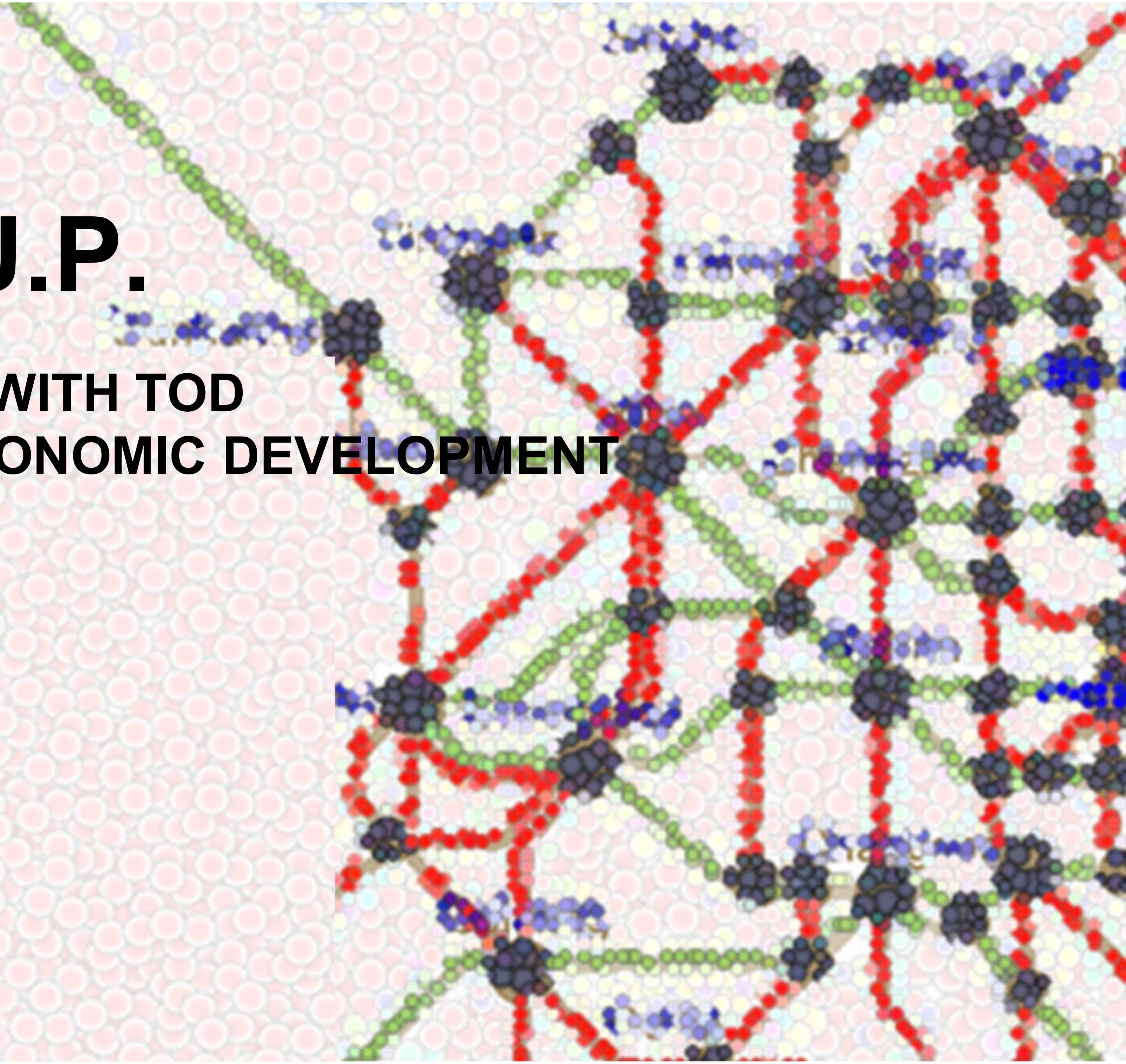
# Relaunching U.P.

