

National Urban Planning & Management Conclave  
Lucknow – 24<sup>th</sup> Sept. 2022

# Street Networks that make Economic Sense

**Anuj Malhotra**  
General Manager – Planning & Urban Development  
Srinagar Smart City Limited

1 1/4 1 MILE 3/4 1/2 1/4 0 1/4 1/2 3/4 1 MILE 1 1/4 1 1/2 1 3/4 2 MILE 2 1/4 2 1/2 2 3/4 3 MILE

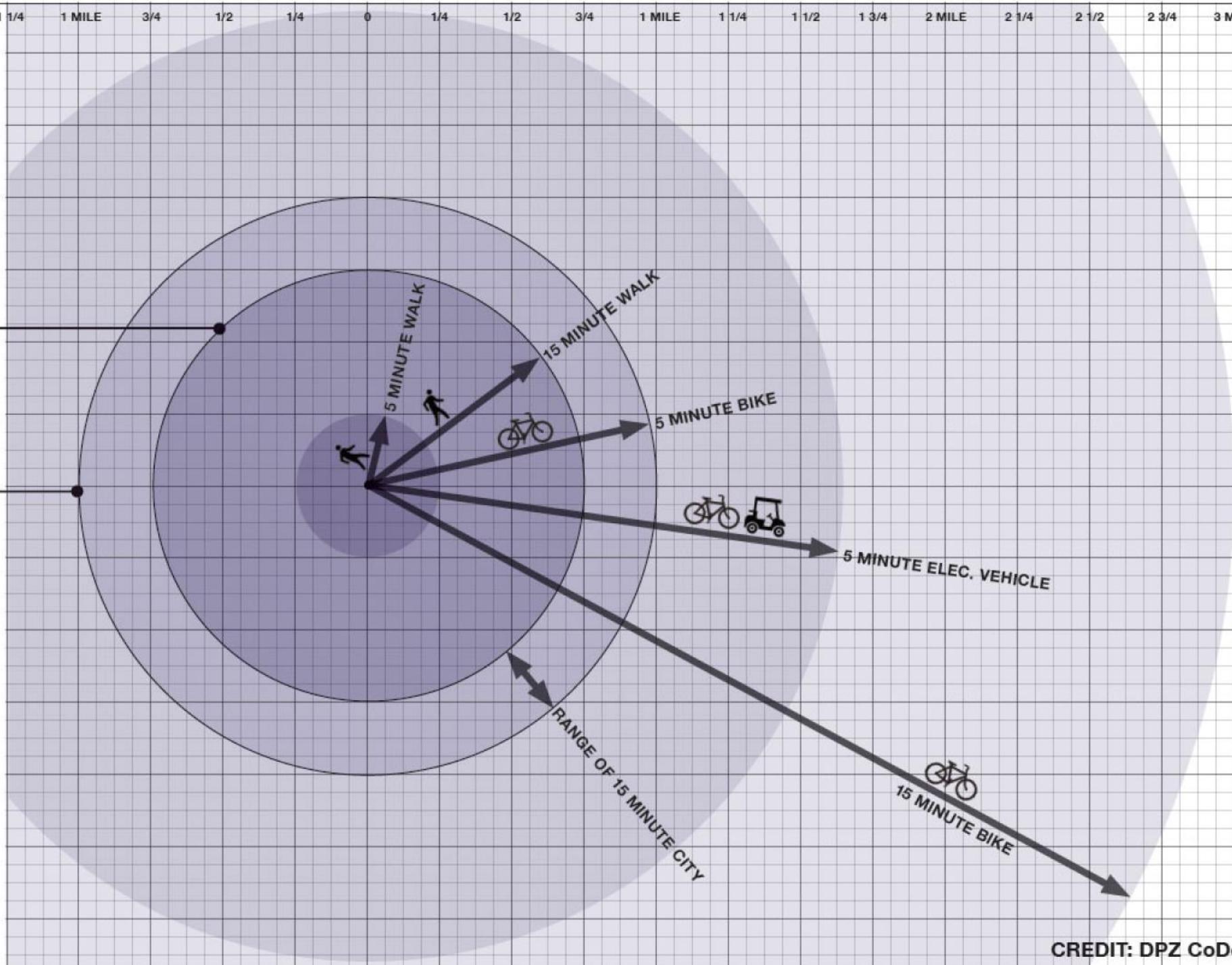
**5 MINUTE WALK**   
(3 MPH AVG)  
RADIUS - 1/4 MILE  
ACRES - ~126  
DWELLING UNITS - 1,000 @ 8/AC  
POPULATION - 2,600 @ 2.6/UNIT

**15 MINUTE WALK**   
(3 MPH AVG)  
RADIUS - 3/4 MILE  
ACRES - ~1,130  
DWELLING UNITS - 9,040 @ 8/AC  
POPULATION - 23,500 @ 2.6/UNIT

**5 MINUTE BIKE**   
(12 MPH AVG)  
RADIUS - 1 MILE  
ACRES - ~2,010  
DWELLING UNITS - 16,100 @ 8/AC  
POPULATION - 41,860 @ 2.6/UNIT

**5 MINUTE ELEC. VEHICLE**   
(20 MPH AVG)  
RADIUS - 1 2/3 MILE  
ACRES - ~5,580  
DWELLING UNITS - 44,700 @ 8/AC  
POPULATION - 116,200 @ 2.6/UNIT

**15 MINUTE BIKE**   
(12 MPH AVG)  
RADIUS - 3 MILE  
ACRES - ~18,100  
DWELLING UNITS - 144,800 @ 8/AC  
POPULATION - 376,480 @ 2.6/UNIT



