

The map displays the Gurgaon district, which is divided into several tehsils and blocks. The northern part of the district is colored yellow, while the central and southern parts are green. The coastal area is blue. Major cities and towns are labeled, including Gurgaon, Faridkot, Bahawalpur, and others. The map also shows the district's boundaries with neighboring districts and states.



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IL&FS Ecosmart assumes full responsibility for all conclusions, errors / omissions in this report.



Executive Summary



Subcity Plan NDMC

EXECUTIVE SUMMARY

State of the City Assessment

E-1 Introduction

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) programme aims to promote the sustainable development of cities by eliminating legal, institutional and financial constraints that have impeded management of, and investment in, urban infrastructure and services. It also seeks to strengthen municipal governments and their functioning.

A City Development Plan is a pre-requisite to access funds available under the programme. New Delhi Municipal Council (NDMC) has initiated the preparation of a Sub-City Plan for the area under its administration.

E-2 Objective of Sub-City Plan

The Sub-City Plan (SCP) will outline a vision for the future development of New Delhi, based upon a thorough understanding of the area's current state of development, the challenges it faces and its potential. In this process, it seeks to identify priority areas of intervention and strategies for achieving set goals.

The Sub-City Plan intends to evolve a consensus based Plan, incorporating future development goals for the NDMC area that capitalize on its potential and addresses current bottlenecks. This will further be based on the area's role within the larger city of Delhi as a whole. It will also undertake a preliminary assessment of capacity building needs in the organization, in order that the Council may better fulfill its obligations.

The following sections details the key development characteristics of the area based on secondary data and consultations with relevant stakeholders at the disaggregated level.

E-3 City Assessment: Analysis of Existing Situation

E-3.1 Study area and its demographics

The NDMC area constitutes the core of the city. This is the old imperial Delhi, the capital established in 1911. It includes the government of India headquarters, government housing, private housing, the Central Business District of the city; and prominent institutional areas. The area is characterized by wide roads, parks and gardens.

The demographic status of the NDMC area vis-à-vis the city is as follows:

	Delhi	NDMC
Area	1483 sq.km	42.74 sq.km
Population (2001)	1.38 Crores	2.94 lakhs
Decadal Rate of growth	46.31 %	- 2%
Density	9294	6660

The projected population of the area for 2021 is 4.19 lakhs. This is based on an extrapolation of MPD-2021 estimates for Zone - D)

The literacy rate in the area, at 83.24%, is one of the highest within the city.

E 3.2 Land and Urban Growth Management

New Delhi was planned in a geometric pattern, over a triangular base, with three major functions at the apex. viz. Commercial, Governmental and Recreational: Connaught Place, Government Complex and the India Gate are the respective centers of these major activities, which fall within the NDMC area.

The NDMC area is contained within Planning Zone D of Delhi as per the Master Plan for Delhi (MPD). The existing land use in Zone D, (as per MPD 2001), indicates that over 30% land is devoted to recreational uses; 37% comprises of residential area (i.e. Bungalow area, government colonies and private colonies); 3% of the area is commercial (CBD, community centers located at Gole market, Khan market, local shopping centers and non hierarchy commercial centers); and rest of the area comprises of government, public and semi public institutions and roads infrastructure. Within the residential area, government housing estates, and bungalows constitute over 80% of the area.

The Zonal Development Plan for the NDMC area is currently being developed by the Delhi Urban Arts Commission (DUAC). The draft indicates the following:

- Densification of areas north of Rajpath, with addition of institutional and commercial functions
- Densification of areas south of Rajpath, through increase in residential uses.

At present there are 38 J.J. clusters in the NDMC area, housing more than ten thousand households, and occupying more than 14 hectares of land. Seven clusters are located on land belonging to the NDMC; a majority of slums are located on lands belonging to the L&DO. Most slums in the area are small clusters, comprising less than 100 households; and occupying lands meant for residential or recreational use. It is proposed to make NDMC a slum-free area by 2010.

Key issues in the area of land and growth management are summarized below

- Limited decision making authority in planning and development by NDMC, in their area.
- A large portion of land ownership within NDMC area rests with L&DO and CPWD. There is no comprehensive collective data base for decision making in the area.
- Considerable densification is planned in the NDMC (as per MPD 2021), including the bungalow zone, and in the government housing estates. Substantial up-gradation of infrastructure will be required to cater to the increase in resident and floating population due to densification and improvements in connectivity.
- Need to address housing requirements across income groups.

E 3.3 Built Heritage: Conservation and Management

An area of about 28 sq.km. within the overall extent of 42.74 sq. km of the NDMC area is occupied by the planned city of 'Lutyens New Delhi'. Within this, about 22.3 sq.km is designated as the Lutyens Bungalow Zone.¹ (LBZ)

Approx. 31% or 847 Ha of the LBZ is under residential uses, of which a large proportion comprise bungalows and residential precincts of heritage value; 8% or 224 Hectares is under offices, including the Government Complex of N/S Block; 6.22% or 174.5 Ha is devoted to institutional uses; 0.45% or 12.5 Ha is under commercial uses; 47.86% or 1340 Ha is landscaped (ceremonial & recreational green) & of great heritage significance; and 7.22% or 20 Ha is under roads which are landscaped with different types of trees and hedges.

In addition to the heritage value of the various constituents of 'Lutyen's New Delhi' such as the Government Complex, the Central Vista, the commercial centre of Connaught Place and the

¹ Zonal Development Plan Zone Division D -New Delhi. DDA

residential Bungalow zone, the NDMC area also includes within its boundaries 22 monuments, sites and heritage precincts designated as being of National Significance by the ASI, which pre-date the establishment of 'Lutyens New Delhi' and which, together with 125 other heritage buildings and precincts of state significance, enrich and enhance the distinctive urban environment within the NDMC area as a whole.

Issues with respect to the LBZ, and heritage in the NDMC area include

- The LBZ has not been recognized in the Master Plan 2021 as a Conservation Zone.
- Detailed delineation of the LBZ is required to ensure that all the distinguishing components of the garden city capital are managed to retain their heritage significance. Further, a detailed inventory of all the heritage components of the LBZ is not available.
- Need for restoration and Heritage Management Plans for the important public buildings in order to ensure that they are conserved according to international norms.
- Need for a comprehensive mechanism and effective and simple instruments to ensure that heritage concerns are integrated into development processes in the area.
- There is a need for legislation specifically applicable to different sub-zones of Lutyens New Delhi. Sub-zones with lesser heritage significance must be identified and approached in a different manner.
- Development of a Heritage Cell - capacity building within the NDMC with respect to heritage concerns.

E 3.4 State of Environment:

There are various interrelated key stressors which affect the quality of land, water and air in the NDMC area. This is significantly due to dense population inhabiting the surrounding areas of NDMC and immense population floating in and out of NDMC area on a regular basis.

The air quality of NDMC area faces high stress due to growing vehicular population on the roads and two power plants located on the periphery of NDMC area². In 2006, the concentration of NOx surpassed the standards by almost 35%. The main area of concern, however, is the high concentration of SPM and RSPM which is six times the permissible limit. The annual average concentration of CO has shown a declining trend in the past few years, but it is still above the permissible standards.

Surface water resources in and around the NDMC area comprise river Yamuna, various drains and ponds. The River and drains are highly polluted. The area has a number of man made and artificial surface water bodies. The source of water for the water bodies is untreated water supplied by DJB, and it's quality is not monitored.

The ground water level in the NDMC area varies between 60 - 90 meters below ground level. The long term seasonal fluctuation of ground water shows a significant trend of decline in the NDMC area at a rate of 73 cm/year and 60 cm/year during pre and post monsoon respectively. This can be attributed to large scale private ground water abstraction by residential colonies, institutions, hotels, etc.

Ambient noise levels measured by Central Pollution Control Board in two locations in NDMC area (Nauroji Nagar and Mandir Marg) indicate that day time and night time noise levels often exceed 60 dB(A) --- as against the permissible level (max.) of 55 - 60 dB(A) during the day, and 45 dB(A) during the night.

Summarising the key issues with respect to the environment, these include:

² Daily ambient air quality at I.T.O intersection as obtained from C.P.C.B from 1999 till 2006 has been studied

- High level of noise in commercial areas and along major arterial roads, partly due to unorganized commercial activity, and the lack of enforcement of laws relating to the use of pressure horns and DG sets
- Depleting ground water levels
- Lack of regular monitoring of surface water bodies

E 3.5 Landscape and Horticulture

The NDMC area has a much larger green cover than any other metropolitan area in the country. The green areas of NDMC can be broadly classified into two categories viz the ridge area; and gardens and avenue areas. The Central Ridge area was taken over by the Forest Department (from CPWD) for its protection and management in 2004. The gardens and avenues are maintained by the horticulture department of NDMC.

An important issue related to the landscape of New Delhi is that most of the trees planted at the time of development are near the end of their lives, and require replacement in a phased manner, according to a landscape plan which follows the original planting schemes.

The NDMC has a number of Grade I Vistas designated as heritage precincts. These include The Central Vista Precinct to the east of the Presidents Estate and the Shanti Path Vista to the south of the Presidents Estate.

The forest covers in NCT of Delhi in general and NDMC area in particular has shown an increasing trend. While in 2001 the forest cover of New Delhi District that comprises a large part of NDMC area was 9.73 sq km, in 2003 it increased to 14.54 sq km. As per the ZDP (2001) the ridge (Zone D6 and D10) "should be maintained in its pristine glory and no infringement is to be permitted there."

Issues in this sector are summarized below:

- Absence of inventories of the original planting within the area of the Bungalow compounds
- No action plan for strengthening and augmentation of facilities of nurseries, which will include self reliance in meeting requirements for plantation and replacement; and maintenance works Shortage of water for irrigation; lack of equipment for maintenance; poor on-site facilities for staff
- Inadequate public facilities in parks.
- Certain issues with respect to roadside plantation are: the changes in road sections and increase in road widths, paving over of the green area and soft surfaces in which the trees were originally planted, fall in the water table, etc.

E 3.6 Water Supply

The NDMC area is supplied 120 MLD water by the Delhi Jal Board (DJB) through 19 metered connections. In addition, ground water is abstracted through 90 operational tube wells, yielding a total of 10 MLD. The total availability of water in the area is thus 130 MLD (table below)

This seems to indicate that the water supply is more than adequate for the current residential population. However these estimates do not account for the variable floating population traveling to and through NDMC area on a daily basis. Water demand estimations for the NDMC area, undertaken by three different agencies, reflect large variations in assessment, which can be attributed to the lack of accurate information regarding floating population in the area.

The total available under ground storage in the area is 50.52 ML as against 130 MLD of water supply, i.e. 9.327 hours of average supply. While this is sufficient, the geographical distribution of storage needs review.

The distribution net work consists of 352 km length of water mains (4 inches to 42 inches in diameter). These are augmented (as required) and maintained by the NDMC. On-line Booster pumping stations have been installed in the distribution system to improve pressure in the localized pockets with inadequate pressure.

Water is supplied to JJ clusters in the NDMC area through water tankers, public water hydrants, and deep bore hand pumps. In addition to this, water is supplied free of cost to 55 Public Toilet Utilities (PTUs), departmental public conveniences / urinal blocks, and for fire fighting operations (30 Static water tanks).

The key issues in this sector are as under:

- While the resident population of the NDMC area is relatively small, there is a substantial floating population. It is necessary to estimate the floating population in order to arrive at an accurate estimation of the water demand in the area.
- It is understood that water supply is intermittent and hours of supply vary from 2 to 8 hours a day. It is necessary to rationalize distribution of water.
- There is a need to evaluate the output of the operational tube wells vis-a-vis original observed discharge, so as to assess the quantity and quality of water available; and the fall in the water table.
- The number of private tube wells in operation in residential and commercial areas needs to be assessed.

E 3.7 Sewerage

For the available water supply from all sources at 130 MLD, the sewage generation at 80% of water supplied is 104 MLD. However, as mentioned above, this estimate does not account accurately for the impact of the floating population in the area. Moreover, it does not take private ground water abstraction into account. It is thus likely that waste water generation exceeds this estimate.

A sewerage system including a conveyance network of 350 kms, and two Sewage Pumping Stations (SPS's) are operated and maintained by the NDMC. The sewage is delivered to DJB for treatment at the Okhla Sewage Treatment Plant

As per M/s TCE recommendations (1988), NDMC has carried out renovation, rehabilitation and laid new sewers as per design recommendations in Area North of Rajpath, Area south of Rajpath, Diplomatic area. Improvements in the Area South of Railway line are currently in progress.

Issues in the sewerage sector include

- Need to assess the correct volume of sewage generated in the NDMC area.
- Ensuring restoration of carrying capacity of sewers, through repairs and rehabilitation, adopting the most appropriate technology

E-3.8 Solid Waste Management:

The NDMC area generates about 400 tonnes of municipal solid waste (MSW) per day, consisting of municipal garbage, horticultural waste and construction and demolition debris. As per the Master Plan of Delhi, 2021, the projected generation of municipal solid waste in 2021 is 550 tonnes per day.

NDMC has developed a strategy for a door-step collection, operating through NGOs and RWAs. Secondary collection and transportation is being managed through a PPP with a private contractor. Additionally, 450 pairs of litter bins (blue and green) have been provided in public spaces for preventing littering. An additional 650 pairs are to be provided shortly. Street cleaning is managed through manual sweeping by conservancy staff; and mechanical sweeping by PWD as well.

NDMC has a compost plant at Okhla for processing and disposal of waste. This has remained shut due to various reasons. Waste from the area is currently being sent to Ghazipur landfill site (operated by the MCD), for disposal.

The prominent medical establishments in the area include AIIMS, Safdarjung Hospital, Lady Harding Medical College and Ram Manohar Lohia Hospital. Management of biomedical waste is the responsibility of the generators themselves.

Key issues in solid waste management are:

- Lack of segregated storage of the different types of waste generated (domestic and commercial garbage, construction and demolition debris, horticultural waste etc.)
- Need for appropriate equipment for regular removal of garbage without spilling and dirtying the roads (collection and transportation).
- Need to address crucial grey areas like management of construction and demolition debris, e-waste etc.
- Capacity building of the municipal staff.

E 3.9 Roads and Transportation

Delhi is planned on a ring and radial road pattern. The total length of major arterial and sub arterial roads in the NDMC area is about 150 Km. The ROW of roads varies from 30 m to 50 m; while the carriage way of roads varies from 2 lane to seven undivided C/W, four lane and six lane divided C/W.

Traffic characteristics in the NDMC area mirror those in the city. There has been an exponential growth in number of vehicles on the roads in Delhi. This has not been matched by a corresponding increase in the carrying capacity of the roads. Due to deficiencies in the public transport system, the decennial growth rate has been substantially higher in case of private vehicles (94.54%) as compared to commercial vehicles (18.22%).

The area experiences a large extent of through traffic --- an average of 69 % on the radial roads --- resulting on heavy stress on it's network. Traffic volumes on major arterial roads such as Janpath, Ashok Road, KG Road, Parliament Street, inner and outer circle of Connaught Place far exceeds the capacity of these roads.

The area also witnesses heavy pedestrian volumes, particularly in the commercial zones. Significant peak hour pedestrian flows are experienced on Sansad Marg, B.K.S. Marg, Janpath, Pandit Pant Marg, Red Cross road, Rajendra Prasad Road, Ashok Road, K.G. Marg and Rafi Marg.

In terms of public transportation, Delhi Transport Corporation (DTC) and privately owned State Transport Authority (STA) operate buses in the area. Two bus terminals are located in NDMC area - Shivaji Bus Terminal (between Shaheed Bhagat Marg and B.K.S Marg behind Madras Hotel in Connaught Place) and Kendriya Terminal (near C. Secretariat). Both the terminals are small.

Rajeev Chowk, located at Connaught Place, is a major hub of the metro network. This has increased the accessibility of the CBD considerably. Also, a part of the NDMC Area is served by rail network of Ring Rail from Lodhi Colony- Dhola Kuan. The city's main railway station is located just north of Connaught Place, with easy access through the CBD.

Para transit modes in NDMC area mainly constitutes of taxi and auto rickshaws; and a limited Phat-Phat Sewa currently in operation from inner circle of Connaught Place.

Issues in the sector include

- Traffic intensities are beyond the capacity of road network especially during peak hours of the day.
- Convergence of traffic in Central Area Road network due to city structure induces 60 %- 70 % through traffic causing congestion in NDMC Areas especially in peak hours.
- Improved accessibility in Central area has resulted in more footfalls. This heavy movement pedestrian traffic, without an increase in facilities, is a hazard to the pedestrian safety.
- Improper road design - No consideration for disabled and pedestrians on road, lack of continuity of pedestrian footpath.
- There is a heavy unmet demand of parking. The critical Area for Parking in NDMC Area are C. P. & Surrounding areas, Khan Market, Sarojini Nagar Market, I.N.A Market, Patiala House Courts and Delhi High court.
- There is lack of integration between different modes of public transport and intermediate public transport systems causing more use of personalized vehicles.
- There is lack of proper road signage, road markings and street furniture.

E-3.10 Power supply

Power Supply in NDMC Area is received from Delhi Transco Ltd (DTL) at 6 sub-stations. The electricity Department oversees the further distribution of power within the area. Distribution losses are at approx. 12 %.

Load growth in the NDMC area has been 160% between the years 1980 (127 MVA) to 2007 (330 MVA). Increase in demand from residential areas has been negligible: commercial areas account for a large part of the increased demand, concentrated during daytime / working hours.

There are about 17 - 18,000 street light poles in the area. Light from these is often obstructed by tree foliage.

Issues in the sector are summarized below:

- Efficient functioning of electricity department is significantly obstructed due to old equipment used.
- Sub-stations located in private buildings are in extremely poor condition, although they under the control of the NDMC
- Large procedural delays in responding to repair and maintenance requirements. There is no centralized monitoring of the entire system
- Capacity building is required at lower and working levels.

E-3.11 NDMC Finances

The financial performance of New Delhi Municipal Council (NDMC) during the last five years (as studied) indicates a surplus position with revenue income having grown at an average annual growth rate of 10.04% against an annual average rate of increase of 6.57% in case of revenue expenditure.

The revenue income of NDMC has grown to a level of Rs. 1078.98 crores in the FY 2004-05 from the level of Rs. 749.52 crores in the FY 2000-01. The revenue account of NDMC from the year 2002-03 has shown a healthy surplus. The operating ratio over the period of analysis has hovered around unity indicating that revenue income is being wholly utilized to meet expenditure.

Major sources of revenue income are taxes; and distribution of water supply, electricity etc. NDMC generates about 96% of income through its own sources which clearly indicates that it is self-sustaining; and reliance on grants is minimal. The surplus in the account indicates that the funds are available to meet deficiencies in the capital account as and when they arise.

The major items of revenue expenditure include Electricity (41%), Social & Development Services (16%), Water Supply (6%) and Administrative Department (19%). It is observed that about 22% of the total revenue income is being spent on the salaries and other related costs.

The NDMC has been a zero debt Council since FY 2004-2005.

E-3.12 Institutional Structure

The functioning of the New Delhi Municipal Council is governed by the NDMC Act, 1994. In accordance with this, the area is governed by an 11 member council, headed by a Chairman, nominated directly by the Government of India. Of the 10 members, 5 are officials, and 5 are non-officials. Among the latter, 3 are Members of the Legislative Assembly; representing constituencies in the NDMC are, while the remaining 2 are drawn from eminent personalities.

The Act further specifies the main or obligatory functions of the Council, in the area administered by it. These functions are undertaken by various departments within the NDMC. The three most significant departments, in terms of service delivery, and interaction with the public are

- Civil Department, responsible for roads, water supply and sewerage
- Public Health Department, responsible for Solid Waste Management and drainage
- Electricity Department, which handles distribution of power and street lighting

An analysis undertaken in the Public Health Department revealed that

- Technology management and the techno structure in the NDMC need considerable strengthening. Standardization of outputs and procedures is not well established, contributing to delays in decision making.
- The current environment within the organization does not promote creativity and managerial enterprise.
- There are substantial issues of inter-departmental coordination.

The foremost implication of the above is that NDMC functions with a large operating core and support structure, and inadequate techno and middle structures, making the departments self-centered, with little coordination.

E-4 Vision for Development

Based on the above assessment, and the concerns expressed during the stakeholder workshops held, the following Vision Statement was formulated for the NDMC area:

An area that provides vibrant social and recreational spaces for the city as a whole through optimum utilization of land;

Demonstrates responsibility in the use and management of resources - water, waste water; solid waste; power

Builds efficiency in its service functions through adequate planning for renewal; the judicious use of staff & available technologies; and information management systems;

Is governed in a transparent, participative and responsive manner.

The focus areas are appropriate infrastructure, organizational efficiency and use of technology in processes and information management.

In order to achieve the above, an assessment of gaps was undertaken across all sectors. Strategies to bridge the gaps were elaborated. These are elaborated below.

E-5 Strategies for Infrastructure Development

Strategies for improving water supply include (a): to undertake an accurate estimation of the water demand in the area (b): augmentation and rehabilitation of the distribution network (c): provision of efficiency in distribution and metering and (d): improvement of filtered water supply.

Strategies for sewerage comprise (a): rehabilitation and augmentation of the sewerage network. Strategies for solid waste management include (a): segregation of waste streams to ensure efficient treatment and disposal (b): clean surroundings in public areas (c): awareness raising and training for municipal staff and the public. The strategy outlined for improving drainage is to undertake interim anti-flood works until such time as the Comprehensive Drainage Master Plan for Delhi (initiated by GNCTD) is complete. NDMC should participate fully in the initiative to ensure the integration of its area in the overall drainage plan for the city.

Strategies for roads and transportation include (a): optimization of transport infrastructure (b): enhancement and management of parking (c): integration of modes of public transport (d): ensuring pedestrian safety and connectivity (e): enhancement of road infrastructure.

Strategies for improving environmental quality in the NDMC area include strengthening the environmental functions of NDMC (b): enhancing green cover and bio-diversity and (c): reduction of environmental footprint of NDMC.

Strategies for urban heritage management are (a): initiation of systematic heritage management (b): development of comprehensive information management system (c): development of in-house capacity within NDMC for conservation planning and management (d): prioritization of identified heritage sub-zones and precincts (e): development of heritage tourism circuits within the NDMC area. Urban renewal in the NDMC area is closely linked to the built heritage. Strategies for urban renewal are (a): upgradation and renewal of Connaught Place as Metropolitan City Center (b): redevelopment of obsolete land uses (c): installation of a service corridor along major arterial and sub-arterial roads.

Strategies for augmenting capacity and strengthening the NDMC as an organization include (a): strengthening corporate functions and quality consciousness (b): focusing on HR functions and training. The overall strategy to improve governance in the NDMC area is to implement a strategic e-governance initiative for the organisation's key functions.

E-6 Strategies for the Urban Poor

Within the broader goals of the local body, it is envisaged that the NDMC area will become slum-free keeping in view the forthcoming Commonwealth Games 2010. (Estimates Committee Report, 2004-05, pp. 44- 45) However, deficiencies with respect to urban basic services in the slums, need to be addressed until such time as they are relocated from the NDMC area. In this context, the overall strategy to address the requirements of the urban poor will be to undertake in-situ upgradation of services.

E-7 Project and Capital Investment Plan

Based on the above strategies, project identification and a capital investment plan have been prepared for all sectors. The shares of the major sectors, in the period 2007 -2012, as shown in the table below (table E-1) are water supply (2.2%), sewerage (8.9%), urban heritage (3.0%), environmental management (9.2%), roads and transportation (30.5%), urban renewal (41.5%), governance (.7%), organizational strengthening (1.4%).

Investment requirements for upgrading services for the urban poor account for 1.7% of the total investment.

E-8 Financial Sustenance Plan

In order to assess the investment sustaining capacity of NDMC, the municipal fiscal situation has been simulated, based on a Financial Operating Plan (FOP). The FOP is essentially a multi-year forecast of municipal finances for a term of 15 years. It has been used to forecast the revenue income and operating expenditures for the period between FY 2005-06 and FY 2019-20. The department wise capital investments are presented in the table E-2 below.

Table E-2: Department-wise investment

Department	Total Investment (Rs Lakh)	Investment by Department (Rs Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12
NDMC	114975	57487.5	3320.3	12096.6	18279.5	14824.1	8966.9
CPWD	1380	690.0	140.0	175.0	125.0	125.0	125.0
DJB	900	450.0	200.0	250.0	0.0	0.0	0.0
Waqf Board	25	12.5	9.0	1.3	0.8	0.8	0.8
AAI / Gol	500	250.0	150.0	25.0	25.0	25.0	25.0
DMRC	30	15.0	2.5	5.0	2.5	2.5	2.5
DDA	20	10.0	7.5	2.5	0.0	0.0	0.0
GNCTD	400	200.0	25.0	100.0	75.0	0.0	0.0
Pvt.	26550	13275.0	1262.5	3062.5	3213.8	3058.8	2677.5
Beneficiary Contribution	1397	698.3	11.7	203.9	225.0	257.6	0.0
DTTDC	500	250.0	50.0	50.0	50.0	50.0	50.0
TOTAL	146676	73338.2	5178.5	15971.9	21996.7	18343.9	11847.7

NDMC is required to make investments not only to meet the capital costs as presented above, but also the O & M costs. The total O & M cost that will have to be borne by NDMC are presented in the table below:

Table E-3: O & M requirements of NDMC

	Total investment for which O & M reqd. by NDMC (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Estimated O & M Cost to be borne by NDMC	113013.19		354.63	1041.67	4866.58	6998.78	8263.67

Forecasting of municipal revenues have been made taking into account events that will lead to augmentation of municipal revenue flows. These include introduction of professional tax; completion of real estate development projects; renewal of building leases on favorable terms; and the notification of circle rates. In addition to these, reform measures have been suggested to effect

increases in revenue. In the area of property tax these include (a): time limit be set for completion of assessments after issue of notice for revising assessments; and (b): Time limit be set for completing action on cases remanded by courts. In the case of water supply, these include (a): increased metering, leading to increased monitoring of water use (b): regular upward revision of water tariffs.

The projections undertaken indicate that the NDMC is able to sustain the investment requirements for the projects identified. The revenue account experiences a deficit in the years 2007-08 and 2008-09. Similarly, the capital account experiences a deficit until the year 2011-12. The overall account reflects a deficit in the years 2007-08 to 2010-11. However, the closing balance remains in surplus throughout the period 2005-06 to 2020-21, indicating that surpluses accumulated in previous years, together with the cash flows in the revenue and capital accounts considered jointly, are sufficient to meet the investment requirements, without recourse to a loan.

Table E-1: Projects proposed under sub-mission-1 (Urban Infrastructure and Governance) and sub-mission-2 (Basic Services to the Urban Poor)

Sector	Total Investment (Rs Lakhs)	% of Total Investment Proposed	2007-08	2008-09	2009-10	2010-11	2011-12	Central Govt (@ 35%)	State Govt (@15%)	ULB/ Parastatal/ other agencies (@50%)
sub-mission 1										
WATER SUPPLY	2530.25	1.73	694.00	1047.00	389.25	200.00	200.00	885.59	379.54	1265.13
SEWERAGE	10370.00	7.07	370.00	1770.00	3710.00	3310.00	1210.00	3629.50	1555.50	5185.00
HERITAGE MANAGEMENT (BUILT AND NATURAL)	3440.00	2.35	1565.00	775.25	378.25	366.25	355.25	1204.00	516.00	1720.00
ENVIRONMENT	10731.00	7.32	30.00	795.00	3706.00	3200.00	3000.00	3755.85	1609.65	5365.50
DRAINAGE	490.00	0.33	80.00	230.00	180.00	0.00	0.00	171.50	73.50	245.00
SOLID WASTE MGMT	720.00	0.49	9.00	341.00	190.00	90.00	90.00	252.00	108.00	360.00
ROADS AND TRANSPORTATION	35620.00	24.28	4110.00	7260.00	7650.00	8575.00	8025.00	12467.00	5343.00	17810.00
URBAN RENEWAL	78392.00	53.45	3300.00	18680.00	26287.00	19825.00	10300.00	27437.20	11758.80	39196.00
GOVERNANCE	791.25	0.54	50.00	230.00	230.00	281.25	0.00	276.94	118.69	395.63
ORGANISATIONAL DEVELOPMENT	1610.50	1.10	16.50	41.50	522.50	515.00	515.00	563.68	241.58	805.25
sub-total 1	144695.00	98.65	10224.50	31169.75	43243.00	36362.50	23695.25	50643.25	21704.25	72347.50
sub-mission 2										
BASIC SERVICES TO THE URBAN POOR	1981.44	1.35	132.39	773.75	750.00	325.00	0.00	990.72		990.72
sub-total 2	1981.44	1.35	132.39	773.75	750.00	325.00	0.00	990.72	0.00	990.72
TOTAL	146676.44	100.00	10356.89	31943.50	43993.00	36687.50	23695.25	51633.97	21704.25	73338.22



Table of Contents



Subcity Plan NDMC

TABLE OF CONTENTS

CHAPTER - 1 INTRODUCTION

1.1	BACKGROUND	1-1
1.2	SUB-CITY PLAN	1-1
1.2.1.	<i>Objective of Sub-City Plan.....</i>	1-1
1.3	SCOPE.....	1-2
1.3.1.	<i>Area Assessment: Analysis of Existing Situation</i>	1-2
1.3.2.	<i>Stakeholder Consultations & Evolution of a Vision for the Area vis-à-vis the City</i>	1-3
1.3.3.	<i>City Investment Plan and Financial Alternatives</i>	1-3
1.3.4.	<i>Diagnostic for Capacity Building.....</i>	1-3
1.4	STRUCTURE OF REPORT	1-4

CHAPTER - 2 DEMOGRAPHIC PROFILE

2.1	DEMOGRAPHIC STATUS.....	2-1
2.1.1	<i>Area and Population</i>	2-1
2.1.2	<i>Population Density.....</i>	2-2
2.1.3	<i>Population Growth Trend.....</i>	2-2
2.1.3	<i>Literacy Rate.....</i>	2-3
2.1.3	<i>Population Projection</i>	2-3

CHAPTER - 3 LAND & GROWTH MANAGEMENT

3.1	INTRODUCTION	3-1
3.2	PLANNING FRAMEWORK.....	3-2
3.3	LAND OWNERSHIP AND LAND USE	3-3
3.3.1	<i>Residential</i>	3-3
3.3.2	<i>Commercial Areas.....</i>	3-5
3.3.3	<i>Recreational Areas.....</i>	3-5
3.4	DEVELOPMENT PROPOSALS AND INITIATIVES	3-5
3.5	SLUMS.....	3-8
3.5.1	<i>Access to Infrastructure.....</i>	3-9
3.6	ISSUES	3-12

CHAPTER - 4 ENVIRONMENT PROFILE

4.1	STATE OF ENVIRONMENT IN NDMC AREA.	4-1
4.1.1	<i>Air Quality.....</i>	4-2

4.1.2	Water Resource	4-9
4.1.3	Noise Levels	4-15
4.1.4	Biodiversity & Vegetation	4-17
4.2	FUNCTION OF NEW DELHI MUNICIPAL COUNCIL AS PER NDMC ACT FOR PROTECTION AND IMPROVEMENT OF ENVIRONMENT IN THE AREA	4-27
4.2.1	Obligatory functions of the Council.....	4-27
4.2.2	Discretionary functions of the council.....	4-28
4.3	FACTORS CAUSING STRESS ON THE ENVIRONMENT OF NDMC AREA	4-28
4.3.1	Density, Land Use and Urban Form.....	4-28
4.3.2	Transportation.....	4-29
4.3.3	Energy Production, Transmission and Use	4-29
4.3.4	Solid waste generation and disposal.....	4-29
4.3.5	Habitat loss and degradation	4-29
4.3.6	Introduction of exotic species	4-30
4.3.7	Wastewater	4-30
4.3.8	Storm water.....	4-30
4.3.9	Emission of air pollutants	4-30
4.4	KEY INSTITUTIONAL ISSUES.....	30

CHAPTER - 5 BUILT HERITAGE CONSERVATION & MANAGEMENT

5.1	SPECIAL HERITAGE CHARACTERISTICS OF THE NDMC AREA	5-1
5.2	HERITAGE SIGNIFICANCE OF ZONES WITHIN THE NDMC AREA	5-2
5.3	EXISTING STATUS OF THE LUTYENS BUNGALOW ZONE.....	5-4
5.3.1	Delineation of the Lutyen's Bungalow Zone (LBZ) and Issues	5-4
5.3.2	Defined Character Zones within the LBZ.....	5-5
5.4	EXISTING STATUS OF ASI PROTECTED MONUMENTS AND SITES OF NATIONAL SIGNIFICANCE WITHIN THE NDMC AREA AND IMPLICATIONS.....	5-8
5.4.1	Location of ASI Protected Monuments and Sites of National Significance within the different character zones of the NDMC Area.....	5-8
5.4.2	Impact of Buffer Zones (Prohibited Area and Regulated Area) associated with ASI Protected Monuments and Sites of National Significance....	5-9
5.5	NDMC IDENTIFIED (NOTIFIED) HERITAGE BUILDINGS AND PRECINCTS	5-9
5.5.1	Categories and Location of Heritage Buildings and Precincts identified (notified) by the NDMC.....	5-9
5.5.2	Related regulations.....	5-9
5.6	EXISTING REGULATIONS AND INSTITUTIONAL FRAMEWORK FOR CONSERVATION AND MANAGEMENT OF HERITAGE WITHIN THE NDMC AREA	5-10
5.7	IMPLICATIONS OF THE DDA ZONAL DEVELOPMENT PLAN FOR ZONE 'D'	5-15
5.8	IMPLICATIONS OF RECENT DUAC INITIATIVES FOR THE NDMC AREA ON THE HERITAGE AND IMPACT OF PROPOSED RE-DENSIFICATION	5-16

5.9	IMPORTANT ISSUES RELATED TO THE BUILT AND NATURAL HERITAGE OF THE NDMC AREA	5-16
5.9.1	<i>Lutyens Bungalow Zone</i>	5-16
5.9.2	<i>Financial Issues</i>	5-17
5.9.3	<i>Managerial Issues</i>	5-17
5.10	OTHER AREAS WITHIN THE NDMC JURISDICTION.....	5-18

CHAPTER - 6 LANDSCAPE & HORTICULTURE

6.1	LANDSCAPE AND HORTICULTURE WITHIN THE LBZ - SIGNIFICANCE OF VISTAS, GARDENS AND TREE LINED AVENUES AND STREETS AS AN INTEGRAL PART OF THE PLANNING OF NEW DELHI	6-1
6.1.1	<i>Grade I & Grade II Vistas As Designated Heritage Precincts And Conservation Areas</i>	6-2
6.1.2	<i>Central Ridge Reserve Forest As A Component Of The Plan For New Delhi</i>	6-3
6.2	CHARACTERISTICS OF NATURAL HERITAGE WITHIN THE NDMC AREA.....	6-3
6.2.1	<i>Environmentally significant 'ridge' area</i>	6-3
6.2.2	<i>Natural drainage channels or 'nallahs' and adjacent green areas</i>	6-3
6.3	DESIGNED PARKS AND GARDENS WITHIN THE NDMC AREA.....	6-3
6.4	LUTYENS BUNGALOW ZONE	6-4
6.4.1	<i>Technical Issues</i>	6-4

CHAPTER - 7 WATER SUPPLY

7.1	BACKGROUND	7-1
7.2	WATER DEMAND	7-1
7.3	WATER SUPPLY	7-2
7.3.1	<i>Water Supply through Various Sources</i>	7-2
7.4	WATER DISTRIBUTION SYSTEM	7-3
7.4.1	<i>Water Supply to JJ Clusters</i>	7-7
7.4.2	<i>Free Water Supply</i>	7-7
7.4.3	<i>Maintenance of Water Distribution System</i>	7-7
7.4.4	<i>Manpower</i>	7-8
7.5	EXPENDITURE AND TARIFF STRUCTURE	7-8
7.6	REVENUE FROM SUPPLY OF WATER	7-9
7.7	WATER FOR HORTICULTURE PURPOSES	7-10
7.7.1	<i>Sources of raw water / unfiltered water supply</i>	7-10
7.8	UNACCOUNTED FOR WATER (UFW)	7-11
7.9	ISSUES REQUIRING ATTENTION	7-11

CHAPTER - 8 CITY SEWERAGE SYSTEMS

8.1	STUDIES CARRIED OUT IN THE PAST	8-1
8.2	STATUS OF IMPLEMENTATION OF MASTER PLAN OF SEWERAGE	8-1
8.3	RECOMMENDATION OF THE SUB - COMMITTEE OF TAB.....	8-3
8.4	PROPOSALS UNDER CONSIDERATION FOR EXECUTION.....	8-3
8.5	DETAILS OF EXPENDITURE DURING THE LAST FIVE YEARS	8-4
8.6	ISSUES REQUIRING ATTENTION	8-4

CHAPTER - 9 STORM WATER DRAINAGE

9.1	INTRODUCTION	9-1
9.2	INSTITUTIONAL ARRANGEMENT	9-1
9.3	SECTOR ASSESSMENT	9-1
9.3.1	NDMC Drainage system	9-1
9.3.2	Kushak Nallah	9-2
9.4	KEY ISSUES	9-3

CHAPTER - 10 SOLID WASTE MANAGEMENT

10.1	INTRODUCTION	10-1
10.2	DOOR-STEP COLLECTION	10-1
10.3	PREVENTION OF LITTERING	10-1
10.4	SECONDARY COLLECTION AND TRANSPORTATION	10-1
10.5	STREET CLEANING	10-2
10.6	PRIVATIZATION OF COLLECTION AND TRANSPORTATION SERVICES	10-2
10.7	PROCESSING AND DISPOSAL	10-4
10.8	AWARENESS GENERATION	10-5
10.9	CAPACITY BUILDING	10-5
10.10	MIS AND MONITORING.....	10-5
10.11	KEY ISSUES.....	105

CHAPTER - 11 ROAD AND TRANSPORT

11.1	INTRODUCTION	11-1
11.1.1	Transportation Systems	11-1
11.1.2	Road Network	11-1
11.1.3	Rail Network	11-2
11.1.4	Delhi Metro Rail	11-3
11.1.5	Air Network	11-4
11.1.6	Public Transport Connection	11-4
11.1.7	Para Transit	11-5
11.2	TRAFFIC CHARACTERISTICS	11-5
11.2.1	Vehicular Growth Trends	11-5
11.2.2	Traffic Volumes	11-6
11.2.3	Saturation Level of Intersections	11-8
11.2.4	Pedestrian Volumes	11-8
11.2.5	Parking Characteristics	11-10
11.3	TRAVEL CHARACTERISTICS	11-12
11.3.1	Intra Urban Movements	11-12
11.3.2	O-D Characteristics in C.P.	11-13
11.4	REVIEW OF EARLIER STUDIES IN NDMC AREA	11-13
11.5	ISSUES AND CRITICAL AREAS FOR ROADS AND TRAFFIC	11-14

CHAPTER - 12 POWER SUPPLY

12.1	BACKGROUND	12-1
12.2	ORGANIZATIONAL	12-1
12.3	TECHNICAL	12-1
12.4	NDMC'S PRINCIPAL TASKS	12-2
12.5	ROAD LIGHTING SYSTEM	12-4
12.6	LOAD GROWTH IN NDMC AREA	12-4
12.7	LOAD FORECAST	12-4
12.8	VACANCY POSITIONS	12-7

CHAPTER - 13 ULB FINANCE

13.1	OVERVIEW OF NDMC FINANCES	13-1
13.2	EXTERNAL ASSISTANCE	13-2

13.3 PROPERTY TAX	13-4
13.4 DEBT SERVICING	13-7
13.5 ESTABLISHMENT EXPENDITURE	13-7
13.6 KEY ISSUES AND CONCLUSIONS	13-11

CHAPTER - 14 INSTITUTIONAL ASPECTS

14.1 OVERVIEW.....	14-1
14.2 WORK DONE SO FAR	14-1
14.3 OUTCOME	14-1
14.4 IMPLICATIONS	14-2
14.5 ENABLERS AND GOOD PRACTICES	14-2
14.6 EMERGING AREAS THAT REQUIRE ATTENTION AT NDMC FOR ORGANIZATION RESTRUCTURING	14-3
14.7 THE NEXT STEPS	14-3

CHAPTER - 15 STAKEHOLDERS WORKSHOP

15.1 INTRODUCTION.....	15-1
15.2 CONSULTATION METHODOLOGY	15-1
15.3 STAKEHOLDER PROFILE	15-2
15.4 CONSULTATION FINDINGS	15-4
15.4.1 Stakeholder Consultation workshop:	15-4
15.4.2 Key Findings of the Workshop	15-6
15.5 CONSULTATION SESSIONS WITH TRADERS ASSOCIATION AND RESIDENTS WELFARE ASSOCIATION.....	15-8
15.5.1 Key findings of discussions with Traders Association:	15-8
15.5.2 Key findings of discussions with Residents Welfare Association	15-9

ANNEXURE

Annexure 1: Agenda for the Workshop (Session 1)
Annexure 2: Agenda for the Workshop (Session 2)
Annexure 3: Proceedings of the Stakeholder Consultation Workshop for NDMC sub city plan, held on 18th May 2007.
Annexure 4: Proceedings of the Stakeholder Consultation Session for NDMC sub city plan, held on 1st June 2007 with Traders Associations and Residents Welfare Associations
Annexure 5: List of Attendees for NDMC Stakeholders Workshop

CHAPTER - 16 SWOT, VISION & STRATEGIES

16.1 INTRODUCTION.....	1
16.2 SWOT ANALYSIS	1
16.2.1 Strengths	1
16.2.2 Weaknesses.....	1
16.2.3 Opportunities	2
16.2.4 Threats.....	2
16.3 VISION STATEMENT	3
16.4 STRATEGY FOR CIVIC INFRASTRUCTURE DEVELOPMENT	3
16.4.1 Strategy for Water Supply.....	3
16.4.2 Strategy for Sewerage.....	6
16.4.3 Strategy for Solid Waste Management.....	8
16.4.4 Strategy for Drainage	9
16.4.5 Strategy for Traffic and Transport.....	11
16.4.6 Strategy for Environmental Management	14
16.4.7 Strategies for Urban Heritage	16
16.4.8 Strategies for Capacity Building and Organisational Strengthening.....	19
16.4.9 Urban Renewal.....	21
16.4.10 Governance.....	23
16.5 STRATEGIES FOR URBAN POOR	24

CHAPTER - 17 INVESTMENT FRAMEWORK

17.1 INTRODUCTION.....	17-1
17.2 SECTOR WISE INVESTMENT OPTIONS: SUB-MISSION 1	17-1
17.2.1 Water Supply.....	17-1
17.2.2 Sewerage	17-2
17.2.3 Solid Waste Management	17-3
17.2.4 Storm Water Drainage.....	17-4
17.2.5 Roads and Transportation	17-5
17.2.6 Environment	17-7
17.2.7 Heritage Management - Built and Natural	17-8
17.2.8 Urban Renewal.....	17-11
17.2.9 Organisational Strengthening	17-12
17.2.10 Governance.....	17-13
17.3 SECTOR WISE INVESTMENT OPTIONS: SUB-MISSION 2	17-14
17.4 SUMMARY OF COSTS	17-15

CHAPTER - 18 PROJECT & CAPITAL INVESTMENT PLAN

18.1 INTRODUCTION.....	18-1
18.2 INVESTMENT PLAN: SUB-MISSION 1.....	18-1

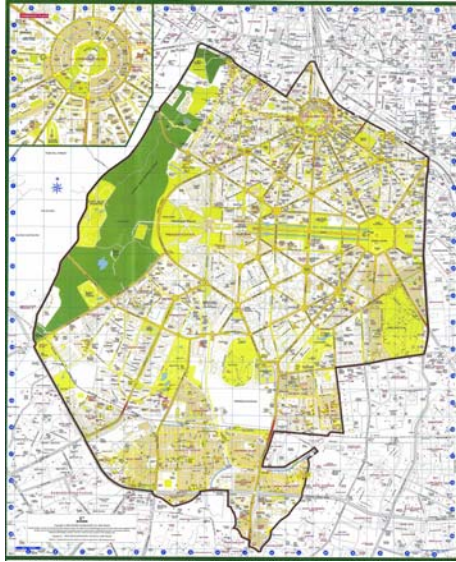
18.2.1	Water Supply.....	18-1
18.2.2	Sewerage	18-3
18.2.3	Solid Waste Management	18-4
18.2.4	Storm Water Drainage.....	18-5
18.2.5	Roads and Transportation	18-5
18.2.6	Environment	18-8
18.2.7	Heritage Management - Built and Natural	18-9
18.2.8	Urban Renewal.....	18-12
18.2.9	Organisational Strengthening	18-13
18.2.10	Governance.....	18-15
18.3	INVESTMENT PLAN SUBMISSION 2.....	15
18.3.1	Services for the Urban Poor	15
18.4	SUMMARY OF PROJECT INVESTMENT PLAN.....	16

CHAPTER - 19 FINANCIAL OPERATING PLAN

19.1	INTRODUCTION.....	19-1
19.2	DEPARTMENT WISE INVESTMENT	19-1
19.3	O & M COSTS	19-2
19.4	KEY ASSUMPTIONS IN FOP	19-2
19.5	EXPENDITURE ON PROJECTS IDENTIFIED	19-6
19.6	PROPOSED CASH FLOW FOR NDMC	19-6
19.7	CONCLUSIONS	19-7

CHAPTER - 20 INSTITUTIONAL REFORMS

20.1	INTRODUCTION.....	20-1
20.2	PROVISION OF SERVICES	20-2
20.3	E-GOVERNANCE	20-2
20.4	GRIEVANCE REDRESSAL	20-2
20.5	AGENDA FOR INSTITUTIONAL REFORMS	20-3
20.6	MEASURES ALREADY INITIATED	20-3
20.7	FURTHER RECOMMENDATIONS	20-3
20.8	CONCLUSIONS	20-4



Chapter – 1 : Introduction



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Subcity Plan NDMC

CHAPTER - 1

INTRODUCTION

1.1 BACKGROUND

The Government of India has recently announced the Jawaharlal Nehru National Urban Renewal Mission (JNNURM). The objectives of the JNNURM are as under:

- To focus attention on integrated development of infrastructure services in cities;
- Establish linkages between asset-creation and asset-management through reforms aiming at long term project sustainability;
- To ensure adequate funds to meet deficiencies in urban infrastructure services;
- To scaling up delivery of civic amenities and provision of utilities with emphasis on universal access to the urban poor;
- Focus particularly on urban renewal programmes for old city areas to reduce congestion; and
- Provision of basic services to the urban poor including improved housing, water supply and sanitation, and ensuring delivery of other existing universal services of the government for education, health and social security.

The programme seeks to initiate 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; It also seeks to strengthen municipal governments and their functioning. JNNURM comprises of two sub-missions, namely (i) Sub-Mission for Urban Infrastructure and Governance, and (ii) Sub-Mission for Basic Services to the urban Poor.

A City Development Plan is a pre-requisite to access funds available under the programme. New Delhi Municipal Council (NDMC) has initiated the preparation of a Sub-City Plan for the area under it's administration.

1.2 SUB-CITY PLAN

The Sub-city Plan promotes partnership among the various stakeholders in a city- the city government, the private business sector, civil society, academic, and national government agencies- to jointly analyze growth issues, develop a vision for the future, formulate development strategies, design programmes, prioritize projects, mobilize resources, implement, monitor and evaluate implementation.

1.2.1. Objective of Sub-City Plan

The Sub-City Plan (SCP) will outline a vision for the future development of New Delhi. Based upon a thorough understanding of the area's current state of development, the challenges it faces and its potential, it will set out an agenda for development, in order to achieve the development vision. In this process, it will identify priority areas of intervention and alternative strategies for achieving set goals. It will further seek to ensure that project investment decisions arrived at

through this process are financially and institutionally sustainable by addressing the organisational needs of the municipal government, in terms of capacity building of staff; it's financial accounting and budgeting procedures; and systems for ensuring accountability and transparency in processes of governance.

The Sub-City Plan thus aims to

(a): evolve a consensus based Sub-City Plan, incorporating a future development vision for the NDMC area, that capitalizes on it's potential and addresses current bottlenecks. This will further be based on the area's role and function within, and relationship to, the larger city of Delhi as a whole.

The SCP will include identification of financing action plans for achievement of identified goals in the short- term, medium term and long term perspective; and will also address implementation of the identified reforms under JUNURM, in order to access funds being made available under the programme.

(b): undertake a preliminary diagnostic assessment of the key areas to be targeted for capacity building within the NDMC, in order that the organization may better fulfill its obligations. The diagnostic will aim to identify key areas of inefficiency, particularly as related to functions involving a high degree of customer interface; or as impacting revenue collections.

1.3 SCOPE

The SCP will primarily address three key aspects:

1. Evaluation of the Municipal Area, through secondary sources, so as to develop a thorough understanding of the area's strengths and weaknesses; opportunities available and threats.
2. Multi -Stakeholder Consultations / Workshops aimed at sharing the above, in order to evolve a broad based vision for future development. This will also include formulation of a development strategies
3. Investment Plan and financial alternatives for the NDMC

1.3.1. Area Assessment: Analysis of Existing Situation

This stage of the assignment will focus on fact finding and analysis with regards key development characteristics; and will be based on secondary data and extensive consultation with relevant stakeholders at the disaggregate level. This will include aspects of

- Demography and economy
- Growth and land management
- Physical Infrastructure - including water supply, sanitation, municipal solid waste, flood control & drainage, roads/urban transport and urban environment; dependence on other municipal agencies for provision
- Environment
- Institutional arrangements
- Financial assessment

This report contains the findings of the above and covers elements of growth and development; institutional framework for service delivery; current service levels, gaps and future requirements in terms of services and investments; and key financial issues; optional strategy elements for service delivery enhancement and financial sustainability. This will be followed by the following actions.

1.3.2. Stakeholder Consultations and Evolution of a Vision for the Area vis-à-vis the City

The results of the first phase of analysis will be disseminated in consultations with key stakeholders and civil society, in order to develop a vision for the future development of the area - a shared and collective vision for area in a medium-term perspective.

Strategies to achieve the vision these will be suggested, which will further be translated into programmes and projects, followed by identification of priority projects for implementation under JNNURM. These will be short listed with respect to their contribution to the development vision of the area, as well as the city as a whole. It is expected that most projects will dove-tail into larger schemes for the city, whereas certain niche projects will address the local development vision specifically.

1.3.3. City Investment Plan and Financial Alternatives

An Investment Plan (IP) will be drawn up, to provide an estimate of the level and type of investment that will be needed to implement the projects and programmes identified in Phase 2. This will be an estimate and approximation only, providing an order of investment, arrived at by using financial norms or standards for service provision and up gradation. Where identified projects form a subset of projects identified at the city level, investments to be made by NDMC specifically will be isolated.

Broad strategies for financial viability of the proposed investments and improving fiscal sustainability - including options for PPP in service delivery and/or operation and maintenance (O&M), wherever relevant - will also be provided. The investment schedule will lay out the costs and revenue estimates of all priority projects in the remaining 5 years of the mission period.

1.3.4. Diagnostic for Capacity Building

The preliminary Diagnostic will aim to identify problem areas for intervention for capacity within the NDMC, in order that the organization may better fulfill its obligations. It will assess the focus areas where inputs may be most effective in enhancing the functional efficiency and overall performance of the organization.

The diagnostic will include the following tasks:

- Initial research on the key functions performed and services provided by NDMC; and structuring of the organization in order to meet these
- Meetings with officials in various departments
- Focused group discussions within the key departments

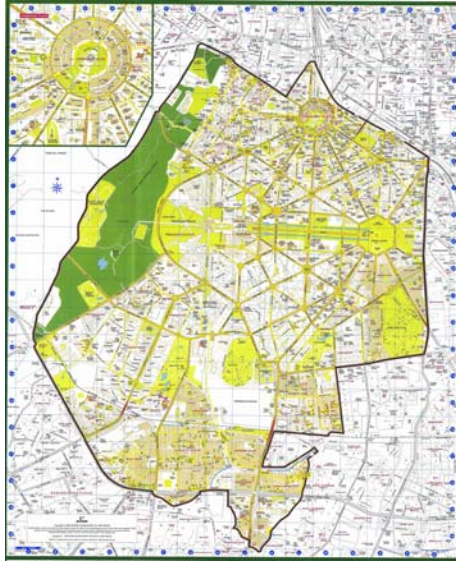
- Meetings with key persons in senior management (heads of departments, others identified)

The result of the diagnostic will be an assessment of the key areas in which interventions for capacity building are to be targeted.

1.4 STRUCTURE OF REPORT

This report presents the results of the assessment of the NDMC area. It is presented in the following chapters:

Chapter 1	Introduction
Chapter 2	Demographic Profile
Chapter 3	Land and Growth Management
Chapter 4	Environment Profile
Chapter 5	Built Heritage
Chapter 6	Landscape & Horticulture
Chapter 7	Water Supply
Chapter 8	Sewerage
Chapter 9	Storm Water Drainage
Chapter 10	Solid Waste Management
Chapter 11	Road and Transport
Chapter 12	Power Supply
Chapter 13	ULB Finance
Chapter 14	Institutional Aspects
Chapter 15	Stakeholder Consultations
Chapter 16	SWOT, Vision & Strategies
Chapter 17	Investment Framework
Chapter 18	Project & Capital Investment Plan
Chapter 19	Financial Operating Plan
Chapter 20	Institutional Reforms



Chapter – 2 : Demographic Profile

CHAPTER - 2 DEMOGRAPHIC PROFILE

2.1 DEMOGRAPHIC STATUS

Delhi has been one of the fastest growing cities in the country, marking a decadal population growth rate which is almost double the nation's average growth rate. The 2001 census, recorded a population of 1.38 Crores residing within Delhi with 3.81% annual growth rate and 46.31% decennial growth rate during 1991-2001. However, this growth has been characterized by highly concentrated development in disparate pockets of the city. The NDMC area, which was initially planned out by Luyten (and is also called Lutyen's Delhi), is one of the areas that have shown comparatively steady or low rate of population growth. Approximately 2.14% population of Delhi, inhabit the NDMC area.

2.1.1 Area and Population

The NDMC area is inhabited with a total resident population of 284,640 persons as per Census, 2001. Circle wise details of population and area are summarized in Table 2.1. Of the total NDMC population maximum population reside in Sarojini Nagar (13.8%) and Kidwai Nagar circle (12.2%) while lowest is in Mandir marg circle (3.7%).

Table 2.1: Circle wise population and Area of NDMC

Circle No.	Circle Name	Area (Sq. km)	Population (2001)
1	Connaught place	1.29	21000
2	Mandir Marg	1.69	10610
3	Gole market	2.28	33000
4	Parliament house	3.89	22980
5	Bengali market	2.78	24665
6	Pandara marg	2.37	19490
7	Sunehri Masjid	2.5	5000
8	Lodhi colony	2.98	12990
9	Jor Bagh	3.56	24875
10	Chanakya Puri	10.83	12500
11	Sarojini Nagar	1.63	39500
12	Moti Bagh	2.15	28030
13	Kidwai Nagar	2.32	35000
14	India gate	2.50	5142
Total		42.74	294783

(Source: Census 2001)

2.1.2 Population Density

Density of population is an important indicator to study population concentration and it is defined as number of persons per square kilometer. Delhi's density of population, according to 2001 census is 9294 persons per sq km, as against the national density of 324 persons per sq km in 2001. The population density of Delhi is amongst the highest in the country.

The density of population of NDMC area is 6660 persons per square kilometer. Within NDMC, Sarojini Nagar circle has the maximum density (24233 persons per square kilometer) while Chanakya Puri is a low-density area (1154 persons per square kilometer). The circle wise density in NDMC area is depicted in Table 2.2

Table 2.2: Circle wise density within NDMC area

Circle No.	Circle Name	Density
1	Connaught place	16279
2	Mandir Marg	6278
3	Gole market	14473
4	Parliament house	5907
5	Bengali market	8872
6	Pandara marg	8223
7	Sunehri Masjid	2000
8	Lodhi colony	4359
9	Jor Bagh	6987
10	Chanakya Puri	1154
11	Sarojini Nagar	24233
12	Moti Bagh	13037
13	Kidwai Nagar	15086
14	India gate	2056
Total		6660 ¹ (Avg)

Source: Census of India, 2001

A comparative assessment with other regions of Delhi depict that NDMC area shows a significantly lower population density as compared to other districts of Delhi such as North-East (29,468) or Central district (25,855) that are nearly 5 times more densely populated, as per the Economic Survey of Delhi, 2003-04

2.1.3 Population Growth Trend:

The decennial population growth, of Delhi between the periods 1991-2001, is 46.31%. However, in NDMC area the population has more or less remained stationery. It shows a slight decrease at the rate of 2% between the decades 1991-2001. The table 2.3 depicts the population trend of NDMC over three decades.

¹ Calculation of Average density of each zone= Total population/Total Area

Table - 2.3 : The decadal growth rate of population of NDMC during 1981-2001

Population			Decadal Growth	
1981	1991	2001	81-91	91-01
273048	301309	294783	10.35%	- 2%

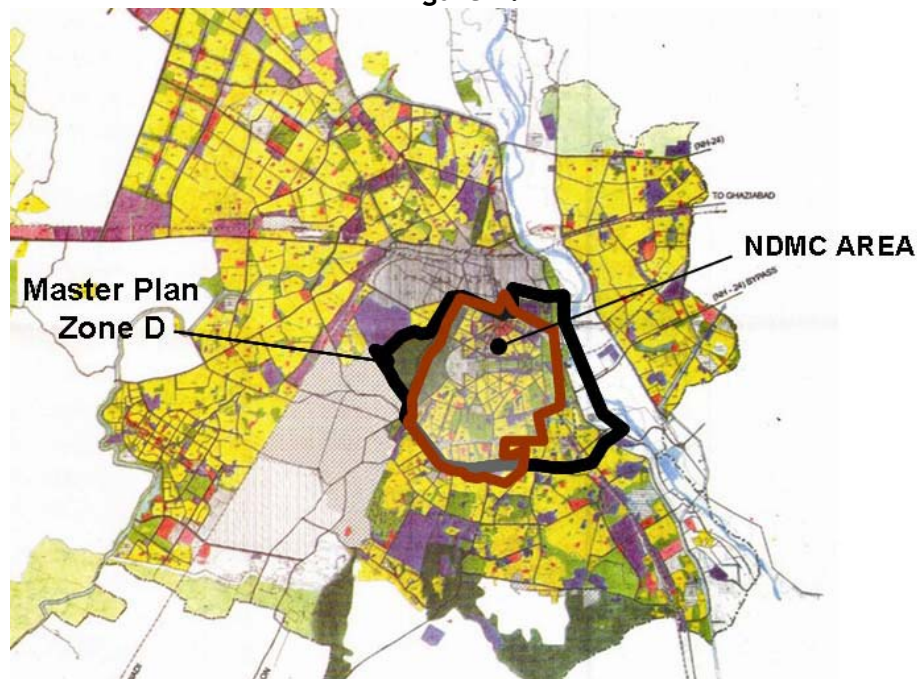
Although low figures are recorded for resident population, NDMC has a large floating population, being the Central Business District for Delhi city as a whole. It is estimated that the daily floating population in the NDMC area has increased from an approximate number of 10,00,000 persons per annum to 15,00,000 per annum. (Source: Estimates Committee Report)

2.1.4 Literacy Rate

Literacy rate in Delhi was 81.67 in 2001, as per the Census. This is among the highest in the country. The NDMC area with 83.24% literacy rate is one of the highest within the city as shown as well.

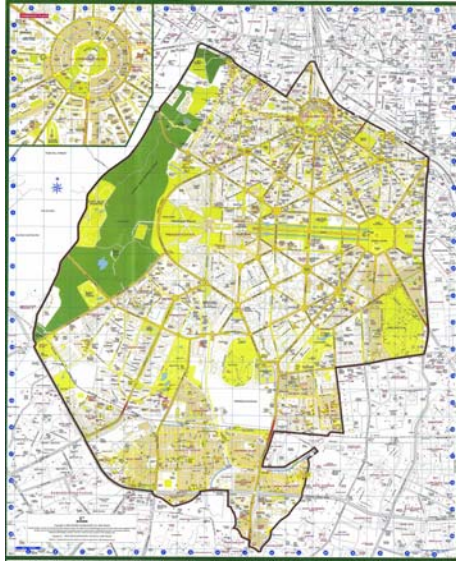
2.1.5 Population Projection

The Master Plan for Delhi provides the Zone-wise population for the city. The Zone D area includes the NDMC area as shown in the Figure 2.1.

Figure 2.1

As per the Master Plan, this area had a population of 5.87 Lakhs in 2001 and the projections for 2021 indicate a population of 8.13 Lakhs.

Extrapolating the above data onto to the actual NDMC area, which had a population of 2.94 Lakhs as per the 2001 census, the projected population in the NDMC area, for the year 2021, works out to 4.2 lakh. Since MPD envisages densification of this area, the projection has been done as per the estimates of the MPD.



Chapter – 3 : Land & Growth Management



IL&FS ECOSMART

Subcity Plan NDMC

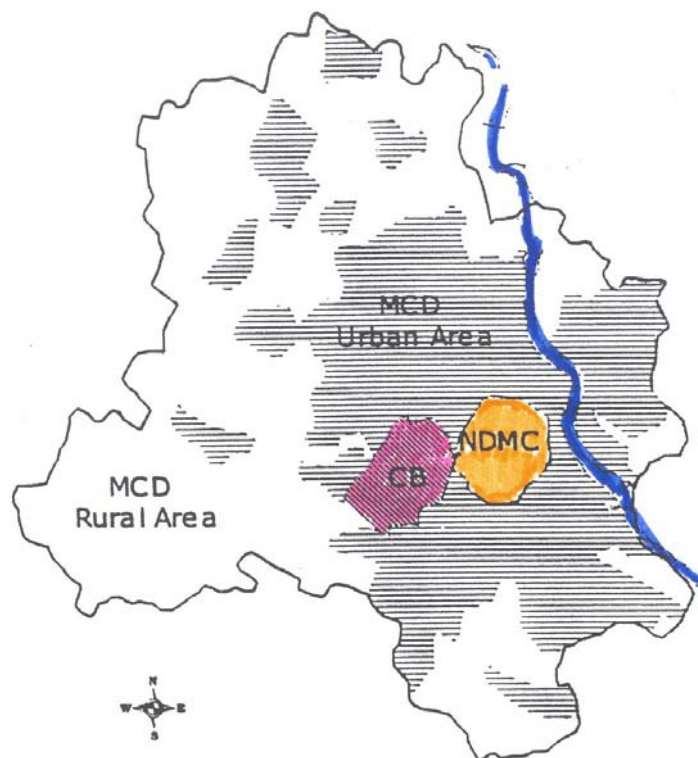
CHAPTER - 3

LAND & GROWTH MANAGEMENT

3.1 INTRODUCTION

NDMC area is situated between river Yamuna on one side and the ridge on the other and comprises of important central areas of Delhi (Ref. Map 3.1). It is adjacently located towards the south of the historical city of Shahjahanabad and extends up to the ring road. In the east, it is surrounded by river Yamuna and towards the west, by Paharganj, Karol Bagh, rehabilitated colonies such as Rajinder Nagar and Pusa Institute. Other institutions such as Rashtrapati Bhawan, Parliament House, Supreme Court, Delhi High Court and the Central Government Ministries are some of the important land marks within the zone.

NDMC has a spatial coverage of approximately 42.7 sq. km and is uniquely characterized with historical monuments and systematic plantations.



Map 3.1: NDMC Area - Location w.r.t. Delhi

The capital city of New Delhi, as planned by Sir Edwin Lutyens, is completely contained within the NDMC area. New Delhi was planned in a geometric pattern, over a triangular base, with three major functions at the apex. viz. Commercial, Governmental and Recreational: Connaught Place, Government Complex and the India Gate are the respective centers of these major activities. Connaught Place was conceived as the city centre, located geographically in the middle of Old and New Delhi. The Government complex is located towards the South West of Connaught Place.

South East of the Connaught Place and alongside river Yamuna, the area depicts a recreational land use character with India Gate and National Stadium in close proximity. India Gate and the Government Complex are linked by a monumental grid, known as the Central Vista. Flanking the Central Vista, to the north and south, are residential areas, which have a low density of population. These areas, along with the government complex, India Gate and the National Stadium, covering a total area of 22.3 sq. kms. are currently termed as the "Lutyens Bungalow Zone" (LBZ). Refer Map 3.2

3.2 PLANNING FRAMEWORK

The NDMC area is nearly wholly contained within Planning Zone D of Delhi (Refer Map 3.3 - from slide). Within the overall guidelines provided by the Master Plan for Delhi (MPD), the Zonal Development Plan¹ details the specific interventions in Zone D, which is further divided into 21 sub-zones for the purpose. (Refer Table 3.1)

Table 3.1: Sub-zones, Planning Zone D, Delhi

Sub-zone	Areas Included	
D1	Connaught Place	CBD
D2	Mana Sundari Marg	
D3	Kasturba Gandhi Marg	Bungalow Zone
D4	Sansad Marg	Bungalow Zone (Part)
D5	DIZ Area	
D6	Upper Ridge Area	Ridge
D7	Purana Qila	
D8 & D9	India Gate & Central Sectt.	
D10	Budha Jayanti Park	Bungalow Zone
D11 & D12	Khan Market & Akbar Road	Bungalow Zone
D13, D14, D21	Chanakyapuri, Safdarjung, Sarojini Nagar	Bungalow Zone
D15 & D16	Lodhi Colony, Dayal Singh College	
D17, D18, D19, D20	Nizamuddin, Jangpura, Kilolari, Lajpat Nagar, Kotla Mubarakpur	

Source: Zonal Development Plan for Zone D (1993), Delhi Development Authority

The Urban Local Body is not directly involved in the planning process for the overall area under its administration. As per the Allocation of Business Order, the Architecture and Environment Department, NDMC, performs the following functions:

- Advise the Council on matters of Architecture and Town Planning at Municipal level
- Design, Planning and coordination of all architectural projects of NDMC, from conception to completion
- Building permit/sanction of all buildings within the NDMC area
- Collection of tax on Building Permit applications

¹ Section 10 of Delhi Development Act (1957) outlines the procedure for preparation and approval of the ZDP

- Monitoring of all on-going constructions within the NDMC area, as per sanctioned plan

The NDMC Act, 1994 further elaborates the role of the Council in the area of land and growth management as:

- The maintenance and development of the value of all properties vested in or entrusted to the management of the Council (obligatory function)
- The provision of housing accommodation for the inhabitants of any area or for any class of inhabitants (discretionary function)
- The construction and management of poor-houses, rest houses, shelters, etc (discretionary function)

Thus all development and building proposals for the area are vetted by the agency's Architectural Department, headed by the Chief Architect (CA).

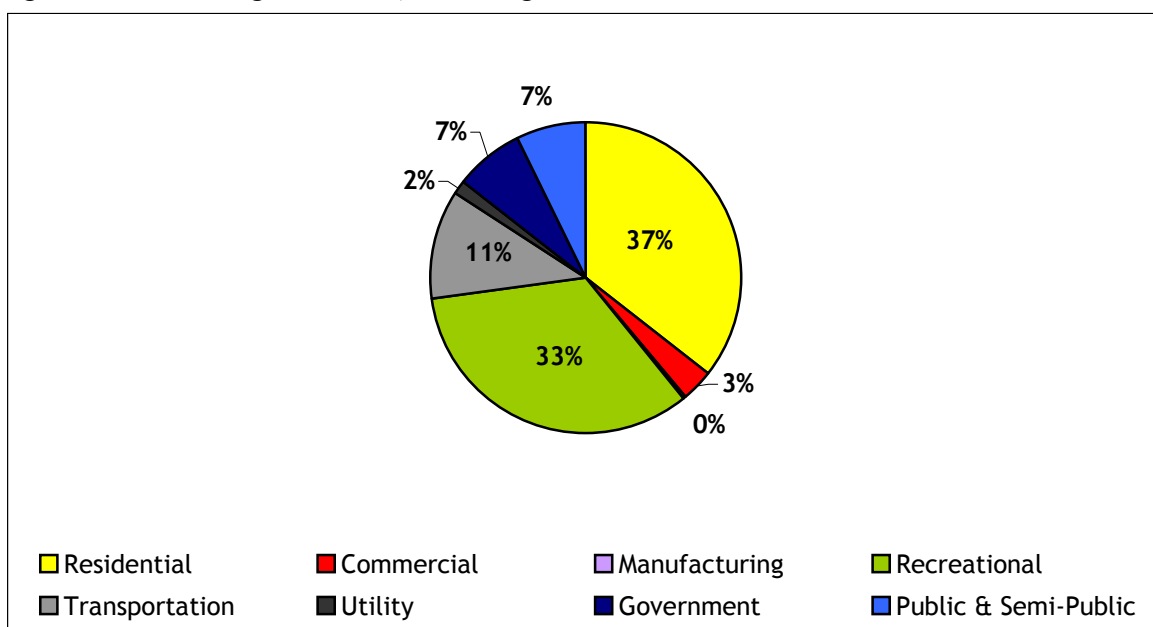
3.3 LAND OWNERSHIP AND LAND USE

A large part of the land within the NDMC geographical confines is under the ownership of CPWD and the L&DO. (Exact land ownership figures were not available). After these, the significant land owner is the Council itself.

3.3.1 Residential

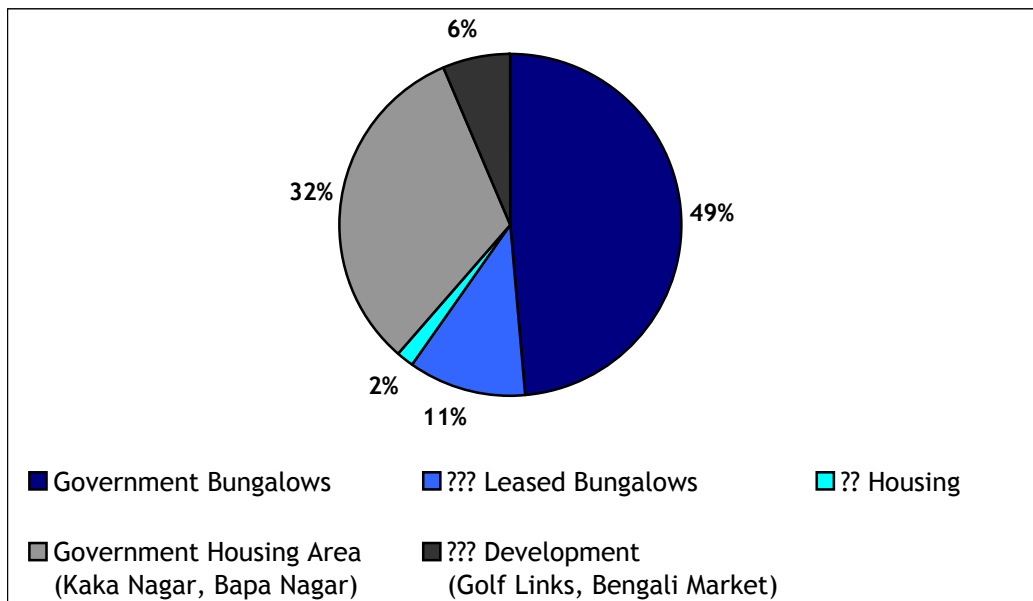
The existing land use in Zone D, as per MPD 2001 is given below:

Figure 3.2: Existing Land Use, Planning Zone D



Source: Zonal Development Plan for Zone D (1993), Delhi Development Authority

Over 30 % of the land is devoted to recreational uses. Within this land-use distribution, the composition of residential development is given in the figure below. As indicated, government housing estates, and bungalows constitute over 80% of the residential development in the area.

Figure 3.3: Existing Distribution of Residential Development

Bungalow Area

The Bungalow area comprises of large sized plots and has a pleasant environment. The area depicts a unique low density character in the heart of the city. Towards the South of Central Vista there are larger sized bungalows occupied by Government functionaries. These have a colonial style design with the main building component of about 7% of ground area with low boundary wall and with a number of out-houses. Most of the bungalows are single storeyed except at a few places, where double storey buildings also exist, such as South/North avenues area.. The most important aspect of bungalow area is that no bungalow height dominates the tree height.

North of Rajpath is mainly reserved for the residence of middle and lower rank employees of government and the bungalow concept is gradually reduced to smaller size of plots and low rise housing avenues around.

Government colonies

In addition to the Government housing in the bungalow area, there are other large Government housing areas located in this zone. These are Minto Road, part of schemes known as Gole Market, Chanakya Puri, Moti bagh, Sarojini Nagar, Netaji Nagar, Kidwai Nagar, Laxmi Bai Nagar, Lodhi Estate, Rouse Avenue and a number of other schemes to accommodate and house Government employees. Also along the railway line, railway quarters are in existence.

Private colonies

Areas such as Jor Bagh, Golf Links, Malcha Marg, Bengali Market, Chanakya Puri, Netaji Nagar, Ansari Nagar, etc. are developed as private plotted housing estates.

Public, Semi-public and Institutional Uses

Social cultural institutions located near Mandi House serve the whole city. In addition, national level institutions such as National Archives, National Museum, National Gallery of Modern Art, National Rail Museum. Teen Murti Bhawan, Indira Gandhi National Centre for Arts, Indira Gandhi Memorial are located in the NDMC area. Prominent Medical Colleges and Hospitals, include AIIMS, Lady Harding Medical College and Ram Manohar Lohia Hospital. The area has premier educational institutions such as Lady Irwin, Jesus and Mary, and Maitreyi college as well as the Institute of Archaeology and National School of Drama. The Parliament House, Supreme Court, Central Government Ministries, Delhi High Court, Union Public Service Commission, Government complex near the Tilak Bridge/I.P. Marg are located in NDMC.

NDMC area has a concentration of Government and public sector undertaking offices. These are mainly situated in Connaught Place, Parliament Street and Central Secretariat.

3.3.2 Commercial Areas

The commercial areas in NDMC are in the following hierarchy:

- (a) Connaught Place and Extension (CBD). The area of CBD is 141.2 ha.
- (b) Community Centres, located at Gole Market, Khan Market, Malcha Marg (Chanakyapuri), Yashwant Place (Chanakyapuri),
- (c) Local Shopping Centres
- (d) Non-heirarchy Commercial Centres such as Laxmi Bai Nagar, INA Market, Palika Bazar (Connaught Place), State Emporia, Sen Nursing Home, Press Area (Bahadur Shah Zafar Marg) and Sarojini Nagar market.

3.3.3 Recreational Areas

The Recreational use account for more than 30% of the total land use in the NDMC area. The area is characterized with open spaces such, parks and recreational facilities such as Delhi Flying Club, National Stadium, Delhi Polo Club, Race Course, Jawahar Lal Nehru Stadium, Lodhi Garden, Budha Jayanti Park, Mahavir Vanashtali, Central Vista, Nehru Park etc. The central ridge in this zone, which is a rocky outcrop of the Aravali Hills is declared as reserved forest.

3.4 DEVELOPMENT PROPOSALS AND INITIATIVES

Proposals for Lutyen's Bungalow Zone have been detailed in the section on Built Heritage (Refer Section 5)

Key proposals of the Zonal Development Plan (1993) for Zone D are given below:

Bungalow Zone

Area	Proposal
Residential Plotted	<ul style="list-style-type: none"> Any new construction must have same plinth area as the existing bungalow and a height not exceeding the height of bungalow in place or if plot is vacant. Height of bungalow must be equal to height of the bungalow which is the lowest of those on adjoining plots. Existing built-up area of a bungalow plot may be used for more than one DU provided the plot is not sub-divided. All existing trees to be preserved. For incorporation of out house to main building, the building envelope to be maintained with minor modifications. No basement is permitted
Residential Group Housing	Any addition/alteration/reconstruction to be as per the sanctioned scheme or as per prescribed development norms of MPD-2001
Residential Public Housing	<ul style="list-style-type: none"> No additional new floor to be added to non-bungalow Government residential accommodation. Efforts to be made to construct new Government accommodation outside the LBZ.
Semi-detached houses (Ferozshah and Dr. Rajendra Prasad Road)	<ul style="list-style-type: none"> Likely to be re-developed in near future.
Non-residential plots	<ul style="list-style-type: none"> DCRs to be worked out based on urban form studies. Max. permissible height: 21.5 mts (Parliament street/Mahadev Road)
State Government Guest Houses (Copernicus Marg)	<ul style="list-style-type: none"> Punjab Bhawan GC-25%, FAR 100, Height 14 m Setbacks : F-60 ft; R-100 ft.; S-60 ft. Haryana Bhawan GC-25%, FAR 100, Height 14 m Setbacks : F-80 ft.; R-100 ft.; S-60 ft. Maharashtra Bhawan GC-25%, FAR 100, Height 26 m Setbacks : F-40 ft; R-100 ft.; LS-20 ft.; RS-10 ft.+73 ft 9inch

Other Residential Areas

Area	Proposal
Government Housing Areas (inc. Gole Market, Chanakyapuri, Moti Bagh, Sarojini Nagar, Netaji Nagar, Laxmi Bai Nagar, Lodhi Estate, etc)	<ul style="list-style-type: none"> Most of these areas are proposed for re-densification for which comprehensive re-development schemes with provision of community facilities within stipulated norms of MPD-2001 are to be prepared. Some of these schemes have already been approved by DUAC and NDMC while most of them are in various stages of approval and preparation.

Work Centers

Area	Proposal
Convenient Shopping Centers	Average area of 0.11 ha per 5000 population
Yusuf Sarai Market	Shops to be shifted to Fire Brigade Lane Commercial center or any other such commercial center.
Government Offices (CP-D1, ITO Complex-D2, Parliament Street-D4, Central Vista-D9)	<ul style="list-style-type: none"> ▪ New Government offices proposed at two locations: <ol style="list-style-type: none"> 1. IA Area (17 ha). 2. Moti Bagh Area (26 ha). 3. MCD Civic center (4.7 ha) at Jawahar Lal Nehru Marg (Developed) ▪ Detailed parking proposals for sites in sub-zones D1, D2 and D9 to be formulated.

The detailed Development Plan for the NDMC area is currently being drawn up by the Delhi Urban Arts Commission (DUAC). The key proposals of this plan, which is still in preparation, are as under:

(i) **Densification of areas north of Rajpath, focusing on**

- The area south of Gole Dakhanna, up to Patel Chowk in the east, bound by Gurudwara Rakab Ganj Road in the south. Medium density of development, including residential, mixed and institutional use is proposed.
- The area between Windsor Place in the west up to Purana Qila Marg in the east, bound by Dr. Rajendra Prasad Road in the south and Tolstoy Marg in the north. Medium density of development (with some high density residential use on Feroze Shah Road) is proposed. This consists mainly of residential development, with commercial and institutional development along Feroze Shah Road and the stretch of Janpath south of Windsor Place.

The built up area in these lots is proposed to be augmented from the current 357100 sq.mts, to a total of 1304247 sq. mts. This amounts to a net increase of 947147 sq. mts.

- (ii) **Densification of residential lots south of Rajpath, in the Bungalow Zone.** The built up area is proposed to be doubled from the existing 200223 sq. mts, to a total of 400446 sq. mts, amounting to a net increase of 200223 sq. mts.
- (iii) **Re-organisation and densification of Sunehri Bagh Area,** increasing the number of Bungalows from 15 (existing) to 31 (proposed), a net increase of 16 bungalows

In addition to the above interventions, significantly in the LBZ Area, densification is also proposed for Aliganj, south of Lodi Colony; and Netaji Nagar. The details of these proposals are not available. However, with respect to the redevelopment of employer housing (government housing estates), the Master Plan 2021 recommends (at minimum) doubling of the existing density. It further suggests that "the infrastructure enhancement and the housing provision for new intensive development can be financed from the funds generated through cross-subsidisation of commercial use as provided in the hierarchical level of development" (Draft MPD-2021, pg. 23)

3.5 SLUMS

The Enforcement Department of the NDMC is responsible for all matters relating to encroachments and slums.

At present, there are 38 J.J. clusters in the NDMC area, inhabited by more than ten thousand households, and occupying more than 14 hectares of land (Refer Map 3.4, and comprehensive list in Annexure 3.1). Seven clusters are located on the land area under NDMC ownership and the remaining are located over the properties of other landowning agencies in the NDMC area. The agency wise details of JJ cluster is provided in Table 3 and Table 4 (based on the detailed survey conducted in 2005 by the Slum and JJ Department of MCD.)

As evident from Table 1, a significant number of slums are located on land owned by the L&DO². The largest slum in NDMC area is Sanjay Camp Part-I and Part II at Chanakyapuri on land earmarked for a District Park. The slums are located between railway line and the railway museum behind Singapore and Iraq Embassy. The slum has 4250 jhuggies spread over an area of 4.5 ha and is located on L&DO land. A majority of slums in the NDMC area are small clusters, having less than 100 households.

Most of the slums in the NDMC area are located on encroached properties meant for recreational and residential use. A significant number is situated adjacent to water bodies or drains. Slums over L&DO land significantly comprise of encroachments of land, designated for institutional and recreational use.

Table 3.2: Analysis of JJ clusters in NDMC area in terms of Land owing Agency, Land Use and Size

Land owing Agency	Area in Sq. m.	Total slums	No. of Jhuggies
CPWD	13350	10	748
L&DO	86750	16	8272
NDMC	11650	5	805
Others	28700	7	1042
Grand Total	140450	38	10867
Landuse			
Adjacent to Water Body	9550	3	612
Institutional	19600	9	2792
Recreational	47000	8	2296
Residential	64300	18	5167
Grand Total	140450	38	10867
Number of Household			
> 500 HH	73850	6	7550
100-500 HH	37250	10	2297
1-100 HH	29350	22	1020
Grand Total	140450	38	10867

²The Land & Development Office under Ministry of Urban Affairs and Employment is the superlessor in charge of about 60,000 properties consisting of 20,000 hectare of land of different types of the Central Government in Delhi. Out of this 3147 are Nazul & perpetual leases of land & remaining are rehabilitation leases transferred from the Department of Rehabilitation.

Table 3.3: Analysis of JJ clusters in NDMC with respect to Land owing Agency and earmarked Land Use

Land owing Agency	Landuse	Area in Sq. m.	Total no of slums	No. of Jhuggies
CPWD	Institutional	6350	5	327
	Recreational	3600	2	314
	Residential	3400	3	107
CPWD Total		13350	10	748
L&DO	Adjacent to Water Body	900	1	12
	Institutional	12350	3	2425
	Recreational	19500	2	1100
	Residential	54000	10	4735
L&DO Total		86750	16	8272
NDMC	Adjacent to Water Body	8650	2	600
	Institutional	900	1	40
	Residential	2100	2	165
NDMC Total		11650	5	805
Others	Recreational	23900	4	882
	Residential	4800	3	160
Others Total		28700	7	1042
Grand Total		140450	38	10867

The Slum & J.J. Dept. of MCD is the nodal Agency for the removal of JJ Clusters and as per the policy of the Government of India, it is the responsibility of the land owing agency to estimate the relocation charges, and deposit the same with the Slum & J.J Dept for shifting the J.J. Clusters from its land. In accordance with this, NDMC has already deposited over Rs. 1 crore with MCD towards the removal of slum clusters at Arjun Dass Camp (East Kidwai Nagar); Arjun Dass Bengali Camp (East Kidwai Nagar); and backside of house No. 2, Tughlak Lane and 21-A Aurangzeb Lane. The time frame for the removal of the slums is not known.

3.5.1 ACCESS TO INFRASTRUCTURE:

As per the information from various departments providing services in JJ clusters of NDMC area, it is evident that most of the slums have some provision of services. However waste storage facilities such as masonry dustbins are mostly common arrangements for both the JJ clusters and the neighboring residential colonies or institutional areas. It is also evident that in the last three years NDMC has spent approximately 33 lakh for provision of basic amenities to slum clusters such as drinking water, paved footpath and Jan Suvidha complexes.

As per the outcome budget 2006-2007 of Govt. of NCT of Delhi, in NDMC area, Rupees 10 lakh have been approved for sanitary and environmental facilities to improve the environment of the clusters.

Following section describes the current arrangement of water supply, sanitation and sewerage in JJ clusters of NDMC area.

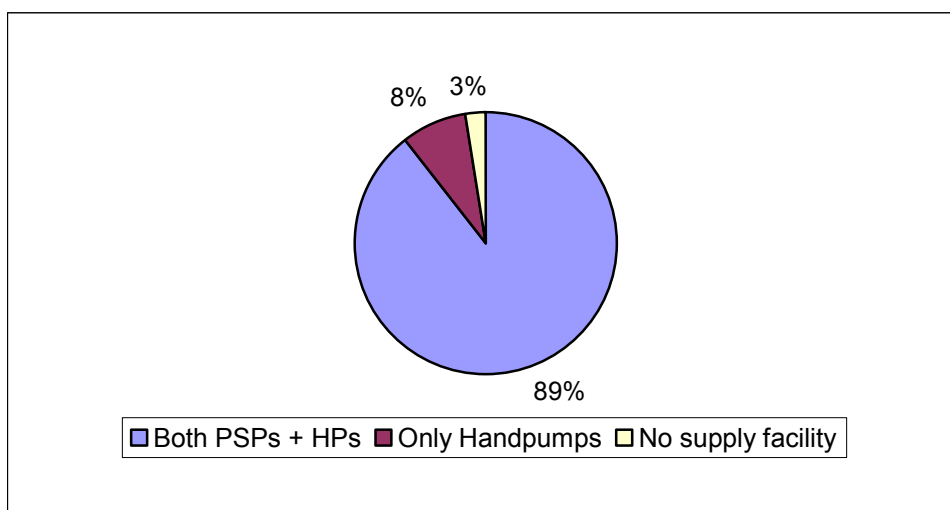
WATER SUPPLY

The water supply provisions in J.J Clusters of NDMC area appear reasonably adequate as per the information with respect to the infrastructure and number of hours of supply.

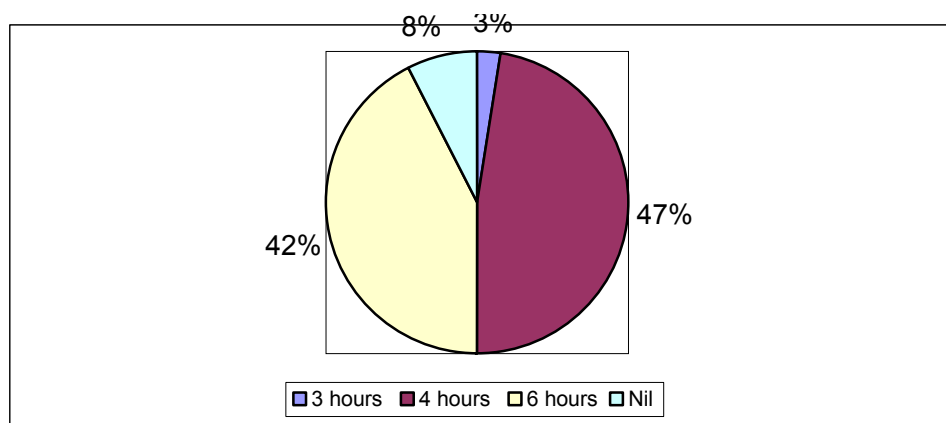
Access to water through piped supply and hydrants exist in most of the slums. Only 11% of the total number i.e. 4 slums do not have water provisioning infrastructure. While maximum numbers of slums are equipped with at least 1 to 3 hydrants or piped supply system. Also, a large proportion of slums (i.e. 71%) have at least 1 to 4 hand pumps in each slum cluster. However in few slums, some hand pumps are no longer functional.

