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CITY LEVEL PROJECTS

Strategies of Redevelopment
for
General Pool Residential Accommodation (GPRA) Colonies

Delhi Urban Art Commission

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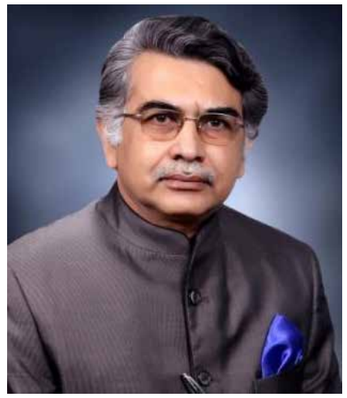
Preface



The city of Delhi, capital of this vast land of diversities, is a city laden with layers of history, a place where civilizations have lived, prospered and perished over centuries. The modern city today, built over and around a rich tapestry of heritage, presents an opportunity at every turn, to allow for co-existence of the past, present and the future. In order to understand this multidimensional urban spectrum and attempt to plan the future, various city level studies have been initiated by the DUAC. I hope that these studies will help the planners of modern day Delhi to carefully articulate urban space, structure, form and environment and sensitively address future requirements.

I convey my thanks to all the Consultants and Members of the Commission who have tirelessly worked on this research project to bring out this document. I also take this opportunity to place on record my sincere appreciation of the efforts of Secretary and other staff of DUAC for providing the necessary administrative support to make this happen.

I fondly hope that the authorities of the local, state and national government take these studies seriously and implement, in right earnest, the suggestions given herein.

October, 2020

Sd/-
Prof. Dr. P.S.N.Rao
Chairman, DUAC

Foreword

General Pool Residential Accommodation (GPRA) is a series of redevelopment projects for government employees located within significant land parcels around the city core.
This study was taken up by DUAC to prepare a holistic vision bearing in mind elements of landscape design, ecology, mobility, urban controls, identity and quality of open spaces. As most of these developments are located in areas with large, mature green cover, the preservation of its ecology, especially trees, is of utmost priority.

These redevelopment proposals based upon the existing norms require a large number of tree to be cut, which disturbs the existing ecology. The tree cutting, or tree transplantation often leads to the loss of mature and native tree species and thus loss of large range of biodiversity.
Redevelopment proposals for GPRA projects received by DUAC often necessitate the need for large parking infrastructure (in form of basements) based on regulations (as per Master Plan for Delhi -2021, Unified Building Bye Laws 2016 etc.) to accommodate the requisite vehicular parking numbers. The need to remove the existing trees is thus built into the current parking norms.

Other restrictions include building heights controls mandated by the Airport Authority of India (AAI), that limits the top elevation of the built form, thus ruling out the possibility of enhanced heights that may make low ground coverage possible and thus reduce the need for tree cutting.

In addition, the redevelopments are often seen in isolation and designed as gated islands cutting the right of way for general public and preventing the application of walkability from the nearest transit hub, thus negating the very idea of Transit Oriented Development (TOD).
A study of the current redevelopment proposal's site planning also reveals an increase in road surface areas. It is intuitive that we need to encourage the increase of green cover over hard surfaces to reduce heat island effect.
Also, the individual complexes do not display comprehensive landscape design, landscape elements, urban controls and façade control. They fail to bring a sense of identity to the precinct as a whole.

There is a major benefit from planning the GPRA redevelopments as a comprehensive sub-set of the city fabric. The creation of meaningful open spaces to derive the maximum benefit out of city infrastructure (including social and recreational infrastructure), should compel us to review the current practice of isolated developments, and re-evaluate the criteria's/benchmarks for such isolated developments and treat the seemingly separate plots as an unified masterplan. Our endeavor may be to envision inclusive, sustainable and functional spaces balancing the ecological and the built fabric and ensure they co-exist in harmony.

As demonstrated in this study, efficient planning coupled with sustainable design and engineering is required at the planning, design, construction and maintenance stages in our cities to improve the quality of the open spaces. Redevelopment is a challenging process as it needs to preserve the essential character of the city and blend the future requirements with advanced design innovations which serve the needs of society.

October, 2020

Sd/-
Samir Mathur
Member, DUAC

INTRODUCTION

General Pool Residential Accommodation (GPRA) is a scheme for group housing. All Central Government employees working under government of NCT are entitled for allotment of accommodation, under the Directorate of Estates in India, classified under 11 categories based on the designation of the employees.
This report highlights existing redevelopment patterns of GPRA colonies. It suggests a holistic strategy for the same and demonstrates feasible densities through derived efficiency factors.

AIM

To suggest a comprehensive strategy for redevelopment of GPRA colonies which ensures minimum tree-cutting, efficient parking strategy, pedestrian friendly & sustainable mobility networks, preservation of native plant species, increase of green areas over hard paved areas and efficient building core design.

OBJECTIVES

EFFICIENCY FACTORS DERIVATION TO ADDRESS

- Loss of trees
- Lack of efficient and adequate parking facilities
- Lack of walkable zones
- Loss of ecology (native plant species)
- Excessive run-off due to increase in impervious surfaces
- Inefficient core designs leading to excessive ground coverage

DEMONSTRATION of feasible densities (conceptual) for colonies with scope of redevelopment in the future.

ASSESSMENT INDEX FORMULATION (PROFORMA) to guide future redevelopment projects in terms of quantitative and qualitative parameters.

PROCESS

STUDY

DEMAND AND AVAILABILITY

PATTERNS OF REDEVELOPMENT THROUGH MAPPING

ANALYSIS

CASE STUDIES OF COLONIES APPROVED FOR REDEVELOPMENT (as in the year 2020)

MOHAMMADPUR
THYAGRAJ
KASTURBA NAGAR
SRINIVASPURI
NETAJI NAGAR
SAROJINI NAGAR
EAST KIDWAI NAGAR
NEW MOTI BAGH

Based on

- Qualitative factors
- Quantitative factor
- Comparative analysis to identify strengths and weaknesses

IDENTIFICATION OF

NEEDS , ISSUES AND REGULATORY NORMS

that need to be addressed in order to facilitate residential redevelopment processes

DEMONSTRATIONS

LAXMIBAI NAGAR
LODHI COLONY
R.K PURAM

WEST KIDWAI NAGAR
NANAKPURA
ANDREWS GANJ
NEW MOTI BAGH
SADIQ NAGAR

Colonies with scope for future Redevelopment, identified by DUAC

FINDINGS

- EFFICIENCY FACTORS
- ASSESSMENT INDEX
- REDEVELOPMENT DEMONSTRATIONS

EXECUTIVE SUMMARY

The recent surge in GPRA Colonies Redevelopment projects in Delhi prompted the initiation of this study, focused on strategies of redevelopment. The boundary of the delineated study area extends along the Inner Ring road in the north and the Outer Ring Road in the south. It encompasses some major GPRA Redevelopment projects such as East Kidwai Nagar, Sarojini Nagar, Mohammadpur, Netaji Nagar, Kasturba Nagar and New Moti Bagh.

Within the study area, the prevailing redevelopment pattern has been analyzed under different layers such as Mobility, Social Infrastructure, Height Regulations, Density and Green Zones to identify the critical aspects which need to be strategized in order to achieve a holistic redevelopment scheme. A conceptual master plan has been suggested for the same that follows an outward to inward approach and considers the entire zone combined as one big land parcel rather than fragmented land parcels.

A study of the design parameters of redevelopment proposals for GPRA colonies (within the study area and approved by DUAC (before or in the year 2020), led to the identification of issues which are often overlooked by designers in the process of conforming to the development norms. Major issues such as excessive razing of existing full-grown trees, loss of native tree species and alteration of microclimate, increase in the extent of impervious surfaces, increase in basement extent due to increasing parking demands, lack of sustainable mobility networks and ineffective building core designs have been addressed through careful assessment of their contributing quantitative parameters, which further led to the derivation of an 'Efficiency Factor' pertaining to each issue.

To further assess the efficiency of design, an 'Assessment Index' has been formulated which assesses livability standards in terms of qualitative parameters such as comfort, satisfaction quotient, identity and sustainability, in correspondence to their respective quantitative parameters.

With the combined application of 'Efficiency Factors' and 'Assessment Index', Feasible Densities have been demonstrated for selective GPRA colonies, which are within the study zone and have the potential of redevelopment in the near future (i.e. after the year 2020).

1 EFFICIENCY FACTORS

ENSURES

- Minimum **TREE-CUT**
- Efficient **PARKING** strategy
- Walkable and sustainable **MOBILITY** networks
- Preservation of **ECOLOGY**
- Increase of **GREEN AREAS** over hard paved areas
- Efficient building **CORE DESIGN**

+

2 ASSESSMENT INDEX

INDICATES

- Liveability Standards of residential areas by assessing the design in terms of qualitative parameters such as :

-COMFORT

-SATISFACTION

-IDENTITY

-SUSTAINABILITY

with the respective quantitative parameters

+

3 REDEVELOPMENT DEMONSTRATIONS

EXHIBITS

- **FEASIBLE DENSITIES**
- Possible outcomes when redevelopment proposals are worked out based on the suggested efficiency factors and in compliance with the existing building norms.

CONTENTS

Chapter 01

STUDY | Relevance

1.1 Introduction About GPRA

The General Pool Residential Accommodation (GPRA) Colonies in Delhi dates back to the pre-independence era. These accommodations are under the administrative control of the Directorate of Estates (DoE) in Delhi. All Central Government employees and the employees working under the Government of NCT of Delhi, who are working in the offices, which have been specifically declared eligible for General Pool, are entitled for allotment of accommodation from General Pool.

In the 1940s, one of the first GPRA colony was brought up in the Lodhi area to accommodate Central Government Employees and Staff. The pattern was followed which resulted over 50 GPRA colonies within Delhi.
However, the housing scenario in the city has changed manifold over the period of time. The population influx in the last 50 years has resulted in an increase in residential demand, thus, indicating the need to redevelop these colonies and increase their capacity to accommodate the present and future housing demands.

1.2 Scenario of GPRA housing stock (Year 2020)

As per CPWD, a larger number of civil servants were recruited in last few years, as the dimensions and complexities of governance have been increased, and there is a corresponding rise in the need for their housing.

The demand and availability status of GPRA colonies stated in 2018-19 MoHUA Annual Report (refer to the table) implies that the total shortage of Dwelling Units is 22276, of which the major shortage is for Type II and Type III Dwelling Units. This figure of 22276, justifies the need of re-development with increased density.

Dwelling Unit Typology	Unit Area (Sq.mts)	Availability	Demand	Shortage	% of satisfaction level (Availabilty / demand)
I	40.8	13174	9034	0	151.8
II	54	22781	26933	4152	84.58
III	63	12753	15646	2893	81.51
IV	103	5189	6904	1715	75.16
IV Special	123	790	2565	1775	30.8
VA	166.5	1680	2470	790	68.02
VB		1276	2314	1038	55.14
VIA	225	990	1661	671	59.6
VIB		227	354	127	64.12
VII	308.5	238	232	0	102.59
VIII	424.5	150	254	104	59.06
DS		1658	3390	1732	48.91
SK		291	7570	7279	3.84
		61197	75326	22276	68.08

Table 1.2 | Demand and Availibilty status of GPRA in Delhi as on March 2019
Source | 2018-19 MoHUA Annual Report , Chapter 16, Page 179

1.3 Projection of Housing Stock availibility

The logbook of demand and availability, maintained by Directorate of Estates, has been referred for the projection of Housing Stock avalibility. The increase in dwelling units by the proposed redevelopment of 7 colonies (i.e. Mohammadpur, Thyagraj Nagar, Kasturba Nagar, Netaji Nagar, Sarojini Nagar, East Kidwai Nagar and Srinivaspuri), as in year 2020, has been considered to estimate the shortage/surplus of DUs' *.
From the matrix below, it is inferred, that once all the 7 colonies (mentioned above) get redeveloped and occupied, there will be no shortage of Dwelling Units of Type II, III, IV, V and VI. Infact the number will be in surplus, assuming that there is no considerable increase in demand in the near future.
This projection implies that in the future redevelopment projects, the increase of density needs to be decided strategically.

House Type	Demand	Availability as on 22-11-2019	Shortage as on 22-11-2019	Additional Availability (increase of DUs' by redevelopemnt of 7 colonies	Shortage	Surplus	Total Availability
	Source: DoE _Demand & Availability Status as on 14-11-2019	Source: DoE Website dated 22-11-2019 (includes East Kidwai Nagar allotment)			After all the 7 colonies get redeveloped, assuming that the demand does not increases in near future.		After all the 7 colonies get re-developed
I	7901	15144	0	0	0	7243	15144
II	26802	24208	2594	8168	0	5574	32376
III	17129	14122	3007	7698	0	4691	21820
IV	10050	7075	2975	6242	0	3267	13317
V	4979	3875	1104	2684	0	1580	6559
VI	1910	1660	250	1876	0	1626	3536
VII	241	468	0	0	0	227	468
VIII	254	263	0	0	0	9	263
DS (Double Suits)	3390	1783	1607	0	1607	0	1783
SK (Single Suit with Kitchen)	7570	299	7271	0	7271	0	299
Total	80226	68897	18808	26668			
				Once all the 7 colonies get redeveloped, there will be no shortage of Type II, III, IV, V, VI., assuming that the demand does not increase in near future.			

Table 1.3 | Projection of Housing Stock Aavailibility

*Note : The saleable component of Dus', proposed in the redevelopment of 7 approved colonies, is also included in the calculation of DUs', fulfilling the demand.

1.4 Need of Redevelopment

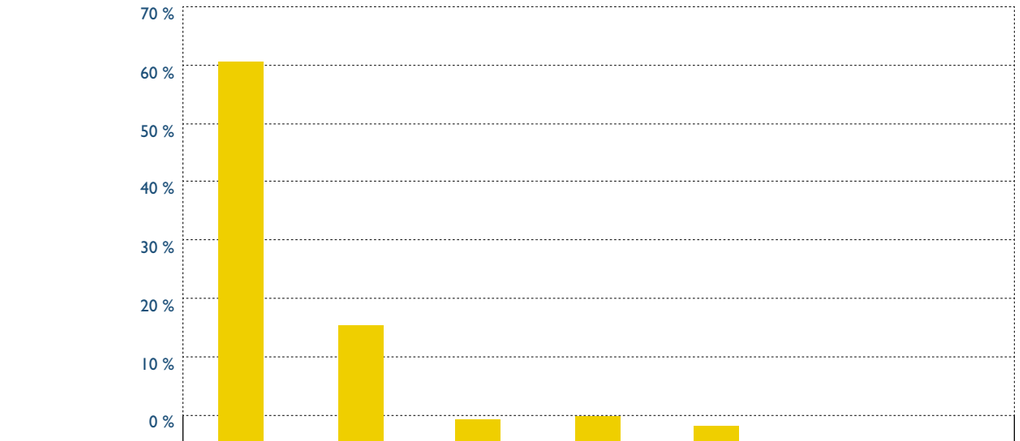
In the current scenario i.e. in year 2020, the redevelopment of 7 GPRA colonies is proposed because of two prime reasons, one being the shortage of Dwelling Units as per the demand, and second being the dilapidated state of the existing structures, as they are around 50-75 years old. And, as elucidated in the above matrix, the first cause will be eleminated once all the 7 colonies are redeveloped (provided there is no sudden increase in demand in the near future); the second cause that is the dilapidated state of the existing strucures, will form the main reason for the future need of GPRA Colonies redevelopment.

1.5 GPRA Colonies in Year 2020, as per DoE

- There are 207 GPRA colonies existing within Delhi, as per Directorate of Estates (refer Annexure A.**1**).

- The graph below depicts that 66% of the total colonies have housing stock less than 50, and 34% of total colonies have housing stock in the range of 51-15000, of which only 9% (19 colonies) have housing stock greater than 1000.

- The 5 Colonies i.e. Srinivaspuri, Netaji Nagar, Kasturba Nagar, Kidwai Nagar East and Sarojini Nagar, which are under the process of re-development (approved), fall under this 9%.
  The remaining 14 colonies (i.e. Dev Nagar, Kali Bari, Andrew Ganj, Moti Bagh, Aram Bagh, Sadiq Nagar, Lodhi Colony, Laxmi Bai Nagar, Timarpur, Nanakpura, Lodhi Road Complex DIZ Area, MB Road, RK Puram) can be the potential choices of CPWD for re-development in near future.
  Therefore, these colonies are more relevant to this study and a viable approach needs to be explored to assess the feasibility of re-development of these 14 colonies.



Existing Housing Stock Range (DU Range)	1-50	51-500	501-1000	1001-2000	2001-5000	5001-10000	10001-15000
Number of Colonies	136	44	8	10	7	1	1
% of Number of colonies	**66 %**	**21 %**	**4 %**	**5 %**	**3 %**	**0.5 %**	**0.5 %**

Graph 1.1 | Depicting the relationship between Number of GPRA Colonies and their holding range of Dwelling Units.

S.No.	Location	Housing Stock (no. of Dwelling Units)
1	Minto Road M S Flats	56
2	Akbar Road	61
3	Foch Square	62
4	Kalibari Apartments	62
5	Jam Nagar	69
6	Pandara Park	79
7	Lodhi Estate	80
8	Pusa Road	81
9	Bapa Nagar	82
10	HUDCO Place	84
11	Janpath	87
12	Tilak Lane	90
13	Tagore Road	96
14	Minto Road Old	97
15	Sardar Patel Marg	98
16	Teen Murti House	104
17	Peshwa Road	124
18	South Avenue	125
19	Chitra Gupta Road	126
20	Asia House	131
21	U D P Nehru Nagar	135
22	Shahjahan Road	138
23	Vithal Bhai Patel House	144
24	Mayapuri	146
25	Asian games Village	165
26	New Minto Road Hostel	184
27	Mayapuri Press Colony	185
28	Hanuman Road	195
29	Bharti Nagar	196
30	North Avenue	199
31	Rabindra Nagar	215
32	Vinay Marg	237
33	Deen Dayal Upadhaya Marg	243
34	Andrewz Ganj Extension	256
35	Kaka Nagar	285
36	Aliganj	312

S.No.	Location	Housing Stock (no. of Dwelling Units)
37	Kidwai Nagar West	325
38	Albert Square	340
39	Mandir Marg	362
40	NW Moti Bagh	400
41	Chanakya Puri	430
42	Lancer Road	430
43	Commonwealth Games Village	440
44	New Moti Bagh	492
45	B K S Marg	556
46	Pandara Road	616
47	Curzon Road	747
48	Pragati Vihar	792
49	Panchkuian Road	821
50	HUDCO Place Extension	833
51	Vasant Vihar	854
52	Minto Road Area	936
53	Dev Nagar	1074
54	Kali Bari Marg	1112
55	Andrewz Ganj	1293
56	Shrinivaspuri	1335
57	Moti Bagh	1346
58	Aram Bagh	1594
59	Sadiq Nagar	1610
60	Lodhi Colony	1871
61	Laxmi bai Nagar	1972
62	Timarpur	1984
63	Nanakpura	2105
64	Lodhi Road Complex	2221
65	Netaji Nagar	2408
66	Kasturba Nagar	2494
67	Kidwai Nagar East	2671
68	D I Z Area	3086
69	Sarojini Nagar	3740
70	M B Road	9017
71	R K Puram	11992

Colonies approved for re-development	
Colonies with potential for re-development	

Table 1.4 | List of GPRA Colonies and their respective Housing Stock, (greater than 50 number) before re-development (existing), as per DoE.
Source | https://gpra.nic.in/gpra/housingstock

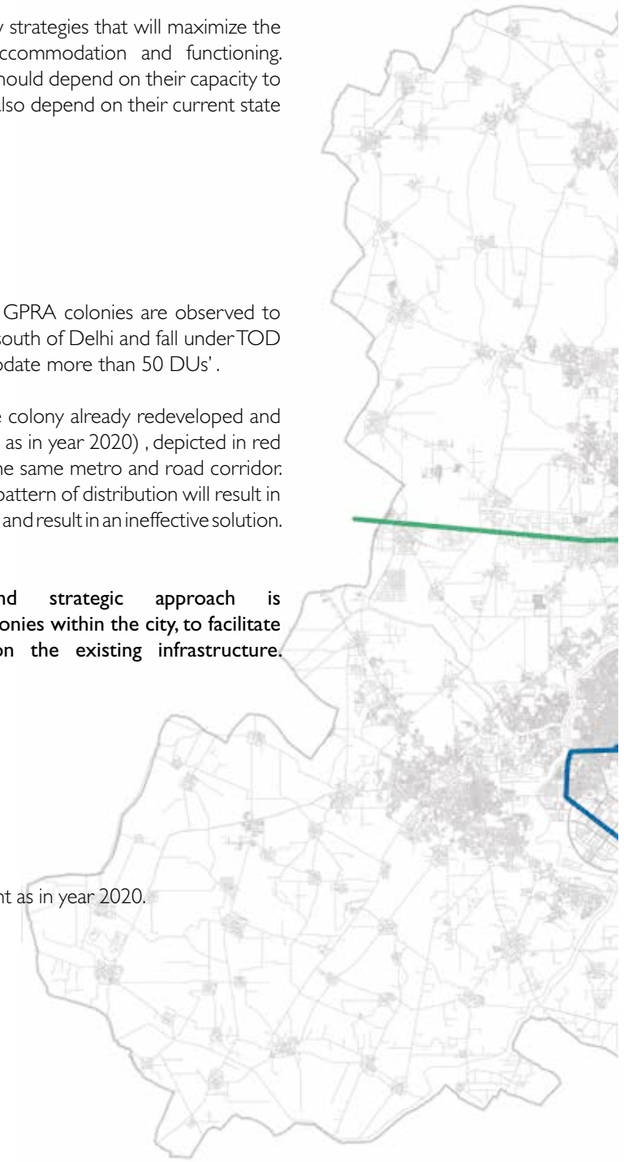
1.6 Prevailing redevelopment pattern of GPRA colonies

It is imperative that the redevelopment patterns follow strategies that will maximize the efficiency of the housing colonies in terms of accommodation and functioning. Thus the selection of the colonies for redevelopment should depend on their capacity to meet the present and future housing demands. It will also depend on their current state of construction.

PRESENT SCENARIO (YEAR 2020) :

- The map shows the present scenario where the GPRA colonies are observed to be located along different metro networks in the south of Delhi and fall under TOD influence. Colonies marked on this map accommodate more than 50 DUs' .
- Seven colonies approved for redevelopment (one colony already redeveloped and other six are under the process of redevelopment as in year 2020) , depicted in red dots within yellow zone are concentrated along the same metro and road corridor. This is observed as a non-viable approach, as such pattern of distribution will result in excessive dependence on the existing infrastructure and result in an ineffective solution.

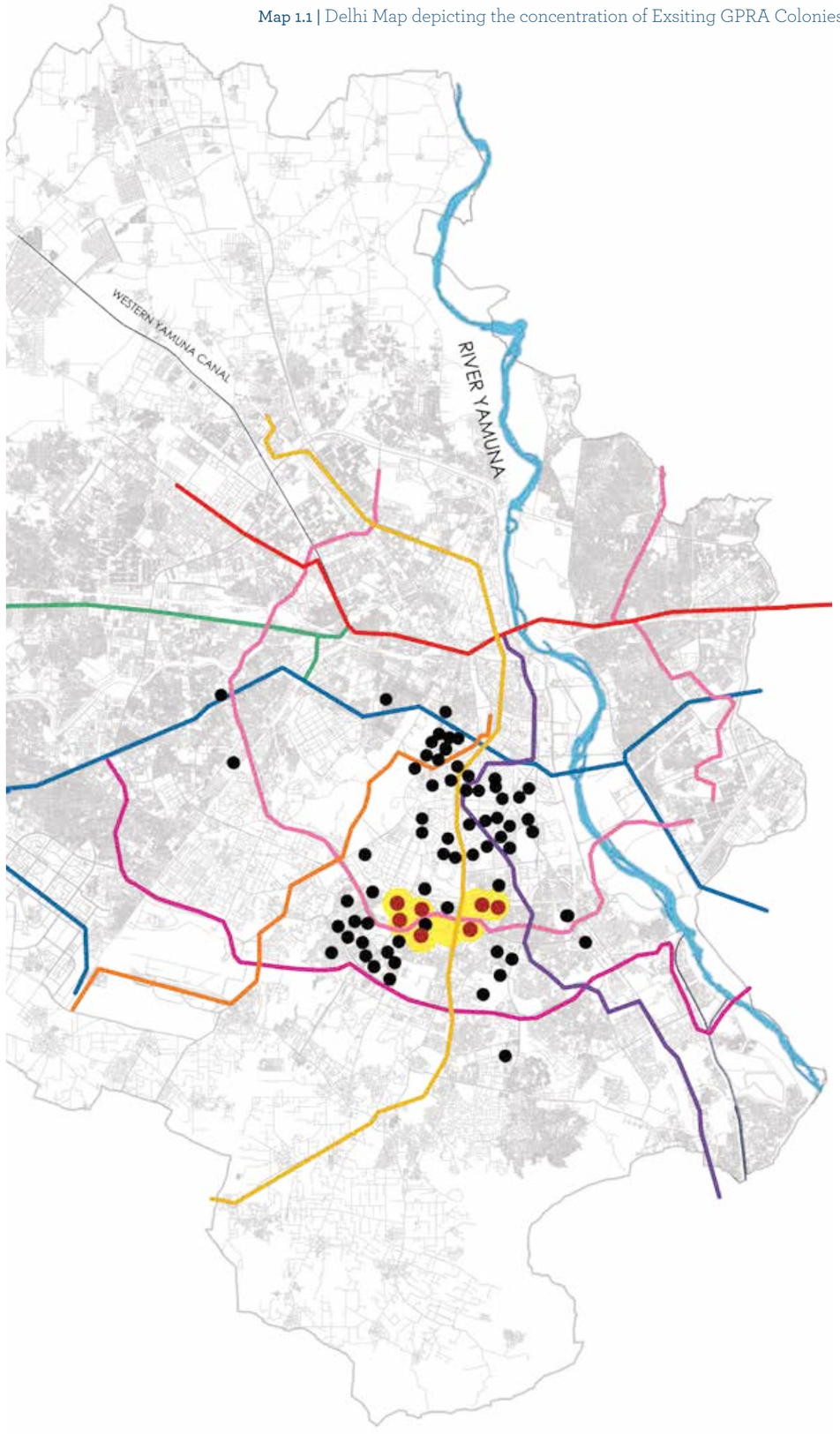
Thus, a well-integrated, comprehensive and strategic approach is required for the redistribution of the densities in colonies within the city, to facilitate efficient connectivity and reduce dependence on the existing infrastructure.



LEGEND

- GPRA colonies approved for redevelopment as in year 2020.
- Other GPRA colonies
- **Road Network**
- **Metro Network**
- Yellow line
- Blue line
- Violet line
- Green line
- Red line
- Airport line
- Pink line
- Magenta line

Map 1.1 | Delhi Map depicting the concentration of Exsiting GPRA Colonies within the city



Chapter 02

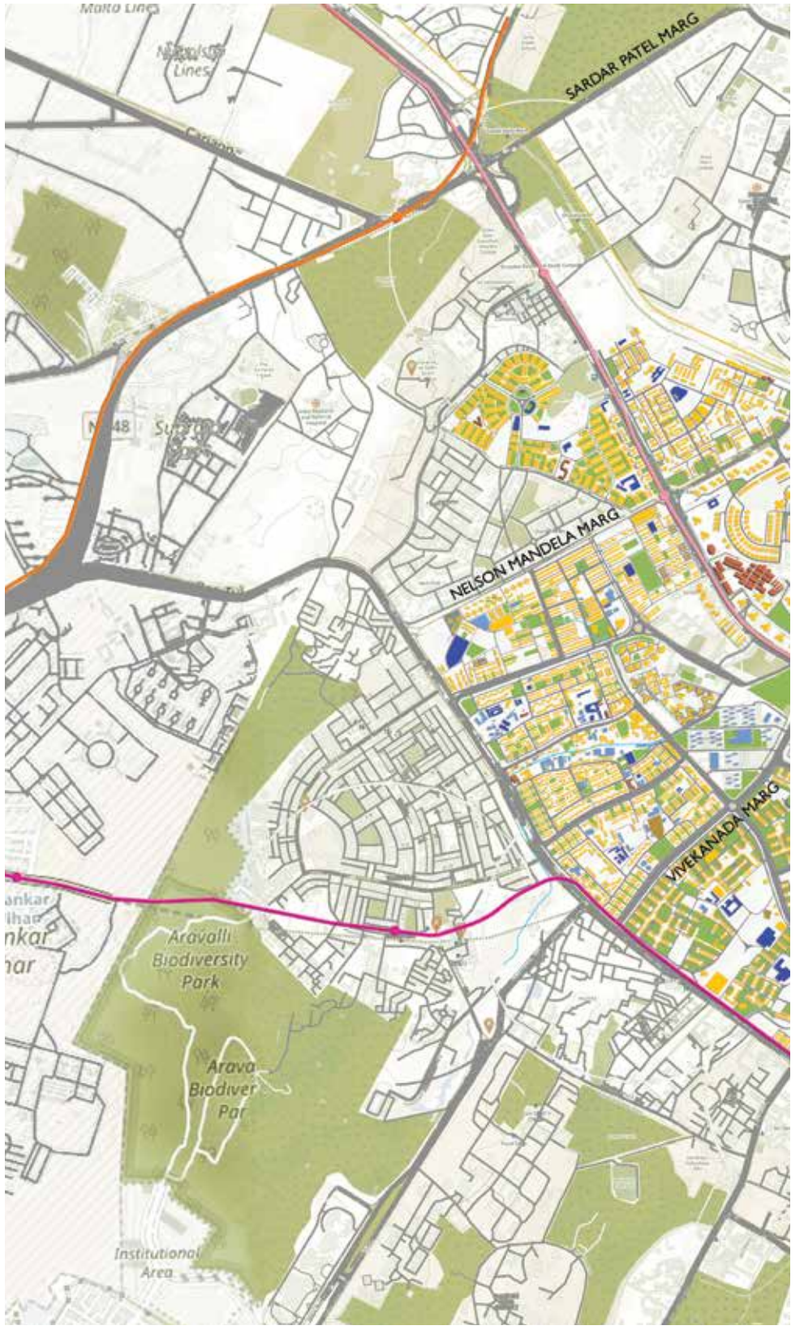
ANALYSIS | Prevailing Redevelopment Pattern

2.1 Introduction

The aim of re-development for the delineated zone is to increase the density of the accommodations and look at the redevelopment of all the colonies with a holistic approach. The past & present patterns show that the colonies were redeveloped in isolation of the context and the surrounding colonies. This resulted in a plotted development character. Such methods of development will certainly overcome the shortage of GPRA housing stock. However once occupied to their maximum capacity, an incomprehensive approach for Redevelopment of these residential colonies will lead to issues and challenges related to functionality and circulation that the residents will have to face in their daily lives.

Thus, the 7 GPRA colonies that are under the re-development at present, have been studied together to understand the impact of each colony on the surroundings.

The map provides landuse data of 7 colonies within the study area along the major roads and metro lines. A visual analysis suggests that the delineated zone is primarily Residential, particularly occupied by GPRA colonies and well connected by the Delhi metro network.
Consequently, the identification of a suitable method for Redevelopment becomes a complex process due to presence of numerous social infrastructure buildings that render a strong context for a holistic approach for residential Redevelopment



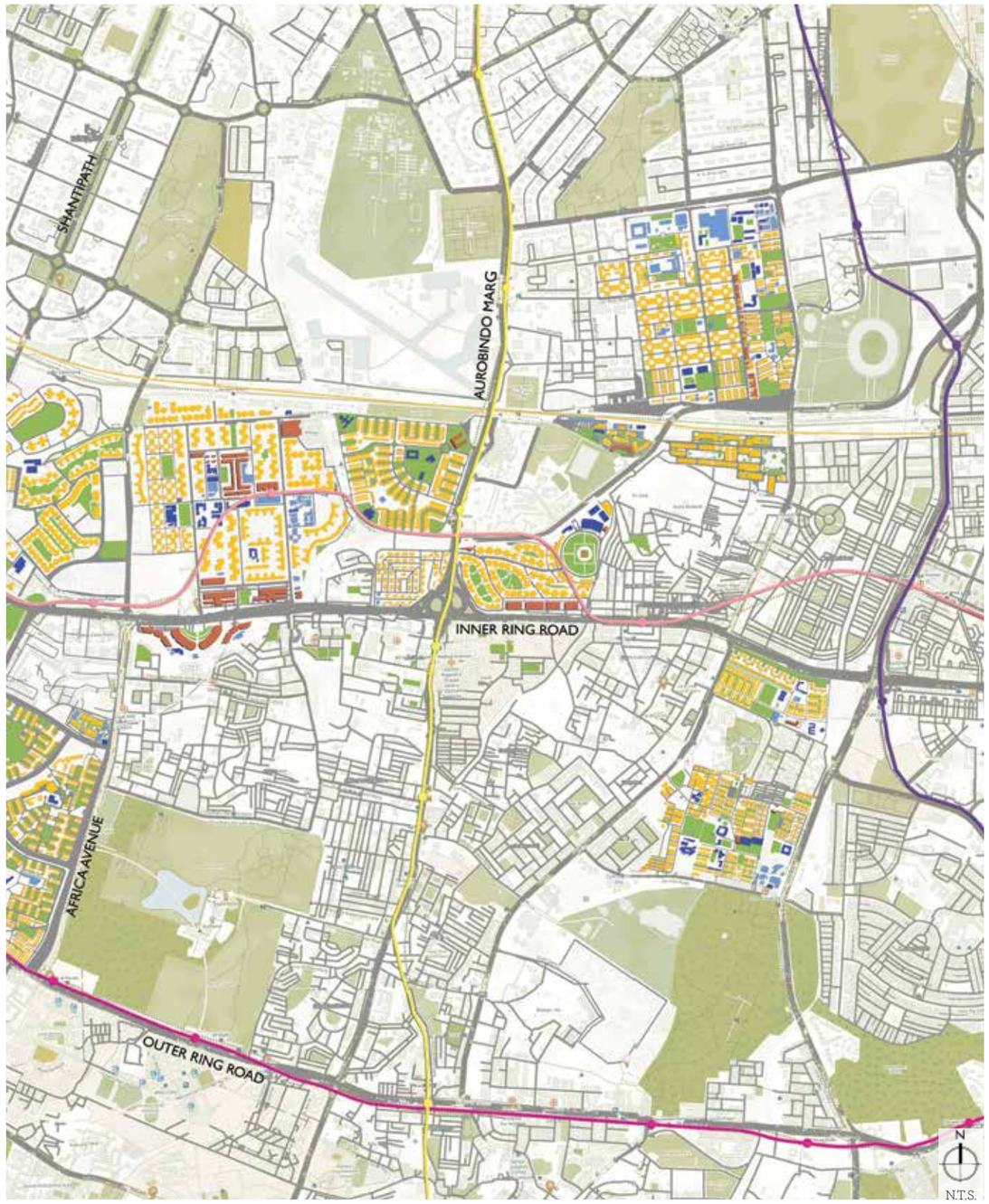
LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Greens

Delhi Metro Line

- Magenta Line
- Airport Line
- Pink Line
- Yellow Line

Map 2.1 | Land Use Map of the zone, with concentration of GPRA colonies which are under re-development process



2.2 | Study Area Boundary Delineation

The delineated study area is confined within the Inner ring road, Brigadier Hoshiyar Singh Marg and Lodhi Road in the north ; Lala Lajpat Rai Marg and Josip Broz Tito Marg in the east ; Outer Ring road in the south and NH48 in the west.