CREDIT: DPZ CoDesign









2019.04.30 11:02

# Karol Bagh, New Delhi

## Grid Size: Retail on GE

No. of main intersections: >350 per sqkm

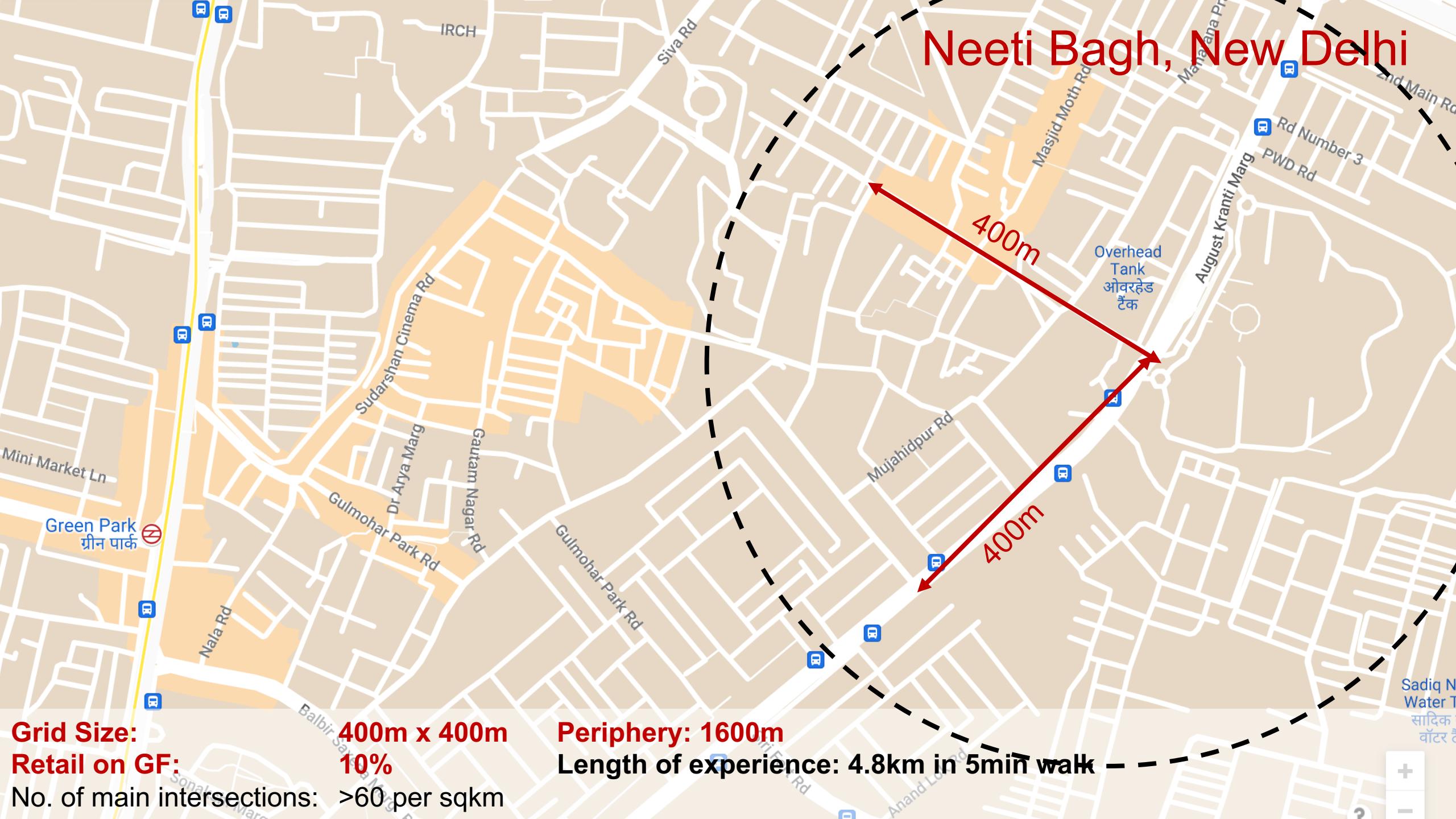
110m x 110m  
100%

100%

## Periphery: 400m

**Length of experience: 12.4km in 5min walk**

# Neeti Bagh, New Delhi

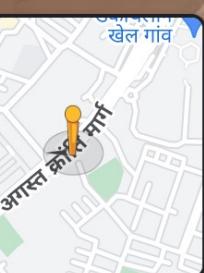




New Delhi



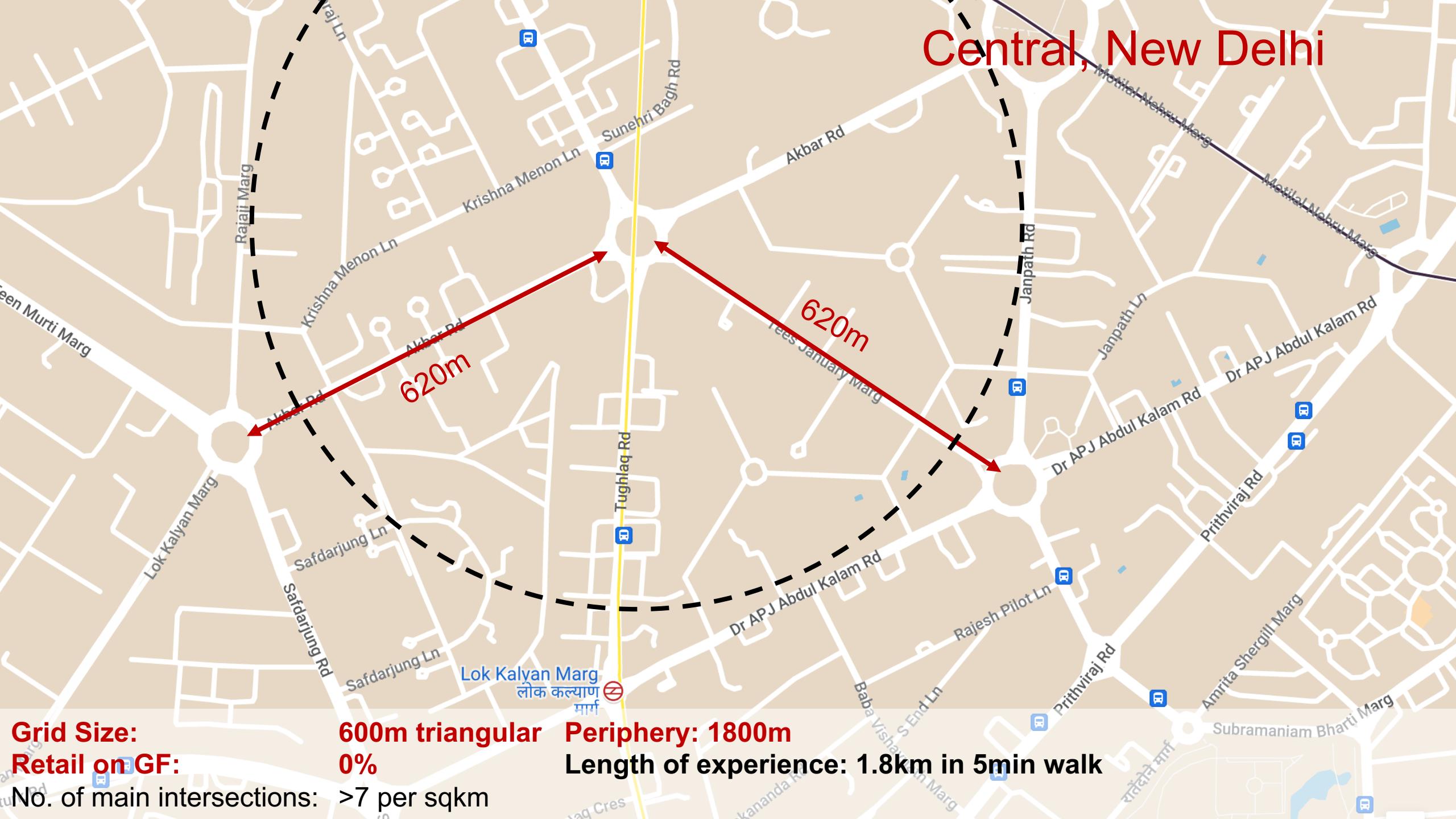
August Kranti Marg



Google



# Central, New Delhi



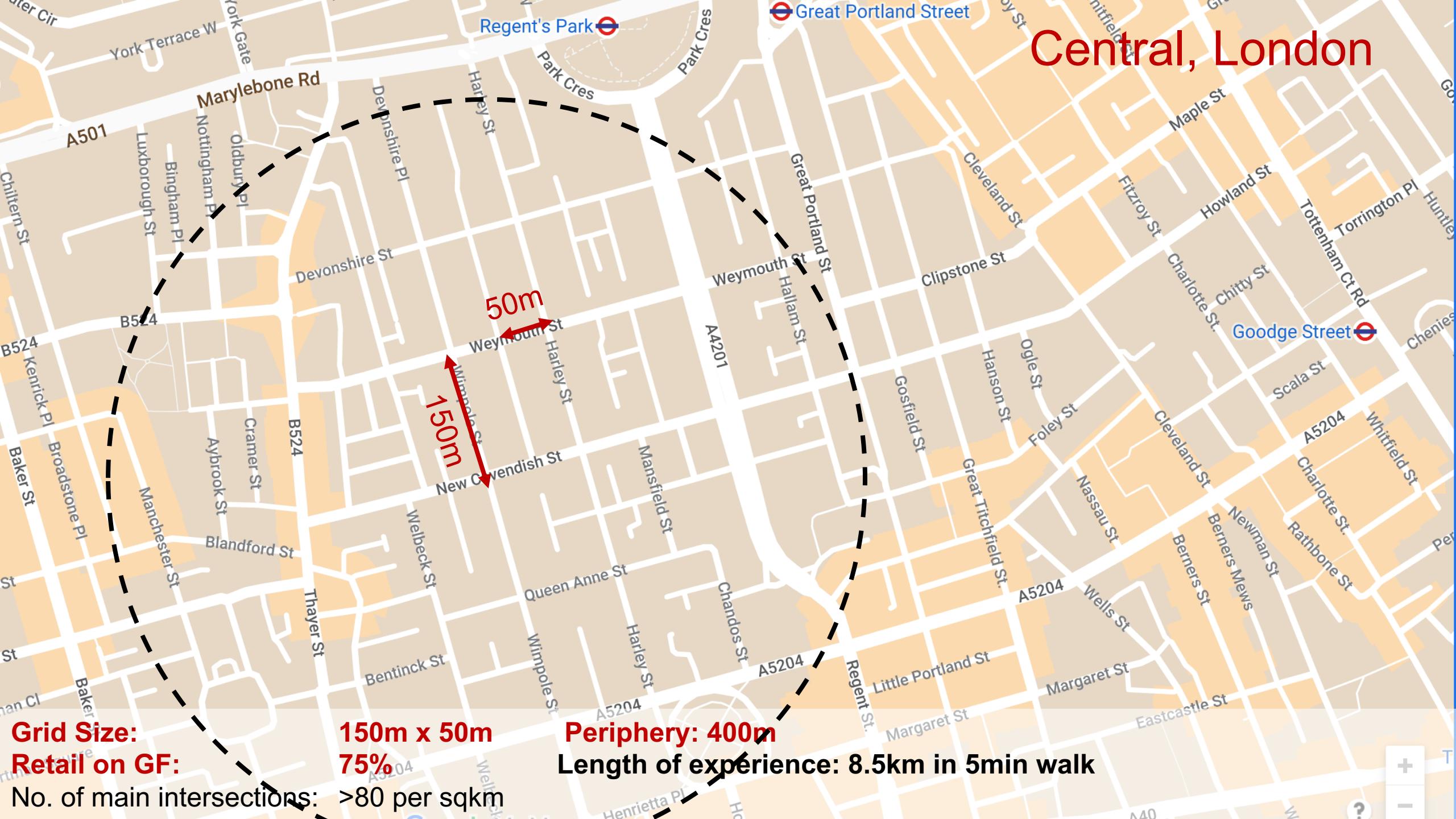


# Manhattan, New York





# Central, London



CAFFÈ NERO

THE ITALIAN COFFEE CO

CAFFÈ  
NERO

THE ITALIAN COFFEE CO

THE ITALIAN COFFEE CO

LZ1

A

3



habitat

COSTA

MA56 XBT

GB

# Central, Barcelona

## Grid Size: Retail on GF

No. of main intersections: >80 per sqkm

## Periphery: 480m

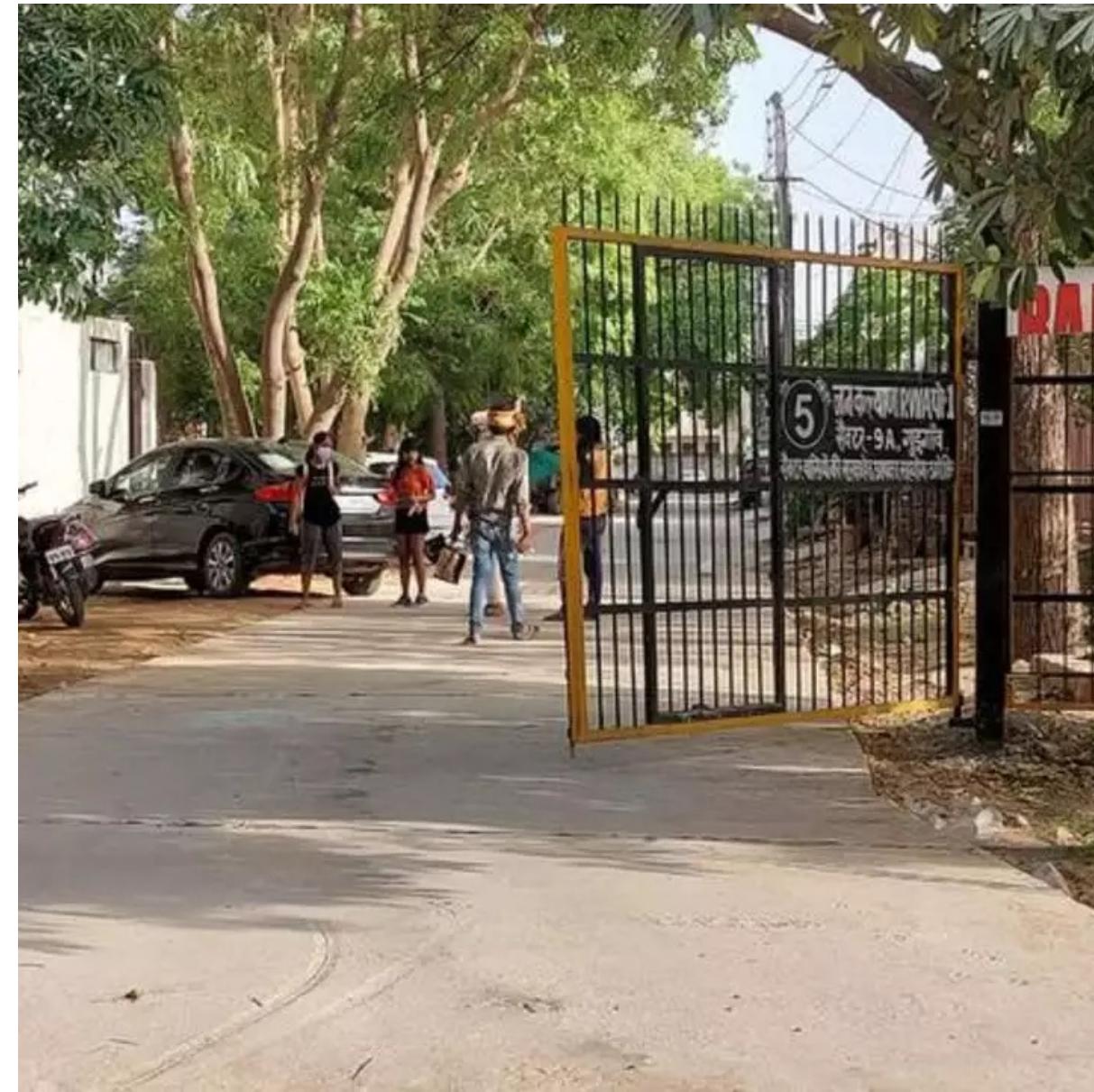
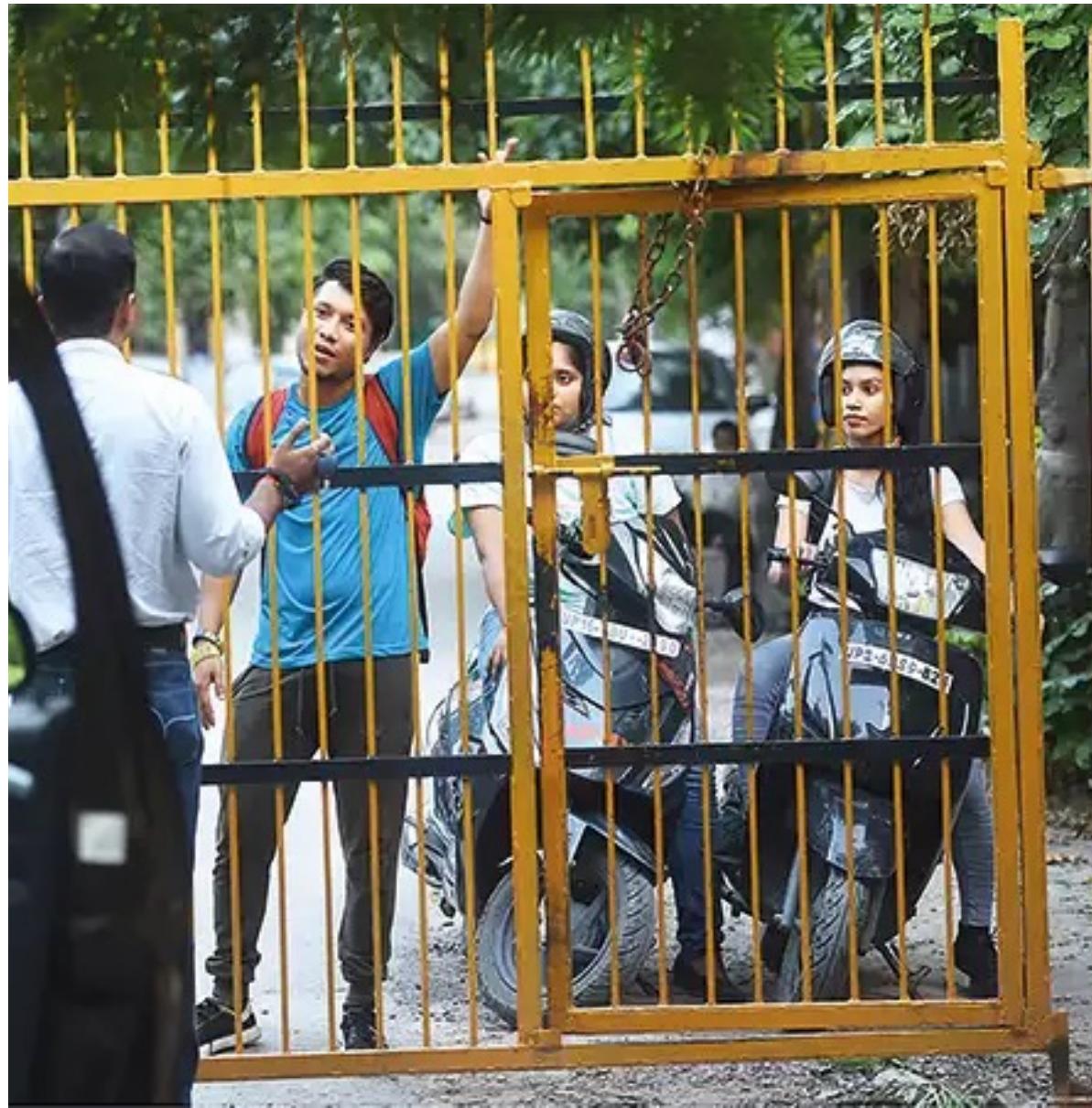
**120m x 120m  
80%**



How [street network/ economy] gets ruined!

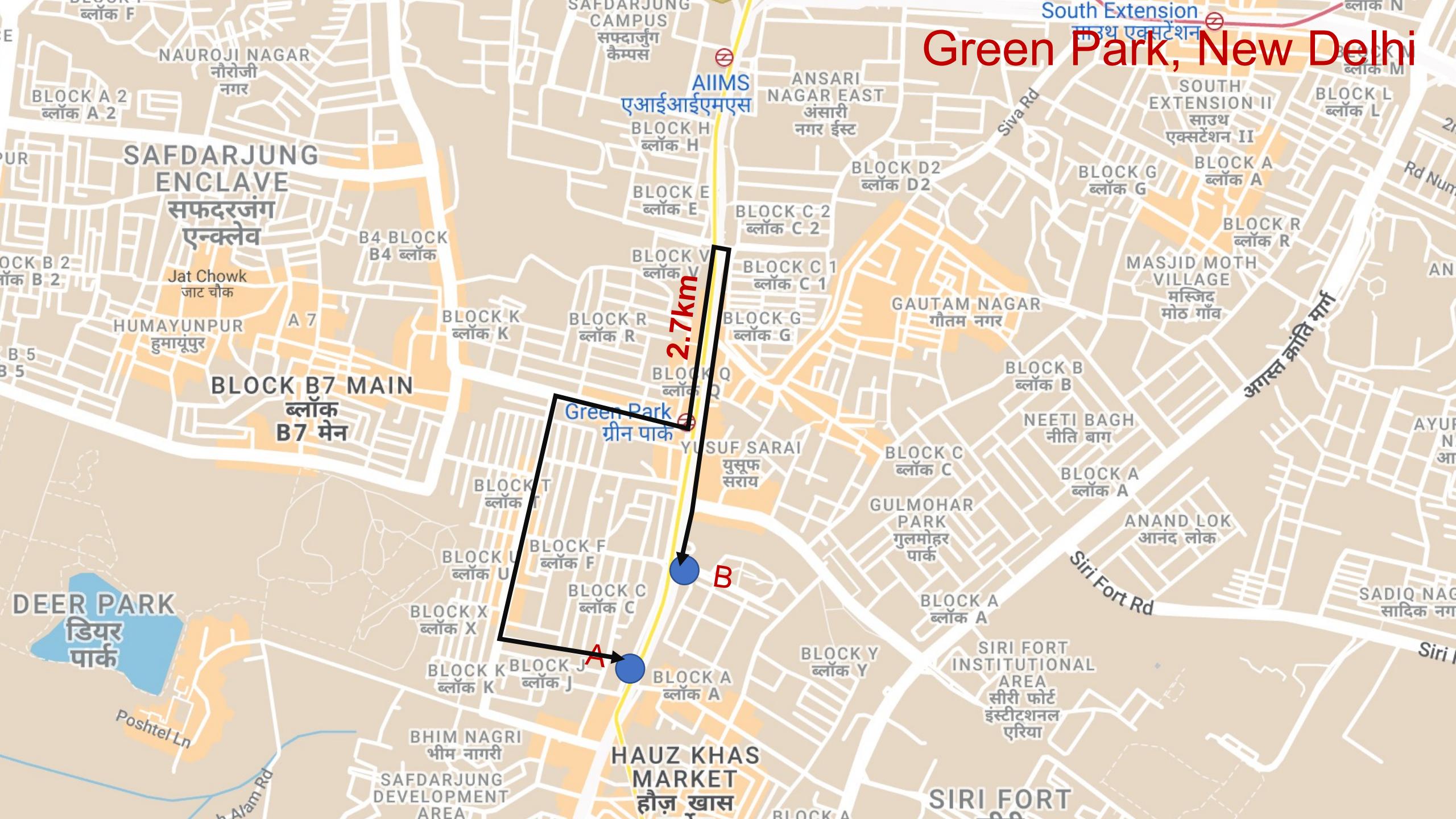
# Green Park, New Delhi





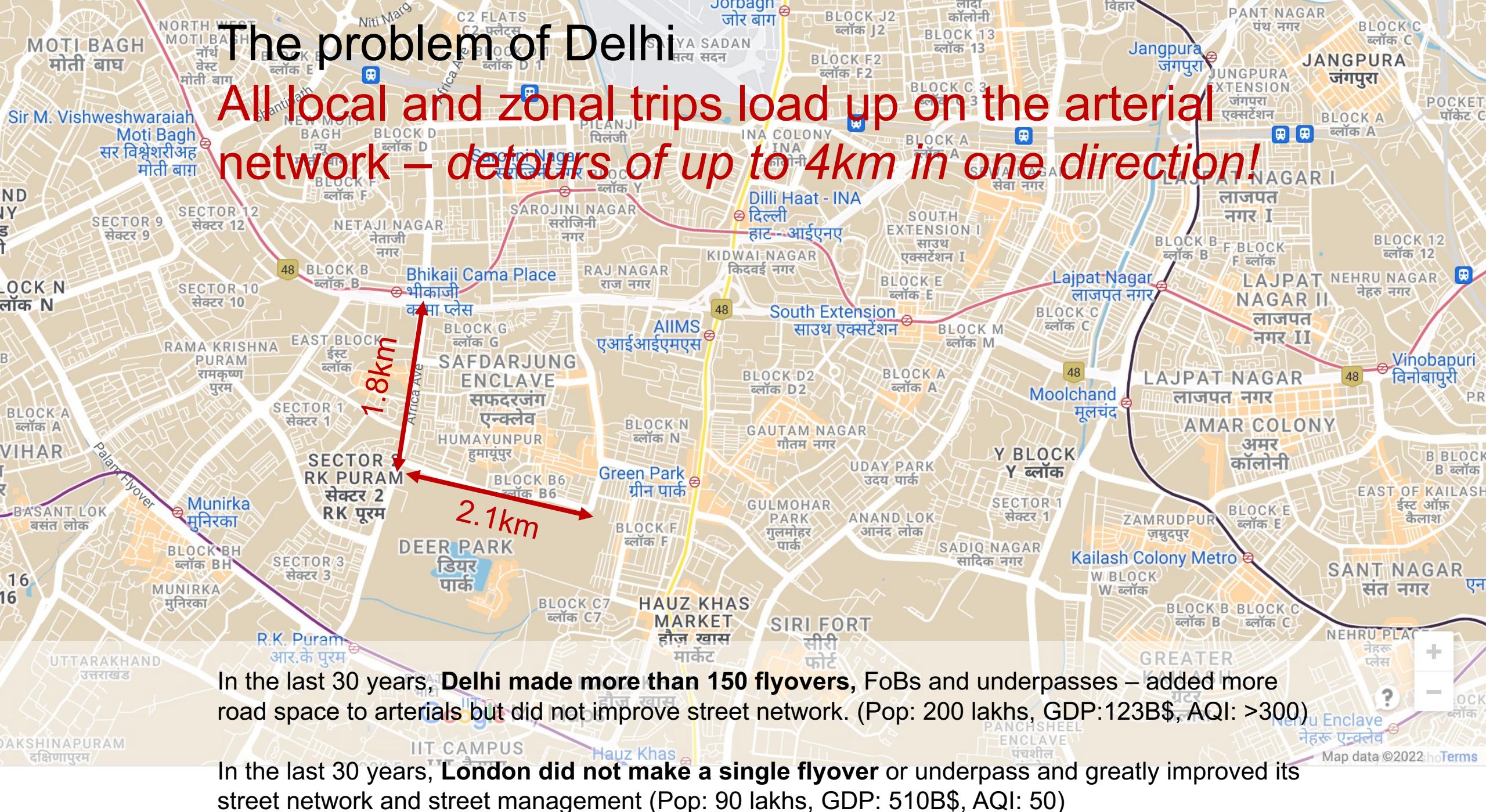


# Green Park, New Delhi



# The problem of Delhi

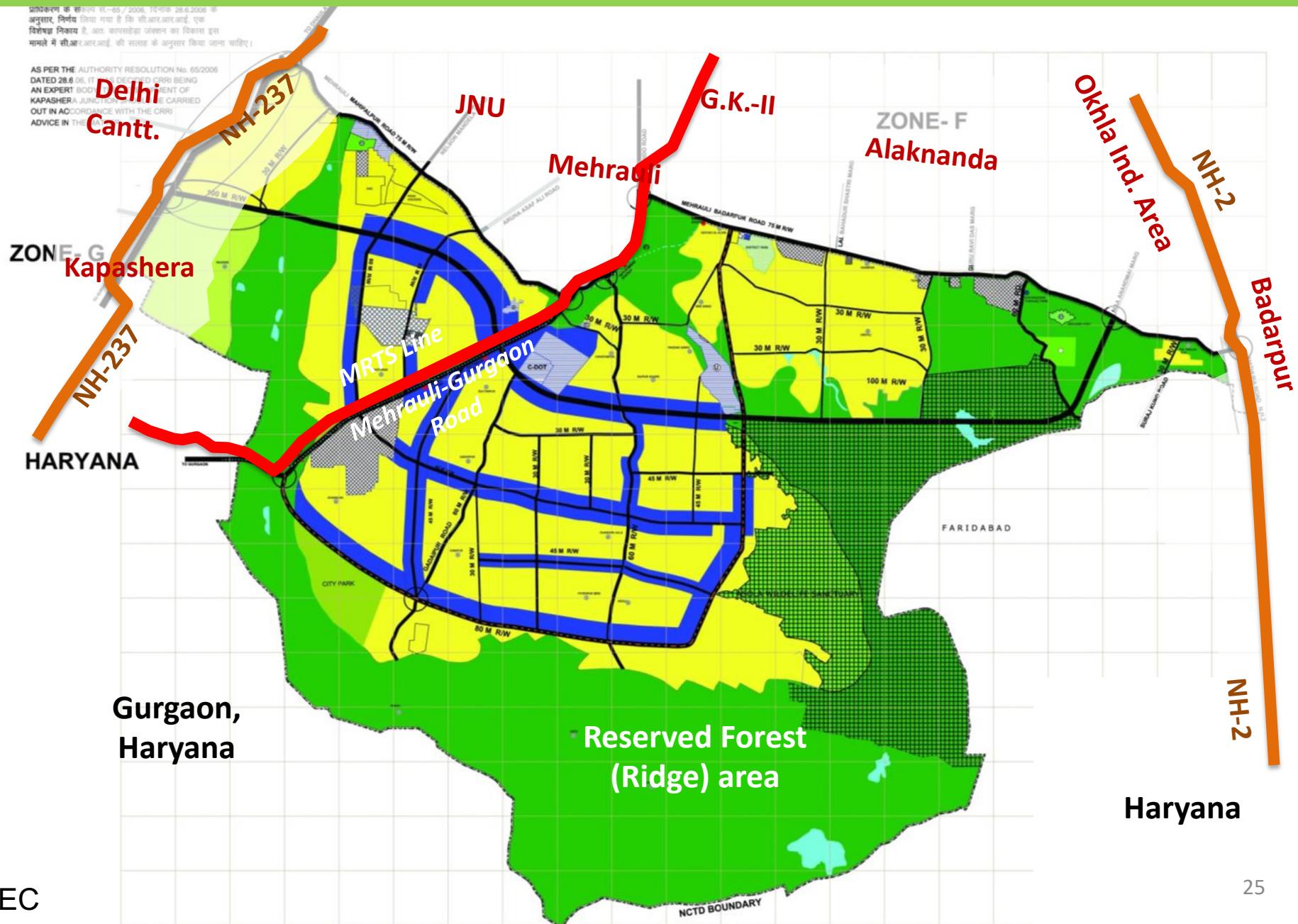
## All local and zonal trips load up on the arterial network – detours of up to 4km in one direction!