Almost 90% of the total slums in NDMC area have a daily water supply of 4 to 6 hours through the given arrangement. In other areas, tanker provision is also given to slum dwellers. Please refer the **Annexure 3.2**, for slum wise details of infrastructure facilities.

Figure 3.4: Water supply Arrangement in JJ clusters



Source: EE, Water supply, NDMC

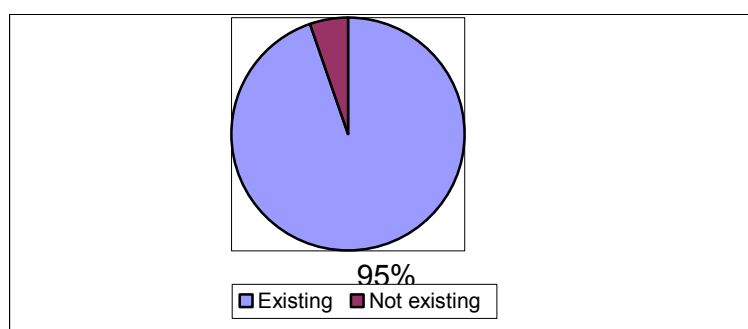
Figure 3.5: Hours of water supply in slum pockets of NDMC

Source: EE, Water supply, NDMC

SANITATION AND SEWERAGE

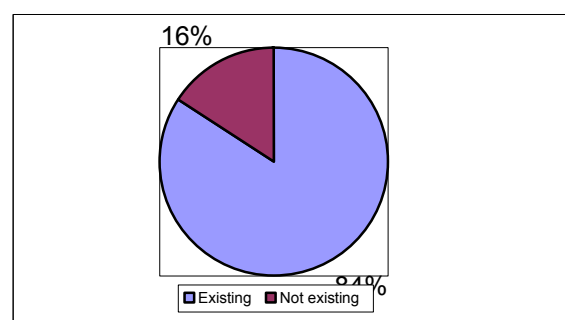
Community toilet arrangement exists in more or less all slum clusters within NDMC area. These are mostly Sulabh shauchalayas run either on pay and use basis or for free use. (Specify number of seats per complex)

Sewerage arrangement through sewer lines exist in almost 84% of the total J.J clusters in NDMC area. A 150mm to 300mm dia sewer line exists carrying the sewerage discharge generated from the cluster. In some clusters there are no sewer lines and individual toilets are connected to septic tanks.

Figure 3.6: Sanitation Arrangement in JJ clusters

Community toilet arrangement

Source: MoH, Health Department, NDMC & EE, Sewerage, NDMC.



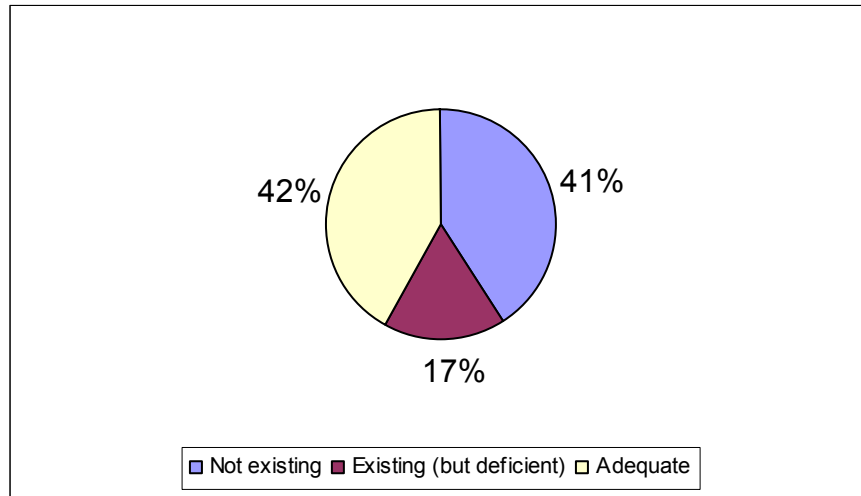
Sewer lines arrangement

STREET LIGHTING

Street lighting arrangement is most of the slums in NDMC area is either absent or inadequate. The figure below depicts that approximately 17 slums have no street lighting arrangement at all while, in 5 slums, although the lighting arrangements

exist, it is inadequate for the entire cluster. Around 15 slum clusters are found to have adequate street lighting arrangements.

Figure 3.7: Street Lighting Arrangement in JJ clusters



Source: Electrical department, NDMC

3.6 ISSUES

Key issues in the area of land and growth management are summarized below:

- The ULB has very limited decision-making authority in planning and development of the area under its jurisdiction. In addition to this, a significant portion of the land within the administrative confines of NDMC is under the actual ownership of central government agencies such as L&DO and CPWD.
- The MPD-2021 envisages meeting a substantial part of the additional growth requirements of the city through densification of planning zones A - H. Although exact figures are not as yet available, considerable densification is planned in the NDMC area, including the bungalow zone, and in the government housing estates. Moreover, improvements in connectivity, by virtue of the newly opened Metro hub in Connaught Place, will lead to an increase in the floating population of the area. Substantial up-gradation of infrastructure will be required to cater to the increase in resident and floating population.
- Most of the slums in the area are located on lands earmarked for residential and recreational uses. As much as 7.3 hectares of land earmarked for these uses and occupied by slums belongs to the L&DO. Since the NDMC area already has over 30 % of available land designated for recreational uses, this presents a unique opportunity to implement in-situ redevelopment schemes for the slum clusters. Additionally, rental housing managed by the ULB for the lower income groups may also be developed. Under the NDMC Act, this constitutes a discretionary function of the Council.

Annexure 3.1

**Report of Comprehensive Survey of J. J. Cluster Existing in NDMC Area
Conducted From 31.12.2004 to 05.01.2005**

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Land use	Name of Land Owning Agency	Outer Boundary	No. of Jhuggies (approx.)
1.	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	5950	River / Nallah / Water flow	NDMC	One Side Central Market Kidwai Nagar and one side INA Market	350 Nos.
2.	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	2700	River / Nallah / Water flow	NDMC	One Side Central Market Kidwai Nagar and one side INA Market	250 Nos.
3.	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	900	Proposal E.S.S	NDMC	One side boundary of Khushid Lal Bhawan, one side NDMC E.S.S	40 Nos.
4.	Jhuggies at Dhibi Ghat No. 15, South Avenue	700	Residential	NDMC	One side south Avenue Market, birth sides service road	35 Nos.
5.	J. J. Cluster at back of house no. 2, Tuglak Lane and 21-A Aurangzeb Lane	1400	Residential	NDMC	One side NDMC Health Store, on the back lane of 21-A Aurangzeb Lane.	130 Nos.
6.	Vivekanand Camp Part-II Chanakyapuri near Bapu Dham Service Centre	10000	Residential	NDMC 500 Sq. m. L&DO 9500 Sq. m.	Gate No. 3 of American School, one side Bapu dham S/Centre one side Chandragupt Marg	500 Sq. m. area allotted to NDMC for E.S.S (12-4 only on NDMC land) - 400 Nos.
7.	Sanjay Camp Part-I, Railway Camp Colony, Chanakyapuri	31200	District Park / Residential	NDMC - 1800 L&DO - 29400	One side railway line, one side railway museum	1800 Sq. m. area allotted to NDMC for E.S.S - 3500

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Land use	Name of Land Owning Agency	Outer Boundary	No. of Jhuggies (approx.)
					behind Singapore Embassy	Nos.
8.	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg	500	Residential	L&DO	Old P&T quarter and President Estates qrs.	85 Nos.
9.	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	2100	Residential	L&DO	One side NDMC Pump House other side Maharajs Agrasen Marg	140 Nos.
10.	Raju Camp, C-33 Block, Havlock Squater, Kali Bari MArg	1200	Residential	L&DO	One side Health Enf. Store and other side P&T Staff quarters	64 Nos.
11.	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squarter, Kali Bari Marg	500	Residential	L&DO	One side Health Enf. Store and other side P&T Staff quarters	30 Nos.
12.	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg	3500	Residential	L&DO	Boundary of E.S.S right side kali Bari marg	252 Nos.
13.	J. J. Cluster near Cement Godown Netaji Nagar	6750	Govt. Offices	L&DO	Cement Godown CPWD, one side railway line and under bridge of Africa Avenue	1800 Nos.
14.	J. J. Cluster Known as Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	5400	Neighborhood Playground	L&DO	One side boundary of Sanshya near Wireless area amd Multi-storeyed flats ring road.	350 Nos.
15.	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	14100	District Park / Residential	L&DO	One side railway line one side railway museum behind Iraq	750 Nos.

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Land use	Name of Land Owning Agency	Outer Boundary	No. of Jhuggies (approx.)
					Embassy	
16.	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand Vidyalaya	2100	Residential	L&DO	Boundary of Vidhan Chand Vidyalaya, one side Flyover Ring Road, Moti Bagh	125 Nos.
17.	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	4800	Re-developed area	L&DO	One side New Khanna Market one side Prem Nagar and Kotla Mubarakpur nallah	600 Nos.
18.	Rajiv Gandhi Camp behind T.P. Lane, Mother Terressa Crescent	900	Residential	L&DO	One side Kushak nallah other side Govt. flats	14 Nos.
19.	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother Terressa Crescent	900	Nallah / River / Water flow	L&DO	On the berm of kushak nallah and one side Govt. flats	12 Nos.
20.	J. J. Cluster near Jawahar Bhawan between R.P. Road and Raisina Road	800	Socio-Culture Institute	L&DO	One side Jawahar Bhawan, back of Shastri Market	25 Nos.
21.	Pacca J. J. Cluster near Princes Park Sangli Mess	Approx. 2000	Residential	L&DO	Sangam Apptt. Tilak Marg sangle Mess	125 Nos.
22.	J. J. Cluster known as Madrasi Capm behind D-II Flats, Kidwai Nagar East	3200	Redeveloped area	CPWD	In between D-II flats, Kidwai Nagar, East	150 Nos.
23.	J. J. Cluster behind Palika Dham and Hotel Nicco, Bangla Sahib Road.	1500	Retail and General Business (CBD)	CPWD	Back side of office of V.S.N.L and one side Palika Dham Complex	60 Nos.
24.	J. J. Cluster known as Madrasi Camp behind D-II flat Nos. 65-68	200	Redeveloped area	CPWD	In between D-II flats, Kidwai Nagar, Eats	25 Nos.
25.	Jhuggies at Talkatora Park	400	Green Area	CPWD	Backside of Talkatora	14 Nos.

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Land use	Name of Land Owning Agency	Outer Boundary	No. of Jhuggies (approx.)
	Lane Behind Talkatora Stadium				Stadium and Park Lane	
26.	J. J. Camp Bharti Nagar, Khan Market	2350	Residential	CPWD	One side NDMC boosting pumping station, one side Tennis Court and D-II flats, Bharti Nagar	40 Nos.
27.	Labour Camp, Humayun Road, Khan Market	3200	District Park	CPWD	Back side of Cementary, one side Humayun / Road and Khan Market	300 Nos.
28.	Indira Camp, Pandara Road behind Kendriya Bhandar	550	Residential	CPWD	Within D-II flats, Pandara Road, backside of Kedriya Bhandar	27 Nos
29.	J. J. Cluster, back of Chelmsford Club, Raisina Road	450	Socio-Culture Institute	CPWD	Backside of Chelmsford Club and one side Raisina Road.	32 Nos.
30.	J. J. Cluster behind Meridien Hotel, Dr. Rajinder Prasad Road	1000 (Scattered)	Socio-Culture Institution	CPWD	One side Meridian Hotel and back lane of M.P. Flats, Dr. R.P. Road	60 Nos.
31.	J. J. Cluster behind Kashmir House Rajaji Marg	500	Residential	CPWD	Backside of Kashmir House. One side Kusha Road	40 Nos.
32.	Bhaiya Ram Capm, Race Course Club, Race Course Road.	7000	Playground / Stadium / Sports Complex	RACE COURSE CLUB	In the compound of Race Course Club	500 Nos.
33.	J. J. Camp at DID, Race Course near Riding Club, Safdurjung Road	2900	Playground / Stadium / Sports Complex	RACE COURSE CLUB	One side DID, One side Rose Garden	85 Nos.
34.	J. J. Cluster at Purana Quila Road, N.S.C.I	7800	Playground / Stadium / Sports Complex	NSCI	In the compound of NSCI and one side Purana	250 Nos.

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Land use	Name of Land Owning Agency	Outer Boundary	No. of Jhuggies (approx.)
					Quila Road	
35.	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	1000	Residential	RAILWAY	Safdurjung Railway Line	35 Nos.
36.	J. J. Cluster at Shiv Mandir near Railway Flying Club	2000	Residential	RAILWAY	Delhi Flying Club and Railway	65 Nos.
37.	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	1800	Residential	FLYING CLUB	Delhi Flying Club	60 Nos.
38.	J. J. Camp near Masjid Polo Ground, Race Course Club, Kamal Attaturk Road.	6200	Playground / Stadium / Sports Complex	DEFENCE	In the compound of Race Course Club	47 Nos.

Annexure 3.2

S.N	Name and Location of J. J. Cluster	Name of Land Owning Agency	No. of Jhuggies (approx.)	Total population	Water supply		Toilet Clusters	Sewerage	Street Lighting
					Piped Supply/ Hydrants	Hand pumps			
1.	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	NDMC	350	2030	2	2	1	No sewerage system, whatever is being discharged, is flowing into the nearby Nallah.	Not Existing
2.	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	NDMC	250	1450	2	2	1	No sewerage system, whatever is being discharged, is flowing into the nearby Nallah	Not Existing
3.	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	NDMC	40	232	3	1	0	A 150 mm dia sewer line exists	Not Existing
4.	Jhuggies at Dhobi Ghat No. 15, South Avenue	NDMC	35	203	4	6	1	A 150 mm dia sewer line exists outside Jhuggi cluster. PTU exists connected to sewerage system.	2
5.	J. J. Cluster at back of house no. 2, Tuglak Lane and 21-A Aurangzeb Lane	NDMC	130	754	4	2	1	A 230 mm dia sewer line exists outside Jhuggi cluster. There is a common toilet connected to sewerage system	5
6.	Vivekanand Camp Part-II Chanakyapuri near Babu Dham Service Centre	NDMC 500 Sq. m. L&DO 9500 Sq. m.	50	290	4	3	1	Public Toilet exists which is connected to 250mm dia sewer line.	7
7.	Sanjay Camp Part-I, Railway Camp Colony, Chanakyapuri	NDMC – 1800	40	232	15	4	1	Public Toilet exists which is connected to 150mm dia sewer line.	20

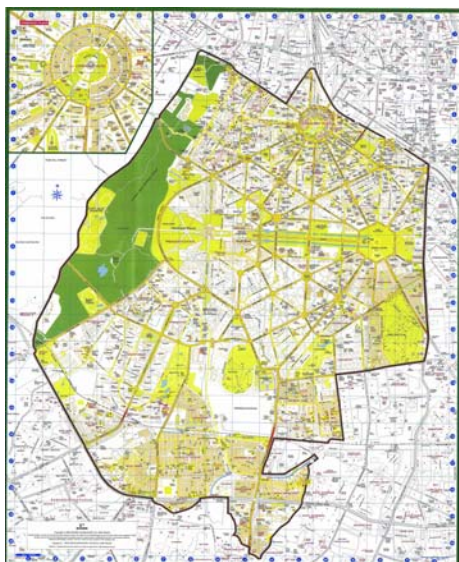
S.N	Name and Location of J. J. Cluster	Name of Land Owning Agency	No. of Jhuggies (approx.)	Total population	Water supply		Toilet Clusters	Sewerage	Street Lighting
					Piped Supply/ Hydrants	Hand pumps			
8.	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg		85	493	4	1	1	A 300mm dia sewer line exists outside Jhuggi Cluster. There is a common toilet connected to sewerage system.	Not Existing
9.	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	L&DO	140	812	2	0	1	No sewerage system, whatever is being discharged, is flowing into the nearby Nallah.	Not Existing
10.	Raju Camp, C-33 Block, Havlock Squater, Kali Bari Marg	L&DO	64	371.2	3	1	1	There is a common toilet which is connected to 450mm dia sewerage system.	2
11.	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squater, Kali Bari Marg	L&DO	30	174	6	4	1	A 300mm dia sewer line runs outside J.J cluster. Common toilet exists connected to sewerage system.	Not Existing
12.	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg	L&DO	252	1461.6	10	4	0	A 300mm dia sewer line runs at Kali Bari lane outside J.J cluster.	12
13.	J. J. Cluster near Cement Godown Netaji Nagar	L&DO	1800	10440	5	1	1	There is a common toilet which is connected to sewerage system.	24
14.	J. J. Cluster Knownas Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	L&DO	350	2030	5	0	1	A 250mm dia sewer line exists which carries discharge of Jhuggi Cluster.	5

S.N	Name and Location of J. J. Cluster	Name of Land Owning Agency	No. of Jhuggies (approx.)	Total population	Water supply		Toilet Clusters	Sewerage	Street Lighting
					Piped Supply/ Hydrants	Hand pumps			
15.	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	L&DO	750	4350	0	2	2	A 250mm dia sewer line exists outside Jhuggi Cluster.	20
16.	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand Vidyalaya	L&DO	125	725	2	0	1	A 200mm dia sewer line exists	Not Existing
17.	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	L&DO	600	3480	1	1	1	Sulabh Shauchlaya (International Exists) for Jhuggi clusters. Sewer line is connected to 230mm dia municipal sewer.	Not Existing
18.	Rajiv Gandhi Camp behind T.P. Lane, Mother Terressa Crescent	L&DO	14	81.2	0	1	1	A 230 mm dia sewer line exists outside Jhuggi clusters.	2
19.	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother Terressa Crescent	L&DO	12	69.6	1	1	1	A 230 mm dia sewer line exists outside Jhuggi clusters	Not Existing

S.N	Name and Location of J. J. Cluster	Name of Land Owning Agency	No. of Jhuggies (approx.)	Total population	Water supply		Toilet Clusters	Sewerage	Street Lighting
					Piped Supply/ Hydrants	Hand pumps			
20.	J. J. Cluster near Jawahar Bhawan between R.P. Road and Raisina Road	L&DO	25	145	0	0	1	Public Toilet Exists which is connected to 200mm dia sewer line.	3
21.	Pacca J. J. Cluster near Princes Park Sangli Mess	L&DO	125	725	7	4	1	Inside the cluster a 250mm dia sewer line exists which carries discharge of JJ cluster.	Not Existing
22.	J. J. Cluster known as Madrasi Camp behind D-II Flats, Kidwai Nagar East	L&DO	150	870	3	0	1	A 300mm dia sewer line exists which carries discharge of JJ cluster.	Not Existing
23.	J. J. Cluster behind Palika Dham and Hotel Nicco, Bangla Sahib Road.	CPWD	60	348	2	3	1	There is no separate line for JJ cluster. A 200mm dia sewer line exists for Palika Dham which carries discharge of J.J cluster.	5
24.	J. J. Cluster known as Madrasi Camp behind D-II flat Nos. 65-68	CPWD	25	145	1	0		A 300mm dia sewer line exists outside which carries discharge of JJ cluster.	Not Existing
25.	Jhuggies at Talkatora Park Lane Behind Talkatora Stadium	CPWD	14	81.2	1	1	1	There is no separate line for J.J cluster. A 200mm dia sewer line runs outside J.J cluster which carries their discharge.	4
26.	J. J. Camp Bharti Nagar, Khan Market	CPWD	40	232	3	1	1	A 300mm dia sewer line exists outside JJ cluster and there is a common toilet for use of the	Not Existing

S.N	Name and Location of J. J. Cluster	Name of Land Owning Agency	No. of Jhuggies (approx.)	Total population	Water supply		Toilet Clusters	Sewerage	Street Lighting
					Piped Supply/ Hydrants	Hand pumps			
								dwellers.	
27.	Labour Camp, Humayun Road, Khan Market	CPWD	300	1740	4	2	1	There exists a common toilet for J.J cluster and the sewer is connected to storm water barrel.	24
28.	Indira Camp, Pandara Road behind Kendriya Bhandar	CPWD	27	156.6	2	-	1	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 230mm dia municipal sewer line.	2
29.	J. J. Cluster, back of Chelmsford Club, Raisina Road	CPWD	32	185.6	1	1	1	No sewer line	1
30.	J. J. Cluster behind Meridien Hotel, Dr. Rajinder Prasad Road	CPWD	60	348	4	1	1	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 300mm dia municipal sewer line	3
31.	J. J. Cluster behind Kashmir House Rajaji Marg	CPWD	40	232	2	3	1	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 300mm dia municipal sewer line	10
32.	Bhaiya Ram Camp, Race Course Club, Race Course Road.	CPWD	500	2900	7	13	1	There is a common toilet for use of the dwellers and sewer connection of the	

S.N	Name and Location of J. J. Cluster	Name of Land Owning Agency	No. of Jhuggies (approx.)	Total population	Water supply		Toilet Clusters	Sewerage	Street Lighting
					Piped Supply/ Hydrants	Hand pumps			
								said toilet is connected in 300mm dia municipal sewer line	
33.	J. J. Camp at DID, Race Course near Riding Club, Safdurjung Road	RACE COURSE CLUB	85	493	3	7	1	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 230mm dia municipal sewer line	15
34.	J. J. Cluster at Purana Quila Road, N.S.C.I	RACE COURSE CLUB	250	1450	12	1	1	A 200mm dia sewer line exits carrying the sewerage discharge generated from the cluster.	10
35.	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	NSCI	35	203	1	0	1	There is no sewer line.	Not Existing
36.	J. J. Cluster at Shiv Mandir near Railway Flying Club	RAILWAY	65	377	0	3	1	There is no sewer line	Not Existing
37.	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	RAILWAY	60	348	2	2	1	There is no sewer line for J.J Cluster. This discharge from common toilet flows into sump well of Delhi Flying club which is pumped into Municipal main.	Not Existing
38.	J. J. Camp near Masjid Polo Ground, Race Course Club, Kamal Attaturk Road.	FLYING CLUB	47	272.6	2	2	1	There is no sewer line. Individual toilets are connected with Septic Tanks	31
	Total		7057	40930.6	130	80	36		



Chapter – 4 : Environment Profile

CHAPTER - 4 ENVIRONMENT PROFILE

4.1 STATE OF ENVIRONMENT IN NDMC AREA.

The study area environment can essentially be seen in terms of two components of urban management- the environment per se, or the habitat, and services management. The former pertains to the natural features and resources like the ridge, city forest, air and noise, water (water bodies-river, lakes, drains and ponds- and ground water) and land with reference to open spaces, green areas and other surface and sub-surface conditions. The latter is related to the built environment and includes the environmental infrastructure - water supply, sewerage, solid waste disposal, and the transportation network. The focus of this chapter will be on the environment per se or the habitat. The service management part will be dealt within the subsequent chapters. The baseline data for the purpose of analyzing the state of environment in NDMC area has been collected from a large number of agencies through secondary survey as indicated in **Fig. 4.1**.

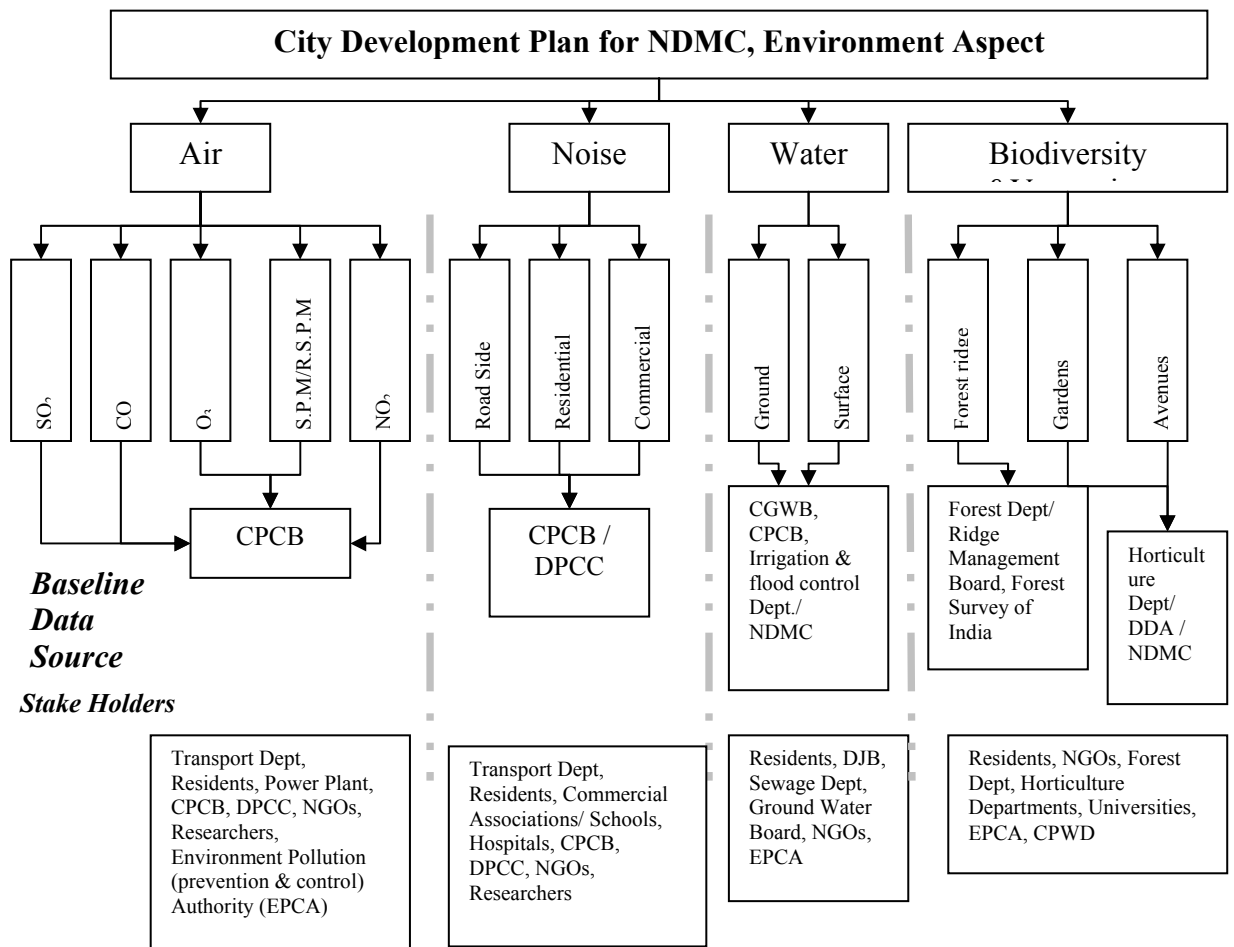


Figure 4.1: Source of baseline information and stakeholders

The environmental aspect of the sub city development plan of NDMC area will focus on Natural Resource Conservation which includes management of water (surface and ground), air and noise. Following three fold approach and strategy will be adopted.

- a) Management of natural resources and the related environment infrastructure and services in a manner that would lead to optimization of use of natural resources, and reduction / abatement of pollution;
- b) Conservation and development of the natural features existing in the NDMC area with a view to enhancing their environmental value; and
- c) Development and preservation of open spaces, greens and landscape / recreational areas that characterizes the NDMC area.

Urban environment baseline

The urban environment baseline includes a detailed study of air quality, water quality, noise level along with biodiversity and vegetation in the NDMC area.

4.1.1 AIR QUALITY

Air quality has emerged as a major concern for the NDMC area. The principal sources of air pollution within the NDMC area are vehicular traffic and power plants (located in periphery). Besides these anthropogenic sources, climate and natural sources also play an important role in increasing the pollution levels. Delhi has a semi-arid climate, with an extremely hot summer, average rainfall and very cold winters.

The contribution of **vehicular pollution** increased from 23 per cent in the year 1970-71 to an appalling 72 per cent in 2001¹. The travel demand, the per capita trip rate (number of trips made by an individual) and the per capita trip length (distance traveled by an individual on an average) in Delhi are one of the highest amongst the developing countries. Hence, vehicular pollution has become a serious problem in the urban areas. The factors which contribute to vehicular pollution include an increase in travel demand, increase in the number of vehicles, constrained road space, over aged vehicles, poor quality of fuel, and poor road conditions. Various measures have been taken to control vehicular pollution in Delhi in general and NDMC area in particular. Conversion of public transport and the commercial vehicles (buses, autos, taxis, etc.) to CNG has resulted in reduction of air pollution substantially. With the phasing out of lead in gasoline from 2000, significant reduction has been achieved in lead emissions and associated health problems. To meet the complex and ever growing transportation requirements of the city, an integrated Mass Rapid Transit System (MRTS) is being executed.

Significant pollution is also caused by a large number of **diesel generating sets**, which are installed in various commercial establishments like Sarojni Nagar, Khan Market, Connaught Place, Yashwant Palace, Gole Market, etc. The erratic power supply caused a phenomenal increase in the number and use of diesel generating sets resulting in increased levels of pollution.

¹ Delhi HDR 2006

The air quality baseline of the NDMC area will be formulated by analyzing the concentration of Oxides of Nitrogen, Oxides of Sulphur, Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM), Carbon Monoxide and Ozone in the ambient air quality of the N.D.M.C area. For the purpose of formulation of baseline, daily ambient air quality at I.T.O intersection as obtained from C.P.C.B from 1999 till 2006 has been studied and inference has been drawn based on the yearly maximum, average and 95 percentile levels of each of the gases.

Oxides of Nitrogen

The Oxides of Nitrogen (NO_x) are formed during the combustion processes due to oxidation of atmospheric nitrogen and to a lesser degree by oxidation of organic nitrogen in fuels. The vehicular traffic is a major source of NO_x emissions

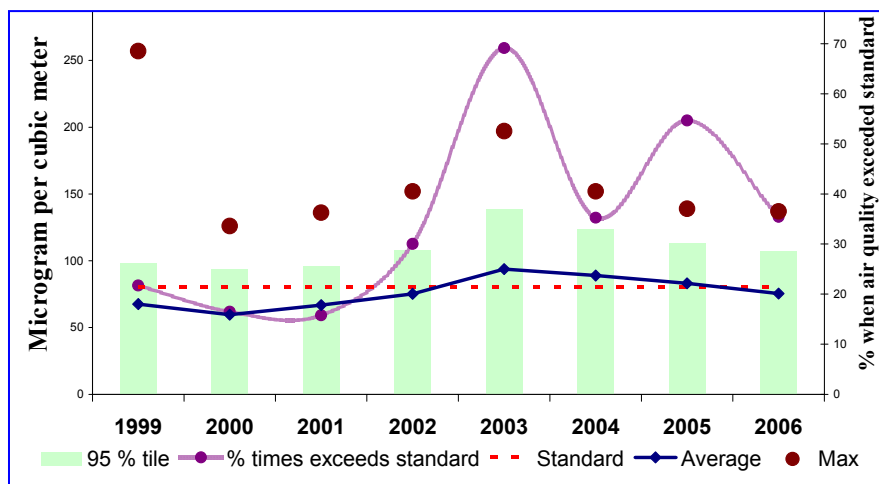


Fig. 4.2: Ambient air Quality of NO₂ at ITO intersection

in NDMC area which causes irritation of the pulmonary tract and affects the functioning of lungs. Higher concentrations can even result in the narrowing of the air passage. Annual average concentration of NO_x has increased from 68 mg/m³ in 1999 to 75 mg/m³ in 2006 (Fig. 4.2). The average nitrogen concentration in air reached its peak in 2003 when it was 94 mg/m³. Similar trend is reflected while studying 95 percentile values which increased from 98 mg/m³ in 1999 to 107 mg/m³ in 2006 and reached its peak in 2003 at 139 mg/m³. As compared to previous year there is a decrease in 2006 (Fig. 4.2). The annual mean of NO_x level in NDMC area is above the annual average of National Ambient Air quality standards of 80 mg/m³ between 2003 and 2005. While in 1999 and 2001, the ambient air quality exceeded the standards 22 percent times and 15 percent times, in 2003 and 69 percent and 35 percent in 2006, respectively. The peak value of NO_x concentration in 1999 was found to be 257 mg/m³ as compared to a peak value of 107 mg/m³ in 2006.

Possible reasons for NO₂ levels rise:

- Introduction of CNG programme: poor maintenance may increase NO_x emissions.
- Huge growth in diesel vehicles since 1998-99 specifically in diesel passenger cars. Diesel vehicles emit more NO_x than petrol vehicles (Euro 3: diesel emitted 3 times higher NO_x as compared to petrol).
- Growing numbers of four-stroke two-wheelers, constituting about 70- 80 per cent of new sales: four-stroke emits more NO_x than two-stroke, but lesser CO and HC and PM.

- d) Two gas based power plants viz I.P Gas Turbine Power Plant and Pragati Power station located on the periphery of NDMC area.

Oxides of Sulphur

Oxides of Sulphur (SO_x) are released in the ambient air in the form of Sulphur Dioxide

(SO₂) and Sulphur Trioxide

(SO₃). As per the observations,

SO₂

constitutes

95% of the

SO_x in the

ambient air,

remaining

5 % or less

may be in

the form of

SO₃. The major

anthropogenic source of SO₂ in the atmosphere is burning of fossil fuels. Bacterial decomposition of organic matter, forest fires, etc. also adds to the SO_x in ambient air. The harmful health effects of the SO₂ include irritation of eyes and respiratory system, increased mucous production, cough and shortness of breath. A higher concentration of SO₂ can even cause acid rain.

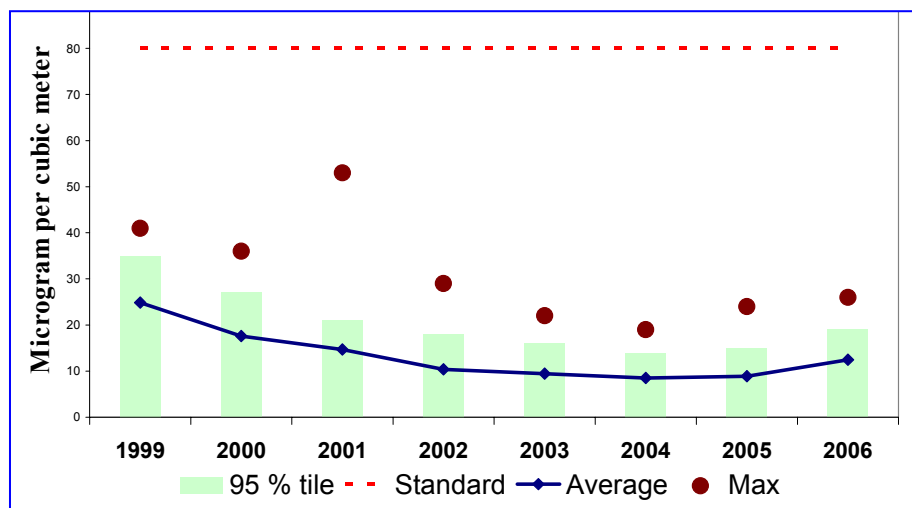


Fig. 4.3: Ambient air Quality of SO₂ at ITO intersection

An analysis of ambient air quality at the ITO crossing depicts a reduction in the concentration level of SO₂. Annual mean SO₂ level reduced from 25 microgram per cubic meter, in the year 1999, to 12 Microgram per cubic meter in 2006 (**Fig. 4.3**). The SO₂ level thus depicts a 50% reduction over a span of seven years. Similar trend is reflected through 95 percentile values which have decreased from 35 in 1999 to 19 in 2006. However when compared to the immediate previous year, a negligible increase in SO₂ is evidenced in the year 2006.

The present reduction in SO_x concentrations in the ambient air can be attributed to adoption of environment friendly technological options such as large scale conversion of all buses/Taxis/Autos in CNG mode. The annual average SO₂ level in the NDMC area are well within the National Ambient Air Quality Standard (NAAQS) i.e. 80 microgram per cubic meter.

Particulate Matter

Table - 4.1: Annual Average Emissions from Coal Based Thermal Power Plants

Year	Particulate Matter Emissions (mg/m ³)	
	Rajghat Power Station	I.P. Power Station
1993-94	144	
1994-95	139	
1995-96	142	210
1996-97	144	275

Year	Particulate Matter Emissions (mg/m ³)	
	Rajghat Power Station	I.P. Power Station
1997-98	145	166
1998-99	149	210
1999-00	127	190
2000-01	125	180
2001-02	127	135
2002-03	124	125

Source: Towards clean air, a case study of Delhi

Amongst all the parameters of air pollution, particulate matters such as SPM and RSPM have emerged as critical ones in almost all urban areas of India. High SPM concentrations are primarily irritants but they do not have direct health consequences when compared to the effects of its Respirable fractions (PM₁₀ and PM_{2.5}). Therefore, worldwide, air quality monitoring is significantly focusing on measurement of finer particles which can penetrate the human respiratory systems. Since the year 2000, the focus on Suspended Particulate monitoring has shifted to PM₁₀ in India, as well. Being a critical pollutant, PM₁₀ has also been included in National Ambient Air Quality Standards. A large number of urban / man made background sources contribute to such high particulate pollution. The two coal based power plants located at the periphery of NDMC area viz Rajghat coal based power project, I.P coal based power station are major source of particulate emissions along with vehicles plying on the roads. The annual average emissions from these power plants are given in Table 4.2. As evident through the table, the annual average emissions from the thermal power plant show a declining trend due to use of better quality of coal and technologies like electrostatic preceptor.

Suspended Particulate Matter

SPM are fine particles of soot, dust, etc. They are present in the air due to various natural factors. In case of Delhi, presence of arid and semi arid region in

north-west, loss of moisture from top

soil strata, etc. and anthropogenic factors, such as extensive urbanization and construction activities, increasing vehicular population, captive and domestic power generation are some of the major contributors to SPM in ambient air. High SPM levels cause respiratory diseases and reduced visibility. While the human nostrils filter out 99% of the inhaled large and medium sized particles, the rest may enter the wind pipe and lungs where some inhaled particles cling to the protective

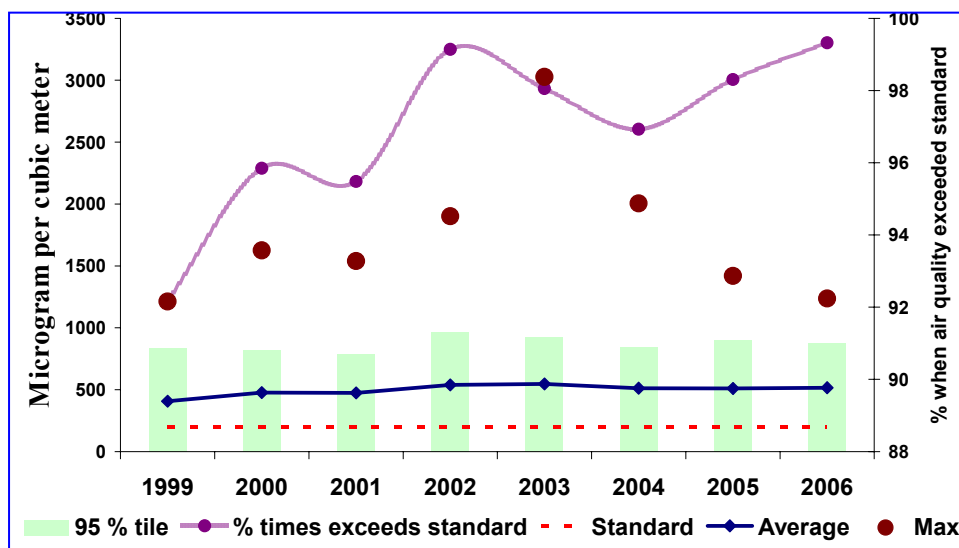


Fig. 4.4: Ambient air Quality of SPM at ITO intersection

mucous. The SPM concentration in the NDMC area is showing a slow increase and the annual average value of SPM has increased from 407 in 1999 to 516 microgram per meter cube in 2006 (Fig. 4.4). The concentration of SPM in the NDMC area drastically exceeds the permissible air quality standard of 200 microgram per cubic meter. The 95 percentile value has also been increasing steadily. The Maximum concentration is witnessed during 2003 and 2004, at more than 2000 Microgram per cubic meter, while during rest of the years the maximum has remained below 2000 Microgram per cubic meter but above 1200 Microgram per cubic meter. While in 1999 the daily ambient air quality exceeded the standards 92 percent times, in 2006 it exceeded the standards 99 percent times (Fig. 4.4).

Respirable Suspended Particulate Matter (RSPM)

RSPM are the suspended particulates, less than 10 micrometers in diameter (PM10).

It can pose a great health hazard as these particles can be easily inhaled and can get accumulated in the alveoli (tiny air sacs in the lungs). This slows down the exchange of Oxygen and Carbon Dioxide in the blood. The finer the particles, the longer is their propensity to remain air borne. Fuel

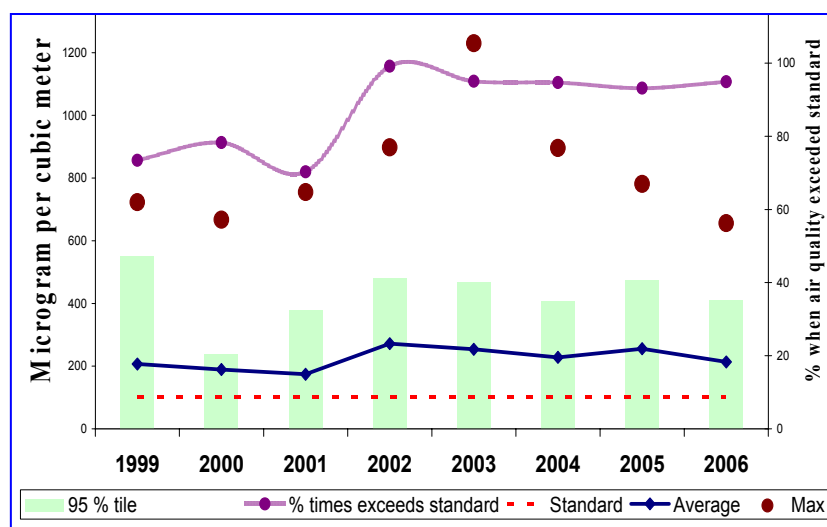


Fig. 4.5: Ambient air Quality of RSPM at ITO intersection

combustion in power plants, Diesel Generator sets, and motor vehicles

are major sources of RSPM in the NDMC area. The other polluting sources are refuse and refuse burning, solid waste disposal, construction activities, and traffic/road dust. The RSPM concentration in the NDMC area is showing a steady increase and the annual average value of RSPM has increased from 207 in 1999 to 213 microgram per meter cube in 2006. The concentration of RSPM in NDMC area is severely above permissible limit of 100 Microgram per cubic meter. The 95 percentile value at 1999 was 549; this has however reduced to 411 in 2006. The maximum concentration is noticed during the years 2002 and 2003 which is more than 1200 Microgram per cubic meter, while during rest of the years the maximum value ranged between 600 to 1200 Microgram per cubic meter. In 1999 the daily ambient air quality exceeded the standards i.e 100 Microgram per cubic meter 92 percent times; in 2006 it exceeded the standards 99 percent times.

Carbon Monoxide

Carbon Monoxide is produced as a result of incomplete combustion of fuel. Vehicles and DG sets are major sources of CO emissions in the NDMC area. Carbon Monoxide displaces Oxygen in the blood, leading to progressive Oxygen starvation and severe health effects. In higher concentrations, the effect of Carbon Monoxide could become fatal. CO is monitored by CPCB on an 8 hourly basis between 06:00 - 14:00, 14:00 - 22:00 and 22:00- 06:00. As evident from figure, annual average CO level has

gradually been reducing. The maximum concentration has been observed between the time intervals of 14:00- 22:00 i.e. 5255 Microgram per cubic meter in 1999 whereas in 2006 it is reduced to 2593 Microgram per cubic meter (**Fig. 4.6**). Despite this reduction the concentration of CO in the NDMC area is higher than the NAAQS standards for CO, i.e. 2000 Microgram per cubic meter. Similar trend is noticed while studying the 95 percentile, depicting a reduction from 10351 to 4583 Microgram per cubic meter between the time intervals of 14:00 - 22:00. While in 1999 the percent of times the concentration of CO in air exceeded by 80% , 96% and 72% of time in the time interval of 0600:14:00, 14:00 - 22:00 and 22:00 - 06:00 respectively, in 2006 this was reduced to 41%, 66% and 68% (**Fig 4.6**). This could be attributed to the stringent implementation of vehicular emission norms, fuel quality up-gradation and better maintenance of engines through all possible measures i.e. promotional, educational and enforcement.

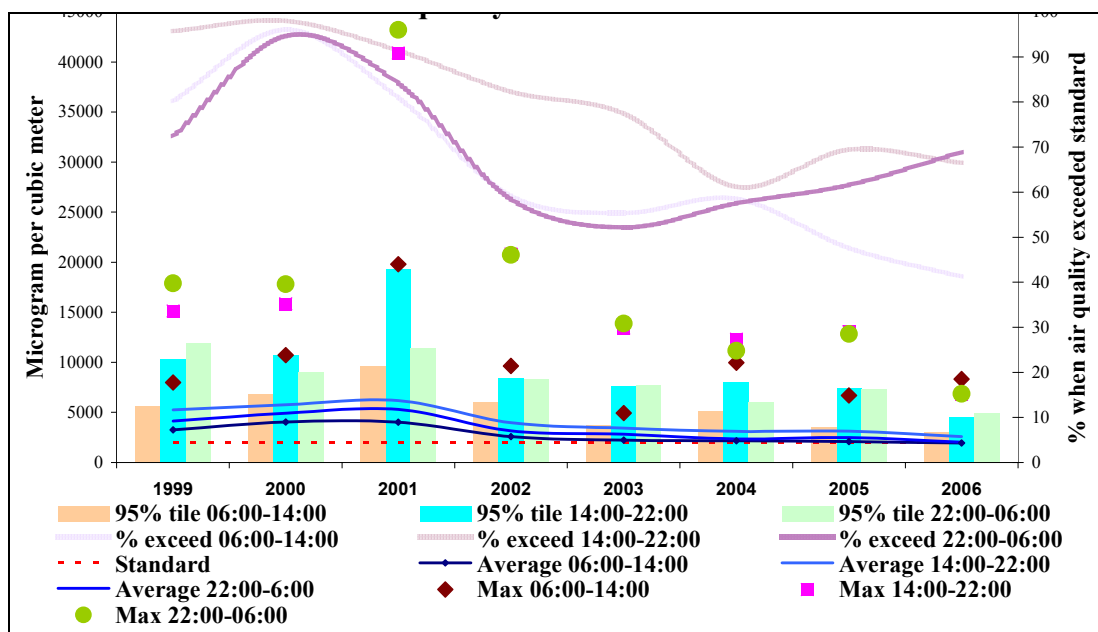


Fig. 4.6: Ambient air Quality of CO at ITO intersection

Ozone

Ozone at the ground level is a secondary pollutant, formed by reaction of Oxides of Nitrogen and Hydrocarbons in the presence of sunlight. The major harmful effects on human health include eye, nose and throat irritation and reduced resistance to colds. It can also aggravate asthma and bronchitis. The average concentration of ozone has been increasing from 29 Microgram per cubic meter in 1999 to 36 Microgram per cubic meter in 2006 (**Fig.**

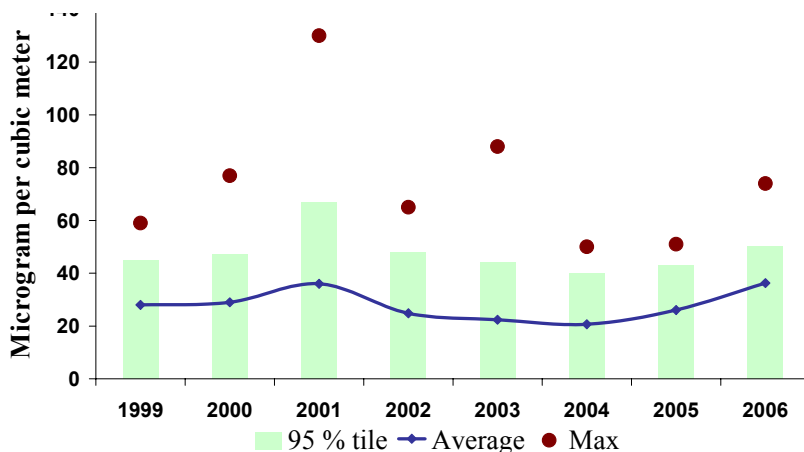


Fig. 4.7: Ambient air Quality of Ozone at ITO intersection

4.7). Similar trend is observed in 95 percentile value which increased from 45 Microgram per cubic meter to 50 Microgram per cubic meter between 1999 - 2006 and reached its peak in 2001 at 67 Microgram per cubic meter (**Fig. 4.7**).

Actions taken to improve air quality in NDMC area.

The main source of air pollution in NDMC area is vehicular exhaust. Therefore, a strategy for use of cleaner fuel, reduction in fuel consumption, efficient maintenance of engines and installation of pollution control devices was adopted. Government of Delhi initiated the following steps in this direction:

- Mandatory fitting of catalytic converters -April, 1995
- Introduction of Low Sulphur Diesel - April, 1996.
- Introduction of CNG buses - April, 1998.
- Complete removal of leaded petrol - September, 1998.
- Restriction on plying of goods vehicles during day time-December, 1998
- Mandatory premixing of lubricant oil in petrol and ban on sale of loose lubricant Oil- December, 1998
- Petrol and diesel with 500 ppm sulphur and petrol with 1 per cent benzene
- Low smoke 2T oil introduced, pre mix 2T oil in retail outlet
- Emission norms made stringent since 1991, regular PUC drives
- Emission norms for catalytic converter fitted vehicles made stringent
- Amendment of Motor vehicle Act to bring CNG vehicle under permit & Tariff jurisdiction of government - September, 1999.
- Registration of private vehicles only conforming to Euro-II norms - April, 2000.
- Phasing out of Commercial vehicles older than eight years - April, 2000.
- Stricter emission norms (Bharat Stage - II) for registration of new taxis - October, 2001.
- Conversion of entire fleet of buses into CNG fuel mode- November, 2002.
- Euro-III norms mandatory for all four-wheeler w.e.f 1st April 2005.
- Euro-III norms mandatory for all two and three wheelers w.e.f 1st April 2005.
- 0.035% Sulphur in Diesel being supplied in Delhi w.e.f April 2005.
- 0.015% Sulphur in Petrol being supplied in Delhi w.e.f 1st April 2005.
- Stringent Emission Norms for 'in use' vehicles
- Pollution checking centers have been computerized and upgraded to current tail pipe emission norms & procedures.
- Fully automated vehicles inspection and certification units have been set up in collaboration with ARAI Pune for better and quality inspection of all light & heavy vehicles.
- Strengthening of air quality monitoring.
- Inspection and maintenance programmes have been set up.
- Creation of bus terminus at the city boundaries to bypass transit traffic
- Setting up independent fuel testing laboratories to check fuel adulteration

The ambient air quality in NDMC area has improved to a certain extent over the year. Statistics have shown that not only has the rising trend in pollution level been checked, but the level of various pollutants in the ambient air is coming down. Though Delhi remains a polluted city, there is not much of chemical pollution observed in NDMC area. Carbon Monoxide, Nitrogen Dioxide, Lead and Sulphur Dioxide levels have all shown a declining trend. The annual average of 25 Microgram per cubic meter of Sulphur Dioxide in the year 1999 came down to as much as 9 Microgram per cubic meter during 2005 at ITO Intersection, whereas NO₂ rose from 68 Microgram per cubic meter in 1999 to 83 Microgram per cubic meter in 2005. Further, there has been a marked decline in the annual Lead levels after

introduction of unleaded petrol in 1998. Also, the results show a significant improvement in the overall air quality of the NDMC area.

Despite of the declining trends it is evident that certain parameters are above the NAAQS permissible standards for air quality. SPM, RSPM, CO and NO_x exceed severely above the standards at the monitored locations. This may be the root cause of respiratory problems affecting thousands of people in the NDMC area every year.

The three main sources of air pollution in the NDMC area is vehicular emission, emission coming from the power plants, and from diesel generator sets. Apart from the issue of pollution on account of power, the major area of planning and intervention would relate to transportation planning. Apart from the phenomenal growth in the number of vehicles, almost 8-10 times in the last two decades in absolute terms, the most significant aspect, in the context of congestion and pollution, relates to the growth in personalized transport as compared to the availability of public transport.

Despite the phenomenal growth in vehicular population, the levels of Nitrogen Dioxide have increased only slightly. The concentration of other pollutants like Lead & Benzene have also registered marked decline. This can be attributed to various initiatives and measures taken over the past few years, like introduction of CNG and EURO II norms etc and phasing out of old commercial vehicles.

Issues with air environment of NDMC area

- High through traffic and traffic congestion during peak hour
- Emissions from D.G. sets
- The rotaries in the N.D.M.C area gets locked during peak hour causing high degree of stress to air environment
- Power plants located at the periphery
- Ozone concentration showing an increasing trend
- High concentration of RSPM and SPM causes detrimental effects on the people living and working in the area.

4.1.2 WATER RESOURCE

A brief study of ground and surface water conditions in the NDMC area has been carried out in this section. The surface water resources in and around NDMC area basically comes from river Yamuna and various drains and the lakes/ponds. Although the river does not fall in the NDMC boundary, yet the ground water of the NDMC area is greatly affected by the river because of its close proximity. The Ground water in NDMC area occurs in confined and semi-confined conditions, with depths varying from 2 m to 30 m



Fig. 4.8 Location distribution of low ground water level in Delhi. (In meters)

below the ground level (*refer Fig. 4.8*), and, in the alluvial terrain, several sandy aquifers that occur at different levels.

Ground Water

Groundwater is one of the major sources for water supply in many parts of the country. In NDMC area too, ground water contributes to the water supply, but not much data is available on the quantity or quality. The ground water is replenished regularly through rainwater infiltration. Sustainable use of ground water means withdrawal of ground water at a rate at which it is replenished through recharge. Faster withdrawal rates would lead to fall in water table and finally depletion of ground water. The NDMC is responsible for supply of potable water in the area. It receives its bulk of supplies from DJB and uses ground water to meet the shortages. However, the aquifer is a much larger unit and the fall in the ground water is not because of the activities in NDMC area. Delhi over draws ground water and that could be the main cause for the fall of water level in NDMC area.

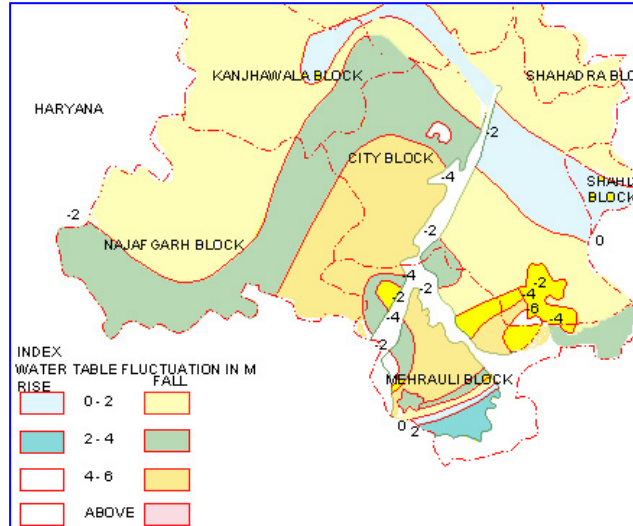


Fig: 4.9 Water level fluctuation 1962-77

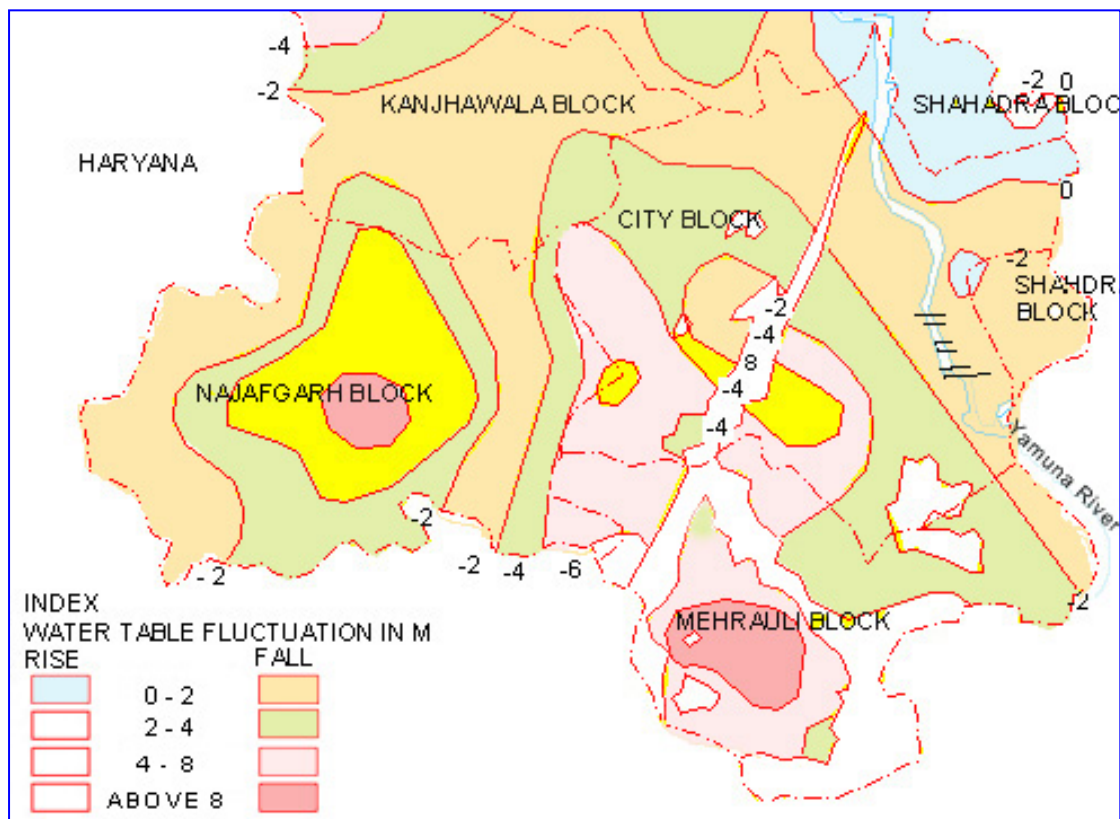


Fig: 4.10 Water level fluctuation in Delhi

The pre monsoon water level in the NDMC area is of the range 20 - 30 m below ground level (bgl). However in the central part of NDMC area the water level is in the range of 10-20 m bgl. While the post monsoon water level is less than 2m at Panchkuiya road, but at Talkatora, Rail Bhawan, Connaught Place and Kidwai Nagar area the water level is in the range of 10 to 20 m bgl. Deeper water level in the range of 20 to 40 m bgl is encountered in Shanti path and Chanakyapuri. Long term trend in ground water level monitored over last 20 years from 1984 to 2003 show a steep decline in the NDMC area. A decline of 1 to 1.5 m/year has been observed in Kidwai Nagar, South Block, Birla Mandir area.

The long term seasonal fluctuation of ground water shows significant trend of decline in the NDMC area at a rate of 73 cm/year and 60 cm/year during pre and post monsoon respectively.

The Central Ground Water Board assessed the ground water recharge potential during the year 2004 for New Delhi district which comprises a majority of area under NDMC and found that recharge from rainfall during monsoon season is 185.64 ha m, recharge from other sources is 81.98 ha m ; recharge from rainfall during non monsoon season is 43.54 ha m and recharge from other sources during non monsoon season is 20.23 ha m. **Hence the total annual ground water recharge is 331.39 ha m.** For New Delhi District it has been estimated that the annual withdrawal during non monsoon season is 33.14 ha m and hence the net annual ground water availability is 298.25 ha m. While the existing gross ground water draft for domestic water supply is 509.49. This indicates that the ground water is over exploited in NDMC area and hence significant decrease in pre and post monsoon water levels has been observed. Furthermore, according to Central Ground Water Board there is an addition potential recharge of 50 ha m in the water logged and shallow water table areas of New Delhi district.

Detailed study on the state of ground water has been carried out in Lodi road and Rashtrapati Bhawan area by CSE. In terms of sub surface geology of the Lodi road area the first layer of clay and kankar extends to depth of 8m bgl. This is followed by kankar and silt upto 20m; this layer is again underlain by clay and kankar upto 50m bgl.

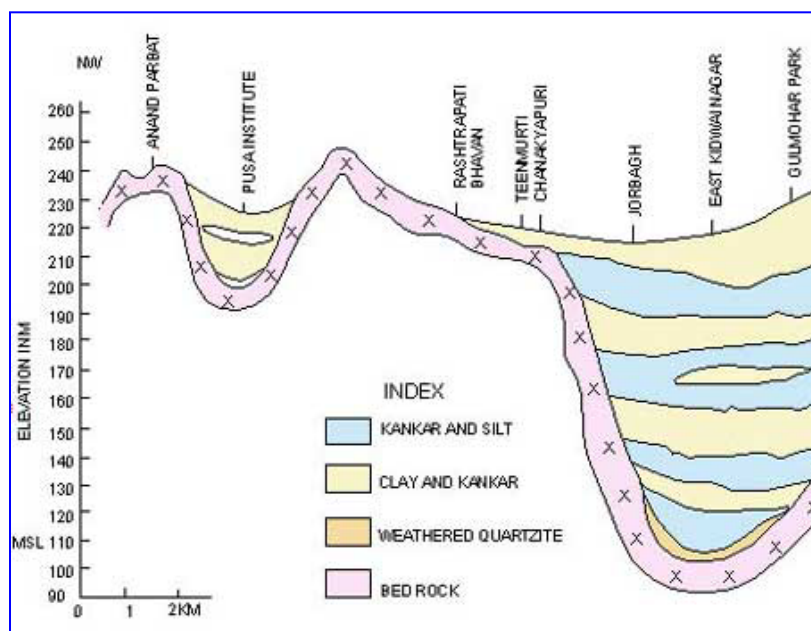


Fig: 4.11 Water level fluctuation 1983-95.

A comparative study of water level map of 1960 and 2002 shows in Lodi road the water level which was at 5 to 10m below ground level has gone down to 10 to 15 mts below ground water level. In Lodi road fresh water occurs in shallow zones as depicted in Figure

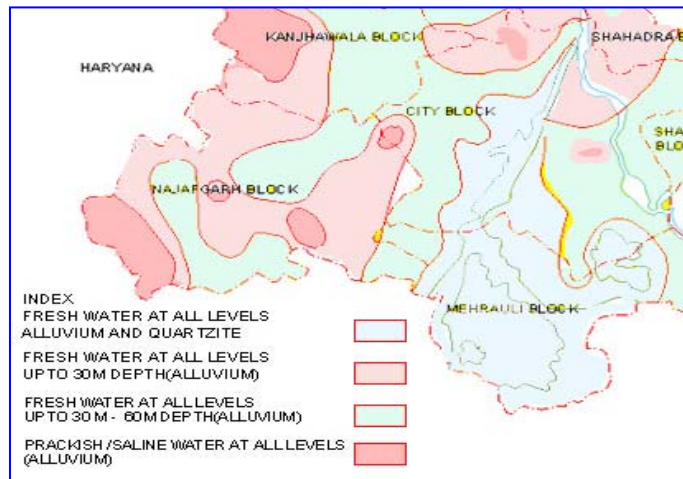


Fig. 4.12 Fresh water at all levels

The sub surface geology in Rastrapathi Bhavan consists of the first layer of clay and sand extends to depth of 3m, which is followed clay inter mixed with Kankar 8m below ground level. This is followed by layer of sand between 8 to 10m. This is followed by weathered and fractured quartzite, which extends up to 40m bgl. This is followed by partially fractured quartzite, which extends to greater depths. A comparative study of water level map of 1960 and 2002 shows in Rastrapathi Bhavan the water level which was at 5 m bgl in 1996 has gone down to 10 to 15 mts bgl over a decade.

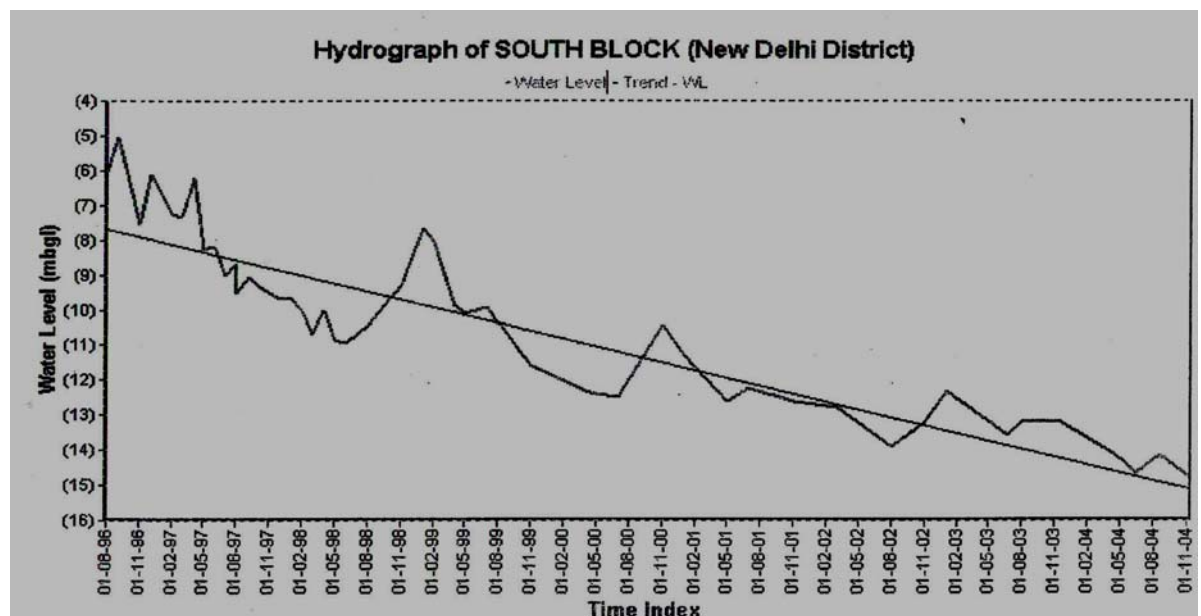


Fig. 4.13: Surface geological cross section

Surface Water

Based on studies, some of the features that are revealed about the surface water resources in and around NDMC area are:

- (i) The Yamuna river and the drains are highly polluted;
- (ii) The supply of water for human use is adequate, but is characterized by iniquitous distribution in per capita terms in different areas, and significant wastage in NDMC area;

- (iii) Assuming that 80 percent of the water is converted into waste water, the capacity to treat waste water is grossly deficient; and
- (iv) The planned re-use of treated waste water is minuscule.

The NDMC area also has a number of man made and artificial surface water bodies. These are located at central park in Connaught place, Bangla Shib, Talkatora Gardern, Mughal Garden, Central Secretariat, India Gate, Rajpath, Bhuli Bhitayari park, Buddha Jayanati Park, Safdarjung's tomb, Nehru Park, Lodi Gardern, Samriti Vatika, Bistdari along Simon Bolivar Marg, Bhagwan Mahavir Vanasthali, Sanjay park lake near Sarojni Nagar etc. While the water bodies in the parks and at Rajpath and India gate are maintained by N.D.MC, the ones located in central ridge are maintained by the forest department. The source of water for the water bodies are untreated water supplied by DJB. The water quality is not monitored. The water is changed by the agency maintaining the water body, quarterly, on an average. Boating is encouraged in many of the artificial water body. Since water proofing is done in most of the manmade surface water bodies located in NDMC area , they do not recharge the ground water. Also the ecosystem is not very diverse in these man made water bodies.

Action taken to improve Water level in NDMC area

Rain Water Harvesting.

The depleting ground water in the NDMC area can be augmented through rainwater harvesting. There have been substantial efforts of rain water harvesting in the NDMC area. Water harvesting and recycling has been proposed on a 3 km. stretch of the Central Ridge Stream (Kushak Nala) by NDMC. This involve resectioning and modifying the stream bed, assessing the rainfall characteristics in the catchments and runoff characteristics, upgrading the waste water inflow to surface drainage standards through bacteriological inputs, creating weirs at several locations. The stream banks are to be landscaped as an urban asset. There is a provision in the building bye-laws that no new building would be given a completion certificate unless and until it has rainwater harvesting provision in it. In addition to it, the NDMC itself has completed 17 such works in the buildings belonging to the Council. NDMC has also recommended 85 such projects to the CGWB for their advice and 3 works for rainwater harvesting are in progress. NDMC is also looking at rainwater collection, which is a very traditional way of collecting rainwater for being used for various purposes. In order to optimally utilize the rain water for being used for various purposes in the city, NDMC should explore the possibility that even the existing buildings in the area are gradually made to adopt water harvesting techniques. In order to achieve this objective, the possibility of extending certain incentives to such building owners who go for water harvesting works should also be considered seriously. Some of the existing and proposed water harvesting structure as recommended by Central Ground Water Board and implemented by NDMC is given in Table 4.2.

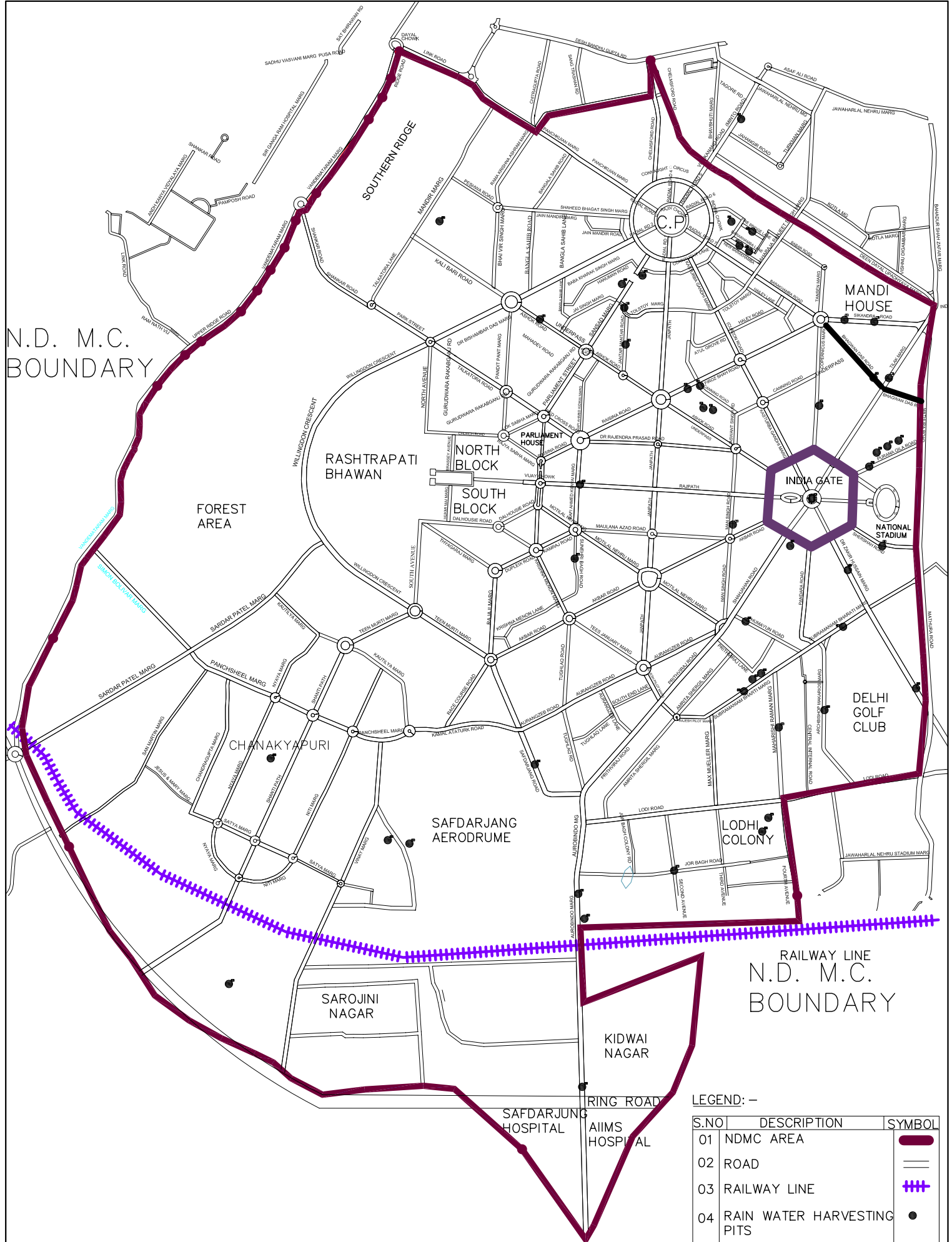
Table 4.2: Location at which rain water harvesting pits are proposed by NDMC.

S.no	Location	S.no	Location
1	Lady Irwin college at Sikandra Road	27	Sunehri Bagh Lane
2	Nepal Embassy, Both side Barakhamba road	28	Humayun Road

S.no	Location	S.no	Location
3	Tilak Marg	29	Central Parking at Khan Market
4	Lane by the sides of High court-NDMC school side	30	Outer Parking near toilet in Khan Market
5	Institute of Archaeology at Sikandra road	31	Bikaner House
6	Crossing of Tolstoy marg	32	Subhramanyam Bharti Marg
7	Man Singh road (Near NDMC Nursery)	33	Khanna Market in Lodi Road
8	Jantar Mantar road both side	34	Barat Ghar near Lodi Colony
9	Ashoka Road, both Side	35	Safdarjung fly over, Both side
10	Brig Hoshiar Sungh road (Sanjay park side)	36	Masjid at Madhav Rao Scindhia Marg
11	Firoz shah crossing Canning	37	Park near Lakshmibai Nagar
12	Himachal Bhavan at Firoz Shah Road	38	Under INA fly over
13	India Gate	39	Purana Quila Road
14	Lakshmibai Nagar (back of petrol pump)	40	Bhagwan Dass Road
15	Lakshmibai Nagar near Navyug school & shops	41	Outer parking near toilet of Subramaniam Bharti Marg
16	FICCI auditorium at Barakhamba Road	42	Rafi Marg - Raj Path crossing
17	Archbishop Marg	43	Netaji nagar near railway line
18	Bikaner House	44	Minto Road, Both side near bridge
19	Aurobindo Marg Fly over	45	Fire brigade office barakhamba road
20	Second Avenue - Jor Bagh	46	Sansad Marg Park hotel
21	Bank of baroda between Sansad Marg and Janpath	47	2 nd avenue Jor Bagh junction near Lodi Road
22	Copernicus Marg - C- Hexagon junction	48	Zakir Hussain Marg - Near foot of the bridge
23	Purana Quila Road - C. Hexagon junction	49	Kaka Nagar near corner of Zakir hussain Marg
24	Purana Quila Road - Lane adjoining A.B. Flats	50	Aurobindo Marg opposite fire station
25	Purana Quila Road - in Lane behind C.M. residence	51	In front of vidyut bhavan Barakhamba road
26	Maharishi Raman Marg, at drain crossing main road	52	Animal Hospitals Veterinary Lab, Moti Bagh, Chanakyapuri, near nallah

Issues with surface and ground water resource in the NDMC area

1. The ground water level in NDMC area is falling.
2. The artificial surface water bodies in the NDMC area are generally lined and hence do not contribute to ground water recharge.



Map 4.1. LOCATION OF
RAIN WATER
HARVESTING UNITS

Scale: NTS

SUBCITY PLAN
FOR NDMC

IL & FS Ecosmart Limited,
New Delhi

3. Surface water quality of the water bodies in NDMC area is not monitored on a regular basis; there is no institutional mechanism for the same.

4.1.3 NOISE LEVELS

Noise is emerging as a major pollutant and irritant as well as a constant source of disturbance and health hazards. Against a permissible level of 50-60 dB (A), the sound level in NDMC area often exceeds 60 dB (A). Faulty and leaking silencers, over-use of horns and vehicles plying on roads accentuate noise level, besides the noise from commercial activities; generator sets, etc. are major source of noise pollution in the NDMC area. Detrimental effects of traffic noise can be under 3 major groups-the subjective effects, the behavioral effects, and physiological effects. Subjective effects such as annoyance, disturbance, dissatisfaction, botheration and noisiness can upset balance between stress and recuperation and thus cause chronic fatigue, reduced efficiency and in increased incidence of ailment. Physiological effects are those that startle or cause fright phenomenon and can result in harmful effects on various part of the body. Exposure to Noise can raise blood pressure, accelerate heart rate, contract blood vessels of the skin increase muscular tension and at extremely high levels and long periods of exposure, it may cause deafness.

In the NDMC area attempts to control noise hazard has been made by proper land use planning, such as location of public, semi-public and commercial activities along major transport arteries, a buffer is also created for residential zones. Green buffer through thin leaved trees, land formations, mounds, embankments, etc. along major roads could provide effective barriers to transmission of noise in a majority of areas in NDMC.

However it is necessary to improve monitoring and effective implementation of the Noise Pollution (Level) Rules 2000 and, to further notify certain areas as 'No Horn Zones'. The design and surface material of roads and pavements should also ensure reduction of noise. The concerned authorities should prepare area wise traffic calming schemes and a Noise Monitoring and Control Plan (NMCP).

Noise levels in the NDMC area exceed permissible levels according to a study by Central Pollution Control Committee in 2005 -06 **Table 4.3** indicates the ambient noise levels measured by Central Pollution Control Board in two locations in NDMC area.

Table-4.3 : Ambient Noise Levels in NDMC Areas for 2005 - 2006

S.no	Monitoring Site	L _{eq} in db (A) for Year 2005		L _{eq} in db (A) for Year 2006	
		Day Time	Night Time	Day Time	Night Time
1	F- Block Narauji Nagar	64.4	63.2	68.3	67
2	NDMC Flats Mandir Marg	69.7	63.2	63.9	57

Note: Night time -10:00PM - 06:00 AM, Day time - 06:00 AM - 10:00 PM
 *Ambient Noise Standards for Residential area: Day Time: 55 dB(A) Night Time : 45 dB(A)

Recommendations

The DPCC has recommended following steps for control of noise in Delhi. Similar kind of recommendations is applicable to NDMC area as well

- Ban on pressure horns to be effectively implemented.
- Well designed silencers and mufflers be installed on the vehicles (including in auto-rickshaws), at the manufacturers level.
- Synchronized traffic signaling to be introduced on Ring Road and all other major traffic corridors within NDMC limits.
- A comprehensive Traffic Management Plan including effective implementation and extension of traffic restrictions, construction of sub-ways and fly-overs be chalked out on priority basis.
- Use of generators for commercial and residential should be properly enclosed and equipped with noise muffling devices.
- Extensive plantation of trees on the road curbs and the road side colonies be undertaken in a definite time target.
- Hoardings of noise absorbent materials be encouraged.
- Noise barriers could be considered around the hospitals schools and other locations in silence zones.
- Mass awareness programmes be launched for people's participation, in noise abatement programme aided by continuous noise monitoring and display network at important locations in the NDMC area.

Actions Taken To Curb Noise Pollution in NDMC Area

1. Banning the use of loudspeakers beyond certain fixed hours and imposing hefty fines on defaulters.
2. The growing number of DG sets is categorized as one of the source of noise pollution in the NDMC area. The guidelines issued on the subject by Government from time to time are as under:-
 - a) The maximum permissible sound pressure level for new diesel generator (DG) sets with rated capacity upto 1000 KVA, manufactured on or after the 1st July, 2003 shall be 75 dB(A) at 1 meter from the enclosure surface.
 - b) The diesel generator sets should be provided with integral acoustic enclosures at the manufacturing stage itself.
 - c) Noise from DG set shall be controlled by providing an acoustic enclosures or by treating the room acoustically, at the users end.
 - d) The acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB(A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure/acoustic treatment. Under such circumstances the performance may be checked for noise reduction upto actual ambient noise level, preferably, in the night time). The measurement for Insertion Loss may be done at different points at 0.5 m from the acoustic enclosure/room, and then averaged.

- e) The DG set shall be provided with proper exhaust muffler with insertion loss of minimum 25dB(A).
 - f) These limits shall be regulated by the Delhi Pollution Control Committee.
 - g) The manufacturer shall offer to the user a standard acoustic enclosure of 25dB(A) insertion loss and also a suitable exhaust muffler with insertion loss of 25 dB(A).
 - h) The user shall make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirements by proper siting and control measures.
 - i) Installation of a DG set must be strictly in compliance with the recommendations of the DG set manufacturer.
 - j) A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use.
3. Order of the Lt. Governor of Delhi in respect of D.G. sets
- a) Generator sets above the capacity of 5 KVA shall not be operated in residential areas between the hours of 10.00 PM to 6.00 AM except generator sets of Group Housing Societies and Multi Storey residential apartments.
 - b) Generator sets above the capacity of 5 KVA in all areas residential/commercial/industrial shall operate only with the mandatory acoustic enclosures and other standards prescribed in the Environment (Protection) Rules, 1986;
 - c) Mobile generator sets used in social gathering and public functions shall be permitted only if they have installed mandatory acoustic enclosures and adhere to the prescribed standards for noise and emission as laid down in the Environment (Protection) Rules, 1986.

Issues with Noise Level

- High level of noise in commercial areas and major arterial roads
- Unorganized commercial establishments contribute to high noise levels
- Enforcement of acts and laws needs to be more strict specially related to pressure horns and D.G. sets

4.1.4 BIODIVERSITY AND VEGETATION

The NDMC area has a much larger green cover than any other metropolitan city in the country, and can be termed as "Green City". This zone has a unique green character, with tree studded avenues, large open spaces, the Ridge, the Central Vista and parks/playgrounds. The central ridge in this zone is declared as reserved forest.

Large parks and recreational facilities in this zone are the Delhi Flying Club, National Stadium, Delhi Polo Club, Race Course, Jawahar Lal Nehru Stadium, Lodi Garden, Budha Jayanti Park, Mahavir Vanashtali, Central Vista, Nehru Park etc. The green areas of NDMC can be broadly classified into two categories viz the ridge area and gardens, avenues area. While the former is maintained by the forest department, the latter is maintained by the horticulture department of NDMC.

Gardens and avenues.

Horticulture Department of NDMC is maintaining about 1,107 acres of green area including 7 gardens and 53 roundabouts. In the entire NDMC area the Road Berms have been converted into beautifully maintained green strips. The trees along the roadsides are 75,000 and in Garden 1,60,000. Apart from maintenance works, various development and improvement works for environmental improvement by way of tree plantation, grassing, etc. have been taken up by NDMC to reduce air pollution. There are large green areas (**Table 4.4**) including 6 gardens (area : 384.58 acres), central vista (area:182 acres), 53 roundabouts, 82 parks in residential colonies, green strips and avenue plants along roadsides along with recently renovated central park of Connaught Place. NDMC carries out regular maintenance of parks and gardens and plantation of trees, shrubs and ornamental plants in available spaces.

Table 4.4 : Brief statistics on Gardens and Avenues in NDMC area

Total Green Area	1,107 acres	Major Gardens/ Park	7
Roundabouts	50	Trees on Roadsides	75,000
Trees in Gardens	1,60,000	Glass House	1
Nurseries	3	Rose Gardens	3
Urban Forest	1 (38 acre)	SmallGardens	8
Park in Gov. colonies	4	Race Course	1
Golf Club	1		

The NDMC area is well known for its well maintained gardens. Few important gardens in the N.D.M.C area are The Mughal Garden, Nehru Park, Lodi Garden Talkatora. These gardens caters to not only the residents of NDMC area but to people from all over National Capital Territory of Delhi. The central park of Connaught Place after its renovation has become the most recent attraction in the NDMC area.

The **Mughal Garden** is located in the premises of the President house. This garden has some exotic and rare flower plants. The dwarf orange trees and numerous rose plants are special attraction of the garden. Recently the President Estate has established a special Herbal Garden with rare and exotic collection.



The **Nehru Park** stretches over 70 acres/ 283350 sqm of land with a lawn area of 50 acres. The park has 1950 trees below 5 years of age and 5131 trees above 5 years of age. There are 175 Flower beds spread over 2 acres/ 16096 sqm.



The **Lodi Garden** adjoining the India International Center has the tombs of Sayid and Lodi rulers. Spread over 85 acres / 344050 sqm and has a lawn area of 60 acres. The garden has beautiful trees, lawns, flowering shrubs, fountains, lakes, a baoli, a rose garden, a bonsai garden, a glass house and jogging/walking tracks. There are 1100 trees below 5 years of age and 6050 trees above 5 acres. There are around 250 flower beds spread over 3 acres/ 12144 sqm.



The **Talkatora Garden** spread over 45 acres has Persian landscaping. A waterfall, lily pond, an open-air theater Sur-Tall, jogging/walking tracks, a swimming pool, and a baoli that enhances the Mughal ambience.



Covering an area of 41,500 sq m and built above Rajiv Chowk metro station in the heart of the city, the **Central Park** had been taken over by the DMRC in 2001 when the area was needed for construction of two Metro stations below the surface. The park has since been re-developed according to international standards by DMRC. After its redevelopment the central park has been handed over to NDMC on December 2006. It may be used by the visitors of Connaught Place for sitting, relaxing and enjoying the surroundings. It has four water bodies and the 21 fountains. Extensive landscaping has also been carried out in the park. Lush grass has been planted over 27,000 square meters and 500 trees and 1,000 shrubs have also been planted. The species of plants have been carefully selected and most of them are evergreen. This will ensure that the park remains a visual delight around the year. Some of the species that have been planted are white champa, royal palm, gulmohar, pink tabebuia, bottlebrush, India laurel and Ashoka.



Roundabouts

There are 53 roundabouts in NDMC area out of which maintenance of 24 are outsourced to private companies like Maruti (9) , Noida Toll Bridge (4), MTNL (6) , Indian Railways (3) , ITC (1) and IGL (1)

Avenues

The NDMC area has typical characteristic in terms of extensive tree cover along the roads. Each road of the NDMC area has been planted with a particular species of tree to give the road a uniform character. The prominent species of trees lining the roads are Neem, Arjun, Jamun, Imli, Bahera, Mahua, Peepal, Alstonia, Amaltas, Philkhan and Gulmohar. The lists of roads that have been planted with these species of trees are given in Table 4.5.