## RECONNECTING REGIONS WITH TOD
## FOR SUSTAINED SOCIO-ECONOMIC DEVELOPMENT



ROMI ROY

Director (HUPW) DDA

# Relaunching U.P.

## AS A TRILLION DOLLAR ECONOMY

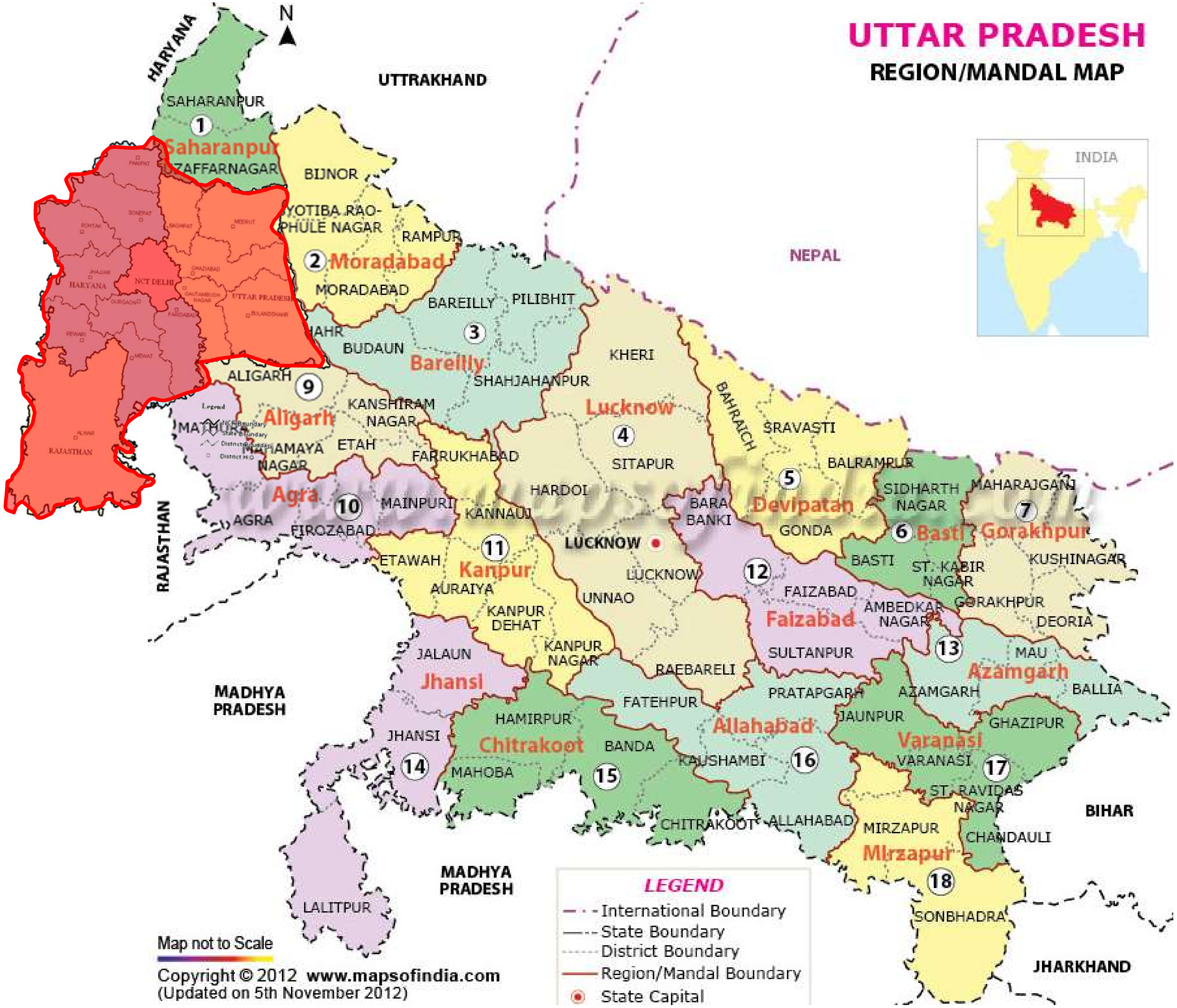
FROM EXPORTING LABOUR

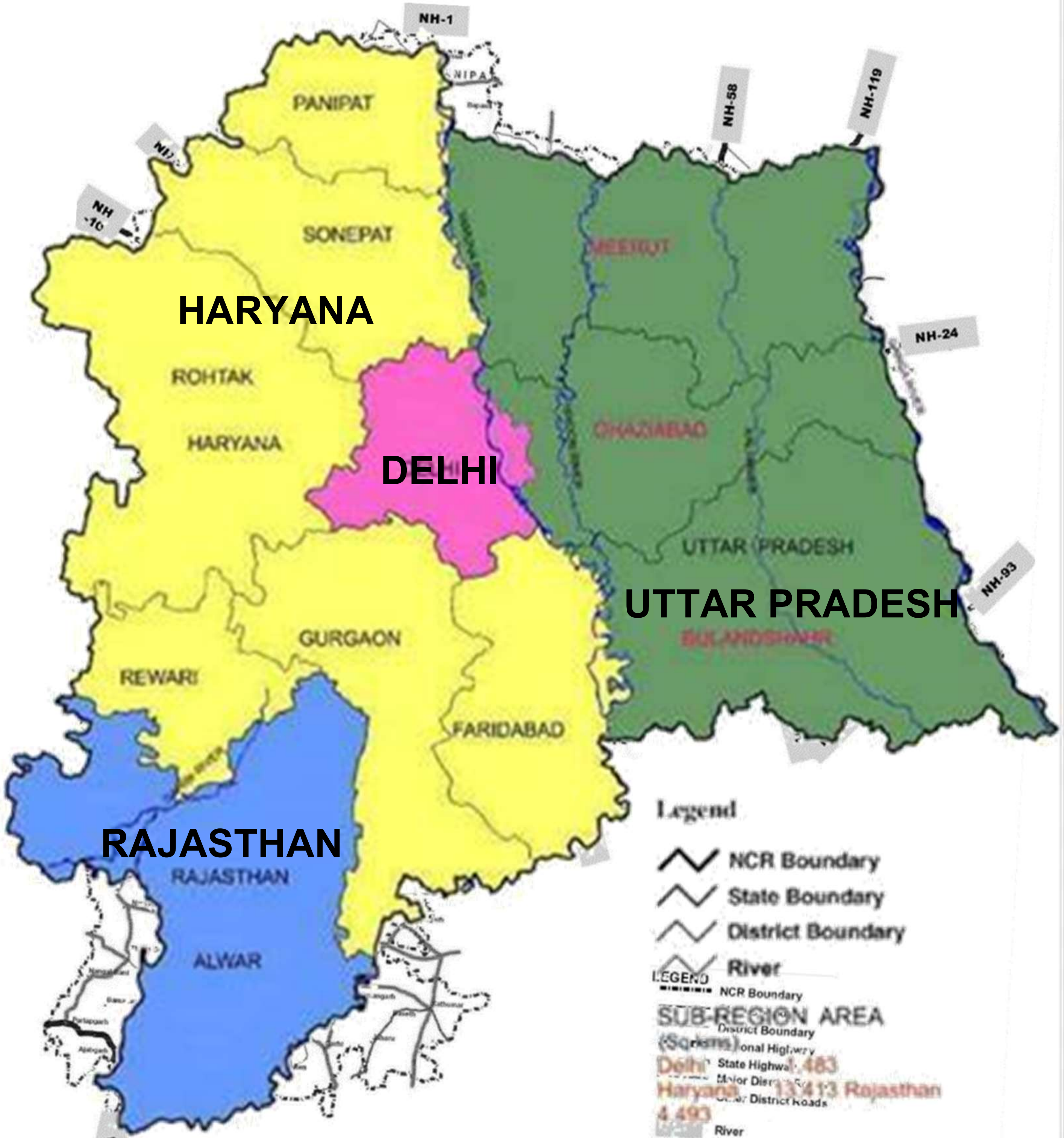
TO IMPORTING SKILLED/ UNSKILLED LABOUR & BLUE+WHITE COLLAR EMPLOYEES

CREATE REGIONAL ECOSYSTEMS BASED ON TRANSIT

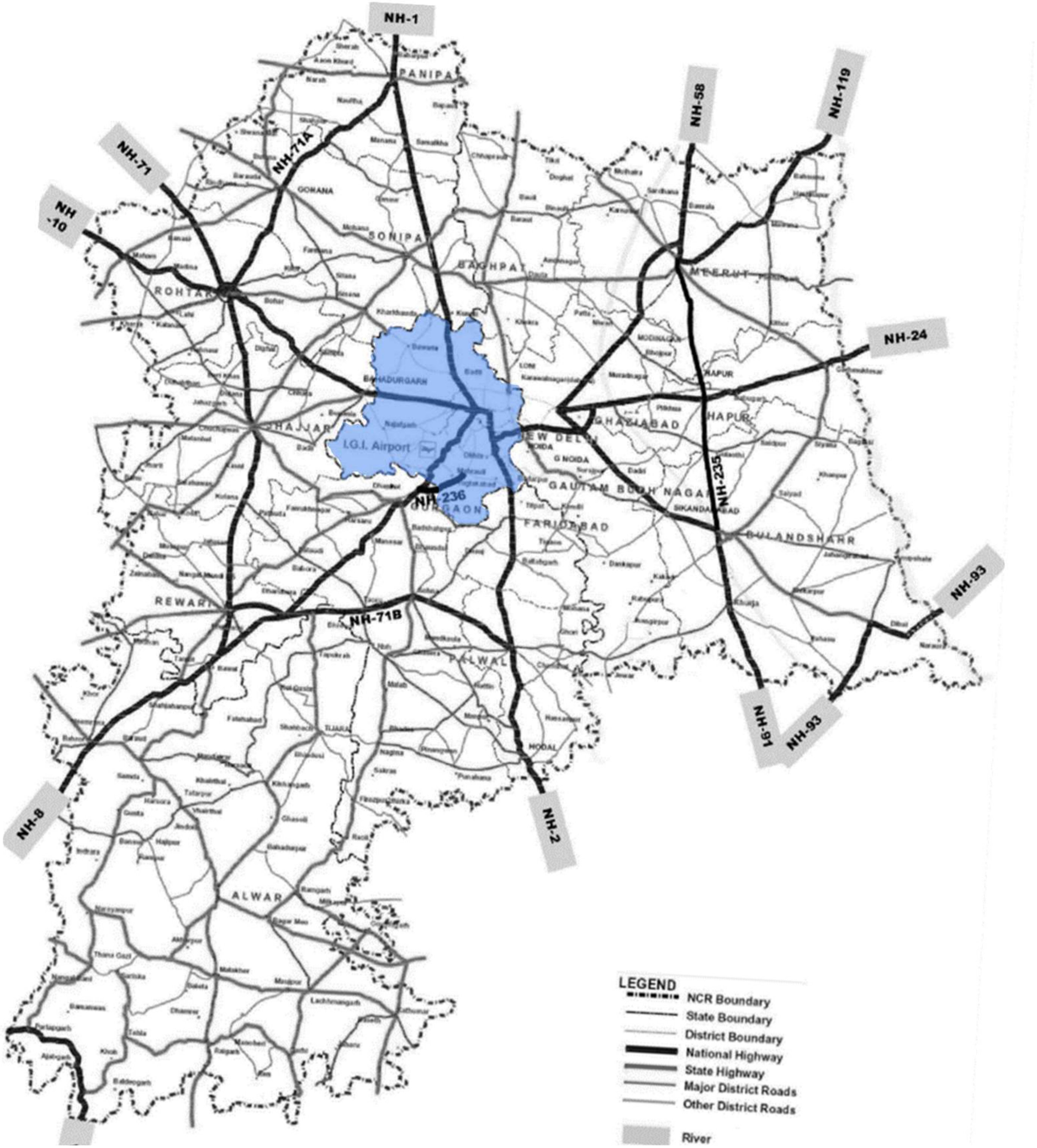
CREATE JOBS – WITH HOUSING BALANCE

# Develop City Regions

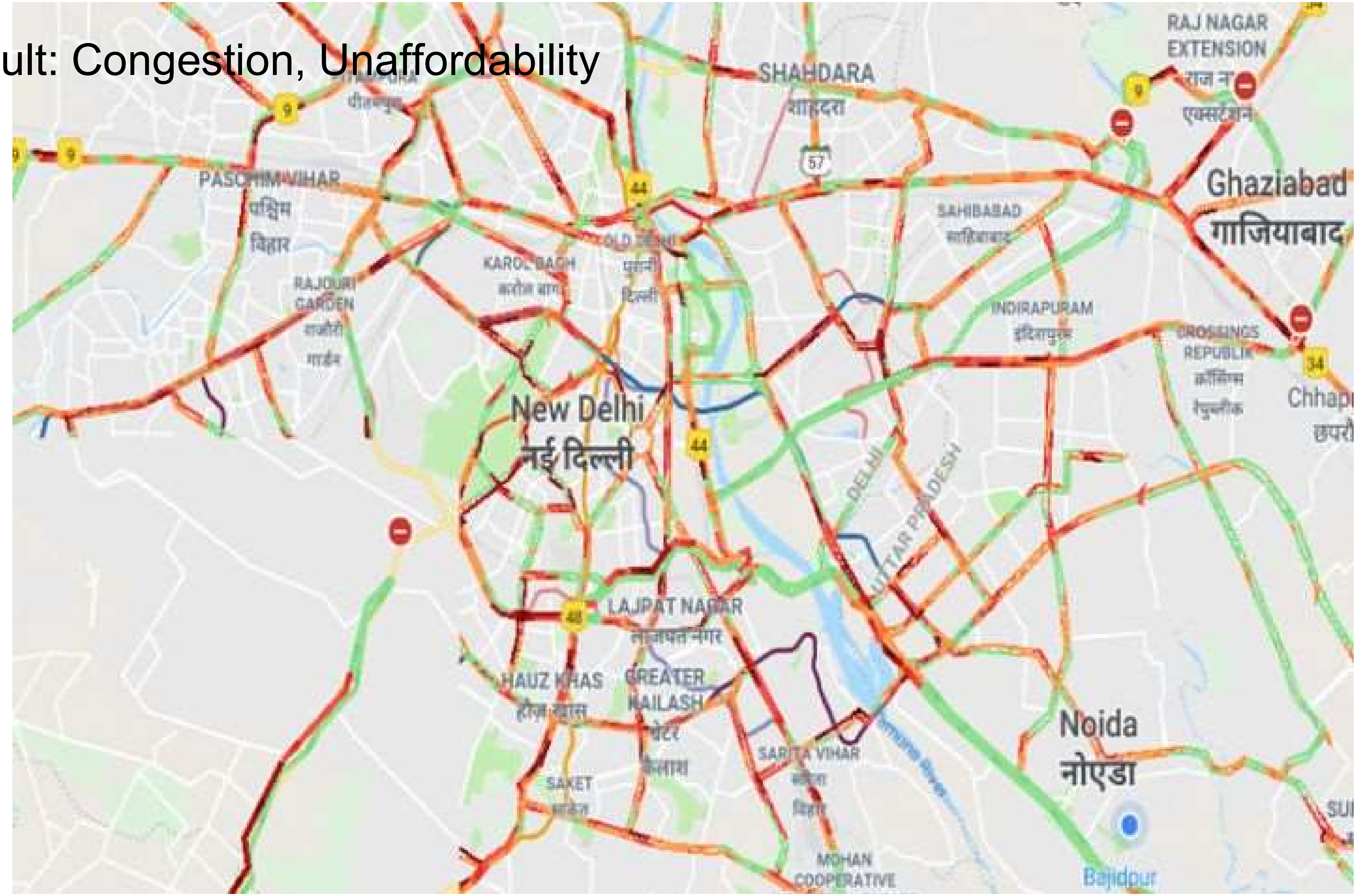

UTTAR PRADESH
REGION/MANDAL MAP
N
INDIA
HARYANA
UTTRAKHAND
NEPAL
RAJASTHAN
MADHYA PRADESH
MADHYA PRADESH