New Delhi

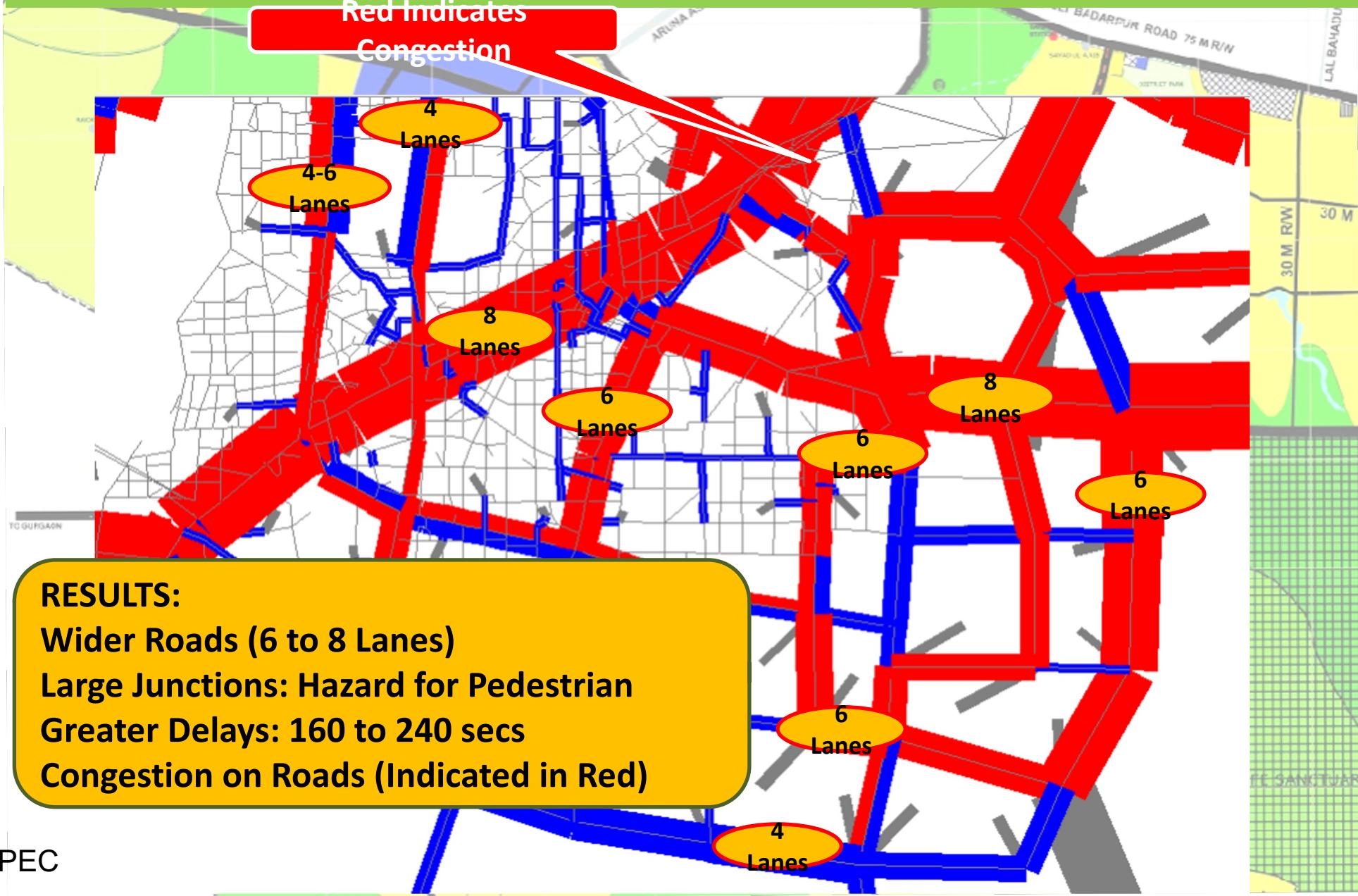


# Existing Zonal Development Plan for Zone J



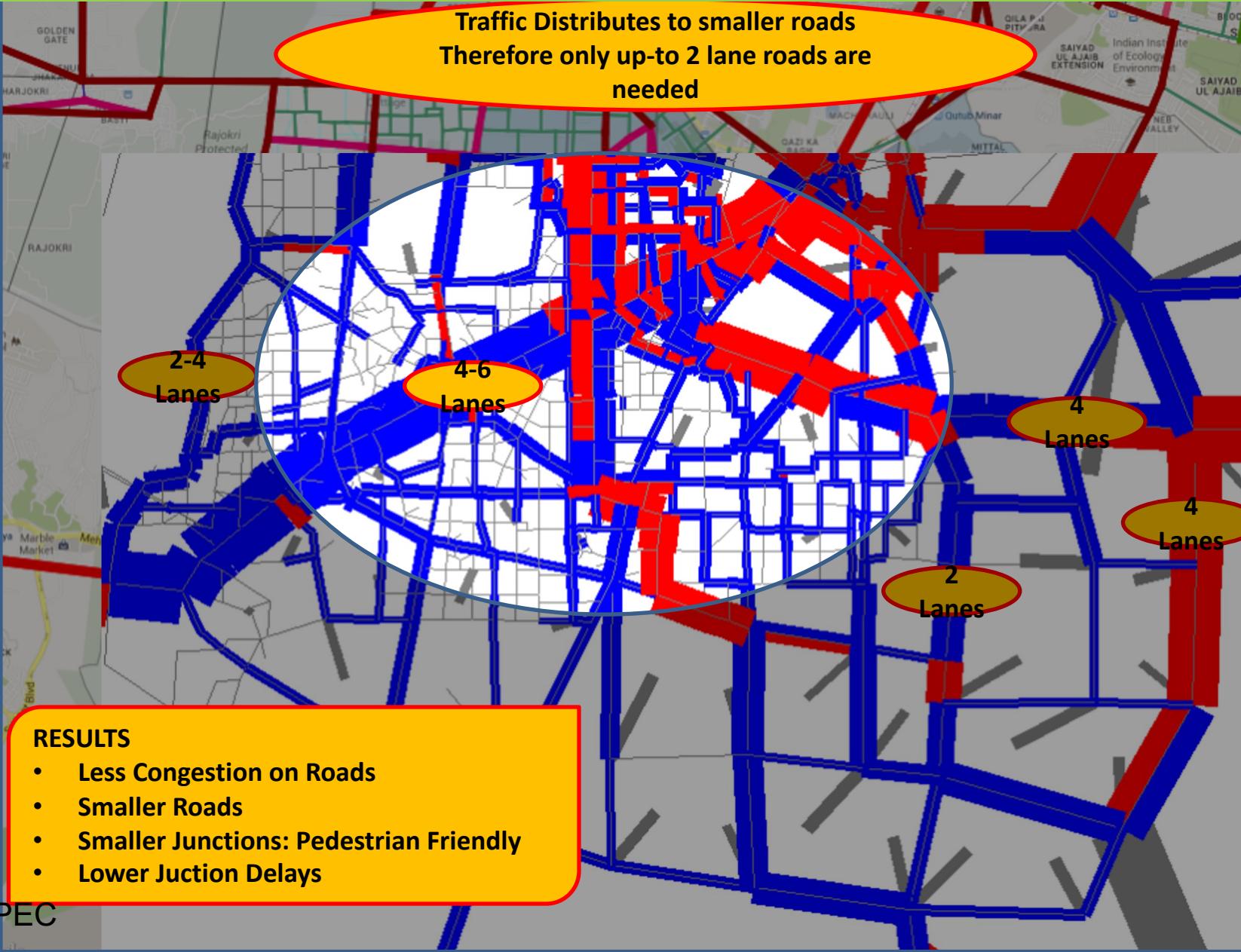
# Lanes Requirement & Congestion

Without secondary and tertiary network roads



# Lanes Requirement & Congestion- with road network

## With Secondary and Tertiary network roads in place



## ROW & Vehicle- Km Impacts

### Conventional Approach

Few Wider Roads



VHT = 11.68 Mn Veh-hr

6-8  
Lanes

183 Million  
Veh. Km/yr.

### Network Approach

Dense Tight Street Network



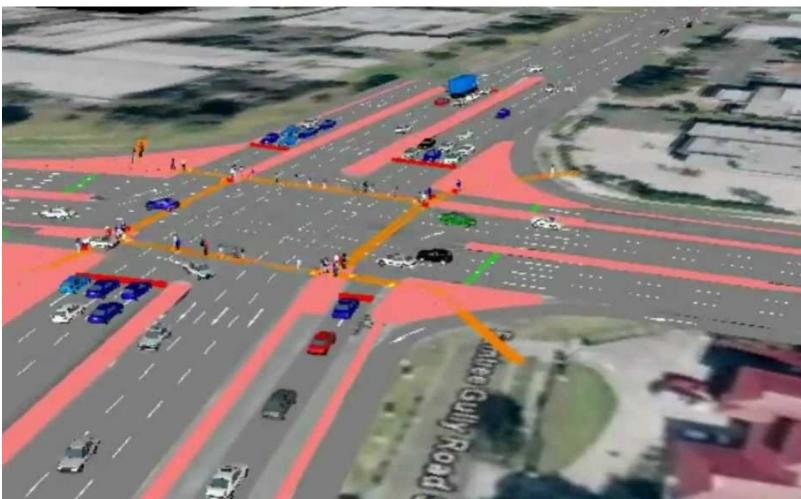
VHT = 7.2 Mn Veh- hr

2-4 Lanes

116 Million  
Veh.-Km/yr.

## Intersection Delay Impacts

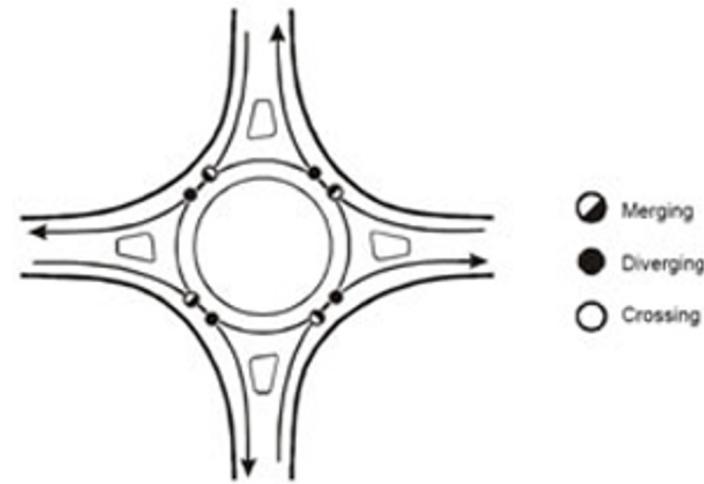
### Conventional Approach



Wider Junctions : Average Delay per vehicle 200 seconds



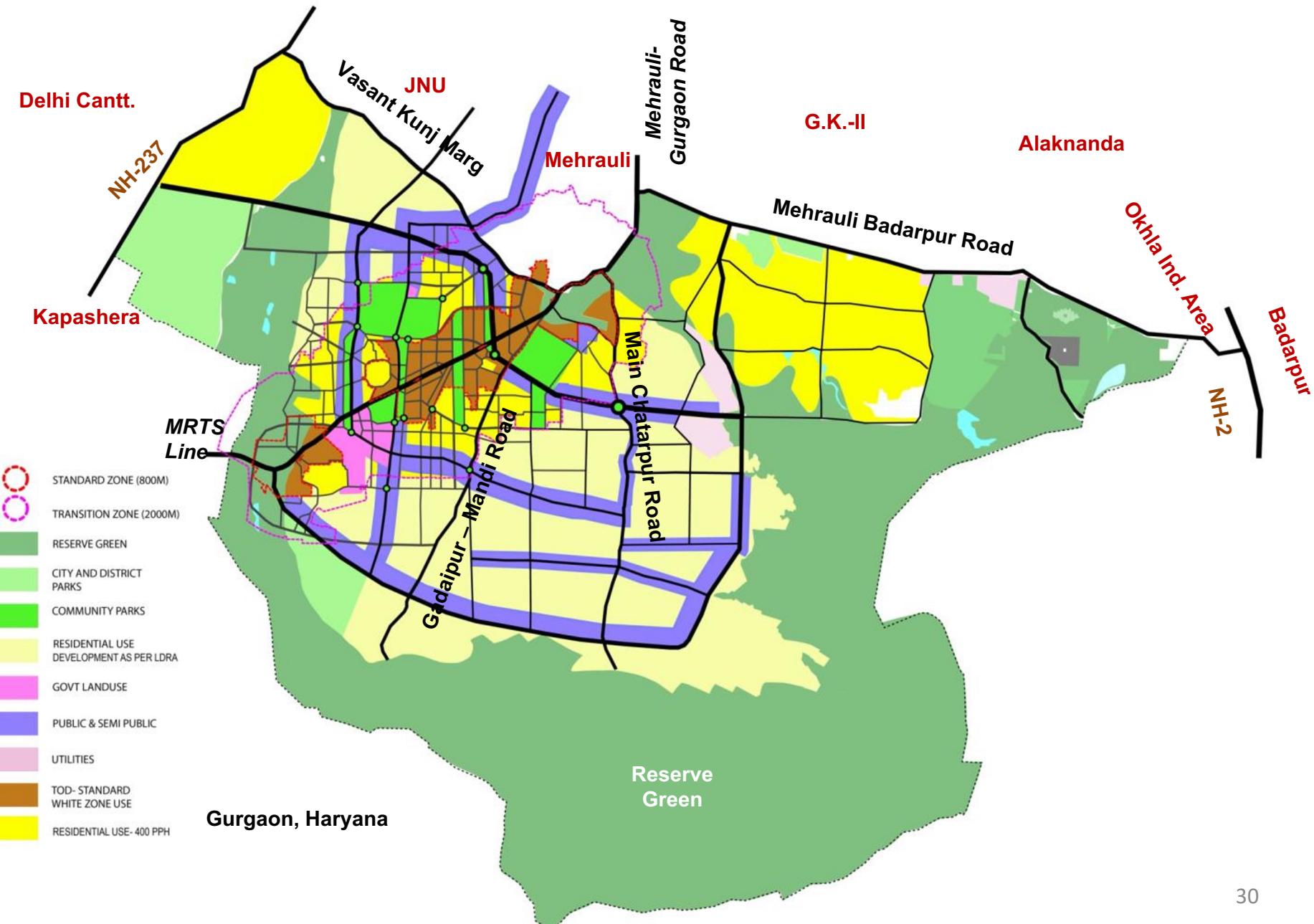
### TOD-Network Approach



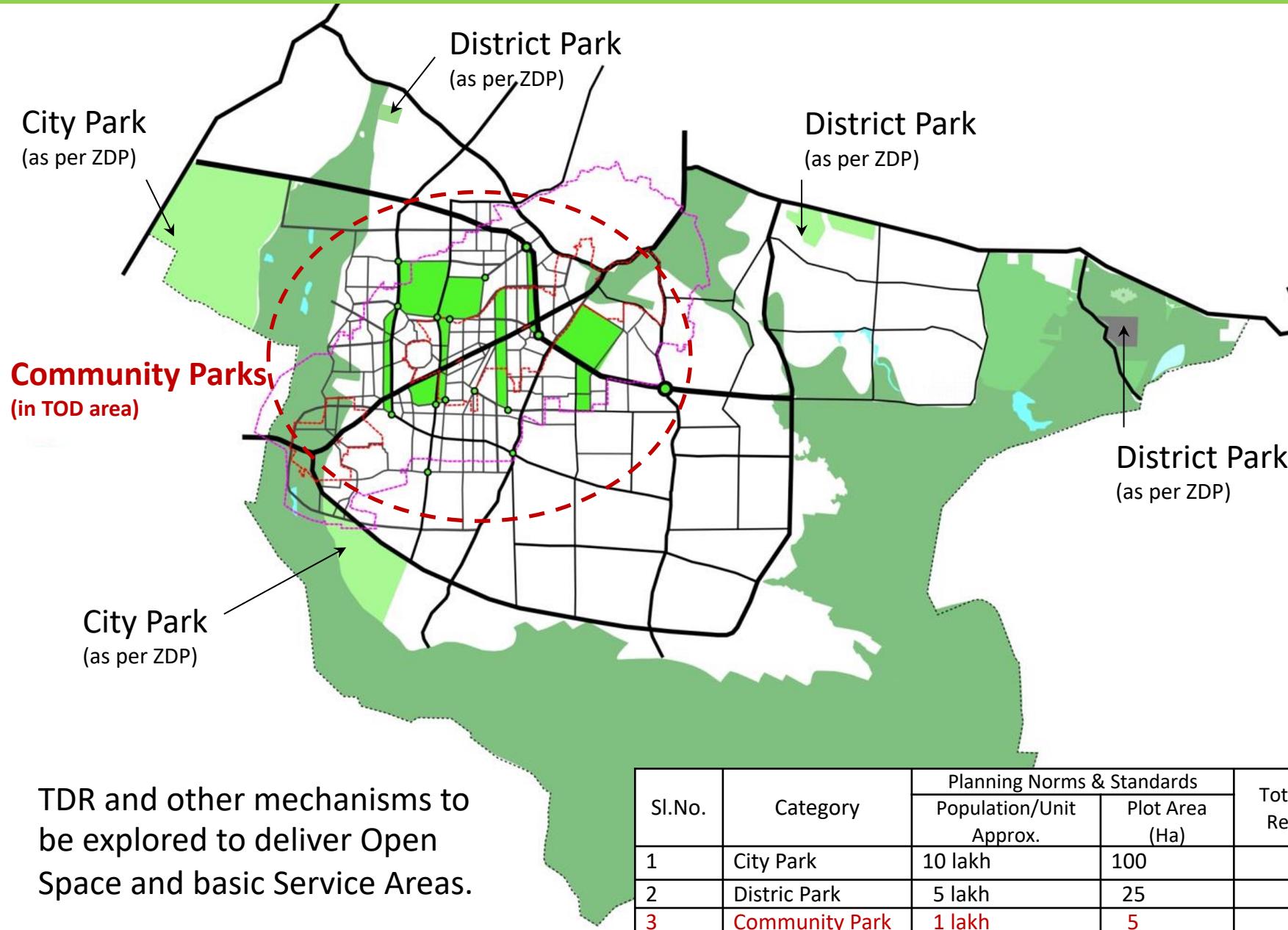
Smaller Junctions : Average Delay per vehicle 20 seconds