Table 4.5: Characteristic trees planted in the avenue of NDMC area

S.no	Common Name	Scientific Name	Name of Road
1	Neem	<i>Azadirachta Indica</i>	Safdarjang Road, Kasturba Gandhi Marg, Prithviraj Road, Aurangzeb Road, Tees January Marg, Lodi Road, Aurobindo Marg, Kamal Ataturk Marg, Pandara Road, Sansad Marg, Jai Singh Road, Jantar Mantar Road, Shahjahan Road, Sardar Patel Marg.
2	Arjan	<i>Terminalia arjuna</i>	Teen Murti Marg, Janpath, Park Street, Pandara Road
3	Jamun	<i>Syzygium cerasoides</i>	Rajpath, Ashok Road, Raisina Road, Rajaji Marg, K. Kamraj Marg, Sunehri Bag Road, Motilal Nehru Marg, Tughlaq Road, Feroz Shah Road.
4	Imli	<i>Tamarindus indica</i>	Tilak Marg, Akbar Road, Baba Kharak Singh Marg, Pandit Panth Marg, Gurudwara Road
5	Bahera	<i>Terminalia balerica</i>	Dr. Rajendra Prasad Road
6	Mahua	<i>Madhuca indica</i>	Rajesh Pilot Marg
7	Pipal	<i>Ficus religiosa</i>	Mandir Marg, Mother Teresa Crescent, Panchsheel, Simon Bolevard Marg
8	Banyan tree	<i>Ficus Microcarpa</i>	Bhagwan dass road, Bisham pitamah marg
9	Chataun	<i>Alstonia scholaris</i>	Kautilya Marg, Max Mullar Road, Aurobindo Marg, Vinay Marg
10	Amaltas	<i>Cassia fistula</i>	Amrita Shergill Marg, Shantipath, Humayun Road
11	Pilkhan	<i>Ficus infectoria</i>	Zakir Hussain
12	Gulmohar	<i>Delonix regia</i>	Shantipath
13	Putranjiva	<i>Putranjiva roxburghii</i>	Race Cource Road
14	Khirni	<i>Schleichera trijuga</i>	Maulana Azad Marg
15	Sausage tree	<i>Kigelia pinnata</i>	Purana Quila Road

Many of the avenue trees were planted about 100 years back and due to various reasons they need to be replanted. Such trees amount approximately to about 200 trees per year. In addition, the metro construction caused felling of about 300 trees which also needs re-plantation. Plantation of new trees and to nurturing the same is a challenging task. The survival rate of the trees that are planted along the road is extremely poor. Callous attitude of the citizens often causes the death of the plant when they are of breast height size. In the whole process, avenue trees rarely get replaced.

Forested Area

In recent years, the forest covers in NCT of Delhi in general and NDMC area in particular has shown an increasing trend. While in 2001 the forest cover of New Delhi District that comprises a large part of NDMC area was 9.73 sqkm, in 2003 it increased to 14.54 sq km. This trend is visible by the study of time series forest cover map during 1999, 2001 and 2003. The forest cover in the NDMC area has increased due to various initiatives taken by the government in Afforestation. The Central Ridge which is the rocky outcrop of Aravali Hills, serves as the green lungs for the NDMC area. The natural forests are mainly of Tropical Dry Deciduous type. The main native tree species of the ridge forests include *Anogeissus pendula*, *Ziziphus mauritana*, *Ehretia laevis* and *Balanites aegyptiaca*. The fauna species found in Central ridge are neelgai (blue bull), mongoose, porcupine, monkeys and monitor lizards. Around 250 species of birds can still be spotted in and around the area. However, the ridge areas have always been under pressure due to ever-increasing urbanization and development activities. Government of Delhi has set up a Ridge Management Board headed by the Chief Secretary to address the issue of increasing pressure and protect the environment from environmental deterioration.

The expansion of forest coverage in Delhi in general and NDMC area in particular has received a big boost from the Bhagidari process. Delhi's Department of Environment and Forests has associated various stakeholders like RWAs, MTAs, Eco-Clubs in schools and colleges, corporate sector enterprises, NGOs, and citizens in protecting and nurturing the environment. The government provides free saplings and encourages community organizations under Bhagidari to help in planting the saplings and looking after them. These initiatives have contributed to significant increases in NDMC area's forest cover



Fig. 4.14 Forest Cover in NDMC area 1999



Fig. 4.15 Forest Cover in NDMC area 2001

Management And Protection Of Central Ridge

As per the decision of Land & Development Officer, (L&DO), Ministry of Urban Development and Government of NCT of Delhi, 423 ha of Central Ridge has been taken over by the Forest Department on 06.09.2004 from CPWD for protection and Management.

For protection of Central ridge, the Department has engaged 25 ex-servicemen.

The Department has started cleaning the Ridge and public is being involved in plantation activities and for maintaining cleanliness in Ridge. Fencing of vulnerable areas is being undertaken to prevent encroachment.

The Forest Department along with the horticulture department of NDMC are the main greening agencies of the NDMC area and is undertaking plantation, protection of forest/ trees. The Forest Department is participating and associated in the Bhagidari activities, Eco clubs etc. The Department is making wide publicity through electronic and print media, banners, hoardings, and with the association of NGOs for involving all cross-section of the Society in plantation. The Department organizes various programmes on environment & Forest for creating public awareness.

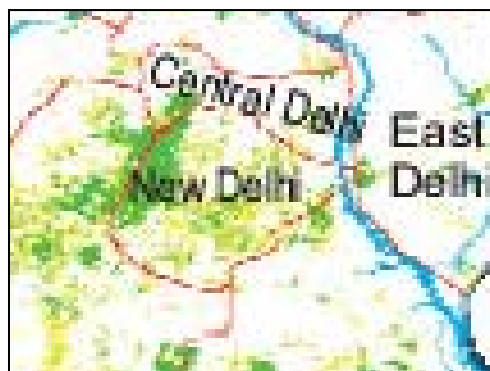


Fig. 4.16 Forest Cover in NDMC area 2003

The NDMC area has seen rapid urbanization in the last few decades, which is putting pressure on its green cover. The number of vehicles is also increasing rapidly. Though introduction of CNG has significantly reduced air pollution, there is no alternative to green cover for combating air pollution. There is growing realization for augmenting measures for ground water recharge where trees / forests can play major role in reducing run off and water conservation. There is great enthusiasm and sensitivity among citizens particularly children for protection of trees in the NDMC area.

Actions taken to improve biodiversity and vegetative cover.

Over the past one decade, the NDMC area has seen extensive afforestation activities, the Greening Delhi Action Plan since 1998 by Department of Forests and Wildlife, Government of NCT of Delhi has been extensively coordinating the afforestation activities. The species are selected based on requirement of the area of plantation. The recommended species for the purpose of plantation as per Greening Delhi Action Plan 2006 -07 are provided in Table 4.6.

Table 4.6: Recommended species for the purpose of plantation as per Greening Delhi Action Plan 2006-07

Plant species for Roadside: <i>Cedrela Toona</i> (Tun) <i>Ficus infectoria</i> (Pilkhan) <i>Koelreuteria apiculata</i> <i>Peltaforum species</i> <i>Schleichera trijuga</i> (Kusum) <i>Chukarassia tabularis</i> <i>Swietenia mahogany</i> (Mahogany) <i>Sterculia alata</i> (Var. diversifolia) <i>Alstonia scholaris</i> (Chhataun) <i>Kigelia pinnata</i> <i>Terminalia arjuna</i> (Arjan)	Plant species for lanes/ streets: <i>Cassia fistula</i> (Amaltas) <i>Lagerstroemia thorelli</i> (Pride of India) <i>Pongamia glabra</i> (Papari) <i>Callistemon lanceolatus</i> (Bottle Brush) <i>Grevillea robusta</i> (Silver oak) <i>Aegle marmelos</i> (Bael) <i>Hollarrhena pubescens</i> <i>Wrightia tinctoria</i> <i>Nyctanthes arbortristis</i>	Residential areas (small trees/ shrubs): <i>Tabernaemontana coronaria</i> (Chandni) <i>Lagerstroemia indica</i> <i>Hamelia patens</i> <i>Bougainvillea</i> <i>Poinciana pulcherrima</i> <i>Cestrum nocturnum</i> (Rat ki Rani) <i>Hibiscus</i> <i>Gardenia florida</i> (Gandhraj) <i>Murraya</i> (Kashipatta)
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<p><i>Pterospermum acerifolium</i> (Kanak Champa) <i>Cassia fistula</i> (Amaltas) <i>Putranjiva roxburghii</i> (jiya pota) <i>Grevillea robusta</i> (Silver oak) <i>Barringtonia acutangula</i> <i>Azadirachta Indica</i> (Neem) <i>Terminalia balerica</i> (Bahera) <i>Bishchoefia javanica</i> <i>Sarraca asoka</i> (Sita Asoka)</p>	<p><i>Lagerstroemia speciosa</i> (Pride of India) <i>Syzygium cumuni</i> (Jamun) <i>Schleichera oleosa</i> (Kusum) <i>Pistacia integerrima</i> <i>Albizia lebeck</i> <i>Cochlospermum gossypium</i> <i>Michelia champaca</i> <i>Erythrina suberosa</i></p>	<p><i>Lausonia indica</i> (Mehndi) <i>Cassia fistula</i> (Amaltas) <i>Azadirachta indica</i> (Neem) <i>Polyalthia longifolia</i> (Asok)</p> <p>For checking Noise Pollution & suspended particulate matters: <i>Azadirachta indica</i> (Neem), <i>Cassia fistula</i> (Amaltas), <i>Ficus religiosa</i> (Pipal), <i>Ficus infectoria</i> (Pilkhan), <i>Mimusops elengi</i> (Maulsiri), <i>Ficus glomerata</i> (Gular), <i>Terminalia arjuna</i> (Arjun), <i>Kigelia pinnata</i>, <i>Syzygium cumini</i> (Jamun), <i>Bauhinia variegata</i>, <i>Bombax ceiba</i> (Semul), <i>Cassia nodosa</i>, <i>Cassia javanica</i>, <i>Jacaranda mimosaeifolia</i>.</p>
<p>Lawn & Gardens: <i>Chukrassia tabularis</i> <i>Alstonia scholaris</i> (Chataun) <i>Cassia fistula</i> (Amaltas) <i>Lagerstroemia thorelli</i> <i>Callistemon laceolatus</i> <i>Koelreuteria apiculata</i> <i>Jacaranda mimosaeifolia</i> (Jacaranda) <i>Cassia javanica</i> <i>Mimusops elengii</i> (Maulsari) <i>Barringtonia acutangula</i> <i>Schleichera trijuga</i> (Kusum) <i>Putranjiva roxburghii</i> <i>Sapium sebiferum</i> (Makhan tree) <i>Azadirachta indica</i> (Neem) <i>Polyalthia longifolia</i> (Asok) <i>Aegle marmelos</i> (Bael) <i>Ficus religiosa</i> (Pipal) <i>Cinnamomum camphora</i> (Camphor) <i>Terminalia Chebula</i> (Harar) <i>Terminalia balerica</i> (Bahera) <i>Ficus Glomerata</i> (Gular) Shurbs <i>Cassia glauca</i> <i>Tabernaemontana coronaria</i> (Chandni) <i>Lagerstroemia indica</i> <i>Hamelia patens</i> <i>Bougainvillea</i> <i>Poinciana pulcherrima</i> <i>Cestrum nocturnum</i> (Rat ki Rani) <i>Nerium oleander</i> <i>Hibiscus</i></p>	<p>School/ Education Institution/ Office complex: <i>Chukrassia tabularis</i> <i>Alstonia scholaris</i> (Chitvan) <i>Cassia fistula</i> (Amaltas) <i>Lagerstroemia thorelli</i> <i>Callistemon laceolatus</i> <i>Koelreuteria apiculata</i> <i>Jacaranda mimosaeifolia</i> <i>Cassia javanica</i> <i>Mimusops elengii</i> (Maulsari) <i>Barringtonia acutangula</i> <i>Schleichera trijuga</i> (Kusum) <i>Putranjiva roxburghii</i> <i>Sapium sebiferum</i> (Makhan tree) <i>Azadirachta indica</i> (Neem) <i>Polyalthia longifolia</i> (Asoka) <i>Aegle marmelos</i> (Bael) <i>Ficus religiosa</i> (Pipal) <i>Cinnamomum camphora</i> (Camphor) <i>Terminalia Chebula</i> (Harar) <i>Terminalia balerica</i> (Bahera) Shurbs <i>Cassia glauca</i> <i>Tabernaemontana coronaria</i> (Chandni) <i>Lagerstroemia indica</i> <i>Hamelia patens</i> <i>Bougainvillea</i> <i>Poinciana pulcherrima</i></p>	<p>Parking space: <i>Putranjiva roxburghii</i> (Putranjiva) <i>Lagerstroemia indica</i> (Pride of India) <i>Syzygium spp.</i> (Jamun) <i>Cassia fistula</i> (Amaltas) <i>Pongamia glabra</i> (Papari) <i>Ficus infectoria</i> (Pilkhan) <i>Mimusops elengii</i> (Maulsari) <i>Delonix regia</i> (Gulmohar) <i>Samania saman</i></p> <p>For controlling Air Pollution: <i>Ficus religiosa</i> (Pipal), <i>Albizia lebbek</i> (Siris), <i>Cassia fistula</i> (Amaltas), <i>Zizyphus jujuba</i> (Ber), <i>Azadirachta indica</i> (Neem), <i>Tamarindus indica</i> (Imli), <i>Dalbergia sissoo</i> (Shisham), <i>Butea monosperma</i> (Dhak), <i>Ficus glomerata</i> (Gular), <i>Ficus infectoria</i> (Pilkhan), <i>Alstonia scholaris</i> (Chitvan/ Chattaun), <i>Acacia nilotica</i> (Desi kikar)</p> <p>For area where gaseous pollutants are dominant <i>Acacia nilotica</i> (Desi kikar), <i>Aegle marmelos</i> (Bel), <i>Ailanthus excelsa</i> (Ulloo neem), <i>Albizia lebbek</i> (Siris), <i>Alstonia scholaris</i> (Sataun), <i>Azadirachta</i></p>

<i>Gardenia florida</i> (Gandhraj) <i>Murraya</i> Kashipatta <i>Lausonnia indica</i> (Mehndi)	<i>Cestrum nocturnum</i> (Rat ki Rani) <i>Nerium oleander</i> <i>Hibiscus</i> (Gurhal0 <i>Gardenia florida</i> (Gandhraj) <i>Murraya</i> (Kashipatta) <i>Acalypha</i>	<i>indica</i> (Neem), <i>Dalbergia sissoo</i> (Shisham), <i>Ficus religiosa</i> (Pipal), <i>Ficus infectoria</i> (Pilkhan), <i>Lagerstroemia flosreginae</i> , <i>Mimusops elengi</i> (Maulsiri), <i>Nerium indicum</i> (Kaner).
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*Scientific Name (Common Name)

The strategy for improvement of green cover in the NDMC area through plantation of trees is as follows:

- Identification of areas for Afforestation by concerned agencies/ public & proper planning of plantation activities.
- Site preparation for plantation. Selection of species suited to the plantation site/ localities
- Raising of sufficient saplings in nurseries.
- Application of modern technology for raising saplings, Use of organic composts and root trainers.
- Protection of existing trees.
- Leaving of sufficient space at least 6 ft x 6 ft around the tree trunks along the avenues to protect them from choking due to tiling and black topping
- Planting of tall & healthy saplings and transplantation of suitable trees.
- Protection of plants from biotic interference by fencing/ installing tree guards.
- Post Plantation care particularly the maintenance and regular watering.
- Regular monitoring.

Probable sites for plantation includes educational institutions, hospitals, bus shelters, bus stations, parks & gardens, road sides & central verge, service lanes, along railway lines, along the drains, ponds and water bodies, residential areas, community centres, market area/ complexes, parking places, office complexes, religious institutions etc.

Forest Department of Govt. of NCT of Delhi is distributing free saplings to public from departmental nurseries like Birla Mandir nursery (behind Birla Mandir, Mandir Lane) located in various parts of NDMC area. The department has distributed saplings to the public in Bhagidari Mela, Eco Club meet, Health Mela, Stree Shakti Mela & other Government functions. Also free samplings are available in a number of petrol pumps and mother dairy outlets in the NDMC area to promote afforestation. The list of such Retail outlets is given in **table 4.7**

Table 4.7: List of Retail outlets from where free distribution of saplings are undertaken for NDMC area.

S. No	Name Of The Retail Outlet	Address	S. No	Name Of The Retail Outlet	Address
1	Auto Car Care	Niti Marg, Near Ashoka Hotel, New Delhi - 110 021	24	Sarojini Nagar	Ring Road, Naroji Nagar
2	Automotives	Lodi Road, New Delhi - 110 003	25	Cgo Complex	Scope Complex
3	Batra Car Care Centre	Hamayun Road, Delhi - 03	26	Car Care	Lodi Road, New Delhi - 110033
4	Central Service Station	E-24 , Connaught Place, New Delhi - 110 001	27	Jiwan Ss	Q-Point, Mann Singh Road, New Delhi - 110001
5	Hemkunt Service Station	Near Lodi Hotel, Jangpura Extn. New Delhi 110 003	28	Modern Ss	Janpath, Opp. Eastern Court, New Delhi - 110001
6	Laxmi Super Service	Opp, Super Bazar, Laxmibai Nagar, Delhi- 110 023	29	Anand Filling Station	Irwin Road, New Delhi - 110001
7	Rajeev Service Station	Sunder Nagar, Near Zoo, New Delhi - 110 003	30	Bcc Auto Pvt. Ltd.	Barakhamba Road, Connaught Place, New Delhi - 110001
8	Safdarjang Service Stn.	Safdarjang Road, New Delhi - 110 003	31	Kamla Bhel & Co P Ltd	12 Scindia House, New Delhi - 110001
9	Bedi Motors	Race Course, Club Road, New Delhi - 110 003	32	National Service Station	H Block, Connaught Circus, New Delhi - 110001
10	Prem Oil Corporation	Central Secretariat, Church Road,,New Delhi-1	33	Sondhi Motors	21c Connaught Place, New Delhi - 110001
11	R.N. Soin & Sons	Netaji Subhash Marg, N.Delhi,	34	Gymkhana Service Stn	Club Road, Near Race Course, New Delhi-110003
12	M/S Ashoka Tourist S Stn	Niti Marg, Chanakyapuri New Delhi	35	Yashwant Place	Opp. Chanakya Cinema, Vinay Marg, Chanakya Puri, New Delhi-110021
13	M/S Capital Oil Agencies	Ring Road, Nauroji Nagar New Delhi	36	Mother Dairy Booth	Opp. Flat No. D li/321, Kendriya Bhandar, Pandara Road
14	M/S Dtts	Brig Hoshiar Singh Road, Laxmibai Nagar New Delhi - 110023	37	Mother Dairy Booth	Adjacent Shop No. 1788 Type li Flats, Laxmibai Nagar

S. No	Name Of The Retail Outlet	Address	S. No	Name Of The Retail Outlet	Address
15	M/S Engineers S/Stn	Sri Aurobindo Marg Near Safdarjung Aerodrome New Delhi - 110003	38	Mother Dairy Booth	D li Flats,R K Ashram Marg,Gole Market
16	M/S Rk S/Stn	Opp. Chanakya Cinema Yashwant Palace,Vinay Marg, New Delhi-21	39	Mother Dairy Booth	Adjacent loc Petrol Pump, Ring Road Mkt Sarojini Ngr
17	Coco - Connought Place	L-Block, Connought Place, New Delhi-110001	40	Mother Dairy Booth	Udayan Marg, Opp. Birla Mandir, Kalibari
18	Metropole S/Stn	23-A, Connaught Place, New Delhi - 110001	41	Mother Dairy Booth	Opp. Navyug School, Lodi Colony
19	M/S Nineteenth Hole S/Stn	Dr. Zakir Hussain Road, Near Delhi Golf Club New Delhi	42	Mother Dairy Booth	Opp. Flat No. 180, Jor Bagh, Lodi Colony
20	M/S Pearey Lal & Sons	42, Janpath New Delhi	43	Mother Dairy Booth	Opp Patrol Pump, Kaka Nagar
21	M/S Rajdhani S/Stn	Mayur Bhawan, C.P. New Delhi	44	Mother Dairy Booth	Sardar Patel Marg, Adjacent lb Colony, Bapu Dham
22	M/S Shanker Automobiles	Bhai Veer Singh Marg Near Gole Market New Delhi	45	Mother Dairy Booth	Opp. Flat No. 288 Chanakya Puri
23	Delhi Haat	Delhi Haat, Opposite Ina Market Delhi			

For protecting and improving the vegetation cover' transplantation of trees, replacement of old/ over-mature trees, removal of tiling/ black topping and embedded tree guards around trees and enrichment of vegetation in existing forest areas are suggested. The existing vegetation in case of open forest or parks and gardens where density of trees is low, can be improved by enrichment planting and aided natural regeneration. Mixed indigenous species should be planted as far as possible in such areas.

Forests and Water

The relationships between forest ecosystems and hydrology form vital strands in the web of interconnections that sustains the NDMC area. Vegetation checks the rapid runoff and recharges aquifers and evapo-transpiration from plants suffuses atmosphere of the locality with enough moisture to significantly cool the microclimate. Forests help maintain healthy aquatic ecosystems and provide reliable supplies of clean freshwater. But not only do they filter and clean water --

forests also help prevent soil erosion, reduce sedimentation in reservoirs and mitigate the risks of mudslides and floods, all problems that can threaten water supplies. While forests themselves consume water, they also improve infiltration rates, thereby helping recharge underground aquifers.

Issues

- Protection of trees in avenues, tree guard gets vandalized.
- Proper Security during Night
- Shortage of water for irrigation
- Inadequate drinking water and toilet facilities in parks
- Shortage of machineries
- Shelter for malis and other staff
- Hawkers, parking

4.2 FUNCTION OF NEW DELHI MUNICIPAL COUNCIL AS PER NDMC ACT FOR PROTECTION AND IMPROVEMENT OF ENVIRONMENT IN THE AREA

The NDMC act defines a set of obligatory and discretionary functions that directly and indirectly influence the protection and management of environment in the NDMC area. These are listed below in the subsequent section.

4.2.1 Obligatory functions of the Council

Subject to the provision of the NDMC Act and any other law for the time being in force, it shall be incumbent on the Council to make adequate provisions by any means or measures which it may lawfully use or take, for each of the following matters, namely :-

- a) The laying out or the maintenance of public parks, gardens or recreation ground.
- b) The construction, maintenance and cleansing of drains and drainage works and of public latrines, urinals and similar conveniences.
- c) The construction and maintenance of works and means for providing supply of water for public and private purpose.
- d) The scavenging, removal and disposal of filth, rubbish and other obnoxious or polluted matters.
- e) The construction or purchase, maintenance, extension, management for providing a sufficient supply of pure and wholesome water.
- f) The reclamation of unhealthy localities, the removal of noxious vegetation and generally the abatement of all nuisances.
- g) The regulation of places for the disposal of dead and the provision and maintenance of places for the said purpose.

- h) The lighting, watering and cleansing of public streets and other public places.

4.2.2 Discretionary functions of the council

Subject to any general or special order of the Government or the Central Government from time to time, the Council may provide either wholly or in part for all or any of the following matters, namely:

- a) The planting and care of trees on roadsides and elsewhere.
- b) The organization, construction, maintenance and management of swimming pool, public wash houses, bathing places and other institutions designed for the improvement of public health.
- c) The provision for unfiltered water.
- d) The improvement of New Delhi in accordance with improvement schemes approved by the Council.
- e) The establishment and maintenance of, and aid to, libraries, museums, art galleries, botanical and zoological collections.
- f) The establishment and maintenance of, and aid to, stadia, gymnasia, akharas and places for sports and games.
- g) The construction and maintenance of cattle pounds.
- h) The organization or management of chemical or bacteriological laboratories for the examination or analysis of water, food and drugs for the detection of disease or research connected to public health or medical relief.

4.3 FACTORS CAUSING STRESS ON THE ENVIRONMENT OF NDMC AREA

The activities of people living in and around the NDMC area - how they live, how they move about, the resources that they use and the waste they create – determine the level of stress caused on the natural environment of the NDMC area. NDMC area being the heart of Delhi, experiences immense environmental stress due to the floating population, in the area than the local inhabitants. Hence, it is essential to examine the environmental stress from a more macro perspective of NCT of Delhi as a whole. This section provides an overview of some of the key parameters that affect the quality of land, water and air in the NDMC area of Delhi.

4.3.1 Density, Land Use and Urban Form

The number of people living in Delhi has an indirect effect on environmental conditions of the NDMC area. Though the NDMC area has a low density but it is surrounded by high density pockets. All basic services and amenities (both residential and floating) such as food, water, shelter, clothing, mobility, waste management, recreation and community, come at some cost to the environment. The type and scale of impact depends on how those services are provided. Living in energy efficient houses, for example, conserves energy, than living in poorly insulated houses. Commuting by public transit causes less pollution per capita than

commuting by individual vehicles. Similarly use of renewable energy in the form of solar heaters, garden lights, etc causes less stress to environment than using fossil fuel based sources. Although the residential population is relatively low, the NDMC area by virtue of its commercial and institutional character has a large influx of floating population. The infrastructural need of this population is also required to be catered. This causes a high degree of stress to the NDMC environment, adversely affecting the air & water quality and noise levels.

4.3.2 Transportation

Vehicular traffic is a major environmental concern significantly due to air emissions from internal combustion engines as well as, amount of land brought under transportation usage. Water quality is also affected by transportation, since storm water runoff from roads and parking lots, drain heavy metals, oils and other pollutants into the water. NDMC area geographically being the city centre of Delhi, receives a lot of, through traffic which can adversely affect the air environment. A detail study of vehicular population in NDMC (Refer chapter 11 on Road and transport) reflect the vehicular volume and degree of road congestions during peak hours.

4.3.3 Energy Production, Transmission and Use

Every stage of the energy cycle - production, transmission and use - affects the state of the environment. There are two power plants, Pragati and Indraprastha located in the periphery of the NDMC area. Emissions from these power plants affect the ambient air quality of the area. In the NDMC area there are high incidence of promoting the use of renewable power like solar water heater, and street lights (for gardens and lawns) to reduce impacts on environment.

4.3.4 Solid waste generation and disposal

NDMC area generates about 400 T Municipal Solid Wastes (MSW) a day. It does not have any landfill located within its geographical confines. The waste is presently being disposed in MCD maintained landfill facilities located in Gazipur and Okhla. Thus causing a significant environmental concern in and around landfill sites (Refer chapter 10- Solid Waste Management).

NDMC has a large area under green cover which includes gardens, parks, avenue trees, etc. The garden waste generated from these areas has high potential of composting, bio methanisation, etc. However, in present scenario, such waste is predominantly burnt, causing a loss of nutrient and valuable resource.

4.3.5 Habitat loss and degradation

Habitat loss and degradation can adversely affect the wildlife conditions. Over the last 50 years, there has been a dramatic physical alteration of NDMC area that has led to significant loss of natural wetlands, streams, forests, meadows and other habitats. Impaired water quality and contaminated sediments have reduced the availability and quality of aquatic habitat. The NDMC area is a planned sub city developed in early 19th century. The development phase of this area, witnessed a large scale loss of habitat. Even where natural areas are protected, degradation can take place from surrounding land uses and inappropriate human use. For example, overuse of parks may lead to erosion and loss of plant species.

4.3.6 Introduction of exotic species

The introduction of foreign species can alter the balance in terrestrial and aquatic systems. Many exotic species are now found in the parks and natural areas of NDMC. These include plants that were introduced by the British during the construction of New Delhi.

4.3.7 Wastewater

Wastewater is the effluent generated through sewage treatment. It adversely affects the water environment when effluent is discharged in water bodies such as River Yamuna. More significant is the impact of combined sewer overflows which causes impaired water quality around the outfalls, and leads to high bacterial loadings in River Yamuna. Though the river Yamuna does not come under planning boundary of NDMC, yet it is greatly affected by activities occurring in NDMC area. Resultantly, the degraded condition of the river is likely to cause a high degree of environmental stress to the area.

4.3.8 Storm water

In natural systems, rainfall infiltrates into the ground. In urban areas, such as NDMC, this is unlikely since most of the infrastructure such as roads, parking lots and rooftops are impervious. Storm water runoff is a threat to the water environment since rainwater gets collected in the city's storm sewer system, and is discharged into rivers. This affects the water quality since pollutants such as heavy metals, organic chemicals, bacteria and phosphorus gets drained into water bodies.

4.3.9 Emission of air pollutants

Air pollution comes from a multitude of sources - residential, recreational, industrial, commercial and institutional - and can lead to local, regional and global impacts. Emissions from vehicles are a major contributor to degradation of air environment in NDMC. Stationary sources such as fossil fuel power plants in the periphery of NDMC area are major contributors of sulphur dioxide, which affects local air quality and causes acid rain. All combustion sources emit carbon dioxide, a potent greenhouse gas that is a major cause of climate change (global warming).

4.4 KEY INSTITUTIONAL ISSUES

There are several regulatory agencies operating at the national and city level in the NDMC area for implementation of regulations related to environment. **Table 4.8** shows the various agencies and their roles.

Table - 4.8: Agencies in Environmental Management and their role.

Agency	Role
Forest Department	Management of central ridge, Plantation in Central Ridge, Development of City Forests, Linkages with other Govt. agencies, RWAs, NGOs, Eco Clubs.
NDMC	Ensuring water supply and management of water. Management of central ridge, Undertake afforestation activities, up keep of the parks and roundabouts. All works related to horticulture, maintenance of municipal parks and gardens. Solid waste management, drainage, sewerage and street cleaning.

Agency	Role
Delhi Government	Bhagidari project, increased emphasis on afforestation, Undertake afforestation activities.
PWD	Plantation of trees on various roads, flyovers of Delhi, traffic intersections, schools, residential colonies, hospitals, etc.
Delhi Jal Board	Undertake afforestation activities. Supply of treated water for drinking purpose and untreated water for irrigation purpose.
DTC	Undertake afforestation activities. Maintenance of bus to improve air quality by ensuring minimum per unit emissions.
Health Department	Undertake Afforestation activities
The Department of Environment	Improving the overall Environmental Quality in Delhi. Engaged in overall environmental assessment, monitoring, protection and awareness generation among the people of Delhi. Multidimensional approach is being adopted by the Department for promotion, conservation and preservation of Environment.
Food & Civil Supplies Deptt.	Prevention of fuel adulteration.
Delhi Pollution Control Comitee (DPCC)	Compliance to water, air, noise parameters.
Central Pollution Control Board (CPCB)	Monitoring of air and water quality. Compliance to national standards.
Environmental Pollution (Prevention and Control) Authority (EPPCA)	Enforcement of environmental regulation in NCR, hazardous substances.
Central Water Commission	Monitors water quality.
Central Ground Water Board	Ground water monitoring.
Irrigation and Flood Control Department	Management of surface water bodies - lakes, tanks and ponds.
NGOs - TERI, CSE, TAPAS, INTACH	Creating awareness, research and conducting studies, publications creating awareness.
Delhi Traffic Police	Implementation of traffic laws, checking PUC, Enforcing regulations to reduce noise pollution, easing traffic congestion and bottle necks.
Ministry of Environment and Forest	Formulation of acts , rules and regulation for the improvement of environment. Nodal agency in the administrative structure of the Central Government, for the planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programmes.
Central Ground Water Authority	To regulate indiscriminate boring and withdrawal of ground water and to issue necessary regulatory directions with a view to preserve and protect the ground water.

Although the planning for NDMC area has made progress in moving towards ecosystem approach to planning and managing activities, there are still many institutional and structural issues that contribute to environmental impairment as does pollution or resource depletion. The foremost issue being, lack of long term foresight. Very often, decisions are made based on annual business cycles, or terms of office, or five-year planning horizons. Rarely do decision-makers consider the impacts of their actions on the following generation.

Secondly, lack of integration of environmental issues within NDMC administration and decision-making is another major discrepancy. There is no specific department

which addresses and monitors environmental issues. The horticulture department responsible for addressing environmental aspects is also not geared to address and make suggestions with respect to environmental issues. Many of the NDMC activities have severe environmental implications but planning and decision-making rarely considers such issues in a systematic and comprehensive manner.

In terms of environmental protection and enhancement, the governance system in NDMC is characterized by jurisdictional fragmentation. Responsibility of environmental aspects is distributed amongst multiple departments, ministries and conservation authorities. This leads to gaps, overlaps and lack of coordination of efforts. Inadequate coordination and protocols for data collection and management implies that information is often hard to locate and is stored in incompatible formats.

However, there is a growing understanding of the institutional barriers to sustainability, and therein lies tremendous opportunity. More and more citizens and decision-makers are concerned about the environment, they understand about the need for systematic planning, integration of environmental considerations into planning and incorporation of long-term consequences of actions, in the thinking process.



Chapter – 5 : Built Heritage Conservation & Management



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Subcity Plan NDMC

CHAPTER - 5

BUILT HERITAGE CONSERVATION & MANAGEMENT

5.1 SPECIAL HERITAGE CHARACTERISTICS OF THE NDMC AREA

The planned city of 'Lutyens New Delhi', inaugurated in 1931 as the capital of India, continues to determine the unique character of the NDMC area to a large extent, and constitutes the most important heritage component within the NDMC area. An area of about 28 sq.km. within the overall extent of 42.74 sq. km of the NDMC area is occupied by the planned city of 'Lutyens New Delhi'. Within this, about 22.3 sq.km (2230 hectares) is designated as the Lutyens Bungalow Zone.¹

Combining 'Beaux Arts features and garden city environs, monumental axial boulevards lined with one-storey bungalows', Lutyens New Delhi, with its planning system of radial diagonals and quadrilateral grid designed to emphasise and integrate pre-existing major historic monuments and environmental features 'as a synthesis of Indian and Western architectural and civic ideals'², was intended to be among 'the most unique and attractive cities of the world'.³ 'Under the powerful inspiration of Lutyens, an 'Indo-British' school of architecture flourished in Delhi in the 1920's and 1930's which was one of the last flowerings of the Classical tradition anywhere'⁴

Even today, despite extensive, largely ad-hoc transformations, New Delhi is considered to 'represent a powerful concept in urban design incorporating garden city principles' with its 'open, green, low density configuration providing the larger metropolis with an enormous lung space, and 'constitutes the finest, most beautifully designed urban form in India or, for that matter, anywhere in the world.'⁵

Conceptualized as a distinctive 'Garden City' and 'Imperial Capital', with significant similarities with the planning of Washington D.C. and Paris, the 2800 hectares of Lutyens New Delhi (1.88% of the area of 1,48,600 hectares of the NCT, 0.88% of the area of the 31,82,00 hectares of the DMA), which comprises the major section of the NDMC area, has been recognized as an area of potential World Heritage significance for the 'magnificent balance' of built heritage, public spaces and green areas due to which 'it retains its essential character as a garden city capital'⁶

In addition to the heritage value of the various constituents of 'Lutyens New Delhi' such as the Government Complex, the Central Vista, the commercial centre of Connaught Place and the residential Bungalow zone, the NDMC area also includes within its boundaries 22 monuments, sites and heritage precincts designated as being of National Significance by the ASI, which pre-date the establishment of 'Lutyens New Delhi' and which, together with 125 other heritage buildings and

¹ Zonal Development Plan Zone Division D -New Delhi. DDA

² INTACH Charter on Lutyens Delhi, 2002

³ p.80, Robert Grant Irving, 'Indian Summer: Lutyens, Baker, and Imperial Delhi', OUP, 1981

⁴ Gavin Stamp quoted in Andreas Volwachen, 2004

⁵ LBZ Report of the Committee Constituted by the Ministry of Urban Development, 1998

⁶ LBZ Report of the Committee Constituted by the Ministry of Urban Development, 1998

precincts of state significance, enrich and enhance the distinctive urban environment within the NDMC area as a whole.

A significant feature of the identified heritage components within the NDMC area is that a large proportion of them are under the ownership of the Central Government ministries, agencies and organizations, as well as different State Governments and the Armed Forces, and continue to be in use, while a substantial proportion are the responsibility of public and private trusts or are privately owned.

Table 5.1: ASI Protected Monuments and Sites located within the NDMC area, and NDMC Identified Heritage Buildings & Precincts.

ASI Protected/Maintained within LBZ Area - National Significance		Non-ASI Central/ State Govt. Owned in LBZ Area		Under Dept. of Archaeology and Museums GNCTD		Waqf Board, Church of North India, Public Trusts,		Private	
LBZ	Other	LBZ	Other	LBZ	Other	LBZ	Other	LBZ	Other
Grade I		Grade I		Grade I		Grade I		Grade I	
21	1	14		8		7		-	
		Grade II				Grade II		Grade II	
		31				31		9	
		Grade III				Grade III		Grade III	
		6				8		5	
		Heritage Precincts/ Vistas						Heritage Precincts/ Vistas	
		3 Grade I						2 Grade II	

Another significant feature which characterises the NDMC area is the complex inter-linkage between the built heritage, urban design structure, the designed landscape and environmental features such as the Central Ridge, which exemplifies the valuable relationship developed between the built and natural resources of this area as part of the 'garden city plan' of 'Lutyens New Delhi'. This should be conserved and managed as an integral part of a sustainable sub-city development plan for the NDMC area.

In addition the green areas and the Reserve Forest also provide significant environmental services to the city as a whole through abatement of pollution, carbon sequestration and modulation of the microclimate, and should be considered as zones of environmental protection.

5.2 HERITAGE SIGNIFICANCE OF ZONES WITHIN THE NDMC AREA

Global Historic and Architectural Significance of Lutyen's New Delhi & necessity for heritage value based planning

The historic and architectural significance attached to the planned city of 'Lutyens New Delhi', located within the core of the NDMC area, is acknowledged globally. Even the architect Le Corbusier, designer of Chandigarh, had recognized that 'New Delhi was built by Lutyen with extreme care, great talent and true success. The critics may rant as they will but the accomplishment of such an undertaking earns respect.'

Due to factors such as its potential for designation as a UNESCO World Heritage Site and a World Heritage City, as well as threats to its heritage values posed by both continuing ad-hoc transformations and periodic insensitive proposals for large-scale 're-densification' (NDRAC 1974, Expert Group 1995, TCPO 1997, DG (W) 1997, MOUAE/DDA 1997), the Lutyens Bungalow Zone or LBZ within the NDMC area (550 hectares of residential bungalows, with approximately 400 hectares under Government ownership and 150 hectares in private ownership) was designated by the World Monument Fund as one of the 100 most endangered sites in the world in 2002.

This was followed the preparation of a Charter on Lutyens Delhi by INTACH, with considerable international support, for the 'specific objective of declaring the Lutyens' Bungalow Zone area as a legally protected entity' in order to ensure that proposed predatory, profit-driven and exploitative 're-densification' did not overpower 'the special ambience and character that befits the capital of contemporary India'. It was stated that the 'official-politician-builder lobby periodically advocates the demolition of the bungalow areas to make place for high density developments without contemplating the loss entailed in terms of its historic and heritage value. Such demolitions would forever obliterate the last vestige of a magnificent garden city, which is considered unique among capitals of the world.'⁷ The Charter further suggests that ' a holistic Conservation Plan for New Delhi should be evolved in which conservation and development plans are welded together for sustainable growth'.

In addition to its global significance, it should be recognized that the various constituents of the planned city of 'Lutyens New Delhi', as well as environmental resources and heritage buildings which lie outside the present boundary of the Lutyens' Bungalow Zone, are heritage resources of considerable historical, archaeological, architectural, functional, economic, recreational and educational value to the citizens of contemporary Delhi.

The responsibility for safeguarding and conservation of such a site of recognized global significance, rests with the NDMC within whose jurisdiction it is situated. Such global recognition of the heritage value of Lutyens' New Delhi has immense potential benefit in terms of support to leverage financial assistance for preparation of a management plan as well as providing increased impetus for heritage tourism. This has been experienced in other cities such as Brasilia, Brazil and Bhaktapur and Patan in the Kathmandu Valley, Nepal which have benefited immensely due to recognition as World heritage cities. An INTACH - UNESCO conference held in 2006 to launch a network of Heritage Cities, with the participation of the Chairperson, NDMC, had also highlighted the potential and challenges of planning for the heritage area of Lutyens' New Delhi.

The sub-city development plan approach for the heritage of the NDMC area will therefore take a comprehensive view of the entire heritage area of New Delhi as a whole, keeping in mind the principles on the basis of which the city was planned and constructed, the diverse heritage significance and values of its various components as well as its important contemporary role within the vibrant, globally significant capital of India. Within the broad brush characterization of different character zones, especially those located to the north of Rajpath, it is also necessary to look at areas in detail, at a disaggregated level, to identify pockets of

⁷ INTACH Charter on Lutyens Delhi, 2002

smaller conservation areas which retain their original value and character to a large extent, and for which detail heritage conservation guidelines are urgently required.

5.3 EXISTING STATUS OF THE LUTYENS BUNGALOW ZONE

The Lutyens' Bungalow Zone, defined in the 1988 guidelines and re-delineated as per clause 28(iv) of the 1988 guidelines, comprises only a section of the original components of New Delhi, with notable exclusions in the form of areas north of Rajpath which were 'visually, physically and from a planning point of view a well integrated part of the LBZ', and the Connaught Place area (under norms prescribed by the NDRAC) which was the main high value commercial centre designed by Lutyens team.

The NDMC area is considered to have a relatively stable population, but today caters to an enormous load of commuters as it is one of the major work centres of the metropolis due to the Government offices and corporate hub located there. The total area of the LBZ according to the 1988 delineation was 2230 (2800) hectares. The Land Utilisation within the LBZ area is as follows:

- 31.25% of the area of the LBZ or 847 Hectares is Residential, of which a large proportion is the bungalows and residential designed precincts of heritage value
- 8% or 224 Hectares is Offices, including the monumental, magnificent Government Complex of North Block and South Block
- 6.22% or 174.5 Hectares is Institutional, including significant princely mansions of the various states as well as the National Archives designed by Lutyens himself.
- 0.45% or 12.5 Hectares is Commercial, including the important heritage precincts of Connaught Place and Gole Market.
- 47.86% or 1340 Hectares is landscaped or ceremonial and recreational green, and of great heritage significance
- 7.22% or 20 Hectares is Roads which are landscaped with different types of trees and hedges, and are in themselves important constituents of the character of the planned city of New Delhi.

The delineation of the boundaries of the LBZ has important implications on the conservation of the heritage character of important components of Lutyens New Delhi.

5.3.1 Delineation of the Lutyens Bungalow Zone (LBZ) and Issues

The 1988 D.O. (Guidelines) stated that the LBZ will consist of the entire Lutyens' Delhi excluding:

1. The area between Baba Khark Singh Marg on the South, Panchkuin Road on the North and the Ridge on the West. This corresponds to the DIZ Area and Sub-Zones D 5 and D-6 of the Zonal Development Plan and is of significant heritage value as it was the location of Gole Market and the residential precincts designed by Lutyens team for clerical and other staff.

2. The area between Baba Kharak Singh Marg, Ashok Road, Barakhamba Road and Connaught Place. This corresponds to Sub-Zones D 4 and D1 of the Zonal Development Plan and many significant heritage components of the original plan of Lutyens New Delhi are located within it.
3. Mandi House. This corresponds to part Zone D3
4. Institutional Area where the Supreme Court is situated. This corresponds to part Zone D3

Areas which were not part of Lutyens original plan but which were included are:

- 1) Nehru Park
- 2) Yashwant Place
- 3) Area between Yashwant Place and the Railway Line on the South
- 4) Area lying between Nehru Park -Yashwant Place on the West and the boundary of Lutyens' Delhi on the western edge of Safdarjung Aerodrome and the Race Course.

The 1988 D.O. states, that the demarcation line of the LBZ should not run along prominent roads because if it does so, there will be a situation with bungalows on one side of the road and high rise buildings on the other side. It was therefore decided that the demarcation of the LBZ should run along the first inner/ outer road or lane from the prominent road through which the demarcation line is shown in the map. However, the demarcation can run through the prominent road where there is a park, ridge or green area on the other side of the road.

Issues related to existing demarcation line of the LBZ:

A large number of anomalies associated with the existing demarcated boundary of the LBZ have been identified by various studies and specialists. These anomalies and exclusions have, over a period of time, resulted in extremely adverse impacts on the heritage value of significant constituents of the planned 'garden city' of Lutyens New Delhi. This requires a careful redelineation of the LBZ boundary.

A clear and careful definition of the boundaries of the LBZ is required, through a transparent and participatory process, which would ensure that areas earlier excluded, with an associated significant detrimental impact on their heritage value, would be brought into the redefined LBZ.

A sub-committee has been constituted by the DUAC which is examining the present boundary and proposing a re-delineation with three main sub-zones. It must be ensured that there is no further detrimental impact on the heritage value of the city as a whole, and also on specific heritage constituents and sub-zones of Lutyens New Delhi. Important to mention in this context is the controversy and infructuous expenditure associated with the Police Memorial which was constructed obstructing the Grade I listed heritage precinct of the Shanti Path Vista, in violation of the existing guidelines.

5.3.2 Defined Character Zones within the LBZ

On the basis of the densities, environmental quality, present functions and extent of transformation, New Delhi has, in the past, been categorized into three

segments by various committees constituted to examine issues involved in 'redevelopment/ re-densification' of various parts of the planned city of 'Lutyen's New Delhi'. These broad segments were:

- The area north of Connaught Place and south of Shahjehanabad, (Part within NDMC Area)
- The area north of Central Vista, (Within NDMC Area) and
- The area south of Central Vista. (Within NDMC Area)

These areas North and South of Central Vista within the NDMC area were distinguished by a distinctive environmental quality of the green spaces and landscape, and identified as

- Areas with organized green spaces (The Ridge Reserve forest and the Central Vista linking the Presidents Estate and Government Complex with the Stadium),
- Areas of low density with high green cover (Associated with the Residential Bungalows North and South of the Central Vista, as well as the Safdarjung Aerodrome/Race Course) and
- Areas of low density with moderate green cover (Mainly in the southern section, associated with Government Staff Quarters and Privately leased Bungalows)

These segments were further broadly sub-divided into eight zones by the 1998 MoUD Committee on the basis of urban form, character and utilization. These are:

ZONE	EXTENT & LOCATION	HERITAGE VALUE
Zone 1	Central Vista and Surroundings: This extends from the Presidents Estate upto the National Stadium and includes Vijay Chowk, Central Vista and the C-Hexagon. It also includes the facades of buildings along Central Vista, both North and South of Rajpath.	Conservation area designated in the MPD 2021 & included in NDMC list of heritage buildings and precincts. Global significance.
Zone 2	Open Spaces: Consists of the major green spaces, including the Ridge, parks such as Lodhi Gardens and Nehru Park, the Race Course, Safdarjang Aerodrome, and surrounding open spaces, and clubs such as the Delhi Golf Club, Delhi Gymkhana Club and Chelmsford Club.	Areas of environmental and heritage significance. Includes areas of Reserve Forest and ASI designated monuments and sites of National Significance.
Zone 3	Government Bungalows South of Rajpath: Includes the area lying between the Moti Lal Nehru Marg roundabout on the east, Central Vista on the north, Rashtrapati Bhawan on the west and Akbar Road on the south. Area also includes Safdarjang Road, the area between Akbar Road, Aurangzeb Road and Prithviraj Road.	Area of great conservation significance which has remained relatively untransformed
Zone 4	Senior Officers Residential Areas: All post-Independence construction in southern LBZ, including Rabindra Nagar, Humayun Road, Pandara Road, Bapa Nagar, Kaka Nagar, as well as Government housing lying between Sardar Patel Marg and Kautilya Marg and	Main Road structure part of Lutyens New Delhi plan.

ZONE	EXTENT & LOCATION	HERITAGE VALUE
	including Chanakyapuri government accommodation.	
Zone 5	Other Government Residential Areas: This zone comprises of the Gole Market area, Mata Sundari Area, Lodhi Colony, Kidwai Nagar, Sarojini Nagar, Netaji Nagar.	Some sections of this zone are of considerable heritage significance as part of the original plan for Lutyens New Delhi. Includes Gole Market residential precincts designed by Lutyens' team
Zone 6	Government Bungalows and others to the North of Rajpath: Broadly, it also encompasses roads such as parts of Janpath, parts of Ashok Road, Jaisingh Road, Mansingh Road, Kasturba Gandhi Marg, Canning Lane, etc. which are under great stress due to heavy traffic.	Some sections of this zone adjacent to the Presidents Estate are of considerable heritage significance as religious structures and residential bungalows of a smaller scale which retain their original ambience and character such as the Gurudwara Rakabganj Road and semi-detached residences along FerozeShah Road which have transformed to some extent.
Zone 7	Connaught Place and Surroundings: Area North of Rajpath centering around Connaught Place with radial roads such as Barakhamba Road, Kasturba Gandhi Marg, Janpath, Windsor Place, etc.	Includes extremely significant sections of the overall plan of Lutyens' New Delhi.
Zone 8	Privately leased bungalows and other residential areas: Four distinct pockets of privately leased bungalows and other residential areas, including Bengali Market, Tilak Marg, Jorbagh, Golf Links and bungalows on Prithviraj Road, Aurangzeb Road, Amrita Shergill Marg etc.	Some sections are of heritage significance as part of the overall plan for Lutyens' New Delhi.

Thirty six large plots ranging in area from 2 to 9 acres were designated for various princely states on the north and south of present-day Rajpath, some of which are occupied by heritage buildings, offices and socio-cultural institutions of great significance.

Details of the 147 Heritage Buildings and Precincts according to their location in the various character zones are given in Map 1 and Appendix A.

In addition, smaller conservation areas which retain their heritage value are also indicated in the various character zones. Within each character zone, the town planning elements of the original plan for 'New Delhi' such as the road network with associated planting, the parkways and gardens, the public buildings and offices, the residential accommodation of various types, the tertiary sector, the residences of the maharajas, and the religious buildings which are important components of heritage value are identified and located on the Map.

5.4 Existing Status of ASI Protected Monuments and Sites of National Significance within the NDMC Area and Implications

5.4.1 Location of ASI Protected Monuments and Sites of National Significance within the different character zones of the NDMC Area

The ASI Protected Monuments and Sites of National Significance within the NDMC area can be categorized into:

- **Individual complexes and monuments which helped to determine the layout and configuration of Lutyen's New Delhi**, which were prominently and consciously integrated into the plan for New Delhi and which continue to be of great significance in terms of the town planning character and visual linkages within the LBZ.

This first category of ASI Protected Monuments and Sites of National Significance within the LBZ includes:

- (a) The Jantar Mantar Complex on Parliament Street
 - (b) The Shikargah within the Teen Murti House Complex
 - (c) Monuments within (along the boundary of) the Delhi Golf Club
 - (d) The Group of Monuments within the Lodhi Gardens
 - (e) Agrasen ki Baoli on Hailey Road
 - (f) The complex of monuments associated with Purana Quila west of Mathura road
 - (g) Safdarang's Tomb at the crossing of Aurobindo Marg and Lodhi Road
- **Those complexes and sites of national significance which are located within the present-day boundaries of the NDMC area**, provide interest within the areas in which they are located, but which were not consciously instrumental in defining the overall plan of the city of New Delhi

This second category of ASI Protected Monuments and Sites of National Significance within the NDMC area as a whole includes:

- a) Najaf Khan's Tomb Complex in Lodhi Colony associated with the Aliganj Complex
- b) Darya Khan Lohani's Tomb in East Kidwai Nagar
- c) Tomb to the east of Nehru Stadium

In addition to the monuments and sites included in the Central Government Notified List of ASI protected heritage of National Significance which pre-date the construction of New Delhi, there are also **some Nationally Significant buildings, complexes and sites constructed as part of the plan for New Delhi, which are in continuing use by the Government of India**, and which are maintained by the expertise of the ASI under an agreement with the CPWD and the NDMC.

This special category of Nationally Significant Heritage Buildings, Complexes, Sites and Areas includes:

- a) Buildings within the Presidents Estate
- b) Jaipur Column - Rashtrapati Bhavan
- c) North and South Block
- d) Dominion Columns, Near South Block
- e) Parliament House

- f) India Gate
- g) India Gate Canopy

- The List also includes the ASI Office Building adjacent to the National Museum at JanPath (within the National Museum Plot) which, however, is not included in the Central Government Notified List as being of either historical, archaeological or architectural significance.

5.4.2 Impact of Buffer Zones (Prohibited Area and Regulated Area) associated with ASI Protected Monuments and Sites of National Significance

According to the Ancient Monuments and Archaeological Sites and Remains Act, 1958 (Amended 1994) there is provision for a 100m Prohibited Zone and a 200m Regulated Zone surrounding all ASI Protected Monuments and Sites of National Significance.

Map 3 indicates location of all 22 ASI Protected Monuments and Sites of National Significance, with an indication of properties affected by the delineation of the associated 'Prohibited' and 'Regulated' Areas. Heritage Buildings protected by the GNCTD Department of Archaeology are also indicated, together with the area under their associated 'Buffer Zones'. Specific development controls are required to be formulated for these areas.

5.5 NDMC IDENTIFIED (NOTIFIED) HERITAGE BUILDINGS AND PRECINCTS (CONSERVATION AREAS) WITHIN THE NDMC AREA AND RELATED REGULATIONS

5.5.1 Categories and Location of Heritage Buildings and Precincts identified (notified) by the NDMC

The List of Heritage Buildings and Precincts within the NDMC Area, comprises 147 Heritage Buildings and Precincts, of which 53 are categorized as Grade I, requiring conservation and restoration with no alterations; 73 are categorized as Grade II, requiring conservation with internal changes permitted and 21 are categorized as Grade III, in which additions can be permitted, subject to approvals by the HCC.

Many of these are individually listed as heritage precincts, but it is seen that there is a significant concentration of these heritage structures associated with parks and gardens in the NDMC area, such as the Lodhi Gardens, the Delhi Golf Links and the Karbala -Aliganj area. No individual government owned bungalows under the CPWD, outside the Presidents Estate, are included in the list. As some are of individual architectural significance, designed by Baker and Lutyens team, a survey and list of these is also required. A condition survey of the encroachments which are affecting the heritage character of some of these bungalows has previously been carried out by a court appointed expert.

5.5.2 Related regulations

The final list of Heritage Buildings and Precincts under the jurisdiction of the NDMC, which was first published in September, 2001 for public opinion has yet to be formally notified. However, since December 2003, Clause 23 related to 'Conservation of Heritage Sites including Heritage Buildings, Heritage Precincts and Natural Feature Areas' has been added to the amended Building Byelaws, according to which the Heritage Conservation Committee is required to scrutinize and approve any proposals related to conservation, restoration, changes, modifications

and extensions to the notified heritage buildings and precincts. Issues related to this are related to the necessity for site and context specific controls and guidelines for development within the sites of the three grades of heritage buildings and precincts.

5.6 EXISTING REGULATIONS AND INSTITUTIONAL FRAMEWORK FOR CONSERVATION AND MANAGEMENT OF HERITAGE WITHIN THE NDMC AREA

No	Name of Agency & Relevant Regulatory Framework	Responsibilities	Reporting Structure
1	MoUD	Letter D.O.No. K-13011/17/86 -DDHA dtd. 8.2.88- for regulating construction to ...'maintain the present character of Lutyens' Delhi' and D.O. No. K-13011/31/90-DDIB (Vol.V) dtd. 6.10.95 communicating that existing guidelines for Lutyens' Bungalow area should be strictly enforced.	Nodal Ministry - Directive issued to DDA, CPWD, TCPO, L&DO, Lands Division
2	NDMC	The 42.74 sq. km area under the New Delhi Municipal Council includes the planned city of New Delhi established in 1911. The NDMC area or New Delhi Zone has a total of 147 notified heritage buildings and precincts categorized into three Grades (304 heritage buildings and complexes identified by the INTACH 2000 List of Historic Buildings of Delhi), as well the Connaught Place area, the Central Vista, New Delhi Bungalow Zone and also the Lodhi Gardens and the Delhi Golf Club which have been identified as Conservation Areas in the INTACH 2000 List. Three important heritage conservation initiatives supported by the NDMC include the schemes for Connaught Place, Gole Market and N.P.Boys S.S. School on Mandir Marg. No planning functions. DDA is required to consult the Local Body (NDMC) while planning for the area.	NDMC reports to the Ministry of Home Affairs, Gol. NDMC Chief Architect is responsible for heritage conservation activities of NDMC related to scrutinizing of documents and granting of permissions related to conservation and new development. The Director, Horticulture of the Horticulture Department is responsible for the conservation, maintenance and upkeep of the parks, gardens, green ceremonial spaces and roadside planting in the NDMC area.
3	Archaeological Survey of India -Delhi Circle Ancient Monuments, Archaeological Sites and Remains Act, 1959 Notification issued in 1997 under Rule 32 of the Ancient	Designation & protection of 22 monuments, archaeological sites and remains of National significance within the NDMC area, as well as the management of any site on the tentative list of World Heritage Sites. The ASI also coordinates with the NDMC to prohibit, restrict and regulate development in the areas (100+200m buffer zones) demarcated around the protected area of each national monument.	Central Government organization under the Union Ministry of Culture Nodal officer: Superintending Archaeologist, Delhi Circle. Overall Responsibility: Director General of the ASI, reporting to the Secretary, Culture (Gol)

No	Name of Agency & Relevant Regulatory Framework	Responsibilities	Reporting Structure
	Monuments, Archaeological Sites and Remains Rules, 1959 UNESCO World Heritage Convention	The Lutyens Bungalow Zone within the NDMC area has been identified as a potential World Heritage Site by UNESCO experts.	
4	GNCT Delhi Department of Archaeology & Museums 'Delhi Ancient and Historical Monuments and Sites and Remains Act' 2005	Conservation, preservation and 'beautification' of monuments other than those maintained by the Archaeological Survey of India; Survey, listing, documentation, Acquisition and protection of monuments; Archaeological explorations and excavations; Educational activities and bringing out departmental publications. At present only 20 monuments are under the maintenance of the Dept. of Archaeology(Website), of which 8 are located in the NDMC area. GNCTD Department of Archaeology has undertaken restoration works on monuments and historic buildings which are privately owned and located within the premises of the Delhi Golf Club. The GNCTD Dept. of Archaeology coordinates with local authorities to prohibit, restrict and regulate development in the areas (50 + 100m buffer zones) demarcated around the protected area of each state monument.	The Deputy Director of Archaeology is the Nodal Officer under the Director of Archaeology, reporting to the Secretary (Art & Culture), Delhi Government. An advisory committee under the chairmanship of Secretary (Art & Culture) has been proposed by the GNCTD Department of Archaeology, comprising prominent experts from various disciplines to advise and oversee the activities of conservation of monuments and other related activities of the department.
5	DDA - Heritage Cell (Delhi Urban Heritage Foundation notified in 1999 under a sub-section of the DDA Act) Number of provisions for conservation of the built heritage in its 15 Planning Zones in the MPD 2021 as well as the Zonal Development	Preparation of Master Plans, Zonal Development Plan for Zone Division -D New Delhi & Sub-Zonal Plans which take heritage conservation into account. MPD-2021 contains a conservation strategy that identifies the Central Vista as one of the key Heritage Zones and also stipulates that while preparing layout plans, 52 protected monuments in Zone D (22 in NDMC area) ASI protected monuments as well as heritage buildings listed by the GNCTD Department of Archaeology, and NDMC 'should be suitably incorporated'. Earlier sub-zonal development plans have been prepared and approved for sub-zones within the NDMC area. In the case of major monuments it is necessary that the surrounding area	Ministry of Urban Development (Gol) Delhi Urban Heritage Foundation under the Director (--) who should be a qualified Architect, Conservation Architect or Landscape Architect. MPD-2021 identifies the agencies concerned with the protection of Delhi's built heritage as the ASI, GNCTD Department of Archaeology, MCD, NDMC , Cantonment

No	Name of Agency & Relevant Regulatory Framework	Responsibilities	Reporting Structure
	Plan for the Zone Division - D New Delhi - approved 1993). MPD 2021 mentions that development plans / schemes should conform to the amended Building Byelaws 1993, vide Clause 23 according to the chapter inserted on 'Conservation of Heritage Sites including Heritage Building, Heritage Precincts and Natural Feature Areas'	should be identified in the layout/detail plan, and should have building controls in relation to height, material and 'spread' of the monuments. Suggests that with the aim of framing policies and strategies for conservation, appropriate action plans, 'Special Development Plans' and conservation schemes may be prepared by all the agencies (concerned organization local authority). Recognition by the Delhi Urban Heritage Foundation of local efforts to conserve the built heritage, as part of DDA's catalytic awareness generation and capacity building efforts. DUHF mandate includes finance and execution of conservation works. DMPD-2021 identifies the agencies concerned with the protection of Delhi's built heritage as the ASI, GNCTD Department of Archaeology, MCD, NDMC, Cantonment Board and DDA. The DDA has formulated and financed the implementation of proposals for designated heritage resources with the assistance of INTACH and other organizations	Board and DDA.
6	CPWD	Responsible for the upkeep and maintenance of government owned historic buildings in Delhi, which include heritage resources of great significance such as the Rashtrapati Bhavan, Secretariat Buildings, Parliament House and Central Vista as well as the architecturally significant historic bungalows and other buildings located within the New Delhi zone. The CPWD is also responsible for over 72,000 original drawings prepared by Lutyens and other architects for buildings within the New Delhi area. Construction activity for Government Sites	The Central Public Works Department reports to the Ministry of Urban Development
7	Land & Development Officer	Land use control through the exercise of the lessor's right.	
8	Delhi Urban Arts Commission - DUAC Set up by an	DUAC advises on 'preserving and developing the aesthetic quality of urban and environmental design within Delhi'. Guides the local body on any project or	The Delhi Urban Arts Commission consists of a body of experts and reports to the Ministry of Urban Development.

No	Name of Agency & Relevant Regulatory Framework	Responsibilities	Reporting Structure
	Act of Parliament, under the Delhi Urban Arts Commission Act of 1973	development proposal which affects the skyline or the aesthetic quality of the surroundings and redevelopment in the vicinity of historical areas and 'conservation, preservation and beautification' of monumental buildings, public parks and public gardens. According to the existing Act the DUAC has a restricted advisory role with powers of rejection of non-conforming projects. However, recently the DUAC has constituted a sub-committee to look into the planning of the LBZ area, and Mani, Chowfla Associates have been engaged for the work related to 're-densification', despite the recommendations of the previous committees set up by the MoUD to look into this issue.	
9	Heritage Conservation Committee - HCC Established by an order of the High Court to ensure implementation of Clause 23.16 of the Unified Building Byelaws Central Vista Committee	HCC to be consulted by the Commissioner, MCD; Vice-Chairman, DDA; Chairman, NDMC before granting permission for any development, redevelopment, engineering operations, additions, alterations, repairs, renovations, demolition of any part of any listed building, listed precincts or listed natural areas. Committee earlier set up to examine issues related to the Central Vista Area and advise keeping heritage value as its focus	HCC reports to the MoUD. Associated with the DUAC.
10	DTTDC Incorporated in 1979 (name changed to DTTDC in 1989)	The DTTDC has sponsored and undertaken proposals for tourism development in various heritage sites and urban villages in collaboration with the ASI, INTACH, & DDA, including events at the Khair-ul-manzil Masjid and Lal Darwaza on Mathura Road.	An undertaking of GNCTD
11	Delhi Waqf Board established under the Waqf Act, 1954, is governed by the more comprehensive	The Waqf Board is one of the most important property owners in the historically significant areas such as Shahjahanabad and various villages. In the New Delhi area, 25 Waqf properties are included in the NDMC list of notified heritage buildings and precincts. These include mosques,	Seven members, three of whom are elected representatives and four who are appointed by the GNCTD.

No	Name of Agency & Relevant Regulatory Framework	Responsibilities	Reporting Structure
	1995 Waqf Act.	Dargahs, tombs and Khanquahs, Karbala, extensive historic graveyards associated with large open, green areas, and some commercial and residential properties with some commercial properties rented out for generating revenue.	
12	Delhi Shiromani Gurudwara Prabandhak Committee	The SGPC is responsible for the maintenance and upkeep of the historic Bangla Sahib Gurudwara Complex on Ashoka Road and the Rakabganj Gurudwara Complex on Rakabganj Road-Church Road	
13	Ministry of Defence & the three Armed Services	Major owners of land and responsible for the areas currently occupied by barracks such as 'Princes Park' etc.	Gol Ministry
14	Various State Governments	Assigned land by the Central Government for their offices and guest houses with historic properties such as Travancore House, Kashmir House etc.	
15	Airports Authority of India	Safdarjang Aerodrome area	Ministry of Civil Aviation

The following non-governmental and other organizations are also undertaking initiatives related to the built and natural heritage of the NDMC area.

No	Name of Organisation & Regulatory Framework	Responsibilities	Reporting Structure
1	Pani Morcha	Concerned with water resource management in Delhi - actively working in close coordination with INTACH & Tapas in identification of the traditional components of the historic water harvesting and storage system in Delhi, - identified numerous historic tanks, Talkatora & Ugrasen baolis, the Talkatora bund, Lodhi Garden and other water channels with a potential for revival and reintegration into the contemporary city.	NGO
2	INTACH	Involved with identification and conservation of heritage components not in the purview of the ASI and not formally protected by the Delhi Department of Archaeology. INTACH has prepared a List of Heritage Buildings in Delhi, published in 2000, and, while functioning as an active pressure group, has also assisted the NDMC with the identification of heritage buildings, vistas and precincts in the NDMC area. Filed PIL's related to the Chanakyapuri Vista and development in the Connaught Place Area. Consultants associated with INTACH have formulated guidelines (Heritage Tool-kit) for	Nodal quasi-autonomous Heritage NGO

No	Name of Organisation & Regulatory Framework	Responsibilities	Reporting Structure
		integration of heritage within the JNNURM City Development Plans.	
3	The Church of North India & Others	Responsible for the upkeep and maintenance of numerous significant historic properties, primarily including important Church complexes, gardens and historic educational institutions and schools which have been identified in the INTACH 2000 Listing of Delhi as well as the NDMC List. The Cathedral Church of Redemption (former Viceregal Church) on Church Road, the Free Church on Parliament Street, the Sacred Heart Cathedral at Ashoka Place, St. Thomas Church on Mandir Marg, have been identified in the NDMC list	
4	Delhi University	Important colleges such as the Lady Harding Medical College and Lady Irwin College on Sikandra Road, affiliated with Delhi University, which were established as important institutions within New Delhi, have been designated by the NDMC as significant heritage resources	Lady Irwin College has recently undertaken conservation and upgradation works through grants from the GNCTD.
5	Resident Welfare Associations and Shopkeepers Associations in heritage areas	Local Residents Associations in areas such as Aliganj and the Gole Market area etc. which have a high concentration of significant heritage resources, have an important role to play in the routine maintenance and upkeep of the areas around the protected areas of monuments, as well as unprotected heritage resources in their localities.	

5.7 IMPLICATIONS OF THE DDA ZONAL DEVELOPMENT PLAN FOR ZONE 'D'

The DDA Zonal Development Plan for Zone - Division D, approved and authenticated excluding LBZ area on behalf of the Central Government in 1999, has given the following directions which have significant implications for the LBZ, within the NDMC area:

- Heritage guidelines for redevelopment of the identified areas are to be worked out by DDA in consultation with the Local Body (NDMC) and DUAC.
- The Planning agencies and Local Body (NDMC) has to take special care for maintenance of the protected monuments and historical heritage sites since Zone 'D' holds a lot of importance from the tourist's point of view.
- The central Zone 'D' may have to take care of deficiencies in terms of School/ Colleges, community centres etc in the adjoining zones A, B, E and F.

- The Planning Agency (DDA) has to take the lead in preparing urban renewal schemes for selected areas in consultation with the Local Body concerned (NDMC) for speedy implementation

The DUAC had made the following suggestions on the Zonal Development Plan for Zone Division - D to the DDA in 1994, which were agreed upon:

- A large area in the vicinity of the monuments is required to be kept for preservation/conservation of the monuments and there should be controls on construction in that area. Studies may be conducted for all monuments for the same.
- A proper landscape plan needs to be worked out for the Lutyens Bungalow Zone since the life of the existing trees may not be more for than 15 to 20 years.

These suggestions which have important implications in terms of safeguarding and management of the built and natural heritage of the area, though agreed upon by the DDA, have not been carried out as yet.

5.8 IMPLICATIONS OF RECENT DUAC INITIATIVES FOR THE NDMC AREA ON THE HERITAGE AND IMPACT OF PROPOSED RE-DENSIFICATION OF IMPORTANT HERITAGE AREAS NORTH OF JANPATH

The proposals being formulated by a private consultant for the sub-committee constituted by the Strategic Working Group for the LBZ by the DUAC should be put in the public domain for suggestions and a public hearing, and a transparent and consultative process followed throughout.

From a brief glance at the proposals, there is an impression that the proposals are based on inadequate site surveys and data, and that the ground realities regarding numerous areas of great heritage value have not been adequately taken into account.

5.9 IMPORTANT ISSUES RELATED TO THE BUILT AND NATURAL HERITAGE OF THE NDMC AREA

5.9.1 Lutyens Bungalow Zone

Technical Issues

- Identification and detail redelineation of the LBZ to ensure that all the distinguishing components of the garden city capital are managed and conserved to retain and enhance their heritage significance. These include elements such as the Government Complex on Raisina Hill, the central vista - Rajpath- terminating at Purana Quila, the north-south avenue - Janpath - , the system of avenues, green spaces and landscape features, landmark buildings, and surroundings; the business districts and commercial areas of Connaught Place and Gole Market; the various types of residential areas with bungalows, staff quarters and residential precincts designed by Lutyens and his team etc.
- Preparation of a detailed inventory, heritage map and database of all built, landscape and natural heritage components of the LBZ with indication of the specific heritage significance and grading based on an assessment of its heritage value as well as the extent and type of development or change which

it can undergo without compromising on or losing its heritage value and significance.

- Identification of Sub-Zones with lesser heritage significance for which detailed urban design guidelines for development could be prepared as part of the overall heritage management plan - these zones could take up the development pressures from other more significant parts of the city and contribute to its dynamic development as one of the cores of the global capital city of Delhi
- Detailed studies, development of policy guidelines and identification of appropriate landuses, and development of urban design guidelines of areas, complexes, groups of buildings and all listed individual sites, buildings and open spaces of heritage significance falling within the 8 defined character zones of the LBZ identified by the 1998 LBZ Expert Committee in an integrated manner.
- Identification of coordinated, detail proposals for conservation, restoration, preservation and revitalization of areas, complexes, groups of buildings and all listed individual sites, buildings and open spaces of heritage significance falling within the 8 defined character zones of the LBZ (as identified by the 1998 LBZ Expert Committee and other specialists)
- Detailed studies, development of policy guidelines and identification of appropriate landuses, and development of urban design guidelines for the 15 Plots presently occupied by Barracks on which redevelopment is possible.
- Restoration and Heritage Management Plans for the important public buildings are required to ensure that they are conserved according to international norms.

5.9.2 Financial Issues

- Value of property in this area has skyrocketed precisely because of its location and environmental quality, which cannot be compromised by succumbing to development pressures.
- Identification of financial mechanisms for conservation of individual heritage buildings as well as heritage precincts - Possibility of compensating for curtailment of development within the LBZ by provision of TDR mechanism. System of grants and subsidies for heritage conservation.
- Development of a PPP model which would be used for private Grade II Heritage precincts such as the Connaught Place and Gole Market areas, where only the public arcade is owned by the NDMC and the shops owned by individuals. Shopkeepers Associations could play a part in this process.
- Heritage tourism could help to generate revenue.

5.9.3 Managerial Issues

- The Lutyens Bungalow Zone, as a whole, has not been recognized in the Master Plan 2021 as a Conservation Zone. This should, once and for all, be designated as the New Delhi Heritage Zone.

- Within the LBZ, separate Grade I and Grade II Vistas and Conservation Areas have been identified separately. This could lead to a fragmented rather than a comprehensive approach to the heritage character of the LBZ area.
- Legislation specifically applicable to different sub-zones of Lutyens New Delhi needs to be formulated.
- Structure of the heritage management framework and administrative arrangement required within the NDMC has to be developed keeping the requirements for conservation expertise in mind.
- Comprehensive New Delhi Conservation Plan should be formulated through involvement of conservation professionals, taking into account the built as well as the natural heritage.
- DUAC has a mandate to ensure conservation of Lutyens New Dehi, by controlling growth and ensuring consonance with the essential character of the area. However, the DUAC does not have the mandate to plan for the area. The Strategic group mechanism, involving various government and private agencies, established by the DUAC for planning for the area, with its various responsibilities should be studied.
- Institutional Bottlenecks should be identified and resolved and transparency of the Planning Process needs to be ensured.

5.10 OTHER AREAS WITHIN THE NDMC JURISDICTION

a. Technical Issues

- Inappropriate site development of Darya Khan's Tomb

c. Managerial Issues

- Development of a Heritage Cell - Expertise required within the NDMC and definition of the role of the CPWD.



Chapter – 6 : Landscape & Horticulture



IL&FS ECOSMART

Subcity Plan NDMC

CHAPTER - 6

LANDSCAPE & HORTICULTURE

6.1 LANDSCAPE AND HORTICULTURE WITHIN THE LBZ - SIGNIFICANCE OF VISTAS, GARDENS AND TREE LINED AVENUES AND STREETS AS AN INTEGRAL PART OF THE PLANNING OF NEW DELHI

The Vistas, Gardens and tree lined parkways, avenues, and roads constitute an important component of the plan for the 'garden city like' Lutyens' New Delhi. Immediately after World War I, beginning in 1920, planting of 24 indigenous species of trees, along with about 20 types of shrubs, was undertaken alongside the avenues and roads, road by road, under the supervision of Mr. Grierson, Lutyens' associate - William Robertson Mustoe and Walter George. This was followed in the 20's and 30's by planting associated with the development of the bungalows, princely mansions and other housing, leading to considerable variation in both the age and treatment of planting schemes within individual properties.

In all about 10,000 trees and over 100 km of hedges were planted, and an important issue related to the landscape of New Delhi is that most of the trees planted at that time are near the end of their lives, and require replacement in a phased manner, according to a landscape plan which follows the planting schemes of the original plan for Lutyens' New Delhi.

Map 2 (Based on Plan by Pradip Krishen) indicates the species and location of avenue trees planted during the 1920s and 30s, which still exist and contribute to the 'garden city like' character of sections of New Delhi. It also correlates data from the tree census carried out by the NDMC indicating age and condition of trees. The drawing also shows road sections of roads of different widths, including parkways, avenues 300', 150' and 100' wide and 60' wide service roads with associated trees and hedgerows.

A list of tree species, tall shrubs used in hedgerows and location is given in Appendix B.

The criteria for selection of the 13 species of trees (24 in all, including species considered to be fast-growing and 'temporary') considered suitable for planting alongside the parkways, avenues and roads, as well as the roundabouts were whether the tree quickly produced a crown that provided shade and secondly whether it was evergreen or provided fruit. As stated in the Final Report of the Delhi Town Planning Committee regarding the selected site, " ... the lines of trees and buildings are dependent on one another for effect. Another important point is the kind of trees to be used for avenues. As has been remarked before, the size of the special trees selected for the avenues determine the width of avenues in which they are to stand. For the purpose of getting the right effect from the design of an avenue, both the size and shape of trees are of importance; ..."

Other issues identified related to roadside planting are:

- The changes in road sections and
- increase in road widths,

- Paving over of the green area and soft surfaces in which the trees were originally planted,
- Fall in the water table,

All of which contribute to weakening of the root structure of existing trees and slow growth of the replacement trees.

In addition, the character of the roads in the LBZ has changed substantially with the increase in heights of the boundary walls and removal of the hedgerows which originally defined the plot edges due to security reasons.

The system of 'Ron points' or roundabouts which are landscaped and within which some listed heritage buildings are situated, as well as the planting of the C-Hexagon area are also of significance and require specific management plans.

6.1.1 Grade I & Grade II Vistas as Designated Heritage Precincts and Conservation Areas

Within the Zonal Development Plan, the MPD 2021, as well as the NDMC list of heritage buildings and precincts, there are a number of Grade I Vistas designated as heritage precincts. These include:

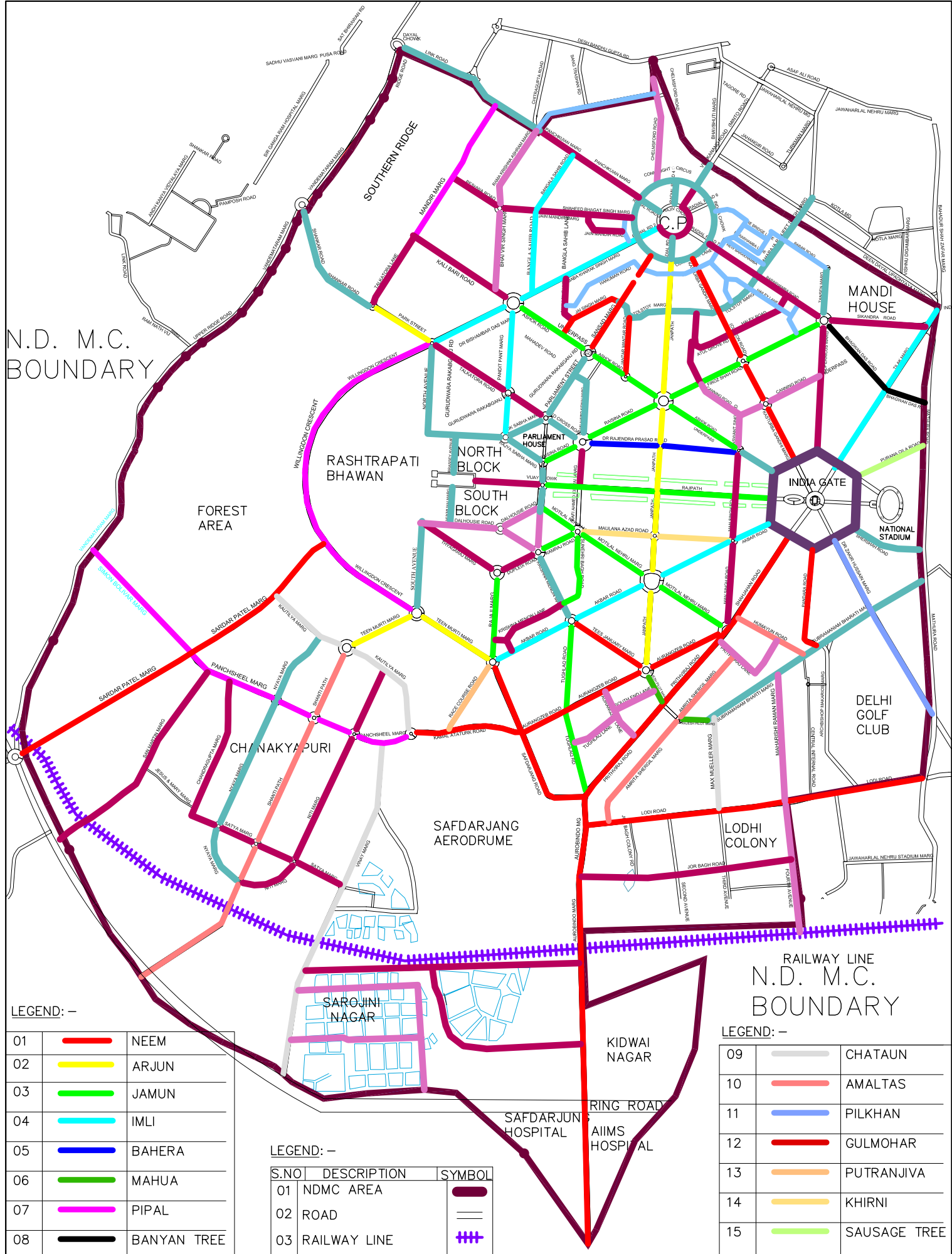
- The Central Vista Precinct to the east of the Presidents Estate
- The Shanti Path Vista to the south of the Presidents Estate.

Important aspects related to these are the lines of sight, the landscape including the species of trees and shrubs, the scale, height and character of buildings which require conservation guidelines.

The Central Vista Area (comprising 180 acres of land from Vijay Chowk, both sides of Rajpath, Maulana Azad Road, Dr. Rajinder Prasad Road on the side as well as ManSingh Road, Janpath and Rafi Ahmad Kidwai Road and C-Hexagon that traverse the Rajpath at specific locations - Map attached) has been identified by NDMC as a priority area, and Dr Bisht of the Resource Survey Division of the Forest Research Institute has undertaken an inventory of roadside plantations maintained by the NDMC. This includes preparation of inventories of diseased trees, identification of causes and suggestions of control measures as well as preparation of a replacement plan for old and diseased trees. In addition identification and listing of trees in Lodhi Garden, Talkatora Garden and Nehru Park is being done by the FRI. The FRI has to also provide 'suggestions' for landscaping of roadsides, streetscaping based on floral/foilage characteristics. An important consideration in this regard is that the landscaping of roadsides has to take into account the significance of the original planting plan for the areas with the LBZ.

Major species planted in the Central Vista area include Amaltas, Bakain, Bargad, Gulmohar, Imli, Jacaranda, Jamun, Mulberry, Neem, Pipal, Siris and Jamun is the predominant species along the Rajpath lawns.

The tree inventory list of Central Vista indicates that out of 1,864 trees, 793 trees are healthy, 770 trees showed symptoms of disease, 566 trees showed symptoms of physical and physiological stress. Out of these 107 trees have been recommended for replacement with the same species to maintain and preserve the aesthetics of



LEGEND: -

01	—	NEEM
02	—	ARJUN
03	—	JAMUN
04	—	IMLI
05	—	BAHERA
06	—	MAHUA
07	—	PIPAL
08	—	BANYAN TREE

LEGEND: -

S.NO	DESCRIPTION	SYMBOL
01	NDMC AREA	—
02	ROAD	—
03	RAILWAY LINE	+++

LEGEND: -

09	—	CHATAUN
10	—	AMALTAS
11	—	PILKHAN
12	—	GULMOHAR
13	—	PUTRANJIVA
14	—	KHIRNI
15	—	SAUSAGE TREE

the site. Replacement of deformed Jamun seedlings along Rajpath has also been recommended. A blockwise detail of species growing in Central Vista has been provided which is to be mapped.

6.1.2 Central Ridge Reserve Forest As A Component Of The Plan For New Delhi

In addition to its environmental significance (discussed in detail in Section 1.6.1) the New Delhi or Central Ridge, considered to be too barren, was the focus of planned afforestation from 1914, and constitutes an important component of the plan for New Delhi. Mr. P.H. Clutterbuck, Conservator of Forests of the United Provinces, prepared a list of trees which were considered appropriate for the Ridge, and by 1929, over 1000 acres of the Ridge had been planted with different species. Part of the ridge to the east of the Upper Ridge Road and Link Road has been included in the LBZ, and forms the western edge of the Willingdon Crescent/ Presidents Estate.

6.2 CHARACTERISTICS OF NATURAL HERITAGE WITHIN THE NDMC AREA

6.2.1 Environmentally significant 'ridge' area

The Ridge (Zones D6 and D 10), defined as a rocky outcrop of the Aravali Hills, is 'to be maintained in its pristine glory and no infringement is to be permitted including commercial displays' according to the Zonal Development Plan. It further states that it should be preserved and 'developed as a forest', and no construction should be allowed. The Ridge area, in addition to its environmental significance, also has a number of designed parks and gardens located on the fringes and within it, including the historic late-mughal period Talkatora Garden. The ridge still contains a number of indigenous species of the Delhi area, though it is dominated by the Vilayati keekar introduced by afforestation work.

6.2.2 Natural drainage channels or 'nallahs' and adjacent green areas.

Various important drainage channels or 'nallahs' within the NDMC area and their associated green areas with vestiges of the vegetation indigenous to Delhi are also of environmental significance. These are currently overgrown and neglected, constituting a health hazard. These could be integrated within the proposed greenways project.

6.3 DESIGNED PARKS AND GARDENS WITHIN THE NDMC AREA

Within the NDMC area, the list of heritage buildings and precincts includes the Central Vista precincts designed as a processional 'parkway', while a number of the roundabouts and parks are included within the LBZ. The 1998 MoUD Committee report includes parks developed on the Ridge such as Buddha Jayanti Park and Mahavir Vanasthali, as well as the Lodhi Gardens and Nehru Park within Zone II - Open Spaces. The historic designed garden and surroundings of Safdarjangs Tomb, contiguous to Safdarjang Aerodrome, and Nehru Park within the LBZ are also important parks and gardens of the NDMC area, each with its own distinctive character.

In addition, the following agencies and government organizations are concerned with management of different aspects of the built and natural heritage within the NDMC area.

No	Name of Agency & Regulatory Framework	Responsibilities	Reporting Structure
1	Forest Department	Responsible for the ridge forest associated with the extension of the Aravalli Hills known as the Ridge, within which are located significant historic resources of New Delhi. - 864 ha. of the Central or New Delhi ridge within which historic shikargahs, gardens and bunds are located and numerous heritage resources from the Tughlaq and later British period . The DDA Zonal Development Plan states that as per notification issued under the Forests Act, 1140.77 ha. of the Central Ridge are declared as Reserve Forest, where no construction, either permanent or temporary, is permitted.	The GNCTD Forest Department, DDA, NDMC, CPWD, L&DO (Land and Development Office) of the Ministry of Urban Development control different parts, or different functions, on the Ridge. This has lead to construction and encroachment on the Ridge.
2	Forest Research Institute, DehraDun	Appointed by the Horticulture Department, NDMC to prepare a plan for phased replacement of historic trees in the NDMC area.	
3	Delhi Metro Rail Transit System	Likely impact on the trees, unexcavated archaeological heritage and significant heritage sites in NDMC area. Final route decided in consultation with the ASI Also likely to provide improved access to certain heritage sites, beneficial for viability of certain cultural tourism circuits.	
4	National Capital Region Planning Board The Draft Regional Plan 2021 for the National Capital Region prepared by the NCR Planning Board	'Special emphasis on integrated tourism development and heritage conservation and management in the Region. Proposes to employ the instrument of the Town & Country Planning Legislation to protect the area around identified heritage resources.'	NCR Planning Board under the Ministry of Urban Development

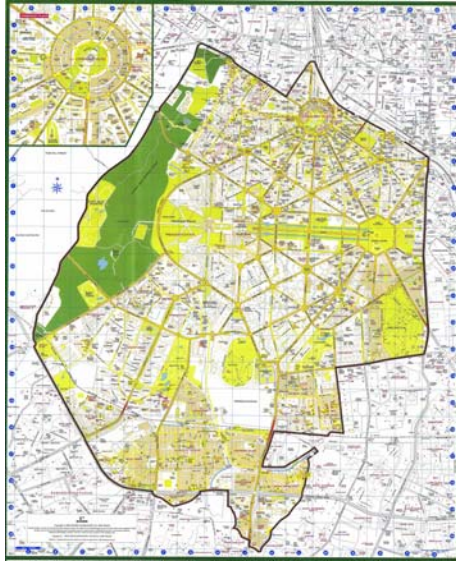
6.4 LUTYENS BUNGALOW ZONE

6.4.1 Technical Issues

- Formulation of policy guidelines and a Management Plan for the significant natural heritage, system of open spaces, green areas and vegetation of Lutyens New Delhi
- Necessity for ensuring that there is no increase in the traffic into this area due to changes in densities and landuses, as the area is already under severe environmental stress, resulting in the loss of trees and valuable green spaces

along the roads and avenues due to successive road-widening and increase in hard paved surfaces - also leading to non-replenishment of the water table.