Within this area, there are 15 GPRA colonies, of which 7 are under Redevelopment and 8 other colonies will be the potential choice of CPWD for re-development. The area has been analyzed under 5 layers, i.e. Mobility, Social Infrastructure, Green Spaces, Height Regulations and Density, to understand the viability of each potential colony for its Redevelopment

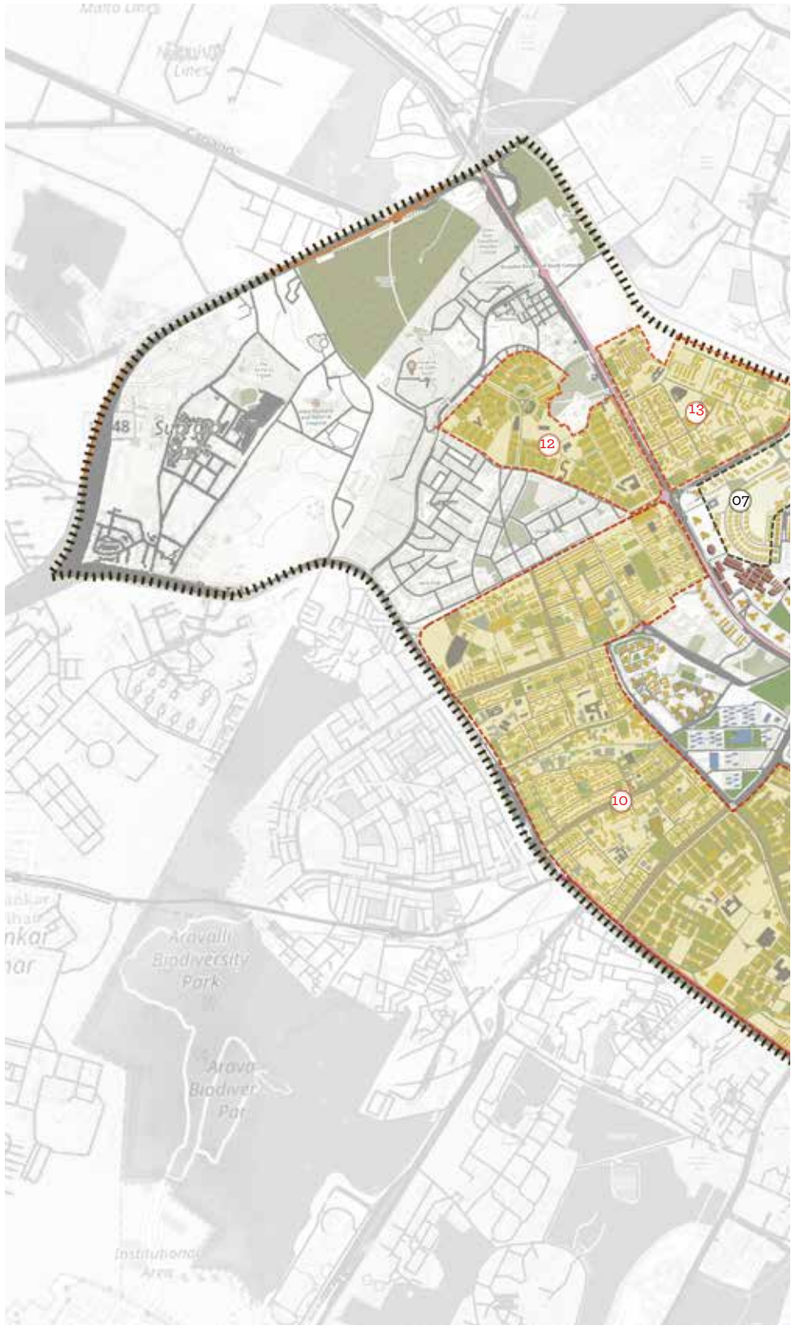
LEGEND

APPROVED FOR REDEVELOPMENT AS IN YER 2020

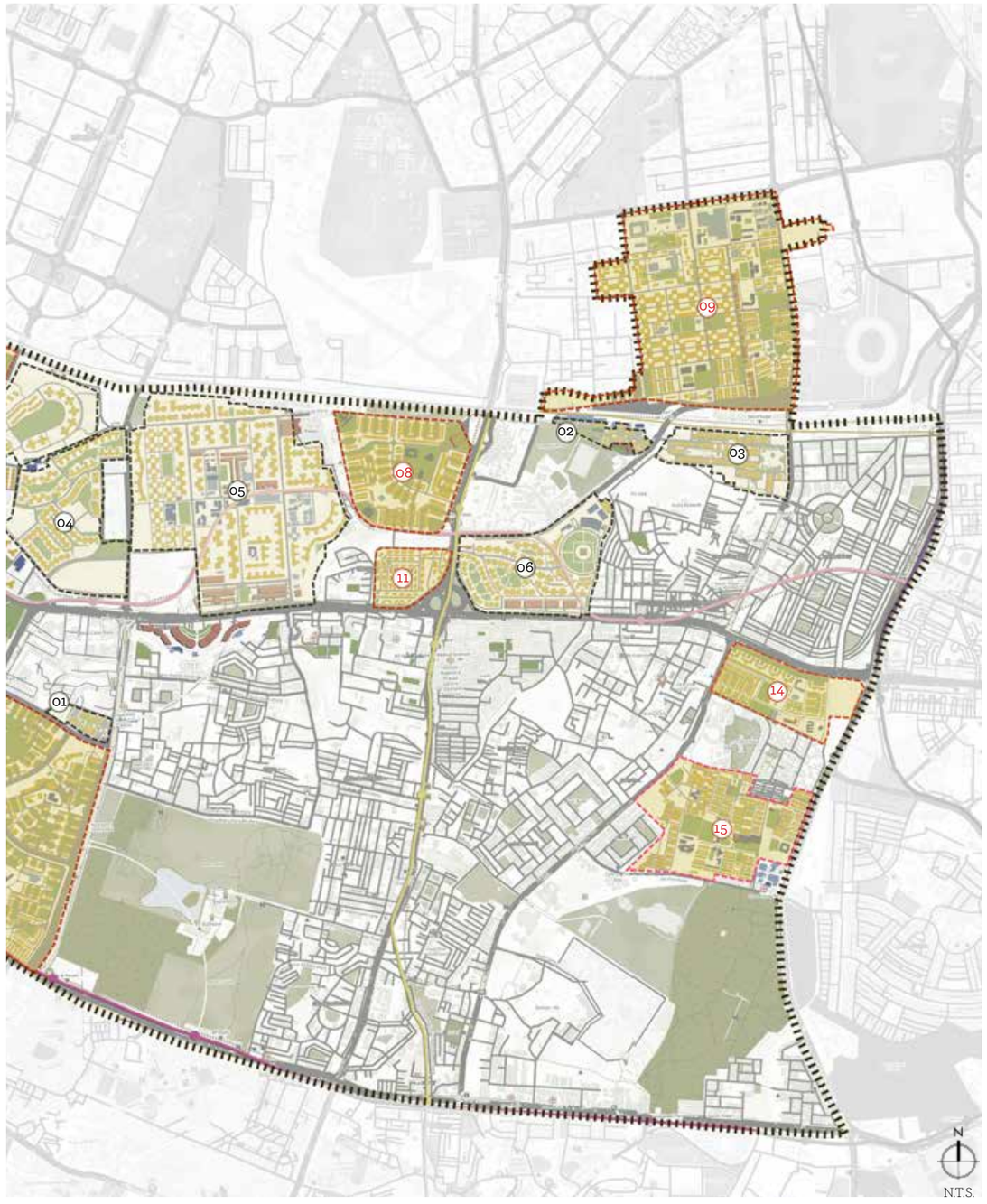
- 01 Mohammadpur
- 02 Thyagraj
- 03 Kasturba
- 04 Netaji Nagar
- 05 Sarojini Nagar
- 06 East Kidwai Nigar
- 07 New Moti Bagh (already redeveloped)

POTENTIAL FOR REDEVELOPEMNT

- 08 Laxmi Bai Nagar
- 09 Lodhi Colony
- 10 R.K. Puram
- 11 West Kidwai Nagar
- 12 Nanakpura
- 13 NW Moti Bagh
- 14 Andrews ganj
- 15 Sadiq Naagr



Map 2.2 | Map depicting the Study Area Boundary delineation

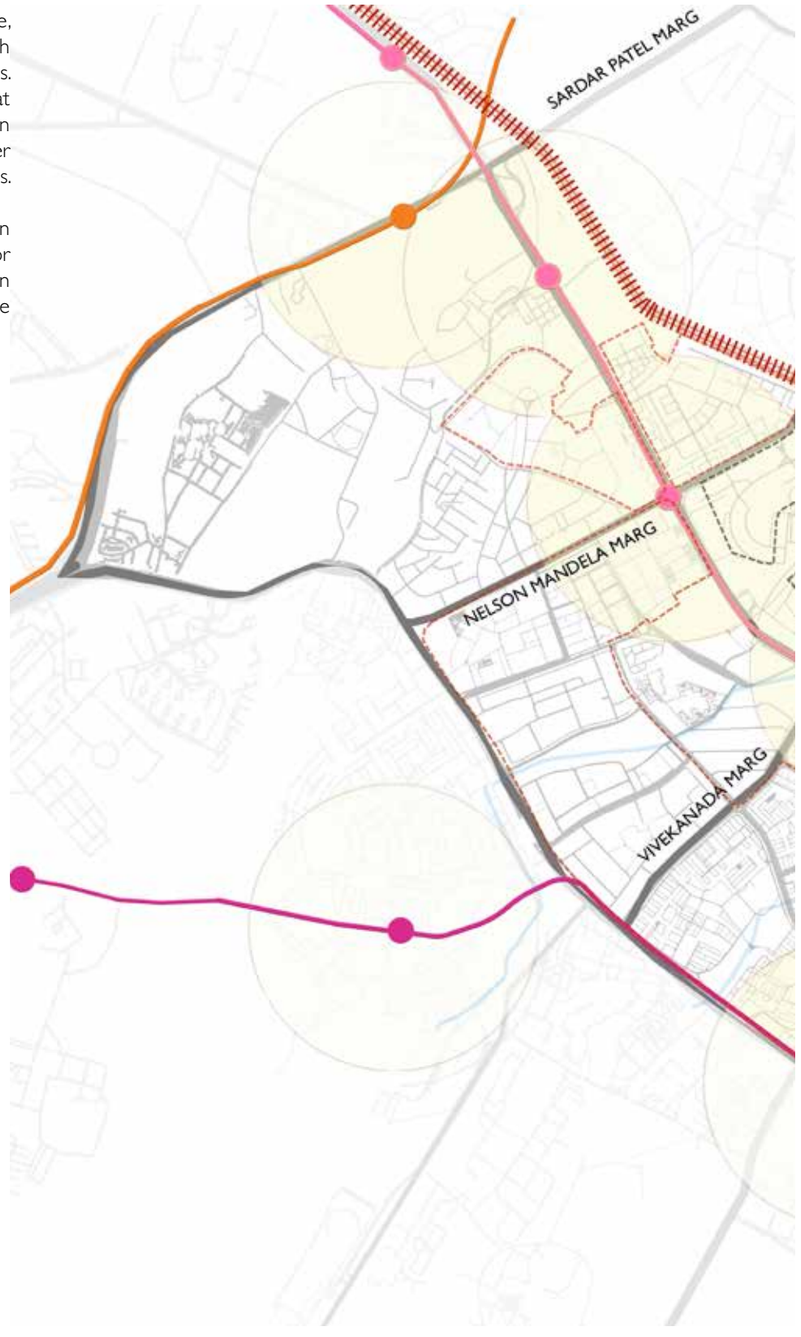


2.3.1 | Prevailing Redevelopment Pattern Analysis| **Mobility**

In order to understand the movement patterns and routes that connect the colonies, the study area has been overlaid with the metro network indicating the stations that falls within 800m walking distance and the road network.
It is inferred that 5 out of 7 colonies under Redevelopment i.e. - East Kidwai Nagar, Sarojini Nagar, Netaji Nagar and New Moti Bagh & Mohammadpur are well-connected with the Pink Metro line and are accessed through the Inner-Ring Road. Increasing the density in the same corridor will congest it further, and load the existing metro and road infrastructure.

Furthermore, the Pink Metro line, is not directly connected with the hub of Government Offices. Thus the increase in the density at this stretch would had not been a viable solution as it will further aggravate the mobility issues.

Conclusively the concentration of the colonies along the major transit routes should have been considered while increasing the density in the colonies.



LEGEND

- Road Network
- Metro Network
  - Yellow line
  - Pink line
  - Magenta line
  - Violet line
  - Airport line
  - Ring Railway

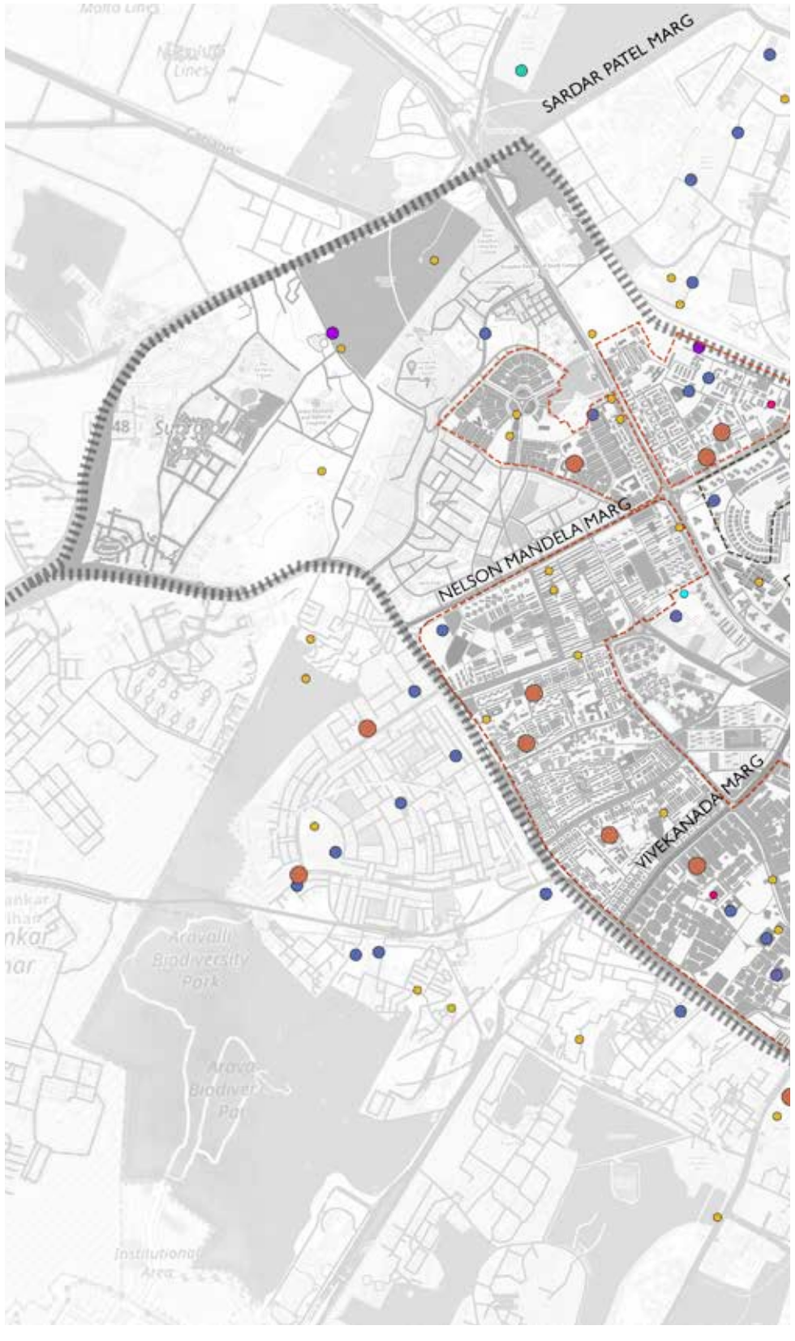
Map 2.3 | Map depicting the mobility pattern within the Study Area

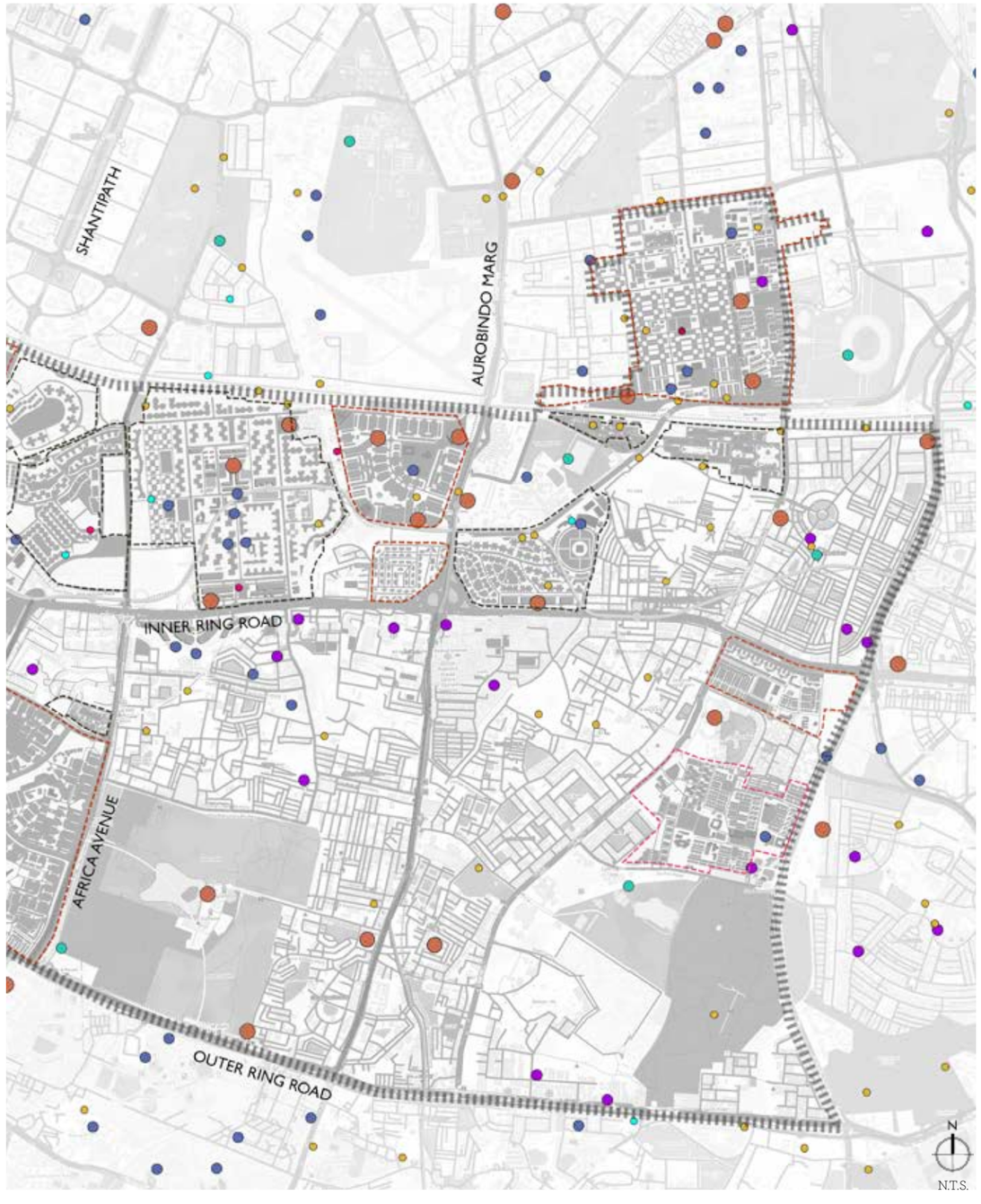
2.3.2 | Prevailing Redevelopment Pattern Analysis

Social Infrastructure

As reflected in the map, the study area at present is well-equipped with social infrastructure. The existing social infrastructure in the vicinity of the colonies should be retained and integrated with the redevelopment proposal schemes.

Map 2.4 | Map depicting the location of different Social Infrastructures within the Study Area





LEGEND

Educational
- School & College

Public Infrastructure
- Hospital
- Religious
- Baraat Ghar
- Dispensary
- Sports

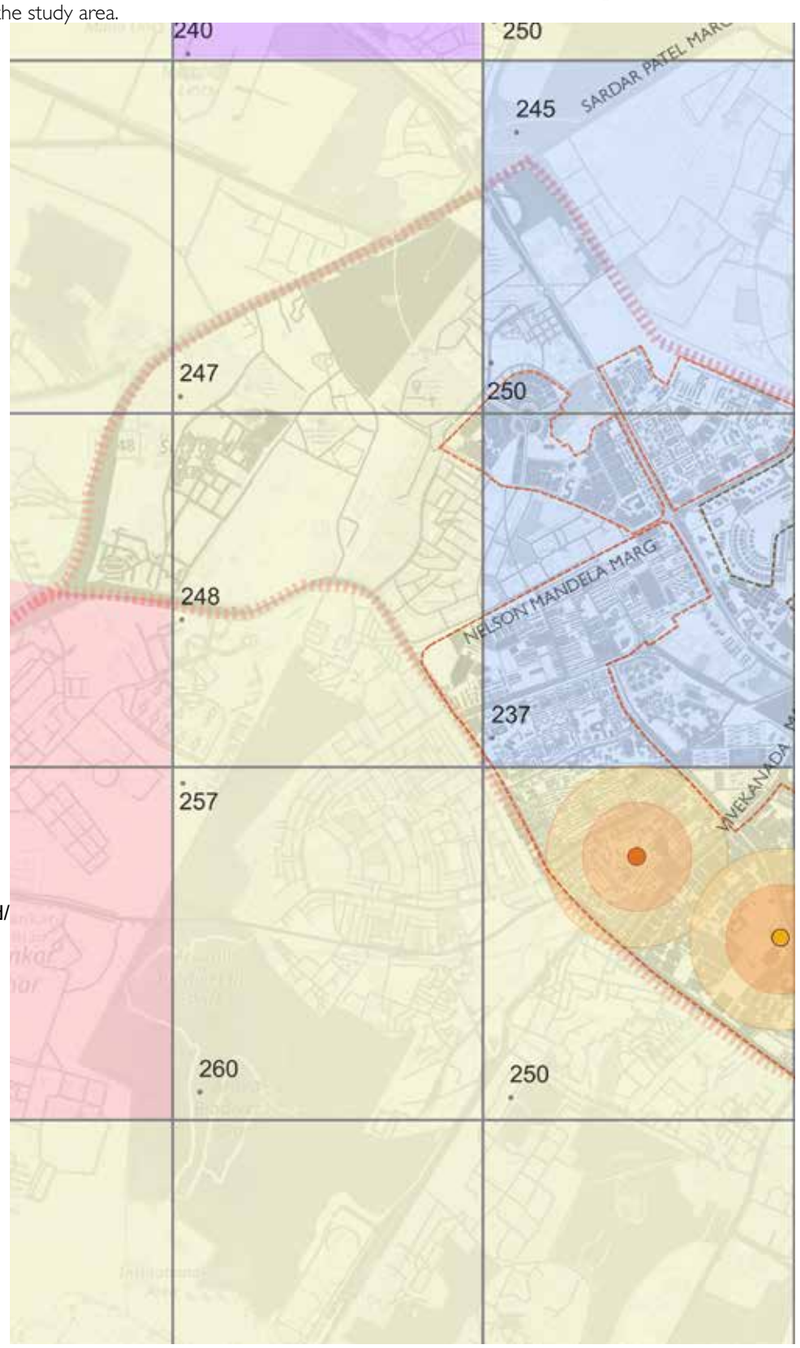
Commercial
- Commercial facility

ANALYSIS | Prevailing Redevelopment Pattern

2.3.3 | Prevailing Redevelopment Pattern Analysis| **Regulatory**

In addition to the urban design principles, certain regulatory norms play an important role in controlling the city skyline. The two governing bodies which regulate the same, are Airport Authority of India and Archaeological Survey of India.

The regulatory grid of the permissible heights assigned by the AAI and the radius around the monument which is restricted from development as laid down by ASI have been overlaid on the map to understand the height restrictions applicable to the colonies within the study area.



LEGEND

Airport Authority of India (AAI) Permissible Top Elevation

***Source** : AMASR Act 1958 (Refer Annexure A.11)*

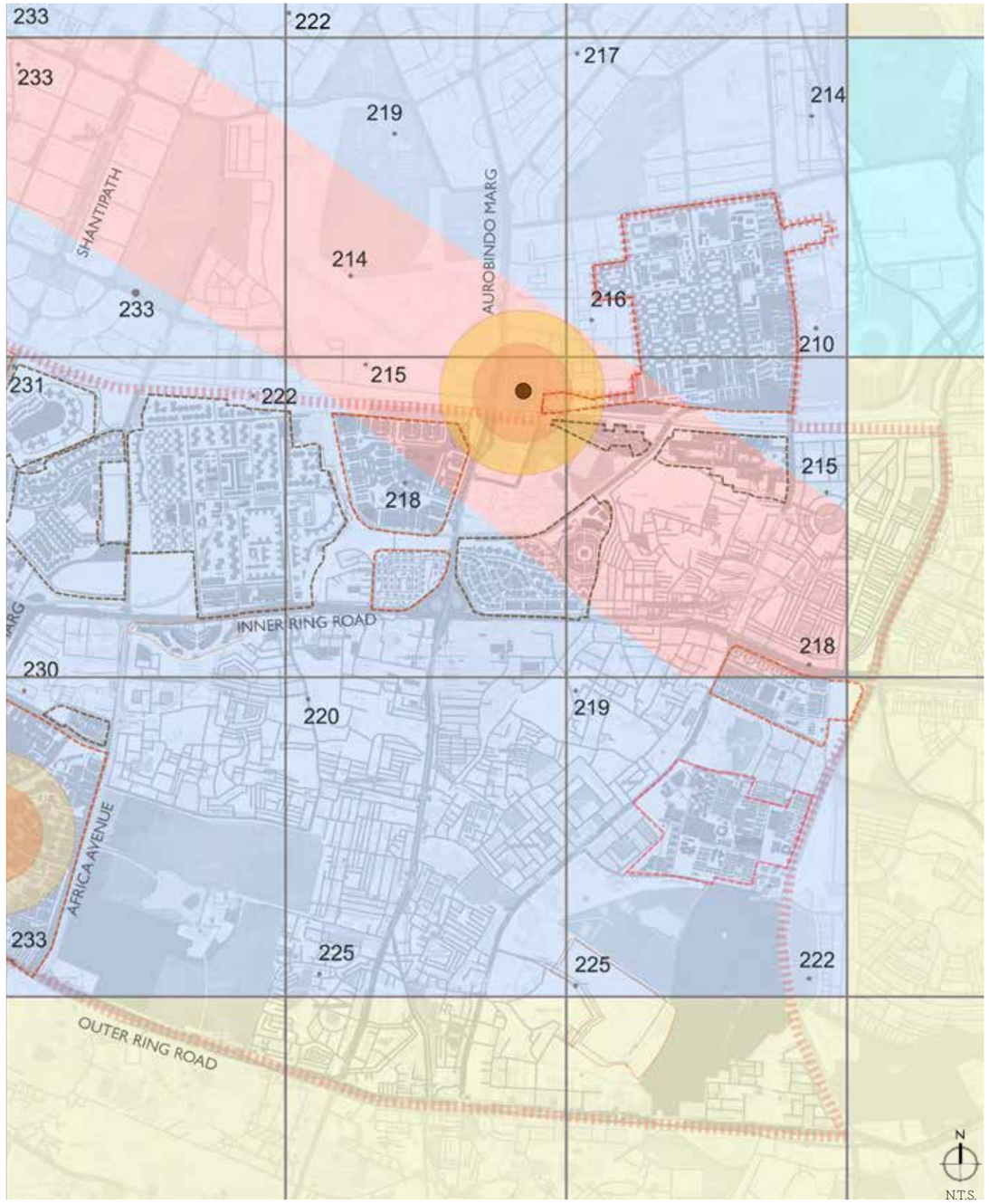
- Permissible Top Elev. 290m.
- Permissible Top Elev. 270m.
- Permissible Top Elev. 260m.
- Permissible Top Elev. 250m.
- NOC to be obtained

Monuments & their Prohibited/ Regulation Areas

***Source** : AMASR Act 1958 (Refer Annexure A.10)*

- Wazirpur group of monuments', R.K Puram, Sector 5.
- Tomb of Bijri Khan, R.K Puram, Sector 5
- Najafkhan tomb, Lodi Colony
- 100 m_Prohibited zone
- 200 m_Regulated zone

Map 2.5 | Map overlaid with AAI Height Regulatory Grid and ASI Height Regulation radius for the study area



ANALYSIS | Prevailing Redevelopment Pattern

2.3.4 | Prevailing Redevelopment Pattern Analysis| **Density**

The prevailing pattern of GPRA Colonies redevelopment is mainly associated with increase in density. The same is illustrated below through a time line and Density Mapping.

LEGEND | Table 2.1 | Densities of GPRA Colonies **IN YEAR 2011**.

DENSITY | 0-70 DU/ha	
01 New Moti Bagh	1.12
02 West Kidwai Nagar	22.86
03 Nanakpura	37.10
04 RK Puram	40.79 (average)
05 Sarojini Nagar	44.90
06 NW Moti Bagh	45.08
07 Lodhi Colony	53.11
08 Andrews Ganj	53.89
09 Sadiq Nagar	55.09
10 Laxmi Bai Nagar	57.89
11 Netaji Nagar	62.70
12 East Kidwai Nagar	67.00

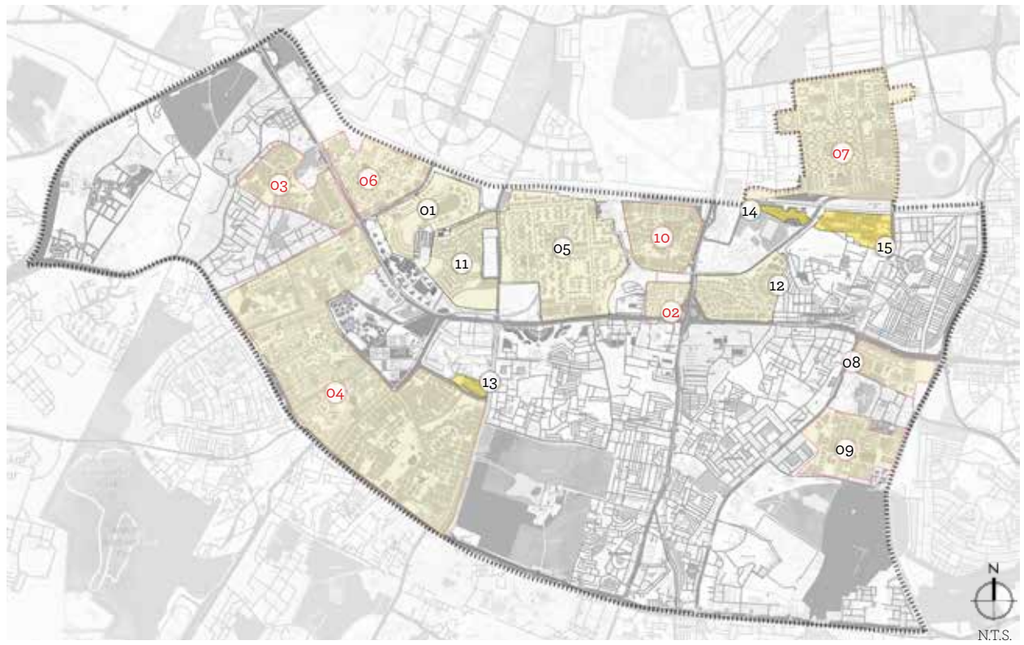
DENSITY | 71-140 DU/ha	
13 Mohammadpur	89.10
14 Thyagraj	111.90
15 Kasturba	118.00

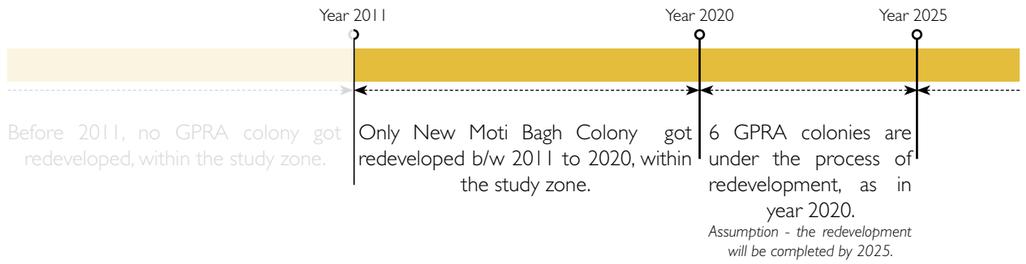
DENSITY | 141-210 DU/ha
No colony within study zone

In Year 2011 (before redevelopment)
A uniform distribution of density is seen within the study zone, mostly within the range of 1-70.

Colour | Colonies already redeveloped or proposed for redevelopment, as in year 2020.
Colour | Colonies with potential for redevelopment in future.

Map 2.6 | Mapping of GPRA Colonies Densities, **IN YEAR 2011** (before any redevelopment)





LEGEND | Table 2.2
Densities of GPRA Colonies **IN YEAR 2025** (projected)

DENSITY | 0-70 DU/ha	
01 New Moti Bagh	11.04
02 West Kidwai Nagar	22.86
03 Nanakpura	37.10
04 RK Puram	40.79 (average)
06 NW Moti Bagh	45.08
07 Lodhi Colony	53.11
08 Andrews Ganj	53.89
09 Sadiq Nagar	55.09
10 Laxmi Bai Nagar	57.89

DENSITY | 71-140 DU/ha	
05 Sarojini Nagar	95.90
11 Netaji Nagar	106.80
12 East Kidwai Nagar	132.40
14 Thyagraj	137.50

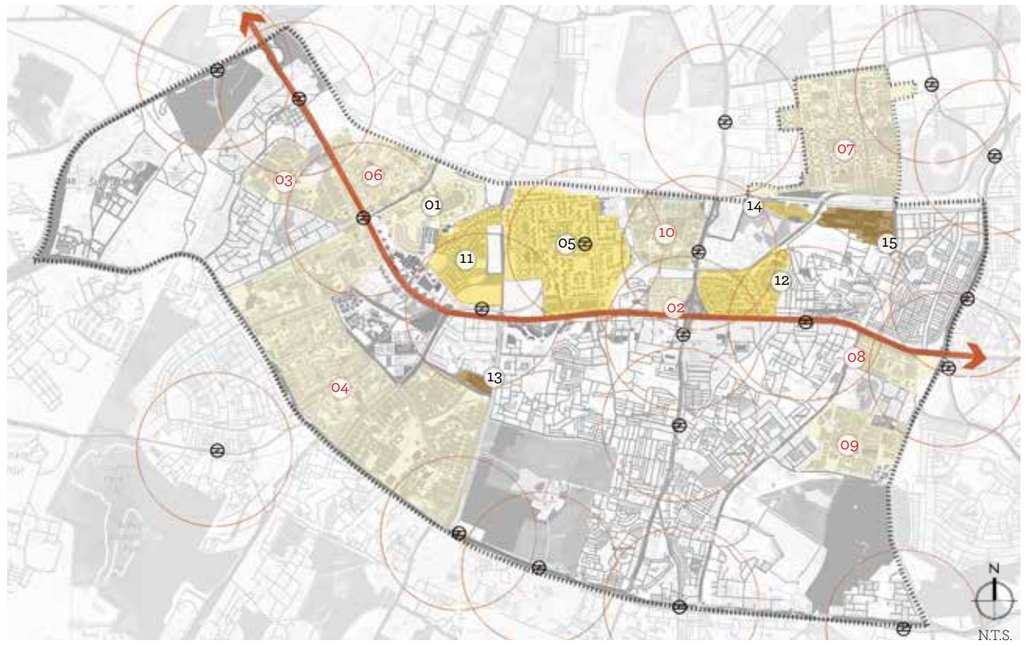
DENSITY | 141-210 DU/ha	
15 Kasturba	167.80
13 Mohammadpur	192.40

In Year 2025 (projected, after all the 7 colonies get redeveloped)
The density distribution is not uniform. To understand the efficiency of the density distribution, the metro network along with walkability radius is overlaid on the study area.

It is observed that the colonies proposed with the maximum density i.e. Kasturba Nagar and Mohammadpur, do not fall under the walkability radius.

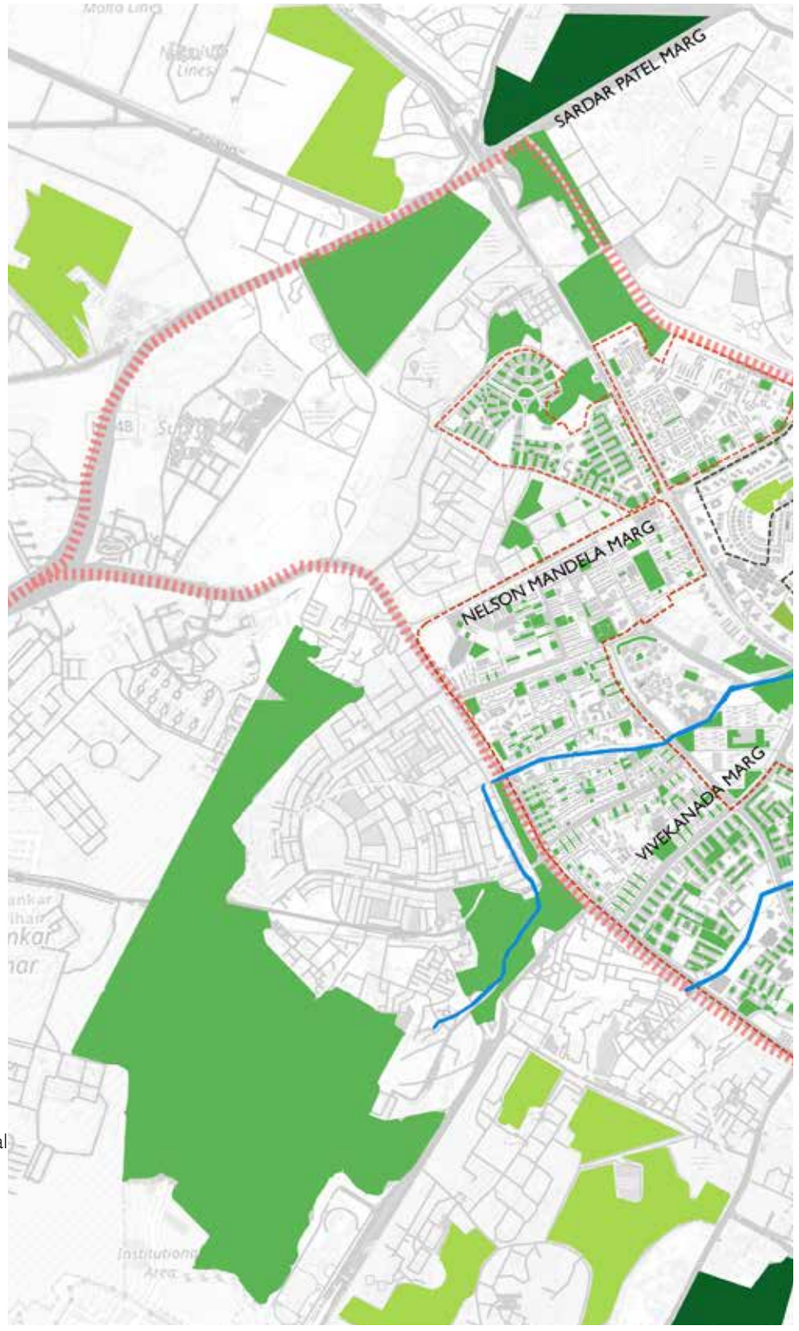
Colour | Colonies already redeveloped or proposed for redevelopment, as in year 2020.
Colour | Colonies with potential for redevelopment in future.

Map 2.7 | Mapping of GPRA Colonies Densities, **IN YEAR 2025** (**projected**, after all the 7 colonies get redeveloped)



2.3.5 | Prevailing Redevelopment Pattern Analysis | **Green Zones**

The map depicts a scattered pattern of sizeable green zones within the study area under different ownerships i.e. Regional Park ; City Park ; District Park ; Community Park ; Private Greens ; Green within monuments and Nullahs. These zones have the potential to be transformed into functional and ecological zones, by developing inter-connections along the natural and built corridors. The desired green network is possible only when re-development of the individual colonies are considered holistically and not as plotted development or in isolation.

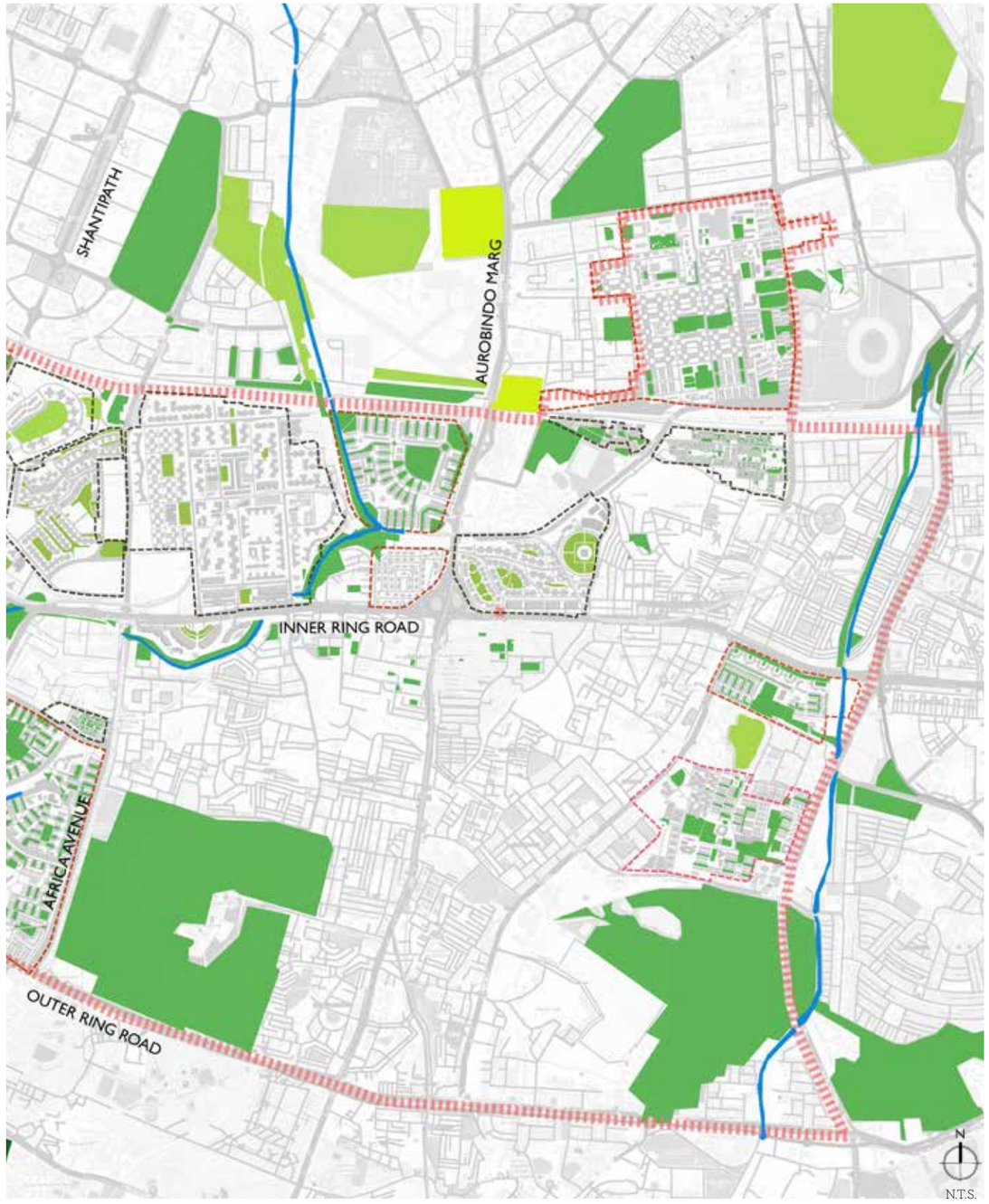


LEGEND

- Regional Park
- City Park, District Park, Community Park
- Green within historical monuments
- Private Green
- Nullah

Source : Green zones as per MPD 2021

Map 2.8 | Map depicting the location and hierarchy of green spaces of different ownerships within the Study Area



2.4 | Inferences

The prevailing Redevelopment Pattern is mainly associated with an average increase of 58 DU/ha density, along single transit route and approached as plotted developments.