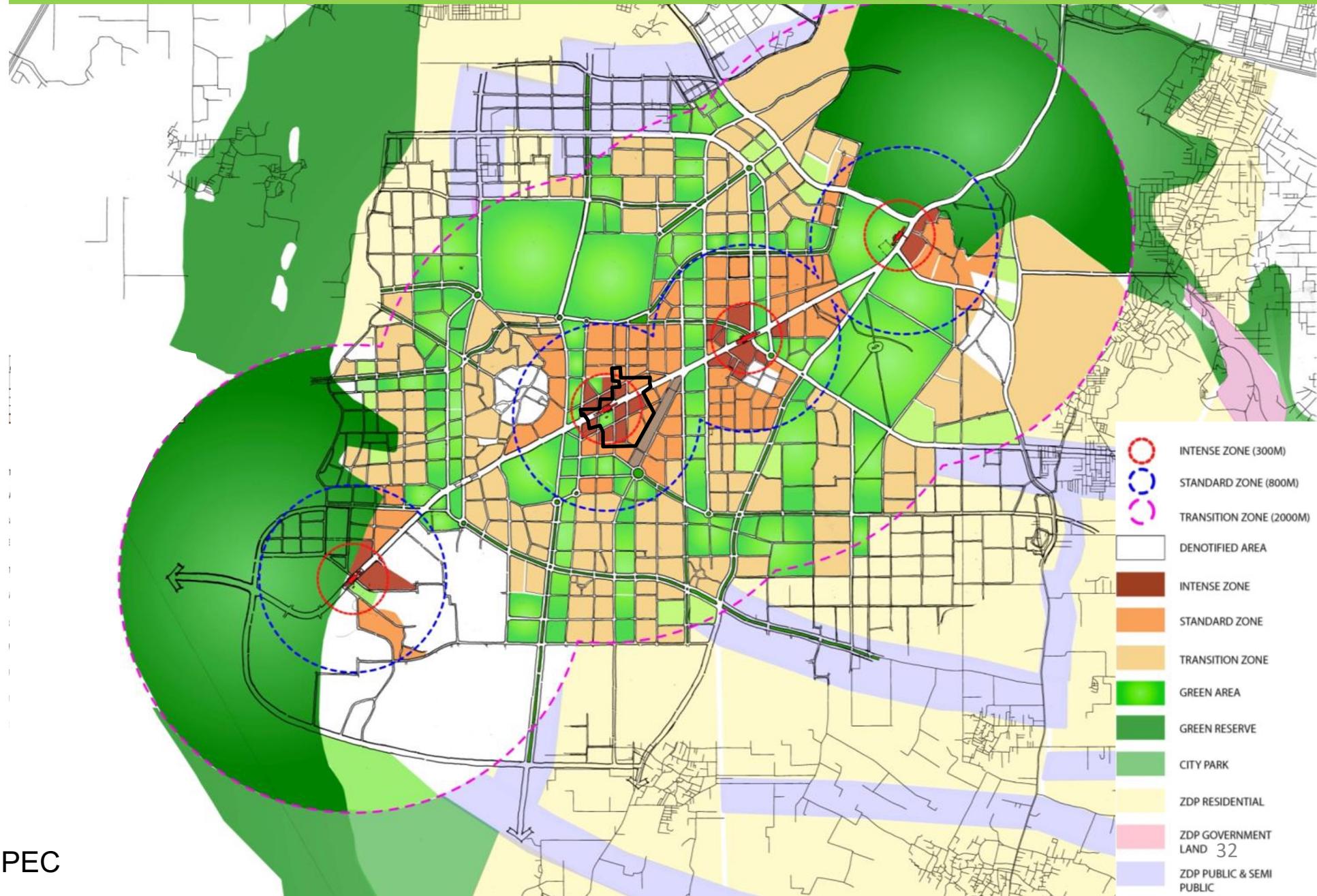
# ZDP and TOD Integrated Plan



# Open Space- Final Hierarchy- ZDP Level



# TOD Sector Level Plan



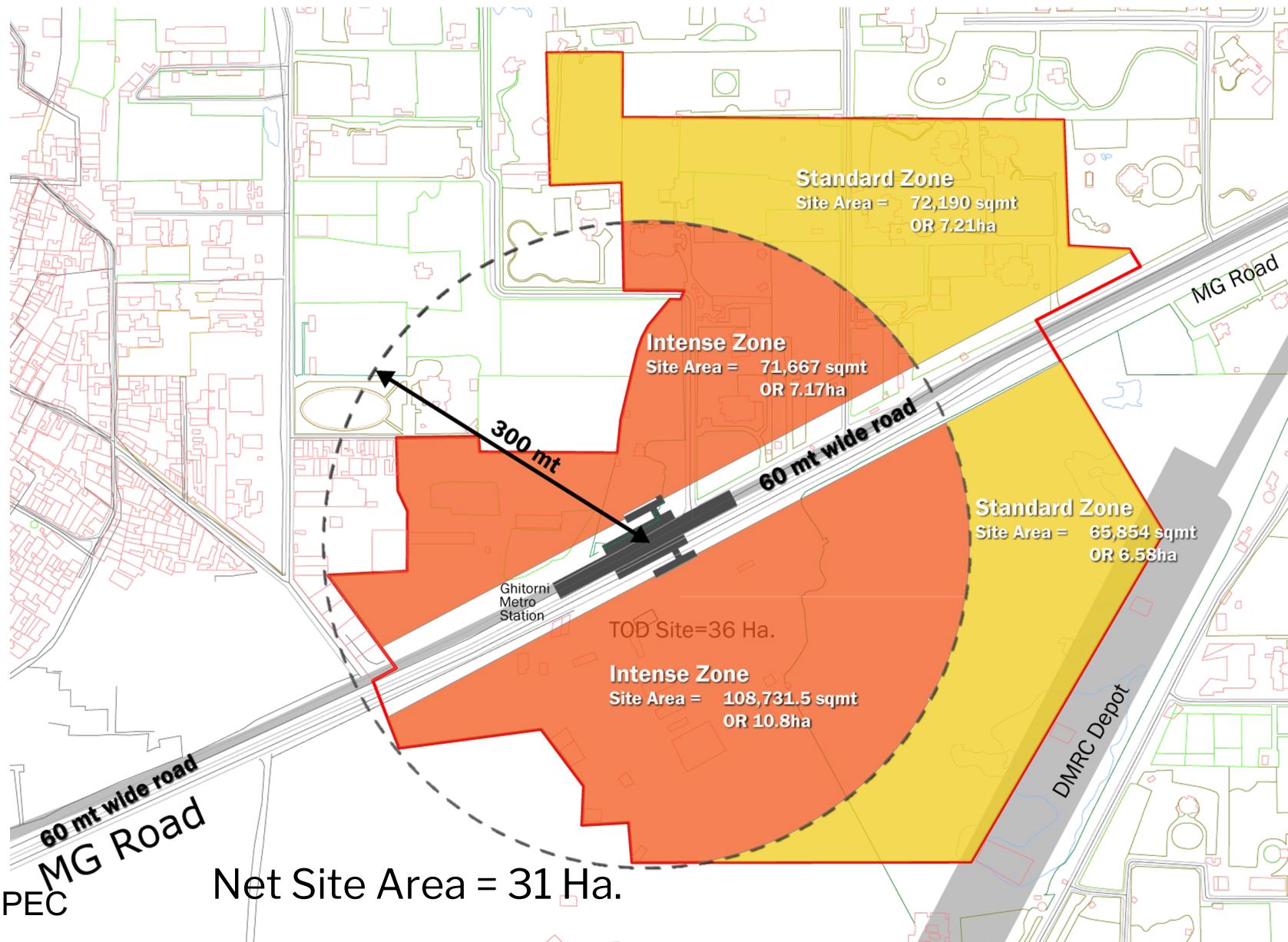
# Scheme 1- Design on Test site including NBCC land at Ghitorni Station

TOD Norms tested by empanelled consultants on the test site.



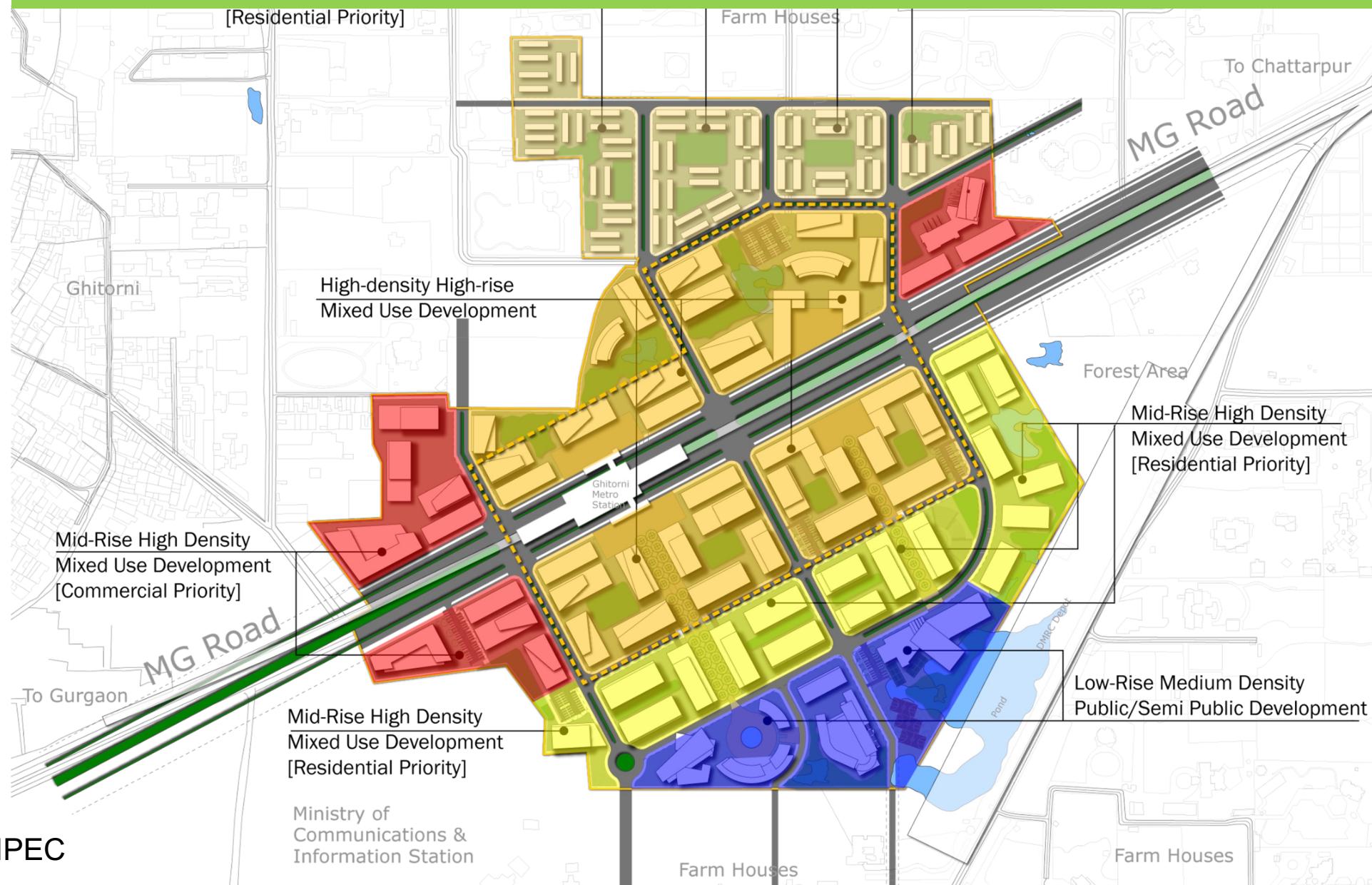
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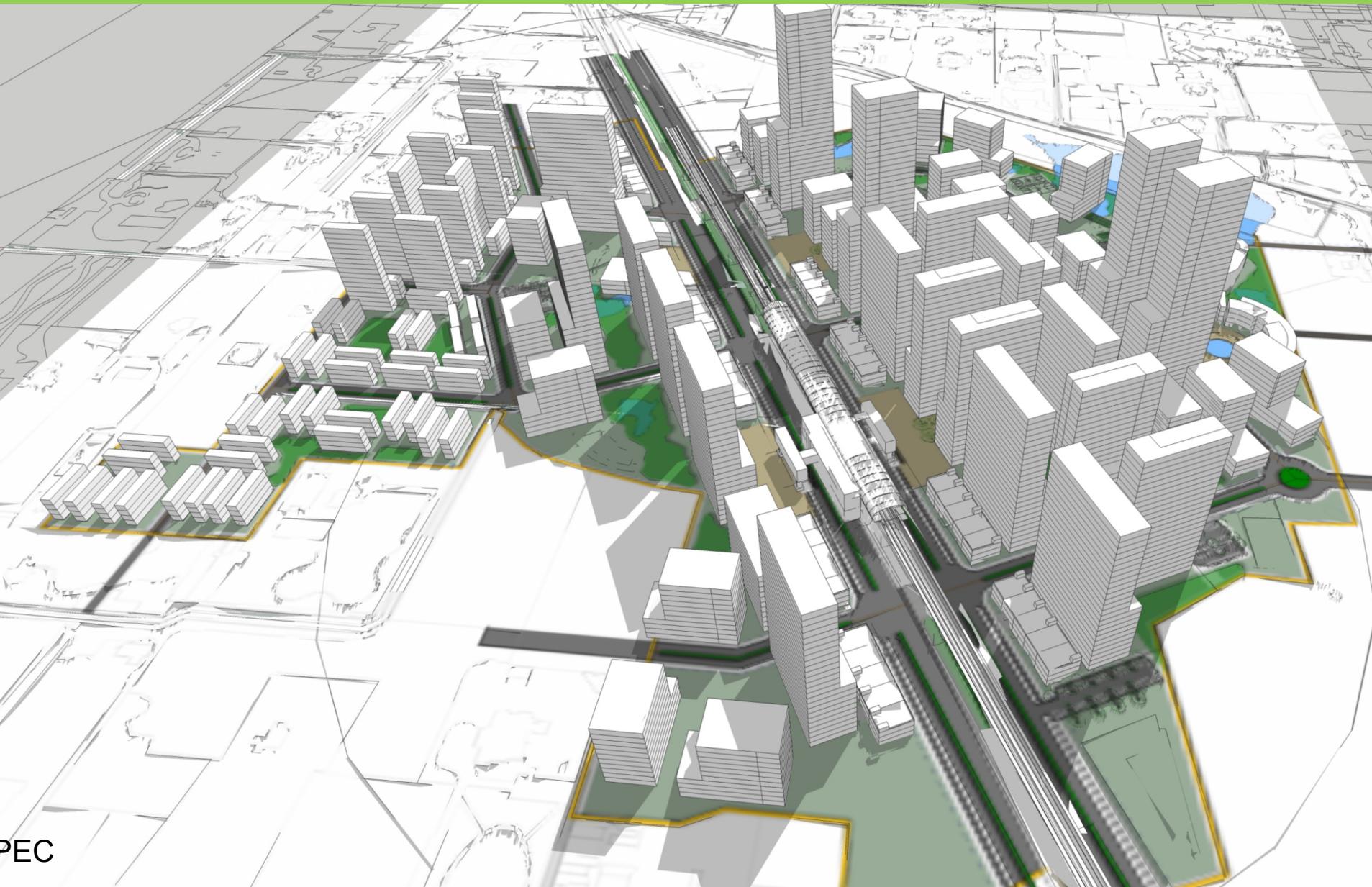
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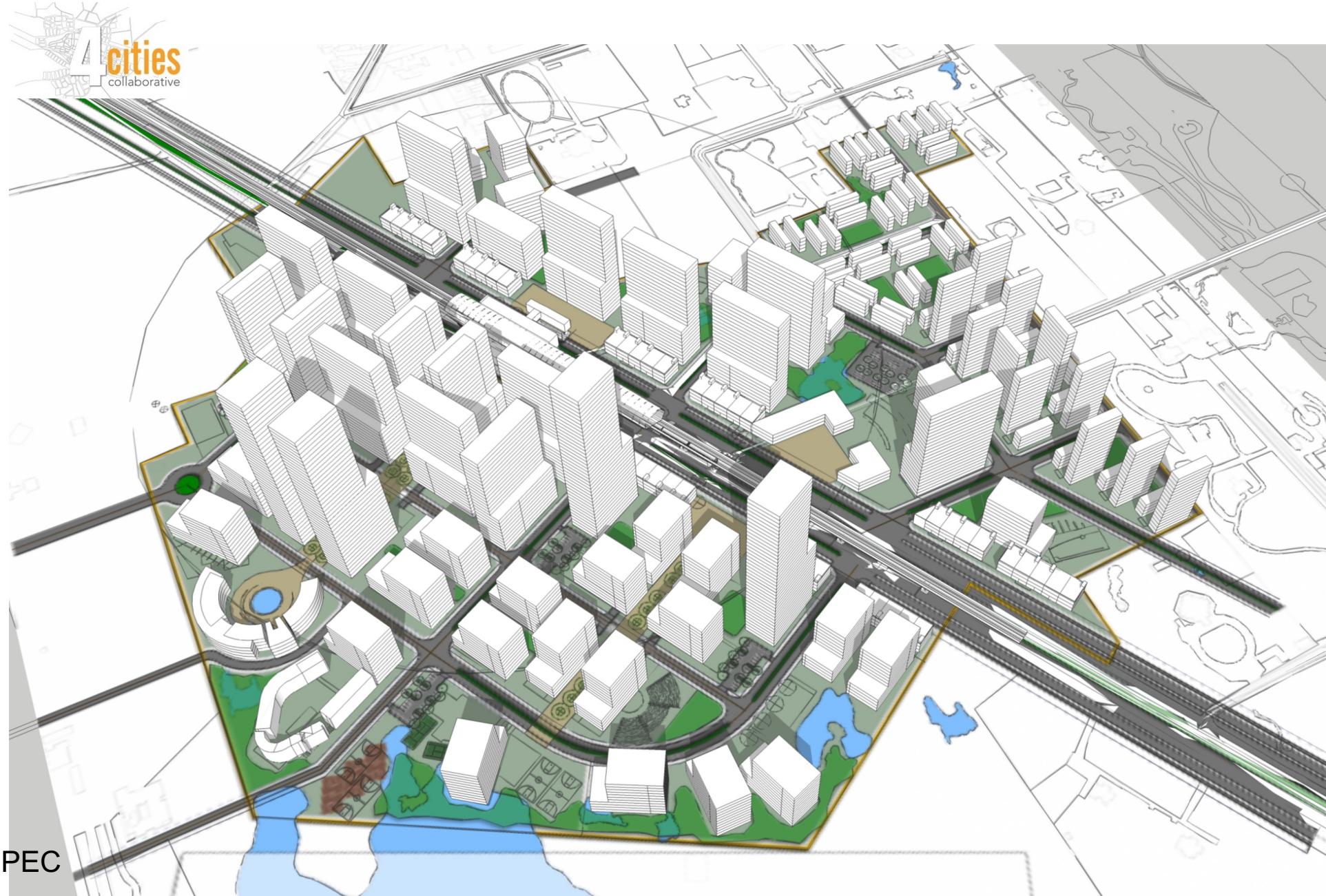
# **Scheme 1- Design on Test site including NBCC land at Ghitorni Station**

TOD Norms tested by empanelled consultants on the test site.