- Inventories of trees along the major roads of the NDMC area has also been undertaken and is required to be mapped, along with replacement requirements.
- Inventories of the original planting within the area of the Bungalow compounds have not been done and is required for a comprehensive idea of the extent to which the original planting survives.
- An action plan for development and strengthening, augmentation of facilities of nurseries is required, which will include self reliance in meeting requirements for plantation / replacement, horticultural maintenance works and capacity building of the staff through technical training and infrastructure support.



Chapter – 7 : Water Supply



Subcity Plan NDMC

CHAPTER - 7 WATER SUPPLY

7.1 BACKGROUND

The section presents an overview of the current water requirement and supply within NDMC area based on the total population and other functional requirements of the area.

The area has seen a phenomenal growth of population since independence as may be seen from the population figures. However the figures also depict that there is no considerable change in the population during the last three decades.

Year	Population as per Census of India
1941	93733
1951	276314
1961	261545
1971	293702
1981	273036
1991	294149
2001	294783
1991	357220]* Population projections as per M/s TCE
2001	442865]* Population projections as per M/s TCE

7.2 WATER DEMAND

Water demand estimation for the NDMC area is based on demand estimations done by three different agencies. These are (a) as per Tata consulting Engineers, a private consultancy (b) as per Master Plan Delhi (2001) and (c) as per the Delhi Jal Board (DJB)

Estimation of water demand by TCE

M/s Tata Consulting Engineers* (TCE) were retained as consultants for developing "Water Transmission and Distribution System in NDMC area "in 1986. As per the report submitted in July 1988, the average domestic water demand was estimated as 87 mld on the basis of 243 lpcd for a projected population of 357220 in the year 1991 and 116 mld at the rate of 263 lpcd for a projected population of 442865 in the year 2001.

Industrial water demand was estimated as 0.78 MLD for the only industry in Shankar market. For the embassies it was estimated at the rate of 45 kld / ha and for the Presidents Estate as 2.5 MLD. Non domestic water demand was estimated at 74.6 MLD; and the

Overall water demand is 224.83 MLD, accounting for the floating population as well.

However the actual population as per Census 2001 is 294783, and is far too less as compared to population estimations of TCE.

Estimation Of Water Demand As Per Master Plan Delhi (MPD) 2001 - whole Delhi

MPD - 2001 published in the Gazette of India vide notification dated 1st August 1990 details out the water supply requirements for the city as a whole, within its Infrastructure section. As per the same, the per capita water requirement has been estimated as 80 GPCD / 363 LPCD with the following categorization:

S. No.	Description	water demand
1.	Domestic	225
2.	Industrial commercial and community requirements based on 45000 lit/ha/day	47
3.	Fire protection based on 1% of total	4
4.	Gardening based on 67000 lit/ha/day	35
5.	For floating population and special uses like embassies, big hotels.	52
	Total	363

With the provision that minimum water supply in any residential area should be 135 litres (30 gallons) per capita per day.

Estimation of Water Demand by Delhi Jal Board (DJB) - whole Delhi

The Delhi Jal Board has estimated the total water demand as 274 lpcd/60 GPCD. Following table depicts the categorical distribution of the same¹.

S. No.	Description	Capacity
1.	As per CPHHEO Manual, rate of domestic water supply for Metro cities is 150 lpcd at consumers point, and allowing 15% losses in distribution	172 LPCD at production point
2.	Industrial, Commercial, Community needs @45000 lts /Ha/day	47 LPCD
3.	Special uses, embassies, floating population, hotels, airports, railway stations etc.	52 LPCD
4.	Fire protection @ 1 % of total demand	3 LPCD
5.	Total	274 LPCD approx 60 GPCD

7.3 WATER SUPPLY**7.3.1 Water Supply through Various Sources****1) Surface water supply through metered connections**

NDMC receives its water supply from the Delhi Jal Board (DJB) through 19 metered water connections. It received an average of 119.55 MLD based on observed meter

¹ As per the DJB and NDMC Acts, the current quantum of water supplied to the NDMC area will be maintained, and if it is to be reduced, this can be done only with the consent of the NDMC.

readings on 2nd December 2006 and 2nd January 2007 jointly taken by NDMC and DJB staff.

2) Ground Water Abstraction

Whereas 137 tube wells were drilled in NDMC area, presently, 90 tube wells are operational. The yield of water varies from 300 GPH to a maximum of 2500 GPH operating on an average for 14 hours a day. The cumulative yield is estimated at 10 MLD. The water drawn from the tube wells is pumped into the 23 reservoirs and Booster Pumping Stations (BPSs) where water from DJB is received and distributed in the Distribution system. The ground water table is between 60 to 90 feet below Ground Level.

Thus on an average 130 MLD of water is supplied in NDMC area.

3) Deep Bore Hand pumps

In addition to above, some 600 deep bore hand pumps have also been provided in different parts of NDMC area to meet water requirements in colonies.

4) Private Abstraction of Ground water

Additionally, a number of tube wells have been drilled by various establishments like Hotels, Restaurants and other buildings. This calls for a study of ground water abstraction by the private sector. This will also help in assessing the waste water generation due to such private underground water abstractions.

Water supply availability varies from 2 hours to 8 hours per day.

Water availability per person based on 2001 Census population is 441 lpcd

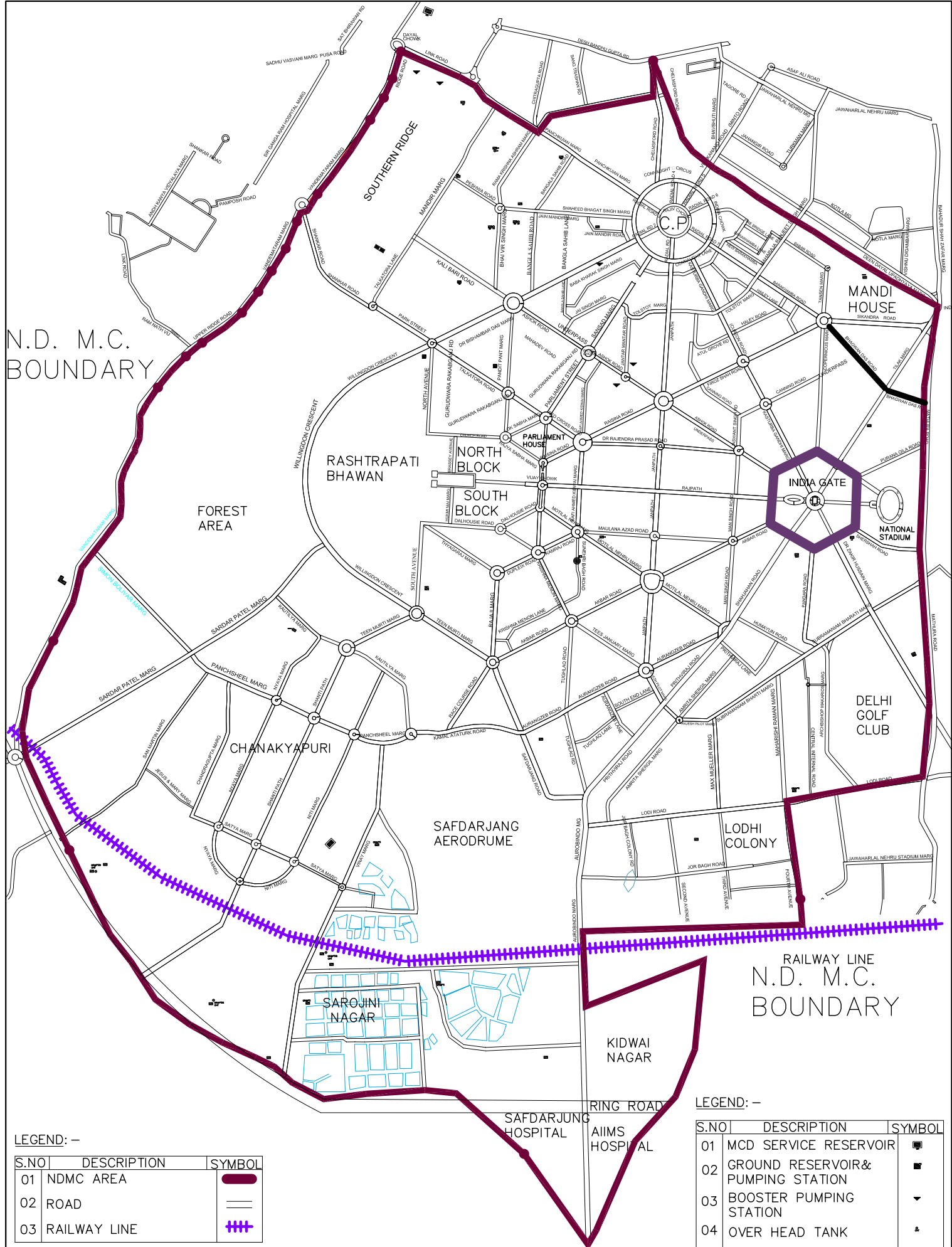
7.4 WATER DISTRIBUTION SYSTEM

List of Underground Reservoirs (UGR) with location, capacity, No of pumps installed and their HP as also year of commissioning

S. No.	Location of UGR pumps & motors installed prior to 1991	Capacity in ML	Centrifugal pumps with 1450 RPM Induction motor	Pumps coupled with 1450 RPM Induction motor	Year of commissioning
			Horse Power (HP)	Approx discharge & (Head mts)	
1.	Laxmi Bai Nagar	1.35	50 HP-3 nos	89 lps (30 mts)	1989
2.	West Kidwai Nagar	2.00	50 HP-5 nos	60 lps (42 mts)	2000
3.	Jor Bagh	8.00	100 HP-5 nos 50 HP-3 nos	147.5 lps (35 mts) 77.78 lps (35 mts)	1998
4.	K Block Sarojini Nagar	1.35	60 HP-4 nos	96.00 lps (42 mts)	1 set, 1996
5.	Sarojini Nagar Railway Station	2.70	100 HP-3 nos 60 HP-3 nos	110.00 lps (44 mts) 70.00 lps (45 mts)	2 sets, 2000 1 set, 2001 3 sets 1986 about 20 years old*

S. No.	Location of UGR pumps & motors installed prior to 1991	Capacity in ML	Centrifugal with 1450 motor	Pumps coupled RPM	Induction	Year of commissioning
6.	Bengali Market	3.40	100 HP-3 nos 50 HP-2 nos	75.00 lps (30 mts) 60.00 lps (30 mts)		1 set, 2002 4 sets, 1985 about 21 years old*
7.	Tilak Marg	8.00	100 HP-5 nos 50 HP-3 nos	60.00 lps (38 mts) 60.00 lps (40 mts)		1989*
8.	Pandara Road	1.35	40 HP-3 nos	45.00 lps (35 mts)		1 set, 1997 2 sets, 1998
9.	Bharti Nagar	3.00	100 HP-4 nos 50 HP-1 nos	75.00 lps (30 mts) 60.00 lps (30 mts)		1 set 2003 4 sets, 1995
10.	Tulglak Crescent	2.40	60 HP-5 nos	100.00 lps (38 mts)		3 sets, 2003 2 sets, 2004
11.	Vinay Marg	3.40	100 HP-5 nos 40 HP-2 nos	140.00 lps (40 mts) 45.00 lps (35 mts)		3 sets, 100 HP 2003 4 sets, 2000
12.	Kaka Nagar	0.45	30 HP-2 nos	28.00 lps (45 mts)		1999
13.	Moti Bagh	2.05	60 HP-4 nos	70.00 lps (45 mts)		3 sets, 1998 1 sets, 2004
14.	Mandir Marg	0.60	30 HP-3 nos 12.5 HP-1 nos	68.00 lps (24 mts) 28.00 lps (24 mts)		3 sets, 1994 1 sets, 2003
15.	Pt. Pant Marg	1.10	40 HP-4 nos	45.00 lps (35 mts)		3 sets, 1998 1 sets, 2003
16.	North Avenue	0.80	20 HP-4 nos 12.5 HP-2 nos	26.00 lps (38 mts) 18.00 lps (35 mts)		2 sets, 2002 4 sets, 1985*
17.	Shivaji Stadium	3.00	50 HP-5 nos	60.00 lps (42 mts)		1998
18.	Harijan Basti	0.60	20 HP-4 nos	22.00 lps (40 mts)		2 sets, 2004 2 sets, 1986*
19.	Netaji Nagar	2.05	40 HP-3 nos 50 HP-3 nos	45.00 lps (35 mts) 45.00 lps (40 mts)		5 sets, 1994 1 set, 2002
20.	Rajdoot Marg	1.20	20 HP-2 nos 30 HP-2 nos	45.00 lps (35 mts)		2 sets, 1990 2 sets, 2001
21.	Naroji Nagar	0.45	40 HP-3 nos	45.00 lps (40 mts)		3 sets, 2000
22.	South Avenue	1.15	30 HP-6 nos	68.00 lps (24 mts)		3 sets, 1985* 3 sets, 2001
23.	Meena Bagh	0.12	20 HP-2 nos	22.00 lps (40 mts)		2 sets, 1999

Total available Under Ground storage is 50.52 ML as against 130 MLD of water supply, that is 9.327 hours of average supply.



LEGEND: -

S.NO	DESCRIPTION	SYMBOL
01	NDMC AREA	
02	ROAD	
03	RAILWAY LINE	

LEGEND: -

S.NO	DESCRIPTION	SYMBOL
01	MCD SERVICE RESERVOIR	
02	GROUND RESERVOIR & PUMPING STATION	
03	BOOSTER PUMPING STATION	
04	OVER HEAD TANK	

LOCATION OF BPS, OHT,
UGR & PS

Scale: NTS

SUBCITY PLAN
FOR NDMC

IL & FS Ecosmart Limited,
New Delhi

Out of a total of 109 pump & motors installed at different UGRs & Booster pumping stations 19 pumps & motors are more than 15 years old.

NDMC has also installed on-line Booster pumping stations in the distribution system to improve pressure in the localized pockets suffering from inadequate pressure. The details of such installations are as under:

S. No.	Location pf Pumping Station	No. of pumps & HP	Source of Water Supply
1.	Sardar Patel Marg & Panchsheel Marg Crossing	2 nos 100 HP each	33" water main from Palam Reservoir
2.	Janpath	2 nos 40 HP each	12" water main from Talkatora Reservoir
3.	23 Block Lodhi Colony	2 nos 10 Hp each	from Hassanpur Reservoir : This can be transferred to Jorbagh system

NDMC receives water from DJB through 19 metered connections as per details below:

S. No.	Location of Meter	Size in mm	Status of metering as on 2 nd Jan, 2007 Meters working except at 5 places
1.	Palam reservoir	450	
2.	Palam reservoir	400	
3.	Talkatora reservoir	400	
4.	Talkatora reservoir	500	
5.	Talkatora reservoir	300	
6.	Talkatora reservoir	300 (by pass)	
7.	Talkatora reservoir	300 (Lodi road)	
8.	Hassanpur reservoir	500	Billing as per average consumption, meter out of order
9.	Hassanpur reservoir	450	
10.	Ashoka Hotel	250	
11.	Chanakya Puri	200	Billing as per average consumption, meter out of order
12.	Moti Bagh	150	
13.	Netaji Nagar	150	Billing as per average consumption, meter out of order
14.	Supreme Court	150	
15.	Sikandara Road	600	
16.	Nizamuddin	500	
17.	Reading Road	600	Billing as per average consumption, meter out of order
18.	Rani Jhansi road	450	Billing as per average consumption, meter out of order

19.	Bhuli Bhatiari	100	
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NDMC area is divided in SIX zones for distribution of water based on supplies received from DJB reservoirs and direct tapings as per details below:

S. No.	Name of DJB Reservoir	Command area / Main areas served
1.	Jhandewalan Reservoir & Bhuli Bhatiari Tapping 100 mm dia	Entire Balmiki Basti & adjoining area (286 no) No of flats - 1325 (750 Nos double storeyed and adjoining area) Entire Connaught Place area, Jain Mandir Road, Emporium Bldgs & Hanuman Road (Residential area)
2.	Talkatora Reservoir	No of flats 490 (entire North Avenue and adjoining MP Bungalow area) MP Bungalow area, Total Flats - 150 Entire Meena Bagh MP flats, Partly Motilal Nehru Marg, Partly Maulana Azad Road, partly Janpath No of flats / bungalow 49
3.	Palam Reservoir and 2 nos tapings 150 mm at Moti Bagh & Netaji nagar	Entire Moti Bagh, No of flats 2332, Entire Netaji Nagar from Ring Road to Rly line, No. of Flats - 3620 Entire Nauroji Nagar from Ring Road to Khushak nala, No of flats 864 No. of Flats - 226 Entire East & West Kidwai Nagar, No of flats 3068
4.	Hassanpur Reservoir & 2 No of tapings of 300 mm dia at Ashoka Hotel & 200 mm dia at Chanakyapuri police Station	Entire Vinay Marg - 2 hours supply to Embassies, Hotel and Complex No of flats 807 Entire Sarojini Nagar, No of flats 3871 Entire Laxmi Bai Nagar area, No of flats 2100 Entire Pandara Road and Pandara Park area, No of flats 982 Entire South avenue & adjoining area, No of Bungalows 603 Entire Malcha marg and adjoining area, No of Bungalows 886 Tughlak Crescent and adjoining area
5.	Direct from Bhagirathi Tapping at Nizammuddin	Bharti Nagar, Rabindra nagar, Khan Market, Kaka Nagar U/G Tank and adjoining area No of Flats 2292

		Aliganj, Jorbagh, Lodhi Colony and adjoining area, No of flats / bungalows 4110 Entire Kaka Nagra area, No of flats 46
6.	Hans Bhawan tapping	C-I / C-II flats along Tilak Marg, Purana Quila and area bounded by Rajpath, Janpath, Tolstoy Marg, Baralhamba road, Sikandara Road, Mathura Road. Entire Bengali Market and adjoining area. No of flats approx 360

Public Water Hydrants

300 public water hydrants have been provided to meet water requirements in different areas (market places, JJ clusters...etc).

7.4.1 Water Supply to JJ Clusters

About 38 JJ Clusters exist in the NDMC area. Water supply is provided through water tankers, public water hydrants and deep bore hand pumps. (Refer section "Land and Growth Management" for details)

7.4.2 Free Water Supply

1. For Public Conveniences

Free water supply is provided to approximately 155 Public Toilet Utilities (PTUs) departmental public conveniences / urinal blocks. These PTUs are gradually being upgraded / renovated on BOT basis. Ninety Four PTUs located in South of Rajpath are being upgraded and there is a proposal to upgrade those towards the North of Rajpath as well.

2. For Fire Fighting Operations

There are 30 Static water tanks for meeting water requirements of Delhi Fire Service. Free unmetered water connections exist for such tanks. NDMC has informed "that there is no area in NDMC, which is not covered by any official piped water supply".

Follow up of TCE Report

It is informed by NDMC officers that the capital works suggested in the Master Plan of Water Supply for 2001 prepared by M/s TCE have since been completed.

7.4.3 Maintenance of Water Distribution System

Water supply system has progressively been added over the years as per requirement. However a number of water mains have outlived their useful life. Wherever possible such mains have been / or being cleaned by scrubbers and being replaced as per requirements based on assessment after survey of such mains. Efforts are being made by regulation as far as possible to provide equitable

distribution of water.

Distribution net work consists of 352 km length of water mains (4 inches to 42 inches in diameter)

7.4.4 Manpower

An Executive Engineer(W.S) assisted by 4 Assistant Engineers(Civil) & One Assistant Engineer (Mechanical) and Junior Engineers are responsible for works relating to construction (capital works) as well as maintenance works (revenue works).The Water Supply division looks after Control room (working round the clock) having 12 water tankers, 20 water trolleys for providing water for functions etc , 6 Service centers for attending to public complaints regarding low pressure, leakages etc, and 3 service centers relating to pumping operations. The service centers work from 9 am till 5 pm.

7.5 EXPENDITURE AND TARIFF STRUCTURE

Details of Expenditure during the last Five Years are as follows:

(Amount Rs. in Thousand)

S. No.	Name of the Scheme	Financial Year				
		2001-02	2002-03	2003-04	2004-05	2005-06
1.	Maintenance of Water Supply system in NDMC area	4478	5488	5283	5493	5400
2.	Repair & Maintenance of Booster pumps and tube wells	4695	2108	2960	4057	4518
3.	Strengthening of Water supply system Capital Works	21453	16015	9823	4930	6322

Tariffs for Water Supplied

The tariff structure is more or less, as the DJB structure, however certain differences are highlighted in the comparative statement as below:

Comparative Statement of Water tariff structure in NDMC and DJB.

Water Connection Type	NDMC		DJB	
	Quantity	Rate / month RS. / KL + 50% *	Quantity	Rate / month RS. / KL + 50% *
Domestic Cat I	Upto 10 KL	0.35	Upto 6 KL	0.00
	Next 10 KL	1.00	6 to 20 KL	2.00

	Next 10 KL	1.50	20 to 30 KL	7.00
	Above 30 KL	3.00	Above 30 KL	10.00
Non Domestic Cat II	Upto 50 KL	5.00	Upto 25 KL	10.00
	Above 50 KL	10.00	25-50 KL	20.00
			Above 50 KL	30.00
Cat III	Upto 50 KL	8.00	Upto 25 KL	15.00
	Next 50 KL	12.00	25-50 KL	25.00
	Above 100 KL	16.00	50 - 100 KL	35.00
			Above 100 KL	50.00

(* Sewerage maintenance charges)

Water Connection Size mm	Minimum Charges / pm			Service Charges / pm (per month)	
	Cat I Rs. + 50%	Cat II Rs. + 50%	Cat III Rs. + 50%	Category	Rate pm
Upto 15 mm	20.0	100.0	300.0	Domestic (A) area upto 200 sq. m.	40.0
20 - 25 mm	100.0	100.0	300.0		
40 - 50 mm	200.0	200.0	300.0	Domestic (B) above 200 sq. m	120
80 & above	500.0	500.0	500.0	Non Domestic Cat II Cat III	250.0 600.0

In addition to above Water cess charges are payable @ 2 paise / KL
Meter maintenance (rent) @ Rs 10.00 pm in case of meters issued by the DJB.

Charges for Tanker Water Supply

Water supplied through tankers on request for functions etc by individuals is provided in trolleys of 5000 to 10 000 litres capacity on payment basis. Within NDMC area at Rs. 450/- and outside NDMC area at Rs. 750/-.

7.6 REVENUE FROM SUPPLY OF WATER

Details of metered and un-metered supply of water

Metered supply of water

Total number of Domestic Water connections - 21964 (CAT-I)

Total number of Non domestic water connections - 3765

(Non domestic connections in two categories

CAT-II - 3626 and CAT - III - 139)

Un-metered supply of water

Total numbers of 3869 water connections are charged at Flat Rate. (Rate varies from Rs. 2 /- to Rs. 40/-)

Revenue Income year wise from water supply for last 5 years

Year	Revenue realization (Rs Crores)
2001-02	14
2002-03	14
2003-04	15
2004-05	14
2005-06	20

7.7 WATER FOR HORTICULTURE PURPOSES

Water requirements during summer months of April to Mid July is estimated by the Horticulture department at the rate of 6 litres per sq. meter per day (for 1100 acres of horticulture space as 26.73 MLD) and for the non peak months at the rate of 3 to 5 litres / sq meter; taking an average of 4 lit / sq m, it will be around 18 MLD.

As of now 40 tube wells are under operation with the horticulture department besides 7 open wells in different areas.

In addition to above, the CPWD through Delhi Central Circle X supplies unfiltered water (UFWS) to NDMC (and MCD) areas for horticultural activities.

7.7.1 Sources of raw water / unfiltered water supply

For almost 75 years a raw water pumping station established at the right bank of Yamuna River at Rajghat in the "Rajghat Power House" complex has been a source of raw water.

Treated Sewage Effluent from Okhla Sewage Treatment Plant (STP) is another source of water supply for meeting Horticulture demand and once the pumping main is fully operational will substitute Yamuna water supply. This system has come in use since the last about 4 years.

CPWD draws upto 30 MGD / 135 MLD of water supply from these two systems as per seasonal demand. 70 to 75% of this, i.e; 20 - 22 MGD / 91 - 100 MLD goes to the NDMC area. The supply from Rajghat pump house is made (i) through a 46 inches pipe line upto Tilak Bridge from here a number of pipelines take off and (ii) another 36 inch pipe line via Delhi gate to Connaught Place (CP). Two important mains from Tilak Bridge are 21 inch water main upto Hassanpur reservoir and another 42 inch pipe line to CP. The two lines meet at CP and supply water to onward areas. A 36 inch water main from CP feeds Bhuli Bhatiari reservoir. From Hassanpur reservoir water is pumped to another two reservoirs at Moti Bagh and Nanakpura. A well laid out water supply network exists for supply of UFWS. Water supply to Bungalows / Kothies is through 2 inch dia pipes.

Capacities of reservoirs at :

1. Bhuli Bhatiari	30.22 ML (million litres)
2. Hassanpur	9.008 ML
3. Moti Bagh	5.68 ML

4. Nankpura 1.59 ML

In addition to above a small reservoir 0.46 ML at Parade ground is receiving water by pumping from Willingdon Crescent underground booster pumping station. Water is supplied to Budha Jayanti park.

Since the raw water supply / UFWS system is very old, it suffers from leakages and needs repairs at places besides renovation and augmentation.

As per decision taken by the Ministry of Urban Development, water supply being made from Yamuna river and Okhla STP has been segregated at CP in late 2006 and the areas served by the two sources are as under:

(i). Treated effluent from Okhla STP

India Gate, Lodhi Garden, Lodhi Road, Shahjahan Road, Pandara Road, Prithviraj Road, Tuglak Road, Race Course Road, Akbar Road, Janpath, Ashoka Road, Barakhamba Road, Kasturba Gandhi Marg, Parliament Street, Thyagraj Road, Rajaji Marg, Aurangzeb Road, Lodhi Road, Amrita Shergil Marg, Safdarjung Road, Chanakyapuri, Sarojini Nagar, Nauroji Nagar, Kidwai Nagar, Nanakpura, Moti Bagh, RK Puram (NDMC area) etc.

(ii). Yamuna Water

Rashtrapati Bhawan, Babakharak Singh Marg, Bhagwan Dass Marg, Gurudwara Rakabganj Road, Willingdon Crescent road, RML hospital, Sucheta Kriplani hospital, DIZ area, Panchkuian Road, Ridge area, Budhajayanti park, Mahavir Vanasthali in NDMC area and Aram Bagh, Minto Road, and Pusa Institute in MCD area.

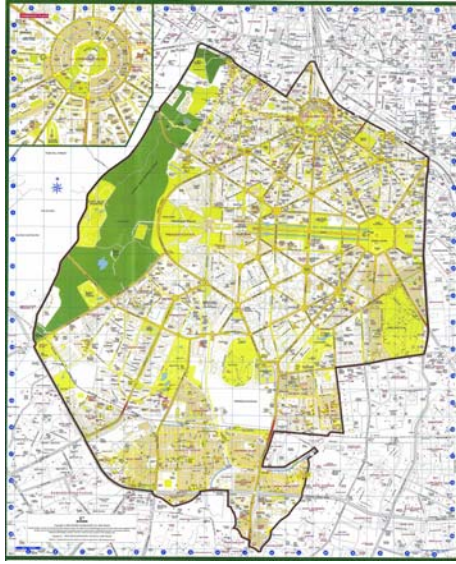
7.8 UNACCOUNTED FOR WATER (UFW)

Based on studies carried out by M/s Span Consultants there is about 1% loss in the Underground reservoirs and accounting for 12% distribution losses there is 10 MLD of unaccounted for water out of estimated receipt of 105 MLD. This is another 10%. Thus approximately 23 to 25% unaccounted for water is there. The CPHEEO manual has given a suggested figure of losses at 15%. The same Consultant feels that "At present no systematic leakage assessment surveys are carried out in NDMC and therefore the extent of water loss through leakage from the distribution system is not known. Sufficient number of field tests will, have to be undertaken in different parts of NDMC area to get some feedback on this by NDMC".

7.9 ISSUES REQUIRING ATTENTION

- a. It is informed that although the resident population is relatively small, 294783 as per Census 2001 a substantial population is floating type. It is therefore necessary to estimate the floating population (a) regularly working in NDMC area say for 8 hrs or more call it work force. And, (b) those who frequent for shopping, site seeing etc i.e.; for a small time where such population does not pose problem of burden on water supply & sewerage services. As per the discretionary functions, NDMC may carry out Census in its area.
- b. To assess the water demand for resident population and work force. Assess water demand and consequent component of sewage on a rational basis.

- c. It is understood that water supply is intermittent and hours of supply vary from 2 to 8 hours a day. A study is called for to rationalise distribution of water. NDMC had drilled almost 137 tube wells out of which only 90 are operational at present. There is need to evaluate the output of such tube wells vis a vis original observed discharge and the depth of water table at the time of boring the tube well, so as to assess the quantity of water available as also quality of water besides fall in water table.
- d. In addition the number of private tube wells in operation in residential, commercial areas like Hotels & restaurants, and non residential areas needs to be assessed. A field survey is called for.
- e. To assess unfiltered water supply received from various sources like CPWD, Horticulture Dept.'s tube wells etc for non domestic needs.
- f. There are 23 UGRs constructed over a period of time, structural condition and leakages if any need to be studied and appropriate measures taken.
- g. The pipe net work for water supply similarly needs to be studied to know condition of pipes like extent of incrustation of pipes to work out if repairs/ renovation / replacement are called for.
- h. There is need to audit the efficiency of E & M equipment both at the BPSs and tube wells.
- i. Review of tariffs to ascertain economic viability of the system. It is noted that although NDMC receives water from the DJB, its water rates are relatively lower.



Chapter – 8 : City Sewerage System

CHAPTER - 8 CITY SEWERAGE SYSTEM

8.1 STUDIES CARRIED OUT IN THE PAST

Master Plan of Sewerage

The existing sewerage system is more than 50 years old. It has been modified over the years from time to time, such as the piped RCC sewers laid along Sikandara road, C Hexagone, till a new Sewage Constructed by the DJB in Pragati Vihar. New Delhi Municipal Committee during 1986 had awarded the work to M/s Tata Consulting Engineers (TCE) relating to "Study of Sewerage system in NDMC area" with the objective to assess existing sewerage system and to identify proposals by which such improvements can be implemented economically. The report was submitted by M/s TCE in May, 1995 suggesting improvements in the existing sewerage system. Recommendations made in the TCE report were accepted and approved by the New Delhi Municipal Council for implementation.

M/s TCE had prepared a Master Plan of sewerage for the year 2001, and had assumed certain population projections. However the population projections are much higher than the Census population of 2001.

The TCE report divided the area under the Council into four zones as under:

1. Area North of Rajpath
2. Area south of Rajpath
3. Diplomatic area and
4. Area South of Railway line.

Waste Water generation was estimated by M/s TCE for 1991 & 2001 as under:

(In MLD)

Year	Population	Domestic	Commercial	Community	Floating Population	Infiltration	Total
1991	357220	86.75	22.87	33.73	17.62	28.41	189.38
2001	442865	116.50	22.97	34.02	17.62	33.72	224.83

For the available water supply from all sources at 130 MLD, the sewage generation at 80% of water supplied is 104 mld.

Sewerage system of NDMC area is an integral part of overall sewer system of NCT of Delhi. Entire quantity of sewage generated and flowing through NDMC area is discharged into the sewer net work operated and maintained by the DJB and further transmitted by the DJB for treatment at the Okhla Sewage Treatment Plant. However operation and maintenance of sewer system within the NDMC area is with the NDMC.

8.2 STATUS OF IMPLEMENTATION OF MASTER PLAN OF SEWERAGE

Pursuant to the recommendation of M/s TCE, NDMC carried out renovation, rehabilitation and laid new sewers as per design recommendations. Zone-wise implementation status is as under:

1.	For the Area north of Rajpath	Fully Implemented
2.	For the area South of Railway line	Fully Implemented
3.	Diplomatic Area	Partially Implemented due to underground strata problems NDMC during 2000-01 decided to implement the sewerage scheme using trench less technology and open cut method. However Delhi Police did not accord permission to lay sewers using open cut method of laying sewers.
4.	South of Rajpath	Yet to be implemented. Considering the security related sensitivity.

Technical Advisory Board

Keeping in view the problems being encountered in maintenance of sewerage system by the NDMC and also keeping in view the forthcoming Commonwealth Games scheduled to be held during the year 2010, the NDMC felt the urgency of the improvement of the sewerage.

A Technical Advisory Board (TAB) was constituted by NDMC in early 2005, under the Chairmanship of Engineer in Chief, NDMC to study the various aspects of laying sewers in Diplomatic area and areas South of Rajpath using trenchless technology and open cut method.

A Sub committee was further constituted under the Chairmanship of Dr S.R. Shukla, Former Adviser (PHEE), CPHEEO to study the feasibility of providing sewerage system in South of Rajpath and Diplomatic zone using trenchless technology considering all the aspects, problems and issues and to suggest and recommend the most techno-economic solution under the prevailing circumstances. The sub Committee was constituted with the following members:

- | | |
|--------------------------------------------------------------------------------------|----------|
| i). Dr S.R. Shukla
Former Advisor (PHEE), CPHEEO
Ministry of Urban Development | Chairman |
| ii). Shri R.P.Sharma
Superintending Engineer(PH)
NDMC | Member |
| iii). Shri Neeraj kant
Executive Engineer
NDMC | Member |
| iv). Shri M. Ali
Assistant Engineer (Sew Proj)
NDMC | Member |

A draft copy of the report was submitted by the sub - committee on 28th July 2005 and strongly recommended the use of trenchless technology for laying of sewers in both the zones at S.No. 3) & 4) above.

8.3 RECOMMENDATION OF THE SUB - COMMITTEE OF TAB

The sub committee has opined that the design of sewer network is based on guidelines and norms as brought out in the 'Manual of Sewerage and Sewage Treatment' published by the Ministry of Urban Development, Govt. of India. The design is based on projected population and water demand and consequent generation of sewage. The projected population for the year 2001 is adequate to cater to the need till 2040.

It was further decided by the TAB, since the Afro - Asian Games and the Commonwealth games are to be held during 2008 and 2010 respectively, the implementation of the schemes be taken up on priority and be commissioned at the earliest.

8.4 PROPOSALS UNDER CONSIDERATION FOR EXECUTION

Rehabilitation of 66 inch diameter brick sewer from Q point to Dayal singh College, Lodhi Road is administratively approved for Rs. 12.46 crores. The final draft of Notice Inviting Tender (NIT) is under approval for call of tenders.

Work of providing 1148 mm diameter branch sewer line for the Vinay Marg flats in a length of 170 meters is proposed to be taken up at an estimated cost of Rs. 1.14 crores under Trenchless Technology & has been sanctioned administratively. This is proposed to be taken up as a pilot project.

8.5 MANPOWER AND SEWER MAINTENANCE

An Executive Engineer (Sewerage Projects) is responsible for execution of Sewerage projects in NDMC area and is assisted by Assistant Engineers and Junior Engineers.

An Executive Engineer(Sewer maintenance) assisted by 5 Assistant Engineers (Civil) & 8 Junior Engineers (Civil) and 1 Junior Engineer (Mech) are responsible for sewer maintenance works , having 7 Complaint centers working from 9 AM till 5 PM for attending to public complaints and a Central Control Room running round the clock (24 Hours).

Field staff	Sewer man	200 Nos.
	Work Assistant	1 No.

Main Equipments	Sewer jetting machines	2 Nos.
	Suction machines	2 Nos.
	Sewer Winching machines	4 Nos.

Sewer system is in existence having a length of 350 km varying from 4 inches to 2100 mm in diameter.

Sewer System including Two Sewage Pumping Stations is operated and maintained by NDMC.

8.6 DETAILS OF EXPENDITURE DURING THE LAST FIVE YEARS

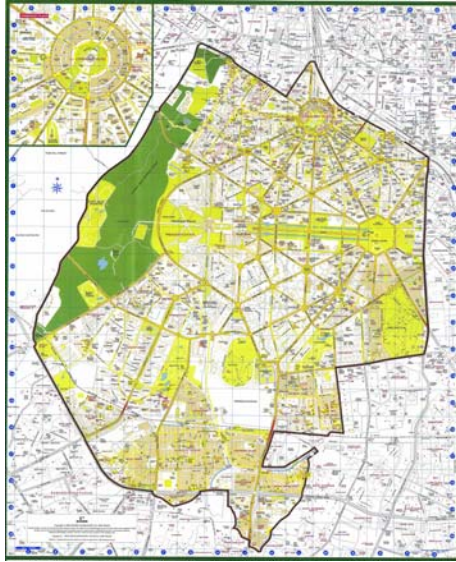
(in Rs. Thousand)					
Financial Year	2001-02	2002-03	2003-04	2004-05	2005-06
Expenditure on Maintenance of Sewer system	6552	5067	6043	7968	7374
Augmentation works	18843	12833	13694	1715	312

8.7 ISSUES REQUIRING ATTENTION

1. To assess the correct volume of sewage generated in the NDMC area.
2. Evaluation of the system to ascertain the extent of siltation, settlement if any requiring repairs / rehabilitation to restore the carrying capacity as per design.
3. To ensure that sewer over flows which might have been provided to avoid surcharged conditions are closed and pollution is abated.
4. To take effective steps for restoration of carrying capacity of sewers, by repairs, rehabilitation adopting the most appropriate technology.
5. To implement use of Trenchless Technology in sewer laying it requires-
 - Qualified and experienced personnel for planning and execution of such a project.
 - Special types of machines and tools for the project implementation.
 - Special types of pipes suitable under different underground conditions.
 - GIS & GPR survey to know the underground conditions regarding availability of other services before taking up the work.
 - Soil Investigation is necessary to know the underground strata.
 - Location of Starting and target pits to be fixed in consultation with Delhi Police and concerned security agencies keeping in consideration the security concerns in VVIP areas before taking up such work.
6. There is need to audit the efficiency of E & M equipment at the SPSs.

STATEMENT OF VARIOUS SCHEMES ON WHICH THE EXPENDITURE INCURRED UNDER HEAD OF A/C D-2-17-11(B) UNDER CAPITAL WORKS DURING LAST FIVE STARTING FROM 2001-02 TO 2005-06.

		2001-02	2002-03	2003-04	2004-05	2005-06
1.	Augmentation of Trunk Sewer K.G. Marg Con. Place New Delhi part-II	2233428	1539385	706570	4601890	20629
2.	Laying of sewer line from Akbar Bhawan to Khushak Nallah and branches thereof.	207088	-	-	-	-
3.	Augmentation of sewerage form South Avenue to Lodhi Road through Tyag Raj Marg, Duplex Lane, K.M. Marg, Khan Market, Subramaniam Bharti Marg and Mehrishi Raman Marg.	1705860	625404	742649	50383	-
4.	Laying of sewer line form Kamal Attaturk Marg Aurangzeb Road, South End Road and branches thereof.	56816	-	-	14678	8000
5.	Laying of sewer line at Kautilya Marg from intersection of Shanti Path to Panchsheel Marg.	3347348	1449628	400330	-	-
6.	Augmentation of sewerage system in Kidwai Nagar Part-II	622265	261994	-	-	-
7.	Laying of diversion sewer line of 250-300-400-450mm dia for Augmenting the sewerage system of Part of Laxmi Bai Nagar.	124843	1630225	98821	-	-
8.	Augmentation of sewer from Jaswant Singh Road to K.G. Marg through canning road.	-	643468	1954467	431756	220349
9.	Augmentation of sewerage in area bounded by Bapa Nagar, Shershah Suri Marg and Dr. Zakir Hussain Marg.	-	71759	1912319	963981	-
10.	Augmentation of sewerage in NDMC area shifting of house connection in a part of Laxmi Bai Nagar.	-	-	148816	748328	-
	Grand Total	82,97,648.00	62,21,863.00	59,63,972.00	68,11,016.00	2,48,978.00



Chapter – 9 : Storm Water Drainage



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Subcity Plan NDMC

CHAPTER - 9

STORM WATER DRAINAGE

9.1 INTRODUCTION

Storm water drainage is a neglected subject resulting in chaos and emergency situation during rainy season in general and after heavy precipitation in particular. Most of these unpleasant situations can be mitigated with appropriate planning, thorough implementation and MIS based monitoring and maintenance.

The topography of Delhi is relatively flat with small hillocks running from Wazirabad barrage in the north to Mehrauli in the south. The NDMC area, however, is almost flat. The major drainage system of Delhi is such that all water collected through main drains, link drains and rivulets is discharged into the river Yamuna. The National Capital Territory of Delhi had been divided into five drainage basins on the basis of topographical characteristics and existing drainage network, namely, Najafgarh, Alipur, Shahdara, Khushak Nallah and Mehrauli drain. Of these, the Khushak Nallah passes through the NDMC area.

9.2 INSTITUTIONAL ARRANGEMENT

Five departments - the Municipal Corporation of Delhi, NDMC, DJB, PWD and the Department of Irrigation and Flood Control are responsible for the drainage system in Delhi. NDMC is implementing water supply, sewerage, anti-flood work and covering of drains ('Nallah') within its area. Roads and storm water drains are closely inter-linked. The allocation of responsibility in NDMC is in conformity with this - both roads and surface drains are looked after by the same Department. The total area is divided into two divisions for this purpose.

9.3 SECTOR ASSESSMENT

9.3.1 NDMC Drainage system

NDMC area is surrounded by a much larger area of MCD, therefore there is a close inter-linkage with the natural as well as man-made drains in MCD area and beyond. Therefore the aspect needs to be looked into in the wider context. There are 14 drainage system networks in the NDMC area out of which 13 are covered drains and one open Nallah (Khushak). Two systems drain off to Dr. Sen Nursing Home Nallah in MCD area, two systems drain off to Khushak Nallah at Lodhi Road near Dayal Singh College in MCD area and the balance 10 systems are interconnected and joined at Q point. The length of Khushak Nallah is 11 Kms out of which 4.7 Km is covered. The balance 13 systems are 14 Km long having RCC pipes / brick barrel between 600mm to 2700mm dia.

It is reported that there is no major problem in the drainage sector except some low-lying areas, where water logging occurs during heavy precipitation, such as the Railway bridge underpass at Africa Avenue (Chanakyapuri), from where accumulated water has to be pumped out.

The service drainage along the roads are trapped through bell mouth and connected to longitudinal drain 600 Km long (road side drainage along main roads as well as service roads). Out of the 600 km, 30 km is open drainage system.

The following recommendations made in the Delhi Master Plan, 2021 are relevant for the drainage situation in NDMC area:

- Drainage should be linked with ecology and green network by adopting the concept of 'bio-drainage'.
- Dumping of solid waste and construction debris ('malba') has to be controlled through public awareness generation.
- Regular de-silting of drains to be arranged.
- Drainage to be integral part of road development as well as flyovers and grade separators.
- Proper data base should be prepared and GIS based drainage mapping and planning should be promoted.
- Sub wells need to be developed under flyovers for trapping rain water.
- Pump-house should be provided in low-lying areas with back-up power.

9. 3.2 Kushak Nallah

NDMC has taken up the project of ecological development and rain water harvesting of Khushak Nallah¹. The stretch between S.P. Marg to Satya Marg is being taken up for ecological development. There is a growing realization about the long term benefits by turning to bio-drainage solutions rather than engineering solutions for mitigating problems of natural drains.

The purpose of development of Khushak Nallah is to have

- On channel storage and aquifer recharge.
- Integration of vegetal and aqueous landscape elements.
- Improved usage of the area.

As per the proposed project,

- Eight separate lagoons will be constructed in the entire stretch and will have fountains for aeration at four locations. These would have retention time of 2 hours and expected to reduce suspended solids by about 90%.
- There would be 7 numbers of septic tanks.
- Plantation of flowering shrubs and trees has been planned.
- Bio-remediation through pisciculture.
- Civil works have already started and project is likely to be completed by 31

¹ Consultant - M/s INTACH

Dec.'07 and the total computed project cost is around Rs 200 lakh.

9.4 KEY ISSUES

The key issues for improving the drainage arrangement in NDMC area are:

- In the entire city of Delhi, there is lack of comprehensive approach and planning due to multiplicity of agencies looking after this subject, namely, MCD, NDMC, DJB, PWD, Department of Irrigation and Flood Control etc. The last Master Plan for drainage was made way back in 1977, despite of that the system is yet to be upgraded or implemented.
- Adjustment of the levels and gradients of all the drains in Delhi and their regular cleaning and de-silting for unhindered flow during lean-season and adequate capacity to carry storm water during heavy precipitation.
- Coordination in planning and construction of roads and drains is necessary. Provision of sheathing pipes of suitable diameter along the storm water drains for carrying all cables, small pipelines etc. so that the necessity of digging the road and interrupting the drainage system can be minimized.
- It is observed that often after construction of a drain, it is not thoroughly cleaned of construction debris before putting on the slab covers and commissioning the drain. Thus the drain is choked from day one and the blockage builds up with passage of time.

It is seen from the table in Annexure 9.2 that the actual expenditure on drainage has been far less than the approved funds during the 5th Five Year Plan, indicating that identified works have not been taken up.

Annexure 9.1

Figure 9.1: Stretch of Kushak Nallah in NDMC area



Annexure 9.2

Table-9.1: Covering of nallahs and anti-flood works in NDMC area (Scheme-wise approved outlay under annual plan 2006-07 of GNCTD)

Sl. No.	Name of schemes	10 th FYP (2002-07) *	Expnd. [#] 2002-03	Expnd. 2003-04	Expnd. 2004-05	Annual Plan 2005-06			Annual Plan 2006-07 Approved outlay			
						Appd. [@] outlay	Revd. ^{\$} outlay	Expnd. tentative	Revn. [†]	Cap. ^x	Loan	Total
1	Capacity aug. of SWD system incl. covering of Khushak Nallah	150.00	12.19	22.50	2.19	20.00	20.00	9.90	20.00			20.00
2	Capacity aug. and improvement of road side drains	50.00	21.96	33.06	27.43	20.00	20.00	3.38	20.00			20.00
3	Improvement of drainage system in colonies	50.00	29.26	15.90	5.34	30.00	30.00	28.89	30.00			30.00
4	Repair and de-silting of SWD system	150.00	18.46	10.52	25.87	55.00	55.00	9.52	55.00			55.00
	Total	400.00	81.81	81.98	60.83	125.00	125.00	51.69	125.00			125.00

- Expenditure, @ - Approved, \$ - Revised, † - Revenue, x - Capital (all amounts - Rs. In lakh)

* FYP - Five Year Plan, SWD - Storm water drainage, Aug. - augmentation, Source - NDMC.



Chapter – 10 : Solid Waste Management

CHAPTER - 10

SOLID WASTE MANAGEMENT

10.1 INTRODUCTION

NDMC area generates about 400 tonnes of municipal solid waste (MSW) per day, basically consisting of municipal garbage, horticultural waste and construction and demolition debris. NDMC is responsible for proper management of this waste. Additionally, bio-medical waste and e-waste are generated, which are outside the purview of the NDMC Act. Management of biomedical waste is the responsibility of the generators. As per the Master Plan of Delhi, 2021, the existing capacity to handle waste in 2001 was 245 tonnes per day, whereas the projected generation of municipal solid waste in 2021 is 550 tonnes per day.

10.2 CURRENT SYSTEM OF WASTE MANAGEMENT

10.2.1 PRIMARY WASTE COLLECTION

Primary collection refers to the collection of waste from the places where it is generated. This may include the following: door-to-door collection by cart or tricycle, community bin service, street sweeping, drain cleaning and private collection.

Door-Step Collection

In the year 1996, NDMC started an initiative in 51 colonies within its area for segregation of household garbage at source by distributing polythene bags of uniform size (cost Rs. 60 per month to the NDMC). The bags were to be collected by the municipal staff. However, the plan did not succeed in terms of compliance, use of the distributed bags and payment of the monthly charges (cost of bags plus collection service).

NDMC has changed its strategy and a modified scheme of door-step collection is on the anvil. The scheme would involve NGOs and RWAs for operation. Reportedly three NGOs have been short-listed and MoUs are under preparation. Cycle carts would be given to the NGOs for operation in the respective identified areas (Circles). The cycle carts would have a partition for segregated collection of bio-degradable and non-bio-degradable waste, which would then be taken for further processing, recycling and disposal.

Presently wheel barrows are being used. Necessary tools and implements as well as stores of consumable articles have been provided to the conservancy staff.

Street sweeping

Other than door-to-door collection, which is being practiced in very few localities at an informal level, the most usual method of primary waste collection is street sweeping by Municipal Safai Karamcharis or cleaning staff.

Within the NDMC areas, the NDMC employees (Safai Karamcharis) collect waste from the households and commercial areas and bring it to the nearest waste receptacle.

All roads and lanes as well as public places are manually swept daily, using long

handled 'Delhi' broom. Mechanical sweeping has been recently started in a limited manner by the PWD for the roads constructed and maintained by them. Keeping in view the wide roads and the fast traffic, mechanical street sweeping appears to be the rational choice, starting with the wide main thoroughfares. This would increase cleaning efficiency and reduce occupational hazards. However, one crucial issue is proper construction of the road with correct leveling, construction of appropriate storm water drains and effective storage for municipal solid waste. Without these, the mechanical street sweepers can not function properly.

10.3 SECONDARY STORAGE

Waste collected from the source is stored at a common point from where it is lifted by the garbage collection vehicle and disposed conveniently at the identified landfill. This common point implies secondary storage of waste.

Around 450 pairs of litter bins (blue and green) have been provided for preventing littering. Additional 650 pairs are to be shortly provided. There is ample scope of improvement in the municipal storage and collection system, presently comprising masonry bins and open metallic containers. Plans are afoot to convert the existing masonry bins ('dhalao') into "Garbage Stations" (specially designed masonry bins with separate containers and chutes for segregated storage and collection, infrastructure facilities like water pipe for washing, electric light etc.). 20 such "Garbage Stations" were made and commissioned earlier. However, improvements are required for better management of these (listed in Annexure 10.1).

Within the NDMC area, presently, there are three types of waste storage points available in the circles. These are masonry dustbins, Garbage stations and Trolleys. There are 249 Masonry Dustbins with a total capacity of 663 metric tonne, 23 Garbage Stations of which 3 are managed by NDMC and 20 have been given on private contract on a Built Operate and Transfer (BOT) basis with revenues to NDMC of INR. 8500 per month. The total capacity of these garbage stations is 32 metric tonnes. Total capacity of Masonry Dustbins and Garbage Station is more than double the waste generated. The circles are also equipped with 405 metallic trolleys.

Wheeled bins of 1100 liter capacity (a pair of blue bins for recyclables and a pair of green bins for bio-degradable waste) would replace the open containers and these bins would be picked up by refuse collector-compactors to be managed by private operators.

10.4 TRANSPORTATION OF WASTE

The transportation vehicles collect the waste from the storage points and ultimately dispose off to the final disposal site. NDMC maintains a large fleet of vehicles for transportation and secondary collection of waste from various waste receptacles to the final disposal site. These are:

- a) Garbage trucks of NDMC - 60 Nos.
- b) Hired trucks from private contractors - 20 Nos.
- c) Small trucks for attending to specific complaints - 5 Nos.

There are certain gaps in this transportation of waste by vehicles in NDMC area. It has been observed that the total carrying capacity of the vehicles is two times of

the waste generated but the present transportation efficiency of NDMC vehicles is only 64% due to overlapping and inefficient system of vehicle routing. In addition, the open transportation fleet is not in accordance with MSW Rule 2000 causing potential health hazards to the sanitary workers.

NDMC has therefore recently signed an agreement with a private operator for storage and systematic collection of municipal solid waste and its transportation to the designated landfill site at Ghazipur. As per the concession agreement:

- Out of 14 circles in NDMC, 12 circles are to be handed over to the selected private operator, incorporated as a 'Special Purpose Vehicle' (SPV).
- The concessionaire has been authorized to (i) investigate, study, design, engineer, procure, finance, modify, construct, operate, maintain and transfer the Project Facilities (ii) collect Municipal Solid Waste from the "Street Corner Bins" and "Garbage Stations" within the 'Area of Operations' and to segregate, transport and deliver at the designated landfill facility and / or treatment facility (iii) collect, transport and deposit the landscape waste at the treatment facility. The project facilities would be provided strictly as per the approved design and COD¹ would be achieved as per schedule

Privatization is to be implemented in the 12 circles under jurisdiction of NDMC.

The private operator has to achieve a 'Segregation Benchmark', which would measure the quantum of Biodegradable MSW that escape sorting and thereby reach the landfill as depicted in table 10.1.

Table 10.1: Segregation Benchmark

Year of Operation	Months from COD	Segregation Benchmark (in % terms)	R = Applicable Penalty for corresponding Months (in % terms)
Year 1	1 - 12	50	NIL
Year 2	13 - 24	45	5
Year 3	25 - 36	40	5
Year 4	37 - 48	40	10
Year 5	49 - 60	35	10
Year 6	61 - 72	35	15
Year 7	73 - 84	30	15
Year 8	85 - End of Concession Period	30	15

Source: NDMC

10.5 PROCESSING AND DISPOSAL

NDMC had a compost plant at Okhla, which was commissioned in 1985 (capacity - 200 tons of input garbage per day). The compost plant had remained shut from time to time due to different reasons. The compost plant has been closed recently. When in operation, it was reported to be taking about 50 tonnes garbage per day. An integrated project is being developed at the site. The residues would be sent to the designated sanitary landfill (as available in future).

¹ Date of Commission

Trench composting of the horticultural waste is being done in a limited way inside the gardens, parks and by the sides of roads. However, this activity often faces stiff public opposition. Due to inadequate trenching space, majority of leaf litter can not be composted.

The garbage is being sent to Ghazipur landfill site operated by the Municipal Corporation of Delhi.

10.6 AWARENESS GENERATION AND CAPACITY BUILDING

10.6.1 Awareness generation

NDMC is trying to involve the RWAs for their support in segregation at source, appropriate collection, minimizing littering and regular payment of applicable charges. Punishment for non-compliance should be used as the last resort. The private operator has to organize awareness campaign as per the recently signed concession agreement for collection and transportation.

10.6.2 Capacity Building

Capacity building of the municipal staff is also felt to be an important issue for improving efficiency and level of involvement as well as clear understanding of their respective delegated work. Development of planning capability is also crucial for sustained activity under changing circumstances.

NDMC has arranged training programs for 'Safai Karamchari' regarding their job and about segregation of garbage. Medical examination and treatment facilities have also been provided to them for enhancing their performance. Even anti-alcohol anti-tobacco programs have been organized.

Aprons with NDMC logo and protective gears have been provided to them for reducing occupational hazards.

10.6.3 MIS And Monitoring

A strong monitoring mechanism is essential for efficient service delivery. Such a mechanism can be made effective through appropriate use of MIS (Management Information System).

10.7 KEY ISSUES

Being a land-locked area with high cost of land, NDMC does not have processing and disposal facilities within its area. It has a compost plant located at Okhla. The rest of the municipal solid waste is sent to the landfill at Ghazipur, under MCD administration. However, the compost plant is currently not functional. The key issues for improving the solid waste management situation are:

- Appropriate storage of the different types of waste indicated above (domestic and commercial garbage, construction and demolition debris, horticultural waste etc.)
- Prevention of littering through adequate provision of litter bins at public places and markets
- Efficient street sweeping.

- Regular removal of garbage without spilling and dirtying the roads (collection and transportation).
- Addressing crucial grey areas like management of construction and demolition debris, e-waste etc.
- Awareness generation amongst the public and other stakeholders.
- Capacity building of the municipal staff.

Annexure-10.1**LOCATION OF EXISTING MASONRY DUSTBINS**

(Source: NDMC)

Circle Number - 1

Identification Number.	Location	Numbers
1/1	Near Harsha Bhawan, behind 'E' block middle circle	1
1/2	Near Pack Well & Co., opp. Stall No. 9, Shankar Market	1
1/3	Near Gate No. Palika Bazar	1
1/4	Near Kothi No. 20, Buta singh Chowk, Ashoka Road	1
1/5	Behind Hanuman Mandir, Hanuman Lane	1
1/6	Near Mini Market, Bangla Sahib Lane	1
1/7	Near the wall of Guru Dwara Bangla Sahib	1
1/8	Behind Police Station staff quarters, Jai singh Road	1
1/9	Near Thapar House, Janpath Lane	1
1/10	Behind Bank of Baroda, Janpath Lane	1
1/11	Near Kothi No. 7, Jantar Mantar Road	1
	Grand Total	11

Circle Number - 2

Identification Number	Location	Numbers
2/1	Raisina School	1
2/2	Mandir Marg Police Station	1
2/3	Harijan Basti	1
2/4	Behind Prem Nath Motors	1
2/5	R.K.A Marg Lane	1
2/6	Behind Navyug School	1
2/7	R.K.A. Marg Lane (opp. Elecetric Sub-Station)	1
2/8	Opposite Palika Place (opp. R.K.A. Marg)	1
2/9	85 Block (near Lady Hardinge Staff Qtrs.)	2
2/10	Dr. Lane (Near Gupta Sweets)	1
2/11	Inside Kalawati Hospital (Bangla Sahib Marg)	1
	Grand Total	12

Circle Number - 3

Identification Number	Location	Numbers
3/1	Near Mother Dairy, DIZ area Sector 4	1
3/2	Inside R.M.L. Hospital	2
3/3	Civil Enquiry NDMC G Point	1
3/4	Near President state Quarters	1
3/5	Near Electric Pole number 15, Mandir marg	1
3/6	J.J Cluster Kali Bari (Near N.P Girls school)	1
	Grand Total	7

Circle Number - 4

Identification Number	Location	Numbers
4/1	Rajender Prasad Lane	1
4/2	Jantar Mantar Road (near Bunglow No. 6)	1
4/3	Back Side of Reserve Bank	1
4/4	Near Press Club Rafi Marg	1
4/5	Reserve Bank Lane, Parliament Street	1
4/6	Church Road	1
4/7	Naer 35 Gali R.L. Bhavan Gate	1
4/8	Near Police Station North Avenue	1
4/9	Park Lane, Talkatora Indoor Stadium	1
4/10	Gate No. 1 Talkatora Stadium	1
4/11	Ghat No. 6 Mahadev Road	1
4/12	Pt. Pant Marg (opp. Film Division)	1
4/13	Bungalow No. 5 Ghat No. 4	1
4/14	Bungalow No. 15 Ghat No. 4	1
4/15	Bungalow No.24 Ghat No. 4	1
4/16	Bungalow No. 18, G.R.G Road	1
4/17	Gate No. 4 Central Sectt.	1
4/18	Gali backside 5, Pt. Pant Marg, Film Division	1
4/19	DIZ Area, Pt. Pant Marg	1
	Grand Total	19

Circle Number - 5

Identification Number	Location	Numbers
5/1	Behind Gopal Tower Bara Khamba Lane	1
5/2	Toder Mal Lane	1
5/3	Behind Post Office Babar Road	1
5/4	Behind Babar Palace, Todar Mal Road	1
5/5	Gomati Guest House (Behind Tansen Road)	1
5/6	College Lane	1
5/7	College Lane	1
5/8	College Lane	1
5/9	Sikander Lane	1
5/10	Sikander Lane	1
5/11	Bhagawan Das Lane	1
5/12	Sangli Mess	1
5/13	Sangli Mess, Dhobi Ghat	1
5/14	Sangli Mess	1

Identification Number	Location	Numbers
5/15	Farid Kot House Lane	1
5/16	Farid Kot House Lane	1
5/17	Copernicus Marg BOT	2
5/18	Madhav Rao Scindia Road	1
5/19	Jaswant Singh Lane	1
5/20	NabhaHouse, Sikander Road	1
5/21	Canning Lane (behind Lady Irwin School)	2
5/22	Balwant Rai Mehta Lane	1
5/23	Copernicus Lane	1
5/24	Bhagawan Das Lane	1
5/25	H.C. Marg	1
5/26	Bijli Ghar H.C. Marg	1
5/27	Behind Janpat	1
5/28	Behind Chander Lok Building	1
5/29	Telegraph Office	1
5/30	Atul Grover Road	2
5/31	Sangli Mess	1
5/32	Behind Kailash Building	1
5/33	Shri Ram Plot Car Parking	1
5/34	Halley Lane, Dhobi Ghat Qtrs.	1
5/35	Halley Lane, Dhobi Ghat Qtrs.	1
5/36	Hyderabad Complex	1
	Grand Total	39

Circle Number - 6

Identification Number	Location	Numbers
6/1	Near Ravinder Nagar, Amrita Shergil Marg.	1
6/2	Amrita Shergil Marg, Taxi Stand	1
6/3	P.R.Lane near Church, NDMC Flates.	1
6/4	Opp.28 Akbar Road.	1
6/5	Near Tajmahal Hotel, Gali Darbanga Ghat	1
6/6	Humayun Road, C.I/14 Flats	1
6/7	Pandara Road Market	1
6/8	Behind B block, Pandara Road	1
6/9	Near M.S. Flats, Shahjahan Road.	1
6/10	6 Maulana Azad Road, Vice President House	1
6/11	12 Janpath Kothi Ram Vilas Paswan Back	1
6/12	Near Dhobi Ghat, Bapa Nagar	1
6/13	Near SQ 45, Bapa Nagar inside.	1

Identification Number	Location	Numbers
6/14	Near CGHS Dispensary, Dr.Z.H. Marg	1
6/15	Opp. C.I/2, Pandara Park	1
6/16	Pandara Park back lane C-I/35	1
6/17	Pandara Park back lane AB Flats	1
	Grand Total	17

Circle Number - 7

Identification Number	Location	Numbers
7/	Sunehari Bagh Lane	1
7/	Moti Lal Nehru Marg	1
7/	30 January Lane	1
7/	Krishna Menon Lane	2
7/	Behind kothi No. 4, Rajaji Marg	1
7/	Back side of kothi No. 10, Rajaji Marg	1
7/	Back side of kothi No. 1, Akbar Road	1
7/	Back side of kothi No. 2, Akbar Road	1
7/	Back side of kothi No. 3, Akbar Road	1
7/	Back side of kothi No. 30, Aurangzeb Road	1
7/	Back side of kothi No. 26B, Aurangzeb Road	1
7/	Sena Bhavan, K. Kamraj Road	1
7/	Tyag Raj Marg	1
7/	Kushak Lane	1
7/	Backside of Kashmir House	1
7/	South Avenue Lane	1
7/	Staff Quarters, Tara Mandal	2
7/	Police Staff Quarters, Tara Mandal (left side)	1
7/	Nehru Smarak, 24 Teen Murty Road	1
7/	Dhobi Ghat No. 15, Souh Avenue	1
7/	Inside PM House, Teen Murti Lane	1
	Grand Total	23

Circle Number - 8

Identification Number	Location	Numbers
8/1	Lodhi Estate, N.P. School	1
8/2	Lodhi Estate, Kanada School	1
8/3	Infront of Kothi No. 47	1
8/4	Infront of Kothi No. 30	1

Identification Number	Location	Numbers
8/5	Infront of Kothi No. 61	1
8/6	Infront of Kothi No. 75 to 85	1
8/7	Retadon Lane	1
8/8	Outer Kaka Nagar	1
8/9	Service Lane	1
8/10	Dr. Zaqir Hussain Marg	1
8/11	Golf Course Road Kothi No. 50	1
8/12	Golf Course Road Kothi No. 40	1
8/13	Golf Course Road Kothi No. 14	1
8/14	C.W.C. Palika M. Center	1
8/15	Palika Niwas	1
8/16	Block No. 5,6	1
8/17	Block No. 9	1
8/18	Block No. 11	1
8/19	Block No. 14	1
8/20	Block No. 16	1
8/21	Block No. 17	1
	Grand Total	21

Circle Number - 9

Identification Number	Location	Numbers
9/1	Amrita Shergil lane behind 35 P.R.Road	1
9/2	DID Safdarjung Rd.	1
9/3	Race Courses J.J. Cluster	1
9/4	NDMC Sanitary Store, Tughlak Lane	1
9/5	Aurangzeb Lane, NDMC School backside	1
9/6	Munda Ghat	1
9/7	House No. 996 CPWD Qr. Jor Bagh Road	1
9/8	Near Gurdwara, Aliganj	1
9/9	Near Qr. No.23/173 Lodhi Road	1
9/10	Near Qr. No.23/151 Lodhi Road	1
9/11	Backside of NDMC School, Jor Bagh	1
9/12	House No. 110 Block No. 19	1
9/13	Backside of House No. 167, Jor Bagh	1
9/14	Near H.No. 108, Jor Bagh	1
9/15	Backside of House No. 73, Jor Bagh	1
9/16	Near H.No.B.163 B.K.Dutt Cly. Market	1
9/17	Near H.No.C-118, B.K. Dutt Cly.	1
9/18	Near H.No.C-112, B.K.Dutt Cly	1

Identification Number	Location	Numbers
9/19	Near H.No.C-49, B.K.Dutt Cly.	1
9/20	Near H.No. C-81, B.K.Dutt Cly	1
9/21	Near H.No. C-4, B.K.Dutt Cly	1
9/22	Near H.No. C-63, B.K.Dutt Cly	1
	Grand Total	22

Circle Number - 10

Identification Number	Location	Numbers
10/1	Near American Embassy, Chander Gupta Marg	1
10/2	Near Swiss Embaassy, Chander Gupta Marg	1
10/3	Near UAE Embassy, Chander Gupta Marg	1
10/4	Near Sadhu Samaj Dharam Marg	1
10/5	Near Kitchner Road Center, Dharam Marg	1
10/6	Near China Embassy, Naya Marg	1
10/7	Near Rail Museum	1
10/8	Bapu Dham, Chanakya Puri, Harija Basti	1
10/9	Near I.B. Colony Road, S.P. Marg	1
10/10	Near Backside Indonesia Embassy, Kotilya Road	1
10/11	Near Bardolai Marg, Behind P.S. Chanakya Puri	1
10/12	Near Tamilnadu Bhawan, Kotilya Marg	1
10/13	Near Pakistan Embassy	1
10/14	Near German Embassy	1
10/15	Near Petrol Pump,Opp. Chanakya Cinema	1
10/16	Near Rly. Bridge, D-1 Viney Marg	1
10/17	Near Naval Public School, Viney Marg	1
10/18	Near Behind D-1/53 Satya Marg	1
10/19	Near Behind D-1/93 Satya Marg	1
10/20	Opp. Amrit Bhawan, Satya Marg	1
10/21	Near Viney Marg/Cricket Ground	1
	Grand Total	21

Circle Number - 11

Identification Number	Location	Numbers
11/1	Near Shop No. 101 Sarojini Nagar Market	1
11/2	Near A-115 Sarojini Nagar	1
11/3	Near A-215 Sarojini Nagar	1
11/4	Near A-350	1
11/5	Near X-301 Sarojini Nagar	1

Identification Number	Location	Numbers
11/6	Near XY-12 Sarojini Nagar	1
11/7	Near F-1 Nauroji Nagar	1
11/8	Near G-105 Nauroji Nagar	1
11/9	Near G-143 Nauroji Nagar	1
11/10	Near G-237 Nauroji Nagar	1
11/11	Near Primary School (NDMC), Nauroji Nagar	1
11/12	Near F-119 Nauroji Nagar	1
11/13	Near G-1 Sarojini Nagar, G1-827	1
11/14	Near EPT-11 Sarojini Nagar	1
11/15	Near L-10 Sarojini Nagar	1
11/16	Near K-14 Sarojini nagar	1
11/17	Near K-145 Sarojini Nagar	1
	Grand Total	17

Circle Number - 12

Identification Number	Location	Numbers
12/1	Begum Zaidi Market	1
12/2	Govt. School in front of Community Centre	1
12/3	Govt. School Backside in front of A Block	1
12/4	C-II/112 Moti Bagh	1
12/5	Palika Niketan(99 Qrs.)	1
12/6	Backside Barat Ghar	1
12/7	Cement Godown	1
12/8	Com/Art College	1
12/9	Com/Art College	1
12/10	In front of College	1
12/11	E Block Near Mother Dairy	1
12/12	In front of CGHS Dispensary	1
12/13	A Block Netaji Nagar	1
12/14	Anant Ram Dairy	1
12/15	CPWD Paper Godown	1
	Grand Total	15

Circle Number - 13

Identification Number	Location	Numbers
13/1	Subzi Mandi in front of CGHS Disp. East Kidwai Nagar	1
13/2	Central Market East Kidwai Nagar	1
13/3	Near Community Hall, D-Block East Kidwai Nagar	1

Identification Number	Location	Numbers
13/4	Near 40 Qr. E Block East Kidwai Nagar	1
13/5	Barat Ghar E-Block East Kidwai Nagar	1
13/6	South Market C-Block	1
13/7	Near Park B-Block East Kidwai Nagar	1
13/8	NDMC School B-Block, East Kidwai Nagar	1
13/9	D-II/50 Ring Road side East Kidwai Nagar	1
13/10	Near Mandir West Kidwai Nagar Or. No. 235	1
13/11	Near Gas Agency West Kidwai Nagar	1
13/12	Yusuf Sarai Market, East Ansari Market	1
13/13	Near Safrdarjang Gate No. 11, S.J.Hospital	1
13/14	Back Petrol Pump (Aurobindo Marg) Laxmi Bai Nagar	1
13/15	Near Delhi Hat Laxmi Bai Nagar	1
13/16	Infront of Navyug School Laxmi Bai Nagar	1
13/17	Side of Barat Ghar Laxmi Bai Nagar	1
13/18	Near Qr. No. 491 Near Gole, Laxmi Bai Nagar	1
13/19	Near Market Gole, Laxmi Bai Nagar	1
13/20	Hodi near Q.No. 77 Laxmi Bai Nagar	1
	Grand Total	20

Circle Number - 14

Identification Number	Location	Numbers
14/	Near Air HQ, Rafi Marg	1
14/	Near Kothi No. 6, Rajendra Pd. Road	1
14/	Near Gate of National Stadium	1
14/	Purana Quila Road near Nursing Hospital	1

Annexure - 2

LOCATION OF GARBAGE TROLLEYS

(Source: NDMC)

Circle Number - 1

Sl. No.	Location	Numbers
1	Opp. Ram House, behind 'A' block middle circle	2
2	Near Marina Hotel, behind 'G' block middle circle	3
3	Near British Motor Car Co. behind 'G' block middle circle	5
4	Near Competent House, behind 'F' block middle circle	1
5	Near Competent House, behind 'F' block middle circle	1
6	Near Metro Hotel, behind 'F' block middle circle	4
7	Behind Arya Samaj Mandir, Hanuman Road	1
8	Near Police Station Bangla Sahib Lane	3
9	Behind Police Station Staff Quarters, Jai Singh Road	1
10	Near State Bank of India, Parliament Street	1
11	Near Jiwan Tara Building, Parliament Street	1
12	Near Janta Dal Office, Jantar Mantar Road	1
13	Behind Imperial Hotel, Janpath Lane	1
15	Near Ann Purna Bakery, Janpath Lane	1
16	Opp. Hanuman Mandir Parking, Baba Khark Singh Marg	1
	Grand Total	27

Circle Number - 2

Sl. No.	Location	Numbers
1	Mandir Marg Police Station	2
2	Basti Chowk, Panchkuin Road	
3	R.K.A. Marg	2
4	Palika Niketan	
5	Dr. Lane, Sector 1	1
6	Dr. Lane (near Gupta Sweets)	
7	Panchkuin Road	1
8	85 Block (near lady Hardinge Staff Qtrs.)	1
	Grand Total	7

Circle Number - 3

Sl. No.	Location	Numbers
1	Baird lane market	2
2	Post Office Veer Bhai Singh marg	1
3	Veer Bhai Singh Marg near Red Light	1
4	Palika Dham Electric Substation No. 4	3
5	Vakil Lane near Vidya public school	1
6	Near Sulabh Sauchalaya Near Raja Bazar	2
7	Behind Raghumal School	1
8	Raja Bazar JJ Cluster	2
9	Behind Emporium Lane	3
10	Jain Happy school Park	1

Sl. No.	Location	Numbers
11	Opposite Birla Mandir parking	1
12	Opposite Birla Bus Prking	1
13	NP boys Senior Secondary School Mandir Marg	1
14	Opposite South Indian club Mandir Marg	1
15	Udyan Marg Shop Number 4	1
16	Udyan Marg Near CNG Petrol Pump	2
17	Scindiya Road Near Bus stop 216	1
18	Back Side Chug Dharam Shala Udyan Marg	1
19	Back Side Bhai Veer Singh Marg	1
20	NP Girls School Gol Market	1
21	R.K. Ashram Marg	1
22	Kali Bari Marg	1
23	Near electric pole Number 15, Mnadir Marg	1
24	RML Subway at Baba khadag singh marg	1
25	Near Electric Pole number 10 Udyan marg	1
26	Do 21, Udyan Marg	1
27	Near Electric Pole Number 31, H Block	1
28	Near electric Pole Number 3, H block	2
29	Near electric number 3 R. K. Marg	1
30	Near electric number 56, R. K. Marg	1
31	Near electric Pole number 62,Near Delhi Medicos, R.K. Marg	1
32	Near Mother Dairy G. Point	2
33	Near RML Hospital G. Point	1
34	Near Electric Pole Number 57, Block Number 4	1
35	Near Block Number 70, G. Point	2
36	Near Electric Sub Station G Point	2
37	Near Block No. 74,75, Kali Bari	1
38	Near Electric Pole No. 9 J Block	1
	Grand Total	50

Circle Number - 4

Sl. No.	Location	Numbers
1	Shastri Market, Raisina Rd.	3
2	Near Meridian Hotel, Dr. Rajendra Pd. Rd.	1
3	Aditya Sadan	1
4	Back Side Flat No. 200, North Avenue	1
5	Back Side CPWD Club North Avenue	1
6	Back Side Flat No. 50, North Avenue	1
7	Back Side Flat No. 8, North Avenue	2
8	Back side Flat No. 270, North Avenue	1
9	R.K.A Marg	1
10	Parking Talkatora Stadium	2
11	UCO Bank, Parliament Street	1
12	Mahadev Road (near Kendrya Bhandar)	2
13	Imtiyaz Khan Marg, Radio Station	1
14	Nursing Hostel Lane	1
15	Near CPWD Horticulture Enquiry Talkatora Road	1

Sl. No.	Location	Numbers
16	Bungalow No.2-A, Ghat No. 4	1
17	Bungalow No.10, Ghat No. 5	1
18	Bungalow No.16, Ghat No. 5	1
19	Bungalow No.9, Ghat No. 5	2
20	Gurudwara Rakab Ganj Road Backside	1
21	Gali 14, Pt. Pant Marg	1
	Grand Total	27

Circle Number - 5

Sl. No.	Location	Numbers
1	Babbar Rd. (near Railway Qtrs.)	1
2	Behind Railway Qtr. Babar Rd.	1
3	Behind Railway Line Babar Rd.	1
4	Babar Rd. (near Shanker Mkt.)	1
5	Behind Kothi No. 29 , Babar Lane	1
6	Behind Ram Chander Dayal Kothi (Near School Lane Flyover)	1
7	School Lane Flyover	1
8	Maliwali Gali Babar Place	1
9	Maliwali Gali Babar Place	1
10	Sangli Mess, Dhobi Ghat	1
11	Sikander Rd.	1
12	Sikander Rd.	1
13	Sikander Rd.	3
14	Sikander Rd. Copernicus Marg	1
15	Copernicus Marg, Sangli Apartment	1
16	Safder Hashm Marg	1
17	New Dordarshan, Copernicus Marg	1
18	Copernicus Marg, (Near BOT)	2
19	Rajender Pd. Lane	4
20	Rajender Pd. Lane	1
21	Baroda House, K.G. Marg	1
22	Baroda House, K.G. Marg	2
23	Canning Rd. (in front of Lady Irwin School)	1
24	Pataudi House, Canning Lane	2
25	Navyug School, Pataudi House, Canning Lane	2
26	Canning Lane, Pt. Shukla Lane House, House of Hon'ble Kirti Azad, M.P	3
27	Ravinder Shukla Lane	3
28	Ravinder Shukla Lane	4
29	Ferozshal Rd.	6
30	B.J.P Office, Ashoka Rd.	1
31	Ashoka Road Gate	1
32	Behind Vardhaman Building, Tolstoy Marg	4
33	Bara Khamba Lane	2
34	Hindustan Times Building, K.G. Rd.	2
35	Halley Road	2
36	Vakil Lane	6
37	Rajender Pd. Lane	4
	Grand Total	72

Circle Number - 6

Sl. No.	Location	Numbers
1	Behind A,B 14, Pandara Road	1
2	B Block Near Flat No. 15 Pandara Road	1
3	Near Sanitary Inspector office.	1
4	Tikona Park, A Block	1
5	A Block side Road	1
6	Behind D-II/325, Shahjahan Road	1
7	Behind JS Model School., Pandara Road	1
8	Near D-II/353, Shahjahan Road.	1
9	Near Electric Sub Station, Pandara Road.	1
10	Near CPWD Park, Opp. D-II Flats, Pandara Road	1
11	Behind AB-90, Shahjahan Road	1
12	Near C-II/76, Shahjahan Road.	1
13	Near AB-79, Shahjahan Road.	1
14	Near Boundary Walls of Bikaner House, Shahjahan Road.	1
15	A Block side Lane	1
16	Near C-I/17, Pandara Road	1
17	Behind Horticulture Eng. Pandara park	1
18	Near CI/34, Pandara park	1
19	By the Side of Govt. Boys School, Pandara Park.	1
20	Near NDMC Pry. School, Pandara Park.	1
21	Near CGHS Dispensary, Dr.Z.H.Road.	1
22	Delhi High Court, Shershah Road.	1
23	On Road between Bapa Nagar & Shershah Road.	1
24	Near NDMC Pry. School, Near Bapa Nagar	1
25	Behind Delhi High Court Bapa Nagar.	1
26	Near KendryaBhandar, Bapa Nagar.	1
27	Near Flat No. C-II/7, Bapa Nagar	
28	Near CPWD Park on Service, Bapa Nagar	1
29	Near C-I/46, Bapa Nagar	1
30	Near Dhobi Ghat, Bapa Nagar	1
31	Near Electric Station Dhobi Ghat Bapa Nagar	1
32	Between Flat No. 39 to 40, Meena Bagh Lawn	1
33	Inside 2 Akbar Road	1
34	Near Masjid Darbangha Lane	1
35	Near Masjid Darbangha Lane	1
36	Between Lawn of Flat No. 29 to 40, Meena Bagh, Maulana Azad Road	1
37	Near Dhobi Ghat, Darbangha Lane.	1
38	7 Man Singh Road	1
39	Infront of CPWD Eng. Gate, Kota House Lane	1
40	Infront of CPWD Enq, Kota House Lane	1
41	In fronn to CPWD flats, Kota House Lane	1
42	Back side of Jaiselmer house , Kota house lane	1
43	Amrita Shergil Marg , near Empire Coal Company	1
44	Vidyut Bhawan Gali	1
45	Vidyut Bhawan Gali	1
46	Vidyut Bhawan Gali	1

Sl. No.	Location	Numbers
47	Vidyut Bhawan Gali	1
48	D 1/35 ,Ravindra Nagar	1
49	CPWD Enq. , Ravindra Nagar	1
50	CPWD Enq. , Ravindra Nagar	1
51	CPWD Enq. , Ravindra Nagar	1
	Grand Total	50

Circle Number - 8

Sl. No.	Location	Numbers
1	Indira Camp J.J Cluster, Near Rly. Crossing Lodhi Colony	1
2	Near Shop No. 1 Khanna Market C M/s Chhabar Floor Mill	1
3	Near Navyug School	1
4	Jor Bagh Road Near gate of Mausam Vibhag	1
5	Near Goel Taxi Stand Opp. Post office Jor Bagh	1
6	Parking Lodhi Garden Lodhi Road	1
7	Near Kothi No. 100 Lodhi Estate Behind Kothi No. 76, Lodhi Estate	1
8	Infront of 36 Lodhi Estate	1
9	Infront of 28 Lodhi Estate	1
	Grand Total	9

Circle Number - 9

Sl. No.	Location	Numbers
1	In Front of Block No. 21 JoreBagh	1
2	H Block Front of Masjid Karbala	1
3	Front of J Block JoreBagh Road	1
4	Front of Palika kunj Karbala	1
5	Front of NDMC Dispensary Karbala	1
6	Front of Elective Substation Flat Aurbindo Marg	1
7	Near Temple &Front of Air Port Authority Aurobindo Marg	1
8	Chamunda Ghat Tuglak Krinsent	4
9	Tughlak Lane Dhobi Ghat	2
10	Parking Race Course Road	1
11	Near Zimkham Petrol Pump	1
12	J.J.Camp Masjid Race Course	1
13	In Front of Multi Story, Aliganj	1
14	In side of School, Aliganj	1
15	M.Q. Aliganj	1
16	Ajmalkha Road	2
17	Najli Khan Road	1
	Grand Total	22

Circle Number - 10

Sl. No.	Location	Numbers
1	Near Kothi No. B-44, Rajddot Marg	1
2	Infront of Kothi No. 7, Rajddot Marg	1
3	Behind Diplomat Hotel S.P. Marg	1

Sl. No.	Location	Numbers
4	Near NDMC Elect.Sub station S.P. Marg	1
5	Behind Kothi No. 17, Kautlya Marg	1
6	Infront of NDMC Nursery, Gianizail Singh Trust Circular Road	1
7	Infront of Bulgaium Embassy near British School	1
8	Behind Jessus Merry College	1
9	Outside the Gate of Bapu Dham	1
10	Near the boundary Wall of IB Colony Mauas Road	1
11	Near Sanskriti School Radhi Krishnan Marg	1
12	By the Side of Rose Garden	1
13	Infront of Singapore Embassy, infront of Sanjay Camp	1
14	In the corner of park near Bhutan Embassy at Chander Gupt Marg	1
15	Infront of Ashoka Hotel Parking at Panchsheel Marg	1
16	Infront of Bhairon Mandir, Vinay Marg	1
	Grand Total	16

Circle Number - 11

Sl. No.	Location	Numbers
1	Brig. Hoshiyar Singh Road, Infront of Pillangi Village	2
2	C-Block, Brig. Hoshiyar Rd. Sarojini Nagar	1
3	D-Block, Brig. Hoshiyar Road. Sarojini Nagar	1
4	F-101, Brig. Hoshiyar Rd. Sarojini Nagar	1
5	H-Block, Brig. Hoshiyar Rd. Sarojini Nagar	1
6	I-101, Brig. Hoshiyar Rd. Sarojini Nagar	1
7	L-101, Brig. Hoshiyar Rd. Sarojini Nagar	1
8	Africa Avenue 1st Cross Road	1
9	Africa Avenue 2nd Cross Rd.	1
10	Infront of SN Repo Africa Avenue	1
11	6th Cross Road, Africa Avenue	1
12	Gawaliyar Parties, Africa Avenue	1
13	EPT Block 6th Cross Rd.	1
14	HPT Block 6th Cross Rd.	1
15	Besides Navyug School, HPT	1
16	Sarojini Nagar Market, Health Corner	1
17	Delhi Public Libarary, H Block Sarojini Nagar	2
18	5th Cross Road Near 1st Avenue	1
19	5th Cross Rd. Near 2nd Avenue Sarojini Nagar	1
20	6th Cross Road H Avenue, Sarojini Nagar	1
21	6th Cross Rd. G Avenue, Sarojini Nagar	1
22	GI-1078 9th Cross Road	2
23	5th Cross Rd. School No.-1 G Avenue	1
24	EF Block 5th Cross Rd. Sarojini Nagar	1
25	1st Cross Rd. C Block Sarojini Nagar	1
26	2nd Cross Rd. C Block Sarojini Nagar	1
27	5th Cross Rd. C Block Sarojini Nagar	1
28	7th Cross Rd. C Block Sarojini Nagar	1
29	9th Cross Rd.C Block Near Pump House NDMC Barat Ghar	1
30	Near Suvidha Mkt X-Block	1
31	Near Khalsa School 5th Cross Rd.	1

Sl. No.	Location	Numbers
32	Near YZ Block Backside	1
33	Y Block Back Side, Khalsa School	1
34	XY Block Sarojini Nagar	1
35	Infront of Rattan Chand Public School	1
36	Infront of Shop-196 Parking area, Mkt. Sarojini Nagar	1
	Grand Total	39

Circle Number - 12

Sl. No.	Location	Numbers
1	Grig2 Kalyan Kandas, Near Circle, Netaji Nagar Market	2
2	New Toilet Block, Netaji Nagar Market	1
3	D Block Near Starony Store CPWD Netaji Nagar	
4	Rly. Line Cement Godam JJ Corp. Netaji Nagar	1
5	Infront D Block near NDMC Barat Ghar College Rd	
6	Near CPWD Office College Road Netaji nagar	
7	Near Mian Gets Art College Netaji Nagar	
8	E Block Near College Netaji Nagar	
9	Surrounding Subhash Park Near B Block Netaji Nagar	1
10	A & B Block Dispensary Rd. CGHS Netaji Nagar	
11	Aceeding Sr. Sec. School (Palika Bhawan) Netaji nagar	1
12	Anant Ram Dairy Near Gas Godam	
13	Shiv Mandir Netaji Nagar	2
14	M Block Netaji Nagar	1
15	A Block Near Park Netaji Nagar	1
16	SN Depo. A Avenue Rd. Netaji Nagar	2
17	Palika Niketan gate to RK Puram	1
18	Vet. Hospital NDMC Moti Bagh	1
19	99Q NDMC C-D flat Moti Bagh	
20	Block Line C-D/62 Moti Bagh	1
21	Bangali School Near K Block M. Bagh	2
22	Near Kiosk Shanti Path, Moti Bagh	1
23	Back Lane of B Block and D-II	
24	Backside of C-II/120 Moti bagh	
25	Near D-II B-36 Moti Bagh	
26	Near D-II/B-17 Moti Bagh	1
27	Near D-II/B-69 Moti Bagh	1
28	Near Shiv Mandir Moti Bagh	1
29	Sr. Sec. School Near A Block	
30	Infront CPWD of the Moti Bagh	
31	Charak Palika Hospital Rd.D-II Flat Moti Bagh	
32	Charak Palika Hospital Rd.D-II Flat Moti Bagh	1
33	Opp. C-II/84 Moti Bagh	1
34	Barat Ghar (Surrounding) E Block	2
35	Near E/216 Moti Bagh	
36	Infront NDMC Barat Ghar Moti Bagh	2
37	Opp. CNG Pump Shanti Path	1
38	North West Moti Bagh Type IV, Type III Near Ring Road.	1
	Grand Total	29

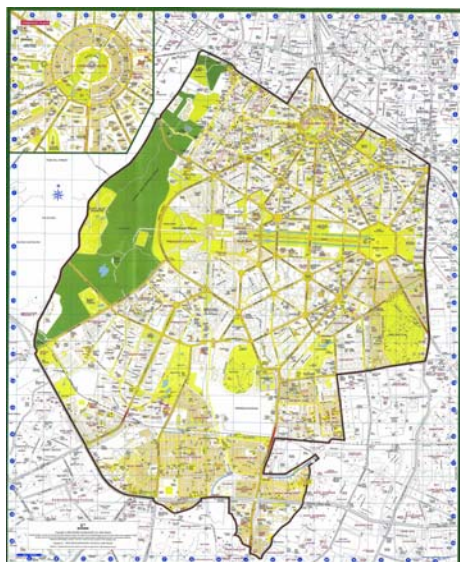
Circle Number - 13

Sl. No.	Location	Numbers
1	Near Electric Sub Station Kidwai Nagar West	1
2	Near CPWD Enquiry Office West Kidwai Nagar	1
3	Opp. D-II/23 Enquiry Office West Kidwai Nagar	1
4	Near D-II/135 Enquiry West Kidwai Nagar	1
5	Behind D-II/183 Enquiry West Kidwai Nagar	1
6	Near D-II/40 Enquiry West Kidwai Nagar	1
7	Near D-II/73 Enquiry West Kidwai Nagar	1
8	Opp. Gali of S.J.H Drs. Hostel Service Rd. Ring Rd.	1
9	Near Arjun Das Camp West Kidwai Nagar	1
10	Balmiki Camp Facing Road	1
11	Near DCM Booth West Kidwai Nagar	1
12	Near S.J.H Dharmshala Ringh Rd.	1
13	Near Gali S.J.H Aurobindo Marg	1
14	Qtr. 425 Laxmi Bai Nagar	1
15	Qtr. 353 Laxmi Bai Nagar	1
16	Qtr. 281 Laxmi Bai Nagar	1
17	Qtr. 133 Laxmi Bai Nagar	1
18	Infront of Navyug School L.B. Nagar	1
19	Near 1605 Navyug School L.B. Nagar	1
20	Near 474 Navyug School L.B. Nagar	1
21	Near 705 Navyug School L.B. Nagar	1
22	Near 635 Navyug School L.B. Nagar	1
23	Near Veg. market Navyug School L.B. Nagar	1
24	D-II/10 East Kidwai Nagar	1
25	Near D-721, East Kidwai Nagar	1
26	Behind E-455, East Kidwai Nagar	1
27	Near E-313, East Kidwai Nagar	1
28	Opp. C-385 Kidwai Nagar	1
29	Behind D-II/100 Kidwai Nagar East	1
30	Near D-II/79 Kidwai Nagar East	1
31	Near D-II/34 Kidwai Nagar East	1
32	Behind D-II/17 Kidwai Nagar East	1
33	D-II/61 Near Kidwai Nagar East	1
34	Near D-II/49 Kidwai Nagar East	1
35	Behind A-III Kidwai Nagar East	1
36	Behind A-213 Kidwai Nagar East	1
	Grand Total	36

Annexure-3

DETAILS OF GARBAGE STATIONS BID OUT BY NDMC

S. No.	Location	Circle No.
1	L Block Middle Circle, Connaught Place	1
2	Ashok Road near Bangla Sahib Gurudwara	1
3	Ashok Road near Ashok Yatri Niwas	1
4	Near Palika Bazar	12
5	R.K. Ashram Marg, Nr Electric Sub Station	2
6	Shivaji Stadium Terminal	3
7	Shershah Suri Marg	6
8	Khan Market	6
9	Humayun Road	6
10	Dr. Zakir Hussain Marg (Kaka Nagar Side)	8
11	Dr. Zakir Hussain Marg (Golf Course Side)	8
12	Maxmuller Marg Opp. Bharti Nagar	8
13	Satya Marg Opp Yashwant Place	10
14	Existing garbage station/Dhalao Bearing No.DV-175/10 on Niti Marg, Opp. To Nehru Park	10
15	Near Dilli Haat, Aurbindo Marg	13
16	Near Ina, Aurbindo Marg	13
17	Aurbindo Marg near the gate of Safdarjung Hospital	13
18	Opp National Stadium C-Hexagon	14
19	Opp Jodhpur Mess C-Hexagon	14
20	Bhagwan Dass Road Opp. Supreme Court	14



Chapter – 11 : Road & Transport

CHAPTER - 11

ROAD & TRANSPORT

11.1 INTRODUCTION

NDMC area is characterized with wide roads and streets, being a part of the Lutyen's design form. However, the city structure forces a large of through traffic including personalized modes and public transport to pass through NDMC area causing congestion and delays.