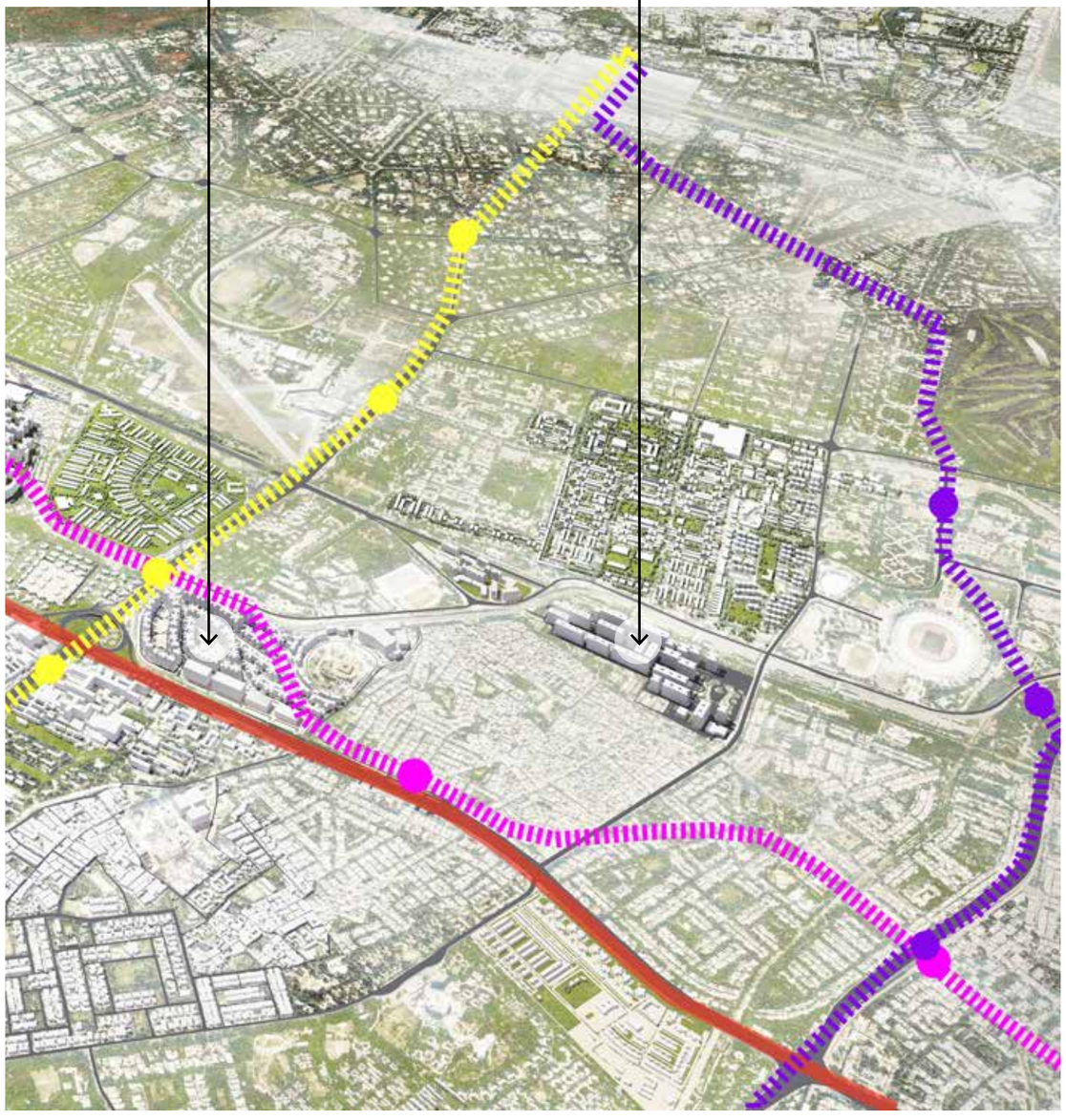
Redevelopment is the need of future because of the dilapidated condition of existing structures. However, the increase of density needs to be strategically decided, and, the redevelopment should be considered holistically and not as isolated, gated developments.

Inner Ring Road

Metro Lines

Colonies proposed with the maximum increase of density i.e. Kasturba Nagar (an increase of 50DU/ha) and Mohammadpur (an increase of 105 DU/ha), do not fall under the walkability radius of the nearest metro stations .

A considerable increase of density in Sarojini Nagar (increase of 51 DU/ha) would do not seem to be a viable solution as it is situated along the Pink metro line which is not directly connected with the hub of Government Offices. This would aggravate the mobility issues in this zone.



Map 2.9 | Map depicting the location and hierarchy of green spaces of different ownerships within the Study Area

ANALYSIS | Prevailing Redevelopment Pattern

2.5 Suggested Strategy | Comprehensive Redevelopment

The previous analysis/study layers justify the need of an alternative approach for redevelopment of GPRA colonies. Thus, a comprehensive strategy with an outward to inward approach is the need for the redevelopment of GPRA colonies, which develops links/connects with the surrounding existing green zones/network/natural features, forming continuous mobility network for pedestrians, cyclists, and vehicles.

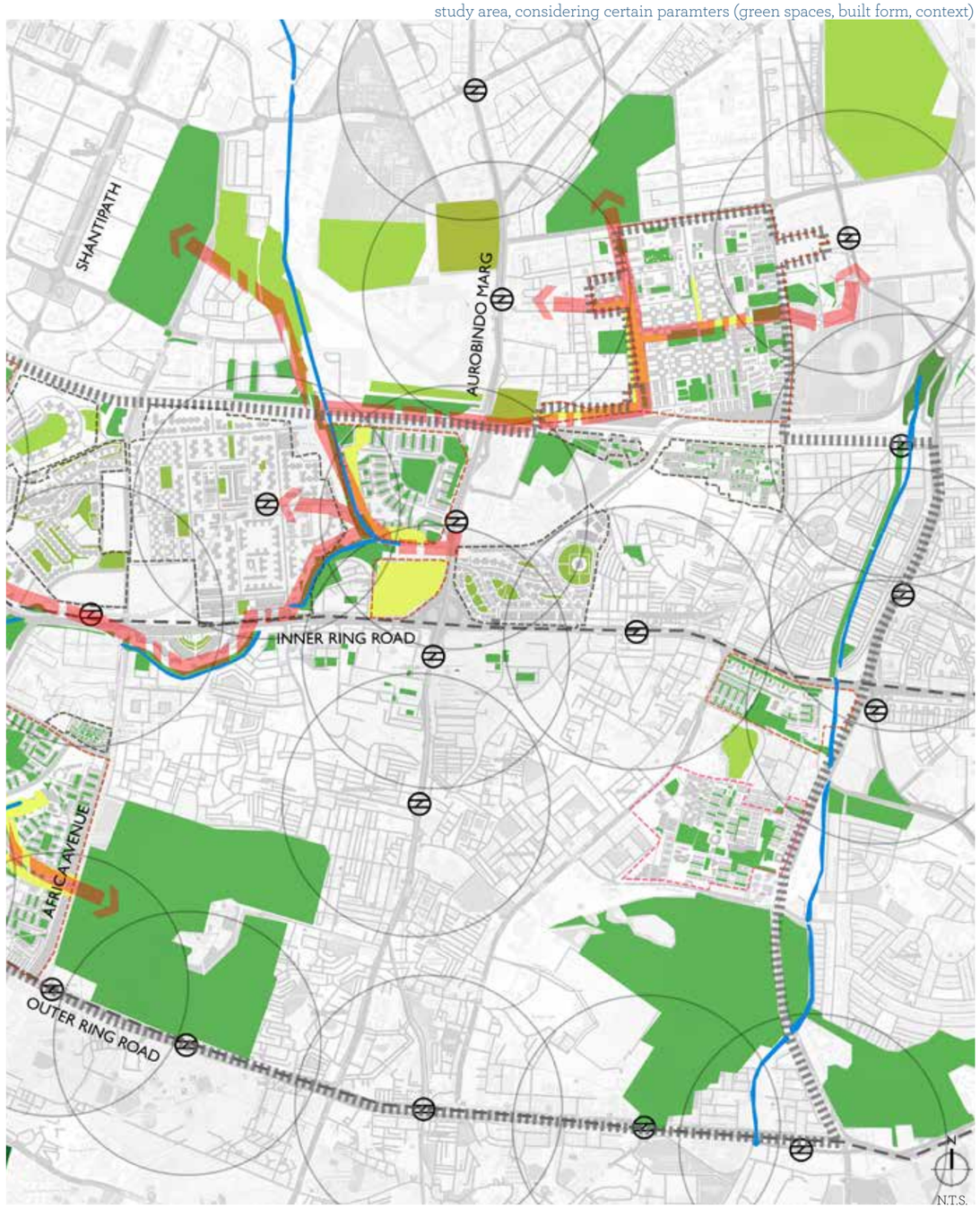
Considering the same, a conceptual strategy is explored showing possibility of regeneration of green networks, by strategically carving out greens from the individual sites of GPRA colonies such that they get linked with the existing green zones. And, the developed linkage, forms the basis of any redevelopment within any particular site.

LEGEND

- Regional Park
- City Park, District Park, Community Park
- Green within historical monuments
- Private Green
- Proposed Green
- Proposed Ecological and Pedestrian Network
- Nullah

Source : Green zones as per MPD 2021

Map 2.10 | Map depicting the Conceptual Strategy for different possibilities of re-generating the the green networks within the study area, considering certain paramters (green spaces, built form, context)



ANALYSIS | Prevailing Redevelopment Pattern

Chapter 03

EFFICIENCY | Assessment and Derivation

3.1 Efficiency Factors | Formulation Process

The 6 Efficiency Factors formulated to address the corresponding identified issues, are quantified to an ideal value by evaluating the relative design parameters through a defined process.

This formulation process is broadly under three heads i.e. Data Collection, Issues Identification and Assessment & Derivation

1 Data Collection

STEP 01

The design proposals of 7 GPRA colonies (as in year 2020, under the process of redevelopment), are studied thoroughly for their Quantitative Parameters, and a comparative analysis is done to understand the before and after scenarios.

2 Issues Identification

STEP 02

The design proposals of 7 GPRA colonies are assessed to identify the issues, and each issue is addressed by formulating it's corresponding efficiency factor.

3 Assessment & Derivation

STEP 03

The relative parameter values corresponding to each factor, are compared and assessed for each colony, to determine an ideal value.

3.2 Step 01 | Data Collection

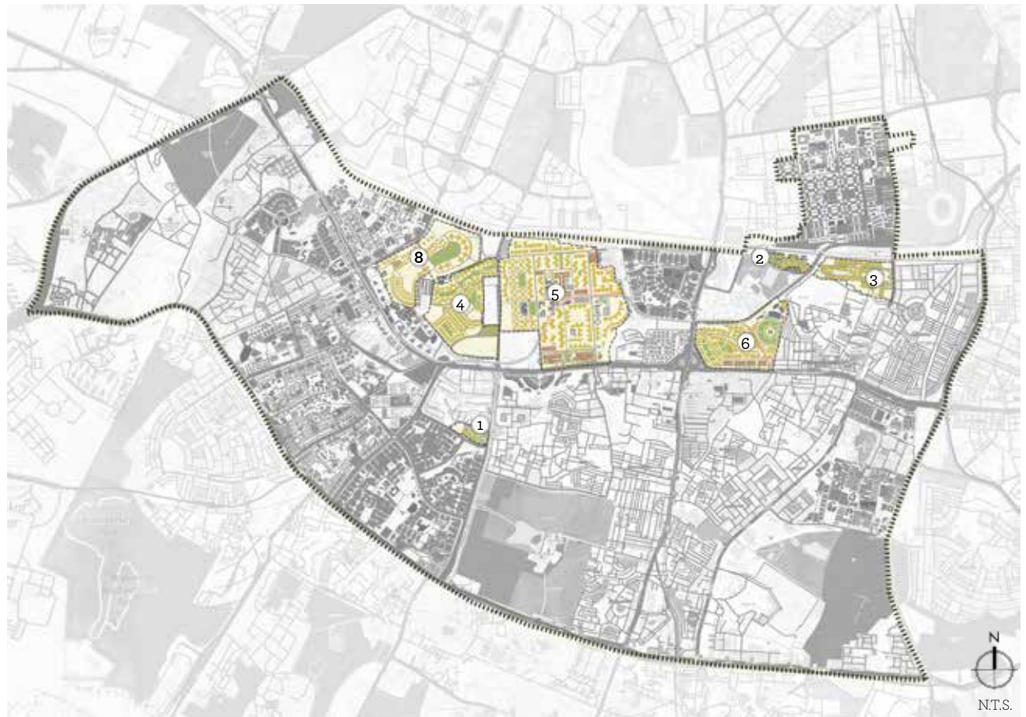
The design proposals of 7 GPRA colonies, marked on the map below, (as in year 2020, New Moti Bagh had already redeveloped and the other six colonies are under the process of redevelopment), are studied thoroughly for their Quantitative Parameters in a specific format i.e. Data Index, under the broad heads of Built Form, Site Planning and Block & their Placement.

After an individual study of each colony, the imperative parameters are compared collectively for before and after scenarios, to understand the pros and cons, offered by each design.

LEGEND

01 Mohammadpur
02 Thyagraj
03 Kasturba
04 Netaji Nagar
05 Sarojini Nagar
06 East Kidwai Nigar
07 Srinivaspuri *(falls out of the delineated study area, but considered for the analysis)*
08 New Moti Bagh *(had already been redeveloped, by the year 2020, but considered for a comparative analysis)*

Map 3.1 | Map depicting the location and precincts of GPRA colonies which are under re-development process.

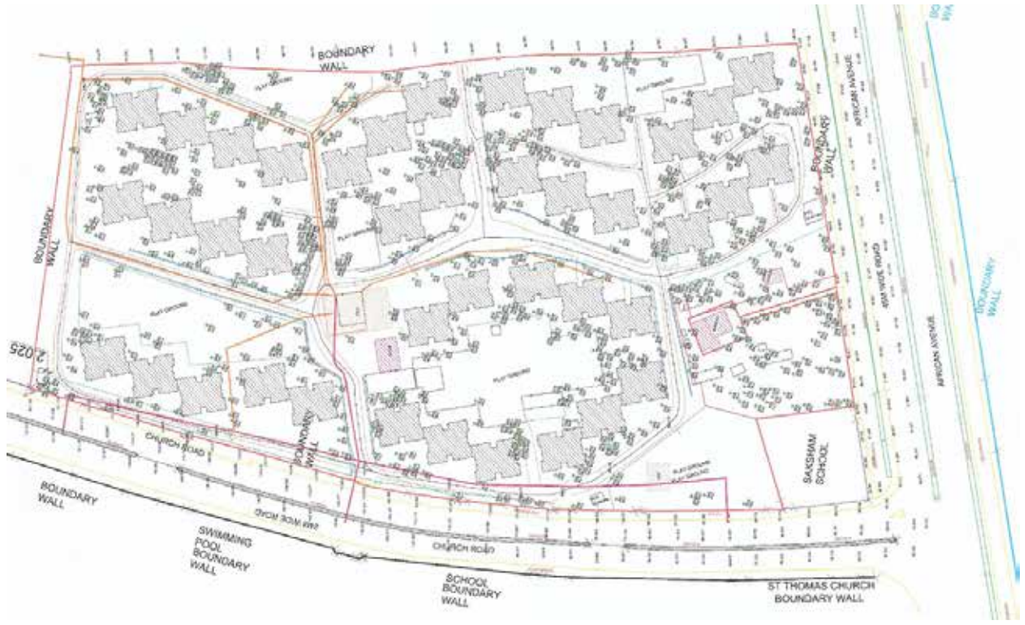


EFFICIENCY | Assessment and Derivation

3.2.1 Mohamaddpur

Project Redevelopment of General Pool Residential Colony at Mohammadpur, New Delhi
Site Area 3.68 ha
Architect Gian P. Mathur and Associates Private Limited.
Status Approved by DUAC in May 2019.

Map 3.2 | **BEFORE REDEVELOPMENT** | Layout Plan



Map 3.3 | **PROPOSED** | Layout for redevelopment of Mohammadpur

Image 3.1 | **PROPOSED** | Aerial View

EFFICIENCY | Assessment and Derivation

Data Index | Quantitative Parameters

A. BUILT FORM

1.	SITE AREA	36,800 sq.m. (3.68 ha)
2.	DWELLING UNITS (number)	708
3.	DENSITY (DU/ha)	192.4
4.	HEIGHT	45
5.	F.A.R.	137.88
6.	GROUND COVERAGE (%)	20.30 % (7470.4 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area	79.7 % (29,329.6 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)	103.3 DU's/ha

B. SITE PLANNING

7	RETAINING THE EXISTING			
	7.1	Primary Street Patterns retained (approx. %)		30 - 40 %
	7.2	Percentage of Trees Retained		61 %
8.	BASEMENT			
	8.1	Area % (of site area)		0
	8.2	Extent		0
9	PARKING NUMBER			
	9.1	Total Parking number proposed		702
		9.1.1	Stilt	-
		9.1.2	Surface	288
		9.1.3	MLCP (mechanized & ramp)	414
		9.1.4	Basement	-
10	CIRCULATION			
	10.1	Pedestrian Network		
		6.1.1	Character	
			6.1.1.1	Continuous network without any break points. — Provided
			6.1.1.2	Covered/ Shaded walkways — Not Provided
			6.1.1.3	Walkways amidst green areas. — Provided
			6.1.1.4	Planned/Designed to have a minimum walking distance — Partially
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)	
			6.1.2.1	To nearest Transit-hub — 0.8 (Bhikaji Cama Place Metro station)
			6.1.2.1	To social infrastructure and green spaces — 0.5
	10.2	Vehicular		
		6.2.1	Tower Drop-off points	Provided
		6.2.2	% of Paved Area at ground level (paved area/open area)	24.49 %
11	TREE CUT SPECIFICATIONS			
	11.1	Number of Existing Trees		634
	11.2	Number of Tree Cut		247
	11.3	Tree Cut Percentage		38.96 %
	11.4	Specifications		

No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
	DATA NOT PROVIDED				

11.5	Number of Native Trees Cut	DATA NOT PROVIDED
11.6	Number of Trees cut with girth more than 200/300mm	DATA NOT PROVIDED
11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED

12	ADDITIONAL TREES PLANTED SPECIFICATIONS			
	12.1	Number of additional trees planted		DATA NOT PROVIDED
	12.2	Specifications		

No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous
	DATA NOT PROVIDED		
	DATA NOT PROVIDED		
	DATA NOT PROVIDED		

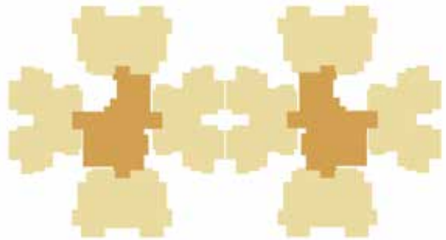
13	OPEN SPACES QUALITY		
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided
	13.2	Consolidated green areas for diversified age-groups.	Partially
	13.3	Well-connected green spaces within premises	Fragmented

C. BLOCKS AND THEIR PLACEMENT

13 BUILT-UP AREA & BLOCK CORE TYPOLOGY

Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core area per floor (sq.m.)	**Core Area per sq.m. of DU's Area**
II - 8 to a Core	614.64	500.55	114.09	0.227
III - 8 to a Core	693.55	581.74	111.81	0.192

14 CLUSTERING OF BLOCKS



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.
Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	Church Road , ROW is 24 m but as per Zonal Development Plan is 30 M, 3m left for road widening.

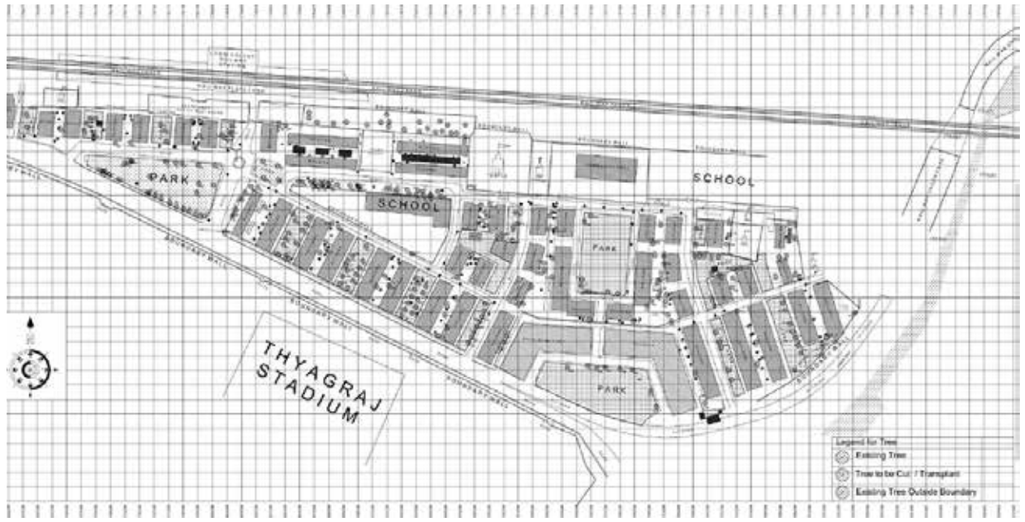
Table 3.1 | Data Index of Quantitative Parameters for Mohammadpur re-development proposal

EFFICIENCY | Assessment and Derivation

3.2.2 Thyagraj Nagar

Project Redevelopment of General Pool Residential Colony at Thyagraj Nagar, New Delhi
Site Area 5.38 ha
Architect Benjamin Benjamin and Vats
Status Approved by DUAC in December 2018.

Image 3.4 | **BEFORE REDEVELOPMENT** | Layout Plan



Map 3.5 | **PROPOSED** | Layout Plan for redevelopment of Thyagraj Nagar

Image 3.2 | **PROPOSED** | View

For DATA INDEX of the quantitative parameters for the proposal, Refer **Annexure, Table A.3.2,** Page number 166.

EFFICIENCY | Assessment and Derivation

3.2.3 Kasturba Nagar

Project Redevelopment of General Pool Residential Colony at Kasturba Nagar, Delhi
Site Area 21.37 ha
Architect CP Kukreja Architects | CPKA
Status Approved by DUAC in December 2018

Map 3.6 | **BEFORE REDEVELOPMENT** | Layout Plan

Map 3.7 | **PROPOSED** | Layout Plan for redevelopment of Kasturba Nagar

Image 3.3 | **PROPOSED** | View

For DATA INDEX of the quantitative parameters for the proposal, Refer **Annexure, Table A.3.3,** Page number 168.

3.2.4 Sriniwaspuri

Project Redevelopment of General Pool Residential Colony at Sriniwaspuri, New Delhi
Site Area 29.59 ha
Architect Sikka Associates Architects
Status Approved by DUAC in May 2019

Map 3.8 | **BEFORE REDEVELOPMENT** | Layout Plan

Map 3.9 | **PROPOSED** | Layout Plan for redevelopment of Sriniwaspuri

Image 3.4 | **PROPOSED** | Aerial View

For DATA INDEX of the quantitative parameters for proposal, Refer **Annexure, Table A.3.4,** Page number 171.

EFFICIENCY | Assessment and Derivation

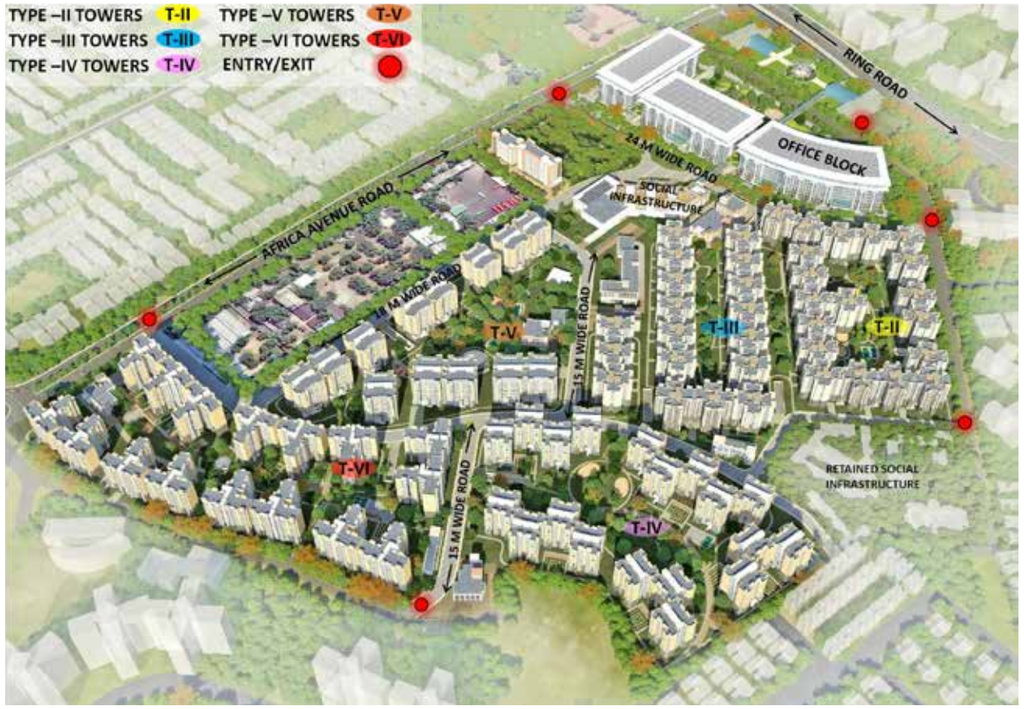
3.2.5 Netaji Nagar

Project Redevelopment of General Pool Residential Colony at Thyagraj Nagar, New Delhi
Site Area 44.24 ha
Architect Gian P. Mathur and Associates Private Limited.
Status Approved by DUAC in February 2020

Map 3.10 | **BEFORE REDEVELOPMENT** | Layout Plan

Map 3.11 | **PROPOSED** | Layout Plan for redevelopment of Netaji Nagar

Image 3.5 | **PROPOSED** | Aerial View



For DATA INDEX of the quantitative parameters for proposal, Refer **Annexure, Table A.3.5,** Page number 174.

3.2.6 Sarojini Nagar

Project Redevelopment of General Pool Residential Colony at Sarojini Nagar, New Delhi
Site Area 104.48 ha
Architect Gian P. Mathur and Associates Private Limited
Status Approved by DUAC in January 2020

Map 3.12 | **BEFORE REDEVELOPMENT** | Layout Plan

Map 3.13 | **PROPOSED** | Layout Plan for redevelopment of Sarojini Nagar

Image 3.6 | **PROPOSED** | Aerial View

For DATA INDEX of the quantitative parameters for proposal, Refer **Annexure, Table A.3.6,** Page number 177.

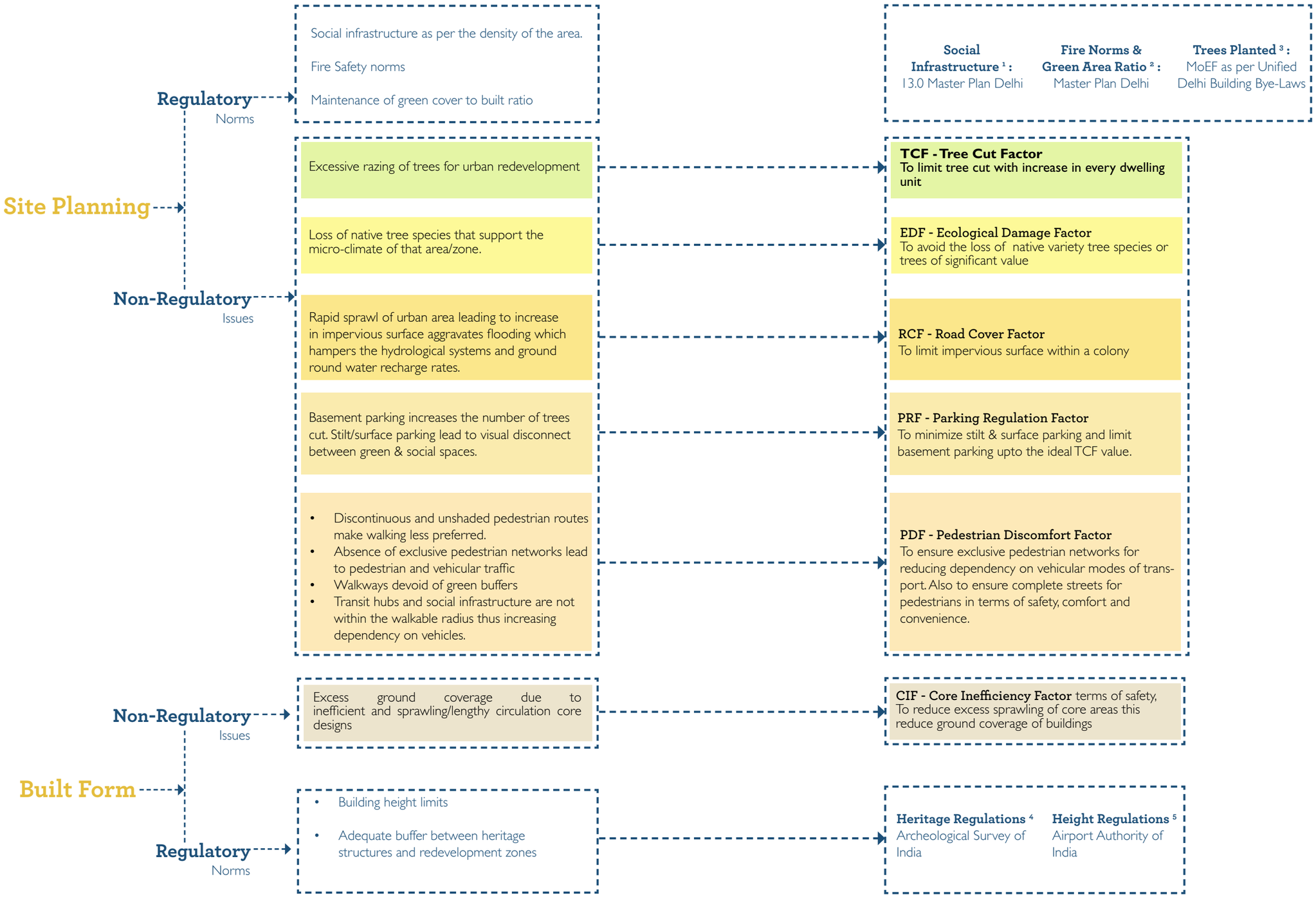
3.2.7 Data Index: Comparative Study

		EXISTING					PROPOSED						CONCLUSIONS			
Approved GPRA Colonies	Site Area (Ha.)	DU's	Density (DU's/ Ha.)	Average Height (mts.)		Tree density	DU's	Achieved Density (DU's/ Ha.)	Height Achieved (mts.)		Achieved FAR	Trees to be cut	Retained Tree Density	Increased Densities (DU's/ Ha.)	Tree Cut (%)	Remarks
Mohammadpur	3.68	328	89.10	9.00	634	172.28	708	192.40	45.00		137.88	247	105.16	103.30	38.96	•Top elevation was increased by AAI after special permission and thus more number of storeys were allowed to be built • A large volume of trees (approx 40%) were cut on the site to allow development
Thyagraj	5.38	602	111.90	9.00	349	64.87	740	137.50	31.95		107.56	40	57.43	25.60	11.46	• Only 25% increase in density with Type 2,3 and 4 DU's. • Social infrastructure like School, temple etc. are being retained in the site.
Kasturba Nagar	21.37	2521	118.00	9.00	1203	56.29	3585	167.80	43.95		193.30	405	37.34	49.80	33.67	• Type 2 to type 6 DU's with a proposed density of 167DU's/ ha.
Srinivaspuri	29.59	1429	48.30	9.00	2763	93.38	4994	168.80	89.05		199.92	1114	55.73	120.50	40.32	• Maximum height achieved amongst all GPRA projects which allowed for more number of dwelling units in the site
Netaji Nagar	44.24	2772	62.70	9.00	3906	88.29	4727	106.80	36.60		120.80	1560	53.03	44.10	39.94	• Approximately 40% of trees are proposed to be cut to accommodate 1955 additional dwelling units while retaining social infrastructure like Schools, post offices etc.
Sarojini Nagar	104.48	4687	44.90	9.00		114.02	10015	95.90	42.45		172.53	3465	80.86	51.00	29.09	• Type 2 to Type 6 units are proposed and maximum social infrastructure is retained

EFFICIENCY | Assessment and Derivation

3.3 Step 02 | Identified Issues & Norms of Redevelopment

Proposals of 7 GPRA redevelopment colonies are studied to identify the issues, and are addressed by formulating their corresponding efficiency factors.



NOTE :

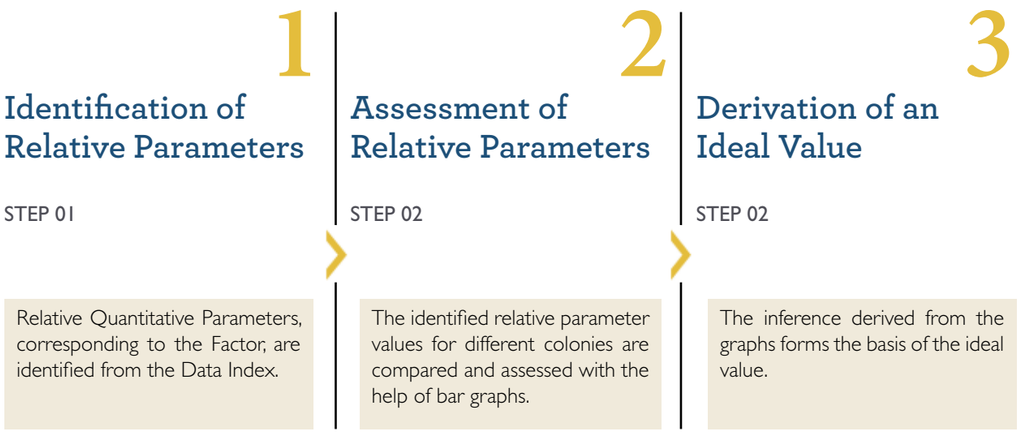
References :

[1] Annexure A.6 , Page 182
[2] Annexure A.7 , Page 184
[3] Annexure A.8 , Page 185
[4] Annexure A.9 , Page 186
[5] Annexure A.10 , Page 188

EFFICIENCY | Assessment and Derivation

3.4 Step 03 | Assessment and Derivation

A 3-step process has been followed for the quantification of each Efficiency Factor to its ideal value.



1
SITE PLANNING

3.4.1 Tree Cut Factor | TCF

Redevelopment project sites, with the presence of upright full-grown trees, allows two approaches. One, to clear the site and do the desired development. The second is to do the development responsibly considering the value of every tree.

The second approach has been quantified through this Factor, which allows development/ redevelopment in a controlled way and helps in reducing the large-scale tree cutting. Different design strategies (not in the scope of this report)can be worked upon by the designer, to achieve the ideal value of this quantified factor. The achievement of an ideal value will lead to a balanced design which will in turn ensure preservation of the green cover.

Step 01 | Identification of Relative Parameters

The relative quantitative parameters applicable are

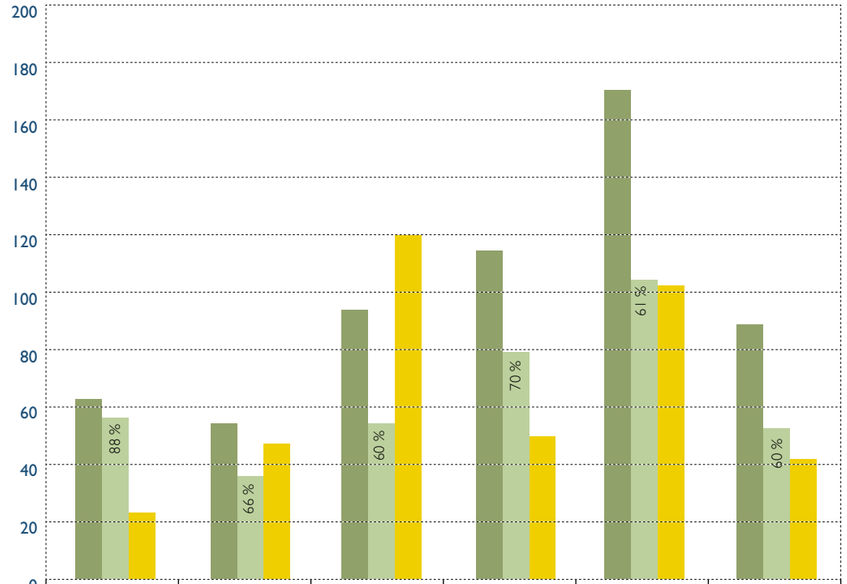
1. Number of Existing trees
2. Number of Trees Cut.
3. Increased number of Dwelling Units

Step 02 | Assessment of Relative Parameters

The numeric values of the above identified parameters for each colony are put together and analyzed through a bar graph illustration, to understand their co-relation.

		Existing Tree Density (no. of existing trees/site area in ha.)	Retained Tree Density (no. of trees cut/site area in ha.)	Increased DU Density (DU/ha) (proposed density - existing density)
COLONY				
1.	Thyagraj	64.87	57.44	25.7
2.	Kasturba Nagar	56.29	37.34	49.8
3.	Srinivaspuri	93.38	55.73	120.5
4.	Sarojini Nagar	114.02	80.86	51.0
5.	Mohammadpur	172.28	105.16	103.3
6.	Netaji Nagar	88.29	53.03	44.2

Table 3.2 | Tabulation of Existing Tree Density, Retained Tree Density and Dwelling Units Density for each colony



	Thyagraj 01	Kasturba Nagar 02	Srinivaspuri 03	Sarojini Nagar 04	Mohammad-pur 05	Netaji Nagar 06
Existing Tree Density	64.87	56.29	93.38	114.02	172.28	88.29
Retained Tree Density	57.44	37.34	55.73	80.86	105.16	53.03
Increased DU Density (DU/ha)	25.70	49.80	120.5	51.00	103.30	44.20

Graph 3.1 | Bar Graph depicting the co-relation of Existing Tree Density, Retained Tree Density and Increased DU Density.

Observations :

1. In case of Thyagraj, the percentage of retained tree density achieved is the maximum i.e. 88%, with the minimum increase in DU density i.e. increase of 25.60 DU/ha. Thus, it is inferred that this proposal accommodated more number of Dwelling Units with optimum number of tree cuts.
2. In the case of Srinivaspuri and Mohammadpur, the percentage of retained tree density achieved is the minimum i.e. 60% and 61% respectively, with the maximum increase in DU densities i.e. 120.5 and 103.30 DU/ha. Thus, it is inferred that in these two proposals, the Dwelling Units are increased at the cost of existing trees.
3. In the case of Netaji Nagar, the percentage of retained tree density is the minimum i.e. 60%, and the increase in DU density is also quite low i.e. 44.20 DU/ha. Thus, it is inferred that this proposal did not accommodate more Dwelling Units even by increasing the number of tree cuts, thus turns out to be in-efficient.

From the above observations, it is concluded that the minimum increase in DU density, will leads to the maximum retention of tree density. Therefore, the Dwelling Units are increased at/against the cost of existing trees.

The relationship between the parameters, illustrated in the above graph, is further quantified in two parts i.e.

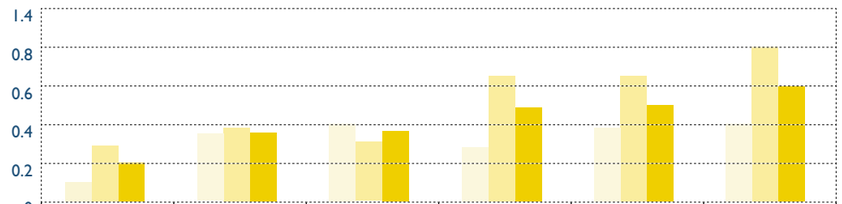
A : Ratio of 'Number of Trees Cut' to 'Total Number of Existing Trees'
B : Ratio of 'Number of Trees Cut' to 'Increased Number of Dwelling Units'

As both the ratios hold equal importance, an average is calculated to obtain a unique value.

The quantified values of the two ratios for each colony are put together for a comparative study in the table below, and then analyzed through a bar graph illustration.

		Number of Existing Trees	Number of Trees Cut	Increased Number of Dwelling Units	No. of Tree cut / No. of Existing Trees **A**	No. of Tree cut / Increased no. of DU **B**	**A+B / 2**
COLONY							
1.	Thyagraj	349	40	138	0.11	0.29	**0.20**
2.	Kasturba Nagar	1203	405	1064	0.34	0.38	**0.36**
3.	Srinivaspuri	2763	1114	3565	0.40	0.31	**0.36**
4.	Sarojini Nagar	11913	3465	5328	0.29	0.65	**0.47**
5.	Mohammadpur	634	247	380	0.39	0.65	**0.52**
6.	Netaji Nagar	3906	1560	1955	0.40	0.80	**0.60**

Table 3.3 | Tabulation of the two ratios and their average value for each colony



		Thyagraj 01	Kasturba Nagar 02	Srinivaspuri 03	Sarojini Naagr 04	Mohammadpur 05	Netaji Nagar 06
Number of Tree Cut / Number of Existing Trees	**A**	0.11	0.34	0.40	0.29	0.39	0.40
Number of Tree Cut / Increased no. of DU	**B**	0.29	0.38	0.31	0.65	0.65	0.80
Average	**A+B / 2**	**0.20**	**0.36**	**0.36**	**0.47**	**0.52**	**0.60**

Graph 3.2 | Bar Graph depicting the co-relation of two ratios and their average value

Observations for Graph 3.2

1. In the case of Thyagraj, more number of Dwelling Units are accommodated with optimum number of tree cuts, as the average value is minimum i.e. 0.2
2. In the case of Netaji, the colony did not accommodate more Dwelling Units even by increasing the number of tree cuts, as the average value is maximum i.e. 0.6

From the above observations, it is concluded that Thyagraj's proposal is the most efficient, thus the average value i.e.0.2, is considered to be the TCF ideal value (maximum).

