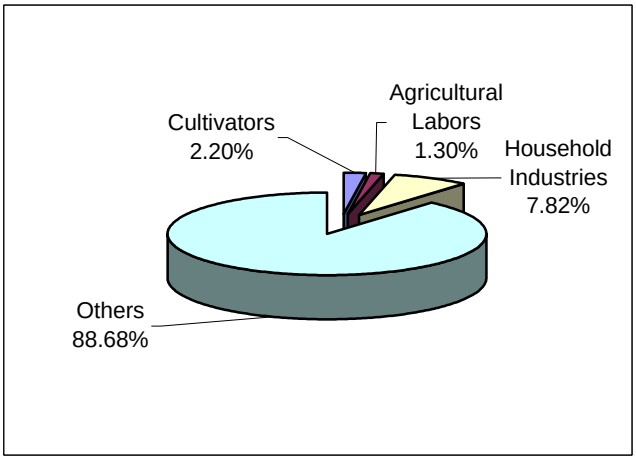
About 88 per cent of the population is engaged in tertiary sector, whereas a very less percentage of 3.5 per cent of population is engaged in primary sector.

Table 4.1: Occupational structure

Occupational Structure	2001		1971	
	Number	Percentage	Number	Percentage
Primary	9961	3.50	4410	2.87
Secondary	22252	7.82	13325	8.69
Tertiary	252437	88.68	135660	88.44
Total	**284650**	**100.00**	**153395**	**100.00**

Source: Census of India 2001

Fig 4.2: Occupational Distribution, 2001



Source: Census of India 2001

As per census 2001 out of the total workers, 2.20% constitute the cultivators, 1.30% as agricultural labors, 7.82 in household industries and 88.68 % in the category of others as given in Fig 4.2.

During 1971-2001, the employment scenario of the city has been changed. It has been observed that in contrast to other cities of India, the employment in secondary sector has been decreased from 8.69 per cent to 7.82 per cent. This may be due to the closure of many manufacturing units in the city to protect the environment for the sake of the Taj. It is also interesting to note that during these periods; the primary sector has also seen increase of 3.5% in 2001 from 2.87% in 1971. It is the fact that this increase may be large number of

agricultural labour force. The tertiary sector or service sector has not shown much increase from 88.44 per cent in 1971 to 88.68% in 2001.

Table 4.2: Economic Base, Occupational Distribution, 1971

Occupation Structure	Category	Number of workers	% of total
Primary	Agriculture	4410	2.87
Secondary	Household industry	13325	8.69
Tertiary	Manufacturing	37755	24.61
	Electricity, gas and water supply	-	-
	Construction	4618	3.01
	Transport, storage and communication	19642	12.80
	Banking and insurance	-	-
	Trade and business	33829	22.05
	Services	39816	25.96
Sub-Total		135660	88.44
Total		**153395**	**100**

Source: Census of India 1971

The classification of the above occupational categories was not available for the year 2001 so it is not analysed.

4.3 TRADE & COMMERCE

Agra is a commercial city. There are more than 50000 shops & commercial establishments registered at Nagar Nigam. The average growth rates of commercial establishments is high compared to hotels & restaurants.

Table 4.3: Trade & Commerce establishment 2004-2005

Details	2004-2005
Shops & Commercial Establishments	50188
Hotels & Restaurants	146
Market Stalls	195
Market vendors	462
Offices and Institutions	1144
Total	**52135**

Source: Detailed Project Report for Integrated Solid Waste Management Systems for Agra

4.4 INDUSTRIES

As per the report of District Industries Centre, Industrial Development in Agra at a Glance, the total number of SSI units in the city is 5263 and the investment in these SSI units is Rs.263-15 crores. The total number of exporting SSI units is 131 and shoe export units are 87.

The annual export from exporting SSI units and shoe export units is approximately Rs. 1500-00 crores and Rs. 1000-00 crores respectively. The annual export from SSI units also includes the indirect export. The sectoral distribution of investment shows that Rs. 89 crores and Rs.42,50.00 crore is being invested in agro-based industry and service sector respectively.

Table 4.4: Details of SSI units-Agra

S. No.	Particulars	Number/Amount
1.	No. of SSI units	5263
2.	Investment in SSI units	Rs. 263-15 crores
3.	No. of exporting SSI units	131
4.	Annually export from these units (including indirect export)	Rs. 1500-00 crores
5.	No. of shoe export SSI unit	87
6.	Annually export from these units	Rs. 1000-00 crores

Source: District Industries Centre, Agra

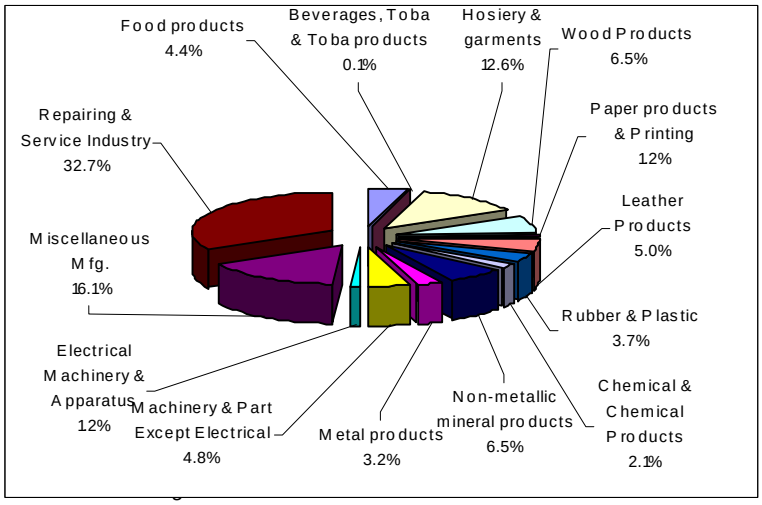
Table 4.5: Type of SSI Unit

	Kind of SSI Unit	Number	Percentage to total
1	Food products	232	4.4
2	Beverages, Toba & Toba products	4	0.1
3	Hosiery & garments	663	12.6
4	Wood Products	342	6.5
5	Paper products & Printing	63	1.2
6	Leather Products	263	5.0
7	Rubber & Plastic	194	3.7
8	Chemical & Chemical Products	113	2.1
9	Non-metallic mineral products	341	6.5
10	Metal products	166	3.2
11	Machinery & Part Except Electrical	253	4.8
12	Electrical Machinery & Apparatus	63	1.2
13	Miscellaneous Mfg.	847	16.1
14	Repairing & Service Industry	1719	32.7
Total		**5263**	**100**

Source: District Industries Centre, Agra

From the above table, it can be seen that the maximum percentage of SSI units are in repairing & service industry. There are also about 30,000 households artisan units in the city. Agra city has been the traditional seat of Iron Casting Products from the Mughal period. Before 1993 there were approximately 250 foundry units in the city but with the declaration of Taj Trapezium Zone in 1997-98 and implementation of strict pollution norms many industries were closed down. Now there are only 166 foundry units working in the city by adopting the environment friendly fuel.

Fig 4.3: Distribution of SSI units



The shoe manufacturing industry in Agra exists mainly in the form of cottage industries. There are about 5,000 to 7,000 such units in Agra. Besides, there are about 200 export-oriented units. These employ more workers. In addition, there are mid-size manufacturing units, which can be classified as small-scale industries. Such units employ about 10 to 50 workers. According to State government records, about 1.5 lakh pairs of shoes are manufactured a day in Agra by the cottage, small-scale and medium-scale footwear units together. About two lakh people work in the shoe industry in Agra.

About 1.5 lakh pairs of shoes are manufactured in Agra per day by the cottage, small scale and medium scale footwear units. There are also a large number of ancillary industries, supporting footwear industries in Agra. About 65% of total domestic requirement of shoes in India is supplied from Agra.

Agra is also famous for its Petha. Petha is manufactured by over 750 cottage units of the city and it has been the source of livelihood for several thousand residents. The origin of petha dates back to the Mughal era. Presently, the well-known Agra petha is manufactured in the narrow lanes of the centuries-old Noori Darwaza Market and other places of the city.

Chapter 5
Heritage and Tourism

5.1 IMPORTANCE OF CONSERVATION OF HERITAGE

Conservation of art work in the form of sculptures (stone, metal, wood) metals and their alloys, paintings, manuscripts, textiles, bone-ivory artifacts, monuments and heritage buildings is one of most important and challenging tasks of modern times. The fast pace of industrialization and unplanned growth has created avoidable problems to the architects, civil engineers, conservation scientists and restorers.

Deterioration of artifacts material is a spontaneous phenomenon and sets in as soon as the artistic creation leaves the hands of a stone carver, metal caster, painter, etc. The agencies of decay and destruction are all pervading and distributed all around in nature, it will not be wrong to say that nature wants the material to undergo degradation so that it can be created again. These cyclic processes of creation and deterioration are continuously occurring in nature. Conservation of heritage of mankind is indeed, a battle against the agencies destruction and decay. Conservation is a serious work and should be undertaken by trained conservators with a full understanding of material, alteration processes, stabilization of artifacts with respect to their immediate environment.

Material of an object cannot be changed because of its irreplaceable nature but the type of environment around the heritage buildings, monuments, museums, archives, art galleries etc. could be controlled by careful planning and management. The axiom: *'Wrong Conservation is worst than no Conservation'*. Hence, the need for a team of trained and experienced conservators, architects, planners, human resource developers, environmentalists etc.

5.2 HERITAGE OF AGRA

Agra has a long history, which can be traced back to the neo-lithic period. The rock shelter paintings have been found in village Rasoolpur, Patsal, Madanpur, Jajali and were discovered by Dr Giriraj Kumar of Rock Art society of India

The excavations conducted in and around Agra have revealed bricks, pottery, sculptures at Surajpur, inscription and sacrificial pillars near Bayana, sculptures, bricks and coins at Budiya-ka Tal and tehu at Itmadpur.

Agra fort was invaded by Mahmud Shah in 1080 – 81 A.D and poet Salman who was present at Agra during the siege observed that the fort is old and strong and had not been conquered so far.

Before the arrival of Mughals in the first quarter of the sixteenth century, Agra was under Delhi Sultans (1206 – 1526) who left their mark through buildings in Sikandara. Some of the ruins can be located in the present times.

Roman Catholic Cemetery, as it is popularly called, is situated on the eastern extension of the Mahatma Gandhi Road (MG Road), opposite to the Civil Court of Agra. It is one of the ancient most Christian cemeteries in Agra. As per reports, the site of the cemetery is part of the estate granted by Akbar to the Roman Catholic Mission. The cemetery contains tombs of different nationalities.

Roman Catholic Cemetery

About sixty monuments including three World Heritage Sites are under the protection of the Archaeological Survey of India (ASI) and most of them belong to the architectural grandeur of the Mughals (1526-1707). The list of protected monuments is given in *Annexure 5.1*.

Besides these monuments there are about one hundred unprotected monuments, heritage buildings, remains of gardens etc. which should be the target of the present development plan of Agra city. With tourist's interest in mind there is a need to survey these historical places and develop them as places of tourist interest by providing facilities like motorable roads, basic amenities like toilets, potable water, a respectable canteen, trained guides etc.

St. Johns College founded in 1850

Environmental Impact on Monuments:

In order to keep the monuments at Agra in sound and strong condition for survival till posterity the quality of air should be free of industrial pollutants, suspended particulate matter fly ash etc. In this connection the Apex court has ordered the closure of Iron foundries, which were polluting the environment. The Indian Railways having a shunting yard near Agra fort were asked to use low content sulphur fuel in order to keep the pollution under control.

Authorities of Mathura Refinery are aware of the importance of role of air pollution and accordingly they have taken measures for up-gradation of pollution control equipment for the reduction of Sulphur Dioxide (So_2) contents of air during winter months (November-December- January-February). This is significant because the gaseous pollutants are heavier than air and have a tendency to remain suspended at lower levels and their concentrations during low temperatures in winter months may cross critical limits and thus, set in the process of degradation of material of monuments (marble, sandstone, mortar, iron dowels, iron clamps etc).

Suspended particulate matter (SPM) is reported to be higher then permissible levels at Agra and they are a cause of concern. They contain red colored compounds of iron, which cause oxidation of so_2, No_X etc. to corresponding acids. These mineral acids even in small concentrations can be harmful to the material of monuments and also to the living beings.

In view of the above, the following issues are identified:-

- Survey and documentation of unprotected monuments.
- Testing and analysis of soil in the vicinity of heritage structures.
- Setting up of a museum to unfurl the history of the town.
- Survey of pollution creating industries and the type of waste – gaseous products, liquids, solid matter (SPM), fly ash etc.
- Collection of environment data like precipitation maximum minimum temperature, relative humidity and its fluctuations, for last 10 years with special reference to monsoon months and winter months.
- To draw a plan for conservation of heritage buildings, monuments, museum objects, excavated material etc.

5.3 TOURISM

There are seven Tourism Circuits in the state of Uttar Pradesh identified by the Department of Tourism. The eight circuits cover all the segments of tourism like history, religion, culture, adventure and eco-tourism.

i. Buddhist circuit,
ii. Bundelkhand circuit,
iii. Vindhya circuit,
iv. Braj (Agra-Mathura) circuit,
v. Avadh circuit,
vi. Water cruise and the wildlife circuit,
vii. Eco-tourism and adventure circuit,
viii. Agra falls in Braj (Agra-Mathura) circuit.

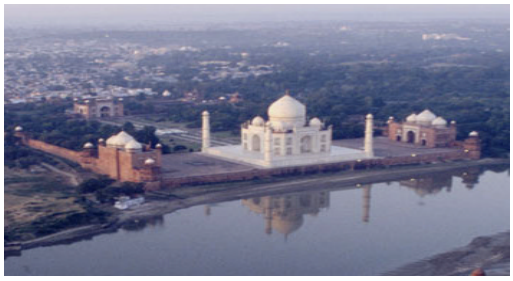
5.3.1 Significance of tourism in Agra

Agra's importance on tourist map cannot be underestimated; it is one of the key tourist destinations attracting tourists from all over the world. The city forms one edge of the prime tourist circuit in India- the so-called Golden Triangle, the other two cities being Delhi and Jaipur. The city is rich in its art, heritage and culture, which are also reflected in its historical monuments. This makes the city as one of the most attractive tourist places of the country. The Agra city currently has three world heritage sites: the Taj Mahal, Agra Fort and Fatehpur Sikri. This entire area is called Taj Trapezium (TTZ), a 10,400 sq. km area around the monument where industrial business is limited.

Location of Agra with other Tourist

Tourist Triangle: Jaipur, Agra, Delhi

5.3.2 Tourist destinations



View of The Tai Mahal and its

The city has huge tourism potential due to the Taj Mahal. The city has numerous monuments of historical importance that give impetus to the tourism in the city. The major tourist spots in the city include Taj Mahal, Fatehpur Sikri, forts, temples, etc. Radha Swami Samadhi, Dayal Bagh, Ram Bagh, Jama Masjid, Mehtab Bagh, Itmad-ud-Daulah, Sikandara, Mariyam's Tomb, Mankameshwar Mandir, Rawali, Kailash Mandir, Balkeshwar Mandir, Baptist Church, Sai-ka-Takia are also major attraction spots for tourists and devotees.

TAJ MAHAL

Agra Fort

Taj Mahal one of the seven wonders of the world is situated on the banks of the River Yamuna, at the northern end of formal gardens. The emperor Shah Jahan built this white marble mausoleum for his queen Mumtaz Mahal. Its construction started in 1631 and was completed in 1648. Twenty thousand people were deployed to work on it. The material was brought in from all over India and central Asia and it took a fleet of 1000 elephants to transport it to the site.

AGRA FORT

Fatehpur Sikri

Agra Fort is among the World Heritage Monuments. It is situated on the western bank of the River Yamuna in Agra and is less than 2 kilometers from the Taj Mahal. The fort is notable for its smooth blending of Hindu and central Asian architectural styles.

FATEHPUR SIKRI

Itimad-UD-Daulah

Fatehpur Sikri has been declared as the World Heritage site since 1986. It was built between 1571 & 1585 and the entire structure is in red sandstone. It is a beautiful blend of Indo-Islamic architectural elements. The sandstone is richly ornamented with carving and fretwork. Fatehpur Sikri was abandoned 14 years after its creation.

ITIMAD-UD-DAULAH

Located on the left bank of river Yamuna, the most beautiful building in Agra is the tomb of Itimad-ud-Daulah after Taj.

This monument was built by Nur-Jahan between 1622-1625 A.D. for her father Mirza Ghiyath Beg, who was appointed the Prime Minister of the Empire shortly after Nur Jahan's marriage to Jehangir and titled as 'Itimad-ud-Daulah' which means Lord Treasurer of the Empire.
The garden is on the opposite bank of the River Yamuna to Agra's Red Fort. It is a classic tomb garden with stone-edged flower beds on the lawns. This is unlikely to have been the original planting pattern.

MEHTAB BAGH

A typical four quartered Moghul garden, covering an area of 25 acres, is situated behind the Taj across the river Yamun. This garden had four paths of white plaster which met in the center. The article in Discovery magazine says that there was a rectangular pond at the point where the paths met. At the southern end of the garden there was an octagonal pool more than 100 feet wide

Mehtab bagh

RAM BAGH – OR BAGH-I-NUR AFSHAN (BAGH-I-GULAFSHAN)

Ram Bagh is one of the earliest gardens of Mughal Empire. Originally this garden was set up by Babur but it was later on renovated and renamed by Jahangir as Bagh-I-Nur Afshan. It is commonly believed that when Babur died in 1530 A.D. his mortal remains was first temporarily buried in this garden till they were taken to the final resting place at Kabul. Its original name was Aram Bagh. It is a typical example of Mughal pleasure-garden. Water was drawn from the river and flowed into a network of broad canals, tanks and water-chutes (Cascades) descending from one terrace to the other.

5.3.3 Tourist arrivals

Being in proximity of Delhi and being well connected to it by rail and road transport, Agra is prime city for domestic as well as foreign tourists. It is also estimated that nearly 55 percent of all foreign tourists visiting the country make a trip to Agra. The tourist arrivals to the Taj Mahal in the year 2005 were about 18,87,307 with 82.02 percent Indian tourists and 17.98 percent as foreign tourists.

Table 5.1 Number of Tourist-Taj Mahal (in lakhs)

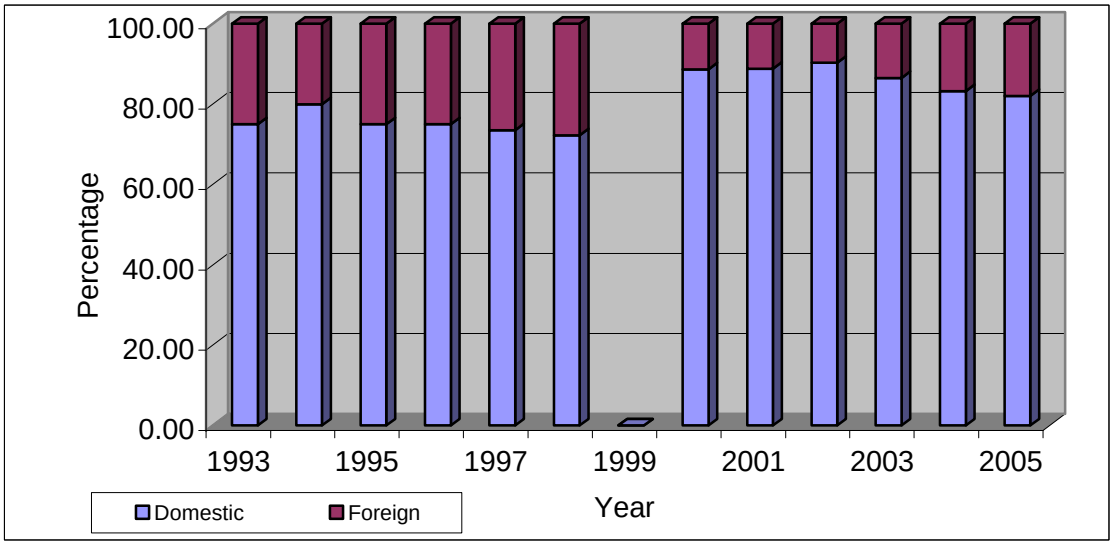
Year	Domestic	Foreign	Total	Growth
1993	15.27	5.09	20.36	-
1994	16.32	4.08	20.4	0.17
1995	15.89	5.3	21.19	3.77
1996	16.27	5.42	21.69	2.41
1997	16.29	5.87	22.16	2.14
1998	16.33	6.26	22.59	2.01
1999	Break up not available		17.46	-22.72
2000	17.83	2.28	20.11	15.18

Year	Domestic	Foreign	Total	Growth

Year	Domestic	Foreign	Total	Growth
2001	19.77	2.5	22.27	10.69
2002	15.9	1.71	17.61	-20.90
2003	16.03	2.5	18.53	5.30
2004	18.47	3.71	22.18	19.70
2005	18.87	4.13	23	3.65

Source: U.P. Tourism Office, Agra

Fig 5.1 Composition of Tourists-Taj Mahal



Source: U.P. Tourism Office, Agra

The above table shows that the tourist inflow in the city is increasing every year except in the years 1999 and 2002 where there is a sharp decline. Foreign tourists comprise about 20% of the total tourist arrivals (Figure 5.1). The growth rate of the tourists is varying in all the years. As per the figures provided by U.P. Tourism Office, Agra for the last 12 years the maximum number of tourist was in the year 2005.

About 90 percent of the tourists both domestic and foreign visit the three main sights Taj Mahal, Agra Fort and Fatehpur Sikri. The other tourist places like Sikandara, Itmad-ul-Daula, Ram Bagh are visited by very less number of tourists. Agra is perceived as a one-day destination, with Taj Mahal as the only attraction point.

The visits to Agra are seasonal. The foreign tourists come during the months of October to March/April whereas the domestic tourists come during the months of June/July or during festival period from August to October. There is a steady flow of tourists throughout the year.

5.3.4 Tourist accommodation

Over the last few years the hotel industry in Agra has shown a major growth. Before 1988, there were no hotels in Agra providing international quality standards and very less number of other hotels. With the boom in the tourism sector the number of hotels has increased in Agra. They include: Taj Group, Welcome Group, Oberoi, Trident, Jaypee Group etc. These hotels are best in terms of luxury and facilities and target both the luxury and peace oriented segments. The city has also many economy hotels.

As per the study by Ministry of Tourism, Government of India (Market Pulse Report-2004), Agra's availability of 175-rooms/lakh tourist is substantially lower than the national average of 423 rooms/lakh tourist and the state average of 404 rooms/lakh tourist. However, this could

be contributed to the fact that a larger number of tourists of Agra stay in Delhi. It is also lower than Varanasi, which has 558 rooms/lakh tourists in the state of Uttar Pradesh.

Table 5.2: Availability of Rooms in Agra –2004

City/State	Total number of rooms	Rooms / lakh tourist
Agra	**3,891**	**175**
Varanasi	18,423	558
Uttar Pradesh	295,436	404
India	1,171,121	423

Source: Ministry of Tourism, GOI in A Market Pulse Report,2004

Although the Taj and Agra fort are major tourist destinations, thousands of visitors leave Agra without even a night stay at hotel. Agra is close enough to both Delhi and Jaipur to visit only as a stopover. Thus a great deal of potential income is lost.

5.4 ISSUES AND POTENTIALS

The emerging issues are:

Congested approach roads

- The duration of stay of the tourists in Agra is only one day.
- Various other tourist destinations like Itmad-ud-Daula are not well connected with the city.
- The approach road to various tourist destinations is also highly congested so tourists do not prefer to visit them.
- There are no proper signage boards in the city.
- Lack of tourist information centers.
- Unhygienic conditions in the city, even the tourist places like Agra fort are not well maintained
- There are no evening activities for the tourists.
- As Agra is famous for its local handicrafts and petha, a tourist bazaar is not in the city. There are various UP tourism shops/emporiums and petha shops, but they are located at different places of the city.
- There is also a menace of the hawkers. They sometimes harass the tourists, which is major source of dissatisfaction among the tourists.

Potentials for tourism development are:

- Agra falls in the prime tourist circuit in India- the so-called Golden Triangle.
- The city also boasts three World Heritage Sites.
- Agra's proximity to Mathura, the religious tourism can be promoted.
- Agra has a rich cultural heritage; various programmes can tap the religious potential of the city.
- Taj Mahotsav is organized annually; such kind of programmes/events can be organized frequently to attract large number of tourists.

Chapter 6
Infrastructure

6.1 WATER SUPPLY

6.1.1 *Source of Water*

The source of water supply in the city is mainly surface water. The river Yamuna is the only surface water source, which enters the town from northeast corner, flow towards south of the city for some distance and then turns towards left.

There is extreme shortage of raw water in the river Yamuna during summers, the lowest discharge has been observed as 101.7 mld. Out of this discharge the average summer drawl of raw water is of the order of 99 mld. Due to high pollution level in Yamuna water the demand of drinking water of Agra, which is presently 142 cusecs and projected to be 276 cusecs in the year 2036 could not be met from this source. Foreseeing the shortfall in River Yamuna, the Central Govt. has earmarked 140 cusecs raw water for Agra and 10 cusecs from Tehri reservoir. This 150 cusecs raw water will be conveyed upto Palra fall of Upper Ganga canal through its system and then it has to be brought to Agra. this will meet the raw water requirement upto 2011 by which raw water quality in Yamuna river is expected to improve considerably and further requirement will be met again from the river.

Table: 6.1- Demand of Ganga and Yamuna water in various years

Year	Water demand (cusec)	Ganga water (cusec)	Yamuna water (cusec)	Percentage of dilution with Yamuna water	Remark
2006	142	140	-	-	Even after dilution quality of water will become potable and within the norms.
2011	160	140	20	12%	
2016	179	140	39	25%	
2021	199	140	59	30%	
115 CUSEC YAMUNA WATER WILL BE AVAILABLE FROM GOKUL BARRAGE					

Source: U.P. Jal Nigam; June 2006

6.1.2 *Water Quality*

The increased pollution load has impaired the river water quality to such an extent that the pre-chlorination dose as high as 20mg/l is necessary to bring down the coliform count within the acceptable limits formulated by the CPHEEO, Govt. of India. The water quality of river Yamuna is far from satisfactory as per CPCB norms. The water quality is as under:

Water Reservoir: Chipitola

Table: 6.2- Water Quality of River Yamuna

S. No.	Parameter	Observation	CPCB Standard	Remarks
1	Color (Hazen Unit)	300 - 400		
2	pH	7.8 - 9.5	6.5 – 8.5	
3	Chemical Oxygen Demand (C.O.D)	5.0 – 35.0	3.0	12 Times
4	Biochemical Oxygen Demand (B.O.D)	38.0 – 110.0	10.0	11 Times
5	Oxygen (D.O.) minimum	0 – 12.0	4.0	4 Lt. g.l
6	Most Probable Number (MPN) Index / 100 ML	$4x10^4$ – $240x10^4$	5000	50 Times
7	Fical Colifarm / 100 ML	$11x10^3$ – $18x10^3$	2000	9 Times
8	Total Ammonic Nitrogen	4.4 – 40.0	1.0	40 Times

Source: Agra Jal Sansthan; May 2006

6.1.3 Service Area

As against fourteen water supply zones proposed in the earlier planning, presently twenty-five zones have been set up, based on topography & operational convenience, to cover the entire master plan area for the design stage of 2001, incorporating all the existing zonal works. Following are the existing zone:

Hariparbat, Lohamandi, Maithan, Chatta, Kotwali, Rakabganj, Tajganj-I, Kandhari, Sikandra-I, Shahganj-I, Cantt.zone, Trans Yamuna I, Trans Yamuna II, Ghatwasan I, Ghatwasan II, Swami Bagh, Dayal Bagh I, Swami Bagh & Dayal Bagh II, Sikandra II, Bodla I, Bodla II, Bodla III, Shahganj II, Shahganj III, Tajganj II & Tajganj III.

6.1.4 Distribution and Duration of Supply

In most of the areas of Nagar Nigam water distribution system is available but still in some wards like Sikandra-II, Bodla-II, Shahganj-III, Tajganj-II, III, Trans Yamuna-II & Ghatwasan-II no water supply network is available. Water requirement in these areas is met by tube wells and hand pumps. There are about 4017 stand posts and about 4598 hand pumps in the city. These areas are facing acute water shortage so there is an urgent need for the augmentation of water distribution network of these areas. Besides this consumers are getting water for 5 hrs per day, both in the morning and evening.

6.1.5 Water Treatment

The transmission mains carry water from the source i.e. Yamuna to the water treatment plants and subsequently towards the Master Balancing Reservoirs for further distribution to the consumers. Presently there are two water works namely Jeoni Mandi water treatment plant and Sikandara water treatment plant. Both the treatment plants are giving a final output of about 270 mld, details given as under and are catering to three water supply zones (Map 3) including the cantonment area.

Water Works–I (Jeoni Mandi): Raw Water Pumping plant having capacity of 260 mld. This raw water pumped through Water Mains of 1500 m to WTP having capacity of 250 mld, which is giving final output of 180 mld. The storage capacity for this treated water, is 35 ml.

Water Works–II (Sikandara): Raw Water Pumping plant having capacity of 158 mld. This raw water is pumped through Water Mains of 1450 m to Water Treatment Plant (WTP)

having capacity of 144 mld, which is giving final output of 90 mld. The storage capacity for this treated water, is 5 ml.

The total storage capacity available within Agra is about 48200 KL comprising of 12 nos. of reservoirs. Further this water is distributed to Agra city through distribution network of 1100 km length of pipes with diameter ranging from 80 mm to 800 mm of CI, RCC, MS and PSC pipes.

6.1.6 Water Supply and Demand

The minimum per capita water supply recommended by CPHEEO for cities with population of one lac and above is 150-200 lpcd for domestic and non-domestic needs. After consultation with officials it has been decided that the per capita water supply for Agra should be kept 150 lpcd, out of which 135 lpcd goes to meet domestic demands 15 lpcd of water over and above 135 lpcd will take care of institutional demands, floating population and other demands. As per standard of 150 lpcd the water requirement for the projected population of 22.7 lakhs for the year would be of 340 mld and if 30% wastage during distribution is also considered then the water requirement would be 442 mld. As per estimate of U.P. Jal Sansthan 70% of the area is covered by piped water supply however in some of the areas the supply is uneven.

Table 6.3: Projected Water Demand

Year	Population	Water Demand (mld) @(150+15%)=172.50 lpcd As per CPHEEO's Norms	Bulk Water Demand (mld)	Total Water Demand (mld)	Raw Water Demand (10% wastage)	
					In mld	In cusec
2001	1,259,979	217	67	284	312	126
2006	**1,419,980**	**245**	**75**	**320**	**352**	**142**
2011	1,600,299	276	83	359	395	160
2016	1,803,517	311	91	402	442	179
2021	**2,032,540**	**350**	**98**	**448**	**493**	**199**
2026	2,290,647	395	105	500	550	222
2031	2,581,529	445	112	557	613	248
2036	**2,909,350**	**502**	**120**	**622**	**684**	**276**

Source: U.P. Jal Nigam; June 2006

6.1.7 Water Connections

There is no data available for the number of water connections in the city. Also, the domestic connections are not metered in the city, hence the water charges are not collected on metre basis. The domestic water charges are collected on the basis of annual ratable value and the diameter of the piped water supply.

Table 6.4: Minimum Water Charges- Domestic

S. No.	Annual Rental value	½"	¾"	1"
1.	Upto Rs. 360	648	961	1489
2.	Upto Rs. 2000	1296	1946	3074
3.	Upto Rs. 3500	1946	3074	4258
4.	Upto Rs. 5000	2500	3620	5430
5.	More than Rs. 5000	3241	4791	6787

Source: Agra Jal Sansthan; June 2006

The industrial, commercial, government, semi-government sector connections are metered in the city. The water charges per kilo litre for various sectors is given in the table below which shows that an increment of about 7.5 per cent per year in the rate of water charges.

Table 6.5: Water Charges for other uses

S. No.	Sector	Consumer class	Rs. per kilo litre			
			2003-04	2004-05	2005-06	2006-07
1.	Special areas and Industrial buildings	Panchtara hotel, teentara hotel, hotel lodge, cold store, ice factory, bottling plant, nursing home, petha industries, etc. (with metre)	30.40	32.70	35.15	37.80
2.	Other Commercial buildings	Cinema, restaurant, etc. (with metre)	15.00	16.10	17.30	18.60
3.	Government, semi-government, Institutional organizations	M.E.S., ADRD, Air Force, Telecom, Police department, PAC, Banks, Railways, Electricity department, Schools, etc. (with metre)	12.15	13.00	14.00	15.00
4.	Cantonment board	Cantonment board (with metre)	8.60	10.00	10.75	11.60

Source: Agra Jal Sansthan; June 2006

6.1.8 Institutional arrangement

The UP Jal Nigam is vested with the responsibility of the design and execution of water supply works and wastewater (sewage) collection, transportation and disposal related works. While Jal Sansthan Agra is responsible for the operation and maintenance (O&M) of water supply system and wastewater collection (sewerage) system.

Present level of Operation & Maintenance of water supply system by Jal Sansthan is far from satisfactory. There could be several reasons for such undesirable system performance. There are total 741 personnel to handle operation and maintenance issues of Agra water supply, which comprises of 3 managers, 37 technical staff and 701 field staff.

Poor raw water quality, excessive water loss due to leaks in water pipes and pipe appurtenances, inadequate flow and pressure at the consumer taps and prevailing unhygienic conditions in the city are some of the important issues of immediate concern. National Environmental Engineering Research Institute (NEERI) study of 1997 for Agra city reveals that the UFW ranges between 40-45 % of the total supply.

6.1.9 *On-going projects*

Currently, water supply scheme which is under execution is under Taj Trapezium Zone (TTZ) programme. The scheme aims at reorganizing the conveyance mains, balancing reservoirs, and distribution system for uniform and effective distribution of treated water and extending the water supply facility in the newly developed area. The estimated pre design cost of this scheme was Rs. 72.80 crore of which Rs. 61.50 crore worth projects are either under progress or completed / commissioned.

Fig 6.1: Taj Trapezium Zone

TTZ programme was initiated in 1997-98 for protection of Taj Mahal. The funding of this programme is equally shared by Central and State Government. The initial amount agreed upon was Rs. 600 crore. Funds were placed at disposal of a state level Mission Management Board (M.M.B) with Chief Secretary as its Chairman. Further in 1999-2000 a Taj Trapezium Environment Conservation Fund was constituted to ensure availability of funds for schemes intended to environmental protection of Taj Mahal and placed at the disposal of M.M.B.

Table: 6.6- Present Status of TTZ Programme

S. No.	Item	Status before T.T.Z.	Works proposed in T.T.Z.	Works completed in T.T.Z.	Present status
1	Zonal pumping station	11 Nos.	10 Nos.	2 Nos.	13 Nos.
2	Rising main	32 Km	32 Km	22 Km	54 Km
3	Distribution net work	418 Km	818 Km	419 Km	837 Km
4	Clear water storage OHT/CWR	51974 Kl	36325 Kl	2882 Kl	80799 Kl

Source: U.P. Jal Nigam; June 2006

6.1.10 *Major Issues*

- 15 per cent of the city area is not by piped water network.
- In Sikandra-II, Bodla-II, Shahganj-III, Tajganj-II & III, Trans Yamuna-II & Ghatwasan-II the water requirement is met by Hand pumps and tankers.
- The UFW ranges between 40-45 per cent of the total supply, which is very high.
- The pressure at tail end is very low.
- Excessive water loss due to leaks in water pipes and pipe appurtenances.
- Damaged water mains and distribution mains.
- 95 per cent of the leakages due to service lines.

6.2 SEWERAGE SYSTEM

6.2.1 Service Area

The city of Agra has underground sewerage system, which is operated and maintained by the Agra Jal Sansthan. Planning, construction and commission of the projects related to sewerage system is under the purview of Jal Nigam. NEERI, Nagpur prepared sewerage Master Plan for the city in 2002. This Master Plan divides the city into 25 sewerage zones, regrouped in 8 sewerage districts on the basis of topography and physical barriers like railway lines, river, National Highway etc. (Map 4)

- Tajganj Sewerage district consisting Tajganj I, II and III zones.
- Northern sewerage district covering Dayalbagh and parts of Sikandara I, Sikandara II, Khandari, Ghatwasan II zones.
- Eastern sewerage district covering Transyamuna-I and Transyamuna-II.
- Western Sewerage District covering Bodla-I, Bodla-II, Bodla-III, Shahganj-III and parts of Lohamandi, Sikandara-I, Sikandara-II, Shahganj-I and Shahganj-II
- Southern-I sewerage district covering Bundukatra and part of Shahganj-I
- Southern-II sewerage district covering part of Shahganj-II.
- Central sewerage district covering Ghatwasan-I, Kotwali, Maithan, Hariparbat, Chhata, Rakabganj and parts old Khandari, Ghatwasan-II and Lohamandi.
- Cantonment.

Table 6.7: Zone wise wastewater generation

S. No.	Name of Zone	Projected population				Water requirement @ 150 lpcd (MLD)+5% 172.50 as per CPHEO	Waste Water (MLD) @ 80	Other Waste Water generated	Total W/W generation in MLD
		2001	2009	2024	2034				
1	Northern Zone	138012	167104	239190	303796	52.40	41.92	11.60	53.52
2	Eastern Zone	122378	148175	212095	269382	46.47	37.18	10.48	47.66
3	Western Zone	358536	434113	621384	789219	136.14	108.91	29.80	138.71
4	Southern Zone I	70124	84906	121533	154359	26.63	21.30	14.40	35.7
5	Southern Zone II	24116	29199	41796	53085	9.14	7.33	25.08	32.41
6	Central Zone	221756	268501	384328	488136	84.20	67.36	6.6	73.96
7	Tajganj Zone	290332	351532	501378	639087	110.25	88.20	-	88.20
8	Cantonment	34725	42045	60182	76438	13.19	10.55	-	10.55
	Total	**1259979**	**1525575**	**2183687**	**2773501**	**478.44**	**382.75**	**97.96**	**480.71**

Source: U.P. Jal Nigam; June 2006

6.2.2 Network Coverage

In most of the zones of Agra city, sewer lines have not been laid except for certain parts of in old city area, which were laid in the year 1976. The existing system is spread over the area of 1400 hectares but devoid of proper house connection and mostly the sewage goes into the open drains. The system is badly silted, choked and damaged at number of places and overloaded due to the growth of population the city. Improper means of disposals of wastewater has also resulted in environmental pollution and creates unhygienic conditions. In

urban areas, a large population is not covered by safe sanitation facilities due to lack of well-established sewerage system.

Table 6.8: State of Sewerage System

Wastewater generated daily (mld)	153
Present operating capacity/ Capacity of Treatment Plants (mld)	90.25
Area covered under the sewerage system	17%

Source: Agra, Jal Sansthan ; May 2006

6.2.3 *Sewerage Distribution Network*

A large network of sewers of length consisting of local and branch/main sewers covers the city. The city lacks basic adequate sanitation facilities. The treatment capacities being inadequate, result in discharge of untreated sewage into water bodies, particularly river Yamuna and other nallahs passing by the city. Majority of the lines are non-functional due to extensive silting.

Sewage Treatment Plant in Agra

6.2.4 *Sewage Treatment Plants*

Three Sewage Treatment Plants (STPs) were built under Yamuna Action Plan Phase I. The STPs at Burhi ka Nagla (2.25 mld) and Peela Khar (10 mld) are made to perform beyond capacity, but still treat only 10% of the sewage they receive. Mean while, the Dhandupura STP (78 mld) remains under utilized. Besides effluent from these STPs do not conform to CPCB discharge standards. Please refer below figure for locations of STPs.