Major arterial roads passing through NDMC area are Aurobindo marg, Dr. Zakir Hussain Marg, Outer Circle C.P., Janpath, K.G.Marg, Bara khamba road, Ashoka road, Punchkuin road, Lodhi Road etc. Delhi Metro has its major interchange at C.Place between North -South corridor (Vishwa Vidyalaya to Central Sect.) and East-West Corridor (Indraprastha to Dwarka). Major bus terminals in the NDMC area are located at Central Secretariat and Shiavaji stadium, while New Delhi Railway Station and Nizamudin Railway Stations are located on the periphery of NDMC area. Traffic in the NDMC area is bound to significantly increase in the coming years with increased accessibility and consequent boom in the real estate.

The subsequent sections depict the present traffic transportation scenario in the NDMC Area and identify the key areas of Improvement or Issues of Concern.

11.2 EXISTING SYSTEM

11.2.1 Transportation Systems

The transport system of Delhi and NDMC Area consists of a well-developed transport network system, based on ring and radial pattern, large fleet of buses (DTC & CNG) and suburban rail system including MRTS. The majority share of travel needs of commuters is met by road based transport systems. Due to continuous increase in population, employment opportunities and number of vehicles, there is constant increase in demand over the years and infrastructure has not grown in same proportions making the existing network system function beyond the capacities. This has led to serious traffic problems of congestion, delays, safety, pollution and system management.

NDMC area is well connected to other parts of Delhi by road and rail network. Major traffic movement from East to West of city passes through NDMC area and bridges over river Yamuna form the critical points of traffic movement at city level. The residential population in NDMC Area is less but the floating population generated by commercial, Institutional and tourist activities are very high.

11.2.2 Road Network

The total length of major arterial and sub arterial roads in the NDMC area is about 150 Km. (Map 11.1) Most of the roads have bituminous surface. The ROW of roads is varying from 30 m to 50 m while the carriage way of roads varying from 2 lane to seven undivided C/W, four lane and six lane divided C/W roads The entire roads under NDMC area can be grouped into Major and minor roads. The major roads can further be grouped according to the importance of road under national importance;

tourist importance and commercial/health/Institutional/marketing importance while the rest as minor roads.

Roughness survey on roads covering junction & rotaries by using bump integrator (Recording at every 100 m.) was done by NTBCL as a part of Audit & Up gradation of NDMC roads in February 2005 (Refer Table 11.1 & Map 11.2). The studies have indicated that as per International Roughness standards only 15 roads (with respect to riding quality) are in excellent condition, 79 roads are in good condition. The studies have indicated that roughness on the road varies from 1500 mm/Km to 8000 mm/Km as observed on roads & junctions.

Table 11.1 Roughness Values of NDMC Roads

S. No	Roughness Values	Classification of Roads / rotaries	No. of NDMC Roads	No. of NDMC Rotaries
1	0 - 2000	Excellent	15(11.90%)	0(%)
2	2000 - 3000	Good	79(63.49 %)	10(35.70%)
3	3000 - 4000	Fair	19(14.30%)	13(46.45%)
4	4000 - 6000	Poor	13(10.31%)	5(17.85%)
	Total		126(100%)	28(100%)

Classification of roads with respect to the width of C/W is presented in Table 11.2 & Map 11.3. It can be observed from the table that more than 83% of roads has Carriageway Width four lane or more. It can be observed 70% of road length doesn't have a divided carriageway. Analysis shows that 95% of road length has footpath and street light along the road. Service roads are missing along 90% of the network. There is prohibition on parking on 51 roads, while heavy / commercial vehicles are not allowed on 90 roads.

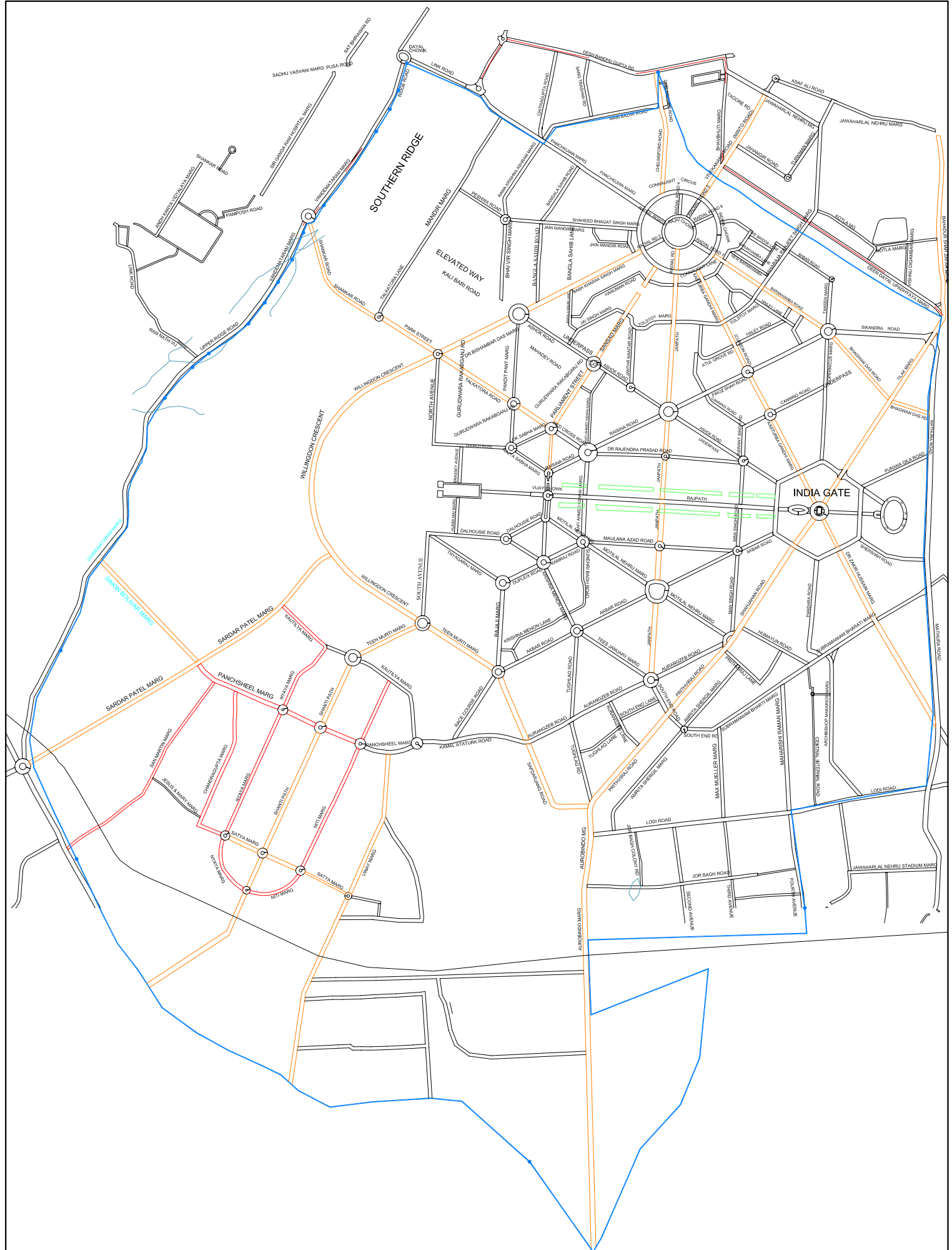
Table 11.2 Carriageway Width of road network in NDMC Area

S.No.	Carriageway Width	Status	Road Length(Km)	Percentage
1.	Seven Lane	Undivided	2.20	1.74%
2.	Six Lane	Divided	12.33	9.77%
3.	Six Lane	Undivided	6.95	5.50%
4.	Five Lane	Divided	12.45	9.86%
5.	Five Lane	Undivided	17.74	14.06%
6.	Four Lane	Divided	12.20	9.67%
7.	Four Lane	Undivided	41.11	32.58%
8.	Three Lane	Undivided	17.95	14.22%
9.	Two Lane	Undivided	3.23	2.56%
	Total		126.16	100.00 %

Besides proper illumination, there is scope for improvement of footpath, median, landscape, traffic signal road markings and street furniture along the road to match International Standards.

11.2.3 Rail Network

Only a part of the NDMC Area is served by rail network of Ring Rail from Lodhi Colony- Dhola Kuan and DMRC network passing through Connaught Place. Stations along the ring rail are Lodhi Colony, Safdarjung, Sarojini Nagar, Chankya Puri, Moti

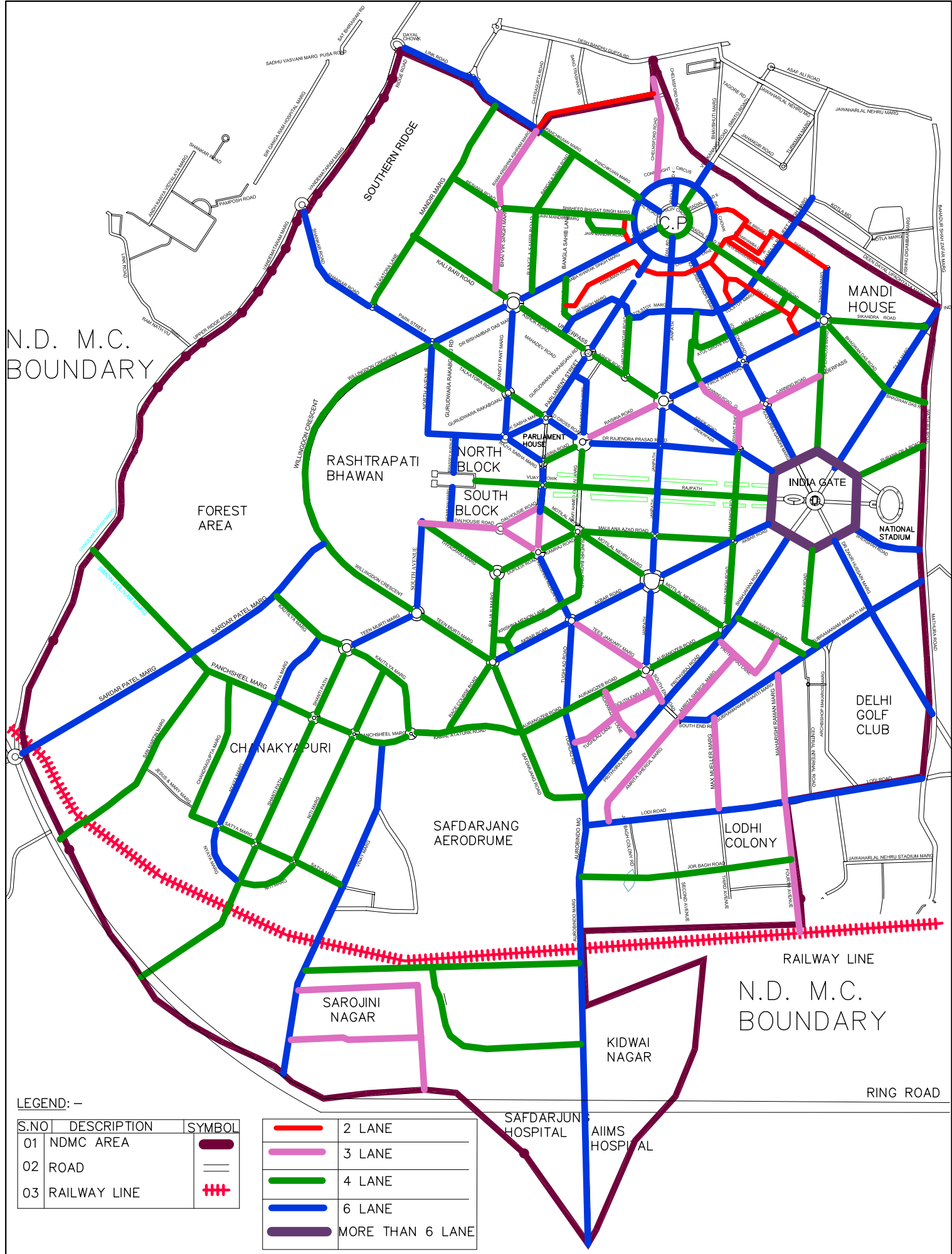


ROAD NETWORK
MAP N.D.M.C. AREA

Scale: NTS

SUBCITY PLAN
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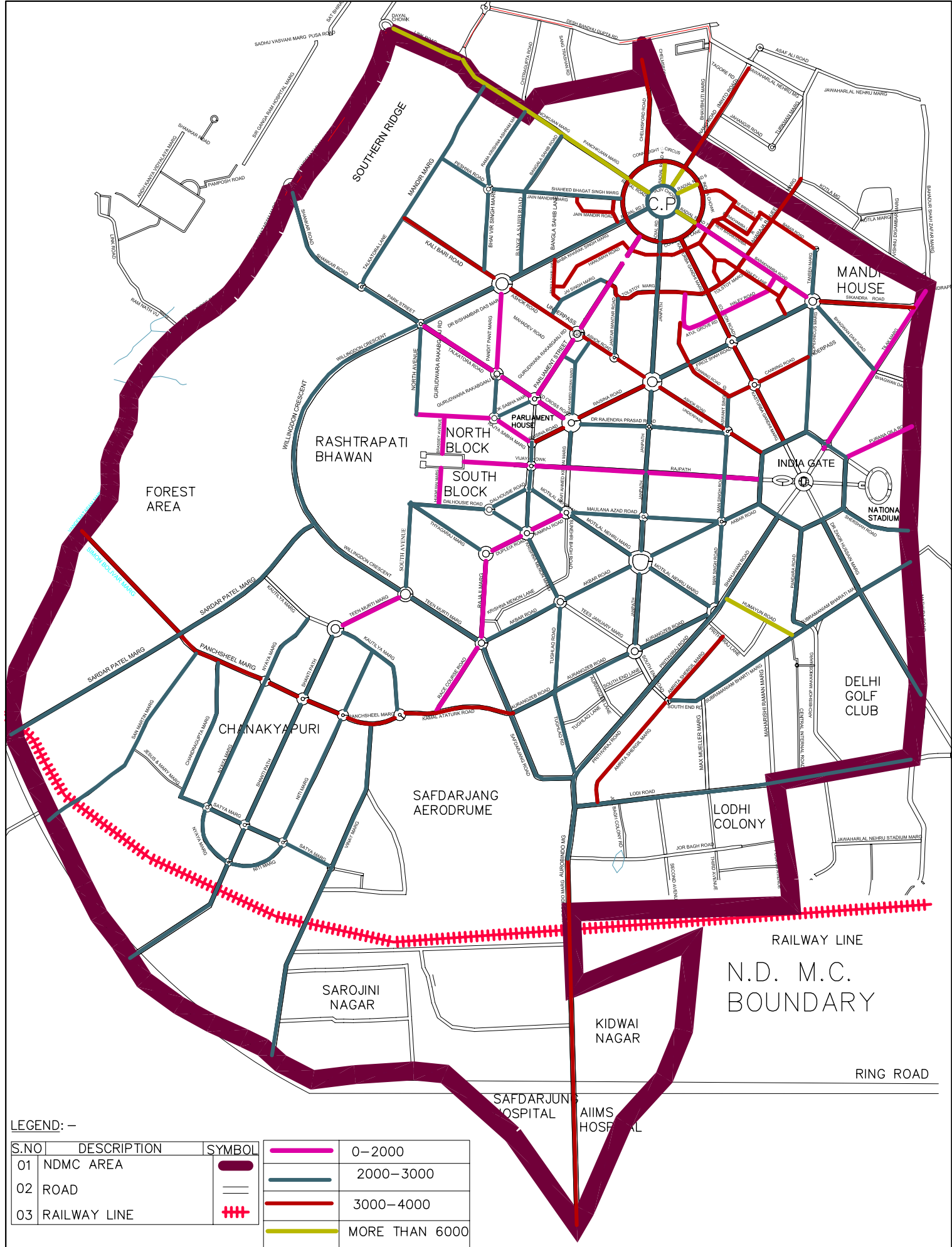


C/W of ROAD NETWORK
FOR N.D.M.C. AREA

Scale: NTS

SUBCITY PLAN
FOR NDMC

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New Delhi



ROUGHNESS VALUES
ROAD NETWORK

Scale: NTS

SUBCITY PLAN FOR NDMC

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Bagh and Dhola Kuan. At present the skeleton service of ring rail provide limited access in NDMC Area due to following reasons:

- Absence of integration with feeder bus operations
- Absence of commuter facilities at stations
- Convenient access of platforms to commuters.
- Competitive and attractive parallel bus service

The ring railway service could be significantly improved by proper integration with radial lines and MRTS systems.

11.2.4 Delhi Metro Rail



NDMC Area is connected to rest of Delhi by two corridors of the Delhi Metro. Delhi Metro is a rail based system, comprising of a network of underground, elevated and surface corridors aggregating to 198.5 Km to meet the travel demands of people of Delhi. Delhi Metro project is being implemented in phases, while the phase I has been completed, phase II construction work is under progress as per the details

below.

MRTS Phase-I

The first phase of the Metro with a total length of 68.3 km. has been completed and put to operations in March 2006. The details of the completed corridors are as follows:

Table 11.3: Completed MRTS corridors

S. No.	Particular	Length (Km.)
1	Delhi University- Central Sectt. (Underground corridor)	11.0
2	Shahdara - Rithala (Rail / surface / elevated corridor)	28.0
3	Barakhamba Road- C.P. - Dwarka (Underground / elevated)	22.8
4	Extension to Dwarka	6.5

MRTS Phase-II

On completion of Phase-I, Phase-II work has been started which include three corridors with a total length of 39.3 km and is expected to be completed by 2010. The detail of the corridors is as follows:

Table 11.4: In Pipeline corridors

S. No.	Particular	Length (Km.)
1	Barakhamba road - Indraprastha-NOIDA	12.5
2	Vishwa Vidhalaya - Sanjay Gandhi Transport Nagar	8.6
3	Central Sectt. to Vasant Kunj	18.2

11.2.5 Air Network

Safdarjung Aerodrome is located in the NDMC Area on Aurobindo Marg. The aerodrome is being used for some VIP movement and training facilities.

11.2.6 Public Transport Connection

Delhi Transport Corporation (DTC) and privately owned State Transport Authority (STA) Operate buses in Delhi. Two bus terminals are located in N.D.M.C. area - they are Shivaji Bus Terminal (between Shaheed Bhagat Marg and B.K.S Marg behind Madras Hotel in Connaught Place) and Kendriya Terminal (near C. Secretariat). Both the terminals are small terminals and together handle about 800 bus trips (12 hours) .The average hourly accumulation was observed to be 20 buses at Shivaji Bus Terminal and 5 buses at Kendriya Terminal.

About 75% buses at Shivaji Stadium and 77% of buses at Kendriya Terminal have short term parking duration of less than two hours. About 22% of the buses at Shivaji Stadium and 23% of the buses at Kendriya Terminal have medium term parking duration between 2 to 4 hrs.

The bus system would continue to be more accessible for a larger part of the population in the city. Between Metro & bus, metro is definitely a better system - but also has a higher fare structure. In spite of the gradual expansion of metro network, buses would continue to carry as large proportion of the public transport trips and act as the important feeder to the metro system. Therefore, the Shivaji Stadium and Central Secretariat Bus Terminals would continue to have relevance in the coming years.

A comparison of DTC/ STA Bus and Delhi Metro fares for different distance slabs are presented in Table 11.5. It is seen that for travel distance up to 4 km, Metro is 200%- 250% costlier than bus, for travel distance between 4 to 8 Km, Metro is 60% - 100% costlier, between 8 to 12 Km it is 43% - 57 % costlier, while for travel distance greater than 12 Km it is 20 - 40% higher than the present bus fares. There is a significant share of the bus passengers who cannot afford the higher metro fare. As revealed by the opinion survey of bus passengers as much as 33 % total bus passengers willing to shift to the metro, desired the metro fares to be same as the bus fares.

Table 11.5 Comparison of DTC/ STA Bus and Delhi Metro Fares

DTC/ STA Bus			Delhi Metro		
S No	Distance Slab	Fare	S No	Distance Slab	Fare
1	< 4	2	1	< 2	6
2	4 - 8	5	2	2 - 4	7
3	8 - 12	7	3	4 - 6	8
4	> 12	10	4	6 - 9	10
5			5	9 - 12	11
			6	12 - 15	12
			7	15 - 18	13
			8	> 18	14

Source : RITES Study 2005

11.2.7 Para Transit

Para transit modes in NDMC area mainly constitutes of Taxi, Auto Rickshaws and Cycle Rickshaws. Besides a limited Phat-Phat Sewa currently in operation from inner circle of Connaught Place. These play a significant role in connecting mass transport modes to the residential areas.

The present Taxi/Auto stands could be better organized through uniform spatial distribution at strategic locations, exclusively designed parking areas and information booths/signage/maps with clear indication of the official fare rates. On many 'No-Parking' Locations, it is commonly seen that drop-off vehicles tend to flout the parking ban. It is proposed to provide properly designed drop-off points utilising the service roads/ available sites abutting the carriageway at strategic locations so that the traffic flow is not impeded.

11.3 TRAFFIC CHARACTERISTICS

Traffic characteristics of the NDMC Area owe its character to the Lutyens design of the sub city of Delhi and major intersections which are in the form of rotaries. The ring and radial pattern of the city network induces through traffic on the roads in NDMC Area. Monuments, tourist places, commercial establishments, offices, religious places etc. generates mix traffic flow conditions in the study area.

11.3.1 Vehicular Growth Trends

There has been an exponential growth in number of vehicles on the road in Delhi, which increased from 2.14 lakh in 1971 to 5.36 lakh in 1981, 17.64 lakh in 1991, 34.54 lakh in 2001 and 45.5 lakh in 2005. There is an annual compound growth of 6.5%, while the road length has increased at a growth rate of 2 % per annum. The trend of registered motor vehicles in Delhi is presented in Table 11.6. It can be observed that decennial growth rate is substantially higher in case of private vehicles (94.54%) as compared to commercial vehicles (18.22%).

The percentage distribution of categories of motor vehicles in Delhi shows that there has been a rapid increase in the number of cars during the decade while there has been a decline in the other category of vehicles. About two third of motor vehicles are two wheelers though a decreasing trend in that share has been observed since 1990. The share of cars has increased from 22% in 1991 to 31% in 2005. The growth of private vehicles has resulted in the increased number of vehicles on the streets of Delhi and NDMC Area increasing traffic densities, congestion, vehicle emissions and associated problems on road. It is estimated that total personalized vehicles will increase to 44.2 lacs by 2011 and 96 lacs by 2020 (92 % of total motor vehicles). This high vehicle ownership leads to non availability of adequate parking spaces.

Table 11.6 Trends of Registered Motor Vehicles in Delhi (In '000)

Year	Car	Sc/Mc	3 Whlr.	Taxi	Goods	Buses	Total
1980	117	334	20	6	36	8	521
1985	175	637	31	9	59	14	925
1990	384	1191	62	10	99	19	1765
1995	618	1708	78	13	132	28	2576
1998	805	2077	86	17	149	35	3167
2000	910	2262	90	18	161	39	3480

Source : Delhi Statistical Handbook & Tpt. Dept.

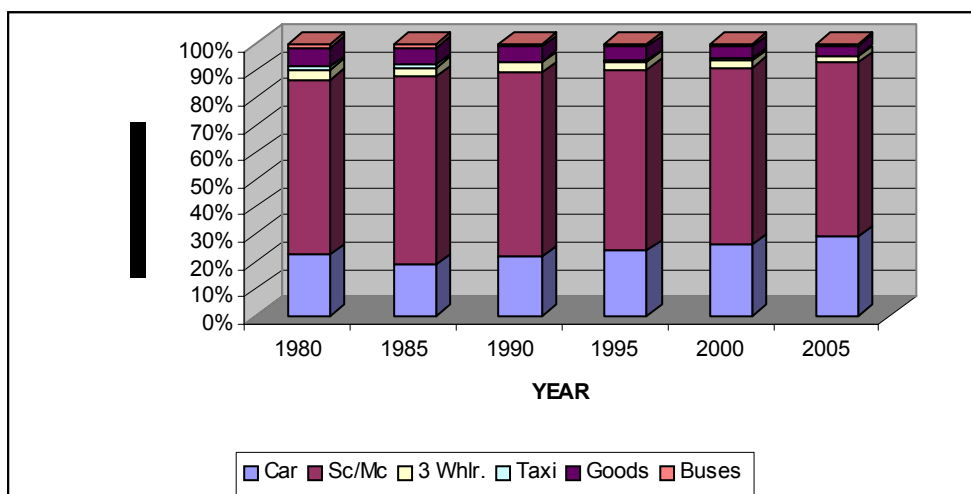


Fig. 1 Trends of registered motor vehicles in Delhi

11.3.2 Traffic Volumes

Traffic volumes and composition on major arterial roads in NDMC Area are presented in table 11.7. India Gate, Minto Road, Aurobindo Marg, Dr. Zakhir Hussain Marg, Punchkuin Road and outer circle of Connaught Place carry more than 90000 vehicles. Cars and two wheelers i.e. the personalized modes constitutes more than 65 % of the traffic at all locations of study, while goods vehicles and slow moving vehicles have very marginal share in the traffic flows.

Table 11.7 : Traffic volumes on major arterial roads in N.D.M.C. Area

S.No.	Location	Duration (Hours)	Traffic Volume	TRAFFIC COMPOSITION (in percentage)					
				Cars	Auto	2 Whlr	Bus	Goods	Slow
1	Minto Road	16	98417	33.0	19.9	36.4	4.6	1.4	4.7
2	Punchkuin Road	16	90728	26.8	24.4	40.5	2.3	1.3	4.8
3	SBS Marg	16	36319	31.7	14.3	35.3	12.4	0.8	5.5
4	Sansad Marg	16	28329	33.7	16.0	31.8	14.6	0.7	3.2
5	Janpath	16	54634	51.1	18.9	23.4	2.8	0.6	3.1
6	Bara Khamba Road	24	39471	39.8	22.7	25.6	8.9	0.8	2.1
7	Tilak Marg	16	53932	36.6	19.1	32.1	6.3	0.8	5.1
8	Zakir Hussain Marg	16	96712	48.7	11.9	28.6	3.6	4.7	2.5
9	India Gate	16	108525	53.6	11.6	28.9	3.1	2.0	0.8
10	Aurobindo Marg	16	97085	47.8	14.4	26.8	8.4	1.2	1.3
11	Sardar Patel Road	16	62239	44.8	11.7	31.3	4.8	3.1	4.4
12	Shankar Road	16	78086	51.8	8.8	31.8	4.4	1.5	1.7

Source : C.R.R.I. Study 2002

As a measure of congestion, traffic volumes along major corridors in NDMC Area V/C (Volume of traffic / capacity of road) ratio have been calculated and presented in Table 11.8 & Map 11.4. The acceptable value under normal traffic conditions is less than 0.8. The highest V/C ratio 0.93 is observed on the Outer Circle of Connaught Place. Other critical roads in NDMC Area are Janpath, Ashok

road and Inner Circle of C.P. The next level of congestion between V/C ratio between 0.6 and 0.8 is observed on K.G.Marg, Parliament Street, Talkatora road, Baba Kharak Singh Marg and Gurudwara Rakabganj Road.

Table 11.8: V / C Ratios along Major Corridors in NDMC Area

S No	Road Name	Average V/C	
		Morning Peak	Evening Peak
1	Ashok Road	0.91	0.89
2	Baba Kharak Singh Marg	0.74	0.71
3	Dr. Rajendra Parshad Marg	0.45	0.53
4	Firoz Shah Marg	0.55	0.58
5	Gurudwara Rakabganj Road	0.65	0.55
6	Inner Circle (C.P.)	0.71	0.87
7	Janpath	0.84	0.92
8	Kasturba Gandhi Marg	0.63	0.61
9	Middle Circle (C.P.)	0.31	0.31
10	Outer Circle	0.93	0.87
11	Parliament Street	0.63	0.54
12	Radial Road No. 1	0.49	0.58
13	Rajpath Road	0.31	0.34
14	Sansad Road	0.46	0.47
15	Talkatora Road	0.65	0.50
16	Tolstoy Marg	0.57	0.58

Source : RITES Study 2005

The Degree of Congestion value on the major corridors on the network was computed and is presented in Table 11.9 & Map 11.5. A degree of congestion value below 40 is considered acceptable. The degree of congestion is a relative value of the maximum posted speed observed on the road network to the speed on the particular road link.

The highest degree of congestion was observed at Middle circle of C.P. followed by radial roads. Other congested roads with degree of congestion between 60 and 70 are K.G.Marg, Inner Circle and Parliament street. Degree of congestion is also high on Outer Circle, Tolstoy Marg, Ashok Road and Baba Kharag Singh Marg.

Table 11.9 Degree of Congestion along Major Corridors

S No	Road Name	Average Degree of Congestion
1	Ashoka Road	47
2	Baba Kharak Singh Marg	40
3	Inner Circle (C.P)	60
4	Janpath	44
5	Kasturba Gandhi Marg	62
6	Middle Circle (C.P)	73
7	Outer Circle	46
8	Radial Roads	70
9	Rajpath Road	25
10	Sansad Marg	53
11	Tolstoy Marg	59

Source : RITES Study 2005

11.3.3 Saturation Level of Intersections

The saturation level of an intersection is expressed in terms of the peak hour 'Y' value which is defined as follows: $Y = Y_1 + Y_2 + \dots + Y_n$, where $Y_n = V_n / Q_n$, V_n = Hourly Vehicular Inflow (PCU) from approach arm "n" and

Q_n = Hourly Vehicular Saturation capacity (PCU) of approach arm "n"

The 'Y' of the important and critical intersections in the NDMC Area is presented in Table 11.10. A peak hour 'Y' value below 0.8 is considered acceptable, while values exceeding 1.0 indicates that the junction is beyond the saturation capacity that can be effectively handled. Most of the junctions of the Outer Circle C.P. with radial roads are most congested with 'Y' values exceeding 1.0. Critical congestion levels are observed along Tolstoy Marg, Janpath and K.G.Marg junctions. Among the rotaries Gole Dakhana, Windsor Place, Patel Chowk and Krishi Bhawan have 'Y' values exceeding 1.0.

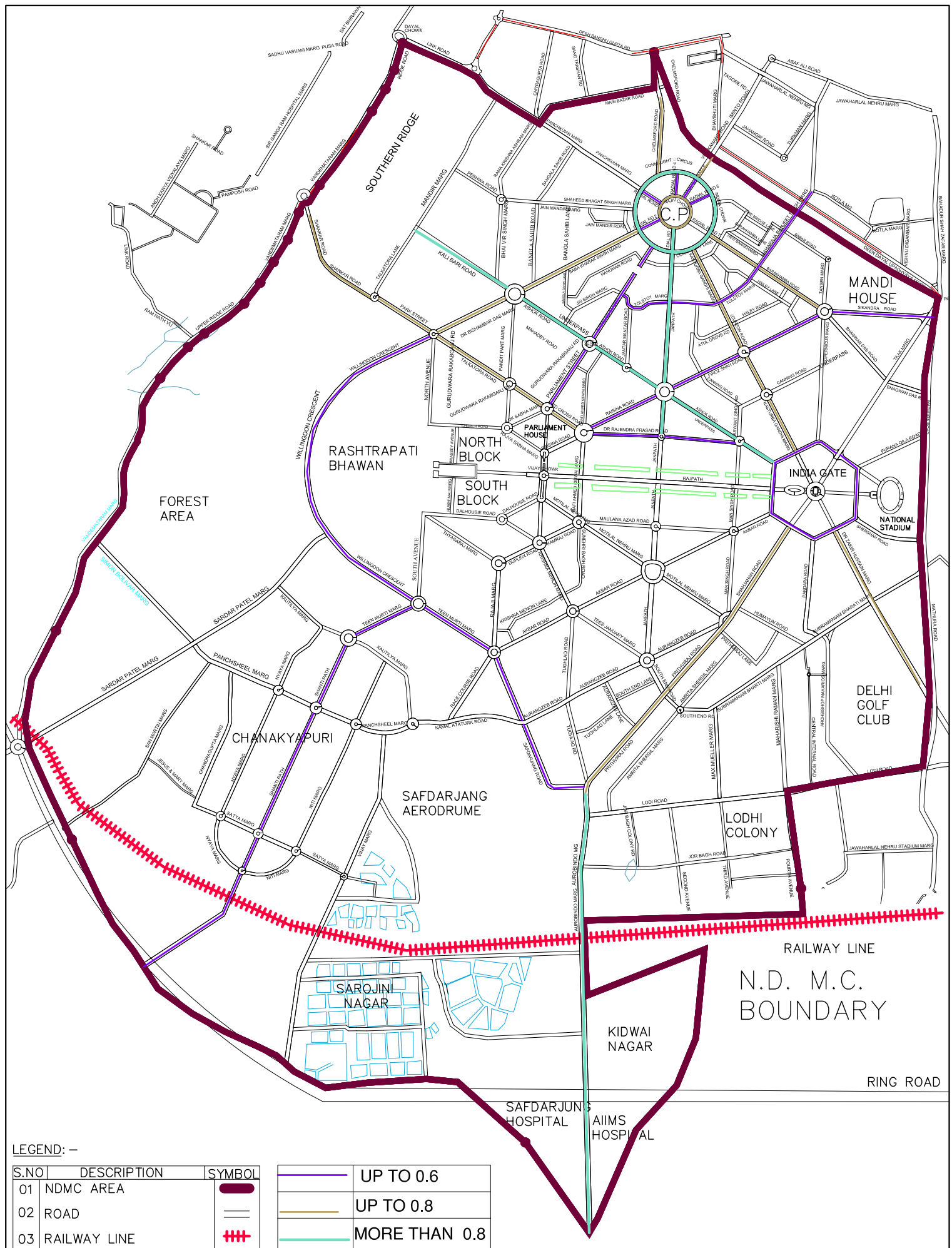
Table 11.10: Peak hour 'Y' value at Major Intersections in NDMC Area

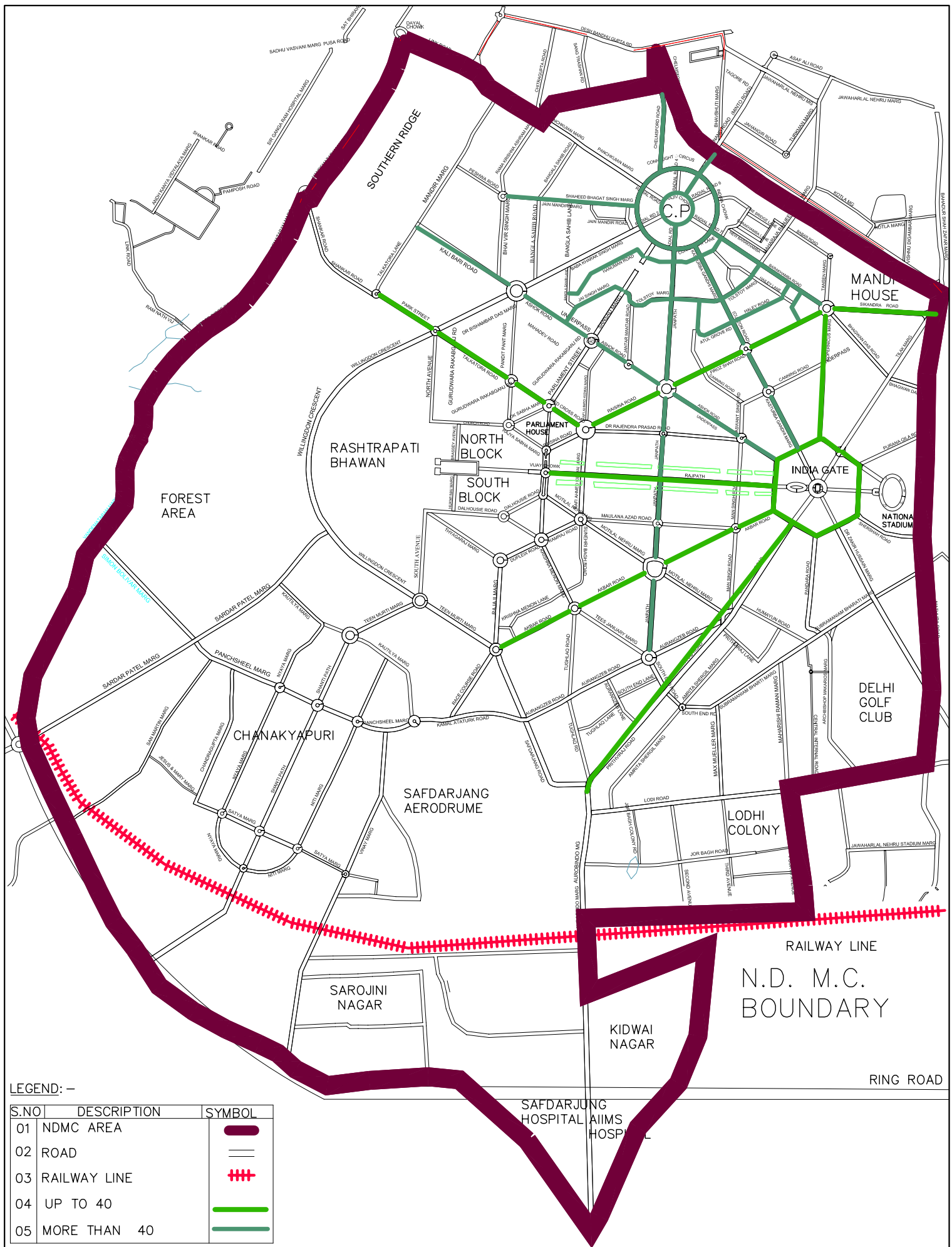
S No	Junction Name	'Y' value	
		Morning Peak	Evening Peak
1	K.G. Marg + Tolstoy Marg	0.93	0.91
2	Janpath + Tolstoy Marg	0.94	1.11
3	Gole Dak khana Rotary (B.K.S Marg + Ashoka Road)	1.76	1.70
4	Patel Chowk Rotary (Ashoka Road + Parliament Street)	1.24	1.20
5	Windsor Place Rotary (Janpath Road + Firozshah Road)	1.48	1.53
6	Krishi Bhawan (Rafi Marg + Rajendra Parshad Marg)	1.10	1.10
7	Rajpath Road + Janpath Road	0.71	0.73
8	Barakhamba Road + Outer Circle	1.22	1.13
9	Kasturba Gandhi Marg + Outer Circle	1.20	1.12
10	Janpath + Outer Circle	1.37	1.29
11	Sansad Marg + Outer Circle	1.09	1.06
12	Baba Kharak Singh Marg + Outer Circle	1.75	1.85
13	Shaheed Bhagat Singh Marg + Outer Circle	1.44	1.40
14	Panchkuian Road + Outer Circle	1.16	1.09
15	Chelmsford Road + Outer Circle	1.35	1.29
16	State Entry Road + Outer Circle	1.08	1.11
17	Vivekanad Marg (Minto Road) + Outer Circle	1.52	1.64
18	Nirulas + Outer Circle	1.19	1.13

Source : RITES Study 2005

11.3.4 Pedestrian Volumes

The NDMC Area witnesses heavy pedestrian volumes along and across the roads due to concentration of commercial, tourist and office activities, throughout the day. Although footpaths are available on most of the road sections, their continuity is





DEGREE OF
CONGESTION ON ROAD

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disrupted due to encroachment by hawkers or parking and also due to level difference at junctions etc.

Peak hour pedestrian volumes along the major roads / intersections in NDMC Area are presented in Table 11.11. It can be observed that apart from Connaught Place significant peak hour pedestrian flows are experienced on Sansad Marg, B. K. S. Marg, Janpath, Pandit Pant Marg, Red Cross road, Rajendr Prasad Road, Ashok Road, K. G. Marg and Rafi Marg.

Table 11.11 Pedestrian Flows along Major Roads in NDMC Area

S No	Intersection / Location	Along Traffic			
		Morning Peak		Evening Peak	
		Arm. With Max. Peak Hr. Flow		Arm. With Max. Peak Hr. Flow	
1	Radial Road No- 7 (Inner Circle)	1215	Radial Road No. 1	648	Radial Road No.1
2	K. G Marg (Outer Circle)	1750	Janpath Road	2114	Janpath Road
3	Radial Road No- 1 (Outer Circle), Janpath	1407	Sansad Marg	1417	Sansad Marg
4	Sansad Marg (Outer Circle)	2610	Middle Circle	6726	Sansad Marg
5	Radial Road No- 1 (Inner Circle)	1098	Middle Circle	1595	Middle Circle
6	Radial Road No.2 (Middle Circle)	1324	Outer Circle	2057	Inner Circle
7	Radial Road No.2 (Outer Circle), Baba Kharak Singh Marg	1760	Inner Circle	3343	Baba Kharak Singh Marg
8	Shankar Market Mode/Shankar Market Pedestrian	1103	Minto Road Side	2693	Minto Road Side
9	Sansad Marg (Near Jantar Mantar)	2007	Jai Singh Road	1142	Jai singh Road
10	Krishi Bhawan Rotary	1048	Rajpath	1444	Janpath+Rajendra Prasad Road Crossing
11	MP's Club Rotary (Church of North India)	1582	Gole Dakhana Rotary	1256	Gole Dakhana Rotary
12	K.G. Marg +Cannaught lane Crossing	1845	Janpath	1216	K.G. Marg +Tolstoy Marg Crossing

Source : RITES Study 2005

Heavy pedestrian volumes along the roads are vulnerable when they intend to cross the roads and they come in conflict with heavy vehicular traffic. This conflict is quantified in terms of PV^2 value, where 'P' is the cross pedestrian traffic and 'V' is the corresponding vehicular traffic in peak hour for the road section. Locations where PV^2 value exceeds the critical value of 2×10^8 warrants the need for provision of safe pedestrian crossing facilities. Table 11.12 presents the locations with critical PV^2 values. The locations that require safe pedestrian facilities are Gole

dakkhana, Windsor Place, Tolstoy Marg and all locations on outer circle intersections.

Table 11.12: Locations with Critical PV² Values

S No	Intersection	Pedestrian Crossing Arm/ Direction	Cross-Pedestrian Traffic (P)	Peak Hr Vehicular Traffic (V)	PV ² Value (x 10 ⁸)
1.	Radial Road No-7 (Middle Circle)	Radial road no. 6	273	3358	31
2.	K.G. Marg (Outer Circle)	K.G. Marg	1173	3343	131
		Barakhamba Road	44	6943	21
3.	Radial Road No. 1 (Outer Circle)	Janpath Road	645	3541	81
		Sansad Marg	75	6051	28
		K.G. Marg	278	7475	155
4.	R. Road No. 5	Inner Circle	1063	1013	11
5.	Shankar Market Mode	Shankar Market Side	1632	812	11
		Barakhamba Road Side	323	5489	97
		Minto Road Side	505	6229	196
6.	Baba Kharak Singh Marg	Gole Dakhana	328	5283	92
		C.P. Outer Circle	174	5283	49
7.	Patel Chowk Rotary	Parliament Street	445	3572	57
		Ashoka Road	665	5939	235
8.	Janpath road+ Tolstoy Marg Crossing	Windsor Rotary	348	4929	85
		Sansad Marg	280	2365	16
		C.P. Outer Circle	415	4029	67
		K.G Marg	308	3259	33
9.	K.G. Marg+ Tolstoy Crossing	Firoz Shah Road	347	4128	59
		Janpath Road	157	2840	13
		C.P. Outer Circle	675	3434	80
		Barakhamba Road	561	3560	71
10.	R. M. L. Rotary	Gole Dakhana	115	5761	38
11	Sansad Marg	Jantar Mantar Chowk	1751	1785	56
12	Janpath Road	Janpath +Tolstoy Marg	1648	3541	207
13	K.G. Marg	K.G. Marg+ Tolstoy Marg	1429	3783	145
14	Barakhamba Road	Barakhamba+ Tolstoy Marg	2640	2853	215

Source : RITES Study 2005

11.3.5 Parking Characteristics

Different types of vehicles require parking space in the CBD, business/market centers to meet their loading/unloading or shopping needs. However, vehicles used

by people who work there often occupy much of the parking space (about 20 to 25%) for longer duration. Consequently the number of parking spaces remaining for shoppers, traders and visitors to business are eventually insufficient. Thus, ease of parking for people visiting business area/market area leaves much to be desired. Further, the parking demand is also increasing due to the growth of private vehicles (Cars@10% per annum and 2W@ 6% per annum) in Delhi. There is an acute shortage in meeting even the present parking demand. Therefore attempts have to be made to improve the parking situation by means of providing additional parking supply and regulating the use of parking space.

On an average a car is parked either at the residence or at the office for about 90 to 95 percent of the time. This is very important because the space for parking needs to be provided based on the demand and especially in CBDs of urban areas where land is scarce. The lower parking norms coupled with ineffective control over land use have resulted in acute shortage of parking.

Parking is the single most important traffic issue in NDMC Area. The Area attracts a large number of daily commuters, shoppers and visitors and a significant percentage of these trips are made by private modes, which require parking space. Most of the multi-storied buildings in Connaught Place Area provide parking facility only for their employees, while the visitors/ shoppers have to use the parking facilities located in the open spaces/ on-street. The parking characteristics observed in the Connaught Place Area are presented in Table 11.13.

Table 11.13: Parking Characteristics in Connaught Place Area

Location	Total parking Demand (ECS)	Peak Parking Accumulation (ECS)	Parking Supply (Sqm.)	Parking Supply (ECS)	Peak Parking Index	Parking Turnover
	(A)	(B)		(C)	(B/C)	(A/C)
I: Within CP Outer Circle	14265	5342	76766	4216	1.27	3.38
ON-STREET	6491	2136	27188	2175	0.98	2.98
Middle Circle	2251	559	9295	743	0.75	3.03
Radial Road	4240	1577	17903	1432	1.10	2.96
OFF-STREET	7774	3206	49578	2041	1.57	3.81
Within Outer Circle	3151	1088	8568	429	2.54	7.34
Inner Circle	1861	751	8960	449	1.67	4.14
Palika Parking Complex	1770	1016	35000	1060	0.96	1.67
Verandah Blocks	992	351	2050	103	3.42	3.95
II : Outside Outer Circle	22110	7656	117974	7444	1.03	2.97

ON-STREET	10485	3459	51452	4116	0.84	2.55
OFF-STREET	11625	4197	66522	3328	1.26	3.49
ON-STREET Total	16976	5595	78640	6291	0.89	2.70
OFF-STREET Total	19399	7403	116100	5369	1.38	3.61
Grand Total	36375	12998	194740	11660	1.11	3.12

Source : RITES Study 2005

Palika Parking with a supply of about 1050 ECS has a peak parking index of 0.9, while at the same time the surface parking lots have a value of up to 3.4. This may be attributed to the fact that for short-term parkers (up to 2 hours) and for long-term parkers (> 6 hours - mostly monthly pass holders), the rate for both facilities is same. Consequently, both these category (about 60 % of the total parking demand) prefer to use the surface parking closer to the shops/ offices rather than the Palika Parking that requires a walk of up to 700 m for some blocks.

Besides Connaught Place and it's surrounding areas, parking situation is critical other locations. Among the commercial locations are Gole Market Area, Khan Market, Bengali Market, Sarojini Nagar Market, INA Market , while Institutional areas like Delhi High Court, Patiala House Courts lack in proper supply of parking spaces forcing the parked vehicles very close to the main carriageway and on street parking in the neighborhood roads. There is need for proper planning and management of parking sites at above locations to meet the demand of parking.

Table 11.14 : Parking Demand at Prominent Locations in NDMC Area

S. No.	Location	Peak Demand ECS	Peak Supply ECS	Shortfall (%)
1.	Connaught Place	5342	4216	21%
2.	Outside Connaught Circus	7656	7444	3%
3.	INA Market	212	148	30 %
4.	Sarojini Nagar Market	1171	692	41%

ECS = Equivalent Car Space

11.4 TRAVEL CHARACTERISTICS

11.4.1 Intra Urban Movements

As per the household survey in the study area conducted in 2001 by RITES Limited, a total of 176 lakh trips are being performed per day. The per capita trip rate in the study area has been estimated at 1.27 (PCTR of 1.1 in 1993-94). The per capita trip rate for vehicular trips is observed 0.87 compared to 0.76 PCTR in 1993-94. PCTR of inter zonal trips is estimated at 0.76 while that of intra zonal trips is 0.51.

The modal share of passenger trips in the Delhi Urban Area is presented in Table 11.13. About 33% of total trips are walk trips, while among the vehicular trips 60% of trips are performed by buses including chartered and school buses plying in the area. Personalised vehicle trips have a share of 27 % of vehicular trips in the DUA.

Table 11.15 : Modal Share of Passenger Trips

S. No.	Mode	Passenger Trips (in % age)
		2001
1.	Bus	59.8
2.	Car/Jeep	10.3
3.	Two - Wheeler	17.2
4.	Auto Rickshaw	3.1
5.	Cycle	5.3
6.	Train	0.7
7.	Other	3.6

Source : RITES Survey, 2001

11.4.2 O-D Characteristics in C.P.

Movement pattern of traffic entering C.P. from main radials has been studied by carrying out roads side O- D surveys. The percentage of through traffic on the radial roads is presented in Table 11.16. Through traffic entering from various roads varies from 56% on K. G. Marg to 77 % on K.G.Marg. (Also Map 11.6)

Table 11.16: Movement pattern in C.P. Area

S. No.	Road Name	Through traffic %
1	Bara Khamba Road	75.3 %
2	K.G.Marg	55.6%
3	Janpath	57.9 %
4	Sansad Marg	75.0%
5	Baba Kharak Singh Marg	76.5 %
6	Punchkuin Road	63.0 %
7	Minto Road	74.1 %
8	State Entry Road	63 %
	Average	69 %

Source : RITES Study 2005

11.5 REVIEW OF EARLIER STUDIES IN NDMC AREA

In recent past, following studies were conducted to identify the various problems plaguing NDMC Area and suggest suitable improvement measures. These are as follows:

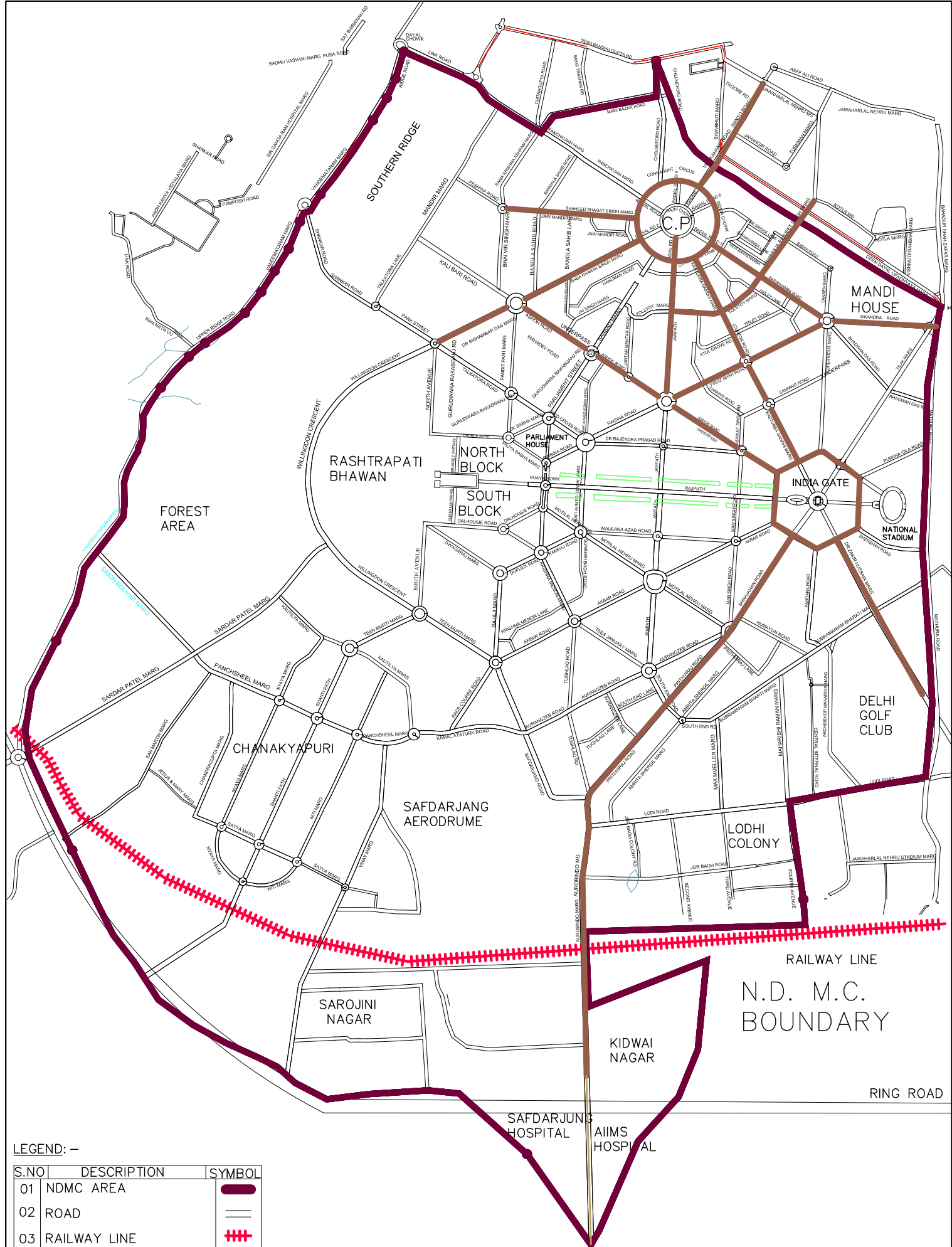
1. New Delhi Redevelopment Advisory Committee (NDRAC) Study by School of Planning & Architecture, New Delhi-1972.
2. Study By National Transportation Planning & Research Centre (NATPAC) - 1983
3. Master Plan for Pedestrian Facility in Connaught Place by RITES -1992.
4. Connaught Metropolitan City Centre Committee Report - 1992.
5. Redevelopment of Connaught place & its precincts Report - (RITES) May 2005.

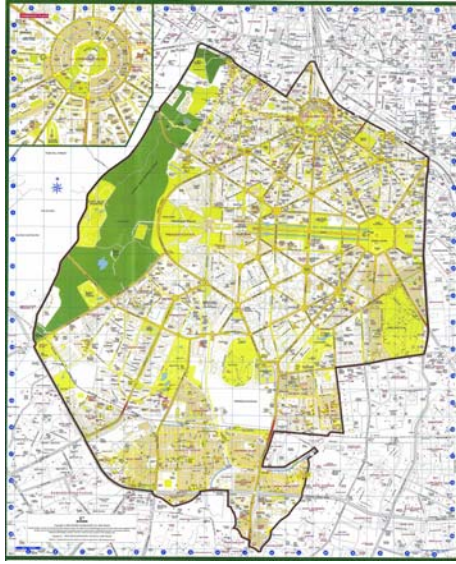
The gist of common recommendations of the above reports is as follows:

- CLOSURE OF INNER CIRCLE & ITS PEDESTRIANISATION - NDRAC -1972 / RITES-1992 / CMCCC-1992
- PARKING - REASSESSMENT, LONG TERM/ SHORT TERM, INCREASE IN CAPACITY, PAID PARKING - NDRAC-1972/ NTPRC-1983/ RITES-1992/ CMCCC-1992
- REORGANISATION OF BUS ROUTES/ DIVERSION OF BUS ROUTES FROM OUTER CIRCLE/ INTEGRATION OF BUS STOPS WITH PEDESTRIAN MOVEMENT - NDRAC-1972/ NTPRC-1983/ RITES-1992/ CMCCC-1992
- PROVISION OF SUBWAYS FOR FREE PEDESTRIAN MOVEMENT - RITES-1992/ CMCCC-1992
- CREATION OF MULTITIER PARKING/ PUBLIC CONVENIENCES/ RESTORATION OF FAÇADE - CMCCC-1992

11.6 ISSUES AND CRITICAL AREAS FOR ROADS AND TRAFFIC

- i) Traffic intensities are beyond the capacity of road network especially during peak hours of the day - Critical Area for Traffic Congestion are C.P & it's surroundings, Ashok Road, Gole Market, Gole Dak Khana, Aurobindo Marg.
- ii) Convergence of traffic in Central Area Road network due to city structure induces 60 %- 70 % through traffic causing congestion in NDMC Areas especially in peak hours.
- iii) Increased/ Improved accessibility in Central area has resulted in more footfalls. This heavy movement pedestrian traffic and their conflicts with vehicular movement are a hazard to the pedestrian safety especially along major corridors.
- iv) Improper road design - No consideration for disabled and pedestrians on road, lack of continuity of pedestrian footpath.
- v) With the increase in vehicle ownership, there is heavy demand of parking and inadequate supplies forces the parking spillover on the right of way, thereby reducing the capacities of the network. The critical Area for Parking in NDMC Area are C. P. & Surrounding, Khan Market, Sarojini Nagar Market, I.N.A Market, Patiala House Courts and Delhi High court.
- vi) There is lack of integration between different modes of public transport and intermediate public transport systems causing more use of personalized vehicles. Also there is inadequate connectivity to public transport from residential areas.
- vii) There is lack of proper road signage, road markings, street furniture and other landscape features along roads considering VIP area and their movement.
- viii) There is no provision for environment friendly modes like cycles and cycle rickshaws in road design and parking.





Chapter – 12 : Power Supply



Subcity Plan NDMC

CHAPTER - 12

DISTRIBUTION OF ELECTRICITY

12.1 EXISTING STATUS OF POWER DISTRIBUTION

12.1.1 Total power received

Total quantum of power receiving capacity in NDMC area is approximately 580 MVA as depicted through the Incoming Feeder Capacity below, from Delhi Transco Limited.

SN	Incoming Feeders	Capacity
1	66 KV FEEDERS	240 MVA
2	33 KV FEEDERS	300 MVA
3	11 KV FEEDERS	40 MVA
	TOTAL	580 MVA

DERC has allocated 350 MW of power for NDMC area from BTPS out of its total generation capacity of 705 MW i.e. around 50% of its generation. After accounting 9% of power for auxiliary consumption and 1% for transmission losses, the power allocation to NDMC is reduced to 315 MW (approx).

12.1.2 Power distribution Infrastructure

Feeders

There are 8 No.s 66 KV, 19 No.s 33 KV and 6 No.s 11 KV incoming feeders supplying power to NDMC area.

Points

Power Supply in NDMC Area is received from Delhi Transco Ltd (DTL) at following Points:

- IP Power Station
- GT Station
- 220 KV Park Street Sub-station
- 220 KV Lodhi Road Sub-station
- Ridge Valley Sub-station
- Kilokari Grid Sub-station

All above are connected to the Northern Grid. In case there is a failure of Northern Grid, 50% of NDMC area gets its power supply from GT station.

Sub stations

Locations and Voltage Grating of Sub-Stations in NDMC are given in the table below. It depicts the area/ load served by each sub station.

	Name of 66 KV S/S	Transformer Capacity
1	Vidyut Bhawan - 50+50+20	120 MVA
2	School Lane - 50+50+20+20	140 MVA
3	B.D. Marg (Temp.)- 20 MVA	20 MVA
	33 KV S/S with Installed Capacity	Transformer Capacity
1	Electric Lane- 15+20	35 MVA
2	Connaught Place- 16+20	36 MVA
3	Baird Lane- 16+16	32 MVA
4	Tilak Marg- 16+16	32 MVA
5	Nirman Bhawan- 10+10+10	30 MVA
6	Vidyut Bhawan -16+20	36 MVA
7	Kidwai Nagar- 10	10 MVA
8	Nehru Park-15+16	31 MVA
9	Bapu Dham-15+16+10	41 MVA
10	Scindia House- 20+20	40 MVA
11	National Archive- 20+20	40 MVA
12	Race Course- 20+20	40 MVA
13	Hanuman Lane- 20+20	40 MVA
14	S. J. Airport-20+20	40 MVA
15	Dalhousie Road-20+20	40 MVA
16	Mandi House-16	16 MVA
17	Shahajahan Road-16	16 MVA
18	A.I.I.M.S- 15+16+16	46 MVA
		580MVA

Total No. of Switching Stations in NDMC area are 78, of which 31 are automatic and 47 are manual.

Road Lighting Infrastructure

The street lighting infrastructure comprise of total number of 104 high masts with around 907 fittings. These range in size between 9 m to 30 m, as depicting below in the table.

Total number of street lights is 19531. These are mercury and sodium lights covering a road length of 42 kilometers.

Table: Total No. of High Masts

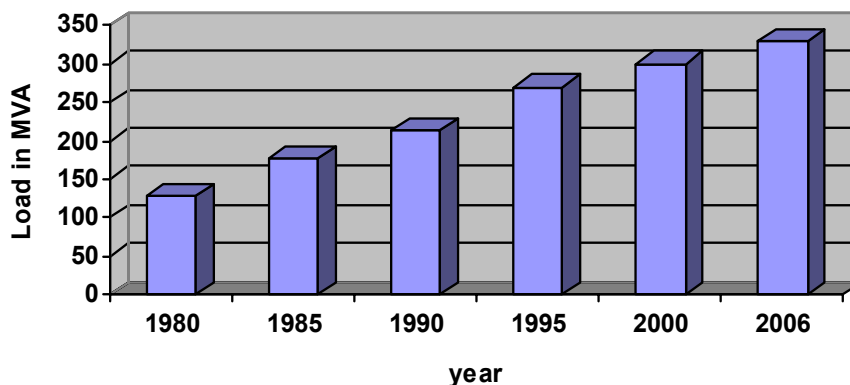
Size	Quantity	No. of Fittings
30 m	33 Nos.	518 Nos.
20 m	10 Nos.	89 Nos.
16 m	05 Nos.	20 Nos.
12 m	54 Nos.	270 Nos.
09 m	02 Nos.	10 Nos.
Total	104 Nos.	907 Nos.

12.1.3 Growth in Power and Peak load

Current demand for power is 330 MVA against an existing capacity of 580 MVA. Power load or power demand depicts a constant growth over a span of 25 years. From 1990 to 2006 there has been more than 50% growth in the load demand, as depicted in the table. This can be significantly attributed to large number of private offices and complexes that has come up in the central business district.

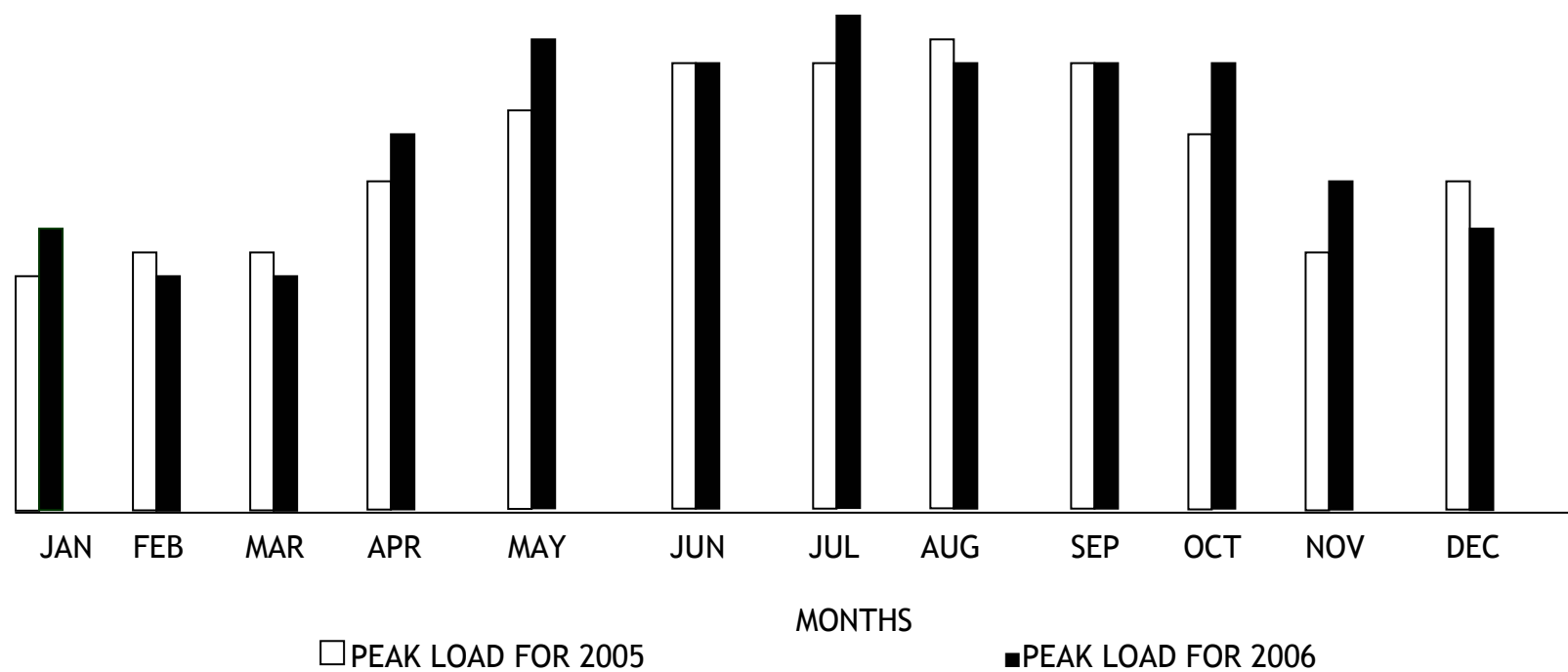
Table: Power load growth in NDMC area

Year	Load (in MVA)
1980	127
1985	176.4
1990	213.6
1995	270
2000	300
2006	330



The peak load of power in the year 2005 and 2006 was in the month of August and July. As depicted in the figure below, peak load of 325 MVA for the year 2005 occurred on 4th Aug. At 1500 hrs and peak load of 343 MVA for the year 2006 occurred on 4th July at 1500 hrs.

Figure: PEAK LOAD IN NDMC AREA

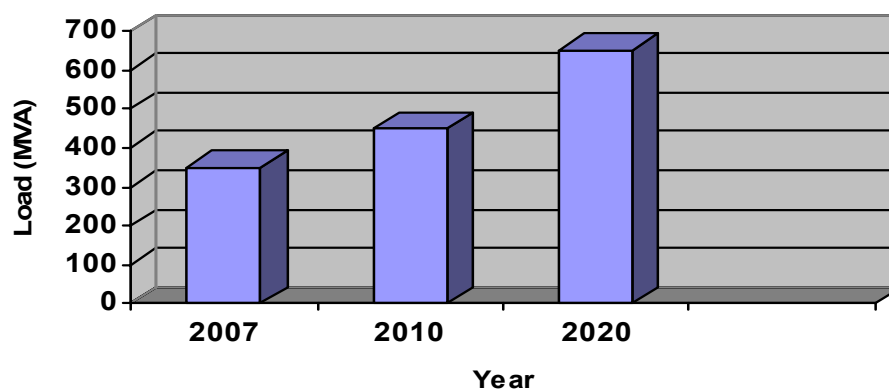


12.1.4 Load Forecast

It is forecasted that with the given growth of power demand in NDMC area and with projected growth in population, around 650 MVA of power will be required to cater the future demand in 2020 as depicted in the table below.

Table: Forecasted power load

Year	Load (in MVA)
2007	350
2010	450
2020	650



12.2 INSTITUTIONAL ARRANGEMENT

12.2.1 NDMC's Principal Tasks

The principle tasks of NDMC with respect to power supply and distribution is as follows:

- To provide stable and reliable power supply to important buildings such as Rashtrapati Bhawan, P.M. House, Parliament House, Supreme Court, Major Hospitals, Government Buildings and various Foreign Missions.
- The user (mainly CPWD) to change over to alternate source in the event of any failure.
- Accordingly NDMC has to ensure installed capacity of system which is at least 1.5 times of peak demand.
- Provision of street lighting arrangement

12.2.2 Vacancy Positions

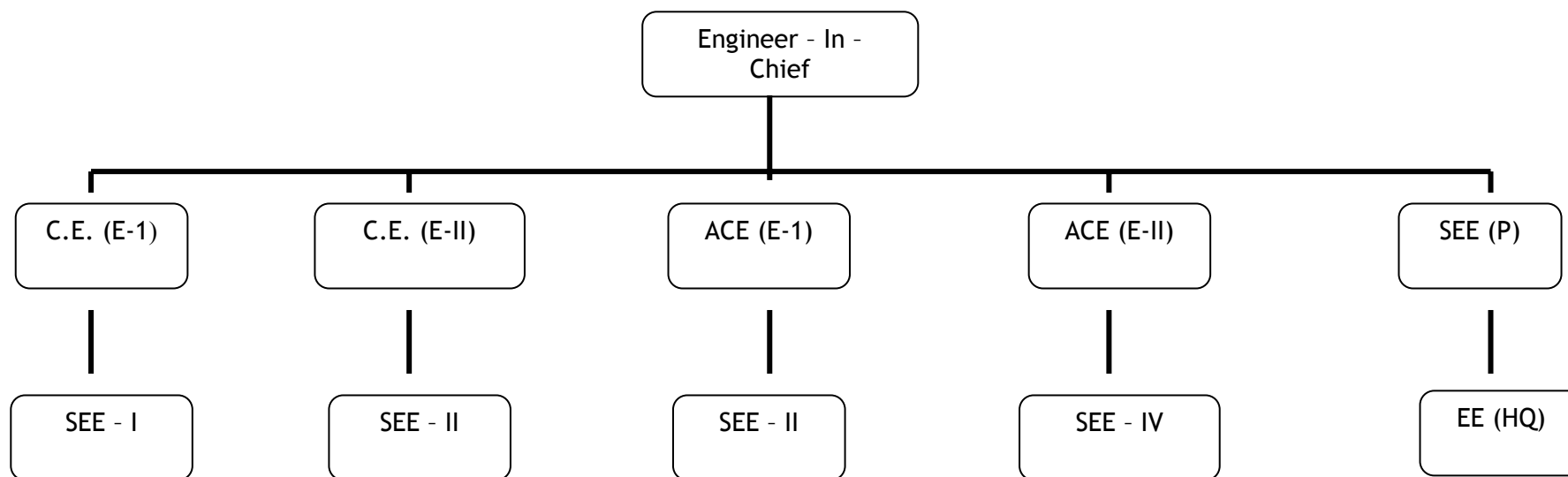
The vacancy positions in the electricity department of NDMC are as depicted in the table below.

	Sanctioned	Vacant
C.E. (E)	02	NIL
A.C.E.	02	01
S.E.E.	05	02
E.E.E.	26	04
A.E.E.	62	22
J.E.E.	201	93

12.2.3 Organizational Structure

The organizational structure of the electricity department for delivering these services in NDMC area is as follows:

FIGURE: ORGANISATIONAL STRUCTURE OF ELECTRICITY DEPARTMENT



12.3 ISSUE ANALYSIS

Following are the organizational and technical issues with respect to power distribution within NDMC.

12.3.1 TECHNICAL ISSUES

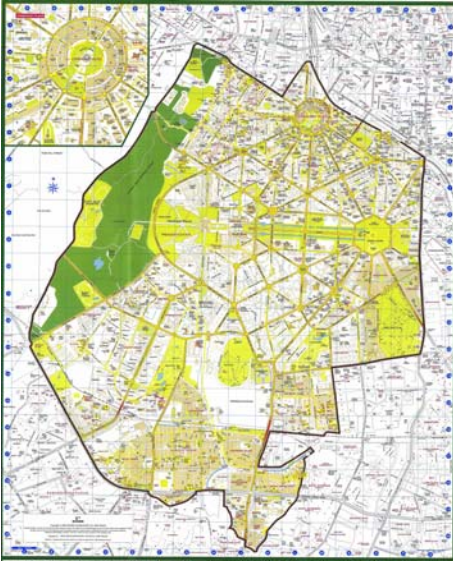
- Efficient functioning of electricity department is significantly obstructed due to old equipments and procedures within the functioning of NDMC. Efforts are on to replace old equipments by new generation apparatus. Examples of procedural delays
 - School Lane 66/33 kV 50 MVA transformer of BHEL make is out of commission since 2003 and has not been repaired yet.
 - Tilak Marg and Bapudham 50 MVA transformer of BHEL make are awaiting repairs.
 - Replacement of 66kV under ground cable from GT station to Vidyut Bhawan is pending since 2005.
- Delays are caused due to cumbersome procedures such as inspections, survey reports, write offs, preparations of NIT, procurement etc. and can take couple of years.
- Since the power supply is to be maintained in a predominant VIP area fire fighting and transfer of loads take place resulting in over loading etc.
- Major areas of over loads are CP and other commercial establishments. Aliganj LIG residential area fast developing into commercial activities is an area of over loading.
- Complaints are entered and passed on to the line man who attends the complaints and all records are maintained in the log books.
- A lot of anomalies exist in the street lighting system with practically no emphasis on energy efficiency.

12.3.2 ORGANISATIONAL ISSUES

There have been no recruitments since the year 1993. Out of the seven sanctioned posts at senior level of CE and SE, three are lying vacant. By 2008 one more post will fall vacant. At EE level there are five vacancies. There are 263 sanctioned posts at assistant and junior engineer's level out of which 115 posts are vacant making the grass root level ineffective. What is most surprising is that there are no recruitment rules till now and the entire top level is on Current Charge Duties. The top post of E-in C is reserved for deputation.

Inter agency coordination is maintained by the Planning Head. Inter departmental coordination is maintained by the Execution Head. Both these Heads are technical.

All Commercial decisions are taken by Director (Commercial) who is a non technical Head. With open access system in place shortly technical review will be required.



Chapter – 13 : ULB Finance

CHAPTER - 13

ULB FINANCE

13.1 INTRODUCTION

The purpose of analysis of NDMCs finances is to review and analyze the existing financial situation in terms of trends in the revenues and expenditures of the authorities concerned with the development of the area. This section covers the details of financial performance of New Delhi Municipal Council (NDMC) during the last five years.

13.2 OVERVIEW OF NDMC FINANCES

NDMC performs a range of functions related to the provision of the public services, just as Municipal Corporation of Delhi. The financial overview of NDMC highlights the status of Receipts (Revenue and Capital) and Expenditures (Revenue and Capital)

The revenue receipts comprise own sources (taxes and non-taxes) while Capital Receipts comprise revenues earned from sale of land, general grants from state and central governments and various loans.

The revenue expenditure comprises salaries and wages, establishment, operations and maintenance and interest and debt servicing. Capital expenditure includes grants, equipment/assets, loan repayments and refunds.

Table 13.1 summarizes the financial profile of NDMC between the FY 2000-01 and FY 2004-05.

Major revenue generating stream of NDMC is through provision of services such as electricity; water supply etc. and its major expenditure heads are education, water supply and sanitation, social welfare, etc. Revenue income of NDMC has grown to a level of Rs. 1078.98 Crores in the FY 2004-05 from the level of Rs. 749.52 Crores in the FY 2000-01. The revenue income has grown at an average annual growth rate of 10.04 percent against an annual average rate of increase of 6.57 percent in case of revenue expenditure thus indicating a surplus position during this period.

The capital account consists of grants & loans for activities relating to infrastructure development & improvement of basic services such as medical, education etc.

Table-13.1: Final Status of NDMC (in Rs. Crores)

Item	2000-01	2001-02	2002-03	2003-04	2004-05	Average	% Contribution to total receipt/ Exp
A. Revenue Account							
Income	722.68	752.20	858.27	841.86	1057.57	846.516	97.39
Expenditure	691.79	692.83	734.66	746.38	933.65	759.862	94.17
Surplus	30.89	59.37	123.61	95.48	123.93	86.656	
B. Capital Account							
Income	26.83	18.68	25.13	21.49	21.40	22.706	2.61
Expenditure	55.44	50.84	41.04	55.10	32.84	47.052	5.83
Surplus/(Deficit)	(-28.61)	(-32.16)	(-15.91)	(-33.62)	(-11.44)	-24.336	
Total Income	749.51	770.88	883.4	863.35	1078.97	869.222	100.00
Total Expenditure	747.23	743.67	775.7	801.48	966.49	806.914	100.00
Total Surplus/Deficit	2.28	27.21	107.7	61.87	112.48	62.308	

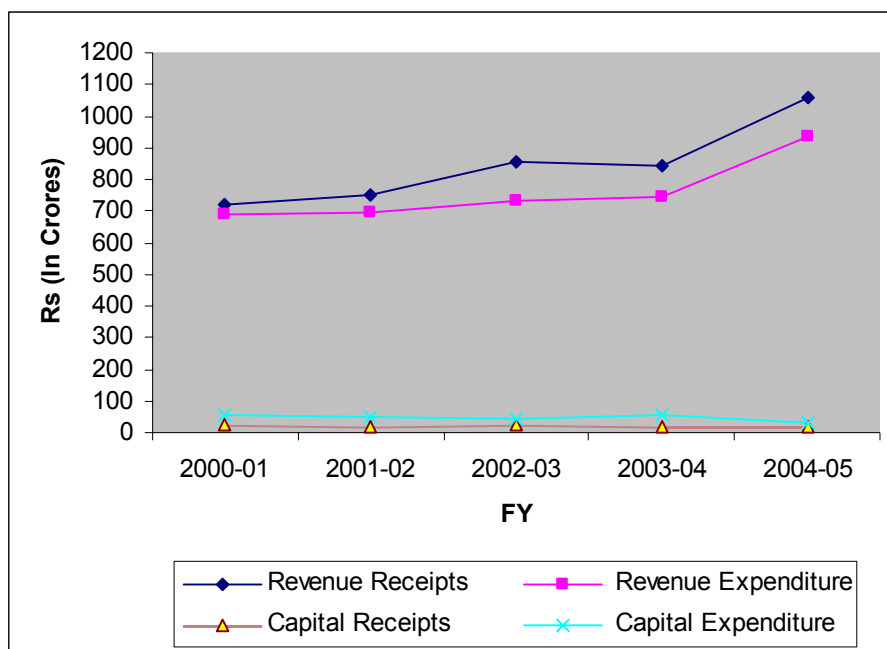
Source: Budgets 2002-03 to 2006-07, NDMC

Figure13.1 Trends in Income and Expenditure

Table 13.1 depicts a surplus condition in NDMC finances over four years.

The revenue income has grown at an average annual growth rate of 10.04 percent against an annual average rate of increase of 6.57 percent in case of revenue expenditure thus indicating a surplus position during this period.

Percentage contribution of Revenue Income to total Income is 97%, while maximum expenditure is made on revenue expenses i.e. 94% of the total expenditure.



13.2.1 Revenue Account Analysis

The revenue account comprises of two components, revenue income and revenue expenditure. Revenue income comprises of internal/own resources in the form of tax and non-tax items. External resources are in the form of shared taxes/transfers and revenue grants from the State Government. Revenue expenditure comprises of expenditure incurred on salaries, operation & maintenance expenditure and debt servicing.

Revenue Income

Revenue income comprises receipts generated through Own Sources as well as receipts in the form of Assigned Revenues and Grants. It accounts to almost 97% of the total income of NDMC.

Table 13.2: Major Head-Wise Break-up of Revenue Income (In Rs Crores)

Item	2000-01	2001-02	2002-03	2003-04	2004-05	Average	% of Revenue Income
Taxes & other duties	102.83	123.95	152.17	145.92	176.52	140.278	16.57
Interest	30.28	24.55	32.53	27.43	178.94	58.746	6.94
Administrative Department	6.83	0.41	5.32	0.46	1.28	2.86	0.34
Social & Development Services	4.24	3.43	3.31	3.43	4.17	3.716	0.44
Electricity	470.32	483.71	534.14	534.7	537.34	512.042	60.49
Water Supply	0.001	2.02	0.001	15.02	14.46	6.3004	0.74
Roads	0	0	0	0	0	0	0.00
Other Municipal Works	94.23	97.14	112.4	97.92	109.75	102.288	12.08
Loans & Advances to Employees	1.56	1.46	1.29	1.38	1.06	1.35	0.16
Misc. external Assistance	12.39	15.53	17.1	15.6	34.05	18.934	2.24
Deposit Works	0	0	0	0	0	0	0.00
Total	722.68	752.20	858.26	841.86	1057.57	846.5144	100.00

Source: Budgets 2002-03 to 2006-07, NDMC

Own sources

Own source of revenue income includes income in the form of taxes, fees and fines, supply of electricity, supply of water etc. Own sources are further classified into tax and non-tax sources.

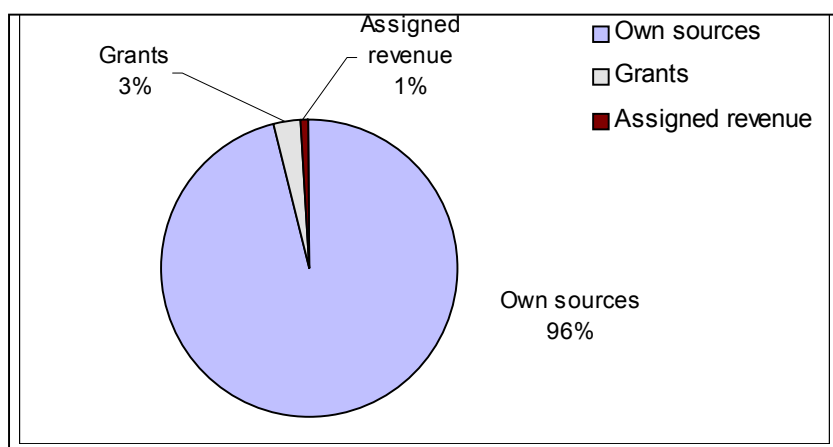
- **Tax Sources:**
About 19 percent of the total revenues are derived from the Tax sources which include House Tax, Duty on Transfer of Property,

Property Tax is one of the major components of the Revenue income of NDMC. The following table shows the figures for demand and collection of property tax from 2001 to 2006. The average collection is about 18% which, if improved will provide a considerable income to the ULB.

Property Tax - Demand and Collection					
Year	Arrear	Demand	Collection (Current + Arrears)	Balance	Collection %
2001 - 02	438.91	122.57	101.02	459.66	17.99%
2002 - 03	459.66	127.14	117.02	459.42	19.94%
2003 - 04	459.42	197.35	111.74	543.78	17.01%
2004 - 05	543.78	151.81	130.31	556.00	18.73%
2005 - 06	556.00	177.19	132.87	592.17	18.12%

Advertisement Tax and other taxes.

- **Non-Tax Sources:** NDMCs major earnings are through non-tax sources, which include income generated through supply of electricity, which forms 60 percent of the total revenue. The revenue income has grown from Rs. 749.51 Crores in FY 2000-01 to Rs.1078.97 Crores in FY 2004-05.

Figure 13.2 Source wise break up of revenue

External Assistance

This head comprises receipts in the form of Assigned Revenue and Grants, which form 4 percent of the total revenue.

Main Features of Revenue account (Receipts) are as follows:

- Income from own sources accounts for about 96 percent of the total revenue.
- Revenue from sale of electricity accounts for about 59 percent of the total revenue and has shown an average annual growth rate of 3.47 percent
- Income from tax sources has shown an average annual growth rate of 15 percent.

Revenue Expenditure

Revenue expenditure has been analysed based on expenditure heads broadly classified under the following heads: Taxes & other Duties, Interest, Administrative Department, Social & Development Services, Electricity, Water Supply, Roads and Other Municipal Works etc.

Revenue expenditure grew from Rs.747.22 Crores in the FY 2000-01 to Rs. 954.84 Crores in FY 2004-05 at an average annual growth rate of 6.57 percent. The major items of expenditure include Electricity (41%), Social & Development Services (16%), Water Supply (6%) and Administrative Department (19%).