BIHAR
JHARKHAND
PANIPAT
SONEPAT
ROHTAK
JHAJJAR
HARYANA
NCT DELHI
GURGAON
FARIDABAD
REWARI
MEWAT
ALWAR
RAJASTHAN
BAGHPAT
MEERUT
GHAZIABAD
GAUTAMBUDH NAGAR
UTTAR PRADESH
BULANDSHAHR
Legend
NCR Boundary
State Boundary
District Boundary
District H.Q
SAHARANPUR
1
Saharanpur
MUZAFFARNAGAR
BIJNOR
JYOTIBA RAO-PHULE NAGAR
RAMPUR
2
Moradabad
MORADABAD
BAREILLY
PILIBHIT
3
Bareilly
BUDAUN
SHAHJAHANPUR
KHERI
Lucknow
4
SITAPUR
HARDOI
LUCKNOW
LUCKNOW
UNNAO
RAEBARELI
BAHRAICH
SRAVASTI
BALRAMPUR
5
Devipatan
GONDA
BARA BANKI
SIDHARTH NAGAR
6
Basti
BASTI
ST. KABIR NAGAR
MAHARAJGANJ
7
Gorakhpur
KUSHINAGAR
GORAKHPUR
DEORIA
ALIGARH
9
Aligarh
KANSHIRAM NAGAR
MATHURA
MAHAMAYA NAGAR
ETAH
FARRUKHABAD
Agra
10
AGRA
FIROZABAD
MAINPURI
KANNAUJ
11
Kanpur
ETAWAH
AURAIYA
KANPUR DEHAT
KANPUR NAGAR
12
FAIZABAD
Faizabad
AMBEDKAR NAGAR
SULTANPUR
13
MAU
Azamgarh
AZAMGARH
BALLIA
PRATAPGARH
JAUNPUR
GHAZIPUR
Varanasi
VARANASI
17
ST. RAVIDAS NAGAR
CHANDAULI
JALAUN
Jhansi
JHANSI
14
LALITPUR
HAMIRPUR
Chitrakoot
BANDA
MAHOBA
15
CHITRAKOOT
FATEHPUR
Allahabad
KAUSHAMBI
16
ALLAHABAD
MIRZAPUR
Mirzapur
18
SONBHADRA
LEGEND
International Boundary
State Boundary
District Boundary
Region/Mandal Boundary
State Capital
Map not to Scale
Copyright © 2012 www.mapsofindia.com
(Updated on 5th November 2012)