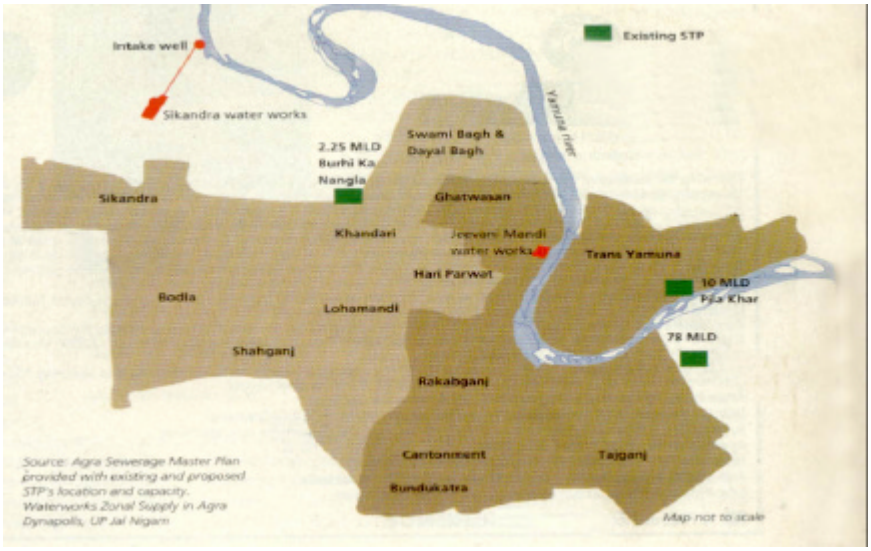


Fig 6.2: Location of Sewage Treatment Plant in Agra

6.2.5 *On-going projects*

Currently, sewerage scheme which is under execution is under Taj Trapezium Zone (TTZ) programme. The phase–I of Master plan for providing sewerage facility in Taj Ganj sewerage district and for renovation and extension of sewer lines in City sewerage district was

approved by M.M.B in July 2000. The estimated and sanctioned cost of phase –I was Rs. 43.57 crore with expected completion by June 2003, of which only projects worth Rs. 23 crore have been completed. Under this scheme 89.127 km of sewer lines have been laid and construction of 4 sewage-pumping stations is under progress.

6.2.6 *Sewerage master plan*

U.P. Jal Nigam has prepared Sewerage Master Plan based on the record prepared by NEERI Nagpur in 2002. In this master Plan the city was divided into 7 sewerage districts. Detailed works proposed in all sewerage districts except the Central Sewerage District wherein 50 per cent of existing lines can be reused in addition to the existing lines. The abstract of the works proposed for all sewerage districts is given as under:

Table 6.9: Abstract of works proposed as per Sewerage Master Plan

S. No.	Zone	Area Covered	Brief description of works
1	Central Sewerage District	Hari Parbat, Rakabganj, Kotwali, Chatta etc.	Providing 129 Km. new sewer lines 3 Nos. major & 5 Nos. small pumping stations.
2	Northern Sewerage Zone	Sikandra, Dayalbag etc.	147 Km. sewer lines 2 Nos. major and 10 nos. small pumping station and 38.00 MLD S.T.P.
3	Eastern Sewerage Zone	Trans Yamuna area	61.40 Km. sewer line, 3 major and 3 small SPS and 26.00 MLD STP
4	Western Sewerage Zone	Shahganj, Bodla etc.	255 Km. sewer line 4 major and 4 small SPS and 105.00 MLD STP
5	Sothern Sewerage Zone-I	Bundu Katra area	63.40 km. sewer line, 2 major and 6 small SPS and 29.00 MLD STP.
6	Southern Sewerage Zone-II	Shahganj area	30.20 km. sewer line, 1 major and 1 small SPS and 29.00 MLD STP.
7	Tajganj Sewerage Zone	Whole of Tajganj spread all round Taj Mahal	342 Km. sewer line, 4 major & 7 small pumping stations and 37.00 MLD STP

Source: U.P. Jal Nigam; June 2006

6.2.7 *Major Issues*

- The area covered by the sewerage system is only 17 per cent
- About 50 per cent of the sewerage system is not in working condition.
- Mostly the sewage goes into the open drains.
- The system is badly silted, choked and damaged at number of places and overloaded due to the growth of population.
- The STPs are made to perform beyond capacity, but still treat only 10% of the sewage they receive.
- Improper means of disposal of wastewater has also resulted in environmental pollution and creates unhygienic conditions.
- Treatment capacities being inadequate, results in discharge of untreated sewage into water bodies, particularly river Yamuna and other nallahs.
- The STPs at Dhandupura treats city sewer and discharge of 17 nallahs whereas STPs at Pila Khar and Magla Budi treats only discharge coming from nallah water.

6.3 STORM WATER DRAINAGE

6.3.1 *Service Area*

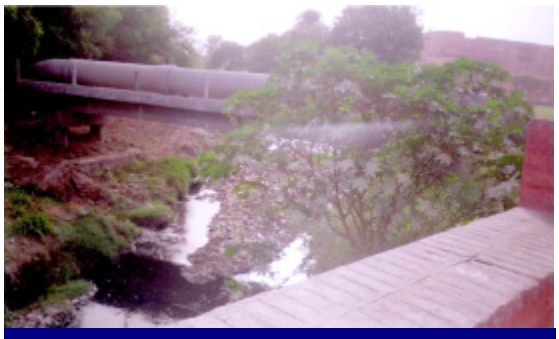
The drainage system of Agra was laid about 55 years back and drains are in bad condition. The system comprises hierarchy of natural and man-made drains that ultimately discharge

surface run off and sewage to River Yamuna because at most part of the city there is no sewerage system. Natural nallahs are the main carriers of the storm water.

6.3.2 *Primary and Secondary Drains*

U.P. Jal Nigam prepared a Agra storm water PFR with drainage system designed on basis of macro level planning. The information of drains above 60 cm width was collected and mapped in the study area of 15807 ha. For this purpose city was divided into two major

Open drains in Sanjay Palace



Nallah near Agra Fort

zones: CIS Yamuna and TRANS Yamuna based on major physical boundary River Yamuna. Drains along with their catchment area were marked. The CIS and Trans Yamuna area is further divided into 11 drainage zones.

Table 6.10: Salient Features of existing main drains

S. No.	Name of Zone	Existing Main Drain	Area Covered (ha.)	Area left for future development (ha.)
1.	Zone I (Karamyogi)	• Karamyogi Nalla • Anurag Nagar Drain • Rajwaha Drain • Balkeshwar Nalla	375.67	88.86
2.	Zone II (Dayal Bagh)	• Nalla Nagla Bopdi	2436.5	Nil
3.	Zone III (Shastripuram)	• Bapu Nagar Nalla • Bi-pur Nala	2436.5	Nil
4.	Zone IV (City)	• Water Works Drain • Krishna Colony Nalla • Vedant (Paliwal) Drain • Bhairon Nalla • Khoja Nalla • Pipe Mandi Nalla	937.40	Nil
5.	Zone V (Mantola)	• Mantola	3785.00	Nil
6.	Zone VI Taj)	Nil	931.01	Nil
7.	Zone VII (Kheria Air Base)	Nil	2629.08	1500
8.	Zone VIII (Naripura & Dewri Road)	Nil	1971.5	Nil
9.	Zone IX (Taj Nagri Phase-II)	Nil	935.45	Nil
10.	Zone X	• Ram Bagh Nalla	786.67	181.81

S. No.	Name of Zone	Existing Main Drain	Area Covered (ha.)	Area left for future development (ha.)
	(Foundry Nagar)	• Foundry Nagar Nalla (new drain already constructed) • Etamad-ud-Daulah Drain • Moti Mahal Nalla • Ram Bagh Chauraha Drains • Yamuna Bridge Station Drain		
11.	Zone XI (Peelakhar)	• Pilakhar Nalla • Naunihai Industrial Drain • Kalindi Vihar Drain (newly constructed drain)	505.90	Nil

Source: U.P. Jal Nigam

The table above shows the existing main drains in each of the eleven zones with the area covered and the area left for future development. It can be seen that in Zones II, III, IV, V, VI, VIII, IX and XI there is no area left for future development whereas in the remaining zones an area of about 1770 h. is left for future development. There are about twenty-five major drains in CIS and Trans Yamuna areas, which directly falls into the river Yamuna and there are about thirty-eight secondary drains. Mantola nallah is the longest nallah of the city and covers around one third of the city catchments. Primary and secondary drains/nallah's are of mixed type i.e kutcha and pucca. These drains/nallah's are mainly made in brick masonry without plaster and some portion in stone masonry. The salient features of major existing drains in the city is given in *Annexure 6.1*. These drains are heavily silted and broken in many places and are in very bad conditions. The lengths of primary and secondary drains are given in the table below.

Table 6.11: Lengths of primary and secondary drains

S. No.	Name of the Drain	Length (m)	S. No.	Name of the Drain	Length (m)
	Primary Drain/nalla				
1.	Bapu Nagar Drain	600	33.	Nehru Nagar Drain	225
2.	Bipur Bazar Drain	670	34.	Mughal Raod Drain	525
3.	Dayal Bagh Main Drain	1170	35.	Bagh Farzana Drain	1000
4.	Karmyougi Nala	800	36.	Church Road Drain	800
5.	Anurag Nagar Nala	400	37.	Ram Nagar, Sursadan Drain	1600
6.	Rajwaha Nala	1159	38.	Municipal Corporation Drain	450
7.	Balkeshware Nala	486	39.	Wazirpur Drain	870
8.	Water Works Drain	3900	40.	St. Peter's College Drain	600
9.	Krishna Colony Drain	511	41.	Belanganj Drain & Branch	1850
10.	Vedant Drain	275	42.	Bijalighar Drain	1630
11.	Bhairow Nala	2150	43.	T.B. Hospital Drain	1279
12.	Khoja Drain	241	44.	Ashok Nagar Nala	1720
13.	Pipal Mandi Drain	261	45.	Kothi Meena Bazar Nala	2600
14.	Mantola Nala	10400	46.	FCI Nala	2000
15.	Taj East Drain	4888	47.	Arjun Nagar Nala	1500
16.	Taj West Drain	190	48.	Sultanpura/Namner Nala	1800
17.	Ram Bagh Nalla	ABCD-770	49.	Dewari Road Drain	900

S. No.	Name of the Drain	Length (m)	S. No.	Name of the Drain	Length (m)
		m, BB1B3-470 m, CC1-300 m			
18.	Moti Mahal Nalla	AB1-324 AB-58 A2B2-207	50.	Madhu Nagar Drain	1100
19.	Ram Bagh Chauraha Nalla	460	51.	Naulakaha Drain/Nai Basti Drain	900/ 2500
20.	Et Ma Dud Daula Drain	1350	52.	Chipitola Drain	300
21.	Radha Nagar Nalla	500	53.	PWD Main Drain	800
22.	Pilakhar Nalla	1558	54.	Branch of PWD Drain	100
23.	Pilakhar Nala- Branch CC2	240	55.	Gyaspura drain	300
24.	Naunihai / Industrial State Nalla	790	56.	Prabhu Cinema	900
25.	Kalindi Vihar Nala (ABC)	ABC- 1030 DB-700	57.	Sector 4 Drain (Left)	600
26.	**Secondary Drains/nalla**		58.	Sector 4 Drain (Right)	600
27.	Jaswant Nagar Drain	600	59.	Sector 4 Drain (Main Drain)	950
28.	Nagla Budhi Drain	900	60.	Rui Ki Mandi	500
29.	Vidya Nagar Drain	1000	61.	Branch of Kothi Meen Bazar Drain	600
30.	Veer Nagar Drain	1200	62.	Branch of Kothi Meen Bazar Drain	600
31.	Water Works Chauraha Drain	1200	63.	Rajpur Chungi Drain	2500 -1100
32.	Shakti Nagar Nala	500			

There are about twenty-five major drains in CIS and Trans Yamuna areas, which directly falls into the river Yamuna and there are about thirty-eight secondary drains. Mantola nallah is the longest nallah of the city and covers around one third of the city catchments. Primary and secondary drains/nallah's are of mixed type i.e kutcha and pucca. These drains/nallah's are mainly made in brick masonry without plaster and some portion in stone masonry. These drains are heavily silted and broken in many places and are in very bad conditions. The lengths of primary and secondary drains are given in the table above.

6.3.3 Tertiary Storm Water Drains:

There are not much tertiary drains in Agra. Tertiary drains are roadside drains, which are missing in majority portion of Agra. These drains are pucca drains (lined in brick and stones masonry).

6.3.4 Water Logging Areas

The water-logged areas (26 numbers) of the city during the rains are: -

- Sur Sadan & Ram Nagar
- Vijay Nagar
- Khandari Chauraha
- RBS College
- Nadia Katra
- Loha Mandi/ Anand Nagar
- Bhim Nagar
- Mental Hospital
- Bipur Bazar Sikandra
- Kedar Nagar
- St. John's Chauraha
- Belanganj Railway yard
- Mughal Road
- MALL Road
- Naripura Road
- Mustafa Quarters.
- Seolajat
- Gopalpura
- Behind 509 Army Base Workshop
- Kotli Bagichi & Dewri Road.
- Subhash Bazar
- Agra Aligarh Road
- Etamad-Uddaula Area
- Naunihai Area
- Tehri Bagia
- Hamid Nagar Talaiya

The reasons behind the water logging are:

- Topography of the city ie. GL varies between 170 m to 150 m.
- Silting of the drain
- Dumping of debris and garbage into the open drains and nallah
- Unlined drains
- Buildings over the drain
- Inadequate drainage system
- Increased runoff due to increase in impervious area.
- Drains and nallahs carrying sullage
- Roads below the drains top level

6.3.5 Major Issues

The city is facing big problem of Storm Water Drainage due to:

- Old drains which are heavily silted, broken at places and encroached by buildings
- Most of the drains are inadequate in size and there is urgent need for planned desilting & remodeling of drains.
- Drains becoming non-functional due to garbage dumping by residence.

- Water logging has become a regular feature because of building that have come up just over the drains
- The vertical walls are of the drains in damaged condition resulting in water logging of the adjoining areas.
- Initial designs of drains are no longer to adequate to carry the increase run off. The increase in run off is due to more area, as per new development, getting paved.

6.3.6 On-going projects

Storm water drainage scheme, which is under execution, is under Taj Trapezium Zone (TTZ) programme. Project for providing drainage system in Sikandra, navalganj, Bhim nagar and Mustfa quarters areas of the city, costing Rs. 5.65 crore was sanctioned by M.M.B. of which physical progress worth Rs. 4.42 core is complete and remaining is under progress.

Additionally an amount of Rs.0.95 crore has also been sanctioned by M.M.B. for desilting and repairing of four drains namely Paliwal park drain, Mantoal drain, Bhario drain and Taj East Gate drain.

6.4 SOLID WASTE MANAGEMENT

6.4.1 Components of Solid Waste Management

Solid Waste Management (SWM) practices has broadly the following components and a clear understanding of each of these components is necessary for a really effective Solid Waste Management system:

- Generation
- Storage of Waste at Source
- Composition of Waste at Source
- Segregation of Waste at Source
- Primary Collection of Waste
- Temporary Storage of Waste
- Transportation of Waste
- Treatment and / or
- Disposal of Waste

Each of the above components is discussed below:

6.4.2 Generation of Solid Waste

The waste generated from the city includes household waste, commercial waste, clinical waste and industrial waste.

Following are the major sources of generation of waste at city level:

- Local residents,
- Hotels, Restaurants
- Bazaar and vegetable markets,
- Hospital and dispensaries,
- Others

About 628MT of solid waste is generated every day in the city, which comes out to be about 492 grams per capita per day. As per the NEERI Strategy Paper on SWM in India, (February 1996) the per capita waste generation in the city with population range of 10-20 lakhs should

be 270 grams per capita per day. For the purpose of solid waste management the city is divided into 19 sanitary wards (Map 5). Each sanitary ward comprises 3 to 5 wards and is managed by a Sanitary Inspector.

6.4.3 *Source of Solid Waste Generation*

From the above table it can be observed that the domestic waste is the major source of waste generation in the city. The average waste generated from the city is 492 grams per capita per day, which is higher than the standard/norms prescribed in the Manual on Municipal Solid Waste Management; Ministry of Urban Development & Poverty Alleviation, Government of India; 20001 (270 grams per capita per day for city with population in between 10 lakhs and 20 lakhs). The major waste generation points in the city are Kotwali, Noori gate, Lohamandi.

Table 6.12: Source wise break up of Solid Waste

Source	Waste Generation Per day (MT)	Per centage to the Total
Domestic	271	43.15
Shops and Commercial Establishments	262.5	41.80
Petha waste	36	5.73
Hospital Wastes	9.4	1.50
Other*	49.1	7.82
Grand Total	**628**	**100**

** construction & demolition waste, waste generated by floating population*

Source: Agra Nagar Nigam

Detailed project Report for Integrated Solid Waste Management

Waste from Petha industry

Agra is famous for its petha sweet and petha making produces substantial quantity of organic waste. It also produces large quantity of vegetable waste mainly peelings, seeds and fleshy part around the seeds. There are around 400 petha industry units. The situation is worst in the Petha industry area, as the petha waste attracts flies, mosquitoes and strays too. In some areas the garbage waste is recklessly burnt in open dump yards placed on the main highway road.

Petha waste lying on the road

Dumping of the waste in open drains near Agra fort

Bio-medical waste

There are about 127 private hospitals and about 101 government hospitals and medical offices in the city. The waste generated from the hospitals is about 9.4MT per day, which constitutes about 1.50 per cent of the total waste generated in the city. The collection, transportation and disposal of the hospital waste is taken care by the Dutta Enterprises. About 75-80 per cent of the hospitals are registered with Dutta Enterprises for collection and disposal of the waste. The vehicles of Dutta Enterprises collect the waste from these hospitals and dispose the waste in scientific manner.

6.4.4 Composition of Solid Waste

The waste produced from households, shops and commercial establishments are composed of food and other discarded waste materials such as paper, plastic, glass, metal, rags, packaging materials. The waste is found to be rich in organic matter and contains about 49 per cent organic content which is reasonably high as compared to other cities of India.

6.4.5 Storage and Collection of Waste

The system of storage at source does not exist in the city. The households, shops do not store the waste at source nor do they segregate the waste as recyclable and non-recyclable waste. Most of the waste is thrown on the streets, treating streets as receptacle of waste. This has led to an ugly and unhygienic atmosphere of the city. Thus there is a need to educate people to change their habit so as to store waste at source, dispose off the wastes as per the directions of the Nagar Nigam.

Waste thrown in the nallah near Ram Lila ground

Almost 75-80 per cent of the hospitals segregate the waste while the waste from rest of the hospitals gets mixed with the Nagar Nigam waste. There are a number of notices issued by the Agra Nagar Nigam, Agra Development Authority and District Collector to these hospitals regarding the segregation and safe disposal of the hospital waste. ANN is setting up a common facility for treatment of bio-medical waste from hospitals and medical institutions in the city.

a) Primary Collection of Waste

The primary collection of waste refers to house to house collection of waste or collection of wastes in the community waste bins either by the resident themselves or by the sanitary workers. There is no organized arrangement for house-to-house collection of waste in almost whole city except for some parts in the city. Community bins are also not available at convenient locations for depositing the waste. The waste from households, restaurants, shops is being deposited on the streets or thrown into the nallahs, open drains, open spaces etc. The waste is collected through the street sweeping. It was also observed that the condition around the bins is unhygienic and unaesthetic. The waste from the Petha industry areas like Noorganj is also not collected on daily basis with the result, the waste attracts flies, mosquitoes and strays too.

As per National Solid Waste Association of India, 2000 households are covered in the door-to-door collection of waste and the segregation of waste is starting in Ram Nagar and Surya

Nagar areas. Thus on account of limited and unorganized system of primary collection on household level street sweeping is the only method left for primary collection.

Street Cleaning: The street sweeping operations are inefficient in the city. While one worker sweeps the road, cleans the small drains, a second worker picks up the sweeping, which are kept in heaps by the first one. The sweeping is collected in the traditional wheel barrow which is taken to waste storage points and put either on ground or manually transferred to the dumper placer containers. The total length of roads in the city is 1724 km and each sweeper is entrusted 300-500 metres road length for street sweeping. The working hours of sweepers are 7 hours per day and the work is not carried out on Sundays. Sweepers are given containerized handcarts and wheelbarrows. There are approximately 800 wheelbarrows and 10 handcarts. For sweeping of streets, sweepers are paid at the rate of Rs.15 per month for buying of the brooms. The brooms used are usually short handled. The various equipments provided to the sweepers are ghamela, spade and collection trays.

Besides, the ANN has private sweepers engaged by the contractors in Tajganj ward at the 1 km periphery of Taj Mahal. In some parts of Tajganj ward the street sweeping is being privatized.

Table 6.13: Number of Sweepers-2005

S. No.	Type of worker	Numbers
1.	Departmental sweepers	2215
2.	Contract sweepers	300
	Total	2515
Sweeper Population ratio		**507**

Source: Health Department, Agra Nagar Nigam

b) Temporary Storage of Waste

At present there are about 561 waste storage depots in the city and out of which 225 are the open storage points causing nuisance and unsanitary conditions. The distribution of temporary waste storage point is non-uniform in the city.

Table 6.14: Temporary Storage Points for Collection of Solid Waste

S. No.	Type of waste Storage depot	Number
1.	Open waste storage depots	225
2.	Masonary waste storage depots	86
3.	Dumper Placer Container (8 cmt)	150
4.	Dumper Placer Container (4.5 cmt)	100
	Total	**561**

Source: Health Department, Agra Nagar Nigam

Temporary Storage Points: MG Road and Yamuna Kinara Road. Waste is overflowing from the containers thus creating unhealthy conditions

The dumper placer containers are placed in the areas of Rakabganj, Hariparbat. The dumper placer containers are not well maintained; about 70 per cent of the containers are damaged. The system of secondary storage does not match with the primary collection system in the city. The sanitary workers use the traditional handcart and deposit the waste on ground instead of putting in the containers. This creates in sanitary conditions around the bin and the stray animals get attracted towards it. The premises of the containers are also found with over flowing and decomposing waste. Some of the containers are located on the footpaths and on narrow road margins causing obstructions to the traffic and pedestrian movement. The sanitary ward wise distribution of temporary storage points is given in Annexure 6.1.

6.4.6 Transportation of waste

The transportation of waste involves the following activities:

- Movement of vehicles to various temporary storage points,
- Loading of wastes using baskets and other lifting tools,
- Lifting of wastes from the open yards on the way to the disposal site and
- Transportation to the disposal site

It is very essential to synchronize the whole operation of collection of waste with the transportation for effective management of the waste and for achieving cost efficiency in the process.

Open transportation of waste: Water Works Chauraha

Vehicular Fleet of the Nagar Nigam: The lifting and transportation of waste in the city area is done by Nagar Nigam. Nagar Nigam has inadequate vehicular fleet to transport the total waste generated within the city.

Process of Transportation of Wastes: The open transportation system is adopted for carrying solid waste from the temporary storage points to the disposal site. Waste is collected from various temporary storage points and open waste storage depots and loaded to the transport vehicle manually. Manual loading is time consuming and thus reduces the efficiency of the vehicles and manpower deployed for the purpose. The waste is not transported from all the storage points. In some areas like Hariparbat- III, only 22 per cent of the total waste stored in the containers is transported to the disposal site. Further, manual handling of wastes poses threat to the health of Sanitary Workers, as the waste is highly contaminated.

Table 6.15: Description of Vehicular Fleet of Nagar Nigam

S. No.	Type of Vehicle	Total No.
1.	Tipper large	17
2.	Tipper- Small	14
3.	Dumper (8cum)	16
4.	Dumper (4.5cum)	17
5.	Tractor with trailer	3
6.	Three Wheeler	6
	Total	**73**

Source: Feasibility Report for Solid Waste Management Works, Agra Nagar Nigam

The vehicles involved in the transportation of waste include small & large tipper, tractors, dumper placers and tipping trucks. There are 73 transport vehicles out of which around 45 are available for operation. Therefore, the transport fleet efficiency is only 60 per cent. One of the reasons for this is the poor maintenance of the vehicles. There is no routine maintenance and repairs being done which leads to more frequent breakdowns and less life span of the vehicles. About 325MT of waste is transported per day, of the total waste generated in the city (628MT). This backlog creates unsanitary conditions.

6.4.7 Treatment and Disposal of Wastes

The main objective of treatment and disposal is to clear waste from the disposal site in an environmentally friendly manner with little/no serious implication on the health and hygiene of the micro and macro environment. It is the responsibility of the local body to ensure safe disposal of the wastes generated within its jurisdiction.

There is no processing of waste being done at the city level. The entire waste, which is collected, is taken for dumping to the disposal site. At present there is no sanitary landfill site in Agra. The disposal is carried out following the method of crude dumping where the waste is neither spread nor covered. In some areas the garbage waste is recklessly burnt in open dump yards placed on the main highway road. The present dumping site is at Shahdara near Jarnah nallah on Agra-Firozabad road. The site has also been exhausted and now the vehicles are dumping the waste along the road margins.

6.4.8 Institutional Arrangement

The solid waste management is the responsibility of the Health Department of Nagar Nigam whereas Engineering Department assists in the procurement of the vehicles, equipment and developing the landfill site, etc. The Chief Health Officer is responsible for waste management. The Health Department has total employee strength of 2299 out of which 2090 (90.9%) are the sanitary workers.

All municipal authorities in the country were expected to complete the implementation of Municipal SWM rules 2000 by December 2003.For effective implementation of these rules ANN got the detailed project report prepared by US AEP and Clean Technology initiative as per the proposal of above study on decentralization of administration and interdepartmental co-ordination the requirement of the estimated staff shall be much less than the existing staff.

Table 6.16: Staff for Solid Waste Management

S. No.	Designation	Number
1.	Chief Health Officer	1
2.	Senior Health Officer	1
3.	Additional Health Officer	1
4.	Zonal Sanitary Inspector	0
5.	Chief Sanitary Inspector	2
6.	Sanitary Inspector	16
7.	Sanitary Supervisor	98
8.	Workers	2090
9.	Driver	90

Source: Agra Nagar Nigam

Table 6.17: Present Scenario of Solid Waste Management services in Agra

Functional Element	Detail
Segregation of Storage at Source	Generally absent, waste is thrown on streets.
Primary Collection	Does not exist, waste is deposited on the streets and picked up through sweeping.
Waste Storage Depot.	Very unscientific, waste is stored on open sites/ masonry enclosures. A few containers are however, in use.
Transportation	Manual loading in open trucks/ partly dumper placers.
Frequency of Removal	Daily
Processing	No processing is carried
Disposal	Crude landfill at Shahdara unauthorized dumping in open space.

6.4.9 Issues

- The waste is handled multiple times leading to potential health hazards for the workers as all types of wastes including hospital wastes, human wastes, etc. are disposed off in the same storage points. The sanitary workers are not given any protective clothing. Multiple handling of the waste is taking place in all the areas of the city.
- In Agra all the waste is added to the Nagar Nigam waste without segregation.
- Nagar Nigam does not have a proper disposal site for dumping of solid waste.
- The arrangement for separate collection of infectious biomedical waste is non-existent and there are no separate arrangements for transportation of infectious waste from hospitals and nursing homes.
- Several temporary storage points are not cleared on a day-to-day basis. This backlog of unserved bins continues to buildup during rest of the week.
- Community involvement is absent.

6.4.10 On-going projects/proposals

Agra Nagar Nigam is considering the project of energy generation from solid waste on Build Operate and Transfer basis by private involvement.

6.5 ROAD NETWORK

6.5.1 Existing Linkages

Poor Condition of Road

Agra is well connected by air, rail and road network. The city is on daily route of Indian Airlines and is only 30 minutes flight from Delhi. It is also on the main Delhi-Mumbai broad gauge (BG) railway line and well connected by BG to major cities like: Bharatpur, Gwalior and Kanpur. Agra is served by seven railway stations: Raja-ki-Mandi, Agra Cantonment, Agra City, Agra Fort, Idgah, Yamuna Kinara and Bilochpura and 2 bus stations (Agra Fort and Idgah). The city is falling on the corridor of Golden Quadrilateral under the ever since major scheme of NHDP. Moreover it is located on the junction of four National Highways namely Delhi - Kolkata (NH-2), Agra - Mumbai (NH-3), Agra - Jaipur (NH-11) and Agra - Aligarh (NH-93) and two State Highways namely Agra - Fatehabad (SH-62) and Agra – Gajnair (SH-39). The city is considered, from tourism point of view, to be one of the nodes of 'golden triangle' consisting of Delhi – Agra – Jaipur. The journey time by rail from the Delhi to Agra takes about 3 hours.

6.5.2 Road Network

The road network within the city is not developed enough to cater for the requirement of tourism, which Taj Mahal attracts. Intermediate Public Transport (IPT) is the popular mode of transport due to lack of proper public transport system. In fact the road network of the city offers poor level of service affecting safety, efficiency and economy of traffic operation within the city. The total road length of 1724 km in Agra Nagar Nigam area (including pucca road, semi pucca road, kaccha road) hasn't increased in last three years (since 2003). The year wise change in road length and the maintenance cost has been concisely presented in table 6.18.

Table 6.18: Road length and its maintenance cost in Agra Nagar Nigam Area

S. No.	Type	Total length (km) on 01/04/03	Maint. Cost in 2003-04 (lac)	Total length, m on 01/04/04	Main. Cost in 2004-05 (Lacs)	Total length, m) on 01/04/05	Maint. Cost in 2005-06 (Lacs)	Total length (km) of roads as on 1.4.06
1	Pucca	1050.35	331.89	1079.10	368.21	1110.00	531.21	1169.00
2	Semi Pucca	370	82.97	346.00	122.73	320.00	227.96	267.00
3	Kachha	303.65	-	298.90	-	294.00	-	288.00
Total		**1724.00**	**414.86**	**1724.00**	**490.94**	**1724.00**	**759.88**	**1724.00**

Source: Agra Nagar Nigam

Table 6.19: Description of reserve routes by Agra Development Authority

S. No.	Name of Road	Description of Road			Status of Footpath
		Length (km)	Width (m)	Surface	
1	Ram Raghu to Khandari Hndi Sansthan road upto Byepass	4	18	SDC	5' wide one side
2	Deewni Xing to Khandari Xing to RBS College road - Madiya Katra	2	18	SDC	Kutcha
3	Sanjay Place to RBS Xing to Transport nagar road	4	18	SDC	Kutcha
4	Sursadan Xing to Paliwal Park	0.8	15	SDC	Pucca Built up Recently
5	Motilal Nehru Marg upto Jevene Mandi	2.3	10	SDC	Not Available
6	Bypass Marg to Kamla Nagar 'B' Central Bank	2	15	SDC	Kutcha
7	Kamla Nagar Tankee Marg	2	18	SDC	Kutcha
8	Kamla Nagar Interial Main Roads	6	12	SDC	Kutcha
9	Bypass to Gandhi Nagar Main Road	1.5	15	SDC	Kutcha
10	Hariparwat Crossing to Ghatiya Xing to City Station road upto Belanganj	3	15	SDC	Not Available/not required
11	Surya Nagar Main road	1	12	SDC	Kutcha
12	Dewani Xing to Nehru Nagar Main Road	1.5	12	SDC	Kutcha
13	Colony Road Lawyers Colony	1	12	SDC	Kutcha/not required
14	Ghatiya Taj Club Paliwal Pak Gate Main Road	2.5	12	SDC	Not Available
15	Bag Farijana Road	1	12	SDC	Kutcha
16	Bypass to Kakreta Road	2	9	SDC	Kutcha
17	Bypass to Mau Road	1.5	9	SDC	Kutcha
18	Media Katra to Lohamandi Xing to Ratan Muni marg upto Pachkuiyan Road	2	15	SDC	Pucca 5m available
19	Panchkuia to Nalband Xing	1	12	SDC	Shoulder
20	Panchkuia to Gokulpura	1.2	9	SDC	Not Available
21	MG Road to Kidwai Park to Rajamarndi Ralway Station upto Tota Ka Tal	2	12	SDC	Kutcha
22	Moti Kunj Marg	1	7.5	SDC	Kutcha
23	Sikandra to Bodla Xing	3	18	SDC	Kutcha
24	Lohamandi Jaipur House to Pratap Nagar Xing	2	9	SDC	Kutcha
25	Dhakran Xing to Bijilighar Via Sardarbhatti marg	1.5	9	SDC	Not Available
26	Madina Hotel to Hathighat Bya Chimman Puri Wale Marg	2	10	SDC	Not Available
27	Daresi No. 2 to Kachharigha to Belanganj Market Road	1	9	SDC	Not Available

S. No.	Name of Road	Description of Road			Status of Footpath
		Length (km)	Width (m)	Surface	
28	Water works Xing to Jeevni Mandi to Balanganj Xing	2	10	SDC	Kutcha
29	Jeevni Mandi to Manuna Kinara Hathighat Kath Ka Pul	2.5	18	SDC	Kutcha
30	Water works Xing to Balkeshwar Marg till Balkeshwar Mandi	2	18	SDC	Kutcha
31	Balkeshwar Devi Mandir to Dr. Sudarshan road	1	12	SDC	Not Required
32	Mahila Chikitshalya to Masta Bagachi Langde Ki Chowki Marg	1.2	9	SDC	Not Available/not required
33	Mahila Chikitshalya Ring Road Abhinandan to Vijay Nagar Main Road	1.5	18	SDC	Kutcha
34	Gadhapara to Basant Talkies marg	1	12	SDC	Not Required
35	Transyamuna Phase-I Bypass to Naraich Link Marg	1.8	12	SDC	Kutcha
36	Nunbai Sabjimandi to Daudayal Misthan Bhandar Marg	1.5	18	SDC	Kutcha
37	Daudayal Misthan Bhandar (Nunhai) to Industrial Area Main road	1	18	SDC	Kutcha
38	Chalesar Bypass to Slaughterhouse Marg	2.5	18	SDC	Kutcha
39	Chaleswar bypass to Bangara Village Marg	1.5	9	SDC	Kutcha
40	Bodla Xing to Cod Saket Colony Xing Bya Bhoginpur Xing to Hasanpura Marg	2	12	SDC	Kutcha
41	Lohamandi Xing to Kothi Meena Bajar Saket Xing Rishi Marg to Maruti State Xing Marg	3	15	SDC	Kutcha
42	Kharia Vip to Idgah Bus Stand Bya Namneer Xing to Sai Ka Takiya Marg	3	15	SDC	Kutcha
43	Bijilighar Xing to Agra Fort to Taj Mahal Marg	1.2	18	SDC	Pucca Built up Recently
44	Puranmandi Xing to Shyamlal Marg to Basai Police Chowki Marg	2	15	SDC	Not Available
45	Shyamlal Marg to Pucci Sarai Marg	2	12	SDC	Not Available
46	Bundu Katra Xing to Madhu Nagar to Tak Phiroj Khan Marg	1.5	15	SDC	Kutcha
47	Gwalior Marg to Chawli Marg	2	12	SDC	Kutcha
48	Man Singh Palace to Rajpur Road	0	0	SDC	Kutcha
49	Amar Hotel to rajpur Xing road	0	0	SDC	Kutcha
50	Master Plan road Shamshabad Marg to Fatehabad road	0	0	SDC	Kutcha
51	Puranimandi Xing to Taj Basti	0	0	SDC	Not Available
52	Upadyay Nursing Home to Shashi Nagar road	0	0	SDC	Kutcha

S. No.	Name of Road	Description of Road			Status of Footpath
		Length (km)	Width (m)	Surface	
53	Shyam Lal Xing to Gober Chawki Road	0	0	SDC	Not Available

Source: Transport Department, Agra Nagar Nigam SDC: Surface Dressing

Table 6.20: Description of reserve routes by Agra Development Authority

S. No.	Name of the road
1	VIP road to Koria road by Idgah Bus Stand Mall road to Tident Hotel
2	Old Mandi to Tajview Hotel
3	Old Mandi to Old Fatehabad road up Pandit Moti Lal Nehru Park
4	East Gate of Taj Mahal to Shilpgram road
5	West Gate of Taj Mahal to Khat of Pull Stant Road (behind Lal Killa) upto Hathighat
6	Hathighat to Coast of Jammuna by Jivini Mandi upto Water Works
7	Front of Amar Singh Gate Fort upto Kariappa road
8	Bhagirati Devi Marg
9	Moti Mahal to Maihtab Bagh
10	Mahatma Gandi Marg

Source: Transport Department, Agra Nagar Nigam

It is evident, from the decreasing Kachha and Semi Pucca road length in proportion with the increasing Pucca roads that some work has been done in conversion of type of roads. This might be the reason behind the increasing maintenance cost where the road length remains unchanged. The width of existing roads is varying from 7m to 18m. It has been felt that there is an urgent need to widen the carriageway and extend the road lanes.

Mahatma Gandhi Road (MG Road) acts as north-south spine of the city dividing the CIS Yamuna area into two parts. It is a major commercial corridor handling about 60-70% of the traffic. Thus it is the busiest road of the city, which has traffic congestion problems in the following six junctions: Bhagwan Takies, Hariparwat, Raja Mandi, St. Johns, Collectorate and State bank. Apart from MG Road junctions another six congested junctions have been identified. These are: Ram Bagh, Water Works Circle, Sultan Ganj Pulia, Yamuna Kinara marg, Bizli Ghar, Subhash Bazar (Kotwali Area).

Parking on road reduces capacity

6.5.3 Parking

On-road parking is a major problem on MG road from Civil court to Hari Parwat crossing, Fubbarra area, Bhagwaan Takies crossing, Khanderi crossing to Water Works crossing via Bhagwan Takies at Mathura-Kanpur road, Sikandra – Bodla – Shahganj marg, Madiya Katra to Lohamandi crossing and New Agra area at Dayalbagh Marg. Parking space is needed in these areas to decrease on-street parking. Using the complete right of way may bring some solution to this problem.

6.5.4 Street Lighting

Agra Nagar Nigam is responsible for the operation and maintenance of street lights in the city, There are about 28,048 light points in Agra. As per National Transportation planning and Research Centre (NATPAC) study, 1994, only 35-40% are functional at any given point of time. Normally a team of 1 lineman and 2 helpers can handle 1000 points for repair and maintenance, so to handle 28,048 light points, Manpower required is 28 teams where as only 11 teams are available in Agra Nagar Nigam which is insufficient.

6.5.5 Registered Vehicles

Increasing population in Agra is putting pressure on city roads. As per TERI study, the city has witnessed an annual increase of 5.5 percent in private registered vehicles during the last five years, which stands about 4.75 lakhs as on March 2006.

Table 6.21: Number of Registered Vehicles Agra City

S. No.	Vehicles	1985	1990	1995	2002	2006
1	Two Wheelers	47364	102669	157547	267272	387215
2	Cars, Motor cabs, Jeeps, maxi cabs	4956	7272	12328	23584	39664
3	Buses, Omni buses	1241	566	1081	1303	2542
4	Goods carriages	4572	5410	4631	4796	7076
5	Tractors & trailers	9051	14846	18207	23017	28046
	Others	1331	2295	6007	6368	11157
	Total	**68515**	**133058**	**199801**	**326340**	**475700**
	Percentage increase	-	94.20	98.67	129.04	124.77

Source: RTO, Agra

From the above table it is observed that there is a continuous growth in number of registered vehicles in the city of Agra thereby putting more stress on the existing road network. The percentage growth rate with reference to the year 1985 as the base year is about 125 per cent.

