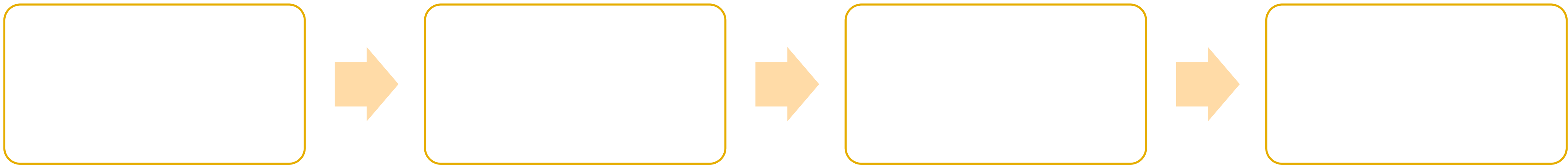


Land Pooling Policy

*Aatish, Anmol, Anupriya, Anushka, Dibakar, Harsha, Harshit,
Janhvi, Mansi, Neelabh, Trisha, Udit*

Introduction



The purpose of our studio is to understand the relationship of **lower order plans with higher order plans**. We have done this through taking Land Pooling Policy in Delhi as an example of implication of Master Plan modification on zonal plan

The process of land assembly and planning in Delhi is undergoing a change. A shift from large-scale land assembly to land readjustment, **the way town planning is practiced** and experienced in Delhi **changes completely**. Delhi will experience a shift from **plan-based to project-based development** and **state-led to market-led planning**.

Due to this, the **existing Zonal Plans** for land pooling zones will become **redundant**. In this study, we will be assessing **how the zonal plans must change** in order to **accommodate the new land pooling policy** as well as propose **modifications** to the policy.

Contents

- Legislative framework for Hierarchy of Plans**
- Historic and planning background**
 - An account of Delhi’s experiences with land assembly from colonial to present times
 - Transitioning from Land Acquisition to Land Pooling policy
 - Process through which land pooling got accommodated into Delhi’s master plan
- Components of the final policy draft**
- Policy review**
- Introduction to case study: Zone L, Delhi**
- Zonal-level implications**
 - Demography
 - Housing
 - Trade and commerce
 - Industrial
 - Social infrastructure
 - Recreational
 - Transport
 - Physical infrastructure
 - Land use
- Detailed study: Sector 3, Zone L**
- Conclusions**
- Approach to revised zonal plan**
- Recommendations to the policy**

Understanding Purpose and Contents of Lower Order Plans

City	Town Planning Acts	Development Authority	Hierarchy of plans
Delhi	Delhi Development Act, 1957	Delhi Development Authority	Master plan Zonal Plan Layout plan
Mumbai, Maharashtra	Maharashtra Regional and Town Planning Act, 1966	CIDCO- Special Planning Authority	Regional plan Interim Development Plan Development Plan Town Planning Scheme Layout Plan
Noida, UP	Uttar Pradesh Industrial Area Development Act, 1976	Noida Development Authority	Master Plan Sector Plan
Patna, Bihar	Aatish		
Indore, MP	Madhya Pradesh Nagar Tatha Gram Nivesh Adhiniyam, 1973	Indore Development Authority	Regional Plan Development Plan Zonal/Coordination Plan
Chennai, Tamil Nadu	Tamil Nadu Town and Country Planning Act, 1996	Chennai Metropolitan Development Authority	Regional Plan Master Plan New Town Development Plan Detailed Development Plan
Cuttack, Orissa	Odisha Development Authorities Act, 2015	Cuttack Development Authority (CDA)	Interim Development Plan Comprehensive Development Plan Local Development Plan Zonal Development Plan
Naya Raipur, Chhattisgarh	The Chhattisgarh Nagar Tatha Gram Nivesh Adhiniyam 1973	•Naya Raipur Development Authority	Regional Plan Development Plan Zoning Plan
Gurgaon, Haryana	Mansi		
Andhra Pradesh	THE ANDHRA PRADESH (ANDHRA AREA) TOWN-PLANNING ACT, 1920.	Tirupati Urban Development Authority (TUDA)	Master plan Zonal plan

Understanding Purpose and Contents of Lower Order Plans

Cities	Studied by	Land Assembly Tool	Details
Delhi	Anushka, Janhvi	Land Pooling	
NAINA, Maharashtra	Anupriya, Anmol	Town Planning Scheme	All landowners contribute equal % of land 60% goes to CIDCO for development of city-level infra 40% remains with landowners; 2.5 FSI on remaining land CIDCO develops EWS housing, internal amenities and roads Financing mechanism: 15% land reserved for Growth Centre.
Noida, UP	Udit	Land Acquisition	
Patna, Bihar	Aatish		
Indore, MP	Harshit	Town Planning Scheme	From acquired land parcel, 23.92% goes under Madhya Pradesh reservation for developing housing for urban poor and reserve government land, 41.62% land goes for layout facility. Remaining 44.72% of land returned to land owners after completion of scheme.
Chennai, Tamil Nadu	Trisha	Town Planning Scheme	Use and development of land to be in conformity with development plan
Cuttack, Orissa	Dibakar	Town Planning Scheme	
Naya Raipur, Chhattisgarh	Neelabh	Land Acquisition	The Development Authority shall, taking into consideration, the cost of land acquisition, cost of rehabilitation, maintenance and administrative cost, development cost, location and usage of the property, fix reserve premium every year for different land uses
Gurgaon, Haryana	Mansi		
Andhra Pradesh	Harsha	Land Acquisition	

Salient features

I. Inclusiveness: Farmers as entrepreneurs

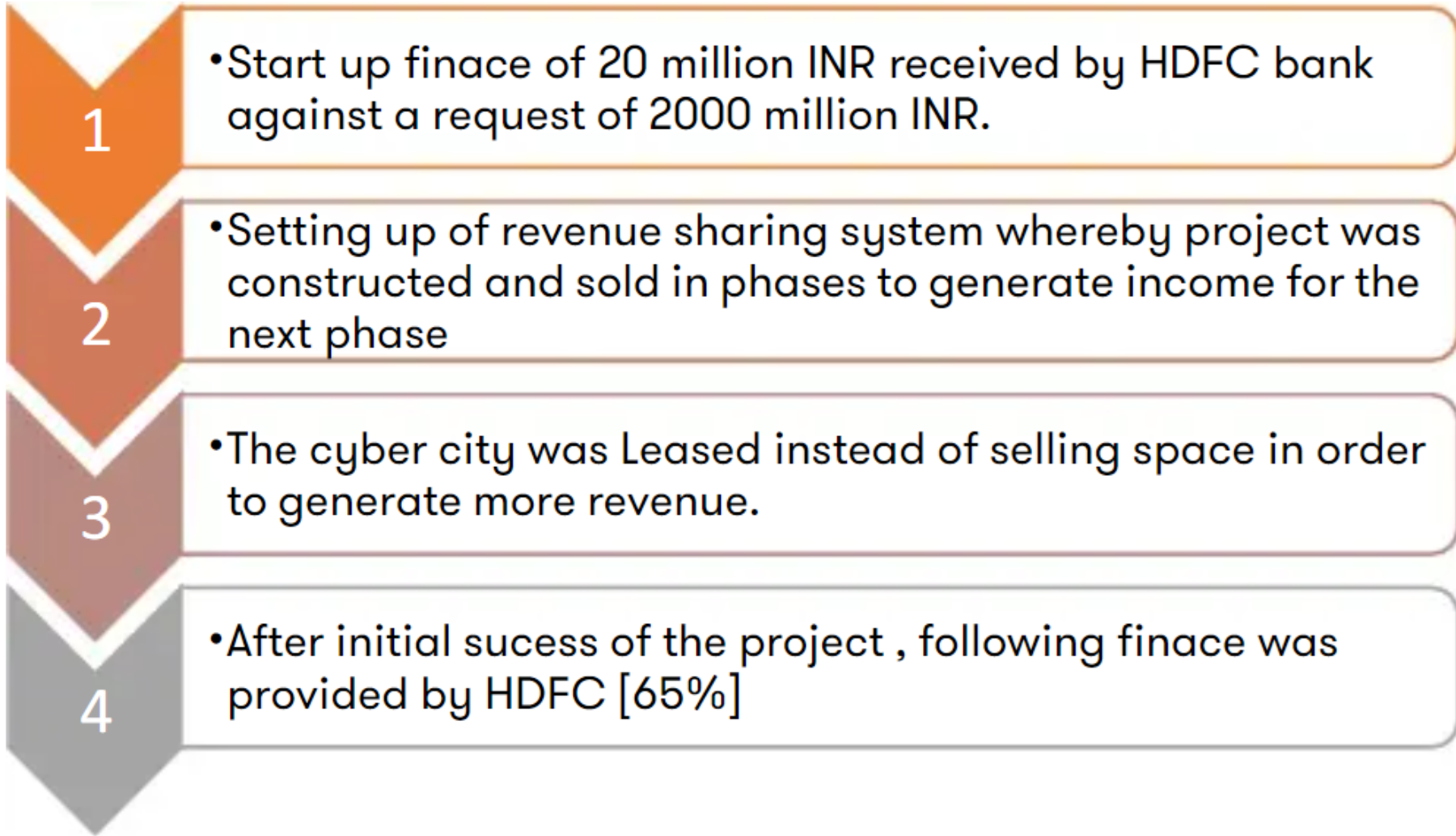
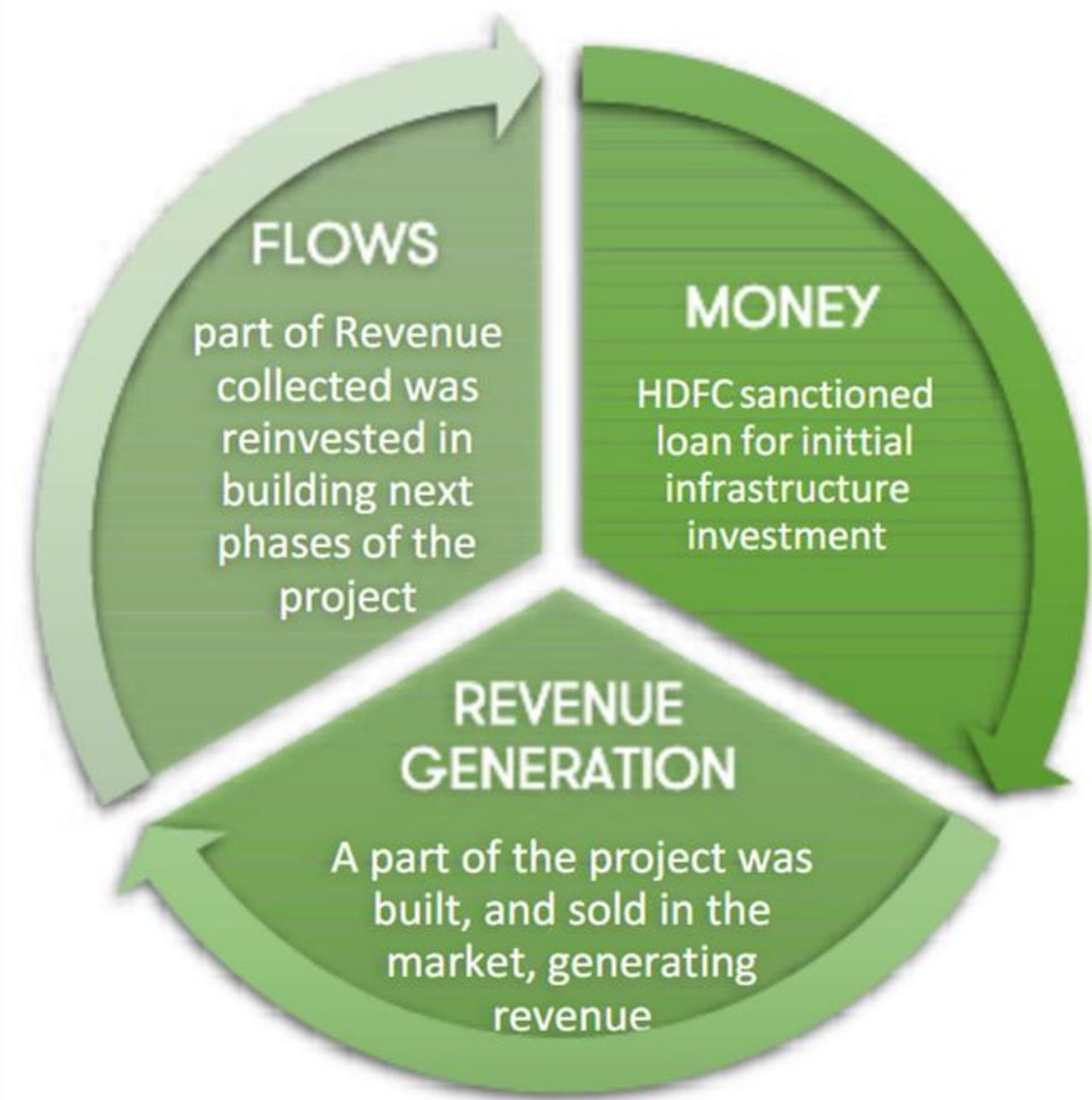
- Ensured that all the peasants, who were the shareholders remain a part of the company throughout the process, and that **landownership could be maintained**.
- **Revenue sharing:** all the shareholders were entitled to a percentage of the sales as dividends in proportion to their land holdings, and that accumulated through sales. Each landowner according to the Joint Development Agreement signed was the owner of that percentage in the FSI as per the master plan.
- One person from each family was involved in the construction and drew a **constant source of income** from the project, not as an employee but as an entrepreneur.
- Through a series of aptitude tests conducted, the entrepreneurs were sorted out depending on individual strengths and were given training in for **capacity enhancement**.
- Due to lack of liquid assets, the **only form of initial investment** was made by **pooling in their shares of land**, which was at that point of time valued at 2,145 INR.

II. Creation of a constant source of revenue

- Strategy for development of the project into various **phases**, beginning with villas and larger apartments, and using the money from advertising and pre-bookings for other phases. Once the initial sales kicked up, and the project gained popularity, the remaining phases received most of their funding, up to 65% from HDFC.
- This ensured **equity returns**. It was collectively decided that 30% of sale proceedings would be shared between everyone and the rest was invested in the company funds.

III. Economical

- Project cost was cut down by using **sustainable construction methods**.
- A lot of **construction works** were carried out by the **farmers themselves**, making use of the available resources first.



Mechanism for a constant source of revenue

Source: Course of Project Development Management by Wim Wambecq and Bruno De Meulder

A brief history of land assembly in Delhi

Development at what cost?

Britain's political economy in India **worked to advance the British**, and to a lesser degree Indian, financial interests at the cost of those at the bottom rungs of society

Bengal Regulation I

1824

Marked the **start of land acquisition** in India

To promote **British commercial interests**

Land acquired for **construction of Railways**

Revolt of 1857

1857

1/3rd of the city **demolished**, then **rebuilt**

British government's decision to **sanitise and improve** Delhi

Construction of railway network in and around Delhi saw **massive acquisition of land**

Land Acquisition Act



1894



Allowed **acquisition of private lands by the government for public purposes**

To **expand control** throughout the country

Infrastructure like railways, roads, bridges, communication network as a **means to transfer their army** and weaponry.

Drawbacks:

1. No way to raise **objections**
2. Only dealt with compensation, not **resettlement / rehabilitation**
3. Compensation only to those who have **legal ownership** of lands
4. Large scale **resentment** among landowners

The new capital

1911

British India's capital shifted **from Calcutta to Delhi**

Rapid **growth of population** (4 lacs at the start of 20th C to 160 lacs at the start of 21st C)



Building of New Delhi

1912

16,000 ha were needed, most was **owned by poor farmers**

Area to be acquired was notified with the **market value**

Debates over form of **compensation** — land, cash, or revenue remission. Just **cash payments were finalised**.

Some suggested that farmers be compensated in lands located as close as possible to Delhi, receive small sums for restarting their farms on new lands.

No provision for rehabilitation and resettlement of the displaced

Dispossessed Delhi landowners offered a supply of farmers to Punjab

Source(s): (i) Sasidharan, S., 2015. Landlocked in Peri-urban Politics around Delhi's Land Policy. (ii) Johnson, D. A., 2010. Land Acquisition, Landlessness, and the Building of New Delhi. Radical History Review, pp. 91-116.

Jurisdiction
Planning

	DIT	MCD	DDA
Jurisdiction	Piecemeal approach, scheme-by-scheme over acquired land	Within municipal area	Comprehensive planning over entire planning area
Planning	Immediate	Immediate	For future

Delhi Improvement Trust (DIT) established

1937

Thought to be able to ignore politics and **perform in public interest**, unlike an elected ULB

Independence & partition

1947

Refugees flood in and population nearly doubled from 9 lakh in 1941 to 17 lakh in 1951

Additional population began accommodating themselves in **villages**

Birla Committee

1950

Reviewed the performance of DIT

Recommended to **dissolve DIT**, instead form an exclusive planning and development authority for Delhi

DDA established

1957

Under the **Delhi Development Act of 1957**

Objective: To promote and secure the development of Delhi

An **autonomous** authority to operate on a **self financing model**

Lieutenant Governor of Delhi as its **chairman**

Same year **MCD estd.** too

Delhi's first master plan

1961

Land Policy by DDA; large scale public **land acquisition** and dispose the same on a **leasehold basis**; Nationalisation of land, formation of a **land bank**

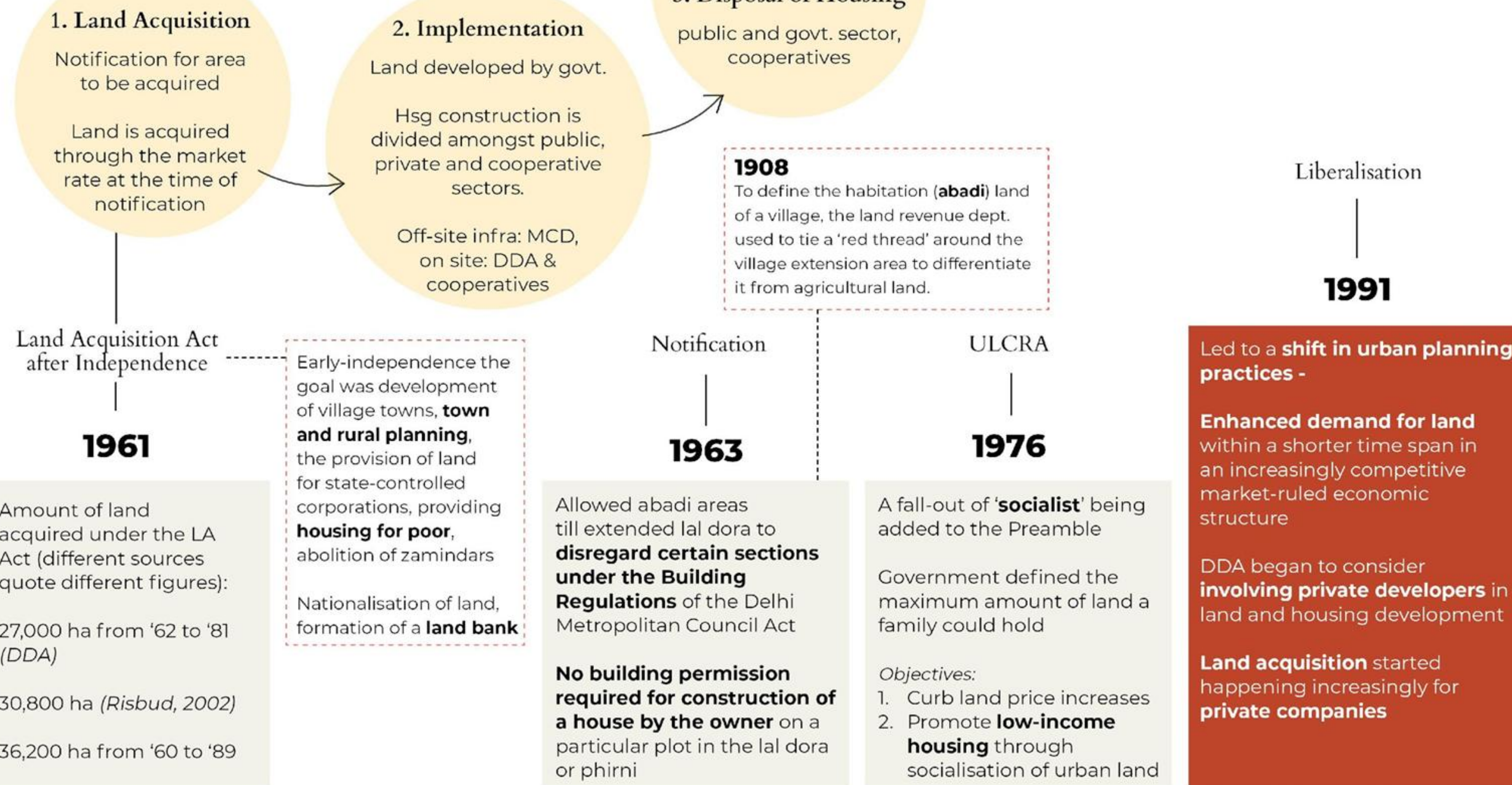
Public sector-led process with very little private participation in terms of development of both shelter and infrastructure services

The **colonial approach of state control over institutions continued** even after Independence

This initiated the saga of **state controlled metropolitan planning** in Delhi that later spread to other Indian metropolises

Source(s): (i) Sasidharan, S., 2015. Landlocked in Peri-urban Politics around Delhi's Land Policy. (ii) Mallik, C. & Sen, S., 2017. Land Acquisition Policy and Praxis: The Case of Peri-urban Delhi. Research Gate, pp. 114-126.

Process



Source(s): (i) Sasidharan, S., 2015. Landlocked in Peri-urban Politics around Delhi's Land Policy. (ii) Johnson, D. A., 2010. Land Acquisition, Landlessness, and the Building of New Delhi. Radical History Review, pp. 91-116.

* Demand and supply gap of housing

J.B.Kshirsagar, Commissioner (Planning), DDA, 2013

Master Plans	Acquisition planned	Acquired
1962	1,372 hectares annually (~27,440)	777 hectares annually (~15,540)
2001	24,000 hectares	9,507 hectares
total	51,440 hectares	25,047 hectares
Time period	Development planned	Land developed
1961-1981	14,479 hectares	7,316 hectares
1981-2001	17,493.15 hectares	8,388.15 hectares
total	31,971.15 hectares	15,704.15 hectares

Alternate techniques of land assembly (UDPFI guidelines):

1. **Land pooling** and distribution schemes, popularly known as town planning schemes
2. Transfer of development rights (**TDR**)
3. System of **accommodation reservation**

AMDA proposes an alternative land policy

2003

DDA publishes MPD 2021

2007

Criticisms to Land Acquisition

1. Underperformance

Land acquisition becoming a **difficult and tedious process**

Resulted in **demand-supply gap** of housing *

2. Unfair compensation

Compensation on past agricultural land value and not at the present commercial value
Farmers **lose their livelihood**

3. From public to private

Drifted from the **earlier goal of 'public purpose' to large scale acquisition** for dams, mines, and **private companies at the cost of displacing the poor**

4. Escalating land prices

Auctioning land at high prices led to building of luxury housing, forced up the price of land for low cost housing, and **increased squatting** and **illegal subdivision** of land

Studied **various forms of land assembly** in India, and recommended a **method of land pooling based on TPS of Gujarat**

This model was **rejected** by the private sector as not being feasible with the low quantum of land being returned to the participants

Guidelines to **reframe** the policy

The **first plan to propose involvement of the private sector** in assembly and development of land

Structural change as it completely did away with the land acquisition policy

Source(s): (i) Danyal, K. Y., 2016. Land Acquisition in India-Past and Present. Jamia Law Journal. (ii) Mallik, C. & Sen, S., 2017. Land Acquisition Policy and Praxis: The Case of Peri-urban Delhi. Research Gate, pp. 114-

Reconsideration of
land acquisition policy

2009

Land Acquisition
Amendment Bill

Residents/RWA to prepare a layout
plan and get it approved by the
local body. All existing exemptions
regarding sanction of building
plans in the village abadis will
cease to exist from the date of
notification of these regulations.

2011

The Building Regulations for Special
Area, Unauthorized Regularized
Colonies and Village Abadi, 2010

Effect of land acquisition on the affected families
was to be gauged by a **Social Impact assessment**
before resorting to land acquisition

Return of land to owner if it is unutilised for 5 yrs

Anti-industry: land acquisition process difficult,
reducing land available for industry

2013

The Right to Fair Compensation and
Transparency in Land Acquisition,
Rehabilitation and Resettlement Act, 2013

Provisions to provide
fair compensation,
transparency to the
process of acquisition,
assures **rehabilitation**

New land policy

2007-13

Policy for **operationalising private sector participation** in
assembling and developing the additional land proposed for
urbanisation under MPD 21

NCAER analysed financial feasibility of 3 models formulated by
AMDA, DDA and a separate research and advisory wing of DDA

Land pooling
policy published

2013

Final model approved by DDA and published as a
modification of MPD 21

Published policy advocates **land readjustment** as
a preferable model of access to land in NCTD

Entire **planning
process is changing**

Big departure from
large scale land
acquisition

Source(s): Ribeiro, E. F., 2011. The Future of Land as a Resource for Urban Development. Institute of Town Planners, India, 8(2).

Summing up

The first Delhi Master Plan came in 1961. That time, DDA used to acquire lands directly from landowners at a price determined by DDA under the **Land Acquisition Act 1894**. They would then develop the land and sell it as they wished. Landowners’ consent was not taken. This process was **undemocratic** and **non-participatory**.

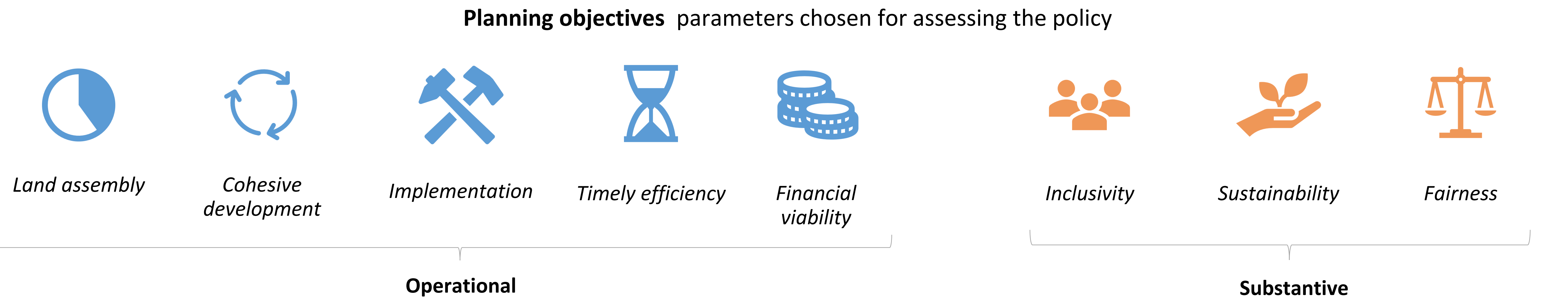
Limitations of Land Acquisition:

- 1. Underperformance leading to demand and supply gap of housing
- 2. Unfair compensation
- 3. From public to private
- 4. Unplanned and haphazard development

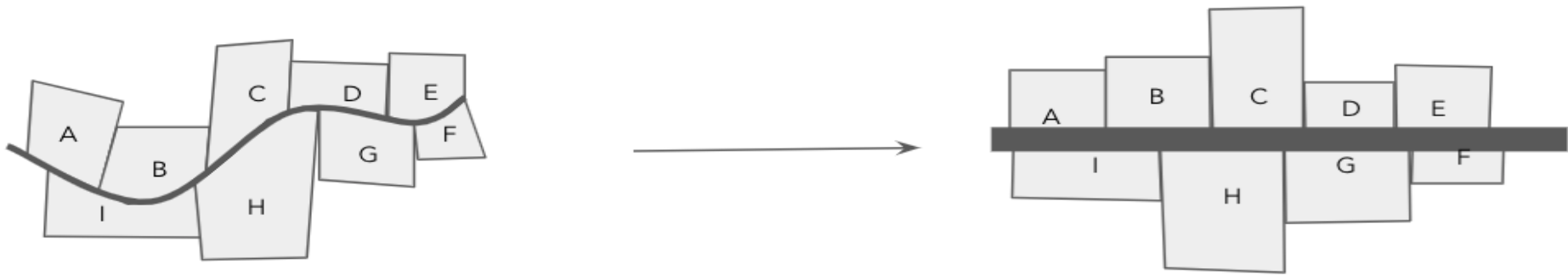
In 2013, a new chapter ‘**Land Policy**’ was inserted in MPD 2021. In this, landowner(s) or a developer (referred to as Development Entity or DE) shall be authorized to **pool land** for combined planning, servicing, and share of land for development.

The primary aim of this policy is to offer **control to the landowner** and their **consent** is necessary before selling of land. It enables **private developers to build housing units in the city, hence making them partners in the development process**.

Will Land Pooling be a better arrangement?

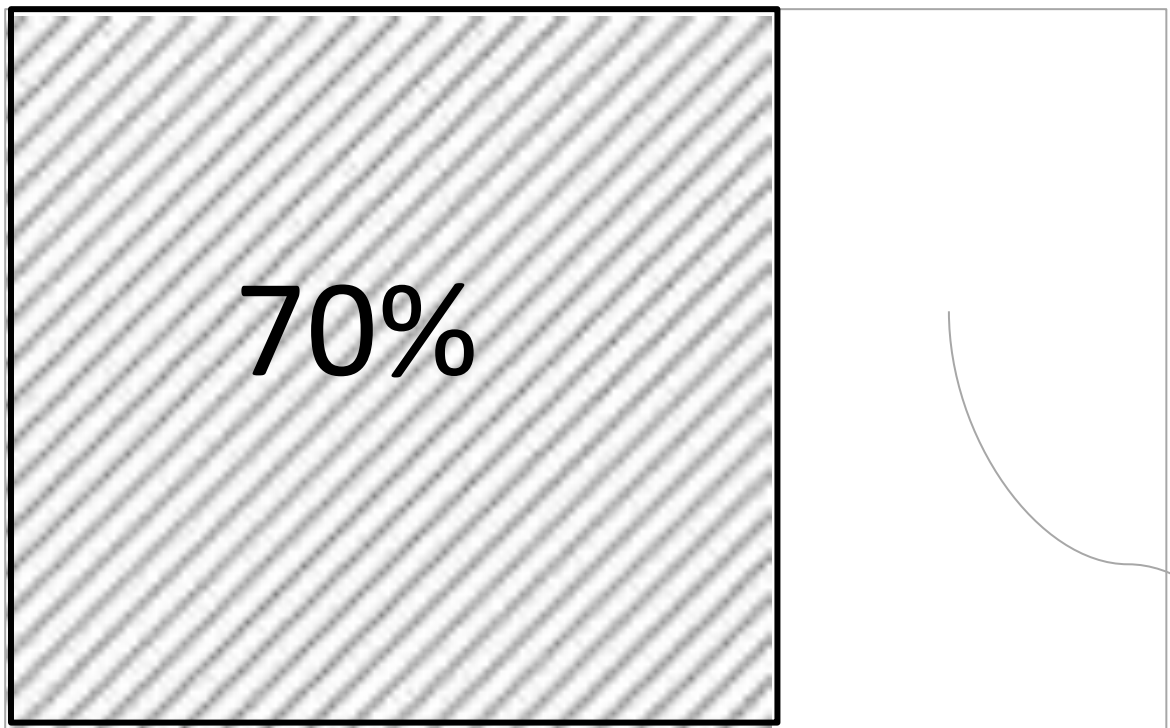


Components of Land Pooling Policy



Spatial Components of the Policy

I. Land allocation

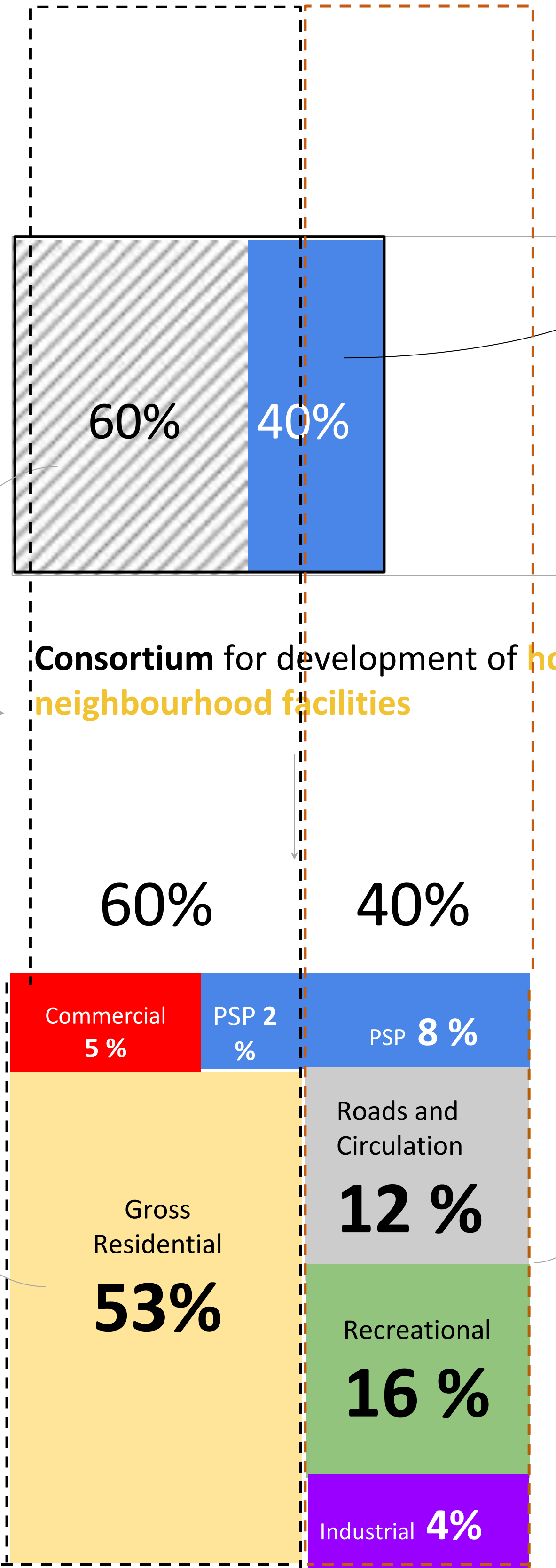


Un-pooled land at a later stage making **45% land available for city level infrastructure/facilities**

Land Use distribution at **city level**:

50% of neighborhood level facilities returned to DDA for govt. offices

Net Residential land to be a **maximum of 55% of Gross Residential land**



DDA for development of **city level physical infrastructure**

Consortium for development of **housing, neighbourhood facilities**

MPD 21

- 8-10% for PSP
- 10-12% for circulation
- 15-20% for recreational
- 4-5% for industrial

Inferences

Problems with Land Acquisition:

- Unfair compensation**
 - From public to private
 - Unplanned and haphazard development
 - Delay in implementation**

1. An attempt to **balance the land value** to ensure **minimum monetary exchange**

This 60-40 distribution reduces the need for large-scale compensation

2. Set aside the area needed for provision of **city-level facilities**

Will this city-level distribution fit into overall land use distribution as given in the Master Plan?

3. This distribution might ensure **timely implementation**



II. Development Regulations

a. Permissibility

The DE/Consortium may also adopt innovative ways for achieving a **vertical mix of uses** (residential, commercial, PSP).

b. Development Control Regulations

FAR and Ground Coverage

FAR for Residential, city-level commercial and city-level PSP shall be as per prevailing **Master Plan**.

For **group housing** residential FAR of **200** to be applicable on **Net Residential land**.
For **plotted housing**:

	Area of Plot (sq. m)	Max. Ground Coverage %	FAR	No. of DUs
² [1	Upto 50	90*	350	3]
2	Above 50 to 100	90*	350	4
3	Above 100 to 250	75**	300**	4
4	Above 250 to 750	75	225	6
5	³ [Above 750 to 1000	50	200	9
6	Above 1000 to 1500	50	200	9
7	Above 1500 to 2250	50	200	12
8	Above 2250 to 3000	50	200	15
9	Above 3000 to 3750	50	200	18
10	Above 3750	50	200	21]

Inferences

New concept introduced: **vertical mixing** is promoted for residential, commercial, PSP

The policy **doesn't talk about permissibility in detail**. That might result in **incompatible land use zoning**.

Housing typology

- Policy doesn't specify **housing typologies** and distribution for various income groups.
- **Unit sizes** haven't been mentioned for income groups other than EWS.



II. Development Regulations

c. Subdivision regulations

Amalgamation and subdivision of city-level PSP plots as well as commercial plots shall be allowed, following Master plan norms.

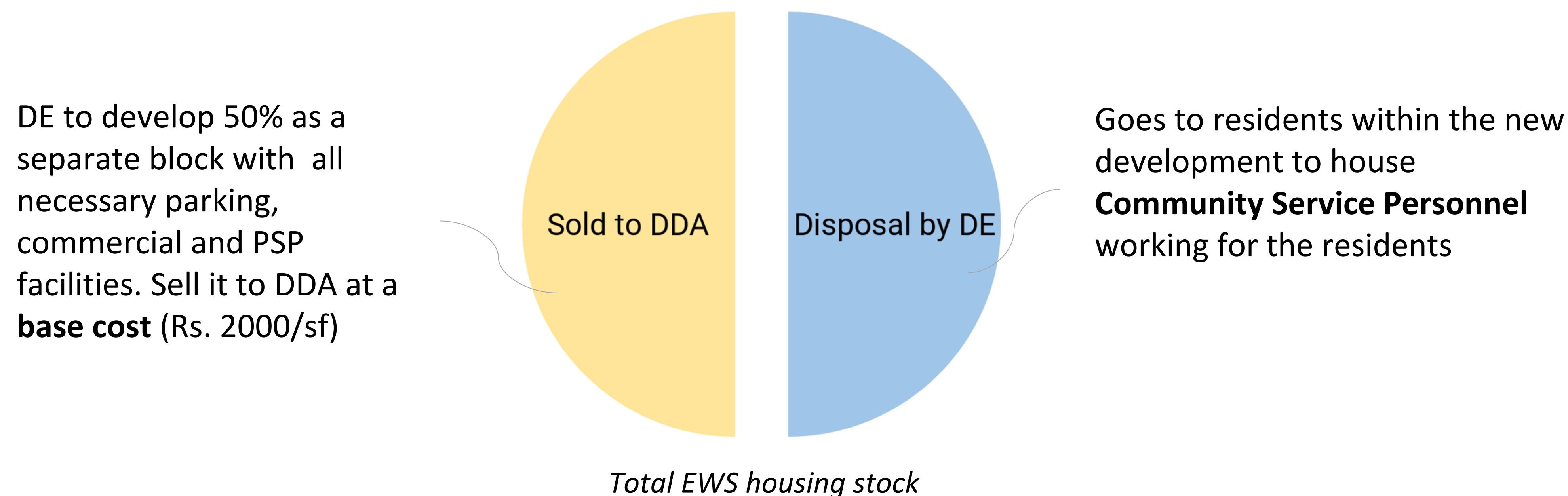
The entire pooled land is bounded on **at least one side by a road of minimum 30m ROW** (existing or proposed) as per ZDP.

d. EWS Housing

FAR: DE/Consortium shall utilize a **mandatory FAR of 15% “over and above” the maximum permissible residential FAR**. The resultant **increase in density** shall be considered over and above the permissible density as per Master Plan.

Unit sizes: 30-40 sq.m.

Parking: 0.5 ECS/100 sq.m. of BUA.



Inferences

Problems with Land Acquisition:

- . Unfair compensation
- . **From public to private**
- . Unplanned and haphazard development
- . **Delay in implementation**

Inclusivity

- The policy is accommodating EWS in **“over and above” FAR**. Use of this language is not inclusive.
- No provision of additional FAR for **home-based industries** (as given in MPD '21).
- 50% of the EWS housing stock is covered up as **servant quarters** for MIG and HIG.

Viability

- It is the **government’s fundamental job to do social housing** and ensure protection and inclusion of the vulnerable. By letting the private sector construct EWS housing, DDA is doing away with this **responsibility**.
- Private sector is **inexperienced** in undertaking social housing projects and for them, **profit is paramount**.
- Private developers may be **hesitant** to develop EWS projects if not **profitable**.

II. Development Regulations

e. Sustainable development

Mandatory **green building norms** as per Master Plan and Building Bye Laws; minimum 10% of all energy consumption shall be through **solar fittings** or other **renewable energy sources**, prescribed for green-field developments under the Smart Cities Mission of MoHUA.