# Scheme 1- Sample Drawing

# Built Massing



New York today



Courtesy: HCP

# New York in 1782



## New York in 1807



Courtesy: HCP

New York today



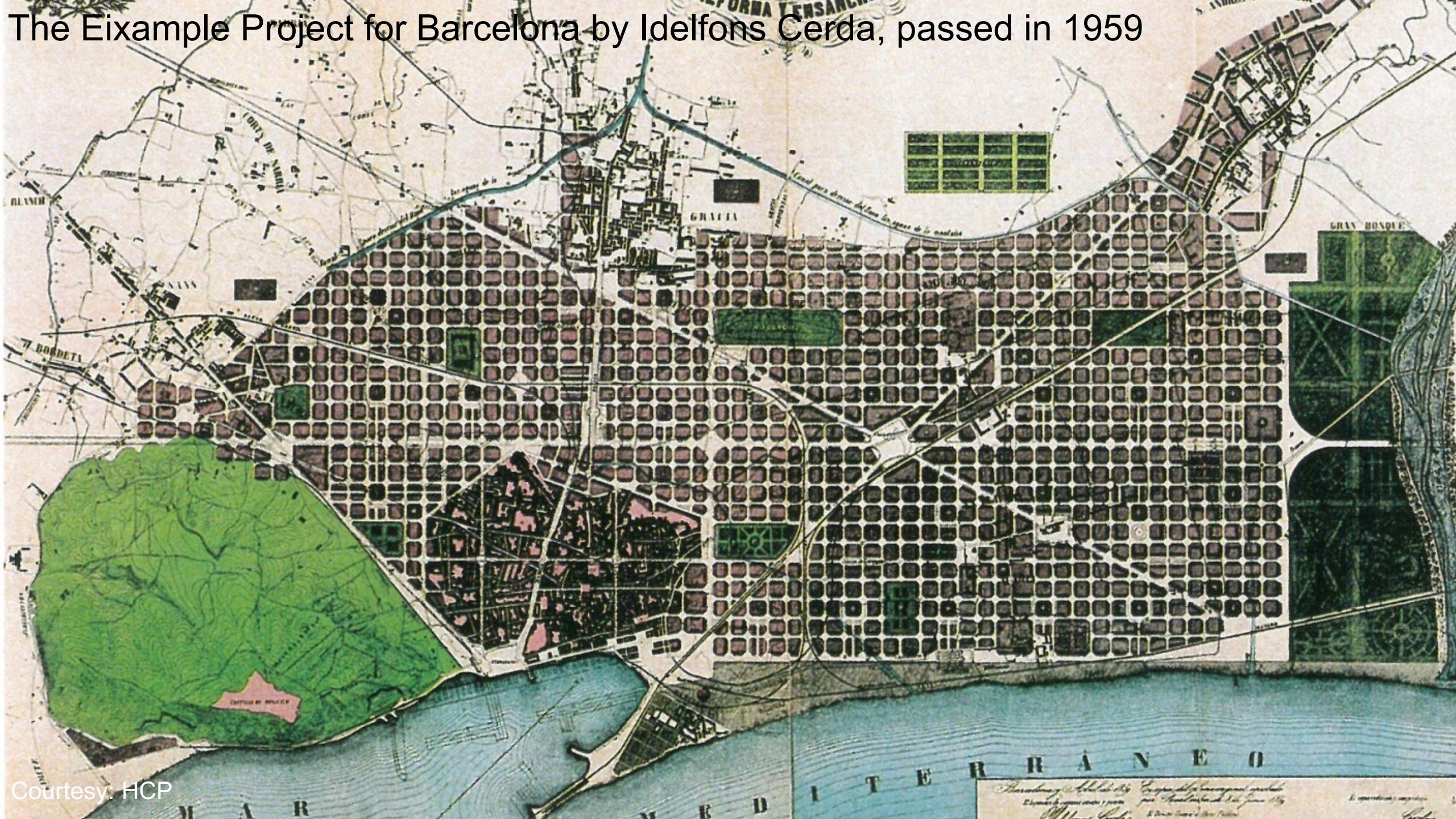
Courtesy HCP

Barcelona Walled Town, View from the Farmland, 19<sup>th</sup> Century



View of the walled town at the start of the 19<sup>th</sup> century

The Eixample Project for Barcelona by Ildefons Cerdà, passed in 1859



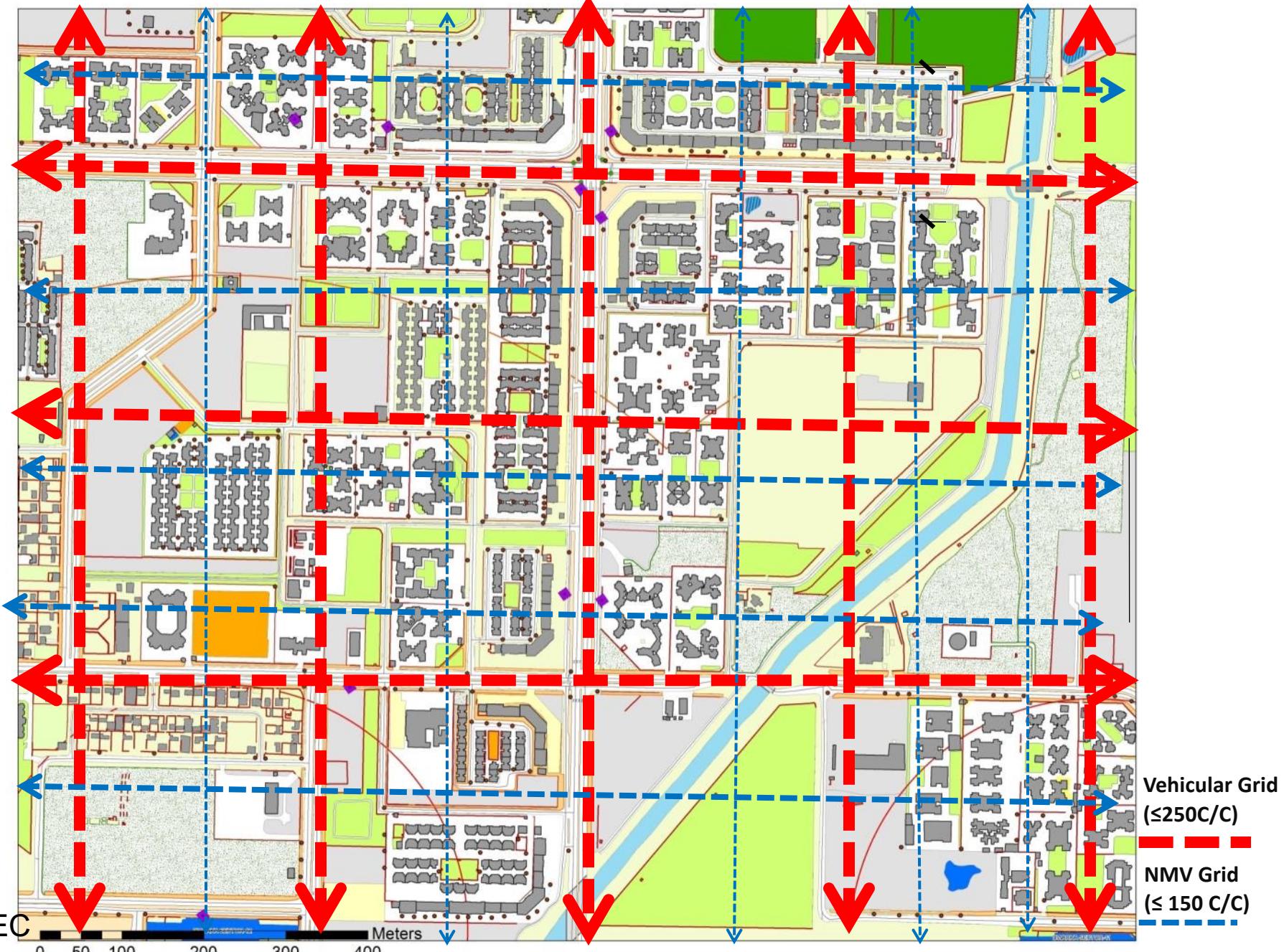
Courtesy: HCP

Barcelona today....

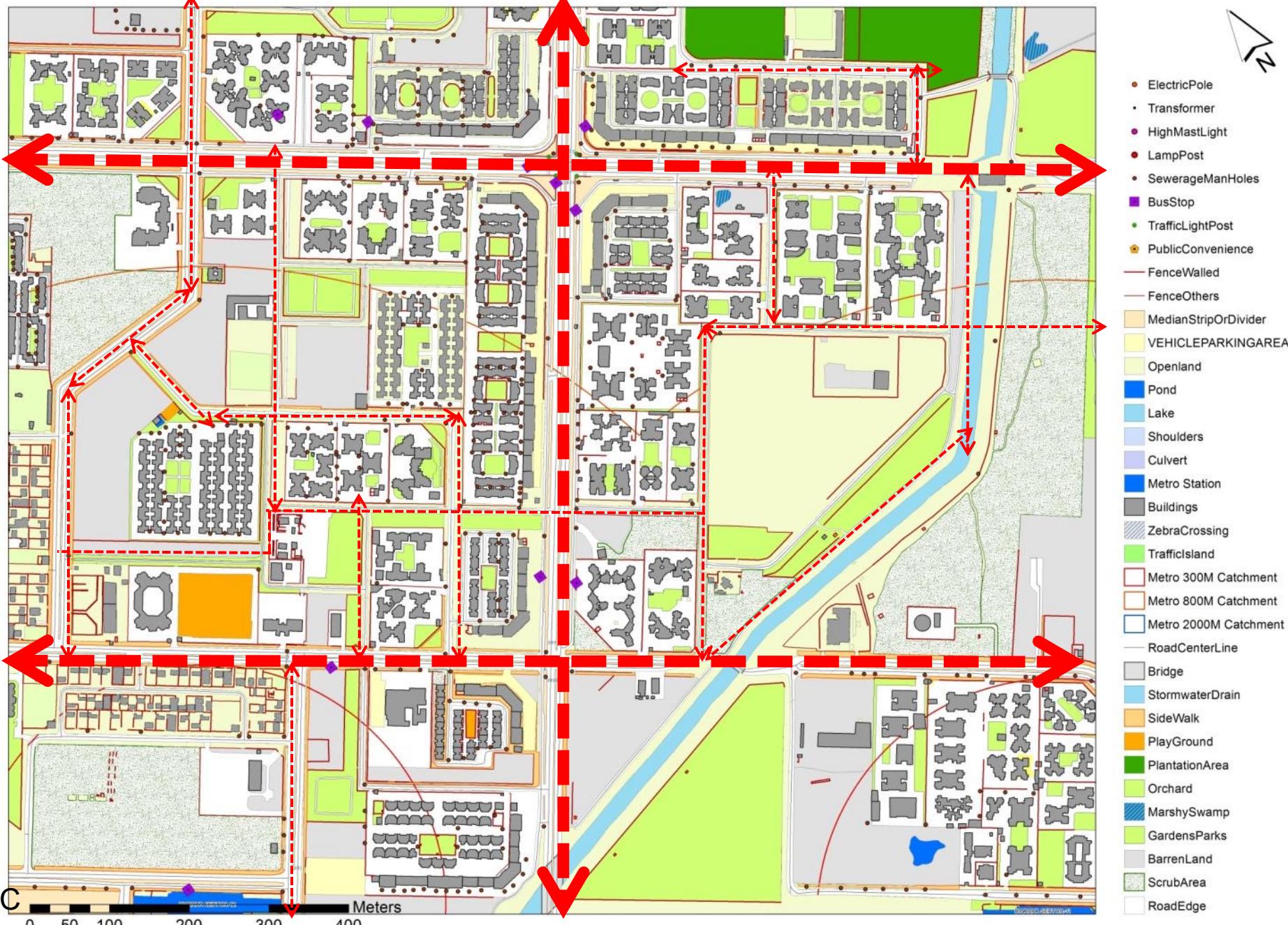


Courtesy: HCP

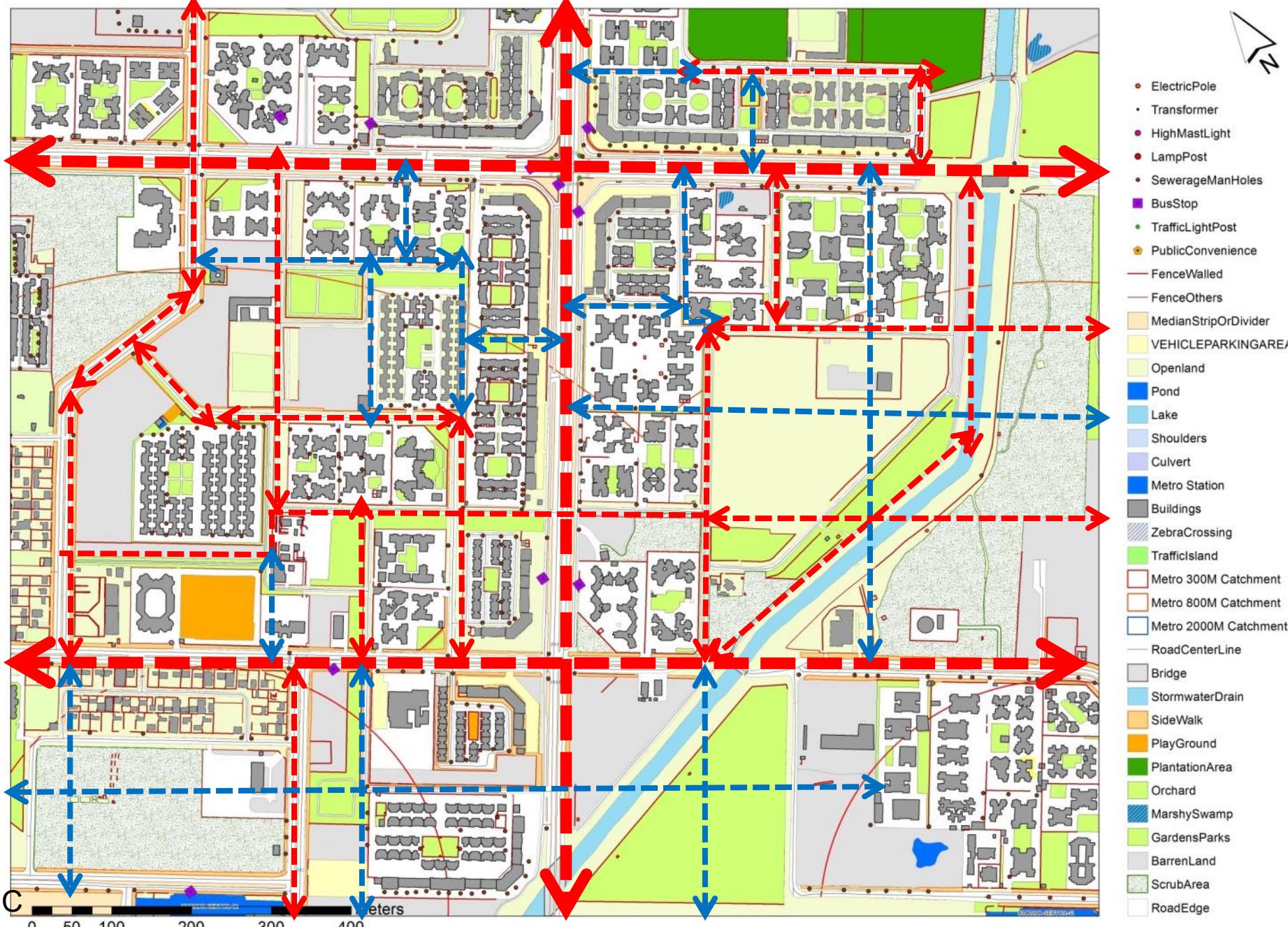
# Dwarka, Delhi (Optimal street plan)



# Dwarka, Delhi – Existing Plan



# Dwarka, Delhi – Proposed Network



# Policy & Regulations

National TOD Policy

“Care needs to be taken that the amalgamated plots are redesigned to allow finer network of streets and dispersion of open spaces.”

IRC SP-118:2018 Manual for Planning and Development of Urban Roads and Streets

Network of 125m x 125m

Spacing for NMT streets to be less than 125m

Transit Oriented Development Policy – Gazette Notification 30<sup>th</sup> July 2021 | CG-DL-E-30072021-228596

Network of 80-100m for NMT

Spacing of vehicular streets 250m x 250m

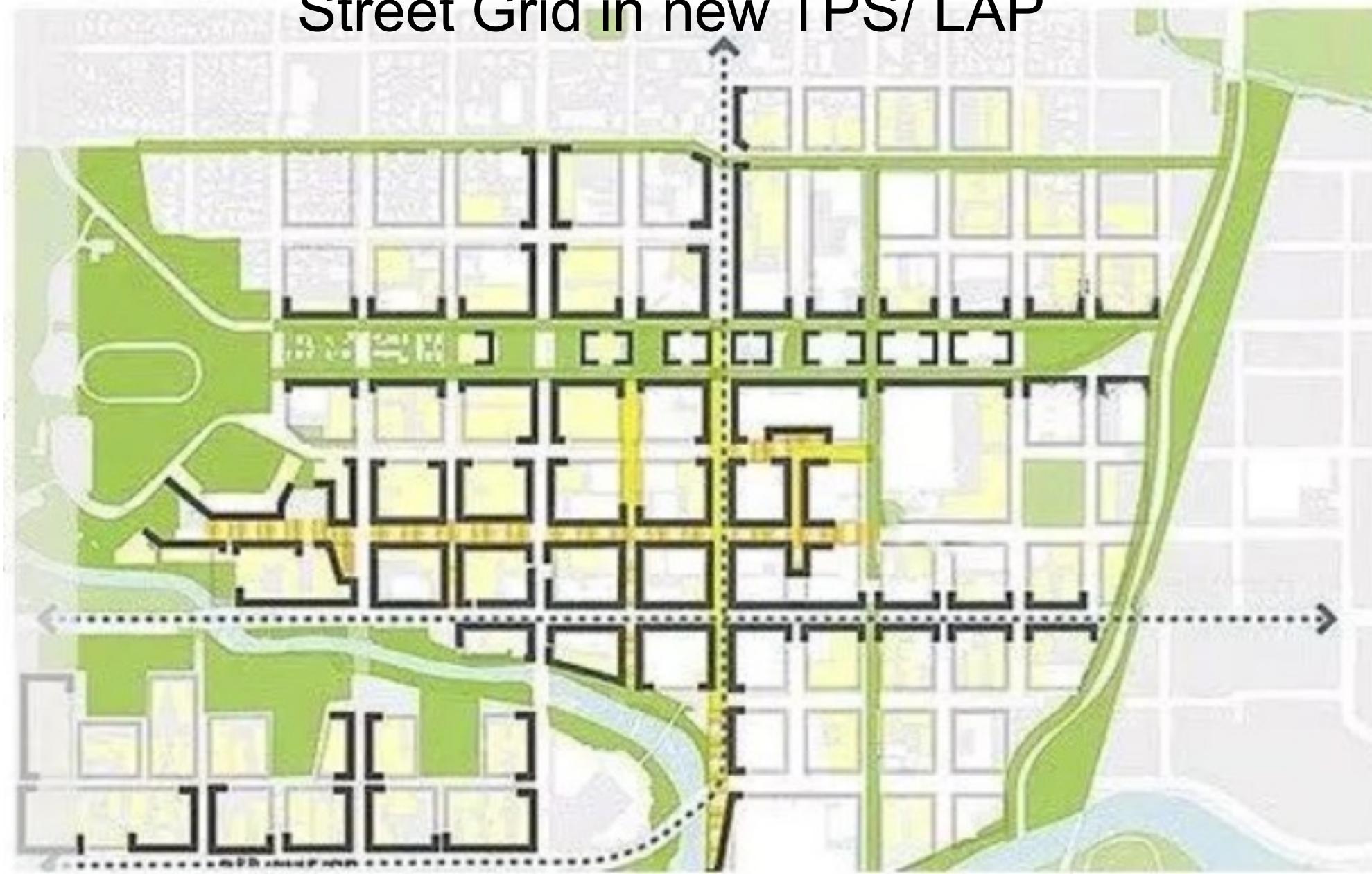
## For Greenfield Development

- Roads/ Street Network to be planned and executed first.