6.5.6 Cargo Transportation

Agra city has a Transport Nagar located on NH-2, near Sikandra. This Transport Nagar is being further developed and improved. However many transport agencies are operating from various parts of the city, resulting in many cargo vehicles parked on the roads. This on-road parking hampers the smooth flow of traffic. Yamuna Kinara marg and road stretch from Rambagh Crossing on Kanpur road are the most effected stretches by such kind of truck parking.

6.5.7 Intra-city Transportation

Agra at present does not offer good intra-city public transportation to local and floating population. Current options for intra-city movement are : autos, taxis, buses, etc.) It does not have eco-friendly service for commuters. Agra Development Authority runs battery operated mini buses from eastern and western gate of Taj Mahal to its inner gates. These buses compete with cycle rickshaw, private mini-buses and hoarse cargos and find it hard to sustain themselves.

There are 2 Depot workshop and 1 Regional workshop along with 2 Bus Stations (Agra Fort & Idgah) working at present in Agra. One depot workshop is working at Foundary Nagar. There is also a semi finished Bus Station working in Transport Nagar. Almost a fleet of 250 buses is associated with these workshops where there the maintenance of the said fleet is carried out. In spite of that, almost 950 buses are being operated through fore said bus stations daily.

6.5.8 Traffic Management

There are only 6 traffic light signals in the city and work is under progress for another 23 traffic signals at crossings and T-Junction. Traffic lights at important traffic junctions are either absent or are non-functional. This creates problems at the junction resulting in delay and accidents. Traffic management system needs to be revamped to have safe and timely movement.

Table 6.22: Number of Major Traffic Junctions in Agra

S. No.	Locality / area of the city	Major Junctions (no.)
1	Itmad-ud-dulla	8
2	Chatta	8
3	Hari Parwat	7
4	Loha Mandi	8
5	Sanjay Palace	3
6	New Agra	9
7	RakabGanj	15
8	Sadar	8
9	Shahganj	18
10	Tajganj	11
11	Taj Mahal	7

Source: Agra Nagar Nigam

6.5.9 Issues

Road and traffic problems being faced by the city are: deteriorated road conditions, insufficient streetlights, unorganized parking problem, traffic congestion and absence of proper traffic management. Some of the heritage sites like Itma-ud-dullah , Chini ka Rauza are not in approach of tourists because of poor condition of the roads leading to these sites. Issues identified in this sector are :

- Mixing of regional and city traffic on corridors
- Delay at intersection due to non-standard configurations.
- Unorganized Parking on road
- Absence of traffic management plan / its implementation
- Increase in volume of two wheelers
- Varying carriageway width creating turbulence in traffic flows.
- Lack of good eco-friendly intra city public transport (from Taj Mahal point of view).
- No proper fare policy for taxis, autos and buses.
- Street furniture, road and tourism signage are also insufficient in the city
- No proper drains for draining out the water into main drains
- Barely any footpath for safe pedestrian movement.
- A number of rail-road crossings which add to traffic chaos in the city.

6.5.10 On-going projects

On-going project of Public works department in Agra city are:

- Laying of road from Kheria Airport to eastern gate of Taj Mahal.
- Road widening to six-lane opposite JP hotel.

Another on-going project, of ANN, is of installing 30 traffic signals by BEL of which 15 are ready for commissioning.

Chapter 7
Physical and Environmental Aspects

7.1 Land use

The first Master Plan of Agra was prepared for the plan period 1971-2001. In this Master Plan the land use was prepared for an area of 8360 Ha. The second Master Plan for a plan period of 2001-2021 (Map:7) stands approved and the land use break up is provided for an area of 20036.97 Ha. would be utilised for urban acitivities, including housing, commerce, industries, tourism, community services, transport, parks, amusement and entertainment centres, parks and parking spaces. About 50 per cent of area is for residential use and about 2 percent for commercial use.

The Master Plans 2001 approved by the Govt. of Uttar Pradesh in the year 1973 envisage following land use break up for the additional land of the order of 8360 hac.

Table7.1: Land Use Break Up for additional land

Land Use	Area in hac.	Percentage
Residential	3254	39.0
Commercial	300	3.5
Community facilities	1252	15.0
Govt. & commercial office Space	60	0.7
Industrial	1040	12.4
Open space & reservation	1000	12.0
Transport	1254	15.0
Other	200	2.4
Total	**8360**	**100.0**

Source: Agra Master Plan-2021

From the above table it can be seen that, the percentage of area for residential use is less than 40 percent. Master Plan 2021 for the city of Agra for the plan period 2001-2021 has also been approved by Government of Uttar Pradesh on 20.8.2004, where in the following existing land use for the Agra Development area and proposed land use have also been given as under.

Table 7.2: Existing Land Use of Agra Development Area 2001

Land Use	Area in ha.	Percentage
Residential	4886.34	61.84
Commercial	148.74	1.88
Wholesale Commercial	58.88	0.75
Industrial	542.72	6.87
Community facility	842.62	10.66
Office	177.93	2.25
Traffic & Transportation	858.65	10.87
Crenulations / Burial ground	31.25	0.40
Park Place Ground	105.22	1.33
Historical Monument	116.48	1.47

Land Use	Area in ha.	Percentage
Nursery	24.09	0.30
Gardens	69.12	0.87
Sewage Farms	38.35	0.49
Total	**7901.39**	**100**
Other Agricultural, forest, settlement, rivers, open spaces etc	44119.24	
Total	**52020.63**	

Source: Agra Master Plan-2021

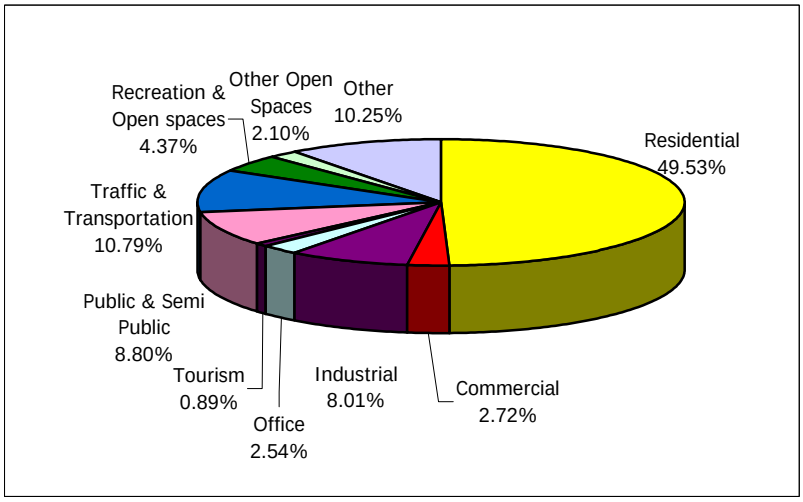
The revised Master Plan 2021 takes into account the requirements of urban population of 22.5 lakh as estimated by 2021 and focusing on city's historical and archeological significance.

Table 7.3: Proposed Land Use as per Master Plan 2021

S. No.	Land use	Area (in hac.)	Percentage
1	Residential	9923.80	49.53
2	Commercial	544.17	2.72
3	Industrial	1606.31	8.01
4	Office	508.40	2.54
5	Tourism	178.18	0.89
6	Public & Semi Public	1763.40	8.80
7	Traffic & Transportation	2161.60	10.79
8	Recreation & Open spaces	875.40	4.37
9	Other Open Spaces	421.58	2.10
10.	Other	2054.13	10.25
Total		**20036.97**	**100**

Source: Agra Master Plan-2021

Fig 7.1: Proposed Land Use as per Master Plan 2021



Source: Agra Master Plan-2021

Policy Guidelines – Master Plan 2021

Agra Master Plan 2021 envisages an urban area of the order of 20,000 ha which has been subdivided into various landuses as given in the table above. It is also estimated that the housing shortage for the plan period of the order of 2.5 lakh. The important policy decisions relevant for the purpose of preparation of CDP are as under:

- Industries
  - Non-pollutant industries be allowed to function in the city. 292 coal based industrial units be closed.
  - Industries related to software technology and information technology be promoted
  - Other polluting industries in the city be considered to be relocated
- Tourism
  - Proper access be provided for the monuments and the places of heritage value.
  - A barrage be constructed downstream of Taj so that Yamuna river retains water and the river is used for the recreational purposes
  - Area north of Taj Mahal across the river be developed as a National Park so that it attracts the tourists
  - In order to attract tourists international Golf course and stadium be constructed
  - Land measuring about 175 ha on Fatehabad marg be used for tourism related recreational activities
  - Agra be connected internationally by setting up an international airport
  - Taj ganj area near Taj Mahal be developed and beautified so that this can be a centre of handicraft and cottage industry for the tourist
- TTZ area
  - Industrial units falling in this area be relocated in a phased manner
  - Parks and river development be undertaken as apart of tourism attraction
  - River Yamuna should be made pollution free by establishing treatment plants
- Traffic and transportation
  - A ring road is proposed in order to by-pass the Agra city and avoid congestion in the city area
  - Where ever necessary underground/multi-storied parking be proposed to meet the parking requirements
  - On the out-skirts of the city transport nagars are proposed on the Mathura road, Gwalior road and Kanpur road
- Water Supply
  - In order to reduce the water losses during distribution network needs to be improved and worn out/rusted pipes needs to be replaced
  - Proper water harvesting techniques be adopted for ground water conservation and recharge
- Sewerage and Drainage
  - Sewer lines be laid in a planned manner so that the sewer is properly collected and disposed
  - The sewer flowing in drains be treated at suitable locations and the treated sewer be allowed to fall downstream of Yamuna
  - Sufficient number of sewerage treatment plants be constructed
  - As far as possible on both the sides of open drain three metres of strip be reserved for tree plantation
- Solid Waste
  - A plan be prepared for solid waste management and disposal
  - Proper arrangement be made for collection and disposal of solid waste
  - Arrangement be made for instruments, vehicles, machines and manpower for the disposal of solid waste
- Water Harvesting
  - Natural ponds be preserved
  - The land surrounding the natural ponds be used for recreational purposes

Areas Under Mantola

- Nai Ki Mandi
- Pipal Mandi
- Kotwali

Further as Master Plan for 2021 the housing shortage is estimated table 2, 56,488 Units. Which will also take care of the increase in population during the plan period by about 1 million persons.

7.3 HOUSING

As per the census, 2001, the number of households in the city was 209997 with an average family size of 6. The Master Plan 2021 envisages about 450,000 number of households in the city with family size of 5. Presently city has 199,497 residential units on which the deficit is about 16585 units. The Master Plan has also envisaged that the city will require 256,488 units by the year 2021.

As per the survey conducted by I.P.E. Pvt. Ltd the availability of housing stock was further as under in the year 2003

Table 7.4: Number of Built-up Properties

Ward Name	Total No of Built-up Properties (Residential + Plots)
Hariparvat	44281
Chatta	34804
Kotwali	8531
Lohamandi North	29437
Lohamandi South	26821
Rakabganj	17254
Ward No 7	3000
Tajganj	21500
Total ANN	**185628**

Number of households, as per 2001 census, in Nagar Nigam Area is 1,97,656 while the built-up properties as per the above survey statistics is 1,85,628 and further assuming one dwelling unit for each household, the housing shortage works out to be about 13,028 dwelling units.

The new residential colonies are being developed by ADA and Avas Vikas Parishad. These colonies are given below:

Agra Development Authority, Agra

- Jaipur House Colony, Agra
- Kedar Nagar Colony, Shahganj, Agra
- Ashok Nagar, Pachkuinya, Agra
- Shastri Puram Colony, Sikandra, Agra
- Kalindi Vihar, Firozabad Road, Agra
- Taj Nagari, Tajganj, Agra
- Shahid Nagar Colny, Tajganj, Agra
- Nehru Enclav, Fatehabad Road, Agra
- Indrapuram Colony, Fatehabad Road, Agra
- Transport Nagar, Sikandra, Agra

U. P. Avas Evam Vikas Parishad, Agra

- Sikandra Yojna Scheme, Bodla, Sikandra, Agra
- Kamla Nagar Yojna Scheme, Kamla Nagar, Agra
- Trans Yamuna Colony, Firozabad Road, Agra

7.4 ENVIRONMENTAL ASPECTS

The exponential population growth together with rapid urbanization and tourist pressure in Agra over the years has substantial impact on the environment management of the city. Agra city has also historic importance, which is amply evident from the numerous historical monuments in and around the city and hence attracts the tourists from all over the world. Thus there is a great pressure on the environment of the city. Although the presence of industrial and commercial activities, tends to have strong impact on the environmental quality of the city.

The environmental aspect is an important component for the sustainable development of a city. This chapter attempts to assess the existing status of the urban environment of the Agra city. The present chapter systematically deals with the environmental components particularly in terms of Air, Water, wastewater and solid waste in the Agra city.

7.4.1 *Urban environment quality of the city*

This section discusses the impact of urbanization on the natural and social environment and the resulting deterioration in urban environment quality perceived in the city. The parameters establishing the environmental health of the city are: Air Quality, Water Quality, Noise Level, Green Area, Sanitation and Hygiene and Ground Water level. These have been discussed in detail for the city.

a) Air Quality

The principal sources of Air pollution in Agra are from vehicular emissions, industrial emissions, construction related activities. The use of dirty fuel in inefficient vehicles moving on slow and ill-maintained and congested roads is a major cause of vehicular emissions. While source of industrial emissions are mainly from foundaries, small-scale industries and the major source of industrial emissions is Mathura refinery.

The selected station for conducting ambient air quality monitoring is Nunhai Industrial Area. As evident in Table 7.5 pollution levels have reduced from the year 2001 to year 2005. As per the National Ambient Air quality Standard Notification no. SO 384(E) dated 11th April 1994, 15 ug/cu.m is the standard for SO_2 and Nox while 70ug/cu.m is for SPM. All the three-parameter levels are within the prescribed limit in Nunhai Industrial Area. Thus, as per norms the SPM is very high whereas SO_2 and NO_X are under limit. The Respirable Suspended Particulate Matter (RSPM) in this area is 172.

Table 7.5: Air Quality Monitoring in Nunhai Industrial Area

Year	SO_2 (ug/m^3)	NO_X(ug/m^3)	SPM (ug/m^3)
1999	19	16	935
2000	17	13	784
2001	12	10	723
2002	7	10	475
2003	7	10	498
2004	8	8	454
2005	8	11	374

RSPM- 172 ug/m^3 (Annual Average for the Year 2005)

Source: UP Pollution Control Board, Agra

Table 7.6: Air Quality Monitoring in Bodla

Year	SO_2 (ug/m^3)	NO_X(ug/m^3)	SPM (ug/m^3)
1999	8	7	429
2000	8	8	548
2001	12	10	539
2002	7	10	401
2003	7	10	458
2004	8	9	385
2005	8	11	337

RSPM- 141 ug/m^3 (Annual Average for the Year 2005), Source: UP Pollution Control Board, Agra

The SO_2 and NO_X levels are showing an increasing trend whereas the SPM levels is decreasing. Further, the SPM is very high and the other two levels normal. The Respirable Suspended Particulate Matter (RSPM) in this area is 141.

b) Water Quality

The main source of water for Agra town is River Yamuna. River Yamuna water is however highly polluted, hence it is first treated and then supplied for drinking purposes through the existing water works and the associated distribution system. River Yamuna , which serves as a sewage conduit for towns along its banks, remains seriously polluted even after the implementation of the Yamuna Action Plan Phase-I. The Table 7.7 below shown that the pollution level of Yamuna River.

Table 7.7: Status of Water Pollution in Yamuna at Jal Sansthan Intake

Parameters	CPCB Standards of Raw Water Source for Public Use as per IS: 1982	2002		2003		2004		2005		2006 (till April)	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
pH	6.5 - 8.2	7.9	9.4	7.3	9.5	7.8	9.4	7.1	9.1	7.8	9.1
D.O.	>4 mg/l	0	16.5	1	15	1.5	14.8	2.6	12.8	1	12.8
B.O.D	<3 mg/l	4.2	32	4	26	6	28	2.2	38	2.2	38
C.O.D	<10 mg/l	14.7	102	21.6	68	20	64	20	72	20	72
Ammonia	<1.0 mg/l	-	-	-	-	4.4	40	0.6	40	10	32
Chlorine Demand		6.2	56.7	9.2	47.2	13.2	134	7.5	141	56.7	116
MPN Index/100 ML	Not more than 5000	120*10^3	2400*10^3	70*10^3	310*10^3	110*10^3	240*10^3	7*10^3	160*10^3	7*10^3	160*10^3

Source: Annual Report 2004-05, CPCB Agra.

c) Noise Level

The daytime Noise level at Taj Mahal is 65.5 dB, which exceeds the prescribed noise level of 50 dB. The noise level decreases to 56.2 dB during the night. The reason may be due to the visitors coming to Taj Mahal in daytime. (Source: Environmental Management Plan (EMP) of Agra City, Taj Eco city project, CPCB Agra)

The noise levels during night are also high compared to the prescribed limts, this may be due to the improper land use planning including activities around Taj Mahal, honking of horns, use of loud speakers, ringing of bells in vicinity of Taj and improper buffer zone etc.

Encroachment in Ramlila Ground

d) Green Area

As per the data available in District Forest Office (DFO), Tajganj Agra, the total reserve forest area in the city is 1912.20 hectares. The green area in the city comprises of about 58 parks, out of which 3 are city level parks namely: Shahjahan Park, Paliwal park and Nehru Park. There are also 4 mela grounds in the city:

Nehru Park

Subash Park

- Ramlila ground
- Kotti Meena Bazaar
- BSNL ground
- Shilp Ground

e) Water Bodies

Nagar nigam has 41 listed pokhars/ponds of different sizes. These water bodies comprising an area of about 0.45 sq.km (41.45 bighas) are spread in four revenue wards namely Lohamandi, Hariparvat, Chatta and Tajganj. Revenue wards in central and south-western area of nagar nigam are almost devoid of water bodies. Out of these 41 water bodies 13 ponds have either been fully or partly encroached or filled by earth. Example of such natural ponds are Tota ka Taal, Guru ka Taal. 28 ponds comprising 0.37 sq.km (34 bighas) are still available in the pond form itself.

Water body of Paliwal Park

There is urgent need of protection / beautification / conservation of 36 (including the 8 partly filled ones) ponds. Water bodies also exist in Paliwal Park and Sardar Patel Park.

Existing situation of Kale ka Taal.

Water body Kale Ka Taal has been totally encroached by multistoried building.

f) Sanitation and Hygiene

About 628 MT of waste is generated in the city everyday. There is no efficient transportation and disposal facility of the solid waste in the town, which creates unsanitary and unhealthy conditions. The petha waste generation in the city is about 36 MT, which is fully organic in nature. The waste is not collected daily and gives rise to flies, thus creating unhealthy conditions and breeding ground for the mosquitoes. The drains are also choked with polythene and other solid waste, which leads to the overflow of the wastewater from the drains. The nallah near Ramlila ground is filled with the polythene waste thus creating unhealthy environment.

Nallah near Ramlila ground: Full of polythene waste

g) Ground Water level

The western parts of Uttar Pradesh are characterized by deeper water levels ranging from more than 30mbgl, as noticed in most part including Agra. The water levels have shown a declining trend over the last two decades due to over exploitation of the ground water resource. The water level declining trends in these blocks are about 30 to 55cm/year in either pre or post monsoon period or both. Based on the draft report by the Central Ground water Board, U.P. Northern region the available ground water resource in Agra was 109269.50 ha.m. There are some places identified by the department for rain water harvesting in the city.

Table 7.8: Places of Rain water Harvesting

S. No.	Name of Zone	Area Covered (Ha)	Area for Water Harvesting (Ha)	Place / Location
1.	Zone I (Karmyogi)	375.67	Nil	Nil
2.	Zone II (Dayal Bagh)	2436.5	100.42	Dayal Bagh
3.	Zone III (Shashtripuram)	2436.5	4.72	Guru Ka Taal
		-	63.66	Sikandra Tomb
		136.37	45	Sikandra road drain / Mathura road drain
4.	Zone IV (City)	937.40	2.33	Paliwal Park
		-	19.75	District Jail
		-	13.0	Van Chetna Kendra
		-	17.57	RBS Agriculture College
5.	Zone V (Mantola)	37.85	7.85	Sardar Patel Park
		-	35.46	Fort
		-	7.16	St. Joseph Firls College
		-	517.00	509 Army Base
		-	13.66	Agra Club, Stadium, CTO, GPO
6.	Zone VI (Taj)	931.01	76.07	Taj and adjoining area
7.	Zone VII (Kheria Air Base)	2629.08	891.08	Air Base
8.	Zone VIII (Naripura & Dewari road)	1971.5	115/112.59	Dewri Road Drain / COD
9.	Zone IX (Taj Nagri Phase II)	935.45	Nil	Nil
10.	Zone X (Foundry Nagar	786.67	Nil	Nil
11.	Zone XI (Peelakhar)	505.9	Nil	Nil

Source: Agra Nagar Nigam

7.5 ISSUES OF URBAN ENVIRONMENT

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 Agra city.

- Air pollution in the city is localized and limited to roads, industrial areas, major junctions and at some extent in residential areas. While pollution in the city along arterial roads is due to increased traffic, small-scale industries and also the Mathura Refinery.
- The surface water of the city is contaminated. Water resources in the city are polluted due to disposal of sewerage directly into the surface drains or surface water bodies.

- At present, solid waste is one of the critical issues in Agra. Solid waste has been identified as one of the most pressing urban environment issues. The absence of a sanitary landfill site is another critical issue related to sanitary land filling which rears its ugly head in most urban centers of India.

Chapter 8
Basic Services for Urban Poor

The chapter discusses about the slum population in the city with their access to basic services drawn from discussions with the slum people, discussions with the DUDA officials and the secondary data. The aim is to identify the various issues related to the status of infrastructure and suggest strategies and proposals for the improvement and efficient service delivery. It also deals with the spatial location of the slums in the city.

8.1 SLUM POPULATION

As per the Census 2001, the total slum population in the city is 1,21761. The percentage of slum population in the city is 9.5 per cent of the total population, which is less than the percentage of slum population to total urban population of the state (12.7 per cent).

As per DUDA there are 252 slum pockets (Map:8) with a population of the order of 5.5 lakhs i.e. about 44 per cent of the total population. (The slum pocket wise population is given in *Annexure 8.1*).

The slum population in the city has been spread over in many wards. As per Census, the ward wise slum population is given in *Annexure 8.2*. The household (HH) size in slums works out to be 6.86, which is more than the HH size of the total population (6.45). The sex ratio in the slums (850) is more than that of the total population (846) where as the literacy rate is 51.32 per cent, which is very less than the total literate population (60.14 per cent).

Informal Settlements along the road

Out of a total number of 80 wards in the city, 44 number of wards have slums (Fig 8.1). The slum population in the wards varies from 2.66 per cent to maximum of 91.85 per cent. Ward nos. 11 and 17 near Taj Nagar and Trans Yamuna have more than 50 percent of the population as slum population.

The ward wise slum population distribution is shown in Map 9.

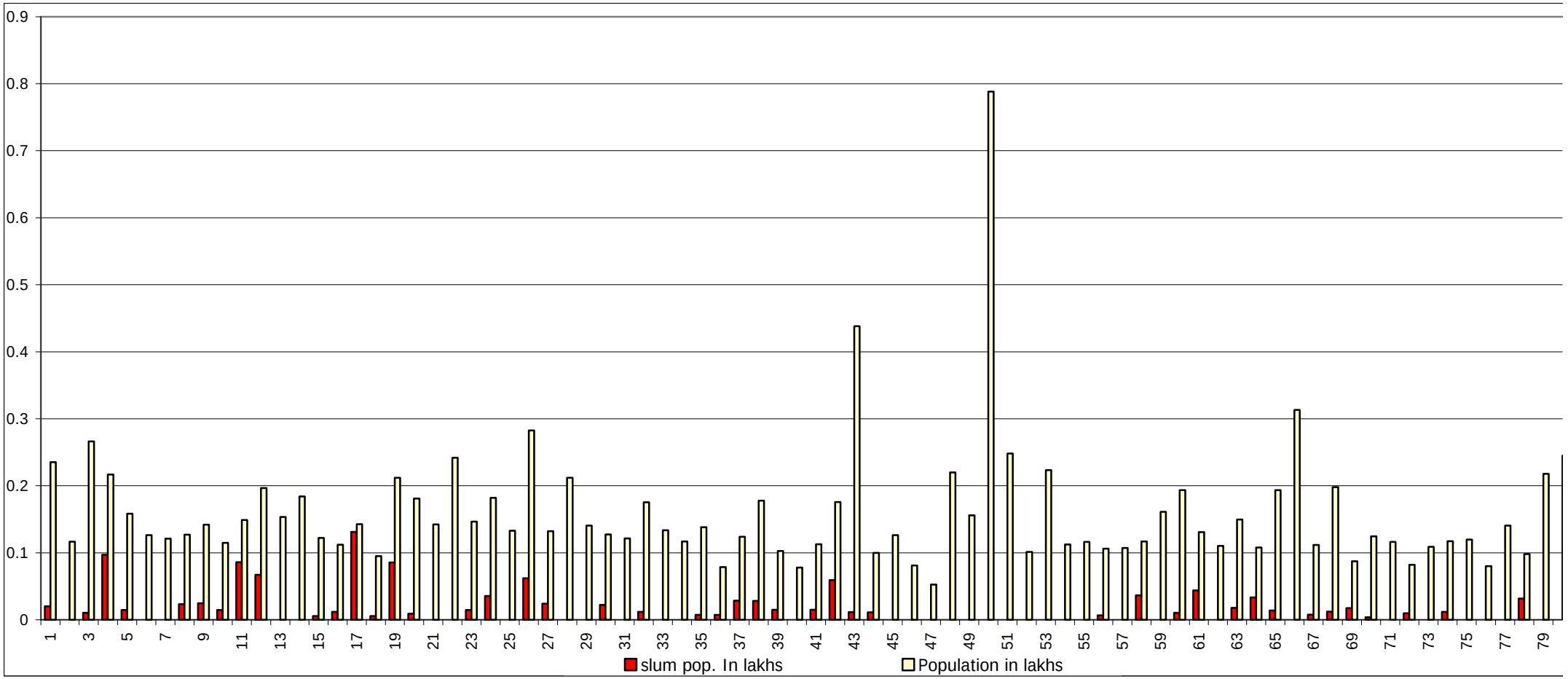


Fig 8.1: Ward wise slum population to total population

Table 8.1: Social Composition in slums

Category	General	ST	SC	BC	OT	Minority Population	Total
% of population	10.44	0.01	53.18	19.94	3.44	12.99	100.00

Source: District Urban Development Authority

Social Composition: From the above table it can be seen that more than 50 per cent of slum population belongs to SC category, whereas the ST population is very less (0.01 per cent).

8.2 POPULATION BELOW POVERTY LINE

As per the Government of India, poverty line for the urban areas is Rs. 296 per month i.e. people in India who earn less than Rs. 10 per day and as such about 21000 families are estimated to be living below poverty line in Agra city.

8.3 BASIC SERVICES

The living conditions of the slum population is analyzed on the following three criterias:

- Type of Houses
- Accessibility to water
- Sanitation Facility

8.3.1 Housing Scenario and Demand

Most of the houses in the slums are pucca with brick wall, PCC flooring whereas some people live in jhopris. There are about 20-25 slums in Sekhmandu Qazipada area. The slums have come up on both the sides of the nallah with worst living conditions. The basic services are also very poor in Naripura.

Housing condition in slum areas

Table 8.2: Type of Houses-2001

Category	Pucca	Semi-Pucca	Kaccha	Jhopri	Others	Total
Percentage of population	50.07	27.11	10.48	8.82	3.52	100.00

Source: District Urban Development Authority

Table 8.3: Ownership of House (1997-98)

Category	Own House	Rent	Illegal	Others	Total
Percentage of population	92.43	2.86	1.05	3.67	100.00

Source: District Urban Development Authority

From the table above it can be seen that the more than 90 per cent of the population have their own houses whereas the remaining live in other kind of accommodation as given above. It has been further estimated by DUDA that about 8500 new dwelling units would be required to be constructed in the various slum pockets at the cost of Rs. 1 lakh each. The data for land ownership and other community facilities in the slums was not available in DUDA so it is not analyzed.

8.3.2 *Accessibility to water services*

More than 18 per cent of the population does not have any water facility. However, 21.29 per cent of the population has individual connections. In some areas like Raj Nagar the water is supplied through stand posts and piped network supplies with street taps.

Table 8.4: Accessibility to water services-2001

Category	Public	Private Tap	Private hand pump	Others	Total
Percentage of population	32.40	21.29	28.02	18.29	100.00

Source: District Urban Development Authority

8.3.3 *Sanitation Facility*

About 40 per cent of the population does not have access to sanitation facility. A very less of 15 per cent of the population is having private flush system. Open defecation is common in areas, which lack the toilet facility.

Table 8.5: Sanitation Facility-2001

Category	Public	Private Flush	Private Soak pit	Others	Total
Percentage of population	32.44	15.75	12.21	39.59	100.00

Source: District Urban Development Authority

The low cost sanitation units are provided in slums and slums cum public places, these are being maintained by Sulabh, Shikshan Sansthan and Social Welfare Society. The number of users are 112560.

Table 8.6: Statement of Low Cost Sanitation Units in slums and slums cum public places (Phase I and Extended Phase)

S. No.	Location	Slum / Public	No of Users Dec. 2003	Remarks
Phase I				
1	Moti Mahal	Slum	3875	Handed over to ANN Maintenance by Sulabh
2	Nagla Cahua-I	Slum	2635	Handed over to ANN Maintenance by Sulabh
3	Nagla Chaua-II	Slum	3720	Handed over to ANN Maintenance by Sulabh
4	Nala Kazi Para	Slum	3875	Handed over to ANN Maintenance by Sulabh
5	Sunder Para	Slum	3100	Handed over to ANN Maintenance by Sulabh

S. No.	Location	Slum / Public	No of Users Dec. 2003	Remarks
6	Raj Nagar	Slum	-	Handed over to ANN Maintenance by Sulabh
7	Nagla Mohan	Slum	3720	Handed over to ANN Maintenance by Sulabh
8	Kutlupura-II	Slum	1860	Handed over to ANN Maintenance by Sulabh
9	China Duar	Slum	4650	Handed over to ANN Maintenance by Sulabh
10	Nagla Tholu	Slum	3410	Handed over to ANN Maintenance by Sulabh
11	Kutlupura	Slum	1860	Handed over to ANN Maintenance by Sulabh
12	Khatena	Slum	3565	Handed over to ANN Maintenance by Sulabh
13	Nagla Chidda	Slum	3720	Handed over to ANN Maintenance by Sulabh
14	Tila Shekhmannu	Slum	4350	Handed over to ANN Maintenance by Sulabh
15	Tal Mangleshwar	Slum	4340	Handed over to ANN Maintenance by Sulabh
16	Rui Ki Mandi	Slum	3720	Handed over to ANN Maintenance by Sulabh
17	Ram Nagar	Slum	3720	Handed over to ANN Maintenance by Sulabh
18	Tulsi Chabutra	Slum	3100	Handed over to ANN Maintenance by Sulabh
19	Nagla Bhola Mohangarh	Slum	-	Handed over to ANN Maintenance by Sulabh
20	Moti Katra	Slum	3720	Handed over to ANN Maintenance by Sulabh
21	14 Biswa Naraic	Slum	3720	Handed over to ANN Maintenance by Sulabh
22	Gadhapara	Slum	5425	Handed over to ANN Maintenance by Sulabh
23	Bara Adhara	Public cum Slum	4650	Handed over to ANN Maintenance by Sulabh
24	Balkeshwar-I	Public cum Slum	9300	Handed over to ANN Maintenance by Sulabh
25	Nagla Teja	Public cum Slum	4650	Handed over to ANN Maintenance by Sulabh
26	Naraich Ambedkar Park	Public cum Slum	3100	Handed over to ANN Maintenance by Sulabh
27	Prem Nagar	Public cum Slum	3875	Handed over to ANN Maintenance by Sulabh
28	Lal Maszid	Public cum Slum	4650	Handed over to ANN Maintenance by Sulabh

S. No.	Location	Slum / Public	No of Users Dec. 2003	Remarks
29	Pir Kalyani	Public cum Slum	3430	Handed over to ANN Maintenance by Sulabh
30	Nagla Kheria	Public cum Slum	3100	Handed over to ANN Maintenance by Sulabh
31	Nagla Popa	Public cum Slum	3720	Handed over to ANN Maintenance by Sulabh
Sub- Total			**112560**	
Extended Phase				
1	Gokul Pura Balmik Masti	Slum	2500	Agra
2	Bundu Katra-I	Slum	1850	Maintained by Renewal
3	Bundu Katra-II	Slum	1850	Engg. Muzzafar Nagar
4	Ganga Nagar	Slum	2300	Maintained by Brij Mohan, Cont. Aligarh
5	Naval Ganj Trans Yamuna	Slum	1800	Maintained by Smt. Bhu
6	Nunhai Trans Yamuna	Slum	1770	Devi Mahila & Bal Vikas
7	John Mill Yamuna Kinara Road	Slum	2420	Shikshan Sansthan, Agra
8	Khatik Para	Slum	1830	Shikshan Sansthan, Agra
9	Tajganj	Slum	1520	Shikshan Sansthan, Agra
10	Etmadudaula Near SPS	Slum	1460	Shikshan Sansthan, Agra
11	Nawal Ganj West Trans Yamuna	Slum	1710	Maintained by Jai Gaytri
12	Bidha Ka Bagh Ring Road	Slum	2370	Maa Bal Vidhya Mandir
13	Nagla Balchand	Slum	1230	Samiti, Agra
14	Nunhai Trans Yamuna	Slum	1740	Samiti, Agra
15	Katra Bazir Khan	Slum	1350	Samiti, Agra
16	Gajamam Nagar Kothi Meena Bazar	Slum cum Public	1800	Maintained by Shobhit
17	Charhat Baluganj	Slum cum Public	2100	-
18	Teela Gokul Pura Punchkuiyan	Slum/Public	1500	Social Welfare Society
Sub- Total			**33100**	
Grand Total			**112560**	

Source: Yamuna Pollution Control Unit, U.P. Jal Nigam, Agra

8.3.4 Storm Water Drainage

The poor sanitary conditions are prevailing due to lack of drains and collection of wastewater in pits. The clogged drains have also increased the vulnerability of the slum dwellers. Inside the settlements there are no paved drains or pathways, the wastewater from homes gets collected in open soak pits. The stagnant water in the pits results in mosquito breeding.

8.3.5 Solid Waste

There is no provision of solid waste collection or disposal in the slum areas. The plastic waste was disposed in open spaces and the piles of waste was seen at various locations.

Based on the data collected from the DUDA, consultations with the stakeholders, reconnaissance survey and city assessment it can be seen that the population living in the slums lacks access to infrastructure services like safe drinking water, sanitation, drainage, access roads, solid waste disposal and other community facilities. Thus there is need for slum up gradation programmes through improved basic services.

8.3.6 Issues

- More than 18 per cent of the population does not have any water facility.
- 50% houses in slums are pucca with brick wall, PCC flooring whereas some people live in jhopris
- Poor sanitary conditions due to clogged drains, collection of household wastewater in open pits.
- Poor quality of water supply.
- Some slums have come up along the drains, which have increased the vulnerability of the residents living there.
- Slums also lack toilet facility, which results in open defecation.

Chapter No.9

Financial profile

The Accounts Section of Agra Municipal Nagar nigam (ANN) headed by Accounts Officer handles the Finance Management & Accounts of the Nagar nigam. This section also looks after the monitoring of grants, transfers from State Government, PF accounts, salaries, advances etc.

9.1 FINANCIAL PROFILE

The Income – Expenditure Accounts of the nagar nigam for the last five financial years i.e. year 2001-02, 2002-03, 2003-04, 2004-05 and 2005-06 were obtained and have been analyzed for the assessment.

The current accounting system is cash-based i.e. income & expenditure heads are maintained on cash receipt/ payment basis. Expenses on new projects are treated as Capital Expenditure and expenses towards maintenance are treated as Revenue Expenditure.

As regards implementation of accrual based accounting system, ANN has informed that it is being pursued and likely to be adopted from the year 2007-08.

9.2 REVENUE RECEIPTS

- **Receipts from Taxes**
- **Non-Tax Revenue**
- **Transfers including Grants**

Based on the Accounts procured from ANN, the information in respect of Revenue Receipts is as under:

Table 9.1: Revenue Receipt

Year	Revenue Account Receipts (Rs. In Lakhs)			
	Tax	Non-Tax	Transfers including Grants	Total
2001-02	874.09	934.21	2874.59	4682.89
2002-03	519.52	987.16	2684.02	4190.70
2003-04	623.78	352.67	2707.31	3683.76
2004-05	1180.39	398.94	3626.36	5205.69
2005-06	646.37	389.13	6097.51	7133.01

Source: Agra Nagar Nigam

As stated earlier ANN is pursuing Cash Basis Accounting i.e. on actual receipt basis. The trend of receipts for the last year has been examined and is shown table 9.2.

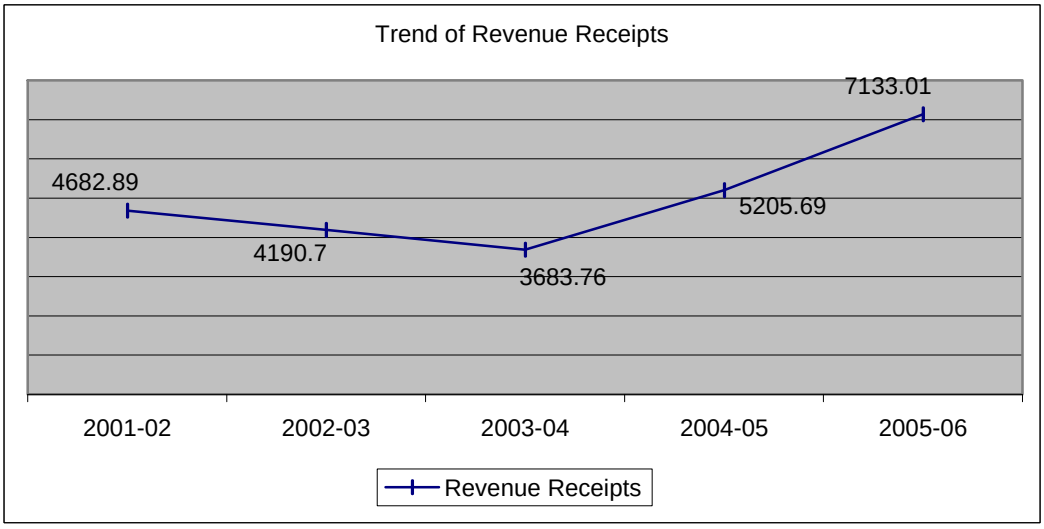
Table 9.2: Trend in revenue receipts

(Amount in Lakh)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Revenue Receipts	7133.01	5205.69	3683.76	4190.70	4682.89
Increase/ decrease (%)	37.02%	41.31%	-12.10%	-10.51%	

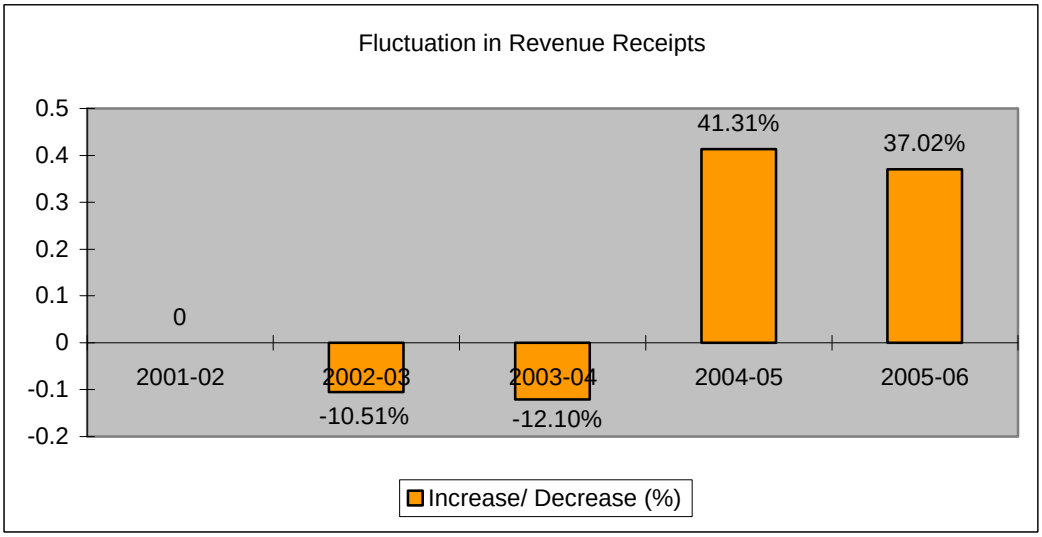
Source: Agra Nagar Nigam

Figure 9.1: The trend of Revenue Receipts



Source: Agra Nagar Nigam

Figure 9.2: Fluctuation in Revenue Receipts



Observations:

- The revenue receipts show a declining trend during the years 2002-03 and 2003-04
- The trend reversal is observed in year 2004-05
- The increasing trend is maintained in the year 2005-06 but at a lower rate
- This trend is not a very correct measure of the revenue potential of ANN as the accounting is on cash basis and the overall amount not only depends upon the revenue for a particular year but also on collection efficiency during the year.