Figure 13.3 Source wise Break up of Revenue Expenditure

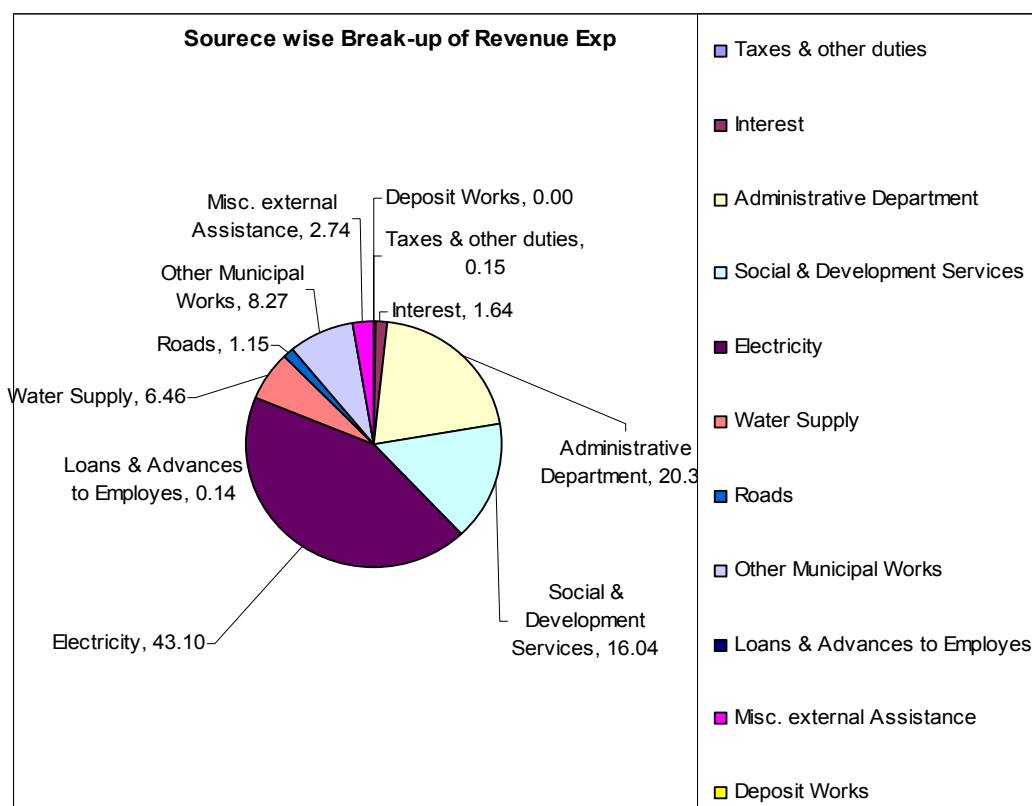


Table 13.3: Major Head-Wise break-up of Revenue Expenditure (In Rs Crores)

Item	00-01	01-02	02-03	03-04	04-05	Average	% of Revenue Exp
Taxes & other duties	0.92	0.95	1.2	1.27	1.33	1.134	0.15
Interest	42.85	7.11	5.44	4.83	1.89	12.424	1.64
Administrative Department	110.58	125.15	167.92	139.38	228.33	154.272	20.30
Social & Development Services	113.09	113.86	111.42	128.33	142.64	121.868	16.04
Electricity	268.66	326.44	330.8	344.49	367.27	327.532	43.10
Water Supply	54.4	45.05	37.96	46.87	61.13	49.082	6.46
Roads	4.25	8.41	10.35	11.32	9.44	8.754	1.15
Other Municipal Works	55.36	52.18	58.09	61.59	87.16	62.876	8.27
Loans & Advances to Employees	1.44	1.43	1.04	0.94	0.62	1.094	0.14

Item	00-01	01-02	02-03	03-04	04-05	Average	% of Revenue Exp
Misc. external Assistance	40.23	12.25	10.46	7.34	33.83	20.822	2.74
Deposit Works	0	0	0	0	0	0	0.00
Total	691.78	692.83	734.68	746.36	933.64	759.858	100.00

Source: Budgets 2002-03 to 2006-07, NDMC

Debt Servicing

A review of the loan statement of NDMC reveals that as on 31.3.2004 NDMC had Rs. 32.01 Crores as outstanding loan. During the FY 2004-2005 it repaid the whole of this amount together with an outflow on account of interest of Rs.1.88 Crores. NDMC has become a zero debt corporation since then.

Establishment Expenditure

Establishment expenditure (inclusive of Bonus, Gratuity, Pension & other employee benefits) of all sections accounts for just about 36 percent of the total revenue expenditure. The growth in this component has been at an overall average annual growth rate of 6.04 percent.

Table-13.4: Establishment Expenditure

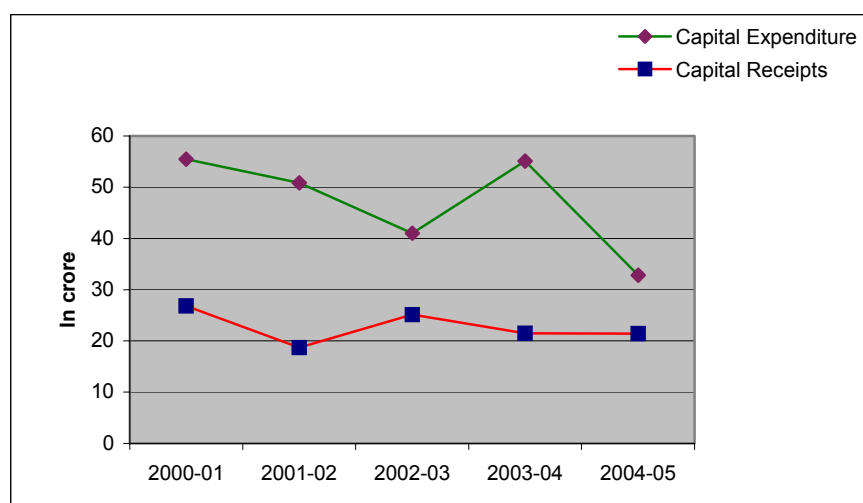
Items	2000-01	2001-02	2002-03	2003-04	2004-05	Avg
Salary & Allowance	149.34	166.32	176.17	186.90	204.60	236.30
Other Employee Cost	21.02	4.04	4.15	4.14	3.96	7.46
Total	170.36	170.36	180.32	191.04	208.56	184.13
% of Revenue Expenditure	22.73	22.10	20.41	22.13	19.33	21.34
% of Revenue Income	22.80	22.91	23.25	23.84	21.58	22.87

Source: Budgets 2002-03 to 2006-07, NDMC

13.2.2 Capital Account Analysis

The Capital account comprises of two components, Capital Income and Capital Expenditure. Capital income in NDMC significantly comprise of miscellaneous external assistance and income from deposit works. Capital expenditure in NDMC significantly comprises of expenditure incurred on Roads and bridges, water supply and sanitation and social welfare. The trend in growth of capital expenditure and capital receipts is as depicted in the figure below.

Figure 13.4 Capital Account



Capital Income

Capital income is basically the plan funding received from various agencies for carrying out work under the various heads. A major portion of the receipts received under this head is allocated for Roads & Bridges. MLA Constituency Fund gets the second largest share. The figure for the five-year period is as given below:

Table-13.5: Plan funding for 5 Years (in Rs. Crores)

Items	2000-01	2001-02	2002-03	2003-04	2004-05
Roads & Bridges	1.68	3.00	1.75	7.42	5.75
Water Supply & Sanitation	1.50	0.50	0.63	1.25	0.63
Housing	-	-	-	-	-
Urban development	2.01	1.68	1.50	0.32	0.60
Education	1.73	1.58	1.08	0.63	0.50
Welfare of SC/ST/OBC	0.15	-	-	-	-
Medical	0.31	0.50	0.50	0.50	1.00
Public Health	0.00	0.00	0.13	0.30	0.21
Agriculture & Allied Services	-	-	-	-	-
Power	-	-	-	-	-
Economic Services	-	-	-	-	-
Nutrition	0.27	0.30	0.25	0.30	0.75
Labour & Labour Welfare	0.05	0.01	-	0.01	-
Social Welfare	0.53	-	-	-	-
Sports & Youth	0.04	-	-	-	-

Items	2000-01	2001-02	2002-03	2003-04	2004-05
Services					
MLA Constituency Fund	2.94	4.14	4.35	4.35	4.30
TOTAL	11.21	11.71	10.18	15.08	13.74

Source: Budgets 2002-03 to 2006-07, NDMC

Table-13.6: Major Head-Wise Break-up of Capital Income (In Rs Crores)

Item	00-01	01-02	02-03	03-04	04-05	Average	% of Capital Income
Taxes & other duties	0	0	0	0	0	0	0.00
Interest	0	0	0	0	0	0	0.00
Administrative Department	0	0	0	0	0	0	0.00
Social & Development Services	0	0	0	0	0	0	0.00
Electricity	0	0	0	0	0	0	0.00
Water Supply	0	0	0	0	0	0	0.00
Roads	0	0	0	0	0	0	0.00
Other Municipal Works	0	0	0	0	0	0	0.00
Loans & Advances to Employees	0	0	0	0	0	0	0.00
Misc. external Assistance	6.98	8.02	6.72	13.57	10.74	9.206	40.54
Deposit Works	19.86	10.66	18.41	7.92	10.66	13.502	59.46
Total	26.84	18.68	25.13	21.49	21.4	22.708	100.00

Source: Budgets 2002-03 to 2006-07, NDMC

Capital Expenditure

The trend for capital expenditure has been varying over the five-year period. It saw a sharp fall in the year 2002-03. The major heads of capital expenditure include Roads & Bridges, Water Supply & Sanitation, and Social Welfare etc. The break up for major heads has been presented in a table below.

Table-13.7: Plan expenditure for 5 Years (In Rs. Crores)

Items	2000-01	2001-02	2002-03	2003-04	2004-05
Roads & Bridges	3.40	4.46	2.48	6.30	5.75
Water Supply & Sanitation	1.93	1.66	0.68	0.82	0.77
Housing	-	-	-	-	-

Urban development	1.19	0.70	0.20	0.41	0.68
Education	2.52	1.68	0.87	1.32	0.58
Welfare of SC/ST/OBC	0.10	0.10	-	0.19	-
Medical	0.40	0.21	0.08	0.45	1.47
Public Health	0.08	0.07	0.23	0.39	0.29
Agriculture & Allied Services	0.32	0.02	0.14	0.12	-
Power	2.89	6.70	-	-	-
Economic Services	-	0.00	-	-	-
Nutrition	0.25	0.39	0.21	0.22	0.42
Labour & Labour Welfare	0.02	0.01	0.01	0.09	-
Social Welfare	0.47	0.50	0.22	0.15	(0.00)
Sports & Youth Services	0.06	-	0.02	-	-
MLA Constituency Fund	1.35	3.12	4.64	5.33	1.68
TOTAL	14.99	19.61	9.80	15.80	11.64

Source: Budgets 2002-03 to 2006-07, NDMC

Table 13.8: Major Head-Wise Break-up of Capital Expenditure (In Rs Crores)

Item	2000-01	2001-02	2002-03	2003-04	2004-05	Average	% of Capital Exp.
Taxes & other duties	0	0	0	0	0	0	0.00
Interest	0	0	0	0	0	0	0.00
Administrative Department	0.005	0.1	0.1	0.03	0.03	0.053	0.11
Social & Development Services	9.92	10.35	10.23	7.91	6.05	8.892	18.90
Electricity	3.96	8.42	4.66	9.99	3.22	6.05	12.86
Water Supply	1.21	2.15	1.6	0.98	0.4	1.268	2.69
Roads	7.98	6.64	6.09	14.52	9.61	8.968	19.06
Other Municipal Works	16.76	11.02	10.33	15.56	7.8	12.294	26.13
Loans & Advances to Employes	0	0	0	0	0	0	0.00
Misc. external Assistance	0	0	0	0	0	0	0.00
Deposit Works	15.6	12.16	8.03	6.11	5.74	9.528	20.25
Total	55.435	50.84	41.04	55.1	32.85	47.053	100.00

Source: Budgets 2002-03 to 2006-07, NDMC

13.3 ANALYSIS AND CONCLUSIONS

13.3.1 Operating Ratio: Operating ratio is defined as the ratio of revenue expenditure to revenue income, which is an indicator of profitability of the operations of a local body. For NDMC, it is less than unity indicating that the revenue expenditure is met by revenue income.

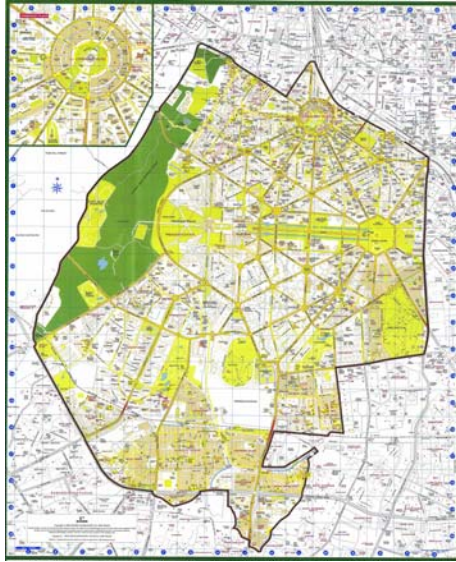
NDMC is generating about 96% of income through its own sources which clearly indicates that it is able to self sustain and the reliance on the grants is minimal. The surplus in the account implies that the funds are available to meet the deficiency in the Capital account as and when it arises

It is observed that about 22% of the total revenue income is being spent on the salaries and other related costs which is well below the average when compared to other local bodies

Table-13.9: Key Indicators

Item	2000-01	2001-02	2002-03	2003-04	2004-05
Operating Ratio	1.00	0.96	0.88	0.93	0.88
Share of assigned revenue (%)	0.45	0.56	0.71	0.74	1.05
Share of grants (%)	2.58	3.05	2.70	3.38	4.15
Share of internal sources (%)	96.97	96.39	96.59	95.88	94.80
Share of Establishment Expenditure to Revenue Expenditure (%)	34.24	35.64	35.98	38.84	33.82
Share of Establishment Expenditure to Revenue Income (%)	34.13	34.38	31.59	36.05	29.93
Capital Utilization Ratio	2.07	2.72	1.63	2.56	1.54

13.3.2 Capital Utilization Ratio is the ratio of capital expenditure to the capital income. This ratio indicates the performance of the local body in terms of utilization of capital income - it also serves as an indicator of the local bodies' capacity to utilize capital resources. A capital utilization ratio of greater than unity indicates that revenue account surplus has been utilized for capital works, which is a positive feature. A capital utilization ratio below unity indicates that either capital income is being diverted for revenue expenditure (when operating ratio is above unity) or that part of capital income is unspent during the FY under consideration. In case of NDMC, the capital utilization ratio is greater than unity and showing minor growth during last four FY.



Chapter – 14 : Institutional Aspects

CHAPTER - 14

INSTITUTIONAL ASPECTS

14.1 OVERVIEW

An earlier (inception) report presented some details on our understanding of the context in which the NDMC's Public Health department is currently working, what we see as the boundaries of the assignment, a framework for our analysis, proposed methodology, etc.

This report presents outcome of our dialogues with Sr. Officials at NDMC. It focuses on the outcome of these dialogues. It also includes an analysis of their implication for looking at both capacity building and necessary organization design for the proposed sub city development plan.

14.2 WORK DONE SO FAR

Our work consisted of desk review of available background documents, review related to best practices in solid waste management internationally and dialogues with several Senior Officials of NDMC. Some of the persons will include the following:

- Senior officials dealing with Personal and Welfare matters in NDMC
- Director of Training
- MOs-Health Department
- Chief Engineer, Electrical
- Director Commercial tax, etc

Our dialogues related to exploring both facilitating and hindering aspects in their work, , work processes, systems if any in place, current workload, etc. The discussions revealed certain general trends that need attention.

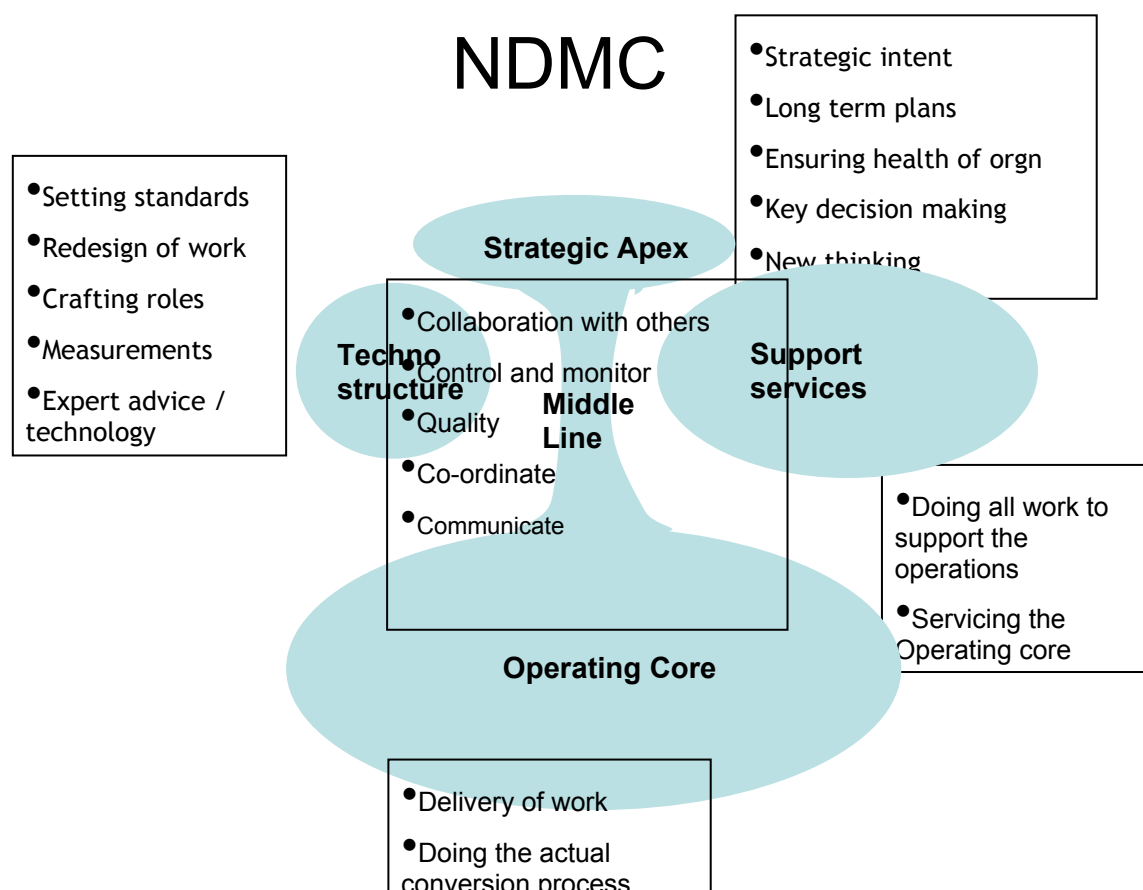
14.3 OUTCOME

Our discussions showed the following trend in NDMC as an organization today:

- Huge gap within the middle structure and between the top and the bottom (See Figure 1)
- Work is pushed to the top of the middle structure such that they have to do /supervise /decide on the final outcome
- Parts of the middle structure, especially at the lower level acting mostly from the operating core (See Figure 1)
- Lower levels unable to take up responsibilities
- Issues of inter-departmental coordination

- Coordination between staff at some level standardized-e.g. collection of SWM-work process standardized. However, work gets done only through mutual adjustment
- Is the techno structure able to rise to the occasion? Perhaps partly but needs attention
- Training needs analysis done but requires fine-tuning

Figure 1



14.4 IMPLICATIONS

Palika Kendra seems to function more as a back-end operating office dominant and not particularly internal customer sensitive.

NDMC functions with a huge operating core and support structure and a weak techno and middle structures making the NDMC units/departments self-centered with little coordination

14.5 ENABLERS AND GOOD PRACTICES

There is already considerable reflection in the organization regarding structure related issues as these. Many senior officials are therefore doing one or both of the following to make the establishment more responsive.

- ❖ First, a good amount of effort is being put in the direction of restructuring and rationalization of posts
- ❖ Second, some efforts are already on in the right direction regarding divesting responsibilities to subordinate officers so that Senior officials have time for value added work to NDMC

There is potential for the multiplication of such efforts.

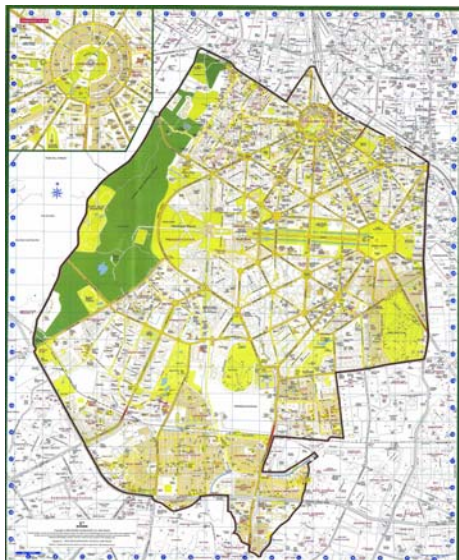
14.6 EMERGING AREAS THAT REQUIRE ATTENTION AT NDMC FOR ORGANIZATION RESTRUCTURING

- ❖ *Strengthening middle structure*
 - Increasing responsibility at lower levels of the middle structure
 - Defining and strengthening the techno structure
- ❖ *Defining the objectives of the training/capacity building department*
 - Clear strategies for training department (tech, behavioural, quality movement, customer service orientation, etc)
- ❖ *Define objectives of HR*
 - Strategic, being employee champions, taking care of HR Infrastructure, (HRIS) etc.
- ❖ *Attending to issues in Inter-departmental Coordination*
 - Coordination between, training, welfare & establishment in HR
 - Sending personal establishment to the respective departments
- ❖ *Organization-wide change management*
 - Strategic Apex (or top management) in collaboration with techno structure, respective departments and middle management to drive organizational change initiatives, quality movement in the organization, customer sensitivity campaign, awareness programmes for reducing solid waste in the area, etc.

14.7 THE NEXT STEPS

The above are emerging outcomes. There seems a need to broad-base these to work further on organization structure and design.

We plan to have a few focus group discussions with staff from the Public Health department, senior Staff of NDMC. The focus of these would be to elicit their observations on how to gear up for the future to become an excellent municipality. This would also provide an opportunity to share the outcome of our discussions and their implications.



Chapter – 15 : Stakeholder Workshop

CHAPTER - 15

STAKEHOLDER CONSULTATION

15.1 INTRODUCTION

Consulting with key stakeholders is an important factor in a planning process since stakeholders provide quality inputs which help in making quality decision-making, also greater stakeholder satisfaction with the output is possible through their involvement and sense of ownership in developing the plan. The chances of successful implementation increase as more stakeholders feel committed to the plan or project's goals. And lastly, good governance, transparency and open communication in a system is ensured only if a broader perspective is developed beyond the personal agendas of the system.

This section details the stakeholder's involvement and the participatory process undertaken to prepare NDMC sub city plan, and also highlights the key observations and findings of these consultations.

15.2 CONSULTATION METHODOLOGY

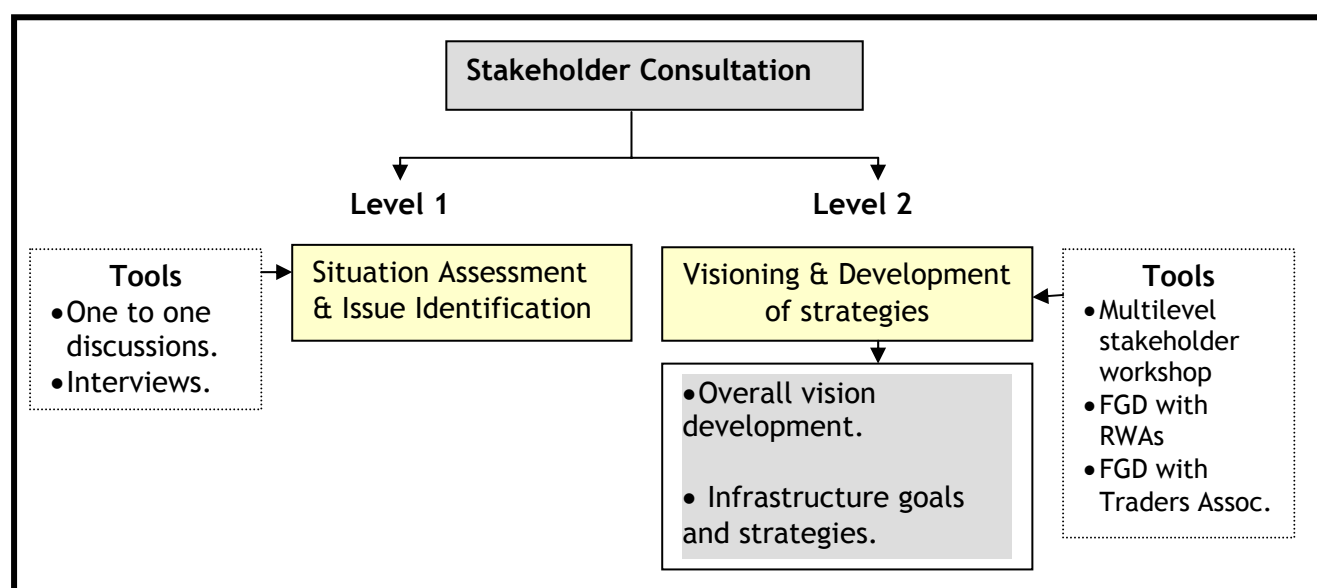
The consultation process for NDMC sub city plan has been conducted at two different levels.

The **preliminary or the first level of consultations** comprised of discussions, one to one interactions and interviews with respective stakeholders. These were done to assess the current state of the NDMC area with respect to aspects such as land and growth management, built and natural heritage, environmental conditions, landscape and horticulture, financial and institutional status of the urban local body and levels of urban basic services & infrastructure such as water supply, sewerage, waste management, road and transportation, power supply, etc. The situation assessment study also evaluated the unmet demand and discrepancies of the respective system and sector.

The **Second level of consultation** was conducted through a multi stakeholder workshop, and separate consultation sessions with Resident Welfare Associations (RWAs) and Traders Associations as a sequel to the situation assessment of the area. The workshop focused on development of future perspective and visions for the NDMC area vis-à-vis the city of Delhi through suggestions from sector specific panel experts and discussions with government authorities, prominent citizens, institutional and academic experts, NGO representatives, RWAs and Traders Associations.

Below given diagram depicts the consultation procedure as explained:

FIGURE 15.1 CONSULTATION METHODOLOGY



15.3 STAKEHOLDER PROFILE

Various stakeholder groups were identified during the consultation program. The consultation process was formulated to target stakeholders at varied levels. Two core groups of stakeholders were consulted at the preliminary and secondary level as highlighted in this section:

- **Preliminary consultation:** Following stakeholders were consulted to gauge the current situation of the area during the first level preliminary consultation process.

TABLE 15.1 LIST OF STAKEHOLDERS CONSULTED

S.N	Areas	Stakeholders consulted
1	Land Growth Management	Chief Architect, NDMC, S. Sengupta,
		Chief Architect, CPWD, Ravi Kakkar.
		Director, Enforcement department (NDMC), R.C Meena
		Enforcement department (NDMC), Tulsi Ram
		Kuldeep Singh, Architect
2	Built heritage & Natural Heritage	Chief Architect, NDMC, S. Sengupta,
		Senior Architect, NDMC, Mr Rakesh Goyal,
		Director of Horticulture, Subhash Chandra
		GIS Computer Department, NDMC
		Former Chief Town Planner, Member MoUD Committee on New Delhi (Buch Committee), Sayed S Shafi
		Member, DUAC & Member, Heritage Conservation Committee, AGK Menon
		Former Chief Town Planner, E.F.N.Ribeiro
		Landscape Architect & Member DUAC, M. Shaheer
		Tree Expert & Author, Pradip Krishen
		Landscape Architect, Rommel Mehta
		Architect, Malay Chatterjee
		Jt. DG, Archaeological Survey of India, R.C. Aggarwal
		State Department of Archaeology & Museums, GNCTD, BSR

S.N	Areas	Stakeholders consulted
		Babu Forest Research Institute, Dehradun, R. Chand
3	Environment	Bacteriologist, NDMC, K.K Das Director of Horticulture, Subhash Chandra Chief Conservator of forest, S.K Aggarwal & Uma Kant Assistant Engineer, NDMC, Balbir Singh, Superintending Engineer , Rakesh Sharma Engineer in Chief (Retired), Delhi Jal Board, P.K Jain Assistant Engineer, R.A Bharati
4	Institutional Assessment & Capacity Building	Anurag Goyal, Director (projects), NDMC Director (Training), NDMC Mr.Kiran Singh, Sanitation Officer, NDMC Mr.Shyam Singh Phougat, CSI (South) , NDMC Mr.R.K.Gupta, CSI (North), NDMC Mr.Ved Prakash, Sanitary Inspector, Circle 7 , NDMC Sanitary Inspector, Circle 3, NDMC Ms.Minakshi Gupta, NDMC Dr PK Sharma(CMO), NDMC All the Sanitary Inspectors from all the Circles of Sanitary Departments and supervisors & above of the horticulture Department
5	Urban Finance	Anurag Goyal, Director (projects), NDMC SM Ali, Director (Commercial), NDMC
6	Water supply and Sewerage System	Superintending Engineer (Public Health), R.P Sharma, R.S Thakur Executive Engineer (Water Supply), C.M. Narang Executive Engineer (Sewerage), R.K Batra Executive Engineer (Projects), C.M Oberoi Director of Horticulture, Subhash Chandra SPAN Consultants
7	Road & transportation	NDMC officials - <i>Superintending Engineers (R-I), (R-II)</i> <i>XEN (Five Divisions)</i> Delhi Traffic Police, DCP Traffic, Mr. D.P.Verma Members of New Delhi Traders Association (NDTA) Delhi Metro Rail Corporation - PRO office IDFC
8	Power supply	SE, planning, Electrical Dept., NDMC, O. P. Gupta Retired C. E. DVB, M H. K. L. Kaushal

Secondary level consultation: The secondary level consultation exercise comprised of three sessions. Firstly, a stakeholder consultation workshop with participants from multi level expertise, agencies and groups; Secondly, a consultation session with representatives of Traders Associations of NDMC area, and lastly, discussion with representatives of Residents Welfare Associations (RWAs).

- **Stakeholder consultation workshop:** The workshop comprised of representatives from 6 major categories. These are:
 - a. Representatives of Resident Welfare Associations (RWAs)

- b. Government representatives from Sector specific agencies.
- c. Non Government Organizations (NGOs) representatives.
- d. Traders Associations.
- e. Prominent Citizens.
- f. Institutional/Academic Representatives.

The list and names of attendees present in the stakeholder consultation workshop is attached in Annexure 5.

- **Traders Association:** A separate discussion session was organized with Representatives of Traders association of NDMC area. Following is the list of representatives who participated in the consultation exercise:

TABLE 1.2: MEMBERS OF TRADERS ASSOCIATION

S.No	Persons Consulted	Traders Associations
1	P. Khanna	New Delhi Traders Association (NDTA)
2	Vinay Bahl	New Delhi Traders Association (NDTA)
3	Pramod Gupta	Bengali Market
4	Krishan Kalra	Sarojini Market
5	Satram Dass	Sarojini Market

- **Resident Welfare Association:** Four RWAs were consulted from different regions of NDMC area. The list of the same is given below:

TABLE 1.3: MEMBERS OF RWAs

S.No	Persons Consulted	Residents Welfare Association (RWA)
1	P.N Khanna	Golf Links RWA
2	G.K Kotwalwala	Babar Lanes RWA (Bengali Market)
3	Anita Bambey	Babar Lanes RWA (Bengali Market)
4	Virendre Tuli	Diplomatic Enclave RWA
5	Narayan Shamnani	Bhagat Singh Lane RWA

15.4 CONSULTATION FINDINGS

15.4.1. Stakeholder Consultation Workshop

In continuation to consultations being carried out in the NDMC area, the stakeholder workshop was organized to deliberate on the following aspects:

- a. Developmental and infrastructural goals for the NDMC area in the next 20 years.
- b. Broad Strategies that could be taken up for achieving this.
- c. Prioritization of issues for implementing this.

The workshop was inaugurated by the Honorable Minister of State (Urban Development), Ajay Maken. The workshop was divided into two sessions.

The **first session** highlighted on "Overall Development vision and Direction for Growth" in the NDMC area and was chaired by Mr. B.P Mishra, (Ex. Chairman-NDMC). A distinguished panel of experts made 5 - 10 minute presentations outlining a vision, or goals, for the sector; and suggesting strategies for how these can be achieved. These were illustrated with best practices, or standards, and ideas that the NDMC can adopt for the management of resources and services in the area. These formed the basis of further discussion among stakeholders. The panelists for the first session were:



Shri Ajay Maken, Minister Of State, (Urban Development), Honorable chief guest.

- Built Heritage- Romi Khosla, Architect, Urban Planner
- Natural Heritage- Pradip Krishen, Tree Expert
- Land Growth Management- Sudhir Vohra, Architect, Urban Planner
- Environment / Horticulture- Ravi Aggarwal, Environmentalist, Toxics link
- Governance (NDMC / Delhi)- B. P. Mishra, Ex Chairman, NDMC

The **second session** emphasized on "Infrastructure Goals and Direction for growth", Chaired by Mr. Omesh Saigal, (Ex. Chief Secretary). Following were the panel of experts who deliberated on infrastructural aspects within NDMC area.

- Roads and Transportation-B I Singal, D-MITS
- Water Supply and Sewerage- Ranbir Yadav, DJB - could not be present
- Solid Waste Management- Dr. Sunil Pandey, TERI
- Power, Mr. S.R Sethi, Delhi TRANSCO

Both the sessions were documented and audio recorded alongside a detailed coverage by leading newspapers of the city, as depicted in the clippings below. The proceedings of the workshop were uploaded over the local body's website to solicit queries and suggestions at a mass level.

The agenda of the workshops and detailed proceedings is presented in Annexure 1, 2 & 3. The sector wise key findings are presented in the subsequent section.

15.4.2. Key findings of the workshop

The NDMC area is an island in the city that enjoys better standards of development than the city at large. It is closely linked to the city in terms of its functioning. Following are the key findings with respect to the overall perspective about the NDMC area and its infrastructure requirements.

Overall Perspective

- **Development planning perspective of NDMC area should have a social development orientation:** Redevelopment or planning of NDMC area should be seen from a perspective of development of human resource and social opportunities.
- **Creation of more public spaces for the city:** Central areas should be redeveloped to create more public spaces for city-wide use. These should be accessible through public transport.
- **Reduce the environmental footprint of the area:** reduction of solid waste; water consumed and waste water generated.
- **Redevelopment and densification, retaining green character:** Redevelopment of land, for more efficient use, at greater densities, in this area is inevitable - eg.: government colonies in dilapidated condition. This should be undertaken while retaining and enhancing the green areas within the NDMC. Green and vacant spaces shall be developed as public places. Also, nallahs within the NDMC area can be redeveloped and beautified.
- **Densification or development to be concomitant with conservation of heritage and areas of historical importance.** Conservation should include careful evaluation of the current usage and significance of buildings having heritage significance. Potential world heritage significance of the garden city must be considered.
- **Integration of Waqf properties:** The Waqf properties should be included in the planning process for NDMC area, emphasized the inclusion of Waqf properties in the planning process. Integrated planning can be undertaken for a group of properties.
- **Ecologically thinking for plantation for NDMC area:** Within NDMC area there is a need to re-think and plan plantation along ecological lines, rather than simply on the basis of aesthetics (as done by the British). Replacement planting will consider the pattern of the original plantation of the Garden City Area. The Ridge needs to be protected and managed in a more comprehensive way.
- **Administration and governance:** Central Government and local government should coordinate closely on issues of land management in the area. There should be a system of people's representation from the area.
- **Use of Technology:** NDMC should make full use of technology options in its administrative and service delivery functions.

- **Capacity building within NDMC:** Staff needs to be motivated and trained to use technology for greater efficiency; develop MIS; and develop a more commercial orientation.

Infrastructure

Services in the area have become old and their maintenance requirements are increasing. There is a need for phased replacement of the infrastructure, as per updated practices. Services in the area should be contained within service ducts, and go underground to the extent possible. Modular systems should be adopted, so that they can be scaled up easily.

- **Technological up gradation of the NDMC power system to tackle the distribution losses:** The T&D losses within the NDMC area are approximately 12%. To bring down the losses ideally to 5%, the system should be fine tuned, automated and upgraded as per new technological options. These include options such as SCADA (Supervisory Control And Data Acquisition), EMS (Energy Management System), GSAS (Grid Substation Automation), Communication System and other applications (Voice, Video, ERP data etc), GIS: Geographic information system of Cables and Transformers, Fault Management System, Energy audit of distribution transformers and LT feeders, Consumer Indexing on LT feeders and Distribution transformers. An MTS (Material Tracking system), system must be available to all managers in order to ensure efficiency
- **Traffic Management within NDMC area:** Three specific traffic characteristics in the NDMC area need special arrangements. These are:
 - High through traffic: address through creation of by passes for major congestion areas.
 - Heavy pedestrian traffic: address by providing adequate facilities such as walkways, and pedestrianisation of key areas.(Pedestrian Plan - refer below)
 - Heavy unmet parking demand: attempt a Central Business District (CBD) dispersal system (parking outside the CBD) that various cities have implemented. Make parking charges prohibitively high during key hours, in order to disperse parking demand.
- **Transportation** - The City wide network being implemented through DIMITS will take care of transportation needs to and from the NDMC area. Within the NDMC area, a dispersal system should be the focus of the transport strategy. The NDMC should also have a comprehensive pedestrian plan; and a network of cycle tracks.
- **Waste management through incorporation of "Polluter pays" principle.** "Polluter Pays" principle should be implemented in the NDMC area, for institutional, commercial and residential (large) generators in order to make them responsible for their waste. NDMC areas should be declared "no tolerance" zone" for littering.
- **Water Supply:** NDMC should implement 24 X 7 water supply in its area. Storage capacity for water to be augmented. Water to be recycled for horticultural purposes - DJB water to be used only for drinking purposes. Installation of small

capacity STPs's in the public gardens, and use of water for horticulture purposes.

- **Law and order provisions and Disaster management plan to be developed for the NDMC area.** Security and law and order considerations needs to be integrated while developing the sub city plan since this is a VIP area. Planning exercise needs to be sensitive to the special requirements of the area. Beggars' rehabilitation plan needs to be developed. Disaster management would include fire, earthquake and other natural and manmade disasters.

15.5 CONSULTATION SESSIONS WITH TRADERS ASSOCIATION AND RESIDENTS WELFARE ASSOCIATION:

Views, reactions were sought from these stakeholder groups in these sessions. The participants were asked for views on the baseline situation related to overall situation and urban infrastructure followed by their priorities for development. The findings of the consultations by stakeholder group have been presented below:

15.5.1. Key Findings of Discussions with Traders Association:

Following were the key issues raised and recommendations made by various Traders Association representatives from NDMC area. A detailed proceeding of the same is attached in **Annexure 4**.

Overall Aspects

- **Inadequate people's Representation:** The trader's associations highlighted the need for a Representational system and accountability in the council. Wherein an autocratic system should be transformed to a more participatory system with greater accountability to the citizens.
- **Capital investments should be NDMCs responsibility:** Redevelopment of facades or capital investments should be the council's responsibility, with O&M responsibilities of the same, falling within the ambit of traders association.
- **Illegal Hawking and Begging:** To prevent illegal hawking and petty trading in the markets, attempts should be made to legalize them during evening hours i.e. between 7 pm to 10 pm. Also measures should be devised to deal with Begging and beggars in and around the markets.

Infrastructural Aspects

- **Power problems due to obsolete infrastructure:** Electricity is a major issue of concern in markets such as Bengali market and Connaught place. Specifically due to obsolete infrastructure such as faulty wires, worn out cables, obsolete infrastructure such as old pillars, which cause frequent power cuts and fire problems in the market due to short circuits.
- **Toilet arrangements in Market complexes:** Toilet arrangements in market complexes are either inadequate or ill maintained. It was suggested that this facility can be conveniently maintained by enforcing the "user pay principle".
- **Lack of proper collection and transportation of waste from the market complexes:** Garbage collection from newly installed green and blue bins in the

market is practically nil. Only rag pickers are observed to be lifting garbage which is of use to them and scattering the rest, thus creating a receptacle of nuisance over the streets. Door to door collection was suggested on a “polluter pay principle”.

- **Inadequate Water supply in the market complex:** Water supply in market complexes is limited to one hour a day. All restaurants and dry cleaners manage to draw excessive water from extraction through bore-wells.
- **Traffic congestion and parking:**
 - **Better management of parking instead of pedestrianisation:** To deal with congestion or unmet parking demands, a systematic pedestrian plan should be devised instead of complete pedestrianisation of the area.
 - **Parking in CP should also be regulated through prohibitions** on outsiders such as metro users and passer byes, thus retaining the character of Connaught place as Central business District.
 - **“Through” traffic in CP:** Railway station currently brings in maximum through traffic and the MCD civic centre and Shivaji terminal being converted into a metro station (en-route to the airport) is likely to further aggravate this. Special provisions such as “re-routing” plan should be devised to de-congest this area from “through” traffic.
 - **Better Street Furniture should be developed:** Good information systems, clear signage and proper street furniture is an immediate requirement for the Connaught place area.
 - **Contractual parking:** contractual parking should be systematically planned and carefully managed.

15.5.2. Key findings of discussions with Residents Welfare Association

Following were the key issues raised and recommendations made by various RWA representatives from NDMC area:

Overall Aspects

- **Multiple land use is an obstacle in residential areas** such as Babar lane. This is significant due to inadequate infrastructure to take the stress of increase in population due to its multiple usages.
- **Encroachments and Unauthorized Squatting:** Religious encroachments along with commercial activities in public areas are not dealt with effectively by NDMC. There is no policy/ law to protect pedestrian’s right of way on the foot path, which are taken over by these encroachments. Unauthorized squatters on pavements, Taxi stands next to schools are a safety concern for the passerby’s and children.
- **Property tax system should be revised** as per unit area method as applicable in the MCD area and not on market rent basis.

- **Heritage and conservation shouldn't be allowed to indiscriminately come in the way of the future:** Renewal or rebuilding should be done along with up gradation of infrastructure to deal with the inevitable densification.
- **Representation of Citizens in Governance Structure of NDMC:** It was strongly felt that the NDMC is governed in an autocratic manner, with inadequate accountability to resident citizens. A system for representation of residents in the body is required.
- **Institutional inadequacies and Inefficient manpower of the council:**
 - NDMC staff is found to be highly incumbent in service delivery such as gardening, sweeping, etc within residential localities. They are highly remunerated and lack accountability due to their long standing job security.
 - Following measures are suggested to capacitate the manpower and improve departmental efficiency within NDMC:

Manpower accountability

- a) To ensure manpower efficiency, an appraisal system should recognize their faults as well as strictly deal with major mistakes.
- b) Time bound action plan should be drawn in each department which should be strictly adhered to.

Departmental accountability

- a) An expert standing committee¹ should be formed to strengthen sector specific areas within NDMC. Also, Empowered nodal officers' needs to be nominated in NDMC to address the concerns of the residents.
 - b) All officials at all levels should have measurable annual and long term targets. These officers should be given the power, the mandate as well as hierarchical authority to take corrective steps.
- **Lack of a representation and a complaint redressal system:** Non representation of stakeholders in the council and lack of regular interaction with the local stakeholder is the biggest roadblock in efficient development and maintenance of the area. Also, No systematic complaint redressal system exists for infrastructure specific issues. It is suggested that the complaints should be addressed by the respective department through an "action taken report".

Infrastructural Aspects

- **Outdated power distribution system:** This causes frequent breakdowns and power failures and thus needs to be revamped and upgraded.
- **Road Infrastructure:** Frequent layering of roads has raised the level of roads causing inflow of water in the residents and damaging the arches due to vehicular movement. Parking needs of commercial areas should be adequately provided for, in order to prevent overspill into residential areas.

¹ Not from the NDMC staff personnel

- **Water Supply management:** Usage of Drinking water for horticulture and cleaning should be stopped and replaced with provisions of unfiltered water for the same. Water harvesting should be done more efficiently. Availability of water, which is insufficient, is an issue.
- **Provisions for adequate sanitary arrangements** such as urinals and toilets should be made in the residential localities as well.

Annexure 1

Agenda for Workshop

Date: 18.05.07

Session 1: "Overall Development vision and Direction for growth",
Chaired by: Mr.B.P Mishra, (Ex. Chairman- NDMC)

Schedule	Agenda
9:30 AM to 9.45 AM	Registration
9:45 AM to 9:55 AM	Welcome Address by Mr. Parimal Rai. (Chairman, NDMC)
9:55 AM to 10:05 AM	Introductory Address by Mr. Mahesh Babu (CEO, IL&FS Ecosmart)
10:05 AM to 10.15 AM	Inaugural Note by Chief Guest, Sh. Ajay Maken
10.15 AM to 10.30 AM	State of the area Presentation
10:30AM to 11.45AM	Presentations by expert panels and discussions - Over all vision w.r.t <i>Built Heritage- Romi Khosla</i> <i>Natural Heritage- Pradeep Kishan</i> <i>Land Growth Management- Sudhir Vohra</i> <i>Environment / Horticulture- Ravi Aggarwal</i> <i>Governance (NDMC / Delhi)- B. P Mishra</i>
11:45 AM to 12:45PM	Discussions on development goals and strategies for the area.
12:45PM to 1:00PM	Concluding Remarks by <i>Sh. B. P Mishra</i>
1:00 PM: 1:30PM	Lunch

Annexure 2

Agenda for Workshop

Date: 18.05.07

Session 2: "Infrastructure Development vision and Direction for growth",
Chaired by: Mr Omesh Saigal, (Ex. Chief Secretary)

Schedule	Agenda
1:45 PM to 2: 00 PM	Registration
2: 00 PM to 2:15 PM	Welcome Address by Mr. Parimal Rai, (Chairman, NDMC)
2:15 PM to 2.30 PM	Introductory Remarks by Dr. Somnath Mukherjee (Vice President, IL&FS Ecosmart)
2:30 PM to 2:45 PM	State of the area Presentation
2:45 PM to 3.30 PM	Presentations by expert Panels and discussions - Roads and Transportation-B I Singal, D-MITS Water Supply and Sewerage-Ranbir Yadav, DJB Solid Waste Management- Dr. Sunil Pandey, TERI Power, Mr. S.R Sethi, Delhi TRANSCO
3.30 PM to 4.30 PM	Discussions on Infrastructure goals and strategies for the area.
4:30PM to 4:45 PM	Concluding Remarks by Mr. <i>Omesh Saigal</i>
4:45 PM to 5:00 PM	Tea

Annexure 3

Proceedings of the Stakeholder Consultation Workshop for NDMC sub city plan, held on 18th May 2007.**Session -I - "Overall Development vision and Direction for growth",**

- The session opened with a welcome address by the NDMC chairman Mr. Parimal Rai. The issues of densification for redevelopment of the prime area, management of through traffic and floating population passing by the NDMC area, availability and enhancement of public recreational places were highlighted in this introductory address. He also pointed out that the sub-city plan would be a vision document for the future of New Delhi.

**Mr. Parimal Rai, Chairman, NDMC**

- Mr. Ajay Maken, the honorable chief guest, stressed the significance of sub city plan in integration with the holistic plan of Delhi. It was highlighted that specific proposals

**Shri Ajay Maken, Minister Of State, (Urban Development), Honorable chief guest.**

should be integrated with city level plans however Local Area plan is a must for successful planning. As far as density of the area is concerned, it is assumed that it's likely to increase however; there is a need to reconsider development control regulations that lead to unauthorized construction.

Furthermore, adequacy of water supply appears unquestionable in this area however frequency

of availability is a matter requiring immediate address due to T&D losses of 12% in the area. Unaccounted for water should be minimized to 15% from 42%. Overall, the minister emphasized that all development in NDMC areas should be carried out keeping in mind heritage considerations and height restrictions.

- Land Growth, Built Heritage and Natural Heritage:** Following were the points highlighted by various panelists and stakeholders with respect to Land Growth Management and Built and Natural heritage of the NDMC area.

- Mr. Romi Khosla (panelist) emphasized the relevance of heritage (in terms of its use to the city). Heritage management does not imply only physical planning, it constitute **development of Human resource and social opportunities**. It is more specific in terms of civic governance in the NDMC area due to three different agencies having authoritative control over the NDMC land. Emphasis was made on five aspects of development. These are-



Mr. Romi Khosla, Architect/Urban Planner

- a. Economic Facilities
(Right to buy, sell and trade)
- b. Social Opportunities
- c. Health guarantees
- d. Local democratic governance
- e. Safety.



Mr. Arun Rewal, Architect/Urban Planner

historical or heritage importance. Since land is scarce it needs to be channelized as per its current demands. Several agencies that do not require being there today, are still there because they occupied land for historical reasons. **Redevelopment** is the need of the hour, the city needs more public spaces, and the NDMC can offer these which should be linked to access (to these) through public transport. Land should come within the administrative confines of the local government for its proper management.

- A layer of development was suggested in the NDMC area having all important planning components which are currently lacking in present day plans. These are development of; a Vision, a development framework, a definition of partnership, Implementation and financing.
- Mr. Sudhir Vohra stressed on the importance of land for its current usage rather than its

- Other experts also stressed on **redevelopment alongside retention of green areas** within NDMC area. Redevelopment was specifically pointed with respect to creating public spaces by taking over large tracts of excess land available with the bungalows. **Government colonies** such as Bapa Nagar and Kaka Nagar that are found to be in extreme dilapidated conditions can be targeted for redevelopment, with specific emphasis on increasing its density, at the same time, development of adequate green and open spaces in these areas.



Mr. Sudhir Vohra, Architect/Urban Planner

- People's representatives by RWA members highlighted on the inevitability of Re-densification and thus mentioned that priority it should be carefully planned for, as areas demarcated for 1 storey development; 2 storey developments; and Multi story development. Vacant land should be identified and put to judicious usage. However tree height and green belt of the area should be carefully maintained and regulated.
- Some Flexibility should be available in interpretation of enlisted areas as per the notifications. Conservation should be viewed with respect to the needs of development. Even if something has been listed, it should be open to debate.
- Another set of experts emphasized on conservation and maintenance of historical and heritage areas. Mr. O.P Jain from Intach stressed on the significance of NDMC area as a



Mr. O.P Jain, INTACH

Garden for the whole city rather than as land resource for the city. **Conservation along with densification** was stressed as an important aspect.

- Mr. AK Jain from DDA ruled out the need for redevelopment. As per the expert, **conservation along with infrastructural development** of the area should be

stressed upon. Examination of need for new roads in the area, development of nallahs such as Barapullah and Kushak nallahs, pedestrianization of the selected areas such as inner circle of Connaught place and development of rail corridors as economic corridors should be focused on.

- The counsel from the Waqf Board emphasized the inclusion of Waqf properties in the planning process. Integrated planning must be undertaken for a group of properties

(eg. Jama masjid --- properties belonging to several owners were developed together; Nizammuddin). This must be done for the Karbala in Lodhi Colony as well.

- Mr. Pradip Krishen emphasized the need to, **ecologically plan plantation** than simply on the basis of aesthetics. Assumptions that the plantation undertaken by the British were necessarily good and needs to be retained were also challenged, since most of the trees planted by them turned out to be dry instead of evergreen. Neem which is found in quite a number in Delhi is the most vulnerable tree. During stormy days it gets uprooted pretty easily



Mr. Pradip Krishen, Ecologist

because there is no tap root for Neem. It was suggested that an audit should be undertaken and plantation should be evaluated in the context of climatic and urban setting. The ridge needs to be protected and managed in a more comprehensive way since its been evidenced that of 12 - 13 species tried out in the ridge at the time of development, only the Vilayati Kikad succeeded, and has now edged out the native species.

- **Environment**

- NDMC is a special administrative zone, but is linked environmentally, to the rest of the city. It serves as an environmental sink for the city. Thus being an intensive resource consumption zone vis-à-vis important environment sink. Exchange value of NDMC needs to be mapped and recognized. Improvement and up gradation of service delivery in the area is required. Area has high water recharge potential, this need to be harnessed. NDMC has to compensate for Delhi in terms of environment Exchange.
- NDMC sits on a huge aquifer (only NDMC). There is a need to re-examine ground water recharge.

- **Administration and Governance**

- BP Misra: NDMC should be empowered to take actions as determined by the act. Since currently Central Govt has significant authority over the area, but isn't in a facilitative state since most of the land falls within its ambit. NDMC effectively governs only 22 sq. kms with approximately 22,000 staff for the same. Visioning for the NDMC area with respect to energy conservation in its area and efficient power distribution was



Mr. B.P Mishra, Ex Chairman (NDMC)

also emphasized.

- RWA members highlighted alteration of the representational system. Introduction of at least 4 independent representatives was stressed within NDMC area, which should be de-linked from political parties. Usage of maximum technological options was also stressed upon.
- NDMC has huge potential to generate resources, however due to certain administrative limitations it is constraint full. 80% of the NDMC property is Govt. property. And it earns only 10% of its revenues from the government property whereas rest 90% is generated from the private property. Embassies and other properties leased out to various agencies merely pay rent and their respective facility bills.

Proceedings: Session 2- "Infrastructure Development vision and Direction for growth"**Power**

The expert panel Mr. Sethi highlighted following aspects with respect to power status of the NDMC area

- NDMC being a deemed licensee for electricity distribution, should maintain a separate balance sheet for distribution.
- There is also a need for commercial orientation in NDMC, the system should get fine tuned and upgraded as per new technological option.
- Automation is required. SCADA has been implemented all over the country on networks of 220V and above however 12% losses are considerably high. Suburban Mumbai (larger area; more theft) has less than 9%; Korea (as a country) has 10% as a whole. A Well



Mr. Baleshwar Rai, Chairman (Power Grid Corporation)

designed distribution systems report losses between 4 - 5 %. Ideally in NDMC as well, the losses shouldn't exceed 5%. Thus measures should be taken in this respect. Therefore, automated systems in NDMC area will cut down the losses. Static meters should be installed since old electro mechanic metes result in more losses as they are slow

by almost 5% to 7%. Automatic meters will also facilitate in online meter reading and bill payment. Automation and up gradation of electrical sub-stations should be undertaken. These include adoption of technologies such as SCADA ((Supervisory Control And Data Acquisition), EMS (Energy Management System), GSAS (Grid Substation Automation), Communication System: for SCADA and other applications (Voice, Video, ERP data etc), GIS: Geographic information system of Cables and Transformers, Fault Management System, Energy audit of distribution transformers and LT feeders, Consumer Indexing on LT feeders and Distribution transformers. An MTS (Material Tracking system), system must be available to all managers in order to ensure efficiency.

Transport

The expert panel Mr. B.I Singal, highlighted following aspects with respect to Transport status of the NDMC area

- NDMC area is ridden with three specific **traffic characteristics** which need special arrangements, these are-
 - a) High through traffic --- the obvious solution is to think of by-passes.
 - b) Heavy pedestrian traffic --- provide adequate facilities, and pedestrianise key areas.

- c) Heavy unmet parking demand --- look at the CDB dispersal systems that various cities have implemented (Miami, Detroit, Houston) i.e. to ensure parking outside the CBD.
- Two specific transportation problems in the NDMC area are:
 - a. To reach and exit the area --- this is being taken care of, as part of the city wide network. There will be 4 - 5 corridors serving the NDMC area
 - b. NDMC dispersal system - this should be the focus within the transport strategy. Pick up people from the radials and transport them to their destination in the area.
- The entire planning for transport is usually vehicle based. Not pedestrian centric at all. A pedestrian plan for the NDMC area could be a pioneering effort.
- The Supreme Court has recommended development of cycle tracks all over the city; this should be implemented in the NDMC area as well.
- Make parking charges prohibitively high during key hours, in order to disperse parking demand.
- Multi storied building should have elevated interconnected pathways. This will be a major factor in reducing congestion.

Waste Management

- The collection efficiency of waste generated from NDMC area should be enhanced. The transport infrastructure should be upgraded. Green (CNG - based) modes of transport could be looked at. Specific issues of plastic waste and bio medical waste management should be tackled in priority.
- "Polluter pays" principle should be incorporated. Institutional and commercial areas need to be held responsible for their own waste and NDMC should regulate this or make this mandatory. Large generators of horticultural waste should keep their waste inside their premises until NDMC can collect it; they should also pay for this service (Bungalows).
- Service fee can be made mandatory in the residential areas
- Allocation of space for waste recycling and segregation stations should be done through NDMC for waste management in their area.
- Declaration of NDMC areas as a "no tolerance zone" for littering - issuance of *chit chalangans* for the same.

Water

- NDMC area has inadequate storage capacity for water. This should be enhanced to ensure regular water supply. Services of this nature may be constructed underground to tackle land constraints.

- Recycle water for horticultural purposes - DJB water to be used only for drinking thus ensuring availability of water for 24 hours in a day.
- Installation of small capacity STPs's in the public gardens, and usage of the water for horticulture purposes.
- It was also suggested to develop water bodies in the NDMC area.
- Storm water drainage system needs to be upgraded, services in the area have become old and they need maintenance.
- International practice of providing modular services needs to be followed so that there is a possibility of increasing their capacity in future.

Others

- Due to paucity of space and congestion problems, the Services in the area should go underground (shopping; parking; toilets, walkways; electrical cables). The sewer system can be revamped making them deeper in order to make space for underground toilet arrangements.
- The city development plan has completely ignored the law and order situation in the city. Security considerations need to be integrated while developing sub city development plan since this is a VIP area and planning exercise needs to be sensitive to the special requirement of the area. The design and placement of barricades and other security structures need to be given due consideration. Beggars in the area are becoming public nuisance and they need to be rehabilitated, the development plan has not taken due account of this aspect. The sub city plan needs to have a section on disaster management without which the plan remains incomplete and inadequate; this would include fire, earthquake and other natural and manmade disasters.
- Technological and management up gradations are required, NDMC does not follow the international system of using service ducts --- this should be introduced. Modular services should be introduced so that they can be augmented efficiently.

Annexure 4

Proceedings of the Stakeholder Consultation Session for NDMC sub city plan, held on 1st June 2007 with Traders Associations and Residents Welfare Associations

Key findings of Consultations with Traders Associations

Following were the key issues raised and recommendations made by various Traders Association representatives from NDMC area:

Bengali Market

- No **people's representation** through elections is a cause of concern since voices of people are barely addressed or heard.
- **Electricity** is a major issue in Bengali market area due to faulty wires, worn out cables, obsolete infrastructure such as old pillars, which cause power break downs time and again often causing fire problems in the market due to short circuits. This problem is seen since almost 4 years, significantly due to increase in the number of offices and MNCs in this area. Approximately 6 points of supply cater around 60 shops, on an average.
- No Street Scape in the Bengali market. Fountains have faulty designs.
- **Toilets** meant for visitors in Bengali market are non usable; these should be properly maintained as done in other parts of NDMC area such as Lodi colony. It was stated that the willingness to pay for facilities exist in the area, thus proper operation and maintenance can be ensured by enforcing the "user pay principle". It is also observed that the staff deployed for facility management in these toilets is anyways charging unofficially from the users. Therefore this practice can be formalized.
- **Waste Management** is matter of concern since although segregated bins have been installed, but their is no collection of garbage from these bins. The representative of the association welcomed the door to door collection system on a user pay basis.
- **Begging** and beggars is becoming a serious law and order problem specifically in and around the markets.



Mr. Pramod Gupta, Bengali Market Traders Association

- **Water supply** in the market complex is starkly inadequate being limited to one hour in a day. All restaurants and dry cleaners manage to draw excessive water from extraction through bore-wells.
- The **parking** management in Bengali market was earlier in the hands of private contractors, until the market association decided to take over its management. Now the parking is being systematically managed and the Bengali markets Traders Association is paying Rs. 60,000/ month for management rights. The Market Association has also been awarded the *Bhagidari* prize for the same.

New Delhi Traders Association

- **Traffic and parking :**

- To deal with congestion or unmet parking demands, complete **pedestrianisation** of the area is not desired. It is advised to make the place convenient for pedestrian through a systematic pedestrian plan and not through complete pedestrianisation of the area. As per the CP plan, it is proposed to pedestrianise parts of the market, and remove parking to far away locations such as Shivaji Park; Jantar Mantar; Curzon Road, etc. However the traders feel that parking should, and can be, better managed at its current location. Presently it is sub-contracted several times, and the cost to contractor increases every time. Therefore the contractor attempts to make it cost effective by fitting more than the manageable number of cars in the given parking space.
- Parking should also be regulated. CP is a shopping arcade and a Central Business district (CBD) and not a recreational area, so parking should be prohibited for metro users and other through tasks. Thus a system should be devised whereby outsiders should be prohibited from parking here.
- Through Traffic in Connaught place is likely to get further aggravated due to construction of the MCD civic centre. Thus, such haphazard planning is also a matter of concern.
- Good information systems, clear signage to guide people about systems that are being put in place (e.g. traffic re-routing in CP) and proper street furniture is an immediate requirement for the Connaught place area.
- Shivaji bus terminus is being converted to a metro station en-route to the airport. Check-in facilities will also be provided here. This will further increase congestion in the area, since airport traffic will also be routed through CP.
- Railway station brings in maximum "through" traffic in the CP area. A dispersal system should be devised whereby more trains should operate from other railway



Mr. P Khanna and Mr. Vinay Bahl, New Delhi Traders Association (NDTA)

stations of the city thus reducing congestion arising in CP due to New Delhi Railway station.

- **Solid waste management and Sanitation:** Garbage collection was highlighted by most of the market Associations (except Sarojini Nagar) since no collection is being done from the bins placed in the market. As a result, in the morning when the markets are swept, these bins get overloaded with no collection throughout the day. Only rag pickers are observed to be lifting garbage which is of use to them and scattering the rest, thus creating a receptacle of nuisance over the streets. It was further highlighted that Connaught place has very few toilet arrangements for regular visitors.
- **Power supply** in the CP market complex is extremely erratic with average power cuts of 3 to 4 hours per day. Resultantly most of the restaurants and shops rely on DG sets to meet its power requirements.
- It was also objected that redevelopment of facades or capital investments for this should not be the responsibility of the traders. The operation and maintenance can fall within the purview of shopkeeper's or traders' responsibility.

Sarojini Nagar Traders Association

- Current **Parking situation** in Sarojini Nagar Market is inadequate and dismal, despite of adequate land availability for parking at least 15,000 vehicles. This systemization of parking space has been pending for almost 7 years. The site the park near the central library located in Sarojini Nagar.
- **Illegal hawking** and petty trading is a common problem in Sarojini Nagar market. It is suggested to legalize these traders and hawkers during the evening hours i.e. between 7 pm to 10 pm.
- **Representational system** and accountability in the council is essential. NDMC is perceived to act in a very autocratic manner. Thus a system should be devised which has scope for debate and questioning through consultation at various levels. A representational and transparent local body will allow for greater accountability.
- **Power arrangement** in Sarojini Nagar market area is sufficiently adequate. It is assumed that power is being diverted from the surrounding government residential areas.



Mr. Satram Dass, Sarojini Nagar Traders Association

Key findings of Consultations with Residents Welfare Association

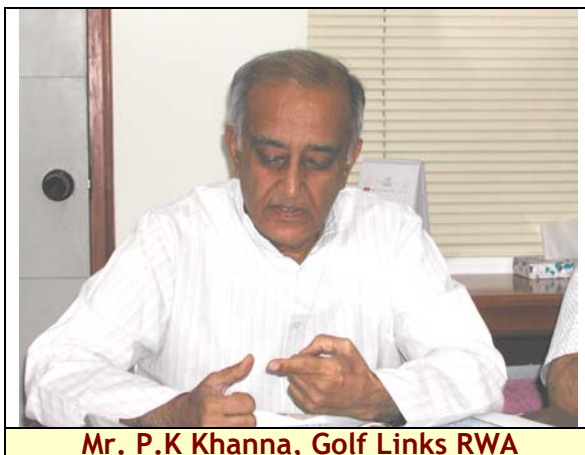
RWA representatives from four different residential colonies of NDMC area, highlighted following issues and concerns during the discussion exercise:

Golf Links RWA

- **Incumbent NDMC staff:** Wasteful expenditure by NDMC should be curbed. Specifically with respect to manpower deployment such as gardeners and sweepers on NDMC

payrolls, who are found to be extremely inefficient. Though highly remunerated, they do not perform due to their long standing job security and lack of accountability.

- **Trees and plantation** in the NDMC area is suffering due to inadequate care and nourishment in the hands of incumbent staff. After plantation the trees are not taken care of, NDMC does not even ensure adequate irrigation to the young sapling, as a consequence their survival rate is very low.
- **Outdated power distribution system** cause frequent breakdowns. These need to be revamped completely. Linked lamp posting, sparking problems, open wires and feeder pillars require immediate attention.
- **Heritage and conservation** shouldn't be allowed to indiscriminately come in the way of the future. Since bungalows have long past lived their lives, renewal or rebuilding is required. Up gradation of infrastructure to deal with the inevitable densification is required.
- Non representation of stakeholders in the council and lack of regular interaction with the local stakeholder is the biggest roadblock in efficient development and maintenance of the area.
- Following measures can be undertaken to capacitate the manpower and improve departmental efficiency within NDMC:



Manpower accountability

- a) In a government system, a successful career path implies not making mistakes. No mistakes are possible only when no work is performed. Thus to ensure manpower efficiency the appraisal system should recognize the mistakes of the employee since an efficient man is likely to incur 20% of rectifiable mistakes. However disasters or major issues should be dealt with, strictly in a system.
- b) Time bound action plan should be drawn in each department. An empowered committee shall evaluate and take actions. Failure to decide or failure to take actions should be made punishable.

Departmental accountability

- a) Group of experts of national standing (not political appointees/ NDMC employees) should be deployed to help, participate and strengthen sector specific areas within NDMC.
- b) Whenever a developmental project is conceived a disagreement of any nature is likely to be at a political level. These disagreements should be recorded and tackled by the committee within a time frame. The committee will find merit and will make it transparent to the public.

- c) All officials at all levels should have measurable annual and long term targets. Any failures and incumbencies should be dealt with strictness in terms of retarded promotions, denial of increments, entry into CRs, etc.

Babar Lane Association:

- **Multiple land use** such as Commercialization within residential areas is a cause of concern. This is significant due to large floating population in the area, whereas, planning measures do not take the same into account while formulating plans and providing for infrastructure. In specific to Bengali Market, this complex was initially developed as a service market, however gradually it has taken the shape of a central market, thus laying stress on the infrastructure of the area.



Mr. G. Kotwalwala and Ms. Anita Bambey, Babar Lane RWA

- No **complaint redressal system** exists for infrastructure specific issues.
- Frequent **layering of roads** has raised the level of roads. This is a cause of concern since raised levels affect the flow of water into the houses. Also, raised roads may damage structures in the area due to movement of tall vehicles, such as buses. (eg. of arches under railway track connecting Red Fort and Salimgarh)
- **Water harvesting** should be done more efficiently. Although a harvesting system has been planned, this system has not been communicated or informed to the residents and RWA members, thus making the system defunct.
- Drinking water should not be used for horticulture and cleaning. Presently, supply of unfiltered water has been stopped; consequently drinking water is being used for washing, cleaning and irrigation in residential localities.

Bhagat Singh Lane Association:

- Numerous Grievances of the residents with respect to sewerage, power, potholes, etc. are often unanswered. A system of redressal should be developed wherein a time bound framework shall be developed, and the respective department should be answerable through an "action taken report".
- Religious encroachments along with commercial activities in public area are not dealt with effectively by NDMC. Unauthorized temples, Makbaras, Grave yards are encroaching foot paths and pavements. There is no policy/ law to protect pedestrian's right of way on the foot path.



Mr. Narayan Shamnani, Bhagat Singh Lane RWA

Diplomatic Enclave Association

- Inadequate Sanitary arrangements such as urinals and toilets are problem of concern in the area.
- Unauthorized squatters on pavements, Taxi stands next to schools are a safety concern for the passerby's and children.
- Stay animals create nuisance in residential settlements thus requiring immediate address.
- Property tax system in NDMC should be as per unit area method as applicable in the MCD area and not on market rent basis. Also government buildings share in property tax should be ensured through enforcement and regulation.
- Empowered nodal officers' needs to be nominated at NDMC to address the concerns of the residents. These officers should be given the power, the mandate as well as hierarchical authority to take corrective steps.



Mr. Virendre Tuli, Diplomatic Enclave RWA

Annexure 5

LIST OF ATTENDEES FOR NDMC STAKEHOLDERS WORKSHOP HELD ON 18.05.2007

SESSION - I

S. No.	Name & Designation	Address, Tel Nos., Email
1.	Sudhir Vohra, Architect, Urban Planner.	sudhir@sudhirvohra.com, 9810065104
2.	Ravi Aggarwal, Toxics Link	9810037355, ravig1@toxicslink.org
3.	Arun Rewal, Architect - Consultant to NDMC.	M:9810025725, arunrewal@eth.net
4.	Makrand Bakrore Sr. Research Associate	Centre for Civil Society Tel : 26537456 M : 9312444725 Email : makrand@css.in
5.	O. P. Gupta SE (E) P, NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9818046203
6.	Parimal Rai Chairman, NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi
7.	Anurag Goyal Director (Projects)	New Delhi Municipal Corporation Palika Kendre, New Delhi Tel : 23364699 M : 9810104273
8.	S. P. Sanwal Director (Admin)	New Delhi Municipal Corporation Palika Kendre, New Delhi
9.	Anand Director	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9810614220.
10.	G. P. Sharma CE, C-II	New Delhi Municipal Corporation Palika Kendre, New Delhi
11.	P. K. Jain Technical Advisor	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 M : 9810056625
12.	Rakesh Chhabra SSI	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9868039497
13.	Mr. Sanjay	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9911109537

S. No.	Name & Designation	Address, Tel Nos., Email
14.	B. B. Pandit FA	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9871555900
15.	Pradip Krishen	M:9811444010, pradipkrishen@yahoo.com
16.	Sandeep Kaushik Advisor (Transport)	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 M : 9812033811.
17.	V. S. Rustagi	M : 9810123819
18.	Vikral Samderiya	M:9968425256, vikalsam@rediffmail.com , Kalpvriksh, 134, Tower 10, Supreme Enclave, Mayur Vihar Phase I, Delhi- 110091, Tel: 22753714
19.	C. L. Jindal	M : 9810098727
20.	Ms. Ranjana Deswal Director	
21.	Jitender Kapoor Ex President	Golf Links Association Golf Links, New Delhi M : 9891470199
22.	N. K. Jain President	Golf Links Association Golf Links, New Delhi Tel : 24619383
23.	Mansoor Ali Sayyed CVO	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9818997272
24.	B. P. Mishra Ex-Chairman, NDMC	9899966669, A-14/3 Tilak Marg, India Gate, Supreme Court Road, Delhi-1
25.	M. K. Rai CMO	M : 9810459019
26.	Subhash Chandra Director (Horticulture)	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9818514440
27.	R. K. Kakkar Sr. Architect, CPWD	Central Public Works Department New Delhi M : 9811683989
28.	Anuradha Chaturvedi	IL&FS Ecosmart Limited

S. No.	Name & Designation	Address, Tel Nos., Email
	Consultant (Heritage)	Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 Tel : 26274989
29.	N. B. Majumdar Advisor (Solid Waste)	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 M : 9891580717
30.	Ravi Kalia	M : 9873123320
31.	Dr. Rommel Mehta, Head, Dept. Of Landscape Architecture, SPA.	M: 9811055227, Tel: 23702382, 23702375- 80, 9811055227, 23363010 (res), 6 Jain Mandir Road, Opp. Shivaji Stadium, New Delhi, myrmdesign@gmail.com.
32.	Aruna P. Sharma	M : 9891517518
33.	B. S. Rawat Dy Director (Planning)	New Delhi Municipal Corporation Palika Kendre, New Delhi Tel : 23392048.
34.	V. S. Madan, IAS Additional Director General	Archeological Survey of India New Delhi Tel : 23012058, 23014456
35.	K. K. Mutreja E-in-C, NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 9818562361
36.	O. P. Jain	Mobile : 9810114582. Indian National Trust for Art and Cultural Heritage, 71, Lodi Estate, New Delhi 110 003, Telephone 24631818, 24641304, 24632267, 24632269, 24692774, 24645482, Fax 24611290, intach@del3.vsnl.net.in <intach@del3.vsnl.net.in>, opjain@sanskritifoundation.org .
37.	S. S. Ghankrokta, Member Secretary.	DPCC, 4th Floor, I.S.B.T. Building, Kashmere Gate, Delhi - 110006, Phone: 011-23860389, Fax: 011-23866781, Email: msdpcc@hub.nic.in M : 9868548801
38.	Sanjay Kanvinde M. Arch, Urban Design	krcindia@airtelbroadband.in
39.	Shri Ajay Maken Minister of State	Urban Development Ministry

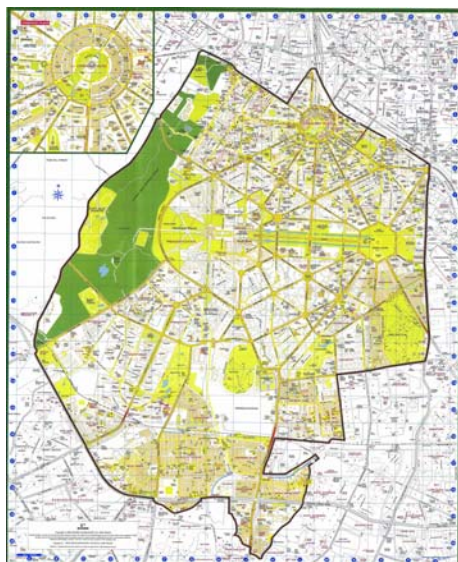
S. No.	Name & Designation	Address, Tel Nos., Email
40.	A. K. Jain Commissioner (CRG).	Office:23378085, akjain@del3.vsnl.net.in
41.	Om Prakash Asst. Information Officer P. R. Dept. NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi Tel : 23362267
42.	S. Miglani Additional Director (PR)	New Delhi Municipal Corporation Palika Kendre, New Delhi M : 23363753
43.	S. Reghunathan Former Chief Secretary, Delhi	A-61, Gulmohar Park, New Delhi-49, regu@nic.in , 9810116055.
44.	Romi Khosla, Architect, Urban Planner	Off. 26837015; res. 24603611; 24691228, off-41730173, info@rk-ds.com
45.	Seema Gulati Member, NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi
46.	Lt. Col. S. K. Garg MoH, NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi Tel: 23742752.
47.	Najimi Waziri, Legal counsel, Delhi Waqf Board.	M : 9810097311, Email : waziri@vsnl.com , najimiwaziri@vsnl.com
48.	S. K. Aggarwal Conservator of Forests	Conservator of Forests, Delhi Tel : 23378513, Conservator of Forests & Chief Wildlife Warden, Dept of Forest and Wildlife, Govt of NCT of Delhi, 2nd floor, 'A' Block, Vikas Bhawan, New Delhi, Tel : 23378513, 23370679.
49.	Mahesh Babu Chief Executive Officer	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 Tel : 24122493-94
50.	Suneetha Kacker	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 Tel : 24122493-94
51.	Neha Rai	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 Tel : 24122493-94

S. No.	Name & Designation	Address, Tel Nos., Email
52.	Sandeep Malhotra	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 Tel : 24122493-94
53.	Somnath Mukherjee Vice President	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 M : 9810502990
54.	Sumit Barat Manager - CDM	IL&FS Ecosmart Limited Suite 276 & 278, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi - 21 M : 9810832482

SESSION - II

S. No.	Name & Designation	Address, Tel Nos., Email
1.	Suneel Pandey Fellow	TERI Tel : 24682100 M : 9811312261, spandey@teri.res.in
2.	Omesh Sehgal Ex Chief Secretary, Delhi	M : 9868821514, 130B, Panchsheel Park, New Delhi-17, M.: 9868821514 / 26496747, omesh2@yahoo.co.in
3.	B.I Singal	DIMITS, bisingal@yahoo.com
4.	G. C. Saha Officer-in-Charge	Central Ground Water Board New Delhi Tel : 23384355 M : 9811854055, oicnd-cgwb@nic.in
5.	A. R. Ramanathan Architect, M/s TEAM.	21-B, Pocket -C, Sidharth Ext. New Delhi 14. Ph. 30901151, 26341039, Mob. 98102 - 89203, ar.ramanathan@gmail.com , Tel: 26341039 M : 9810289203
6.	Lavanya Marla Chintan	46574171, 9313063168, lavanya@chintan-india.org .
7.	Sham Mudgil DCP (F) Ministry of External Affairs	M : 9818201183
8.	N. K. Aggarwal ECGRF - NDMC	New Delhi Municipal Corporation Palika Kendre, New Delhi Tel : 23340754
9.	Anand Mohan DCP, New Delhi	DCP, New Delhi M : 9818099041
10.	Abhay Ranjan Chintan	M : 9312403192
11.	R. K. Jain Chief Engineer	Delhi Jal Board New Delhi M : 9810069901
12.	Ajay Gupta Executive Engineer	Delhi Jal Board New Delhi M : 9810773000
13.	Braja Kishore Singh Addl. Dy. Commissioner of Police	Addl. Dy. Commissioner of Police New Delhi District Tel : 23361919
14.	S. R. Sethi Director (Operations), Delhi Transco.	EE & REM Centre, 2nd Floor, SLDC Building, Minto Road, New Delhi 110002 ,India , 91-11- 23230452/23238263, 23232715

S. No.	Name & Designation	Address, Tel Nos., Email
		Fax 91-11-23231886, dir.opr@delhitransco.gov.in.
15.	P. S. Kohli Secretary	Jor Bagh Association New Delhi Tel : 24627946
16.	J. R. Grover President	Lodhi Colony Market Lodhi Road, New Delhi M : 9811041031
17.	Ashok Goel	M : 9811373676
18.	Ajay Narayan Ex President	Jor Bagh Association New Delhi M : 9811033228
19.	Qamar Ahmad, Spl. CP Traffic	JCP (police) Traffic, 5th floor, Police HQ, IP estate, New Delhi, Fax: 23490436, 23490221, jcptdelhi@vsnl.net
20.	Baleshwar Rai Chairman (PGC)	PGC, New Delhi M : 9811759199
21.	Basab Paul	Tel : 26714244



Chapter – 16 : SWOT, Vision and Strategies



IL&FS ECOSMART

Subcity Plan NDMC

CHAPTER - 16

SWOT, VISION & DEVELOPMENT STRATEGIES

16.1 INTRODUCTION

Evolving a vision for the NDMC area has been an iterative process, involving several interactions with individuals, as well as focus groups. During the deliberations, perspectives on, and aspirations for the area were put forward, in response to the perceived inherent potential of the area, vis-à-vis the shortfalls that are experienced currently. This, and the assessment presented in the previous sections formed the basis of the SWOT analysis of the area, and the subsequent development vision.

16.2 SWOT ANALYSIS

Strengths, weaknesses, opportunities and threats for the NDMC area are presented in the following tables:

16.2.1 Strengths

Sector	Strengths
Land and Growth Management	<ul style="list-style-type: none"> ▫ Low density of population ▫ High Standard of development (existing) ▫ Key cultural institutions located in the area
Environment and Built Heritage	<ul style="list-style-type: none"> ▫ Large extent of green cover ▫ Rich resource of built heritage
Roads and Transportation	<ul style="list-style-type: none"> ▫ Wide, well planned road network ▫ Good connectivity to all parts of Delhi
Service Provision	<ul style="list-style-type: none"> ▫ High standards of service provision
ULB Finances	<ul style="list-style-type: none"> ▫ Healthy financial position of ULB.

16.2.2 Weaknesses

Sector	Weakness
Land and Growth Management	<ul style="list-style-type: none"> ▫ Limited role of NDMC in decision making regarding development ▫ Lack of common data base among various land owning and development agencies ▫ Limited facilities for low income groups
Environment and Built Heritage	<ul style="list-style-type: none"> ▫ lack of comprehensive heritage management plan and strategy ▫ Limited role of NDMC in environment and heritage management
Roads and Transportation	<ul style="list-style-type: none"> ▫ Large extent of through traffic
Service Provision	<ul style="list-style-type: none"> ▫ outdated and inadequate infrastructure for electricity distribution ▫ water supply service is plagued by technical

	and financial deficiencies
Organisational Aspects	<ul style="list-style-type: none"> ▫ Weak inter-departmental coordination ▫ Inadequate systems for information collection analysis and feed-back ▫ Limited commercial orientation within NDMC
Governance	<ul style="list-style-type: none"> ▫ Limited representation from citizens in decision making ▫ Lack of information dissemination among public
ULB Finances	<ul style="list-style-type: none"> ▫ Limited revenues (property tax) accruing from large number of government properties and foreign establishments

16.2.3 Opportunities

Sector	Opportunities
Land and Growth Management	<ul style="list-style-type: none"> ▫ Central location in the city, with vibrant social and cultural institutions ▫ Substantial redevelopment of NDMC areas planned ▫ Obsolete land uses can be used to meet contemporary requirements
Environment and Built Heritage	<ul style="list-style-type: none"> ▫ Potential for development of tourism opportunities, based on heritage resources
Service Provision	<ul style="list-style-type: none"> ▫ well defined and limited geographic area - can spear-head innovative management initiatives

16.2.4 Threats

Sector	Threats
Land and Growth Management	<ul style="list-style-type: none"> ▫ Increasing development initiatives (within area and at peripheries) requiring efficient management of impacts (Metro hub, Civic Center)
Environment and Built Heritage	<ul style="list-style-type: none"> ▫ Avenue trees nearing end of life ▫ Rich resource of built heritage
Roads and Transportation	<ul style="list-style-type: none"> ▫ Increasing vehicular congestion, demanding improved management ▫ Parking problems discourage visitors to commercial areas
Service Provision	<ul style="list-style-type: none"> ▫ Up-gradation of infrastructure lagging commercial development in area
ULB Finances	<ul style="list-style-type: none"> ▫ Revenues and expenditure from distribution of electricity to be separated from municipal cash flows

16.3 VISION STATEMENT

Complementing the SWOT analysis presented above, the following concerns emerged as uppermost amongst all stakeholders¹ during the stakeholder workshops that were undertaken:

- The area should serve the social, community and recreational needs of the city
- Renewal or densification should take care to retain and enhance the green character
- The area should set a benchmark for the effective management of resources and wastes
- Capacity building for improved management of services should be undertaken within the NDMC
- Effective and representative governance

On the basis of the above, the following Vision Statement was formulated for the NDMC area:

An area that provides vibrant social and recreational spaces for the city as a whole through optimum utilization of land;

Demonstrates responsibility in the use and management of resources - water, waste water; solid waste; power

Builds efficiency in its service functions through adequate planning for renewal; the judicious use of staff & available technologies; and information management systems;

Is governed in a transparent, participative and responsive manner.

The focus areas are appropriate infrastructure, organizational efficiency and use of technology in processes and information management.

The organisation's internal vision, as stated in the Memorandum (revised) for the 3rd Delhi Finance Commission is summed up as "Clean Green New Delhi, with State-of-the-Art civic amenities, attracting high end economic, social and cultural activities." The focus areas emerge as civic infrastructure, economic development, sound financial management, and organizational rationalization.

Strategies across sectors to achieve the above vision are elaborated further below.

16.4 STRATEGY FOR CIVIC INFRASTRUCTURE DEVELOPMENT

16.4.1 Strategy for Water Supply

¹ Stakeholders consulted included government representatives, political representatives, academic representatives, NGO's, Traders Associations and RWA's.

Key issues

It has been assessed that although the resident population of the NDMC area is relatively small, the floating population is substantial. Thus the estimates of water demand and supply appear skewed due to the non availability of adequate information w.r.t the burden of floating population on water supply and sewerage services. The key issues in NDMC area with respect to water supply are as follows:

- Availability of potable water at present seems sufficient. However this supply is not likely to be sufficient to meet future projected demands.
- Inadequate availability of potable water for end users due to lack of supply pressure; inadequacies in storage infrastructure and leakages; and large scale use of potable water for other purposes². An associated issue is the difficulty in estimating the number of users in the NDMC area. In addition to the floating population, the large bungalows in the LBZ area often house several families over long periods; and a large number of service providers (and their families)³.

Water supply is intermittent and hours of supply vary from 2 to 8 hours a day. There is an immediate need to rationalize distribution, in order to meet the goal of equitable distribution.

- NDMC is not utilizing the potential to generate revenues from water supply services. Payments to DJB for bulk supply, and NDMC revenues from distribution indicate a wide difference.

Goals

Following goals are envisaged to meet the water requirements of the NDMC area:

- Adequate water, at source, should be ensured for resident as well as floating population.
- Adequate and reliable water supply at user's end
- To strengthen revenue generation from water supply in order to meet capital costs for up-gradation of infrastructure; and O & M costs.

Gaps

Following tables presents an estimation of the gaps in water supply availability and infrastructure:

S. No.	Goal	Gaps
1	Overall water availability	By 2021, an estimated gap of 12.08 MLD is projected
2	Availability at user's end	Assessed distribution losses are 25% (desirable standards are 15 %.) - Water mains in poor condition at certain locations.

² Other purposes include gardening, street cleaning and car washing. While unfiltered water is supplied for this purpose, it does not reach all residential areas; and is used sparingly due to the foul smell of the water

³ As reported by concerned officers.

		Varying water pressure in command areas of different reservoirs Residual pressure at ferrule point is inadequate.
3	Strengthening revenue generation	Cost of procurement not recovered through cost of supply: From domestic category users NDMC is charging Rs. 42.75 while DJB is charging Rs.147.00, thus indicating a difference of Rs. 104 .25 For Non Domestic category users, NDMC has a charge of Rs. 350, while DJB charges Rs. Rs.1125, thus indicating a difference of Rs. 750 Billing as per meter readings is done only for 5% of connections.

Strategies

To address the above gaps, and improve the end user availability of water, a series of projects have been proposed. These projects under the water sector can be categorized under three strategies:

- **Estimation Of Accurate Demand For Water** (& Sewage Generated), through a survey of floating population in the NDMC area - long and short duration. It has been assessed that although the permanent resident population is relatively small, (294783 as per Census 2001), a substantial population is of floating type. It is therefore necessary to estimate the floating population comprising of (a) those regularly working in the NDMC area say for 8 hrs or more call it static population, and (b) those who frequent the area for shopping, site seeing etc i.e.; for a short duration population, and does not pose impact on water supply. As per the discretionary functions of NDMC, it may carry out this census in its area.
- **Augmentation and Rehabilitation of Distribution System** A rational and equitable distribution of water can be aimed for through augmentations, up gradations and rehabilitation of the distribution infrastructure. Presently the UGRs are inadequate, or inappropriately located w.r.t. command area of distribution. The civil structure of various underground reservoir & BPS is in a dilapidated condition resulting in loss of water due to leakage and calls for early remedial measures.