Step 03 | Derivation

The ideal value of Tree Cut Factor has been derived to be less than or equal to 0.2, with a condition that the value of each ratio i.e. 'A' as well as 'B' should be less than or equal to 0.2

$$\frac{\text{NUMBER OF TREES CUT}}{\text{TOTAL NUMBER OF EXISTING TREES}} = A^*$$

$$\frac{\text{NUMBER OF TREES CUT}}{\text{INCREASED NUMBER OF DWELLING UNITS}} = B^*$$

TREE CUT FACTOR | TCF

$$TCF = \frac{A + B}{2}$$

*Each value should be ≤ 0.2

IDEAL VALUE ≤ 0.2

3.4.2 Tree Ecology Damage Factor | EDF

Trees strengthen the distinctive character of a place and help in maintaining a healthy biodiversity.
Fully grown native trees have a higher ecological value as they are well-adapted to the local environmental conditions and provide habitat to other species of wildlife.

While deciding on the tree cut for any redevelopment, considerate thought should be given to decide on the type of trees being cut, as razing Trees with higher ecological value will lead to the loss of biodiversity.
Thus, EDF evaluates the ecological value of trees cut on two parameters i.e. age and nativeness, to assess the impact on the surrounding environment.

Step 01 | Identification of Relative Parameters

The relative quantitative parameters identified are

1. Caliper value of the Tree cut (this value estimates the tree age)
2. Number of Native Trees cut

Step 02 | Assessment of Relative Parameters

The relationship between the above mentioned parameters is quantified in two parts i.e.

A: Ratio of 'Number of Native Trees Cut' to 'Total Number of Trees Cut'
B: Ratio of 'Number of Trees Cut with calibre ≥ 300mm ' to 'Total Number of Trees Cut'

As both the ratios hold equal importance, average has been calculated to obtain a unique value.,

		Total Number of Trees Cut	% of Trees Cut (no. of trees cut/no. of existing trees)	No. of native trees cut / Total no. of trees cut	A	No. of Trees cut with calibre ≥ 300mm / Total no. of trees cut	B	A+B / 2
COLONY								
1.	Thyagraj	40	11 %	Data not available				
2.	Kasturba Nagar	405	34 %	0.52		0.91		**0.71**
3.	Srinivaspuri	1114	40 %	Data not available				
4.	Sarojini Nagar	3671	29 %	Data not available				
5.	Mohamaddpur	247	39 %	Data not available				
6.	Netaji Nagar	1560	40 %	Data not available				

Table 3.4 | Tabulation of the two ratios and their average value for each colony

The values of these parameters are known only for Kasturba Nagar, thus a comparative analysis is not feasible.

Observations for Table 3.4

In the case of Kasturba Nagar, though the percentage of trees cut is relatively less i.e. 34%, the estimated ecology damage value is quite high i.e. 0.71.
Thus, it is inferred that, the percentage of tree cutting and their estimated ecology damage value, both should be considered separately to assess the overall impact on the surroundings. Also, both these values need to be minimum for the preservation of biodiversity.
From the above observation, it is concluded that value of EDF should be least.

Step 03 | Derivation

The ideal value of Tree Ecology Damage Factor is estimated to be less than or equal to 0.2, with a condition that the value of each ratio i.e. 'A' as well as 'B' should be less than or equal to 0.2

$$A^* = \frac{\text{NUMBER OF TREES CUT with calibre} \geq 300\text{mm}}{\text{TOTAL NUMBER OF TREES CUT}}$$

$$B^* = \frac{\text{NUMBER OF NATIVE TREES CUT}}{\text{TOTAL NUMBER OF TREES CUT}}$$

TREE ECOLOGY DAMAGE FACTOR | EDF

$$EDF = \frac{A + B}{2}$$

*Each value should be ≤ 0.2

IDEAL VALUE ≤ 0.2

3.4.3 Road Cover Factor | RCF

Urban redevelopment often results in the increase of impervious surfaces, that :

- Increase the stormwater run-off volumes and in turn pollute the natural waterways, by carrying all the pollutants along its way and eventually contaminate the lakes and rivers.
- Increase the heat island effect (thermal gradient difference between developed and undeveloped areas), which in turn, impact the microclimate.

Step 01 | Identification of Relative Parameters

The relative quantitative parameters identified are

1. Site Area
2. Road Surface Area

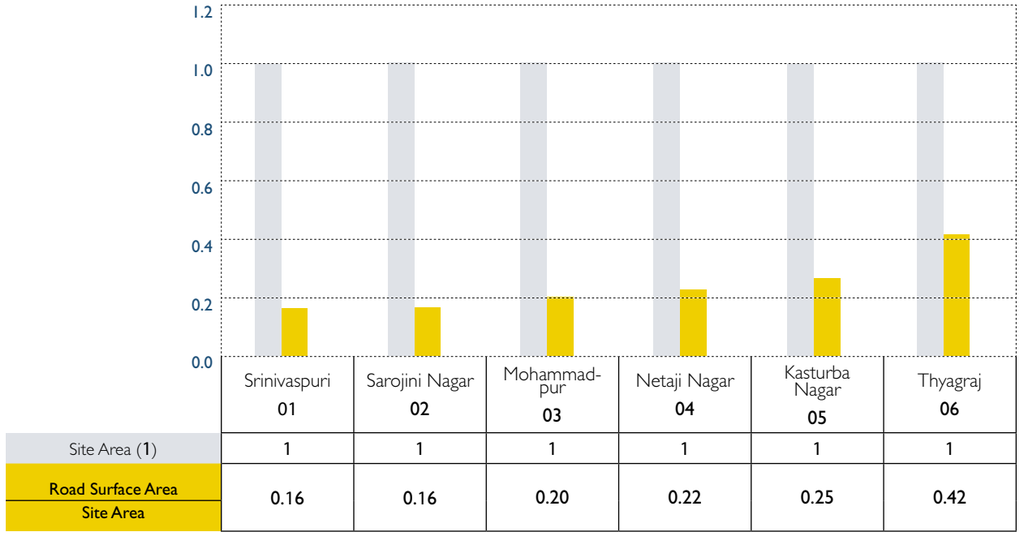
Step 02 | Assessment of Relative Parameters

The numeric values of the above identified parameters and their relationship have been put together and analyzed in Graph 3.3

The co-relation between the parameters has been quantified as the Ratio of 'Road Surface Area' to its 'Site Area', in order to obtain a unique value, that evaluates the extent of road surface area at a particular site.

		Site Area (sq.m.)	Ground Coverage (sq.m.)	Open Area (sq.m.) (site area-ground coverage)	Road Area (sq.m.)	Road Surface Area / Site area
COLONY						
1.	Srinivaspuri	295900.0	67642.0 (22.86%)	228258.0	48728.91	**0.16**
2.	Sarojini Nagar	1044832.0	159023.43 (15.22%)	885808.57	169397.12	**0.16**
3.	Mohamaddpur	36800.0	7470.00 (20.30%)	29330.0	7184.85	**0.20**
4.	Netaji Nagar	442400.0	107503.20 (24.30%)	334896.80	96615.51	**0.22**
5.	Kasturba Nagar	213700.0	30345.4 (14.20%)	183354.60	52817.04	**0.25**
6.	Thyagraj	53800.0	7666.50 (14.25%)	46133.50	22416.29	**0.42**

Table 3.5 | Tabulation of the ratio of 'Road Surface Area' to it's 'Site Area' for each colony



Graph 3.3 | Bar Graph depicting the co-relation of site area and ratio of Road Surface Area to the site area.

Observation for Graph 3.3

1. In the case of Srinivaspuri and Sarojini Nagar, the percentage of Road Surface area is minimum, i.e. 16%. Thus it is inferred that these proposals are efficient in reducing the extent of impervious surfaces, in turn reducing the stormwater run-off and heat-island effect.
2. In the case of Mohammadpur, the percentage of Road Surface area is relatively at a moderate level i.e. 20%. Thus, this value is inferred to be optimum.
3. In the case of Thyagraj the percentage of Road Surface area is maximum, i.e. 42%. Thus, this proposal is inferred to be inefficient.

From the above observations, it is concluded that the Mohammadpur redevelopment proposal is most efficient in reducing the extent of road surface area. Thus, the ratio of 'Road Surface Area' to 'Site Area' i.e. 0.20 is considered to be the RCF ideal value (maximum).

Step 03 | Derivation

The ideal value of Road Cover Factor is derived to be less than or equal to 0.20.

ROAD SURFACE AREA (sq.m.) **A**

SITE AREA (sq.m.) **B**

ROAD COVER FACTOR | RCF

$$RCF = \frac{A}{B}$$

IDEAL VALUE ≤ 0.2

3.4.4 Parking Regulation Factor | PRF

Strategically planned parking can reduce parking issues that hamper the quality of spaces within a residential area:

- Minimizing stilt parking can reduce the circulation required around each block thus, allowing better visual connect between the outdoor spaces at the ground level.
- Minimizing surface parking allows the scope to increase social interactive spaces.
- Optimizing basement parking can help reduce the number of tree cut.
- MLCP should be encouraged so that the related circulation is confined to a single zone and other activities within residential zone is not hampered.

Step 01 | Identification of Relative Parameters

The relative quantitative parameters identified are

1. Basement Parking Capacity
2. Stilt Parking Capacity
3. Surface Parking Capacity
4. MLCP Capacity

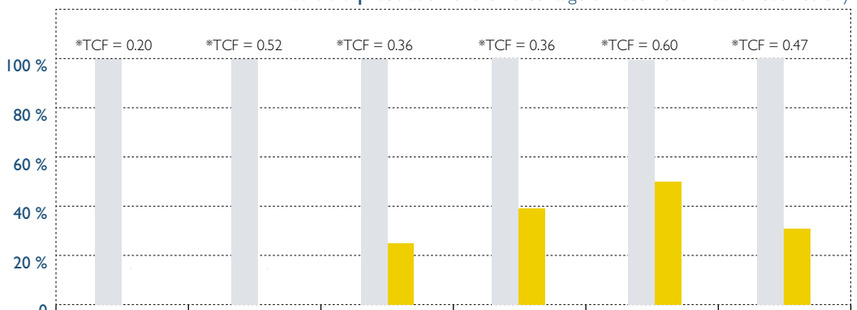
Step 02 | Assessment of Relative Parameters

Assessment is done in two sections.

First, the co-relation of Basement Parking Capacity and its consequence of tree-cutting is analyzed through a bar graph illustration, and Basement Parking Capacity being, directly proportional to the Basement Extent (area), the numeric value of the later is considered for assessment.

		Site Area (sq.m.)	Basement Area at Ground Level (first basement) (sq.m.)	% of Basement Extent (area) at Ground Floor
COLONY				
1.	Thyagraj	53800	0	0%
2.	Mohammadpur	36800	0	0%
3.	Srinivaspuri	295900	72820.99	25%
4.	Kasturba Nagar	213700	82253.13	38%
5.	Netaji Nagar	442400	217306.88	49%
6.	Sarojini Nagar	1044832	323897.92	31%

Table 3.5 | Tabulation of the Percentage of Basement Area for each colony



	Thyagraj 01	Mohammad-pur 02	Srinivaspuri 03	Kasturba Nagar 04	Netaji Nagar 05	Sarojini Nagar 06
Site Area 100%	100%	100%	100%	100%	100%	100%
Basement Area (sq.m.)	0	0	25 %	38 %	49 %	31 %

Graph 3.4 | Bar Graph depicting the co-relation of site area and ratio of Road Surface Area to the site area.
*The value of TCF| Tree CutFactor for each colony is derived in the earlier section 3.4.1 of Chapter 3.

Observations for Graph 3.4

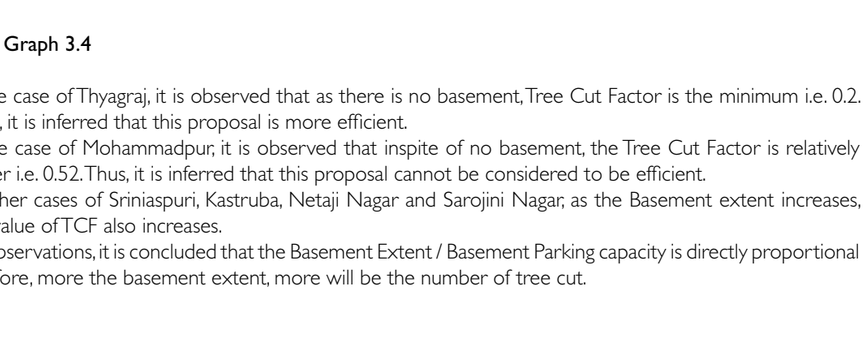
1. In the case of Thyagraj, it is observed that as there is no basement, Tree Cut Factor is the minimum i.e. 0.2. Thus, it is inferred that this proposal is more efficient.
2. In the case of Mohammadpur, it is observed that inspite of no basement, the Tree Cut Factor is relatively higher i.e. 0.52. Thus, it is inferred that this proposal cannot be considered to be efficient.
3. In other cases of Sriniaspuri, Kastruba, Netaji Nagar and Sarojini Nagar, as the Basement extent increases, the value of TCF also increases.

From the above observations, it is concluded that the Basement Extent / Basement Parking capacity is directly proportional to tree cut. Therefore, more the basement extent, more will be the number of tree cut.

Second, the numeric values of the four identified parameters, in terms of ratios (each strategy 'Parking Capacity' to 'Total Parking Capacity', for each colony have been put together and analyzed through a bar graph illustration, to understand their co-relation.

		Total ECS provided	Stilt Parking Capacity Total ECS	Surface Parking Capacity Total ECS	MLCP Capacity Total ECS	Basement Parking Capacity Total ECS
COLONY						
1.	Thyagraj	1125	0.22	0.78	0.00	0.00
2.	Mohammadpur	702	0.00	0.41	0.59	0.00
3.	Srinivaspuri	9136	0.22	0.12	0.44	0.22
4.	Kasturba Nagar	6306	0.06	0.14	0.02	0.78
5.	Netaji Nagar	10867	0.00	0.10	0.00	0.90
6.	Sarojini Nagar	29486	0.00	0.05	0.00	0.95

Table 3.6 | Tabulation of the Ratios of 'Each Parking Strategy Capacity' to 'Total Parking Capacity' for each colony.



	Thyagraj 01	Mohammad-pur 02	Srinivaspuri 03	Kasturba Nagar 04	Netaji Nagar 05	Sarojini Nagar 06
Stilt Parking Capacity Total ECS provided	0.22	0.00	0.22	0.06	0.00	0.00
Surface Parking Capacity Total ECS provided	0.78	0.41	0.12	0.14	0.10	0.05
MLCP Capacity Total ECS provided	0.00	0.59	0.44	0.02	0.00	0.00
Basement Parking Capacity Total ECS provided	0.00	0.00	0.22	0.78	0.90	0.95

Graph 3.5 | Bar Graph depicting the co-relation of Ratios of 'Each Parking Strategy Capacity' to 'Total Parking Capacity', for each colony.
*The value of TCF| Tree CutFactor for each colony is derived in the earlier section 3.4.1 of Chapter 3.

Observations for Graph 3.5

1. In the case of Thyagraj, it is observed that only Surface and Stilt Parking strategies are proposed, and TCF is the minimum i.e. 0.2. Thus, it can be inferred that if MLCP and Basement parking strategies were used at an optimum proportion, then TCF could have been reduced more.
2. In the case of Mohammadpur, it is observed that MLCP and Surface Parking strategies are proposed in almost equal proportion, but TCF is relatively on the higher side i.e. 0.52. Thus, it is inferred that this proposal is not efficient.
3. In the case of Srinivaspuri, it is observed that all four types of strategies are used, and MLCP in it's maximum proportion, still TCF is relatively higher i.e. 0.36. Thus, it is inferred that, TCF is on a higher side because of Basement.
4. In the cases of Netaji and Sarojini, It is oberved that only Surface and Basement parking strategies are proposed, with majority as Basement, and Tree Cut Factor is relatively on the higher side, particularly for Netaji, it is the maximum i.e. 0.6. Thus, it is inferred that any strategy used in isolation is not efficient.

The above observations are tabulated in Table 3.7 (below), to understand the efficiency of each proposal in terms of Parking and the related strategies. Stilt & Surface Parking Strategy Ratios have been added, and MLCP, Basement ratios have been added, to understand their proportions.

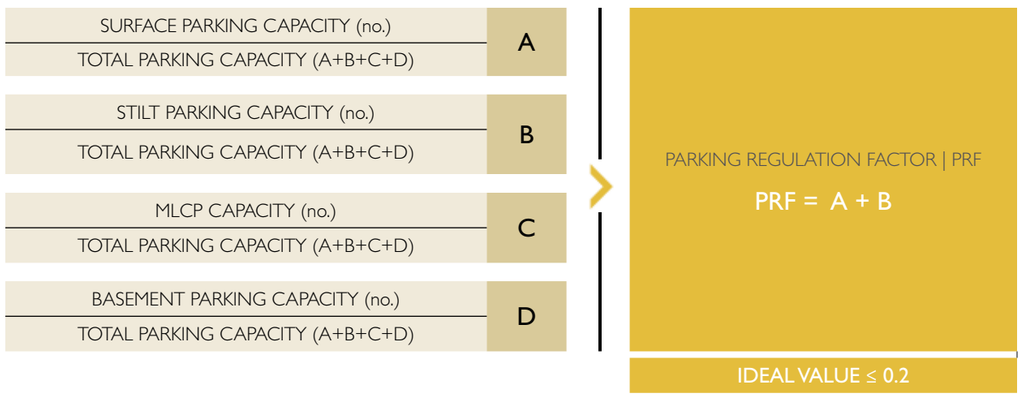
		STILT + SURFACE A+B	MLCP + BASEMENT C+D	TREE CUT FACTOR | TCF
COLONY				
1.	Thyagraj	1.00	0.00	0.20
2.	Mohammadpur	0.41	0.59	0.52
3.	Srinivaspuri	0.34	0.66	0.36
4.	Kasturba Nagar	0.20	0.80	0.36
5.	Netaji Nagar	0.10	0.90	0.60
6.	Sarojini Nagar	0.05	0.95	0.47

Table 3.7 | Tabulation of the Ratios of 'Each Parking Strategy Capacity' to 'Total Parking Capacity' and TCF for each colony..

It is concluded from Table 3.7, that none of the proposals can be considered to be efficient in terms of parking strategies proposed. Basement Parking Strategy should be in conjunction with the ideal value of Tree Cut Factor (TCF), and Stilt & Surface Parking should be minimum in order to reduce the circulation area. Thus, it is suggested that MLCP is encouraged.

Step 03 | Derivation

The ideal value of Parking Regulation Factor is estimated to be less than or equal to 0.2..



3.4.5 Pedestrian Discomfort Factor | PDF

In order to render a residential zone pedestrian friendly, the following issues must be dealt with :

- Discontinuous and unshaded pedestrian routes make walking less preferred.
- Absence of exclusive pedestrian networks lead to pedestrian and vehicular traffic.
- Walkways devoid of green buffers.
- Transit hubs and social infrastructure are not within the walkable radius thus increasing dependency on vehicles.

Step 01 | Identification of Relative Parameters

The relative parameters identified are

1. Pedestrian Discontinuity
2. Un-shaded Walkways
3. Walkway devoid of Greens
4. Unsignalized Pedestrian Crossings
5. Average Walking distance from Type II and Type III Units to nearest Transit Hubs
6. Average Walking distance from Type II and Type III Units to social infrastructure and green spaces

Step 02 | Assessment of Relative Parameters

The above identified parameters for each colony are put together in a Tabulation format (Table 3.8) to assess the Pedestrian Discomfort.

		Pedestrian Network Character				Average Walking Distance from Type 2 & Type 3 Residential Towers	
		Pedestrian Discontinuity	Unshaded Walkways	Walkway devoid of Greens	Unsignalized Pedestrain Crossings	to nearest Transit-hub	to social infrastructure and green spaces
COLONY							
1.	Thyagraj	Partially	Yes	No	Yes	0.91 (bus stop)	0.3
2.	Kasturba Nagar	Yes	Yes	Partially	Yes	1.6 (metro)	0.7
3.	Srinivaspuri	No	Yes	No	Yes	0.6 (metro)	1.3
4.	Sarojini Nagar	No	Yes	No	Yes	0.8 (metro)	0.5
5.	Mohammadpur	No	Yes	Partially	Yes	0.8 (metro)	0.5
6.	Netaji Nagar	Partially	Yes	No	Yes	0.5 (metro)	0.6

Table 3.8 | Tabulation of the identified Parameters of Pedestrian Discomfort for each colony.

To quantify the above parameters and derive an unique value for the PDF, a score method is formulated.

The ideal value of the Factor needs to be minimum as the identified parameters are negative. So, accordingly score values are decided i.e.

- If the condition is not met, then the score to be 0.0
- If the condition is met 50%, then the score to be 0.4
- If the condition is met 100%, then the score to be 0.8

		Pedestrian Network Character				Average Walking Distance from Type 2 & Type 3 Residential Towers		MEAN SCORE
		Pedestrian Discontinuity	Unshaded Walkways	Walkway devoid of Greens	Unsignalized Pedestrain Crossings	to nearest Transit-hub	to social infrastructure and green spaces	
COLONY								
1.	Thyagraj	0.4	0.8	0.0	0.8	0.8	0.0	**0.46**
2.	Kasturba Nagar	0.8	0.8	0.4	0.8	0.8	0.0	**0.60**
3.	Srinivaspuri	0.0	0.8	0.0	0.8	0.0	0.8	**0.40**
4.	Sarojini Nagar	0.0	0.8	0.0	0.8	0.0	0.0	**0.26**
5.	Mohammadpur	0.0	0.8	0.4	0.8	0.0	0.0	**0.33**
6.	Netaji Nagar	0.4	0.8	0.0	0.8	0.0	0.0	**0.33**

Table 3.9 | Tabulation of the identified Parameters Scores for each colony.

Observations for Table 3.9

1. In the case of Kasturba Nagar, it is observed that the Mean Score is maximum i.e. 0.60. Thus, this proposal is inferred as least efficient.
2. In the case of Sarojini Nagar, it is observed that the Mean Score is minimum i.e. 0.26. Thus this proposal is inferred to be relatively more efficient.

From the above observations, it is concluded that Sarojini Nagar is relatively more efficient. Thus the mean score i.e. 0.26, is considered to be the basis of the ideal value of Pedestrian Discomfort Factor.

Step 03 | Derivation

The ideal value of Pedestrian Discomfort Factor has been derived to be less than or equal to 0.20.

PEDESTRIAN DISCONTINUITY — A (score*)

UNSHADED WALKWAYS — B (score*)

WALKWAY DEVOID OF GREENS — C (score*)

UNSIGNALIZED PEDESTRIAN CROSSINGS — D (score*)

AVERAGE WALKING DISTANCE from TYPE II & TYPE III TOWERS to TRANSIT HUBS > 800M. — E (score*)

AVERAGE WALKING DISTANCE from TYPE II & TYPE III TOWERS to SOCIAL INFRASTRUCTURES > 800M. — F (score*)

*Score | 0.0 | if the condition is not met
*Score | 0.4 | if the condition is met 50%
*Score | 0.8 | if the condition is met 100%

PEDESTRIAN DISCOMFOR FACTOR | PDF

$$PDF = \frac{A+B+C+D+E+F}{6}$$

IDEAL VALUE ≤ 0.2

3.4.6 Core Inefficiency Factor | CIF

Building core must be designed efficiently for controlling excess ground coverage. To achieve this, lengthy circulation core should be avoided in the building designs, by allotting the circulation space based on the number of dwelling units per floor.

Step 01 | Identification of Relative Parameters

The relative parameters identified are :

1. Dwelling Units Area[1] per floor
2. Core Area[2] per floor

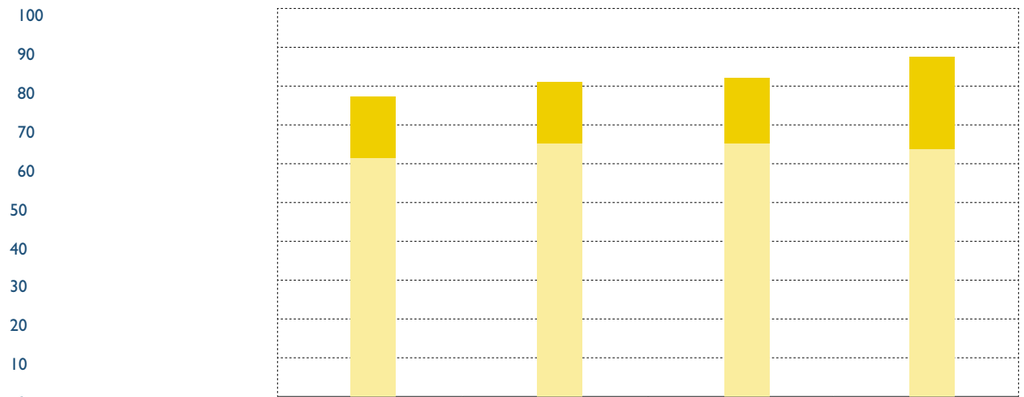
Step 02 | Assessment of Relative Parameters

Typology II | 8 to a Core

The identified parameters for each colony have been put together and analyzed through a bar graph illustration, to understand their co-relation.

		Total Built-up Area of a Floor (DU+core) (sq.m.)	Total DU Area (sq.m.) per floor	Core area per floor (sq.m.)	Area of 1 DU (sq.m.) DUs' Area/ 8	**Core Area (sq.m.) per DU** core area per floor/ 8
COLONY						
1.	Mohammadpur	614.64	500.55	114.09	62.56	**14.26**
2.	Netaji Nagar	653.06	534.01	119.05	66.75	**14.88**
3.	Sarojini Nagar	651.63	530.64	120.99	66.33	**15.12**
4.	Srinivaspuri	692.92	511.04	181.88	86.61	**22.74**

Table 3.10 | Typology II | Tabulation of DUs' Area and Core Area for each colony.



	Mohammadpur 01	Netaji Nagar 02	Sarojini Nagar 03	Srinivaspuri 04
Core Area per DU (sq.m.)	**14.26**	**14.88**	**15.12**	**22.74**
Area of 1 DU (sq.m.)	62.57	66.75	66.33	63.88

Graph 3.6 | Typology II | Bar Graph depicting the co-relation of Area of one DU and Core Area per DU

[1] Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.
[2] Core Area (DU Area) | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

Observations for Graph 3.6

It is observed that the area of one Dwelling Unit for all the proposals are equal, but there is a significant variation in Core Area per DU.

- In the cases of Mohammadpur and Netaji Nagar, the Core areas per DU are almost equal and minimum i.e. 14.26 and 14.88 respectively. Thus, it is inferred that both the proposals demonstrate compact and efficient planning.
- In the case of Srinivaspri, the Core area per DU is maximum i.e. 22.74. Thus, it is inferred that this proposal is inefficient in terms of space usage.

In order to obtain a unique value, Core Area per sqm. of the Dwelling Unit is calculated. This derivation has been termed as CIF,. The same is tabulated below for each colony.

		Total Built-up Area of a Floor (DU area+core) (sq.m.)	Total DU Area (sq.m.) per floor	Core Area per floor (sq.m.)	Core Area per sq.m. of DUs' Area
		A = B+C	B	C	CIF = C/B
COLONY					
1.	Mohamaddpur	614.64	500.55	114.09	**0.227**
2.	Netaji Nagar	653.06	534.01	119.05	**0.222**
3.	Sarojini Nagar	651.63	530.64	120.99	**0.227**
4.	Srinivaspuri	692.92	511.04	181.88	**0.355**

Table 3.11 | Typology II | Tabulation of CIF for each colony..

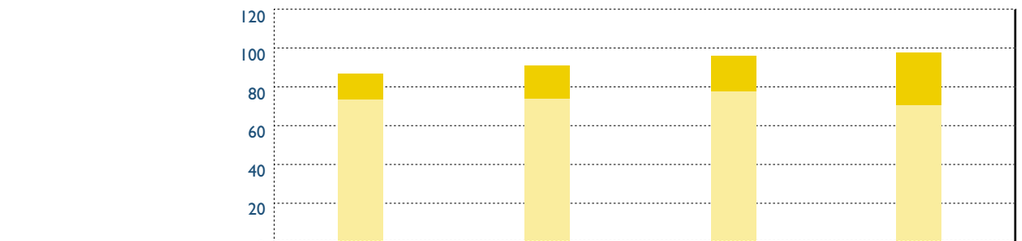
As observed in Tabulation 3.11, for the cases of Mohammadpur, Netaji Nagar and Sarojini Nagar, the CIF values are equal and minimum i.e. 0.22. Thus, 0.20 (rounded off) is considered to be the ideal value of CIF for Typology II.

Typology III | 8 to a Core

The identified parameters for each colony have been put together and analyzed through a bar graph illustration, to understand their co-relation.

		Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	Total DU Area (sq.m.) per floor	Core Area per floor (sq.m.)	Area of 1 DU (sq.m.) DUs' Area/ 8	**Core Area (sq.m.) per DU** core area per floor/ 8
COLONY						
1.	Mohamaddpur	693.55	581.74	111.81	72.72	**13.98**
2.	Sarojini Nagar	731.61	606.77	124.84	75.85	**15.61**
3.	Netaji Nagar	752.16	629.16	123.0	78.65	**15.38**
4.	Srinivaspuri	780.86	597.17	183.69	74.65	**22.96**

Table 3.12 | Typology III | Tabulation of DUs' Area and Core Area for each colony..



Graph 3.7 | Typology III | Bar Graph depicting the co-relation of Area of one DU and Core Area per DU

Observations for Graph 3.7

It is observed that the area of one Dwelling Unit for all the proposals is equal, but there is a significant variation in Core Area per DU.

- In the cases of Mohammadpur, Sarojini Nagar and Netaji Nagar, the Core areas per DU are equivalent and minimum i.e. 13.98, 15.61 and 15.38 respectively. Thus, it is inferred that all the three proposals demonstrate compact and efficient planning.
- In the case of Srinivaspri, the Core Area per DU is maximum i.e. 22.96. Thus, it is inferred that this proposal is inefficient in terms of space usage.

In order to obtain a unique value, Core Area per sq.m. of Dwelling Unit is calculated and this derivation has been termed as CIF, the same is tabulated below for each colony.

		Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	Total DU Area (sq.m.) per floor	Core Area per floor (sq.m.)	Core Area per sq.m. of DUs' Area
		A = B+C	B	C	CIF = C/B
COLONY					
1.	Mohamaddpur	693.55	581.74	111.81	**0.192**
2.	Sarojini Nagar	731.61	606.77	124.84	**0.205**
3.	Netaji Nagar	752.16	629.16	123.0	**0.195**
4.	Srinivaspuri	780.86	597.17	183.69	**0.307**

Table 3.13 | Typology III | Tabulation of CIF for each colony..

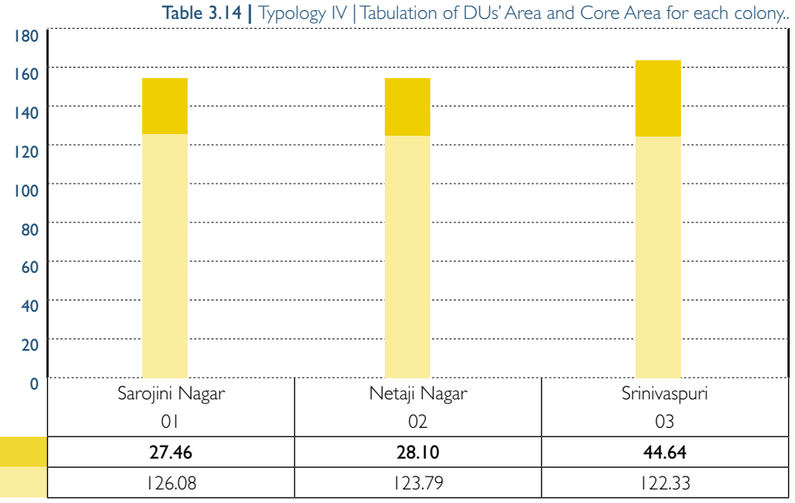
As observed on the Tabulation 3.13, in the cases of Mohammadpur, Sarojini Nagar and Netaji Nagar, CIF values for all the three are equivalent and least i.e. 0.19, 0.20 and 0.19 respectively. Thus, 0.20 is considered to be the ideal value of CIF for Typology III.

Typology IV | 4 to a Core

The above identified parameters for each colony are put together and analyzed through a bar graph illustration, to understand their co-relation.

		Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	Total DU Area (sq.m.) per floor	Core area per floor (sq.m.)	Area of one DU (sq.m.) DUs' Area/ 4	**Core Area (sq.m.) per DU** core area per floor/ 4
COLONY						
1.	Sarojini Nagar	614.13	504.31	109.82	126.08	**27.46**
2.	Netaji Nagar	607.55	495.17	112.38	123.79	**28.10**
3.	Srinivaspuri	667.89	489.33	178.56	122.33	**44.64**

Table 3.14 | Typology IV | Tabulation of DUs' Area and Core Area for each colony..



Graph 3.8 | Typology IV | Bar Graph depicting the co-relation of Area of one DU and Core Area per DU

Observations on the Graph 3.8

It is observed that the Area of one Dwelling Unit for all the proposals is equivalent, but there is a significant variance in Core Area per DU.

- In the cases of Sarojini and Netaji, the Core areas per DU are equivalent and least i.e. 27.46 and 28.10 respectively. Thus, it is inferred that both the proposals demonstrate compact and efficient planning.
- In the case of Srinivaspri, the Core area per DU is maximum i.e. 44.64. Thus, it is inferred that this proposal is inefficient in terms of space usage.

In order to obtain a unique value, Core Area per sq.m. of DUs' area is calculated, and this derivation is referred to be CIF, and the same is tabulated below for each colony.

		Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	Total DU Area (sq.m.) per floor	Core area per floor (sq.m.)	Core Area per sq.m. of DU
		A = B+C	B	C	CIF = C/B
COLONY					
1.	Sarojini Nagar	614.13	504.31	109.82	**0.217**
2.	Netaji Nagar	607.55	495.17	112.38	**0.226**
3.	Srinivaspuri	667.89	489.33	178.56	**0.364**

Table 3.15 | Typology IV | Tabulation of CIF for each colony..

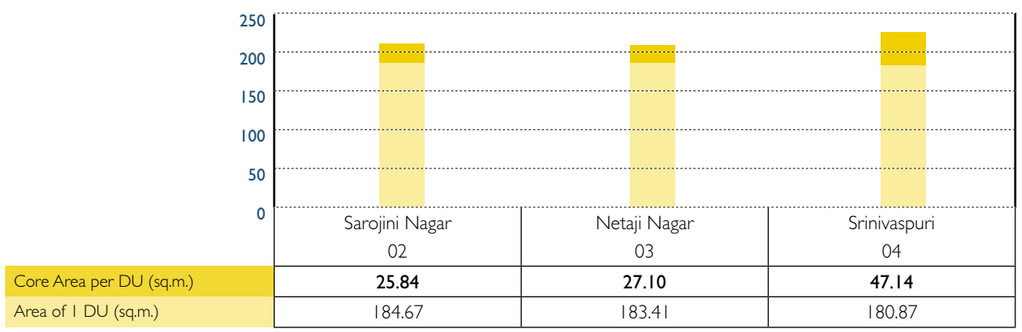
As observed on the Tabulation 3.15, In the cases of Sarojini and Netaji, CIF values for both are equivalent and least i.e. 0.21 and 0.22 respectively. Thus, 0.20 (rounded off) is considered to be the ideal value of CIF for Typology IV.

Typology V | 4 to a Core

The above identified parameters for each colony are put together and analyzed through a bar graph illustration, to understand their co-relation.

		Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	Total DU Area (sq.m.) per floor	Core area per floor (sq.m.)	Area of one DU (sq.m.) DUs' Area/ 4	Core Area (sq.m.) per DU core area per floor/ 4
COLONY						
1.	Sarojini Nagar	842.03	738.67	103.36	184.67	**25.84**
2.	Netaji Nagar	842.03	733.65	108.38	183.41	**27.10**
3.	Srinivaspuri	912.03	723.47	188.56	180.87	**47.14**

Table 3.16 | Typology V | Tabulation of DUs' Area and Core Area for each colony.



Graph 3.9 | Typology V | Bar Graph depicting the co-relation of Area of one DU and Core Area per DU

Observations on the Graph 3.9

It is observed that the Area of one Dwelling Unit for all the proposals is equivalent, but there is a significant variance in Core Area per DU.

- In the cases of Sarojini and Netaji, the Core areas per DU are equivalent and least i.e. 25.84 and 27.10 respectively. Thus, it is inferred that both the proposals demonstrate compact and efficient planning.
- In the case of Srinivaspri, the Core area per DU is maximum i.e. 47.14. Thus, it is inferred that this proposal is inefficient in terms of space usage.

In order to obtain a unique value, Core Area per sq.m. of DUs' area is calculated, and this derivation is referred to be CIF, and the same is tabulated below for each colony.

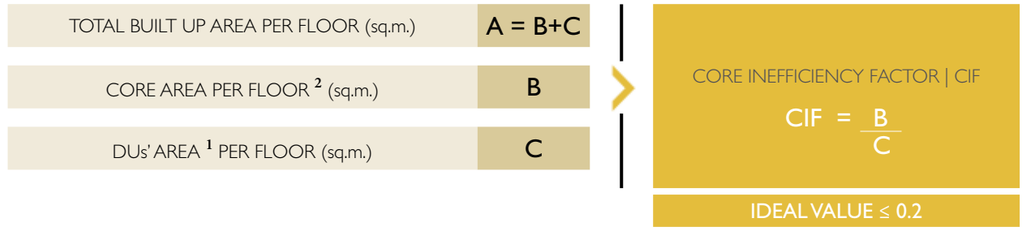
		Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	Total DU Area (sq.m.) per floor	Core area per floor (sq.m.)	Core Area per sq.m. of DU
		A = B+C	B	C	CIF = C/B
COLONY					
1.	Sarojini Nagar	842.03	738.67	103.36	**0.139**
2.	Netaji Nagar	842.03	733.65	108.38	**0.147**
3.	Srinivaspuri	912.03	723.47	188.56	**0.260**

Table 3.17 | Typology V | Tabulation of CIF for each colony..

As observed on the Tabulation 3.17, In the cases of Sarojini and Netaji, CIF values for both are equivalent and least i.e. 0.14 and 0.15 respectively.

Step 03 | Derivation

The ideal value of Core Inefficiency Factor is derived to be less than or equal to 0.20 for all Type Units.



Note :
[1] Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.
[2] Core Area (DU Area) | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

Chapter 04

REDEVELOPMENT PROPOSAL | Demonstrations

4.1 Identification of Colonies for demonstration

Based on the analysis of colonies that are under redevelopment and have been redeveloped, 18 GPRA colonies have been identified, that have the potential for undergoing redevelopment in compliance with the inferences drawn in the previous chapters.

The conceptual redevelopment proposals for 8 out of the 18 colonies have been demonstrated under the categories - Density ; Mobility ; Zoning.

DEMONSTRATED IN THE REPORT

- 01 Laxmi Bai Nagar
- 02 Lodhi Colony
- 03 R.K. Puram, Sector 01
- 04 R.K. Puram, Sector 02
- 05 R.K. Puram, Sector 03
- 06 R.K. Puram, Sector 04
- 07 R.K. Puram, Sector 05
- 08 R.K. Puram, Sector 07

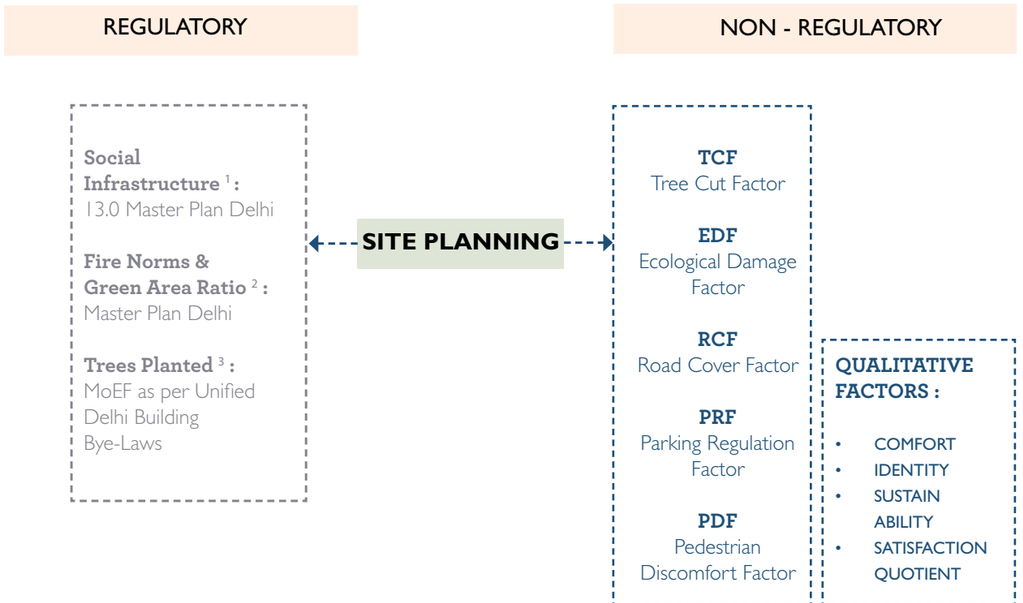
HAVE POTENTIAL FOR REDEVELOPMENT WITHIN STUDY ZONE

- 09 R.K. Puram, Sector 06
- 10 R.K. Puram, Sector 08
- 11 R.K. Puram, Sector 09
- 12 R.K. Puram, Sector 10
- 13 R.K. Puram, Sector 12
- 14 West Kidwai Nagar
- 15 Nanakpura
- 16 NW Moti Bagh
- 17 Andrews ganj
- 18 Sadiq Naagr

Map 4.1 | Map depicting the GPRA Colonies, identified for demonstrations.