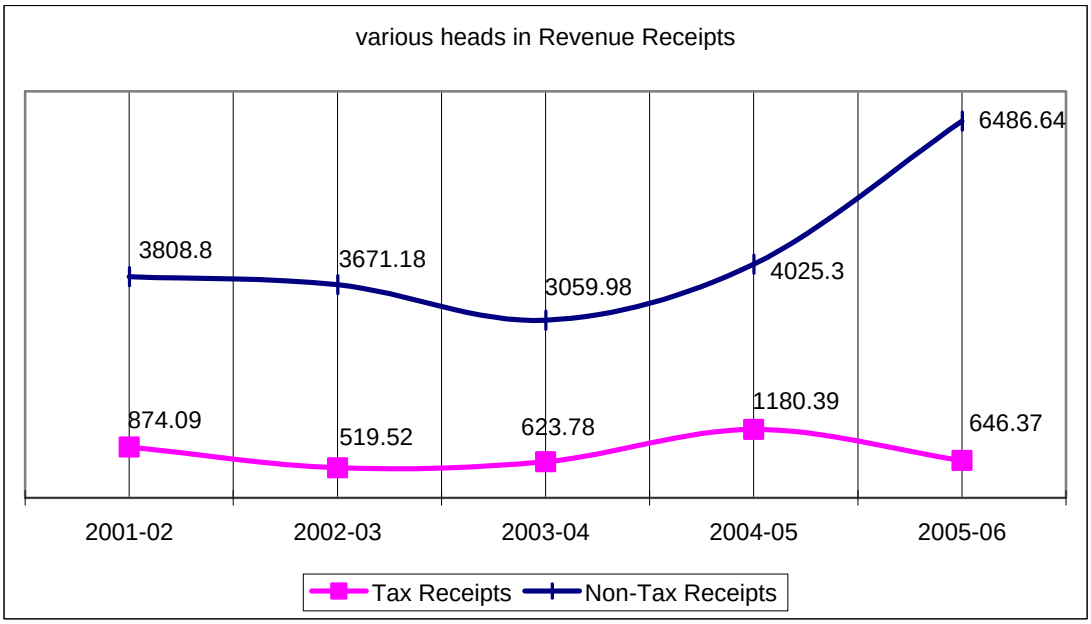
The Revenue Receipts is classified under two main heads i.e. Tax Receipts and Non-Tax Receipts as under

Table 9.3: Tax Receipts & Non Tax Receipt

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Tax Receipts	646.37	1180.39	623.78	519.52	874.09
Non-Tax Receipts	6486.64	4025.30	3059.98	3671.18	3808.80
Total	7133.01	5205.69	3683.76	4190.70	4682.89
Tax Receipts (as % of total receipts)	9.06 %	22.68 %	16.93 %	12.40 %	18.67 %

Source: Agra Nagar Nigam

Figure 9.3: Tax Receipts and Non Tax Receipt



Observations:

- The Tax Receipts are only in the range of about 10% to 20% of the total revenue receipts. As such dependence on non- tax receipts is high.
- While the population and geographical area of the city are increasing, the tax receipts do not show a corresponding increase indicating substantial non-compliance in tax payment.
- Major portion of Non-Tax receipts arises from receipts from State Finance Commission indicating substantial dependence on State Government Funds.

Table 9.4: The contribution of various heads in Revenue Receipts

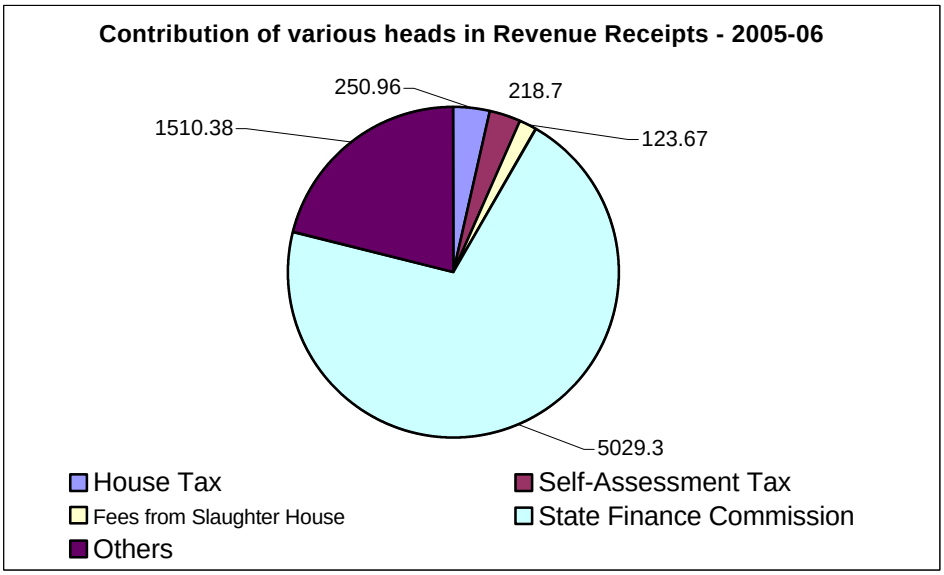
Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
House Tax	469.66	445.45	574.44	405.23	384.93
Fees from Slaughter House	123.67	187.57	164.73	185.78	18.83
State Finance Commission	5029.30	2942.77	2364.99	2315.83	2788.82
Others	1510.38	1629.9	579.6	1283.86	1490.31
Total	7133.01	5205.69	3683.76	4190.70	4682.89
State Finance Commission (as % of Total revenue receipts	70.51 %	56.53 %	64.20 %	55.26%	59.55 %

Source: Agra Nagar Nigam

Observations:

- Major portion of Non-Tax receipts arises from receipts from State Finance Commission indicating substantial dependence on State Government Funds.
- The dependence on State Finance Funds has been about 60 % which has increased to over 70% in year 2005-06.
- The Tax Receipts are only in the range of about 10% to 20% of the total revenue receipts. As such dependence on non- tax receipts is high.

Figure 9.4: The contribution of various heads in Revenue Receipts



- While the population and geographical area of the city are increasing, the tax receipts do not show a corresponding increase indicating substantial non-compliance in tax payment.

9.3 REVENUE EXPENDITURE

- Establishment Expenses
- Operation & Maintenance
- Interest Payment
- Others

Based on the Accounts procured from ANN, the information in respect of Revenue Expenditure in the prescribed format is as under:

Table 9.5: Statement of Expenditure

Year	Revenue Account Expenditure (Rs. In Lakhs)				
	Establishment (Wages & Salaries)	Operation and Maintenance	Interest Payment	Others	Total
2001-02	2488.00	405.57	Nil	1207.49	4101.06
2002-03	2410.51	530.45	Nil	972.29	3913.25
2003-04	2303.34	470.15	Nil	593.94	3367.43
2004-05	2759.76	514.73	Nil	895.09	4169.58
2005-06	3082.32	519.06	Nil	1134.94	4736.32

Source: Agra Nagar Nigam

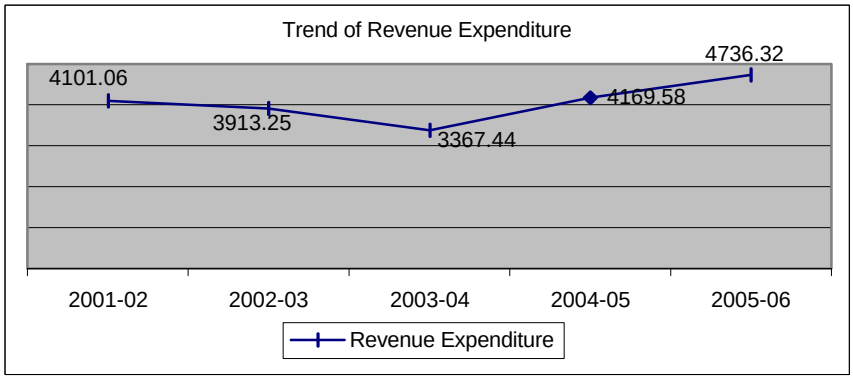
Table 9.6: The trend observed for the Revenue Expenditure during the last five years

(Amount in Lakhs)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Revenue Expenditure	4736.32	4169.58	3367.44	3913.25	4101.06
Trend	13.59%	23.82%	-13.95%	-4.58%	

Source: Agra Nagar Nigam

Figure 9.5: The Trend Revenue Expenditure



Observations:

- The Revenue Expenditure show a declining trend during the years 2002-03and 2003-04, with higher decline in 2003-04.
- The trend reversal is observed in year 2004-05 but increase during 2005-06 is almost half of the previous year.
- This trend is not a very correct measure of the actual expenditure incurred by
- ANN as the accounting is on cash basis and the overall amount not only depends upon the expenditure for a particular year but also on ability to pay for the same.

Figure 9.6: The Fluctuation in Revenue Expenditure

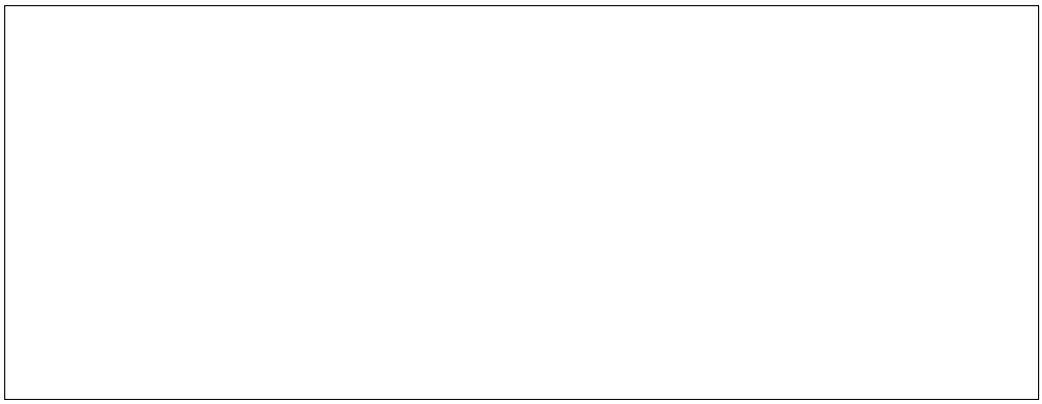
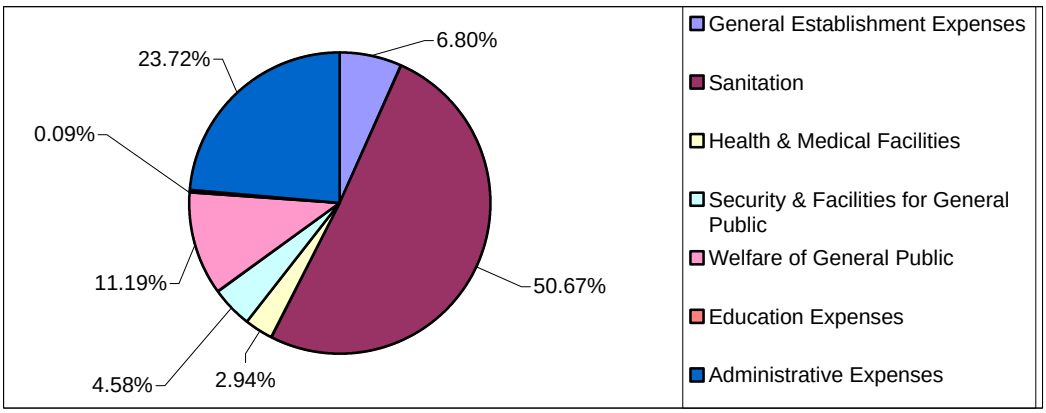


Table 9.7: The contribution of various heads in Revenue Expenditure

(Amount in Lakhs)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
General Establishment Expenses	322.18	289.13	256.20	265.10	286.68
Sanitation	2400.09	2184.66	1887.51	1910.09	2103.10
Health & Medical Facilities	139.29	110.64	96.26	123.39	150.66
Security & Facilities for General Public	216.92	182.98	85.74	137.04	177.22
Welfare of General Public	530.07	296.35	474.03	407.70	189.83
Education Expenses	4.22	3.75	2.98	4.76	4.15
Administrative Expenses	1123.56	1102.08	564.71	1065.15	1189.44
Total	4736.32	4169.58	3367.44	3913.25	4101.06
Sanitation (as % of total revenue expenditure)	50.67 %	52.40 %	56.05 %	48.81 %	51.29 %
Administrative Expenses (as % of total revenue expenditure)	23.72 %	26.43 %	16.77 %	27.21 %	29.00 %

Figure 9.7: Components of Revenue Expenditure 2005-06



s
ervations:

- Major portion of revenue expenditure is on Sanitation which is about 50% of the total revenue expenditure
- The other major expenditure head is Administrative Expenses, which is about 25 % of total revenue expenditure with an exception of year 2003-04.
- Sanitation being most unavoidable service to be provided by a nagar nigam with expenditure of about 50% of total expenditure, shows that only bare minimum civic services are being provided in the city.

9.4 CAPITAL RECEIPTS

- From State Government : Loans and Grants
- Financing Institutions
- Market

Based on the Accounts procured from ANN, the information in respect of Capital Receipts in the prescribed format is as under:

Table 9.8: Capital Receipt

Year	Capital Receipts (Rs. In Lakhs)				
	State Government		Financing Institutions	Market	Total
	Loans	Grant			
2001-02	Nil	319.52	Nil	Nil	319.52
2002-03	Nil	405.99	Nil	Nil	405.99
2003-04	Nil	390.55	Nil	Nil	390.55
2004-05	Nil	201.80	Nil	Nil	201.80
2005-06	Nil	261.02	Nil	Nil	261.02

Source: Agra Nagar Nigam

Table 9.9: Following is the trend observed for the Capital Receipts during the last five years

(Amount in Lakhs)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Capital Receipts	261.02	201.80	390.55	405.99	319.52
Trend	29.35%	-48.33%	-3.95%	27.06%	

Source: Agra Nagar Nigam

Figure 9.8: Trend of Capital Receipt

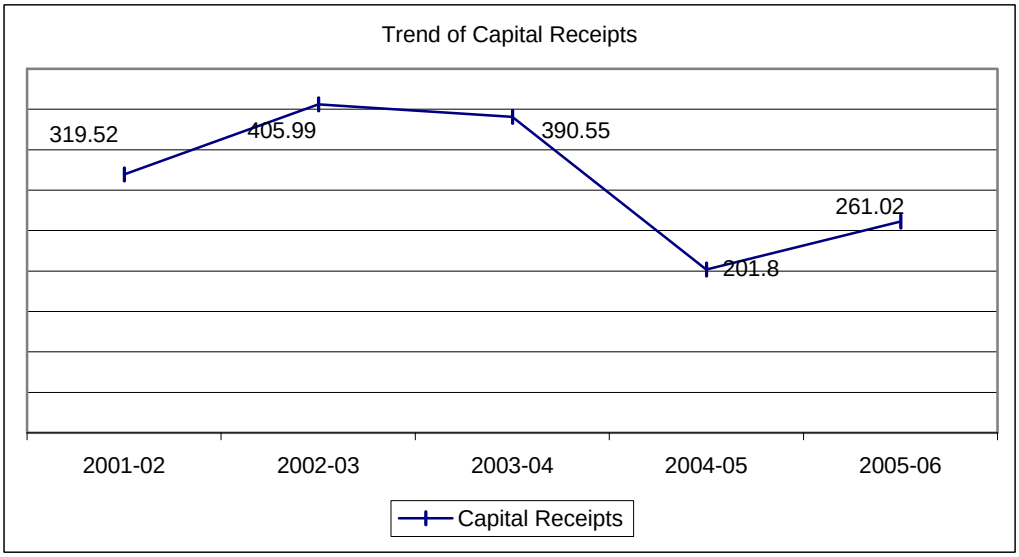
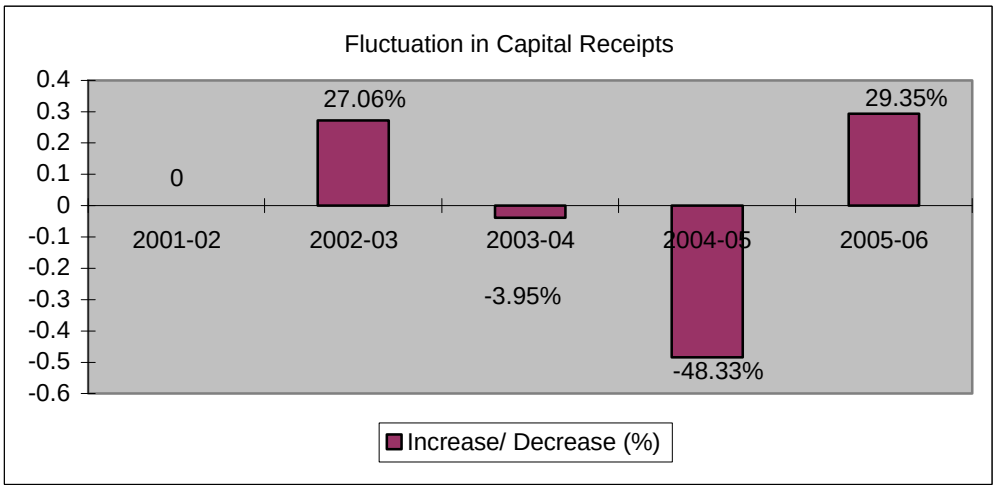


Figure 9.9: Fluctuation in Capital Receipt



Observations:

- The capital receipts show a declining trend during the years 2003-04and 2004-05, the decline during 2004-05 being very pronounced.
- The trend reversal is observed in year 2005-06
- This trend is not a very correct measure of the availability of long term funds to ANN as the accounting is on cash basis and the overall amount not only depends upon the entitlement for a particular year but also on disbursement schedule of the same.

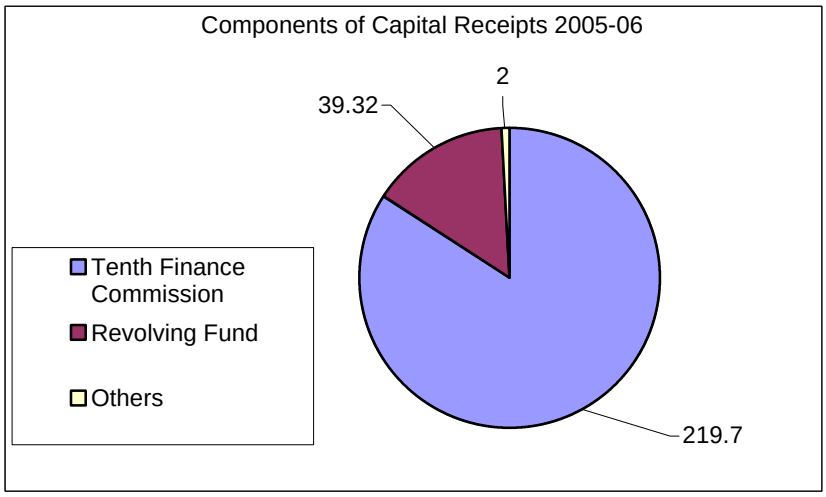
Table 9.10: The contribution of various heads in Capital Receipts

(Amount in Lakhs)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Tenth Finance Commission	219.70	190.55	190.55	378.99	141.72
Revolving Fund	39.32	11.25	200.00	27.00	155.00
Others	2.00				22.80
Total	261.02	201.80	390.55	405.99	319.52
Tenth Finance Commission (as % of total capital receipts)	84.16 %	94.43 %	48.79 %	93.35 %	44.35 %

Source: Agra Nagar Nigam

Figure 9.10: Components of Capital Receipts 2005-06



Observations:

- Major portion of Capital receipts accrue from Tenth Finance Commission
- The above contribution amounts to about 90% of the total capital receipts except in the year 2003-04 and 2001-02
- The shortfall in Tenth Finance Commission receipts during the years 2003-04 and 2001-02 has been met by availing Revolving Fund assistance.
- As the expenditure by ANN is not in projects which generate revenue, availment of revolving fund assistance for such expenditure, which is in the nature of interest free loan, will create asset liability mismatch and shall lead to default or repayment through further borrowings.

Table 9.11**:** The details of Finances of Agra Jal Sansthan

Year	Expenditure (Rs. In Lakhs)	Income (Rs. In Lakhs)
2001-02	539.10	13.60
2002-03	469.41	135.00
2003-04	0.25	105.31
2004-05	301.50	358.50
2005-06	228.36	184.41

Source: Agra Nagar Nigam

9.5 CAPITAL EXPENDITURE

Table 9.12: The trend observed for the Capital Expenditure during the last five years

(Amount in Lakhs)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Capital Expenditure	893.46	827.56	514.88	453.64	429.86
Trend	7.96%	60.73%	13.50%	5.53%	

Source: Agra Nagar Nigam

Figure 9.11: Trend of Capital Expenditure

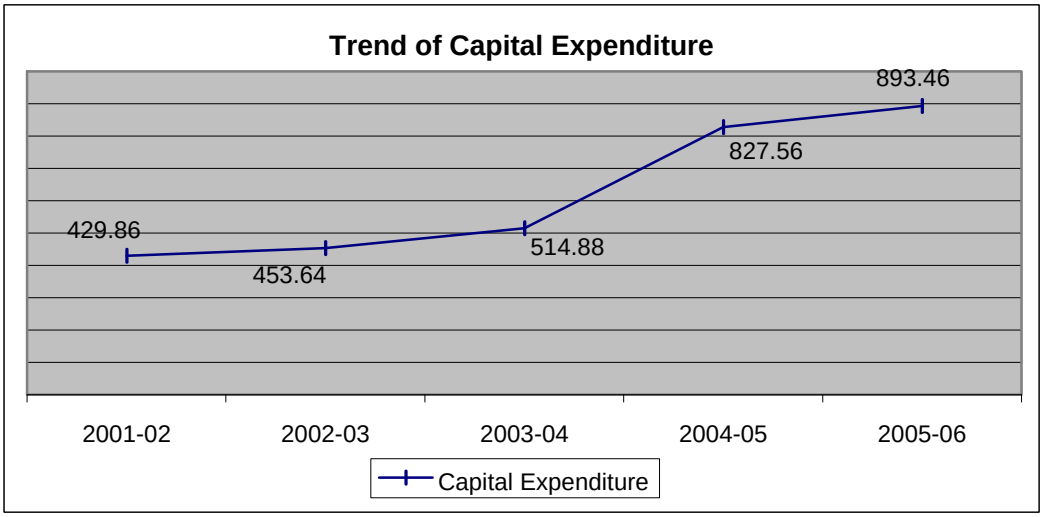
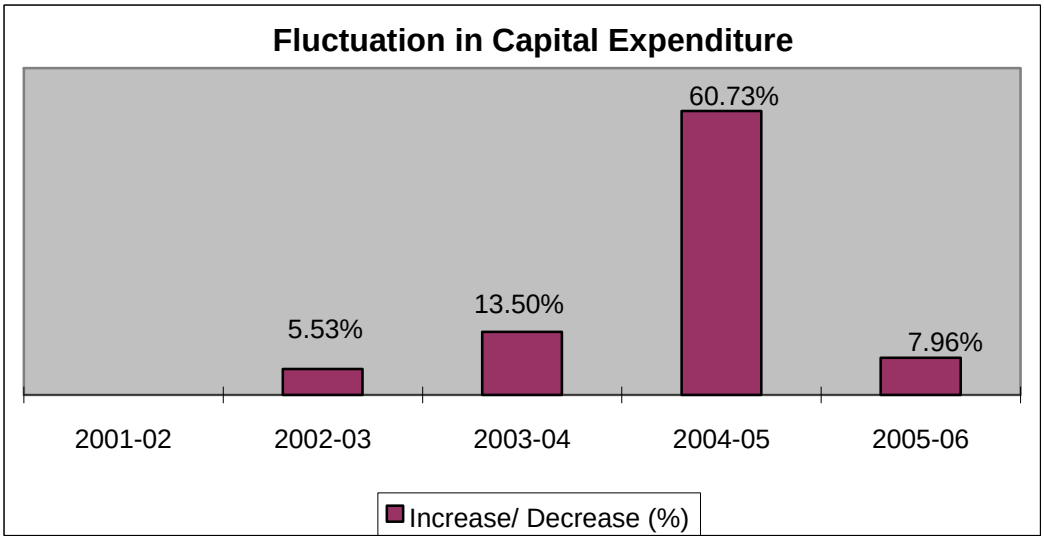


Figure 9.12: Fluctuation in Capital Expenditure



Observations:

- The Capital Expenditure shows an increasing trend over the five years period under review with increase during the year 2004-05 being exceptionally higher.
- The Capital Expenditure is low looking to the population / geographical spread and existing quality of civic services.
- This trend is not a very correct measure of the actual expenditure incurred by ANN as the accounting is on cash basis and the overall amount not only depends upon the expenditure for a particular year but also on ability to pay for the same.

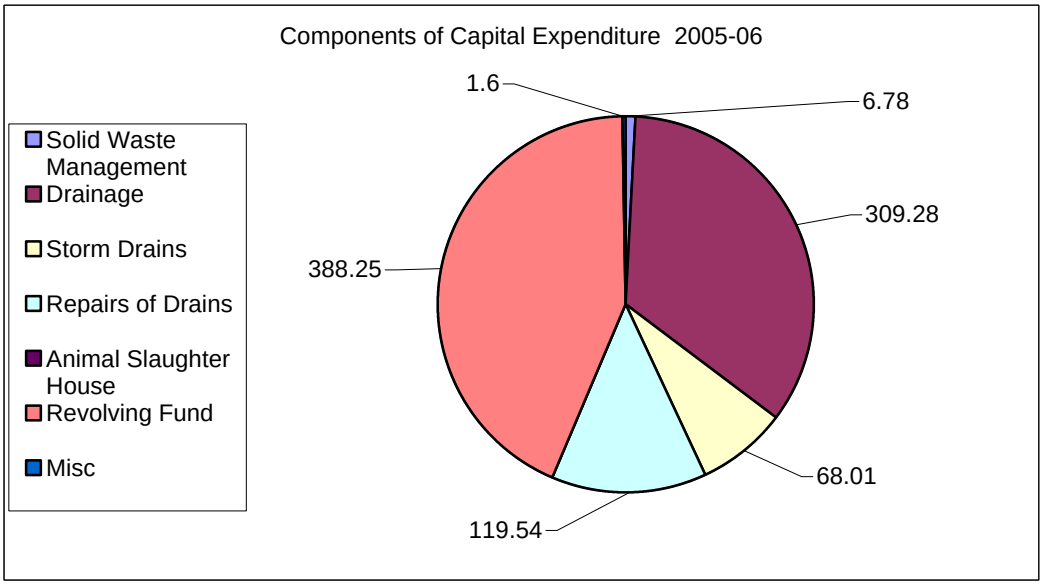
Table 9.13: The contribution of various heads in Capital Expenditure

(Amount in Lakhs)

Particulars	2005-06	2004-05	2003-04	2002-03	2001-02
Solid Waste Management	6.78	9.01	260.88		23.15
Drainage	309.28	286.75		186.09	150.32
Storm Drains	68.01	44.31		2.20	53.07
Repairs of Drains	119.54	281.36			
Animal Slaughter House		1.12			79.14
Revolving Fund	388.25	204.21	253.99	254.07	118.79
Misc	1.60	0.80		11.28	5.39
Total	893.46	827.56	514.88	453.64	429.86
Drainage (as % of total capital expenditure)	34.62 %	34.65 %	0.00 %	41.02 %	34.96 %
Revolving Fund (as % of total capital expenditure)	43.46 %	24.68 %	49.33 %	56.01 %	27.63 %

Source: Agra Nagar Nigam

Figure 9.13: Components of Capital Expenditure 2005-06



Source: Agra Nagar Nigam

Observations:

- Major portion of Capital Expenditure is on Drainage which is about 35 % of the total capital expenditure except in the year 2003-04 during which no expenditure was incurred
- The capital expenditure includes very heavy payment to meet the revolving fund repayment obligation. In the absence of surplus funds received from Tenth Finance Commission have been used for the purpose

Having analysed the composition and absolute value of income by way of tax and non-tax revenue, we have analysed the collection efficiency of ANN for the tax and non-tax revenue over the last three years. The position emerging from the analysis is as follows:

Table 9.14: Demand collection statement of revenue during the year ended 31/03/2004 (Rs. in lacs)

Head	Arrears as on 1/4/2003	Current Year Demand	Total	Recovery Against		
				Arrears	Current Year Demand	Total
General Taxes	122.25	501.58	623.83	98.50	475.93	574.43
Other Tax	0.00	62.30	62.30	0.00	49.34	49.34
Property Tax	0.00	450.00	450.00	0.00	0.00	0.00
Total	122.25	1013.88	1136.13	98.50	525.27	623.77
Other Revenue	5.28	1489.32	1494.60	0.00	1247.06	1247.06
Total	127.53	2503.20	2630.73	98.50	1772.33	1870.83

Source: Agra Nagar Nigam

Table 9.15: Demand collection statement of revenue during the year ended 31/03/2005 (Rs. in lacs)

Head	Arrears as on 1/4/2004	Current Year Demand	Total	Recovery Against		
				Arrears	Current Year Demand	Total
General Taxes	49.40	540.00	589.40	45.30	400.15	445.45
Jal Sans than						43.95
Vidyut Vibhag						68.71
						558.11
Property Tax	450.00	523.30	973.30	0.00	642.55	642.55
Other taxes	12.96	72.38	85.34	0.00	92.38	92.38
Total	512.36	1135.68	1648.04	45.30	1135.08	1293.04
Other Revenue	247.54	1565.99	1813.53	200.50	867.73	1068.23
Total	759.90	2701.67	3461.57	245.80	2002.81	2361.27

Source: Agra Nagar Nigam

Table 9.16: Demand collection statement of revenue during the year ended 31/03/2005(Rs. in lacs)

Head	Arrears as on 1/4/2005	Current Year Demand	Total	Recovery Against		
				Arrears	Current Year Demand	Total
General Taxes	31.29	608.71	640.00	25.20	444.45	469.65
Jal Sans than						43.95
Vidyut Vibhag						135.04
						648.64
Property Tax	330.75	436.64	767.39	0.00	98.23	98.23
Other taxes	0.00	83.66	83.66	0.00	78.47	78.47
Total	362.04	1129.01	1491.05	25.20	621.15	825.34
Other Revenue	745.30	1565.99	2311.29	355.51	1350.19	1705.70
Total	1107.34	2695.00	3802.34	380.71	1971.34	2531.04

Source: Agra Nagar Nigam

9.6 INFRASTRUCTURE PROFILE

Like most of the other municipalities, there is a large gap between the level of infrastructure services required for the city and those provided by ANN. The two issues most important from the point of view of approach to be adopted for future are (i) Present Position of cost incurred and cost recovered in respect of various civic services and (ii) Fresh investment made by ANN on creation of required infrastructure. The position brought out by analysis is as under:

Table 9.17: The details of Cost recovery in Urban Infrastructure

Infrastructure	Cost incurred in service provision (Rs. In Lakhs)			Direct Recoveries (Rs. In Lakhs)		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
Water Supply	469.41	0.25	301.50	135.00	105.31	358.50
Sewerage & Sanitation and Solid Waste Collection	1909.52	1886.57	2180.64	0.50	0.30	0.19
Public Bus Services	Nil	Nil	Nil	Nil	Nil	Nil

Table 9.18: The details of Level of Aggregate Investment in Urban Infrastructure

Infrastructure	Public Investment (Rs. In Crores)				Private Investment (Rs. In Crores)			
	01-02	02-03	03-04	04-05	01-02	02-03	03-04	04-05
Water Supply					NIL			
Sewerage & Drainage	1.50	1.87	Nil	2.87				
Solid Waste	0.23	Nil	2.61	0.09				
Roads (Municipal)		0.18	0.22	0.02				
Street Lighting	0.02			0.01				
Storm Water Drainage	0.53	0.02		0.44				
Total	2.28	2.07	2.83	3.43				

Source: Agra Nagar Nigam

Observations:

- Recovery of cost of providing Water Supply shows an improving trend. However correct assessment would be based on accrual figures, which are not available with ANN.
- There is negligible recovery of cost incurred on Sewerage & Sanitation and Solid Waste Collection.
- There is no public Bus Service in the city.
- There is no private sector investment in the infrastructure.
- Public sector investment is also on lower side.

Chapter 10
Governance, Institutional Framework and Reforms

10.1 BACKGROUND

'Good governance' is the overarching objective of public administration in the civic arena. In virtually all sectors of public intervention and service delivery, it is now agreed that unless and until the state of governance is 'good', service or product delivery will not be proper. In the recent past, a large number of people and organizations have given a variety of definitions of what governance is all about. Governance is defined differently in terms of the context. According to one definition, " the ways in which stakeholders interact with each other in order to influence the outcomes of public policies " is public governance. According to the World Bank, " the manner in which power is exercised in the management of a country's economic and social resources for development " is good governance. There are today dozens of definitions of what governance and good governance is. However, if one has to summaries and list downs the ten characteristics of good governance, they would be:

- Citizen involvement, participation and satisfaction
- Transparency in all decision making
- Accountability of actions taken
- Equality and social inclusion
- Ethical and honest behaviour
- Ability to compete in a global environment
- Efficiency of service delivery
- Respect for democratic values
- Respect for the rule of law
- Use of appropriate technology and environmental sustainability

The United Nations-HABITAT launched a Global Campaign on Urban Governance in the year 1999 in order to support the implementation of the Habitat Agenda goal of "sustainable human settlements development in an urbanizing world ". The goal of the Campaign is to contribute to the eradication of poverty through improved urban governance. It is now widely believed that the quality of governance is the key factor for the eradication of poverty and the creation of prosperity in cities. The United Nations-HABITAT has also been propagating the concept of the 'inclusive city'; a city which promotes growth with equity, a place where everyone, regardless of their economic status, gender, race, ethnicity or religion, is enabled and empowered to fully participate in the social, economic and political opportunities that cities have to offer.

The definition of urban governance according to the Campaign is as follows :

" Urban Governance is the sum of the many ways individuals and institutions, public and private, plan and manage the common affairs of the city. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action can be taken. It includes formal institutions as well as informal arrangements and the social capital of citizens ".

Further, the Campaign also defines good urban governance as follows:
"Urban governance is inextricably linked to the welfare of the citizenry. Good urban governance must enable women and men to access the benefits of urban citizenship. Good urban governance, based on the principle of urban citizenship, affirms that no man, woman or

child can be denied access to the necessities of urban life, including adequate shelter, security of tenure, safe water, sanitation, a clean environment, health, education and nutrition, employment and public safety and mobility. Through good urban governance, citizens are provided with the platform which will allow them to use their talents to the full to improve their social and economic conditions ".

In order to implement the good urban governance agenda, the United Nations HABITAT has proposed that good urban governance is characterized by the following principles:

- Sustainability
- Subsidiary
- Equity
- Efficiency
- Transparency and accountability
- Civic engagement and citizenship and
- Security

Based on the above, several nations have drawn up action plans for good urban governance in their respective contexts. It is in this broad world view, taking into specific cognizance the peculiarities of urbanization and urban local administration in India, that the Government has initiated the JNNURM.

10.2 LEGAL FRAMEWORK

The civic administration in the city of Agra is in the jurisdiction of the Agra Municipal Corporation. This is the principal urban governance institution, in addition to several other organizations and parastatals. Some of these have been established through acts of the state legislature while the others are a part of the state government administrative machinery. The table below gives a list of the laws.

Table 10.1: List of the laws and the institutions established there under

Legislation	Organization
UP Municipal Corporations Adhiniyam,1959	Agra Nagar Nigam
UP Municipalities Act, 1916	Surrounding Municipalities
UP Water Supply and Sewerage Act, 1975	Jal Nigam
UP Water Supply and Sewerage Act, 1975	Jal Sansthan
UP Development Authorities Act. 1974	Agra Development Authority
Water (Prevention and Control of Pollution) Act, 1974	UP Pollution Control Board

The urban local bodies in the state of Uttar Pradesh are governed by two important legislation viz. UP Municipal Corporations Adhiniyam, 1959 and UP Municipalities Act. 1916. These two acts specify the governance framework, spatial jurisdiction and the functional domain of the urban local bodies.

10.3 FUNCTIONAL DOMAIN

As per the Twelfth Schedule (Article 243 W) of the Constitution added by the 74th Constitution Amendment Act of 1992, urban local bodies have to perform the following 18 functions viz.

1. Urban planning including town planning
2. Regulation of land-use and construction of buildings
3. Planning for economic and social development
4. Roads and bridges
5. Water supply for domestic, industrial and commercial purposes
6. Public health, sanitation, conservancy and solid waste management
7. Fire services

8. Urban forestry, protection of environment and promotion of ecological aspects
9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded
10. Slum improvement and up gradation
11. Urban poverty alleviation
12. Provision of urban amenities and facilities such as parks , gardens, playgrounds
13. Promotion of cultural, educational and aesthetic aspects
14. Burials and burial grounds, cremations, cremation grounds and electric crematoriums
15. Cattle pounds, prevention of cruelty to animals
16. Vital statistics including registration of births and deaths
17. Public amenities including street lighting, parking lots, bus stops and public conveniences
18. Regulation of slaughter houses and tanneries.

In the case of UP, the municipal corporations have been performing almost all these functions and therefore, when the UP Act of 1959 was amended in the year 1994, *few* changes were made in respect of the functional domain. As per Chapter V of the UP Municipal Corporations Act of 1959, Section 114 provides for as many as *41 obligatory functions* are to be performed and as per Section 115, as many as *43 discretionary functions* have to be performed.