Pressure drop is witnessed in many areas on account of local blockage /or highly incrustated condition of pipe. Inequitable distribution of water is reported from many areas having variations in elevation level. Many areas having an elevation of RL 220 m or more report low pressure complaints particularly from residents at first floor. This calls for pressure survey to ascertain causes of low pressure and consequent remedial measures.

There are 109 pumps & motors installed at the existing 23 UGR & BPSs out of which as per study conducted 29 pumps and motors need replacement at 13 UGR & BPSs. So far this work has been done at Bengali Market, Tilak Marg and is being taken up at Jor Bagh and North Avenue UGR & BPSs. Out of the remaining 9 locations pumps & motors at Laxmi Bai Nagar BPS can be replaced in second phase and all others in

the first phase. Projects proposed in order to ensure more equitable distribution of water include:

- a. Construction of Underground reservoirs (UGRs) and Pumping stations (BSPs).
- b. Repair of UGRs and BPS.
- c. Replacement of pumps and motors.
- **Promotion of Efficiency in Distribution and Metering.** Based on studies carried out so far approximately 24% to 25% of water received is unaccounted for water. The CPHEEO manual has given a suggested figure of losses at 15%. There is an urgent need to create a Leak Detection Cell and take remedial measures to bring down leakages in a progressive manner.

Presently, the total no. of existing water connections is 27,944. Billing is being done as per meter readings for 5% of connections only. There is need to relocate / remedy 16772 meters so that these are accessible for meter reading and consequent billing. Almost 50% of these meters may require replacement and there is a need to procure 20,000 new water meters. Also, there is need to audit the efficiency of E & M equipment both at the BPS's and tube wells. The projects proposed in this direction are:

- a. Creation of a cell for leak detection, monitoring of flow and pressures.
- b. Procurement of water meters
- c. Efficiency audit of E & M equipment at BPS's and tube wells.
- **Improvement of Unfiltered Water Supply** As mentioned earlier, NDMC receives untreated water for the purposes of horticulture. This is supplied to both the large gardens (although Talkatora Gardens received no UWS), as well as in the residential areas. In spite of this, large scale use of potable water is reported for horticultural use, and for washing cars, in the residential areas. This is due to the unpleasant odour associated with the UWS. Moreover several RWA's reported the non-availability of unfiltered water in their areas.

It is proposed to improve the quantity, as well as quality of unfiltered water reaching the area, in order to optimise the use of potable water. The following are proposed towards this:

- a. Replacement of treated effluent main from Okhla STP
- b. Rehabilitation of raw water trunk and distribution mains
- c. Pilot project for treatment of unfiltered water supply

16.4.2 Strategy for Sewerage

Key issues

As per the assessment by Tata Consulting Engineers (TCE), the existing sewerage system is more than 50 years old; it has been modified over the years from time to time. Of the interventions recommended in the report, those for the area north of Rajpath, and those for the area south of the railway line have been fully implemented, and those for the Doplomatis area have been partially undertaken. Only areas south of rajpath remain to be addressed. As per the assessment of the current state, by the Technical Advisory Board appointed by NDMC, the sewerage

system is adequate for the design population until the year 2040.

The entire quantity of sewage generated in the NDMC area is discharged to the DJB for treatment at the Okhla Sewage Treatment Plant. However operation and maintenance of sewer system within the NDMC area is the responsibility of the NDMC. Some of the key issues in this sector are as follows:

- The current volume of sewerage generated in the NDMC area is not clearly quantified due to inadequate population assessment of the area.
- A scientific study to ascertain the extent of siltation, settlement (if any) requiring repairs / rehabilitation to restore the carrying capacity as per design, etc. is lacking.
- The carrying capacity of sewers requires augmentation.
- There is need to audit the efficiency of E & M equipment at the SPSs.

Goals

Within the current situation, the goals for the sewerage sector include:

- Quantification of sewage generated in the area
- Rehabilitation of sewerage network to restore full carrying capacity
- Augmentation of sewerage network in identified areas.

Gaps

S. No.	Goal	Gaps
1	Quantification of Sewerage Generated	Will be addressed through the survey of the floating population (proposed above)
2	Rehabilitation	Sections have been identified (as per TCE Report). Work to be undertaken
3	Augmentation of network	Sections have been identified (as per TCE Report). Work to be undertaken

Strategies

Currently, sewage generated is considered as 80% of water supplied and NDMC is charged accordingly. The census of the floating population in the area (refer section above) will help to establish the true quantity of sewage generated.

As mentioned above, only some improvement work is required to be carried out on the conveyance network, which is 60 - 80 years old, and is currently inadequate to carry the sewage generated due to the increase in population. In addition to this, certain sections of the system have outlived their life. In this respect the following are proposed:

- **Rehabilitation of Sewerage Network.** This includes -
 - a. De-silting of sewerage system in NDMC area.
 - b. Selective rehabilitation of sewers using trench less technology.
- **Augmentation of Sewerage Network,** including,
 - a. Providing new sewers using trench less technology.
 - b. Augmentation of the sewerage system, at identified locations. It is proposed to undertake this using trench less technology.

16.4.3 Strategy for Solid Waste Management

Issues

Solid waste management within NDMC was, so far, being undertaken by the council's health department and their conservancy staff. Certain key issues, which have been encountered in the area till date include:

- NDMC does not have processing and disposal facilities within its area, being a land-locked area with high cost of land. Waste is disposed at Gazipur land fill site.
- Unsanitary condition of surroundings of secondary collection points
- 450 pairs of litter bins are provided for prevention of littering in various areas. However their location and placement needs to be strategically planned. The current situation depicts unscientific and improper stationing of litter bins.
- So far, no charges are levied for removal of garbage from institutional, commercial and (large) residential generators.

Goals

NDMC has recently initiated public private partnership for waste management, under which services for collection and transportation of waste in 12 out of 14 zones are undergoing privatization. Within the scope of work, storage, secondary collection, transportation and disposal of waste will rest with the private operator. Some of the issues listed above are likely to be addressed through this scheme - such as the conditions around secondary collection points, and appropriate placement of bins. Moreover, RWAs and NGOs have kick- started door step collection on a user pay principle.

However it is envisaged to fulfill the following specific goals w.r.t waste management to bridge outstanding gaps.

- To minimize the environmental footprint of the NDMC area - waste to be minimized through segregation of different waste streams
- To ensure "Polluter Pays Principle" in the NDMC area - it is envisaged that this will be ensured by the RWA's and NGO's undertaking door-to-door collection.
- To make NDMC area a "Litter- free" zone.

Gaps

Following tables presents an estimation of the gaps in waste management in NDMC area:

S.No	Goal	Gaps
1	Segregation of Waste Streams	Bulk generators and specific waste streams not provided for - eg.: C & D waste Inadequate trenching space in NDMC nurseries / gardens for horticultural waste.
2	Clean and healthy environment (at waste storage points - to be addressed by private operator)	Manual lifting of waste Inappropriate storage of different waste streams. Collection and transportation equipment not integrated.
3	Polluter Pays Principle - to be addressed by private operator	Poor service levels No disincentive for littering
4	Litter Free environment	Improper placement of litter bins without any strategic placements (market places, bus stops, etc.) No disincentive for littering. Lack of public awareness

Strategies

The strategies proposed for improving solid waste management are elaborated below:

- ***Segregation of waste streams to ensure effective end treatment and disposal through***
 - a. Arrangements for C & D waste transportation and disposal - skips and vehicle.
 - b. Provision of adequate facilities for composting of horticultural waste in the nurseries in the NDMC area
- ***Ensuring clean surroundings in public areas***
 - a. Procurement of mechanical street sweepers
 - b. Mobile vans to check littering, and issuing fines.
- **Training and awareness generation including:**
 - a. Public awareness generation.
 - b. Training and orientation for municipal staff

16.4.4 Strategy for Drainage

Issues

NDMC area being surrounded by a much larger area of MCD has a close inter-linkage with the natural as well as man-made drains in MCD area and beyond. Thus the key issues are looked in the wider context.

- Interventions in drainage are ad-hoc and piece-meal, rather than following an over-all plan
- Water logging occurs in low-lying areas during heavy precipitation, such as the Railway bridge underpass at Africa Avenue (Chankayapuri)
- Blockages in the drainage system are observed at many places.

Goals

Following goals are envisaged to ensure an efficient drainage arrangement within NDMC area:

- To undertake a comprehensive study of storm water drainage in the area, linked to the drainage system in the city as a whole, and well integrated with the planning of roads, leading to a long term plan for the sector
- To ensure rapid evacuation of drainage waters from all areas of NDMC.
- To ensure that the full capacity of drains is available at all times for evacuation of drainage waters

Gaps

Following tables presents an estimation of the gaps in drainage arrangement in NDMC area:

S.No	Goal	Gaps
1	Comprehensive study of Drainage in the area, linked to the city as a whole, leading to a long term drainage plan	Multiplicity of agencies looking after drainage issues - (MCD, NDMC, DJB, PWD, Department of Irrigation and Flood Control) - leading to piece meal approach. Lack of GIS based data for planning.
2	Rapid evacuation of drainage waters	Lack of regular cleaning and de-silting for unhindered flow during lean-season; and adequate capacity to carry storm water during heavy precipitation. Sub wells have not been developed under flyovers for trapping rain water. Pump-houses with back up powers are absent in low-lying areas.
2	Full capacity of drains available at all times	Lack of regular maintenance Inadequate removal of solid waste and construction debris, which are dumped

		into the drains
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Strategies

The drainage arrangements in NDMC area lack a comprehensive approach and planning due to multiplicity of agencies looking after this subject. This issue has recently been addressed by the Dept. of Irrigation and Flood Control, GNCTD, which is commissioning a city wide survey and study of the drainage situation and requirements. It is anticipated that the study will be completed in 2 yrs. In the interim, the following is proposed:

- **Anti-flood works be undertaken** through -
 - a. Capacity augmentation and improvement of road side drains and drainage system in colonies.
 - b. Provision of pump-house with back-up power for dewatering accumulated water at the railway bridge underpasses.

In order to prepare for emergency situations, an MIS based monitoring system needs to be developed; validated through simulated and actual testing; and meticulously put in practice. This exercise can be effectively done after the comprehensive GIS based study, currently being undertaken by NDMC, is completed.

16.4.5 Strategy for Traffic and Transport

Issues

The functional character of the NDMC area, forces a large through traffic including personalized modes and public transport to pass through NDMC area causing congestion and delays. Some of the key issues of concern are:

- High congestion and traffic load beyond the capacity of road network, in critical areas; and convergence of traffic in central area road network due to city structure (including 60 %- 70 % through traffic) causing congestion in NDMC areas especially in peak hours.
- High growth rate of PCU's on the road. High composition of private and Intermediate Public Transport (IPT) vehicles.
- Heavy on-street parking in areas such as CP & surroundings.
- Inadequate space for free pedestrian movement.

Goals

Goals for the transport sector have been formulated from a review of the secondary data and issues accumulated as a part of stakeholders' inputs and expectations from the system. These are:

- To ensure smooth flow of traffic with minimum congestion conditions

- Safeguarding the environment from the pollution caused due to rapid increase in vehicular traffic and congestion conditions
- To maximize the utilization of designated ROW for vehicular movement by addressing irregular and irrational parking
- To establish a pedestrian friendly environment.

Gaps

The following table presents an estimation of the gaps in roads and transportation systems in the NDMC area:

S. No.	Goals	Gaps
1	Smooth flow of traffic	<ul style="list-style-type: none"> • Congestion due to lack of diversions (by-pass) to central areas • Improper road design & lack of road signage, road markings & etc., • Inadequate traffic regulatory system
2	Safe guarding the environment	<p>high growth rate of PCU's on the road due to:</p> <ul style="list-style-type: none"> • Inadequate & inefficient public transport system • Lack of integration between different modes of public transport and intermediate public transport systems resulting in greater use of private vehicles. • Lack of inter-linkage between residential areas and PTS. • Lack of Dispersal system for public transport system within the NDMC area.
3	Well allocated parking facilities	<ul style="list-style-type: none"> • Lack of proper allocation and maintenance of parking spaces in critical parts of the city • Low parking charges and lack of initiatives in avoiding on-street parking. • Poor management strategies in available parking space.
4	Pedestrian friendly environment	<ul style="list-style-type: none"> • Lack of inter-linkages between footpaths • Lack of street-furniture • Poor surface condition of footpaths • Lack of strategies on evacuation of encroachments.

Strategies

NDMC area has to act as role model for the whole of Delhi in transport system development and optimization (management) of available infrastructure using advanced technological solutions to meet the demands and aspirations of residents and visitors. NDMC area is expected to provide services comparable to the best in the world and accordingly a set of benchmarks have been set for arriving at the projects in the area. Mandate of the NDMC as per the Act has been the backdrop for the identification of improvement proposals. Strategy wise projects identified for improvement of transport situation in NDMC area are presented below:

- **Optimization of Transport Infrastructure:** The available infrastructure needs to be optimally utilized to ease the traffic situation on roads along with the use of latest state of art techniques. Intelligent transport system (ITS) application can increase the efficiency of traffic management, improve the overall capacity of road system and enhance road safety and the urban environment. The capacities of the Rotaries can be increased by proper design as signalized rotaries. Traffic management techniques along congested roads and intersections can also enhance the capacities. The projects proposed are as follows:
 - a. Signalization of rotaries.
 - b. Beautification of Road Corridors in N DMC Area
 - c. Intersection improvement
 - d. Develop Area Traffic Control (ATC) for CBD Area.
 - e. Improvement of street scape (Bengali Mkt., Gole Mkt).
 - f. Road signage, Information system and street furniture along roads.
 - g. Road markings with Thermoplastic paint
 - h. Replacement of Old kerb stones.
- **Enhancement and management of parking** - Parking is the most critical problem in NDMC area especially in commercial areas and areas of intense public activities. Proper management & regulation and pricing as a tool to optimize the parking areas are very important. There is a need to develop new parking facilities using appropriate advanced techniques in busy commercial areas where there is very high value of land as well as scarcity of space and at the same time very high demand of parking. The total projects identified in this strategy are as follows:
 - a. Multi level car parking at Sarojini Nagar
 - b. Multi level car parking behind KG Marg
 - c. Multi level car parking at Baba Kharak Singh Marg
 - d. Multi level car parking at Khan Market and INA markets
 - e. Development of premium parking areas.
- **Integration of Modes of Public Transport** in order to tackle the growing rate of Passenger Count Units. NDMC area is served by Metro and buses as modes of public transport and there is need for proper feeder services for short distance trips from neighborhood to main corridors. Intermediate public transport modes like autos, taxis and mini buses can play a vital role in improving the rider ship metro / buses and this can reduce the load of private vehicles on the road. The reorganization of bus routes can reduce the traffic on CBD area busy roads. The total projects identified in this strategy are as follows:
 - a. Construction of Taxi & Auto Stands.
 - b. Interchange facility at Bus Terminals.
 - c. Battery operated Mini Bus Services from Metro stations and Parking and ride facilities.
 - d. Reorganization of Bus Routes and bus stops.
- **Ensuring pedestrian Safety and Connectivity:** NDMC area attracts a very high day population for the purpose of work, social, recreational and tourist activities and hence the pedestrian movement levels are very high. The vehicular traffic which is very high on the major roads is a danger to the pedestrian safety especially for crossing pedestrians. There is a need to develop

a comprehensive pedestrian plan for NDMC area. The total projects identified in this strategy are as follows:

- a. Construction of foot over bridges at 5 locations
 - b. Pedestrianisation of Connaught Place.
 - c. Pedestrianisation of Markets - Khan Mkt and Prithvi Raj Mkt
- **Enhancement of Road Infrastructure:** To accommodate the growth in demand for road space, there is a need to increase the capacity of roads. Since elevated structures are not permitted in Lutyen's Delhi, we can only go underground to develop exclusive right of ways for major directional movement of South to West and East to West Delhi. Proper techniques like milling are required to control the increasing level of roads. The total projects identified in this strategy are as follows:
 - a. Identification of by-passes / road capacity augmentation measures for the NDMC area
 - b. Construction of connecting ramps
 - c. Widening & strengthening of roads.
 - d. U.G. Connections.
 - e. Milling and up gradation of roads.

16.4.6 Strategy for Environmental Management

Issues

Although, planning for NDMC area has made progress in moving towards ecosystem approach to planning and managing activities, there are still many issues that contribute to environmental impairment as does pollution or resource depletion. These are:

- Lack of environmental consideration in the projects carried out in the area NDMC.
- Lack of comprehensive data on air and noise quality.
- Green cover under threat due to lack of planned approach in plantation and replacement of old trees. High Mortality rate of saplings and decreasing Biodiversity.
- Waste recycling not in common practice, the city's waste acts a burden to the region. Low incidence of solid and liquid waste treatment.
- High energy consumption in area.

Goals

Following goals are envisaged with respect to environment within the NDMC area:

- Every project (either development or maintenance) should evaluate the impact on environment and recommend an environmentally sustainable way of achieving the objective.
- To ensure Stakeholder awareness on air and noise quality in the area. Ready availability of data for research and planning
- To promote species conforming to local soil and environmental conditions. Programmatic replacement of trees taken up, with follow-up to ensure survival. To ensure that young saplings are nurtured and cared for and not vandalized.
- To thrive biodiversity in natural environment.
- To set stringent targets for waste minimization and efficient use of energy and water. Increased use of renewable energy. Reduced ecological footprint.

Gaps

The following table presents an estimation of the gaps in environmental management in NDMC area:

S.No	Goal	Gaps
1	All interventions (development or maintenance) to be optimal, with respect to environment.	Lack of environmental consideration in NDMC projects: No dedicated Environmental Division in NDMC exists, with a vision to integrate air, water, noise and green infra structure in the area.
2	Stakeholder awareness on environmental parameters	Environmental parameters not being monitored causing lack of comprehensive data on air and noise quality
3	Green cover	High Mortality rate of saplings Lack of scientific research and action plan for enhancing sustainable green cover. Non accountability of success rate of plantation.
4	Thriving biodiversity	No regular census of biodiversity Lack of awareness on decreasing biodiversity.
5	Stringent targets for waste minimization and energy efficiency	No solid / liquid waste minimization or treatment measure.

Strategies

- **Strengthening the Environmental Functions of NDMC:** Despite of being the site of considerable construction / renovation activities in the area, there is no in house mechanism in NDMC to provide environmental clearance to these projects. It has been felt that every project (either development or maintenance) needs to evaluate the impact on environment and recommend an environmentally sustainable way of achieving the objective. Hence a dedicated Environmental Department in NDMC, with a vision to integrate project activities with environment has been proposed. The need to continuously monitor

various environmental parameters along with continuous reporting has also been identified as one of the predominant needs in the NDMC area. Thus, the projects in this effect will include:

- a. Structuring of a division ; capacity building of staff and recruitment of subject experts
- b. Establishment of Environmental Quality Monitoring Stations. This includes 3 fully equipped stations for air, water and noise quality monitoring and development of procedures for warehousing and displaying information over the internet (GIS based).
- **Enhancing Green Cover and Bio-Diversity:** A majority of the trees in the NDMC area are reaching the end of their life and hence extensive re plantation is required to replace them. This needs to be carried out through scientific research and development of an action plan for enhancing green cover in a sustainable manner. This includes -
 - a. Research on local species &
 - b. Approach and Master Plan for plantation.

Though it is an accepted fact that the biodiversity of the area is decreasing, a detailed census of flora and fauna is long over due. The outdated data available makes it difficult to formulate an action plan to improve the biodiversity in the area. Thus it is proposed to

- a. Conduct a Census of flora and fauna every 3 yrs.
- b. Research on habitats - birds...etc.
- c. Promoting congenial environment through planned approach.
- **Reduction Of Environmental Footprint Of NDMC Area:** 19531 streetlights, 23 UGRs with Booster pumping stations, 3301 shops and a number of institutional buildings are being maintained by N.D.MC. There is a huge potential of implementing energy efficiency measures in these facilities. Efficient use of energy will reduce the ecological footprint of the area without affecting the output from the area. This includes
 - a. Energy audits of commercial areas under NDMC ownership (Preliminary investigations and tender management for appointing an ESCO).
 - b. Upgradation of street lighting, incorporating systems for energy efficiency.

16.4.7 Strategies for Urban Heritage

Issues

Encompassing most of the planned city of 'Lutyens New Delhi', the NDMC area has been successful in retaining, to a large extent, its distinctive 'urban form based on garden city principles' as a result of existing regulations for the 'Lutyens Bungalow Zone'. However, a number of issues emerging from the lack of a comprehensive heritage conservation and management plan for this area have been identified, which had resulted in this important urban heritage being designated as 'Endangered World Heritage' by the World Monuments Fund. Some of the key issues are:

- Inappropriate changes in the original designed character of the garden city capital due to intense re-densification pressures and the absence of a comprehensive heritage conservation and management plan for the area.
- Inadequate recognition of the specific heritage character and value of the various constituents of 'Lutyens New Delhi' within defined sub-zones⁴
- Delay in notification of List of identified heritage buildings and precincts within the NDMC area to provide a sound basis for urban heritage management
- Insufficient recognition of the valuable relationship developed between the built and natural resources of this area as part of the 'garden city plan' of 'Lutyens New Delhi'
- Lack of acknowledgement of the environmental services provided and the revenue generating potential of the heritage assets
- Deterioration and poor maintenance of certain open green spaces, roadside plantation and certain historic 'parkways'/'vistas, and accelerating loss of mature trees and overall environmental qualities.

Goals

The following goals are envisaged to ensure appropriate conservation and management of the heritage character of defined zones within the NDMC area:

- Formulation and implementation of a comprehensive conservation and heritage management plan for the urban heritage. This will clearly delineate.
 - zones and sub-zones with a concentration of urban heritage (Lutyens Bungalow Zone) to be conserved.
 - other sections of the NDMC area (post-Independence development outside of the LBZ) for which re-development according to local area plans and appropriate regulatory guidelines are permissible.
- Notification of a List of identified heritage buildings and precincts within the NDMC area to enable NDMC to efficiently discharge its responsibility for safeguarding the urban heritage⁵. Integration of the existing GIS with a heritage information system to ensure coordinated action for monitoring and management of the heritage assets, including the natural resources.
- Adequate recognition of environmental services of the NDMC area.
- Capacity building for integrated built and natural heritage conservation and management.
- Formulation and phased implementation of a historically and ecologically sensitive landscape conservation and replacement/replanting plan for open spaces and the road network in the NDMC area.

⁴ Including the 22 monuments, sites and heritage precincts designated as being of National Significance by the ASI, which pre-date the establishment of 'Lutyens New Delhi'; and 125 other listed heritage buildings and precincts of heritage significance.

⁵ as enumerated in Chapter III (u) - Obligatory Functions of the Council, as well as the Heritage Conservation Committee.

Gaps

The gaps identified in achieving identified goals for urban heritage conservation and management are presented in the following table:

S.No.	Goals	Identified Gaps
1	Formulation and implementation of a comprehensive conservation and heritage management plan for the urban heritage within the NDMC area	<ul style="list-style-type: none"> • NDMC is required under the Obligatory Functions of the Council to undertake plans for maintaining and enhancing the value of its heritage assets as well as for overall maintenance of the area. • However, the responsibility for preparation of the Zonal Development Plans & Local Area Plans currently vests with other agencies. As planning functions are not with the NDMC, piece-meal interventions have taken place without due regard for their impact on the heritage significance • Capacity for heritage management required within the NDMC
2	Comprehensive Database & Heritage Information System required for heritage monitoring and management	<ul style="list-style-type: none"> • NDMC List of heritage resources not yet correctly demarcated on maps or formally ratified. (Existing legal framework requires lists of heritage resources to be prepared) • Existing GIS requires expansion and up-gradation
3	Recognition and valuation of environmental services of NDMC area	<ul style="list-style-type: none"> • Lack of data for generating awareness of value of environmental services provided by the natural and cultural resources of the LBZ and other parts of the NDMC area to the city of Delhi
4	Conservation and heritage management of diverse heritage resources within the NDMC areas	<ul style="list-style-type: none"> • Insufficient coordination between various agencies responsible for different heritage components, • no comprehensive conservation and heritage management plan for the urban heritage • insufficient resource allocation.
5	Implementation of a landscape conservation and replacement plan.	<ul style="list-style-type: none"> • Phased tree re-planting plan currently under preparation and inadequate infrastructure in terms of nurseries, equipment and skilled work force, expertise in landscape design and planning for open spaces within the NDMC • Coordination required between various departments regarding road-widening schemes which impact on the roadside planting to ensure natural heritage is not lost • Encroachments onto roadside areas in the form of parking, taxi-stands etc.

Strategies

The strategies for improving heritage management is as elaborated below:

- **Enhancement of Global Image of the NDMC Area within Delhi through Systematic Heritage Management.** Re-delineation and Comprehensive Heritage Conservation & Management Plan for Lutyen's New Delhi.

- **Development Of An Information Management System** To Facilitate Integration Of Heritage (Built And Natural) Management Within Development Processes for the NDMC Area.
 - a. Final Inventory of Heritage Resources to be legally notified and maintained by the NDMC as the basis for future action.
 - b. Expansion of the existing GIS to include a GIS based Cultural Heritage Information System
 - c. Expansion of the existing GIS to include a GIS based Natural Resources Information System
 - d. Evaluation and quantification of Environmental Services provided by the garden city capital.
- **Development of In-House Capacity within the NDMC for Conservation Planning and Management** Of The Heritage (Natural And Built) Resources.
 - a. Establishment of a Heritage Cell within the NDMC Chief Architect's office, linked with Engineering cell and Horticulture Dept.
 - b. Improvement - upgrading and modernization of the NDMC nurseries
 - c. Provision for a Landscape Cell within the Horticulture Department
 - d. Training Programmes for nursery personnel.
- **Prioritization of Identified Heritage Sub-Zones and Precincts** - Preparation & Implementation of Detailed Conservation & Heritage Management Plans.
- **Development of Heritage Tourism Circuits within the NDMC Area.** Formulation and implementation of Heritage Tourism Management Plans for Development of tourism circuits and provision of tourist facilities and material.

16.4.8 Strategies for Capacity Building and Organisational Strengthening

Issues

The NDMC area enjoys a higher level of service than the city of Delhi as a whole. The main services provided by the Council include water supply, sewerage, public health services and sanitation, drainage, distribution of electricity, street lighting, roads and horticultural services. The management of these functions is organized departmentally within the NDMC. The key issues relating to capacity building for better management and delivery of services include

- There is very little strategic thrust in the various departments. Managers are involved in running operations. Action and energy is geared to respond to complaints, rather than strategizing or planning.
- Piecemeal HR approach, wherein very little attention is given to development of employees. The focus of interaction with employees is very welfare oriented. Hence, employees are seen as recipients and see themselves also as recipients.
- There is a large gap between senior management and junior management. This leads to work being overloaded for senior management. Middle and senior management are doing tasks that are very operational, leaving them no time for other work

- Coordination between departments is low, as a result of which work suffers. Stand-offs between departments are not uncommon.

Goals

The following goals are envisaged with respect to organizational strengthening in the NDMC. The focus of the goals identified is (a): to enhance customer experience, and orient the functioning of the NDMC towards this; and (b): to enhance performance within NDMC

- To establish the NDMC as a forward thinking organization
- To focus on capacity building of human resource in the organization, with an aim to ensure quality, timeliness, courtesy and sensitivity in service delivery
- To build a strong middle management , so that top management is free to undertake strategic planning
- To ensure that the various departments of NDMC work seamlessly with each other

Gaps

Gaps in achieving the above set goals are presented below:

S. No	Goal	Gap
1.	NDMC as a forward thinking organisation	No group of people dedicated to long term strategic and tactical thinking Lack of benchmarking and performance monitoring Lack of information gathering, analysis, and application on various aspects of NDMC's functions
2.	Focus on capacity building of HR	No holistic approach to HR, and growing the people and capabilities in NDMC No dedicated HR Department No comprehensive training and skills up-gradation programmes
3.	Developing strong mid-management	Lack of devolution of financial and decision making powers to subordinate officers No training, for mid-levels, in management skills
4.	Good inter-departmental coordination	Strong vertically organisation Lack of shared information and communication base

Strategies

A key area of concern, as reflected in the gaps identified above, is the lack of data, standards and information to organize working within the NDMC, as well as to review its services vis-à-vis its client base. The collection and streamlining of information has been addressed, in part, through the project proposed in the area of governance (ref. strategies for governance).

Strategies to address the other gaps are elaborated below:

- **Strengthening Corporate Functions and Quality Consciousness** - This is seen as an essential step to improve service provision. It is proposed to set up a corporate and quality cell, that will focus on the following aspects:
 - Establishing a strong techno-structure focusing on standards, measurements, analysis and quality within NDMC. The focus of this will be improved service delivery to the general public. This will gradually enable performance targets to be set in place as part of contracts (between organizations, or between employees and the NDMC)
 - Introduce benchmarking, evaluating and performance monitoring across various departments. A system of rewards, based on performance assessment can be developed based.
 - Introducing competition within NDMC Departments / circles for better performance (with reward incentives). Obtaining ISO certification can form the basis of competition
 - Improving financial planning and control systems to deliver results expected. This will focus on output-oriented systems especially in budgeting and expenditure; and the realistic charging of costs.
- **Focus on HR Functions and Training:** The broad aim of this strategy is to build capacity within the NDMC, in order to meet the identified standards, benchmarks and performance criteria that will be the outcome of the first strategy. The key intervention under this strategy is to establish a Human Resource Department that focuses on strategic HR, using instruments such flexibility in staffing; recruitment procedures; promotion based on merit and achievement rather than seniority; linking remuneration to performance; encouraging entrepreneurial behavior...etc

It is also proposed that the HR Department be supported by a strong training department that will report to it. The training department will focus on specific and general training; as well as technical training, through tie-ups with technical institutions so that staff is trained on an ongoing basis to learn use of technology and new productivity enhancing implements. Management training and orientation in the financial aspects of service delivery will be targeted at the middle management within NDMC, in order to strengthen their capacities.

16.4.9 Urban Renewal

Government Housing Estates and bungalows in the LBZ area constitute over 80% of the residential development in the NDMC area. Planned and built before 1960, these areas are characterized by extremely low densities, somewhat incongruous with the surrounding developments and the current context of the city. Renewal (redevelopment) and densification of several government housing areas has been proposed, and the CPWD has developed renewal schemes for Aliganj and Netaji

Nagar⁶. Similarly, the Detailed Development Plan for the NDMC area, currently being prepared by the DUAC, proposes significant densification of residential areas north and south of Rajpath. This however, is still under discussion.

In addition to the above initiatives, the following projects have been proposed:

- **Upgradation and Renewal of Connaught Place as Metropolitan City Center:** NDMC has prepared a plan for this purpose, keeping in view the existing scenario and issues requiring attention. The objectives of redevelopment plan, with a vision of next 25 years include (a): improvement of movement for pedestrians and vehicles, (b): parking & its capacity augmentation; (c): improvement of visual experience and environmental conditions; (d): infrastructure up gradation and (e): Restoration of façade and retrofitting of buildings

Conceptual components of the redevelopment include an uninterrupted continuous vehicular traffic movement on Outer Circus; partial pedestrianisation of the Inner Circle and its integration to the Central Park; under ground parking in Inner Circle; integration of DMRC entry / exits with underground parking and pedestrian movement; movement of vehicles in a loop; improvement of road geometrics; provision of multi storied car parking in the periphery of C.P.; regulated entry / exit to the Inner circle; surface parking on Radial no. 5 and outer circle; exclusive tunnel for services in the middle circle; improvement of landscape and provision of street furniture, improvement of existing subways; provision of new subways in the outer circle and façade restoration of Connaught Place .

- **Redevelopment of Obsolete Land Uses:** In particular, the land occupied by barracks in the NDMC area, now no longer under use. These need to be mapped, and a plan for their use prepared, so as to integrate them within the larger development plan for the area.
- **Provision of Common Utility Ducts along arterial and sub-arterial roads:** As mentioned above, redevelopment for densification is proposed in several areas of the NDMC - including government residential estates, and in the areas North and South of Rajpath. This physical densification will require substantial up-gradation and enhancement of infrastructure - water supply and sewerage networks, drainage, and electricity.

In order to make provision for this infrastructure, as well as enable efficient up-gradation and replacement over the years (as further densification takes place), it is proposed to provide a service corridor, or utility duct along all major arterial and sub-arterial roads in the NDMC area. The pre-cast fibre reinforced concrete duct will contain sewage, water supply lines, electrical and communication cables, and natural gas, along the side walls, allowing a central aisle for a person to walk through.

The system represents state of the art technology in service provision. It allows for efficient maintenance, and will save on future expenses of digging repeatedly for repair and up-gradation of services. A detailed project report will have to be undertaken to ascertain the best system for the area.

⁶ Details of cost...etc were not available

16.4.10 Governance Issues

Key issues in governance, which were highlighted during the stakeholder consultations, particularly by the Traders Associations and the Resident's Welfare Associations include

- Inadequate people's representation in decision making
- Inadequate availability of information regarding status of issues in NDMC area
- Ineffective grievance redressal system

An additional issue, highlighted by other stakeholders was the limited decision making authority of the NDMC in several key areas, including planning.

Goals

NDMC should strive to

- Set a benchmark in participatory governance
- Ensure transparency in information dissemination

S. No.	Goals	Gaps
1.	Participatory Governance	The councilors are nominated, not elected No institutionalised intermediary body to put across RWA's, or traders views to NDMC Inadequate information dissemination to elicit stake-holder's response
2.	Transparency in information dissemination	No systematic collection and analysis of data

Ensuring greater representation, or participation in governance through elected councilors, or other intermediaries is not one that is within the NDMC's jurisdiction. The strategy in the area of governance thus focuses on information gathering, organization, analysis and dissemination. Through this mechanism, it is hoped to elicit citizen's views and reactions; institute a more effective grievance redressal system; and introduce greater transparency in the working of the Council.

Strategy

- **Implementing a Strategic E-governance Initiative in NDMC** An IT study, aiming to develop a strategic technology blueprint for New Delhi Municipal Council has already been undertaken. The study aims to "leverage IT to deliver better services to citizens by gaining financial and administrative efficiencies in its operations, while fostering a culture of information sharing and transparency."⁷ It emphasizes

⁷ "IT Enabled Process Improvement Road Map for NDMC - A Study" by E-Governments Foundation

- Linking the initiative to the mission statement of the NDMC
- Integration for seamless exchange of data between applications
- An Enterprise-wide GIS platform to be implemented in NDMC which brings all the NDMC departments and all other public agencies serving the NDMC citizens on a unified platform.
- Leveraging of transactions for improved decision making
- leveraging the data from the transaction systems to proactively put information out for the citizens and all other stakeholders (e.g. media) using the NDMC portal as the chief information delivery channel.
- The need for top level commitment to sustain the initiative
- The need to adapt key technology innovations

Implementing the strategy involves (a): Development of software for various departments and processes; information collection and management (b): Support for installation and running of software (c): system deployment.

16.5 STRATEGIES FOR URBAN POOR

Issues

Within the broader goals of the local body, it is envisaged that the NDMC area will become slum-free keeping in view the forth coming Commonwealth Games 2010. (Estimates Committee Report, 2004-05, pp. 44- 45) However, deficiencies with respect to urban basic services in the slums, need to be addressed until such time as they are relocated from the NDMC area⁸. The following inadequacies are of concern with respect to the slums within the area:

- a. Inadequate or absence of infrastructure services in specific slum clusters of NDMC. The level of service provision is often far below specified minimum standards⁹, across the sectors of water supply, sewerage and sanitation...etc
- b. Lack of interdepartmental coordination in service delivery in slums due to multiple departments being responsible for various services. There is no single coordinating department, within NDMC, that is responsible for the overall state of infrastructure in the slum clusters.

Goals

The following goals are envisaged with respect to the slums in the NDMC area.

- a. Minimum level of basic services (as per standards) to be available in all slums.
- b. Institution of a cell within NDMC, to coordinate and address all issues relating to slums and urban poor.

Gaps

Following tables presents an estimation of the gaps in slums of NDMC area:

S.No	Goals	Gaps
1	Minimum level of	Deficiencies in existing clusters w.r.t water supply,

⁸ It has been clearly indicated, by concerned officials in the NDMC, that the existing slums are to be relocated - and not redeveloped in-situ. This is despite the location of most of the clusters on government owned lands earmarked for residential and recreational uses.

⁹ The standards adopted are as follows:

	basic services in all slum clusters	sanitation, sewerage and street lighting have been identified - refer Annexure I
2	Interdepartmental coordination in service delivery.	The management of J.J Clusters within NDMC area falls within the ambit of Enforcement department of NDMC. However the scope of work of this department is limited to inspecting encroachments and unauthorized constructions. Resultantly, basic services in slums are provided by the respective departments such as Health Department, Civil Engineering ...etc. as part of their discretionary role, and not as an obligatory function.

Strategies

The emerging strategies to address the issue of inadequate urban basic services in slums of NDMC are:

- ***In-Situ Upgradation of Slums*** - through provision of water supply, street lighting, community toilet arrangement, etc.
- **Water supply**

Water arrangement through hydrants and hand pumps exist in almost all slums. However as compared to the standards/ norms for water supply infrastructure (No. of persons per Community stand posts i.e. 50 to 100 persons per stand post), the existing situation is starkly inadequate. Around 5 times the number of public stand posts is required to cater to the water needs of the existing slum population of the area.

- a. **Short Term:** Detailed slum wise requirements of each cluster are mentioned in the Annexure I. However in order to phase infrastructure development in NDMC slums, the most deficient clusters have been prioritized as critical areas requiring immediate attention. Public Stand Posts (PSP's) are required to be installed in these slums on a priority basis.

It is simultaneously proposed to replace hand pumps with stand posts in slums completely deficient in PSPs.

- b. **Medium term:** Installation of PSPs/hydrants in all other deficient areas (total). Slum areas will be targeted in the long term for replacement of hand pumps with hydrants or Public Stand Posts, since these slums are completely lacking in hydrants and piped water supply arrangements.

- **Community Toilet Arrangement**

Community toilet arrangements exist in more or less all slum clusters within NDMC area. These are mostly Sulabh Sauchalayas. The existence of the toilets does not depict their adequacy vis-à-vis the number of households within these slums. (Based on the norms i.e. 5 families per toilet seat. Assuming that 1 Sulabh complex has three toilet seats).

Around 13 times the existing community toilets infrastructure is required to cater to the current sanitation needs of the slum population of NDMC area. This has been phased as

- a. Construction of community Toilets in Most deficient areas (No.s - 302).

b. Construction of community Toilets in Other deficient areas (No.s - 134).

- **Electrification- Street Lighting**

Street lighting arrangement is absent in almost 17 slum clusters of NDMC area and the existing arrangement in the others is found to be deficient.

- **Short term:** It is suggested that around 147 numbers of street lights may be installed in those clusters in which the lighting system is completely lacking. (Based on the norms i.e. 1 street light/ 50 mts road length).
- **Medium term:** Up gradation of almost 157 numbers of street lights is suggested to be installed in slum clusters observed to be deficient in street lighting arrangements.

ANNEXURE - I

Estimation of GAP Water Supply

S. No.	Name & Location of J. J. Cluster	Piped Supply/ Hydrants	Hand pumps	Total community stand points - Hydrants and hand-pumps (Existing)	Borers	No. of Jhuggies (approx.)	Total population	existing status (population per tap)	Total reqd	Gap
1.	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	2	1	3	-	350	2030	677	41	38
2.	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	2	2	4	-	250	1450	363	29	25
3.	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	3	1	4	-	40	232	58	5	1
4.	Jhuggies at Dhibi Ghat No. 15, South Avenue	4	6	10	-	35	203	20	4	-6
5.	J. J. Cluster at back of house no. 2, Tuglak Lane and 21-A Aurangzeb Lane	4	1	5	-	130	754	151	15	10
6.	Vivekanand Camp Part-II Chanakyapuri near Bapu Dham Service Centre	4	2	6	1	50	290	48	6	0
7.	Sanjay Camp Part-I, Railway Camp Colony, Chanakyapuri	15	2	17	-	40	232	14	5	-12
8.	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg	4	1	5	-	85	493	99	10	5
9.	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	2	0	2	-	140	812	406	16	14
10.	Raju Camp, C-33 Block, Havlock Squater, Kali Bari Marg	3	1	4	-	64	371.2	93	7	3
11.	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squarter, Kali Bari Marg	6	4	10	-	30	174	17	3	-7
12.	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg	10	4	14	-	252	1461.6	104	29	15
13.	J. J. Cluster near Cement Godown Netaji Nagar	5	1	6	1	1800	10440	1740	209	203
14.	J. J. Cluster Knownas Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	5	0	5	-	350	2030	406	41	36
15.	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	0	2	2	-	750	4350	2175	87	85

ANNEXURE - I

S. No.	Name & Location of J. J. Cluster	Piped Supply/ Hydrants	Hand pumps	Total community stand points - Hydrants and hand-pumps (Existing)	Borers	No. of Jhuggies (approx.)	Total population	existing status (population per tap)	Total reqd	Gap
16.	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand Vidyalaya	2	0	2	-	125	725	363	15	13
17.	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	1	1	2	-	600	3480	1740	70	68
18.	Rajiv Gandhi Camp behind T.P. Lane, Mother Terressa Crescent	0	1	1	-	14	81.2	81	2	1
19.	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother Terressa Crescent	1	1	2	-	12	69.6	35	1	-1
20.	J. J. Cluster near Jawahar Bhawan between R.P. Road and Raisina Road	0	0	0	-	25	145		3	3
21.	Pacca J. J. Cluster near Princes Park Sangli Mess	7	2	9	-	125	725	81	15	6
22.	J. J. Cluster known as Madrasi Camp behind D-II Flats, Kidwai Nagar East	3	0	3	-	150	870	290	17	14
23.	J. J. Cluster behind Palika Dham and Hotel Nicco, Bangla Sahib Road.	2	3	5	-	60	348	70	7	2
24.	J. J. Cluster known as Madrasi Camp behind D-II flat Nos. 65-68	1	0	1	-	25	145	145	3	2
25.	Jhuggies at Talkatora Park Lane Behind Talkatora Stadium	1	1	2	-	14	81.2	41	2	0
26.	J. J. Camp Bharti Nagar, Khan Market	3	1	4	-	40	232	58	5	1
27.	Labour Camp, Humayun Road, Khan Market	4	2	6	-	300	1740	290	35	29
28.	Indira Camp, Pandara Road behind Kendriya Bhandar	2		2	-	27	156.6	78	3	1
29.	J. J. Cluster, back of Chelmsford Club, Raisina Road	1	1	2	-	32	185.6	93	4	2

ANNEXURE - I

S. No.	Name & Location of J. J. Cluster	Piped Supply/ Hydrants	Hand pumps	Total community stand points - Hydrants and hand-pumps (Existing)	Borers	No. of Jhuggies (approx.)	Total population	existing status (population per tap)	Total reqd	Gap
30.	J. J. Cluster behind Meridien Hotel, Dr. Rajinder Prasad Road	4	1	5	-	60	348	70	7	2
31.	J. J. Cluster behind Kashmir House Rajaji Marg	2	3	5	-	40	232	46	5	0
32.	Bhaiya Ram Camp, Race Course Club, Race Course Road.	7	13	20	-	500	2900	145	58	38
33.	J. J. Camp at DID, Race Course near Riding Club, Safdurjung Road	3	7	10	-	85	493	49	10	0
34.	J. J. Cluster at Purana Quila Road, N.S.C.I	12	1	13	-	250	1450	112	29	16
35.	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	1	0	1	-	35	203	203	4	3
36.	J. J. Cluster at Shiv Mandir near Railway Flying Club	0	3	3	-	65	377	126	8	5
37.	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	2	2	4	-	60	348	87	7	3
38.	J. J. Camp near Masjid Polo Ground Ground, Race Course Club, Kamal Attaturk Road.	2	2	4	-	47	272.6	68	5	1
	Total	130	73	203	2	7057	40931	202	819	616

Estimation of GAP Sewerage

S. No	Name & Location of J. J. Cluster	Status of sewer lines	No. of Jhuggies
1.	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	No sewerage system, whatever is being discharged, is flowing into the nearby	350
2.	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	No sewerage system, whatever is being discharged, is flowing into the nearby Nallah	250
3.	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	A 150 mm dia sewer line exists	40
4.	Jhuggies at Dhibi Ghat No. 15, South Avenue	A 150 mm dia sewer line exists outside Jhuggi cluster. PTU exists connected to sewerage system.	35
5.	J. J. Cluster at back of house no. 2, Tuglak Lane and 21-A Aurangzeb Lane	A 230 mm dia sewer line exists outside Jhuggi cluster. There is a common toilet connected to sewerage system	130
6.	Vivekanand Camp Part-II Chanakyapuri near Bapu Dham Service Centre	Public Toilet exists which is connected to 250mm dia sewer line.	50
7.	Sanjay Camp Part-I, Railway Camp Colony, Chanakyapuri	Public Toilet exists which is connected to 150mm dia sewer line.	40
8.	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg	A 300mm dia sewer line exists outside Jhuggi Cluster. There is a common toilet connected to sewerage system.	85
9.	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	No sewerage system, whatever is being discharged, is flowing into the nearby Nallah.	140
10.	Raju Camp, C-33 Block, Havlock Squater, Kali Bari MArg	There is a common toilet which is connected to 450mm dia sewerage system.	64
11.	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squarter, Kali Bari Marg	A 300mm dia sewer line runs outside J.J cluster. Common toilet exists connected to sewerage system.	30
12.	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg	A 300mm dia sewer line runs at Kali Bari lane outside J.J cluster.	252
13.	J. J. Cluster near Cement Godown Netaji Nagar	There is a common toilet which is connected to sewerage system.	1800
14.	J. J. Cluster Knownas Harijan Basti, Anat Ram Dairy, Sector- XIII, R. K. Puram	A 250mm dia sewer line exists which carries discharge of Jhuggi Cluster.	350
15.	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	A 250mm dia sewer line exists outside Jhuggi Cluster.	750
16.	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand	A 200mm dia sewer line exists	125
17.	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing	Sulabh Shauchlaya (International Exists) for Jhuggi clusters. Sewer lien is connected to 230mm dia municipal sewer.	600

ANNEXURE - I

S. No	Name & Location of J. J. Cluster	Status of sewer lines	No. of Jhuggies
18.	Rajiv Gandhi Camp behind T.P. Lane, Mother Terressa Crescent	A 230 mm dia sewer line exists outside Jhuggi clusters.	14
19.	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother	A 230 mm dia sewer line exists outside Jhuggi clusters	12
20.	J. J. Cluster near Jawahar Bhawan between R.P. Road and Raisina Road	Public Toilet Exists which is connected to 200mm dia sewer line.	25
21.	Pacca J. J. Cluster near Princes Park Sangli Mess	Inside the cluster a 250mm dia sewer line exists which carries discharge of JJ cluster.	125
22.	J. J. Cluster known as Madras Capm behind D-II Flats, Kidwai Nagar East	A 300mm dia sewer line exists which carries discharge of JJ cluster.	150
23.	J. J. Cluster behind Palika Dham and Hotel Nicco, Bangla Sahib Road.	There is no separate line for JJ cluster. A 200mm dia sewer line exists for Palika Dham which carries discharge of J.J cluster.	60
24.	J. J. Cluster known as Madras Camp behind D-II flat Nos. 65-68	A 300mm dia sewer line exists outside which carries discharge of JJ cluster.	25
25.	Jhuggies at Talkatora Park Lane Behind Talkatora Stadium	There is no separate line for J.J cluster. A 200mm dia sewer line runs outside J.J cluster which carries their discharge.	14
26.	J. J. Camp Bharti Nagar, Khan Market	A 300mm dia sewer line exists outside JJ cluster and there is a common toilet for use of the dwellers.	40
27.	Labour Camp, Humayun Road, Khan Market	There exists a common toilet for J.J cluster and the sewer is connected to storm water barrel.	300
28.	Indira Camp, Pandara Road behind Kendriya Bhandar	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 230mm dia municipal sewer line.	27
29.	J. J. Cluster, back of Chelmsford Club, Raisina Road	No sewer line	32
30.	J. J. Cluster behind Meridien Hotel, Dr. Rajinder Prasad Road	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 300mm dia municipal sewer line	60
31.	J. J. Cluster behind Kashmir House Rajaji Marg	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 300mm dia municipal sewer line	40
32.	Bhaiya Ram Camp, Race Course Club, Race Course Road.	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 300mm dia municipal sewer line	500

ANNEXURE - I

S. No	Name & Location of J. J. Cluster	Status of sewer lines	No. of Jhuggies
33.	J. J. Camp at DID, Race Course near Riding Club, Safdurjung Road	There is a common toilet for use of the dwellers and sewer connection of the said toilet is connected in 230mm dia municipal sewer line	85
34.	J. J. Cluster at Purana Quila Road, N.S.C.I	A 200mm dia sewer line exists carrying the sewerage discharge generated from the cluster.	250
35.	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	There is no sewer line.	35
36.	J. J. Cluster at Shiv Mandir near Railway Flying Club	There is no sewer line	65
37.	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	There is no sewer line for J.J Cluster. This discharge from common toilet flows into sump well of Delhi Flying club which is pumped into Municipal main.	60
38.	J. J. Camp near Masjid Polo Ground Ground, Race Course Club, Kamal Attaturk Road.	There is no sewer line. Individual toilets are connected with Septic Tanks	47

Estimation of GAP Street Lighting

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Length of Roads	No. of Jhuggies (approx.)	Total population	Present status	Total reqd	Gap
1.	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	5950	992	350	2030	0	20	20
2.	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	2700	450	250	1450	0	9	9
3.	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	900	150	40	232	0	3	3
4.	Jhuggies at Dhibi Ghat No. 15, South Avenue	700	117	35	203	2	2	0
5.	J. J. Cluster at back of house no. 2, Tuglak Lane and 21-A Aurangzeb Lane	1400	233	130	754	5	5	0
6.	Vivekanand Camp Part-II Chanakyapuri near Bapu Dham Service Centre	10000	1667	50	290	7	33	26
7.	Sanjay Camp Part-I, Railway Camp Colony, Chanakyapuri	31200	5200	40	232	20	104	84
8.	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg	500	83	85	493	0	2	2
9.	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja	2100	350	140	812	0	7	7
10.	Raju Camp, C-33 Block, Havlock Squater, Kali Bari Marg	1200	200	64	371.2	2	4	2
11.	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squarter, Kali Bari Marg	500	83	30	174	0	2	2
12.	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg	3500	583	252	1461.6	12	12	0
13.	J. J. Cluster near Cement Godown Netaji Nagar	6750	1125	1800	10440	24	23	0
14.	J. J. Cluster Knownas Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	5400	900	350	2030	5	18	13
15.	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	14100	2350	750	4350	20	47	27

ANNEXURE-I

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Length of Roads	No. of Jhuggies (approx.)	Total population	Present status	Total reqd	Gap
16.	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand Vidyalyaya	2100	350	125	725	0	7	7
17.	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	4800	800	600	3480	0	16	16
18.	Rajiv Gandhi Camp behind T.P. Lane, Mother Terressa Crescent	900	150	14	81.2	2	3	1
19.	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother Terressa Crescent	900	150	12	69.6	0	3	3
20.	J. J. Cluster near Jawahar Bhawan between R.P. Road and Raisina Road	800	133	25	145	3	3	0
21.	Pacca J. J. Cluster near Princes Park Sangli Mess	2000	333	125	725	0	7	7
22.	J. J. Cluster known as Madrasi Camp behind D-II Flats, Kidwai Nagar East	3200	533	150	870	0	11	11
23.	J. J. Cluster behind Palika Dham and Hotel Nicco, Bangla Sahib Road.	1500	250	60	348	5	5	0
24.	J. J. Cluster known as Madrasi Camp behind D-II flat Nos. 65-68	200	33	25	145	0	1	1
25.	Jhuggies at Talkatora Park Lane Behind Talkatora Stadium	400	67	14	81.2	4	1	0
26.	J. J. Camp Bharti Nagar, Khan Market	2350	392	40	232	0	8	8

ANNEXURE-I

S. No.	Name & Location of J. J. Cluster	Area of J. J. Cluster (Approx. in Sq. m.)	Length of Roads	No. of Jhuggies (approx.)	Total population	Present status	Total reqd	Gap
27.	Labour Camp, Humayun Road, Khan Market	3200	533	300	1740	24	11	0
28.	Indira Camp, Pandara Road behind Kendriya Bhandar	550	92	27	156.6	2	2	0
29.	J. J. Cluster, back of Chelmsford Club, Raisina Road	450	75	32	185.6	1	2	1
30.	J. J. Cluster behind Meridien Hotel, Dr. Rajinder Prasad Road	1000	167	60	348	3	3	0
31.	J. J. Cluster behind Kashmir House Rajaji Marg	500	83	40	232	10	2	0
32.	Bhaiya Ram Camp, Race Course Club, Race Course Road.	7000	1167	500	2900	0	23	23
33.	J. J. Camp at DID, Race Course near Riding Club, Safdurjung Road	2900	483	85	493	15	10	0
34.	J. J. Cluster at Purana Quila Road, N.S.C.I	7800	1300	250	1450	10	26	16
35.	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	1000	167	35	203	0	3	3
36.	J. J. Cluster at Shiv Mandir near Railway Flying Club	2000	333	65	377	0	7	7
37.	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	1800	300	60	348	0	6	6
38.	J. J. Camp near Masjid Polo Ground, Race Course Club, Kamal Attaturk Road.	6200	1033	47	272.6	31	21	0
	Total	140450	23408	7057	40930.6	207	819	305

ANNEXURE - I

Estimation of GAP Waste and Toilets

S. No.	Name & Location of J. J. Cluster	Toilets	No. of toilet seats	Masonary dustbins	No. of Jhuggies (approx)	Required No. of toilet seats	No of Community Toilets	Gap
1.	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	1	3		350	70	23	22
2.	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	1	3		250	50	17	16
3.	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	0	0		40	8	3	3
4.	Jhuggies at Dhibi Ghat No. 15, South Avenue	1	3		35	7	2	1
5.	J. J. Cluster at back of house no. 2, Tuglak Lane and 21-A Aurangzeb Lane	1	3		130	26	9	8
6.	Vivekanand Camp Part-II Chanakyapuri near Bapu Dham Service Centre	1	3		50	10	3	2
7.	Sanjay Camp Part-I, Railway Camp Colony, Chanakyapuri	1	3		40	8	3	2
8.	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg	1	3		85	17	6	5
9.	Shaheed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	1	3		140	28	9	8
10.	Raju Camp, C-33 Block, Havlock Squater, Kali Bari Marg	1	3		64	13	4	3
11.	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squater, Kali Bari Marg	1	3		30	6	2	1
12.	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg	0	0		252	50	17	17
13.	J. J. Cluster near Cement Godown Netaji Nagar	1	3		1800	360	120	119
14.	J. J. Cluster Knownas Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	1	3		350	70	23	22
15.	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	2	6		750	150	50	48
16.	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand Vidyalaya	1	3		125	25	8	7
17.	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	1	3		600	120	40	39

ANNEXURE - I

S. No.	Name & Location of J. J. Cluster	Toilets	No. of toilet seats	Masonary dustbins	No. of Jhuggies (approx)	Required No. of toilet seats	No of Community Toilets	Gap
18.	Rajiv Gandhi Camp behind T.P. Lane, Mother Terressa Crescent	1	3		14	2.8	1	0
19.	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother Terressa Crescent	1	3		12	2.4	1	0
20.	J. J. Cluster near Jawahar Bhawan between R.P. Road and Raisina Road	1	3		25	5	2	1
21.	Pacca J. J. Cluster near Princes Park Sangli Mess	1	3		125	25	8	7
22.	J. J. Cluster known as Madrasi Camp behind D-II Flats, Kidwai Nagar East	1	3		150	30	10	9
23.	J. J. Cluster behind Palika Dham and Hotel Nicco, Bangla Sahib Road.	1	3		60	12	4	3
24.	J. J. Cluster known as Madrasi Camp behind D-II flat Nos. 65-68		0		25	5	2	2
25.	Jhuggies at Talkatora Park Lane Behind Talkatora Stadium	1	3		14	2.8	1	0
26.	J. J. Camp Bharti Nagar, Khan Market	1	3		40	8	3	2
27.	Labour Camp, Humayun Road, Khan Market	1	3		300	60	20	19
28.	Indira Camp, Pandara Road behind Kendriya Bhandar	1	3		27	5	2	1
29.	J. J. Cluster, back of Chelmsford Club, Raisina Road	1	3		32	6.4	2	1

ANNEXURE - I

S. No.	Name & Location of J. J. Cluster	Toilets	No. of toilet seats	Masonary dustbins	No. of Jhuggies (approx)	Required No. of toilet seats	No of Community Toilets	Gap
30.	J. J. Cluster behind Meridien Hotel, Dr. Rajinder Prasad Road	1	3		60	12	4	3
31.	J. J. Cluster behind Kashmir House Rajaji Marg	1	3		40	8	3	2
32.	Bhaiya Ram Camp, Race Course Club, Race Course Road.	1	3		500	100	33	32
33.	J. J. Camp at DID, Race Course near Riding Club, Safdurjung Road	1	3		85	17	6	5
34.	J. J. Cluster at Purana Quila Road, N.S.C.I	1	3		250	50	17	16
35.	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	1	3		35	7	2	1
36.	J. J. Cluster at Shiv Mandir near Railway Flying Club	1	3		65	13	4	3
37.	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	1	3		60	12	4	3
38.	J. J. Camp near Masjid Polo Ground Ground, Race Course Club, Kamal Attaturk Road.	1	3		47	9	3	2
	Total	36	108		7057	1411	470	434



Chapter – 17 : Investment Framework

CHAPTER - 17

INVESTMENT FRAMEWORK

17.1 INTRODUCTION

This section outlines projects proposed under each sector, in line with the strategies identified in the previous section. These are further differentiated into short, medium and long term investments, based on the time frame for implementation. The chapter is in 2 parts: Part one outlines projects and investment requirements for sub-mission 1 - Urban Infrastructure and Governance; and Part two presents investment requirements for sub-mission 2 - Urban Poor

17.2 SECTOR WISE INVESTMENT OPTIONS: SUB-MISSION 1

The sectors covered under sub-mission 1 include (i) water supply (ii) sewerage, (iii) solid waste management (iv) storm water drainage (v) roads and transportation (vi) environment (vii)) heritage management - built and natural (viii) urban renewal (ix) organizational strengthening and (x) governance.

17.2.1 Water Supply

Projects under identified strategies are enumerated below:

- Estimation Of Accurate Demand For Water
 - Survey of floating population in the NDMC area
- Augmentation and Rehabilitation of Distribution System
 - Construction of Underground reservoirs (UGRs) and Pumping stations (BSPs).
 - Repair of UGRs and BPS.
 - Replacement of pumps and motors.
- Promotion of Efficiency in Distribution and Metering
 - Creation of a cell for leak detection, monitoring of flow and pressures.
 - Procurement of water meters
 - Efficiency audit of E & M equipment at BPS's and tube wells.
- Improvement of Unfiltered Water Supply
 - Replacement of treated effluent main from Okhla STP
 - Rehabilitation of raw water trunk and distribution mains
 - Pilot project for treatment of unfiltered water supply

The investment requirements are outlined below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
SECTOR: WATER SUPPLY				
1. ESTIMATION OF ACCURATE DEMAND FOR WATER (& SEWAGE GENERATED)				
(i) Survey of floating population in the NDMC area - long and short duration	25.00			25.00
2. AUGMENTATION AND REHABILITATION / RATIONALIZATION OF DISTRIBUTION SYSTEM				
(i) Construction of UGR (1.5	350			350.00

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
ML) & BPS at Panchsheel Marg & at Janpath (0.6 ML)				
(ii): Repair of Pandara Road UGR and BPS	15			15.00
(vi) Replacement of Pumps and motors at 9 locations (Laxmi Bai Nagar in Phase II)	94.25			94.25
(iii) Survey and rehabilitation of plumbing (water pipes) in government housing colonies (approx. 17600 blocks) to eliminate shared plumbing (GF & FF)	880			880.00
(iv) Detailed feasibility study for implementation of 24/7 water supply in NDMC area	80.00			80.00
3. PROMOTION OF EFFICIENCY IN DISTRIBUTION & METERING / cost recovery				
(i): Creation of a cell for leak detection, monitoring of flow and pressures. (O & M @ Rs. 12 lakh per year)	25			25.00
(ii): Procurement of water meters	140			140.00
(iii): Efficiency audit of E & M equipment at BPS's and tube wells	10			10.00
4. IMPROVEMENT OF UNFILTERED WATER SUPPLY				
(i) Replacement of 1500mm dia, 2.2 km length of treated effluent main from Okhla STP to Rajghat	900			900.00
(ii). Rehabilitation of raw water trunk and distribution mains		100.00		100.00
(iii) Pilot project for further treatment of unfiltered water received at Lodhi Gdns from Okhla STP	11.00			11.00
TOTAL INVESTMENT	2530.25	100.25		694.25

17.2.2 Sewerage

Strategies and projects identified include:

- Rehabilitation of Sewerage Network
 - De-silting of sewerage system in NDMC area.
 - Selective rehabilitation of sewers using trench less technology
- Augmentation of Sewerage Network
 - Providing new sewers using trench less technology.
 - Augmentation of the sewerage system, at identified locations

Investment requirements in the short, medium and long term are presented below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
SECTOR: SEWERAGE				
1. REHABILITATION OF SEWERAGE NETWORK				
(i) De-silting of sewerage system in NDMC area	50		-	50
(ii): Rehabilitation of sewers using trench less technology (refer details in Annexure I)	5360			5360.00
2. AUGMENTATION OF SEWERAGE NETWORK				
(i) Providing 1148mm dia sewer along Vinay Marg using trench less technology	114			114
(ii) Augmentation of sewerage system from Kamal Attaturk Marg to Prithvi Raj Road	1246		-	1246
(iii) Augmentation of sewerage network, using trench less technology	3600.00	1998.00		
TOTAL INVESTMENT	10370.00	1998.00		12368.00

17.2.3 Solid Waste Management

Proposed strategies and projects are presented below:

- Segregation of waste streams to ensure effective end treatment and disposal
 - Arrangements for C&D waste transportation and disposal - skips and vehicle.
 - Provision of adequate facilities for composting of horticultural waste
- Ensuring clean surroundings in public areas
 - Procurement of mechanical street sweepers
 - Mobile vans to check littering.
- Training and awareness generation including
 - Public awareness generation
 - Training and orientation for municipal staff

Investment requirements are outlined below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
SECTOR: SOLID WASTE MANAGEMENT				
1. SEGREGATION OF WASTE STREAMS TO ENSURE EFFECTIVE END TREATMENT AND DISPOSAL				
(i) Arrangements for C & D waste transportation and disposal - skips and vehicle	21		-	21.00

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
(ii) Strengthening / establishing of composting pits in the NDMC nurseries, including equipment	15			15.00
2. ENSURING CLEAN SURROUNDINGS IN PUBLIC AREAS				
(i) Procurement of mechanical street sweepers - large, medium and small @ 2 each	300	100		400.00
(ii) Procurement of 6 mobile vans to check littering in public places in NDMC @ 4.0 lakh / van (CP, INA, Khan Mkt, Mandi Hse, Yashwant PL., one more)	24			21.00
3. TRAINING AND AWARENESS GENERATION				
(i) Training and orientation for municipal staff for 5 years @ Rs. 40 lakh per annum (Rs. 2,000 per head)	160	200		360.00
(ii) Public awareness generation for 5 years, incl. in schools, hospitals, residential and commercial areas ...etc (@ 50 lakh p.a.)	200	250		450.00
TOTAL INVESTMENT	720	550		1270.00

17.2.4 Storm Water Drainage

Strategies and projects identified are listed below:

- Preparation of a comprehensive drainage master plan for the area
- Anti-flood works
 - Capacity augmentation and improvement of road side drains and drainage system in colonies
 - Provision of pump-house with back-up power for dewatering accumulated water at the railway bridge underpasses

Investment requirements in the short, medium and long terms include

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
SECTOR: DRAINAGE				
1. PREPARATION OF A COMPREHENSIVE DRAINAGE MASTER PLAN FOR THE AREA				
(i) Comprehensive study and survey of the drainage systems linked with the whole of the NCT of Delhi through GNCTD (*)	400		-	400.00

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
2. ANTI-FLOOD WORKS - INTERIM				
(i) Capacity augmentation and improvement of road side drains and drainage system in colonies	70			70.00
(ii) Pump-house with back-up power for dewatering accumulated water at the railway bridge underpass at Chanakyapuri	20		-	20.00
TOTAL INVESTMENT	490			490.00

(*) Preparation of a Comprehensive Master Plan for Drainage in the entire GNCTD Area has been initiated by the Dept. of Irrigation and Flood Control, GNCTD. It is expected to be ready in 2 years (by 2009). Estimated cost: 3- 5 Cr. A core group should be designated within NDMC to cooperate and coordinate with this effort.

17.2.5 Roads and Transportation

Projects under identified strategies are enumerated below

- Optimization of Transport Infrastructure
 - Signalization of rotaries
 - Beautification of road corridors in N DMC Area
 - Intersection improvement
 - Develop Area Traffic Control (ATC) for CBD Area
 - Improvement of street scape (Bengali Mkt., Gole Mkt)
 - Road signage, information system and street furniture along roads
 - Road markings with Thermoplastic paint
 - Replacement of old kerb stones
- Enhancement and management of parking
 - Multi level car parking at Sarojini Nagar
 - Multi level car parking behind KG Marg
 - Multi level car parking at Baba Kharak Singh Marg
 - Multi level car parking at Khan Market and INA markets
 - Development of premium parking area
- Integration of Modes of Public Transport
 - Construction of taxi & auto Stands
 - Interchange facility at Bus Terminals
 - Battery operated Mini Bus Services from Metro stations and park- and-ride facilities.
 - Reorganization of Bus Routes and bus stops
- Ensuring pedestrian Safety and Connectivity
 - Construction of foot over bridges at 5 locations
 - Pedestrianisation of Connaught Place.
 - Pedestrianisation of Markets - Khan Mkt and Prithvi Raj Mkt

- Enhancement of Road Infrastructure
 - Identification of by-passes / road capacity augmentation measures for the NDMC area
 - Construction of connecting ramps
 - Widening & strengthening of roads
 - U.G. connections
 - Milling and up gradation of roads

Investment requirements in the short, medium and long term are presented below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
RS IN LAKHS				
SECTOR: ROADS AND TRANSPORTATION				
1. OPTIMISATION OF TRANSPORT INFRASTRUCTURE				
i) Signalization of rotaries along Ashoka Road, Panchsheel Marg, Talkatora Road & Janpath	200	–	–	200
ii) Beautification of Ten Road Corridors in N DMC Area	1500	–	–	1500
iii) Intersection improvement at ten locations along Tolstoy Marg, Aurobindo Marg	150	–	–	150
iv) Develop Area Traffic Control (ATC) for CBD Area	500	–	–	500
v) Improvement of street scape in Bengali Market, Gole Market	200	–	–	200
vi) Road signage, Information system & street furniture along roads	1000	–	–	1000
vii) Road markings with Thermoplastic paint	250	–	–	250
viii) Replacement of Old kerbs stones	200	–	–	200
2. PARKING MANAGEMENT & ENHANCEMENT				
i) Multi level car parking at Sarojini Nagar Market	4000	–	–	4000
ii) Multi level car parking behind HT Building KG Marg	6000	–	–	6000
iii) Multi level car parking at Baba Kharak Singh Marg	5000	–	–	5000
iv) Multi level Car park at Khan market		4000	–	4000
v) Multi level Car park at I.N.A. Market		2000	–	2000
vi) Development of premium parking areas	200			
3. INTEGRATION OF MODES OF PUBLIC TRANSPORT				
i) Construction of Taxi & Auto Stands	200	–	–	200
ii) Interchange facility at Bus Terminals	100	–	–	100

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
RS IN LAKHS				
iii) Battery operated Mini Bus Services from Metro stations & Parking & ride facilities	500	–	–	500
iv) Reorganization of Bus Routes and bus stops	150	–	–	150
4. PEDESTRIAN SAFETY AND CONNECTIVITY				
i) Construction of foot over bridges at five locations	1000	–	–	1000
ii) Pedestrianisation of Khan Market & Prithavi Raj Market		2000	–	2000
iii) Pedestrianisation of Connaught Place	5000	–	–	5000
iv) Development of a comprehensive pedestrian plan for NDMC area	20			
5. ENHANCEMENT OF ROAD INFRASTRUCTURE				
i) Initial studies for identification of road capacity augmentation measures (incl.by-pass routes) for Central (NDMC) Areas; preparation of DPR for preferred option	700	-	-	700
ii) Ramps connecting School lane Flyover with Deen Dyal Upadhyay Marg	1000	–	–	1000
iii) Widening & Strengthening of roads for a length of 30 km.	6000	–	–	6000
iv) U.G. Connection between Safdarjung & AIIMS Hospitals	250	–	–	250
v) Milling and up gradation of roads	1500	–	–	1500
TOTAL	35620	8000		43600

17.2.6 Environment

Strategies and projects identified include:

- Strengthening the Environmental Functions of NDMC
 - Structuring of a division and capacity building of staff
 - Establishment of Environmental Quality Monitoring Stations
- Enhancing Green Cover and Bio-Diversity
 - Research on local species & Master Plan for plantation
 - Measures to increase bio-diversity
- Reduction Of Environmental Footprint Of NDMC Area
 - Energy audits of commercial areas under NDMC ownership
 - Upgradation of street lighting system, incorporating energy efficiency systems

Investment requirements in the short, medium and long terms include

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakh			
SECTOR: ENVIRONMENT				
1. STRENGTHENING THE ENVIRONMENTAL FUNCTIONS OF NDMC				
(i) Establishment of Environmental Division in NDMC, including (a): structuring of a division (b): capacity building of staff (c): recruitment of subject experts (3)	22	-	-	22
(ii) Establishment of Environmental Quality Monitoring Stations (a):3 fully equipped stations for air, water and noise quality monitoring (b): development of procedures for warehousing and displaying information over the internet (GIS based)	650	-	-	650
2. ENHANCING GREEN COVER AND BIO-DIVERSITY				
(i) Scientific research, and development of an action plan for enhancing green cover in a sustainable manner (a): research on local species (b): Approach and Master Plan for plantation	21	-	-	21
(ii) Increasing Biodiversity (a): Census of flora and fauna every 3 yrs. (@ 8 lakhs/census) (b): Research on habitats - birds...etc (c): Promoting congenial environment through planned approach	8 + 5	16 + 5	8 + 5	47
3. REDUCTION OF ENVIRONMENTAL FOOTPRINT OF NDMC AREA				
i) Energy audits of commercial areas under NDMC ownership (a): preliminary investigations and tender mgmt	25			25
(ii) Up-gradation of street lighting system, incorporating systems for energy efficiency	10000(*)			10000
TOTAL INVESTMENT	10731	21	13	10765.00

(*) subject to approval under JNNURM

17.2.7 Heritage Management - Built and Natural

Proposed strategies and projects are presented below:

- Enhancement of Global Image of the NDMC Area within Delhi through Systematic Heritage Management

- Development Of An Information Management System
 - Final Inventory of Heritage Resources to be legally notified and maintained by the NDMC as the basis for future action.
 - Expansion of the existing GIS to include a GIS based Cultural Heritage Information System
 - Expansion of the existing GIS to include a GIS based Natural Resources Information System
 - Evaluation and quantification of Environmental Services provided by the garden city capital
- Development of In-House Capacity within the NDMC for Conservation Planning and Management
 - Establishment of a Heritage Cell within the NDMC Chief Architect's office, linked with Engineering cell and Horticulture Dept.
 - Improvement - upgrading and modernization of the NDMC nurseries
 - Provision for a Landscape Cell within the Horticulture Department
 - Training Programmes for nursery personnel
- Prioritization of Identified Heritage Sub-Zones and Precincts
- Development of Heritage Tourism Circuits within the NDMC Area

Investment requirements are outlined below:

Strategy/ Project	Short Term Investments (2007-12)	Medium Term Investments (200\12-17)	Long Term Investments (2017-21)	Grand Total
SECTOR: HERITAGE MANAGEMENT - BUILT AND NATURAL HERITAGE				
A) ENHANCEMENT OF GLOBAL IMAGE OF THE NDMC AREA WITHIN DELHI THROUGH SYSTEMATIC HERITAGE MANAGEMENT				
(i) Redelineation and Comprehensive Heritage Conservation & Management Plan for Lutyens New Delhi .	30	-	-	30.00
B) DEVELOPMENT OF AN INFORMATION MANAGEMENT SYSTEM TO FACILITATE INTEGRATION OF HERITAGE (BUILT AND NATURAL) MANAGEMENT WITHIN DEVELOPMENT PROCESSES FOR THE NDMC AREA				
(i) Final Inventory of Heritage Resources to be legally notified and maintained by the NDMC as the basis for future action.	5	1	1	7.00
(ii) Expansion of the existing GIS to include a GIS based Cultural Heritage Information System	10	2	2	14.00
(iii) Expansion of the existing GIS to include a GIS based Natural Resources Information System	15	2	2	19.00
(iv) Evaluation and quantification of Environmental Services provided by the garden city capital	5	2	2	9.00
C) DEVELOPMENT OF IN-HOUSE CAPACITY WITHIN THE NDMC FOR CONSERVATION PLANNING				

AND MANAGEMENT OF THE HERITAGE (NATURAL AND BUILT) RESOURCES				
(i) Establishment of a Heritage Cell within the NDMC Chief Architect's office, linked with Engineering cell and Horticulture Dept.	25	-	-	25
(ii) Improvement - upgrading and modernisation of the NDMC nurseries	250	50	50	350
(iii) Provision for a Landscape Cell within the Horticulture Department	25	-	-	25
(iv) Training Programmes for nursery personnel	25	15	15	55
D) PRIORITISATION OF IDENTIFIED HERITAGE SUB-ZONES AND PRECINCTS - PREPARATION & IMPLEMENTATION OF DETAILED CONSERVATION & HERITAGE MANAGEMENT PLANS				
(i) Sub-Strategies for Aliganj and BK Dutt Colony based on accurate and up-to-date baseline surveys and data.				
Heritage Precincts in Aliganj -	15	15	5	35
Karbala area	10	5	5	20
Identified listed heritage structures - Jor Bagh & Aliganj	20	2.5	2.5	25
Area near Najaf Khans Tomb	5	2.5	2.5	10
(ii) Sub-Strategies for India Gate - C hexagon area, Central Vista				
Planning for all sites adjoining Central Vista, India Gate and C-Hexagon area for public and community purposes	20	-	-	20.00
Conservation and scientific management of the natural resources of the Central Vista, India Gate and C-Hexagon areas	500	150	150	800
(iii) Sub-Strategies for important open space components				
Race Course and Safdarjang Airport Areas as parks integrated into the Zonal Development Plan	500	100	100	700
Removal of encroachments (booths, parking, hard surfacing), and conservation, phased planting and scientific management of the trees, shrubs, groundcover, footpaths of original/modified road sections for all major avenues, roads and roundabouts	800	100	100	1000
Restoration of garden pavilions of the late Mughal period within Talkatora Garden, and conservation of remains of terraces, landscaping and water harvesting	300	100	100	500
Detailed plans for replanting along roads affected by the Metro/Parking etc.	30	10	10	50
(iv) Sub-strategies for restoration and infrastructure up-gradation of important heritage market				

places and commercial centres				
Connaught Place and listed heritage buildings around the outer circle.	Provided For			
Gole Market & surrounding areas.	250	20	20	290
(vi) Sub-strategies for conservation of heritage schools and educational institutions within the NDMC area such as Lady Hardinge College				
All listed government owned educational institutions within the NDMC area	100	50	-	150
E) DEVELOPMENT OF HERITAGE TOURISM CIRCUITS WITHIN THE NDMC AREA				
(i) Formulation & implementation of Heritage Tourism Management Plans for Development of tourism circuits and provision of tourist facilities and material	500	500	500	1500
TOTAL INVESTMENT	3440	1127	1067	5640

17.2.8 Urban Renewal

Projects under identified strategies are enumerated below:

- Upgradation and Renewal of Connaught Place as Metropolitan City Center
 - Construction of service tunnel, and up-gradation of physical infrastructure
 - Façade restoration and retrofitting of buildings
 - Provision of Pedestrian facilities, improvement of landscaping and horticulture
 - Upgradation and augmentation of traffic infrastructure
- Plan for redevelopment of Obsolete Land Uses (Barracks)

The investment requirements are presented below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
SECTOR: URBAN RENEWAL				
1. URGADATION AND RENEWAL OF CONNAUGHT PLACE AS METROPOLITAN CITY CENTER				
(i) Construction of service tunnel, and up-gradation of physical infrastructure – water supply, drainage, sewerage, including irrigation and rain water harvesting	8757			8760.00
(ii) Façade restoration and retrofitting of buildings, including alterations to Pallika Parking	7725			
(iii) Provision of Pedestrian facilities, improvement of landscaping and horticulture	12680			12680.00
(iv) Upgradation and augmentation of traffic	19200			19200

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
infrastructure (parking; provision of subways; and improvement of roads.)				
2. REDEVELOPMENT OF OBSOLETE LAND USES FOR CURRENT DAY NEEDS				
(i) Formulation of appropriate guidelines for development of plots occupied by barracks (not identified as heritage within the existing NDMC list) within the LBZ Area for public and community uses as per the Buch report (integrated with ZDP and Area Development Plans)	30			30
3. PROVISION OF COMMON UTILITY DUCT				
(i) Implementation of common utility ducts (FRC) along 150 kms of arterial and sub-arterial roads in the area.	30000			30000
TOTAL INVESTMENT	78392.00			78395.00

17.2.9 Organisational Strengthening

Strategies and projects identified include

- Strengthening Corporate Functions and Quality Consciousness
 - Consultation and Study by Consultant, through deeper internal stakeholder consultation
 - Setting up of a Central Corporate Cell, with individual cells in key departments
- Focus on HR Functions and Training
 - Creation of a central HR Department
 - Creation of a strong training Department
 - Instituting training programmes - learning and development - for all employees
 - Creation of programmes for orientation and training of newly inducted personnel
 - Creation of middle management training programmes

Investment requirements in the short, medium and long terms are presented below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
Rs in Lakhs				
SECTOR: ORGANISATIONAL DEVELOPMENT				
1. STRENGTHENING CORPORATE FUNCTIONS AND QUALITY CONSCIOUSNESS				
(i) Consultation and Study by Consultant, through deeper internal stakeholder consultations, of issues and requirements	10.5			10.5

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
(ii) Setting up of a Central Corporate Cell, with individual cells in key departments	20.00			20.00
2. FOCUS ON HR FUNCTIONS AND TRAINING				
(i) Creation of a central HR Department, including consultant's inputs; training and capacity building	20.00			20.00
(ii) Creation of a strong training Department, reporting to the HR Department	20.00			20.00
(iii) Instituting training programmes - learning and development - for all employees - first three years @ Rs. 3000 per head per year - 16,000 employees)	1440			1440
(iv) Creation of programmes for orientation and training of newly inducted personnel on an on-going basis @Rs 3000 per head, 500 employees		15.00	15.00	30.00
(iv) Creation of middle management training programmes - in technical, financial and management aspects - in partnership with educational / training institute. (@ Rs. 50,000 per manager, once in 3 years - 200 managers)	100	100	100	300
TOTAL INVESTMENT	1610.5	100	100	1840.5

17.2.10 Governance

The strategy, and projects under it include

- Implementing a Strategic E-governance Initiative in NDMC
 - Development of software for various departments and processes; information collection and management
 - Support for installation and running of software
 - System deployment

The investment implication is outlined below:

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
SECTOR: GOVERNANCE				
1.IMPLEMENTING A STRATEGIC E-GOVERNANCE PROGRAMME IN NDMC				

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
(i) Development of software for various departments and processes; information collection and management	690.00			690.00
(ii) Support for installation and running of software	101.25			101.25
TOTAL INVESTMENT	791.25			791.25

17.3 SECTOR WISE INVESTMENT OPTIONS: SUB-MISSION 2

Sub-mission 2 focuses on interventions for the urban poor, relating to shelter and infrastructure provisions in slum settlements within the NDMC area.

The goal of the NDMC, with respect to slum settlements in its area, is to relocate these settlements, in order to make the area slum-free. However, the onus of initiating proceedings for resettlement remains with the different land owning agencies¹, each of which is required to deposit (with MCD) a sum to cover it's share of the cost of relocation². NDMC only has a limited role, or influence, in the process.

It is thus proposed that, in the interim, basic standards of infrastructure services should be made available to the slum dwellers. This includes the following:

- Up-gradation of water supply
- Provision of adequate sanitation facilities
- Augmentation of sewerage facilities, where requires
- Up gradation of street lighting

The investment requirement, in the short, medium and long term, is presented below (ref. details in Annexure 2):

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakh			
SECTOR: URBAN POOR & SLUMS				
IN-SITU UPGRADATION OF SLUMS THROUGH PROVISION OF BASIC INFRASTRUCTURE				
(a): Water Supply				
Installation of Public stand posts in the most deficient clusters	131			131.00
Replacement of hand pumps with stand posts in slums completely deficient in PSPs	1.5			1.5
Installation of PSPs/hydrants in all other deficient areas		153.90		153.90

¹ Including the CPWD, L&DO & other Central Government agencies (Defence, Railways...etc)

² Estimates' Committee Report, 2004-05, pg. 44-45

Strategy/Project	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakh			
(total)				
Sub Total	132.5	153.90		286.40
(b): Community Toilet Arrangement				
Construction of community Toilets in most deficient areas (No.s - 302).	1812.8			1812.8
Construction of community toilets in other deficient areas (No.s - 134).		794		794.00
Sub-Total	1812.8	794		2606.8
(C): Sewerage Arrangement				
Installation of intermediate sewer lines connecting the community toilet to the main trunk sewer line in 4 slums.	2.39			2.39
Sub total	2.39			2.39
(d): Street Lighting				
Installation of street lights in Slums where no such arrangement exists.	33.75			33.75
Up gradation of street lights in other deficient clusters.		31.75		31.75
Sub Total	33.75	31.75		65.50
TOTAL INVESTMENT	1981.44	979.65		2961.09

17.4 SUMMARY OF COSTS

The total investment proposed under JNNURM (2007 - 2012) for the NDMC area is Rs. 1095.78 Crore. The investment under sub-mission 1 is Rs. 1075.97 Crore; and sub-mission 2 is Rs. 19.81 Crore. The sector wise investments are compiled below:

Sector	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
SUB-MISSION 1: URBAN INFRASTRUCTURE AND GOVERNANCE				
Water Supply	2530.25	100.25		694.25
Sewerage	10370	1998.00		12368.00
Solid Waste Management	720	550		1270.00
Storm Water Drainage	490			490.00
Roads and Transportation	35620	8000		43600
Environment	10731	21	13	10765.00
Heritage Management	3440	1127	1067	5640
Urban Renewal	78392.00			48395.00
Organisational Strengthening	1610.5	100	100	1840.5
Governance	791.25			791.25
Sub-Total	144695	11896.25	1180	125854

Sector	Short Term Investments (2007-12)	Medium Term Investments (2012-2017)	Long Term Investments (2017-21)	Grand Total
	Rs in Lakhs			
SUB-MISSION 2: BASIC SERVICES FOR THE URBAN POOR				
Up gradation of Infrastructure	1981.44	979.65		2961.09
Total	146676.25	12875.9	1180	128815.1

Appendix 1

**Year wise budget allocation for Sewerage arrangement in NDMC area
(Figures in Rs. Lakhs)**

S.No	Strategy / project	Proposed outlay	07-08	08-09	09-10	10-11	11-12	JNNURM	NDMC sources
A	Extension and Up gradation of sewerage Network to intercept sewage abatement of pollution								
1	De silting of sewerage system in NDMC area	50	10	10	10	10	10	18	32
2	Aug of sewers in various NDMC area								
(a)	Schemes with Trench less technology								
1	Aug of sewerage in golf links area up to Lodi road in a length of 2875 m.	1438	10	628	500	300	-	503	935
2	Aug of sewerage in Aliganj in Jor bagh in a length of 2040m.	1020	700	320	-	-	-	357	663
3	Aug of sewerage from moti lal Nehru Marg opp air HQ to man singh road in a length of 2568m.	1880	2	500	1000	378	-	658	1222
4	Aug of sewerage from Chander Gupta Marg to Akbar Bhawan in Chanakyapuri Area in a length of 1510m	1260	60	100	600	500	-	441	819
5	Aug of sewerage from Kamal Attaturk Marg to Prithviraj road in a length of 2009m	1246	500	500	246	-	-	436	810
(b)	Scheme For rehabilitation work								
1	Rehabilitation of swer lines from teen murti marg, Akbar raod, Tuglak road, Tees Jan marg & Prithviraj Marg in a length of 2686m.	721	20	100	500	101	-	252	469
2	Rehabilitation of sewer line from tyag raj marg to Duplex road, Subramanium Bharti Marg, Moti Lal Nehru Marg in a length of 3675m.	305	20	100	500	101	-	252	469
3	Rehabilitation of egg shaped sewer from Ashoka road. Man Singh road to Q point	843	20	223	500	100	-	295	548

S.No	Strategy / project	Proposed outlay	07-08	08-09	09-10	10-11	11-12	JNNURM	NDMC sources
	in a length of 1410ms.								
4	Rehabilitation of 1200 mm (48") dia sewer line from Q point to Zair Hussain Marg	670	100	270	200	100	-	235	435
5	Rehabilitation of 600-700-800-900-1000mm dia RCC NP2 sewer line from Bhai Veer Singh Marg to Parliament street.	550	100	350	100	-	-	192	358
6	Rehabilitation of 66 dia brick barrel from Q pt. to Lodi road in a length of 2100ms	2271	1000	1000	271	-	-	795	1476
	Total A	12254	2542	4086	4127	1489	10	4288	7966

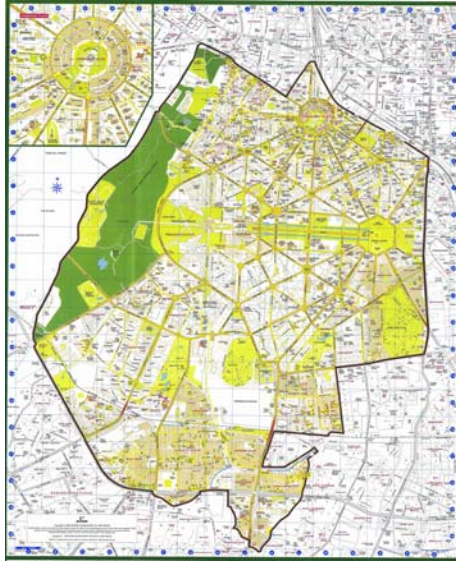
Appendix 2

**Detailed Investment outlay for services for urban poor
(Figures in Rs. Lakhs)**

	Strategy/Project	Short Term Investments	Medium Term Investments	Long Term Investments	Grand Total
	IN-SITU REDEVELOPMENT OF SLUMS				
	In situ redevelopment of Slums-providing water supply, road network, drainage and Housing etc.				
A	WATER SUPPLY				
1	Installation of Public stand posts in the most deficient clusters				
a	J. J. Cluster near Cement Godown Netaji Nagar	50.75			
b	Sanjay camp II	21.25			
c	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	17			
d	Bhaiya Ram Camp, Race Course Club, Race Course Road.	9.5			
e	J. J. Cluster Knownas Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	9			
f	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	9.25			
g	Labour Camp, Humayun Road, Khan Market	7.25			
h	Shaheed Arjun Dass Bengali Camp, on Nallah Kidwai Nagar East	6.25			
i	JJ Cluster near Jawhar Bhawan has no water supply arrangements at all	0.75			
2	Replacement of Handpumps with Standposts in slums completely deficient in PSPs				
a	Rajiv Gandhi Camp behind T.P. Lane, Mother Teresa Crescent.	0.5			
b	J. J. Cluster at Shiv Mandir near Railway Flying Club	1			
3	Installation of PSPs/hydrants in all other deficient area (total)		153.903		
	Sub Total A	132.5	153.903		286.403
B: COMMUNITY TOILETS ARRANGEMENT					
1	Construction of community Toilets in Most deficient areas (no.s - 302)				
a	J. J. Cluster near Cement Godown Netaji Nagar	714			

b	Sanjay Camp Part-II, Railway Camp Colony, Chanakyapuri Iraq Embassy side	288			
c	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	234			
d	Bhaiya Ram Camp, Race Course Club, Race Course Road.	194			
e	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	132			
f	J. J. Cluster Known as Harijan Basti, Anat Ram Dairy, Sector-XIII, R. K. Puram	134			
g	J. J. Cluster known as Diary No. 95, C-31 Block, Kali Bari marg has no toilet arrangement at all	100.8			
h	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane has no toilet arrangement at all.	16			
2	Construction of community Toilets in Other deficient areas (Nos - 134)		794		
	Sub Total B	1812.8	794		2607
C	SEWERAGE				
1	Construction of Sewerage Arrangement In Those clusters with No sewers				
a	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	0.15			
b	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	0.82			
c	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	0.17			
d	J. J. Cluster, back of Chelmsford Club, Raisina Road	1.25			
e	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)				
f	J. Cluster at Shiv Mandir near Railway Flying Club				
g	J. J. Camp near Masjid Polo Ground Ground, Race Course Club, Kamal Attaturk Road.				
	Sub Total C	2.39			2.39
D	ELECTRIFICATION- STREET LIGHTING				
1	Installation of street lights in Slums where no such arrangement exists				
a	Shaheed Arjun Dass Camp on nallah Kidwai Nagar East	5			

b	Shaheed Arjun Dass Bengali Camp, on nallah Kidwai Nagar East	2.25			
c	J. J. Cluster Behind Eastern Court near NDMC ESS, H.C. Mathur Lane	0.75			
d	J. J. Cluster, near NDMC Water Supply Control Room, Kali Bari Marg	0.5			
e	Shaeed Arjun Dass Camp, Laxmibai Nagar at Maharaja Agrasen Marg	1.75			
f	Savargiya Rajiv Gandhi Camp, Old 'G' Point, Havlock Squarter, Kali Bari Marg	0.5			
g	Shankar camp behind C-II Flats, Moti Bagh near Vidhan Chand Vidyalaya	1.75			
h	Indira Gandhi Camp behind New Khanna Market, Lodi Road adjoining NDMC Housing Complex, Palika Niwas	4			
i	Shaheed Arjun Dass Camp on Kushak nallah between Vishwa Yuvak Kendra, T.P. Lane, Mother Terressa Crescent	0.75			
j	Pacca J. J. Cluster near Princes Park Sangli Mess	1.75			
k	J. J. Cluster known as Madrasi Camp behind D-II Flats, Kidwai Nagar East	2.75			
l	J. J. Cluster known as Madrasi Camp behind D-II flat Nos. 65-68	0.25			
m	J. J. Camp Bharti Nagar, Khan Market	2			
n	Bhaiya Ram Camp, Race Course Club, Race Course Road.	5.75			
o	J. J. Camp (Small cluster below Safdurjung flyover Railwayline.)	0.75			
p	J. J. Cluster at Shiv Mandir near Railway Flying Club	1.75			
q	Shiv Mandir J. J. Cluster camp near Delhi Flying Club	1.5			
2	Upgradation of street lights in other deficient clusters		31.75		
	Sub Total D	33.75	31.75		65.5
	Grand Total	1979.94	33.25	947.903	2961.093



Chapter – 18 : Project & Capital Investment Plan



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Subcity Plan NDMC

CHAPTER - 18

PROJECT AND CAPITAL INVESTMENT PLAN

18.1 INTRODUCTION

This section analyses the project-wise investment requirement over the JNNURM years (2007 - 2012), in order to identify the source of funds. In the case of NDMC, Central Government, through JNNURM, will meet upto 50 % of project costs; State Government's contribution will constitute 35 % of project costs; whereas the ULB (NDMC) will be expected to meet the balance 50%, either through it's own revenues, or through private sector participation.