NH-1
NH-58
NH-119
NH-24
NH-93
NH-10
PANIPAT
SONEPAT
HARYANA
ROHTAK
HARYANA
DELHI
MEERUT
GHAZIABAD
UTTAR PRADESH
UTTAR PRADESH
BULANDSHAHR
GURGAON
REWARI
FARIDABAD
RAJASTHAN
RAJASTHAN
ALWAR
Legend
NCR Boundary
State Boundary
District Boundary
River
LEGEND
NCR Boundary
SUB-REGION AREA (Sq.kms)
District Boundary
National Highway
State Highway
Major District Roads
Other District Roads
River
Delhi 1,483
Haryana 13,413
Rajasthan 4,493

The NCR Region doesn’t work
Because of lack of high-speed
reliable transit connections


NH-1
NH-58
NH-119
NH-71
NH-71A
NH -10
PANIPAT
SONIPAT
BAGHPAT
MEERUT
ROHTAK
NH-24
BAHADURGARH
JHAJJAR
I.G.I. Airport
NEW DELHI
GHAZIABAD
HAPUR
NOIDA
G NOIDA
GAUTAM BUDH NAGAR
NH-235
NH-236
GURGAON
FARIDABAD
BULANDSHAHR
NH-93
REWARI
NH-71B
PALWAL
HODAL
NH-91
NH-93
NH-8
NH-2
ALWAR
LEGEND
NCR Boundary
State Boundary
District Boundary
National Highway
State Highway
Major District Roads
Other District Roads
River

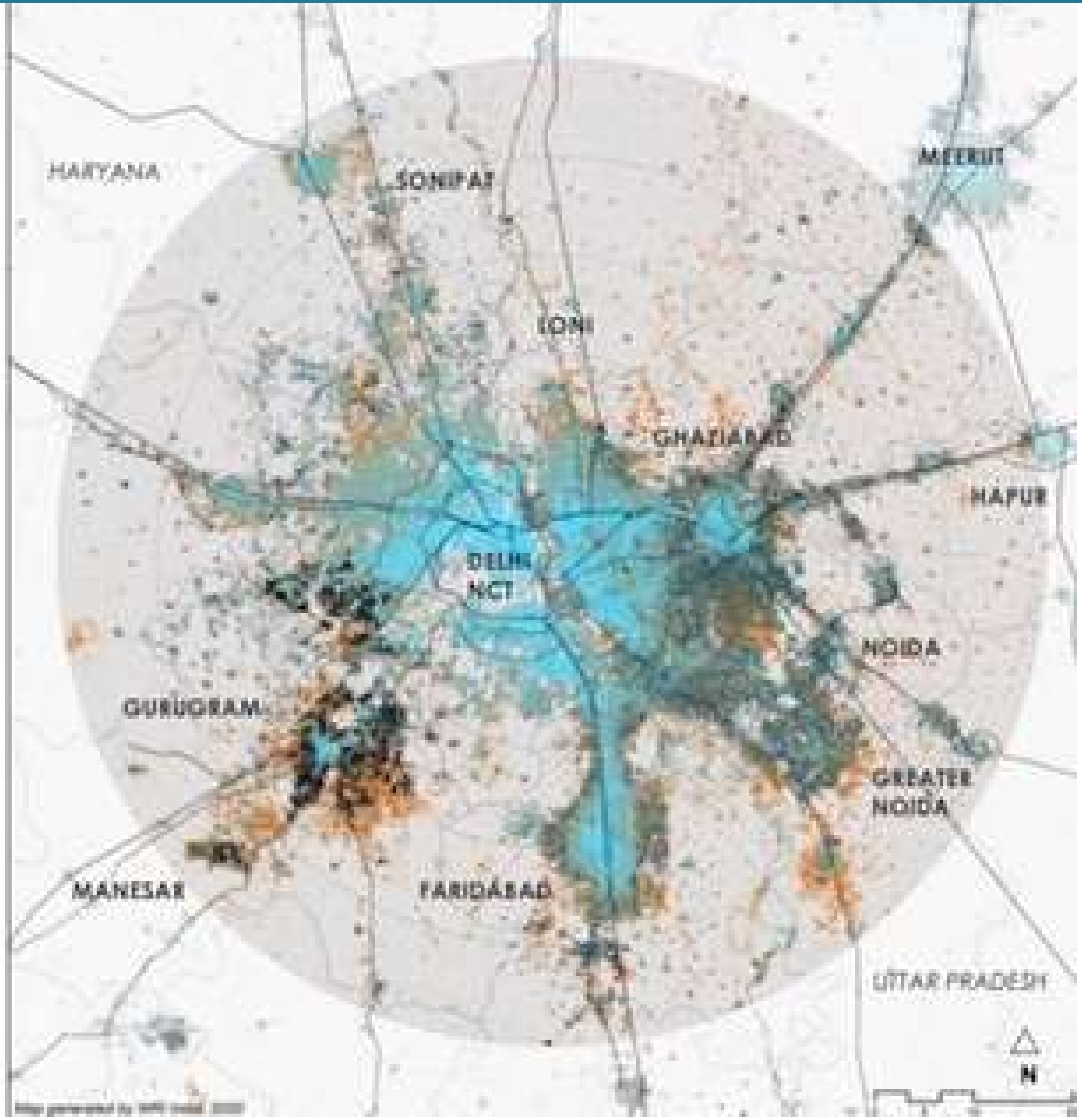
# Result: Congestion, Unaffordability


RAJ NAGAR EXTENSION
SHAHDARA
शाहदरा
PASCHIM VIHAR
पश्चिम विहार
Ghaziabad
गाजियाबाद
SAHIBABAD
KAROL BAGH
करोल बाग
OLD DELHI
पुरानी दिल्ली
RAJOURI GARDEN
राजौरी गार्डन
INDIRAPURAM
इंदिरापुरम
CROSSINGS REPUBLIK
New Delhi
नई दिल्ली
DELHI
UTTAR PRADESH
LAJPAT NAGAR
लाजपत नगर
HAUZ KHAS
हौज़ खास
GREATER KAILASH
SARITA VIHAR
Noida
नोएडा
SAKET
साकेत
MOHAN COOPERATIVE
Bajidpur
9
44
57
48
34