REDEVELOPMENT PROPOSAL | Demonstrations

4.2 Key Principles followed for Demonstrations



THESE PRINCIPLES HAVE BEEN COLLECTIVELY USED TO DEMONSTRATE THE FEASIBLE DENSITIES

- The financial aspect for redevelopment has not been considered in these proposals
- These are not design demonstrations

NOTE :

- EDF values are unknown for the following demonstrations
- PRF calculations only include surface parking and MLCP. Basement parking has not been considered in the following demonstrations
- Basement parking is suggested only if the ideal value of TCF is met, to encourage MLCP.
- References :

[1] **Annexure A.6** , Page 184
[2] **Annexure A.7** , Page 187
[3] **Annexure A.8** , Page 186
[4] **Annexure A.9** , Page 188
[5] **Annexure A.10** , Page 190

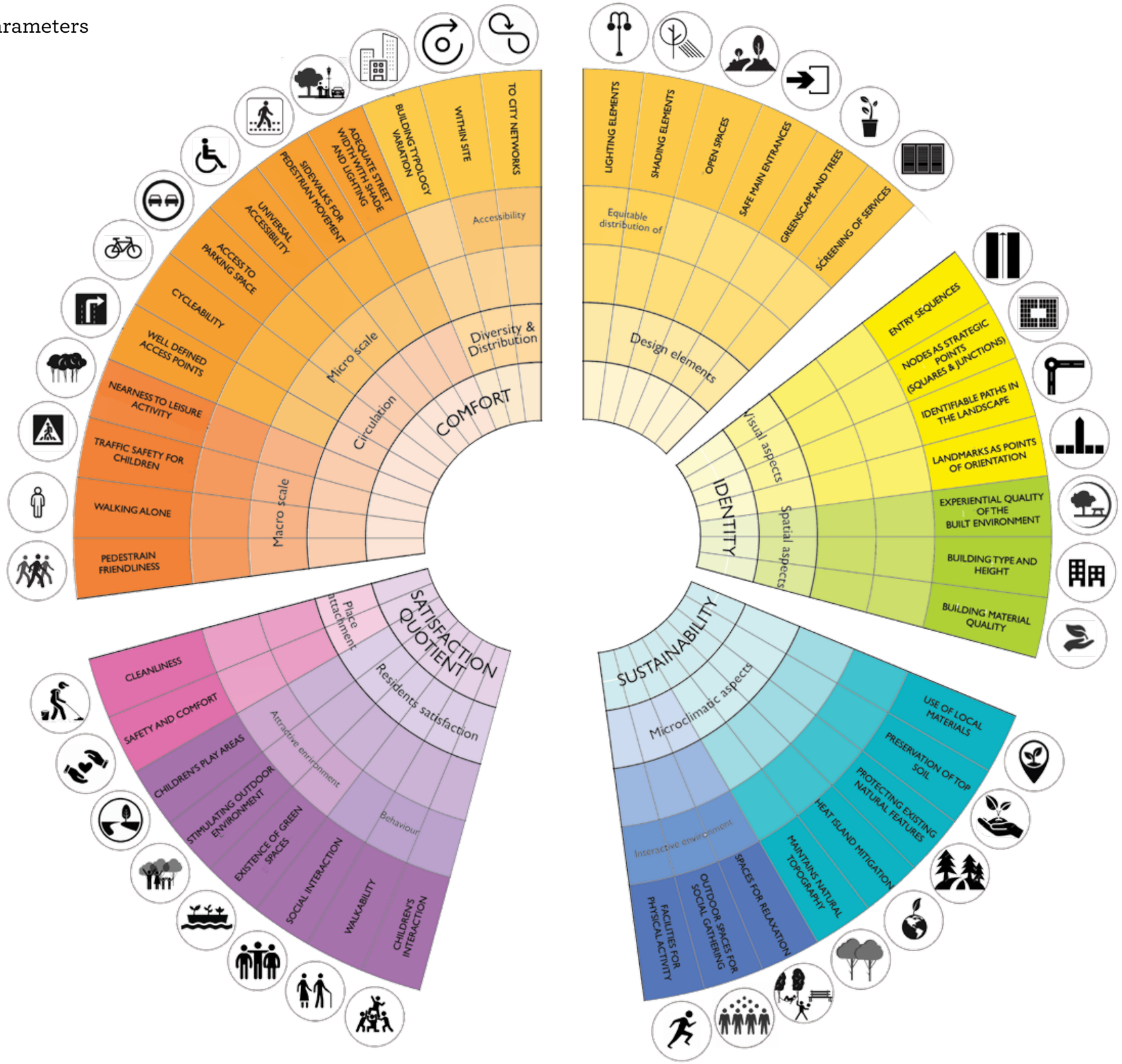
REDEVELOPMENT PROPOSAL | Demonstrations

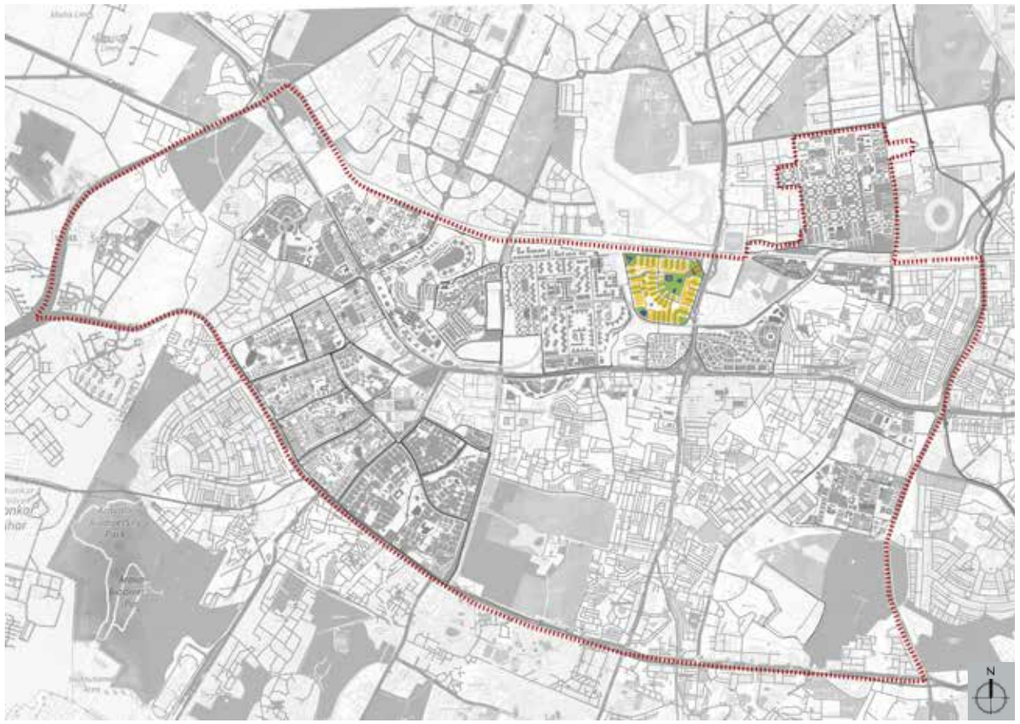
4.2.1 Qualitative Parameters

The qualitative factors intend to inform the study of other aspects that need to be addressed to achieve quality of life in a project. These qualitative parameters use interpretive/theoretical frameworks that inform the efficiency factors.

The interpretive framework consists of factors related to the psychological perception of the environment with respect to the physical characteristics of that environment. Qualitative parameters are general and descriptive but more complex as they involve aspects of social, environmental, economic and aesthetic design. Therefore to asses their value they are compared to quantitative factors as a measurable quantity.

In order to access a design scheme for any redevelopment colony an index is further developed, scoring its qualitative (undetectable) and quantitative (measurable) factors. These subjective-objective measures are placed parallel to each other to derive a scoring system for the GPRA projects.





REDEVELOPMENT PROPOSAL | Demonstrations

4.3.1 LAXMI BAI NAGAR

View from North-East

4.3.1 LAXMI BAI NAGAR | Proposal Overview

SITE AREA : 34.2 ha | Permissible Height : 32M.**

Type - II [5]
Core : 1 to 8DUs
DU : 1600

Type - III [5]
Core : 1 to 8DUs
DU : 896

Type - IV [5]
Core : 1 to 4DUs
DU : 704

MLCP
Parking Provided : 2700

	EXISTING	PROPOSED
Typology	Type II, IV	**Type II , III, IV**
Number of DU	1980	**3200**
Density (DU/ha)	57.89 DU/ha	**93.57** PDmax_H+T
Height	G+1	**G+8**
Ground Coverage (%)	91761.40 (26.83%)	**60641.60 (17.73%)**
Road Area (sq.m.)	36917.40	33183.81
Number of Trees	1502[2]	1249+1853 (Retained+Planted)[1]
Tree Density (no. of trees/ha.)	43.90	**90.71** (Retained +Planted)

Increase in number of DU	**1220** (60% increase)
Number of Trees Cut	**253**
Tree Cut Percentage	**16.8 %**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.19***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.10***
Parking Requirement (as per norms)	4352
Parking Provided (total number)	3922
MLCP (mechanized/ ramp)	2700
Surface	1222
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.31***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor | **CIF**[5] | Ideal Value ≤ 0.2	**0.21***

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 97
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens

Delhi Metro Line

- Pink Line
- Yellow Line

- Site boundary

1. East Kidwai Nagar
2. AIIMS Flyover
3. West Kidwai Nagar
4. Sarojini Nagar
5. Sanjay Jheel Park
6. Delhi Flying Club
7. INA Colony

- Vehicular
- Pedestrian

- Existing built
- Proposed built
- Existing trees

BUILDING USE

CONTEXT

View from North-East

MOBILITY

EXISTING AND PROPOSED

ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. MLCP- Multi-Level Car Parking buildings have been placed towards the periphery to allow better vehicular access and maintain an exclusive residential zone.

3. Social infrastructure such as the existing schools and commercial buildings in the site have been retained in place and have been provided with vehicular and pedestrian routes to facilitate easy access.

View from North-East

4. Type2 and Type 3 towers have been placed towards the south west and south east, visually similar to the upcoming neighboring residential colonies.

5. Towers with higher density have been placed closer to the nearest metro stations within a walkable radius to reduce vehicular use and make the commute more sustainable for the residents

6. Type 4 towers have been spaced amply and located towards the Sanjay Jheel Park for suggesting better view from the towers

FINAL PROPOSAL


View from North-East

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	=	253 / 1502	=	0.17	
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	=	253 / 1220	=	0.20	

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

$$\frac{A+B}{2} = \frac{0.17 + 0.20}{2} = \mathbf{0.19}$$

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=	* / *	=	*	
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=	* / *	=	*	

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$$\frac{A+B}{2} = \frac{* + *}{2} = *$$

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)	
B	SITE AREA (in Sqm)	

ROAD COVER FACTOR — RCF

$$\frac{A}{B} = \frac{33183.81}{342000} = \mathbf{0.10}$$

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	=	3922			
A	STILT PARKING CAPACITY / X	=	0 / 3922	=	0.00	
B	NO. OF SURFACE PARKING / X	=	1222 / 3922	=	0.31	
C	MLCP CAPACITY (no.) / X	=	2700 / 3922	=	0.69	
D	NO. OF BASEMENT PARKING / X	=	0 / 3922	=	0.00	

PARKING REGULATION FACTOR — PRF

$$A+B = 0.31 = \mathbf{0.31}$$

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.4
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.0
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; |0.4| if the condition is met 50% ; |0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$$= \frac{A+B+C+D+E+F}{6} = \frac{0.4 + 0.0 + 0.4 + 0.0 + 0.0 + 0.0}{6} = \mathbf{0.10}$$

IDEAL VALUE ≤ 0.2

	For Type II - 8 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	120.99
B	DUs' AREA PER FLOOR (sqm.)	530.64
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	651.63

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{120.99}{530.64} = \mathbf{0.22}$$

IDEAL VALUE ≤ 0.2

	For Type III - 8 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	124.84
B	DUs' AREA PER FLOOR (sqm.)	606.77
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	731.61

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{124.84}{606.77} = \mathbf{0.20}$$

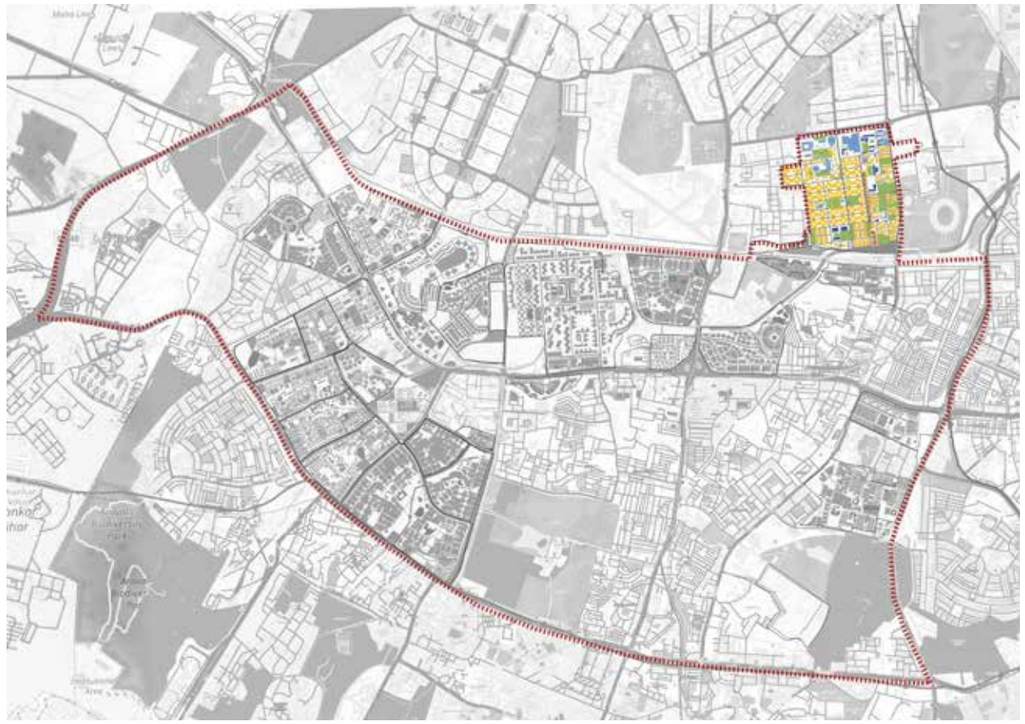
IDEAL VALUE ≤ 0.2

	For Type IV - 4 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	109.82
B	DUs' AREA PER FLOOR (sqm.)	504.31
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	614.13

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{109.82}{504.31} = \mathbf{0.21}$$

IDEAL VALUE ≤ 0.2



4.3.2 LODHI COLONY

4.3.1 LODHI COLONY | Proposal Overview

SITE AREA : 86.35 ha | Permissible Height : 38 M.

Type - II [5]
Core : 2 to 12&16DUs
DU : 3100

Type - III [5]
Core : 2 to 12&16DUs
DU : 4736

Type - IV [5]
Core : 1 to 4DUs
DU : 512

Type - V [5]
Core : 1 to 4DUs
DU : 288

MLCP
Parking Provided : 5940

	EXISTING	PROPOSED
Typology	Type II, III, IV,V	Type II, III, IV,V
Number of DU	4586	**8636**
Density (DU/ha)	53.11	**100.01** PDmax_H+T
Height	G+1, G+2	**G+3, G+4, G+9, G+10**
Ground Coverage (%)	254634 (29.49%)	**254785 (29.51%)**
Road Area (sq.m.)	224468	245425
Number of Trees	3600 [2]	2710+1831 (Retained+Planted) [1]
Tree Density (no. of trees/ha.)	41.69	**52.59** (Retained +Planted)

Increase in number of DU	3642
Number of Trees Cut	**890**
Tree Cut Percentage	**24.72%**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.21***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.28***
Parking Requirement (as per norms)	**9620**
Parking Provided (total number)	**10420**
MLCP (mechanized/ ramp)	5940
Surface	4480
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.43***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor |**CIF**[5] | Ideal Value ≤ 0.2	**0.22***

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 103
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens

Delhi Metro Line

- Violet Line
- Yellow Line

- Site boundary

1. Lodhi Colony Railway Station
2. Najaf Khan's Tomb
3. Khanna Market
4. Indira Paryavaran Bhawan
5. Lodhi Garden
6. Indian Islamic Cultural Centre
7. India Habitat Centre
8. Dayal Singh College
9. Sai Mandir
10. Pragati Vihar Hostel
11. JLN Metro Station
12. JLN Stadium
13. Seva Nagar Railway Station

- Vehicular
- Pedestrian

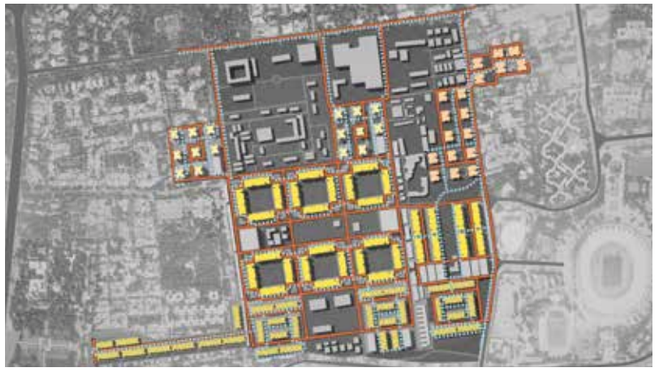
- Existing built
- Proposed built
- Existing trees

BUILDING USE

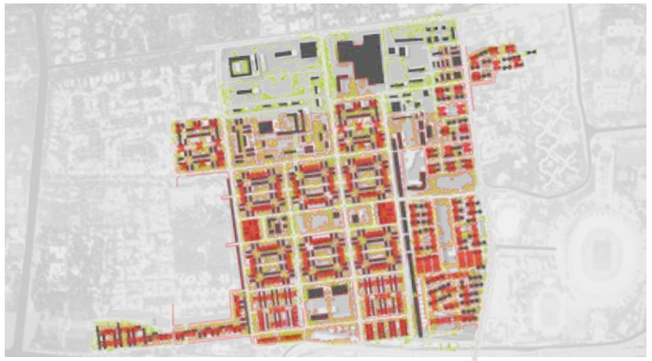
CONTEXT

View from South East

MOBILITY



EXISTING AND PROPOSED



ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. MLCP- Multi-Level Car Parking buildings have been placed towards the periphery to allow better vehicular access and maintain an exclusive residential zone.

View from South East

3. Type2 and Type 3 towers have been placed towards the south west and south east, visually similar to the upcoming neighboring residential colonies.

4. Social infrastructure such as the existing schools and commercial buildings in the site have been retained in place and have been provided with vehicular and pedestrian routes to facilitate easy access.

5. Towers with lower densities have been placed closer to the Lodhi institutional area to suit the visual character of the adjacent built from.

FINAL PROPOSAL


View from South-East

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	=	890 / 3600	=	0.24
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	=	890 / 3600	=	0.24

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

$$\frac{A+B}{2} = \frac{0.24+0.24}{2} = \mathbf{0.24}$$

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=		=	
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=		=	

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$$\frac{A+B}{2} = \frac{}{2} =$$

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)				
B	SITE AREA (in Sqm)				

ROAD COVER FACTOR — RCF

$$\frac{A}{B} = \frac{245425}{863500} = \mathbf{0.28}$$

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	=	10420		
A	STILT PARKING CAPACITY / X	=		=	NA
B	NO. OF SURFACE PARKING / X	=	4480 / 10420	=	0.43
C	MLCP CAPACITY (no.) / X	=	5940 / 10420	=	0.57
D	NO. OF BASEMENT PARKING / X	=		=	

PARKING REGULATION FACTOR — PRF

$$A+B = 0.43 = \mathbf{0.43}$$

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.0
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.4
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; | 0.4 | if the condition is met 50% ; | 0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$$= \frac{\text{A+B+C+D+E+F}}{6} = \frac{0.4 + 0.0 + 0.0 + 0.0 + 0.4 + 0.0}{6} = \mathbf{0.1}$$

IDEAL VALUE ≤ 0.2

	For Type II - 12DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	214.52
B	DUs' AREA PER FLOOR (sqm.)	888.72
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	1103.24

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{214.52}{888.72} = \mathbf{0.24}$$

IDEAL VALUE ≤ 0.2

	For Type II - 16DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	244.6
B	DUs' AREA PER FLOOR (sqm.)	1184.96
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	1429.56

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{244.6}{1184.96} = \mathbf{0.20}$$

IDEAL VALUE ≤ 0.2

	For Type III - 16DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	326.94
B	DUs' AREA PER FLOOR (sqm.)	1315.49
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	1642.43

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{326.94}{1315.49} = \mathbf{0.24}$$

IDEAL VALUE ≤ 0.2

	For Type IV - 4DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	109.82
B	DUs' AREA PER FLOOR (sqm.)	504.31
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	614.13

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{109.82}{504.31} = \mathbf{0.21}$$

IDEAL VALUE ≤ 0.2

	For Type V - 4DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	120.99
B	DUs' AREA PER FLOOR (sqm.)	530.64
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	651.63

CORE INEFFICIENCY FACTOR — CIF

$$\frac{A}{B} = \frac{120.99}{530.64} = \mathbf{0.22}$$

IDEAL VALUE ≤ 0.2

REDEVELOPMENT PROPOSAL | Demonstrations

4.3.3 RK Puram Sector 1

4.3.3 RK PURAM - SECTOR 1| Proposal Overview

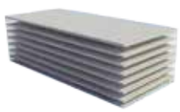
SITE AREA : 20.61 ha | Permissible Height : 30M.**

	EXISTING	PROPOSED
Typology	Type I, II, III	**Type IV**
Number of DU	1276	**856**
Density (DU/ha)	61.91	**41.53** PDmax_H+T
Height	G+1	**G+8**
Ground Coverage in sq.m.(%)	27692.20 (13.44%)	**25701.54 (12.47%)**
Road Area (sq.m.)	67089.99	24358.46
Number of Trees	885[2]	720+1230 (Retained+Planted)[1]
Tree Density (no. of trees/ha.)	42.94	**94.64** (Retained +Planted)

Increase in number of DU	**0**
Number of Trees Cut	**165**
Tree Cut Percentage	**18.64 %**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.19***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.12***
Parking Requirement (as per norms)	**1710**
Parking Provided (total number)	**1974**
MLCP (mechanized/ ramp)	1110
Surface	864
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.44***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor |**CIF**[5] | Ideal Value ≤ 0.2	**0.21***

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 109
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

Type - IV [5]
Core : 1 to 4 DUs
DU : 704



MLCP
Parking Provided : 1110

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens
- Site boundary

1. RK Puram East Block
2. RK Puram Sector 2
3. RK Puram Sector 4
4. RK Puram Sector 5
5. RK Puram West Block

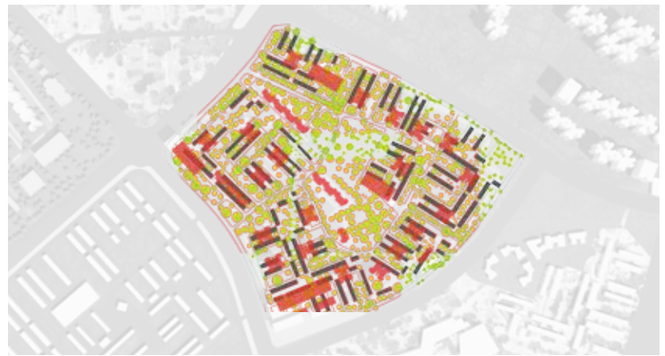
- Vehicular
- Pedestrian
- Existing built
- Proposed built
- Existing trees

BUILDING USE

CONTEXT

MOBILITY

EXISTING AND PROPOSED



ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. MLCP- Multi-Level Car Parking buildings have been placed towards the periphery to allow better vehicular access and maintain an exclusive residential zone.

View from West side

3. Social infrastructure such as the Existing schools and commercial buildings in the site have been shifted to peripheral locations to facilitate easy access and quieter residential areas.

4. Only Type 4 towers have been placed with minimal road network to increase the green footprint with the site.

FINAL PROPOSAL


View from West side

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	= 165/885 =	0.19	
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	=	0.00 =	0.00

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

A = 0.19 = **0.19**

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=	=
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=	=

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$\frac{A+B}{2}$ = $\frac{\quad}{2}$ =

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)		
B	SITE AREA (in Sqm)		

ROAD COVER FACTOR — RCF

$\frac{A}{B}$ = $\frac{24358.46}{206100}$ = **0.12**

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	= 1974		
A	STILT PARKING CAPACITY / X	=	=	NA
B	NO. OF SURFACE PARKING / X	= 864/1974	=	0.44
C	MLCP CAPACITY (no.) / X	= 1110/1974	=	0.56
D	NO. OF BASEMENT PARKING / X	=	=	NA

PARKING REGULATION FACTOR — PRF

A+B = 0.44 = **0.44**

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.4
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.0
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; |0.4| if the condition is met 50% ; |0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$= \frac{A+B+C+D+E+F}{6}$

$= \frac{0.4 + 0.0 + 0.4 + 0.0 + 0.0 + 0.0}{6}$ = **0.10**

IDEAL VALUE ≤ 0.2

	For Type IV | 4DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	109.82
B	DUs' AREA PER FLOOR (sqm.)	504.31
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	614.13

CORE INEFFICIENCY FACTOR — CIF

$\frac{A}{B}$ = $\frac{109.82}{504.31}$ = **0.21**

IDEAL VALUE ≤ 0.2

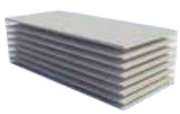
REDEVELOPMENT PROPOSAL | Demonstrations

4.3.4 RK Puram Sector 2

4.3.4 RK PURAM - SECTOR 2| Proposal Overview

SITE AREA : 25.021 ha | Permissible Height : 20M.**

Type - IV [5]
Core : 1 to 4 DUs
DU : 492



MLCP
Parking Provided : 300

	EXISTING	PROPOSED
Typology	Type I, IV	**Type IV**
Number of DU	1360	**492**
Density (DU/ha)	54.36	**19.66** PDmax_H+T
Height	G+1	**G+4**
Ground Coverage (%)	57854.00 (23.12%)	**34934.96 (13.96%)**
Road Area (sq.m.)	66136.79	34319.51
Number of Trees	546[2]	499+1762 (Retained+Planted)[1]
Tree Density (no. of trees/ha.)	21.82	**90.40** (Retained+Planted)

Increase in number of DU	**0**
Number of Trees Cut	**47**
Tree Cut Percentage	**8.61 %**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.09***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.14***
Parking Requirement (as per norms)	984
Parking Provided (total number)	**1110**
MLCP (mechanized/ ramp)	300
Surface	810
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.73***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor | **CIF**[5] | Ideal Value ≤ 0.2	**0.21***

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 115
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens

Delhi Metro Line

- Magenta Line

- Site boundary

1. RK Puram Sector 1
2. Vasant Vihar
3. RK Puram Sector 6
4. RK Puram West Block
5. RK Puram Sector 3
6. RK Puram Sector 4

- Vehicular
- Pedestrian

- Existing built
- Proposed built
- Existing trees

BUILDING USE

CONTEXT

MOBILITY

EXISTING AND PROPOSED

ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. The only MLCP-Multi-Level Car Parking buildings is centrally located for easy approach to all residential units.

3. Social infrastructure such as the Existing schools and commercial buildings in the site have not been relocated to facilitate easy access and quieter residential areas.

4. Only Type 4 towers have been placed with minimal road network to increase the green footprint with the site.

FINAL PROPOSAL

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	= 47/546 =	0.09
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	= ---/--- =	0

*Each value should be ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	= ____ =	
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	= ____ =	

*Each value should be ≤ 0.2

A	ROAD AREA (in Sqm)		
B	SITE AREA (in Sqm)		

X	TOTAL NUMBER OF PARKING PROPOSED	= 1110	
A	STILT PARKING CAPACITY / X	= ____ =	0.00
B	NO. OF SURFACE PARKING / X	= 810/1110 =	0.73
C	MLCP CAPACITY (no.) / X	= 300/1110 =	0.27
D	NO. OF BASEMENT PARKING / X	= ____ =	NA

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.4
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.0
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; |0.4| if the condition is met 50% ; |0.8| if the condition is met 100%

	For Type 1V | 4DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	109.82
B	DUs' AREA PER FLOOR (sqm.)	504.31
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	614.13

TREE CUT FACTOR — TCF

A = 0.09 = **0.09**

IDEAL VALUE ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

A+B / 2 = ____ / 2 =

IDEAL VALUE ≤ 0.2

ROAD COVER FACTOR — RCF

A / B = 34319.51 / 250200 = **0.14**

IDEAL VALUE ≤ 0.2

PARKING REGULATION FACTOR — PRF

A+B = 0.00+0.73 = **0.73**

IDEAL VALUE ≤ 0.2

PEDESTRIAN DISCOMFORT FACTOR — PDF

= **A+B+C+D+E+F / 6**

= (0.4 + 0.0 + 0.4 + 0.0 + 0.0 + 0.0) / 6 = **0.10**

IDEAL VALUE ≤ 0.2

CORE INEFFICIENCY FACTOR — CIF

A / B = 109.82 / 504.31 = **0.21**

IDEAL VALUE ≤ 0.2

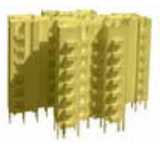
REDEVELOPMENT PROPOSAL | Demonstrations

REDEVELOPMENT PROPOSAL | Demonstrations

4.3.5 RK Puram Sector 3

4.3.5 RK PURAM - SECTOR 3| Proposal Overview

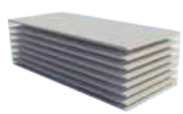
SITE AREA : 30.00 ha | Permissible Height : 28M.**



Type - II [5]
Core : 1 to 8 DUs

Type - II [5]
Core : 1 to 12 DUs

DU : 2000



MLCP
Parking Provided : 1340

	EXISTING	PROPOSED
Typology	Type I, II, III, IV	**Type II**
Number of DU	1244	**2000**
Density (DU/ha)	41.47	**66.67** PDmax_H+T
Height	G+1, G+3	**G+7**
Ground Coverage (%)	57854.00 (29.24%)	**34934.96 (15.49%)**
Road Area (sq.m.)	82332.50	31881.27
Number of Trees	1042[2]	861+1909 (Retained+Planted)[1]
Tree Density (no. of trees/ha.)	34.73 [2]	**92.36** (Retained+Planted) [1]

Increase in number of DU	**756**
Number of Trees Cut	**181**
Tree Cut Percentage	**17.37 %**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.21***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.11***
Parking Requirement (as per norms)	2000
Parking Provided (total number)	**2113**
MLCP (mechanized/ ramp)	1340
Surface	773
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.37***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor | **CIF**[5] | Ideal Value ≤ 0.2	**0.22***

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 121
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

BUILDING USE

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens

Delhi Metro Line

- Magenta Line

- Site boundary

1. RK Puram Sector 4
2. Venkateshwara Balaji Mandir
3. RK Puram Sector 2
4. Deer Park, Hauz Khas
5. Ber Sarai
6. Munirka

CONTEXT

MOBILITY

- Vehicular
- Pedestrian

EXISTING AND PROPOSED

- Existing built
- Proposed built
- Existing trees

ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. MLCP- Multi-Level Car Parking buildings have been placed towards the periphery to allow better vehicular access and maintain an exclusive residential zone.

3. Social infrastructure such as the Existing schools and commercial buildings in the site have been shifted to peripheral locations to facilitate easy access and quieter residential areas.

4. Only Type 2 towers have been placed with minimal road network to increase the green footprint with the site.

FINAL PROPOSAL

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	=	181 / 1042	=	0.17
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	=	181 / 756	=	0.24

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

$\frac{A+B}{2} = \frac{0.41}{2} = \mathbf{0.21}$

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=	———	=	
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=	———	=	

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$\frac{A+B}{2} = \frac{\quad}{2} =$

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)	
B	SITE AREA (in Sqm)	

ROAD COVER FACTOR — RCF

$\frac{A}{B} = \frac{31881.27}{300000} = \mathbf{0.11}$

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	=	2113		
A	STILT PARKING CAPACITY / X	=	———	=	0.00
B	NO. OF SURFACE PARKING / X	=	773 / 2113	=	0.37
C	MLCP CAPACITY (no.) / X	=	1340 / 2113	=	0.63
D	NO. OF BASEMENT PARKING / X	=	———	=	0.00

PARKING REGULATION FACTOR — PRF

$\mathbf{A+B} = 0.00+0.37 = \mathbf{0.37}$

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.0
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.4
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; | 0.4 | if the condition is met 50% ; | 0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$= \frac{A+B+C+D+E+F}{6}$

$= \frac{0.4 + 0.0 + 0.0 + 0.0 + 0.4 + 0.0}{6} = \mathbf{0.1}$

IDEAL VALUE ≤ 0.2

	For Type II | 8 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	120.99
B	DUs' AREA PER FLOOR (sqm.)	530.64
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	651.63

CORE INEFFICIENCY FACTOR — CIF

$\frac{A}{B} = \frac{120.99}{530.64} = \mathbf{0.22}$

IDEAL VALUE ≤ 0.2

	For Type II | 12 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	214.52
B	DUs' AREA PER FLOOR (sqm.)	888.72
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	1103.24

CORE INEFFICIENCY FACTOR — CIF

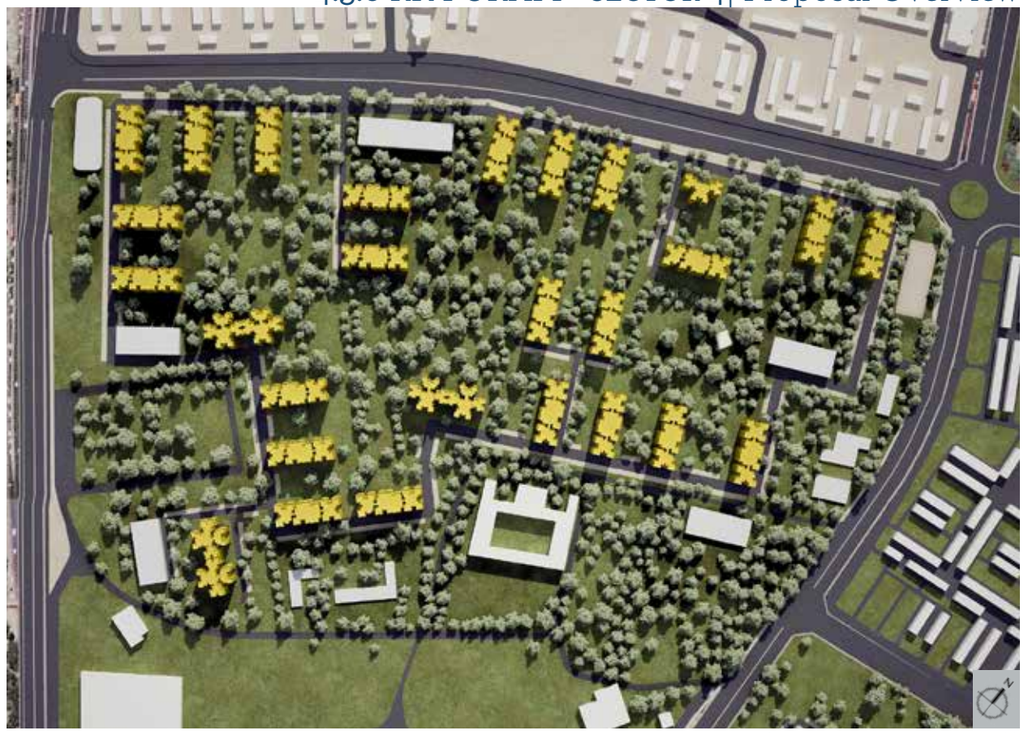
$\frac{A}{B} = \frac{214.52}{888.72} = \mathbf{0.24}$

IDEAL VALUE ≤ 0.2

REDEVELOPMENT PROPOSAL | Demonstrations

4.3.6 RK Puram Sector 4

4.3.6 RK PURAM - SECTOR 4| Proposal Overview

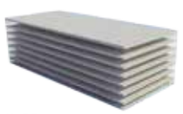


SITE AREA : 40.07 ha | Permissible Height : 35M.**

	EXISTING	PROPOSED
Typology	Type II, IV	**Type II**
Number of DU	1344	**2650**
Density (DU/ha)	33.54	**66.13** PDmax_H+T
Height	G+1	**G+5, G+9**
Ground Coverage (%)	61990.19 (15.47%)	**47455.96 (11.84%)**
Road Area (sq.m.)	115142.50	39856.71
Number of Trees*	1065[2]	904+3013 (Retained+Planted)[1]
Tree Density (no. of trees/ha.)	26.58[2]	**97.76** (Retained +Planted) [1]

Increase in number of DU	**1306 (97.17%)**
Number of Trees Cut	**161**
Tree Cut Percentage	**15.12 %**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.14***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.10***
Parking Requirement (as per norms)	2650
Parking Provided (total number)	**2733**
MLCP (mechanized/ ramp)	1580
Surface	1153
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.42***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor | **CIF**[5] | Ideal Value ≤ 0.2	**0.24***

Type - II [5]
Core : 1 to 12 DUs
DU : 2650



MLCP
Parking Provided : 1580

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 127
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens

Delhi Metro Line

- Magenta Line

- Site boundary

1. RK Puram Sector 5
2. RK Puram Sector 1
3. RK Puram Sector 2
4. RK Puram Sector 3
5. Munirka

- Vehicular
- Pedestrian

BUILDING USE

CONTEXT

View from South side

MOBILITY

EXISTING AND PROPOSED

ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. MLCP- Multi-Level Car Parking buildings have been placed towards the periphery to allow better vehicular access and maintain an exclusive residential zone.

3. Social infrastructure such as the Existing schools and commercial buildings in the site have not been relocated to facilitate easy access and quieter residential areas.

4. Only Type 2 towers have been placed with minimal road network to increase the green footprint with the site.

5.Towers with higher density (G+9) have been placed in south-east zone of the site to avoid height restrictions due to heritage structure in sector 5 and in the east of sector 4.