Several projects have been identified for implementation by agencies other than NDMC. These include the CPWD, DDA, DJB, DMRC, GNCTD, Waqf Board, and other Government of India agencies. In order to reduce the resource requirements from NDMC, projects in which the private sector can be involved in development, management, implementing and financing have been identified. Also, projects in which beneficiary contributions will form part of the source of funds have also been mentioned.

18.2 INVESTMENT PLAN: SUB-MISSION 1

18.2.1 Water Supply

NDMC is supplied bulk water by the DJB, and is responsible for distribution of water in it's area. It is also responsible for the up gradation and maintenance of the distribution network. However, it supplies water in bulk to the storage tanks of several residential areas, within which further distribution is the responsibility of the CPWD. The CPWD also maintains the distribution infrastructure in these residential areas.

Annual investments for proposed projects, as well as the agencies responsible for capital investment and O & M are presented below:

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
WATER SUPPLY								
1. ESTIMATION OF ACCURATE DEMAND FOR WATER SUPPLY (AND SEWERAGE GENERATED)								
Survey of Floating Population	25	25					NDMC	-
subtotal	25	25	0	0	0	0		
2. AUGMENTATION AND REHABILITATION OF DISTRIBUTION SYSTEM								
(i) Construction of UGR (1.5 ML) & BPS at Panchsheel Marg & at Janpath (0.6 ML)	350		200	150			NDMC	NDMC

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
(ii) Repair of Pandara Road UGR and BPS	15	15					NDMC	NDMC
(iii) Replacement of Pumps and motors at 9 locations (Laxmi Bai Nagar in Phase II)	94.25	36	47	11.25			NDMC	NDMC
(iv) Survey and rehabilitation of plumbing (water pipes) in government housing colonies (approx. 17600 blocks) to eliminate shared plumbing (GF & FF)	880	80	200	200	200	200	CPWD	CPWD
(iv) Detailed feasibility study for impl. of 24/7 water supply in NDMC area	80	80					NDMC	-
subtotal	1419.25	211	447	361.25	200	200		
3. PROMOTION OF EFFICIENCY IN DISTRIBUTION & METERING								
(i) Creation of a cell for leak detection, monitoring of flow and pressures. Estt @Rs12 lacs/year; equipment Rs 25 lakh	25	7	10	8			NDMC	NDMC
(ii): Procurement of water meters	140	40	80	20	0	0	NDMC	NDMC
(iii): Efficiency audit of E & M equipment at BPS's and tube wells	10		10				NDMC	-
subtotal	175	47	100	28	0	0		
4. IMPROVEMENT OF UNFILTERED WATER SUPPLY								
(i) Replacement of 1500mm dia, 2.2 km length of treated effluent main from Okhla STP to Rajghat	900	400	500				DJB	DJB
(iii) Pilot project for further treatment of unfiltered water received at Lodhi Gdns from Okhla STP	11	11					NDMC	NDMC
subtotal	911	411	500	0	0	0		
TOTAL	2530.25	694	1047	389.25	200	200		

O & M costs (@ 8%), and agencies responsible for these are provided below. It is assumed that expenditure on O & M will begin upon termination of projects:

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
SECTOR: WATER SUPPLY							
CPWD	880						70

DJB	900			72	72	72	72
NDMC	635				50.8	50.8	50.8

18.2.2 Sewerage

NDMC is responsible for up-grading, augmenting and maintaining the conveyance network for sewage within its area. Sewage is off-loaded to DJB for treatment and disposal.

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
SEWERAGE								
1. REHABILITATION OF SEWERAGE NETWORK								
(i) De-silting of sewerage system in NDMC area	50	10	10	10	10	10	NDMC	NDMC
(ii): Rehabilitation of sewers using trench less technology	5360		1260	2000	2100		NDMC	NDMC
sub-total	5410	10	1270	2010	2110	10		
2. AUGMENTATION OF SEWERAGE NETWORK								
(i) Providing 1148mm dia sewer along Vinay Marg using trench less technology	114	114					NDMC	NDMC
(ii) Augmentation of sewerage system from Kamal Attaturk Marg to Prithvi Raj Road using trench less technology	1246	246	500	500			NDMC	NDMC
(iii) Augmentation of sewerage network in other areas using trench less technology	3600			1200	1200	1200	NDMC	NDMC
sub-total	4960	360	500	1700	1200	1200		
TOTAL INVESTMENT	10370	370	1770	3710	3310	1210		

The entire O & M, @ 10 % of capital costs, will be borne by NDMC. It is presumed that these will be cumulative, with investment, since rehabilitation and augmentation of the sewerage network will be done for various branch sewers independently.

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
SECTOR: SEWERAGE							
NDMC	10370		37	214	585	916	1037

18.2.3 Solid Waste Management

NDMC is responsible for collection and transportation of municipal solid waste in it's area. This has recently been contracted to a private sector operator, in all but 2 circles. Road sweeping continues to remain under NDMC

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
SOLID WASTE MANAGEMENT								
1. SEGREGATION OF WASTES TO ENSURE EFFECTIVE END TREATMENT AND DISPOSAL								
(i) Arrangements for C & D waste transportation and disposal - skips and vehicle	21		21				NDMC	NDMC
(ii) Strengthening / establishing of composting pits in the NDMC nurseries, including equipment	15	9	6				NDMC	NDMC
sub-total	36	9	27	0	0	0		
2. ENSURING CLEAN SURROUNDINGS IN PUBLIC AREAS								
(i) Procurement of mechanical street sweepers - large, medium and small @ 2 each	300		200	100			NDMC	NDMC
(ii): Procurement of 6 mobile vans to check littering in public places in NDMC	24		24				NDMC	NDMC
sub-total	324	0	224	100	0	0		
3. TRAINING AND AWARENESS GENERATION								
(i) Training and orientation for municipal staff for 4 years @ Rs. 40 lakh p.a.	160		40	40	40	40	NDMC	NA
(ii) Public awareness generation for 4 years, incl. in schools, hospitals, residential and commercial areas ...etc (@ 50 lakh p.a.)	200		50	50	50	50	NDMC	NA
sub-total	360	0	90	90	90	90		
TOTAL INVESTMENT	720	9	341	190	90	90		

O & M costs (@ 7%) to be borne by NDMC, are provided below. It is assumed that these will be cumulative with capital investment.

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
SECTOR:SOLID WASTE MGMT							
NDMC	360		0.6	18.2	25.2	25.2	25.2

18.2.4 Storm Water Drainage

NDMC is responsible for the construction and maintenance of all infrastructure for storm water drainage in it's area. This includes man-made as well as natural drains. It is, however, inextricably linked to the rest of the city in planning for surface drainage, and ensuring adequate provision for evacuation of flood waters.

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
DRAINAGE								
1. PREPARATION OF A COMPREHENSIVE DRAINAGE MASTER PLAN FOR THE AREA								
(i) Comprehensive study and survey of the drainage systems linked with the whole of the NCT of Delhi through GNCTD	400	50	200	150			GNCTD	N.A.
sub-total	400	50	200	150	0	0		
2. ANTI FLOOD WORKS - INTERIM								
(i) Capacity augmentation and improvement of road side drains and drainage system in colonies	70	10	30	30			NDMC	NDMC
(ii) Pump-house with back-up power for dewatering accumulated water at the railway bridge underpass at Chanakyapuri	20	20					NDMC	NDMC
sub-total	90	30	30	30	0	0		
TOTAL INVESTMENT	490	80	230	180	0	0		

The O & M costs, @ 5%, will be borne by NDMC, on a cumulative basis, with capital investment. This is outlined below:

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
DRAINAGE							
NDMC	90		1.5	3.0	4.5	4.5	4.5

18.2.5 Roads and Transportation

NDMC is responsible for the construction, maintenance, alteration and improvements of public streets, bridges, culverts, causeways and the like; lighting and cleansing of public streets and other public places; and removal of obstructions & projections in or upon streets, bridges and other public spaces. Public transport services in the NDMC

area are controlled by other agencies, and do not fall within the mandate of the agency.

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
ROADS AND TRANSPORTATION								
A. Optimisation of Transport Infrastructure								
i) Signalization of rotaries along Ashoka Road, Panchsheel Marg, Talkatora Road & Janpath	200	100	100				NDMC	NDMC
ii) Beautification of Ten Road Corridors in N DMC Area	1500	200	800	500			NDMC	NDMC
iii) Intersection improvement at ten locations along Tolstoy Marg, Aurobindo Marg	150	50	100				NDMC	NDMC
iv) Develop Area Traffic Control (ATC) for CBD Area	500	100	200	200			NDMC	NDMC
v) Improvement of street scape in Bengali Market, Gole Market	200		100	100			NDMC	NDMC
vi) Road signage, Information system & street furniture along roads	1000	200	200	200	200	200	NDMC	NDMC
vii) Road markings with Thermoplastic paint	250	50	50	50	50	50	NDMC	NDMC
viii) Replacement of Old kerbs stones	200	50	50	100			NDMC	NDMC
Sub-Total	4000	750	1600	1150	250	250		
B. Parking Management & Enhancement								
iv)Multi level car parking at Sarojini Nagar Market	4000	500	1000	1000	1000	500	PVT.	PVT.
v) Multi level car parking behind HT Building KG Marg	6000	500	1000	1000	1500	2000	PVT.	PVT.
vi) Multi level car parking at Baba Kharak Singh Marg	5000	500	1000	1000	1500	1000	PVT.	PVT.
vii) Multi level Car park at Khan market							—	—
viii) Multi level Car park at I.N.A. Market							—	—
ix) Development of premium parking areas	200	50	50	50	50		PVT.	PVT.
Sub-Total	15200	1550	3050	3050	4050	3500		
C. Integration of Modes of Public Transport								
i) Construction of Taxi & Auto Stands	200	100	100				NDMC	NDMC
ii) Interchange facility at Bus Terminals	100		50	50			NDMC	NDMC
iii) Battery operated Mini Bus Services from Metro stations & Parking & ride facilities	500	100	200	200			PVT.	PVT.
iv) Reorganization of Bus Routes and bus stops	150	50	50	50			NDMC	NDMC

Sub-Total	950	250	400	300	0	0		
D. Pedestrian Safety and Connectivity								
i) Construction of foot over bridges at five locations	1000	500	500				NDMC	NDMC
ii) Pedestrianisation of Khan Market & Prithavi Raj Market							–	–
iii) Pedestrianisation of Connaught Place	5000			1000	2000	2000	NDMC	NDMC
iv) Development of a comprehensive pedestrian plan for NDMC area	20	10	10				NDMC	
Sub-Total	6020	510	510	1000	2000	2000		
E. Enhance Road Infrastructure								
i) Initial studies for identification of road capacity augmentation measures (incl.by-pass routes) for Central (NDMC) Areas; preparation of DPR for preferred option	700			150	200	200	NDMC	NDMC
iv) Ramps connecting School lane Flyover with Deen Dyal Upadhyay Marg	1000	200	400	400			NDMC	NDMC
v) Widening & Strengthening of roads for a length of 30 km.	6000	500	500	1000	2000	2000	NDMC	NDMC
vi) U.G. Connection between Safdarjung & AIIMS Hospitals	250	50	200				NDMC	NDMC
vii) Milling and up gradation of roads	1500	300	600	600			NDMC	NDMC
Sub-Total	9450	1050	1700	2150	2200	2200		
TOTAL	35620	4110	7260	7650	8500	7950		

It is anticipated that the private sector will meet the full capital costs (excl. cost of land), and O & M costs of parking infrastructure; and the IPT services (park and ride...etc). The balance O & M costs will be met by NDMC as elaborated under:

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
SECTOR: ROADS AND TRANSPORTATION							
PVT.	15700	165	490	815	1220	1570	1570
NDMC	19900		245	645	1085	1530	1975

18.2.6 Environment

The environmental responsibilities of the NDMC, as laid down in the Act relate mostly to it's functions with respect to the provision and management of civic infrastructure - water supply, sewerage and sanitation, waste management, maintenance of public parks and drains, cleaning of streets...etc. The projects outlined hereunder seek to extend the role of the NDMC in the environmental well-being of the area under its jurisdiction.

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
ENVIRONMENT								
1. STRENGTHENING ENVIRONMENTAL FUNCTIONS OF NDMC								
(i) Establishment of Environmental Division in NDMC, including (a): structuring of division (b): capacity building of staff	22	10	6	6			NDMC	NDMC
(ii) Establishment of Environmental Quality Monitoring Stations	650		250	200	200		NDMC / CPCB / DPCC	NDMC
sub-total	672	10	256	206	200	0		
2. ENHANCING GREEN COVER AND BIODIVERSITY								
(i) Scientific research, and development of an action plan for enhancing green cover in a sustainable manner	21	7	14	0			NDMC / Forest Dept.	N.A.
(II) Increasing bio-diversity - census of flora and fauna; research on habitats; approach to planning habitats	13	5	8				NDMC / Dept. of Env., GNCTD	N.A.
sub-total	34	12	22	0	0	0		
3. REDUCTION OF ENVIRONMENTAL FOOTPRINT OF NDMC AREA								
i) Energy audits of commercial areas under NDMC ownership (Prelim. Investigations and tender mgmt.)	25	8	17	0	0	0	NDMC	PPP
(ii) Up-gradation of street lighting system, incorporating systems for energy efficiency	10000		500	3500	3000	3000	NDMC	NDMC
sub-total	10025	8	517	3500	3000	3000		
TOTAL INVESTMENT	10731	30	795	3706	3200	3000		

The O & M expenses, @ 3 % of capital costs, will be met on a cumulative basis, by NDMC. These are estimated below:

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
SECTOR: ENVIRONMENT							
NDMC	10672		0.3	23.0	134.2	230.2	320.2

18.2.7 Heritage Management - Built and Natural

As per the Act, the NDMC is responsible for “the maintenance of monuments and memorials vested in any local authority in New Delhi” (obligatory function). Moreover, it also mentions that the council is responsible for the “maintenance and development of the value of all properties vested in, or entrusted to the management of the council.” As a discretionary function, the council is responsible for the planting and care of trees on road sides and elsewhere.

STRATEGY/ PROJECT	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
HERITAGE MANAGEMENT (BUILT AND NATURAL)								
A) ENHANCEMENT OF GLOBAL IMAGE OF THE NDMC AREA WITHIN DELHI THROUGH SYSTEMATIC HERITAGE MANAGEMENT								
(i) Redelineation of Lutyens Bungalow Zone.Comprehensive Heritage Conservation & Management Plan for Lutyens New Delhi .	30	15	15	-	-	-	NDMC	-
Sub-Total	30							
B) DEVELOPMENT OF AN INFORMATION MANAGEMENT SYSTEM TO FACILITATE INTEGRATION OF HERITAGE (BUILT AND NATURAL) MANAGEMENT WITHIN DEVELOPMENT PROCESSES FOR THE NDMC AREA								
(i) Final Inventory of Heritage Resources to be legally notified and maintained by the NDMC as the basis for future action.	5	5	0	0	0	0	NDMC	-
(ii) Expansion of the existing GIS to include a GIS based Cultural Heritage Information System	10	5	5	0	0	0	NDMC	NDMC
(iii) Expansion of the existing GIS to include a GIS based Natural Resources Information System	15	10	5	0	0	0	NDMC	NDMC

(iv) Evaluation and quantification of Environmental Services provided by the garden city capital	5	3	0.5	0.5	0.5	0.5	NDMC	-
Sub-Total	35	23	10.5	0.5	0.5	0.5		
C) DEVELOPMENT OF IN-HOUSE CAPACITY WITHIN THE NDMC FOR CONSERVATION PLANNING AND MANAGEMENT OF THE HERITAGE (NATURAL AND BUILT) RESOURCES								
(i) Establishment of a Heritage Cell within the NDMC Chief Architect's office, linked with Engineering cell and Horticulture Dept.	25	25	0	0	0	0	NDMC	NDMC
(ii) Improvement - upgrading and modernisation of the NDMC nurseries (five nurseries, including tree nursery)	250	200	20	10	10	10	NDMC	NDMC
(iii) Provision for a Landscape Cell within the Horticulture Department	25	25	0	0	0	0	NDMC	NDMC
(iv) Training Programmes for nursery personnel	25	10	5	5	3	2	NDMC	-
Sub-Total	325	260	25	15	13	12		
D) PRIORITISATION OF IDENTIFIED HERITAGE SUB-ZONES AND PRECINCTS - PREPARATION OF DETAILED CONSERVATION & HERITAGE MANAGEMENT PLANS								
(i) Sub-Strategies for Aliganj and BK Dutt Colony based on accurate and up-to-date baseline surveys and data and restoration								
Heritage Precincts in Aliganj -	15	10	2	1	1	1	Waqf	Waqf
Karbala area	10	8	0.5	0.5	0.5	0.5	Waqf	Waqf
Identified listed heritage buildings and structures	20	15	2	1	1	1	NDMC	NDMC
Area near Najaf Khans Tomb	5	4	0.25	0.25	0.25	0.25	NDMC	NDMC
(ii) Sub-Strategies for India Gate - C- Hexagon area, Central Vista								
Preparation of a Plan for all sites adjoining Central Vista, India Gate and C-Hexagon area for public and community purposes	20	15	5	0	0	0	DDA / DUAC	-
Conservation and scientific management of the natural resources of the Central Vista, India Gate and C-Hexagon areas	500	200	150	50	50	50	CPWD	CPWD
(iii) Sub-Strategies for important open space components								
Race Course and Safdarjang Airport Areas as parks integrated into the Zonal Development Plan	500	300	50	50	50	50	AAI / GoI	AAI / GoI

Removal of encroachments (booths, parking, hard surfacing), and conservation, phased planting and scientific management of the trees, shrubs, groundcover, footpaths of original/modified road sections for all major avenues, roads and roundabouts	800	500	150	50	50	50	NDMC	NDMC
Restoration of garden pavilions of the late mughal period within Talkatora Garden, and conservation of remains of terraces, landscaping and water harvesting	300	50	100	50	50	50	NDMC	NDMC
Detailed plans for replanting along roads affected by the Metro/Parking etc.	30	5	10	5	5	5	DMRC	DMRC
(iv) Sub-strategies for restoration and infrastructure upgradation of important heritage market places and commercial centres								
Connaught Place and listed heritage buildings around the outer circle.	#							
Gole Market & surrounding areas.	250	50	125	25	25	25	NDMC	NDMC
(v) Sub-strategies for formulation of appropriate guidelines for development of plots occupied by barracks (not identified as heritage within the existing NDMC list) within the Lutyens Bungalow Zone Area for Public and Community Uses as per the Buch report								
Plots currently occupied by barracks to be integrated within the ZDP and Area Level Plans (within overall framework for conservation)	Refer under Urban Renewal						NDMC	NDMC
(vi) Sub-strategies for conservation of heritage schools and educational institutions within the NDMC area such as Lady Hardinge College								
All listed government owned educational institutions within the NDMC area	100	10	30	30	20	10	NDMC	NDMC
Sub-Total	2550	1167	624.75	262.75	252.75	242.75		
E) Strategies for development of heritage tourism circuits within the NDMC area								
(i) Formulation of Heritage Tourism Management Plans for Development of tourism circuits and provision of tourist facilities and material.	500	100	100	100	100	100	DTTDC	DTTDC
Commemoration and Promotion of Centenary of New Delhi to International Tourists as Global Garden City Capital								

Sub-Total	500	100	100	100	100	100		
TOTAL INVESTMENT	3440	1550	760.25	378.25	366.25	355.25		

The O & M costs, estimated at 7% of capital expenditure will be borne by various agencies as outlined below. These will be borne on a cumulative basis, as works are undertaken and completed.

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
HERITAGE MGMT							
Waqf	25	1	1	2	2	2	2
DDA / DUAC	20	1	1	1	1	1	1
CPWD	500	14	25	28	32	35	35
AAI /Gol	500	21	25	28	32	35	35
DMRC	30	0	1	1	2	2	2
DTTDC	500	7	14	21	28	35	35
NDMC	1800		62.6	93.2	104.8	115.8	126.0

18.2.8 Urban Renewal

The NDMC is responsible for the maintenance and development of the value of all properties vested in, or entrusted to the management of the council. The Master Plan for Delhi (MPD- 2021) has earmarked Connaught Place as the Metropolitan City Center, for the city as a whole, and NDMC has envisaged an ambitious plan for it's upgradation.

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
URBAN RENEWAL								
1. UPGRADATION AND RENEWAL OF CP AS METROPOLITAN CITY CENTRE								
(i) Construction of service tunnel, and up-gradation of physical infrastructure - water supply, drainage, sewerage, including irrigation and rain water harvesting	8757	300	3500	4957			NDMC	NDMC
(ii) Façade restoration and retrofitting of buildings, including alterations to Pallika Parking	7725	50	2100	2400	3175		NDMC /BENEFICIARY	NDMC / PVT
(iii) Provision of Pedestrian facilities, improvement of landscaping and horticulture	12680	700	2300	2630	3950	3100	NDMC / PVT	NDMC / PVT

(iv) Up gradation and augmentation of traffic infrastructure (parking; provision of subways; and improvement of roads)	19200	1750	5750	6300	2700	2700	NDMC / PVT	NDMC / PVT
sub-total	48362	2800	13650	16287	9825	5800		
2. REDEVELOPMENT OF OBSOLETE LAND USES								
(i) Plan to ensure integration of plots currently occupied by barracks within the ZDP and Area Level Plans (within overall framework for conservation)	30		30				NDMC	N.A.
sub-total	30	0	30	0	0	0		
3. PROVISION OF COMMON UTILITY DUCT								
(i) Implementation of common utility ducts (FRC) along 150 kms of arterial and sub-arterial roads in the area.	30000	500	5000	10000	10000	4500		
TOTAL INVESTMENT	78392	3300	18680	26287	19825	10300		

The O & M costs of the above projects are expected to be shared among various stakeholders as mentioned below:

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
SECTOR: URBAN RENEWAL							
Beneficiary	1159				48	48	48
PVT.	3170				99	316	316
PVT.	7680				386	575	575
NDMC	66353				2843.9	4053.6	4644.7

18.2.9 Organisational Strengthening

Project and investment recommendations in capacity building seek to ensure that investments in other sectors are sustainable, by strengthening the management and operational capabilities of the NDMC

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
ORGANISATIONAL DEVELOPMENT								
1. STRENGTHENING CORPORATE FUNCTIONS AND QUALITY CONSCIOUSNESS								
(i) Consultation and Study by Consultant, through deeper internal stakeholder	10.5	10.5					NDMC	

consultations, of issues and requirements								
(ii) Setting up of a Central Corporate Cell, with individual cells in key departments	20		20				NDMC	NDMC
Sub-total	30.5	10.5	20	0	0	0		
2. FOCUS ON HR AND TRAINING								
(i) Creation of a central HR Department, including consultant's inputs; training and capacity building	20	6	14				NDMC	NDMC
(ii) Creation of a strong training Department, reporting to the HR Department	20		7.5	13.5			NDMC	NDMC
(iii) Creation of training programmes - learning and development - for all employees - first three years @ Rs. 3000 per head per year - 16,000 employees)	1440			480	480	480	NDMC	NA
(iv) Creation of programmes for orientation and training of newly inducted personnel on an on-going basis @Rs 3000 per head, 500 employees								
(iv) Creation of middle management training programmes - in technical, financial and management aspects - in partnership with educational / training institute. (@ Rs. 45,000 per manager, once in 3 years - 200 managers)	100			30	30	35	NDMC	NA
sub-total	1580	6	21.5	523.5	510	515		
TOTAL INVESTMENT	1610.5	16.5	41.5	523.5	510	515		

Costs to operate and maintain systems put in place have been estimated at the rate of 2 % of project costs, and are assumed to be required after completion of interventions.

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
ORGANISATIONAL DEVELOPMENT							
NDMC	60				1.2	1.2	1.2

18.2.10 Governance

Project recommendations in governance seek to augment and improve the efficiency of service delivery within NDMC.

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
GOVERNANCE								
1. E-GOVERNANCE: COMPUTERISATION OF PROCESSES AND FUNCTIONS WITHIN NDMC								
(i) Development of software for various departments and processes; information collection and management	690	50	200	200	240		NDMC	NDMC
(ii) Support for installation and operationalising of software	101.25		30	30	41.25		NDMC	NDMC
TOTAL INVESTMENT	791.25	50	230	230	281.25	0		

It is estimated that 2 % of capital costs will be required for purposes of operation and maintenance, after completion of the proposed project. This will be borne by NDMC.

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
GOVERNANCE							
NDMC	791					15.8	15.8

18.3 INVESTMENT PLAN: SUB-MISSION 2

18.3.1 Services for the Urban Poor

The NDMC is responsible for ensuring a basic level of services to all residents within its area. Annual investments required to fulfil this for the urban poor are presented below:

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
BASIC SERVICES TO THE URBAN POOR								
1. IN-SITU UPGRADATION OF SLUMS THROUGH PROVISION OF BASIC INFRASTRUCTURE								
(i) Augmentation of water supply to meet minimum standards	132.5	20	50	50	12.5		NDMC /BENEFICIARY	NDMC

Strategy/Project	Rs in Lakhs	2007-08	2008-09	2009-10	2010-11	2011-12	Agencies Responsible for	
							Capital Investment	O&M
	(IN RUPEES LAKHS)							
ii) Provision of sanitation facilities to meet minimum standards (community toilets)	1812.8	100	700	700	312.5		NDMC /BENEFICIARY	NDMC
iii) Installation of intermediate sewer lines connecting the community toilet to the main trunk sewer line in 4 slums.	2.39	2.39					NDMC /BENEFICIARY	NDMC
iv) Provision of street lights in slums where no facility is currently available	33.75	10	23.75				NDMC /BENEFICIARY	NDMC
TOTAL INVESTMENT	1981.44	132.39	773.75	750	325	0		

Beneficiaries will contribute 12 % of the above capital costs, and bear the related O & M expense. The balance O & M costs will be borne by NDMC. This has been estimated @ 5%, on a cumulative basis, as presented below:

Agency	Total Project Investment (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
BASIC SERVICES TO THE URBAN POOR							
Beneficiary	238	1	5	10	12	12	12
NDMC	1981		6.6	45.3	82.8	99.1	99.1

18.4 SUMMARY OF PROJECT INVESTMENT PLAN

The share of the various sectors, as well as the investment commitment of the Centre, State and the ULB is indicated in the tables below. Moreover, the following is applicable with respect to Central assistance:

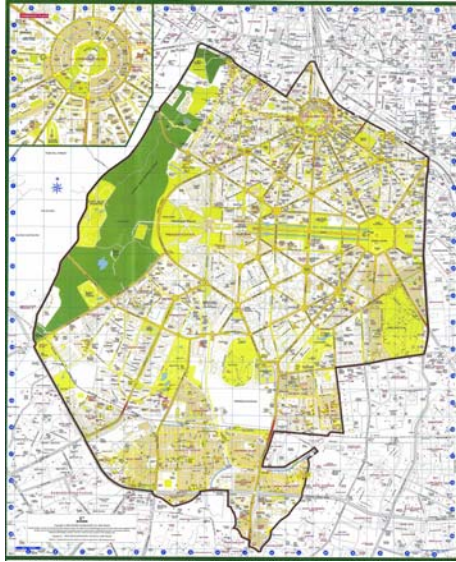
- In case any JNNURM project is also approved as Externally Aided Project (EAP), the EAP funds can be passed through as Accelerated Central Assistance to the State Government, as funds contributed by the state, ULB, FII's...etc.; JNNURM funds can be used as GoI contribution.
- If necessary, internal resources of implementing agencies; MP or MLA Local Area Development Funds may be substituted for institutional funds, or the State's share.

Sector	Total Investment (Rs Lakhs)	% of Total Investment Proposed
Sub-mission 1		
WATER SUPPLY	2530.25	1.73
SEWERAGE	10370.00	7.07
HERITAGE MANAGEMENT (BUILT AND NATURAL)	3440.00	2.35
ENVIRONMENT	10731.00	7.32

Sector	Total Investment (Rs Lakhs)	% of Total Investment Proposed
DRAINAGE	490.00	0.33
SOLID WASTE MGMT	720.00	0.49
ROADS AND TRANSPORTATION	35620.00	24.28
URBAN RENEWAL	78392.00	53.45
GOVERNANCE	791.25	0.54
ORGANISATIONAL DEVELOPMENT	1610.50	1.10
Sub-Total 1	144695.00	98.65
Sub-Mission 2		
BASIC SERVICES TO THE URBAN POOR	1981.44	1.35
Sub-Total 2	1981.44	1.35
TOTAL	146676.44	100.00

Sector	Total Investment (Rs Lakhs)	2007-08	2008-09	2009-10	2010-11	2011-12	Central Govt (@ 35%)	State Govt (@15%)	ULB/ Parastatal/ other agencies (@50%)
sub-mission 1									
WATER SUPPLY	2530.25	694.00	1047.00	389.25	200.00	200.00	885.59	379.54	1265.13
SEWERAGE	10370.00	370.00	1770.00	3710.00	3310.00	1210.00	3629.50	1555.50	5185.00
HERITAGE MANAGEMENT (BUILT AND NATURAL)	3440.00	1565.00	775.25	378.25	366.25	355.25	1204.00	516.00	1720.00
ENVIRONMENT	10731.00	30.00	795.00	3706.00	3200.00	3000.00	3755.85	1609.65	5365.50
DRAINAGE	490.00	80.00	230.00	180.00	0.00	0.00	171.50	73.50	245.00
SOLID WASTE MGMT	720.00	9.00	341.00	190.00	90.00	90.00	252.00	108.00	360.00
ROADS AND TRANSPORTATION	35620.00	4110.00	7260.00	7650.00	8575.00	8025.00	12467.00	5343.00	17810.00
URBAN RENEWAL	78392.00	3300.00	18680.00	26287.00	19825.00	10300.00	27437.20	11758.80	39196.00
GOVERNANCE	791.25	50.00	230.00	230.00	281.25	0.00	276.94	118.69	395.63
ORGANISATIONAL DEVELOPMENT	1610.50	16.50	41.50	522.50	515.00	515.00	563.68	241.58	805.25
sub-total 1	144695.00	10224.50	31169.75	43243.00	36362.50	23695.25	50643.25	21704.25	72347.50
sub-mission 2									
BASIC SERVICES TO THE URBAN POOR	1981.44	132.39	773.75	750.00	325.00	0.00	990.72		990.72
sub-total 2	1981.44	132.39	773.75	750.00	325.00	0.00	990.72	0.00	990.72
TOTAL	146676.44	10356.89	31943.50	43993.00	36687.50	23695.25	51633.97	21704.25	73338.22

Note: In case of Urban Transport Projects, the standard pattern of assistance (@35%) will not apply. The Cabinet Committee on Economic Affairs (CCEA), while considering any such project proposal, may decide the level of assistance (equity and / or loan) to be provided by Central Government.



Chapter – 19 : Financial Operating Plan



Subcity Plan NDMC

CHAPTER - 19

FINANCIAL OPERATING PLAN

19.1 INTRODUCTION

In order to assess the investment sustaining capacity of NDMC, the municipal fiscal situation has been simulated, based on a Financial Operating Plan (FOP). The FOP is essentially a multi-year forecast of municipal finances for a term of 15 years. It has been used to forecast the revenue income and operating expenditures for the period between FY 2005-06 and FY 2019-20. In order to determine options for project structuring, the FOP has been generated only for NDMC accounts, whose share in the investment required is the highest.

19.2 DEPARTMENT WISE INVESTMENT

Several departments / agencies, other than NDMC will also be required to make investments for the projects identified. The department wise capital investments are presented in the table below. Some of the projects that are under the ambit of the para-statal agencies (DJB), while others fall within the purview of Central Government Agencies, which play a large role in the NDMC area. Projects that can draw upon private sector participation have been earmarked and it is assumed that for these projects 50% of the funding would be from the GoI & the State Government; and some part of the balance 50% would come from the private sector as equity. In this case part of the operation and maintenance would be the responsibility of the private sector.

In case of projects relating to urban slums and poor, it is assumed that 12% of the project cost (ULB share) would be borne by the beneficiaries. Taking into account the above assumptions, the proposed means of financing the investment proposed is presented in the table below.

Department	Total Investment (Rs Lakh)	Investment by Department (Rs Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12
NDMC	114975	57487.5	3320.3	12096.6	18279.5	14824.1	8966.9
CPWD	1380	690.0	140.0	175.0	125.0	125.0	125.0
DJB	900	450.0	200.0	250.0	0.0	0.0	0.0
Waqf Board	25	12.5	9.0	1.3	0.8	0.8	0.8
AAI / GoI	500	250.0	150.0	25.0	25.0	25.0	25.0
DMRC	30	15.0	2.5	5.0	2.5	2.5	2.5
DDA	20	10.0	7.5	2.5	0.0	0.0	0.0
GNCTD	400	200.0	25.0	100.0	75.0	0.0	0.0
Pvt.	26550	13275.0	1262.5	3062.5	3213.8	3058.8	2677.5
Beneficiary Contribution	1397	698.3	11.7	203.9	225.0	257.6	0.0
DTTDC	500	250.0	50.0	50.0	50.0	50.0	50.0
TOTAL	146676	73338.2	5178.5	15971.9	21996.7	18343.9	11847.7

Phasing of the total investment over the JNNURM period is depicted in the table below:

	Total Investment (Rs Lakhs)		2007-08	2008-09	2009-10	2010-11	2011-12
Investment Phasing	146676.44		10356.89	31943.50	43993.00	36687.50	23695.25
% of Total Investment	100.00		7.06	21.78	29.99	25.01	16.15

Phasing of NDMC's share of the investment is presented in the table below:

	Investment by NDMC (Rs Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12
Investment Phasing	57487	3320	12097	18280	14824	8967
% of Total Investment	100.00	5.78	21.0	31.8	25.8	15.6

19.3 O & M COSTS

The basis of estimation of the O & M costs, and the agencies bearing the costs across various sectors has been presented in the last section. The total O & M cost to be borne NDMC, over the period 2007-08 to 2011-12 is presented below:

	Total investment for which O & M reqd. by NDMC (Rs. Lakh)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Estimated O & M Cost to be borne by NDMC	113013.19		354.6	1041.7	4866.6	6998.8	8263.7

19.4 KEY ASSUMPTIONS IN FOP

NDMC will be required to make investments not only towards capital costs, but also to ensure adequate O & M. Its ability to sustain the investments made will be determined from the closing balance (surplus / deficit) indication of its accounts. In order to evaluate this, the additional investment requirement was factored into the ULB's fund flow projection, and sustainability was determined based on the criteria that the closing balance requires to reflect an annual surplus in the account.

Trends in the income and expenditure items of the Council were forecast and assessed as the basis for the investment sustenance analysis. The limits for the growth rates of various revenue streams have been fixed between 2% and 12%. For

those heads with growth rate less than 2%, it has been assumed that changes will be effected to bring it up to 2%; and for those more than 12%, it is assumed that it will be sustained at 12% at least.

Simultaneously, certain assumptions have been made with respect to on-going or forth-coming initiatives that are expected to lead to substantial growth in revenues for the ULB. These include:

- the introduction of new taxes (professional tax);
- completion of real estate development projects, including the New Delhi District Center in 2007-08; redevelopment of Chanakya Complex in 2010
- expiry of building leases, and their renewal on fresh terms, including those of the Taj Hotel, Mansingh Road, Lok Nayak Bhavan
- the notification of circle rates on revenues from transfer of property (this is accompanied by the reduction in the ULB's share of Transfer Duty Fees, from 3% to 2%)

Also factored into the revenue and expenditure forecasts is the ring-fencing of the cash flows from the electricity distribution operations of the NDMC. While this has been a major revenue stream accounting (on average) 60% of revenues, it has also accounted for over 40% of total revenue expenditure. From the current year (2007-08), this function is to be regulated as that of a distribution company; and revenues and expenses in the distribution of electricity will be accounted for separately. Moreover, any surplus generated will not be available to other departments in the ULB, to off-set their expenses.

The JNURM benchmarks (85 % coverage in demand, and 90% collection efficiency) for increase in the coverage and collection efficiency of property tax collection have been taken into consideration while projecting revenues in this area. It is anticipated that these targets will be achieved, in the light of the on-going computerization of property tax functions in the ULB¹. Moreover, two measures have been recommended, in order to increase collection efficiency:

- Time limit is set for completion of assessments after issue of notice for revising assessments
- Time limit is set for completing action on cases remanded by courts

Receipts from water supply and electricity had been clubbed, for accounting purposes, until 2004-05, and reliable data for demand and collection of water supply dues is not available. Also, a considerable number of the connections in the areas are bulk connections, wherein tariff per connection is difficult to gauge. However, although bills to the tune of 23.5² lakhs have been issued every year for the last 4 years, recovery has hovered around 14 - 15 lakhs³, indicating a collection efficiency of barely 60%. The following key assumptions have been made in order to forecast revenue growths from this stream:

¹ Coverage of demand is already 100% in the area, for the limited number of properties paying property tax.

² Current demand - not

³ SPAN Report.

- collection efficiencies will increase as a result of increased metering, leading to increased monitoring of water use
- total number of connections will remain the same (although increased metering will lead to greater coverage in billing, insufficient information was available, and this could not be factored into the expected revenues)
- tariffs, which are currently less than those levied by DJB, will be revised upwardly by 20 % every 3 years (4 revisions by 2020-21), so that expenses incurred are adequately recovered.

The guiding assumptions for forecasting income and expenditure are summarized below:

1. Revenue Account: Income

Item	Basis (Current Rate - CAGR, 2000 - 2004) %	Assumption for Forecast (2005 - 2021) - %
A. TAXES, DUTIES & OTHER PRINCIPAL REVENUE		
Taxes:		
House tax		
1. Govt. property	24.60	12.00 - it has been assumed that the service tax recovered from government properties will grow at the ave. CAGR, since there is no change in the number of properties
2. Private property	12.18	As per the DCB statement, - growth in the number of tax paying properties has been minimal, and is the result of properties being divided and sold as separate units; or of properties coming out of the DRC Act - the total (overall) ARV of properties has increased at a rate of 9.7%
Theater Tax	0.00	2.00
Tax on Advertisement	35.12	12.00
Duty on Transfer of Property	16.95	12.00 - however a quantum increase of 25 % is expected in 2008-09, since circle rates have been notified, and are (on average) double the currently declared rates
Professional Tax		Is expected to become effective in 2008 - 09. Anticipated collections (@ 2,500/ professional), are Rs. 10 Cr. p.a.
Other Taxes	14.47	12.00
Building related receipts	11.22	11.22
Fees & Fines		
Fines	3.39	3.39

Item	Basis (Current Rate - CAGR, 2000 - 2004) %	Assumption for Forecast (2005 - 2021) - %
Composition Fee	9.16	9.16
Sewer Connection fee	-45.09	2.00
Compounding Fee	0.00	2.00
Inspection Fee	123.61	12.00
Others	3.93	3.93
B. OTHERS		
Interest	55.91	12.00
Administrative Dept.	-34.20	2.00
Social Services	-0.42	2.00
Electricity	3.39	From 2007-08, it has been assumed that revenues from distribution of electricity will accrue to a separate account
Tax on Consumption of Electricity		It is expected that the council will be permitted to levy this charge (which was previously clubbed with the revenues from electricity distribution), @ 5% of receipts
Water Supply	92.73	Forecasts have assumed: - total number of connections remains the same - improvement in collection efficiency, from the current 60% to 85% by 2012-13 & thereafter - revision in water tariffs by 20 % every 3 years
Other Municipal works	3.89	3.89, overall. However, the following have been factored in: - Additional revenues in 2008-09: Rs 25 Cr. (NDCC); - Rs. 10 Cr. (Taj Mansingh); Rs. 5 Cr. (Lok Nayak Bhavan are also expected in 2008-09. However, these have not been factored in.) - Additional Revenues in 2010-11; Rs. 50 Cr (Chanakya Cinema); Rs. 5.5 Cr. (Akbar Bhavan)
C. EXTERNAL REVENUE		
Advances to Employees	-9.21	2.00
External Assistance	28.75	12.00
Assigned Taxes	35.39	12.00

Expenditure

Collection of Taxes & Duties	9.65	9.65
Interest	-54.17	2.00
Administrative Dept	19.87	12.00
Education	4.13	4.13

Medical & Public Health	9.54	9.54
Animal Husbandry	-2.03	2.00
Other social services	3.59	3.59
Palika Parking	-11.09	2.00
Indoor Stadium	8.52	8.52
Night Shelters	-34.32	2.00
Contribution to NDF	-23.89	2.00
Electricity Supply	8.13	Expenditure on electricity supply will be incurred from a separate account
Water Supply	2.96	2.96
Roads	22.08	12.00
Other Municipal Works	12.02	12.00
Advances to Employees	-19.00	2.00
External Assistance	-4.24	2.00

2. Capital Account

Capital Income		
External Assistance	11.37	11.37
Deposit Works	-14.41	2.00
Capital Expenditure		
Administrative Dept.	31.61	12.00
Education	-12.05	2.00
Medical & Public Health	-6.87	2.00
Animal Husbandry	-100.00	2.00
Other Social Services	-17.40	2.00
Electricity Supply	-5.04	2.00
Water Supply	-24.17	2.00
Roads	4.76	4.76
Other Municipal Works	-17.40	2.00
Deposit Works	-22.12	2.00

19.5 EXPENDITURE ON PROJECTS IDENTIFIED

The projected capital expenditure on identified projects (ref. table above) has been loaded onto the forecasted budget from 2007-08 to 2011-12. In addition, the expected O & M expenditure has been loaded from 2008-09 to 2012-13 on the basis of the estimations presented in table above. From 2012 -13, expenditure on O & M on identified projects has been assumed to increase at the rate of 7 % per annum.

19.6 PROPOSED CASH FLOW FOR NDMC

Based on the above FOP assumptions the cash flow for NDMC (in Rs Crore), based on actuals for FY 2004-05 and projected for the period starting in FY 2005-06 to FY

2011-12 is presented in tabular form below. (Cash flows from 2004-05 to 2012-13) Annex. 19.1 presents the projected cash flow to year 2021.

19.7 CONCLUSIONS

An opening balance for the overall cash flow - expected to reflect a surplus - was not available. However, even in the absence of this, the NDMC is able to sustain the investment requirements for the projects identified. As can be seen from the table, the revenue account experiences a deficit in the years 2007-08 and 2008-09. Similarly, the capital account experiences a deficit until the year 2011-12. The overall account reflects a deficit in the years 2007-08 to 2010-11. However, the closing balance remains in surplus throughout the period 2005-06 to 2020-21, indicating that surpluses accumulated in previous years, together with the cash flows in the revenue and capital accounts considered jointly, are sufficient to meet the investment requirements, without recourse to a loan.

	Head of Account	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
	PART I: REVENUE INCOME & EXPENDITURE								
<i>Receipts</i>									
	Opening Balance	200.54	313.04	402.38	472.99	379.48	268.47	154.64	125.40
	A. TAXES, DUTIES & OTHER PRINCIPAL REVENUE								
	Taxes:								
	House tax								
	Govt property	17.28	19.35	21.68	24.28	27.19	30.45	34.11	38.20
	Private property	130.32	133.15053	144.881665	158.07128	172.22318	231.928052	275.416339	326.71317
	Theater Tax	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Tax on Advertisement	0.1	0.11	0.13	0.14	0.16	0.18	0.20	0.22
	Duty on Transfer of Property	13.28	14.87	16.66	18.66	23.32	26.12	29.25	32.77
	Professional Tax					10.00	10.00	10.00	10.00
	Other Taxes	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	Building related receipts	2.02	2.25	2.50	2.78	3.09	3.44	3.82	4.25
	Fees & Fines:								
	Fines	0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.20
	Composition Fee	1.59	1.74	1.89	2.07	2.26	2.46	2.69	2.94
	Sewer Connection fee	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Compounding Fee	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15
	Inspection Fee	0.25	0.28	0.31	0.35	0.39	0.44	0.49	0.55
	Others	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09
	Sub-Total (A)	165.25	172.18	188.49	206.80	239.11	305.51	356.49	416.17

	Head of Account	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
	B. OTHERS								
	Interest	178.94	200.41	224.46	251.40	281.57	315.35	353.20	395.58
	Administrative Dept.	1.28	1.31	1.33	1.36	1.39	1.41	1.44	1.47
	Social Services	4.17	4.25	4.34	4.43	4.51	4.60	4.70	4.79
	Electricity	537.34	555.54	574.35					
	Tax on Consumption of Electricity				13.68	28.28	29.24	30.23	31.25
	Water Supply	14.46	15.64	15.69	15.69	21.40	23.05	24.70	31.61
	Other Municipal works	109.75	114.01	118.44	123.05	152.83	158.76	219.93	228.48
	Sub-Total (B)	845.94	891.16	938.61	409.59	489.97	532.42	634.19	693.18
	C. EXTERNAL REVENUE								
	Advances to Employees	1.06	1.08	1.10	1.12	1.15	1.17	1.19	1.22
	External Assistance	34.05	38.14	42.71	47.84	53.58	60.01	67.21	75.27
	Assigned Taxes	11.29	12.64	14.16	15.86	17.77	19.90	22.28	24.96
	Sub-Total (C)	46.40	51.86	57.98	64.82	72.49	81.07	90.69	101.45
	TOTAL RECEIPTS (A+B+C)	1057.59	1115.20	1185.08	681.21	801.57	919.01	1081.37	1210.81
	Expenditure								
	Collection of Taxes & Duties	1.33	1.46	1.60	1.75	1.92	2.11	2.31	2.53
	Interest	1.89	1.93	1.97	2.01	2.05	2.09	2.13	2.17
	Administrative Dept	228.33	255.73	286.42	320.79	359.28	402.40	450.68	504.76
	Education	45.72	47.61	49.58	51.63	53.76	55.99	58.30	60.71
	Medical & Public Health	73.51	80.53	88.21	96.63	105.85	115.95	127.02	139.14
	Animal Husbandry	0.35	0.36	0.36	0.37	0.38	0.39	0.39	0.40
	Other social services	20.57	21.31	22.08	22.87	23.69	24.54	25.43	26.34

Head of Account		2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
	Palika Parking	0.55	0.56	0.57	0.58	0.60	0.61	0.62	0.63
	Indoor Stadium	0.86	0.93	1.01	1.10	1.19	1.29	1.40	1.52
	Night Shelters	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09
	Contribution to NDF	1.00	1.02	1.04	1.06	1.08	1.10	1.13	1.15
	Electricity Supply	367.27	397.13	429.41					
	Water Supply	61.13	62.94	64.80	66.72	68.69	70.73	72.82	74.97
	Roads	9.44	10.57	11.84	13.26	14.85	16.64	18.63	20.87
	Other Municipal Works	87.16	97.62	109.33	122.45	137.15	153.61	172.04	192.68
	Advances to Employees	0.62	0.63	0.65	0.66	0.67	0.68	0.70	0.71
	External Assistance	33.83	34.51	35.20	35.90	36.62	37.35	38.10	38.86
	B. Debt Servicing								
	Debt Servicing-Existing								
	Debt Servicing-Proposed								
	C. Additional O&M								
	Additional O&M of New Assets through JNNURM investment					3.55	10.42	48.67	69.99
	TOTAL EXPENDITURE	933.64	1014.91	1104.15	737.87	811.42	895.97	1009.61	1119.70
	Surplus/Deficit	123.95	100.28	80.92	-56.65	-9.85	23.04	71.77	91.11
PART II : CAPITAL INCOME & EXPENDITURE									
Receipts									
	External Assistance	10.74	11.96	13.32	14.84	16.53	18.41	20.50	22.83
	Deposit Works	10.66	10.87	11.09	11.31	11.54	11.77	12.00	12.24

	Head of Account	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
	Contribution to NDMC								
	Contribution State and Central								
	TOTAL	21.40	22.83	24.41	26.15	28.06	30.17	32.50	35.08
Expenditure									
	Administrative Dept.	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	Education	0.76	0.78	0.79	0.81	0.82	0.84	0.86	0.87
	Medical & Public Health	3.34	3.41	3.47	3.54	3.62	3.69	3.76	3.84
	Animal Husbandry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Other Social Seviles	1.95	1.99	2.03	2.07	2.11	2.15	2.20	2.24
	Electricity Supply	3.22	3.28	3.35					
	Water Supply	0.40	0.41	0.42	0.42	0.43	0.44	0.45	0.46
	Roads	9.61	10.07	10.55	11.05	11.57	12.12	12.70	13.30
	Other Municipal Works	7.80	7.96	8.12	8.28	8.44	8.61	8.78	8.96
	Deposit Works	5.74	5.85	5.97	6.09	6.21	6.34	6.46	6.59
	New Development Works				33.20	120.97	182.80	148.24	89.67
	TOTAL	32.85	33.77	34.73	63.01	129.22	167.04	133.51	103.50
	Surplus/Deficit	-11.45	-10.94	-10.32	-36.86	-101.16	-136.87	-101.01	-68.43
	OVERALL ACCOUNTS	112.50	89.34	70.61	-93.51	-111.01	-113.83	-29.24	22.68
	CLOSING BALANCE	313.04	402.38	472.99	379.48	268.47	154.64	125.40	148.08

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Actuals				
					2000-01	2001-02	2002-03	2003-04	2004-05
					In Rs. Crore				
	PART I: REVENUE INCOME & EXPENDITURE								
Receipts									
	Opening Balance					3.76	30.98	138.65	200.54
	A. TAXES, DUTIES & OTHER PRINCIPAL REVENUE								
	Taxes:								
	House tax								
	Govt property	24.60	12.00	%	8.6	9.24	15.76	16.14	17.28
	Private property	12.18	As per projection		82.29	101.02	117.05	111.74	130.32
	Theater Tax	0.00	2.00	%	0.01	0.01	0	0.01	0.01
	Tax on Advertisement	35.12	12.00	%	0.03	0.05	0.04	0.08	0.1
	Duty on Transfer of Property	16.95	12.00	%	7.1	6.1	5.58	7.95	13.28
	Professional Tax								
	Other Taxes	14.47	12.00	%	0	0.02	0.02	0.02	0.03
	Building related receipts	11.22	11.22	%	1.32	1.18	1.4	0.84	2.02
	Fees & Fines:								
	Fines	3.39	3.39	%	0.14	0.07	0.26	0.21	0.16
	Composition Fee	9.16	9.16	%	1.12	1.41	5.04	1.58	1.59
	Sewer Connection fee	-45.09	2.00	%	0.11	0.15	0.14	0.17	0.01
	Compounding Fee	0.00	2.00	%	0.13	0.2	0.21	0.12	0.13
	Inspection Fee	123.61	12.00	%	0.01	0.17	0	0.61	0.25
	Others	3.93	3.93	%	0.06	0.06	0.4	0.06	0.07
	Sub-Total (A)				100.92	119.68	145.90	139.53	165.25
	B. OTHERS								
	Interest	55.91	12.00	%	30.28	24.55	32.53	27.43	178.94
	Administrative Dept.	-34.20	2.00	%	6.83	0.41	5.32	0.46	1.28
	Social Services	-0.42	2.00	%	4.24	3.43	3.31	3.43	4.17
	Electricity	3.39	3.39	%	470.32	483.71	534.14	534.70	537.34
	Tax on Consumption of Electricity		3.39	%					

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Actuals				
					2000-01	2001-02	2002-03	2003-04	2004-05
					In Rs. Crore				
	PART I: REVENUE INCOME & EXPENDITURE								
	Water Supply	92.73	As per projection		0.00	2.02	0.00	15.02	14.46
	Other Municipal works	3.89	3.89	%	94.23	97.14	112.40	97.92	109.75
	Sub-Total (B)				605.90	611.26	687.70	678.96	845.94
	C. EXTERNAL REVENUE								
	Advances to Employees	-9.21	2.00	%	1.56	1.46	1.29	1.38	1.06
	External Assistance	28.75	12.00	%	12.39	15.53	17.10	15.60	34.05
	Assigned Taxes	35.39	12.00	%	3.36	4.28	6.28	6.39	11.29
	Sub-Total (C)				17.31	21.27	24.67	23.37	46.40
	TOTAL RECEIPTS (A+B+C)				724.13	752.21	858.27	841.86	1057.59
	Expenditure								
	Collection of Taxes & Duties	9.65	9.65	%	0.92	0.95	1.20	1.27	1.33
	Interest	-54.17	2.00	%	42.85	7.11	5.44	4.83	1.89
	Administrative Dept	19.87	12.00	%	110.58	125.15	167.92	139.38	228.33
	Education	4.13	4.13	%	38.88	37.74	39.38	43.53	45.72
	Medical & Public Health	9.54	9.54	%	51.05	51.69	51.08	63.60	73.51
	Animal Husbandry	-2.03	2.00	%	0.38	0.40	0.46	0.40	0.35
	Other social services	3.59	3.59	%	17.86	22.04	18.75	19.20	20.57
	Palika Parking	-11.09	2.00	%	0.88	0.87	0.68	0.57	0.55
	Indoor Stadium	8.52	8.52	%	0.62	0.80	0.73	0.64	0.86
	Night Shelters	-34.32	2.00	%	0.43	0.31	0.35	0.39	0.08
	Contribution to NDF	-23.89	2.00	%	2.98	0.00	0.00	0.00	1.00
	Electricity Supply	8.13	8.13	%	268.66	326.44	330.80	344.49	367.27
	Water Supply	2.96	2.96	%	54.40	45.05	37.96	46.87	61.13
	Roads	22.08	12.00	%	4.25	8.41	10.35	11.32	9.44
	Other Municipal Works	12.02	12.00	%	55.36	52.18	58.09	61.59	87.16
	Advances to Employees	-19.00	2.00	%	1.44	1.43	1.04	0.94	0.62
	External Assistance	-4.24	2.00	%	40.23	12.25	10.46	7.34	33.83
	B. Debt Servicing								

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

Head of Account	Current	Proposed	Unit	Actuals				
				2000-01	2001-02	2002-03	2003-04	2004-05
				In Rs. Crore				
PART I: REVENUE INCOME & EXPENDITURE								
Debt Servicing-Existing								
Debt Servicing- Proposed								
C. Additional O&M								
Additional O&M of New Assets through JNNURM investment								
TOTAL EXPENDITURE				691.77	692.82	734.69	746.36	933.64
Surplus/Deficit				32.36	59.39	123.58	95.50	123.95
PART II : CAPITAL INCOME & EXPENDITURE								
Receipts								
External Assistance	11.37	11.37	%	6.98	8.02	6.72	13.57	10.74
Deposit Works	-14.41	2.00	%	19.86	10.66	18.41	7.92	10.66
Contribution to NDMC								
Contribution State and Central								
TOTAL				26.84	18.68	25.13	21.49	21.40
Expenditure								
Administrative Dept.	31.61	12.00	%	0.01	0.10	0.10	0.03	0.03
Education	-12.05	2.00	%	1.27	1.27	1.16	1.24	0.76
Medical & Public Health	-6.87	2.00	%	4.44	5.23	5.13	3.40	3.34
Animal Husbandry	-100.00	2.00	%	0.02	0.00	0.08	0.00	0.00
Other Social Seviles	-17.40	2.00	%	4.19	3.86	3.86	3.27	1.95
Electricity Supply	-5.04	2.00	%	3.96	8.42	4.66	9.99	3.22
Water Supply	-24.17	2.00	%	1.21	2.15	1.60	0.98	0.40
Roads	4.76	4.76	%	7.98	6.64	6.09	14.52	9.61
Other Municipal Works	-17.40	2.00	%	16.76	11.02	10.33	15.56	7.80
Deposit Works	-22.12	2.00	%	15.60	12.16	8.03	6.11	5.74
New Development Works								
TOTAL				55.44	50.85	41.04	55.10	32.85

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Actuals				
					2000-01	2001-02	2002-03	2003-04	2004-05
					In Rs. Crore				
	PART I: REVENUE INCOME & EXPENDITURE								
	<i>Surplus/Deficit</i>				-28.60	-32.17	-15.91	-33.61	-11.45
	OVERALL ACCOUNTS				3.76	27.22	107.67	61.89	112.50
	CLOSING BALANCE				3.76	30.98	138.65	200.54	313.04

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Forecast				
					2005-06	2006-07	2007-08	2008-09	2009-10
	PART I: REVENUE INCOME & EXPENDITURE								
Receipts									
Opening Balance					313.04	402.38	472.99	376.98	240.97
A. TAXES, DUTIES & OTHER PRINCIPAL REVENUE									
Taxes:									
House tax									
Govt property	24.60	12.00	%		19.35	21.68	24.28	27.19	30.45
Private property	12.18	As per projection			133.150525	144.8816649	158.07128	172.223183	231.928052
Theater Tax	0.00	2.00	%		0.01	0.01	0.01	0.01	0.01
Tax on Advertisement	35.12	12.00	%		0.11	0.13	0.14	0.16	0.18
Duty on Transfer of Property	16.95	12.00	%		14.87	16.66	18.66	23.32	26.12
Professional Tax								10.00	10.00
Other Taxes	14.47	12.00	%		0.03	0.04	0.04	0.05	0.05
Building related receipts	11.22	11.22	%		2.25	2.50	2.78	3.09	3.44
Fees & Fines:									
Fines	3.39	3.39	%		0.17	0.17	0.18	0.18	0.19
Composition Fee	9.16	9.16	%		1.74	1.89	2.07	2.26	2.46
Sewer Connection fee	-45.09	2.00	%		0.01	0.01	0.01	0.01	0.01
Compounding Fee	0.00	2.00	%		0.13	0.14	0.14	0.14	0.14
Inspection Fee	123.61	12.00	%		0.28	0.31	0.35	0.39	0.44
Others	3.93	3.93	%		0.07	0.08	0.08	0.08	0.08
Sub-Total (A)					172.18	188.49	206.80	239.11	305.51
B. OTHERS									
Interest	55.91	12.00	%		200.41	224.46	251.40	281.57	315.35
Administrative Dept.	-34.20	2.00	%		1.31	1.33	1.36	1.39	1.41
Social Services	-0.42	2.00	%		4.25	4.34	4.43	4.51	4.60
Electricity	3.39	3.39	%		555.54	574.35			
Tax on Consumption of Electricity		3.39	%				13.68	28.28	29.24
Water Supply	92.73	As per projection			15.64	15.69	15.69	21.40	23.05
Other Municipal works	3.89	3.89	%		114.01	118.44	123.05	152.83	158.76

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Forecast				
					2005-06	2006-07	2007-08	2008-09	2009-10
	PART I: REVENUE INCOME & EXPENDITURE								
	<i>Sub-Total (B)</i>				891.16	938.61	409.59	489.97	532.42
	C. EXTERNAL REVENUE								
	Advances to Employees	-9.21	2.00	%	1.08	1.10	1.12	1.15	1.17
	External Assistance	28.75	12.00	%	38.14	42.71	47.84	53.58	60.01
	Assigned Taxes	35.39	12.00	%	12.64	14.16	15.86	17.77	19.90
	<i>Sub-Total (C)</i>				51.86	57.98	64.82	72.49	81.07
	TOTAL RECEIPTS (A+B+C)				1115.20	1185.08	681.21	801.57	919.01
	Expenditure								
	Collection of Taxes & Duties	9.65	9.65	%	1.46	1.60	1.75	1.92	2.11
	Interest	-54.17	2.00	%	1.93	1.97	2.01	2.05	2.09
	Administrative Dept	19.87	12.00	%	255.73	286.42	320.79	359.28	402.40
	Education	4.13	4.13	%	47.61	49.58	51.63	53.76	55.99
	Medical & Public Health	9.54	9.54	%	80.53	88.21	96.63	105.85	115.95
	Animal Husbandry	-2.03	2.00	%	0.36	0.36	0.37	0.38	0.39
	Other social services	3.59	3.59	%	21.31	22.08	22.87	23.69	24.54
	Palika Parking	-11.09	2.00	%	0.56	0.57	0.58	0.60	0.61
	Indoor Stadium	8.52	8.52	%	0.93	1.01	1.10	1.19	1.29
	Night Shelters	-34.32	2.00	%	0.08	0.08	0.08	0.09	0.09
	Contribution to NDF	-23.89	2.00	%	1.02	1.04	1.06	1.08	1.10
	Electricity Supply	8.13	8.13	%	397.13	429.41			
	Water Supply	2.96	2.96	%	62.94	64.80	66.72	68.69	70.73
	Roads	22.08	12.00	%	10.57	11.84	13.26	14.85	16.64
	Other Municipal Works	12.02	12.00	%	97.62	109.33	122.45	137.15	153.61
	Advances to Employees	-19.00	2.00	%	0.63	0.65	0.66	0.67	0.68
	External Assistance	-4.24	2.00	%	34.51	35.20	35.90	36.62	37.35
	B. Debt Servicing								
	Debt Servicing-Existing								
	Debt Servicing- Proposed								
	C. Additional O&M								

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Forecast				
					2005-06	2006-07	2007-08	2008-09	2009-10
	PART I: REVENUE INCOME & EXPENDITURE								
	Additional O&M of New Assets through JNNURM investment							3.55	10.42
	TOTAL EXPENDITURE				1014.91	1104.15	737.87	811.42	895.97
	Surplus/Deficit				100.28	80.92	-56.65	-9.85	23.04
	PART II : CAPITAL INCOME & EXPENDITURE								
	Receipts								
	External Assistance	11.37	11.37	%	11.96	13.32	14.84	16.53	18.41
	Deposit Works	-14.41	2.00	%	10.87	11.09	11.31	11.54	11.77
	Contribution to NDMC								
	Contribution State and Central								
	TOTAL				22.83	24.41	26.15	28.06	30.17
	Expenditure								
	Administrative Dept.	31.61	12.00	%	0.03	0.04	0.04	0.05	0.05
	Education	-12.05	2.00	%	0.78	0.79	0.81	0.82	0.84
	Medical & Public Health	-6.87	2.00	%	3.41	3.47	3.54	3.62	3.69
	Animal Husbandry	-100.00	2.00	%	0.00	0.00	0.00	0.00	0.00
	Other Social Seviles	-17.40	2.00	%	1.99	2.03	2.07	2.11	2.15
	Electricity Supply	-5.04	2.00	%	3.28	3.35			
	Water Supply	-24.17	2.00	%	0.41	0.42	0.42	0.43	0.44
	Roads	4.76	4.76	%	10.07	10.55	11.05	11.57	12.12
	Other Municipal Works	-17.40	2.00	%	7.96	8.12	8.28	8.44	8.61
	Deposit Works	-22.12	2.00	%	5.85	5.97	6.09	6.21	6.34
	New Development Works						33.20	120.97	182.80
	TOTAL				33.77	34.73	65.51	154.22	217.04
	Surplus/Deficit				-10.94	-10.32	-39.36	-126.16	-186.87
	OVERALL ACCOUNTS				89.34	70.61	-96.01	-136.01	-163.83
	CLOSING BALANCE				402.38	472.99	376.98	240.97	77.14

NOTE:It has been assumed that revenues and expenditure on electricity distribution will accrue into a separate account from 2007-08

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

Forecast

	Head of Account	Current	Proposed	Unit	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
	PART I: REVENUE INCOME & EXPENDITURE									
Receipts										
Opening Balance					77.14	-12.95	-30.62	20.98	57.85	87.06
A. TAXES, DUTIES & OTHER PRINCIPAL REVENUE										
Taxes:										
House tax										
Govt property	24.60	12.00	%		34.11	38.20	42.78	47.92	53.67	60.11
Private property	12.18	As per projection			275.4163391	326.71317	342.68834	362.42243	386.2104	414.13572
Theater Tax	0.00	2.00	%		0.01	0.01	0.01	0.01	0.01	0.01
Tax on Advertisement	35.12	12.00	%		0.20	0.22	0.25	0.28	0.31	0.35
Duty on Transfer of Property	16.95	12.00	%		29.25	32.77	36.70	41.10	46.03	51.56
Professional Tax					10.00	10.00	10.00	10.00	10.00	10.00
Other Taxes	14.47	12.00	%		0.06	0.07	0.07	0.08	0.09	0.10
Building related receipts	11.22	11.22	%		3.82	4.25	4.73	5.26	5.85	6.51
Fees & Fines:										
Fines	3.39	3.39	%		0.20	0.20	0.21	0.22	0.22	0.23
Composition Fee	9.16	9.16	%		2.69	2.94	3.20	3.50	3.82	4.17
Sewer Connection fee	-45.09	2.00	%		0.01	0.01	0.01	0.01	0.01	0.01
Compounding Fee	0.00	2.00	%		0.15	0.15	0.15	0.16	0.16	0.16
Inspection Fee	123.61	12.00	%		0.49	0.55	0.62	0.69	0.78	0.87
Others	3.93	3.93	%		0.09	0.09	0.10	0.10	0.10	0.11
Sub-Total (A)					356.49	416.17	441.53	471.75	507.27	548.32
B. OTHERS										
Interest	55.91	12.00	%		353.20	395.58	443.05	496.21	555.76	622.45
Administrative Dept.	-34.20	2.00	%		1.44	1.47	1.50	1.53	1.56	1.59
Social Services	-0.42	2.00	%		4.70	4.79	4.89	4.98	5.08	5.18
Electricity	3.39	3.39	%							
Tax on Consumption of Electricity		3.39	%		30.23	31.25	32.31	33.41	34.54	35.71
Water Supply	92.73	As per projection			24.70	31.61	33.59	33.59	40.30	40.30
Other Municipal works	3.89	3.89	%		219.93	228.48	237.35	246.58	256.16	266.11

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

Forecast

	Head of Account	Current	Proposed	Unit	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
	PART I: REVENUE INCOME & EXPENDITURE									
	Additional O&M of New Assets through JNNURM investment				48.67	69.99	82.64	88.42	94.61	101.23
	TOTAL EXPENDITURE				1020.46	1137.55	1256.60	1380.66	1518.37	1671.28
	Surplus/Deficit				60.92	73.26	51.11	34.38	24.42	7.43
	PART II : CAPITAL INCOME & EXPENDITURE									
	Receipts									
	External Assistance	11.37	11.37	%	20.50	22.83	25.43	28.32	31.54	35.13
	Deposit Works	-14.41	2.00	%	12.00	12.24	12.49	12.74	12.99	13.25
	Contribution to NDMC									
	Contribution State and Central									
	TOTAL				32.50	35.08	37.92	41.06	44.54	48.38
	Expenditure									
	Administrative Dept.	31.61	12.00	%	0.06	0.07	0.07	0.08	0.09	0.10
	Education	-12.05	2.00	%	0.86	0.87	0.89	0.91	0.93	0.94
	Medical & Public Health	-6.87	2.00	%	3.76	3.84	3.91	3.99	4.07	4.15
	Animal Husbandry	-100.00	2.00	%	0.00	0.00	0.00	0.00	0.00	0.00
	Other Social Sevices	-17.40	2.00	%	2.20	2.24	2.28	2.33	2.38	2.42
	Electricity Supply	-5.04	2.00	%						
	Water Supply	-24.17	2.00	%	0.45	0.46	0.47	0.48	0.49	0.50
	Roads	4.76	4.76	%	12.70	13.30	13.94	14.60	15.29	16.02
	Other Municipal Works	-17.40	2.00	%	8.78	8.96	9.14	9.32	9.51	9.70
	Deposit Works	-22.12	2.00	%	6.46	6.59	6.73	6.86	7.00	7.14
	New Development Works				148.24	89.67				
	TOTAL				183.51	126.00	37.43	38.57	39.75	40.98
	Surplus/Deficit				-151.01	-90.93	0.48	2.49	4.78	7.40
	OVERALL ACCOUNTS				-90.09	-17.67	51.60	36.87	29.20	14.84
	CLOSING BALANCE				-12.95	-30.62	20.98	57.85	87.06	101.89

NOTE:It has been assumed that revenues and expenditure on electricity distribution will accrue in

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

	Head of Account	Current	Proposed	Unit	Forecast				
					2016-17	2017-18	2018-19	2019-20	2020-21
	PART I: REVENUE INCOME & EXPENDITURE								
Receipts									
Opening Balance					101.89	102.07	94.81	71.07	29.59
A. TAXES, DUTIES & OTHER PRINCIPAL REVENUE									
Taxes:									
House tax									
Govt property	24.60	12.00	%		67.32	75.40	84.45	94.58	105.93
Private property	12.18	As per projection			446.33756	482.75076	523.81972	569.83645	621.14608
Theater Tax	0.00	2.00	%		0.01	0.01	0.01	0.01	0.01
Tax on Advertisement	35.12	12.00	%		0.39	0.44	0.49	0.55	0.61
Duty on Transfer of Property	16.95	12.00	%		57.74	64.67	72.43	81.13	90.86
Professional Tax					10.00	10.00	10.00	10.00	10.00
Other Taxes	14.47	12.00	%		0.12	0.13	0.15	0.16	0.18
Building related receipts	11.22	11.22	%		7.24	8.05	8.96	9.96	11.08
Fees & Fines:									
Fines	3.39	3.39	%		0.24	0.25	0.26	0.26	0.27
Composition Fee	9.16	9.16	%		4.55	4.97	5.42	5.92	6.46
Sewer Connection fee	-45.09	2.00	%		0.01	0.01	0.01	0.01	0.01
Compounding Fee	0.00	2.00	%		0.16	0.17	0.17	0.17	0.18
Inspection Fee	123.61	12.00	%		0.97	1.09	1.22	1.37	1.53
Others	3.93	3.93	%		0.11	0.12	0.12	0.12	0.13
Sub-Total (A)					595.21	648.06	707.51	774.09	848.41
B. OTHERS									
Interest	55.91	12.00	%		697.15	780.80	874.50	979.44	1096.97
Administrative Dept.	-34.20	2.00	%		1.62	1.66	1.69	1.72	1.76
Social Services	-0.42	2.00	%		5.29	5.39	5.50	5.61	5.72
Electricity	3.39	3.39	%						
Tax on Consumption of Electricity		3.39	%		36.92	38.18	39.47	40.81	42.19
Water Supply	92.73	As per projection			40.30	48.36	48.36	48.36	58.04
Other Municipal works	3.89	3.89	%		276.45	287.19	298.35	309.94	321.98

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

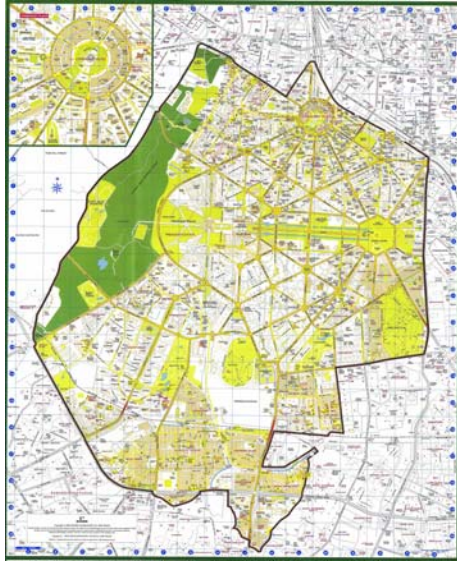
Forecast

	Head of Account	Current	Proposed	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
	PART I: REVENUE INCOME & EXPENDITURE								
	<i>Sub-Total (B)</i>				1057.73	1161.58	1267.87	1385.88	1526.66
	C. EXTERNAL REVENUE								
	Advances to Employees	-9.21	2.00	%	1.34	1.37	1.40	1.43	1.46
	External Assistance	28.75	12.00	%	132.66	148.58	166.41	186.37	208.74
	Assigned Taxes	35.39	12.00	%	43.99	49.26	55.18	61.80	69.21
	<i>Sub-Total (C)</i>				177.99	199.21	222.98	249.60	279.41
	TOTAL RECEIPTS (A+B+C)				1830.93	2008.85	2198.36	2409.58	2654.48
	Expenditure								
	Collection of Taxes & Duties	9.65	9.65	%	4.02	4.41	4.83	5.30	5.81
	Interest	-54.17	2.00	%	2.40	2.44	2.49	2.54	2.59
	Administrative Dept	19.87	12.00	%	889.57	996.32	1115.87	1249.78	1399.75
	Education	4.13	4.13	%	74.34	77.42	80.62	83.95	87.42
	Medical & Public Health	9.54	9.54	%	219.48	240.43	263.37	288.51	316.05
	Animal Husbandry	-2.03	2.00	%	0.44	0.45	0.46	0.47	0.48
	Other social services	3.59	3.59	%	31.43	32.56	33.73	34.94	36.19
	Palika Parking	-11.09	2.00	%	0.70	0.71	0.73	0.74	0.76
	Indoor Stadium	8.52	8.52	%	2.30	2.49	2.70	2.93	3.18
	Night Shelters	-34.32	2.00	%	0.10	0.10	0.11	0.11	0.11
	Contribution to NDF	-23.89	2.00	%	1.27	1.29	1.32	1.35	1.37
	Electricity Supply	8.13	8.13	%					
	Water Supply	2.96	2.96	%	86.74	89.31	91.95	94.67	97.47
	Roads	22.08	12.00	%	36.78	41.19	46.13	51.67	57.87
	Other Municipal Works	12.02	12.00	%	339.57	380.32	425.96	477.08	534.33
	Advances to Employees	-19.00	2.00	%	0.79	0.80	0.82	0.83	0.85
	External Assistance	-4.24	2.00	%	42.90	43.76	44.64	45.53	46.44
	B. Debt Servicing								
	Debt Servicing-Existing								
	Debt Servicing- Proposed								
	C. Additional O&M								

'Annexure 19.1 - New Delhi Municipal Council- Financial Plan

					Forecast				
	Head of Account	Current	Proposed	Unit	2016-17	2017-18	2018-19	2019-20	2020-21
	PART I: REVENUE INCOME & EXPENDITURE								
	Additional O&M of New Assets through JNNURM investment				108.32	115.90	124.02	132.70	141.99
	TOTAL EXPENDITURE				1841.14	2029.91	2239.75	2473.10	2732.67
	Surplus/Deficit				-10.21	-21.06	-41.39	-63.52	-78.18
	PART II : CAPITAL INCOME & EXPENDITURE								
	Receipts								
	External Assistance	11.37	11.37	%	39.12	43.58	48.53	54.05	60.20
	Deposit Works	-14.41	2.00	%	13.52	13.79	14.07	14.35	14.63
	Contribution to NDMC								
	Contribution State and Central								
	TOTAL				52.64	57.36	62.60	68.40	74.83
	Expenditure								
	Administrative Dept.	31.61	12.00	%	0.12	0.13	0.15	0.16	0.18
	Education	-12.05	2.00	%	0.96	0.98	1.00	1.02	1.04
	Medical & Public Health	-6.87	2.00	%	4.24	4.32	4.41	4.50	4.59
	Animal Husbandry	-100.00	2.00	%	0.00	0.00	0.00	0.00	0.00
	Other Social Seviles	-17.40	2.00	%	2.47	2.52	2.57	2.62	2.68
	Electricity Supply	-5.04	2.00	%					
	Water Supply	-24.17	2.00	%	0.51	0.52	0.53	0.54	0.55
	Roads	4.76	4.76	%	16.78	17.58	18.42	19.29	20.21
	Other Municipal Works	-17.40	2.00	%	9.89	10.09	10.29	10.50	10.71
	Deposit Works	-22.12	2.00	%	7.28	7.43	7.57	7.73	7.88
	New Development Works								
	TOTAL				42.25	43.57	44.94	46.36	47.84
	Surplus/Deficit				10.39	13.79	17.66	22.04	27.00
	OVERALL ACCOUNTS				0.18	-7.27	-23.73	-41.49	-51.19
	CLOSING BALANCE				102.07	94.81	71.07	29.59	-21.60

NOTE:It has been assumed that revenues and expenditure on electricity distribution will accrue in



Chapter – 20 : Institutional Reforms

CHAPTER - 20 INSTITUTIONAL REFORMS

20.1 INTRODUCTION

NDMC is governed by the NDMC Act, 1994. At the time of constituting the Act, it was decided to exempt the area from the conventional system of representative local self government, on account of its special characteristics, which are as presented below:

- The area is historically regarded as the seat of Central Authority in the Union of India, and houses important public buildings and institutions.
- The Government of India owns almost the entire land and about 80 percent of the buildings in the NDMC area
- Private ownership of property in the area is minimal
- Efficient functioning of municipal services in this area is critical for the international image of the country, as well as the efficient functioning of the Government itself
- Historically, the area has enjoyed a system of governance very different from that in the National Capital Territory (NCT)

The governing Council of the NDMC consists of the following 11 members;

- A Chairperson, appointed by the Central Government in consultation with the Chief Minister of Delhi.
- Three members of Legislative Assembly of Delhi representing constituencies which comprise, wholly or partly, the New Delhi area
- Five members from amongst the officers of the Central Government nominated by the Central Government
- Two eminent members civil society, nominated by the Central Government in consultation with the Chief Minister of Delhi

In addition to the above, the Members of Parliament representing constituencies in the area are special invitees to the meetings of the Council. In this manner, the NDMC may be said to have an element of representation (through elected representatives), while consisting mainly of nominated members.

The lack of representational governance at the local level emerged as a key point during stakeholder discussions with residents and traders of the area. There is little interaction with respective RWA's, or consultation on development initiatives for the area. The need was felt for an arrangement to overcome the lack of formal representation.

20.2 PROVISION OF SERVICES

Three main departments are responsible for service delivery, and interact with the public for this purpose:

1. Civil Engineering Department, responsible for roads, water supply, sewerage and drainage
2. Public Health Department, responsible for solid waste management
3. Electrical Department, looking after street lighting and electricity distribution.

Each of the above departments has subdivided the NDMC area into smaller geographic units, for ease of operation. The Public Health Department has 14 circles; within the Civil Engineering Department distribution of water is organized through six distribution zones; whereas drainage and sewerage are organized on the basis of 5 zones. The Electrical Department has two broad subdivisions (north and south). The geographical jurisdictions vary in the case of each department; and each department is self contained in its functioning, with little coordination with other departments. Moreover, there currently exists no shared data base, or mapping system in order to facilitate, and inform any inter-departmental coordination.

20.3 E-GOVERNANCE

The NDMC has a fully operational web-site, through which information and services are made available to citizens on-line. Services include application procedures, and forms, for building related activities; water and electricity services; procurement of birth and death certificates; as well as information pertaining to the area --- such as horticultural information, and details of road cutting activities.

Details of various departments, their jurisdictions and key personnel are also available on the web-site.

20.4 GRIEVANCE REDRESSAL

Complaints from the public are received at various points --- Central control room, at Pallika Kendra; the respective service centers of electricity, road maintenance, building maintenance, water supply, sewage, drainage, horticulture etc. In these centers complaints pertaining to CPWD, out of area and other agencies, (which are also responsible for aspects of maintenance in the area) are also lodged. These are further referred to the concerned departments.

In addition to this, the NDMC has established 4 Pallika Suvidha Kendras (or Citizens Service Kiosks) for payment of electricity, water, property tax, enforcement & estate bills, issuance of Birth/Death Certificates, booking of barat ghars and registration of public grievances.

In spite of these facilities, it is felt that response to complaints is poor, and inadequate.

20.5 AGENDA FOR INSTITUTIONAL REFORMS

The agenda for further institutional reforms within the NDMC is guided by the following broad objectives:

- To strengthen departments within the NDMC to complement external agencies that are responsible for aspects of governance in the area. It is important that the ULB have a significant role in all aspects of governance, some of which are currently vested with external agencies (eg.: functions pertaining to planning, heritage management, environment, slums, as identified in the sub-city plan)
- To strengthen and build capacity within the NDMC, so that improvements can be brought about, even while further institutional changes are being considered
- To make customer satisfaction with respect to service provision the primary focus of NDMC's work. To ensure that steps taken to achieve this are sustainable, financially and operationally.

20.6 MEASURES ALREADY INITIATED

An assessment of training needs for class C and class D employees was undertaken in 2006. The study suggested a training plan for the staff of NDMC after taking inputs from all HODs, Engineer-in-Chief, Chief Engineers, Suptdg. Engineers, officers and staff. As a result of this, a training curriculum has been finalised, and partner institutes to impart training have been identified. So far, approx. 110 employees have already been deputed for training. This has so far been targeted at secretarial and clerical skills.

NDMC has also partnered with E-Governments Foundation to increase the use and coverage of e-governance tools in its operations. As a result, an IT Study has been undertaken, to develop a strategic technology blueprint for the ULB. The study was based on a series of meetings with senior officials, thus, leveraging the vast body of knowledge and experience available within NDMC. The final study report makes a key set of recommendations and details an IT blueprint with an implementation roadmap. One of the key recommendations is that NDMC generate information through the data collected and proactively put this out for citizens and other stakeholders. This would greatly increase the perception of participation and transparency of the citizens. Implementation of the IT blue print has been recommended as a project in the sub-city plan.

20.7 FURTHER RECOMMENDATIONS

A diagnostic assessment of requirements for institutional strengthening and capacity building in the NDMC was undertaken as part of the sub-city plan, and the recommendations derived as an outcome of this have been incorporated in the project recommendations (ref. Chapters 16 and 17). The two key strategies identified include (a): to strengthen corporate functions and quality consciousness, by establishing a strong techno-structure, focusing on standards, measurements, analysis and feed-back (this will dovetail with the IT programme outlined above). This will further lead to clear role definitions, benchmarking of performance levels and monitoring of outputs; and (b): developing a strong HR department and a comprehensive training programme.

The focus of the training programmes will be to strengthen skills that are required for the work assigned, and performance levels expected.

In addition, the following strategies would result in strengthening the capacity of the NDMC to provide efficient governance in the area under its jurisdiction:

- Increasing the interaction and role of NDMC departments with regard to external agencies responsible for aspects of governance in the area. This can be undertaken by instituting special cells within existing departments, to address key issues such as planning, environment, heritage management and slums. This has been incorporated into the project recommendations in the sub-city plan.
- An empowered nodal officer (of suitable seniority), be appointed in each department, to monitor and ensure effective grievance redressal. This officer should be accessible to the RWA's, through frequent interaction with them. Redressal of grievances should be undertaken in a time bound manner.
- A group of experts of national standing could be identified and taken on board to support and strengthen sector specific areas within NDMC.

20.8 CONCLUSIONS

The NDMC is committed to strengthening the organization, and building capacities among its staff to improve its performance. The initiative in E-governance will result in greater transparency in the functioning of the ULB, and partly compensate for the current lack of representational governance. Enhanced interaction among officials and citizens of the area needs, however, to be instituted.