Universal accessibility, vibrant public realm, safe neighbourhoods through:

Building type: detached high-rise, medium rise, mixed-type

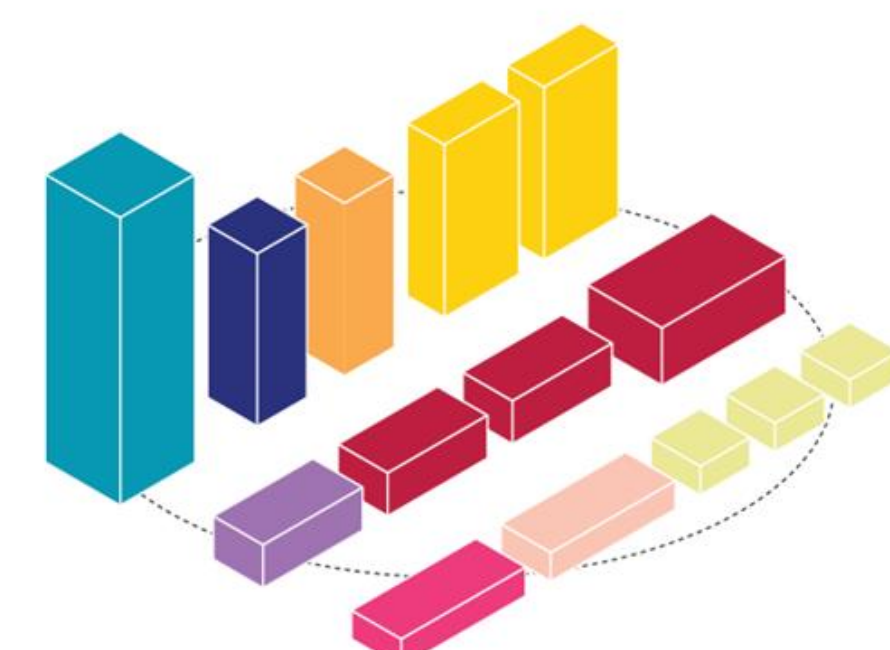
Building frontage: shop-fronts, porch, fore-courts, overhangs

Ground cover and **vertical mixing** of land uses

Street design

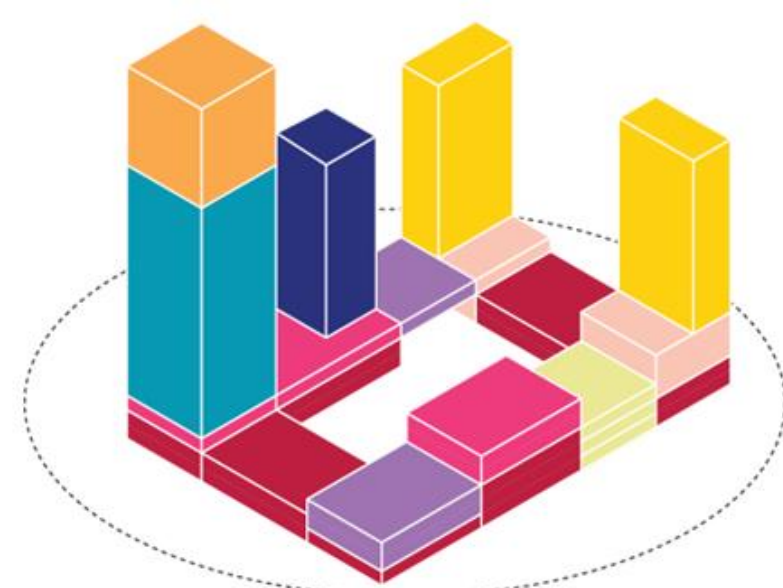
Plantation and open spaces

Single-zoned neighbourhood



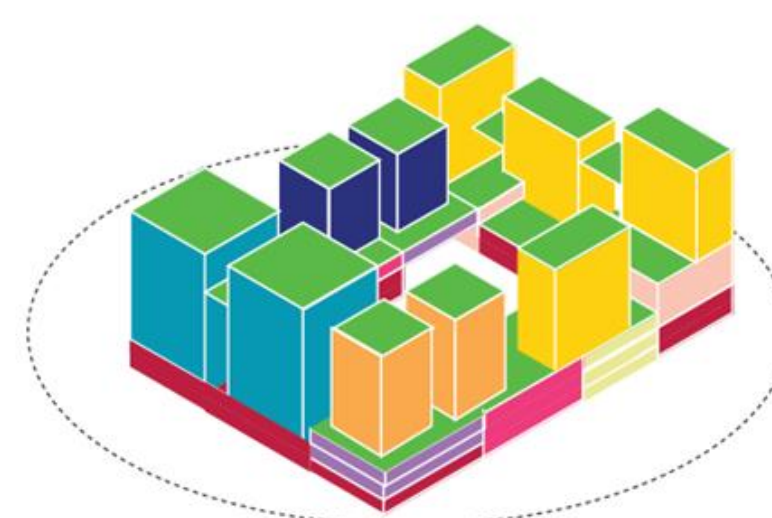
Uses are separate from each other

Mixed-use neighbourhood



Uses are adjacent and connected, reducing building footprint

Mixed-use, compact neighbourhood



Uses are mixed, building footprints and heights reduced, public spaces created vertically

Source: Gensler

Additional development controls for urban design, landscape and built environment **to be notified** as part of the ZDPs for land pooling zones. These will regulate **building and site level aspects** and promote sustainable environment management systems through **integration of blue and green infrastructure** in the sector layout plans.

Inferences

Problems with Land Acquisition:

- . Unfair compensation
- . From public to private
- . **Unplanned and haphazard development**
- . Delay in implementation

Policy **only vaguely talks about sustainable environment management systems** and the blue-green network. It touches upon concepts such as universal accessibility, safe and vibrant neighborhoods, etc. but gives **no concrete regulations**. Should be more specific.

Vertical mixing: the degree to which neighbourhoods mix uses and integrate greens ultimately impacts density, efficiency, wellness, and sustainability. The new policy takes this into account.

Stages of implementation	Role of DDA	Role of DE / Consortium
Members	Development authority	Individual, group of landowners, developer entity owning min 2 ha land
Planning process	Revision of ZDPs when required for new development areas	Pooling 70% land
	Single Window System phase the application process	Apply for the policy
	Preparation of sector plan	Preparation of implementation plan Seeking necessary approvals
	Provision of city level infrastructure in 40% land	Preparation of layout plans and detailed site plans for the remaining 60% land
Development	Facilitate planning and development by DEs/Consortium	Development and finalization Plan with the approval of all constituent landowners
	Dispute resolution	Transfer of the share of built-up space/land to constituent landowners/DEs
	Monitoring	Timely payment of External Development Charges to be paid in installments, currently 8 crore per Ha
Disposal of land	Ensuring sale of 50% EWS housing stock handed over by the DE/Consortium	Ensure development of EWS housing (selling 50% to DDA)

Inferences

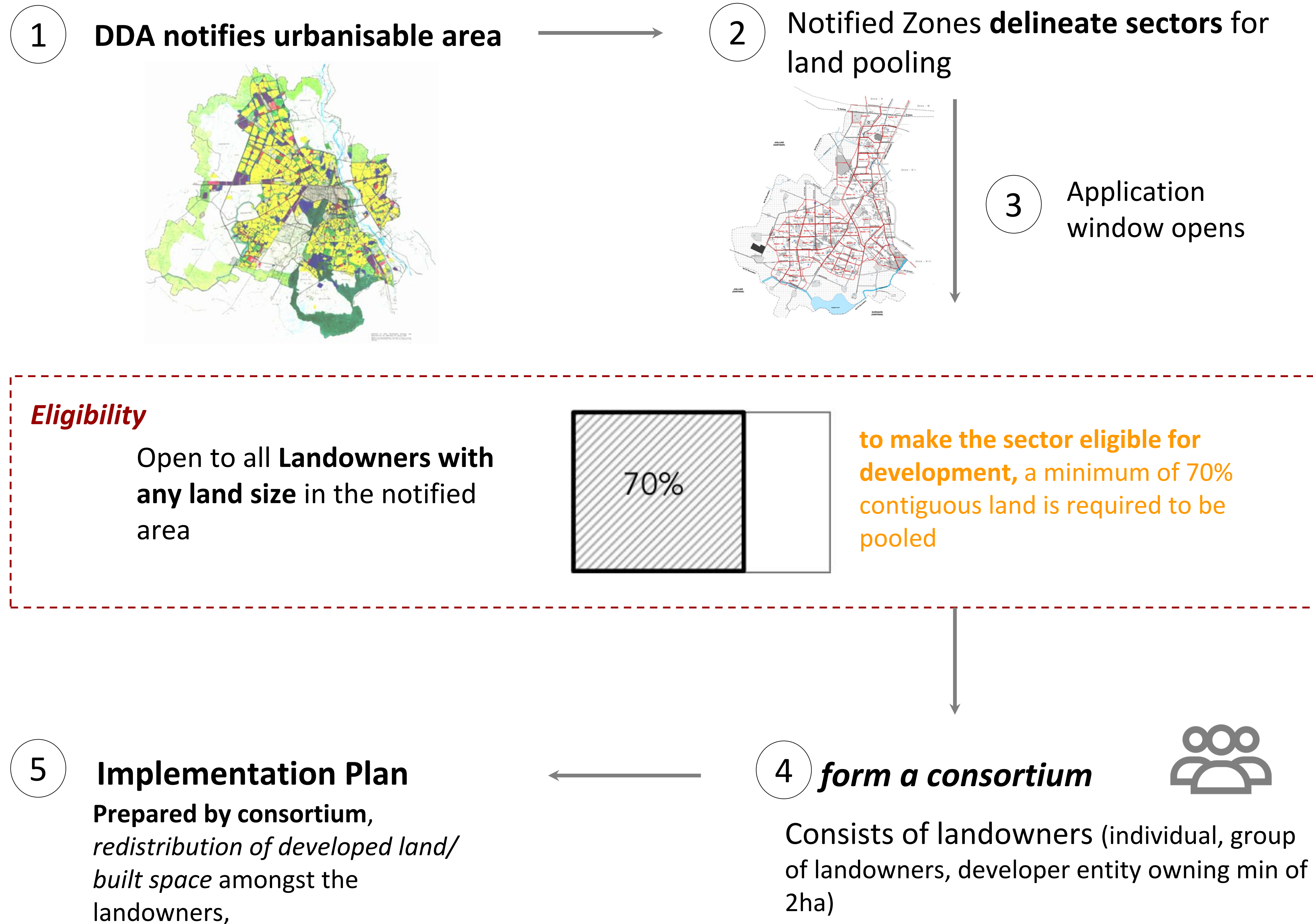
Problems with Land Acquisition:

- Unfair compensation
- From public to private
- Unplanned and haphazard development
- Delay in implementation

EDC is as high as 8 crores per Ha which is too much for a landowner, especially small farmers. This is likely to cause delays in the implementation process.



Application Process



Inferences

Problems with Land Acquisition:

- . Unfair compensation
- . From public to private
- . Unplanned and haphazard development
- . **Delay in implementation**
- . **Undemocratic and non-participatory**

1. Formation of consortium, convincing landowners to participate can be a **lengthy** process

1. **Unfair to small land holders-** Landowners owning less than 2 ha cannot be part of the consortium. Yes, they can combine their plots but that's another tedious process.

1. In case a landowner is **unwilling to participate** and their land is needed for effectuating the policy, then it shall be **acquired** by the government under the **LARR Act, 2013**.

Is it really all that **democratic**?

Inferences

Problems with Land Acquisition:

- Unfair compensation
- From public to private
- Unplanned and haphazard development
- **Delay in implementation**
- **Undemocratic and non-participatory**

Unfair time limit and extension charges

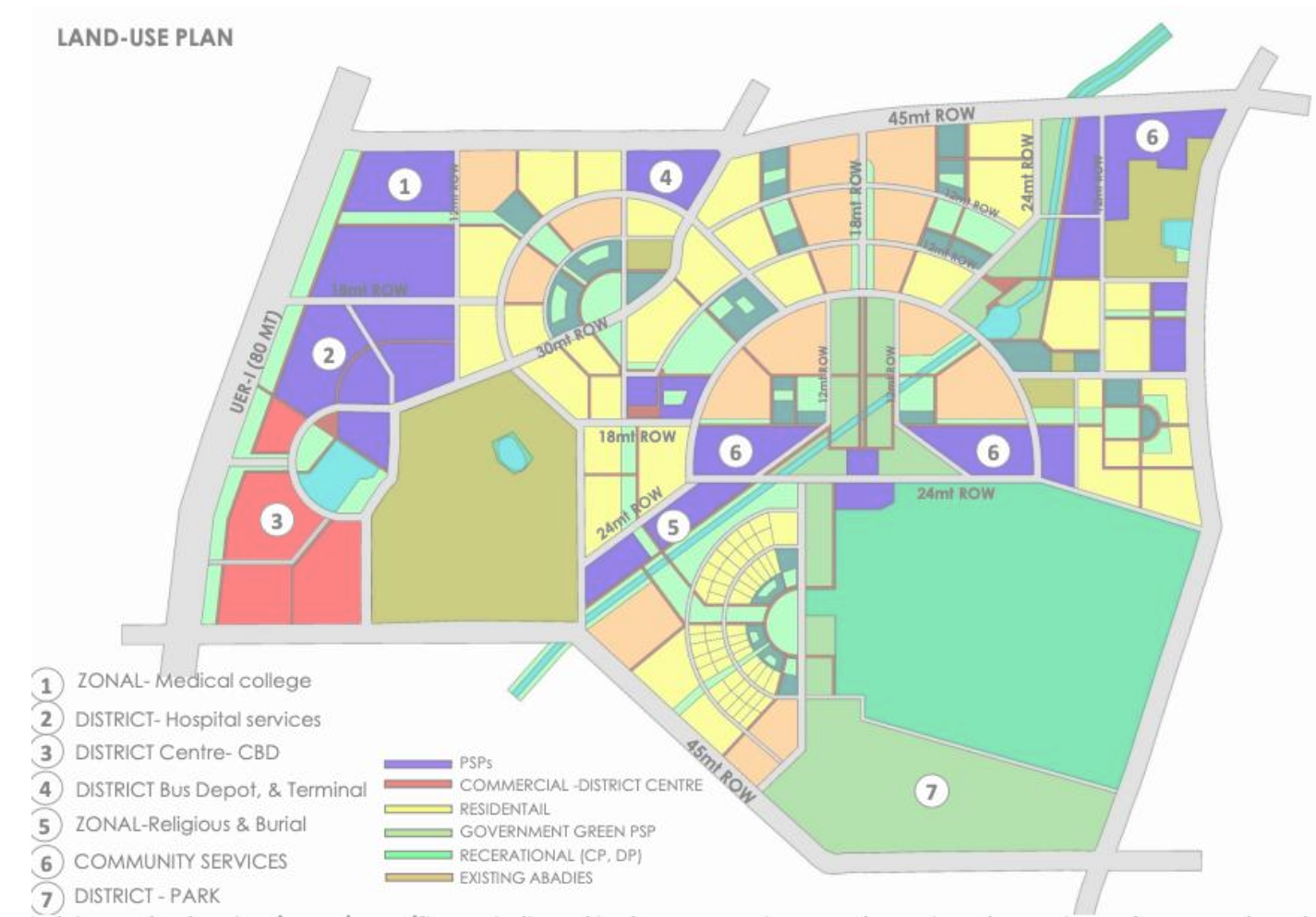
1. Differences in the amount of penalty (for delay in development) paid by DDA and DE (DE’s penalty to the DDA being significantly higher).

2. Consortium has 10 years to complete the development. But if they want to extend, they’ll have to pay **extension charges**:

extension	extension ch
first	5% of EDC
second	10% of EDC
third	15% of EDC

Preparation of plan and layout approval process (after application is accepted)

1 DDA makes **sector plan** and distributes 60-40



Provided by DDA
within 2 months
of application by
consortium

2 **Layout plan** by **consortium**,
neighbourhood level facilities and
redistribution of land,

Final **Entitlement
Certificate** to the
Consortium after
resolving grievances

To be
approved by
DDA

“Provisional
Development License”
(PDL).
*Apply for final
development license*

Development time limit

Service Providing Agencies and DDA **within five years** from the issue of Final Development License to DE/Consortium

Validity of Final Development License shall be ten years, within first 2 years - approvals, rest for construction.

Penalty on delay

Agency shall pay proportionate penalty of 2% of EDC per year for first two years and 3% of EDC per year thereafter to affected DE/Consortium.

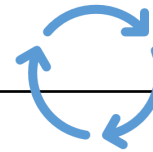
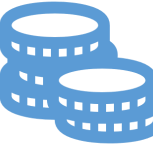
3 Layout plan and building level plans approval

After the issue of final development license, payment of first EDC (20%).

Consortium will submit **detailed layout plans with detailed service plans and building plans** as per building bye-laws to the **regulatory agencies** like DUAC, DJB, DFS, AAI, etc.

Visions of MPD '21 and '41		Does LPP talk about it?	Comments
1	Better quality of life	N	No mention
2	People engaged in productive work	N	As land use is changed from agriculture to residential, people must find employment in other sectors. Policy has no mention of providing city-level workplaces around land pooling zones. Travel distances and commute time will increase.
3	Sustainable development	Y	Policy briefly mentions mandatory green building norms, solar fittings, renewable energy sources
4	Adequate housing (especially EWS)	Y	Mandatory provision of EWS housing (15% over & above)
5	Adequate infrastructure services	Y	Area for city-level facilities has been set aside to be developed by DDA
6	Environmental conservation	N	Policy excludes lal dora abadis, LDRA, land with natural drain, heritage sites
7	Preservation of heritage and its integration with new developments	N	No mention
8	Public-private participation	Y	Policy offers control to the landowner and their consent is necessary before selling of land. It enables private developers to build housing units in the city, hence making them partners in the development process.
9	Community partnership	Y	One of the main guiding principles of the policy is inclusive development
10	Focus on non-ownership housing	N	Policy does not allude of rental housing
11	Mixed use zoning	Y	Vertical mixing is promoted

Land pooling policy is not entirely aligned with the visions of MPD. It does talk of providing adequate housing and infrastructure services, encourages the involvement of private sector, and introduces concepts not talked of before, such as vertical mixing. However, it ignores many other visions of the MPD, such as environmental and heritage aspects, and rental housing.

Operational Parameters	Policy clause	Comments
 Land assembly	<i>19.4 (ii) ...land use distribution will split on a 40:60 basis...</i>	i) 60-40 distribution reduces the need for large-scale compensation ii) A more participatory process than LA
	<i>19.4 (ii) Min. 40% pooled land in every sector shall be reserved for city level infrastructure.</i>	iii) It sets aside the area needed for provision of city-level facilities
	<i>19.2 (vi) Acquisition of any land (by DDA), which has not been offered under land policy and is required for effectuating the policy in any sector under the LARR Act, 2013.</i>	In case a landowner is unwilling to participate in the land pooling process and if their land is needed for effectuating the policy, then it shall be acquired by the government. Challenge of putting so many farmers together in agreement without a champion advocating for them.
 Cohesive development	<i>19.1 (i) Pooling of land under will be done based on sectors.</i>	With the coming of this policy, Delhi will experience a shift from plan-based to project-based development . Land Pooling policy does connect with the master plan; nonetheless, it is going to be implemented as projects. How will these projects connect and culminate into a zonal plan?
 Implementation	<i>19.1 (ix) External Development Charges (EDC) shall be applicable on the total pooled land to cover the actual cost of providing city-level infra.</i>	EDC is as high as 8 crores per Ha which is too much for a landowner, especially small farmers , topped with penalty charges on extension. This is likely to cause delays in the implementation process.
	<i>19.3 (v) Timely payment of EDC (by DE) to DDA and SPAs as per timelines specified in the Regulations.</i>	Differences in the amount of penalty (for delay in development) paid by DDA and DE (DE's penalty to the DDA being significantly higher).
	<i>19.4 (v) DE/Consortium may adopt innovative ways for achieving a vertical mix of uses (residential, commercial, PSP) within a building.</i>	New concept introduced, the degree to which neighborhoods mix uses and integrate greens ultimately impacts density, efficiency, wellness, and sustainability.
 Timely efficiency	<i>19.1 (iii) ...all constituent landowners forming part of the contiguous land in the sector to form a consortium...</i>	Time delays may arise due to: • Convincing landowners to participate can be a lengthy process • Stamp duty • Very high EDC (8 crores per Ha)
 Financial viability	<i>19.4 (vi) d. For EWS housing, the DE shall utilize a mandatory FAR of 15% over and above the maximum permissible residential FAR.</i>	Private developers may be hesitant to develop EWS projects if not profitable .

Land Pooling **operationally seems to be better than Land Acquisition in some ways** (land assembly), although there are issues with cohesive development, timely efficiency, and it raises some questions on financial viability and implementation. These will be assessed subsequently.

Substantive Parameters	Policy clause	Comments
 Inclusivity	<i>19.4 (vi) d. For EWS housing, the DE shall utilize a mandatory FAR of 15% over and above the maximum permissible residential FAR.</i>	By accommodating EWS in “extra” FAR in the policy. Use of this language treats them as “extra people”.
	<i>19.3 (xii) Dispose 50% of EWS housing stock to residents within the new development, at market rates, to house community service personnel working for the residents/owners.</i>	50% of the EWS housing stock is covered up as servant quarters . Policy does not benefit lower income groups as it will be sold at market rates which will be very high.
	<i>19.1 (vi) An individual landowner who has pooled one or more parcels of land in the sector, adding up to a minimum of 2 hectares</i>	Unfair to small land holders as landowners owning less than 2 ha can’t be part of the consortium (yes, they can combine their plots but that’s another tedious process)
 Environment & Sustainability	<i>19.4 (viii) Additional DCRs to promote sustainable environment management systems through integration of blue and green infrastructure in the sector layout plans.</i>	Policy only vaguely talks about sustainable environment management systems and the blue-green network. Should be more specific.
	<i>DCR 11 (ii) Mandatory green building norms as per Master Plan and Building Bye Laws; minimum 10% of all energy consumption shall be through solar fittings or other renewable energy sources.</i>	Policy only briefly mentions mandatory green building norms, solar fittings, renewable energy sources.
 Democratic	<i>19.2 (vi) Acquisition of any land (by DDA), which has not been offered under land policy and is required for effectuating the policy in any sector under the LARR Act, 2013.</i>	In case a landowner is unwilling to participate in the land pooling process and if their land is needed for effectuating the policy, then it shall be acquired by the government. Challenge of putting so many farmers together in agreement without a champion advocating for them.

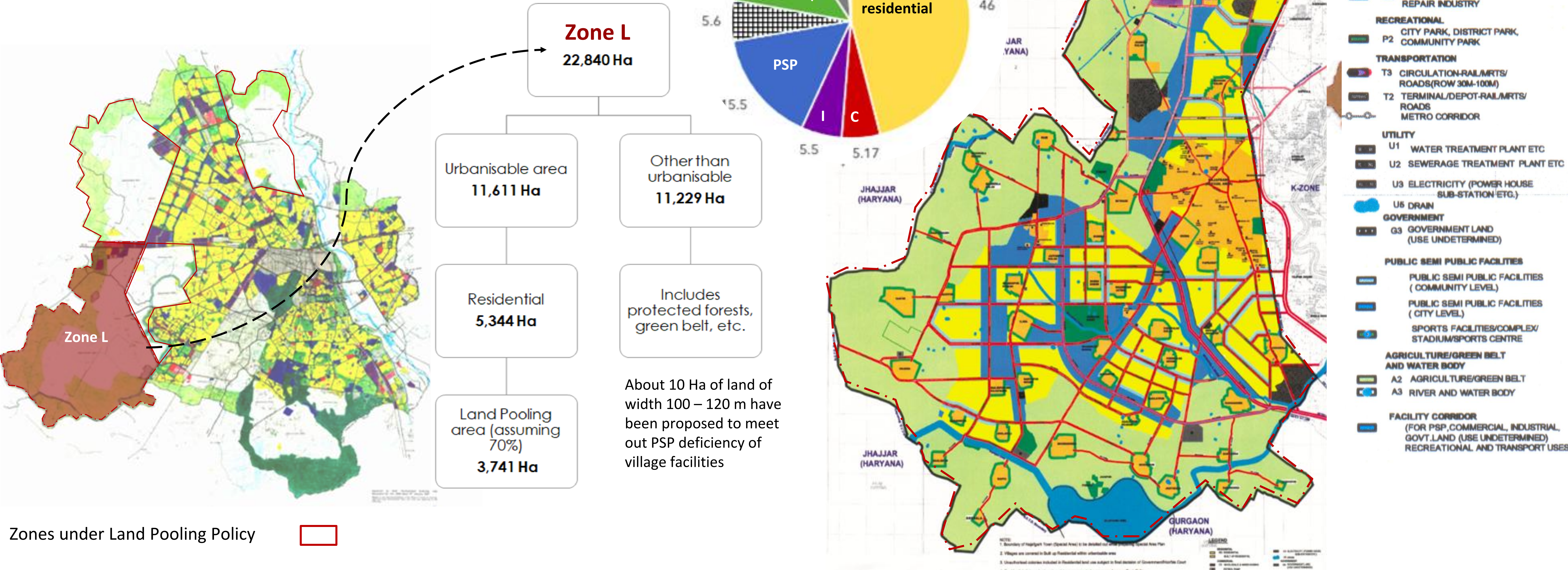
The policy is **lacking in domains of inclusivity, sustainability, and fairness**. There is potential for the policy to be more sensitive towards these parameters, recommendations for which would be given later.

Introduction to case study: Zone L, Delhi

Zone L

Land pooling is proposed for **5 zones** (out of 15) i.e. L, K-I, N, P-II, and a small part of J.

Delhi NCR
Total area = 1,48,400 Ha
Area under land pooling = 19,000 Ha
% area under LP = 12.8%



Zones under Land Pooling Policy

Zonal plan objectives

- To provide **adequate shelter** along with physical & social infrastructure for assigned population.
- To provide **work centers**
- Conservation of **environment**.
- Public, Private and Community participation** to remove bottleneck and delay in the assembly of land
- Redevelopment of existing built-up area, regularization of existing unauthorised colonies**
- Integration of transport network** with the other parts of the city.

Zone Characteristics

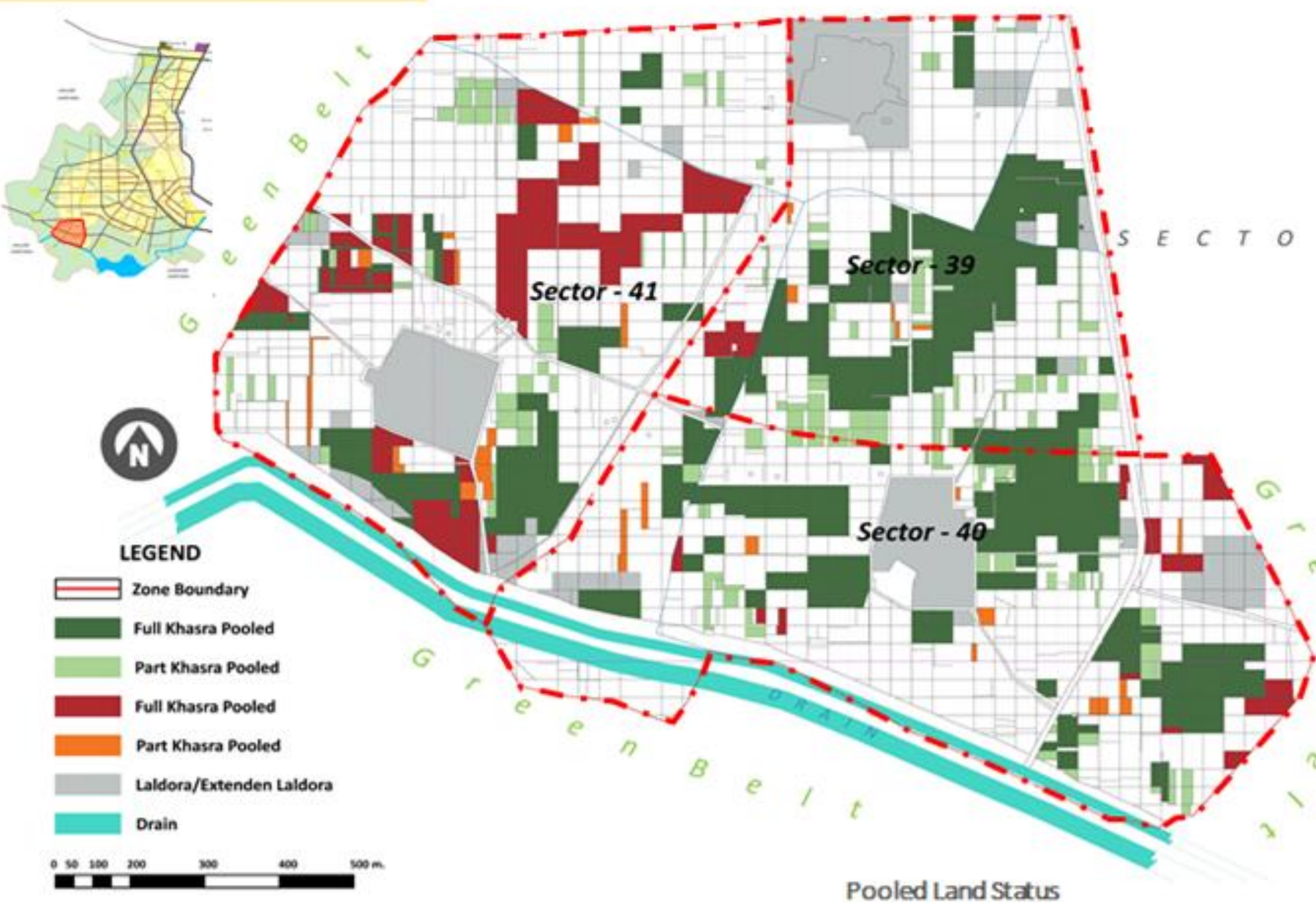
- The zone is the largest of 15 zones of Delhi
- Most of the area of Zone 'L' forms **part of the Najafgarh drainage basin**. Najafgarh Drain is one of the very old drains which emanates from Rajasthan / Haryana as a rivulet.
- The topography of the zone depicts **gentle slope from North to South**.
- Safe drinking water is inadequate. Most of **water requirement is met out by tube well**. However, **the output performance of tube wells has shown a declining trend**.
- The Najafgarh block has **2 protected forests** in village
- In the zone the existing industrial area is Tikri Kalan which has been developed by DDA
- about 500 Ha land is proposed under the industrial use zone** which includes about 100 Ha land at Tikri Kalan under light and Service Industrial use (PVC Bazaar).
- Out of remaining 400 Ha about 80 Ha is proposed for relocation of the industries to be shifted from the existing non conforming areas and about 300 Ha land is proposed for hi tech industries.

Zone 'L' sectors qualified for Land Pooling

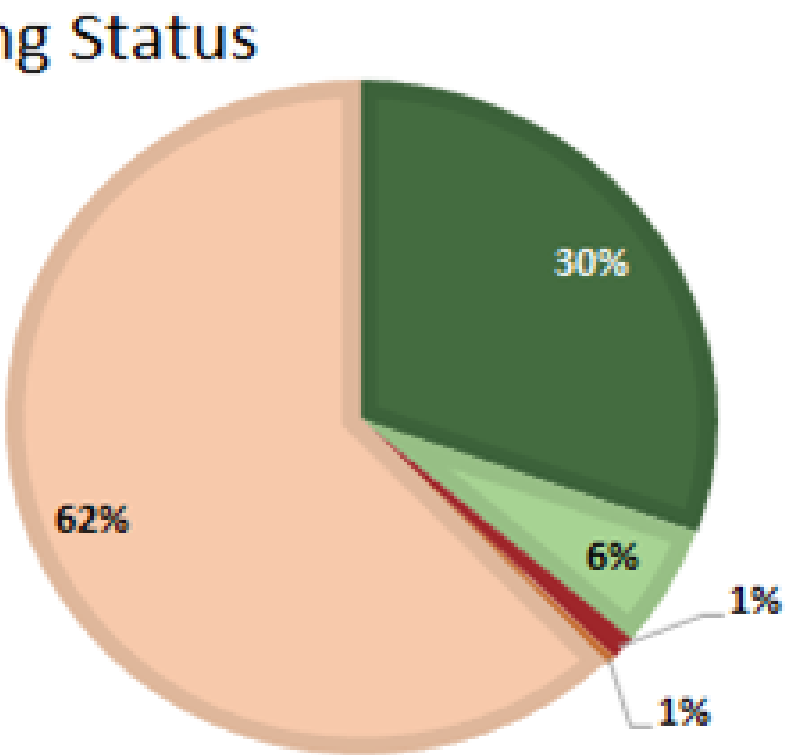
Total area = 22,840 Ha

Sector(s) qualified for land pooling – 4

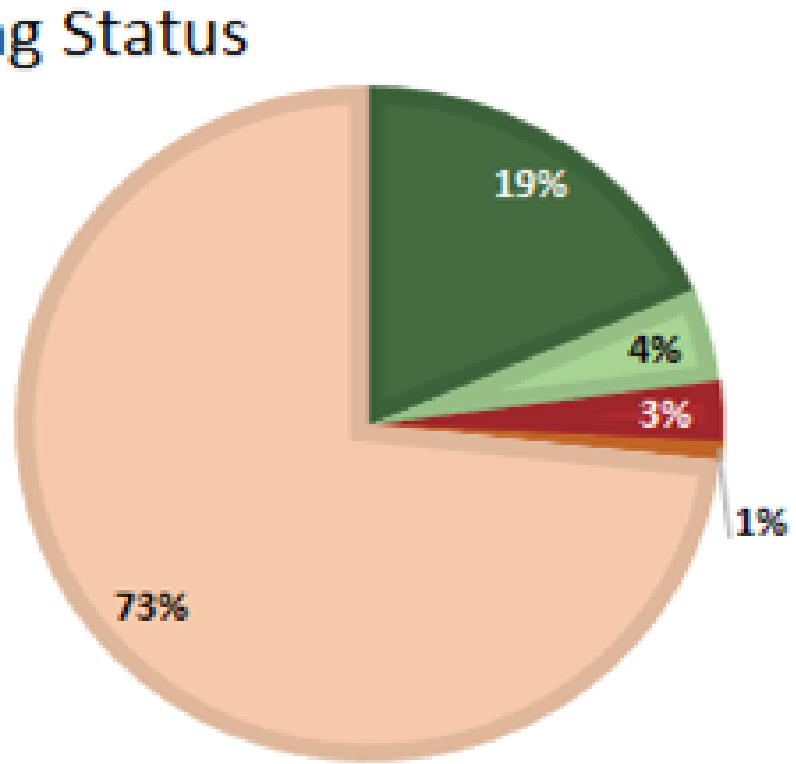
Land Pooling Status



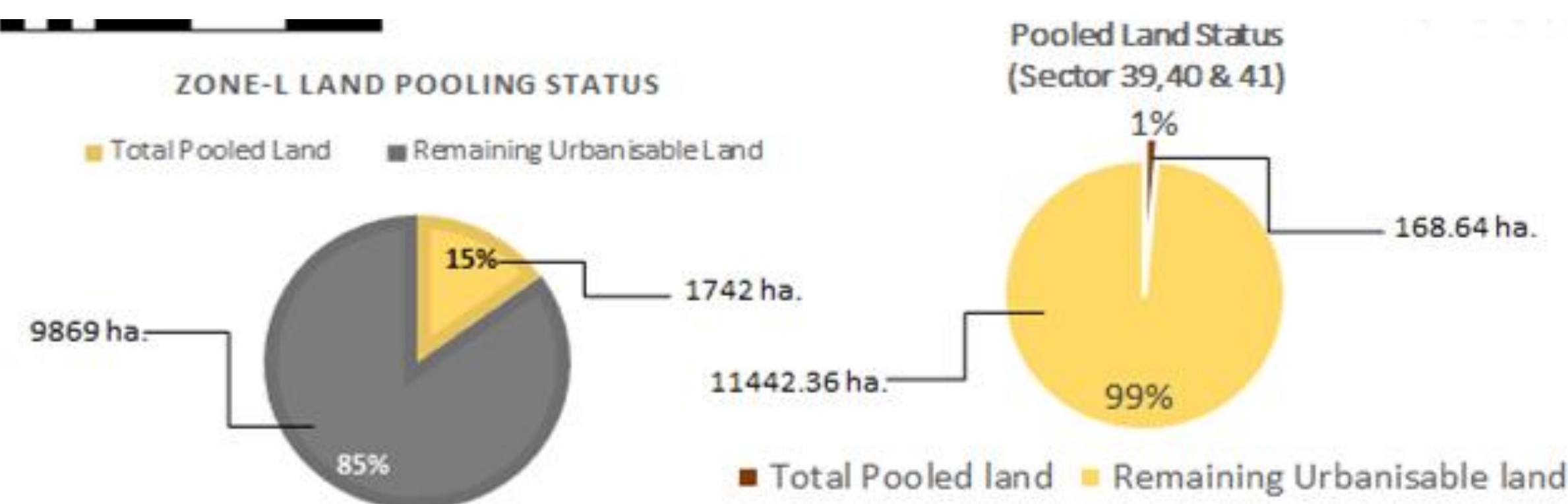
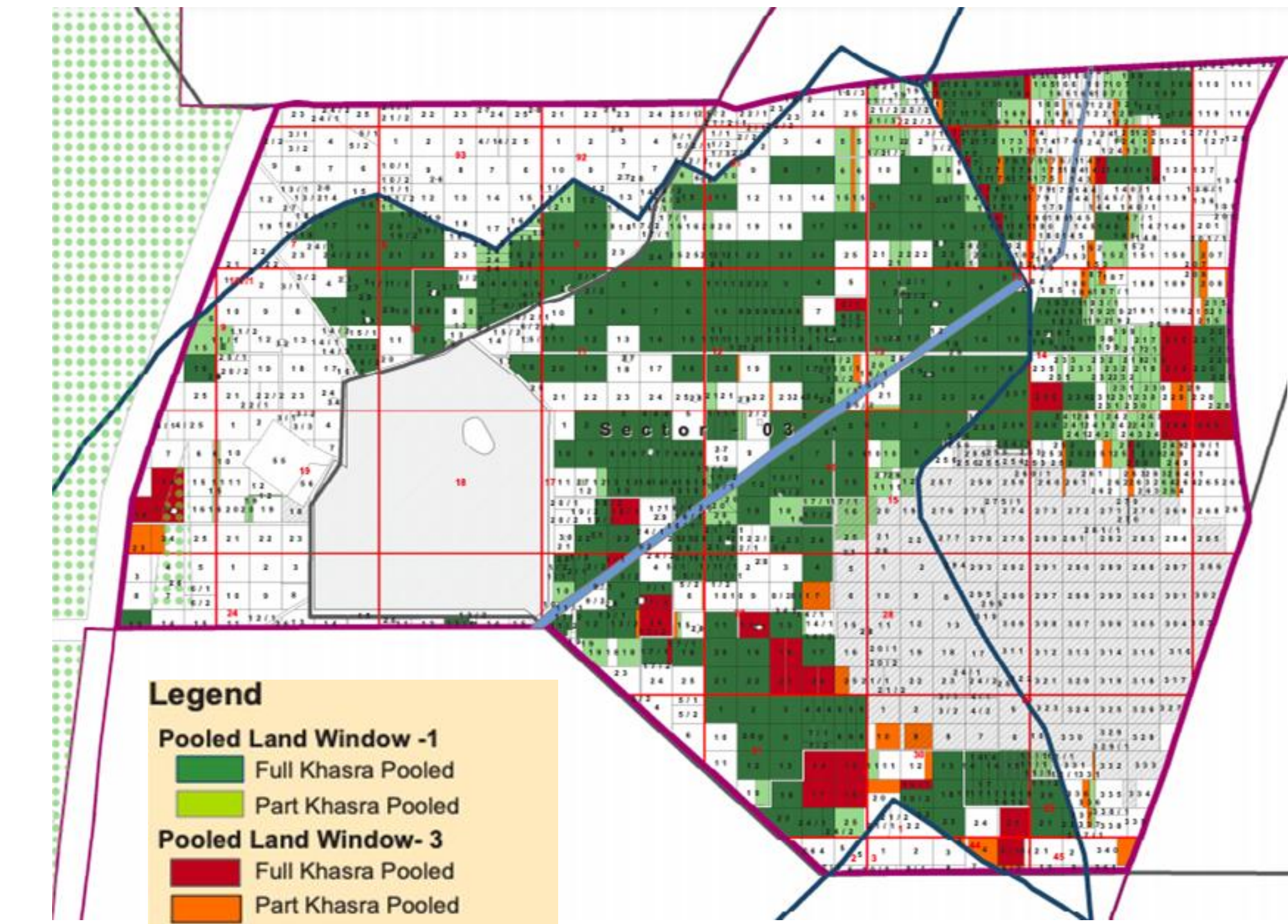
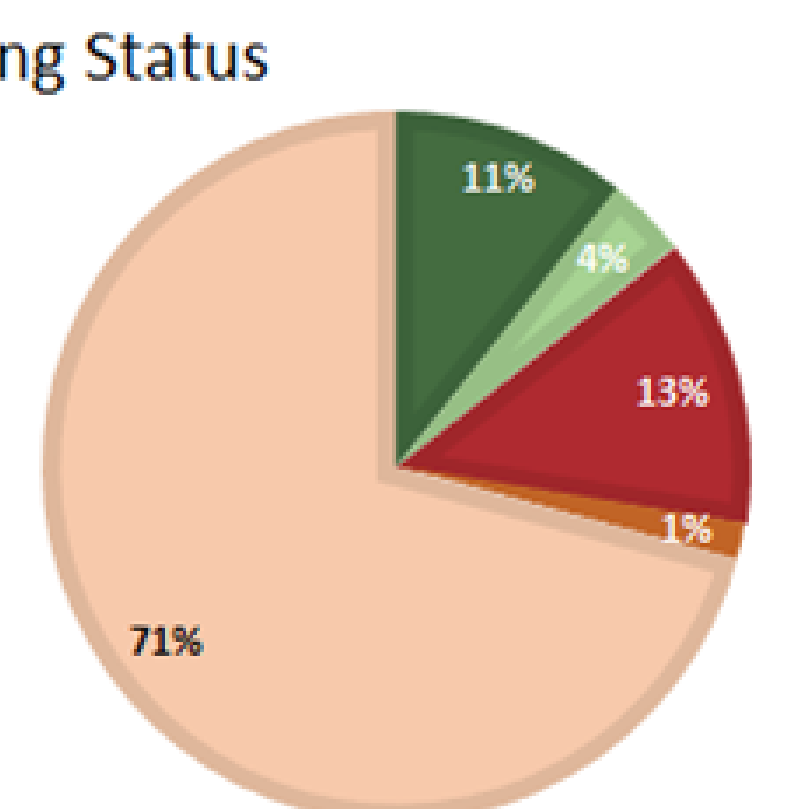
Status	Area in ha.
Full khasra Pooled (W1)	43.15
Part Khasra Pooled (W1)	8.35
Full khasra Pooled (W3)	1.6
Part Khasra Pooled (W3)	0.6
Remaining vacant land	88.3