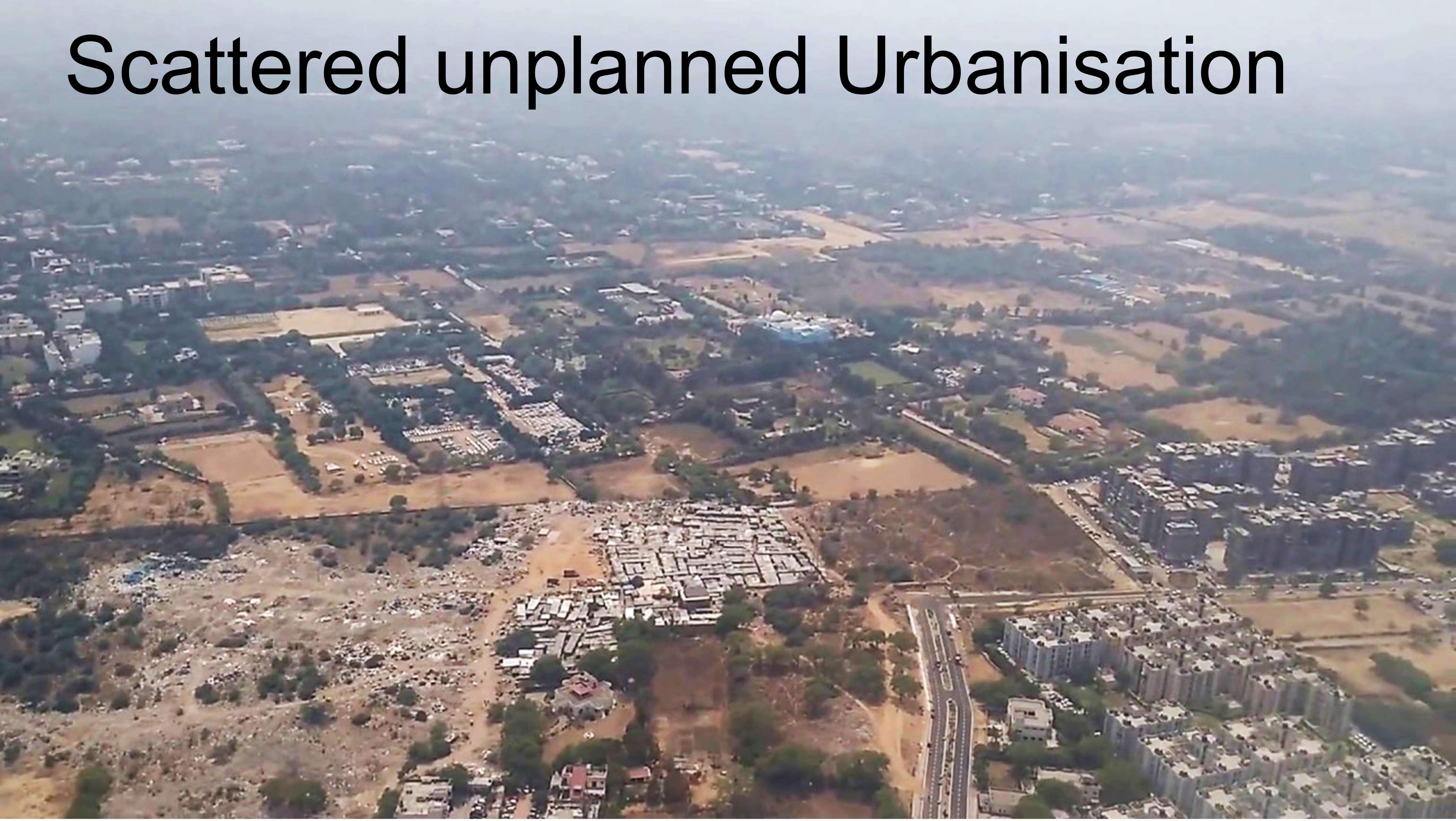
# Problems of Sprawl and Ribbon development