FINAL PROPOSAL

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	= 161 / 1065	=	0.15
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	= 161 / 1306	=	0.12

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

$\frac{A+B}{2} = \frac{0.27}{2} = \mathbf{0.14}$

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=	=	
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=	=	

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$\frac{A+B}{2} = \frac{\quad}{2} =$

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)			
B	SITE AREA (in Sqm)			

ROAD COVER FACTOR — RCF

$\frac{A}{B} = \frac{39856.71}{400700} = \mathbf{0.10}$

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	= 2733		
A	STILT PARKING CAPACITY / X	=	=	0.00
B	NO. OF SURFACE PARKING / X	= 1153 / 2733	=	0.42
C	MLCP CAPACITY (no.) / X	= 1580 / 2733	=	0.58
D	NO. OF BASEMENT PARKING / X	=	=	0.00

PARKING REGULATION FACTOR — PRF

$A+B = 0.00 + 0.42 = \mathbf{0.42}$

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.0
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.4
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; | 0.4 | if the condition is met 50% ; | 0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$= \frac{A+B+C+D+E+F}{6}$

$= \frac{0.4 + 0.0 + 0.0 + 0.0 + 0.4 + 0.0}{6} = \mathbf{0.1}$

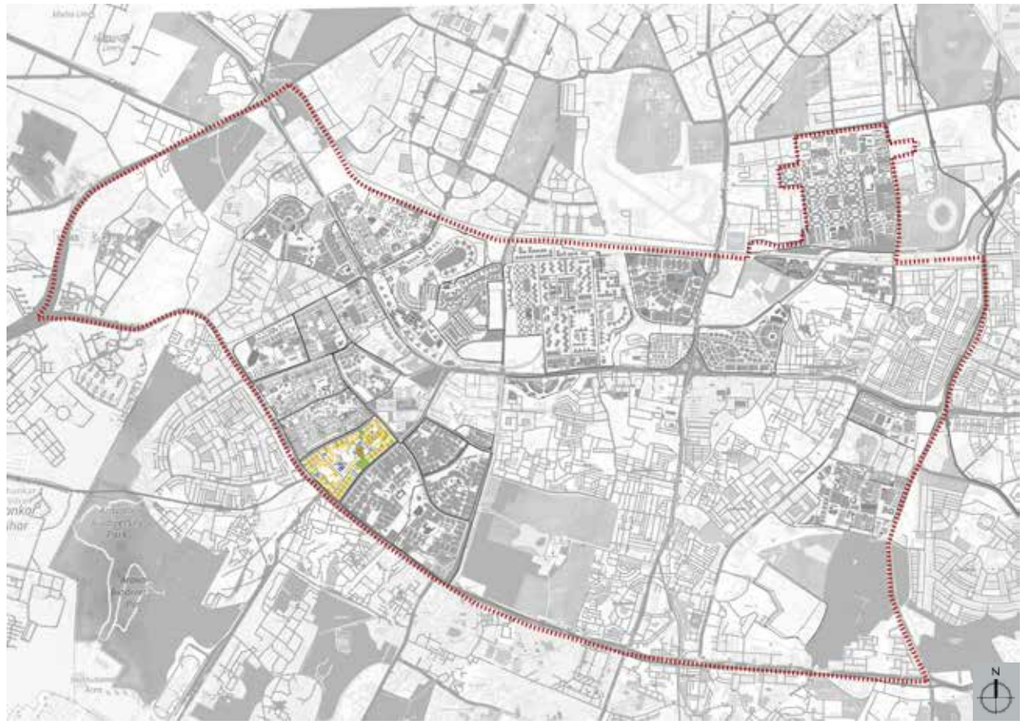
IDEAL VALUE ≤ 0.2

	For Type II | 12 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	214.52
B	DUs' AREA PER FLOOR (sqm.)	888.72
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	1103.24

CORE INEFFICIENCY FACTOR — CIF

$\frac{A}{B} = \frac{214.52}{888.72} = \mathbf{0.24}$

IDEAL VALUE ≤ 0.2



REDEVELOPMENT PROPOSAL | Demonstrations

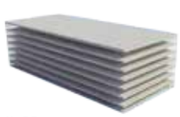
4.3.7 RK Puram Sector 5

4.3.7 RK PURAM - SECTOR 5| Proposal Overview

SITE AREA : 36.69 ha | Permissible Height : 35M.**

Type - III [5]
Core : 1 to 8 DUs

Type - III [5]
Core : 1 to 16 DUs
DU : 1488



MLCP
Parking Provided : 840

	EXISTING	PROPOSED
Typology	Type I, II, III	**Type III**
Number of DU	1680	**1488**
Density (DU/ha)	45.77	**40.56** PDmax_H+T
Height	G+1	**G+5, G+7**
Ground Coverage (%)	56183.78 (15.31%)	**51527.73 (14.04%)**
Road Area (sq.m.)	68257.32	65542.94
Number of Trees	1511[2]	1320+1802 (Retained+Planted) [1]
Tree Density (no. of trees/ha.)	41.18[2]	**85.11** (Retained +Planted) [1]

Increase in number of DU	**0**
Number of Trees Cut	**191**
Tree Cut Percentage	**12.64 %**
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.13***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.18***
Parking Requirement (as per norms)	2232
Parking Provided (total number)	**2326**
MLCP (mechanized/ ramp)	840
Surface	1486
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.64***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor |**CIF**[5] | Ideal Value ≤ 0.2	**0.24***

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 133
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens

Delhi Metro Line

- Magenta Line

- Site boundary

1. Munirka
2. Vasant Vihar
3. RK Puram Sector 6
4. RK Puram West Block
5. RK Puram Sector 4
6. Munda Gumbad Tomb

- Vehicular
- Pedestrian

- Existing built
- Proposed built
- Existing trees

BUILDING USE

CONTEXT

MOBILITY

EXISTING AND PROPOSED

ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. MLCP- Multi-Level Car Parking buildings have been placed towards the periphery to allow better vehicular access and maintain an exclusive residential zone.

3. Social infrastructure such as the Existing schools and commercial buildings in the site have been shifted to peripheral locations to facilitate easy access and quieter residential areas.

View from East side

4. Only Type 3 towers have been placed with minimal road network to increase the green footprint with the site.

5. Towers with higher density (G+7) have been placed in south-west zone of the site to avoid height restriction due to heritage structure in the central zone of the site.

FINAL PROPOSAL


View from East side

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	= 191 / 1511	=	0.13
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	= ----- / --	=	---

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

$\frac{A}{} = \frac{0.13}{} = \mathbf{0.13}$

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	= _____	=	
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	= _____	=	

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$\frac{A+B}{2} = \frac{}{2} =$

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)			
B	SITE AREA (in Sqm)			

ROAD COVER FACTOR — RCF

$\frac{A}{B} = \frac{65542.94}{366900} = \mathbf{0.18}$

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	= 2326		
A	STILT PARKING CAPACITY / X	= _____	=	NA
B	NO. OF SURFACE PARKING / X	= 1486 / 2326	=	0.64
C	MLCP CAPACITY (no.) / X	= 840 / 2326	=	0.36
D	NO. OF BASEMENT PARKING / X	= _____	=	NA

PARKING REGULATION FACTOR — PRF

$\mathbf{A+B} = 0.00 + 0.64 = \mathbf{0.64}$

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.0
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.4
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; | 0.4 | if the condition is met 50% ; | 0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$= \frac{A+B+C+D+E+F}{6}$

$= \frac{0.4 + 0.0 + 0.0 + 0.0 + 0.4 + 0.0}{6} = \mathbf{0.1}$

IDEAL VALUE ≤ 0.2

	For Type III - 16DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	326.94
B	DUs' AREA PER FLOOR (sqm.)	1315.49
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	1642.43

CORE INEFFICIENCY FACTOR — CIF

$\frac{A}{B} = \frac{326.94}{1315.49} = \mathbf{0.24}$

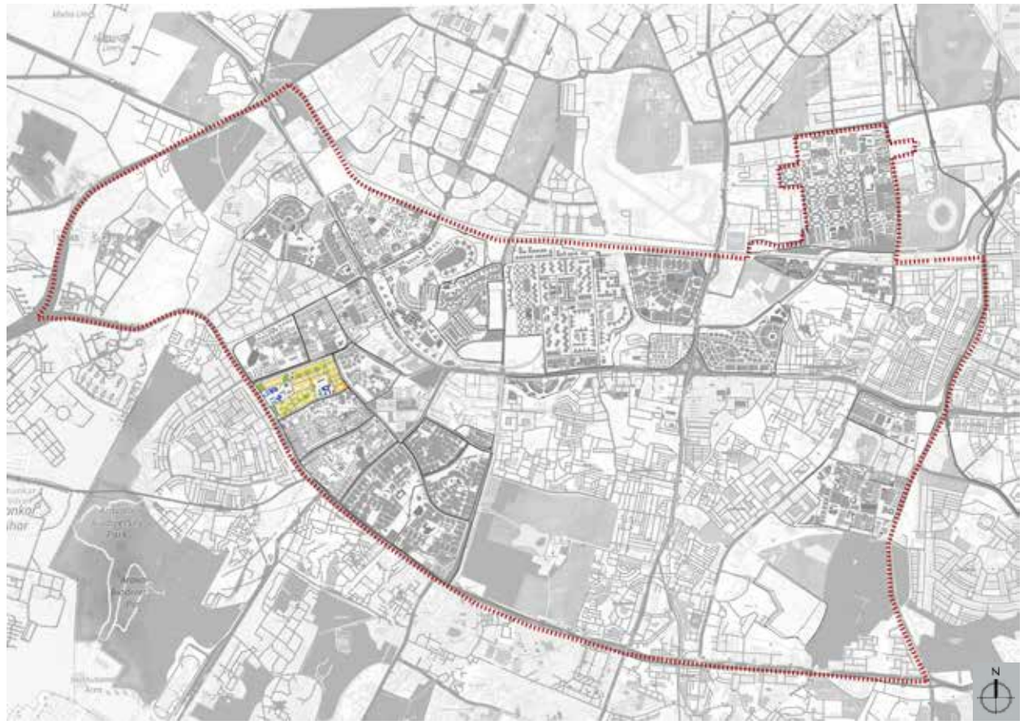
IDEAL VALUE ≤ 0.2

	For Type III - 8 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	172.92
B	DUs' AREA PER FLOOR (sqm.)	649.15
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	822.07

CORE INEFFICIENCY FACTOR — CIF

$\frac{A}{B} = \frac{172.92}{649.15} = \mathbf{0.26}$

IDEAL VALUE ≤ 0.2



REDEVELOPMENT PROPOSAL | Demonstrations

4.3.8 RK Puram Sector 7

View from South-East side

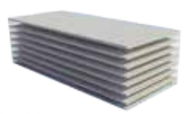
4.3.8 RK PURAM - SECTOR 7| Proposal Overview

SITE AREA : 32.77 ha | Permissible Height : 15M.**

	EXISTING	PROPOSED
Typology	Type I, II	**Type IV**
Number of DU	1272	**622**
Density (DU/ha)	38.82	**18.98** PDmax_H+T
Height	G+1	**G+4**
Ground Coverage (%)	51235.72 (15.63%)	**43759.40 (13.35%)**
Road Area (sq.m.)	80216.50	44902.10
Number of Trees	1514[2]	1288+1699 (Retained+Planted) [1]
Tree Density (no. of trees/ha.)	46.20[2]	**91.18** (Retained +Planted) [1]

Increase in number of DU	0
Number of Trees Cut	226
Tree Cut Percentage	14.93 %
Tree Cut Factor | **TCF**[2] | Ideal Value ≤ 0.2	**0.15***
Tree Ecology Damage Factor | **EDF**[2] | Ideal Value ≤ 0.2	**Indeterminate**[2]
Road Cover Factor | **RCF** | Ideal Value ≤ 0.2	**0.14***
Parking Requirement (as per norms)	1244
Parking Provided (total number)	1253
MLCP (mechanized/ ramp)	150
Surface	1103
Parking Regulation Factor | **PRF**[3] | Ideal Value ≤ 0.2	**0.88***
Pedestrian Discomfort Factor | **PDF**[4] | Ideal Value ≤ 0.2	**0.10***
Core Inefficiency Factor |**CIF**[5] | Ideal Value ≤ 0.2	**0.21***

Type - IV [5]
Core : 1 to 4 DUs
DU : 622



MLCP
Parking Provided : 150

[1] As per the MoEF environmental condition for green cover : Minimum one tree for every 80sqm of land. Refer Annexure A.7
[2] Location of Existing Trees have been take from google image references. Thus, the total number of existing trees and their location is approximate. The tree specifications i.e species and size are indeterminate.
[3] PRF value is not ideal as basement parking has not been considered for this specific proposal.
[4] Pedestrian Discomfort factor calculations here include the average walking distance condition only.
[5] For detail floor plan of towers, refer Annexure A. 4, Pg. 179-181.
* For the calculation of each Efficiency Factor, refer Page 139
** Permissible Height = Allowed Height as per AAI - Average Ground Level (existing). Refer Annexure A.10, Page 190.

LEGEND

- Residential
- Commercial
- Institutional
- Public-Semi Public
- Public Greens
- Site boundary

1. RK Puram Sector 9
2. RK Puram Sector10
3. RK Puram Sector 6
4. Vasant Vihar
5. RK Puram Sector 8

- Vehicular
- Pedestrian
- Existing built
- Proposed built
- Existing trees

BUILDING USE

CONTEXT

View from South-East side

MOBILITY

EXISTING AND PROPOSED

ZONING

1. Small green pockets have been replaced with consolidated greens to accommodate recreational activities and social spaces.

2. The only MLCP-Multi-Level Car Parking buildings is centrally located for easy approach to all residential units.

3. Social infrastructure such as the Existing schools and commercial buildings in the site have not been relocated, being easily accessible without disturbing the residential area circulation.

View from South-East side

4. Only Type 4 towers have been placed with minimal road network to increase the green footprint with the site.

FINAL PROPOSAL


View from South-East side

Efficiency Factor Value - Calculations

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	= 226 / 1514	=	0.15
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	= 226 / ---	=	----

*Each value should be ≤ 0.2

TREE CUT FACTOR — TCF

$\frac{A}{} = \frac{0.15}{} = \mathbf{0.15}$

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=	=
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=	=

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR — EDF

$\frac{A+B}{2} = \frac{}{2} =$

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)	
B	SITE AREA (in Sqm)	

ROAD COVER FACTOR — RCF

$\frac{A}{B} = \frac{44902.10}{327700} = \mathbf{0.14}$

IDEAL VALUE ≤ 0.2

X	TOTAL NUMBER OF PARKING PROPOSED	= 1253		
A	STILT PARKING CAPACITY / X	=	=	0.00
B	NO. OF SURFACE PARKING / X	= 1103 / 1253	=	0.88
C	MLCP CAPACITY (no.) / X	= 150 / 1253	=	0.12
D	NO. OF BASEMENT PARKING / X	=	=	0.00

PARKING REGULATION FACTOR — PRF

$\mathbf{A+B} = 0.00 + 0.88 = \mathbf{0.88}$

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	0.4
B*	UNSHADED WALKWAYS	0.0
C*	WALKWAY DEVOID OF GREENS	0.4
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	0.0
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS >800M	0.0
F*	Avg. WALKING DISTANCE from TYPE II & III to SOCIAL INFRA. >800M	0.0

*Score |0.0| if the condition is not met ; |0.4| if the condition is met 50% ; |0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR — PDF

$= \frac{A+B+C+D+E+F}{6} = \frac{0.4 + 0.0 + 0.4 + 0.0 + 0.0 + 0.0}{6} = \mathbf{0.10}$

IDEAL VALUE ≤ 0.2

	For Type IV - 4 DU Cluster	
A	CORE AREA PER FLOOR (sqm.)	109.82
B	DUs' AREA PER FLOOR (sqm.)	504.31
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	614.13

CORE INEFFICIENCY FACTOR — CIF

$\frac{A}{B} = \frac{109.82}{504.31} = \mathbf{0.21}$

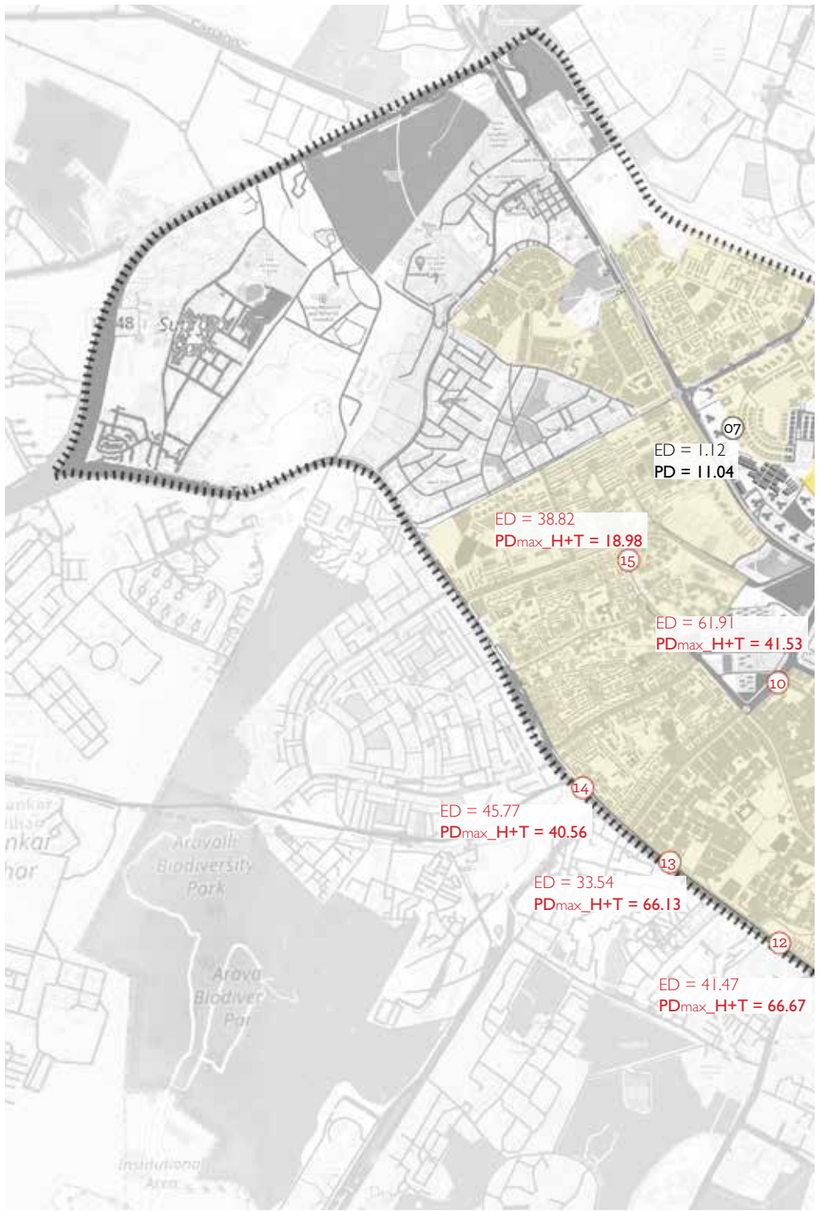
IDEAL VALUE ≤ 0.2

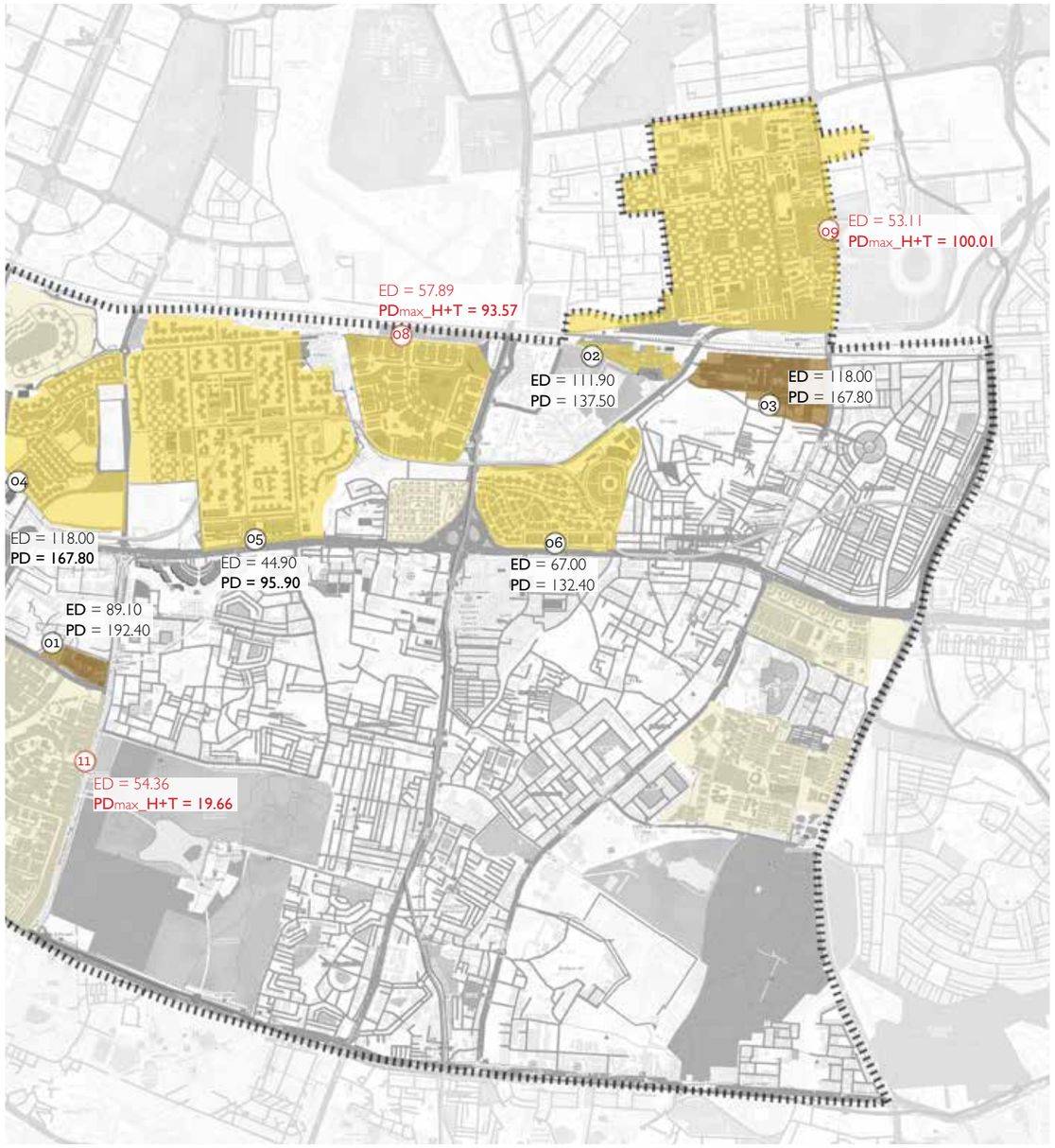
4.4 Projected Densities

GPRA Colonies already redeveloped or under the process of same, as in the year 2020.			
GPRA Colony		ED (DU/ha)	PD (DU/ha)
01	Mohammadpur	89.10	192.40
02	Thyagraj	111.90	137.50
03	Kasturba	118.00	167.80
04	Netaji Nagar	62.70	106.80
05	Sarojini Nagar	44.90	95.90
06	East Kidwai Nagar	67.00	132.40
07	New Moti Bagh		11.04

GPRA Colonies which have scope for redevelopment after the year 2020.						
GPRA Colony (demonstrated)		ED (DU/ha)	Permissible Height* (as per AAI)	PDmax_H (DU/ha)	PDmax_H+T (DU/ha)	PDmax_ W+T (DU/ha)
08	Laxmi Bai Nagar	57.89	32M. (250-218)	260.53	**93.57**	not feasible**
09	Lodhi Colony	53.11	42M. (250-208)	191.14	**100.01**	not feasible**
10	Sector 01, RK Puram	61.91	30M. (260-230)	278.60	**41.53*** **	not feasible**
11	Sector 02, RK Puram	54.36	20M. (250-230)	124.08	**19.66**	not feasible**
12	Sector 03, RK Puram	41.47	28M. (260-232)	160.53	**66.67**	not feasible**
13	Sector 04, RK Puram	33.54	35M. (270-235)	167.70	**66.13**	not feasible**
14	Sector 05, RK Puram	45.77	35M. (270-235)	228.94	**40.56**	not feasible**
15	Sector 07, RK Puram	38.82	15M. (250-235)	77.63	**18.98**	not feasible**

Map 4.2 | Map depicting Existing and Projected Densities of GPRA Colonies within the study zone





LEGENDS

ED
Density before Redevelopment

PD
Proposed Density for Colonies which are under the redevelopment process as in the year 2020

PDmax_H
Maximum Proposed Density considering AAI Height regulation only.

PDmax_H+T
Maximum Proposed Density considering AAI Height regulation and Existing Trees for Colonies which have potential of redevelopment after the year 2020 .

PDmax_W+T
Maximum Proposed Density considering Walk-up buildings heights and Existing Trees.

Density | 1-70 DU/ha

Density | 71-140 DU/ha

Density | 141-200 DU/ha

Colonies already redeveloped or proposed for redevelopment, as in the year 2020.

Colonies with potential for redevelopment in future.

* **Permissible Height** = Allowed Height as per AAI - Average Ground Level (existing)
****Not Feasible** - Not even able to achieve the existing density with walk-up buildings. considering existing trees

REDEVELOPMENT PROPOSAL | Demonstrations

4.5 Proposals | Efficiency Matrix

General Pool Residential Accommodation		Laxmi Bai Nagar		Lodhi Colony		RK Puram Sector-1	
Site Area		342000 sq.m. | 34.20 ha.		863500 sq.m. | 86.35 ha.		206100 sq.m. | 20.61 ha.	
Permissible Height *		250-218 = 32M.		250-212 = 38M.		250-218 = 32M.	
S.N	**Item**	**Existing**	**Proposed**	**Existing**	**Proposed**	**Existing**	**Proposed**
1	**Typology**	II, IV	**II, III, IV**	II, III, IV,V	**II, III, IV,V**	I, II, III	**IV**
2	**Number of DU**	1980	**3200**	4586	**8636**	1276	**856**
3	**Density (DU/ha)**	57.89	**93.57** PDmax_H+T**	53.11	**100.01** PDmax_H+T**	61.91	**41.53** PDmax_H+T**
4	**Height**	G+1	**G+8**	G+1, G+3	**G+3, G+4, G+9, G+10**	G+1	**G+8**
5	**Ground Coverage %**	26.83 %	**17.73 %**	29.49 %	**29.51%**	13.44%	**12.47%**
6	Road Area (sq.m.)	36917.40	**33183.81**	224468.00	**245425.00**	67089.99	**24358.46**
7	Number of Trees	1502	**3102** (retained+ planted)	3600	**4541** (retained+ planted)	885	**1950** (retained+ planted)
8	Tree Density (Trees/ha.)	43.92	**90.71**	41.69	**52.59**	42.94	**94.64**
PROPOSAL SPECIFICATIONS							
9	Increased dwelling units		**1220**		**3642**		**0**
10	No. of Trees Cut		**253**		**890**		**165**
11	Tree Cut Percentage		**16.84%**		**24.72%**		**18.64%**
12	**Tree Cut Factor | TCF**		**0.19**		**0.24**		**0.19**
13	**Tree Ecology Damage Factor | EDF**		Indeterminate*		Indeterminate*		Indeterminate*
14	**Road Cover Factor | RCF**		**0.10**		**0.28**		**0.12**
15	Parking Requirement (as per norms)		4352		962		1710
16	Parking Provided (total number)		**3922**		**10420**		**1974**
16.1	Stilt		0		0		0
16.2	Surface		1222		4480		864
16.3	MLCP (mechanized/ ramp)		2700		5940		1110
16.4	Basement		0		0		0
17	**Parking Regulation Factor | PRF**		**0.31**		**0.43**		**0.44**
18	**Pedestrian Discomfort Factor | PDF**		**0.10**		**0.10**		**0.10**
19	**Core Inefficiency Factor | CIF**		**0.21**		**0.22**		**0.21**

RK Puram Sector-2		RK Puram Sector-3		RK Puram Sector-4		RK Puram Sector-5		RK Puram Sector-7	
250200sq.m. | 25.02 ha.		300000 sq.m. | 30.00 ha.		400700 sq.m. | 40.07 ha.		366900 sq.m.| 36.69ha.		327700 sq.m.|32.77ha.	
250-230 = 20M.		260-232 = 28M.		270-235 = 35M.		270-235 = 35M.		250-235 = 15M.	
Existing	**Proposed**	**Existing**	**Proposed**	**Existing**	**Proposed**	**Existing**	**Proposed**	**Existing**	**Proposed**
I, IV	**IV**	I, II, III, IV	**II**	**II, IV**	**II**	**I, II, III**	**III**	**I, II**	**IV**
1360	**492**	1244	**2000**	**1344**	**2650**	**1680**	**1488**	**1272**	**622**
54.36	**19.66** PDmax_H+T**	41.47	**66.67** PDmax_H+T**	33.54	**66.13** PDmax_H+T**	45.79	**40.56** PDmax_H+T**	38.82	**18.98** PDmax_H+T**
G+1	**G+4**	G+1, G+3	**G+7**	G+1	**G+5, G+9**	G+1, G+3	**G+5, G+7**	G+1	**G+4**
23.12%	**13.96%**	29.24%	**15.49%**	15.47%	**11.84%**	15.31%	**14.04%**	15.63%	**13.35%**
66136.79	**34319.51**	82332.50	**31881.27**	115142.50	**39856.71**	68257.32	**65542.94**	80216.50	**44902.10**
546	**2261** (retained+ planted)	1042	**2770** (retained+ planted)	1065	**3917** (retained+ planted)	1511	**3122** (retained+ planted)	1514	**2987** (retained+ planted)
21.82	**90.40**	34.73	**92.36**	26.58	**97.76**	41.18	**85.11**	46.20	**91.18**
	0		**756**		**1306**		**0**		**0**
	47		**181**		**161**		**191**		**226**
	8.61 %		**17.37%**		**15.12%**		**12.64%**		**14.93%**
	0.09		**0.21**		**0.14**		**0.13**		**0.15**
	Indeterminate*		Indeterminate*		Indeterminate*		Indeterminate*		Indeterminate*
	0.14		**0.11**		**0.10**		**0.18**		**0.14**
	984		2000		2650		2232		1244
	1110		**2113**		**2733**		**2326**		**1253**
	0		0		0		0		0
	810		773		1153		1486		1103
	300		1340		1580		840		150
	0		0		0		0		0
	1.00		**1.00**		**0.42**		**0.64**		**0.88**
	0.10		**0.10**		**0.10**		**0.10**		**0.10**
	0.21		**0.24**		**0.24**		**0.24**		**0.21**

* **Permissible Height** = Allowed Height as per AAI - Average Ground Level (existing)
** **PD**max_**H+T** | Maximum Proposed Density considering AAI Height regulation and Existing Trees for Colonies which have potential of redevelopment in future (after the year 2020) .

REDEVELOPMENT PROPOSAL | Demonstrations

4.6 Year 2020 | Aerial View

LEGEND

APPROVED FOR REDEVELOPMENT AS IN YEAR 2020

01 Mohammadpur
02 Thyagraj Nagar
03 Kasturba Nagar
04 Netaji Nagar
05 Sarojini Nagar
06 East Kidwai Nagar
07 New Moti Bagh
(already redeveloped, as in the year 2020)

POTENTIAL FOR REDEVELOPMENT DEMONSTRATED IN THE REPORT

08 Laxmi Bai Nagar
09 Lodhi Colony
10 R.K. Puram, Sector 01
11 R.K. Puram, Sector 02
12 R.K. Puram, Sector 03
13 R.K. Puram, Sector 04
14 R.K. Puram, Sector 05
15 R.K. Puram, Sector 07

POTENTIAL FOR REDEVELOPMENT IN FUTURE (after the year 2020)

16 R.K. Puram, Sector 06
17 R.K. Puram, Sector 08
18 R.K. Puram, Sector 09
19 R.K. Puram, Sector 10
20 R.K. Puram, Sector 11
21 R.K. Puram, Sector 12
22 West Kidwai Nagar
23 Nanakpura
24 NW Moti Bagh
25 Andrews Ganj

View 4.1 | Aerial View | In the Year 2020

REDEVELOPMENT PROPOSAL | Demonstrations

4.7 Proposed | Aerial View

LEGEND

APPROVED FOR REDEVELOPMENT AS IN YEAR 2020

01 Mohammadpur
02 Thyagraj Nagar
03 Kasturba Nagar
04 Netaji Nagar
05 Sarojini Nagar
06 East Kidwai Nagar
07 New Moti Bagh
(already redeveloped, as in year 2020)

POTENTIAL FOR REDEVELOPMENT DEMONSTRATED IN THE REPORT

08 Laxmi Bai Nagar
09 Lodhi Colony
10 R.K. Puram, Sector 01
11 R.K. Puram, Sector 02
12 R.K. Puram, Sector 03
13 R.K. Puram, Sector 04
14 R.K. Puram, Sector 05
15 R.K. Puram, Sector 07

POTENTIAL FOR REDEVELOPMENT IN FUTURE (after the year 2020)

16 R.K. Puram, Sector 06
17 R.K. Puram, Sector 08
18 R.K. Puram, Sector 09
19 R.K. Puram, Sector 10
20 R.K. Puram, Sector 11
21 R.K. Puram, Sector 12
22 West Kidwai Nagar
23 Nanakpura
24 NW Moti Bagh
25 Andrews Ganj

View 4.2 | Aerial View | Proposed Redevelopment of 8 GPRA Colonies

REDEVELOPMENT PROPOSAL | Demonstrations

Chapter 05

FINDINGS OF DUAC

5.1 Findings of DUAC

The study of design parameters of redevelopment proposals for GPRA colonies (within the study area and approved by DUAC (before or in the year 2020), led to the identification of issues which are often overlooked by designers in the process of conforming to the development norms. Major issues such as excessive razing of existing full-grown trees, loss of native tree species and alteration of microclimate, increase in the extent of impervious surfaces, increase in basement extent due to increasing parking demands, lack of sustainable mobility networks and ineffective building core designs have been addressed through careful assessment of their contributing quantitative parameters, which further led to the derivation of an 'Efficiency Factor' pertaining to each issue.

To further assess the efficiency of design, an 'Assessment Index' has been formulated which assesses livability standards in terms of qualitative parameters such as comfort, satisfaction quotient, identity and sustainability, in correspondence to their respective quantitative parameters.

And, with the combined application of 'Efficiency Factors' and 'Assessment Index', 'Feasible Densities' have been demonstrated for selective GPRA colonies, which are within the study zone and have the potential of redevelopment in the near future (i.e. after the year 2020).

The 'Efficiency Factors', 'Assessment Index' and 'Redevelopment Demonstrations' are the three main findings of the report. These redevelopment strategies when collectively applied can substantially contribute towards a holistic development.

1 EFFICIENCY FACTORS

ENSURES :

- Minimum **TREE-CUT**
- Efficient **PARKING** strategy
- Walkable and sustainable **MOBILITY** networks
- Preservation of **ECOLOGY**
- Increase of **GREEN AREAS** over hard paved areas
- Efficient building **CORE DESIGN**

+

2 ASSESSMENT INDEX

INDICATES :

- Liveability Standards of residential areas by assessing an area in terms of qualitative parameters such as :

-COMFORT

-SATISFACTION

-IDENTITY

-SUSTAINABILITY

with the respective quantitative parameters

+

3 REDEVELOPMENT DEMONSTRATIONS

EXHIBITS :

- **FEASIBLE DENSITIES**
- Possible outcomes when redevelopment proposals are worked out based on the suggested efficiency factors and in compliance with the existing building norms.

5.2 Efficiency Factors

1 TCF
TREE CUT FACTOR

A factor, which evaluates the tree cut ratio and the cost of one Dwelling Unit in terms of number of Trees Cut.

Relative Parameters which collectively define this factor are -
- Ratio of Number of trees cut to the number of existing trees.
- Ratio of number of trees cut to the increased number of dwelling units.

IDEAL VALUE * ≤ 0.2

Minimizes razing of trees for urban redevelopment.

2 EDF
TREE ECOLOGY DAMAGE FACTOR

A factor, which evaluates the ecological value of the trees cut to assess the impact on the surrounding environment.

Relative Parameters which collectively define this factor are -
- Native Trees Cut.
- Trees cut with calibre more than 300mm (girth 1000mm).

IDEAL VALUE * ≤ 0.2

Controls loss of native tree species that support the micro-climate of that area/ zone.

3 RCF
ROAD COVER FACTOR

A factor, which evaluates the road area in respect to its site area, to assess the heat-island effect and stormwater run-off.

Relative Parameters which collectively define this factor are -
- Road area
- Site area

IDEAL VALUE * ≤ 0.2

Controls the increase in impervious surface thus, reducing flooding and enhance ground round water recharge rates.

SITE PLANNING

4 PRF
PARKING REGULATION FACTOR

A factor, which evaluates the different parking strategies, to assess their impact on the tree cut percentage and the increase on circulation area.

Relative Parameters which collectively define this factor are -
- Basement Parking number
- Stilt Parking number
- Surface Parking number
- MLCP (mechanized & ramp) parking number,

IDEAL VALUE * ≤ 0.2

Minimizes the number of trees cut by reducing Stilt and surface parking thus reducing visual disconnect between green & social spaces.

5 PDF
PEDESTRIAN DISCOMFORT FACTOR

A factor, which evaluates the pedestrian ease of mobility to assess the discomfort of residents.

Relative Parameters which collectively define this factor are -
- Pedestrian discontinuity
- Unshaded Walkways
- Walkways devoid of greens
- Unsignalized Walkways
- Walking distance from individual towers to the nearest transit-hub and social infrastructures.

IDEAL VALUE * ≤ 0.2

Ensures walkability and sustainable mobility networks, thus reducing the dependency on Vehicular transport. Also ensures Complete Streets for pedestrians in terms of safety, comfort and convenience.

SITE PLANNING

6 CIF
CORE INEFFICIENCY FACTOR

A factor, which evaluates the core area of a tower in respect to the dwelling unit area to assess the inefficient use of space.

Relative Parameter which collectively define this factor are -
- Core & Circulation area of a typical floor.

IDEAL VALUE * ≤ 0.2

Controls excess sprawling of core areas thus reduces ground coverage of buildings.

BUILT FORM

* Derived Ideal Values are based on the case studies of Redevelopment Proposals of 7 GPRA colonies.

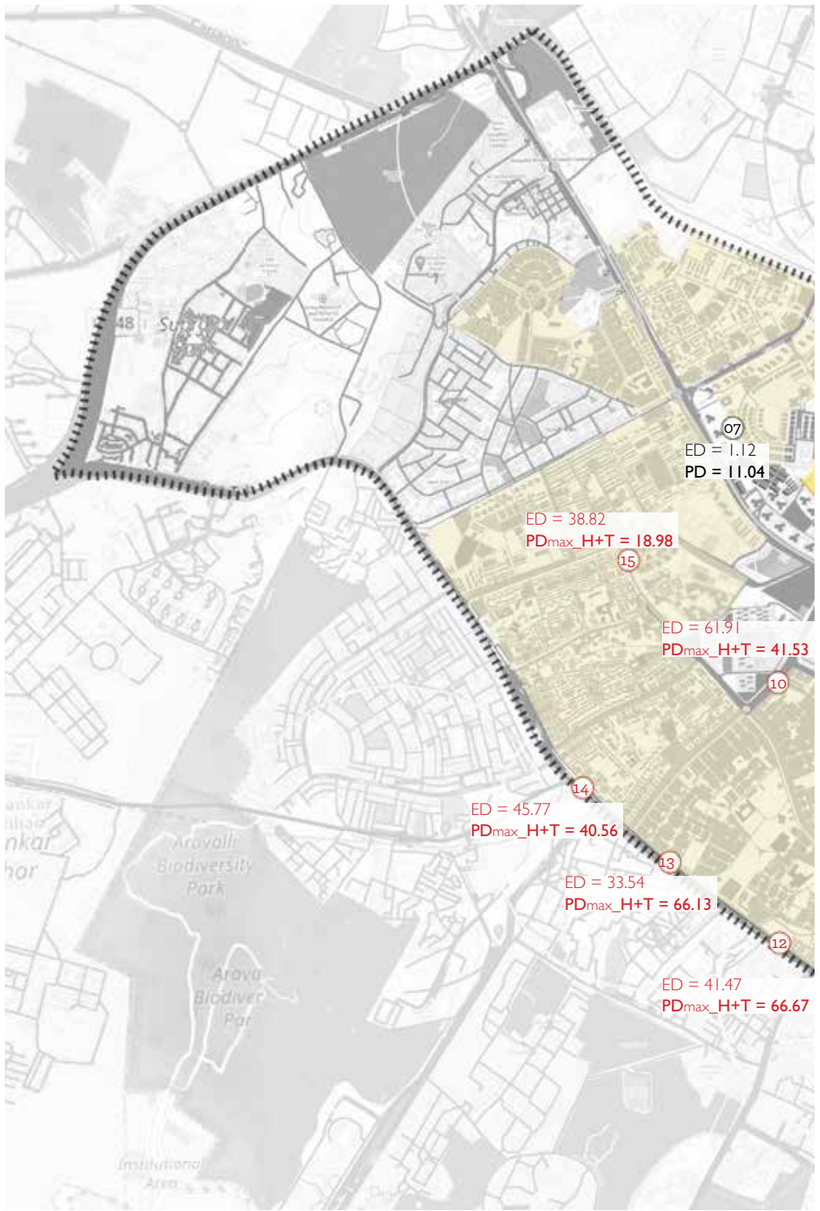
* Derived Ideal Values are based on the case studies of Redevelopment Proposals of 7 GPRA colonies.