Status	Area in ha.
Full khasra Pooled (W1)	37.52
Part Khasra Pooled (W1)	8.95
Full khasra Pooled (W3)	5.65
Part Khasra Pooled (W3)	1.86
Remaining vacant land	148.02



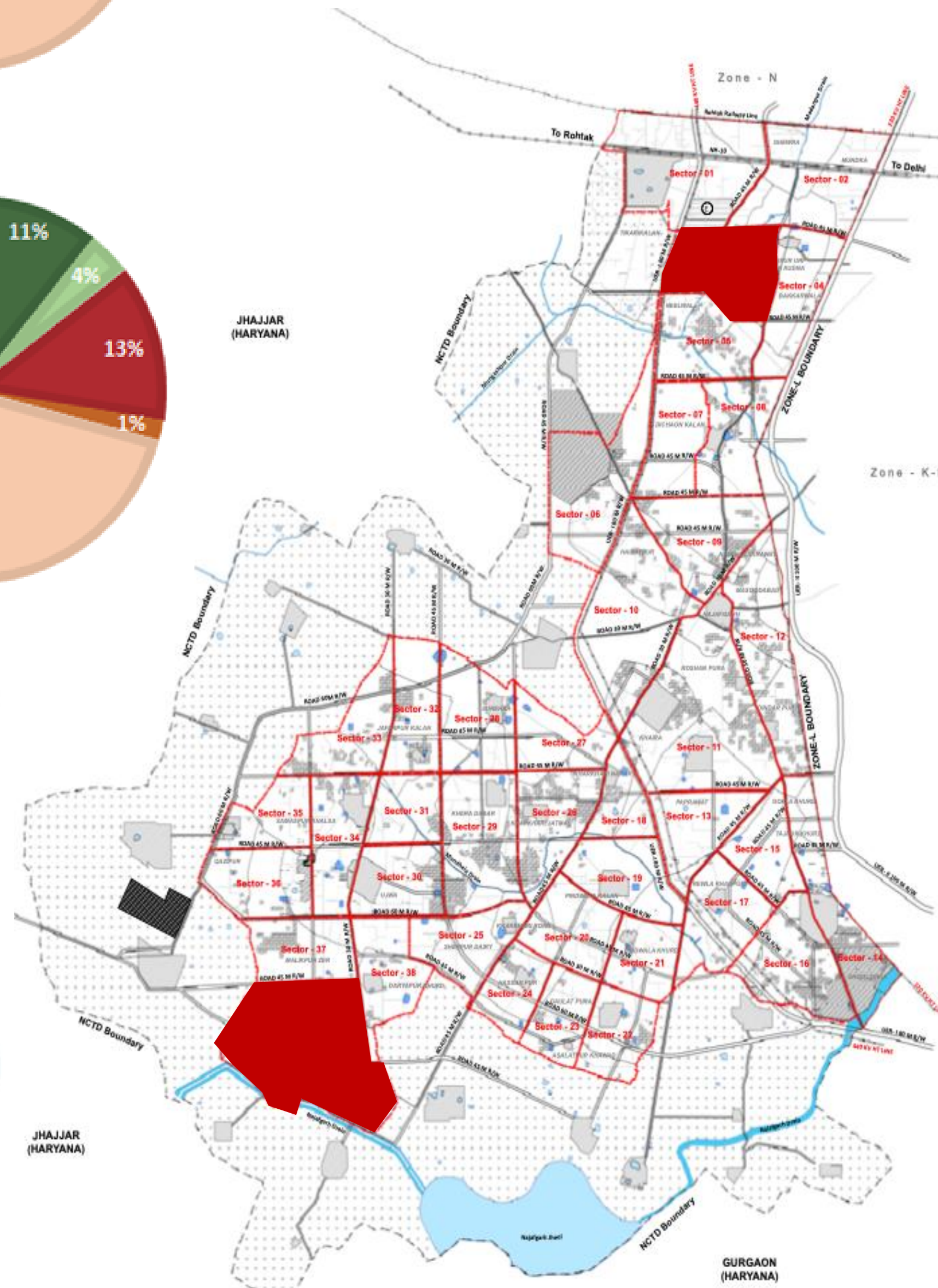
Status	Area in ha.
Full khasra Pooled (W1)	22.45
Part Khasra Pooled (W1)	7.67
Full khasra Pooled (W3)	27.4
Part Khasra Pooled (W3)	3.44
Remaining vacant land	148.04



Area of sector 3 = 302 Ha
Area of land pooled = 46.51%, 140.46 Ha



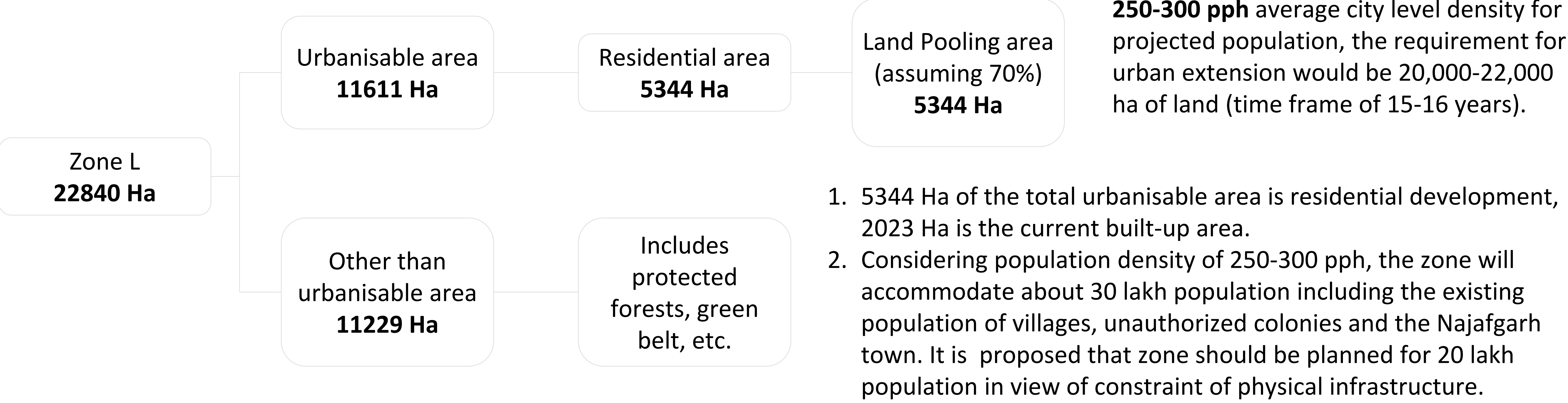
Zone 'L' sector divisions for Land Pooling



DEMOGRAPHY

POPULATION OF ZONE L AS PER MPD 2021

KEY
MAP

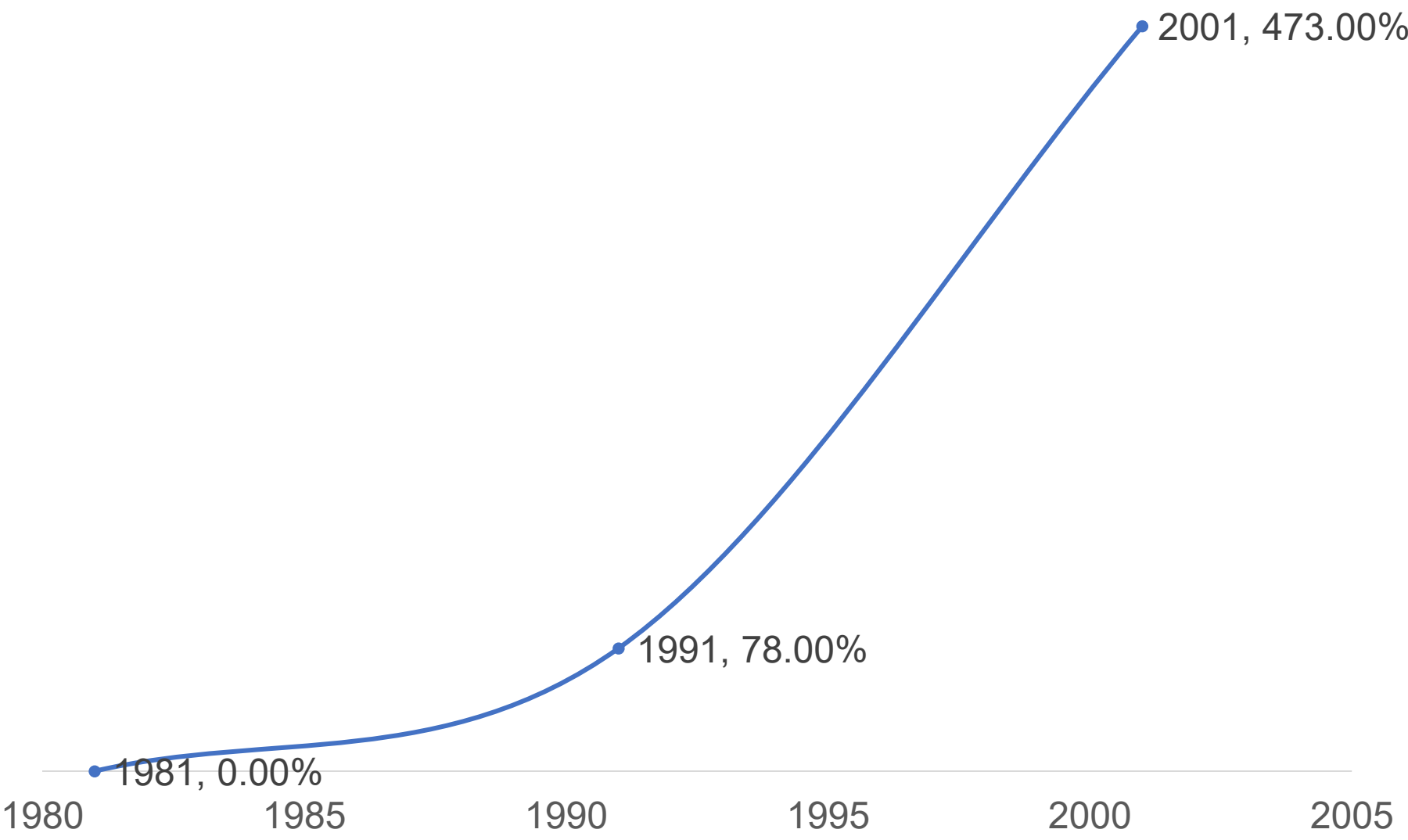


POPULATION TREND OF ZONE L AS PER ZONAL PLAN



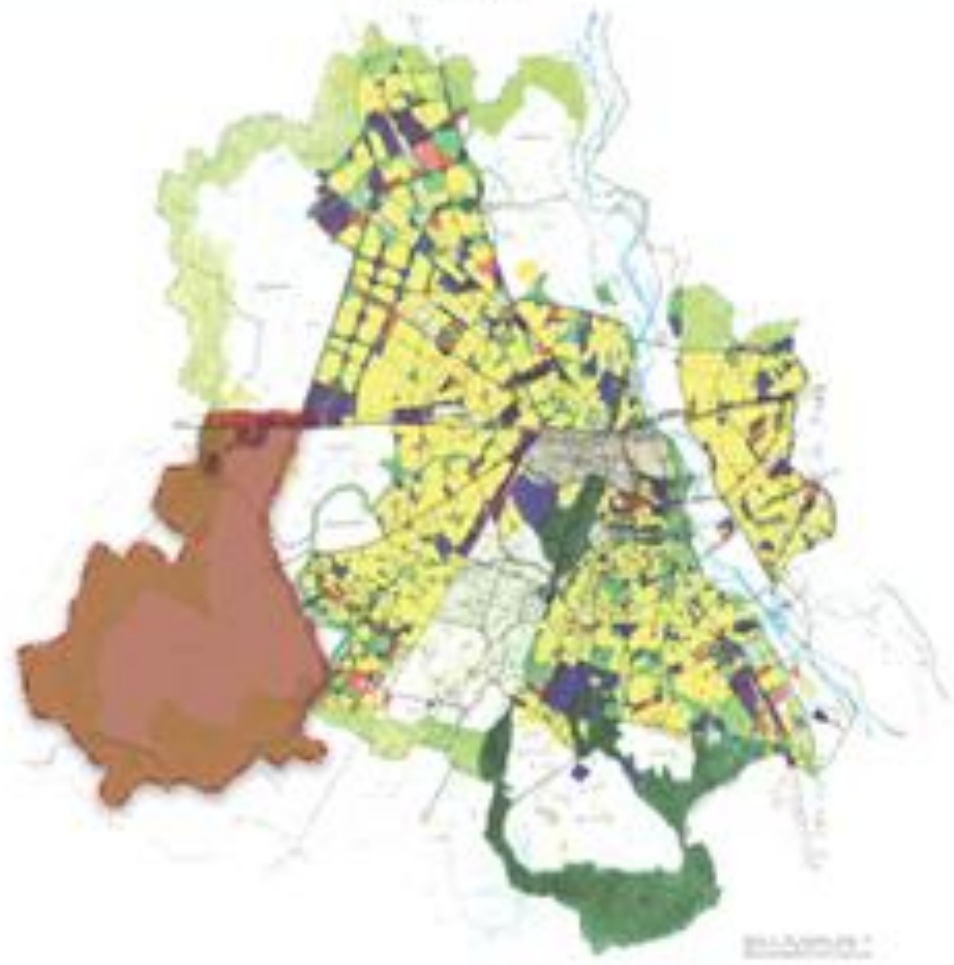
YEAR	POPULATION	GROWTH RATE(%)
1981	88342	-
1991	157561	78%
2001	902696	473%

YEAR WISE POPULATION GROWTH RATE



From zonal plan year wise population data shows in 1981 the population of zone L was 88342 and which increased to 157561 in 1991 with an annual growth rate of 78% and by 2001 the population become 902696 at an annual growth rate of 473%. The possible reason behind the sudden increase in population might be migration of people from rural area to urban area in search of jobs.





According to census 2011 the zone L lies in two sub districts namely Najafgarh sub-district and Punjabi Bagh sub-district. Where as **the zones 75% of area falls in Najafgarh sub-district and 25% on Punjabi Bagh sub-district. Hence the assumed population for zone in 2011 is the equal to the percentage distribution of area in both the sub-districts. The total population of zone L is 1223727.**

	Population of sub-district	%age	Population in Zone L
Najafgarh subdistrict	13,65,152	75%	1023864
Punjabi Bagh subdistrict	7,99,453	25%	199863
Total			12,23,727

Formula used
= P(n) = P+C*n

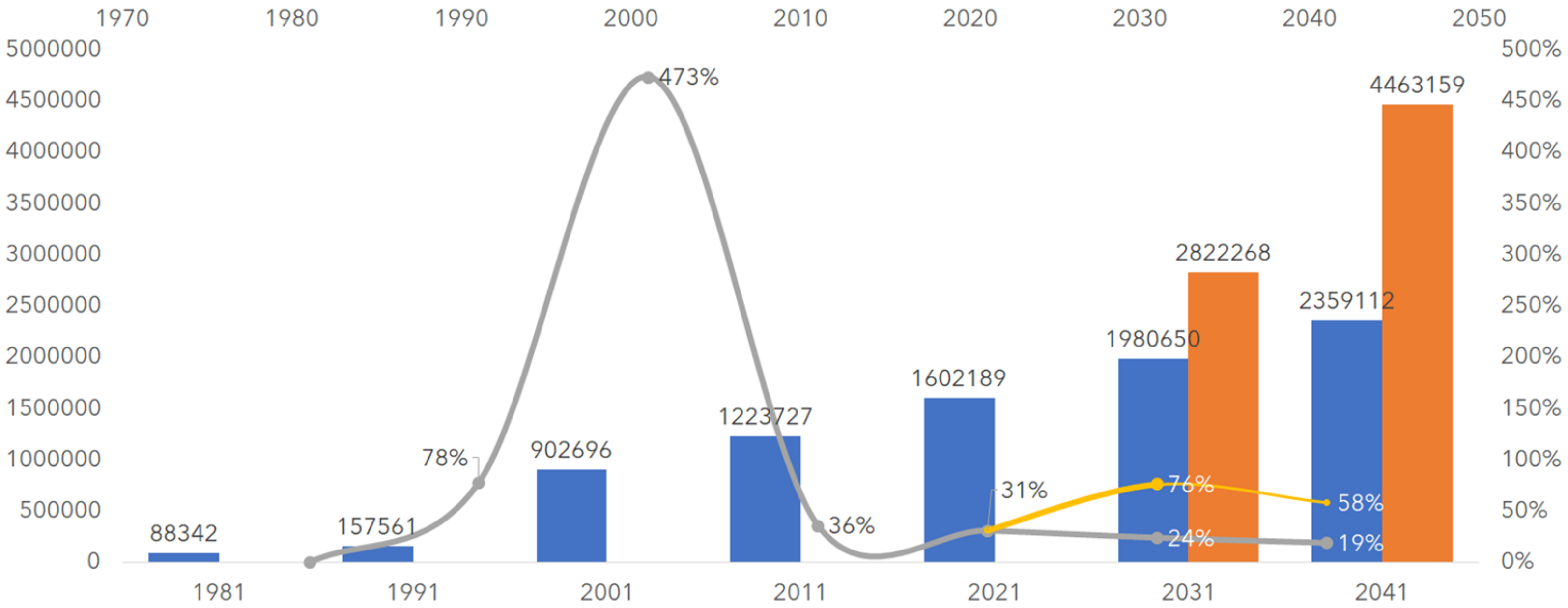
Where,
P(n) = population after n decade
P = present population
C = rate of change of population with respect to time is constant.
n = Number of decades

Where P = 2011 population =1223727
C = (2011 population-1981 population)/30
= (1223727-88342)/30
= 37846.2

Then the population for 2021 will be for which the value of n will be 10
P(10) = 1223727+(37846.2*10)
P(10) = 1602189
Similarly for 2031 = 1980650
And for 2041 = 2359112
It is estimated that by 2031 the development in land pooling area will 40% completed and can accommodate more 865371 numbers of people and by 2041 the area will be fully develop that can accommodate more 2163428 number of people. So, the final population will be:
For 2031 = 1980650+865371=2846021
And for 2041 = 2359112+2163428=4522540

From all we come to know that the population growth in the year 2021-2031 rises from 24% to 76% and from 2031-2041 the growth rate rises from 19% to 58% due to land pooling.

Year	Population	Growth rate	Land pooling phasing	Land pooling population	Final Population	Final growth rate
1981	88342	-	-	-	88342	-
1991	157561	78%	-	-	157561	78%
2001	902696	473%	-	-	902696	473%
2011	1223727	36%	-	-	1223727	36%
2021	1602189	31%	-	-	1602189	31%
2031	1980650	24%	40%	841618	2822268	76%
2041	2359112	19%	100(60%+40%)	2104047	4463159	58%





According to MCD election 2017 zone L is divided into 9 wards which is shown in the table. For calculating the population for 2017 it is given that the number of people given vote and what is the percentage of total voting population given vote. With the given data we are able to calculate the total voting population range after that we **assumed that 40% is the voting population** then we can find the find the total population range. Then taking average population and adding up total to get total population that is 1479716.

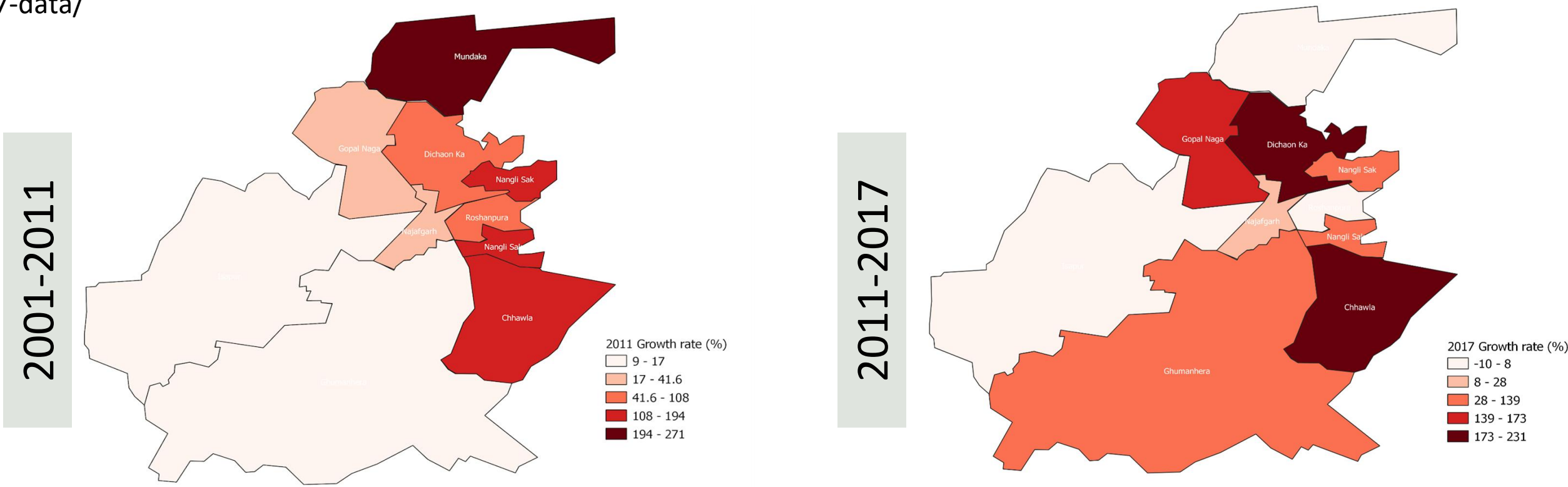
Ward Name	Ward No.	Voting Population	Percentage of people given vote (%)	Total voting Population			Total population		Average Total population
				From	To		From	To	
Ghuman Hera	40S	15252	56-70	21789	27236	40% is the voting population	54471	68089	61280
Isapur	45S	11924	56-70	17034	21293		42586	53232	47909
Mundak	39N	22262	52-56	39754	42812		99384	107029	103206
Chhawla	39S	18619	56-70	26599	33248		66496	83121	74808
Dichaon Kalan	42S	21961	56-70	31373	39216		78432	98040	88236
Nangli Sakrawati	34S	18520	52-56	33071	35615		82679	89038	85859
Gopal Nagar	41S	11347	52-56	20263	21821		50656	54553	52605
Najafgarh	43S	214959	52-56	267134	328767		867817	919182	903813
Roshanpura	44S	15431	56-70	22044	27555		55111	68888	62000
Total									1479716



The final population for **2017 = 1479716**

*Source: <https://www.hindustantimes.com/interactives/mcd-election-results-2017-data/>

Ward Name	Ward No.	2001	2011	2001-11 Growth rate (%)	2017	2011-17 growth rate (%)
Ghuman Hera	40S	39914	43430	9	61280	41
Isapur	45S	46768	53000	13	47909	-10
Mundak	39N	25701	95396	271	103206	8
Chhawla	39S	9047	22606	150	74808	231
Dichaon Kalan	42S	15179	27255	80	88236	224
Nangli Sakrawati	34S	12216	35856	194	85859	139
Gopal Nagar	41S	15301	20209	32	52605	160
Najafgarh	43S	699989	827379	18	903813	9
Roshanpura	44S	38581	57217	48	62000	8
Total		902696	1182348		1479716	



- Out of 9 wards present in Zone L about 77% of people resides in Najafgarh ward and remaining 23% of people reside in rest of the wards.
- In the map is in the form of red gradient color where darker symbolize the highest and lighter symbolize the lowest growth rate of the wards.
- From 2001-11 Mundak ward has the highest growth rate where as Isapur and Ghuman Hera has lowest growth rate.
- From 2011-17 Dichaon Kalan and Chhawla has highest growth rate and Mundak and Isapur has the lowest growth rate.



Hence adding the projected population is

For 2021 = 1623971
2031 = 1984608
2041 = 2345246

CONCLUSION

From both the method used for Population estimation we got two values of population for 2041 by Method 1 =**4463159**
Method 2 = 4449293

Hence the final population we can choose is 4463159 because according to that we can make better decision for facility requirement, open space requirement, housing requirement and commercial space requirement of the area. So, the population might give better result.

WARD WISE POPULATION ESTIMATION

Using arithmetic population projection method population for 2021, 2031 and 2041 is calculated using:

Formula used
= P(n) = P+C*n

Where,
P(n) = population after n decade
P = present population
C = rate of change of population with respect to time is constant.
n = Number of decades

Where C can be calculated using

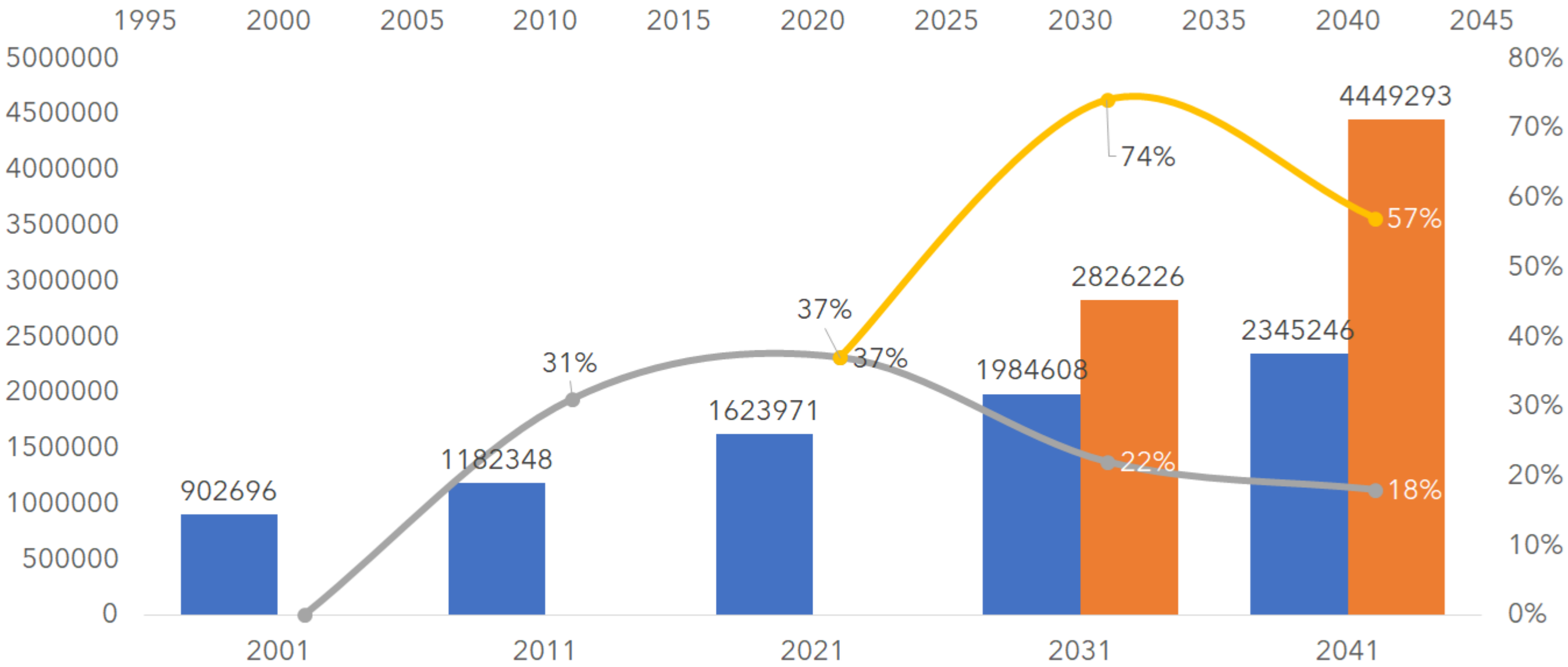
=C = (P-p)/n
Where,
P = present population
p = Last known decades population
n = Number of decades

Ward Name	Ward No.	2001	2011	2017	C	2021	2031	2041
Ghuman Hera	40S	39914	43430	61280	1335.4	66621.9	79975.9	93329.9
Isapur	45S	46768	53000	47909	71.3	48194.2	48907.2	49620.3
Mundak	39N	25701	95396	103206	4844.1	122582.7	171023.6	219464.5
Chhawla	39S	9047	22606	74808	4110.1	91248.85	132349.8	173450.7
Dichaon Kalan	42S	15179	27255	88236	4566.1	106500.5	152161.2	197821.9
Nangli Sakrwati	34S	12216	35856	85859	4602.6	104269.1	150295.7	196322.3
Gopal Nagar	41S	15301	20209	52605	2331.4	61930.5	85245.2	108559.9
Najafgarh	43S	699989	827379	903813	12739	954769	1082159	1209549
Roshanpura	44S	38581	57217	62000	1463.6	67854.2	82490.8	97127.4
Total		902696	1182348	1479716		1623971	1984608	2345246

Year	Population	Growth rate	Land pooling phasing	Land pooling population	Final Population	Final growth rate
2001	902696	-	-	-	902696	-
2011	1182348	31%	-	-	1182348	31%
2021	1623971	37%	-	-	1623971	37%
2031	1984608	22%	40%	841618	2826226	74%
2041	2345246	18%	100(60%+40%)	2104047	4449293	57%

It is estimated that by 2031 the development in land pooling area will 40% completed and can accommodate more 865371 numbers of people and by 2041 the area will be fully develop that can accommodate more 2163428 number of people. So, the final population will be:
For 2031 = 1984608+865371=2849979
And for 2041 = 2345246+2163428=4508674

From all we can see that the population growth in the year 2021-2031 rises from 24% to 74% and from 2031-2041 the growth rate rises from 19% to 57%



HOUSING

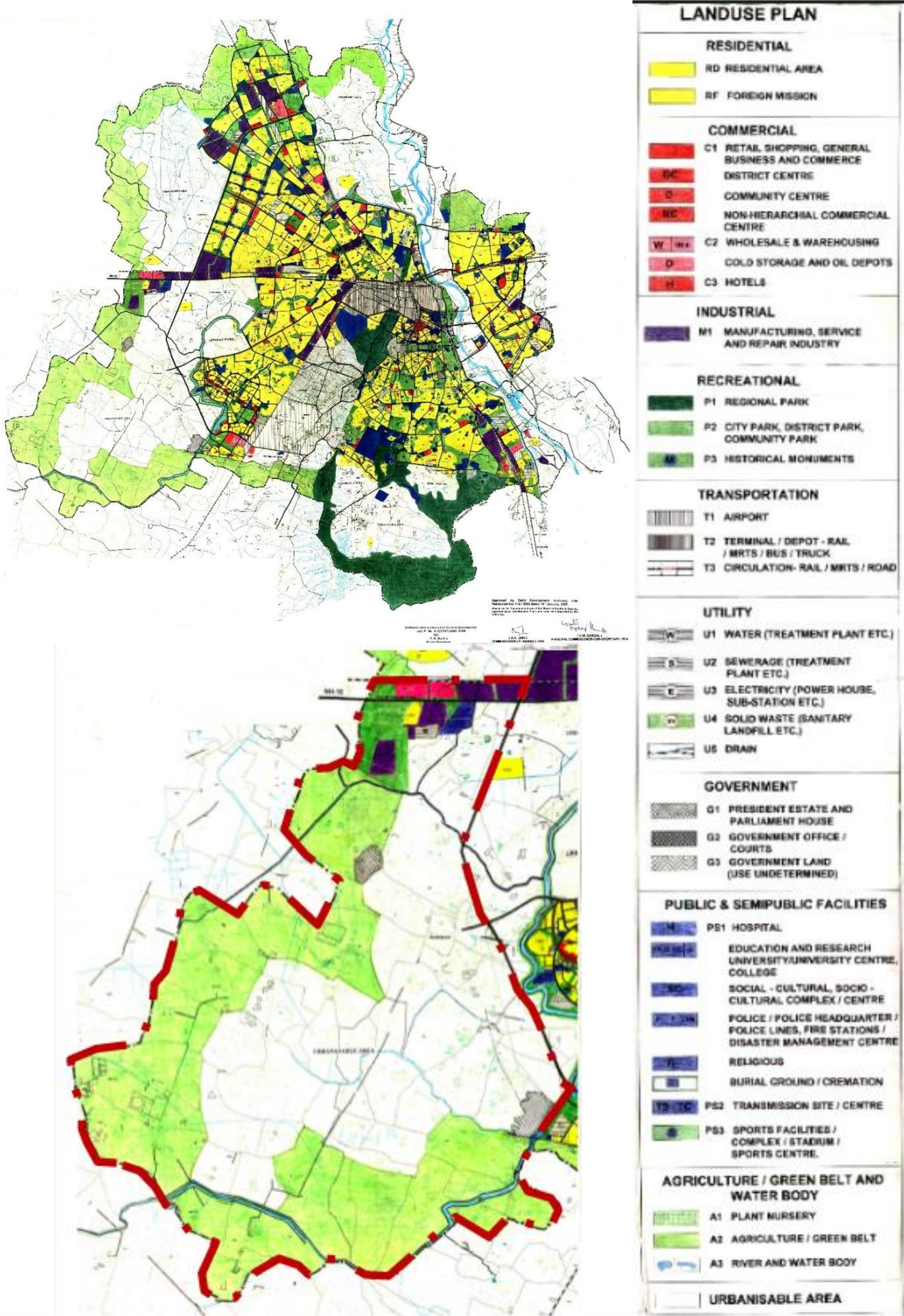
Housing strategy

- In 2001, about 702 sq km of built up was present for 138 lakh population.
- To accommodate the projected population of **230 lakh by the year 2021**, a **three-pronged strategy is recommended**:
 - I. To encourage the population to deflect in the **NCR towns**
 - II. To increase the population holding capacity of the area within existing urban limits through **redevelopment**
 - III. **Extension of the present urban limits** to the extent necessary

Housing need

- Remaining **77 lakh (230-153 lakh)** population:
 - I. 29 lakh already exists in villages, census towns, unauthorized colonies and JJ clusters in the present rural areas.
 - II. 48 lakh additional population is to be accommodated in the future urban extensions.
- 250-300 pph average city level density for projected population, the requirement for urban extension would be 20,000-22,000 ha of land **(time frame of 15-16 years)**.
- The immediate **urban extension** in the **zones of J to L, N & P (I & II)**.
- Additional housing stock around **24 lakh dwelling units**.
 - I. 40% of housing stock in redevelopment of existing urban areas
 - II. 60% of housing (14.4 lakh) provided in new areas.
- **50-55% of housing** in new development reserved for **EWS & urban poor with 25-40 sqm DUs**.

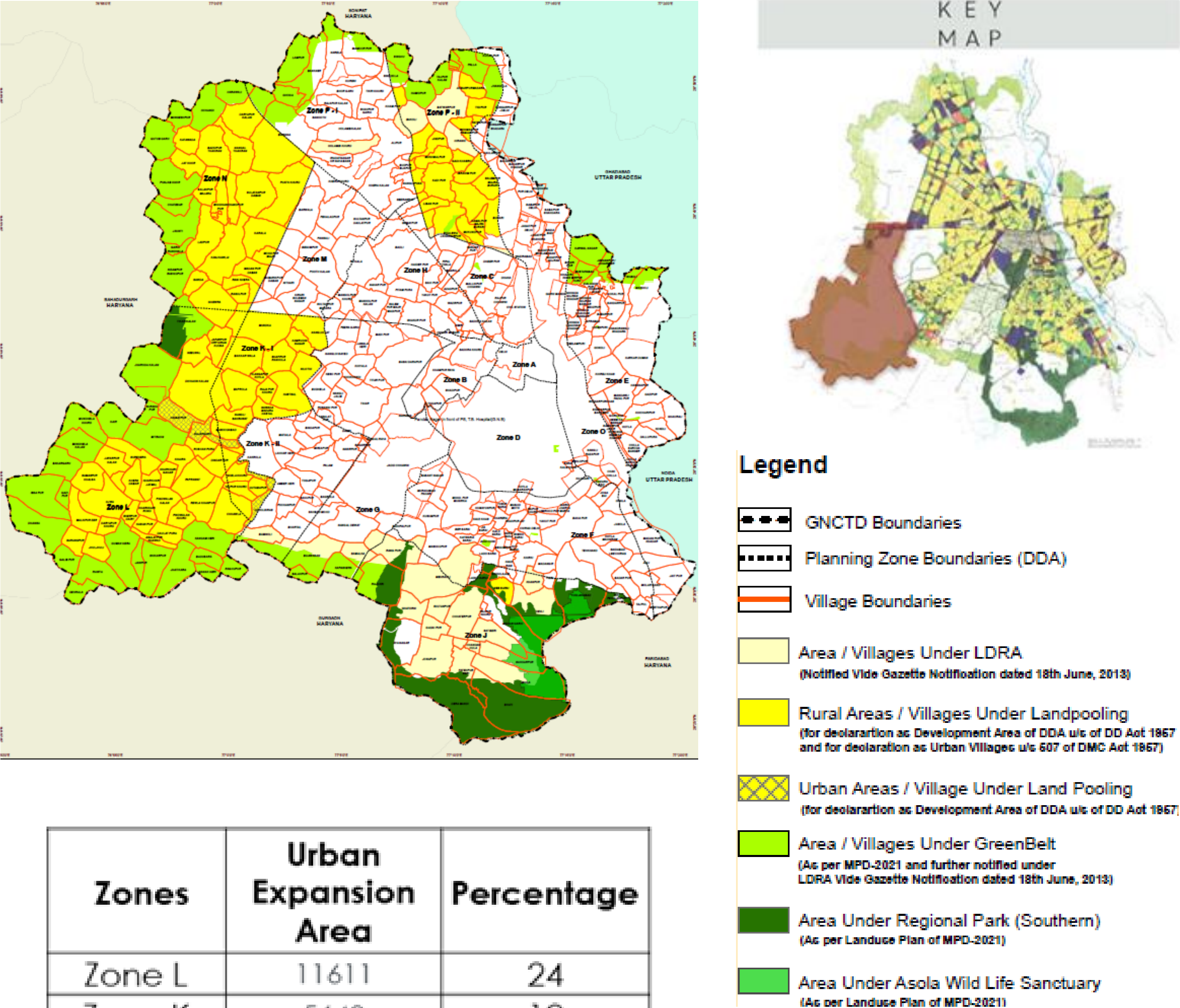
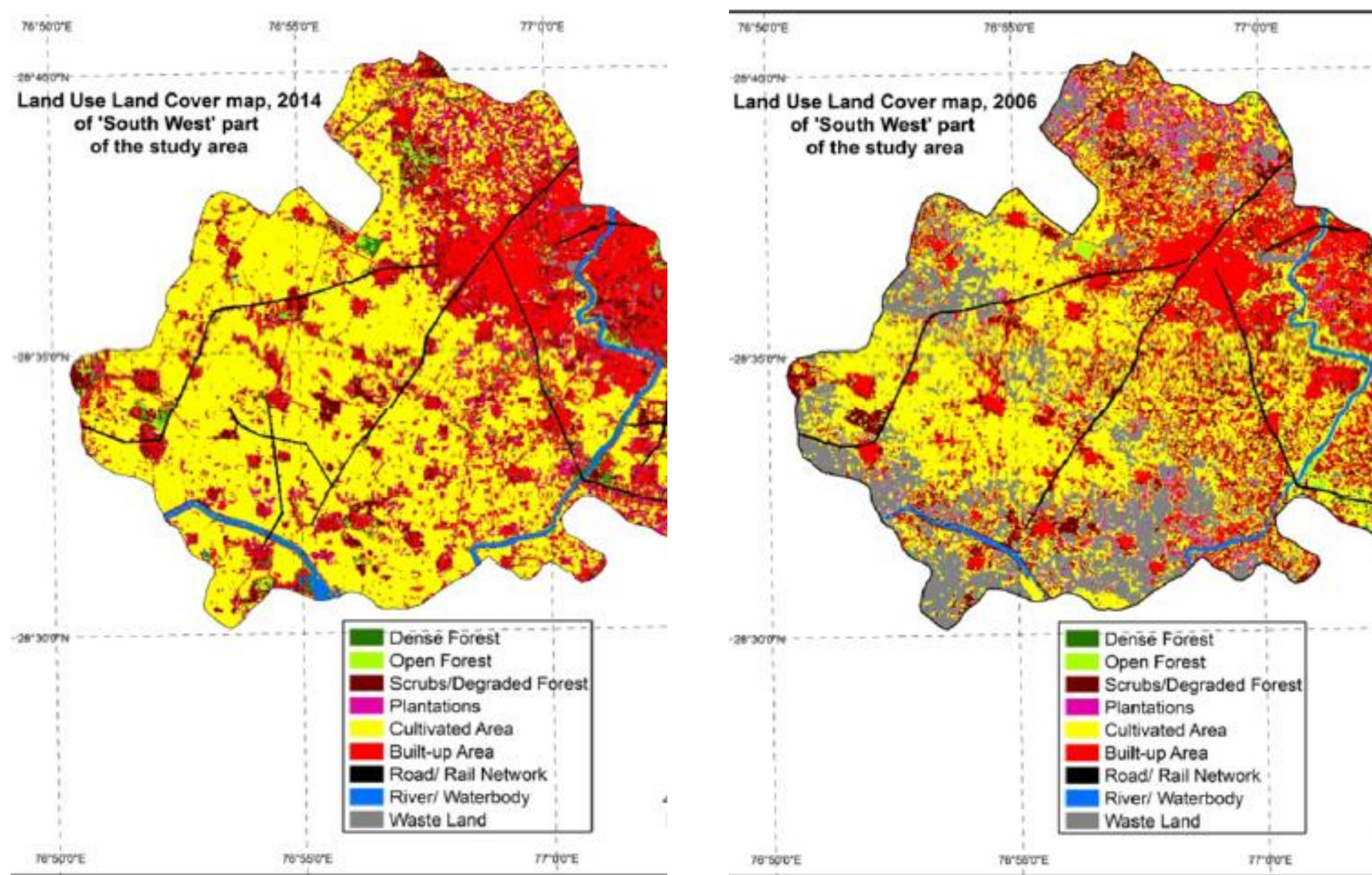
Areas earmarked as rural / agricultural in the previous Master Plans have always been under pressure for utilization for various urban activities and have virtually lost their original character.