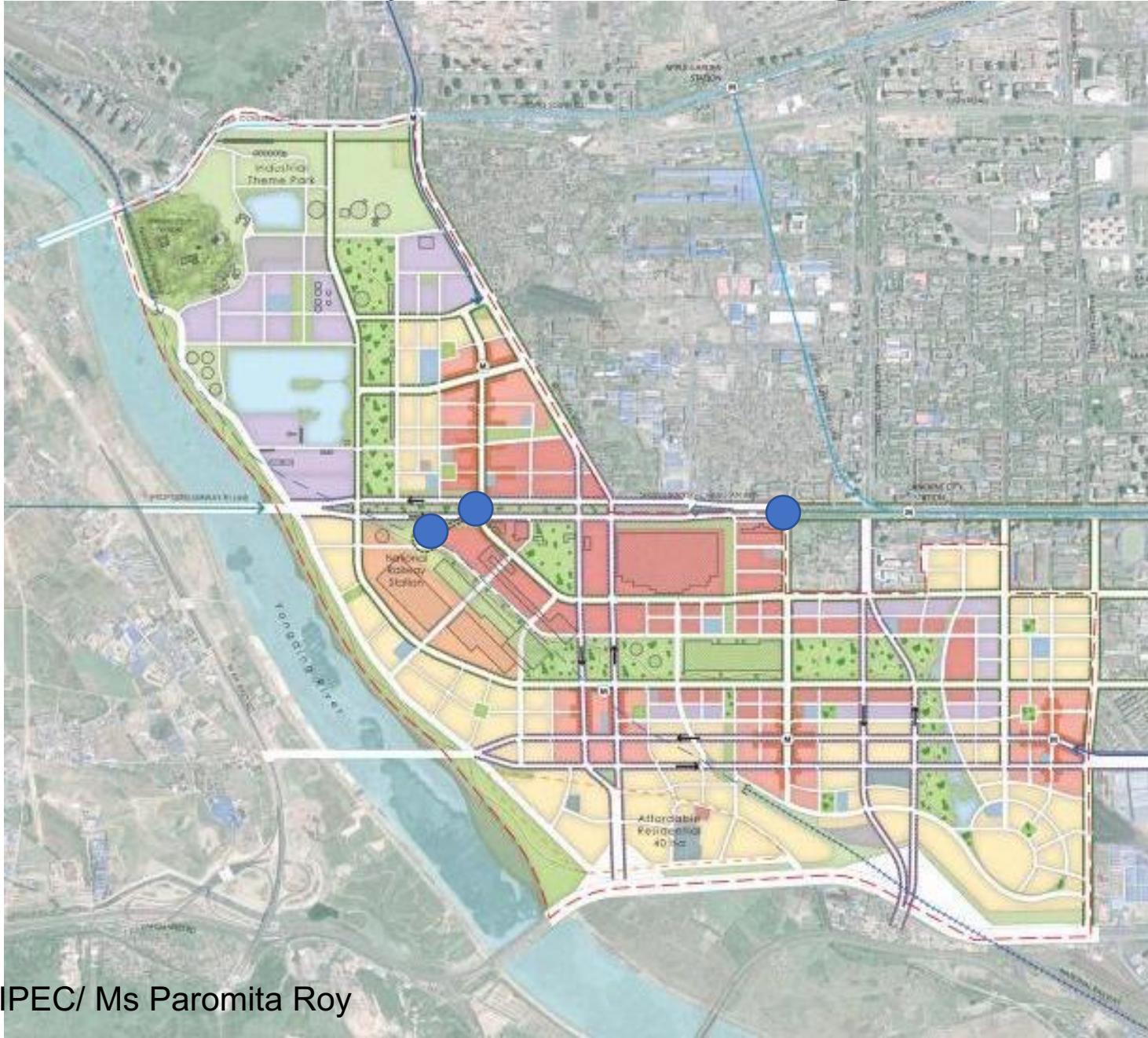
## For Brownfield Development

- Through Local Area Plans & Form-based Codes
- Barter incentives for making new streets or completing missing links

## Street Grid in new TPS/ LAP

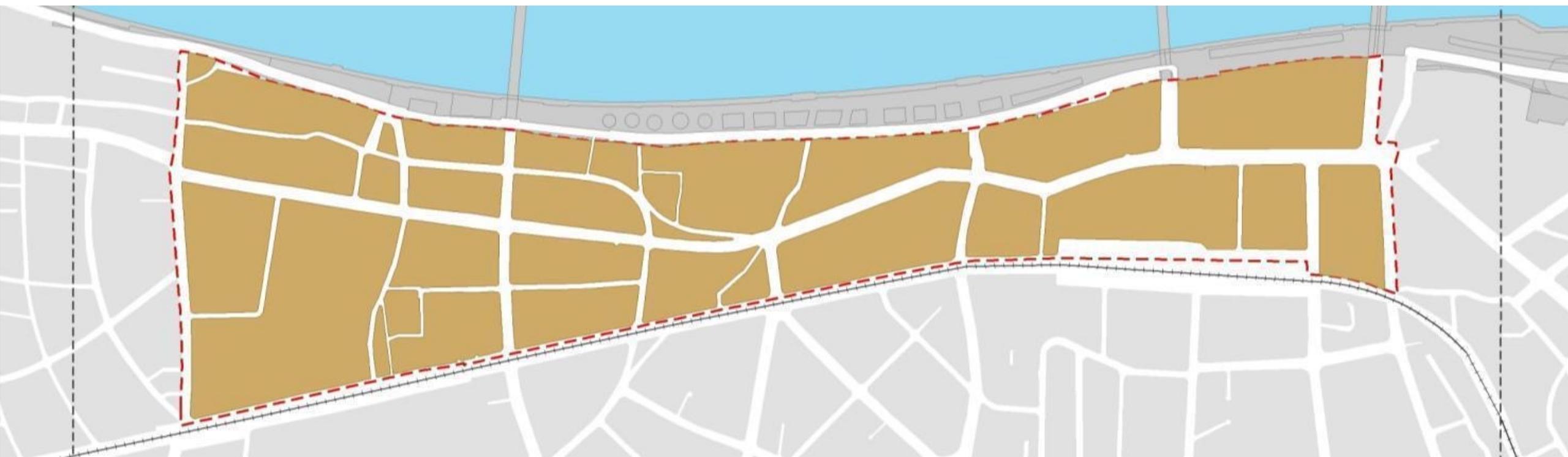


# INFLUENCE ZONE PLAN (LAP around Metro Stations)



A Detailed Influence Zone Plan is a framework that provides a **framework and vision for future TOD development.** Any public or private development within the Influence Zone Plan Areas must adhere to the overall strategies, framework and benchmarks provided by the Plan.

# The street network today



No. of existing blocks - 31  
Area under public domain (streets) = **22%**  
Average block perimeter = 743m

# The street network after the area is redeveloped



No. of proposed blocks - 76  
Area under public domain (streets) = **40%**  
Average block perimeter = 361m

# Vision for a new 24x7 City Centre

**Mix of Uses**

**24x7 City centre**

Promote **Pedestrian and NMT**

24x7 City active streets **with high-density above**  
**Large Green areas for Value creation & Quality of**  
**Life**

**Eyes on the Street**

# Vision:

24x7 City centres with **Eyes on the Street**



# Vision:

24x7 Active frontages with medium density



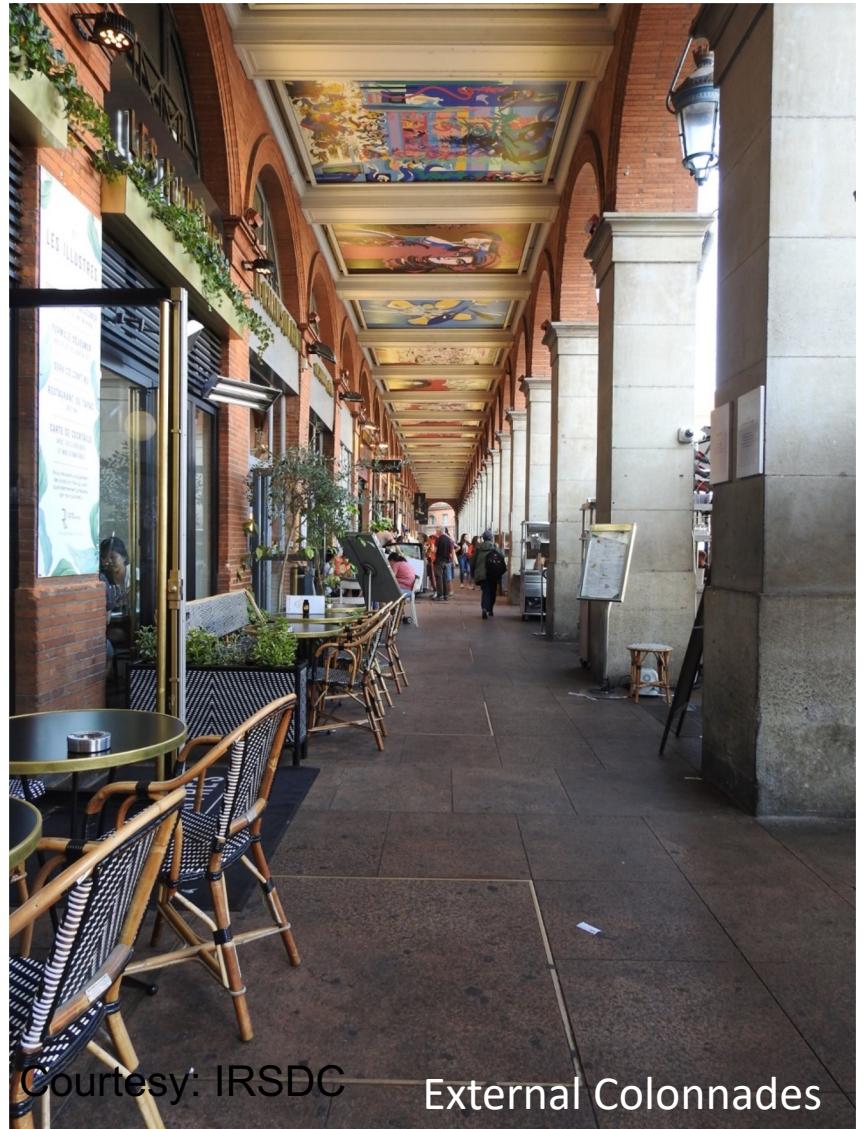
# Vision:

24x7 Active frontages with high-density above



# Vision:

24x7 City centres with Climatic Comfort



Courtesy: IRSDC

External Colonnades



Pedestrian Passages through Sub-Plots

# Vision:

24x7 City centres with **Mix of Uses**



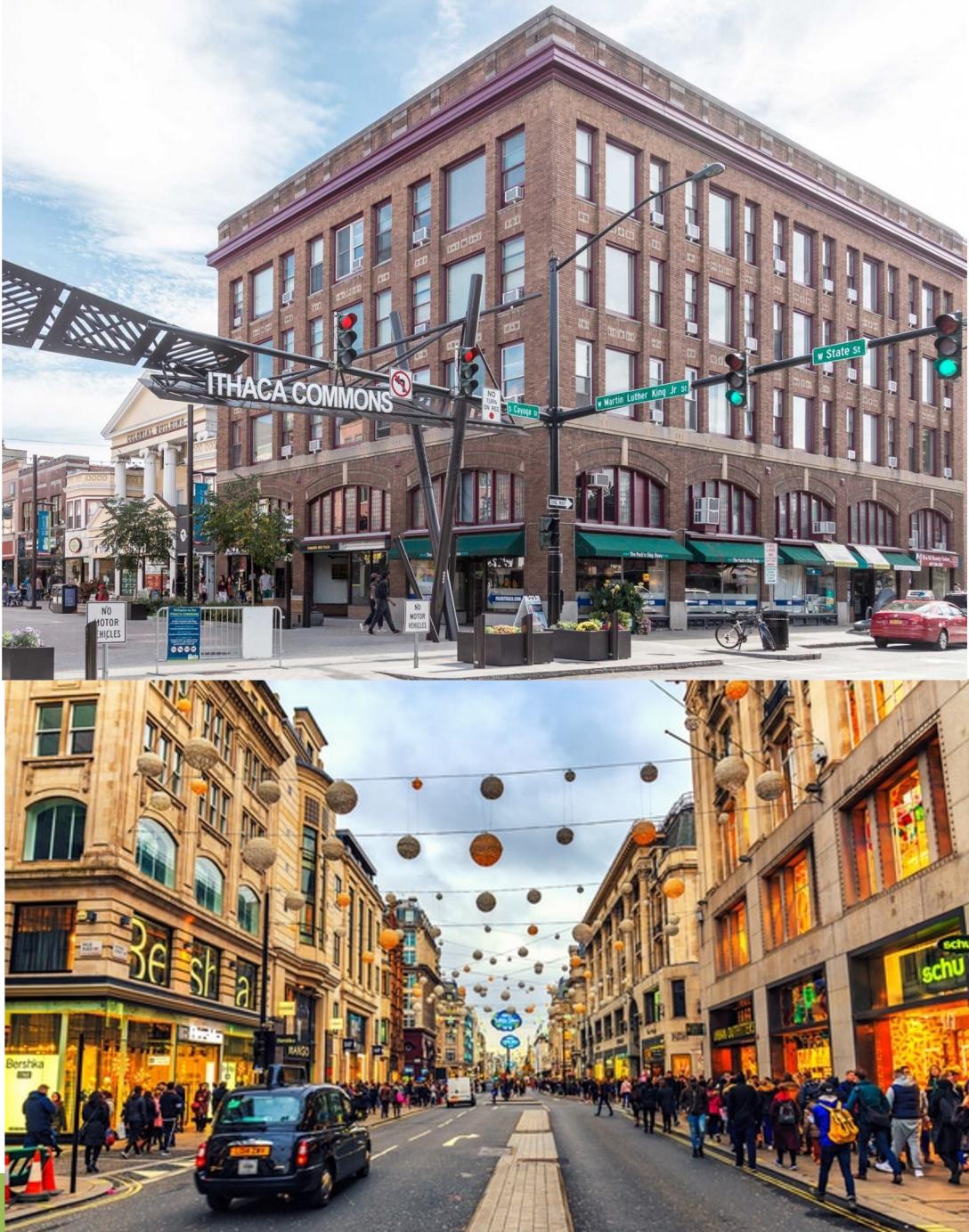
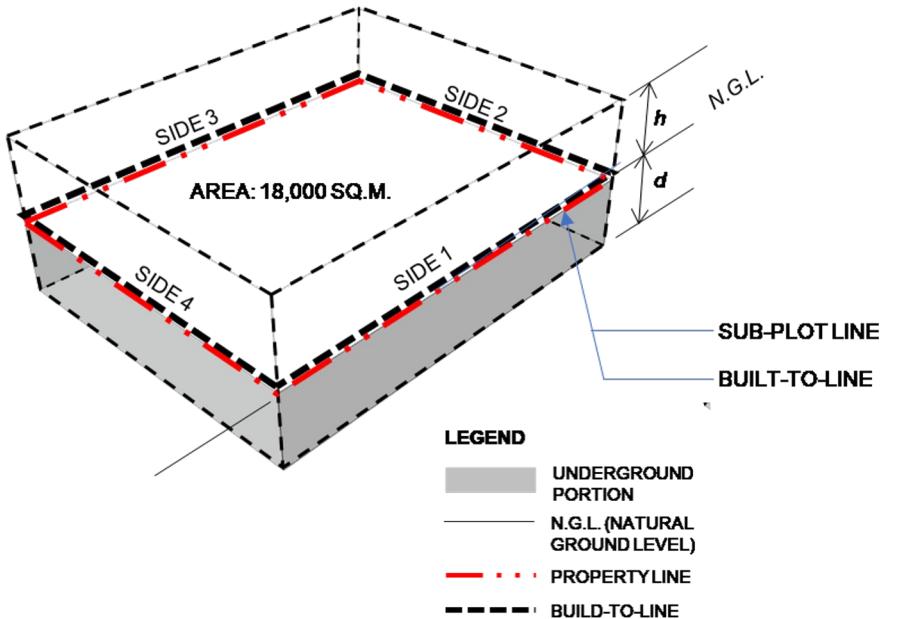
# Vision: Shared large Green areas for **Value creation & Quality of Life**



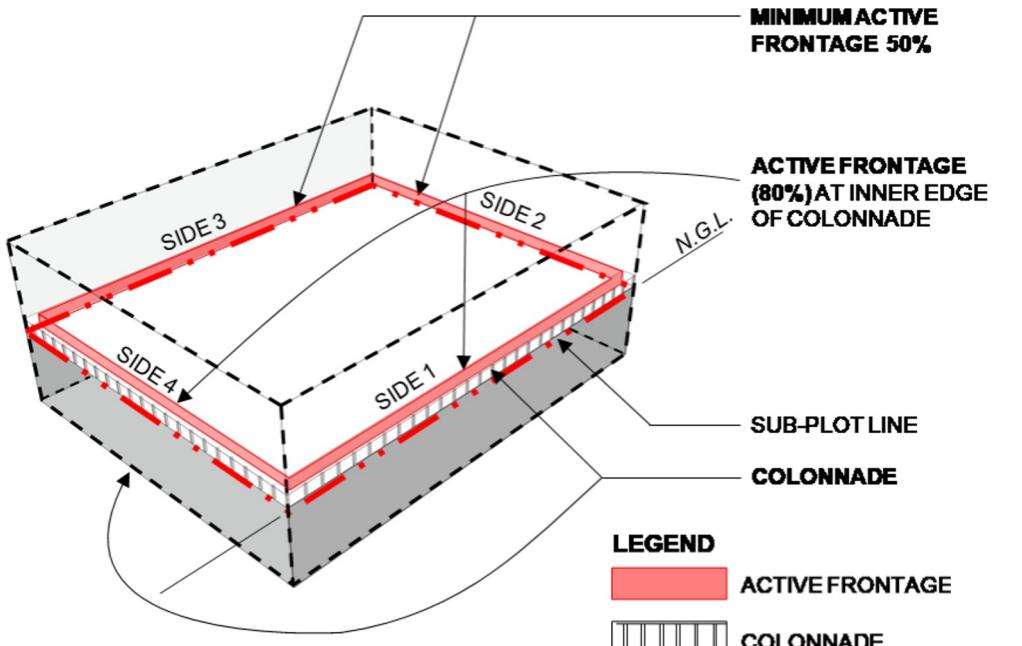
- **Form Based Codes** → **Buildable Volume Cards**  
for every sub-plot, **with 5 parameters:**