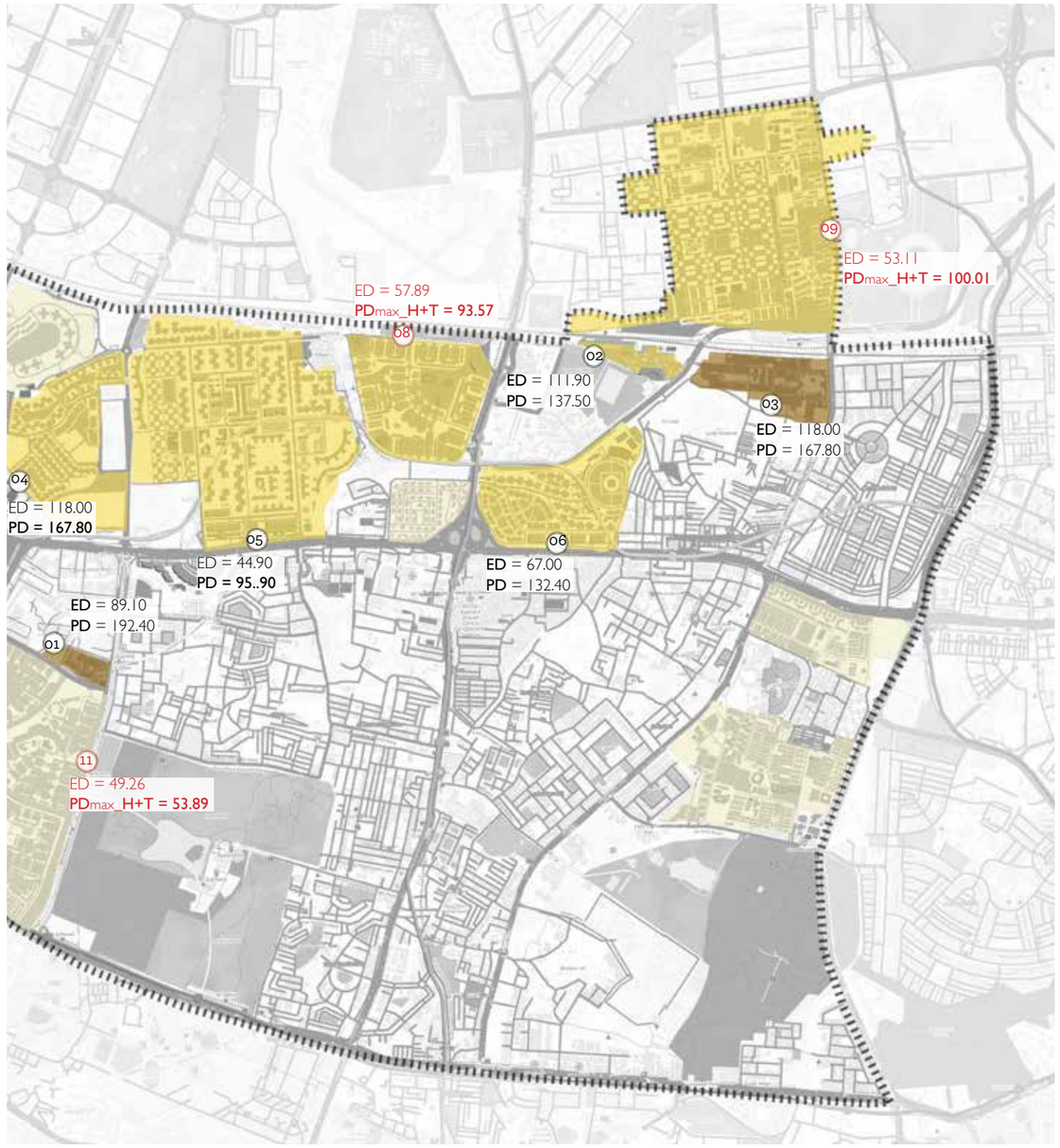
5.3 Proposed Densities

GPRA Colonies which are redeveloped or under the process of same, as in the year 2020.			
GPRA Colony		ED (DU/ha)	PD (DU/ha)
01	Mohammadpur	89.10	192.40
02	Thyagraj	111.90	137.50
03	Kasturba	118.00	167.80
04	Netaji Nagar	62.70	106.80
05	Sarojini Nagar	44.90	95.90
06	East Kidwai Nagar	67.00	132.40
07	New Moti Bagh		11.04

GPRA Colonies which have scope for redevelopment after the year 2020.			
GPRA Colony		ED (DU/ha)	PDmax_H+T (DU/ha)
08	Laxmi Bai Nagar	57.89	**93.57**
09	Lodhi Colony	53.11	**100.01**
10	Sector 01, RK Puram	61.91	**41.53**
11	Sector 02, RK Puram	54.36	**19.66**
12	Sector 03, RK Puram	41.47	**66.67**
13	Sector 04, RK Puram	33.54	**66.13**
14	Sector 05, RK Puram	45.77	**40.56**
15	Sector 07, RK Puram	38.82	**18.98**

Map 5.1 | Map depicting Existing and Proposed Densities within the Study Zone.





LEGENDS

ED
Density before Redevelopment

PD
Proposed Density for Colonies which are under the redevelopment process as in the year 2020

PDmax_H+T
Maximum Proposed Density considering AAI Height regulation and Existing Trees for Colonies which have potential of redevelopment after the year 2020 .

Density | 1-70 DU/ha

Density | 71-140 DU/ha

Density | 141-200 DU/ha

Colonies already redeveloped or proposed for redevelopment, as in year 2020.

Colonies with potential for redevelopment in future.

5.4 Assessment Index

(Quantitative and Qualitative)

Note: All the √ ticks are counted towards the total assessment to evaluate a project's performance.

Maximum Score =156

Score Range
Poor | 0 - 52
Average | 52 -104
Good | 104 - 156

QUALITATIVE FACTORS

			If applicable (then select column below)	COMFORT																				SUSTAINABILITY										IDENTITY							SATISFACTION QUO.					
				Diversity and distribution			Circulation											Design element							Environment and micro climate aspects										Visual aspects				Spatial aspects			Residents satisfaction					
				Building typology variation	Accessibility		Macro scale				Micro scale							Equitable distribution of							Interactive environment														Experiential quality of the built environment			Attractive environment			Behavior		
					Within site	To city networks	Pedestrian friendliness	Walking alone	Traffic safety for children	Nearness to leisure activity	Well defined access points	Cycleability	Adequate parking space	Adaptations and universal accessibility	Sidewalks for pedestrian movement		Adequate street width with shade and lighting	Lighting elements	Shading elements	Open spaces	Safe main entrances	Greenscape and trees	Screening of services	Use of local materials	Preservation of top soil	Protecting existing water bodies	Heat island mitigation	Maintains natural topography	On-site renewable energy	0% discharge(solid waste & water)	Maintains Microflora & Microfauna	Spaces for relaxation	Outdoor spaces for social gathering	Facilities for physical activity	Entry sequences	Nodes as strategic points (squares & junctions)	Identifiable paths in the urban landscape	Landmarks as points of orientation	Building type and height variation	Building material quality	Architectural details	Children's play areas	Stimulating outdoor environment	Existence of green spaces	Social interaction	Walkability	Children's interaction
	If applicable (then select column ahead)			√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
QUALITATIVE FACTORS																																														
SITE PLANNING																																														
1	TREE CUT FACTOR I **TCF**	Fill value																																												
	Ideal value ≤ 0.2	0	√																√		√			√		√	√			√												√	√			
	1.1	No. of existing trees																																												
	1.2	No. of trees cut																																												
	1.3	Increased number of DU																																												
2	TREE ECOLOGY DAMAGE FACTOR I **EDF**	Fill value																																											
	Ideal value ≤ 0.2	0	√																				√	√		√	√			√	√	√	√										√		
	2.1	No. of trees cut with calibre more than 300mm (girth 1000mm)																																												
	2.2	No. of native trees cut																																											
3	ROAD COVER FACTOR I **RCF**	Fill value																																												
	Ideal value ≤ 0.2	0	√																√					√		√	√			√														
	3.1	Road area																																												
	3.2	Site area																																												
4	PARKING REGULATION FACTOR I **PRF**	Fill value																																											
	Ideal value ≤ 0.2	0	√				√	√	√	√			√	√			√	√	√	√	√	√	√	√	√	√	√	√																
	4.1	Stilt parking number provided																																												
	4.2	Surface parking provided																																												
	4.3	MLCP parking provided																																												
	4.4	Basement parking provided																																												
5	PEDESTRIAN DISCOMFORT FACTOR I **PDF**	Fill value																																												
	Ideal value ≤ 0.2	0	√		√	√	√	√	√	√	√	√		√	√		√	√	√	√	√	√	√	√	√	√	√	√				√		√	√					√	√	√	√	√	√
	5.1	Pedestrian continuity																																												
	5.2	Unshaded walkways																																												
	5.3	Walkways devoid of greens																																												
	5.4	Unsignalized pedestrian crossings																																												
	5.5	Average walking distance for Type II & Type III > 800 to social infrastructure spaces																																												
	5.6	Average walking distance for Type II & Type III > 800 to the nearest transit hub																																												
6	OPEN SPACES QUALITY	No value					√	√		√	√									√		√									√	√	√	√	√	√	√				√	√	√	√	√	√
	6.1	Green spaces adjacent to each residential tower/block	√																																												
	6.2	Consolidated green areas for diversified age-groups	√																																											
BUILT FORM																																														
6	CORE INEFFICIENCY FACTOR I **CIF**	Fill value																																												
	Ideal value ≤ 0.2		√											√																																
	6.1	Core & circulation area																																													
	6.2	DU area																																													
7	BLOCKS AND THEIR PLACEMENT	No value	√	√	√	√	√	√		√	√								√	√	√	√		√										√	√	√	√				√	√	√	√	√	√
	Clustering of Blocks																																													

FINDINGS OF DUAC

ANNEXURES

A.1 CLASSIFICATION OF TYPOLOGIES as per CPWD

F.NO. 22011/01/2008-W.5
Govt. of India, Ministry of Urban Development (Works Division), DG/ ARCH/ 6
Source : https://www.mea.gov.in/Images/attach/Annexure_A.pdf

Revision of Plinth Area Norms for General Pool Residential Accommodation (GPRA) to be considered for Central Govt. Employees and its applicability to all Govt. Departments

Plinth Area Norms- for General Pool Residential Accommodation

Type	Unit Area (Main) (Sq.m.)	Staircase/ Circulation (Sq.m.)	Balcony (Sq.m.)	Utility Area/ Balcony (Sq.m.)	ECS Proposed per unit
Type I	40.80	7.00	6.50	2.50	0.5
Type II	54.00	7.00	6.50	2.50	1.0
Type III	63.00	7.00	6.50	3.50	1.3
Type IV					
Main Unit	86.00	7.00	12.00	3.50	2.0
Servant Room - 1	17.00		2.50		
Type IV (Special)					
Main Unit	106.00	7.00	12.00	3.50	2.0
Servant Quarter - 1	17.00		2.50		
Type V					
Main Unit	145.00	7.00	12.00	4.50	2.0
Servant Quarter - 1	21.50		3.50		
Type VI					
Main Unit	203.50	7.00	21.50	4.50	3.0
Servant Quarters - 1	21.50		3.50		
Type VII					
Main Unit	287.00	7.00	35.00	9.00	3.0
Servant Quarters - 2	2x21.50		4.00		
Type VIII					
Main Unit	403.00	7.00	45.00	12.00	4.0
Servant Quarters - 4	4x21.50	3.50	4.00		

A.2 EXISTING GPRA COLONIES IN DELHI as per DoE

S.No.	Location	Total number of DUs
1	Asiad Village CompleX	1
2	Ber Sarai	1
3	Chankya Enclave	1
4	Chanakya Rail Enclave	1
5	Gulmohar Park	1
6	Hari Nagar	1
7	INA Rajya Sabha Awas	1
8	Karkardooma	1
9	Lahori Gate	1
10	Maharaja Lal Lane	1
11	Minto Road	1
12	Narela Police Colony	1
13	New MS Flats Narmada	1
14	Nimri Colony	1
15	P S Krishna Nagar	1
16	Padam Nagar	1
17	Probyn Road	1
18	Pushpa Vihar	1
19	Rajesh Pilot Lane	1
20	Safdarjang Airport Lane	1
21	Safdarjung Enclave	1
22	Safdarjang Develop Area	1
23	Saket	1
24	Satya Sadan	1
25	Sidhartha Extension	1
26	Soami Nagar	1
27	Thomson Road	1
28	Alipur Road	2
29	Court Lane	2
30	H C Mathur Lane	2
31	Jal Vihar Colony	2
32	k kamraj Lane	2
33	k Kamraj Marg	2
34	Model Town-III	2
35	New Police Line	2
36	Shalimar Bagh	2
37	Shayam Prasad Marg	2
38	Sri Ram Road	2
39	Swajas Delux	2
40	Tees January Marg	2
41	Vikas Puri	2
42	Circular Road	3
43	Hauz Khas	3
44	Jantar Mantar Road	3
45	Jor Bagh Nursery	3
46	Kingsway Camp	3
47	Model Town	3
48	Munirka	3
49	Paschim Vihar	3
50	Prithiraj Road	3
51	Rouse Avenue	3
52	Upper Bela Road	3
53	Dupleix Road	4
54	Dwarka	4
55	Greater Kailash	4
56	Jawahar Market	4
57	Maulana Azad Road	4
58	Mayur Vihar	4
59	Press Lane	4
60	South Avenue Lane	4
61	Tilak Bridge	4
62	Todarmal Road	4
63	Working Girls Hostel	4
64	Bunglow Road	5
65	Chelmsford Road	5
66	Dr Bishambar Das Marg	5
67	Lucknow Road	5
68	Metcalfe House	5
69	Raisina Road	5
70	Talkatora Lane	5
71	Bhagwan Das Road	6
72	Copernicus Lane	6
73	Mother Teresa Crescent	6
74	Race Course Road	6
75	San Martin Marg	6
76	Sunehri Bagh Road	6
77	Atul Grove Road	7
78	DR H C Mathur Lane	7
79	Dupleix Lane	7

S.No.	Location	Total number of DUs
80	Kushak Road	7
81	Mall Road	7
82	Moti Lal Nehru Place	7
83	Rajaji Marg	7
84	Thayagraja Marg	7
85	Vasant Kunj	7
86	Aurangzeb Road	8
87	Guard Barracks	8
88	Park Street	8
89	Tughlak Cresent	8
90	Mathura Road	9
91	Press Block	9
92	Dr Zakir Hussain Marg	10
93	Gulabi Bagh	10
94	Jawahar Lal Nehru Marg	10
95	Krishna Menon Marg	10
96	Park Lane	10
97	Purana Quila Road	10
98	Tughlak Lane	10
99	Dr Rajendra Prasad Road	11
100	Motia Khan	11
101	B R Mehta Curzon Lane	13
102	Moti Lal Nehru Marg	13
103	PT Pant Marg	13
104	Rohini	13
105	Safdarjang Lane	13
106	Talkatora Road	13
107	Rajouri Garden	14
108	Lodhi Garden	15
109	College Road	16
110	Teen Murti Marg	16
111	Wilingdon Cresent	16
112	Telegraph Lane	17
113	Windsor Place	18
114	Gurudwara Rakab Ganj Road	19
115	Tughlak Road	19
116	Todar Mal Square	20
117	Humayun Road	21
118	Teen Murti Lane	21
119	Sujan Singh Park	22
120	Western Court Hostel	22
121	Rajpura Road	23
122	Safdarjang Road	23
123	Tilak Marg	24
124	Brahmaputra Flats	26
125	Cornwallis Road	26
126	M S Flats, Bishambar Das Marg	26
127	Ashoka Road	28
128	Babar Place	28
129	Tansen Marg	28
130	Canning Lane	32
131	Meena Bagh	34
132	Jaisalmer House	36
133	Mahadev Road	37
134	Mirdard Road	43
135	Feroz Shah Road	45
136	Prithviraj Lane	49
137	Minto Road M S Flats	56
138	Akbar Road	61
139	Foch Square	62
140	Kalibari Apartments	62
141	Jam Nagar	69
142	Pandara Park	79
143	Lodhi Estate	80
144	Pusa Road	81
145	Bapa Nagar	82
146	HUDCO Place	84
147	Janpath	87
148	Tilak Lane	90
149	Tagore Road	96
150	Minto Road Old	97
151	Sardar Patel Marg	98
152	Teen Murti House	104
153	Peshwa Road	124
154	South Avenue	125
155	Chitra Gupta Road	126
156	Asia House	131
157	U D P Nehru Nagar	135
158	Shahjahan Road	138
159	Vithal Bhai Patel House	144
160	Mayapuri	146
161	Asian games Village	165
162	New Minto Road Hostel	184
163	Mayapuri Press Colony	185
164	Hanuman Road	195
165	Bharti Nagar	196
166	North Avenue	199
167	Rabindra Nagar	215
168	Vinay Marg	237
169	Deen Dayal Upadhaya Marg	243
170	Andrewz Ganj Extension	256
171	Kaka Nagar	285
172	Aliganj	312
173	Kidwai Nagar West	325
174	Albert Square	340
175	Mandir Marg	362
176	NW Moti Bagh	400
177	Chanakya Puri	430
178	Lancer Road	430
179	Commonwealth Games Village	440
180	New Moti Bagh	492
181	B K S Marg	556
182	Pandara Road	616
183	Curzon Road	747
184	Pragati Vihar	792
185	Panchkuian Road	821
186	HUDCO Place Extension	833
187	Vasant Vihar	854
188	Minto Road Area	936
189	Dev Nagar	1074
190	Kali Bari Marg	1112
191	Andrewz Ganj	1293
192	Shrinivaspuri	1335
193	Moti Bagh	1346
194	Aram Bagh	1594
195	Sadiq Nagar	1610
196	Lodhi Colony	1871
197	Laxmi bai Nagar	1972
198	Timarpur	1984
199	Nanakpura	2105
200	Lodhi Road Complex	2221
201	Netaji Nagar	2408
202	Kasturba Nagar	2494
203	Kidwai Nagar East	2671
204	D I Z Area	3086
205	Sarojini Nagar	3740
206	M B Road	9017
207	R K Puram	11992

Total Number of Dwelling Units **70578**

A.3 DATA INDEX : For 6 GPRA Colonies approved (as in year 2020)

Table A.3.1 | Mohamaddpur

Data Index Quantitative Parameters

A. BUILT FORM

1.	SITE AREA	36,800 sq.m. (3.68 ha)
2.	DWELLING UNITS (number)	708
3.	DENSITY (DU/ha)	192.4
4.	HEIGHT	45
5.	F.A.R.	137.88
6.	GROUND COVERAGE (%)	20.30 % (7470.4 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area	79.7 % (29,329.6 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)	103.3 DU's/ha

B. SITE PLANNING

7	RETAINING THE EXISTING			
	7.1	Primary Street Patterns retained (approx. %)		30 - 40 %
	7.2	Percentage of Trees Retained		61 %
8.	BASEMENT			
	8.1	Area % (of site area)		0
	8.2	Extent		0
9	PARKING NUMBER			
	9.1	Total Parking number proposed		702
		9.1.1	Stilt	-
		9.1.2	Surface	288
		9.1.3	MLCP (mechanized & ramp)	414
		9.1.4	Basement	-
10	CIRCULATION			
	10.1	Pedestrian Network		
		6.1.1	Character	
			6.1.1.1 Continuous network without any break points.	Provided
			6.1.1.2 Covered/ Shaded walkways	Not Provided
			6.1.1.3 Walkways amidst green areas.	Provided
			6.1.1.4 Planned/Designed to have a minimum walking distance	Partially
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)	
			6.1.2.1 To nearest Transit-hub	0.8 (Bhikaji Cama Place Metro station)
			6.1.2.1 To social infrastructure and green spaces	0.5
	10.2	Vehicular		
		6.2.1	Tower Drop-off points	Provided
		6.2.2	% of Paved Area at ground level (paved area/open area)	24.49 %
11	TREE CUT SPECIFICATIONS			
	11.1	Number of Existing Trees	634	
	11.2	Number of Tree Cut	247	
	11.3	Tree Cut Percentage	38.96 %	
	11.4	Specifications		

No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
	DATA NOT PROVIDED				

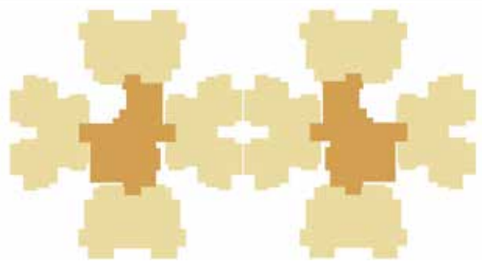
11.5	Number of Native Trees Cut	DATA NOT PROVIDED
11.6	Number of Trees cut with girth more than 200/300mm	DATA NOT PROVIDED
11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED
12	ADDITIONAL TREES PLANTED SPECIFICATIONS	
12.1	Number of additional trees planted	DATA NOT PROVIDED
12.2	Specifications	

No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous
	DATA NOT PROVIDED		

13	OPEN SPACES QUALITY		
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided
	13.2	Consolidated green areas for diversified age-groups.	Partially
	13.3	Well-connected green spaces within premises	Fragmented

C. BLOCKS AND THEIR PLACEMENT

13	BUILT-UP AREA & BLOCK CORE TYPOLOGY				
	Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core area per floor (sq.m.)	**Core Area per sq.m. of DU's Area**
	II - 8 to a Core	614.64	500.55	114.09	0.227
	III - 8 to a Core	693.55	581.74	111.81	0.192
14	CLUSTERING OF BLOCKS				



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.
Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	Church Road , ROW is 24 m but as per Zonal Development Plan is 30 M, 3m left for road widening.

Table A.3.1 | Data Index of Quantitative Parameters for Mohammadpur re-development proposal

Table A.3.2 | Thyagraj

Data Index_Quantitative Parameters

A. BUILT FORM

1.	SITE AREA	53,800 sq.m. (5.38 ha)
2.	DWELLING UNITS (number)	492
3.	DENSITY (DU/ha)	11.04 DU's/ha
4.	HEIGHT	31.95 m
5.	F.A.R.	107.56
6.	GROUND COVERAGE (%)	14.25 % (7,666.5 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area	85.75 % (46,133.5 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)	25.6 DU's/ha

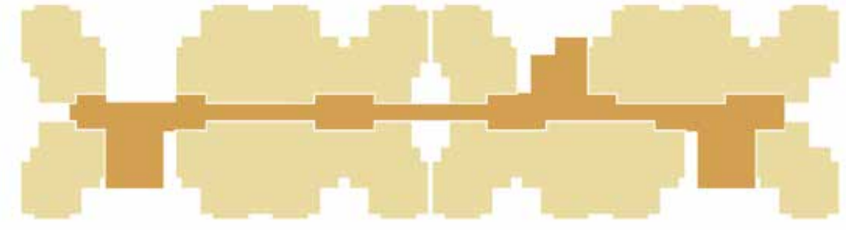
B. SITE PLANNING

7	RETAINING THE EXISTING			
	7.1	Primary Street Patterns retained (approx. %)		40 - 50 %
	7.2	Percentage of Trees Retained		89 %
8.	BASEMENT			
	8.1	Area % (of site area)		0
	8.2	Extent		0
9	PARKING NUMBER			
	9.1	Total Parking number proposed		1036
	9.1.1	Stilt		157
	9.1.2	Surface		879
	9.1.3	MLCP (mechanized & ramp)		-
	9.1.4	Basement		-
10	CIRCULATION			
	10.1	Pedestrian Network		
		6.1.1	Character	
			6.1.1.1	Continuous network without any break points.	Not Provided
			6.1.1.2	Covered/ Shaded walkways	Not Provided
			6.1.1.3	Walkways amidst green areas.	Provided
			6.1.1.4	Planned/Designed to have a minimum walking distance	Provided
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)		
			6.1.2.1	To nearest Transit-hub	0.9 (Bus Stop)
			6.1.2.1	To social infrastructure and green spaces	0.3
	10.2	Vehicular		
		6.2.1	Tower Drop-off points		Provided
		6.2.2	% of Paved Area at ground level (paved area/open area)		48.59 %

11	TREE CUT SPECIFICATIONS					
	11.1	Number of Existing Trees	349			
	11.2	Number of Tree Cut	40			
	11.3	Tree Cut Percentage	11 %			
	11.4	Specifications				
		No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
			DATA NOT PROVIDED				
	11.5	Number of Native Trees Cut	DATA NOT PROVIDED				
	11.6	Number of Trees cut with girth more than 200/300mm	DATA NOT PROVIDED				
	11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED				
12	ADDITIONAL TREES PLANTED SPECIFICATIONS					
	12.1	Number of additional trees planted	DATA NOT PROVIDED			
	12.2	Specifications				
		No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous	
			DATA NOT PROVIDED			
13	OPEN SPACES QUALITY					
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided			
	13.2	Consolidated green areas for diversified age-groups.	Not Provided			
	13.3	Well-connected green spaces within premises	Connected			

C. BLOCKS AND THEIR PLACEMENT

13	BUILT-UP AREA & BLOCK CORE TYPOLOGY				
	Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core & Circulation area per floor (sq.m.)	Core Area per sq.m. of DU's Area
	II - 12 to a Core	1103.24	888.72	214.52	0.241
	II - 16 to a Core	1429.56	1184.96	244.6	0.206
	III - 8 to a Core	822.07	649.15	172.92	0.266
	III - 16 to a Core	1642.43	1315.49	326.94	0.248
14	CLUSTERING OF BLOCKS				



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.
Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	-

Table A.3.2 | Data Index of Quantitative Parameters for Thyagraj Nagar Re-development proposal

ANNEXURES

Table A.3.3 | Kasturba Nagar

Data Index Quantitative Parameters

A. BUILT FORM

1.	SITE AREA	2,13,700 sq.m. (21.37 ha)
2.	DWELLING UNITS (number)	3585
3.	DENSITY (DU/ha)	167.8 DU's/ha
4.	HEIGHT	43.95 m
5.	F.A.R.	193.3
6.	GROUND COVERAGE (%)	14.20 % (30,345.4 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area	85.8 % (1,83,354.6 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)	49.8 DU's/ha

B. SITE PLANNING

7	RETAINING THE EXISTING			
	7.1	Primary Street Patterns retained (approx. %)		20 - 30 %
	7.2	Percentage of Trees Retained		66.33 %
8.	BASEMENT			
	8.1	Area % (of site area)		38.49 %
	8.2	Extent		
9	PARKING NUMBER			
	9.1	Total Parking number proposed		6306
		9.1.1	Stilt	408
		9.1.2	Surface	880
		9.1.3	MLCP (mechanized & ramp)	129
		9.1.4	Basement	4889
10	CIRCULATION			
	10.1	Pedestrian Network		
		6.1.1	Character	
			6.1.1.1 Continuous network without any break points.	Provided
			6.1.1.2 Covered/ Shaded walkways	Not Provided
			6.1.1.3 Walkways amidst green areas.	Provided
			6.1.1.4 Planned/Designed to have a minimum walking distance	Provided
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)	
			6.1.2.1 To nearest Transit-hub	1.6 (Metro station)
			6.1.2.1 To social infrastructure and green spaces	0.7
	10.2	Vehicular		
		6.2.1	Tower Drop-off points	
		6.2.2	% of Paved Area at ground level (paved area/open area)	28.8 %

11	TREE CUT SPECIFICATIONS		
	11.1	Number of Existing Trees	1203
	11.2	Number of Tree Cut	405
	11.3	Tree Cut Percentage	33.67 %
	11.4	Specifications	

No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
4	Kikkar	Native	1300 - 2500	-	-
22	Bakan	Native	300 - 1600	-	-

* For entire list, Refer Annexure Page number 165

11.5	Number of Native Trees Cut	12
11.6	Number of Trees cut with girth more than 300mm	369
11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED

12	ADDITIONAL TREES PLANTED SPECIFICATIONS		
	12.1	Number of additional trees planted	DATA NOT PROVIDED
	12.2	Specifications	

No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous
	DATA NOT PROVIDED		

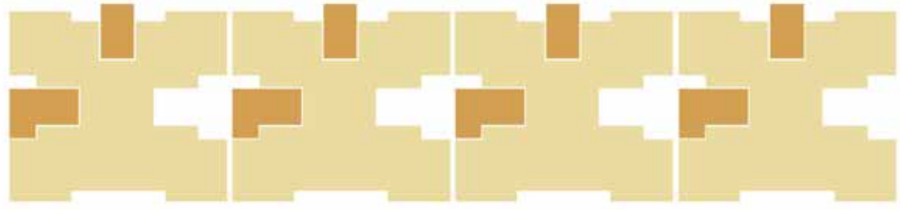
13	OPEN SPACES QUALITY		
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided
	13.2	Consolidated green areas for diversified age-groups.	Partially
	13.3	Well-connected green spaces within premises	Fragmented

C. BLOCKS AND THEIR PLACEMENT

13 BUILT-UP AREA & BLOCK CORE TYPOLOGY

Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core & Circulation area per floor (sq.m.)	Core Area per sq.m. of DU's Area
II - 4 to a Core	389.55	287.59	101.96	0.355
III - 4 to a Core	420.20	320.80	99.40	0.310
IV - 4 to a Core	642.69	519.44	123.25	0.237
V - 4 to a Core	914.98	775.91	139.07	0.179
VI - 4 to a Core	955.64	806.30	149.34	0.185

14 CLUSTERING OF BLOCKS



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.
Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	5046
	15.2	Peripheral Road Widths	-

Table A.3.3 | Data Index of Quantitative Parameters for Kasturba Nagar re-development proposal

ANNEXURES

KASTURBA NAGAR | TREE CUT SPECIFICATIONS					
No. of trees	Tree Specie	Native / Non-Native Tree	Girth (more than 300 mm)	Age	Life Span
4	Kikkar	Native	1300 - 2500	-	-
22	Bakan	Native	300 - 1600	-	-
12	Neem	Native	400 - 1850	-	-
55	Alstoniya	Native	400 - 2000	-	-
27	Papari	Native	400 - 1100	-	-
37	Sahtoot	Native	300 - 1650	-	-
11	Gullar	Native	750 - 2450	-	-
2	Shesham	Native	850	-	-
53	Fykash	Non - Native	400 - 1800	-	-
6	Ber	Native	700 - 1300	-	-
5	Shemal	Non - Native (Naturalized)	700 - 1900	-	-
12	Jamun	Native	350 - 1300	-	-
10	Aam	Native	300 - 1700	-	-
6	Kannail	Non - Native	300 - 700	-	-
6	Pilkhan	Native	450 - 1900	-	-
3	Santra	Non - Native	400 - 450	-	-
8	Putranjiva	Native	450 - 950	-	-
5	Bel	Native	500 - 1000	-	-
54	Ashok	Native	400 - 1200	-	-
1	Safeda	Non - Native	1200	-	-
3	Bargad	Native	800 - 1250	-	-
1	Mehandi	Non - Native	600	-	-
2	Jalebi	Non - Native (Naturalized)	1000 - 1200	-	-
2	Pipal	Native	900 - 1900	-	-
1	Leman	Native	600	-	-
1	Sirash	-	900	-	-
3	Bottle pam	Non - Native	800 - 1200	-	-
12	Sajina	Native	350 - 1200	-	-
2	Amaltash	Native	300 - 1280	-	-
1	Molsari	-	300	-	-
1	Saghwan	Native	750	-	-
1	Dad Tree	-	1600	-	-
Total - 369					

Table A.3.4 | Srinivaspuri

Data Index_Quantitative Parameters

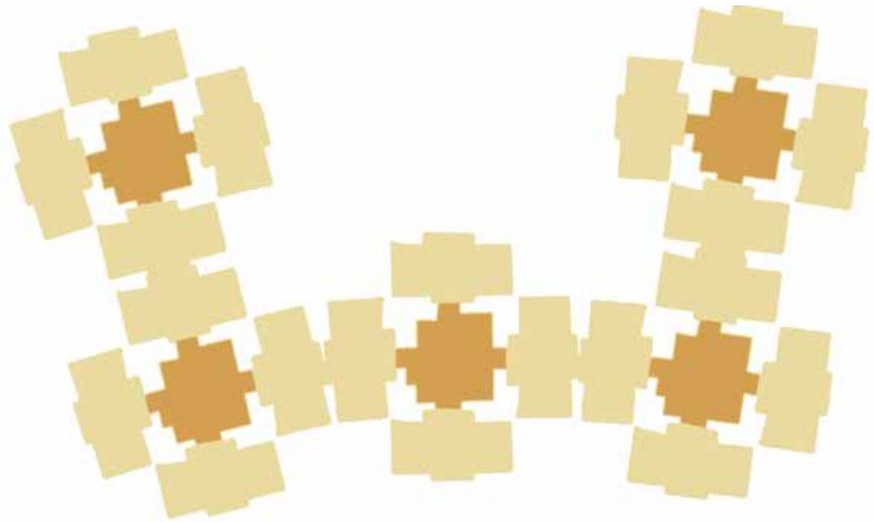
A. BUILT FORM					
1.	SITE AREA				2,95,900 sq.m. (29.59 ha)
2.	DWELLING UNITS (number)				4994
3.	DENSITY (DU/ha)				168.77 DU's/ha
4.	HEIGHT				89
5.	F.A.R.				199.92
6.	GROUND COVERAGE (%)				22.86 % (67642.74 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area				77.13 % (2,28,257 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)				120.5 DU's/ha
B. SITE PLANNING					
7	RETAINING THE EXISTING				
	7.1	Primary Street Patterns retained (approx. %)			20 - 30 %
	7.2	Percentage of Trees Retained			59.68 %
8.	BASEMENT				
	8.1	Area % (of site area)			24.61 %
	8.2	Extent			
9	PARKING NUMBER				
	9.1	Total Parking number proposed			9136
		9.1.1	Stilt		1992
		9.1.2	Surface		1169
		9.1.3	MLCP (mechanized & ramp)		3984
		9.1.4	Basement		1991
10	CIRCULATION				
	10.1	Pedestrian Network			
		6.1.1	Character		
			6.1.1.1	Continuous network without any break points.	Provided
			6.1.1.2	Covered/ Shaded walkways	Not Provided
			6.1.1.3	Walkways amidst green areas.	Provided
			6.1.1.4	Planned/Designed to have a minimum walking distance	Provided
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)		
			6.1.2.1	To nearest Transit-hub	0.6 (Metro station)
			6.1.2.1	To social infrastructure and green spaces	1.3
	10.2	Vehicular			
		6.2.1	Tower Drop-off points		
		6.2.2	% of Paved Area at ground level (paved area/open area)		21.34 %

11	TREE CUT SPECIFICATIONS						
	11.1	Number of Existing Trees	2763				
	11.2	Number of Tree Cut	1114				
	11.3	Tree Cut Percentage	40.32 %				
	11.4	Specifications					
		No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
	11.5	Number of Native Trees Cut	DATA NOT PROVIDED				
	11.6	Number of Trees cut with girth more than 200/300mm	DATA NOT PROVIDED				
	11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED				
12	ADDITIONAL TREES PLANTED SPECIFICATIONS						
	12.1	Number of additional trees planted	DATA NOT PROVIDED				
	12.2	Specifications					
		No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous		
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
13	OPEN SPACES QUALITY						
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided				
	13.2	Consolidated green areas for diversified age-groups.	Provided				
	13.3	Well-connected green spaces within premises	Connected				

C. BLOCKS AND THEIR PLACEMENT

13	BUILT-UP AREA & BLOCK CORE TYPOLOGY				
	Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core & Circulation area per floor (sq.m.)	Core Area per sq.m. of DU's Area
	II - 8 to a Core	692.92	511.04	181.88	0.355
	III - 8 to a Core	780.86	597.17	183.69	0.307
	IV - 4 to a Core	667.89	489.33	178.56	0.364
	V - 4 to a Core	912.03	723.47	180.87	0.260

14	CLUSTERING OF BLOCKS



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	-

Table A.3.4 | Data Index of Qauntitative Parameters for Srinivaspuri re-development proposal

Table A.3.5 | Netaji Nagar

Data Index_Quantitative Parameters

A. BUILT FORM

1.	SITE AREA	4,42,400 sq.m. (44.24 ha)
2.	DWELLING UNITS (number)	4727
3.	DENSITY (DU/ha)	106.8 DU/ha
4.	HEIGHT	36.6 m
5.	F.A.R.	180.5
6.	GROUND COVERAGE (%)	24.3 % (107503.2 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area	75.7 % (334896.8 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)	44.2 DU's/ha

B. SITE PLANNING

7	RETAINING THE EXISTING			
	7.1	Primary Street Patterns retained (approx. %)		40 - 50 %
	7.2	Percentage of Trees Retained		60.06 %
8.	BASEMENT			
	8.1	Area % (of site area)		49.12 %
	8.2	Extent		Extended from building plinth line.
9	PARKING NUMBER			
	9.1	Total Parking number proposed		10867
	9.1.1	Stilt		0
	9.1.2	Surface		1087
	9.1.3	MLCP (mechanized & ramp)		0
	9.1.4	Basement		9780
10	CIRCULATION			
	10.1	Pedestrian Network		
		6.1.1	Character	
			6.1.1.1 Continuous network without any break points.	Provided
			6.1.1.2 Covered/ Shaded walkways	Not Provided
			6.1.1.3 Walkways amidst green areas.	Provided
			6.1.1.4 Planned/Designed to have a minimum walking distance	Not Provided
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)	
			6.1.2.1 To nearest Transit-hub	0.5 (Metro station)
			6.1.2.1 To social infrastructure and green spaces	0.6
	10.2	Vehicular		
		6.2.1	Tower Drop-off points	
		6.2.2	% of Paved Area at ground level (paved area/open area)	28.84 %

11	TREE CUT SPECIFICATIONS					
	11.1	Number of Existing Trees	3906			
	11.2	Number of Tree Cut	1560			
	11.3	Tree Cut Percentage	39.94 %			
	11.4	Specifications				
		No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
			DATA NOT PROVIDED				
	11.5	Number of Native Trees Cut	DATA NOT PROVIDED				
	11.6	Number of Trees cut with girth more than 200/300mm	DATA NOT PROVIDED				
	11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED				
12	ADDITIONAL TREES PLANTED SPECIFICATIONS					
	12.1	Number of additional trees planted	DATA NOT PROVIDED			
	12.2	Specifications				
		No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous	
			DATA NOT PROVIDED			
			DATA NOT PROVIDED			
			DATA NOT PROVIDED			
13	OPEN SPACES QUALITY					
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided			
	13.2	Consolidated green areas for diversified age-groups.	Provided			
	13.3	Well-connected green spaces within premises	Fragmented			

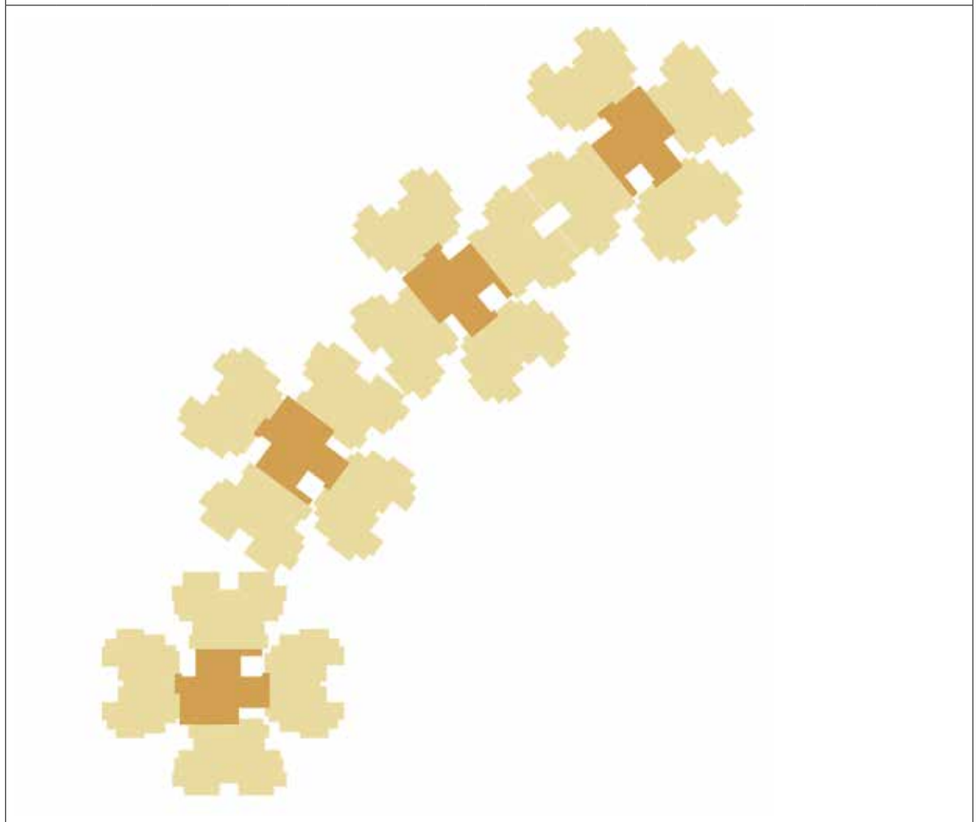
C. BLOCKS AND THEIR PLACEMENT

13 BUILT-UP AREA & BLOCK CORE TYPOLOGY

Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core & Circulation area per floor (sq.m.)	**Core Area per sq.m. of DU's Area**
II - 8 to a Core	653.06	534.01	119.05	0.222
III - 8 to a Core	752.16	629.16	123.0	0.195
IV - 4 to a Core	607.55	495.17	112.38	0.226
V - 4 to a Core	842.03	733.65	108.38	0.147

ANNEXURES

14	CLUSTERING OF BLOCKS		



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY			
15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	-

Table A.3.5 | Data Index of Qauntitative Parameters for Netaji Nagar re-development proposal

Table A.3.6 | Sarojini Nagar

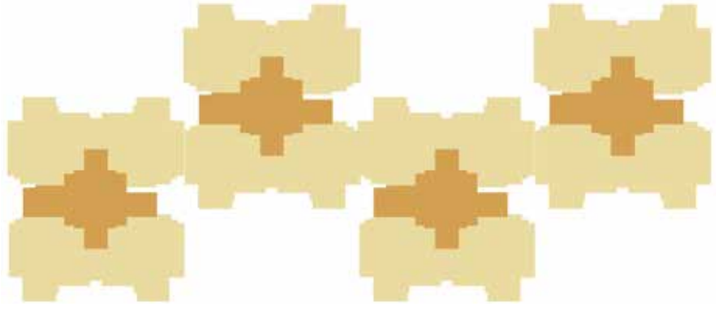
Data Index_Quantitative Parameters

A. BUILT FORM					
1.	SITE AREA				1044832 sq.m. (104.48 ha)
2.	DWELLING UNITS (number)				10905
3.	DENSITY (DU/ha)				119.522 DU/ha
4.	HEIGHT				40.25 M
5.	F.A.R.				1346299.74 sq.m.
6.	GROUND COVERAGE (%)				19.11 % (199667.395 sq.m.)
7.	OPEN AREA (site area - ground coverage) % of site area				80.89 % (845125.11 sq.m.)
8.	INCREASED DENSITY (proposed density - density before re-development)				79.422 DU/ha
B. SITE PLANNING					
7	RETAINING THE EXISTING				
	7.1	Primary Street Patterns retained (approx. %)			90 %
	7.2	Percentage of Trees Retained			70.91 %
8.	BASEMENT				
	8.1	Area % (of site area)			36 %
	8.2	Extent			Along Building plinth line.
9	PARKING NUMBER				
	9.1	Total Parking number proposed			31761 ECS
		9.1.1	Stilt		0
		9.1.2	Surface		785
		9.1.3	MLCP (mechanized & ramp)		240 (only for commercial)
		9.1.4	Basement		30736
10	CIRCULATION				
	10.1	Pedestrian Network			
		6.1.1	Character		
			6.1.1.1	Continuous network without any break points.	Provided
			6.1.1.2	Covered/ Shaded walkways	Not Provided
			6.1.1.3	Walkways amidst green areas.	Provided
			6.1.1.4	Planned/Designed to have a minimum walking distance	Provided
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)		
			6.1.2.1	To nearest Transit-hub	0.8 (Metro station)
			6.1.2.1	To social infrastructure and green spaces	0.5
	10.2	Vehicular			
		6.2.1	Tower Drop-off points		Provided
		6.2.2	% of Paved Area at ground level (paved area/open area)		0.99 % or 23.58 % (7606.21 or 199355.32 sq.m.)