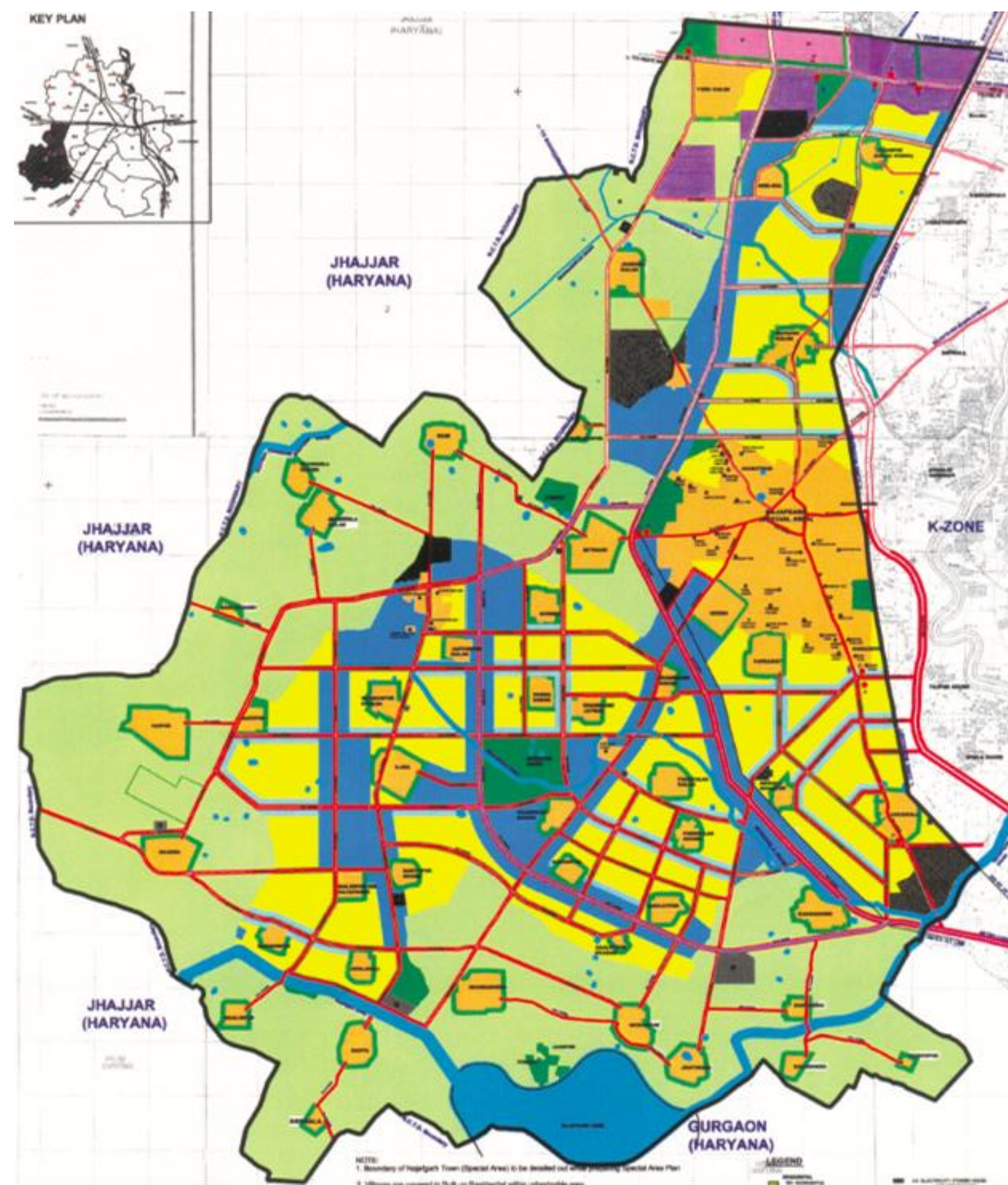
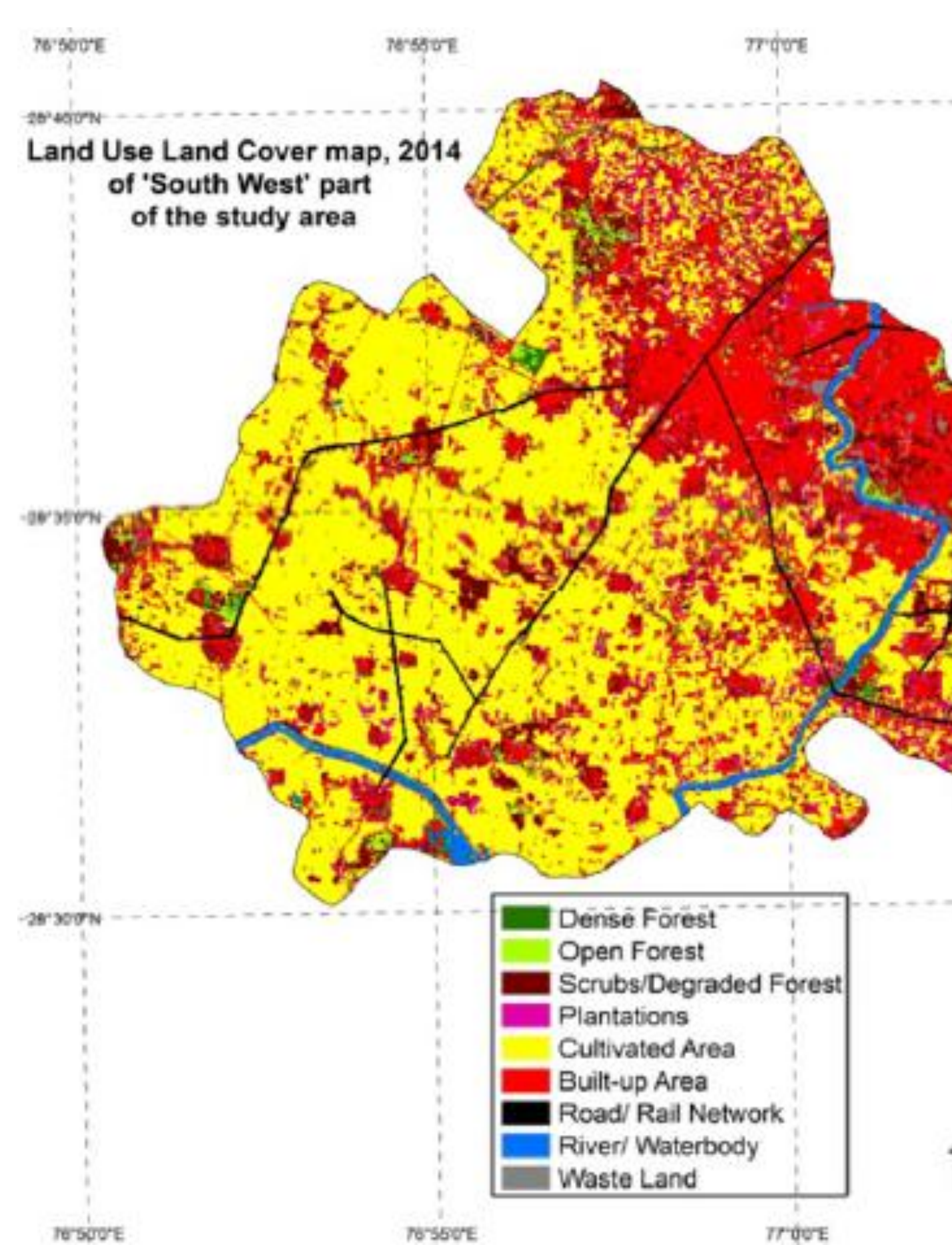
Development Phasing

- **Total Urbanizable Area: 48,832 Ha**
- There would still be a need for the development of housing to the extent of at least **75,000 DUs per annum in different categories**. The land required to be developed in new housing will be to the tune of around **450-500 ha. per annum**.
- Out of 24 lakhs DUs, 10 lakhs DUs will be provided through redevelopment and remaining **14 lakhs through new housing (63 Lakhs pop.)**.
 - **13 lakhs DUs (58.5 Lakhs pop.)** will be provided on new land while the remaining
 - 1 lakh DUs on the place of Unauthorized regularised colonies and other housing areas/ villages.

Development in Zone L



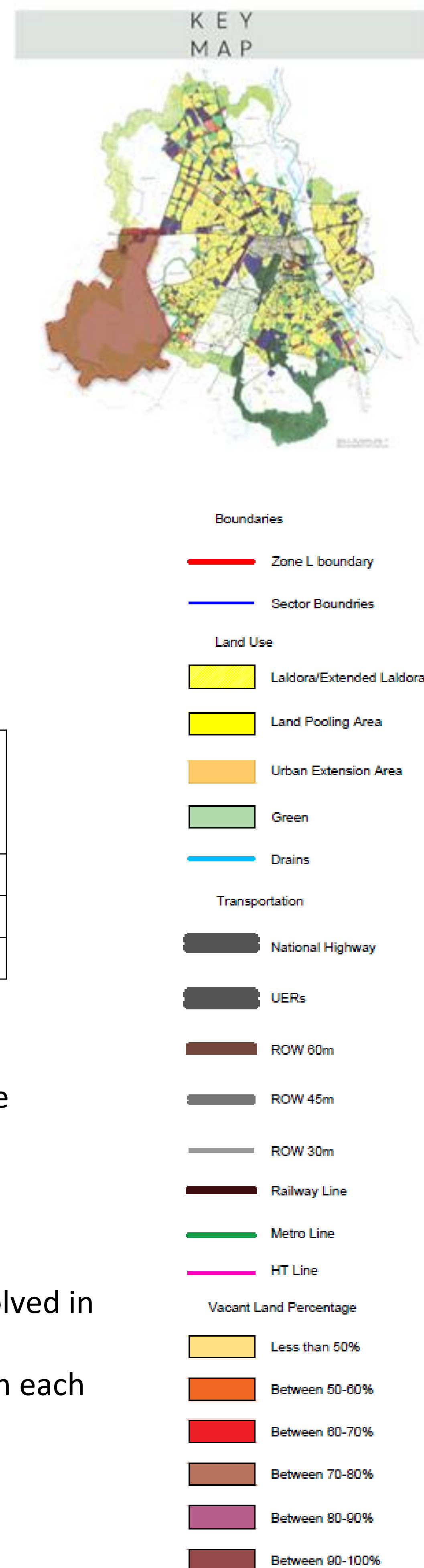
- According to MPD 2021, till the year 2021 3.36 lakhs new DUs (15.12 lakhs pop.) will have to be constructed in the Zone L, to accommodate the projected population of 2021 in master plan.
- And from 2011 to 2016, about 1.32 lakhs should have been constructed in Zone L but these new constructions aren't visible in the LULC maps and the development is not present. The new population which was supposed to be accommodated in Zone L has not been achieved. **This will put pressure on existing settlements and village abadi's.**



Residential Development Area	Area	Neighbourhoods	Dwelling Units	Population
	3,410	136	3,03,111	13,64,000

- For residential development 5344 Ha. of land is proposed in a hierarchy of Neighborhood, community etc.
- Out of this 5344 Ha of residential development, 2023 Ha is current built-up area.
- A Neighborhood module of 20-25 Ha. shall accommodate about 10,000 population as per density norms of Master Plan.
- About 5 Ha. of land in each module shall be provided for neighborhood facilities such as Sr. Secondary School, Park & Play ground etc.

Year	Existing Settlements Population	Dwelling Units	Density
2021	1602189	356042	792
2031	1980650	356042	979
2041	2359112	440144	1166



Unauthorized colonies: Zonal Development Plan

- There are about **154 unauthorized colonies in the zone**, which shall be dealt as per **Government policy for regularization**.
- Master Plan for Delhi-2021 recommends preparation of redevelopment plans for Unauthorized Colonies and the villages; which shall ensure the permissibility of mixed use zoning at property or within the premise level compatible to the predominant residential areas.
- The core area of Najafgarh Town has historical importance, which is proposed to be designated as “Special Area”.

Implication of Land Pooling on Existing Settlements

- **By 2041, 1.68 lakhs more DUs** will be required for the projected population from 2021. It would be main center of settlements for workers involved in development and LIG population.
- Village boundaries have been delineated & the villages in the zone will see vertical growth, forming dense clusters of unplanned development in each sector.
- Zonal Plan must provide adequate facilities in villages instead of **regularizing it on lower standards**.
- Zonal plan must **include redevelopment plans for existing villages along with sector plans** and should consider growth of villages by 2041.

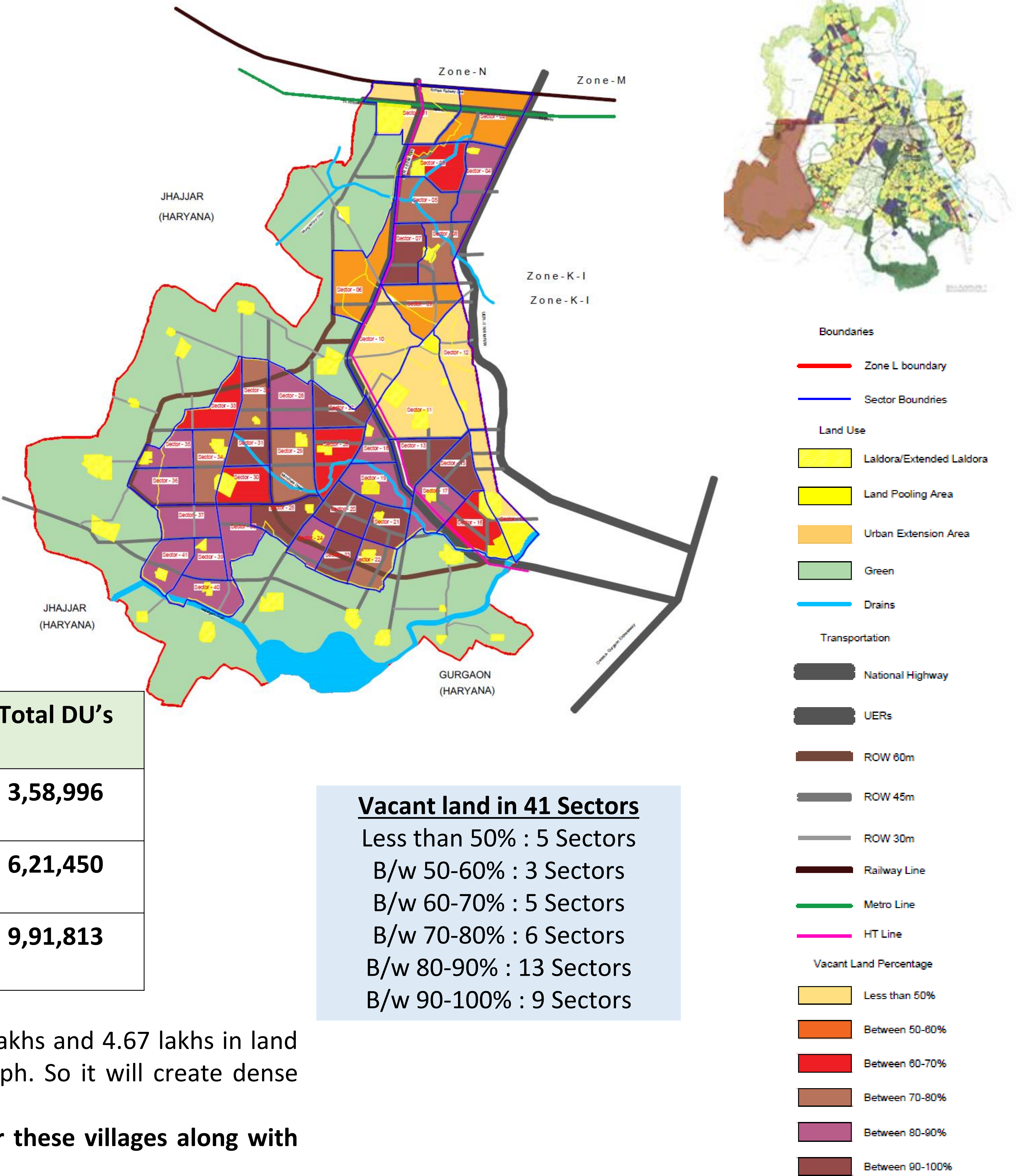


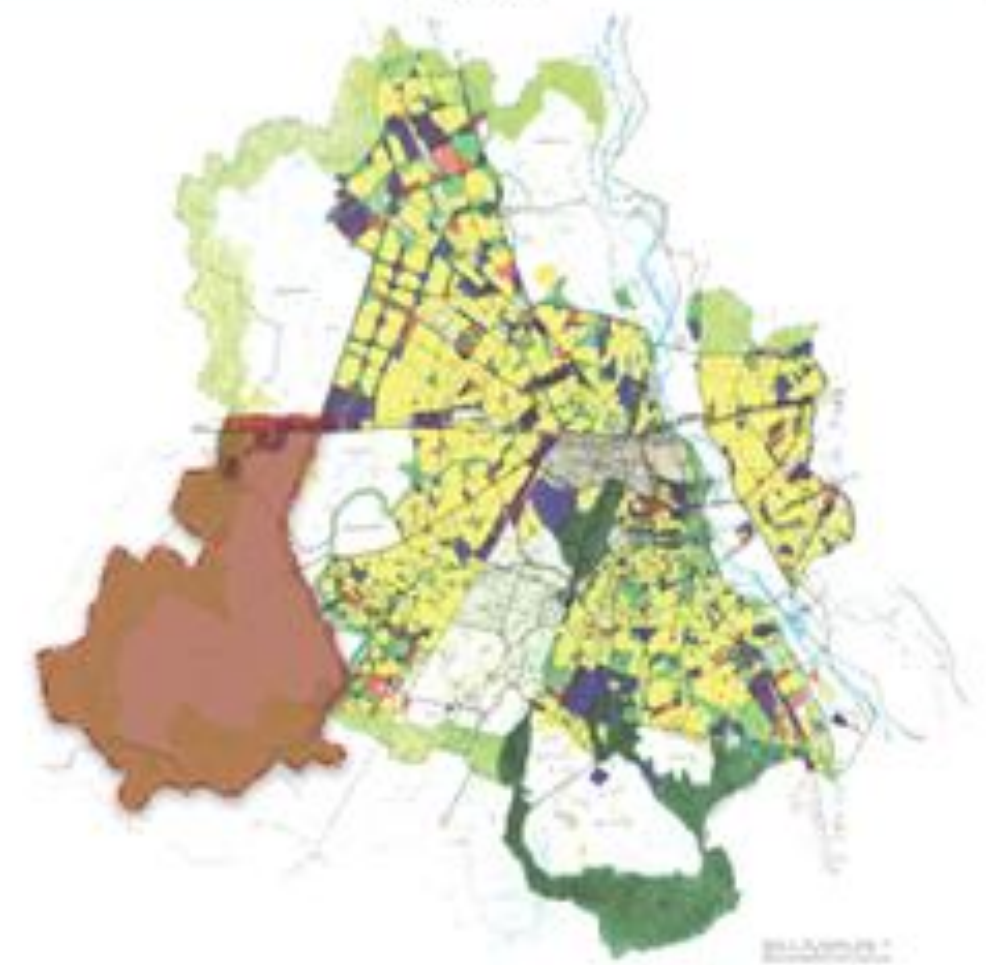
ZONE L Population for Land Pooling Areas, Pooled Land 100%	
Vacant Land	8020 Ha
Land pooling area (100%)	8020 Ha
DDA Area (40%)	3208 Ha
DE Area (60%)	4812 Ha
Gross Residential Area	4251 Ha
Net Residential Area	2338 Ha
DU Density (pph)	200
Pop. Density (pph)	900
Population	21,04,047
Total DUs	467566

30% of the DUs (1.4 lakhs) in LPP area will be for EWS from 15% reserved FAR.

Year	Population Projection	Land Pooling Phasing	Land Pooling Population	Total Population	Total DU's
2021	1615485		-	1615485	3,58,996
2031	1954909	40%	8,41,619	27,96,528	6,21,450
2041	2359112	100% (60%+40%)	21,04,047	4463159	9,91,813

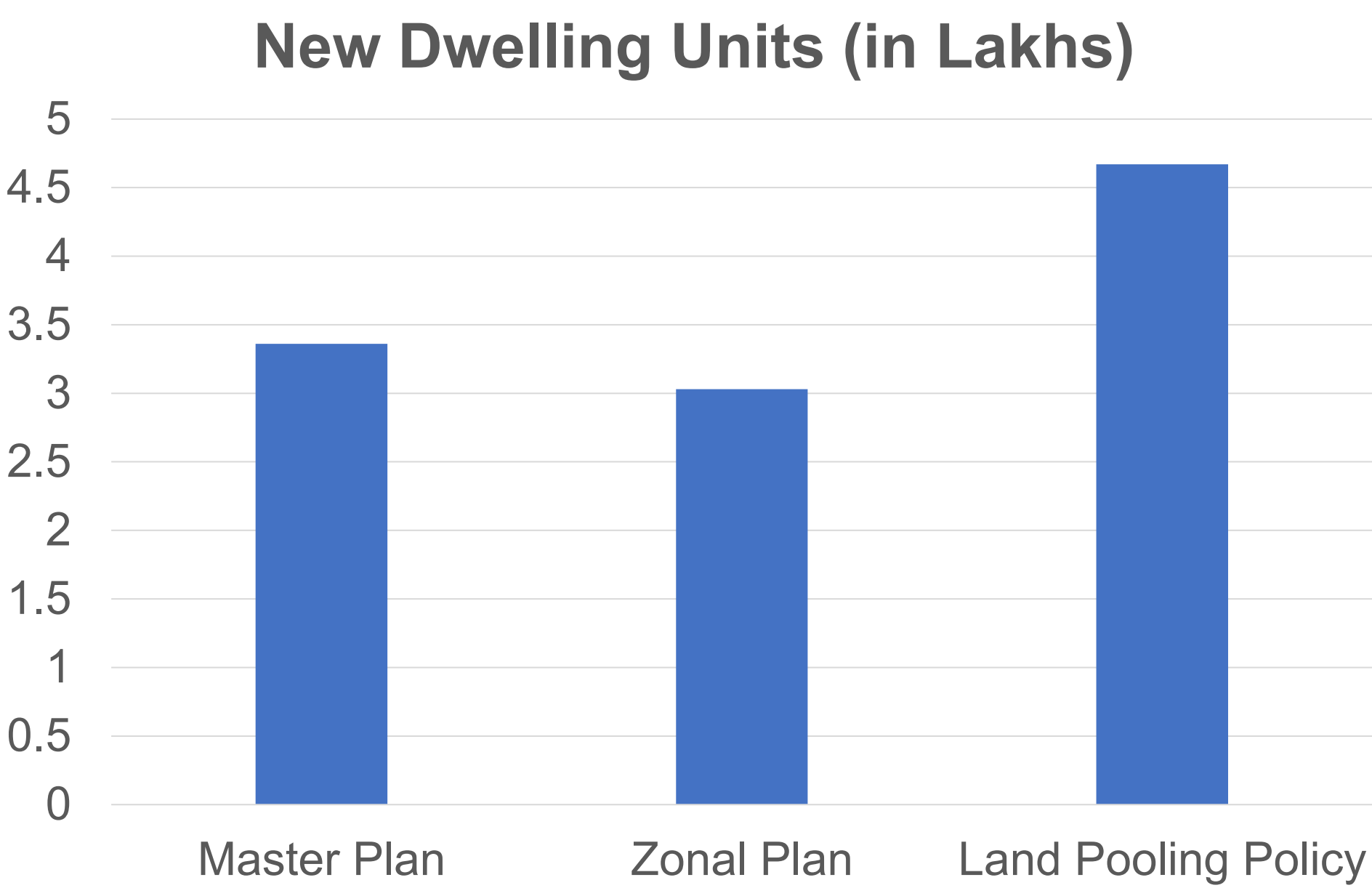
In 2041, the no. of projected dwelling units for existing settlements will be 4.4 lakhs and 4.67 lakhs in land pooling areas. Density of village 1169 pph, where as LPP area will be at 900 pph. So it will create dense unplanned clusters in each sectors as all of the sectors have villages in them. It is necessary for the policy and zonal plan to make redevelopment plans for these villages along with sector plans of vacant areas.





	Master Plan	Zonal Plan	Land Pooling Policy
According to different plans/policies	14.4 lakh DUs (63 Lakhs pop) will be provided in new areas.	The zone can accommodate 30 lakhs pop. but due to constraint of physical infrastructure 20 lakh population is proposed	
Urbanizable / Vacant Area	11,611 Ha	11,611 Ha	8,020 Ha
Calculations	- By 2021, 3.36 lakhs DUs (15.12 lakhs pop.) will have to be constructed in the Zone L. - So the population of the zone will be 38.72 Lakhs including the existing population.	- Proposed DUs in residential development area: 3,03,111 - Proposed population of residential development area : 13,64,000 Tot al Population of Zone L (existing+proposed): 23.6 lakhs + 13.64 lakhs = 36.24 Lakhs	Land pooling area total Population at 900 pph 21,04,047. The total population of the zone including 23.6 lakhs of existing population will be 44.6 lakhs
New Dwelling Units	3.36 Lakhs	3.03 Lakhs	4.67 Lakhs

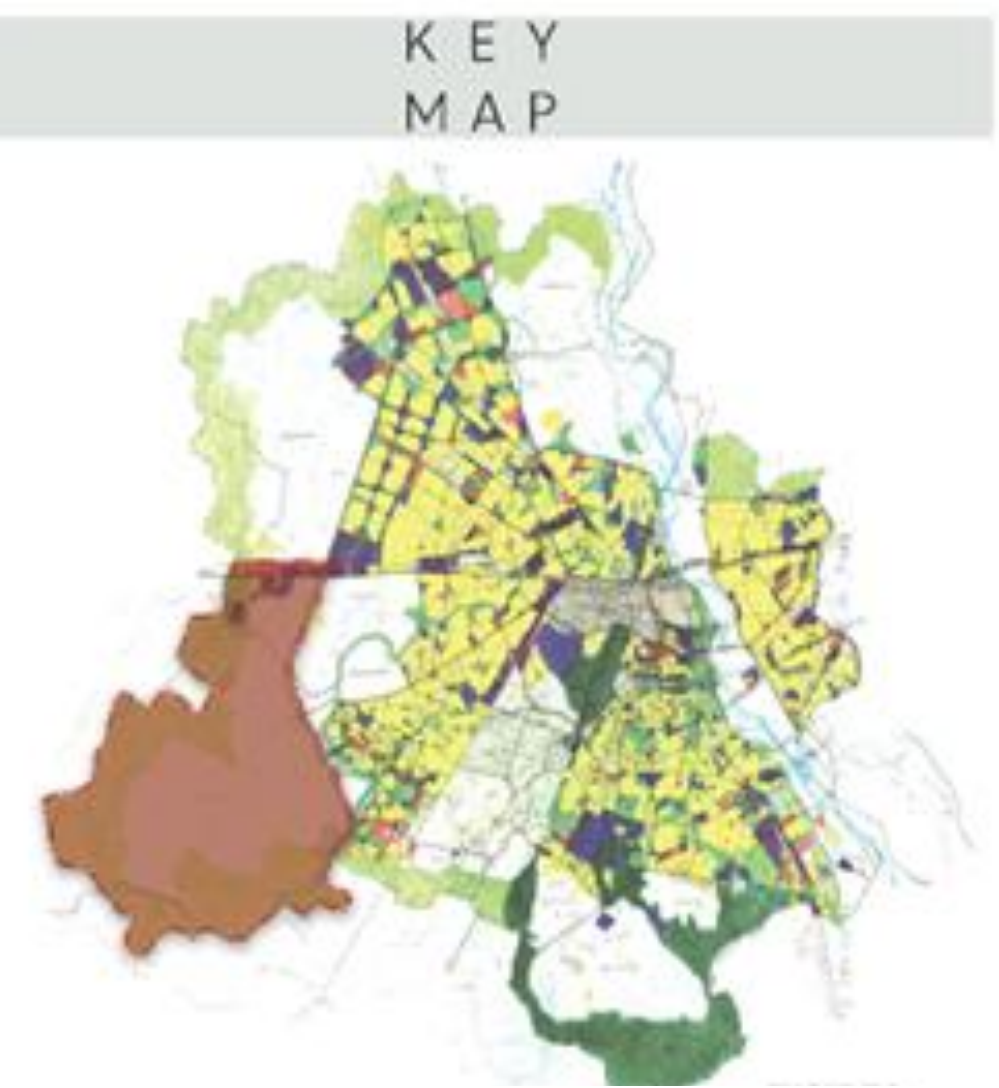
- Existing population – 23.6 lakhs, Number of DU’s by 2041 = **9,91,813** (44.6 lakhs population).
- 4.67 Lakhs DUs will be developed for the population in land pooling areas by 2041. The number of DUs (1.6 lakhs) is more than the 2021 master and zonal plans. Zone L was planned for a population of 20 lacs due to constraints of physical infra, but after land pooling the population will become more than double (44.6 lacs).
- The policy should be changed according to the carrying capacity & the infrastructural constraints of the zone.**



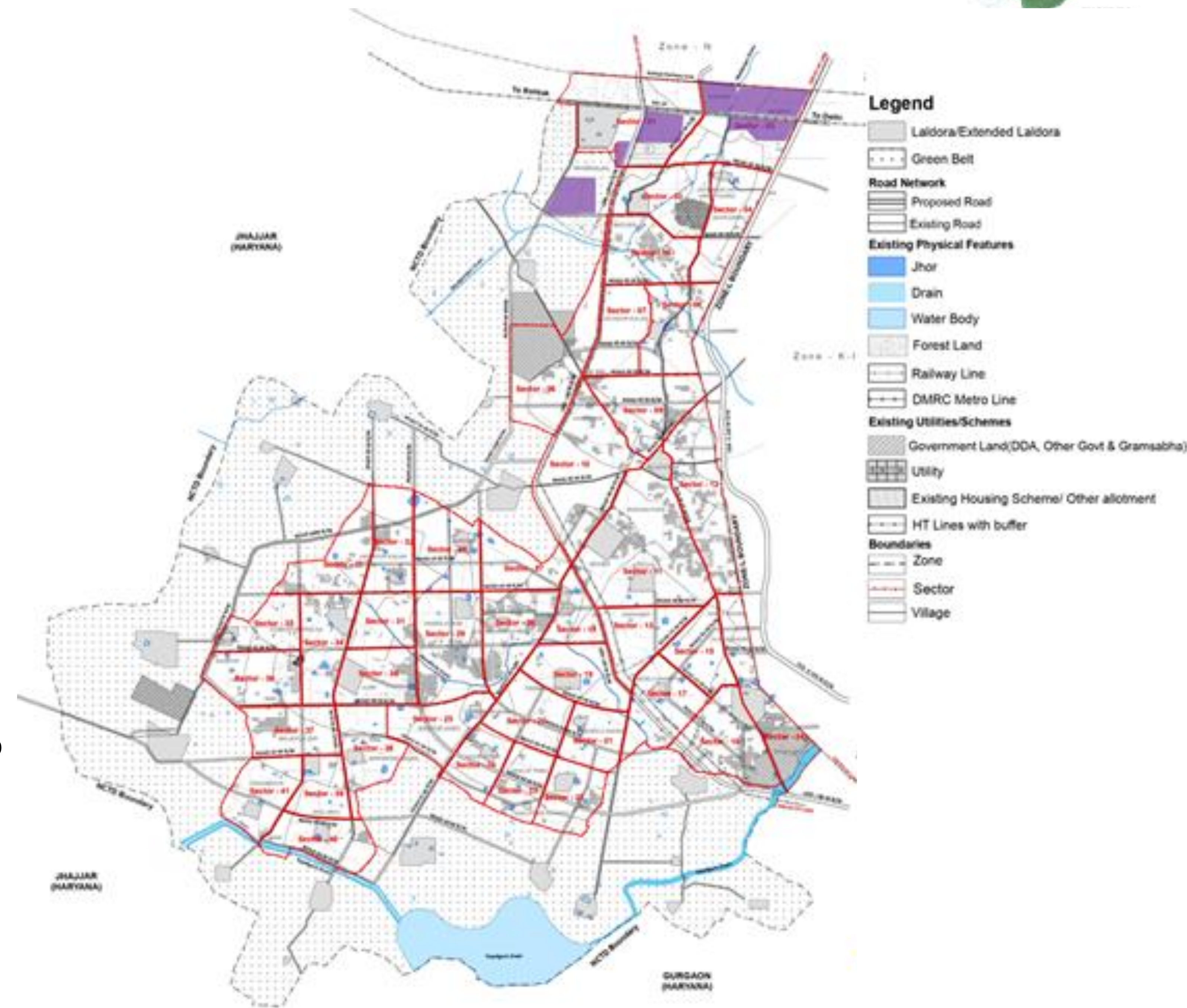
INDUSTRY

INDUSTRY

In the zone L the existing industrial area in **Tikri Kalan** which has been developed by DDA for which the change of land use was notified by MOUD vide no. K-13011/34/95-DDIB, dated 11.11.1998 from Agriculture Rural use zone to **Light and Service Industry** (PVC Bazaar).



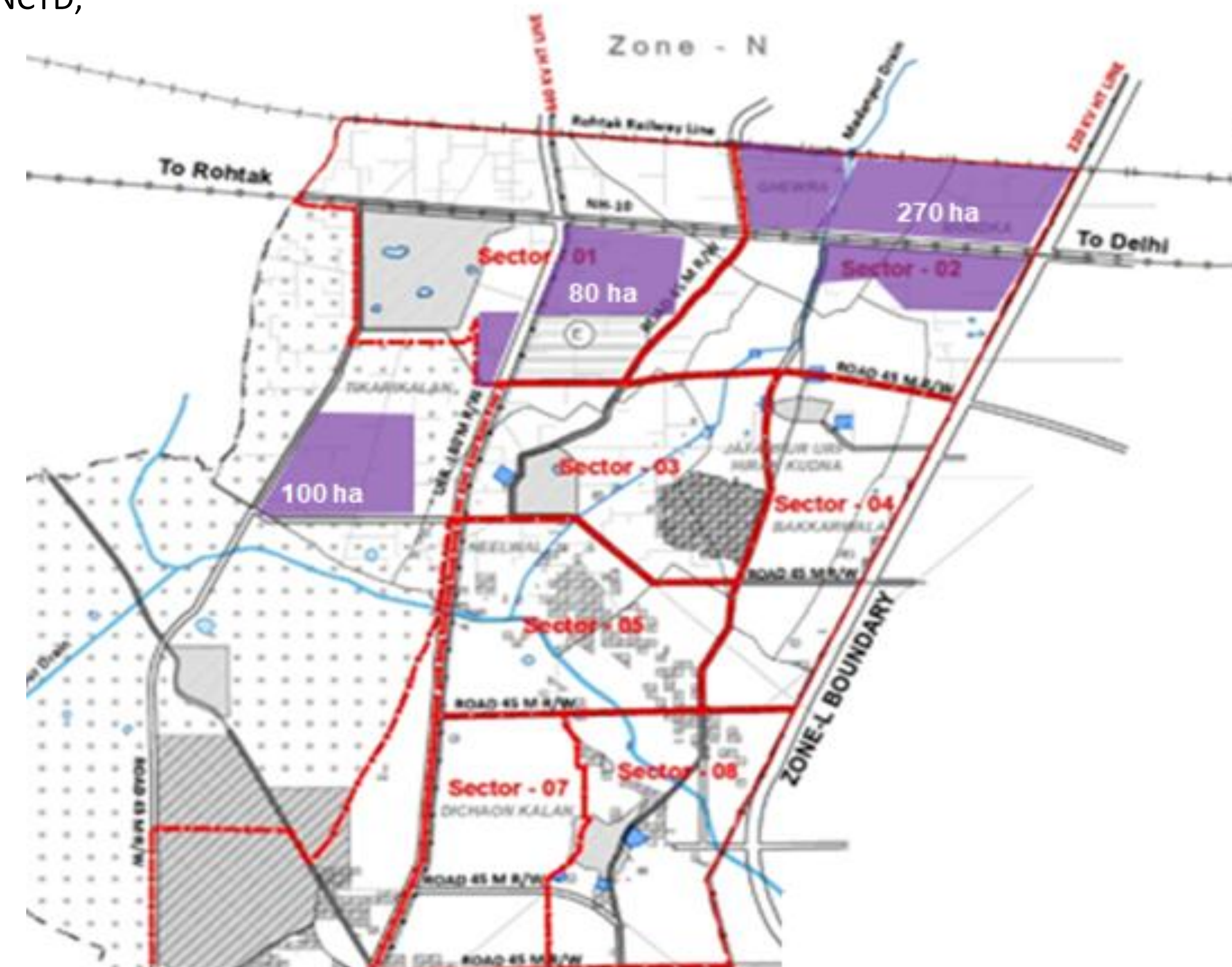
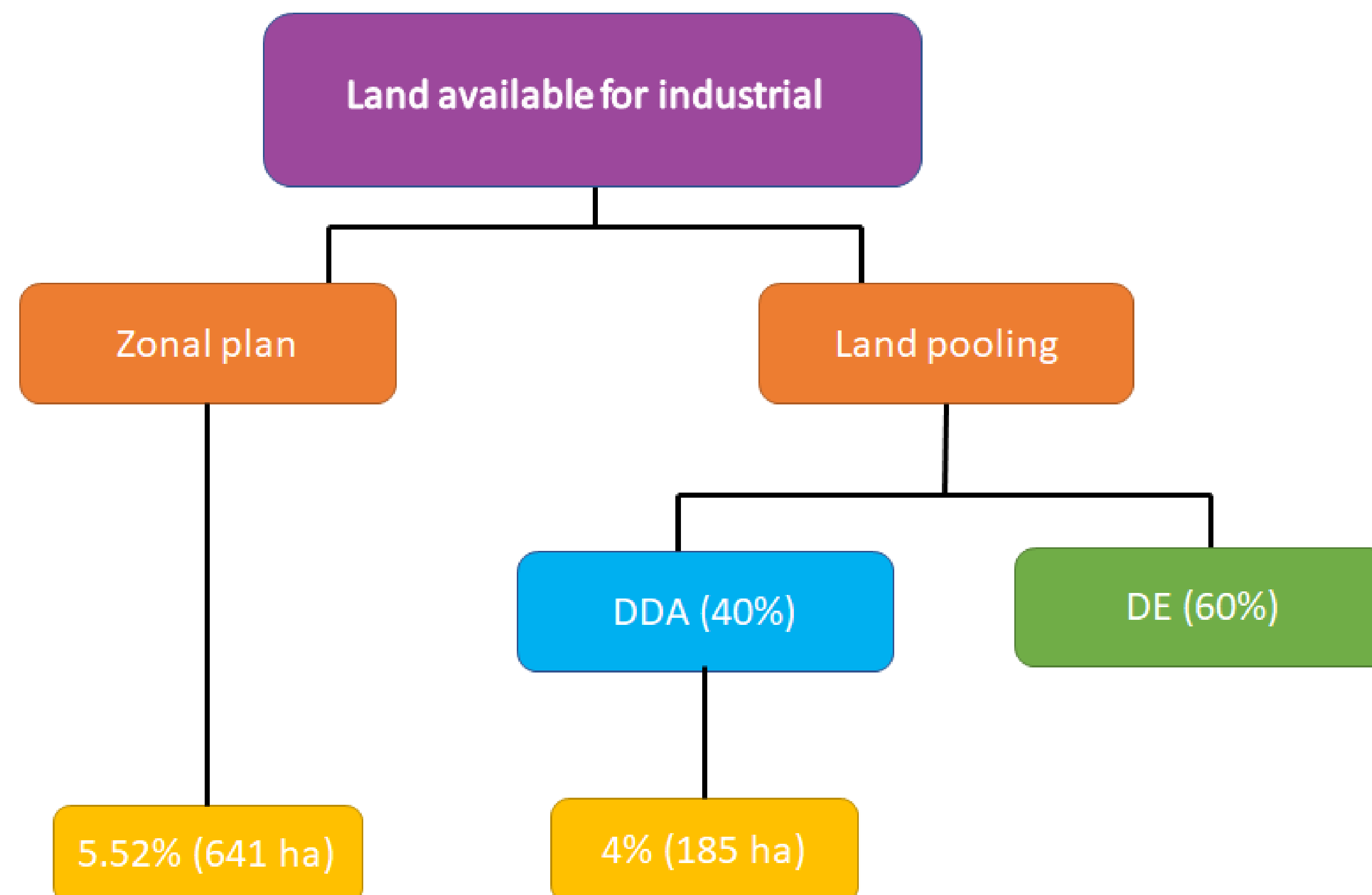
- According to zonal plan land area of about **80 Ha near Tikri Kalan** on South of Rohtak Road, in between Rohtak Road & Railway Line where industrial area of about **219 Ha has been earmarked for industrial use**.
- In this pocket, on West of 220 KV line in area about **32 Ha built-up structures** (pucca / semi-pucca / purely temporary) in scattered form under Warehousing/ Industrial use exists.
- This pocket is proposed to be developed / redeveloped by DSIIDC
- As per notification about **60 Ha land has been added under industrial use** & equivalent area reduced mostly from PSP use & partly residential use.
- Tikri Kalan DDA industrial market area, allotted to the PVC dealers by the Delhi Development Authority (DDA) after a fire broke out at the Jwalapuri plastic scrap market on June 6,1995.