However, functions such as regulation of landuse and fire service are still not transferred to the municipal corporation. Further the issue is that of duplicity of functions with the local body as well as the state government. For the functions which have been transferred to the local bodies, transfer of personnel and funds has not been made.

It may be noted that one of the key recommendations of the Second SFC of UP stating that ULBs should be adequately empowered to discharge responsibilities marked for them in the Twelfth Schedule of the Constitution has not been accepted by the state government.(as per Report of NIUA on Impact of the Constitution 74th Amendment Act on the Working of ULBs, Vol.1., p.32.).

The functions of the other organizations involved in urban management are as follows:

Table 10.2: Functions of organizations involved in urban management

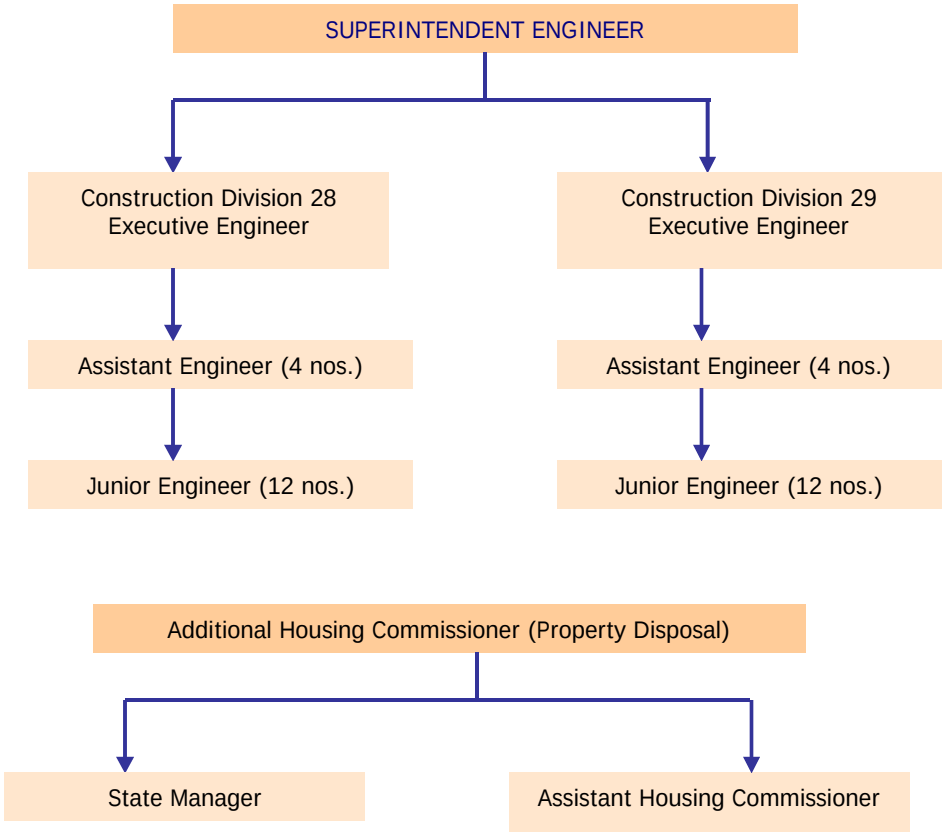
S. No.	Organization	Functional Domain
a)	ADA	Landuse, largescale and development and housing project development
b)	UP Jal Nigam	Planning, design and implementation fresh water supply, sewerage and drainage projects
c)	Jal Sansthan	Maintenance of water supply, sewerage and drainage in the city
d)	UP Housing Board	Developing housing projects
e)	PWD	Maintenance of some of the roads in the city
f)	DUDA	Slum improvement

10.4 INSTITUTIONAL FRAMEWORK AND EXISTING INSTITUTIONAL RESPONSIBILITY

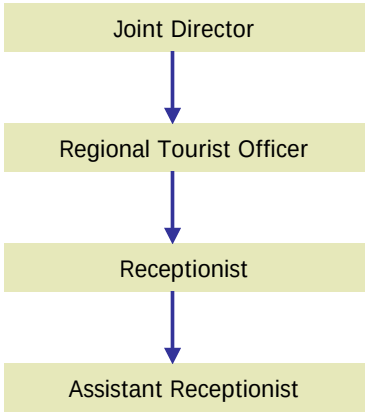
The main organization which is responsible for urban governance and civic management is the Agra Nagar Nigam. The corporation has a democratically elected leadership from the constituencies within the geographic jurisdiction of the corporation boundaries. The present Corporation has been elected in the year 2001 and has duration of 5 years. The term is almost completed and elections are again due in this year 2006. The organizational structure of the various organizations is given as under:

Fig 10.1 Organizational Structure of various departments:

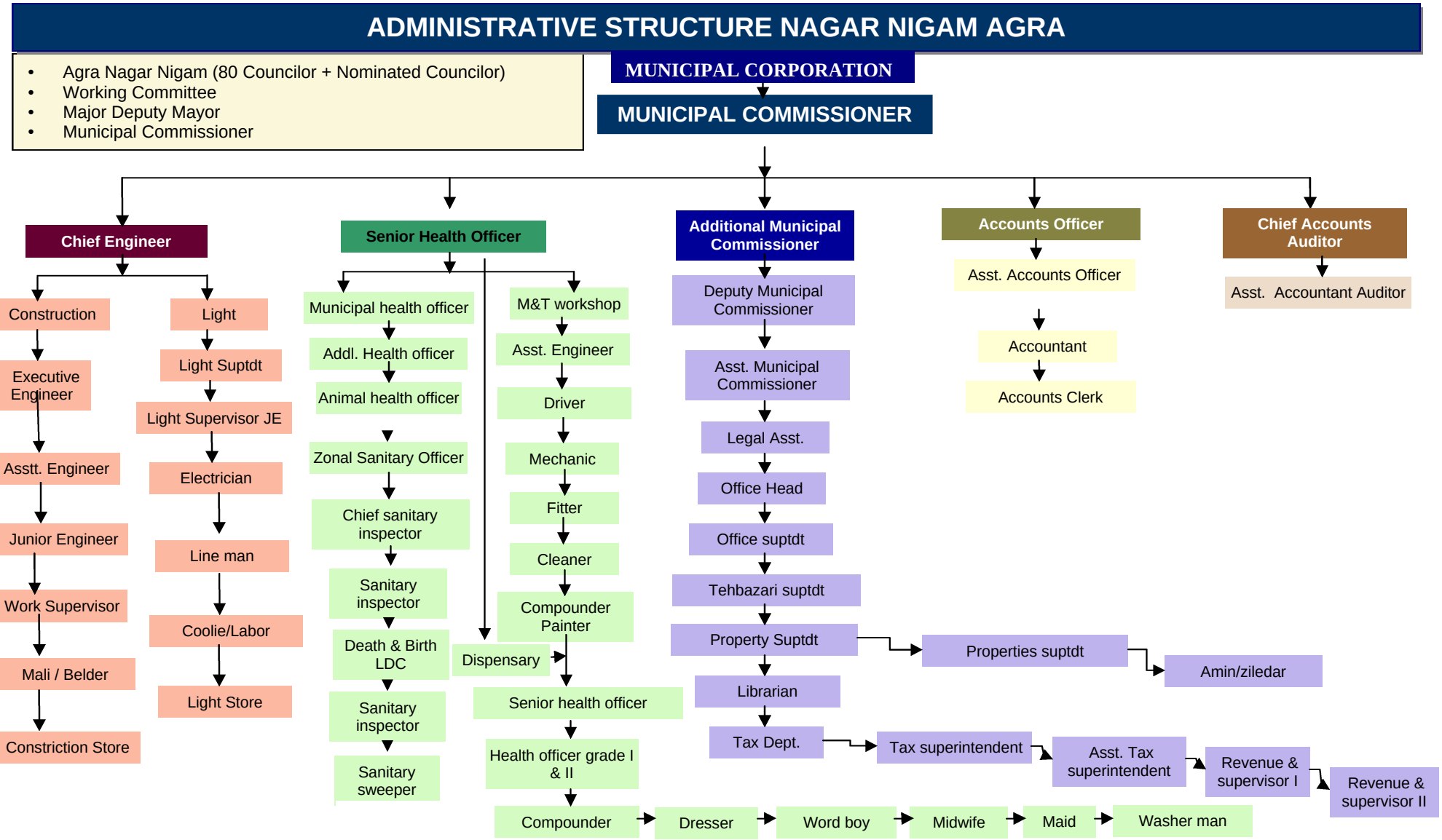
ORGANIZATIONAL STRUCTURE- HOUSING BOARD



ORGANIZATIONAL STRUCTURE- TOURISM

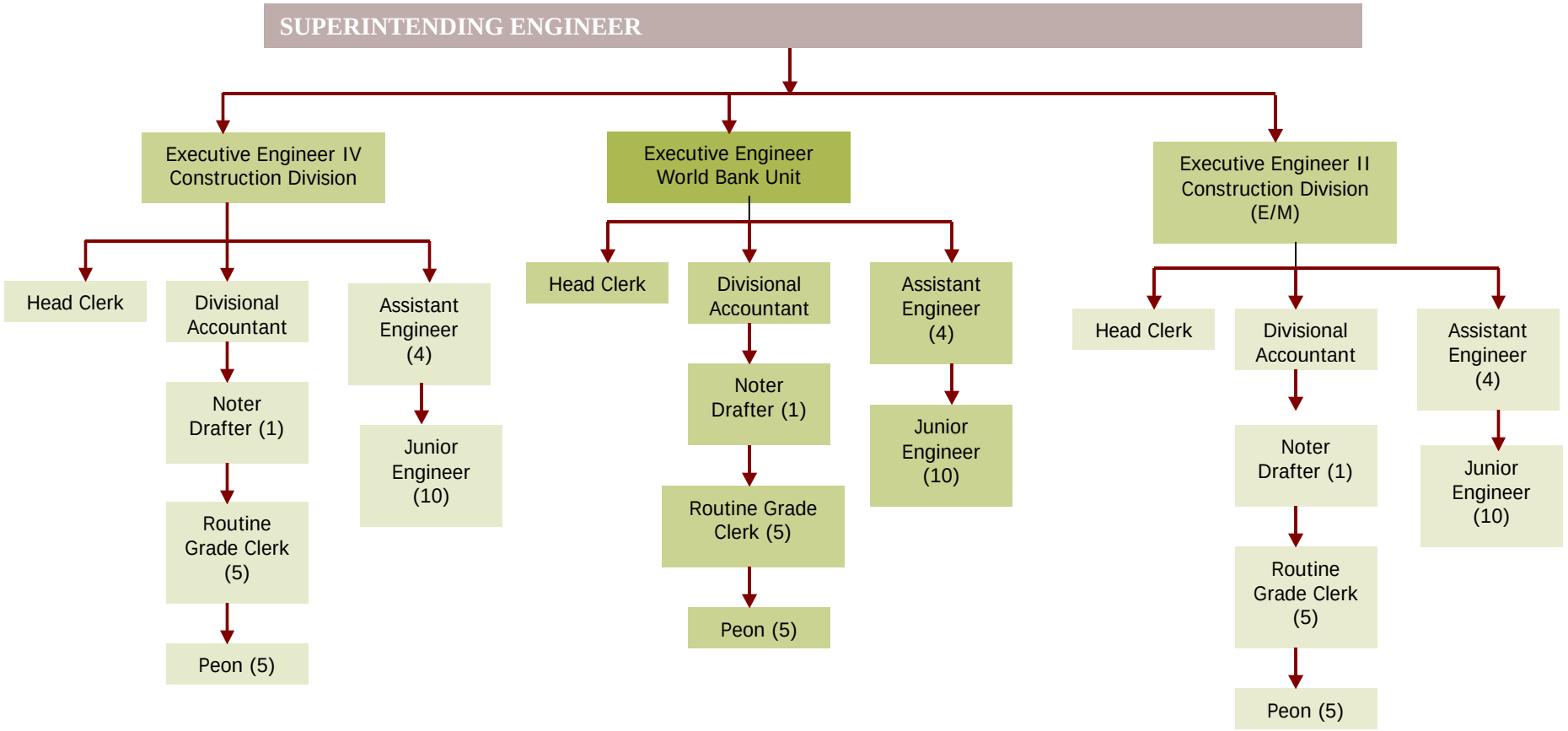


The organizational structure of the Agra Nagar Nigam is as per the Organizational Chart

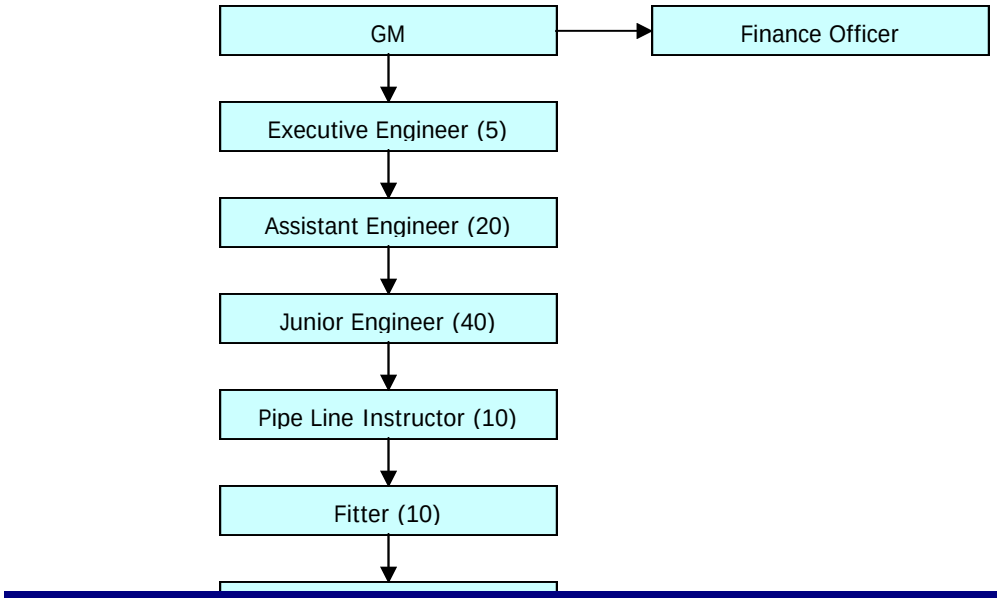


Note:- Secretary, Stenographer, Clerks - Grade I & II, Daftari, Peons are appointed in all the depts.

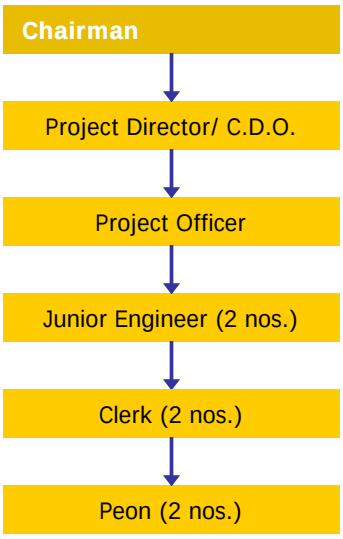
ORGANIZATIONAL STRUCTURE- U.P. JAL NIGAM



ORGANIZATIONAL STRUCTURE- JAL SANSTHAN



ORGANIZATIONAL STRUCTURE- DUDA



ORGANIZATIONAL STRUCTURE- Agra Development Authority

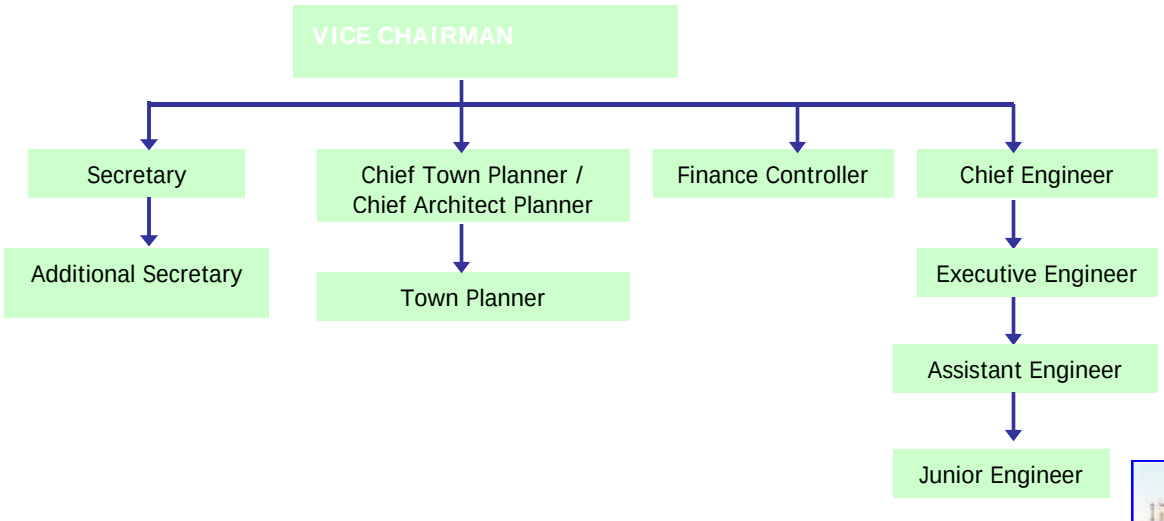


Table 10.3: Existing Institutional Role and Responsibilities

Infrastructure Component	Planning and Design	Construction	Operation and Maintenance
Water Supply	UP Jal Nigam	UP Jal Nigam	UP Jal Sansthan
Sewerage	UP Jal Nigam	UP Jal Nigam	UP Jal Sansthan
Storm Water Drainage	UP Jal Nigam	UP Jal Nigam	UP Jal Sansthan
Solid Waste Management	Agra Nagar Nigam (ANN)	Agra Nagar Nigam (ANN)	Agra Nagar Nigam (ANN)
Roads	PWD, ADA and ANN	PWD, ADA and ANN	PWD, ADA and ANN
Street lighting	ADA,ANN	ADA, ANN	ADA, ANN
Parks	ANN	ANN	ANN

Table 10.4: Status of Existing Role of Private Sector

Infrastructure Component	Planning and Design	Construction	Operation and Maintenance
Water Supply	Nil	Nil	Nil
Sewerage	Nil	Nil	Nil
Storm Water Drainage	Nil	Nil	Nil
Solid Waste Management	Nil	Nil	Nil
Roads	Nil	Nil	Nil
Street lighting	Nil	Nil	MG Road only
Parks	Nil	Nil	Nil

10.5 AREAS OF FRAGMENTATION AND FUNCTIONAL OVERLAP

From the above chart, it can be seen that in the water supply sector, there is a fragmentation of functional activity between the Jal Nigam and the Jal Sansthan. Further, when it comes to the provision of this very basic service to the slum dwellers, another organization called the State Urban Development Authority (SUDA) and the District Urban Development Authority (DUDA) comes into the picture. However, as per the Municipal Act, this function is to be under the Agra Nagar Nigam. Therefore, there is a clear fragmentation on the one hand and functional overlap on the other.

Similarly, some roads are looked after by the PWD, some by the Agra Development Authority and some by the Nagar Nigam, thereby indicating fragmentation of functional responsibility. In the case of street lighting also, one can see fragmentation as well as overlap.

10.6 STATUS OF MUNICIPAL E-GOVERNANCE

There is no system of e-governance in the Agra Nagar Nigam. For the purpose of property tax collection, the Nagar Nigam had commissioned a consultant, which suggested various property tax reforms along with e-governance for tax collection. However, the same has yet to be implemented in the Corporation.

The usage of computers in the Corporation is presently limited to simple desktop publishing and printing of birth and death certificates. We can therefore conclude that there is no e-governance in the city.

10.7 STATUS OF IMPLEMENTATION OF 74TH CONSTITUTION AMENDMENT ACT 1992

In terms of compliance to the 74th Constitution Amendment Act of 1992, the status of the Agra Nagar Nigam is as under :

Functional Devolution	- Incomplete
Reservation of Seats	- Complied
Regular Conduct of Elections	- Complied
Constitution of WCs	**- Yet to comply**
Constitution of MPC	- Yet to comply
Constitution of DPC	- Yet to comply

Further, State Finance Commissions (SFCs) have been duly constituted and their reports submitted. One can therefore conclude from the above that the Constitutional provisions have only been partially implemented.

10.8 STATUS OF REFORMS UNDERTAKEN

In the municipal arena today, municipal reforms constitute broadly the following :

a) Introduction of double entry accounting system,
b) Full computerization of all accounting operations,
c) E-governance operations for a variety of service delivery activities,
d) Rationalized property tax administration,
e) Database development of all municipal owned / rented properties and
f) GIS mapping.

Interactive website development and electronic complaint redressal systems are other reforms. As of date, no municipal reforms have been undertaken by the Agra Nagar Nigam.

However, at the state level, the Agra Nagar Nigams Act of 1959 has been duly amended, as already discussed earlier. Further, at the state level, implementation of reform of Rent Control Act and Urban Land Ceiling Act are other reforms which have been initiated.

10.9 IMPACT OF CURRENT SITUATION ON SERVICE DELIVERY

As already discussed earlier, the current situation of service delivery in the city is most deplorable on account of the fact that none of the reforms have been implemented. Moreover, since the city is a tourist city with a huge number of floating population, the need for a robust civic infrastructure system is a crying need. Added to this, the city is also a home

based industrial city, particularly in the leather sector. Therefore, the lack of proper and efficient service delivery has led to a very sorry state of affairs in terms of various indicators of civic infrastructure.

10.10 ROLE OF PRIVATE SECTOR POTENTIAL FOR PPP

At present, the role of the private sector in municipal service delivery is negligible. A small stretch of street light maintenance on the MG Road has been contracted out and has not been running successfully. Similarly, a limited area around the Taj Mahal has been given out for private sweepers for cleaning. However, even this has not been properly managed and is not a successful experience.

The city of Agra being a major domestic as well as international tourist destination, there is a great scope for improvement with the involvement of the private sector in provision and maintenance of almost all the civic infrastructural services.

10.11 EXISTING ORGANISATIONAL AND GOVERNANCE PROBLEMS

It can be seen that city governance is characterized by a multiplicity of organizations. This often results in inadequate inter-departmental coordination. The result is delays and files moving up and down for clarifications. Each of these agencies have their own agenda, priorities, procedures, lines of accountability, financing norms and so on. The key organizational problems / challenges are as follows :

- Lack of Adequate Awareness and Capacities

The municipal staff lacks adequate awareness of the reform agenda and reforms, which have already been undertaken all over the country in various municipal corporations. This lack of awareness on the one hand and the lack of the capacity or skill to handle tasks in better methods leads to organizational problems and inefficiency.

- Systems Inadequacies

The Nagar Nigam is totally ill equipped with the necessary systems for implementing reforms and improving efficiency. Systems include new methods of register maintenance, data storage and retrieval, etc. Most of the work happens in an ad-hoc manner without laid out procedures; even if the procedures are there, they are outdated and are not suitable for the increasing complexities of a growing metropolis.

- Lack of Adequate Municipal-Parastatal Coordination

The Nagar Nigam needs to coordinate with parastatals such as the ADA, Jal Nigam, Jal Sansthan, etc. Since the Agra Master Plan is prepared by the Agra Development Authority, problems do surface in the implementation of the plan. Areas being developed by the ADA and the older areas within the jurisdiction of the Nagar Nigam often are not properly integrated. In the absence of a Metropolitan Planning Committee, the problems are bound to become complex.

- *Jurisdictional Issues*

The Agra Urban Agglomeration (UA) comprises of areas under the jurisdiction of

a) Agra Nagar Nigam
b) Cantonment Board
c) 2 Nagar Palikas and the
d) Agra Development Authority

The Agra Metropolitan Area constitutes of all the above along with 3 nagar palikas and 2 nagar panchayats in the urban and 179 nagar panchayats in the rural domain.

It can be seen that there are many boundaries and jurisdictional issues crop up time and again for the extension of provision of civic services by the Agra Nagar Nigam which is the biggest urban local body in the metropolitan area on which a greater part of the urban spread is dependant.

- Lack of Citizen Grievance Redressal Systems

It has been observed that while the citizens have a host of problems and they do desire to participate and bring to the notice of the authorities their problems, the absence of a proper grievance redressal system has made it very difficult for the local tax payers to air their difficulties properly and have them redressed. Therefore, in the absence of such a system, the overall efficiency of the system cannot be gauged.

- Lack of Inter-Municipal Coordination

It has been mentioned earlier that the entire urban spatial spread comprises of several urban local bodies. In the absence of a Metropolitan Planning Committee (MPC), inter municipal coordination is not possible.

- *Low Efficiency of Service Delivery*

The obvious outcome of a poorly governed urban area is low level of efficiency of service delivery. This is seen in various aspects such as extent of collection of property tax and other taxes, poor maintenance of roads, poor sanitary conditions, inappropriate solid waste management practices, inadequate street light provision, etc.

- Lack of Reliable Information Base

Accurate and meaningful conclusions can be deduced only when a reliable data base is available with the organization. Unfortunately, the Agra Nagar Nigam as also the other organizations do not have reliable data even for the basic parameters/ indicators.

Chapter 11
Problems, Issues and SWOT Analysis

The problems/issues for the various sectors have been identified on the basis of in-depth analysis of each sector, literature study and discussions with the stakeholders etc. The sectors include demography, economy, urban poor, tourism & heritage, infrastructure including water supply, sewerage, storm water drainage, solid waste management and transportation, environment, municipal finance, governance & institutional development. The major sectoral issues evolved from the city assessment are as follows:

11.1 TOURISM

- No proper documentation of the heritage buildings.
- Lack of tourist infrastructure.
- The tourism potential of the city is not being fully tapped.
- Agra's availability of 175-rooms/lakh tourist is substantially lower than the national average of 423-rooms/lakh tourist and the state average of 404 rooms/lakh tourist.
- The various other tourist destinations like Itmad-ud-Daula are not well connected with the city.
- There are also no proper signage boards and tourist information centers in the city. The evening activities for the tourists are also lacking.
- Some of the heritage buildings are in a dilapidated condition.
- As Agra is famous for its local handicrafts and petha, there is a lack of tourist bazaar in the city.

Unmaintained Heritage building: Idgah and Delhi Gate

11.2 WATER SUPPLY

- The area covered by piped water network is only 85 per cent.
- Hand pumps and tankers meet the water requirement in Sikandra-II, Bodla-II, Shahganj-III, Tajganj-II & III, Trans Yamuna-II & Ghatwasan-II areas.

- The percentage of water loss due to leaks from pipes and pipes appurtenances ranges between 9-37 per cent while UFW ranges between 40-45 per cent of the total supply, which is very high.
- Poor raw water quality.
- Excessive water loss due to leaks in water pipes and pipe appurtenances.
- Damaged water mains and distribution mains.
- Very low pressure at tail end.
- Catchment area of the Zonal Pumping stations is not clearly segregated.
- The length of the pipe network is about 1350km, 95 per cent of the leakages due to service lines.
- Depletion in ground water table.

11.3 SEWERAGE SYSTEM

- Only 17 per cent of the total area of the city is covered by the sewerage system.
- The sewer lines have been laid in the year 1976 in certain parts of old city area and out of it about 50 per cent of the sewerage system is not in working condition.
- Mostly the sewage goes into the open drains. The system is badly silted, choked and damaged at number of places and overloaded due to the growth of population the city.

Sewerage discharged in open nallah

- The STPs are made to perform beyond capacity, but still treat only 10% of the sewage they receive. Mean while, the Dhandupura STP (78 mld) remains under utilized.
- Improper means of disposal of wastewater has also resulted in environmental pollution and creates unhygienic conditions.
- Treatment capacities being inadequate, results in discharge of untreated sewage into water bodies, particularly river Yamuna and other nallahs.
- The STPs at Dhandupura treats city sewer and discharge of 17 nallahs whereas STPs at Pila Khar and Magla Budi treats only discharge coming from nallah water.

11.4 DRAINAGE SYSTEM

- The drainage systems of Agra were laid about 55 years back and are in bad condition. The city is facing big problem of Storm Water Drainage due to its malfunctioning.
- Buildings have come up just over the drains resulting in water logging/flooding of nearby areas.
- Due to new development the areas have been paved resulting in increased run off. There are about 26 major waterlogging areas in the city.
- Lack of Integrated Drainage Plan
- Malfunctioning of drainage system

Open drain at Water Works Chauraha

Condition of Water Body at Nehru Nagar Colony

Open and kuchha nalah at Nalbandh Chauraha

11.5 SOLID WASTE MANAGEMENT

- The solid waste management system in the city is grossly inadequate.
- The average waste generated from the city is 492 grams per capita per day, which is higher than the standard/norms prescribed in the Manual on Municipal Solid Waste Management; Ministry of Urban Development & Poverty Alleviation, Government of India; 20002 (270 grams per capita per day for city with population in between 10 lakhs and 20 lakhs).
- The system of storage and segregation at source does not exist in the city.
- The waste is handled multiple times leading to potential health hazards for the workers, as all types of wastes including hospital wastes, human wastes, etc. are disposed off in the same storage points.
- The sanitary workers are not given any protective clothing.
- Community bins not available at convenient locations
- Street sweeping operations are inefficient
- Several temporary storage points are not cleared on a day-to-day basis
- Community involvement is absent.
- No disposal site in the city, the waste is also dumped along the river bank Yamuna.
- Burning of garbage leads to air pollution.

Dumping of solid waste along River Yamuna near Kailash Temple

Manual lifting of solid waste at Open Collection Point near Mantola

Burning of garbage

11.6 ROAD NETWORK

- The total road length of the city is 1,724 km (including pucca road, semi pucca road, kaccha road) and it hasn't increased in last three years.
- There are about 28,048 light points in Agra, although only 35-40% are functional at any given point of time as per NATPAC study, 1996.
- Insufficient number of bus terminals.
- Mixing of regional and city traffic on main corridors.
- Absence of traffic management plan / its implementation.
- Varying carriageway width creating turbulence in traffic flows.
- Delay at intersection due to non-standard configurations.
- Lack of good eco-friendly intra city public transport (from Taj Mahal point of view).
- No proper fare policy for taxis, autos and buses.
- Street furniture, road and tourism signage are also insufficient in the city
- Barely any footpath for safe pedestrian movement.
- A number of rail-road crossings which add to traffic chaos in the city.

Traffic congestion at Raja Ki Mandi

Railway crossing near Arjun Nagar

11.7 BASIC SERVICES FOR URBAN POOR

The population living in the slums do not have adequate infrastructure facility.

- More than 18 per cent of the population does not have any water facility.
- 50% houses in slums are pucca with brick wall, PCC flooring whereas some people live in jhopris
- About 40 per cent of the population does not have access to sanitation facility, which results in open defecation.

Unhygienic Condition in Slum Areas

- Some slums have come up along the drains, which have increased the vulnerability of the residents living there.

11.8 ENVIRONMENT

- Air pollution is localized.
- Water resources in the city are polluted.
- Less green areas insufficient to have a positive impact on the environment.
- Solid waste is one of the critical urban environment issues in Agra.
- The absence of a sanitary landfill site is another critical issue related to sanitary land filling which rears its ugly head in most urban centers of India.

Air Quality

- SPM reduced by 60% (935 ug/m3 to 374 ug/m3) but is still more than 5 times the standard of 70 ug/m3.

Surface Water

- In April 2006 minimum values of majority of parameters (COD, Ammonia, MNP) have crossed the standard limit.
- Minimum Chlorine demand in 2006 has crossed 38 mg/l (value at which WTP at Delhi are shut down).
- Maximum values of all the parameters are well beyond the standard.

Ground water

- Unfit for drinking as it is saline & high in fluoride content
- Further ground water levels range from more than 30mbgl & water level is declining by about 30 to 55cm/year.

Noise Level

- Noise level at Taj Mahal at daytime is 65.5 dB which decreases to 56.2 dB during the night, but still high than the standard of 50 dB.

11.9 FINANCIAL HEALTH OF AGRA NAGAR NIGAM

- High dependence on non- tax receipts.
- Major portion of Non-Tax receipts arises from receipts from State Finance Commission indicating substantial dependence on State Government Funds.
- While the population and geographical area of the city are increasing, the tax receipts do not show a corresponding increase indicating substantial non-compliance in tax payment.
- Heavy payment to meet the revolving fund
- Sanitation being most unavoidable service to be provided by a nagar nigam with expenditure of about 50% of total expenditure, shows that only bare minimum civic services are being provided in the city.
- The Capital Expenditure shows an increasing trend over the five years period under review with increase during the year 2004-05 being exceptionally higher.
- Recovery of cost of providing Water Supply shows an improving trend. However correct assessment would be based on accrual figures, which are not available with ANN
- There is negligible recovery of cost incurred on Sewerage & Sanitation and Solid Waste Collection.
- There is no private sector investment in the infrastructure

11.10 INSTITUTIONAL ISSUES

- There is a clear fragmentation between the various authorities on the one hand and functional overlap on the other.
- There is no system of e-governance in the Agra Nagar Nigam.
- In terms of compliance to the 74th Constitution Amendment Act of 1992, the status of the Agra Nagar Nigam is as under:

Functional Devolution	- Incomplete
Reservation of Seats	- Complied
Regular Conduct of Elections	- Complied
Constitution of WCs	- Yet to comply
Constitution of MPC	- Yet to comply
Constitution of DPC	- Yet to comply

- As of date, no municipal reforms have been undertaken by the Agra Nagar Nigam.
- The current situation of service delivery in the city is most deplorable on account of the fact that none of the reforms have been implemented.
- At present, the role of the private sector in municipal service delivery is negligible.
- The municipal staff lacks adequate awareness of the reform agenda and reforms, which have already been undertaken all over the country in various municipal corporations.
- The Nagar Nigam is totally ill equipped with the necessary systems for implementing reforms and improving efficiency.
- The Nagar Nigam needs to coordinate with parastatals such as the ADA, Jal Nigam, Jal Sansthan, etc.

11.11 INNER CITY

- The inner city area of the city has narrow streets, which are being encroached by various informal activities and on street parking.
- The petha manufacturing industries create unhygienic conditions.

The study conclusions would enable preparation of City development plan for Agra as per the guidelines of JNNURM.

11.12 SWOT ANALYSIS

The issues for the each sector has formed the basis for carrying the SWOT analysis and formulation of the strategies. The assessment of strengths, weaknesses, opportunities and threats has formed the basis for preparation of vision, strategies and overall preparation of city development plan for the city. The city SWOT analysis has been done after the assessment of various sectors of the city.

STRENGTHS

- Location of Taj Mahal and other World Heritage Sites
- Proximity to New Delhi, the National Capital
- Well entrenched local economy in terms of

- (a) Petha (b) Leather (c) Handicrafts
- River front development area as per Master Plan 2021
- Responsive local and state administration
- Positive initiative in residents
- Arrival of Foreign Tourists

WEAKNESSES

- Pollution
- Haphazard Spatial development
- Dis-organised mixed nature of traffic
- Congested Road Networks
- Lack of modern public transport
- Weak Infrastructure
- Substantial urban poverty & slums
- Reforms yet to take off

OPPORTUNITIES

- Tourism & Heritage
- Willingness of local and state administration to reform
- Willingness of local population to support city development
- Presence of many developmental stakeholders including NGOs

THREATS

- Environmentally sensitive
- Fragile heritage
- Unauthorized settlement growth
- Pollution
- Laxity in implementation

Chapter 12
Stakeholders Consultation and Priority Matrix

12.1 BACKGROUND

As a part of preparation of CDP as per the guidelines of JNNURM, stakeholder consultation is the key component for the purpose of understanding priority of the local people while developing a vision for the city and identifies the projects for the City Development Plan. For this, the project team had visited Agra on several occasions and discussed the issues with officials of government departments and the local people. This chapter outlines the nature of consultation activities conducted by the project team in the overall CDP process.

Consultation with local communities, local government and state government was undertaken by the Consultants to provide an opportunity for community and government participation in the CDP process. These activities have aimed to form an open and cooperative communication process between the team of CDP preparation and all stakeholders.

The overall objective of the consultation process was to get the viewpoints of the stakeholders in the identification of issues as well as vision formulation. Specific objectives were:

i) To involve local residents in the CDP process
ii) To enable stakeholders to express their views about existing problems and proposal;
iii) To create a shared flow of information and
iv) To enable local ownership of the city development plan

12.2 KEY STAKEHOLDERS

Key stakeholders were identified at the beginning of the assessment process. The participants were identified as under:

Table 12.1: List of Stakeholders

S. No.	Stakeholder Group
1.	Non Governmental organizations (NGOs)
2.	Residential Welfare Associations (RWAs)
3.	Representatives of religious bodies
4.	Industry Association
5.	People from slum areas
6.	Students
7.	Prominent local citizens
8.	Traders associations
9.	Others (women group etc)

S. No.	Stakeholder Group
10.	Agra Nagar Nigam and other related Government Organizations
11.	Elected representatives of Ward Committees

12.3 CONSULTATION

Therefore, the CDP has emerged out of the inputs provided by the local stakeholders. In order to prepare the City Development Plan, stakeholder consultations have been undertaken in the following manner:

- Initial Consultation on Project Awareness
- Meetings and Discussion
  - Govt. officials
  - Informal discussions with local residents
  - Meetings with NGOs
  - Meeting with Supreme Court Representative
- Workshops on formulation of City Vision
- Workshop on Project identification
- Workshop on Draft Final Report

Consultation was designed as-

- Short presentations on issues relevant to each of the key sector.
- Discussion following invited presentations.
- Meeting either single or multiple groups focusing on emerging key issues

Project Team with Jal Sansthan Officials, Shri A.N.Srivastava, Sh. S. P. Srivastava and Sh. R.P Singh

12.3.1 *Initial Consultation on Project Awareness*

The initial consultations were held on 19th April 2006, under the chairmanship Mr. Sanjay Prasad, I.A.S., District Magistrate – Agra and other senior officials from various Government Departments like Agra Nagar Nigam, U.P. Jal Nigam, Agra Development Authority, Tourism, Archaeological Survey of India (ASI), District Urban Development Agency (DUDA), RTO etc. During the consultation all the stakeholders were introduced about the CDP and after that various issues related to Agra were discussed. The highlights were the immediate need of city to improve the efficient transportation system, ways to enhance municipal financing system and the overall quality of life of residents on a priority basis.

Consultants meet with CO-Traffic Agra, Mr. Kuldeep Singh

The process also helped in deriving a consensus along with the stakeholders firming up the process and agreeing upon a structured programme to take up the work of the CDP.