11	TREE CUT SPECIFICATIONS						
	11.1	Number of Existing Trees	12926				
	11.2	Number of Tree Cut	3671				
	11.3	Tree Cut Percentage	28.40 %				
	11.4	Specifications					
		No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
			DATA NOT PROVIDED				
	11.5	Number of Native Trees Cut	DATA NOT PROVIDED				
	11.6	Number of Trees cut with girth more than 200/300mm	DATA NOT PROVIDED				
	11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)	DATA NOT PROVIDED				
12	ADDITIONAL TREES PLANTED SPECIFICATIONS						
	12.1	Number of additional trees planted	DATA NOT PROVIDED				
	12.2	Specifications					
		No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous		
			DATA NOT PROVIDED				
13	OPEN SPACES QUALITY						
	13.1	Small-open spaces adjacent to each residential tower/ block.	Provided				
	13.2	Consolidated green areas for diversified age-groups.	Provided				
	13.3	Well-connected green spaces within premises	Connected				

C. BLOCKS AND THEIR PLACEMENT

13	BUILT-UP AREA & BLOCK CORE TYPOLOGY				
	Type	Total Built-up Area of a Floor (DU area+core & circulation) (sq.m.)	DU's Area (sq.m.)	Core & Circulation area per floor (sq.m.)	Core Area per sq.m. of DU's Area
	II - 8 to a Core	651.63	530.64	120.99	0.227
	III - 8 to a Core	731.61	606.77	124.84	0.205
	IV - 4 to a Core	614.13	504.31	109.82	0.217
	V - 4 to a Core	842.03	738.67	103.36	0.139
14	CLUSTERING OF BLOCKS				



Core Area | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

Dwelling Unit Area (DU Area)| Built-up Area of the Dwelling Unit including Balconies area.

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	Africa Avenue and Ring road are proposed for road widening.

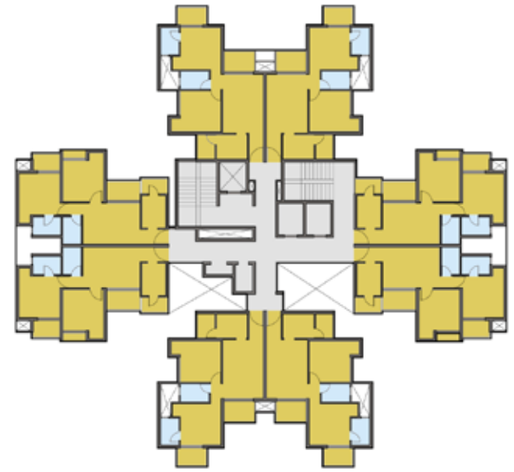
Table A.3.6 | Data Index of Qauntitative Parameters for Sarojini Nagar re-development proposal

A.4 TOWER UNIT PLANS | Referred for Demonstrations

A.4.1. TYPE II

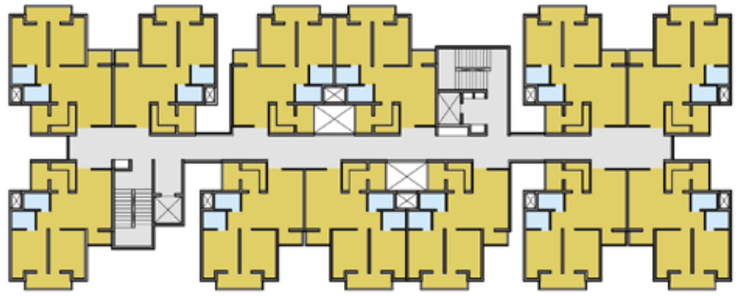
Core 8

Source | Sarojini Nagar Project
Architect | Gian P Mathur Associates Private Limited



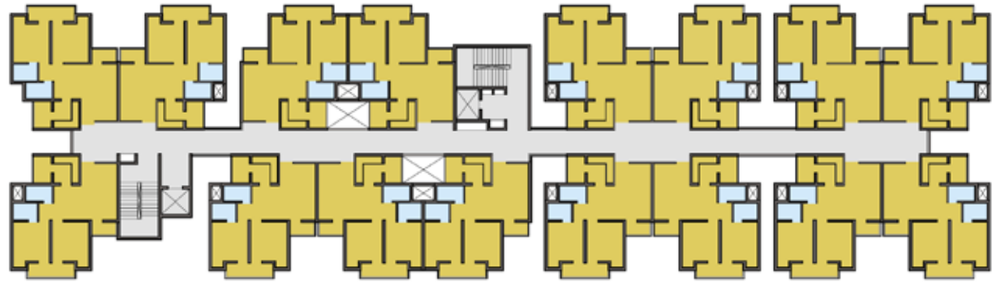
Core 12

Source | Thyagraj Nagar Project
Architect | Benjamin Benjamin and Vats



Core 16

Source | Thyagraj Nagar Project
Architect | Benjamin Benjamin and Vats



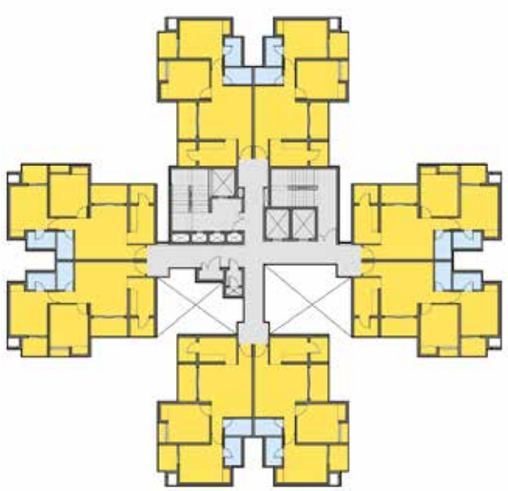
TYPE II				
Number of DU per floor	Total Built-up Area of a Floor (DU area+core) (sq.m.)	Core Area[1] per floor (sq.m.)	DU's[2] Area (sq.m.)	Core Inefficiency Factor | CIF
	A = B+C	**B**	**C**	**CIF = B/C**
8	651.63	120.99	530.64	**0.227**
12	1103.24	214.52	888.72	**0.241**
.16	1429.56	**244.6**	1184.96	**0.206**

[1] Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.
[2] Core Area (DU Area) | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

A.4.2. TYPE III

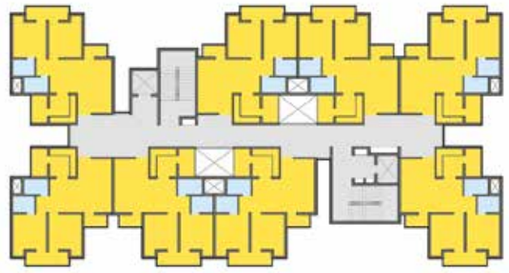
Core 8 | Option 01

Source | Sarojini Nagar Project
Architect | Gian P Mathur Associates Private Limited



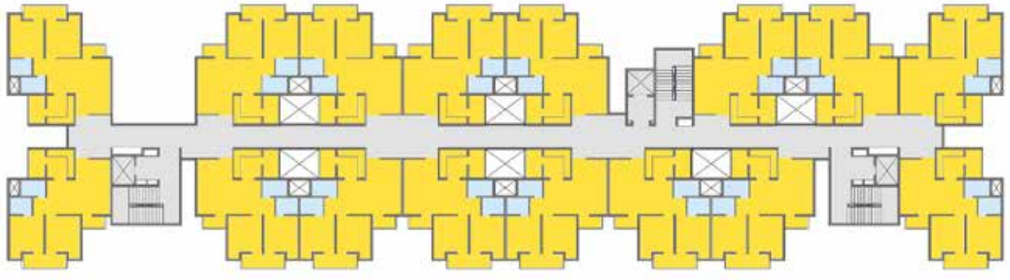
Core 8 | Option 02

Source | Thyagraj Nagar Project
Architect | Benjamin Benjamin and Vats



Core 16

Source | Thyagraj Nagar Project
Architect | Benjamin Benjamin and Vats



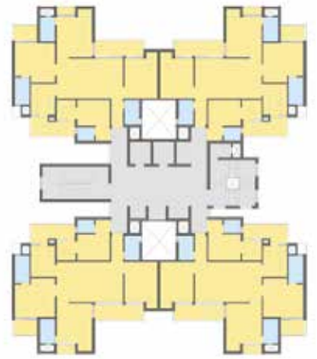
TYPE III				
Number of DU per floor	Total Built-up Area of a Floor (DU area+core) (sq.m.)	Core Area[2] per floor (sq.m.)	DU's[1] Area (sq.m.)	Core Inefficiency Factor | CIF
	A = B+C	**B**	**C**	**CIF = B/C**
8 (option 01) sarojini	731.61	124.84	606.77	**0.205**
8 (option 02) thyagraj	822.07	172.92	649.15	0.266
16	1642.43	326.94	1315.49	0.248

[1] Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.
[2] Core Area (DU Area) | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

A.4.3 TYPE IV

Core 4

Source | Sarojini Nagar Project
Architect | Gian P Mathur Associates Private Limited

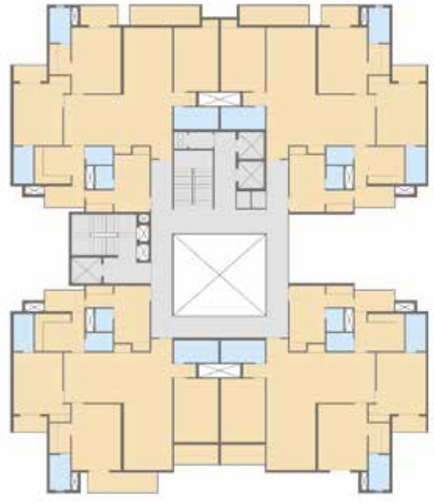


TYPE IV				
Number of DU per floor	Total Built-up Area of a Floor (DU area+core) (sq.m.)	Core Area per floor (sq.m.)	DU's Area (sq.m.)	Core Inefficiency Factor | CIF
	A = B+C	**B**	**C**	**CIF = B/C**
4	614.13	109.82	504.31	**0.217**

A.5.4 TYPE V

Core 4

Source | Sarojini Nagar Project
Architect | Gian P Mathur Associates Private Limited



TYPE V				
Number of DU per floor	Total Built-up Area of a Floor (DU area+core) (sq.m.)	Core Area[2] per floor (sq.m.)	DU's[1] Area (sq.m.)	Core Inefficiency Factor | CIF
	B+C	**B**	**C**	**CIF = B/C**
4	651.63	120.99	530.64	**0.227**

[1] Dwelling Unit Area (DU Area) | Built-up Area of the Dwelling Unit including Balconies area.
[2] Core Area (DU Area) | Built-up Area including Stair Case, Service Shafts/Core, Lifts and Circulation Area.

A.5 Mohammadpur | Assessment Index

(Quantitative and Qualitative)

Note: All the √ ticks are counted towards the total assessment to evaluate a project's performance.

Mohhammadpur Score = 75/156

Score Range:
Poor =0-52, **Average = 52-104**, Good = 104-156

QUALITATIVE FACTORS

No.	Factor	Value	If applicable (then select column below)	Building typology variation	Within site	To city networks	Pedestrian friendliness	Walking alone	Traffic safety for children	Nearness to leisure activity	Well defined access points	Cycleability	Adequate parking space	Adaptations and universal accessibility	Sidewalks for pedestrian movement	Adequate street width with with shade and lighting	Lighting elements	Shading elements	Open spaces	Safe main entrances	Greenscape and trees	Screening of services	Use of local materials	Preservation of top soil	Protecting existing water bodies	Heat island mitigation	Maintains natural topography	On-site renewable energy	0% discharge(solid waste & water)	Maintains Microflora & Microfauna	Spaces for relaxation	Outdoor spaces for social gathering	Facilities for physical activity	Entry sequences	Nodes as strategic points (squares & junctions)	Identifiable paths in the urban landscape	Landmarks as points of orientation	Building type and height	Building material quality	Architectural details	Childrens play areas	Stimulating outdoor environment	Existence of green spaces	Social interaction	Walkability	Children's interaction
				COMFORT																			SUSTAINABILITY											IDENTITY							SATISFACTION QUO.					
				Diversity and distribution			Circulation										Design element						Environment and microclimate aspects											Visual aspects				Spatial aspects			Residents satisfaction					
					Accessibility		Macro scale				Micro scale						Equitable distribution of															Interactive environment							Experiential quality of the built environment			Attractive environment			Behaviour		
	If applicable (then select column ahead)			√	√	√	√	√	×	√	√	×	√	×	√	×	×	×	√	√	√	√	×	√	×	×	×	×	×	√	√	√	√	√	√	√	√	×	×	×	√	√	√	√	√	√
	QUALITATIVE FACTORS																																													
	SITE PLANNING																																													
1	TREE CUT FACTOR I TCF	Fill value																																												
	Ideal value ≤ 0.2	0.52	×																×		×			×		×	×			×											×	×			
1.1	No. of existing trees																																													
1.2	No. of trees cut																																													
1.3	Increased number of DU																																													
2	TREE ECOLOGY DAMAGE FACTOR I EDF	Fill value																																												
	Ideal value ≤ 0.2	NA	-																				-	-		-	-			-	-	-	-										-			
2.1	No. of trees cut with calibre more than 300mm (girth 1000mm)																																													
2.2	No. of native trees cut																																													
3	ROAD COVER FACTOR I RCF	Fill value																																												
	Ideal value ≤ 0.2	0.20	√																√					√		√	√			√																
3.1	Road area																																													
3.2	Site area																																													
4	PARKING REGULATION FACTOR I PRF	Fill value																																												
	Ideal value ≤ 0.2	0.41	×				×	×	×	×			×	×		×	×	×	×	×	×	×	×	×	×	×	×																			
4.1	Stilt parking number provided																																													
4.2	Surface parking provided																																													
4.3	MLCP parking provided																																													
4.4	Basement parking provided																																													
5	PEDESTRIAN DISCOMFORT FACTOR I PDF	Fill value																																												
	Ideal value ≤ 0.2	0.33	×		×	×	×	×	×	×	×			×	×	×	×	×	×	×	×	×	×	×	×	×	×				×		×	×							×	×	×	×	×	×
5.1	Pedestrian continuity																																													
5.2	Unshaded walkways																																													
5.3	Walkways devoid of greens																																													
5.4	Unsignalized pedestrian crossings																																													
5.5	Average walking distance for Type II & Type III > 800 to social infrastructure spaces																																													
5.6	Average walking distance for Type II & Type III > 800 to the nearest transit hub																																													
6	OPEN SPACES QUALITY	No value					√	√		√	√								√		√										√	√	√	√	√	√	√				√	√	√	√	√	√
6.1	Green spaces adjacent to each residential tower/block	√																																												
6.2	Consolidated green areas for diversified age-groups	√																																												
	BUILT FORM																																													
6	CORE INEFFICIENCY FACTOR I CIF	Fill value																																												
	Ideal value ≤ 0.2	0.2	√											√																																
6.1	Core & circulation area																																													
6.2	DU area																																													
7	BLOCKS AND THEIR PLACEMENT	No value	√	√	√	√	√	√		√	√						√	√	√	√		√												√	√	√	√				√	√	√	√	√	√
	Clustering of Blocks																																													

A.6 DEVELOPMENT CONTROL NORMS, as per MPD 2021

MASTER PLAN FOR DELHI 2021
DELHI DEVELOPMENT AUTHORITY

INFRASTRUCTURE REQUIREMENT FOR LAYOUT AT RESIDENTIAL NEIGHBOURHOOD LEVEL

Source : MPD 2021
Chapter 4.0 Shelter, Section 4.4 Development Controls for Residential Use Zone,
Sub-Section 4.4.2 B Use Premises for Residential Use Zone at Community Level and Above, Table 4.2

Provision of Social Infrastructure

Level	Facilities	Area (sq.m.)		
		No.	**Per unit**	**Total**
Neighbourhood Population - 10,000	**Primary School**	**1**	**2,000 - 4,000**	**2,000 - 4,000**
	Sr. Secondary School	**1**	**6,000 - 8,000**	**6,000 - 8,000**
	Religious buildings	**2**	**400**	**400**
	Electric Sub Station 11 KV	**1**	**80**	**80**
	Banquet Halls	**1**	**800 - 2,000**	**800 - 2,000**
	Local Shopping	**1**	**3,000**	**3,000**
	Service Market	**1**	**2,000**	**2,000**
	Informal Bazaar	**1**	**1,000**	**1,000**
	Three Wheeler and Taxi Stand	**1**	**400**	**400**
	Neighbourhood Park	**1**	**10,000**	**10,000**
	Neighbourhood Play Area	**1**	**5,000 - 10,000**	**5,000 - 10,000**
	Underground Water Tank	**1**	**2,000**	**2,000**
	Sewage Pumping Station	**1**	**500**	**500**
	Coaching centres, IT and language training centres	**1**	**500**	**500**
	Dhalao including segregation	**1**	**200**	**200**
	Local Level waste water treatment facility	**1**	**800 - 1200 (as per requirement)**	

CONTROL FOR BUILDING/ BUILDINGS WITHIN RESIDENTIAL PREMISES | GROUP HOUSING

Source : MPD 2021
Chapter 4.0 Shelter, Section 4.4 Development Controls for Residential Use Zone,
Sub-Section 4.4.3 Control for Building/ Buildings within Residential Premises,
Sub Section 4.4.3 B Residential Plot - Group Housing

Residential Plot | Group Housing

Plot Size Minimum (sq.m.)	Maximum Ground Covergae	Maximum F.A.R	Height	Parking
3000	**33.33 % (In case of addition/ alteration of existing DU's for availing balance F.A.R, Ground Covergae upto 40 % may be allowed)**	**200**	**(Subject to clearance from AAI /Fire Department and other statutory bodies)**	**2.0 ECS / 100 sq.m. Built Up Area**

PARKING (Free from F.A.R Structure)

Stilts	Basement
If the building is considered with stilt area of non-habtable height and is proposed to be used for parking, landscaping etc. the stilt floor need not to be included in F.A.R and shall be counted towards height.	**Basement, if considered and used only for parking, utilities and services shall not be controlled towards F.A.R**

PARKING STANDARDS

Use Premises	Residential	Commercial	Public and Semi Public Facilities
Permissible Equivalent Car Spaces (ECS per 100 sq.m. of floor area)	**2**	**3**	**2**

CONTROL FOR BUILDING/ BUILDINGS WITHIN RESIDENTIAL PREMISES | CLUSTER COURT HOUSING

Source : MPD 2021
Chapter 4.0 Shelter, Section 4.4 Development Controls for Residential Use Zone,
Sub-Section 4.4.3 Control for Building/ Buildings within Residential Premises,
Sub Section 4.4.3 C Cluster Court Housing

Cluster Court Housing

Plot Size Minimum (sq.m.)	Maximum Ground Covergae	Maximum F.A.R	Height	Parking
3000	**maximum coverage 100% subject to light and ventilation condition**	**175**	**15 M.**	**2.0 ECS / 100 sq.m. Built Up Area**

PARKING (Free from F.A.R Structure)

Stilts	Basement
If the building is constructed with the stilt area of non-habitable height and is proposed to be used for parking, landscaping etc., the stilt floor need not be included in the FAR but would be counted towards height (within stipulated height).	a) Basement if constructed shall not be included in FAR calculations. b) Basement shall be below the ground floor. Basement area may, however, be extended below the internal courtyard and shaft.

A.7 MoEF | Norm for Tree Plantation

ENVIRONMENTAL CONDITIONS FOR BUILDINGS AND CONSTRUCTIONS

MoEF&CC Notification

Source : Chapter 03, Streamlining Building Plan Approvals and Environmental Clearances, UBBL for Delhi 2016.

For building plans with a total built-up area (BUA) between 5,000 sqm and 1,50,000 sqm, no separate environment clearance will be required provided that the integration of environmental conditions, and thus considering exemption from the requirement of separate environment clearance has been approved and notified by MoEFF&CC.

GREEN COVER (Condition for Built-up Area above 20,000 sq.m. and upto 1,50,000 sq.m.)

- A minimum of 1 tree for every 80 sqm of land shall be planted and maintained. The existing trees will be counted for this purpose. Preference should be given to planting native species.
- Where the trees need to be cut, compensatory plantation in the ratio of 1:3 (i.e. planting of 3 trees for every 1 tree that is cut) shall be done with the obligation to provide continued maintenance for such plantations.

A.8 Delhi Fire Services | Norms

DEPARTMENT OF DELHI FIRE SERVICES

DELHI BUILDING BYE LAW RELATED FIRE

Source : https://dfs.delhigovt.nic.in/content/delhi-building-bye-law-related-fire

11.3 For buildings identified in Bye-law No. 6.2.4.1, the following provisions of means of access shall be ensured

- The width of the main street on which the building abuts shall not be less than 9 meters,
- A building shall abut on a street or streets or upon spaces directly connected from the street by a hard surface approach road, width of which is not less than 9 meters,
- If there are any bends or curves on the approach road, a sufficient width shall be provided at the curve to enable the fire appliances to turn, the turning circle being atleast of 9.0 m radius,
- The approach road to the building and open spaces on its all sides (See Bye-law No. 12.4) unto 6 m width and the layout for the same shall be done in consultation with Chief Fire Officer, Delhi Fire Service and the same shall be of hard surface capable of taking the weight of Fire engine, weighing unto 1(18 tones. The said open space shall be kept free of obstructions and shall be motorable,
- Main entrances to the premises shall be of adequate width to allow easy access to the fire engine and in no case it shall measure less than 5 meters. The entrance gate shall fold back against the compound wall of the premises, thus leaving the exterior access way within the plot free for movement of fire service vehicles. If archway is provided over the main entrance the height of the archway shall not be at a height less than 4 m, and
- For multi-storeyed group housing schemes on one plot, the approach road shall be 9 m in width and between individual buildings; there shall be a space of 6 m around.

12.4 (B) For buildings identified in 8ye-law No. 6.2.4.1 the provisions of exterior open spaces around the buildings shall be as given below:

No.	Ht. of the building up to	Exterior Open spaces to be left our on all sides* (front, rear and sides in each plot)
1.	10 m	3m
2.	15 m	5m
3	18m	6m
4	21 m	7m
5	24 m	8m
6	27 m	9m
7	30 m	10 m
8	35 m	11 m
9	40 m	12 m
10	45 m	13 m
11	50 m	15 m
12	55 m and above	16 m

12.7

- The maximum height of building shall not exceed 1.5 times the width of road abutting plus the front open spaces.
- If a building abuts on two or more streets of different widths, the building shall be deemed to face upon the street that has the greater width and the height of the building shall be regulated by the width of the street and may be continued to this height to a depth of 24 m along the narrower street subject to conformity of Bye-law No. 12.4

A.9 ASI | Ancient Monuments Regulations | AMASR Act

The Ancient Monuments and Archaeological Sites and Remains Act, 1958(24 of 1958)
as amended by
The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010(10 of 2010)

"PROHIBITED AND REGULATED AREAS"

20A. Declaration of prohibited area and carrying out public work or other works in prohibited area.—Every area, beginning at the limit of the protected area or the protected monument, as the case may be, and extending to a distance of one hundred metres in all directions shall be the prohibited area in respect of such protected area or protected monument:

Provided that the Central Government may, on the recommendation of the Authority, by notification in the Official Gazette, specify an area more than one hundred metres to be the prohibited area having regard to the classification of any protected monument or protected area, as the case may be, under section 4A.
(2) Save as otherwise provided in section 20C, no person, other than an archaeological officer, shall carry out any construction in any prohibited area.
(3) In a case where the Central Government or the Director-General, as the case may be, is satisfied that—
(a) it is necessary or expedient for carrying out such public work or any project essential to the public; or
(b) such other work or project, in its opinion; shall not have any substantial adverse impact on the preservation, safety, security of, or, access to, the monument or its immediate surrounding, it or he may, notwithstanding anything contained in subsection
(2), in exceptional cases and having regard to the public interest, by order and for reasons to be recorded in writing, permit, such public work or project essential t the public or other constructions, to be carried out in a prohibited area:

Provided that any area near any protected monument or its adjoining area declared, during the period beginning on or after the 16th day of June, 1992 but ending before the date on which the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Bill, 2010, receives the assent of the President, as a prohibited area in respect of such protected monument, shall be deemed to be the prohibited area declared in respect of that protected monument in accordance with the provisions of this Act and any permission or licence granted by the Central Government or the Director-General, as the case may be, for the construction within the prohibited area on the basis of the recommendation of the Expert Advisory Committee, shall be deemed to have been validly granted in accordance with the provisions of this Act, as if this section had been in force at all material times:

Provided further that nothing contained in the first proviso shall apply to any permission granted, subsequent to the completion of construction or reconstruction of any building or structure in any prohibited area in pursuance of the notification of the Government of India in the Department of Culture (Archaeological Survey of India) number S.O.1764, dated the 16th June, 1992 issued under rule 34 of the Ancient Monuments and Archaeological Sites and Remains Rules, 1959, or, without having obtained the recommendations of the Committee constituted in pursuance of the order of the Government of India number 24/22/2006-M, dated the 20th July, 2006 (subsequently referred to as the Expert Advisory Committee in orders dated the 27th August, 2008 and the 5th May, 2009)."

Amendment of section 20A.—In section 20A of the principal Act (as so inserted b section 4 of this Act), after sub-section (3), the following sub-section shall be inserted, namely:—
"(4) No permission, referred to in sub-section (3), including carrying out any public work or project essential to the public or other constructions, shall be granted in any prohibited area on and after the date on which the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Bill, 2010 receives the assent of the President.".

Insertion of new section 20B.—On and from the 16th day of June, 1992, after section 20A of the principal Act, the following section shall be inserted and shall be deemed to have been inserted, namely:—
"20B. Declaration of regulated area in respect of every protected monument.—Every area, beginning at the limit of prohibited area in respect of every ancient monument and archaeological site and remains, declared as of national importance under sections 3 and 4 and extending to a distance of two hundred metres in all directions shall be the regulated area in respect of every ancient monument and archaeological site and remains:

Provided that the Central Government may, by notification in the Official Gazette, specify an area more than two hundred metres to be the regulated area having regard to the classification of any protected monument or protected area, as the case may be, under section 4A:

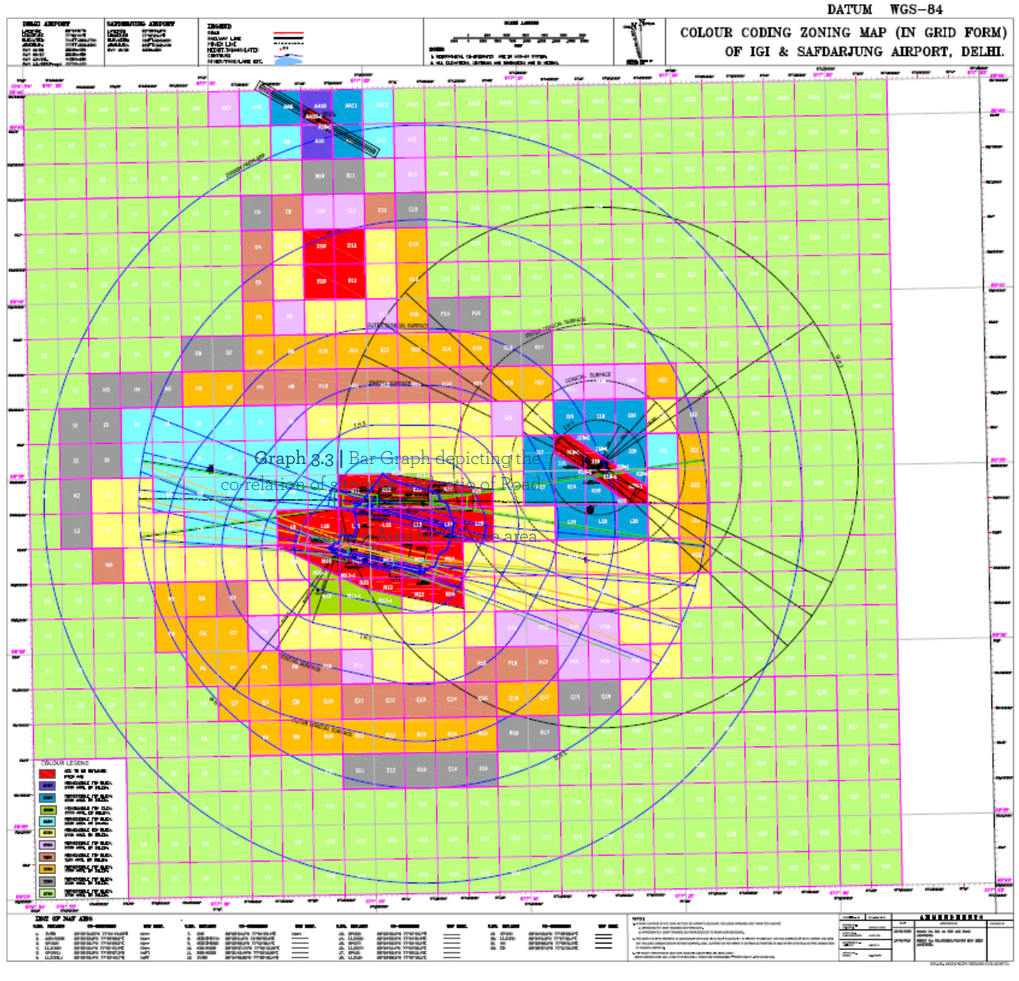
Provided further that any area near any protected monument or its adjoining area declared, during the period beginning on or after the 6th day of June, 1992 but ending before the date on which the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Bill, 2010, receives the assent of the President, as a regulated area in respect of such protected monument, shall be deemed to be the regulated area declared in respect of that protected monument in accordance with the provisions of this Act and any permission or licence granted for construction in such regulated area shall, be deemed to have been validly granted in accordance with the provisions of this Act, as if this section had been in force at all material times.".

ANNEXURES

A.10 Airport Authority of India | Height Regulations

AIR TRAFFIC MANAGEMENT CIRCULAR NO. 6 of 2017
Issuance of No Objection Certificate (NOC) for height clearances around Airport

No Objection Certificate (NOC) for height clearance is issued by Airports Authority of India as per the Govt. of India, Ministry of Civil Aviation Gazette Notification No. GSR751 (E), dated 30th September 2015 and amendments thereto. These provisions are aimed at safeguarding the airspace inand around aerodromes to permit safe and regular aircraft operations and to prevent the aeodromes from becoming unusable due to growth of obstacles around the aerodromes.



Map | Colour Coded Zoning Map (in Grid Form) of IGI and Safdarganj Airport, Delhi
Source : https://nocas2.aai.aero/nocas/CCZMPDF_Links/CCZMGrid_Delhi.pdf

A.11 PROFORMA| DATA INDEX :Quantitative Parameters

Data Index : QUANTITATIVE PARAMETERS

A. BUILT FORM

1.	SITE AREA	
2.	DWELLING UNITS (number)	
3.	DENSITY (DU/ha)	
4.	HEIGHT	
5.	F.A.R.	
6.	GROUND COVERAGE (%)	
7.	OPEN AREA (site area - ground coverage) % of site area	
8.	INCREASED DENSITY (proposed density - density before re-development)	

B. SITE PLANNING

7	RETAINING THE EXISTING				
	7.1	Primary Street Patterns retained (approx. %)			
	7.2	Percentage of Trees Retained			
8.	BASEMENT				
	8.1	Area % (of site area)			
	8.2	Extent			
9	PARKING NUMBER				
	9.1	Total four-wheeler Parking number proposed			
		9.1.1	Stilt		
		9.1.2	Surface		
		9.1.3	MLCP (mechanized & ramp)		
		9.1.4	Basement		
10	CIRCULATION				
	10.1	Pedestrian Network			
		6.1.1	Character		
			6.1.1.1	Continuous network without any break points.	
			6.1.1.2	Covered/ Shaded walkways	
			6.1.1.3	Walkways amidst green areas.	
			6.1.1.4	Planned/Designed to have a minimum walking distance	
		6.1.2	Average Walking Distance from Type 2 & Type 3 Residential Towers (from farthest block)		
			6.1.2.1	To nearest Transit-hub	
			6.1.2.1	To social infrastructure and green spaces	
	10.2	Vehicular			
		6.2.1	Tower Drop-off points		
		6.2.2	% of Paved Area at ground level (paved area/site area)		

11	TREE CUT SPECIFICATIONS						
	11.1	Number of Existing Trees					
	11.2	Number of Tree Cut					
	11.3	Tree Cut Percentage					
	11.4	Specifications					
		No. of Trees Cut	Tree Specie	Native/ Non-Native	Girth (with a variance of 100mm)	Age	Life Span
	11.5	Number of Native Trees Cut					
	11.6	Number of Trees cut with girth more than 200/300mm					
	11.6	Number of Trees cut with their age not equivalent to their life span (in a variance of less or more than 5 years)					
12	ADDITIONAL TREES PLANTED SPECIFICATIONS						
	12.1	Number of additional trees planted					
	12.2	Specifications					
		No. of Trees Planted	Tree Specie	Native/ Non-NAtive	Indigenous/ Non-Indigenous		
13	OPEN SPACES QUALITY						
	13.1	Small-open spaces adjacent to each residential tower/ block.					
	13.2	Consolidated green areas for diversified age-groups.					
	13.3	Well-connected green spaces within premises					

C. BLOCKS AND THEIR PLACEMENT

13	BUILT-UP AREA & BLOCK CORE TYPOLOGY					
	Type	Core	Built-up Area per DU	Core+Circulation area per floor	Total Built-up Area (BUA) per floor	(Core+Circulation) % of Total BUA
	II					
	III					
	IV					
	V					
	VI					
14	CLUSTERING OF BLOCKS					

D. MOBILITY

15	TRAFFIC LOAD INCREASED ON PERIPHERAL ROADS		
	15.1	Number of Cars increases	
	15.2	Peripheral Road Widths	
16	PEDESTRIAN CONNECTIVITY TO THE NEAREST TRANSIT NODES		

A.12 PROFORMA| EFFICIENCY FACTORS

A*	NO. OF TREES CUT / TOTAL NO. OF EXISTING TREES	=	---- / ----	=	----
B*	NO. OF TREES CUT / INCREASED NO. OF DWELLING UNITS	=	---- / ----	=	----

*Each value should be ≤ 0.2

TREE CUT FACTOR **TCF**

$\frac{A+B}{2}$ = ---- / ---- = ----

IDEAL VALUE ≤ 0.2

A*	NO. OF TREES CUT with CALIBRE >300MM / NO. OF TREES CUT	=	---- / ----	=	----
B*	NO. OF NATIVE TREES CUT / NO. OF TREES CUT	=	---- / ----	=	----

*Each value should be ≤ 0.2

ECOLOGY DAMAGE FACTOR **EDF**

$\frac{A+B}{2}$ = ---- / ---- = ----

IDEAL VALUE ≤ 0.2

A	ROAD AREA (in Sqm)
B	SITE AREA (in Sqm)

ROAD COVER FACTOR **RCF**

$\frac{A}{B}$ = ---- / ---- = ----

IDEAL VALUE ≤ 0.2

A	STILT PARKING CAPACITY (no.) / X	=	---- / ----	=	----
B	SURFACE PARKING CAPACITY (no.) / X	=	---- / ----	=	----
C	MLCP CAPACITY (no.) / X	=	---- / ----	=	----
D	BASEMENT PARKING CAPACITY (no.) / X	=	---- / ----	=	----
X	TOTAL NUMBER OF PARKING PROPOSED	=	----		

PARKING REGULATION FACTOR **PRF**

A+B = ---- = ----

IDEAL VALUE ≤ 0.2

	CONDITION	SCORE
A*	PEDESTRIAN DISCONTINUITY	----
B*	UNSHADED WALKWAYS	----
C*	WALKWAY DEVOID OF GREENS	----
D*	UNSIGNALISED PEDESTRIAN CROSSINGS	----
E*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to TRANSIT HUBS > 800M	----
F*	Avg. WALKING DISTANCE from TYPE II & III TOWERS to SOCIAL INFRA. > 800M	----

*Score |0.0| if the condition is not met ; |0.4| if the condition is met 50% ; |0.8| if the condition is met 100%

PEDESTRIAN DISCOMFORT FACTOR **PDF**

$= \frac{A+B+C+D+E+F}{6} = \frac{----}{6} = ----$

IDEAL VALUE ≤ 0.2

	For Type II	
A	CORE AREA PER FLOOR (sqm.)	----
B	DUs' AREA PER FLOOR (sqm.)	----
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	----

CORE EFFICIENCY FACTOR **CIF**

$\frac{A}{B}$ = ---- / ---- = ----

IDEAL VALUE ≤ 0.2

	For Type III	
A	CORE AREA PER FLOOR (sqm.)	----
B	DUs' AREA PER FLOOR (sqm.)	----
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	----

CORE EFFICIENCY FACTOR **CIF**

$\frac{A}{B}$ = ---- / ---- = ----

IDEAL VALUE ≤ 0.2

	For Type IV	
A	CORE AREA PER FLOOR (sqm.)	----
B	DUs' AREA PER FLOOR (sqm.)	----
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	----

CORE EFFICIENCY FACTOR **CIF**

$\frac{A}{B}$ = ---- / ---- = *

IDEAL VALUE ≤ 0.2

	For Type V	
A	CORE AREA PER FLOOR (sqm.)	----
B	DUs' AREA PER FLOOR (sqm.)	----
C	TOTAL BUILT-UP AREA PER FLOOR (sqm.) | A+B	----

CORE EFFICIENCY FACTOR **CIF**

$\frac{A}{B}$ = ---- / ---- = ----

IDEAL VALUE ≤ 0.2

सत्यमेव जयते

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