ZONAL PLAN

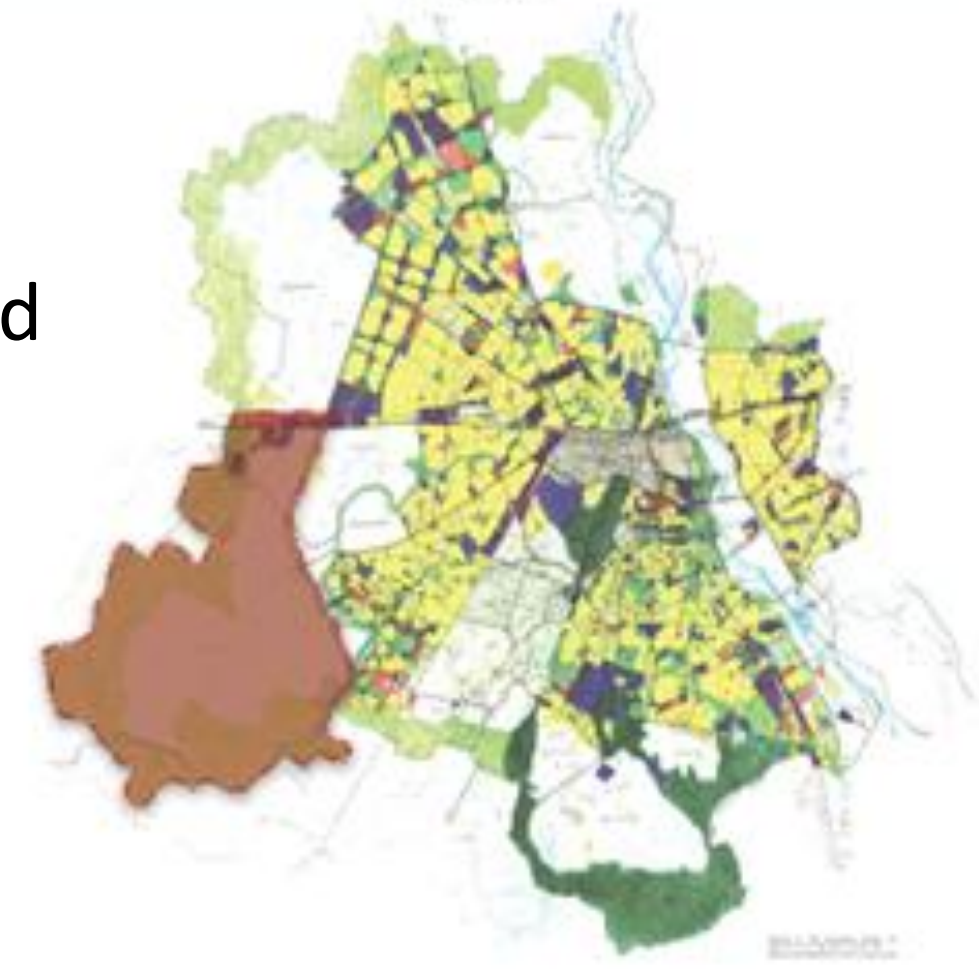
- 100 Ha land at Tikri Kalan under light and Service Industrial use (PVC Bazaar).
- **80 Ha is proposed for relocation of the industries** to be shifted from the existing non conforming areas
- **300 Ha land is proposed for hi tech industries.**
- Other than these industries any non polluting and non hazardous industry which from part of approved Growth Centre / Growth Point plan may be permitted, if approved by DPCC, GNCTD, Authority



Strategy in MPD 2021

Keeping in view the position brought out above as also in the context of the continuing pressure of population growth in Delhi, the following broad policy would be required for the industrial sector:

- Promote hi-tech and low volume -high value added industries, which are not labour intensive.
- Encourage modernization and technological up-gradation of existing industries required for day-to-day needs of the people of the city.



Why Hi-tech Industries

- According to NCAER study— 30% of Delhi's workforce has educational qualification, Delhi has the largest share of workforce so skilled, indicating that the State is ideal for knowledge-based economic activities like IT/ITeS services.
- Delhi has an excellent infrastructure in terms of wide roads, mass rapid transport in the form of metro. Which is an ideal situation for high-tech industries.
- Delhi has the highest internet penetration of 84 per thousand. It can be seen that Delhi is an attractive location for e-commerce and other IT and ITeS industries.
- Promote high-technology and skilled industries in Delhi, to keep immigration of unskilled labor to minimum
- These activities are cleaner and much less infrastructure intensive than manufacturing activities.
- In terms of land-intensity, knowledge based industries can accommodate nearly twice the number of people per unit area of land compared to manufacturing.
- The Knowledge Based industry is a skilled industry requiring 80-90% of its workforce to be skilled as compared to 40%-60% share for high technology manufacturing like electronics and auto-components. Sectors





Development Controls on Service and Light Industrial Plots

Sl.No.	Plot Size (Sq m.)	Maximum Ground Coverage	Maximum FAR in		Maximum height in (m)	
			Plains	Hills	Plains	Hills
1.	Less than 400	60%	1.25	1.00	12	9
2.	Above 400 & upto 4000	50%	1.25	1.00	12	12
3.	Above 4000 & upto 12000	45%	1.25	1.00	12	12
4.	Above 12000	40%	1.00	0.75	12	9

- As per the new Industrial Policy for Delhi 2010-21, the Government is keen on developing and promoting the hi-tech, sophisticated, knowledge-based IT and ITeS industries in the state.
- According to a recent notification issued by the government, only hi-tech and service industries will be allowed to operate in new industrial areas in Delhi. The old manufacturing industries have the option to switch to the hi-tech and service sector.
- Out of the total 29 industrial estates notified by the Delhi government, 8 are in West Delhi.**
- Rising costs of land and its scarcity in Delhi for industrial spaces was one reason why investors were forced to choose NCR.
- West Delhi has cheaper land availability
- DSIIDC is developing a 31ha Knowledge Based Industry at Baprola (zone k-l) at a cost of Rs 2,000 crore. This would create direct employment for about 85,000 people.**

Sufficient land is available for industrial facilities because high-tech industries can handle almost double the amount of people per unit area relative to other industries in terms of land intensity.



TRADE AND COMMERCE

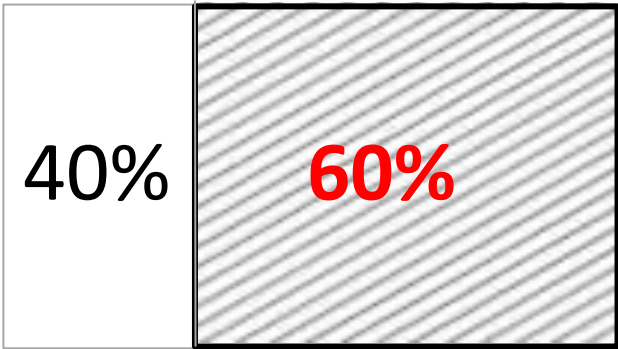
As per the Economic Survey of Delhi 2001-2002, there were about **2.3 lakhs** retail enterprises in Delhi with an employment of **5.4 lakhs** engaged in **trade, commerce and allied services** and this number of retail enterprise is likely to rise up to **4.15 lakh**.

5 Tier System	M PD 20 21		Population	Area
		CBD & Sub-CBD	City and sub city level	
		District Center	About 5 Lakh	40 ha
		Community center	About 1 Lakh	4 ha
		Local shopping center	About 10 thousand	0.3 ha
		Convenience shopping center	About 5 thousand	0.1 ha

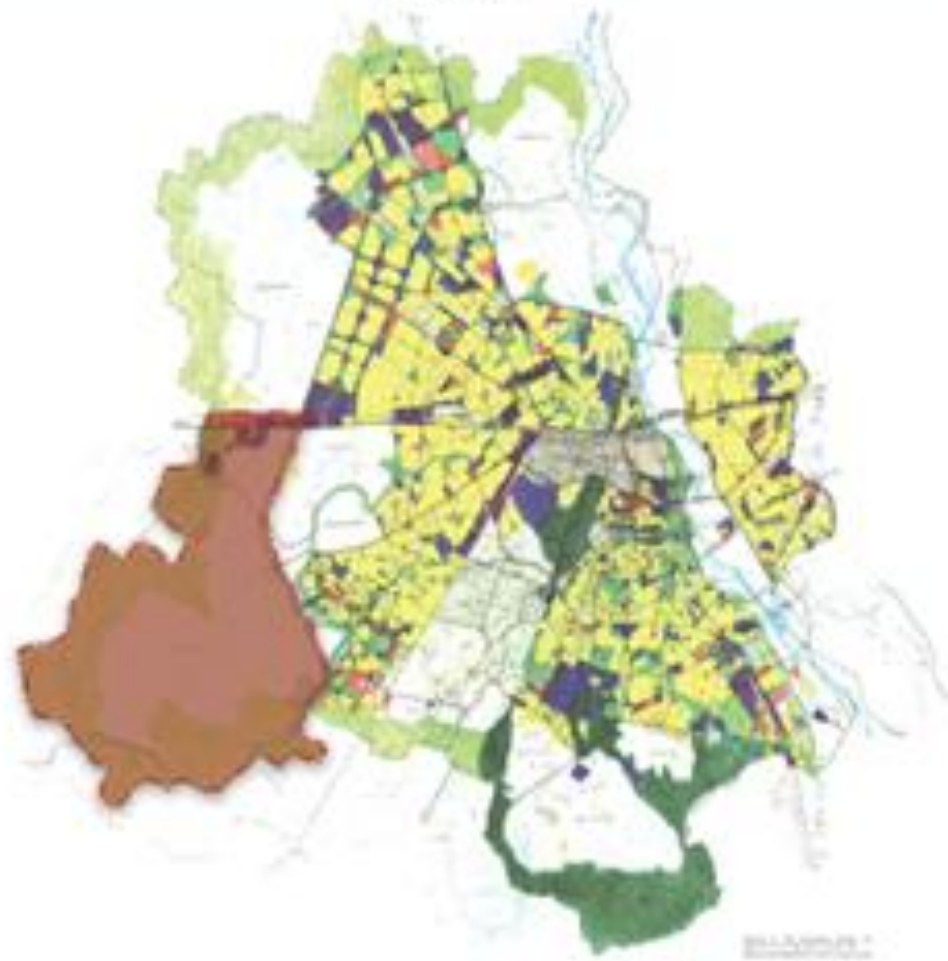
Informal Sector

Contribution of informal sector for the economy of Delhi, was estimated at Rs. 1.01 lakh per enterprise per annum. These sectors are found largely in cities but not in an organized manner. Majorly being mobile in nature, informal sectors are located based on the requirement.

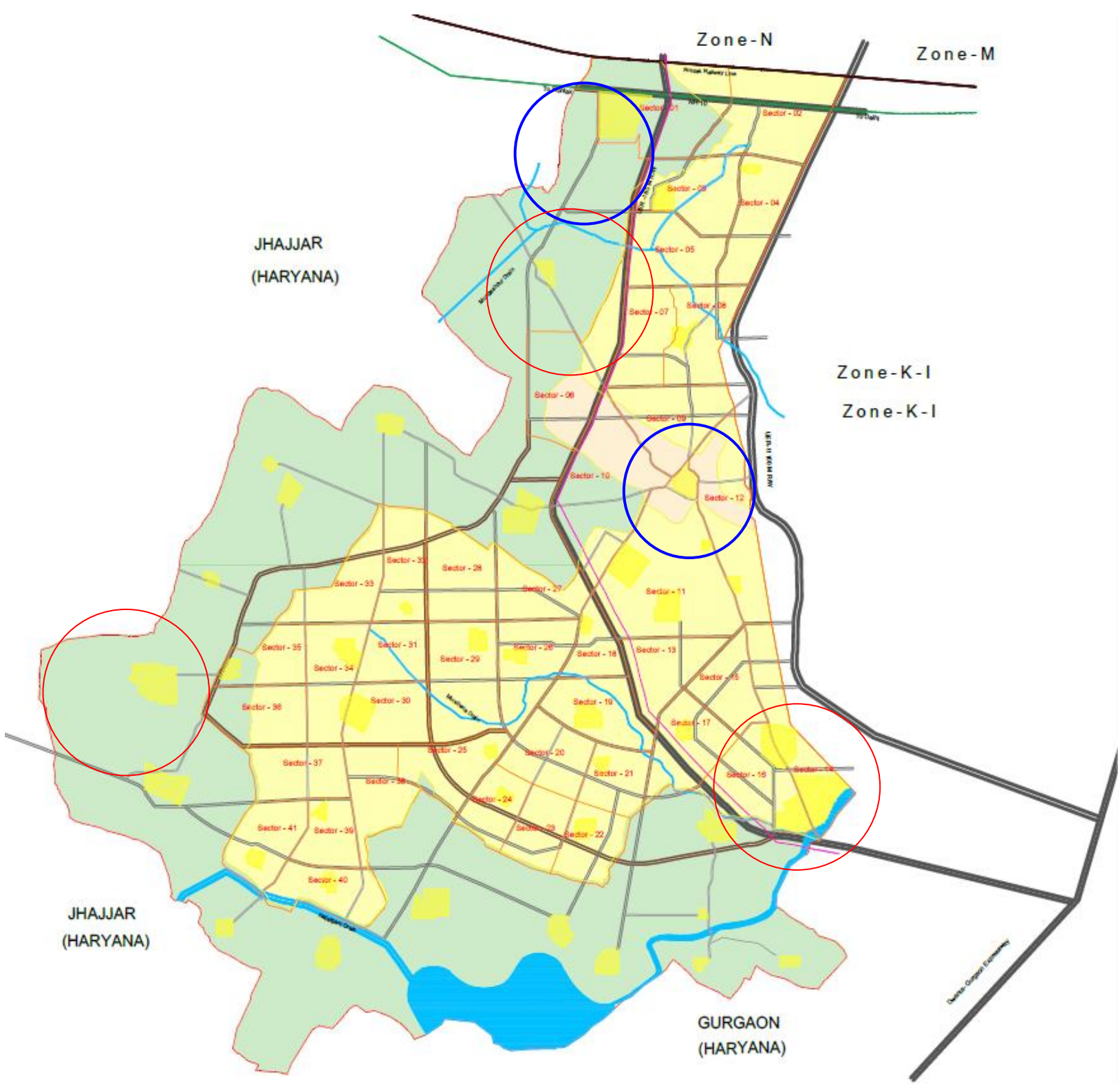
Land Pooling policy



60% of the land will be handed to the Consortium for development of **physical infrastructure**, residential, **commercial**, public and semi-public facilities as per the Policy. **DE** to developed all the commercial area (5%) in the zone.



Commercial Center (Zone L)



In zone L, 3 commercial growth centers have been identified. They are located in Jharoda Kalan, Dhansa and Chhawla.

Najafgarh and Tikri Kalan are the wholesale centers in the zone. These wholesale markets serve as sub-city region market.

Hierarchy	Distribution
CBD & Sub-CBD	-
District Center	5
Community center	20 (Along facility corridor)
Local shopping center	As per layout plan
Convenience shopping center	As per layout plan

Facilities	MPD 2021		Total	
	Population/unit		Unit	Area in ha
District Center/CBD	5 Lakh	40 ha	9	360 ha
Community center	1 Lakh	4 ha	47	188 ha
Local shopping center	10 thousand	0.3 ha	446	133.8 ha
Convenience shopping center	5 thousand	0.1 ha	892	89.2 ha
Total		44.4 ha	1394	770 ha

After land pooling, 240.6 ha of land will be allocated to commercial from the pooled land and in zone, the existing area of commercial use is 130 ha.

After the application of Land Pooling Policy in Zone L, the new estimated population is **44.6 Lakhs**.

Implication

- The available land for commercial activities is less than required.
- All the facilities which cannot be adjusted in the area are proposed to be allocated in vertical mixing which would benefit the commercial activities.
- Commercial activities to be placed in facility corridor along the major road which would help in growth of additional commercial facilities.

Note

City Level and Community level commercial facilities to be provided as per MPD 2021 Development Norms and Standard.



SOCIAL INFRASTRUCTURE

Components of Social Infrastructure as per Master Plan Zonal Plan (Zone L):

- 1.Health Facilities
- 2.Education Facilities
- 3.Sports Facilities
- 4.Communication - Post/ Telegraph/ Telephone Facility.
- 5.Security - Police
- 6.Safety - Fire Station
- 7.Socio - Cultural Facilities
- 8.Disaster Management Centre

City Level and Community level facilities to be provided as per MPD 2021 Development Norms and Standard.

Proposals As per Zonal Plan

City level facilities have been proposed in corridor width of 200 m proposed along road
Neighbourhood / community level facilities are proposed in land having width of 100 – 120 m
Village level facilities are proposed to be located in 20-25% of the green area proposed around villages.

Changes in population after application of Land Pooling Policy:
After the application of Land Pooling Policy in Zone L, the new estimated population is **44.6 Lakhs**.

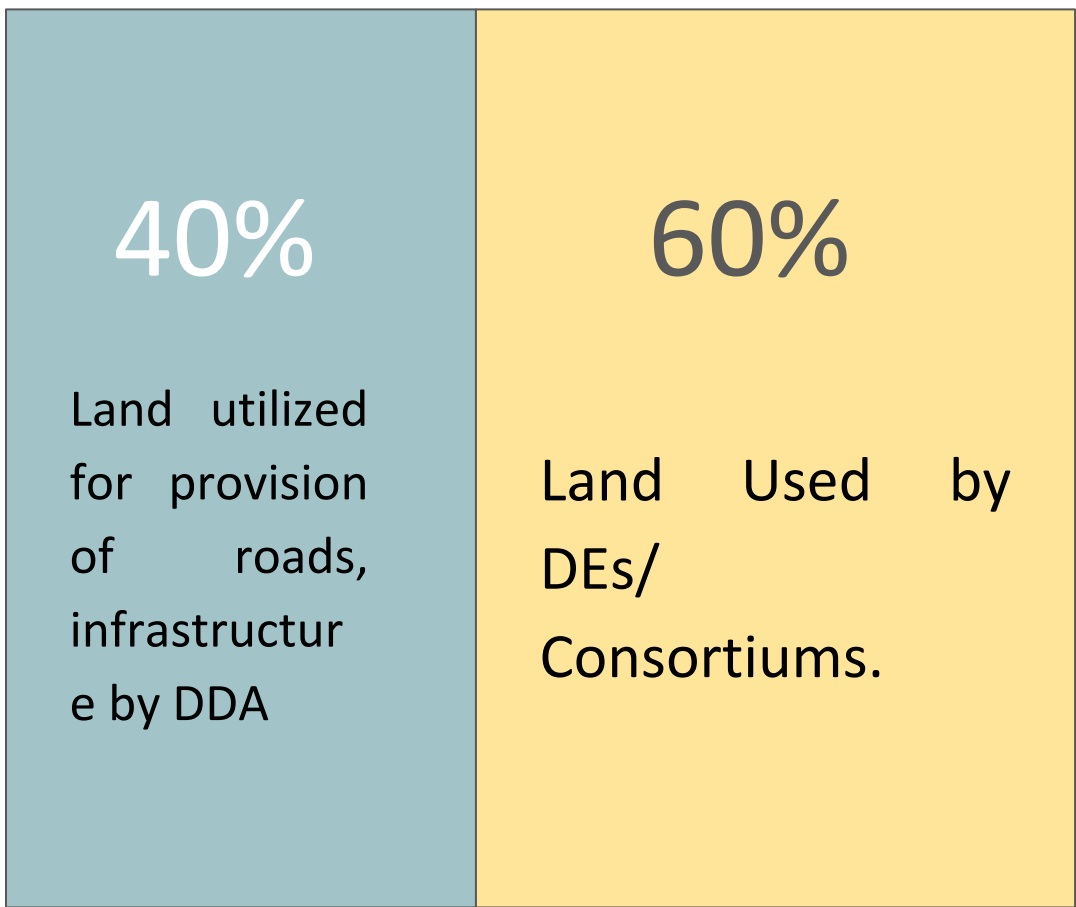
Facilities to be provided as per the new estimated new population



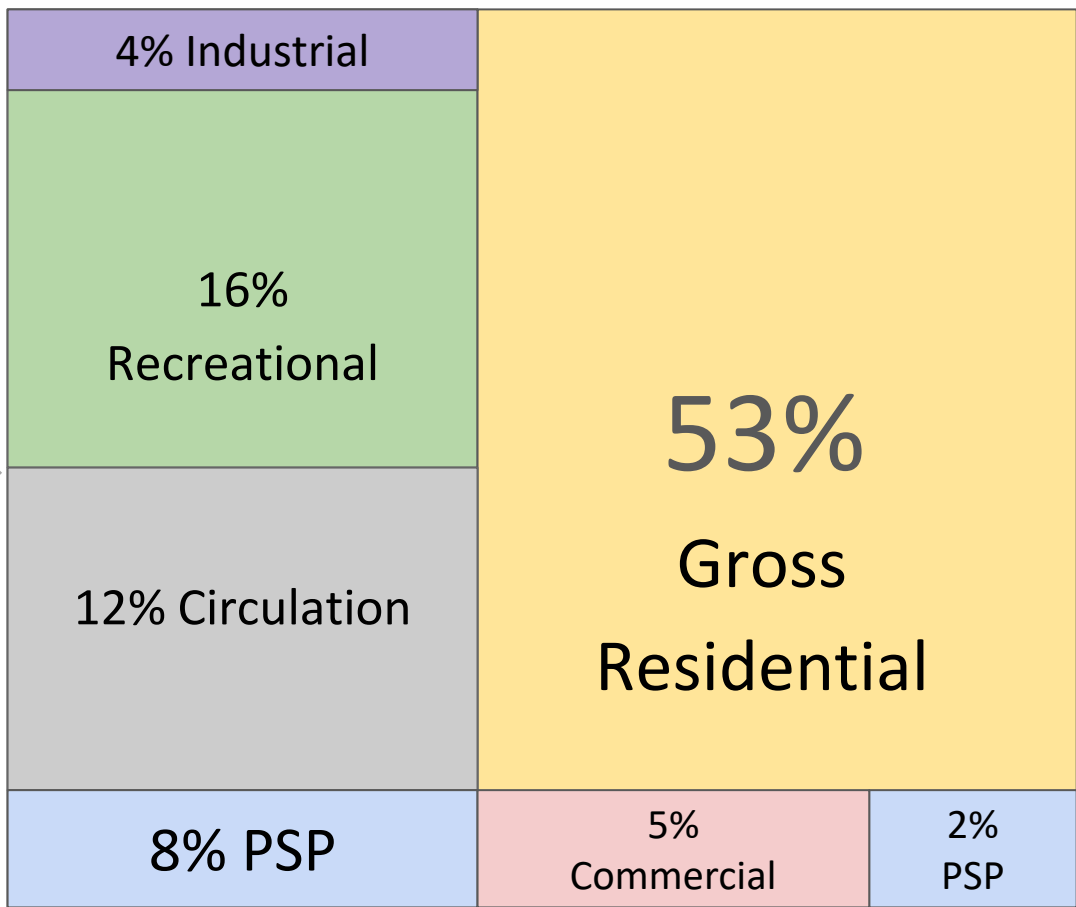
Development Process of Social Infrastructure in Land Pooling

Vertical Mixing

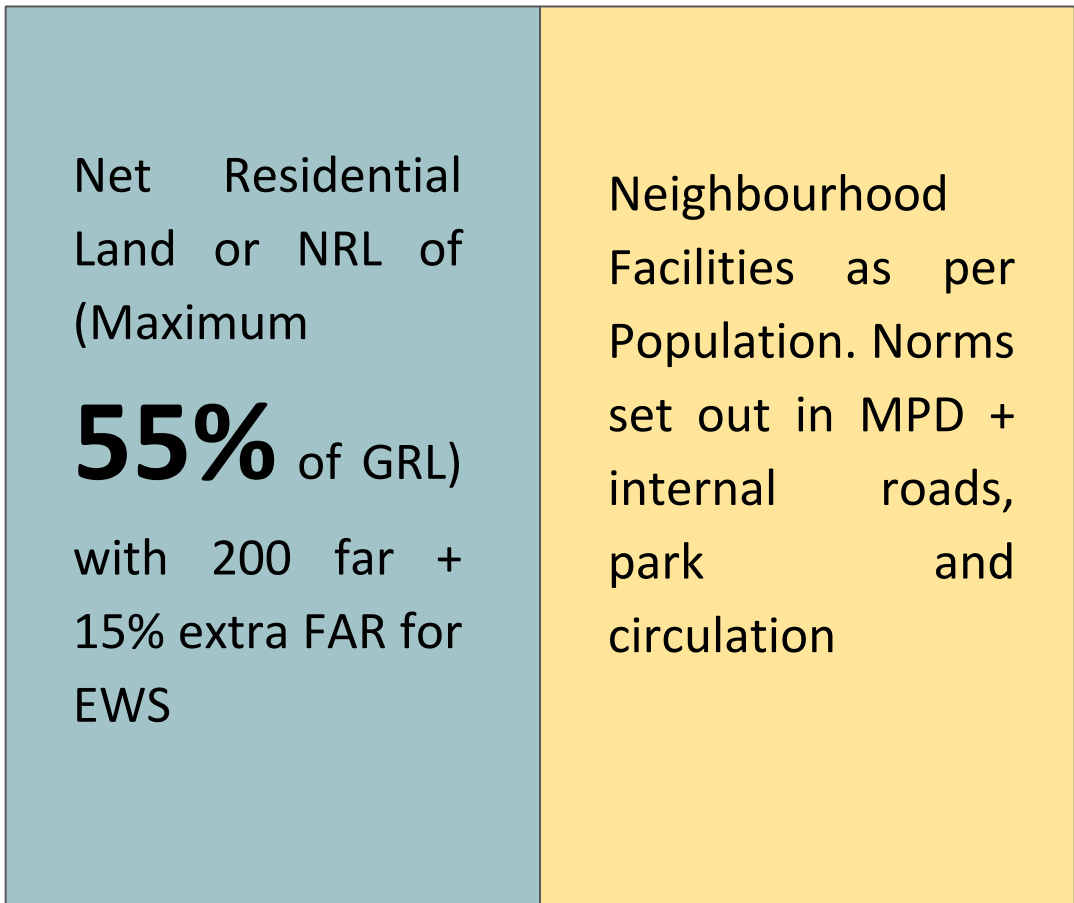
Land Distribution of total Pooled Land



Land Use Distribution of total Pooled Land

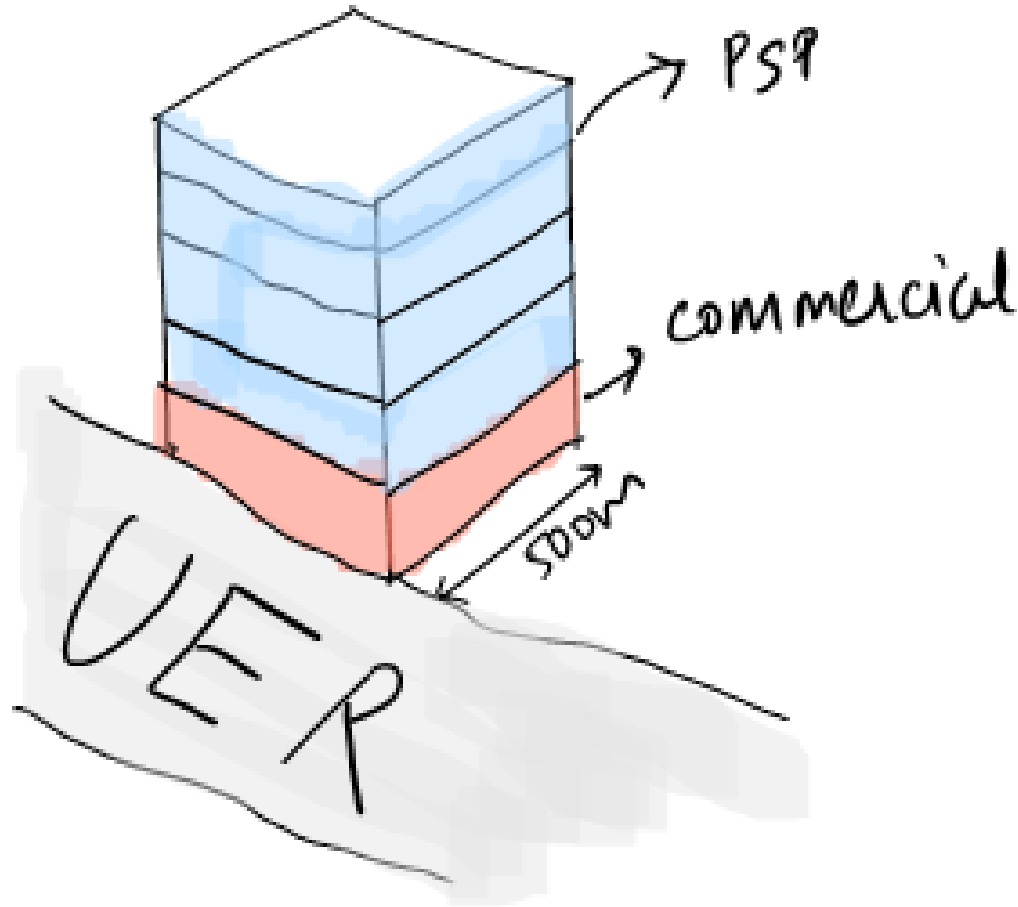


Utilization of 53% Gross Residential Land by DEs/Consortium



Facilities in MPD 2021

Facilities in MPD 2021	Area (in Ha.)
Primary School	0.2
Sr. Secondary School	0.6
Religious Building	0.08
Dispensary	0.12
Coaching centres, IT and Language training centres	0.05
Banquet Hall	0.08
Total (Neighbourhood Level PSP)	1.13 ha



to make the sector eligible for development a minimum of 70% contiguous land of the developable area, is required to be pooled

DDA will provide city level facilities which will be present along the Urban Extension Roads

DE to provide Community level facilities which is developed around the blue - green network

50% of the plots earmarked for Health and Education will be returned to DDA. Village Level facilities to be shared with Neighbourhood Facilities

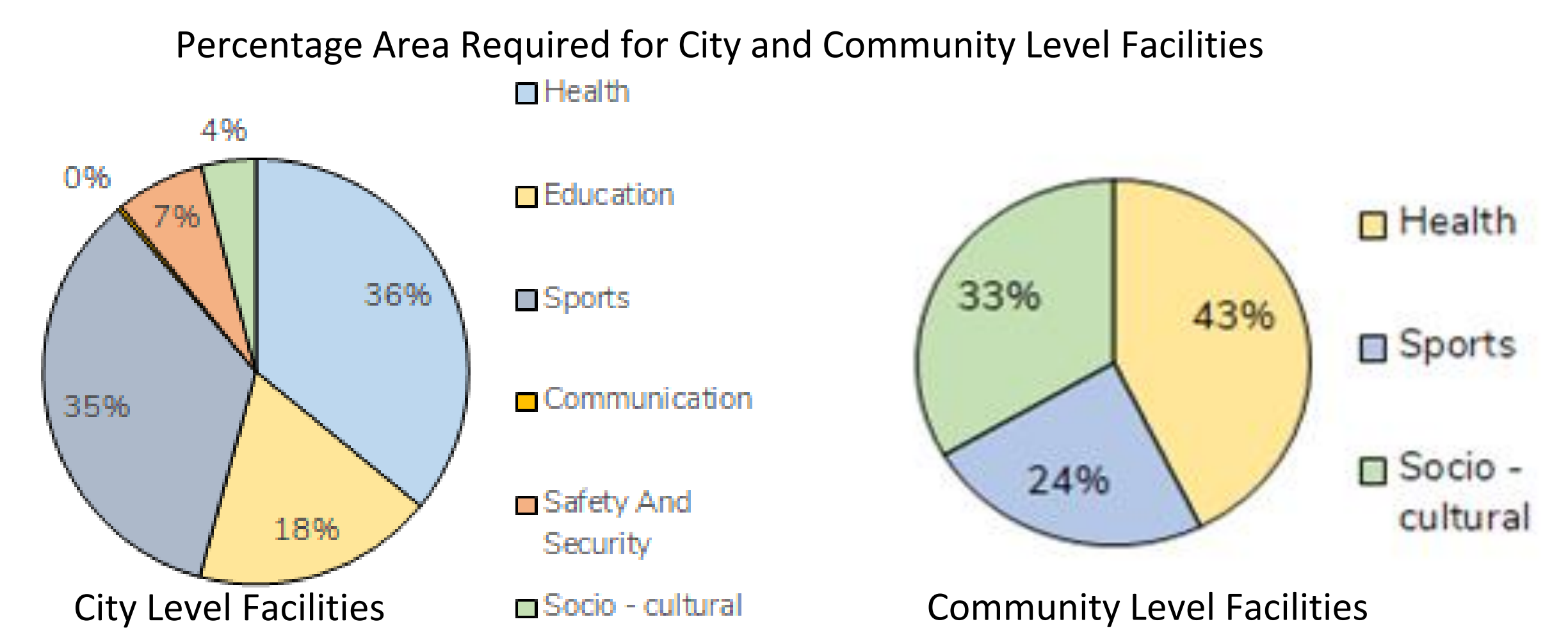
In vertical mixing education and health facilities are to be developed separately and preferred to be developed at lower level with open space.

Vertical mixing will be permitted for Socio-Cultural Facilities with other land uses

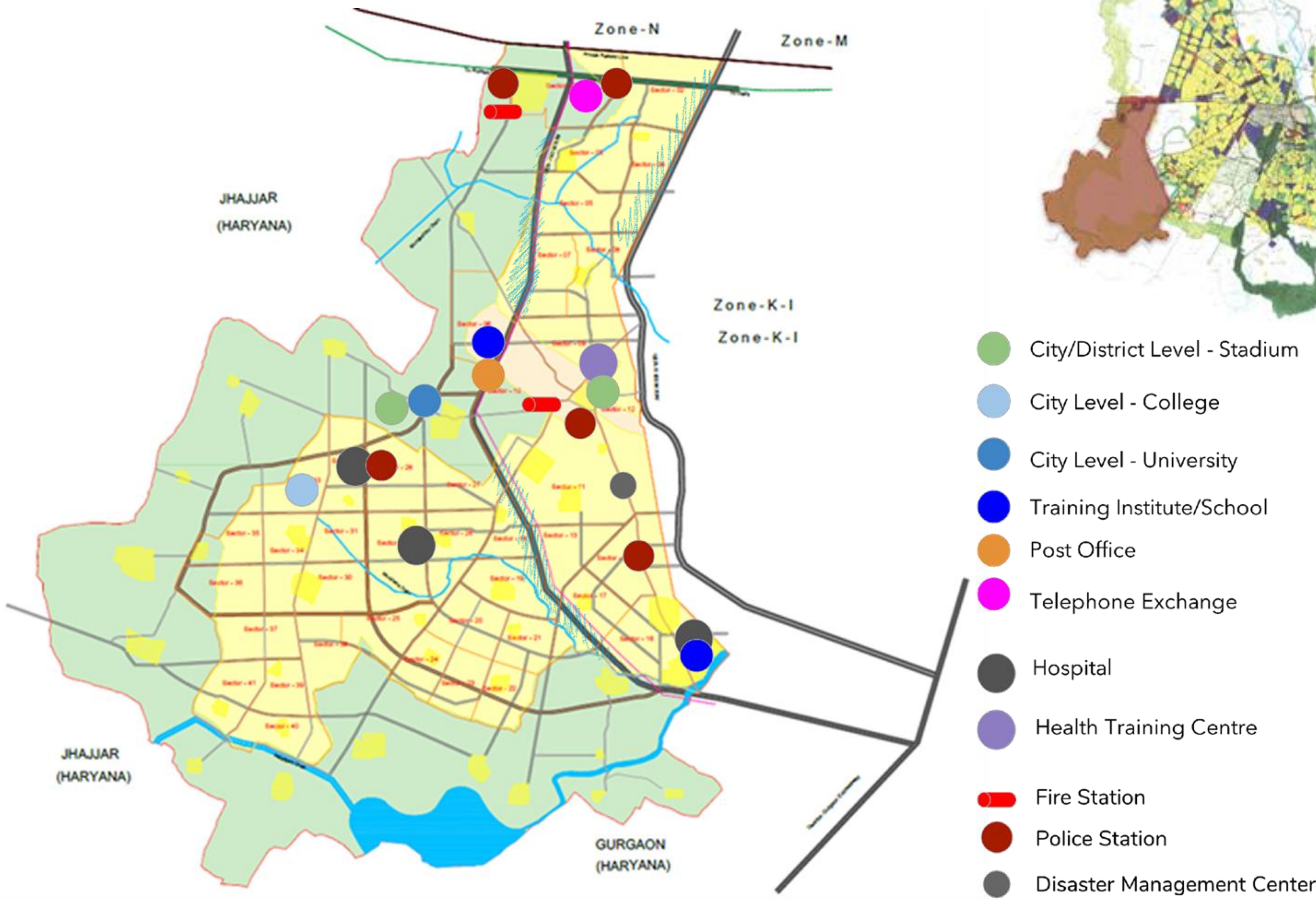


Facilities	City Level Area (in Ha)	Community Level Area (in Ha)
Health	208	68
Education	106.4	0
Sports	200	45
Communication	2	0
Safety And Security	39	0
Socio - cultural	24	60.2
Total Area	579 Ha	173 Ha

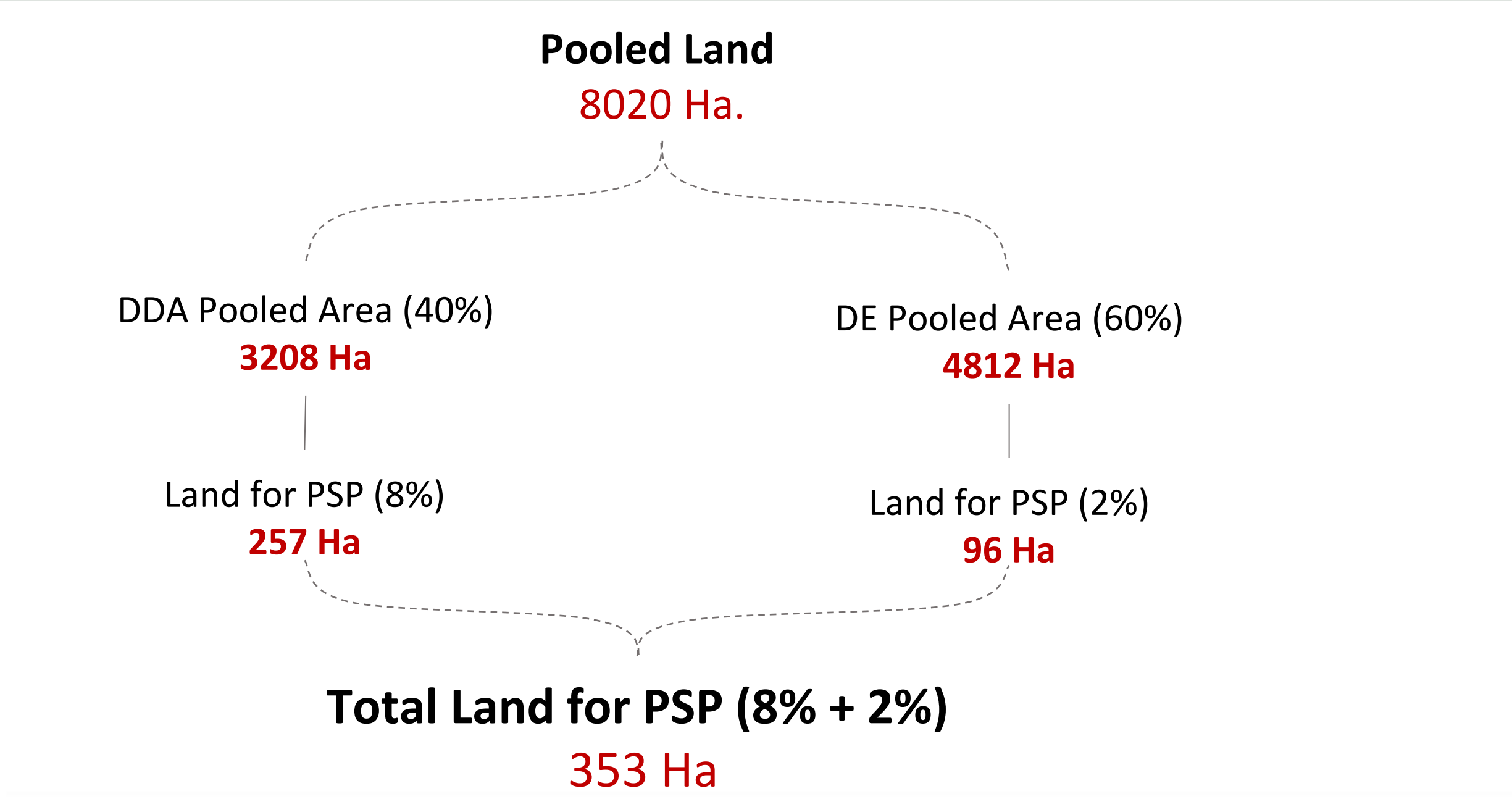
- Total area required for City and Community Level PSP is **752 Ha**.