12.3.2 Meeting with various Stakeholders

Individual meeting with the departments of U.P. Jal Nigam, Jal Sanathan, Agra Nagar Nigam, UP State Pollution Control Board, Central Pollution Control Board, Regional Transport Officer and District Urban Development Authority (DUDA) to acquire statistical information acquired for the purposes of preparation of City Development Plan, laid emphasis on improvement of urban infrastructure and the priority of activities to be undertaken.

a) Meetings with Govt. officials

Discussions with , Mr. Suresh Chandra, Nodal Officer JNNURM

Discussions with ANN Officials

Organization	Sector	Officials
Agra Nagar Nigam	ANN	Mr. S.S.Yadav , Commissioner ANN, Mr. K.P.Tripathi, Dy. Commissioner ANN,
		Mr. Suresh Chandra, Nodal Officer, JNNURM Agra
	Town Planning	Mr. Anup Srivastava
	Solid Waste Management	Dr. O.P.Sharma, Chief Health office.
	Roads & Transportation	Mr. Lokesh Kumar Jain, Traffic Engineer.
	DUDA	Mr. Rakesh Sharma, Mr. Darsha Nand, JE
	Finance Deptt.	Mr. Qasim Raza
U P Jal Nigam	Water	Mr. Sushil Kumar, S.E., Mr. S.C. Srivastava, E.E., Mr. A. S. Bhatti, Mr. S.K. Gupta
Jal Sansthan	Water	Mr. A N Srivastava, Sachiv., Mr. S.P. Srivastava, A.E., Mr. R.P. Singh
DIC	Industry	Mr. Singh
CPCB	Environment	Dr. D. Saha
NCCI	Trade & Commerce	Mr. R.K. Sinha
ASI	Heritage	Dr. D. Dayalan
YAP	Sewerage	Mr. Gopal
Traffic Police	Traffic	Mr. Kuldeep Singh, CO – Traffic Agra

Accounts Department of Agra Nagar Nigam expressed the concern for the shortage of funds to undertake new development projects and even maintaining efficiently the existing infrastructure. The members of the project team have held discussions with the Superintendent, Archeological Survey of India, Circle Officer - Traffic, Traffic Engineer, Agra Nagar Nigam.

During the discussions, the representative of Archeological Survey of India was of the view that there is a need to increase the accessibility and improvement of the environment around the monuments which are protected but are other wise not so prominent on the tourist map thereby could attract more tourists. He also laid emphasis on identifying/listing the other unprotected monuments. He wanted that tourism related facilities should improve, so that the tourist may stay for more than a day and thus contribute to the economy of the city. He also wanted that Agra should have budget accommodation for the Indian tourists.

Discussions with Traffic Engineer, ANN

Apart from other issues during the meeting with Circle officer -Traffic Shri Kuldeep Singh, major issue that emerged was that the existing traffic signals are not fully operational due to lack of co-ordination among the various development agencies.

Following are some of the suggestions of Mr. Lokesh Jain: Traffic Engineer, Agra Nagar Nigam

- Improvement of streetlights
- High mast lights at entry points of the city
- Parking requirement/ Multi Storeyed parking at various congested places like Phagwara Chauraha, Kinari Bazaar, Shahganj, Raja Mandi
- Flyovers to be proposed at various problematic junctions
- Traffic Management for internal roads

Informal discussions with local residents to get the real picture

b) Informal discussions with local residents

Consultants visited the slum areas and Industrial areas like Leather Industry, Petha industry & Foundry works for an informal interaction with the local residents to get the real picture of the area.

Slums Area: Consultants had visited several slum areas, which includes Nal bandh, Mantola, Garib Nagar, Ambedkar Nagar and vikram Nagar. The infrastructure facilities are really poor, there are no proper drains, no water supply and kutchha houses are in higher percent.

Informal discussions with petha industry

The common problems highlighted by the local are:

- All local drains are Kutccha
- Sewerage and wastewater is directly released in open Nala.
- Over flow of nala during rainy season
- Poor sanitation facility
- Non-arrangement of solid waste collection
- Unhygienic and unhealthy surrounding

c) Petha Industry:

Several Petha industries have been visited by the consultants, which were located at Noori Darwaza. The common problems of all the owners of petha industries are given below:

- Problem of solid waste disposal
- No regular collection of waste though petha shopkeepers pay Rs. 1500/- per month additional to ANN for the same
- Lack of basic amenities at proposed locations for petha industries
- Unhygienic condition at Noori Darwaza, absence of solid waste containers

Dead Animals openly tanned by the workers in leather industry

d) Leather Industry:

Industries like Sheetal footware at Jeoni Mandi, Tej Shoes Artoni, Dawar shoes sikandra road and many more leather industries are being visited by the consultants to aware of the actual scenario of the leather industries in the city.

Following are the common issues of leather industry in the city

- Lack of waste disposal containers
- Lack of disposal site for leather waste & leather waste treatment system
- Leather remains are sold to 3rd party for reuse after which waste is dumped along the street creating foul odour and deteriorating the soil quality

View of the office of Agra Iron Foundaries

e) Foundry Work:

The common issues raised by the owners of foundry are:

- Inadequate water availability for both industries and drinking purpose
- Lack of infrastructure facilities
- Lack of raw material
- Consent problem from State Pollution Control Board
- Lack of Manpower
- Unemployment generated by shifting of foundry plants

f) Meetings with NGOs

A meeting with NGOs was held on 25th & 26th June, 2006 representatives from bilateral agencies and NGO's like Sankalp, CSE and Sulabh International. The meeting was called for in response to City Development Plan.

Project team discusses with NGO representatives

Following issues has been raised by the NGOs

- Water supply in limited area of the city with low pressure
- T junctions as compared to crossing creates more congestions
- They mentioned that there is complete absence of any traffic management in the city, and no one adheres to the traffic rules.
- The NGO volunteers raised the issue that only newly planned areas have access to open spaces, gardens etc. There is an inherent need for developing lung spaces.
- Another important issue raised is the condition of drains in the city is very poor and most of the drains remained choked throughout the year.
- The NGO members felt the quality of water is very poor and the quantity becomes a major problem in many areas of the city during summers.

a. Meeting with Supreme Court Representative

As per meeting with the Supreme Court representative following are the foremost priority issues for the Agra city:

- Provision of potable water
- Cleanliness in the city
- Solutions to the traffic related problems
- Upkeep and maintenance of tourist spots
- Night attraction to attract tourists
- Illumination of Taj Mahal

Project Team discusses the issues, problems and suggestion with Mr. Raman, representative Monitoring Committee Supreme

12.3.3 Workshops on formulation of City Vision

As part of the consultation process a full day Stakeholder Workshop was held on 26th June 2006 at Youth Hostel, Agra. For this workshop stakeholders from central, state and local government, also non-governmental organizations, experts from varied fields, RWAs, Associations – traders, transporters, petha industry, shoe-making industry etc. were invited. The main aim of the workshop was to present the findings of the rapid assessment and to formulate vision for the city, also to obtain feedback from the stakeholders, through group discussions, on the priority issues affecting

View of Stakeholders meeting at Youth Hostel

the growth and development of the city. The main agenda of the consultation was a presentation on assessment of the city, development strategies, and finalization of the vision for the city and prioritization of projects identified by the consultants. The project prioritization and vision for the city was also discussed in the workshop. At the out set of the meeting the participants were also appraised of the scope, aims and objectives of preparation of City Development Plan for Agra.

Moreover, from the citywide stakeholder consultations and stakeholder workshop, the following proposals for development of infrastructure emerged.

- Facilities for Urban Poor
- Water Supply, Sewerage and Drainage
- Solid waste management
- Urban Environment
- Road and street lighting/Traffic management

Prioritized sector from the workshop were: Quality of water supply as the top priority, solid waste management, sewerage, roads, traffic & transportation, drainage and tourism.

Following are the foremost priority sectors, as suggested during the workshop;

- Based on the consultations and prioritization of the projects, among all the sectors transport was given the topmost priority. The improvement in water supply and sewerage was given the next priority.
- Some representatives were of the view for carrying out primary survey while preparation of CDP. They were clarified about the scope and time frame for completion of CDP, and it is not possible to undertake primary survey. However, the Consultant had assured that if found any gap, it should verify by visiting the place.
- The Member, Monitoring Committee of Supreme Court suggested that the projects identified should be as per the provisions of the Master Plan-2021. He was informed that Master Plan provisions have been considered while formulating the strategies and identification of projects.
- The representatives also enquired about why education and health have not been considered while identifying the projects. It was informed that these aspects are not under the scope JNNURM.

The workshop was followed by a discussion held with Commissioner, Agra Nagar Nigam along with the Deputy Commissioner. During the discussion Deputy Commissioner expressed his concern about the shifting of Petha Industry that is posing serious health hazard and problems in disposal of waste. Concern was also expressed about the non-maintenance of the existing parks and open spaces due to shortage of funds.

As part of the consultation program and in continuation to consultations being carried out across the city to arrive at a consensus on the key issues identified with regards various elements analyzed and to firm up the optional strategies to address the service delivery and financial issues identified

12.3.4 Workshop on Project Identification

A workshop was held on July 7th 2006 with various representatives from Government Officials, NGOs and members of Citizen Council etc.

Shri S.S.Yadav Commissioner, ANN enquired the tourism vision & strategies and the project identified within it to attract more tourists to the city. It was clarified by the consultants that for

boosting the tourism in the city it is proposed to resolve the problems of approach roads and environs around the lesser known, protected/unprotected monuments, however his suggestion will be kept in view.

Shri Sushil Kumar, SE, Jal Nigam, Informed that the time horizon used by Jal Nigam while planning services (water supply, sewerage, drainage etc) is clashing /not matching with the NURM time frame. These services as per CPHEEO guidelines are designed for 30 years with 2009 as base year and design year as 2034. Due care should be taken for the timeframe while finalizing the CDP. He further informed that in a meeting held in the chamber of Secretary, Urban Development, Ministry of Urban Development, Government of India, that Government of India is willing to share 50% of the cost of the project for transport of Ganga water from Palra Fall and this component may be considered to included in the CDP. He suggested that all the services should be dealt under one window system. Construction, O&M, and revenue collecting agency should be a single agency.

Shri Ramesh Kumar Kardhan, PO, DUDA, wanted to know in general the methodology of CDP preparation. He suggested the consultants should categorize the slums into three categorize – most problematic, less problematic and least problematic and accordingly phase the investment in them. He was informed that the scope of the work is based on the secondary survey and as such the suggestion is not covered in the scope of the work. The categorization will come in the purview of DPR or separate study should be conducted for the purpose.

In order to finalize the comments on the CDP proposals it was decided by Commissioner, ANN that a meeting be held on 11 July 07 at 10 A.M. under the chairmanship of Commissioner, Agra Division in his office.

12.3.5 Consultation- Finalization of Draft Report

A meeting was also held under the Chairmanship of Commissioner Agra Division on 11th July 2006 pursuant to the meeting notice dated 7th July 2006 issued by Nodal Officer JNNURM, ANN. List of Participants the meeting are given in Annexure 12 At the outset of the meeting the Consultants presented the summary of the draft CDP wherein project identification along with estimated cost, funding pattern and city investment plan was explained in detail.

Project Team presents the Draft CDP

The main aim of the workshop was to present the identified projects under JNNURM and to finalize the projects for the city, also to obtain feedback from the stakeholders, through group discussions, on the priority issues affecting the growth and development of the city.

Following suggestions emerged during the meeting:

- It was desired that projects like international airport, international amusement park, sky bus from Sikandara to Taj Mahal should be included. It was agreed that these projects would be funded by state government in terms of land cost and involve fully private investment except for the land cost which shall be borne by the State Government.
- Project for afforestation may also be considered to be included in order to check the desertification.

Dr. Ashok Kumar, IAS, Commissioner, Agra Division chairing the Workshop along with Shri. Shashi Kant Sharma, IAS, VC, ADA and Mr. Shyam Singh Yadav, Municipal Commissioner, ANN

View of Stakeholders who attended the workshop on 07-07-06 from UP Jal Sansthan, Forest Department, Agra Nagar Nigam, Jal Nigam

- While formulating the detailed project reports, the concerned departments will take care of a) the various orders issued by the Honorable Supreme Court in the matters related to the city of Agra and b) the various stipulations laid down by the Ministry of Environment and Forests, Government of India.

12.4 PRIORITY MATRIX

The main outcomes of the consultation are a number of different priorities, which leads to the next important stage of project realization, identified major priority actions in relation to the improvement and enhancement of urban infrastructure. The priority actions is be further detailed out in terms of resources required, responsibilities and involvement of agencies, identification and up gradation of infrastructure and suggestions to overcome these, funding requirements and responsibilities, additional requirements and pre-requisites for successfully accomplishing priority actions.

Table. 12.1 Priority Matrix
Infrastructure and improvement of Urban Environment

S. No.	Activities	Stakeholders					Overall Score
		Govt. officials	NGOs	Environmentalists	Slum Residents	Industry	
1	Improvement/Enhancement of Water supply and its quality	2	3	3	3	3	14
2	Improvement of Drainage System	2	3	3	3	3	14
3	Improvement of sewerage and sanitation system	2	3	3	3	3	14
4	Public Transportation System, Improvement of road network, improvement of traffic management, Improvement of street lighting, signage's, underpasses, flyovers, parking etc.	3	3	3	2	2	13
5	Solid Waste Management	2	3	3	3	3	14
6	improvement of the environment of monuments and heritage area	1	1	3	0	1	6
7	Tourist facilities	3	2	2	0	1	8
8	Improvement of environment	1	2	2	1	1	7
9	Shifting of industries	1	2	3	1	1	8
10	Open space, parks and recreation	1	2	1	1	1	6

Level of Priority	Score
High Priority	3
Medium Priority	2
Low Priority	1
Nil/Unknown	0

Table. 12.2 Priority Matrix
Institutional Strengthening and Reform

S. No.	Activities	Stakeholders					Overall Score
		Govt. officials	NGOs	Environmentalists	Slum Residents	Industry	
1	Institutional reform with coordinated manner	3	3	2	0	2	10
2	Enhancement of municipal finance system	3	2	2	0	3	10
3	Private sector participation	3	2	2	3	3	13
4	Capacity building / training	3	3	3	3	3	15
	Level of Priority	Score					
	High Priority	3					
	Medium Priority	2					
	Low Priority	1					
	Nil/Unknown	0					

Table. 12.3 Priority Matrix

Slum

S. No.	Activities	Stakeholders					Overall Score
		Govt. officials	NGOs	Environmentalists	Slum Residents	Industry	
1	Improvement of drainage and sewerage	2	3	3	3	2	13
2	Solid waste management	3	3	3	3	3	15
3	Rehabilitation/Resettlement	2	1	2	1	1	7

Level of Priority	Score
High Priority	3
Medium Priority	2
Low Priority	1

The workshop identified the following key activities as the priorities.

Sl. No.	Activities	Priority Level
A. Improvement of Infrastructure and city environment		
1	Improvement/Enhancement of Water supply and its quality	High
2	Improvement of Drainage System	High
3	Improvement of sewerage and sanitation system	High
4	Public Transportation System, Improvement of road network, improvement of traffic management, Improvement of street lighting, signage's, underpasses, flyovers, parking etc.	High
5	Solid Waste Management	High
6	improvement of the environment of monuments and heritage area	Medium
7	Tourist facilities	Medium
8	Improvement of environment	medium
9	Shifting of industries	medium
10	Open space, parks and recreation	low
B.	**Institutional Reform**	
1	Institutional reform with coordinated manner	High
2	Enhancement of municipal finance system	High
3	Private sector participation	High
4	Capacity building / training of Agencies	High
C.	**Slum improvement**	
1	Improvement of drainage and sewerage in Slum	High
2	Solid waste management	High
3	Rehabilitation of slums	low

Finally, the findings of workshop can be summarized in terms of improving the basic facilities including quality drinking water, proper sanitary facilities and good quality roads with street furniture.

Chapter 13
Strategic Agenda and Vision

13.1 AGRA CITY VISION

A vision is a statement of where the city to wishes to go, within a given timeframe. The ambitious vision was formulated by considering the strengths, potential, issues/problems, future focus areas, preferences of the residents of the city and physical characteristics of the city. A consensus approach was built up among the various groups of stakeholders in an integrated and cohesive manner to achieve a common vision for the city. The set of criteria's was also formed relevant to JNNURM components to achieve the mission.

In preparing the City Vision, the concerns were:

- Issues related to Agra as an international tourist destination
- Provision of adequate Infrastructure facilities
- Urban Renewal
- Need for intensification of economic regeneration
- Slums and urban poor
- Suggestions from the stakeholder consultations

CITY VISION

Full Utilization of Agra's Potential for Improving the Economy of the City by Providing Equal Access to Best Quality Physical and Social Infrastructure to All Residents and Tourists

GOALS

The various goals have been envisaged for achieving the vision.

- Provide 24x7 hours water supply to every household including the slum areas with sewerage network and solid waste services by the year 2015.
- Efficient and safe transportation system for the city
- Promote the economic opportunities in the city through tourism
- Provide safe and healthier urban environment

The citizens should have access to healthy community life, improved mobility, clean and green environment. The people have a participatory approach in city building. The problems of urban poor are addresses and mitigated in a time bound manner on priorities so that in the near future it could be slum less city

13.2 SECTORAL VISION

The sector vision is important for development of each of the sectors. The targeted approach is necessary for achieving the goal. The sector vision has been culled out of the city assessment, stakeholder consultations, informal discussions and workshop carried out at various stages of CDP.

Heritage and Tourism

Vision

Enhancing and maintaining the competitiveness of Agra as a tourism destination.

The documentation of all the heritage and unprotected monuments will be done. The city level infrastructure and tourist infrastructure will be improved to provide a pleasant experience to the tourists. The different marketing plan will be devised for domestic and international tourists to prolong their stay. It is also envisaged that the other important/forgotten monument in the city is also made accessible and environmental friendly in order to increase the stay of tourists in world-class city. The tourism will be promoted as a major city economy.

Though Agra is world famous due to Taj, but still being close to Jaipur and Delhi (approximately 200km each) the tourists visiting the city mainly visit Taj and do not prefer to stay overnight. For this purpose certain proposals like **International airport**, **Golf Course of international standard**, light and sound programme at Agra fort, **amusement park**, **number of budget hotels in addition to international standard hotels**, **national park**, etc. could also be considered to be provided by the Central/state government separately so as to attract the tourists to increase their stay in Agra. This aspect needs to be taken care on priority by the State/ Central government keeping in view the Common Wealth Games scheduled to be held in 2010 resulting in tourist influx in the city. This influx is expected to add to the economy of Agra city.

Water Supply

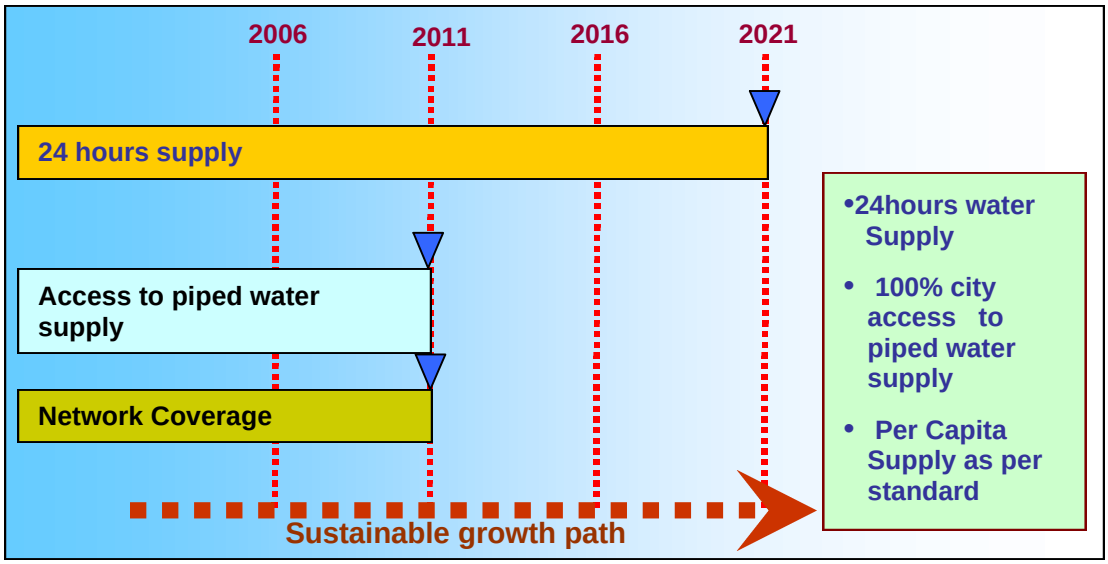
The existing situation of water supply of the city presents a relatively better situation of the city as compared to the other sectors. The quality of water source is the major concern apart from the high unaccounted for water, which is mainly the result of lack of metering, illegal connections and public stand posts.

Vision

To provide good quality water in an equitable, efficient and sustainable manner.

Table 13.1: Current Status and Vision- Water Supply

S. No.	Component	2006	2011	2016	2021
1	Consumer Satisfaction	55%	85%	100%	100%
2	Network coverage	70%	90%	100%	100%
3	Access to piped water supply	85%	95%	100%	100%
4	Per capita supply (lpcd)	140	150	150	150
5	Daily hours of supply	4 - 5	8	12	24x7
6	Unaccounted for Water	40 - 45%	30%	20%	15%



For the above vision following goals have been identified for different horizons. By the year 2011, the city will be covered with 100 percent piped water supply. The per capita supply of water will also be increased to 225 lpcd with 24x7 water supply. All slum areas will also be covered with piped water supply. Thus all the rehabilitation work, replacement of old pipe lines, distribution lines needs to be taken care of by the year 2011. The water quality
Thus, effective and efficient distribution with accessibility to every household is envisaged by the year 2021. Regular maintenance and monitoring of the distribution network will also reduce UFW factor to 15 per cent.

Sewerage

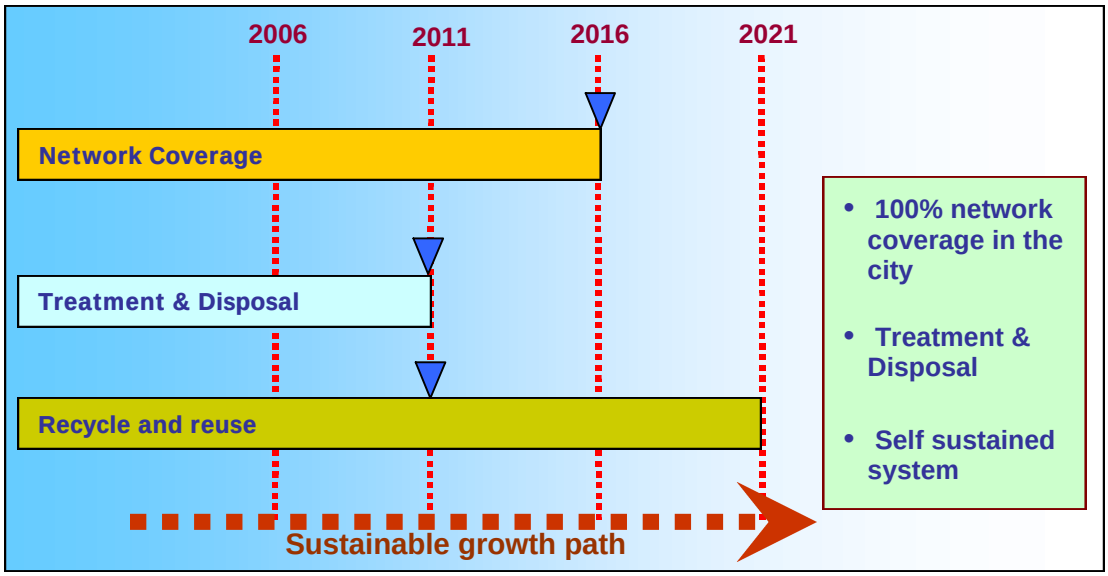
The existing situation of sewerage system of the city reflects the pathetic condition of the environment. The staggered pockets having sewers but not finally connected to STP are discharging the untreated sewage into drains/nallas, which eventually end up in polluting river Yamuna further. The data on missing links connecting the sewers with STPs is not available. The slum dwellers lack the safe sanitation facilities and are exposed to health related diseases. The indiscriminant disposal of sewage into open nallahs is common in many places. The discharge of sewage into the river Yamuna is a big environmental hazard.

Vision

To provide sewerage services to all based on principles of quality, equity, value & responsiveness.

Table 13.2: Current Status and Vision- Sewerage

S. No.	Component	2006	2011	2016	2021
1	Consumer Satisfaction	10%	75%	100%	100%
2	Sewerage Network	17%	85%	100%	100%
3	Treatment & Disposal	10%	75%	85%	95%



To enhance the coverage of safe sanitation facilities following goals have been identified for different horizons. By the year 2016, the city is expected to achieve the sewerage network there by improving the basic infrastructural services.

By the year 2021, 95% of the wastewater should be treated and disposed. The city is expected to achieve a self-sustained system to cater the local population and floating population. The present shortfall/ gap will be met during the successive years. It is also envisaged that regular monitoring and maintenance will be done during the regular time intervals.

Storm Water Drainage

There is no planned storm water drainage system for the city. The tertiary drains are missing in all parts of the city. The dumping of the garbage in the open drains leads to blockage and unhygienic conditions. The surface drains constructed discharge into the nallahs and the river also result in water logging in many parts of the city. The existing storm water drainage system reflects the pathetic condition of the drains carrying storm water as well as sewage discharged by the sewer from segregated pockets of residential areas having network of sewers.

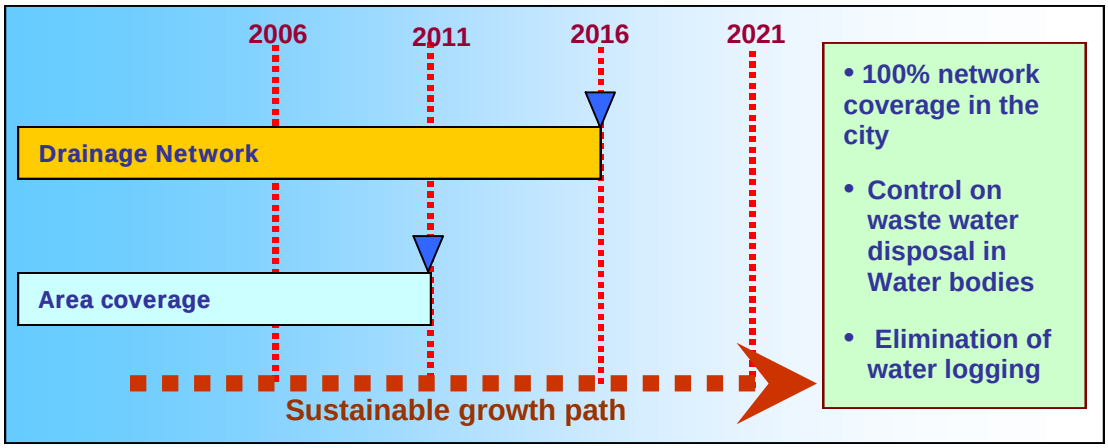
Vision

To improve condition of storm water drain so as to handle run-off water, water logging and rejuvenate water bodies.

Considering the above challenge, the following goals for different horizon years have been identified. There should be reduction in water logging areas of the city and increase the safety. The water logging is to be eliminated completely by 2016. The natural system should be streamlined effectively for safe disposal. Storm water drains coverage should be enhanced to 80% by 2011 and 100% by 2016. In addition to that, at least 50% of the storm water should be recharged by the year 2016.

Table 13.3: Current Status and Vision- Storm Water Drainage

S. No.	Component	2006	2011	2016	2021
1	Drainage Network	N.A.	80%	100%	100%
2	% area covered	N.A.	70%	80%	100%



Solid Waste Management

The existing solid waste management system presents the distressing picture calling for an immediate implementation of solid waste management plan for the city. The solid waste is being handled manually, without giving any protective clothing/ gloves to the sanitary workers, which is a health hazard. There is no segregation of waste and the waste is transported in open trolleys, tractors trucks etc. The solid waste gets piled up in intermediate collection points and due to paucity of transport vehicles whole of solid waste generated is not being transported daily. There is no scientific method for disposal or treatment of the waste in the city.

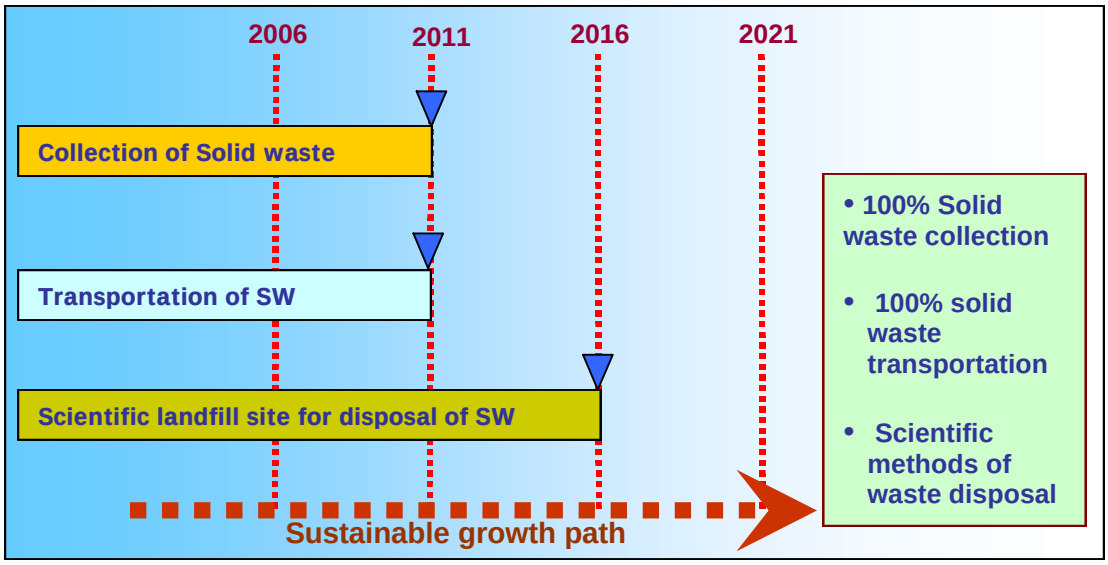
Vision

To achieve environmentally sustainable waste management practice

To put an effective Solid Waste Management System complying with the rules of 2000.The system of HH collection of waste with waste segregation and reuse will be implemented by the year 2011. The open transportation of the waste will be stopped and the transportation requirement will be updated as per the solid waste generation in the city. The working conditions of the sanitary workers will be improved by providing better equipments and material. The scientific methods of waste disposal will be adopted for cleanliness and healthy environment of the city. The effective processing of waste through composting or energy projects will be ensured by the year 2021.

Table 13.4: Current Status and Vision- Solid Waste Management

S. No.	Component	2006	2011	2016	2021
1	Door to Door collection	10%	50%	100%	100%
2	Waste Segregation at Source	N.A.	50%	100%	100%
3	% age solid waste generated to collected	75-80%	100%	100%	100%
4	% age solid waste collected to transported	75-80%	100%	100%	100%
5	Utilizing scientific landfill site for disposal of solid waste	N.A.	80%	100%	100%



Roads and Transportation

The traffic network in the core area of the city is inadequate and inefficient for the present day traffic. The lack of parking spaces, growth of commercial activities including informal sector is putting pressure on existing infrastructure.

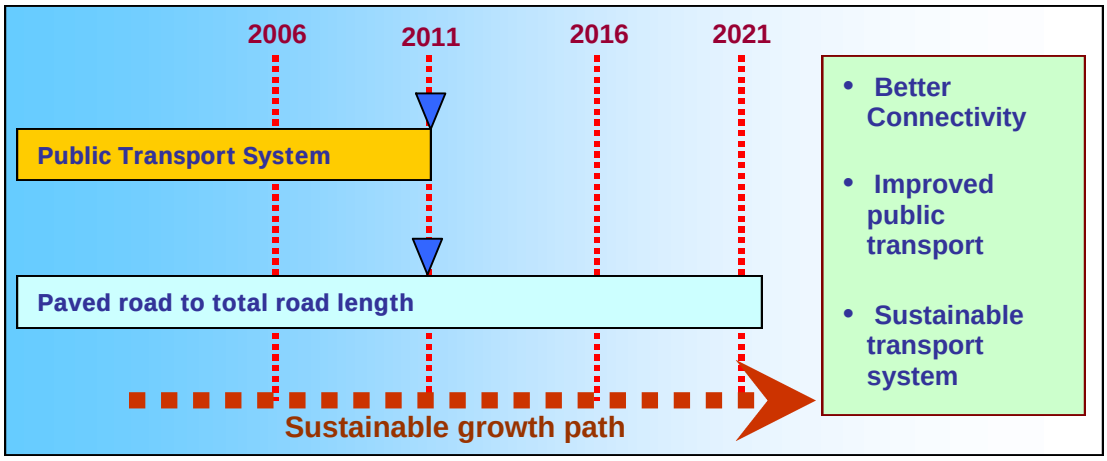
Vision

To provide efficient safe, sustainable transportation system for the city.

To enhance the roads and transportation facilities following goals have been identified for different horizons:

Table 13.5: Current Status and Vision- Roads and Transportation

S. No.	Component	2006	2011	2016	2021
1	Road Network as % of total Area	11%	11%	11%	11%
2	Paved road to total road length	N.A.	80%	90%	100%



Better connectivity with all parts of the city and decongesting the core area of the city. All the road geometric and traffic infrastructure like provision of streetlights, footpath improvement,

traffic signals etc. will be improved and enhanced by the year 2011. The road infrastructure will also be able to cater to the efficient public transport system envisaged for the city. The construction of the roads will be done to suit the local traffic flow and the city environment. The public transport system will be improved by the year 2011. Thus, at the end of the mission the city will have efficient, safe and sustainable transportation system.

Basic Services for Urban Poor

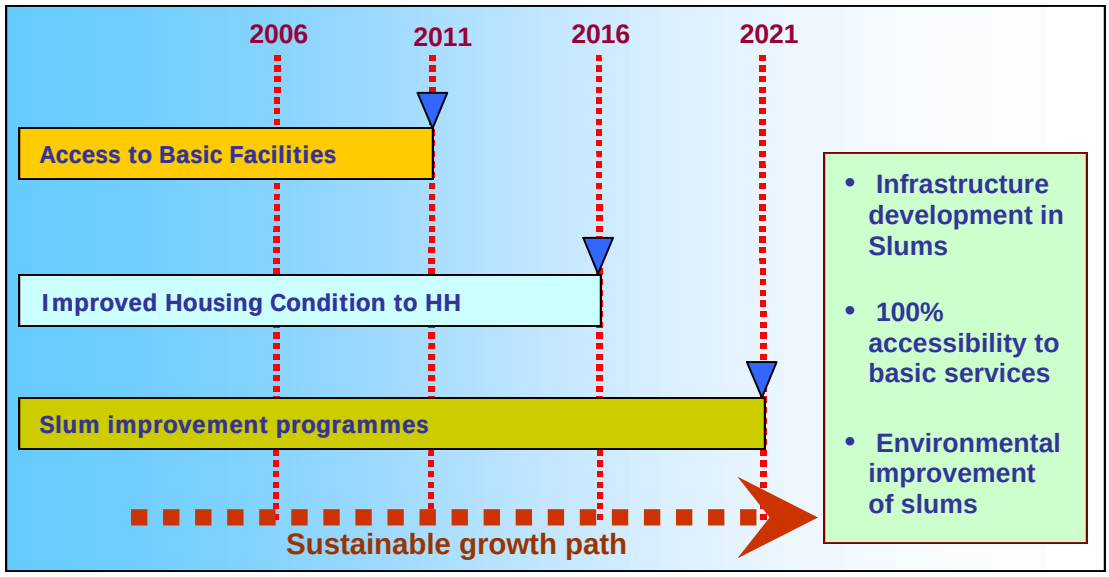
The existing facilities related to the drinking water supply, sanitation, solid waste disposal is a health hazard and is affecting the well being of the people.

Vision

To provide universal access to all services and safe living conditions.

Table 13.6: Current Status and Vision- Urban Poor

S. No.	Component	2006	2011	2016	2021
1	% of HH having access to basic facilities	20%	100%	100%	100%
2	% of HH having improved housing conditions	50 %	90%	100%	100%
3	Slum improvement programmes	N.A.	95%	100%	100%



The integrated development of infrastructure in the slum areas and slum improvement & rehabilitation projects to be initiated in the slums. 100 per cent effective and efficient accessibility to all the basic services by 2016. The integration and development of slum dwellers with the main stream of the city thereby envisaging slum less city by the year 2021. The environmental improvement of the slums will also be an important goal to achieve for the slum areas.

Inner City

Vision

Up gradation of basic services and conservation of inner city area.

The effective and efficient basic services will be provided. The traffic movement to be smoothened with safe pedestrian and vehicular movement. The parking areas will be developed.

Table 13.7: Current Status and Vision- Inner City

S. No.	Component	2006	2011	2016	2021
1	Access to basic facilities	N.A.	100%	100%	100%
2	Public Toilets & Urinals	N.A.	100%	100%	100%

Chapter 14
Development Strategies and Governance Framework

The development strategies are formulated on the basis of assessment of the city and stakeholder consultations. These strategies aim at achieving the sectoral vision and goals thereby achieving the vision for Agra city and JNNURM outcomes. These strategies are pre-requisite for the city to:

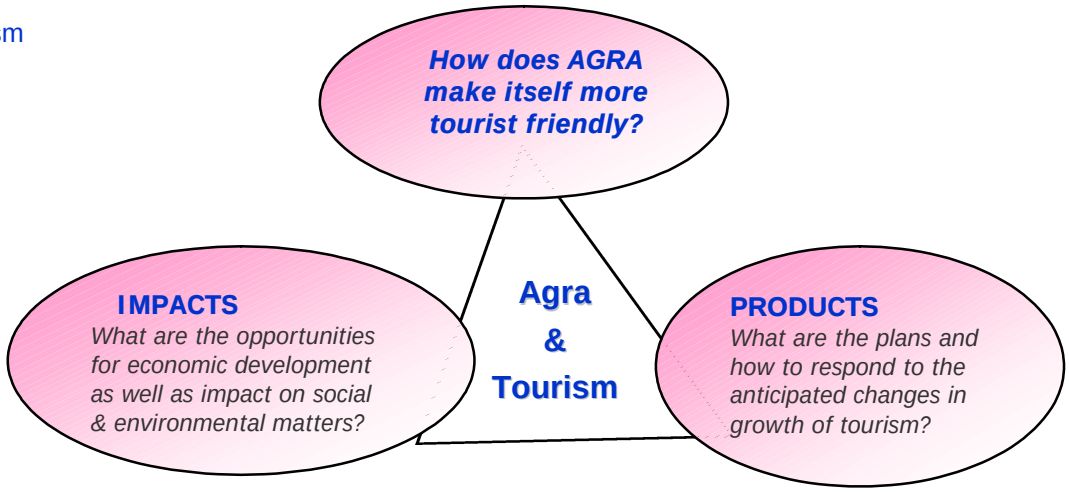
- Emerge as a pleasing, aesthetic, clean and green city, which is sustainable.
- Provide highest quality of life to its citizens, competing with the other cities.
- Provide every citizen with the best access & opportunities for work, education, health, development and recreation.
- Be a safe, tolerant, creative and connected city.

SECTORAL STRATEGIES

Urban economy

- Revitalizing the traditional handicrafts by providing new locations to artisans
- Location for non-polluting industries
- Development of new workspaces/industrial estates

Tourism



To achieve the overall vision of the city and for the development of heritage & tourism in Agra, the key strategic objectives are:

- Restoration and preservation of the heritage buildings/monuments.
- Positioning and maintaining tourism development in Agra as a state/national priority activity.
- Enhancing and maintaining the competitiveness of Agra as a tourism destination.
- Improving existing tourism products and expanding these to meet new market requirements.

- Creation of world-class infrastructure.

Identify stretches of lanes/streets/roads having heritage buildings for suggesting ways of organizing them as a part of heritage walk.

The study and documentation of the heritage buildings/monuments, protected and unprotected monuments in Agra need to be done. The heritage zones should be clearly identified in the maps, with distance from city center, accessibility, location etc. The monuments should be selected for conservation as per the archaeological principles. These heritage sites can be developed as tourist attraction with all the facilities like improving the roads, footpaths, railings, signages, street lights, monument description boards, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins, landscaping, street furniture, etc.