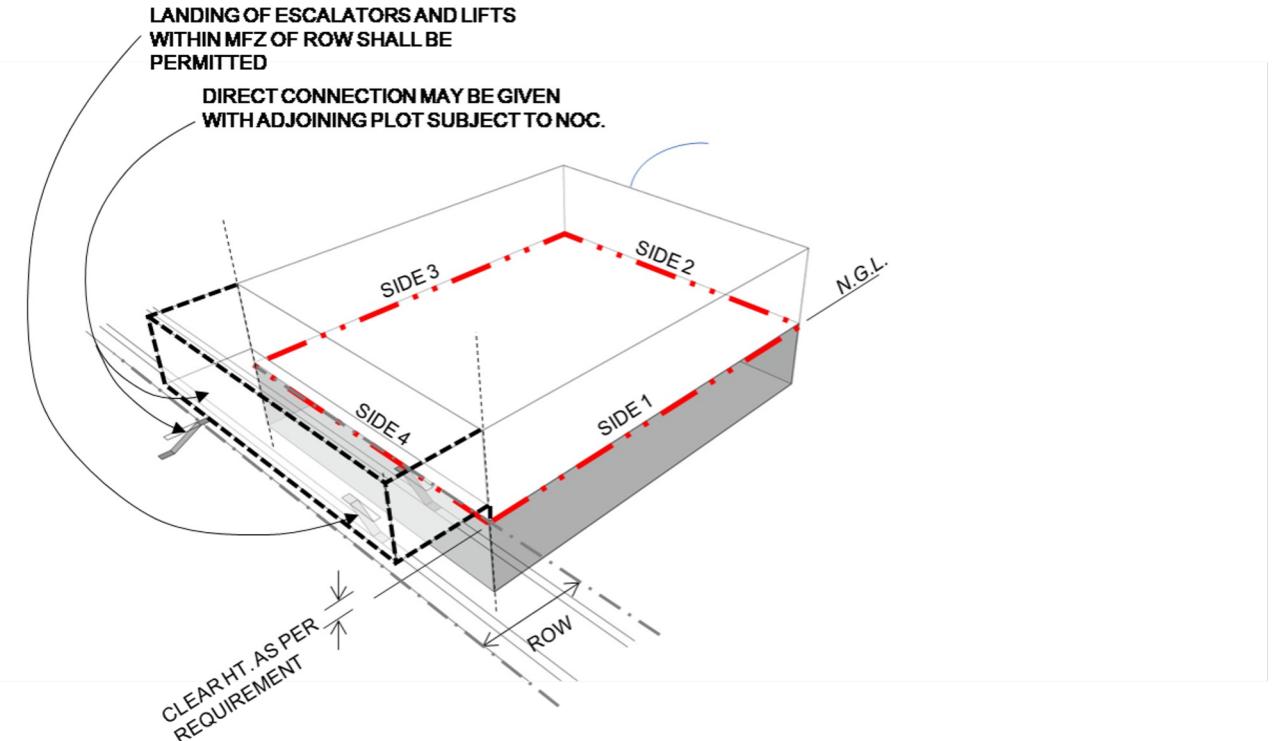
# Volumetric Parameters



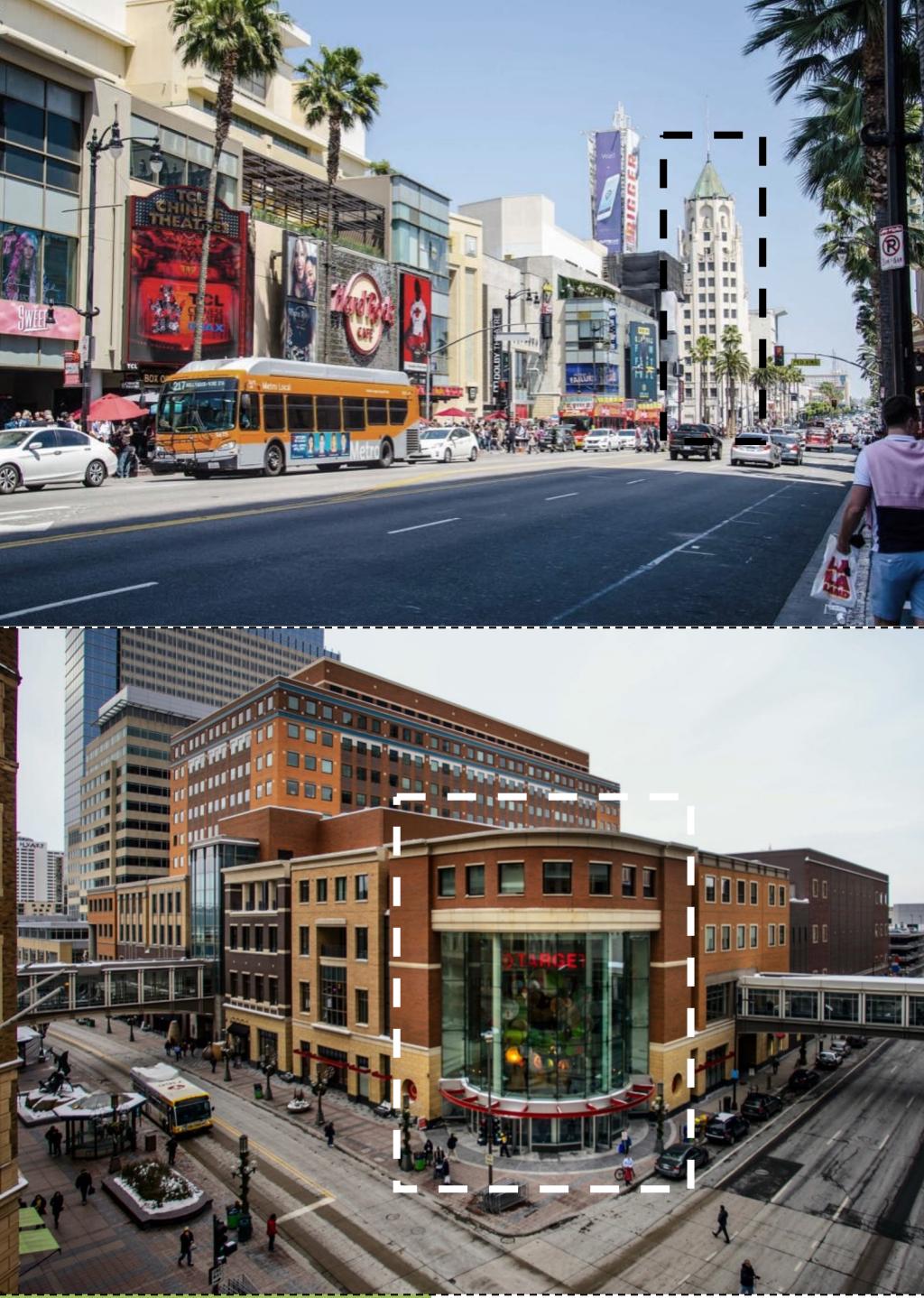
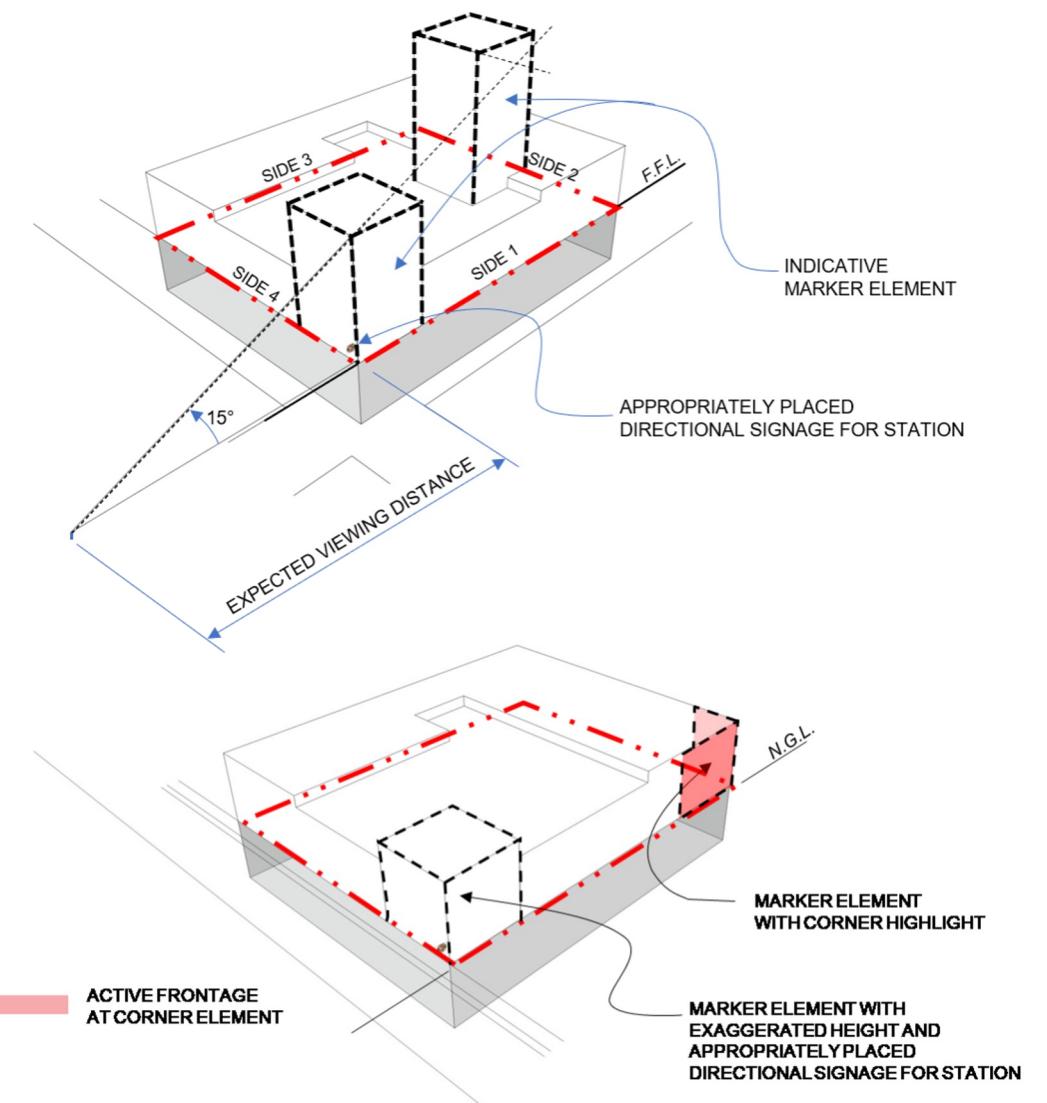
# Edge Conditions



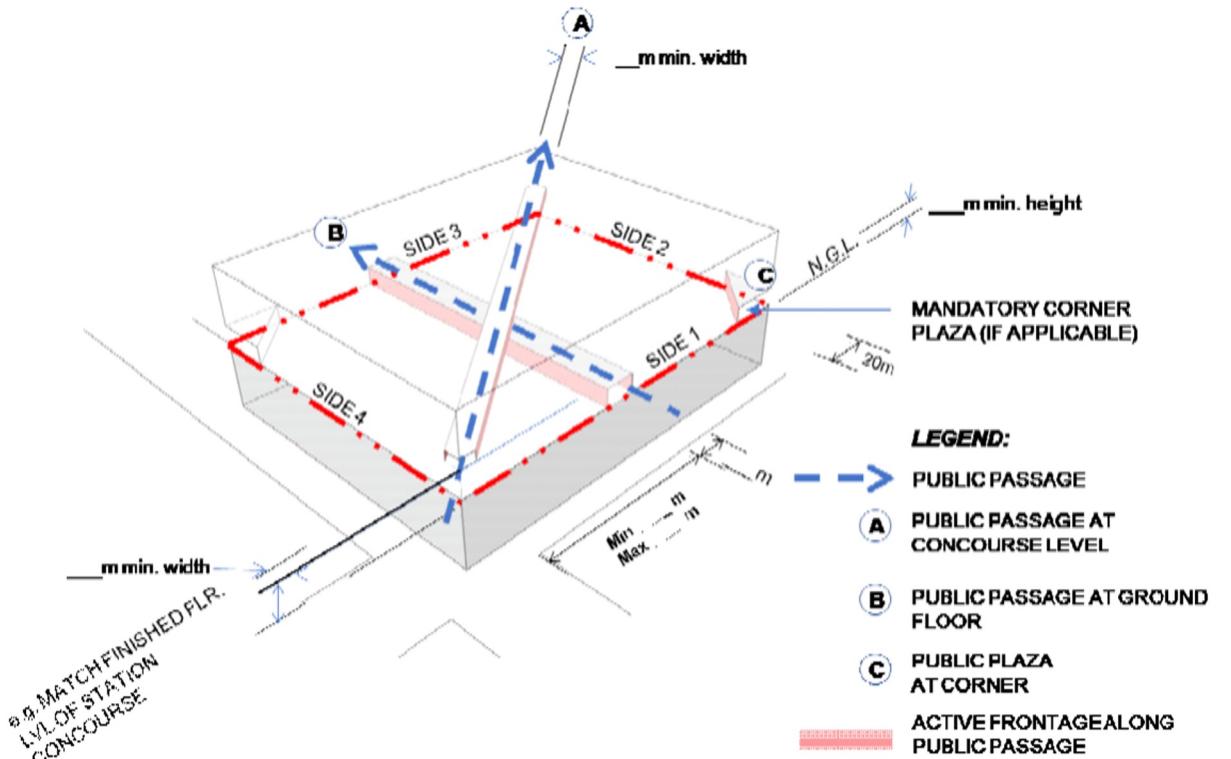
# Projections Permitted Beyond Sub-plot Edge