Possible Location for City Level PSP in Zone L



Land Available for PSP Facilities as per LPP



City Level PSP is to be located along UER with Vertical Mixing in Building Use.
500m Wide land will be used along the UER 1 and UER 2.

① **UER - 1**
Length of Road – 6500 m
Total Area available – 325 Ha.
(Approx.)

② **UER - 2**
Length of Road – 4846 m
Total Area available – 242 Ha.
(Approx.)

Total Land Available – 567 Ha.

This **567 Ha.** of land will be shared with commercial and industrial land uses buildings.

Inferences

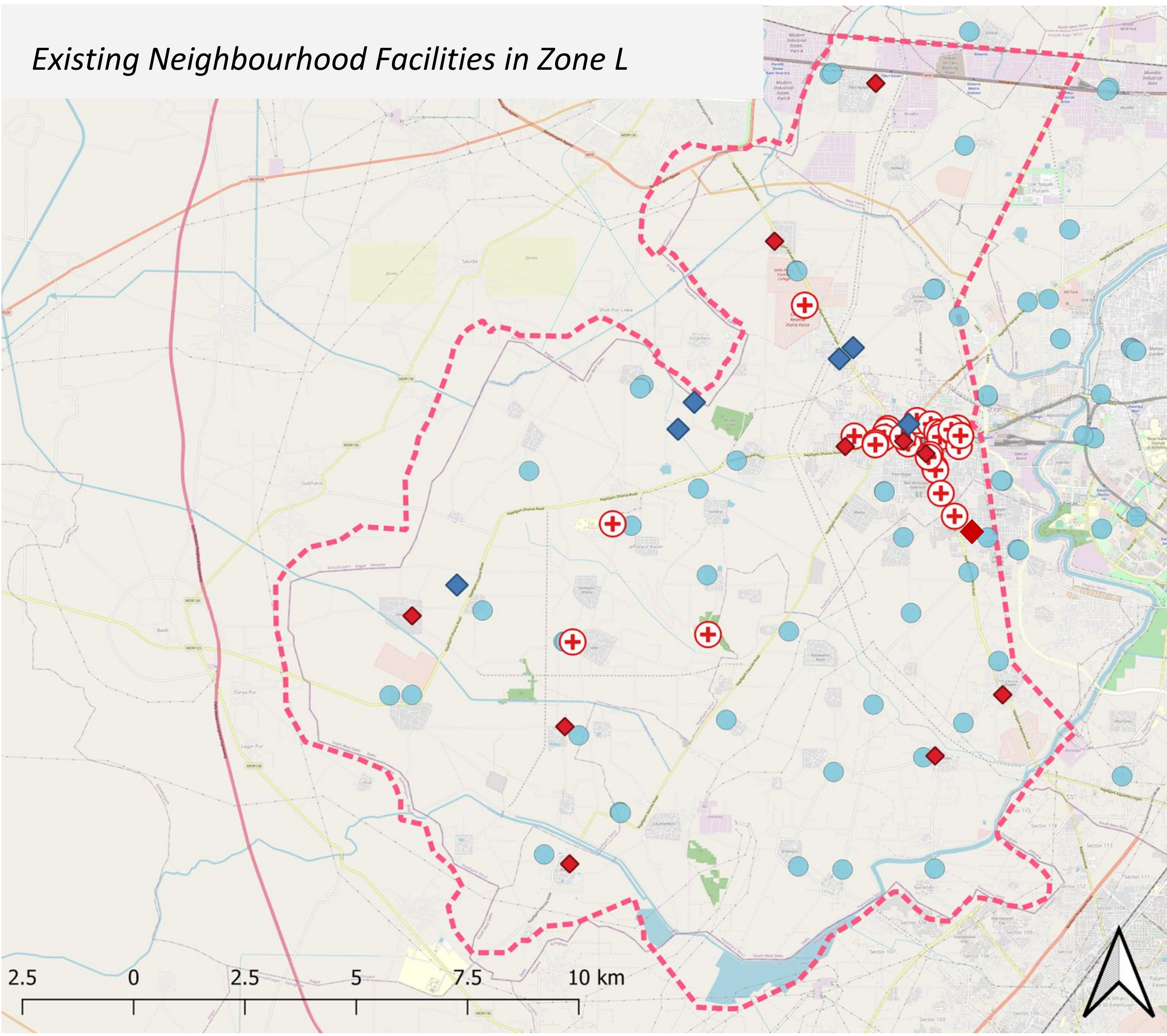
- 399 Ha** additional land is required for City level infrastructure.
- Location for City Level PSP will be majorly along the **UER 1** and **UER 2**.
- Location for community level facilities will be along the **proposed blue green network**.
- Vertical mixing will provide **sufficient area** for PSP.

Zone L – Social Infrastructure – Neighbourhood PSP Facilities

Sr. No.	Facilities	NBHD facilities as per MPD 2021 for 10,000 population		Total Population of Zone L (existing+proposed): 23 lakhs + 21 lakhs = 44 Lakhs	
		Nos.	Area (in Ha.)	Nos.	Area (in Ha)
1	Primary School	1	0.4	440	176
2	Sr. Secondary School	1	0.8	440	352
3	Religious Building	2	0.08	880	71
4	Banquet Halls	1	0.2	440	88
5	Coaching centres, IT and Language training centres	1	0.05	440	22
6	Dispensary	1	0.12	440	53
Total Neighbourhood Level PSP		7	1.13	3028	761 Ha

1. Approximately **440 Neighbourhoods** will be formed in Zone L.
2. 528 Ha of land is required for neighborhood education facilities
3. Majority of existing facilities are near Najafgarh.
4. Irregular distribution of health facilities is observed.
5. Government Dispensaries are not available in all villages
6. Neighbourhood level facilities are more centered at Najafgarh instead of even spread around the villages.
7. List of existing facilities in Zone L
 - Government Schools - 47
 - Hospitals - 31
 - Dispensary (DGD) - 11
 - Schools and Colleges - 6

Existing Neighbourhood Facilities in Zone L



Inferences

- The land required for city and community level facilities is 752 Ha of land.
- With the land pooling policy the land available is 353 Ha. Remaining requirement of facilities will be served through vertical mixing.
- Facility requirement is higher than land available. Vertical mixing may not be a probable solution for all the facilities, such as sports facilities which needs area on ground.
- There is no provision to cater the existing shortage in facilities for the existing population.

	Percentage in LPP	Percentage of Required
City Level PSP	8%	18%
Community Level PSP	2%	3.5%

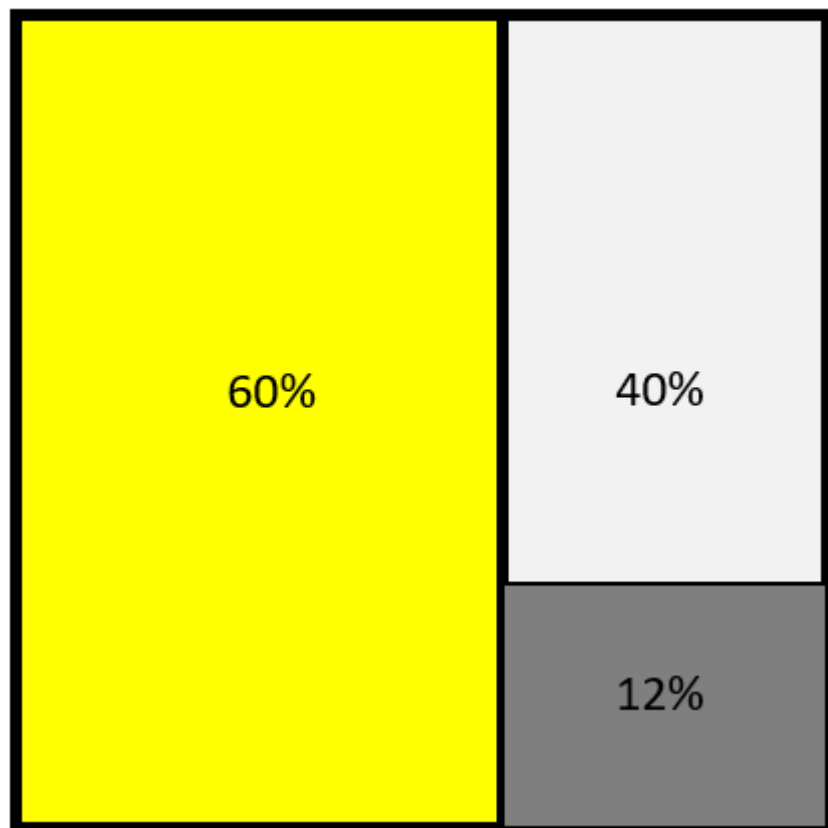
TRANSPORT

Transportation in Zone-L

- The zone has NH10 going towards Rohtak in the North.
- The northern boundary of zone is Railway line.
- Further there is a proposed 60m road radial to the city.
- 1. UER-2- on east as zone dividing road
- 2. Road passing through the middle of the zone will join UER-1
- The zonal roads are 45m ROW in radial grid pattern with center as Najafgarh Area.
- Further each sector is divided by a 30m road.
- Smaller 30m roads connect to village outside the sector area.

Land Pooling Policy

- All pooled areas have one adjacent road as a 30m ROW road.
- The total of pooled area, the circulation will be 12% of the total pooled land being in the part of 40% infrastructure area.
- The policy will automatically help more developed roads in terms of-
 - Continuity
 - Better connectivity
 - Infrastructure connectivity



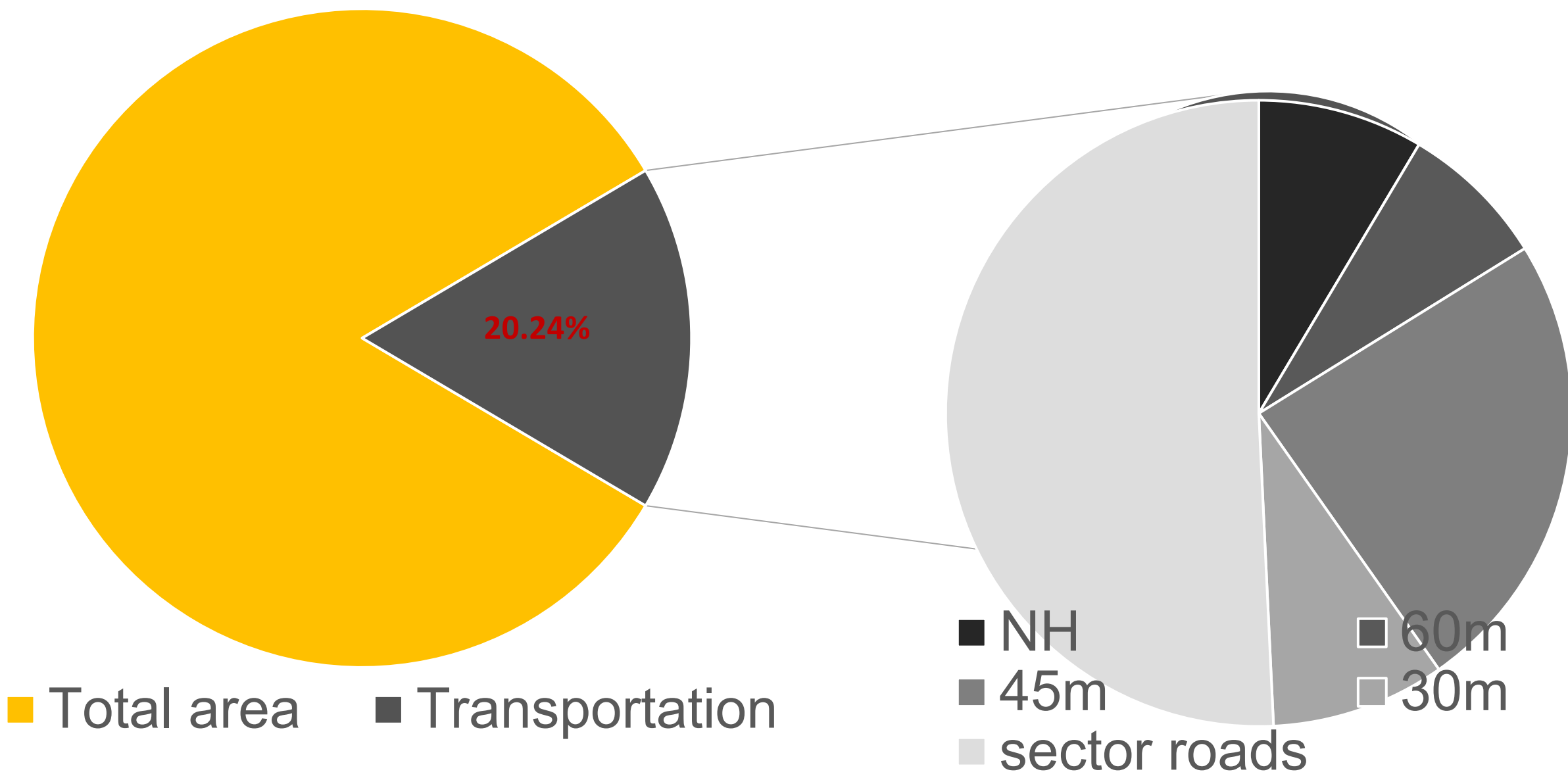
Road hierarchy	Length (km)	Area under them (HA)
NH and City level Roads	25.7	203.41
60m	30.7	181.09
45m	128.7	572.52
30m	5.74	214.19
Sector level roads	12% of area	1206.93
Total	190.84	2378.15



Inferences

The area under Transportation in zone L is way more than the prescribed 10-12% in MPD 2021 summing up to be **20.24%**

Percentage area distribution for Transportation



Road pattern

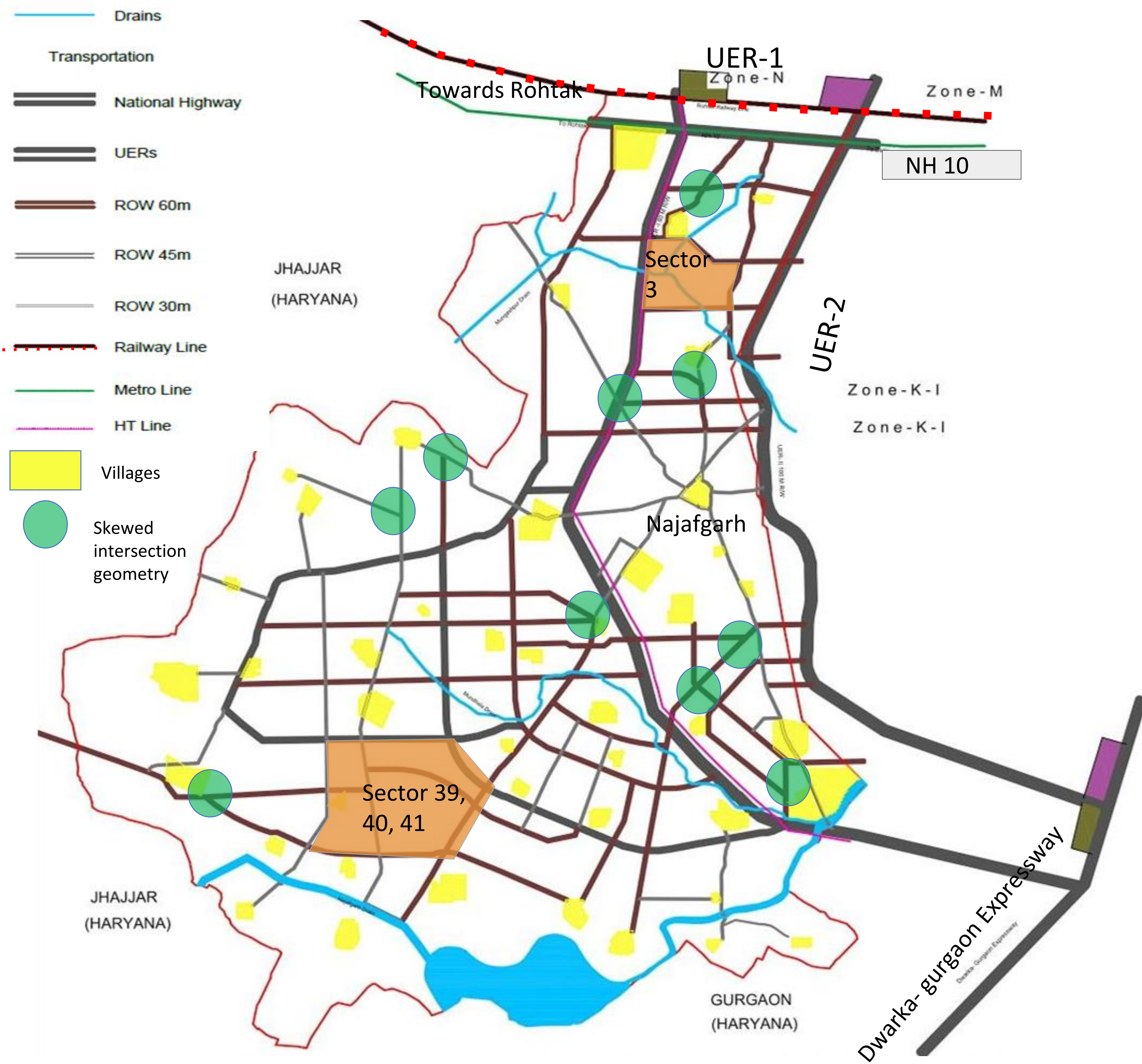
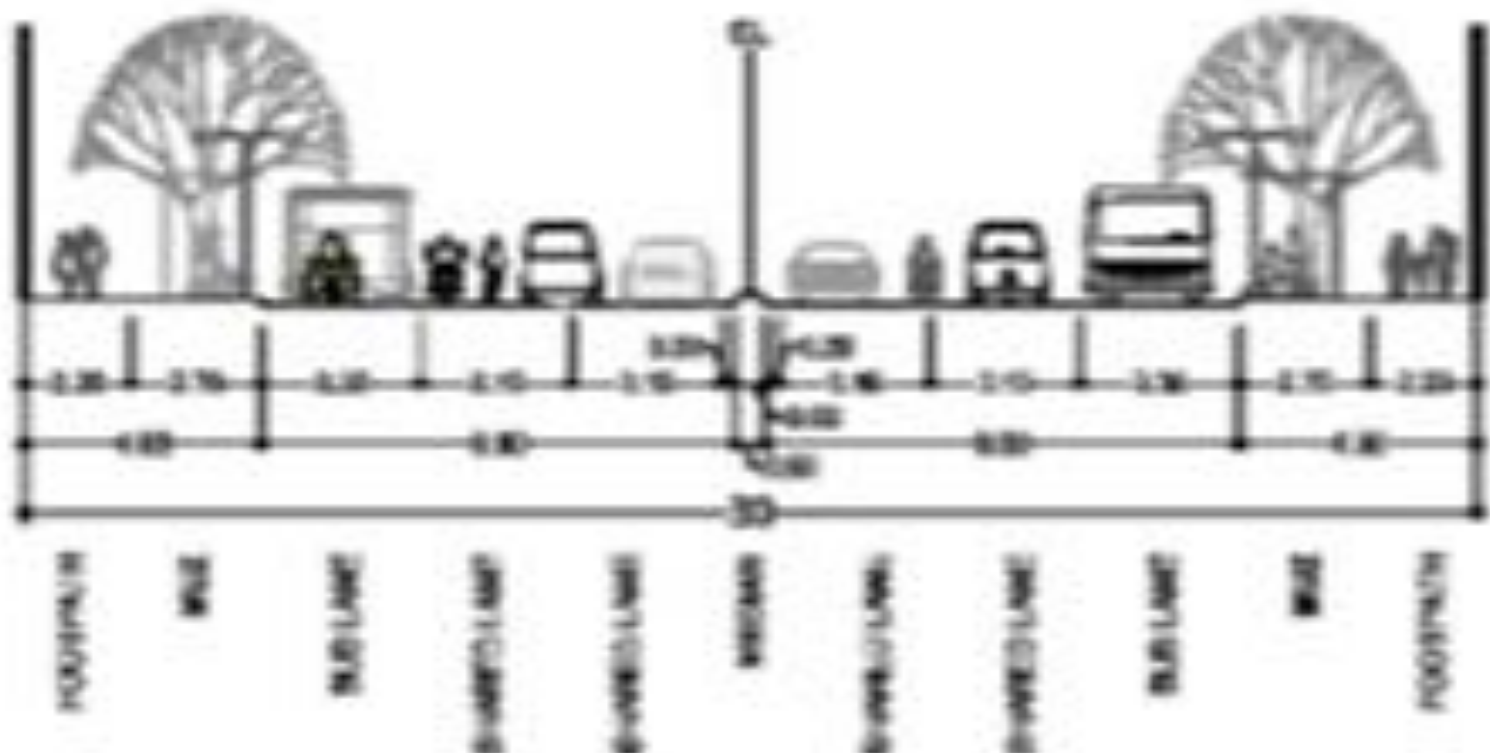
- The proposed Zonal level road pattern is similar to the existing Roads in zone.
- The 30m roads passing through the centre of sectors because of existing villages.
- These roads serve as an access road to village.
- Integration of different hierarchy of roads is-
 1. Not continuous
 2. With abstract street geometry (acute angle junctions)
 3. Inconsistent block sizes and variable sector sizes.



Outer villager road of ROW 9m to be turned into a 30m wide road



Existing roads will be turned into 30 M ROAD WITH 6-Lane MIXED (Design Speed <20km/hr) Collector/ Neighborhood Road Function



Inferences

The Road pattern, street geometry, block sizes and sector division is **skewed**.

There can be possible **congestion** on existing roads in the **piecemeal approach** of development in Land pooling policy with lack of higher hierarchy development phasing.

Phasing of transport

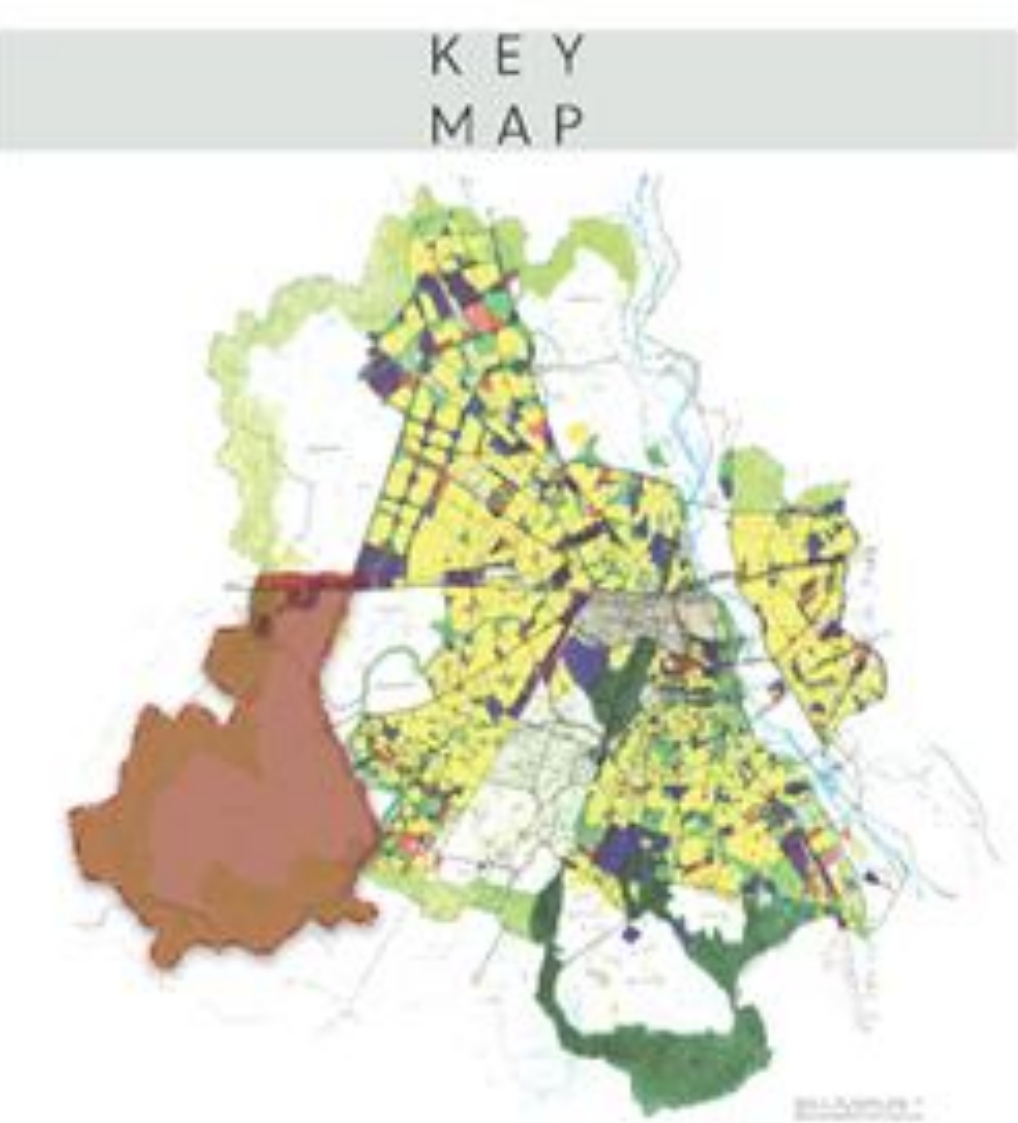
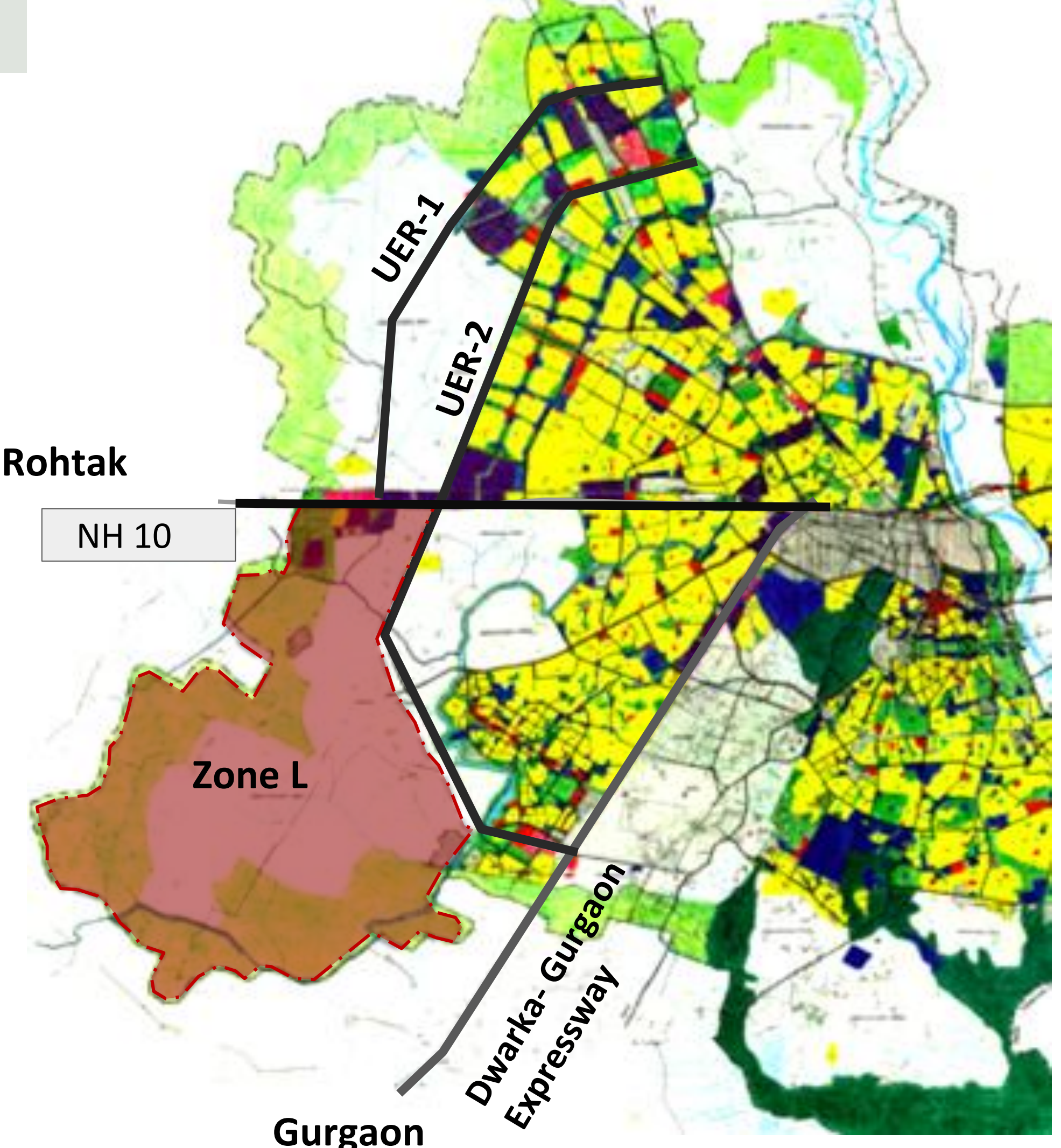
- The development of zone will happen in the sequence of sectors where the land is pooled.
- Current scenario sector 3 is the first to get developed followed by sector 39, 40 and 41 where 50% of land is pooled.
- The development of UERs is done at city level is proposed to be completed within 5 years done by Land Acquisition.

Until the neighboring land is **pooled** the road network will not be continuous and will remain to work on the existing roads. These roads will not be able to carry the traffic that new developed sectors will induce.



Economic Opportunities in Zone L

- The site is well connected to neighboring area like Gurgaon, Rohtak via road and city center in Delhi with both road and PT giving economic activity connectivity to population
- The development of facility corridor along the UERs gives addition to economic activities like commercial and industrial(industrial having 160 Ha along the roads in city level commercial)
- Transportation facilities and connectivity makes it a ideal site for industrial development as good intercity connectivity and warehousing facility.



Developments along Roads

- The metro line
 1. Grey- Passing via Najafgarh joining to blue line metro
 2. Green- is in the northern part of the zone, connecting Tikri Kalan to neighboring industrial areas
- The immediate boundary of Zone has 2 freight complex which help for warehousing purpose on inter-state roads.
- According to draft MPD 2041 there is proposed high Density vertical mixed use development along the Urban Extension Roads
 1. 500m on either sides mixed use
 2. UER-1 passes through the center of zone L benefitting the adjacent sectors.
 3. Zone L has UER-2 as one boundary thus there can be extensive development in sectors-2,4, 8, 9, 12 and 14 over and above Land pooling Policy.

Inferences

- There is economic growth in terms of-
- Job opportunities due to **commercial and PSP along UER**
 - Ideal site for setting up of **industries in terms of connectivity.**
 - Good **PT connectivity** to neighbouring areas.



PHYSICAL INFRASTRUCTURE

Introduction to Zone L

Urbanisable area of Zone L : **11,611 Ha.**

Considering population density of 250 - 300 person pph, capacity 30 lakh population in the zone including the existing population.

It is **proposed that zone should be planned for 20 lakh** population in view of constraint of physical infrastructure.

Changes in population after application of Land Pooling Policy:

After the application of Land Pooling Policy in Zone L, the new estimated population is **44.6 Lakhs.**

MPD on ZDP contents: Physical Infrastructure

The components under physical infrastructure mentioned in the Master Plan 2021 Zonal Plan (zone L): Water Supply, Drainage and Sewerage, Power, and Solid Waste.

The MPD mentions that the Zonal Plan must propose decentralized measures for waste water and solid waste treatment, along with other sustainable practices like water harvesting, composting, etc.

Zonal Plan on Physical Infrastructure

The components under physical infrastructure mentioned in the Zonal Plan 2021 Zonal Plan (zone L):

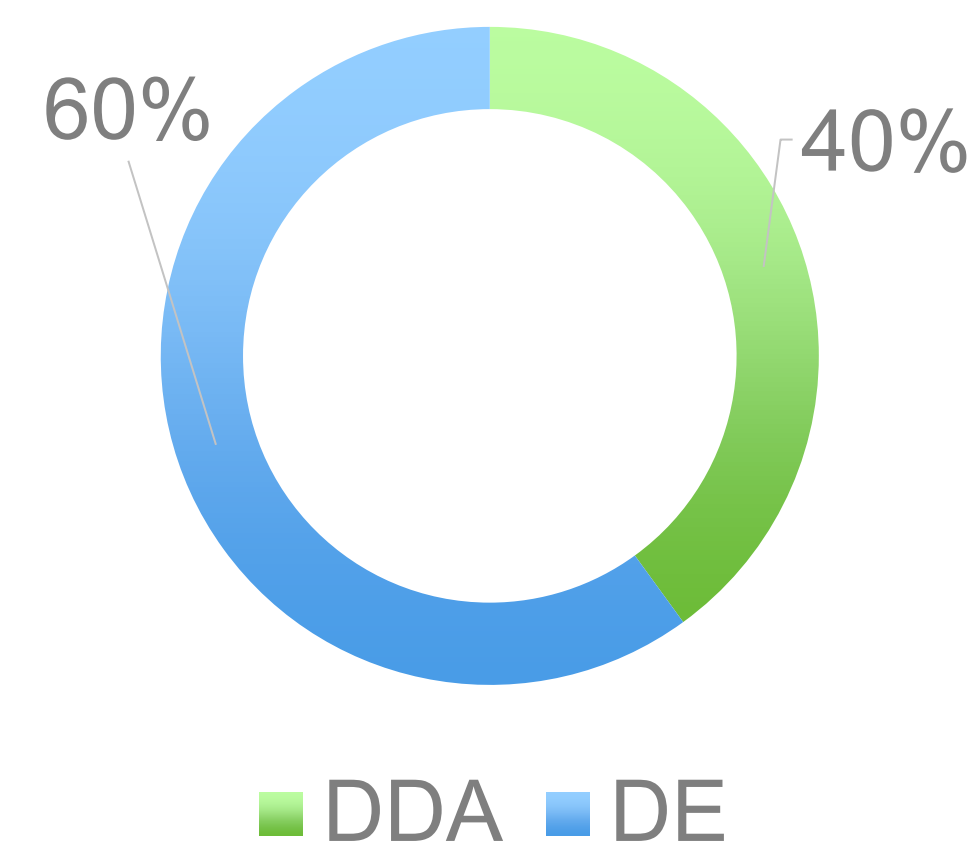
- » Water Supply
- » Sewerage and Drainage
- » Solid Waste
- » Power

The Zonal plan does not detail out anything mentioned in the Master Plan creating a gap between the two plans.

Land Pooling Policy on Physical Infrastructure

Each landowner will surrender land proportionately, free of encumbrances as and when required for city level services, as needed for city level infrastructure in a sector, irrespective of land uses assigned to their original land in the ZDP.

Land break up



40% of pooled land to be surrendered to DDA for development of city level physical infrastructure, recreational and public/semi-public (PSP) facilities as per the ZDPs and layout plan of a sector.

Consortium will retain 60% of pooled land for development of physical infrastructure, residential, commercial, public and semi-public facilities as per the Policy.

Important Definitions : Land Pooling Policy

Service Providing Agency means respective agency responsible for providing services such as water supply, sewerage disposal, solid waste, electricity supply, construction of roads, communication and other distributive services, which will develop trunk infrastructure in the land pooling areas.

External Development Charges (EDC) mean the charges to be paid by DE/Consortium towards the cost of constructing, laying and installing the public infrastructure and services, including inter-alia roads, water supply, sewerage and drainage systems, electricity supply, greens etc.

Final Development License (FDL)





Given below are the roles of the DE and the DDA as per land pooling policy:

The Developer entity/consortium

- » Timely payment of **External Development Charges (EDC)** to DDA and service providing agencies towards the **cost of developing public infrastructure**(EDC shall be payable on the total pooled land).
- » **Time bound development and maintenance (until handed over to ULBs)** of water supply lines, power supply, rain water harvesting, sewage treatment plants, water treatment plants.
- » Bearing the cost of acquisition of land acquired by DDA as per law for the public purpose of ensuring the planned development of infrastructure in the Zones and sectors where the Land Policy is applicable.

The DDA

- » **Revision of ZDPs** as and when required for new development areas, including delineation of sector boundaries.
- » **Overall monitoring** of provision of relevant infrastructure for water supply, sewerage, drainage, power, transportation etc., by service providing agencies in a time bound manner.
- » DDA shall try to ensure to **complete the external development** within a period of **five years** from the issue of Final Development License to DE/Consortium

Since DDA and DE are both responsible for the development of physical infrastructure, coordination issues may arise and there may be unwanted delays in the development of physical infrastructure.

Application for FDL by DE : Physical Infrastructure related requirements

The application for the Final Development License (FDL) shall comprise of:

An **explanatory report (including maps)** indicating **physical infrastructure development works** to be executed in phases through use of **smart-city principles** including arrangements for **disposal and treatment** of waste water, **rain water harvesting**, **solid waste management**, storm water **drainage**, water **recycling**, etc.

The validity of Final Development License so as to complete all development and obtain a completion certificate from DDA in accordance with law shall be **ten years** from the date of its issuance during which period all the prescribed infrastructure development works shall be completed and certificate of completion shall be obtained.





Given below is the course of action that DDA/DE must take in case of delays in the completion of development works by them as per the **Land pooling Policy Regulations**.

The DE /consortium

In case of delays in completion of development by DE:

- » it may apply to the DDA **for extension of FDL (Final development license) at least 30 days before expiry** , accompanied by prescribed fees, clearances and documents in support evidencing the status of development and reasons for non-completion.
- » DDA may extend the FDL up to **maximum of three extensions of one year each**, subject to payment of the extension charges

extension	extension charges to be paid
first	5% of EDC
second	10% of EDC
third	15% of EDC

- » If the project is not completed beyond the extension period, **DE/Consortium shall be liable to pay 15% of the EDC for each year’s delay beyond the extension period irrespective of the reasons thereof.**

The DDA

In case of delays in completion of development by DDA:

- » DDA shall try to ensure **to complete the external development within a period of five years** from the issue of Final Development License to DE/Consortium
- » the DDA **shall pay proportionate penalty of 2% of EDC per year for first two years**
- » **3% of EDC per year thereafter to affected DE** for delay beyond the date of completion of the construction by DE/Consortium or five years whichever is later, provided that all the EDC charges have been paid by DE/Consortium within the stipulated time period.