The surroundings of the Taj Mahal, which is the world heritage site, should be improved. The adequate facilities like improving the roads, footpaths, railings, signages, street lights, monument description boards, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins, landscaping, street furniture, etc.

- International accessibility through airways
- Integration of various tourist attraction places
- Inducing longer stay of tourists at Agra
- Identification and development of tourist products other than Heritage Tourism
- Diversification of tourism products to attract more tourists through a varied consumer choice.
- Comprehensive development of tourist destination for business-cum-pleasure.
- Creation of adequate facilities for budget travelers.
- Creation of tourism infrastructure, so as to preserve handicrafts, folk arts and Indian culture and thereby attract more tourists.
- Strengthening the existing infrastructure and developing new ones where necessary.
- Improve the environment of un-protected monuments and heritage buildings by cleaning and maintaining their surroundings.
- Organize conducted tours of different durations involving different monuments, heritage buildings, tourist bazaars, entertainment parks (attracting children) with facility of purchasing one ticket at single counter. This may include suggesting guesthouses, hotels / motels for the tourists' night stay as well.

INFRASTRUCTURE

Considering the sector challenges and goals, robust strategies have been formulated to create the world-class city infrastructure. The strategies for achieving the vision of the city are:

- Enhancement and Up-gradation of city infrastructure in terms of provision and delivery of municipal services (water supply, sewerage, surface water drainage, solid waste management, roads, bridges, streetlights, community facilities and other civic urban infrastructure and services).
- Improving / achieving the maximum benefits of tourism economy by creating additional infrastructure and additional facilities for increasing number of tourists.
- Adopt GIS mapping for utility planning and management

The sectoral strategies are given as under:

Water Supply

For full coverage of piped water supply and enhancing the duration of water supply the following strategies need to be adopted:

- Augment the existing water supply in the city
- Extend water supply network to all parts of the city
- Adopt GIS mapping for utility planning and management by preparing distribution network plan with full inventory of the water distribution system on GIS platform
- Arrest and reduce unaccounted for water to permissible limit of 15% by - undertaking leak detection study of transmission and distribution mains and house service connections; increase the net of metered connections ; identify illegal connections and subsequently phase-out the stand posts
- Water quality studies and monitoring both at the source and users end
- Adopt preventive maintenance rather than break-down maintenance
- Judicious utilization of treated water by conducting awareness programme for agra's citizen

Sewerage

To ensure full coverage of sewerage network and effective disposal in environmentally friendly manner, the city need to adopt the following strategies.

- Extending sewerage network to un-serviced areas
- Rehabilitating existing sewers
- Provide the missing links in the sewerage system so that the sewage treatment plants (STP) – 2 STPs overburdened & 1 STP under-utilized can start working efficiently
- Substantial improvement in efficiency of the 2 STPS (at Burhi ka Nagla & Peela Khari) required
- Full utilization of the under-utilized STP at Dhandhupra
- Sanitation facilities in the slum areas
- Provision of Public Toilets in the city
- Adopt GIS mapping for sewerage planning and management

Storm Water Drainage

The storm water drainage master plan needs to be implemented in order to strengthen the existing drainage system. The broad strategies to be adopted are:

- To increase the capacity of drains wherever necessary
- To repair dilapidated drains and augment capacity wherever possible
- Drain rehabilitation programme to identify the flood prone areas, desilting of the drains on regular basis
- Construction of tertiary drains

Solid Waste Management

ANN needs to adopt the following strategies so as to improve the disposal of solid waste.

- Household collection of waste with waste segregation and reuse
- Adequate collection and transportation facilities
- Regularize solid waste collection from the slum areas
- Regular maintenance of the container bins and transportation fleet

- Generate public awareness of benefits of segregation of solid waste at source
- Involve community in keeping the surroundings of their mohallah / neighborhood clean
- Opt for new site for proper sanitary landfill

Roads and Transportation

In this sector the need is to focus circulation network, widening and strengthening of important links and traffic management.

- Improvement of road geometrics
- Improving the internal road network
- Connecting bridge over Yamuna
- Efficient transport system for the city
- Improvement of transport infrastructure
    - Public Transport
    - Street lighting
    - Additional Parking lots
    - Junctions and traffic signal improvement
    - Parking areas
    - Pedestrian pathways and crossings

Environment

To improve the urban environment, the city needs to adopt the following strategies:

- Strict norms for pollution control

  The pollution norms should be strictly enforced and any violator should be penalized. The norms and standards for vehicle emission, air quality should be developed and standardized. The norms should be identified for the environmentally sensitive areas of the city. The action plans should be worked out for regular pollution check of air, noise, water and ground water table in the city.

- Prevention of Pollution in the river Yamuna

  The activities along the river should be restricted. The polluting activities like disposal of sewage, dumping of garbage along the riverbank should be prevented in the river. The strict norms should be enforced.

  The proper solid waste disposal sites should be allocated so that garbage is not dumped. The minimum flow of the river should be maintained for reducing the pollution levels. This requires proper study and analysis related to the depth, velocity of flow, etc.

  Public awareness needs to be done for action against activities related to the pollution of the river.Regular cleaning and maintenance of the river.

- Sustainable Riverfront development

  The site clearance and slums rehabilitation needs to be done. The paved pathways, road linkages, landscaping, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins needs to be provided.

- Preservation and conservation of water bodies and development of new parks

  The maintenance and revitalization factors should be suggested for preservation and conservation of water bodies in the city. The pollution levels, water quality check should be done in the city. The water bodies can also be developed as tourist spots

- Conserve ground water resource by adopting rainwater-harvesting techniques

  The rainwater harvesting techniques should be introduced in the city. Existing large government / institutional buildings should set an example by adopting these techniques.

URBAN POVERTY

To improve the living conditions of urban poor the city adopt these strategies :

- Provision of basic services in slum areas
- Slum improvement and rehabilitation programme to cover the whole cross-section of the urban poor
- Community empowerment for establishing linkages between community and bankers so as to facilitate assistance to beneficiaries.
- Identify institutions for imparting specialized training to the community for improving their skills and talents
- Improvement of housing conditions

INNER CITY

To decongest and improve the living conditions of the inner city area the city need to adopt the following strategies :

- Augmentation of existing water and sewer lines, maintain and lay new drains
- Efficient disposal of solid waste to maintain the hygiene of the area
- Shifting of non-conforming household/small industrial units to planned new areas
- Strengthening the road surface and traffic management plan for smooth flow of traffic
- Identify and revitalize the heritage buildings of the inner city

GOVERNANCE FRAMEWORK

Role of State Government - Reforms to be undertaken

The Government of Uttar Pradesh needs to play the role of a facilitator of urban development activities in the city of Agra. For this, the Govt. of UP has to:

- Fully implement the 74th CAA in letter and spirit by complete devolution of all functions and powers
- State level reforms viz. repeal of ULC, Rent Act, rationalization of stamp duty and bringing it down to 5 percent need to be implemented.
- Since the Corporation of Agra has completed its term, elections need to be held within the stipulated time.
- State govt. should facilitate in the setting up of the MPC and DPC.
- State govt. should facilitate municipal-parastatal coordination.

Role of Urban Local Body - Reforms to be Undertaken

The Agra Nagar Nigam is the principal organisation which carries out various civic functions in the city. The ANN should at the earliest take up the following reforms:

- Rationalization of property tax and implementation of IT and GIS based system
- Full implementation of double entry accounting system
- Introduce e-governance for various functions such as property tax collection, issue of birth and death certificates, building plan sanctions, citizen complaint redressal, etc.
- Coordinate with all concerned parastatals for smooth functioning of all civic activities / works / projects (such as those under JNNURM) in the city.
- Coordinate with all concerned parastatals as well as surrounding municipalities /

cantonment so that inter - jurisdictional issues as well as functional overlap can be sorted out once and for all.

- Implement Ward Committee byelaws so that the ward committees can start functioning properly
- Facilitate capacity building exercises for its staff so that they can be made aware of the latest developments in the urban / municipal sector in India.
- Develop a database for all properties owned by the Corporation so that property portfolio management can be done.
- Data base and MIS should be created so that all data is readily available

Role of Private Sector - Proposed Areas of Involvement

Presently, the private sector has hardly any role in the city. There is every possibility and potential to bring about private sector participation in the provision of civic services. For example, private sector participation can be made possible in the following areas:

- Provision and maintenance of public toilets
- Provision and maintenance of parks and playgrounds
- Provision and maintenance of bus shelters
- Solid waste management
- Provision and maintenance of night shelters for the urban poor

Role of NGOs - Proposed Areas of Involvement

The voluntary sector is a great boon for our urban areas. They are the people who have the urge and enthusiasm to work with self-motivation. The need to be sympathetically viewed by the Municipal Corporation and they should be involved at various levels viz.

- Involvement at the planning state
- Involvement at the budget preparation stage
- Involvement at the state of selection of contractors / private service providers
- Monitoring various projects as a watch dog
- Provision and maintenance of various civic services
- Arousing civic consciousness amongst the local residents
- Facilitating complaint redressal
- Keeping the city clean and green
- Making the experience of tourists pleasurable
- Mobilizing all the stakeholders together so that the city can be taken forward to its destination.

If the above issues are taken into account and the above reforms are implemented, the state of governance and urban infrastructure in the city of Agra would certainly see a remarkable improvement in the times to come.

MANDATORY REFORMS

State Level

- Full implementation of 74th CAA
- Repeal of ULCRA
- Reform of Rent Control Act
- Rationalization of Stamp Duty not more than 5%
- Enactment of Public Disclosure Law

- Enactment of Public Participation Law
- Assigning /associating ULBs with “City Planning function”

ULB Level

- Double Entry Accounting System
- E-Governance using IT & GIS application
- Property Tax Reform with IT & GIS
- Levy of User Charges
- Budgets for Urban Poor
- Basic services for Urban Poor

ANN and U.P. State Government have expressed their willingness to undertake mandatory reforms as registered under JNNURM.

Chapter 15
Project Identification and Phasing

15.1 PROJECT IDENTIFICATION

The projects have been identified on the basis of rapid assessment of all the sectors, discussions with local authorities/ stakeholder consultations and the projects eligible for assistance under the JNNURM as indicated in the Toolkit. Keeping in view the guidelines set in Master Plan 2021 for the various sectors, the projects have been identified in short term, medium term and long term perspective in various sectors covered under CDP so as to also achieve the objectives and goals set in the Master Plan 2021.

Based on the stakeholder consultation meet, the prioritization of projects was done so that the views, aspirations and felt needs of the local officials, residents, experts, NGOs, elected representatives and others are given due cognizance. The sectoral priority to the projects is assigned on the basis of various consultations and discussions held with the government departments involved in the implementation of CDP. It also takes into account the aspirations of the residents of Agra expressed in a workshop, informal discussions and meetings held for the purpose.

The sector wise present shortfall and the future problems by the year 2021 is given in the following tables for each sector. The future requirement of the city is meant to take care by the year 2021 for an estimated population of 22.6 lakhs. Thus, the various projects have been identified for meeting the demand in each sector by the year 2021 and the present shortfall. The projects have been divided as per the scope of the Mission:

Sub-Mission I: **Urban Infrastructure and Governance**

Sub-Mission II: **Basic Services for Urban Poor**

Sub Mission I: Urban Infrastructure and Governance

Table 15.1: Analysis –INDUSTRY

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Industry	• Shift of people from industry to agriculture related activities Decrease in number of industries due to strict pollution norms	• Possible decline in the city economy Increase in unorganized / polluting industrial activities	• Negative industrial trends	• Closure of Polluting Industries • Shifting of Polluting Industries
	• Location of industries at non-confirming land use • Petha industries working in the old city areas			• Project for Industries which are Non Conforming • Development of New Industrial Estates

Table 15.2: Analysis - HERITAGE AND TOURISM

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Heritage and Tourism	• Proper documentation of heritage buildings • Lack of tourist infrastructure • Agra has 175rooms/lakh tourist, lower then national & state average • Duration of stay is only I day • Tourist destinations are not well connected with the city • Absence of tourist bazaar • Lack of Heritage/nature parks	• Maintenance of more heritage buildings • Requirement of infrastructure for additional tourists • Increased Tourist accommodation • Development of new tourist destinations • Promotion of heritage tourism	• Well connected tourist destinations with proper infrastructure and maintenance required	Project for Improving Taj Environs Project for Improving other Heritage Sites Development of Tourist Infrastructure: a)Hotels & Eating Places b)Information Centers c)Signage d)Organized Tourist Bazaar e)Public Toilets f) Lighting

INFRASTRUCTURE

Table 15.3: Analysis - WATER SUPPLY

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Water Supply	• 62.54 MLD • 30 % (4.4 lacs) of population not covered by piped water lines • Water leaks in pipes & appurtenances • Inadequate flow & pressure • Poor raw water quality • Supply duration (hrs.) – 5 hours/day • Misuse of community hand pumps	• 489.4 MLD • Piped water supply required for additional population • Further decline in water pressure • Deterioration of water quality • Service duration may decrease	• 551.94 MLD piped water needed • Strengthening / renewal of water works needed	• Water Supply / Renewal Works • Water Supply Distribution Network • Construction of Pumping Stations and Water Works

Table 15.4: Analysis - SEWERAGE

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Sewerage	• STP Capacity 90.25mld • Area uncovered by sewerage system – 17% • Badly silted, choked, damaged at number of places & overloaded • Discharge of untreated sewage into river • 10% of sewerage received by STPs is treated • Absence of public toilets & urinals	• Sewage to be treated would be 313.12MLD • Provision of adequate number of STPs • Maintenance of existing sewerage system & STPs • Provision of community toilets in public areas	• 428.90 MLD to be treated • Additional STPs • Additional Network • Public toilets	• Argumentation of Sewerage System • Const. of STPs • Public Toilets & Urinals • Purchase of Modern Equipment for Desilting

Table 15.5: Analysis -STORM WATER DRAINAGE

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Storm Water Drainage	• About 55 years old drainage system • 25 major drains discharge in R. Yamuna • Encroachments have come up over drains • More than 20 water logging areas • Tertiary drains missing in majority area • Malfunctioning of drainage plan Garbage dumping places Increase in paved area due to new development	• Additional requirement of drains	• Requirement of internal drains • Maintenance & cleaning of drains • Improvement of water logging areas	Storm Water Drainage Network Purchase of Modern Equipment for De-silting

Table 15.6: Analysis - SOLID WASTE MANAGEMENT

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Solid Waste Management	• About 628 MT/day of waste is generated • Segregation & storage at source does not exist • About 70 per cent of the dumper placer containers are damaged • Waste (petha waste) is thrown in nallah and open spaces leading to environment pollution • 73 transport vehicles with 60% efficiency • About 40 % of 561 waste storage depots are open storage points Dumping site is exhausted	• 1,116.35 MT waste will be generated • More number of closed containers • More transport fleet required • New Dumping sites	• The problem of SWM will become enormous and needs scientific management	Solid Waste Management Plan

Table 15.7: Analysis - ROADS & TRANSPORTATION

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Roads & Transportation	• Road length of 1,724 km remained same since last 3 years • Intermediate public transport • Poor level of service affecting safety, efficiency and economy of traffic operation • Insufficient number of bus terminals. • Traffic congestion problems identified on 12 junctions	• Number of registered vehicles is likely to double • Public transport requirements will double since population will become around 22 lakhs • Transportation infrastructure will be under acute strain • More management measures will be needed • Varying carriageway width creating turbulence in traffic flows	• Transportation will become a major problem by 2021	• Multi Storied/ underground Parking • Development of Arterial Roads • Development of Approach Roads to the Taj and other Heritage sites • Improved Street Lighting • Road Widening & Junction Improvement • Intersection Signaling • Improvement of existing bus terminals • Construction of bus terminals
	• Mixing of regional & city traffic on main corridors • Parking on road reduces the capacity • No street lighting in the city • 6 traffic light signals in the city	• Barely any footpath for safe pedestrian movement • Increasing number of pvt. vehicles • Transport agencies operating from various parts of the city: on-road parking • Lack of good eco-friendly intra city public transport • Street furniture, road and tourism signage are also insufficient in the city		• Introduction of CNG based transport system: Autos &Taxi • Improvement of Road Geometric and Street Furniture • Footpath Improvement • Foot Over bridges • Pedestrian Underpasses

Table 15.8: Analysis - URBAN ENVIRONMENT

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Urban Environment	• RSPM of Air very high • Degraded water quality • Surface water of the city is contaminated • Depletion of ground water table • Water logging • High noise level – 62 dB levels • Inadequate sewerage network • Indiscriminate dumping of garbage	• Air quality may deteriorate in future • Water quality may further go down • Noise levels may increase • Sanitation and hygiene may become more problematic	• Overall deterioration of urban environment	• Rain Water Harvesting • Strict Control on Noise, Water and Air Pollution • Closure of Polluting Industries • Shifting of Polluting Industries

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Water Bodies	• Filling of Natural ponds (Tota ka taal, Guru ka taal) • Dumping of waste • Inadequate maintenance of water bodies	• As the city expands, more water bodies may be destroyed.	• Negative effect on the environment.	• Restoration of Water Bodies

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
River Front	• Various slums have come up along the river • Unhealthy conditions along the river side • Discharge of sewerage leading to environment pollution	• The number of slums may increase and cause further problems.	• Degradation in terms of environment and aesthetics	• River Front Development

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Parks/Grounds	• Not properly maintained • Encroachments in some grounds • Inadequate furniture, lighting system	• With the doubling of the population by 2021, more demand for parks and open spaces	• Increased demand.	• Imp. and Beautification of Existing Parks • Sports Complex • Creation of New Parks

Table 15.9: Analysis - INNER CITY

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Inner City	• Highly congested • Haphazard growth • Non-confirming land use • Lack of infrastructure facilities like water supply, drainage, sewerage, solid waste management • Pressure on roads due to excessive commercialization • Lack of parking spaces • Lack of open spaces	• Deterioration of infrastructure due to Ageing • Increase in commercial activities	• Inner city decay	Urban Renewal Project (Select road widening, replacement of water and sewer lines, etc.)

Sub Mission II: Basic Services for Urban Poor

Table 15.10: Analysis - URBAN POOR

Sector	Present Shortfall / Problems 2006	Problems / Requirement 2021		Projects Proposed
		Future	Total	
Urban Poor	• More than 9.5 per cent of population living in slums • 17,657 families are living BPL • 18% of urban poor do not have access to water • 40% population does not have access to sanitation facility • Degraded environmental conditions	• Increase in urban poor and slum areas with doubling of overall population size • Quality of life may further deteriorate • Requirement for basic services will further increase	• The problems of slums and urban poor will become more serious	• Slum Improvement Programmes • (Basic Services & Employment Generation) • Provision of Security of Tenure • Improvement of Shelter

15.2 PROPOSED PROJECTS & PROJECT COST

On the basis of the above analysis and quantum of investment required for various sectors in the City Development Plan over a specified time frame to attain the sustainable growth and to achieve the Mission goals. The costing provided for the projects given below is a rough cost estimate based on UP PWD Schedule of Rates 2006. The costing is based on Departmental estimates and lump sum amounts with suitable escalation factors in each sector for the implementing period.

15.2.1 Industry

The new industrial estates of approximately 8 ha. are proposed in the city wherein the petha industries and various other industries would be shifted and developed.

Table 15.11: Project Cost Estimate - Industry

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Development of new industrial estates for shifting of polluting / non-confirming (including petha industry) approx. 8 Ha.	4.83	ADA
Total		**4.83**	

15.2.2 Heritage & Tourism

The city is a famous international tourist destination and also boasts three World Heritage Sites, but the tourism infrastructure is not adequate to meet the growing demand and the tourist inflow of the city. The city receives both domestic and international tourists. The projects proposed in this sector include the infrastructure improvement around Taj Mahal and other heritage sites in the city. The approximate project cost is Rs. 52.50 crores.

Table 15.12: Projects Cost Estimate - Heritage & Tourism

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Project for infrastructure improvement in Taj Environs (upto 500m outside ASI boundary) for improving the roads, footpaths, railings, signages, street lights, monument description boards, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins, landscaping, street furniture, etc.	22.34	ANN
2	Project for Improving other Heritage protected Sites (upto 500m) or improving the roads, footpaths, railings, signages, street lights, monument description boards, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins, landscaping, street furniture, etc.	30.16	
Total		**52.50**	

15.2.3 Water Supply

As per the city assessment and the stakeholder consultations, the entire city is not covered by the piped water supply and the quality of the water is also poor. To meet the demand and maintain the water quality the following projects have been proposed in consultation with the U.P. Jal Nigam officials and technical assessment. The implementing agency for water supply projects is U.P. Jal Nigam.

Table 15.13: Projects Cost estimate Water Supply

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Reorganization of existing water works (Rehabilitation of Water Works –I)	11.3	U.P. Jal Nigam
2	Distribution network: Replacement of damaged rising main, Replacement of damaged distribution mains	13.45	U.P. Jal Nigam
3	Storage Improvement/ enhancement: Repairing of existing CWR & OHT's	2.15	U.P. Jal Nigam
4	Reduction of UFW: Provision for Unaccounted for Water Woks	2.69	U.P. Jal Nigam
5	Construction/enhancing of	134.02	U.P. Jal Nigam
a)	New sub zonal pumping station for Nai ki mandi sub zone at Subhash Park.		
b)	Enhancing capacity of power sub station at Water Works-I		
c)	New zonal pumping station at Ghatwasan zone-II		
d)	New treatment plant at Water Works-II		
e)	Sludge Treatment plant at Water Works-I & II		
6	Water Works storage Capacity enhancement (Building Capacity at Water Works-I, Water Works-II and zonal pumping station)	4.31	U.P. Jal Nigam
7	Ganga Jal Project	731.04	U.P. Jal Nigam
8	Test Laboratory	1.08	U.P. Jal Nigam
Total estimated cost		**900.04**	

15.2.4 Sewerage

The sewerage system in the city is inadequate. The city requires the augmentation of the system in the entire city and the purchase of modern equipments for desilting**.**

Table 15.14: Projects Cost estimate Sewerage

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Augmentation of Sewerage System		U.P. Jal Nigam
a)	Providing 129 Km. new sewer lines 3 Nos. major & 5 Nos. small pumping stations in Central Sewerage District	98.70	
b)	255 Km. sewer line 4 major and 4 small SPS and 105.00 MLD STP in Western Sewerage District	148.97	
c)	61.40 Km. sewer line, 3 major and 3 small SPS and 26.00 MLD STP in Eastern Sewerage District	72.35	
d)	147 Km. sewer lines 2 Nos. major and 10 nos. small pumping station and 38.00 MLD S.T.P. in Northern Sewerage District	94.56	
e)	63.40 km. sewer line, 2 major and 6 small SPS and 29.00 MLD STP. in Southern Sewerage District-I	79.01	
f)	30.20 km. sewer line, 1 major and 1 small SPS and 29.00 MLD STP. in Southern Sewerage District-II	47.40	
g)	342 Km. sewer line, 4 major & 7 small pumping stations and 37.00 MLD STP in Tajganj Sewerage District	221.08	

S. No.	Projects Proposed	Project Cost (in crores)	Department
2	Purchase of Modern Equipment for Desilting of sewers	1.05	U.P. Jal Nigam
Total estimated cost		**763.13**	

15.2.5 Storm Water Drainage

The project cost for implementing various projects in this sector is Rs. 147.00. The projects proposed include the repair of existing drains, construction and purchase of equipment for desilting of drains.

Table 15.15: Projects Cost estimate Storm Water Drainage

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Repair of Existing drains **Phase I** (Desilting, repair and remodeling of existing drains) Ashok Nagar Branch, T.B. Hospital Branch, Moti Mahal Branch, Water Works Drain, Paliwal Drain, Khoja Drain, Pipal Mandi Drain, Taj West Drain, Madhu Nagar Drain, Shakti Nagar Drain, Nehru Nagar Drain, Tota-Ka-Tal (Existing) Drain, Naulakha Drain, Rui Ki Mandi Drain, Gyaspura Drain, Ram Bagh Chauraha, PWD Drain	80.94	U.P. Jal Nigam
1.1	Construction of new drains Phase I Ram Nagar, Sur Sadan Ponding and Existing Bhairow Nalla, Mental Hospital Drain, Tot Ka Taal to manola via Loha Mandi, Shashtripuram (Sikandra Canal), Taj Nagri Phase II, Dewari Road, Nagla Baghel		U.P. Jal Nigam
2	Repair of Existing drains Phase II Mantola Drain, V.I.P. Road (Sultanpura Drain), Naripura Drain, Tehri Bagia Area Drain (Radha Nagar Extension part of drain), Radha Nagar Drain, Sikandra to Yamuna River, Vayu Vihar Drain	52.50	
3	Construction of new drains Phase III Gwalior Road (LHS), Gwalior Road (RHS), Ashopa Hospital Drain, Transport Nagar Drain, Peelakhar Drain (New), Karmayogi Drain (New), Kamla Nagar C-Block Drain, Ashoka Enclave Road Drain, Sikandara to Guru Ka Tall, Etamad-Ud-Daulah Drain (F-C1 Branch), RBS College Drain		U.P. Jal Nigam
3.1	Repair of Existing drains **Phase III** (Desilting, repair and remodeling of existing drains) Bijli Ghar Branch, Bhairon & Belanganj Drain, Ram Bagh Drain, Taj East Drain, Etamad-Ud-Daullah, Peelakhar Drain, Krishna Colony Drain, Balkeshwar Drain, Rajwaha Drain, Naunihai/Ind. Estate Drain, Kalinid Vihar Drain, Rajpur Chunghi Drain, Arjun Nagar Drain, Azambada Drain, Wazirpura Balmiki Basti Drain, St. Peters College Drain, Bapu Nagar Drain, Dayal Bagh Drain And its Branch, Karmayogi Drain, Muncipal Corporation Drain, Rajpura Drain, Bodhla Road Drain (Left And Right Side), Bagh Farzana Drain, Kothi Meena Bazar Main Drain, Chippitola Drain, Prabhu Cinema Drain, Anurag Nagar Drain, Mughal Road, Sector 4 main, Bipur Bazar, Water Works Chauraha, PWD Drain	32.90	
4	Purchase of Equipment for Desilting of drains	2.10	
Total estimated cost		**168.44**	

15.2.6 Solid Waste Management

There is no solid waste management system taking place in the city. The solid waste collection, transportation and disposal is not being done as per MSW rules. The projects proposed include the purchase of equipments & tools, vehicles, landfill sites, creating community awareness with the help of RWAs, NGOs, etc. and the approximate cost comes out to be Rs. 80.00 crores.

Table 15.16: Projects Cost estimate Solid Waste Management

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	**Purchase of SW transport equipment & tools** (Containerized tricycles, Containerized Handcarts, Seamless handcarts, Dumper placer vehicles, container lifting device, Skip lifters, Hotel waste collection vans, Garden collection vans, Biomedical waste collection vans, Large hauling vehicle, Large hauling container, Bulldozer, Skid Steer Robot, tipper, D.P, Hydraulic crane machine, Platform trolley, Chain mounted Nala cleaning machine large, Nala cleaning machine mounted on LCV / HCV chasis, Sewer jetting cum suction machine, Tools and equipment for desilting-excavator loader with Backhoe attachment, Conversion of existing 15 trucks into DP)	35.03	ANN
2	**Development of Storage points** (Litter bins, Dumper placer green & black colour containers 3.0/3.5/ 4.5 /7 cmt. Cmt, dumper placer container of yellow colour for domestic hazardous waste, black colour skips for construction waste 5 cmt, Asphalt/concrete flooring under the bins)	13.99	ANN
3	**Compost plants** (Compost plants of 600 M.T./day or 3 power plants of 200 MT total capacity.)	27.98	ANN
4	**Land fill site development** (Land fill site development (1 of 280 MT/day or 3 of 80 MT day))	9.45	ANN
5	**Capacity Building** (Generating public awareness (supervision control, MIS))	1.05	ANN
Total		**87.50**	

15.2.7 Roads & Transportation

The creation of a reliable, comfortable, attractive and affordable traffic management system is the long-term solution for solving the traffic problems in the city. Thus, construction of Sky bus is envisaged on the busy traffic corridor of Sikandara to Taj Mahal to provide a high quality transit system. The multi storied parking are envisaged to solve parking problem, congestion in commercial areas, reduction of carriage way, conflict of pedestrian and vehicular spaces.

Table 15.17: Projects Cost estimate Roads & Transportation

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Sky Bus From Sikandara to Taj Mahal	997.90	ADA
2	Multi Storied / underground Parking-5 nos. Pahgwara crossing, Kinari Bazaar, Raja ki mandi, Loha mandi, Shahganj	107.63	ANN
3	Up gradation of existing bus terminals at Idgah and Fort	2.15	PWD
4	Development of new bus terminals (6 nos.)	13.31	PWD
5	Up gradation of workshop	2.15	RTO
6	Purchase of CNG buses	73.10	RTO
7	Development of main and trunk roads	**3218.50**	

S. No.	Projects Proposed	Project Cost (in crores)	Department
	Widening and strengthening of main roads in urban areas	**569.99**	
a)	Mahatma Gandhi Road , Yamuna Kinara Road, two lane Raod along Yamuna River bank, (water works-1) outer side, Old Mathura Road, Bodla-Sikandra Road, Madia Katara Road, M.G.Raod, Loha Mandi Road, M. G. Road to Canal by-pass Bichuri Road, Subhash Park-Koyji Mina Bazar Road, Barah Khamba Road to Airport (Arjun Nagar)		A.D.A.
b)	Bhagwan Takies-Dayal Bagh Raod, VIP Road, Deori Road, Mall Road to Proposed Ring Road, Shamshabad Road, Aligarh Road- Ring Road, Gwalior Road,Widening of Service Road of NH2, Aligarh Road to Proposed RIng Road etc.		P.W.D.
c)	From J.P. Hotel to Proposed Ring Road (100 M.) Fatehabad Road, Prathavi Nath Phatak to 17.5 KM Road to Fatehpur Sikari NH-11. Gwalior Road to Canal by-pass, widening of service road of NH2		N.H.A. I., P.W.D.
8	Construction of remaining master plan Roads under Master Plan 2021 including Road from Fatehabad Road to Gwalior Road excluding urban Area (45m and 30 m wide road), NH-2 to Fatehapur Sikari excluding urban Area. (60,45, 30 m wide Road).Aligarh Road to Jalesher Road excluding urban Area. 45,30 and 24 m wide road	823.77	ADA
9	Proposed constrution of 100 M wide Ring Road Under Master Plan 2021. including Gwalior Road (NH-3) from NH-3 to NH-2 Connecting Fatehabad Road, Shamshabad Road and Deori Road, Strengthening & Widening of Canal Patri Road from Gwalior Road to NH-2, construction of 100m road from NH-2 to NH-2 connecting Aligarh Road & Jalesher Road.	1409.61	NHAI
10	Construction of Rail Over Bridge/Rail Under Bridge at different Railway X-ing including construction of ROB on old Sikandra-Bodla Road, old Mathura Road Guru Ka Tal, Atorni, Elevated Road/R.O.B. from Idgha Bus Stand to C.O.D. at Shahganj X-ing. Widening of R.O.B. at Madiya Katra, Hariparwat, Rawali Temle, Widening of Culvert between Collectrate & Dhakran (M.G. Road), Construction of Elevated Road at Alignment of M.G. Road., Construction of subways, Construction of Yamuna Bridge on Priya-Ghat Road.etc.	415.13	UP Bridge Corporation
11	Development of internal roads	390.69	ANN
12	Development of parking areas in the city	20.99	ANN
13	Development of approach road to Taj & other heritage sites	34.98	ADA
14	Improvement in street lighting	10.76	ANN
15	Intersection Signaling	2.63	RTO
16	Improvement of road geometrics & street furniture	18.41	ANN
17	Footpath improvement	12.47	ANN
18	Foot over Bridges/ Pedestrian underpasses	24.32	ANN
19	Construction of Fly over (Water Works chauraha, Khangari chauraha, Rui ki Mandi)	20.37	ADA/ANN
Total		**4950.35**	

15.2.8 Environment

The environment projects include river front development, improvement and development of parks and protection of forest areas.

Table 15.18: Projects Cost estimate Environment

S. No.	Projects Proposed	Project Cost (in Crores)	Department
1	River Front Development Landscaping, Theme park, bio-diversity park, garden of five senses, musical fountain, activities for passive recreation, tree plantation along the banks of R. Yamuna in conformity with Land use plan 2021	45.65	ADA
2	Improvement and beautification of existing parks	54.83	ANN
3	Development of new parks	18.69	ADA
4	Protection of forest area/ A forestation	16.95	Forest
5	Rain water harvesting in state government & ANN properties and select locations as identified by U.P. Jal Nigam	12.29	ADA/ ANN
6	Restoration and beautification of water bodies	33.26	ANN
7	Construction of weir across river Yamuna downstream of Taj	73.10	State Irrigation
Total		**254.78**	

15.2.9 Inner city

It is envisaged that the infrastructure improvement, road widening, provision of facilities like community toilets, night shelters will improve the quality of basic services and decongest the inner city areas. Some of the inner city areas include: Khatena, Lohamandi, Jatpura, Kinari bazaar, Pepal Mandi, Rawat pada, Shahganj, Bhogipura.

Table 15.19: Projects Cost estimate Inner city

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Selected road widening	49.11	ANN
2	Replacement of water and sewer lines	52.84	U.P. Jal Nigam
3	Laying of new water and sewer lines	66.58	U.P. Jal Nigam
4	Construction of public toilets & urinals	8.40	ANN
5	Night Shelters	1.58	ANN
6	Community Centre/ Hall	2.1	ANN
	Total	**180.61**	

15.2.10 Urban Poverty and Slum

The access to the basic amenities in the slum areas is very poor. Not all the households are having sanitation and water supply facilities. The following projects aim at improving the quality of life of the urban poor.

Table 15.20: Projects Cost estimate Urban Poverty and Slum

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Development and improvement of basic services	480.85	DUDA
2	Construction of community toilets and bath		
3	Construction of community rooms/ child care centre		
4	Construction of about 8500 houses / Financial assistance for improvement of shelter		
5	Provision of security tenure		
Total (LS)		**480.85**	

It is also suggested that while talking up slum up gradation projects priority be assigned to those located in the vicinity of Taj and efforts should also be made to confer security tenure to the slum dwellers since about 92 per cent of them are owners.

15.2.11 Capacity Building

The capacities of the organizations involved in city development need to be upgraded. This is proposed to be done in terms of capacity building programmes specifically designed for each of the organizations involved. This would include training programmes, awareness building, computerization and hiring of short-term manpower.

Table 15.21: Projects Cost estimate Capacity Building

S. No.	Projects Proposed	Project Cost (in crores)	Department
1	Capacity Building	11.60	ANN
Total (LS)		11.60	

15.3 SECTOR WISE PROJECT COST

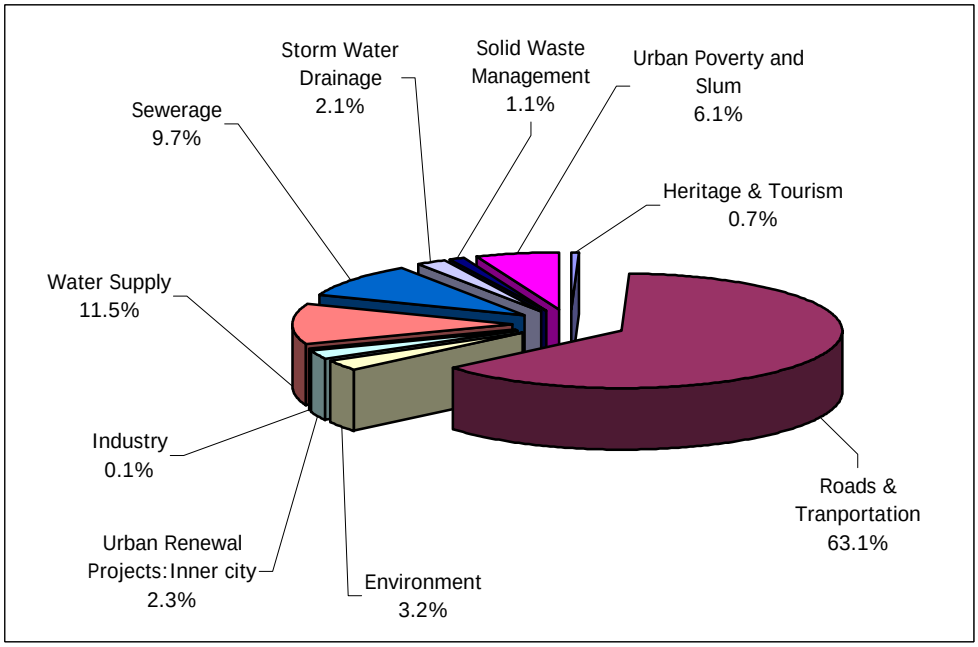
The sector wise project costs shows that maximum investment is required in roads and transportation sector (63.1 per cent) followed by water supply (11.5 per cent) and minimum investment in industrial sector (0.1 per cent). The table 15.21 shows the sector wise project costs. The investment plan for the various projects under each sector is given in Chapter 16.

Table 15.22: Sector wise Projects Cost

S. No.	Sector	Cost (in crore)
SUB - MISSION I		
1	**Industry**	4.83
2	**Heritage & Tourism**	52.50
3	**Water Supply**	900.04
4	**Sewerage**	763.13
5	**Storm Water Drainage**	168.44
6	**Solid Waste Management**	87.51

S. No.	Sector	Cost (in crore)
7	**Roads & Transportation**	4950.35
8	**Environment**	254.78
9	**Urban Renewal Projects: Inner city**	180.61
10	**Capacity Building**	11.60
Sub-Total		**7373.79**
SUB - MISSION II		
10	**Urban Poverty and Slum**	**480.85**
Sub-Total		**480.85**
Grand Total		**7854.64**

Fig. 15.1: Sector wise Project Cost



As per the scope of the mission, the projects costs under Sub- Mission-I is approximately Rs. 7373.79 crores and under Sub Mission II is Rs. 480.85crores.

Table 15.23: Mission wise Cost breakup

Mission	Cost (in crore)
Sub - Mission I	7373.79
Sub - Mission II	480.85
Total	**7854.64**

Fig. 15.2: Mission wise Cost Break up

15.3 PROJECT PHASING

The table outlines the phasing of the projects identified above on the basis of the prioritization of projects, city assessment and financial status.