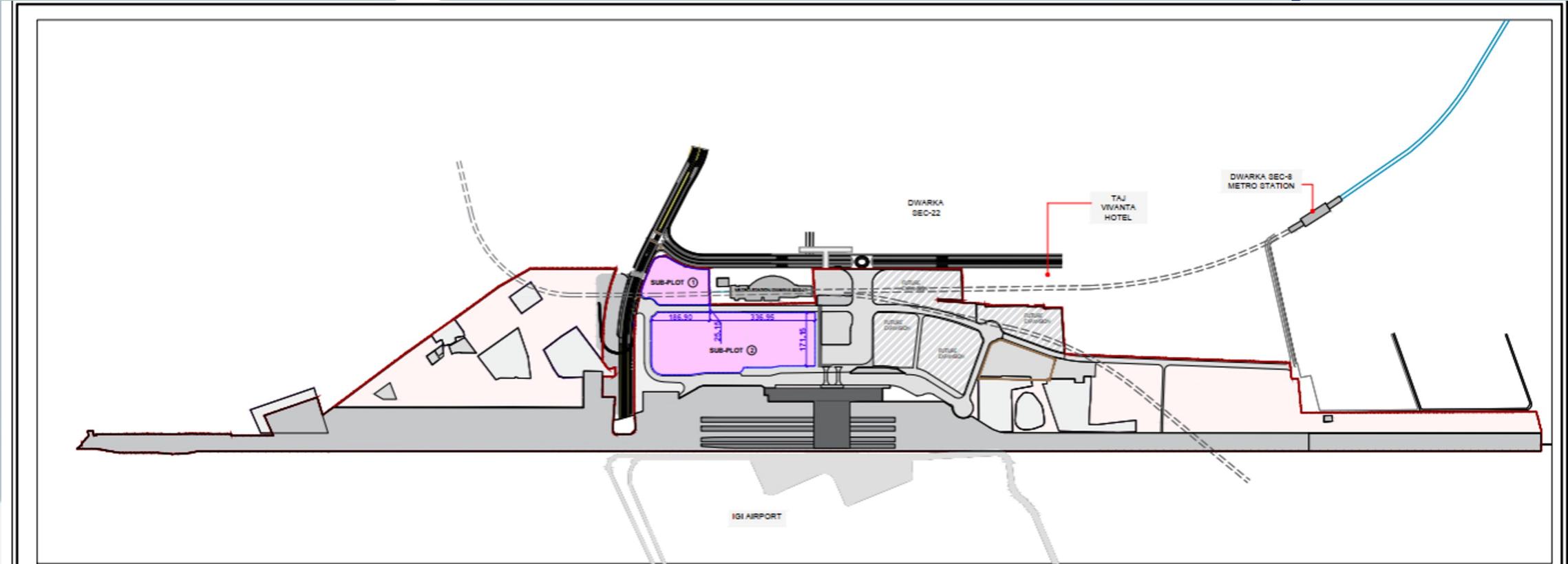
# Way-Finding Features



# Public area Reservations within Sub-plot



# Plots for Commercial Monetisation at Bijwasan



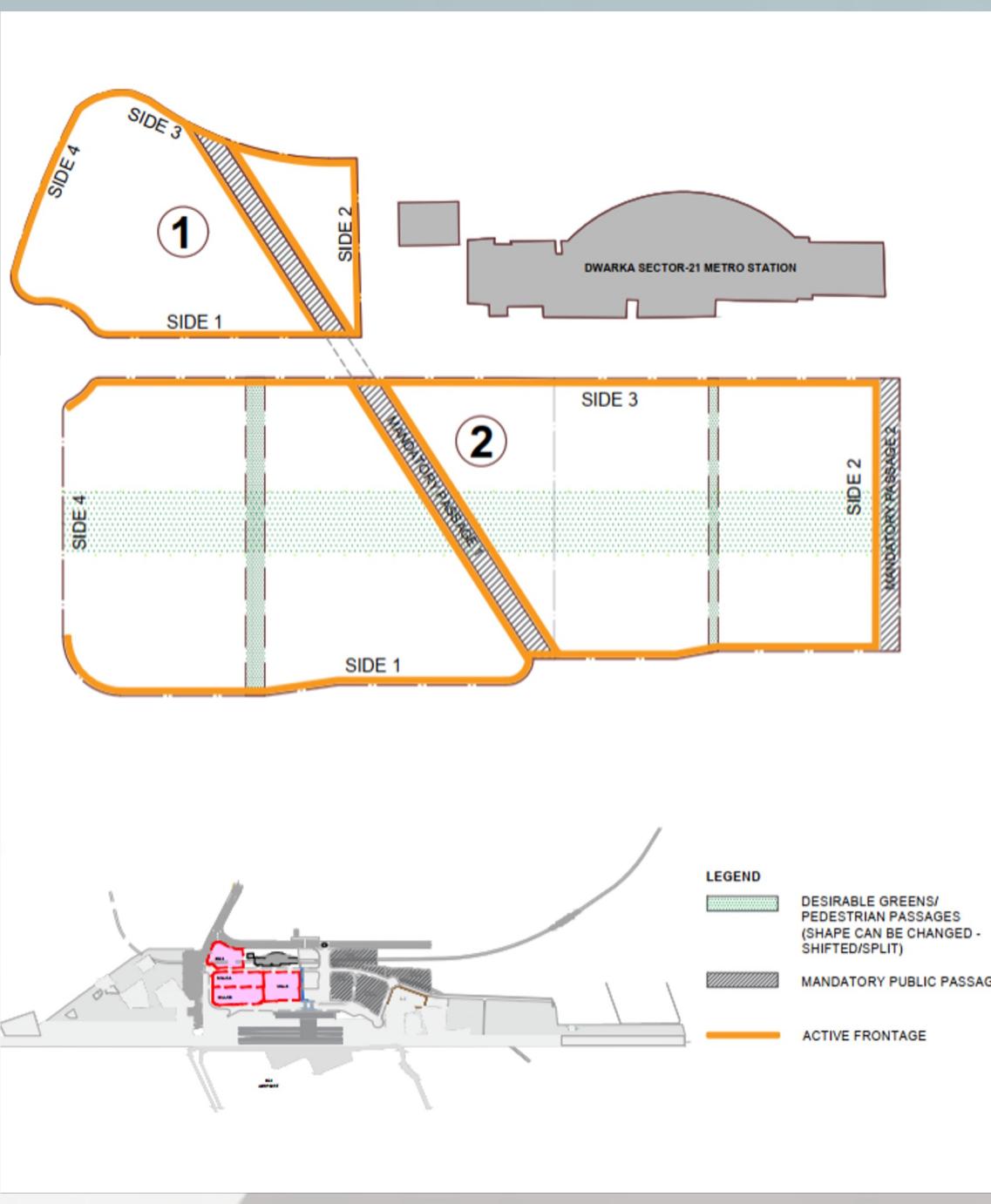
**NOTE:**

1. All dimensions are in Meters.

**MIXED-USE DEVELOPMENT**

LEGEND	SUB-PLOTS	PLOT NO. AS INDICATED IN APPROVED MASTER PLAN NO. BWSN-F-07-(08-01-2015)	AREA(in sq.m)
	1	MU4	26,172.00
			27,908.00
	2	MU5	31,640.00
MU6			37,460.00
<b>SUB TOTAL</b>			<b>1,23,180.00</b>

# Buildable Volume Card for Bijwasan



## NOTES:

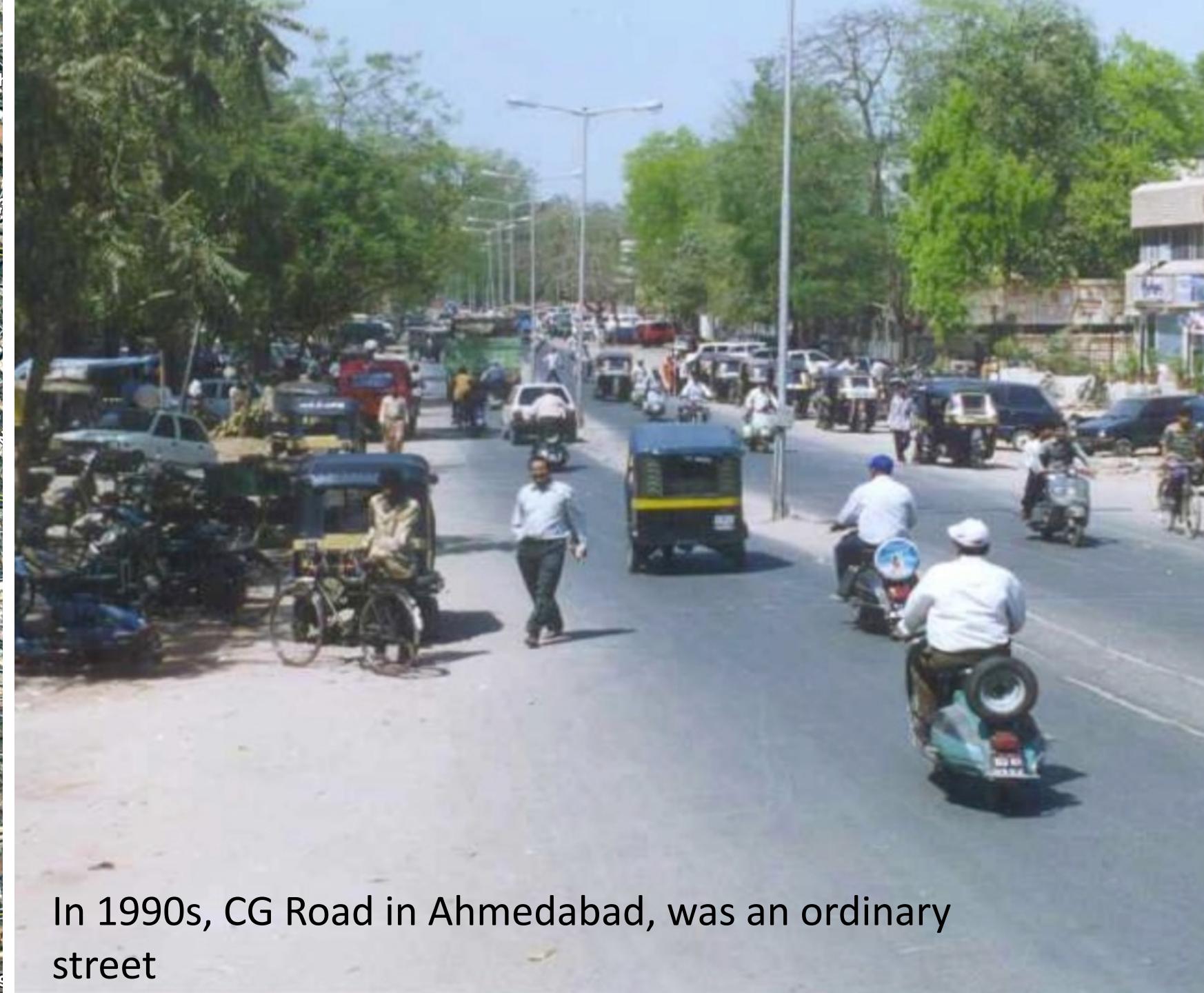
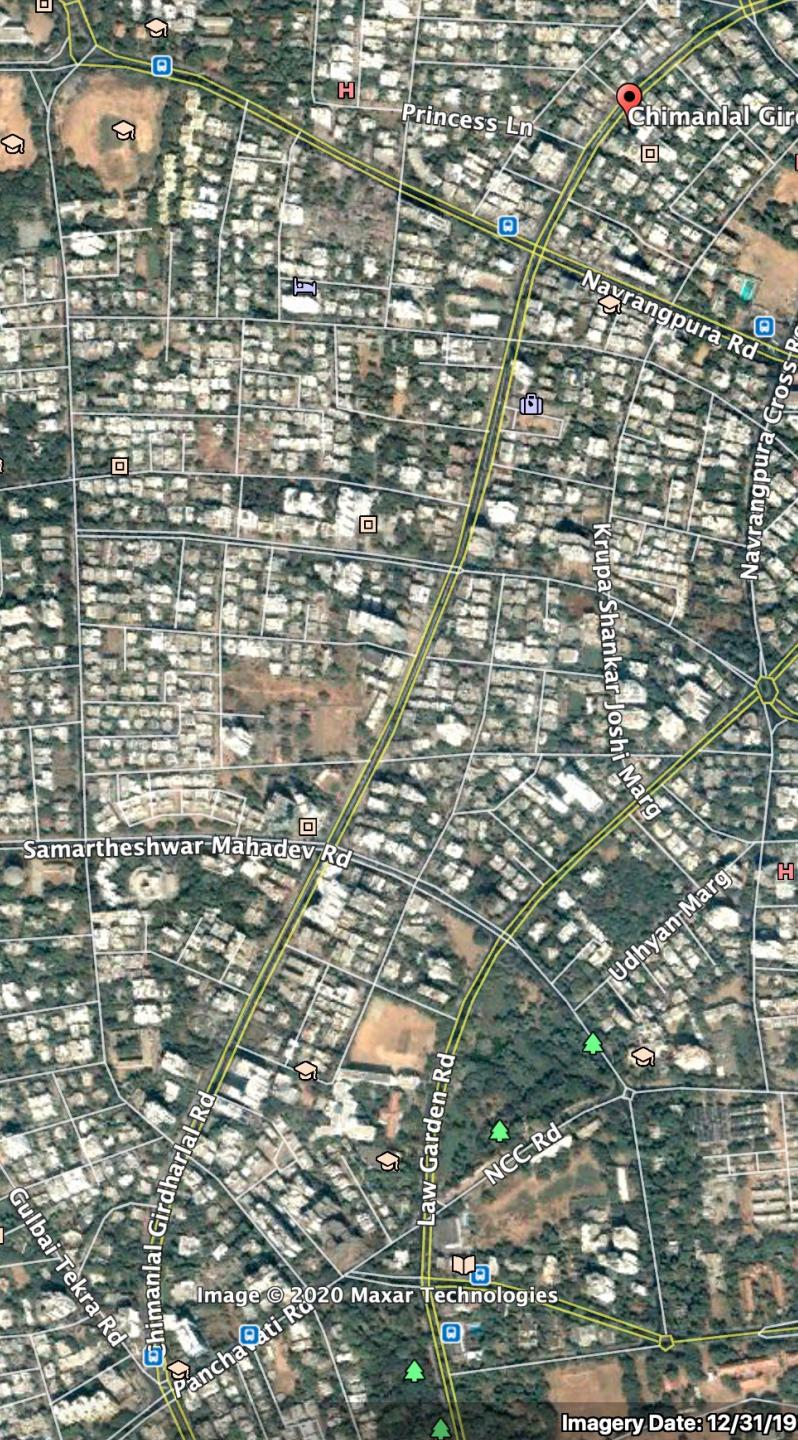
1. THIS BVC SHALL BE READ IN CONJUNCTION TO DWG. NO. BWSN-MP-KD4-ARC-PLN-103/T

### SUB-PLOT 1 (INCLUDING MU4)

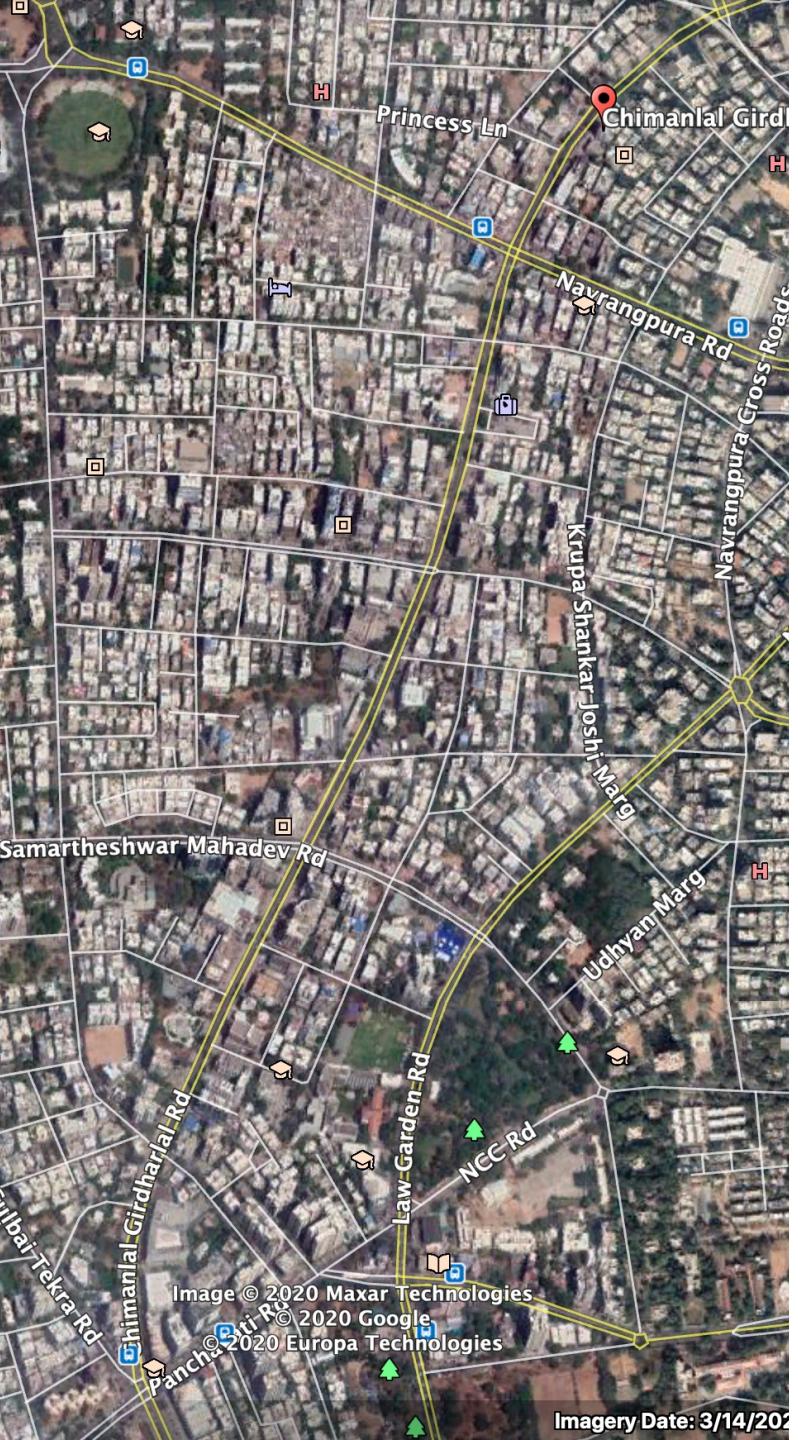
A. VOLUMETRIC PARAMETERS		MEASUREMENTS			
A.1. Maximum permissible Depth of underground structure		As per restrictions of Obligatory Structures (if any)			
A.2. Build-to-Line		Side 1	Side 2	Side 3	Side 4
		Set back: 0 m from Property Line	--	Set back: 0 m from Property Line	Set back: 0 m from Property Line
B. EDGE CONDITIONS		Side 1	Side 2	Side 3	Side 4
B.1. Active Frontage		Mandatory	Optional	Mandatory	Mandatory
B.2. Colonnade		Optional	Optional	Optional	Optional
B.3. Pedestrian entry		Mandatory	Optional	Mandatory	Optional
B.4. Vehicular Entry		Optional	Optional	Optional	Optional
C. PROJECTIONS PERMITTED BEYOND SUB-PLOT EDGE		Side 1	Side 2	Side 3	Side 4
C.1. Projection beyond sub-plot edge		Permitted	--	--	--
D. PUBLIC AREA RESERVATIONS WITHIN SUB-PLOT		Side 1	Side 2	Side 3	Side 4
D.1. Entry of MPP		Mandatory	Optional	Mandatory	Optional
D.2. Public Plazas		Optional	Optional	Optional	Optional

### SUB-PLOT 2 (INCLUDING MU5 & MU6)

A. VOLUMETRIC PARAMETERS		MEASUREMENTS			
A.1. Maximum permissible Depth of underground structure		As per restrictions of Obligatory Structures (if any)			
A.2. Build-to-Line		Side 1	Side 2	Side 3	Side 4
		Set back: 0 m from Property Line	Set back: 0 m from Property Line	Set back: 0 m from Property Line	Set back: 0 m from Property Line
B. EDGE CONDITIONS		Side 1	Side 2	Side 3	Side 4
B.1. Active Frontage		Mandatory	Mandatory	Mandatory	Optional
B.2. Colonnade		Optional	Mandatory	Optional	Optional
B.3. Pedestrian entry		Mandatory	Mandatory	Mandatory	Mandatory
B.4. Vehicular Entry		Optional	Optional	Optional	Optional
C. PROJECTIONS PERMITTED BEYOND SUB-PLOT EDGE		Side 1	Side 2	Side 3	Side 4
C.1. Projection beyond sub-plot edge		Permitted	Permitted	Permitted	--
D. PUBLIC AREA RESERVATIONS WITHIN SUB-PLOT		Side 1	Side 2	Side 3	Side 4
D.1. Entry of MPP		Mandatory	Mandatory	Mandatory	Mandatory
D.2. Public Plazas		Optional	Optional	Optional	Optional



In 1990s, CG Road in Ahmedabad, was an ordinary street



Urban infrastructure work on CG Road in late 1990s transformed it



CG Road is now **city's High Street** and the most important, vibrant commercial, business and finance address. The entire area has transformed into **high value mixed-use neighborhood** with the best brands located on it.

# Complete Streets in CBD of Srinagar

BEFORE



AFTER



BEFORE



AFTER



# Boulevard-Foreshore Road Redesign | BEFORE



# Boulevard-Foreshore Road Redesign | AFTER



# Boulevard-Foreshore Road Redesign | BEFORE



# Boulevard-Foreshore Road Redesign | AFTER





# Sabarmati Riverfront

Reconnecting Ahmedabad to its River

#### **Sabarmati River Front Development Corporation Ltd.**

2nd Floor, "Riverfront House", B/h. H.K. Arts College, Between Gandhi & Nehru Bridge, Pujya Pramukh Swami Marg (River Front Road - West), Ahmedabad - 380009.

Tel: +91 (079) 26580430 | [www.sabarmatiriverfront.com](http://www.sabarmatiriverfront.com)

#### **Sabarmati Riverfront Development Corporation Limited (SRFDCL)**

May 1997 marked one of the golden chapters in the history of Ahmedabad. The Ahmedabad Municipal Corporation launched a Special Purpose Vehicle (SPV) - the Sabarmati Riverfront Development Corporation Limited (SRFDCL). It was entrusted with the responsibility of developing a World-class Riverfront.

#### **Ahmedabad Municipal Corporation (AMC)**

The Ahmedabad Municipal Corporation (AMC), established in July 1950 under the Bombay Provincial Corporation Act, 1949, is responsible for the civic infrastructure and the administration of the city of Ahmedabad.