## 1975 to 2020: Growth of the Delhi Metropolitan Region

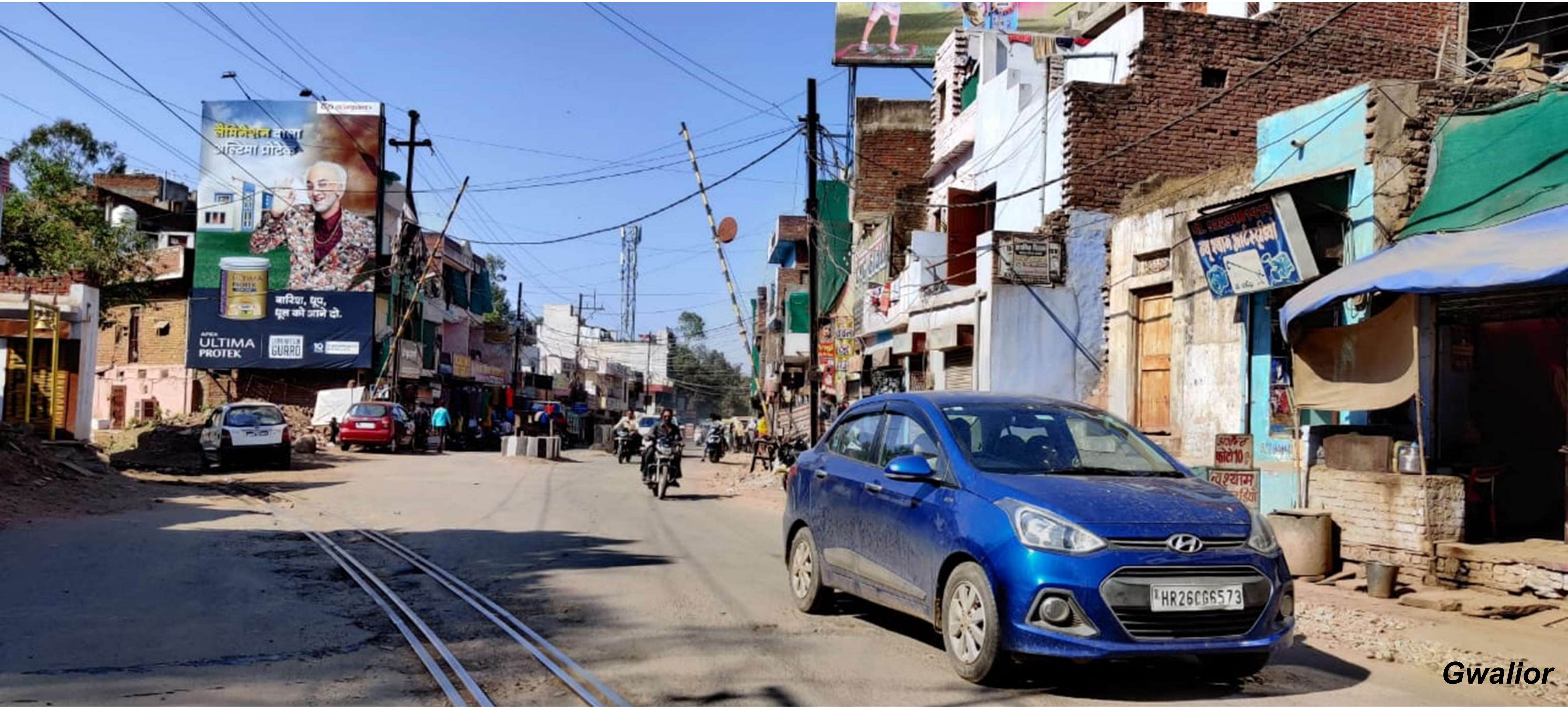
- 🟦 Builtup in 1975
- ▨ Builtup added by 1990
- ⬛ Builtup added by 2000
- ▨ Builtup added by 2010
- 🟧 Builtup added by 2020