Table 15.24: Project Phasing

S. No.	Project	Implementation Period					
		2007	2008	2009	2010	2011	2012
I	**INDUSTRY**						
1	Development of new industrial estates						
II	**HERITAGE & TOURISM**						
1	Project for infrastructure improvement in Taj Environs						
2	Project for Improving other Heritage protected Sites						
III	**WATER SUPPLY**						
1	Re organization of existing water works						
2	Distribution network						
3	Storage Improvement/ enhancement						
4	Reduction of UFW						
5	Construction/enhancing of pumping station, treatment plant						
6	Water Works storage Capacity enhancement						
7	Ganga Jal Project						
8	Test Laboratory						
IV	**SEWERAGE**						
I	**Augmentation of Sewerage System**						
1	Central Sewerage District						
2	Western Sewerage District						
3	Eastern Sewerage District						
4	Northern Sewerage District						
5	Southern Sewerage District-I						
6	Southern Sewerage District-II						
7	Tajganj Sewerage District						
8	Purchase of Modern Equipment for Desilting of sewers						
V	**STORM WATER DRAINAGE**						
1	Repair of Existing & Construction of new drains - I						
2	Repair of Existing drains						
3	Construction of new drains Phase III						
4	Purchase of Equipment for Desilting of drains						
VI	**SOLID WASTE MANAGEMENT**						
1	Purchase of SW transport equipment & tools						
2	Development of Storage points						
3	Compost plants						
4	Land fill site development						
5	Capacity Building						
VII	**ROADS & TRANSPORTATION**						
1	Sky Bus From Sikandara to Taj Mahal						
2	Multi Storied/underground Parking-5 nos.						
3	Up gradation of existing bus terminals at Idgah and Fort						

S. No.	Project	Implementation Period					
		2007	2008	2009	2010	2011	2012
4	Development of new bus terminals (6 nos.)						
5	Up gradation of workshop						
6	Purchase of CNG buses						
7	Widening and strengthening of main roads						
8	Construction of remaining master plan Roads MP 2021						
9	Proposed construction of 100 M wide Ring Road						
10	Construction of Rail Over Bridge/Rail Under Bridge						
11	Development of internal roads						
12	Development of parking areas in the city						
13	Development of approach road to Taj & heritage sites						
14	Improvement in street lighting						
15	Intersection Signalling						
16	Improvement of road geometrics & street furniture						
17	Footpath improvement						
18	Foot over Bridges/ Pedestrian underpasses						
19	Construction of Fly over						
VIII	**ENVIRONMENT**						
1	River front Development						
2	Improvement and beautification of existing parks						
3	Development of new parks						
4	Protection of forest area/ Afforestation						
5	Rain water harvesting						
6	Restoration and beautification of water bodies						
7	Construction of weir across river Yamuna downstream Taj						
IX	**URBAN RENEWAL PROJECTS: INNER CITY**						
1	Selected road widening						
2	Replacement of water and sewer lines						
3	Laying of new water and sewer lines						
4	Construction of public toilets & urinals						
5	Night Shelters						
6	Community Centre/ Hall						
X	**CAPACITY BUILDING**						
XI	**URBAN POVERTY AND SLUM**						
1	Development and improvement of basic services						
2	Construction of community toilets and bath						
3	Construction of community rooms/ child care centre						
4	Financial assistance for improvement of shelter						
5	Provision of security tenure						

Chapter 16
City Investment Plan & Financing Strategy

16.1 INTRODUCTION

The Projects identified under Sub-Mission I and Sub-Mission II for the CDP Agra have been categorized in various sectors. Further, keeping in view the present activities and expertise available with various agencies working in the city, it is proposed that ANN shall get the projects implemented through these agencies. The investment envisaged in the various sectors at 2006 prices is as under:

Table16.1 Sector wise Investment

S. No.	Sector	Amount (Rs. in crores)
SUB-MISSION I		
1	**Water Supply**	742.50
2	**Sewerage**	645.00
3	**Solid Waste Management**	80.00
4	**Storm Water Drainage**	147.00
5	**Environment**	213.47
6	**Urban Renewal Projects: Inner city**	151.29
7	**Roads & Transportation**	4051.75
8	**Heritage & Tourism**	47.00
9	**Industry**	4.00
10	**Capacity Building**	10.00
Sub-Total		**6092.01**
SUB-MISSION II		
10	**Urban Poverty and Slums**	**400.00**
Sub-Total		**400.00**
Grand Total		**6492.01**

These projects are to be implemented over the whole plan period i.e. up to the year 2012 as per following implementation schedule worked out on the basis of time involved in completing the projects and the priority decided for the same.

Table16.2 Projects Implementation Schedule

Project Code	Cost of Project	Schedule of Expenditure (% of Project Cost)					
	(Rs. crores)	2007	2008	2009	2010	2011	2012
Inflation	5.00%						
Heritage & Tourism							
HT/1	20.00	25	25	50			
HT/2	27.00	25	25	50			
Industry							
IND/1	4.00		15	20	30	35	
Environment							
ENV/1	37.47		20	20	20	20	20
ENV/2	45.00		20	20	20	20	20
ENV/3	15.00				50	50	
ENV/4	15.00		50	50			
ENV/5	11.00	25	25	50			
ENV/6	30.00	30	30	40			
ENV/7	60.00		20	20	20	20	20
Water Supply							
WS/1	10.50	50	50				
WS/2	12.50	50	50				
WS/3	2.00	50	50				
WS/4	2.50	50	50				
WS/5	110.00		20	20	20	20	20
WS/6	4.00	50	50				
WS/7	600.00		20	20	20	20	20
WS/8	1.00	50	50				
Sewerage							
SW/1	94.00	100					
SW/2	135.00	16	67	17			
SW/3	62.50			100			
SW/4	79.50			45	55		
SW/5	65.00				100		
SW/6	39.00				100		
SW/7	169.00					50	50
SW/8	1.00	100					
Storm Water Drainage							
SWD/1	73.00	30	30	40			
SWD/2	45.00	20	20	20	20	10	10
SWD/3	27.00		20	20	20	20	20
SWD/4	2.00	100					
Solid Waste Management							
SWM/1	31.00		50	50			
SWM/2	13.00	50	50				
SWM/3	26.00	50	50				
SWM/4	9.00	100					
SWM/5	1.00	100					

Project Code	Cost of Project	Schedule of Expenditure (% of Project Cost)					
	(Rs. crores)	2007	2008	2009	2010	2011	2012
Roads & Transportation							
RT/1	800.00		25	25	25	25	800.00
RT/2	100.00	50	50				
RT/3	2.00	50	50				
RT/4	12.00	30	30	40			
RT/5	2.00	50	50				
RT/6	60.00		20	20	20	20	20
RT/7	456.95			25	25	25	25
RT/8	660.40			25	25	25	25
RT/9	1172.60	15	15	15	15	20	20
RT/10	332.80			25	25	25	25
RT/11	325.00	15	15	15	15	20	20
RT/12	19.50	50	50				
RT/13	32.50	50	50				
RT/14	10.00	50	50				
RT/15	2.50	100					
RT/16	15.50		25	25	25	25	
RT/17	10.50		25	25	25	25	
RT/18	19.50			25	25	25	25
RT/19	18.00	25	25	25	25		
Urban Renewal Projects							
URP/1	39.00		30	35	35		
URP/2	45.50		30	35	35		
URP/3	52.00				30	35	35
URP/4	8.00	100					
URP/5	1.50	100					
URP/6	2.00	100					
Urban Poverty & Slum							
UPS/1	400.00	15	15	15	15	20	20
Capacity Building	10.00	20	20	20	20	20	
Total	**6492.01**						

- For Description of the Projects and Codes of the same Please refer sector wise/ project wise details later in this report.

As can be seen from the above table, the projects shall be implemented over a period of 6 years. The prices during this period will not remain uniform and therefore have to be updated for inflation during this period. An average inflation of 5% per annum on compounding basis has been taken. The updated cost works out as under:

Table16.3 Sector wise Revised Investment

S. No.	Sector	Amount (Rs. in crore)
	SUB-MISSION I	
1	**Water Supply**	900.04
2	**Sewerage**	763.13
3	**Solid Waste Management**	87.51
4	**Storm Water Drainage**	138.57
5	**Environment**	233.49
6	**Urban Renewal Projects: Inner city**	176.79
7	**Roads & Transportation**	4859.63
8	**Heritage & Tourism**	52.50
9	**Industry**	4.83
10	**Capacity Building**	11.60
	Sub-Total	**7373.79**
	SUB-MISSION II	
10	**Urban Poverty and Slum**	**480.85**
	Sub-Total	**480.85**
	Grand Total	**7854.64**

16.2 FINANCING STRATEGY AND INVESTMENT PLAN

As stated above, the required projects have been categorized under various sectors. Each sector comprises of a number of projects. These projects have been structured as under :

- Name of the Sector
- Project Code
- Project Description
- Implementing Agency
- Cost of the project

The structure of projects is followed by the financing strategy and financing options at the end of each sector. Financing options for the projects in each sector have been presented under following heads :

Municipal Government's own resources
State Government's Grants & Loans
Financing Institutions
Capital Market
Offshore Financing
Central Government Grants
Private Sector

The project / sector wise report is as follows:

SUB-MISSION I

Name of the Sector	**Water Supply**
Project Code	**WS/1**
Project Description	Reorganization of existing water works (Rehabilitation of Water Works-1)
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.11.30 crores
Project Code	**WS/2**
Project Description	Distribution network: Replacement of damaged rising main, Replacement of damaged distributions main
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.13.45 crores
Project Code	**WS/3**
Project Description	Storage improvement / enhancement: Repairing of existing CWR& OHT's
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.2.15 crores
Project Implementation Schedule	
Project Code	**WS/4**
Project Description	Reduction of UFW: Provision for unaccounted for Water Works
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.2.69 crores
Project Code	**WS/5**
Project Description	a) New sub zonal pumping station for Nai Ki mandi sub Zone at Subhash Park b) Enhancing capacity of power sub station at Water Works - I c) New zonal pumping station at Ghatwasan zone – II d) Construction of new treatment plant at Water Works - I&II e) Construction of sludge treatment plant at Water Works - I&II
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.134.02 crores
Project Code	**WS/6**

Project Description	Water Works storage capacity enhancement (Building capacity at Water Works –I, water Works – II and zonal pumping station
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.4.31 crores
Project Code	**WS/7**
Project Description	Ganga Jal Project
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.731.04 crores
Project Code	**WS/8**
Project Description	Test Laboratory
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.1.08 crores
Total Cost of the projects	Rs 900.04 crores
Financing Strategy	For Implementing Ganga Jal Project, JBIC, will be providing 50% Loan i.e. to the extent of Rs.365.52 Crores. So the Central & State Government Grant can be used for other projects
Revenue Streams	Revenue by way of increase in water charges

Table16.4 Financing Option- Water Supply

Financing Option	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	Nil
State Government's Grants & Loans	180.01
Financing Institutions	Nil
Capital Market	
Offshore Financing	Nil
Central Government Grants	450.02
Private Sector	270.01
Total	**900.04**

Name of the Sector	**Sewerage**
Project Code	**SW/1**
Project Description	Providing 129 km new sewer lines 3 Nos major & 5 Nos small pumping stations in Central Sewerage District
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs98.70 crores
Project Code	**SW/2**
Project Description	255KM Sewer line 4 major & 4 small SPS and 105.00 MLD STPin Western sewerage district
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.148.97 crores
Project Code	**SW/3**

Project Description	61.40 Sewer line 3 major & 3 small SPS and 26.00 MLD STPin Eastern sewerage district
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.72.35 crores
Project Code	**SW/4**
Project Description	147KM Sewer line 2 Nos major & 10 Nos small pumping station and38.00 MLD STP in Northern sewerage district
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.94.56 crores
Project Code	**SW/5**
Project Description	63.40KM Sewer line 2 major & 6 small SPS and 29.00 MLD STPin Southern sewerage district
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.79.01 crores
Project Code	**SW/6**
Project Description	30.20KM Sewer line 1 major & 1 small SPS and 29.00 MLD STPin Southern sewerage district
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.47.40 crores
Project Code	**SW/7**
Project Description	342 KM Sewer line 4 major & 7 small SPS and 37.00 MLD STPin Tajgang sewerage district
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.221.08 crores
Project Code	**SW/8**
Project Description	Purchase of modern equipment for desilting of sewers
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.1.05 crores
Total Cost of the Projects	Rs.763.13 Crores
Financing Strategy	Project shall be executed through/ by UP Jal Nigam.

Table16.5 Financing Option- Sewerage

Financing Option	Estimate of Additional Resources (Rs. Crores*)
Municipal Government's own resources	228.94
State Government's Grants & Loans	152.63
Financing Institutions	
Capital Market	
Offshore Financing	
Central Government Grants	381.56
Private Sector	
Total	**763.13**

***To be contributed by UP Jal Nigam**

Name of the Sector	**Solid Waste Management**
Project Code	**SWM/1**
Project Description	Purchase of SW transport equipment & tools (Containerized tricycles, Containerized Handicrafts, Seamless Handicrafts, Dumper placer vehicles, container lifting device skip lifters, Hotel waste collection vans, Biomedical waste collection vans, Large Hauling Vehicle, Large hauling container, Bull dozer, Skid steer Robot, Chain mounted Nala Cleaning machine large, Nala cleaning machine mounted on LCV/HCV chasis, sewerage jetting cum section machine, Tools and equipment for desilting excavator loader and Back hole attachment. Conversion of existing 15 trucks into DP).
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.35.03 crores
Project Code	**SWM/2**
Project Description	Development of Storage Points (Litter bins, Dumper placer green & black colour containers 3.0/3.5/4.5/7cmt,Cmt, dumper placer container of yellow colour for domestic hazardous waste, black colour skips for construction waste 5 cmt, Asphalt/concrete flooring under the bins)
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.13.99 crores
Project Code	**SWM/3**
Project Description	Compost plants (compost plants of 600 M.T./day or 3 power plants of 200 MT total capacity
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.27.98 crores
Project Code	**SWM/4**
Project Description	Landfill site development (Landfill site evelopment (1 of 280 MT/day or 3 of 80 MT day)
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.9.45 crores
Project Code	**SWM/5**
Project Description	Capacity Building (Generating public awareness (*supervision control, MIS)
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.1.05 crores
Total Cost of the Project	Rs.87.51 Crores
Financing Strategy	Projects costing to the extent of ANN prescribed contribution i.e. 30% will be implemented without using Central / State Support on private sector participation basis which shall require about 5% for viability gap funding only (Project: SWM3)

Table16.6 Financing Option- Solid Waste Management

Financing Options	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	
State Government's Grants & Loans	17.50
Financing Institutions	
Capital Market	
Offshore Financing	
Central Government Grants	43.76
Private Sector	26.25
Total	**87.51**

Name of the Sector	**Storm Water Drainage**
Project Code	**SWD/1**
Project Description	Repair of existing drains phase 1(Desilting, repair and remodeling of existing drains) Ashok Nagar Branch T.B.Hospital Branch, Moti Mahal Branch, Water Works Drain, Paliwal Drain, Khoja Drain, Pipal Mandi Drain, Taj West Drain Madhu Nagar Drain, Shakti Nagar Drain, Nehru Nagar Drain, Tota-Ka-Tal (Existing) Drain, Gyaspura Drain, Ram Bagh Chauraha, PWD Drain. Construction of New Drains Phase 1 Ram Nagar, Sur Sadan Ponding and existing Bhairow Nalla, Mental Hospital Drain, Tota Ka Taal to manola via Loha Mandi, Shashtripuram (Sikandara Canal), Taj Nagari Phase II, Dewari Road, Nagla Baghel.
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.80.94 crores
Project Code	**SWD/2**
Project Description	Repair of Existing Drains Phase II Mantola Drain, V.I.P. Road (Sultanpura Drain), Naripura Drain, Tehri Bagia Area Drain (Radha Nagar Extension part of drain), Radha Nagar Drain, Sikandra to Yamuna River, Vayu Vihar Drain
Implementing Agency	U.P.Jal Nigam
Cost of the project	Rs.52.50 crores
Project Code	**SWD/3**
Project Description	Construction of New Drains Phase III Gwalior Road (LHS), Gwalior Road (RHS), Ashopa Hospital Drain, Transport Nagar Drain , Peelakhar Drain (New), Karmayogi Drain (New), Kamla Nagar C- Block Drain, Ashoka Enclave Road Drain, Sikandara to Guru Ka Tall, Etamad-Ud-Daulah Drain (F-C1 Branch), RBS college Drain. Repair of Existing Drains Phase-III

	(Desilting, repair and remodeling of existingdrains) Bijli Ghar Branch , Bhairon & Belanganj Drain , Ram Bagh Drain , taj East Drain ,Etamad-Ud-Daulah, Peelakhar Drain, Krishna Colony Drain, Balkeshwar Drain, Rajwaha Drain, Naunihai Drain/Ind Estate Drain , Kalinid Vihar Drain, Rajpur Chunghi Drain, Arjun Nagar Drain, Azambada Drain, Wazirpura Balmiki Basti Drain, St Peters College Drain , Bapu Nagar Drain, Dayal Bagh Drain And its Branch, Karmayogi Drain, Municipal Corporation Drain, Rajpura
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.32.90 crores
Project Code	**SWD/4**
Project Description	Purchase of Equipment for Desilting of Drains
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.2.10 crores
Financing Strategy	Project shall be executed through/ by UP Jal Nigam.
Total Project Cost	Rs.168.44 Crores

Table16.7 Financing Option- Storm Water Drainage

Financing Options	Estimate of Additional Resources (Rs. Crores*)
Municipal Government's own resources	50.53
State Government's Grants & Loans	33.69
Financing Institutions	
Capital Market	
Offshore Financing	
Central Government Grants	84.22
Private Sector	
Total	**168.44**

*To be contributed by UP Jal Nigam

Name of the Sector	**Environment**
Project Code	**ENV/1**
Project Description	River Front Development Landscaping, Theme park, Bio-diversity Park, garden of five senses, activities for passive recreation, tree plantation along the banks of river Yamuna in conformity with Land use plan 2021
Implementing Agency	Agra Development Authority
Cost of the project	Rs.45.65 crores
Project Code	**ENV/2**
Project Description	Improvement and beautification of existing parks
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.54.83 crores

Project Code	**ENV/3**
Project Description	Development of new parks
Implementing Agency	Agra Development Authority
Cost of the project	Rs.18.69 crores
Project Code	**ENV/4**
Project Description	Protection of Forest area
Implementing Agency	Forest
Cost of the project	Rs.16.95 crores
Project Code	**ENV/5**
Project Description	Rainwater harvesting in state government & ANN properties and select locations as identified by U.P. Jal Nigam
Implementing Agency	Agra Nagar Nigam/Agra Development Authority
Cost of the project	Rs.12.29 crores
Project Code	**ENV/6**
Project Description	Restoration and beautification of water bodies
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.33.26 crores
Project Code	**ENV/7**
Project Description	Construction of weir across river Yamuna downstream of Taj
Implementing Agency	Irrigation Department
Cost of the project	Rs.73.10 crores
Financing Strategy	Projects costing to the extent of ANN prescribed contribution i.e. 30% will be implemented through private sector participation (ENV2 (partly), ENV 3 (partly), and ENV 6(partly), and through Irrigation department (ENV/7)
Total Cost	Rs 254.78 crores

Table16.8 Financing Option- Environment

Financing Options	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	21.93*
State Government's Grants & Loans	50.96
Financing Institutions	Nil
Capital Market	Nil
Offshore Financing	Nil
Central Government Grants	127.39
Private Sector	21.93
Total	**254.78**

*To be contributed by Irrigation Department

Name of the Sector	**Urban Renewal Projects**
Project Code	**URP/1**
Project Description	Selected road widening
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.49.11 crores
Project Code	**URP/2**
Project Description	Replacement of water and sewer lines
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.52.84 crores
Project Code	**URP/3**
Project Description	Laying of new water and sewer line
Implementing Agency	U.P. Jal Nigam
Cost of the project	Rs.66.58 crores
Project Code	**URP/4**
Project Description	Construction of public toilets and urinals
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.8.40 crores
Project Code	**URP/5**
Project Description	Night shelters
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.1.58 crores
Project Code	**URP/6**
Project Description	Community Centre/Hall
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.2.10 crores
Total Cost of the Projects	Rs.180.61 Crores
Financing Strategy	Project shall be executed through/ by UP Jal Nigam.

Table16.9 Financing Option- Urban Renewal Projects

Financing Options	Estimate of Additional Resources (Rs. Crores*)
Municipal Government's own resources	54.18
State Government's Grants & Loans	36.12
Financing Institutions	
Capital Market	
Offshore Financing	
Central Government Grants	90.30
Private Sector	
Total	**180.61**

***To be contributed by UP Jal Nigam**

Name of the Sector	**Roads & Transportation**
Project Code	**RT/1**
Project Description	Sky Bus From Sikandara to Taj Mahal
Implementing Agency	ADA
Cost of the project	Rs.997.90 crores

Project Code	**RT/2**
Project Description	Multi Storeyed Parking
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.107.63 crores

Project Code	**RT/3**
Project Description	Upgradation of existing bus terminals at Idgah and Fort
Implementing Agency	PWD
Cost of the project	Rs.2.15 crores

Project Code	**RT/4**
Project Description	Development of new bus terminals (6 nos)
Implementing Agency	PWD
Cost of the project	Rs.13.31 crores

Project Code	**RT/5**
Project Description	Upgradation of Workshop
Implementing Agency	RTO
Cost of the project	Rs.2.15 crores

Project Code	**RT/6**
Project Description	Purchase of CNG buses
Implementing Agency	RTO
Cost of the project	Rs.73.10 crores

Project Code	**RT/7**
Project Description	Widening & Strengthening of main roads in Urban Areas
Implementing Agency	ADA/PWD
Cost of the project	Rs.569.99 crores

Project Code	**RT/8**
Project Description	Construction of remaining Master Plan Roads
Implementing Agency	ADA
Cost of the project	Rs.823.77 crores

Project Code	**RT/9**
Project Description	Construction of Ring Road
Implementing Agency	NHAI
Cost of the project	Rs.1409.61 crores

Project Code	**RT/10**
Project Description	Construction of Rail ROB and RUB
Implementing Agency	UP Bridge Corporation
Cost of the project	Rs.415.13 crores

Project Code	**RT/11**

Project Description	Development of internal roads
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.390.69 crores
Project Code	**RT/12**
Project Description	Development of parking areas in the city
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.20.99 crores
Project Code	**RT/13**
Project Description	Development of approach road to Taj & other heritage sites
Implementing Agency	Agra Development Authority
Cost of the project	Rs.34.98 crores
Project Code	**RT/14**
Project Description	Improvement in street lighting
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.10.76 crores
Project Code	**RT/15**
Project Description	Intersection signaling
Implementing Agency	RTO
Cost of the project	Rs.2.63 crores
Project Code	**RT/16**
Project Description	Improvement of Road geometrics & street furniture
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.18.41 crores
Project Code	**RT/17**
Project Description	Footpath improvement
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.12.47 crores
Project Code	**RT/18**
Project Description	Foot over Bridges /Pedestrian underpass
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.24.32 crores
Project Code	**RT/19**
Project Description	Construction of Fly over (Water Works chauraha, Khangari Chauraha, Rui ki Mandi)
Implementing Agency	ADA/ANN
Cost of the project	Rs.20.37 crores
Financing Strategy	Project shall be executed through/ by UP Jal Nigam, ADA, NHAI and UP Bridge Corporation, RTO, PWD
Total Project Cost	Rs.4950.35 Crores

Table16.10 Financing Option- Roads & Transportation

Financing Options	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	1391051*
State Government's Grants & Loans	990.97
Financing Institutions	
Capital Market	
Offshore Financing	
Central Government Grants	2475.17
Private Sector	165.60
Total	**4950.35**

* To be contributed by the following three agencies:

- ADA Rs.734.10 Crores
- NHAI Rs.422.88 Crores
- UP Bridge Corp. Rs.124.54 Crores
- RTO Rs. 37.99 crores

Name of the Sector **Heritage & Tourism**

Project Code **HT/1**

Project Description Infrastructure improvement in Taj Environs (upto 1km outside ASI boundary) for improving the roads, footpaths, railings, signages, street lights, monument description boards, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins, landscaping, street furniture, etc.

Implementing Agency Agra Nagar Nigam

Cost of the project Rs.22.34 crores

Financing Strategy (i) Borrowings from FI against Escrow of Advertising Receivables
(ii) Parking lots through Private Sector Participation

Table16.11 Financing Option- Heritage & Tourism

Financing Option	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	Nil
State Government's Grants & Loans	4.47
Financing Institutions	3.35
Capital Market	Nil
Offshore Financing	Nil
Central Government Grants	11.17
Private Sector	3.35
Total	**22.34**

Project Code **HT/2**

Project Description Infrastructure improvement in other Heritage Sites (upto 500m) or improving the roads, footpaths, railings, signages, street lights, monument description boards, public conveniences, public telephone booths, information kiosks, vehicular parking, garbage bins, landscaping, street furniture, etc.

Implementing Agency Agra Nagar Nigam

Cost of the project	Rs.30.16 crores
Financing Strategy	(i) Borrowings from FI against Escrow of Advertising Receivables (ii) Parking lots through Private Sector Participation

Table16.12 Financing Option- Heritage & Tourism

Financing Option	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	Nil
State Government's Grants & Loans	6.03
Financing Institutions	5.59
Capital Market	Nil
Offshore Financing	Nil
Central Government Grants	15.08
Private Sector	3.46
Total	**30.16**

Name of the Sector	**Industry**
Project Code	**IND/1**
Project Description	Development of New industrial estates for shifting of polluting/non confirming (including petha industry)
Implementing Agency	Agra Development Authority
Cost of the project	Rs.4.83 crores
Financing Strategy	30% of land (available with Agra Nagar Nigam) will be allotted to Agra Development Authority of development of new industrial estates.

Table16.13 Financing Option- Industry

Financing Option	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	1.45
State Government's Grants & Loans	0.97
Financing Institutions	Nil
Capital Market	Nil
Offshore Financing	Nil
Central Government Grants	2.41
Private Sector	Nil
Total	**4.83**

Project Description	**Capacity Building**
Implementing Agency	Agra Nagar Nigam
Cost of the project	Rs.11.60 crores
Financing Strategy	30% to be financed by Agra Nagar Nigam

Financing Options

Financing Option	Nil
Municipal Government's own resources	Rs.3.48 Crores
State Government's Grants & Loans	Rs.2.32 Crores
Financing Institutions	Nil
Capital Market	Nil
Offshore Financing	Nil
Central Government Grants	Rs.5.80Crores
Private Sector	Nil
Total	**11.60**

SUB-MISSION II

Name of the Sector — **Urban Poverty and Slum**

Project Code — **UPS/1**

Project Description

1) Development and improvement of basic services
2) Construction of community toilets and bath
3) Construction of community rooms/child care center
4) Financial Assistance for improvement of shelter
5) Provision of security tenure

Implementing Agency — Agra Nagar Nigam

Cost of the project — Rs.480.85 crores

Financing Strategy — Funded by Central Government Funds

Revenue Streams — Nil

Table16.14 Financing Option- Urban Poverty and Slum

Financing Option	Estimate of Additional Resources (Rs. crores)
Municipal Government's own resources	
State Government's Grants & Loans	240.42
Financing Institutions	
Capital Market	
Offshore Financing	
Central Government Grants	240.43
Private Sector	
Total	**480.85**

SUMMARY

It is obvious that the projects are not to be implemented in one year. We have therefore scheduled the projects implementation keeping in view the nature of project and the priority for the same; at the same time keeping funds requirement during any year at optimum level.

The following tables give the below mentioned project/ sector wise information in tabular form:

(i) Projects Implementation Schedule during the years 2007 to 2012 (amount wise)
(ii) Sector wise Investment Requirement during the years 2007 to 2012 (amount wise)
(iii) Financing Options

Table 16.15 Project Expenditure Schedule

Project Code	Cost of Project	Schedule of Expenditure (Rs. in crores)					
	(Rs. crores)	2007	2008	2009	2010	2011	2012
Inflation	5.00%						
Heritage & Tourism							
HT/1	22.34	5.25	5.51	11.58			
HT/2	30.16	7.09	7.44	15.63			
Total	**52.50**	**12.34**	**12.95**	**27.20**	**0.00**	**0.00**	**0.00**
Industry							
IND/1	4.83		0.66	0.93	1.46	1.79	
Total	**4.83**		**0.66**	**0.93**	**1.46**	**1.79**	
Environment							
ENV/1	45.65		8.26	8.68	9.11	9.56	10.04
ENV/2	54.83		9.92	10.42	10.94	11.49	12.06
ENV/3	18.69				9.12	9.57	
ENV/4	16.95		8.27	8.68			
ENV/5	12.29	2.89	3.03	6.37			
ENV/6	33.26	9.45	9.92	13.89			
ENV/7	73.10	0.00	13.23	13.89	14.59	15.32	16.08
Total	**254.78**	**12.34**	**52.64**	**61.93**	**43.75**	**45.94**	**38.18**
Water Supply							
WS/1	11.30	5.51	5.79				
WS/2	13.45	6.56	6.89				
WS/3	2.15	1.05	1.10				
WS/4	2.69	1.31	1.38				
WS/5	134.02	0.00	24.26	25.47	26.74	28.08	29.48
WS/6	4.31	2.10	2.21				
WS/7	731.04	0.00	132.30	138.92	145.86	153.15	160.81
WS/8	1.08	0.53	0.55	0.00	0.00	0.00	0.00
Total	**900.04**	**17.06**	**174.47**	**164.38**	**172.60**	**181.23**	**190.29**
Sewerage							
SW/1	98.70	98.70					
SW/2	148.97	22.68	99.72	26.57			
SW/3	72.35			72.35			
SW/4	94.56			41.41	53.15		
SW/5	79.01				79.01		
SW/6	47.40				47.40		
SW/7	221.08					107.85	113.24
SW/8	1.05	1.05					
Total	**763.13**	**122.43**	**99.72**	**140.33**	**179.56**	**107.85**	**113.24**
Storm Water Drainage							
SWD/1	80.94	23.00	24.14	33.80	0.00	0.00	0.00
SWD/2	52.50	9.45	9.92	10.42	10.94	5.74	6.03
SWD/3	32.90	0.00	5.95	6.25	6.56	6.89	7.24
SWD/4	2.10	2.10	0.00	0.00	0.00	0.00	0.00
Total	**168.44**	**34.55**	**40.02**	**50.47**	**17.50**	**12.64**	**13.27**
Solid Waste Management							
SWM/1	35.03		17.09	17.94			

Project Code	Cost of Project	Schedule of Expenditure (Rs. in crores)					
	(Rs. crores)	2007	2008	2009	2010	2011	2012
SWM/2	13.99	6.83	7.17				
SWM/3	27.98	13.65	14.33				
SWM/4	9.45	9.45					
SWM/5	1.05	1.05					
Total	**87.51**	**30.98**	**38.59**	**17.94**	**0.00**	**0.00**	**0.00**
Roads & Transportation							
RT/1	997.90		0.00	231.53	243.10	255.26	268.02
RT/2	107.63	52.50	55.13	0.00	0.00	0.00	0.00
RT/3	2.15	1.05	1.10	0.00	0.00	0.00	0.00
RT/4	13.31	3.78	3.97	5.56	0.00	0.00	0.00
RT/5	2.15	1.05	1.10	0.00	0.00	0.00	0.00
RT/6	73.10	0.00	13.23	13.89	14.59	15.32	16.08
RT/7	569.99	0.00	0.00	132.24	138.86	145.80	153.09
RT/8	823.77	0.00	0.00	191.12	200.68	210.71	221.25
RT/9	1409.61	184.68	193.92	203.61	213.80	299.31	314.28
RT/10	415.13	0.00	0.00	96.31	101.13	106.19	111.50
RT/11	390.69	51.19	53.75	56.43	59.26	82.96	87.11
RT/12	20.99	10.24	10.75	0.00	0.00	0.00	0.00
RT/13	34.98	17.06	17.92	0.00	0.00	0.00	0.00
RT/14	10.76	5.25	5.51	0.00	0.00	0.00	0.00
RT/15	2.63	2.63	0.00	0.00	0.00	0.00	0.00
RT/16	18.41	0.00	4.27	4.49	4.71	4.95	0.00
RT/17	12.47	0.00	2.89	3.04	3.19	3.35	0.00
RT/18	24.32	0.00	0.00	5.64	5.93	6.22	6.53
RT/19	20.37	4.73	4.96	5.21	5.47	0.00	0.00
Total	**4950.35**	**334.15**	**368.50**	**949.08**	**990.70**	**1130.06**	**1177.85**
Urban Renewal Projects							
URP/1	49.11		13.99	17.13	17.99		
URP/2	52.84		15.05	18.44	19.36		
URP/3	66.58				18.96	23.23	24.39
URP/4	8.40	8.40					
URP/5	1.58	1.58					
URP/6	2.10	2.10					
Total	**180.61**	**12.08**	**29.04**	**35.57**	**56.31**	**23.23**	**24.39**
Capacity Building	**11.60**	2.10	2.21	2.32	2.43	2.55	0.00
Urban Poverty & Slum							
UPS/1	480.85	63.00	66.15	69.46	72.93	102.10	107.21
Total	**480.85**	**63.00**	**66.15**	**69.46**	**72.93**	**102.10**	**107.21**
Grand Total	**7854.64**						

Table 16.16: Summary of Funds Requirement Sector wise

Name of the Sector	Schedule of Expenditure (% of Project Cost)					
	2007.00	2008.00	2009.00	2010.00	2011.00	2012.00
Heritage & Tourism	12.34	12.95	27.20	0.00	0.00	0.00
Industry	0.00	0.66	0.93	1.46	1.79	0.00
Environment	12.34	52.64	61.93	43.75	45.94	38.18
Water Supply	17.06	174.47	164.38	172.60	181.23	190.29
Sewerage	122.43	99.72	140.33	179.56	107.85	113.24
Storm Water Drainage	34.55	40.02	50.47	17.50	12.64	13.27
Solid Waste Management	30.98	38.59	17.94	0.00	0.00	0.00
Roads & Transportation	334.15	368.50	949.08	990.70	1130.06	1177.85
Urban Renewal Projects	12.08	29.04	35.57	56.31	23.23	24.39
Capacity Building	2.10	2.21	2.32	2.43	2.55	
Sub Total	**578.01**	**818.79**	**1450.15**	**1464.32**	**1505.28**	**1557.23**
Urban Poverty & Slum	63.00	66.15	69.46	72.93	102.10	107.21
Sub Total	**641.01**	**884.94**	**1519.61**	**1537.25**	**1607.38**	**1664.43**
Grand Total	**641.01**	**884.94**	**1519.61**	**1537.25**	**1607.38**	**1664.43**

16.3 COST STRUCTURING

The total cost of projects in Sub-Mission I (Basic Infrastructure and Governance) is Rs. 7373.79 crores in which the share of Central Government is Rs. 3686.9 crores and contribution from state government is Rs. 1474.76 crores. The remaining 30 per cent contribution is from the various other agencies like ANN, ADA, NHAI, UP Bridge Corporation, UP Jal Nigam, Irrigation Department, R.T.O. private sector participation etc. as detailed in Table 16.19 Among the other agencies the maximum contribution is from ADA (Rs. 734.1 crores) whereas the minimum contribution is from ANN about Rs. 4.93 crores.

As regards the Sub-Mission II (Basic Services for Urban Poor) the cost of projects is Rs. 480.85 crores comprising of 50 percent share from central government and the remaining 50 per cent from state/ ULB/ other parastatal share including beneficiary contribution as per the JNNURM funding pattern.

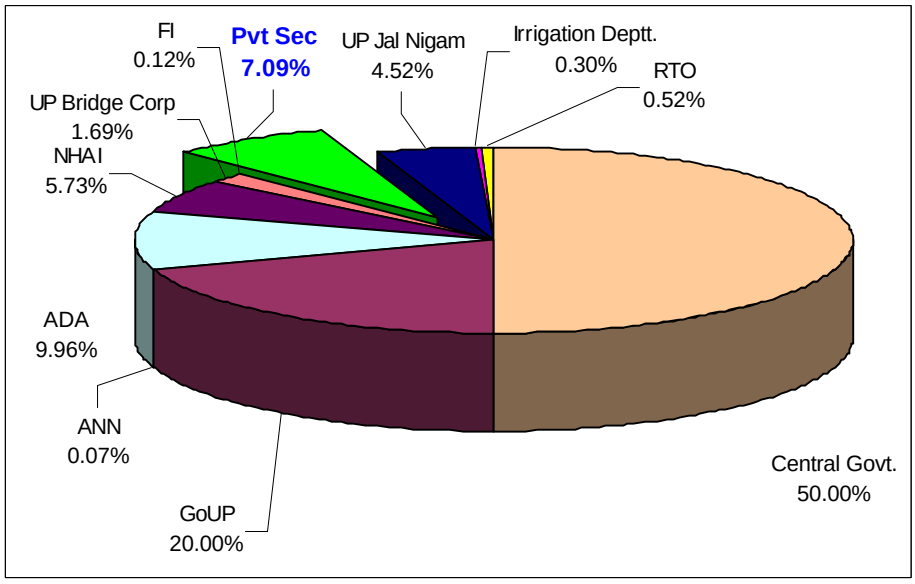
Table 16.17 Cost Structuring (Rs. in crores)

Name of the Sector	TCP*	Central Govt. (50%)	State Govt (20%)	Others (30 %)								
				ANN	ADA	NHAI	UP Bridge Corp	FI	Pvt Sec	UP Jal Nigam	Irrigation Department	RTO
SUB-MISSION I												
Heritage & Tourism	**52.50**	26.25	10.50	-	-	-	-	8.94	6.81	-	-	-
Industry	**4.83**	2.42	0.97	1.45	-	-	-	0.00		-	-	-
Environment	**254.78**	127.39	50.96	-	-	-	-	0.00	54.50	-	21.93	
Water Supply	**900.04**	450.02	180.01	-	-	-	-	0.00	270.01	-	-	-
Sewerage	**763.13**	381.56	152.63		-	-	-	0.00		228.94	-	-
Storm Water Drainage	**168.44**	84.22	33.69	-	-	-	-	-		50.53	-	-
Solid Waste Management	**87.51**	43.75	17.50	-	-	-	-	-	26.25	-	-	-
Roads &	**4950.35**	2475.17	990.07	-	734.10	422.88	124.54		165.60	-	-	37.99

Name of the Sector	TCP*	Central Govt. (50%)	State Govt (20%)	Others (30 %)								
				ANN	ADA	NHAI	UP Bridge Corp	FI	Pvt Sec	UP Jal Nigam	Irrigation Department	RTO
Transportation												
Urban Renewal Projects	**180.61**	90.30	36.12	-	-	-	-	-		54.18	-	-
Capacity Building	**11.60**	5.80	2.32	3.48	-	-	-	-		-	-	-
Sub-Total	7373.79	3686.9	1474.76	4.93	734.1	422.88	124.54	8.94	523.17	333.65	21.93	37.99
SUB-MISSION II												
Urban Poverty & Slum	**480.85**	240.42	240.42	-	-	-	-	-		-	-	-
Sub-Total	**480.85**	240.42	240.42	-	-	-	-	-	-	-	-	-
Grand Total	**7854.64**	3927.32	1715.18	4.93	734.10	422.88	124.54	8.94	523.17	333.65	21.93	37.99

**Total Cost of Projects (Sector wise)*

Fig. 16.1 Cost Structuring for Sub Mission I (Basic Infrastructure and Governance)



16.4 PRIVATE SECTOR PARTICIPATION

The contribution of private sector for Sub Mission I is Rs. 523.17 crores, which is approximately 7.09 percent of the total cost of the projects. The private sector participation is envisaged for various sectors like water supply, solid waste management, roads and transportation, heritage & tourism and environment. The private sector participation is envisaged for maintenance of compost plants, improvement and beautification of existing parks, maintenance of new parks, restoration and beautification of water bodies, multi storied parking, maintenance of foot over bridges /pedestrian underpass and infrastructure improvement in other heritage sites.

16.5 INVESTMENT SUSTAINABILITY

The basic objective of JNNURM is to undertake revenue enhancement measures to ensure sustainability of the given budget. The financial proposal has been given, considering its sustainability through meeting the financial commitments underlying the projects, its O&M expenditure. The urban local bodies will undertake the reforms and also the private sector participation in some projects would ensure long-term sustainability, which will add to meet the sustainability within the framework of implementation.