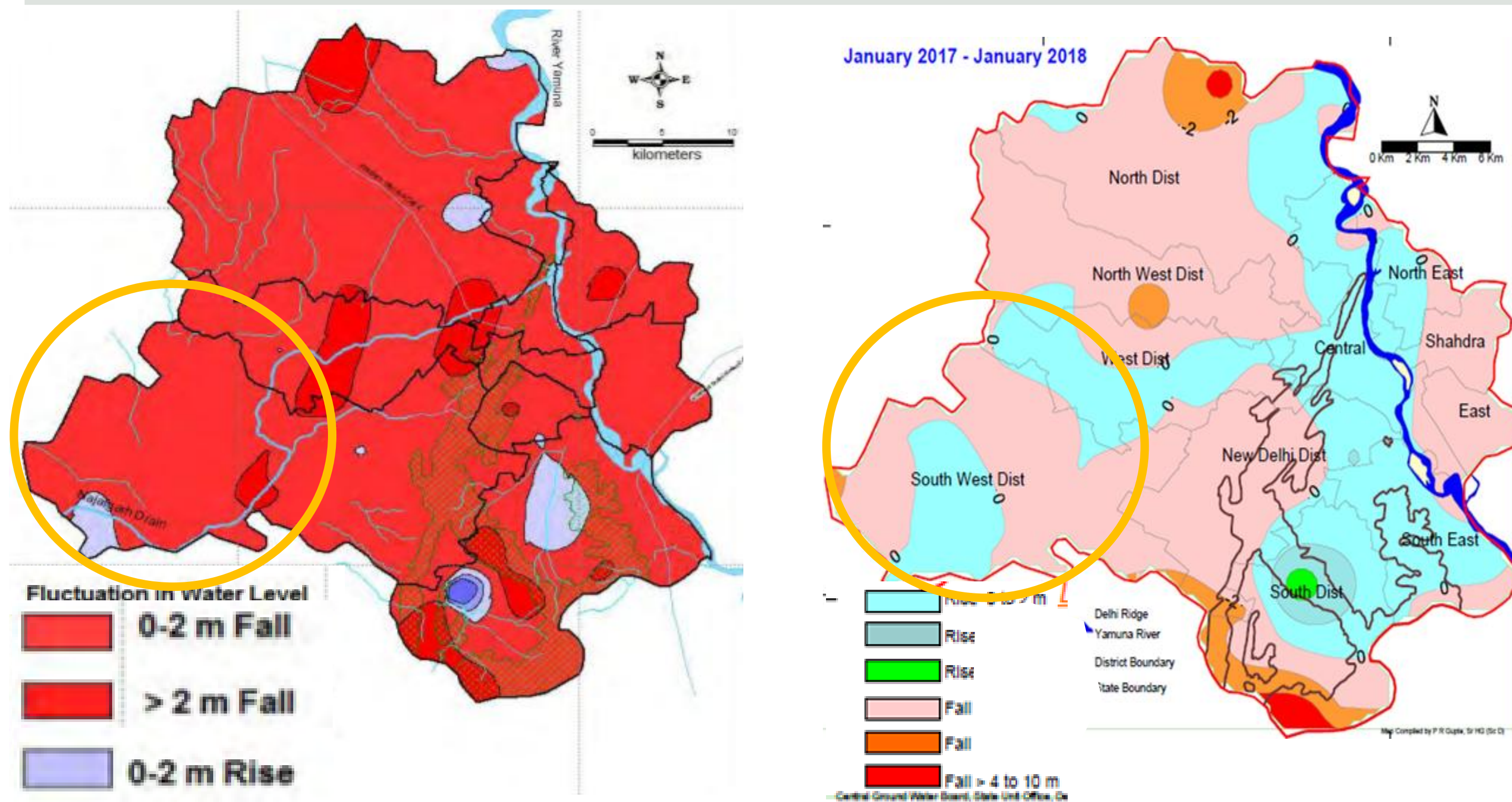
As per the financial model, the DE earns significantly higher profits as compared to DDA. Also, since DDA spends disproportionately higher amounts of money, the above rates as penalty can be justified (DE rates being higher than the rates for DDA).

Contents of Layout plan prepared by DE as per LPP : Physical Infrastructure

The Layout plan created by the DE must contain:

- » **proposed plan** regarding infrastructure development works to be executed
- » **services plans** indicating the **positions of sewers, storm water channels, water supply** (including **strategies** to reduce water demand) and any other public health services;
- » **detailed specifications and designs for disposal and treatment** of storm and sewage water with **estimated cost of each**
- » solid waste management and disposal plan (**zero waste strategies**);
- » **detailed specifications and designs for electric supply including street lighting**;





Maps showing fall in ground water levels in zone L

MPD

More water supplied = More waste water generated = more costs for treatment = Unsustainability

The planning of physical infrastructure (water supply) shall be governed by the following norms:

- » **Rainwater harvesting** shall be an integral part of the storm water drainage plan at the time of sanction of layout plan for all the plots.
- » The natural drainage pattern is not to be disturbed.
- » **Dual pipe system of recycled water** is recommended in new areas and redevelopment schemes.

Water from tube wells

Waste water

Water used

Recycled water

Dual Pipe System

Water requirement

- The fluctuation of water level between 2014-2015 of Delhi shows a **fall in the range of 0.01 to 3.55 m in nearly 87% of wells.**
- The overall data indicates that **zone L shows a continuous fall in comparison to other areas.**

Water requirement as per new projected population (44.6 lakhs): = 641 MLD = 145 lpcd



ZPD

- » The Master Plan mentions that ZPD must specify details on rainwater harvesting, recycling and treatment of water in a decentralised manner, etc. The Zonal Plan does not mention anything regarding such issues.
- » The ZPD also does not mention the source of water supply and does not address the fall in ground water levels in the zone.
- » ZPD only contains the proposal of new treatment plants, etc.

Inferences

- » Sources of water must be mentioned in the zonal plan considering the continuous fall in level of ground water in the Zone L.
- » The Zonal Plan must be updated so that the gap between the MPD and ZPD is bridged. Practices like rainwater harvesting must be mentioned.





Physical Infrastructure (Water Supply)

Given below are the proposals given in the zonal plan:

- » About **34 Ha** of land, for **water treatment plant** has been made available to the Delhi Jal Board in **adjoining zone i.e. K-I**, which will be used by population of Zone-L.
- » **45 Ha** of land in the zone for locating a new water treatment plant near village **Mitraon**, on **Najafgarh Dhansa road**

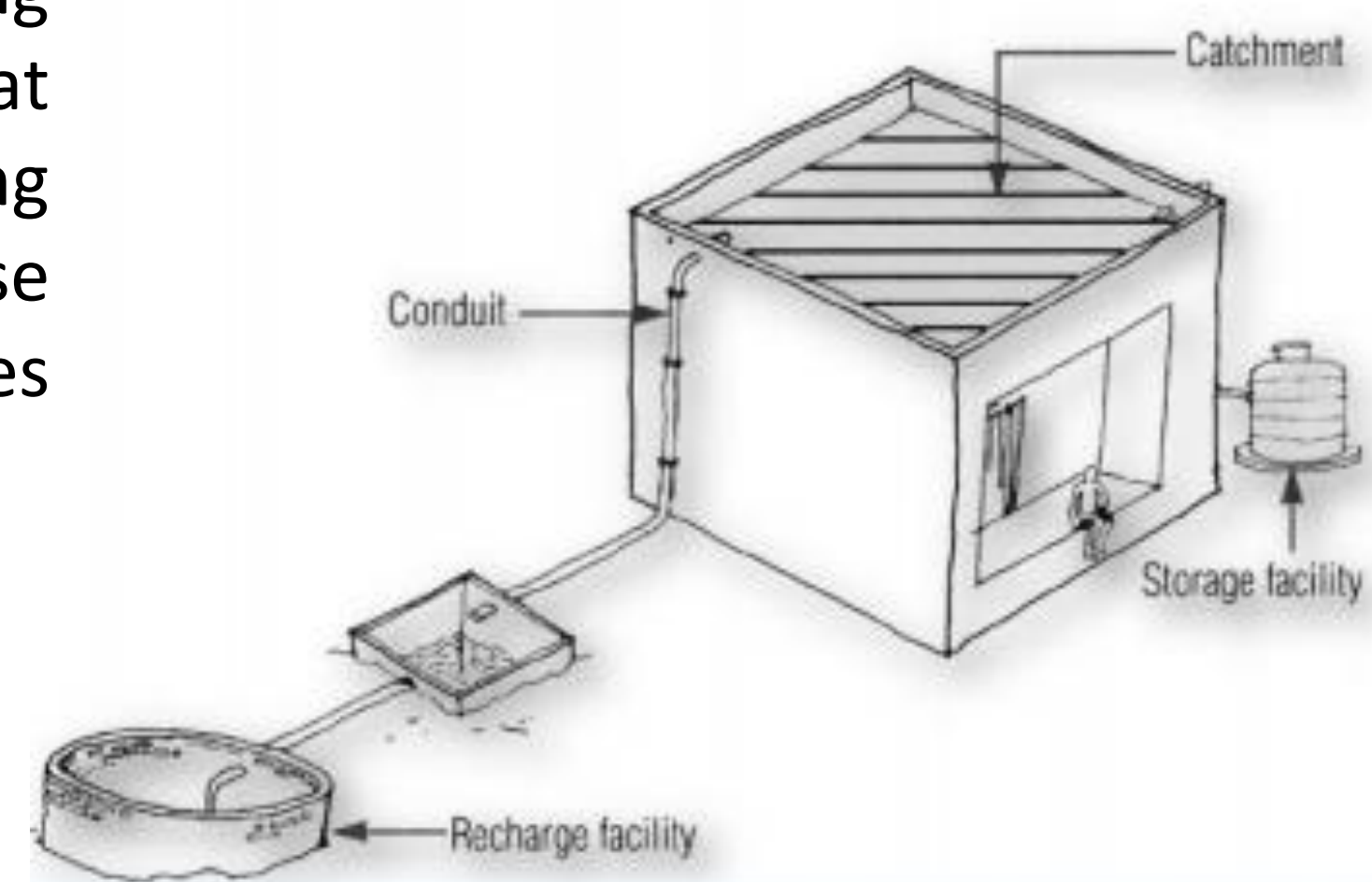
Water requirement as per new projected population (44.6 lakhs): = 641 MLD = 145 lpcd

- » The above proposals are for a population of 20 lakh. Hence, the waste water generated by 44.6 lakhs population will be more than double.
- » Additional requirement for water is 353 MLD.
- » Area required for additional plants = 20 Ha (assuming the average area of a plant to be 0.175 ha per 1MGD water being treated).
- » **Total area in zone L for water treatment Plants = 45 Ha + 20 Ha = 65 Ha.**

Sustainable practices required

- » There is no mention of recycling/reuse of water in the Zonal Plan of zone L and should be mentioned.
- » Rainwater harvesting measures at different hierarchies should be mentioned in the zonal plan.

- » Rainwater harvesting can be done at individual building level through the use of roofs and terraces as catchment areas.



- » Rainwater harvesting can be done at higher scales (for example Neighbourhood level) through the strategic placement of green areas as shown in the figure.





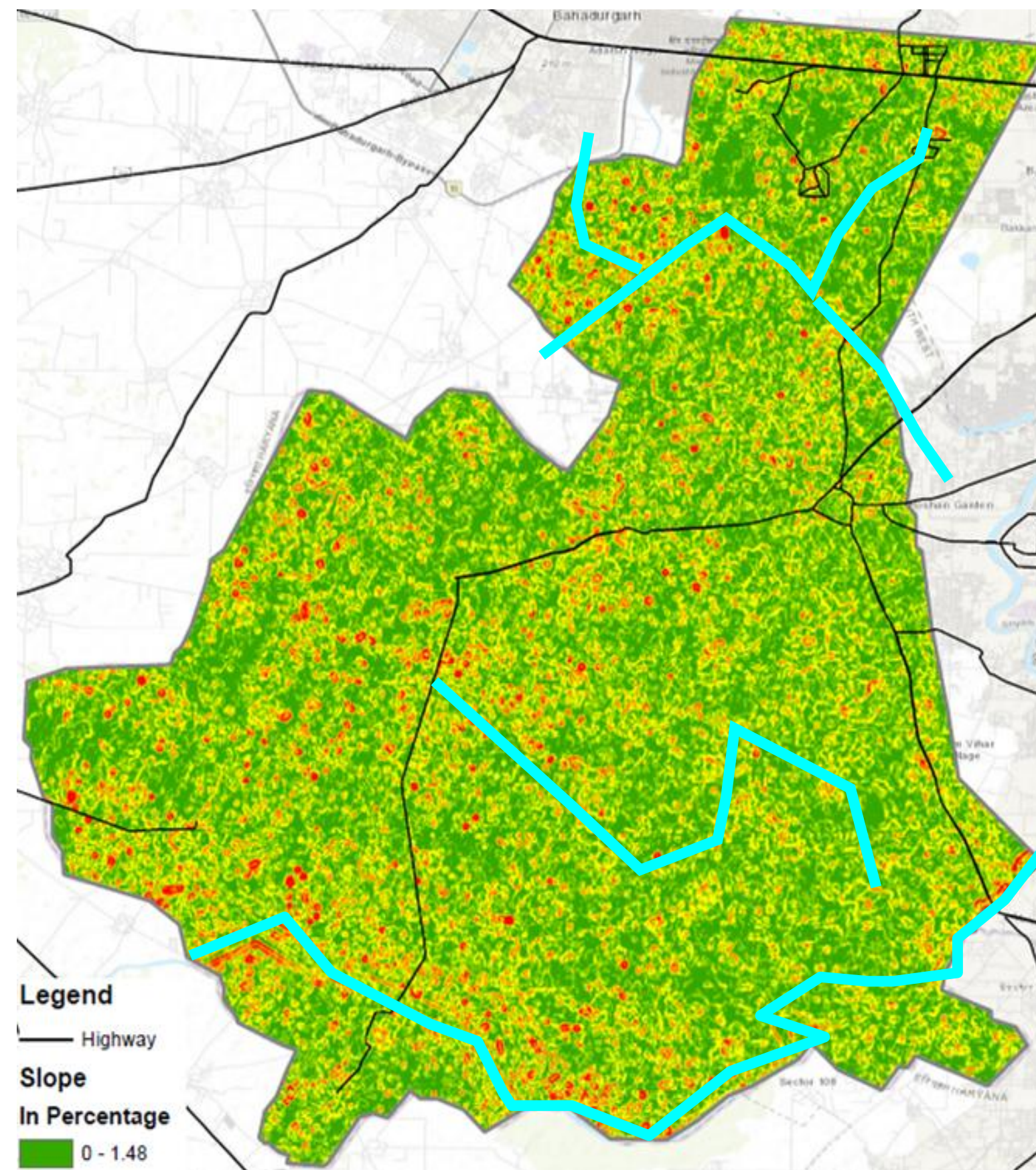
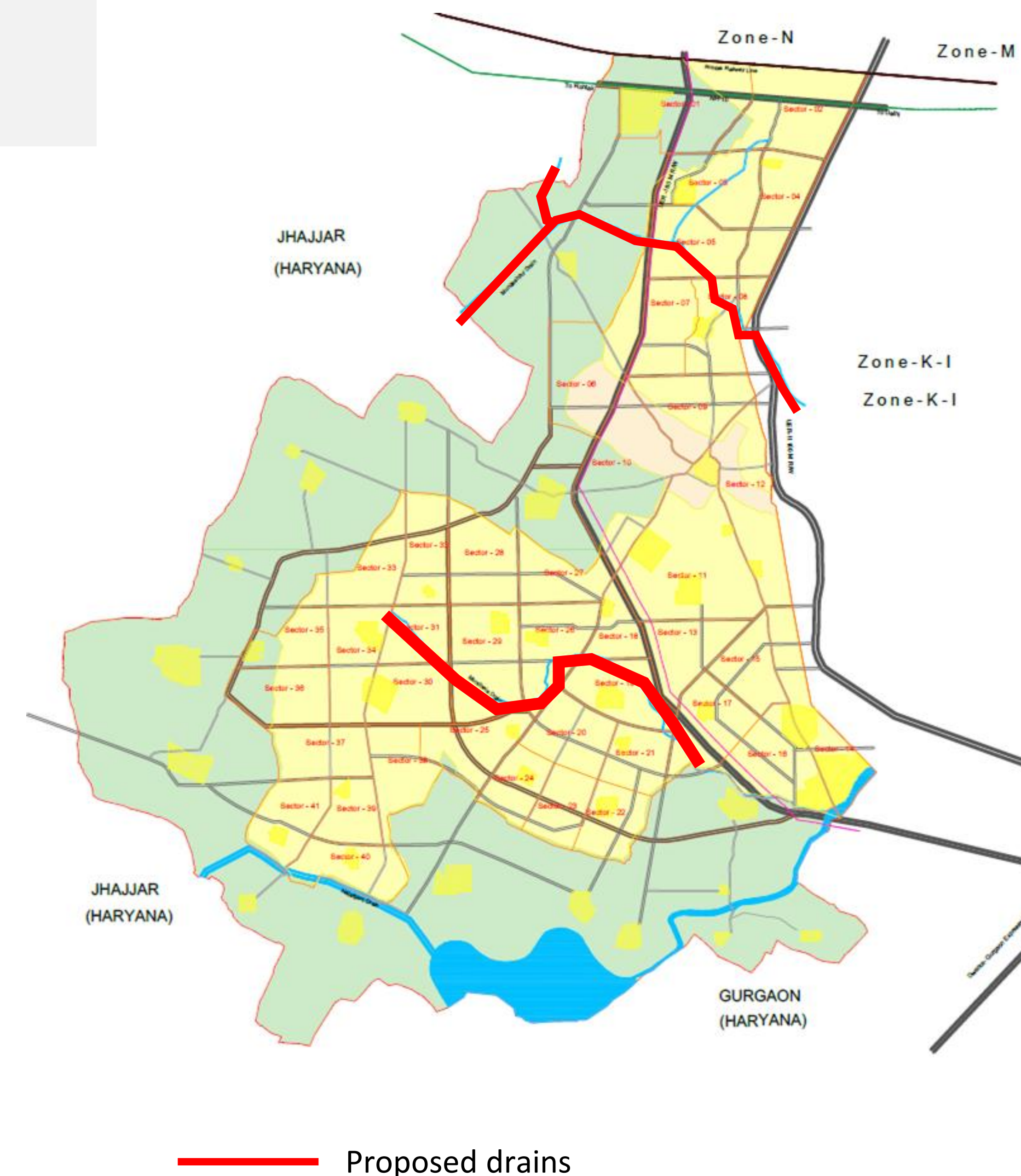
Current Scenario of sewage treatment

The existing capacity of sewerage system in Delhi is inadequate, as only about **55% of the population is covered under organized sewerage system** and about **15% under on-site sanitation** systems. Effluent treatment plants should be provided at outfall of drains and aeration units at interceptions with advanced techniques for maintenance of drains.

ZDP proposals : drainage

The land in Zone L is relatively flat land, suitable for development. There are three major drains in this Zone.

- » It is proposed that the storm water of the urban development shall flow through: Mungeshpur drain and Mandela drain (show on map)
- » Najafgarh Drain has potentially for the developing it as a **lake** which is to be utilized for the recreational activities as well as water recharging area.
- » The development of the lake shall be taken up by Govt. of Delhi, MCD, DDA along with the Haryana Urban Development Authority as part of the area of the proposed lake is falling in the Haryana. Tourist infrastructure would be permitted on the banks of lake / artificial islands



Slope map of Zone L with contour interval of 10m.

MPD

The planning sewerage shall be governed by the following norms:

- » **Underground tank, sewerage-pumping system** shall be provided as per requirement.
- » Provisions for **decentralised sewage treatment plant** shall be made where centralised system is not available.





ZDP Proposals : sewage

Proposal:

- An existing sewerage treatment plant with the capacity of 5 MGD is serving the Najafgarh Town which requires **augmentation**.
- The **new location** of sewerage treatment plant of **80 MGD capacity** is **proposed near the Najafgarh Drain**, in revenue village **Jhuljhuli**.

LPP

If the **Land Pooling policy** gets implemented, the proposed population will increase from 20 lakhs to 44.6 lakhs , hence the total waste water generation will increase from **73.6 MGD to 164.13 MGD** (DOMESTIC USE).

- » One more additional STP of 80 MGD capacity must be proposed in the Zone.
- » Decentralized STPs with smaller capacities can be provided at the community level. Possibility of recovering energy/ gas as fuel from sewage shall be explored.

(Water Supply)

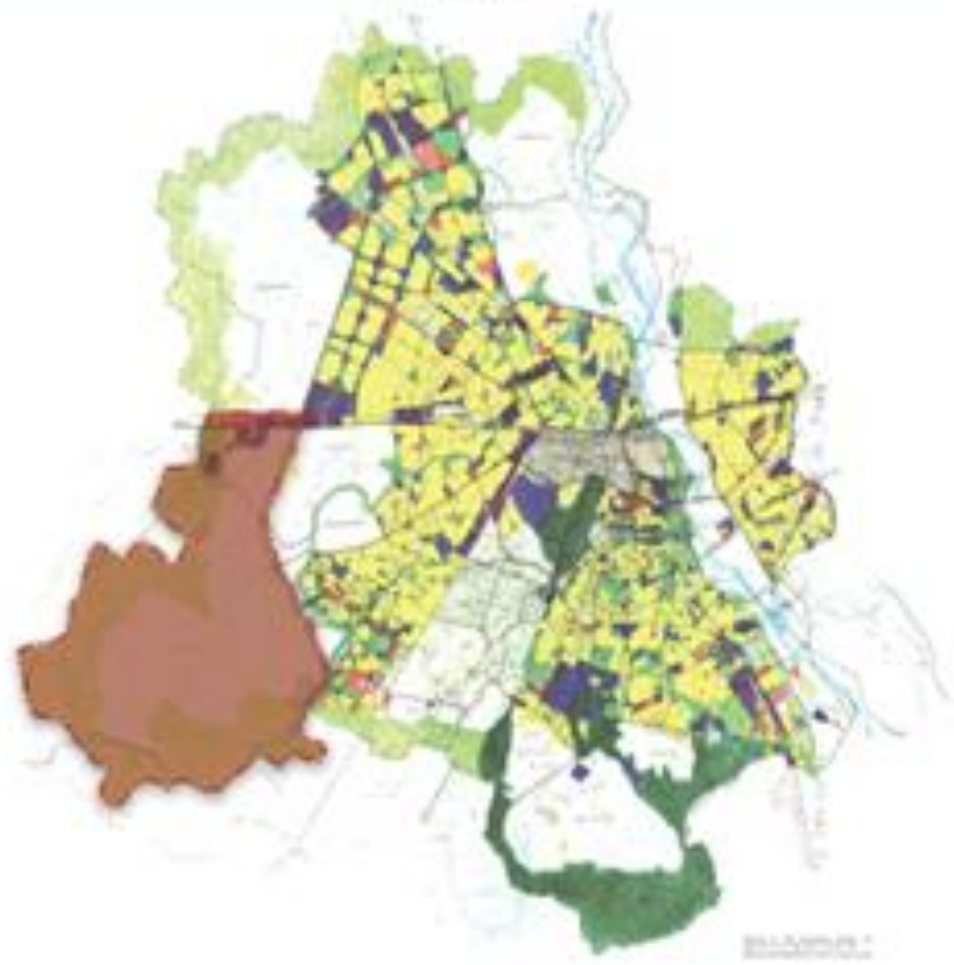
Population		Waste water generated per day	area required for waste water treatment
individual building	8	1 KLD	2.8 sqm
housing colony	700	50 KLD	500 sq m
housing area level	5,000	0.6 MLD	1000 sqm (2 plants of 500 sqm each)
neighbourhoodlevel	10,000	1.39 MLD	600 sqm
community level	1,00,000	13 MLD	6000 sqm

Decentralised STPs with smaller capacities can be provided at the community level. Possibility of recovering energy/ gas as fuel from sewage shall be explored. DTS provides treatment of waste water flows up to 1200 kl/d (kilo litre per day) or even more from domestic sources (CPHEEO, 1987).

» Area requirements have not been mentioned in the Zonal plan and hence should be added, since the population estimation after land pooling will increase, creating around 90.53 MGD more waste water in the zone.

» Area of an STP can range from 0.2 -1.0 Ha per MLD. Assuming a size of 0.6 ha per MLD, **the total area required in zone L for STPs = 372 Ha**





Current Scenario

The present total availability of power is 3170 MW. Based on the 17th Electricity Power Survey of India, Central Electricity Authority (CEA), requirement of power for Delhi in the year 2021, as tentatively estimated by the Delhi Transco Ltd. is 11000 MW.

400 KV ring has been established around Delhi to draw power from northern regional grid, one of which is already existing in zone L apart from an existing generating station near najafgarh drain.

MPD guidelines for ZDP

The planning of physical infrastructure (power) shall be governed by the following norms:

- » Electric sub station shall be provided as per requirement.
- » Pole mounted electric transformers for augmenting electric supply in already developed areas are recommended.
- » Non-conventional sources i.e. solar energy etc. is recommended for public areas in all the establishments.

ZDP Proposals

- » One site of 400 KV is already located in the revenue village of the Tikri Kalan /Neelwal. Other location for 400 KV proposed on the Mitraon Dhansa road.
- » 220 KV grid station site is already under execution at Rewala Khanpur and the other 220 KV grid station has been proposed in revenue village *Daryapur Khurd*.

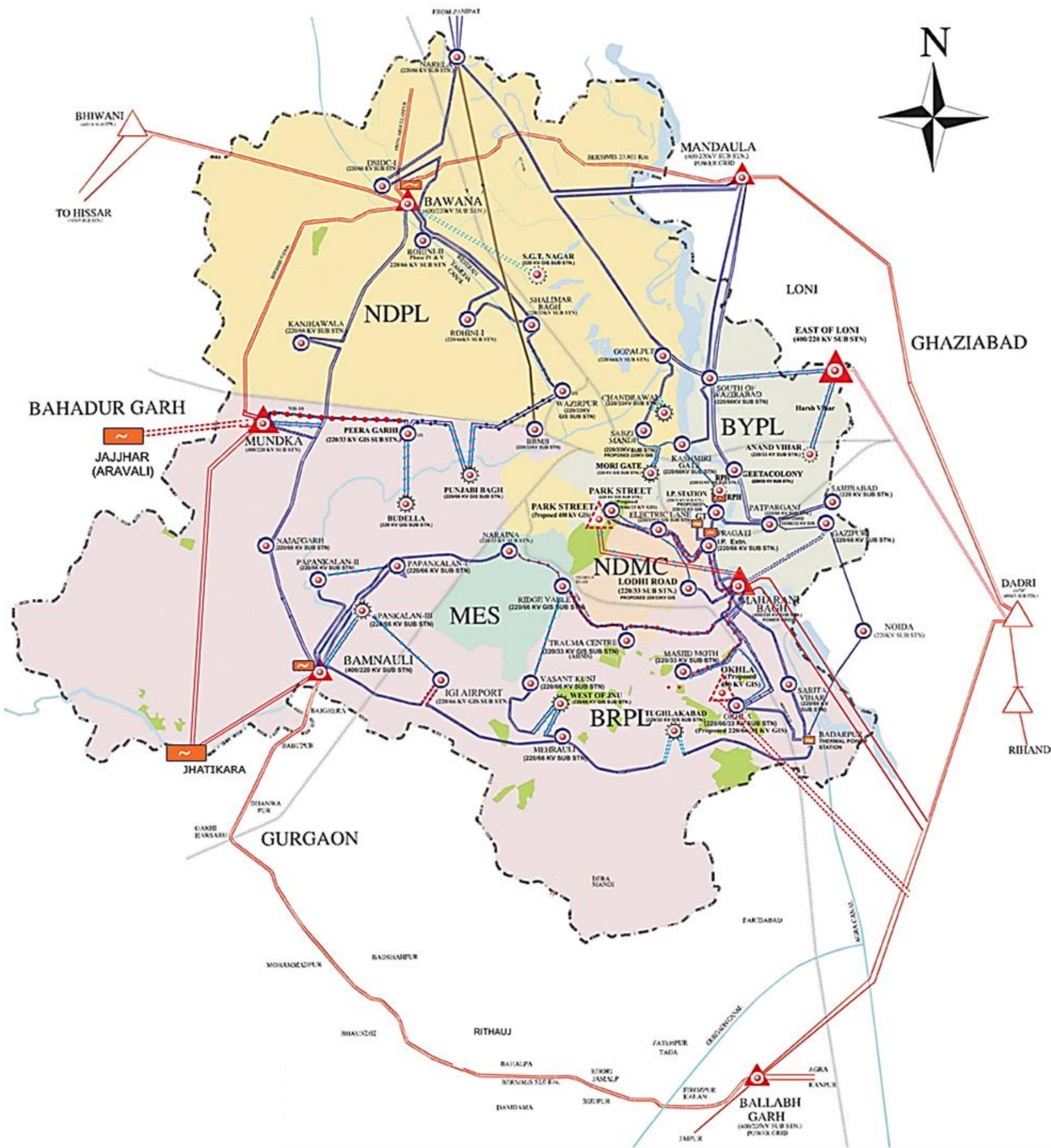
Area requirements in Zone L

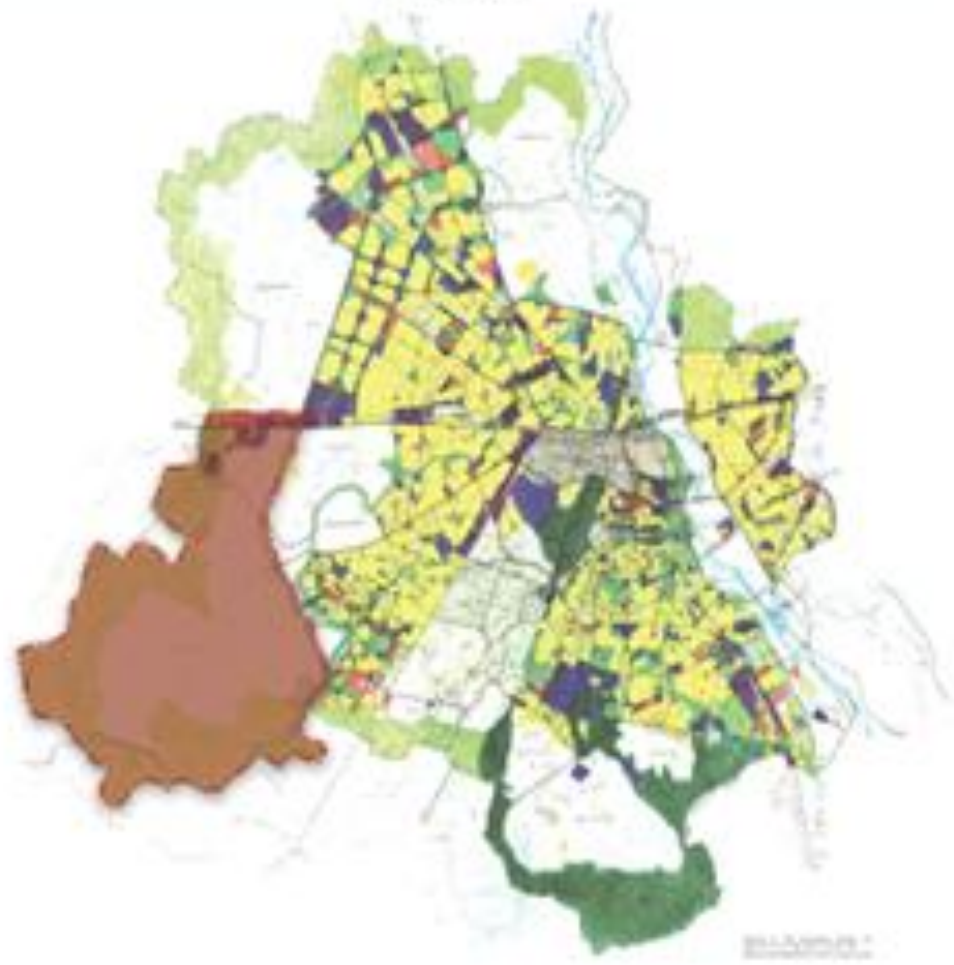
The total area required for Power related physical infrastructure:

- » 400kV x 2 = 40.46 ha
- » 220kV x 2 = 20.2 ha
- » Total area required = 60.66 ha in Zone L

Energy efficiency and sustainability

- » Solar energy should be encouraged for all establishments with floor area of more than 300 sqm.
- » Incentivizing green buildings must be done.





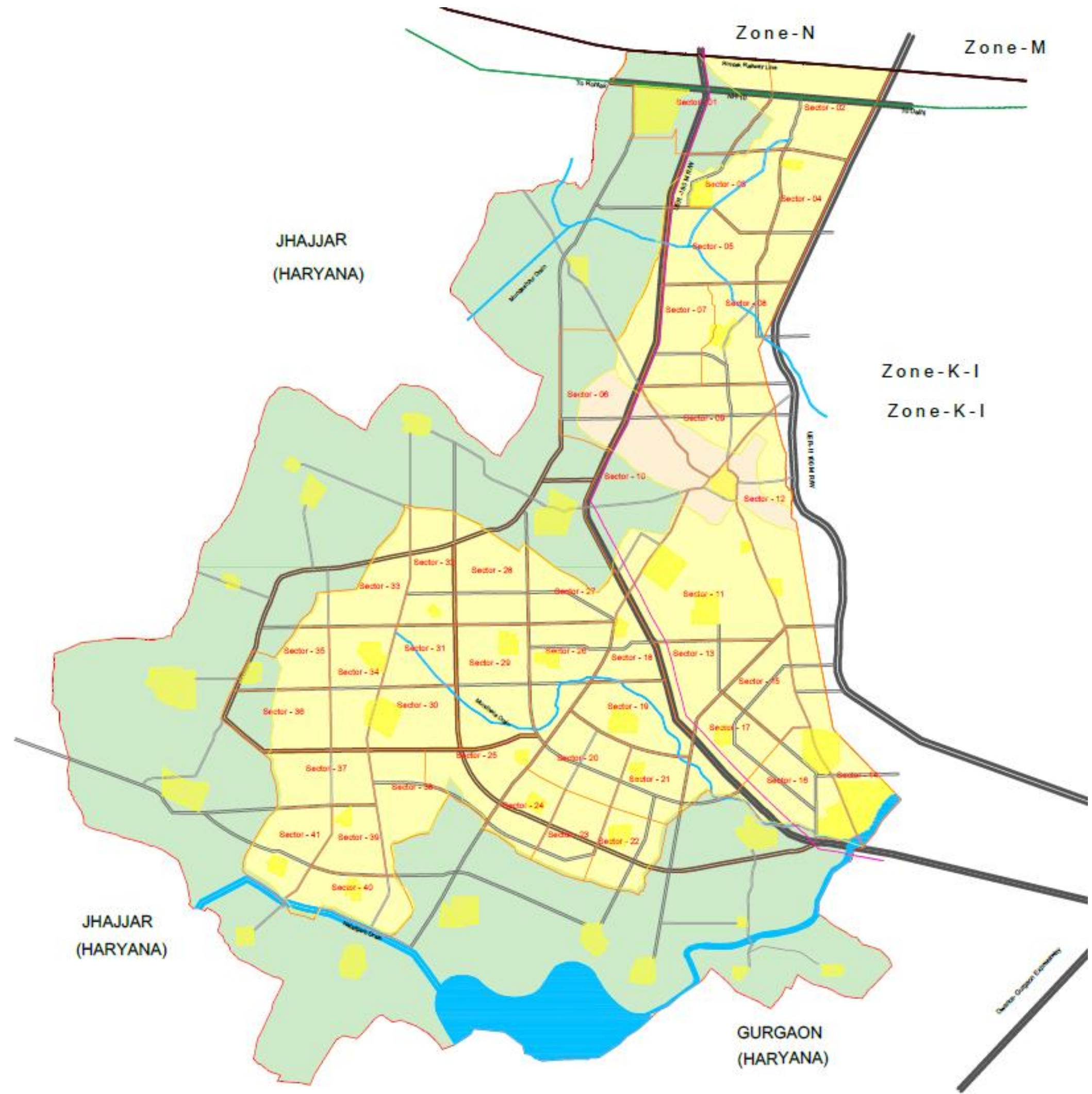
Current Scenario

•The projected average garbage generation upto the year 2021 is **@ 0.68 kg per capita per day** and total quantum of solid waste is 15750 tons/day

MPD

The planning of physical infrastructure (solid waste) shall be governed by the following norms:

- » Dhalaos including facility of segregation of biodegradable and recyclable solid waste should be provided.
- » Provisions for segregated waste disposal shall be made where centralised system is not available. It shall be ensured that no untreated effluent is allowed to exit / spill out of the scheme area.
- » The area required for solid waste disposal through various technologies including sanitary landfill sites shall be reserved in the Zonal Plans. This shall also include **buffer zone** of ‘no development’ around landfill sites.
- » Further, some more viable alternatives to landfills are vermiculture, fossilisation, composting etc. Waste Minimisation Circles (WMCs) should be constituted and made effective



ZDP PROPOSALS

» Proposed plant shall be located based on the requirements in the green belt or at location in **village Tikri Kalan, Jhuljhuli and Kanganheri**: mechanized plant / compost plant for solid waste which is projected to be **1360 tonnes per day**.

With the Land pooling policy applied, the new figure for waste generation will be 2,924 tonnes per day (for 44.6 lakh population).

No area requirements have been mentioned in the Zonal Plan for either Landfills nor treatment plants.

Suggestions

- » **One more treatment plant of similar capacity (1700 tonnes per day) is required in the zone after LPP.**
- » **Decentralised approach** with smaller capacities can be provided at the community level. Possibility of recycling and reusing waste as energy, etc. can be explored.

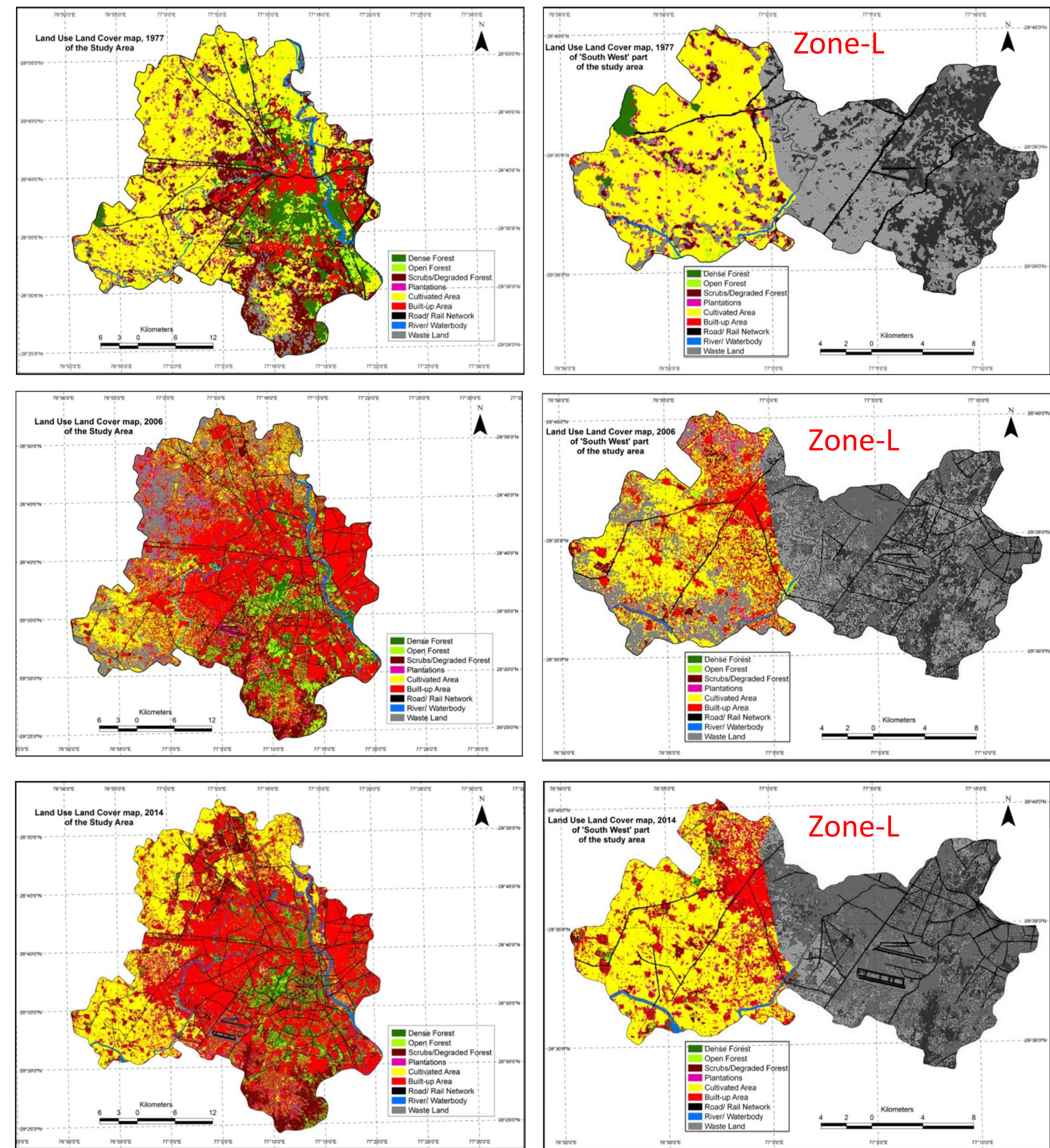
Average area of a landfill serving waste generation of 1000 tones per day is 41.5 Ha.

Hence area required in the Zone L for landfills = **83 Ha**

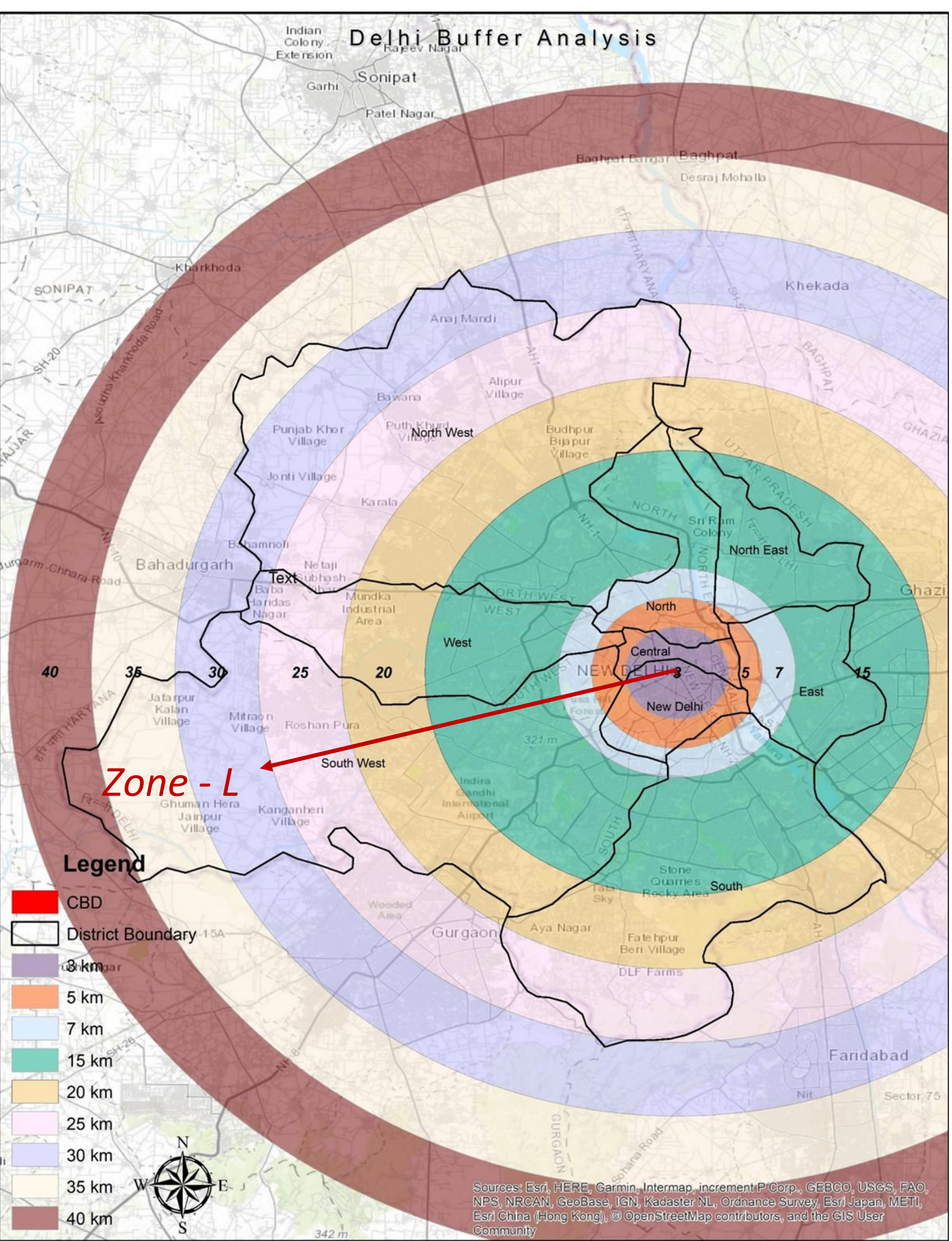


LAND USE

Delhi's growth and district characteristic by LULC Analysis



Buffer Analysis



Analysis and fact

- The effect of changing economy has manifested itself as a change in LULC.
- Correlation between wasteland, cultivable area and built up.

Observation

- Land for expansion came from clearing agricultural land which led to increase in wasteland.
- Increase in built-up area was found to be primarily at the cost of agricultural land and wasteland

Growth factors in Delhi

- Dense development with 25km buffer
- CBD (Connaught Place) to outwards
- Along with metro

Inferences

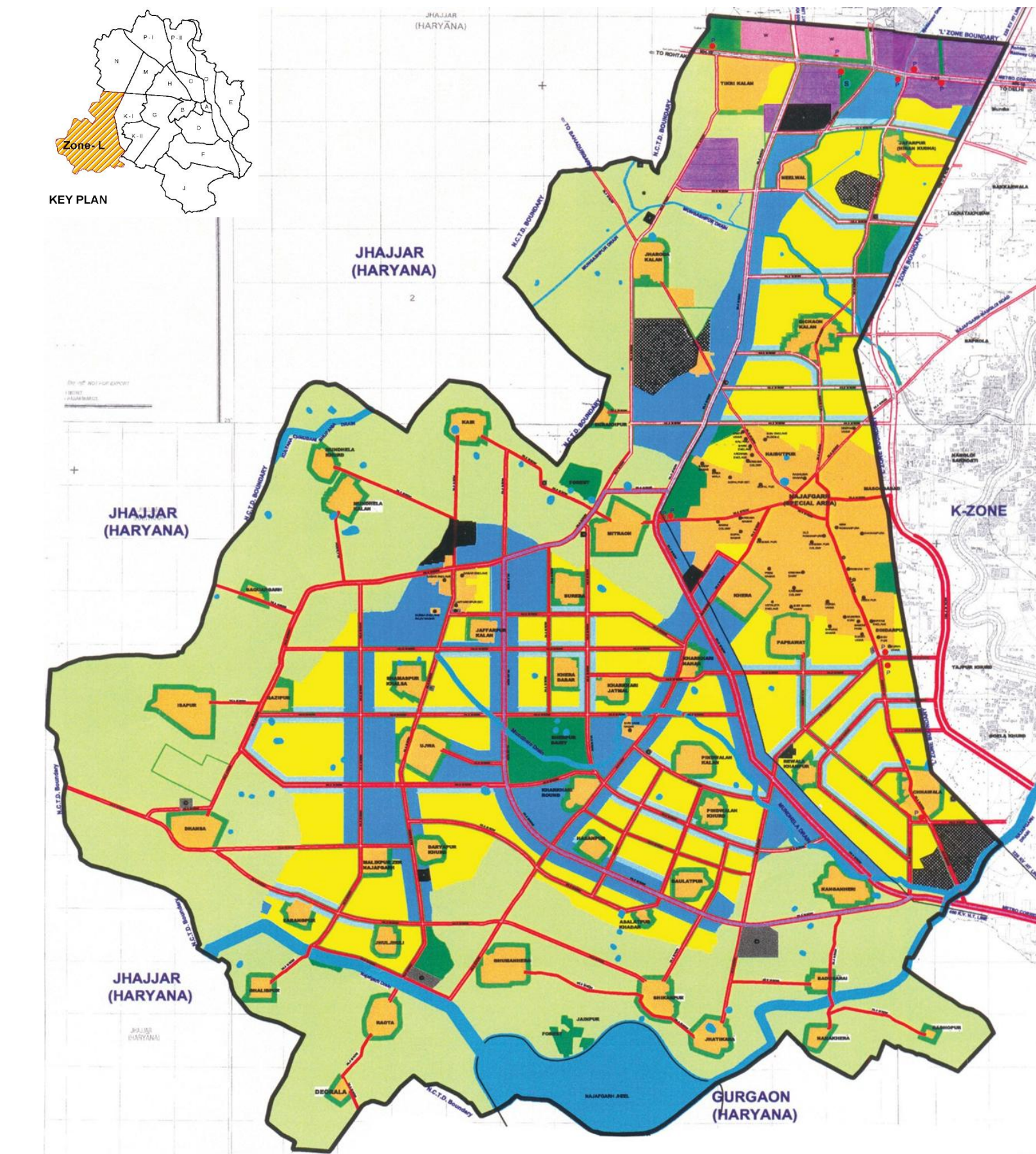
- Rural characteristic of Zone-L has restricted the sprawl of built up in south-west part of the Delhi
- Haibatpur and Najafgarh town is mostly hit by dense development in the Zone-L and became economy and transport hub in rural Delhi.

Image interpretation

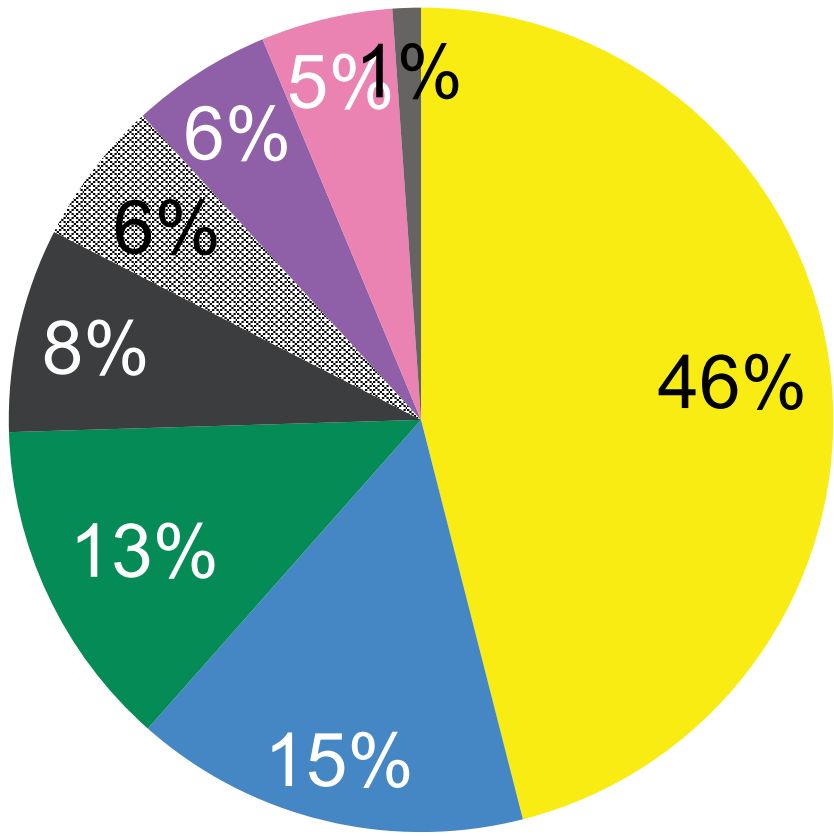
-	1977-1993	1993-2006	2006-2014
Wasteland	↑	↑	↓
Forest are	↓	↓	↓
Cultivable area	↓	↓	↑
Built up	↑	↑	↑



Land Use Zone L

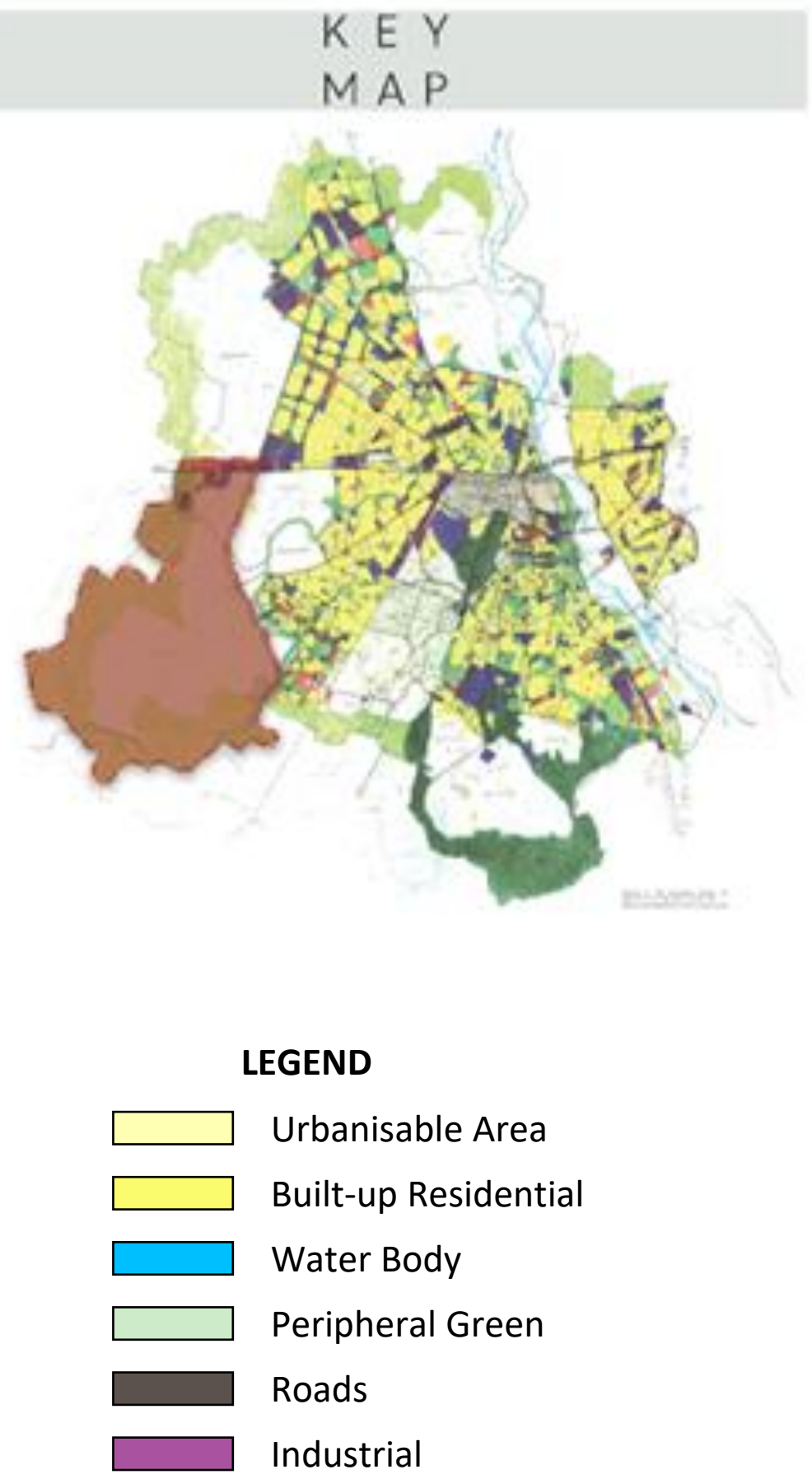
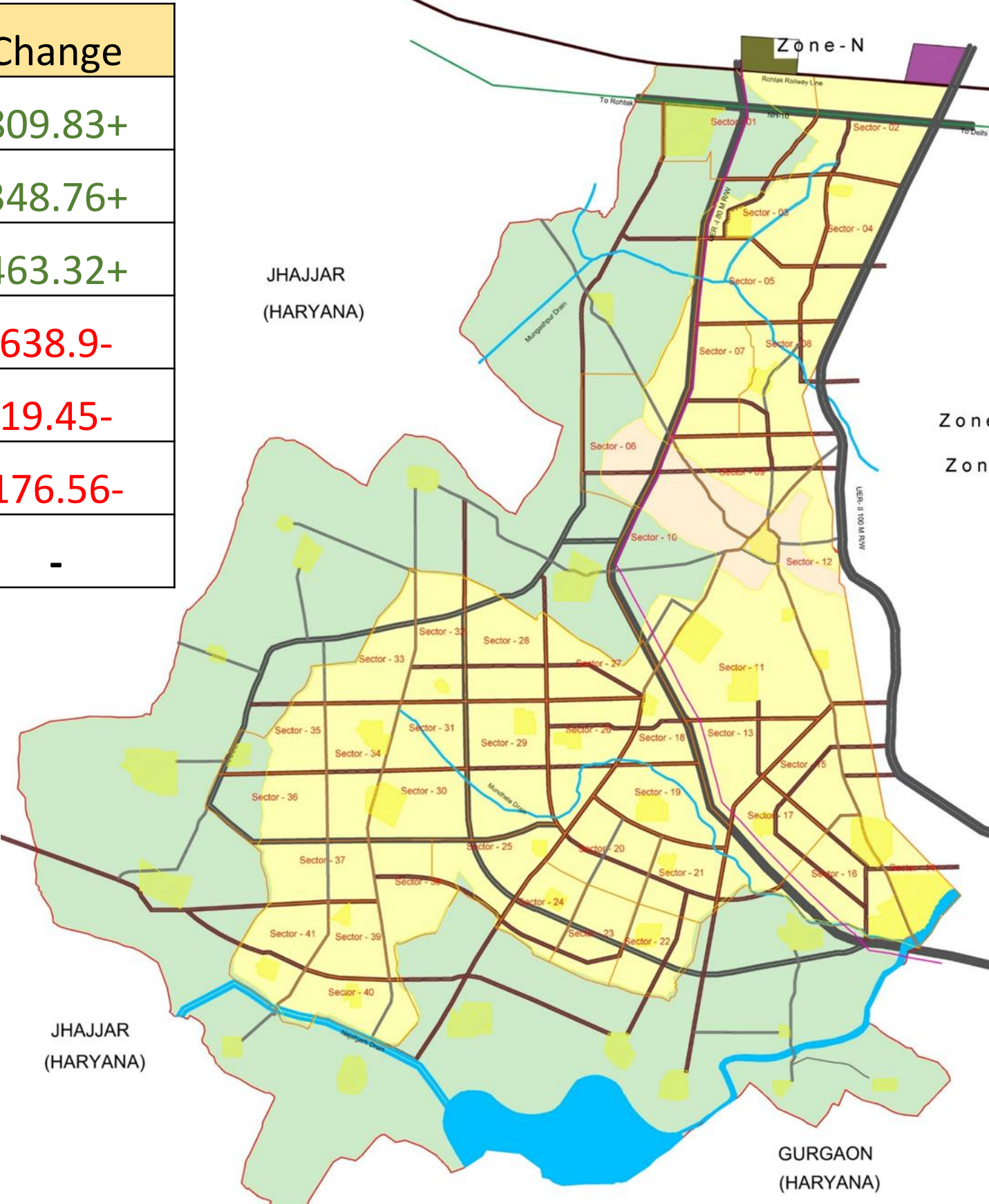
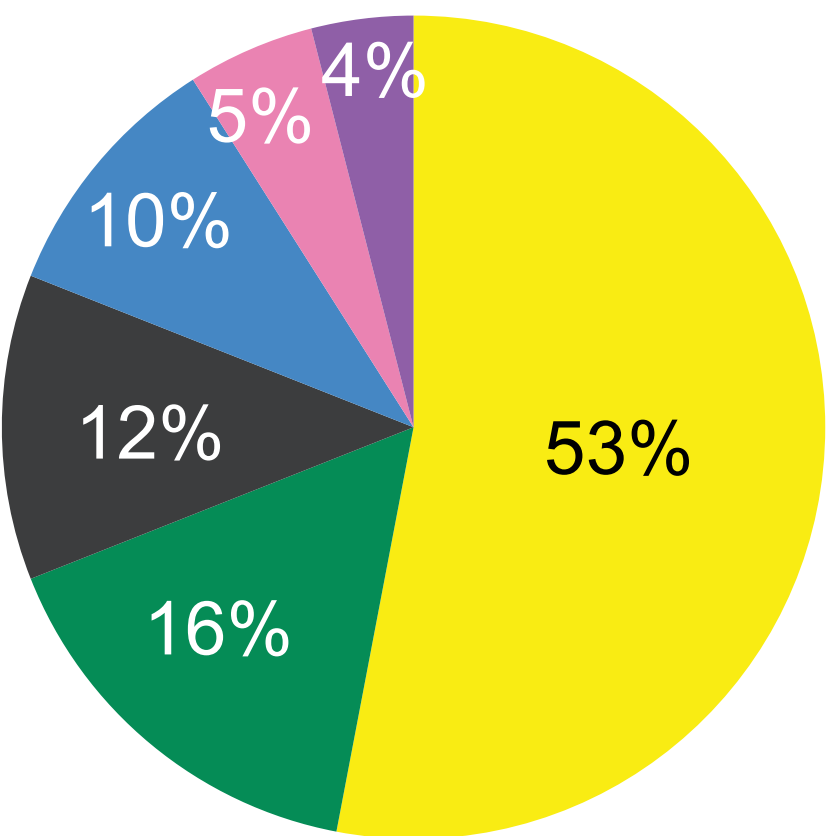


Use	Area (in ha.)
Residential	5344
PSP	1800
Recreational	1509
Transportation	930
Government	658
Industrial	641
Commercial	600
Utilities	129



Land Pooling

Use	Area (in ha.)	Change
Residential	6153.83	809.83+
Recreational	1857.76	348.76+
Transportation	1393.32	463.32+
PSP	1161.1	638.9-
Commercial	580.55	19.45-
Industrial	464.44	176.56-
Total	11611	-



- LEGEND**
- Residential
 - Built-up Residential
 - PSP
 - Recreational
 - Peripheral Green
 - Commercial
 - Industrial
 - Water body
 - Terminal/Depot-Rail/MRTS
 - Circulation-Rail/MRTS/Roads
 - Government land
 - Utility

- Total area- **21933 ha.**
- 58 villages, 1 census town (Najafgarh)
- Zone characteristic – **Predominantly rural**
- Urbanisable area- **11,611 ha**
- Peripheral green- **10,322 ha**
- Population density- **250 – 300pph**
- Urban Land – **632 ha**
- Rural Land – **10,979**

Facility Comparison between Proposed Zonal Land Use Plan and Proposed LLP

Use		Area (in ha.)
Recreational		1509
PSP		1800
Commercial		600

Use	Population	Facility per person
Recreational	20 lakh	7.54 sqm
	25 lakh	6.03 sqm
	30 lakh	5.03 sqm
	44 lakh	3.38 sqm
Use	Population	Facility per person
PSP	20 lakh	9 sqm
	25 lakh	7.2 sqm
	30 lakh	6 sqm
	44 lakh	4.03 sqm
Use	Population	Facility per person
Commercial	20 lakh	3 sqm
	25 lakh	2.4 sqm
	30 lakh	2 sqm
	44 lakh	1.34 sqm

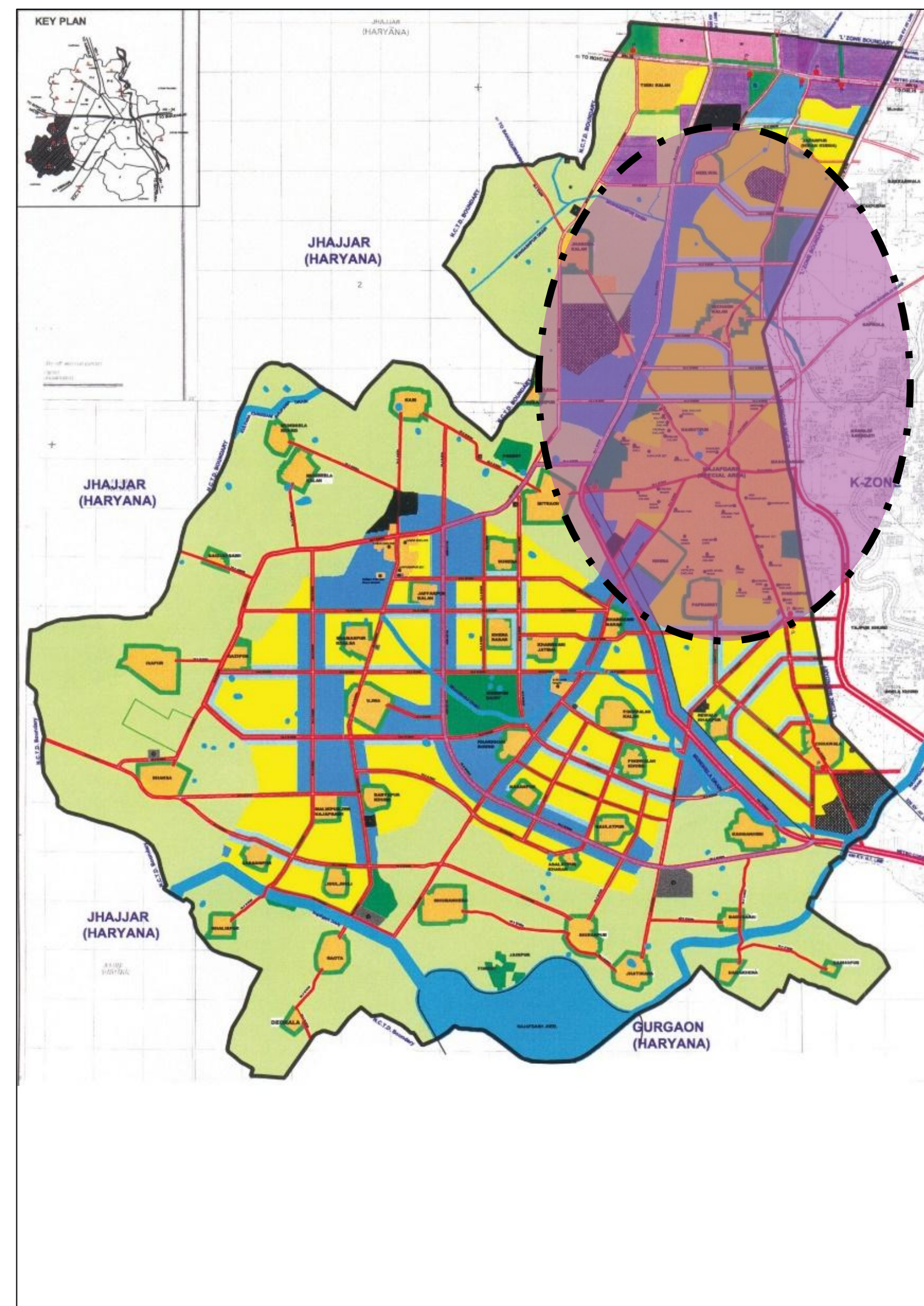
Use		Area (in ha.)
Recreational		1857.76
PSP		1161.1
Commercial		580.55

Use	Population	Facility per person
Recreational	20 lakh	9.28 sqm
	25 lakh	7.43 sqm
	30 lakh	6.19 sqm
	44 lakh	4.16 sqm
Use	Population	Facility per person
PSP	20 lakh	5.80 sqm
	25 lakh	4.64 sqm
	30 lakh	3.87 sqm
	44 lakh	2.60 sqm
Use	Population	Facility per person
Commercial	20 lakh	2.90 sqm
	25 lakh	2.32 sqm
	30 lakh	1.93 sqm
	44 lakh	1.30 sqm

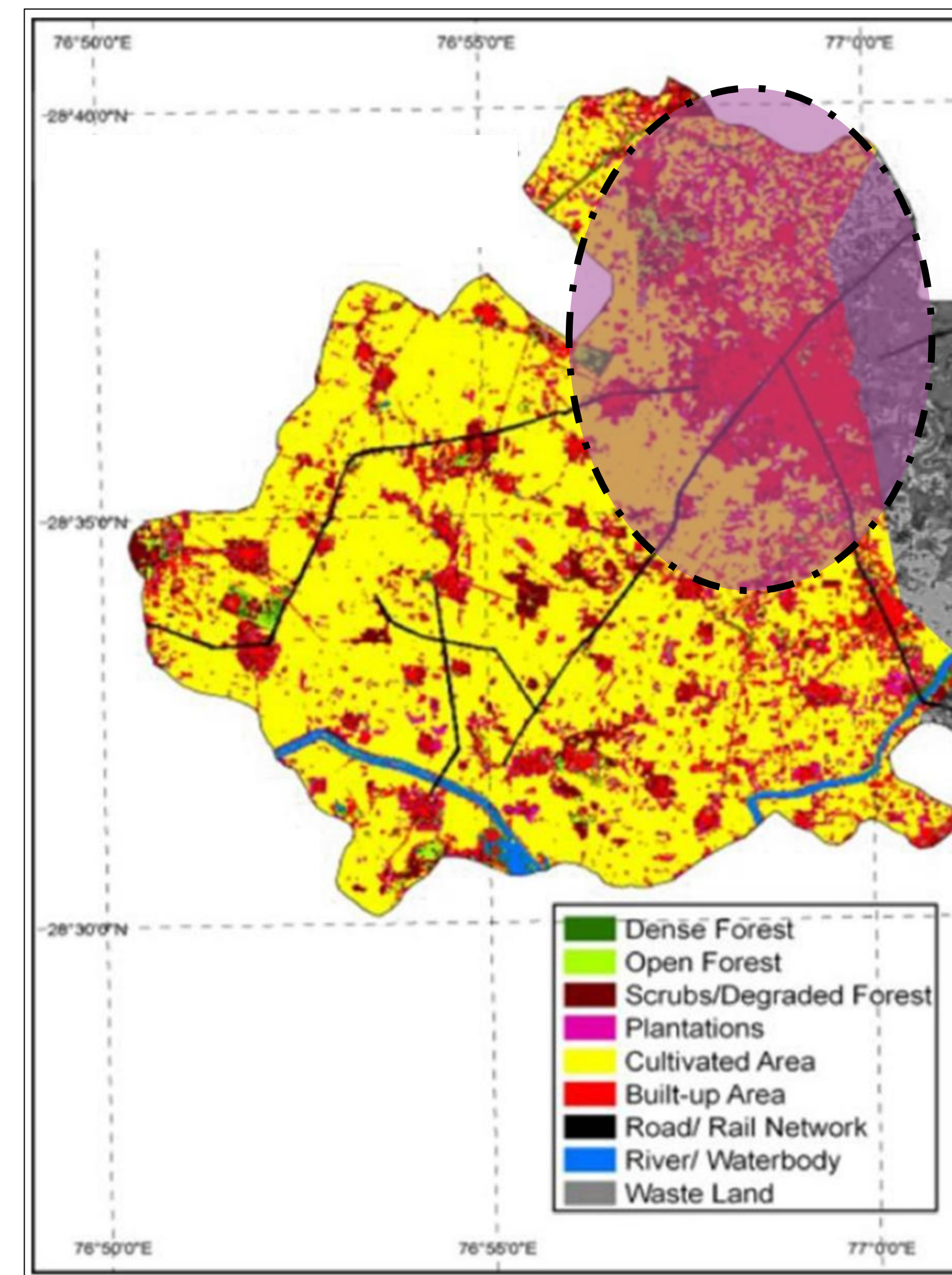
Inferences

- Increment in Residential, Recreational and Transportation indicates that policy has been made to accommodate future population (probably more than holding capacity of zone-l), provide better living condition and smooth transport mobility.
- Decline in PSP, Commercial and Industrial indicates that the policy has not been made to target to provide employment and workplace.

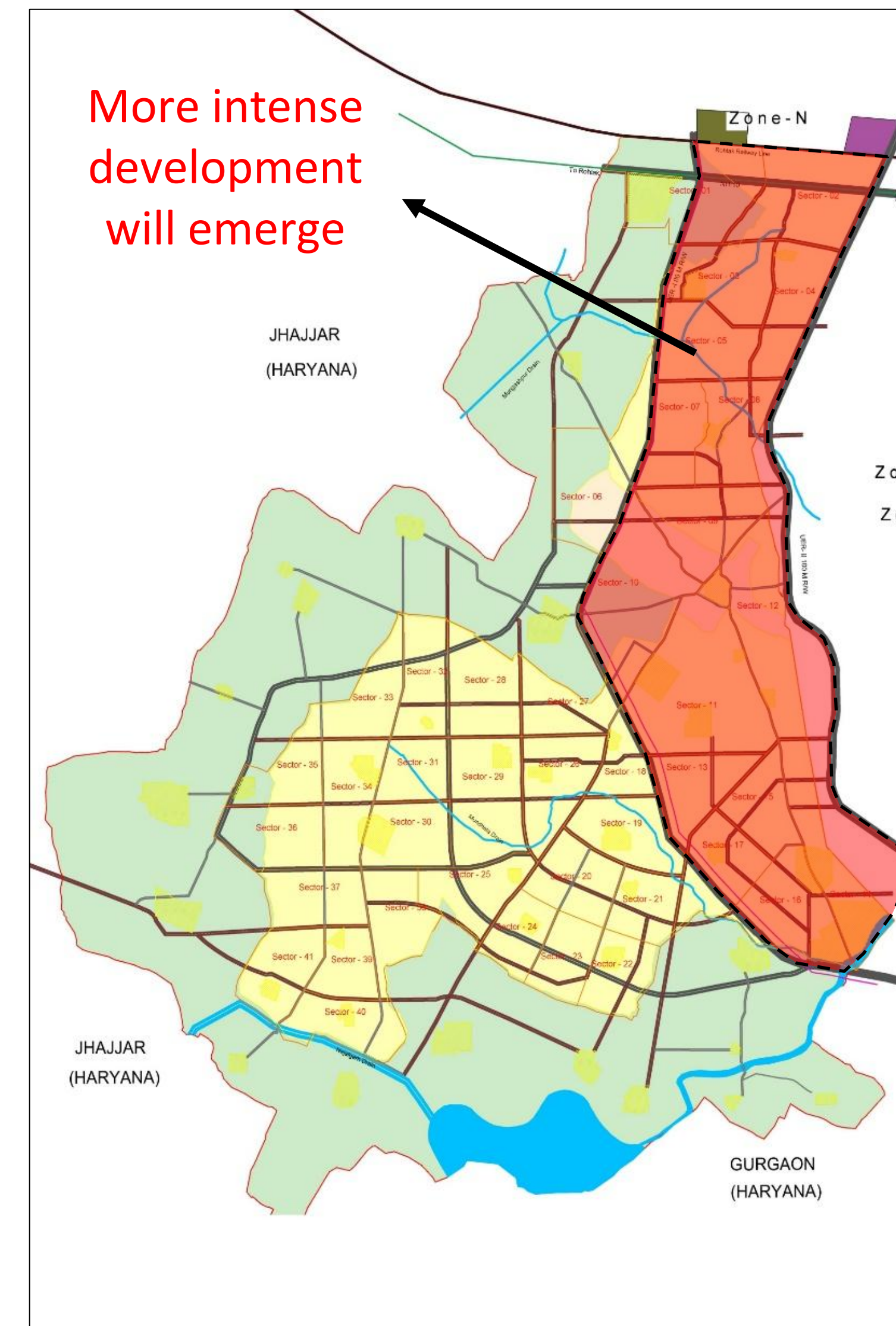
Zonal Development Plan



LULC – Year 2014



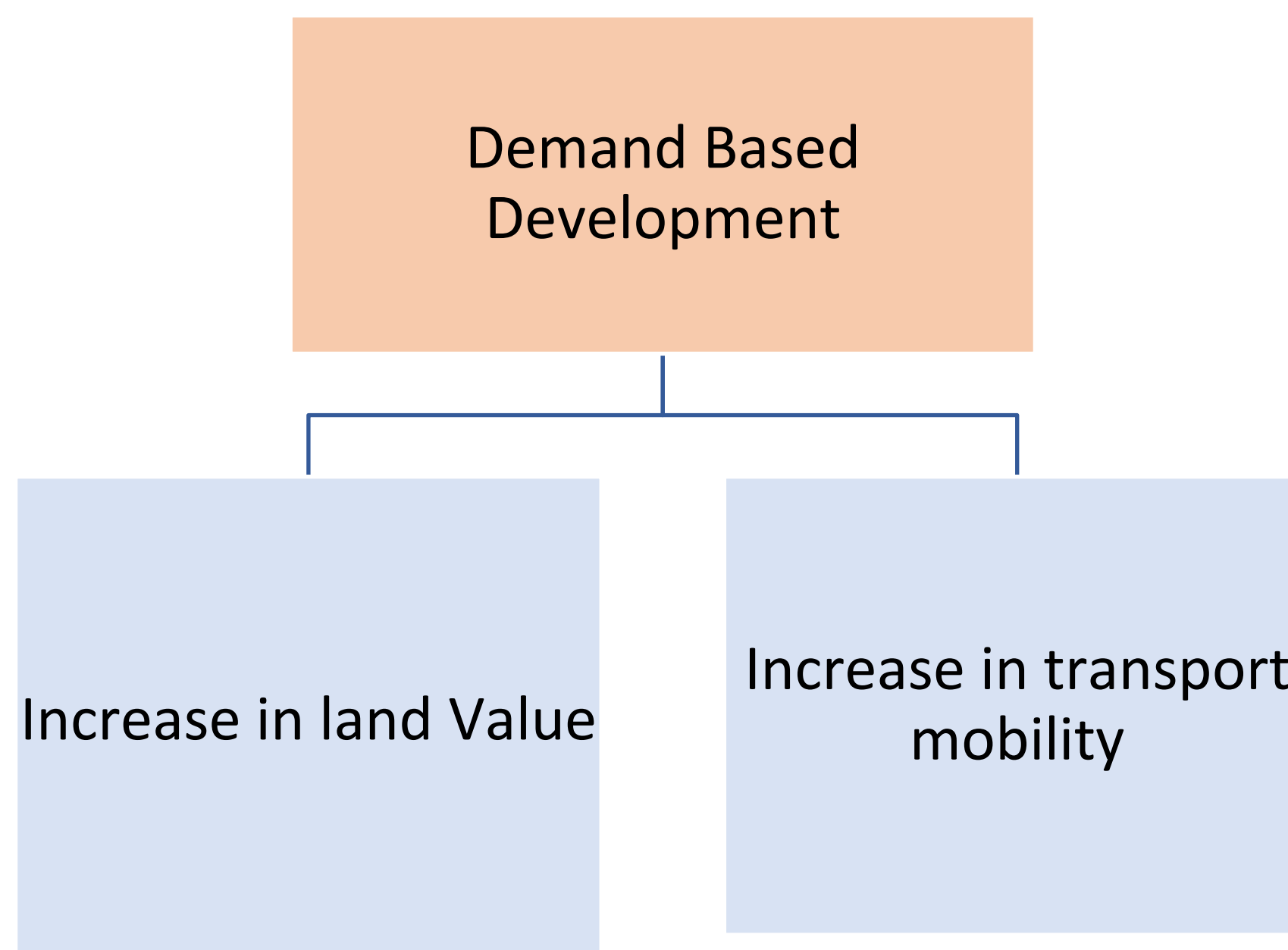
Land Pooling Policy



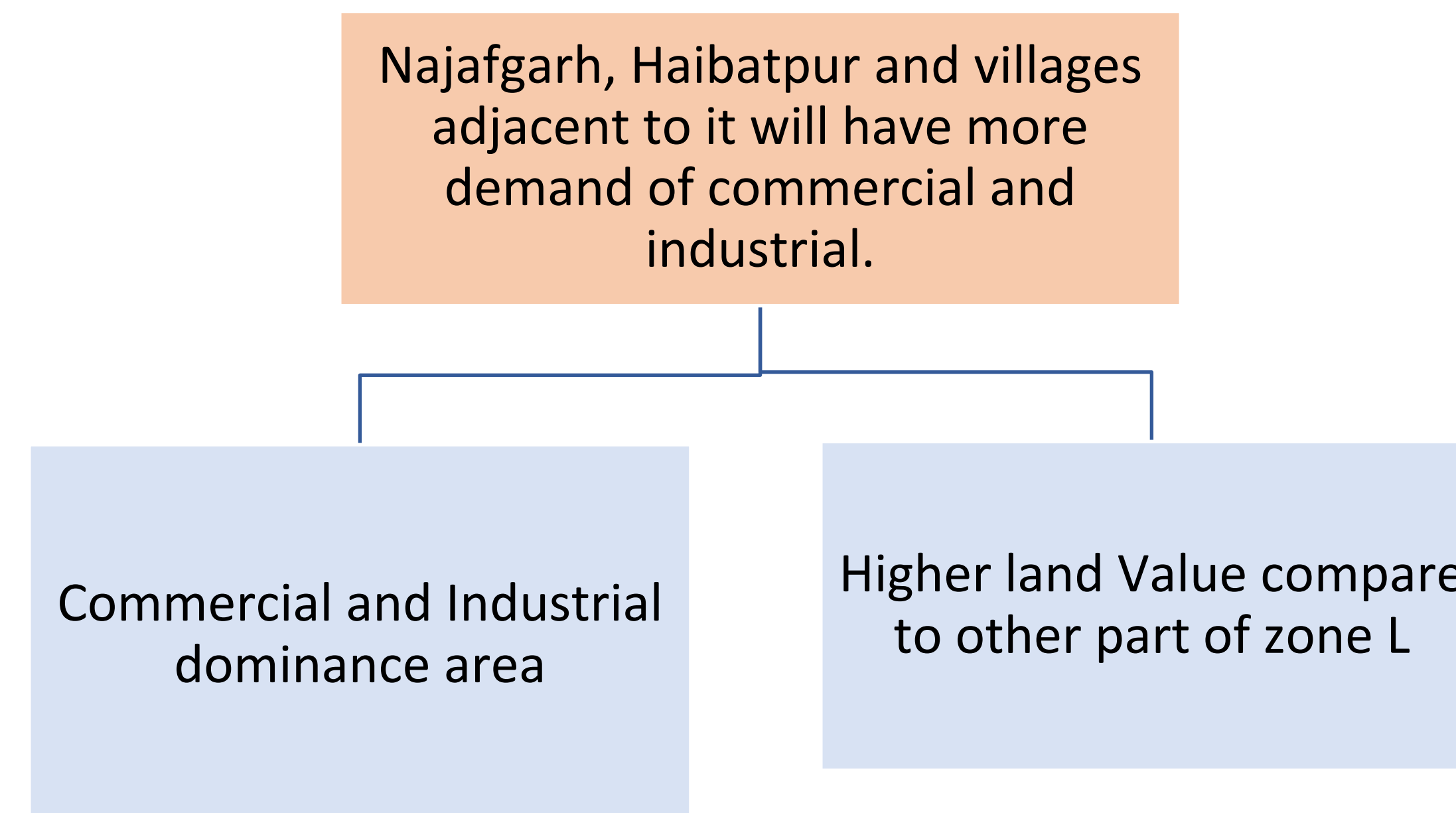
KEY MAP



Impact Overall



Impact on area close to city boundary and resources



Inferences

- Absence of land use plan – demand based development. Market lead approach will entirely change the nature of development.
- 1. Big challenge:** Market lead approach will play key role in development of an area. If the demand is high then land use will change accordingly.
- Managing the gross urbanisable area more than 28,000 acres would be more challenging for DDA. Since the policy is based on market lead approach.
- To fulfill the demand, these sector will require more attention in development and planning management.