HARYANA
SONIPAT
MEERUT
LONI
GHAZIABAD
HAPUR
DELHI NCT
NOIDA
GURUGRAM
GREATER NOIDA
MANESAR
FARIDABAD
UTTAR PRADESH
N

# Scattered unplanned Urbanisation

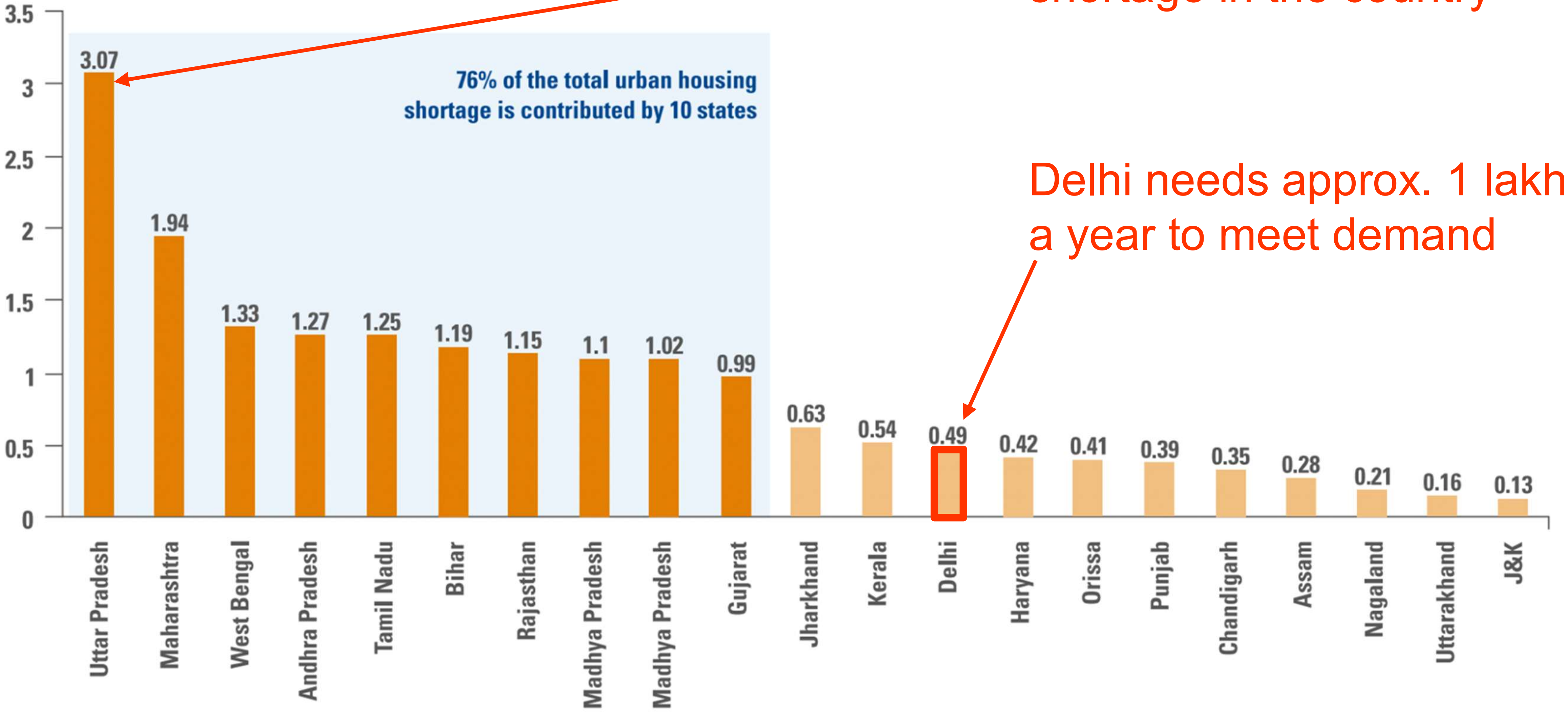


# Unplanned new towns - look like slums


बारिश, धूप,
धूल को आने दो.
ULTIMA
PROTEK
GUARD
HR26CG6573

Gwalior

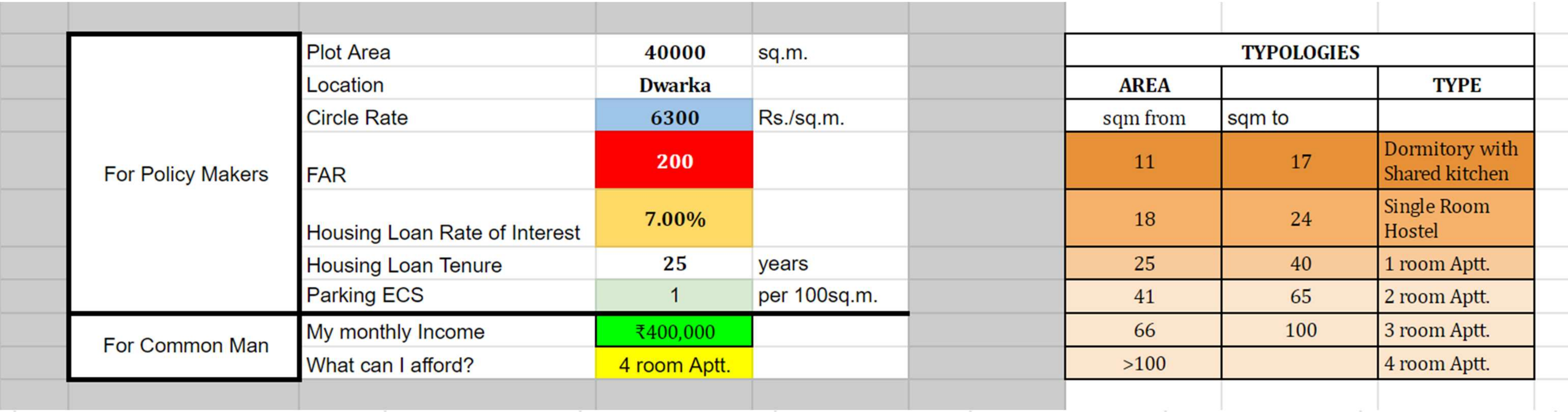
State-wise housing shortage in 2012 (Fig in million)



UP has the highest Urban Housing shortage in the country

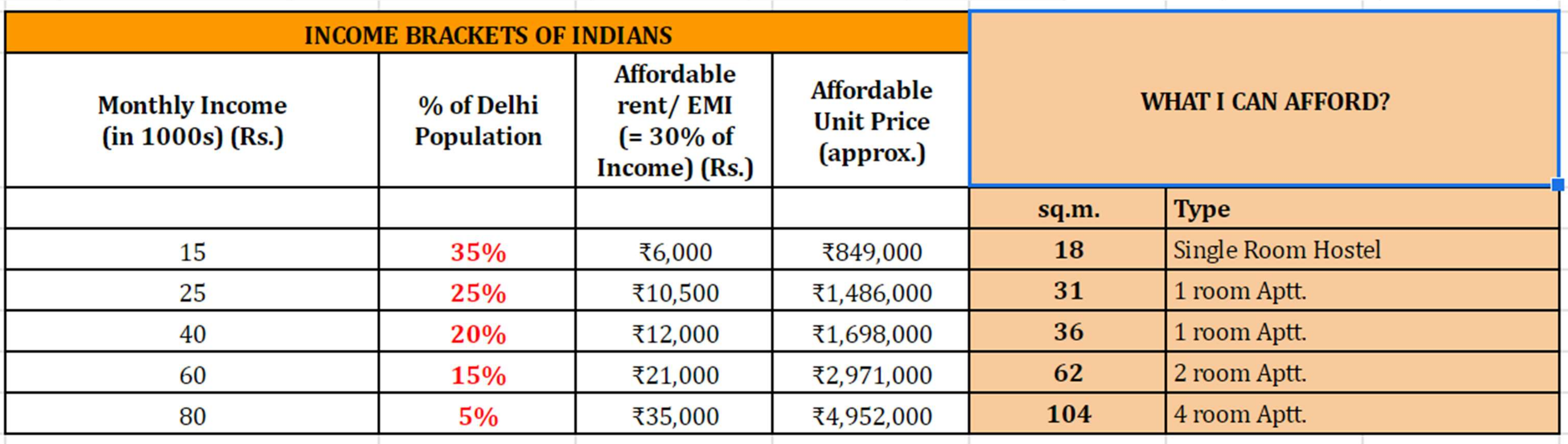
Delhi needs approx. 1 lakh houses a year to meet demand

Source: Report of the Technical Urban Group (TG-12) on Urban Housing Shortage 2012-17, Ministry of Housing and Urban Poverty Alleviation, September 2012



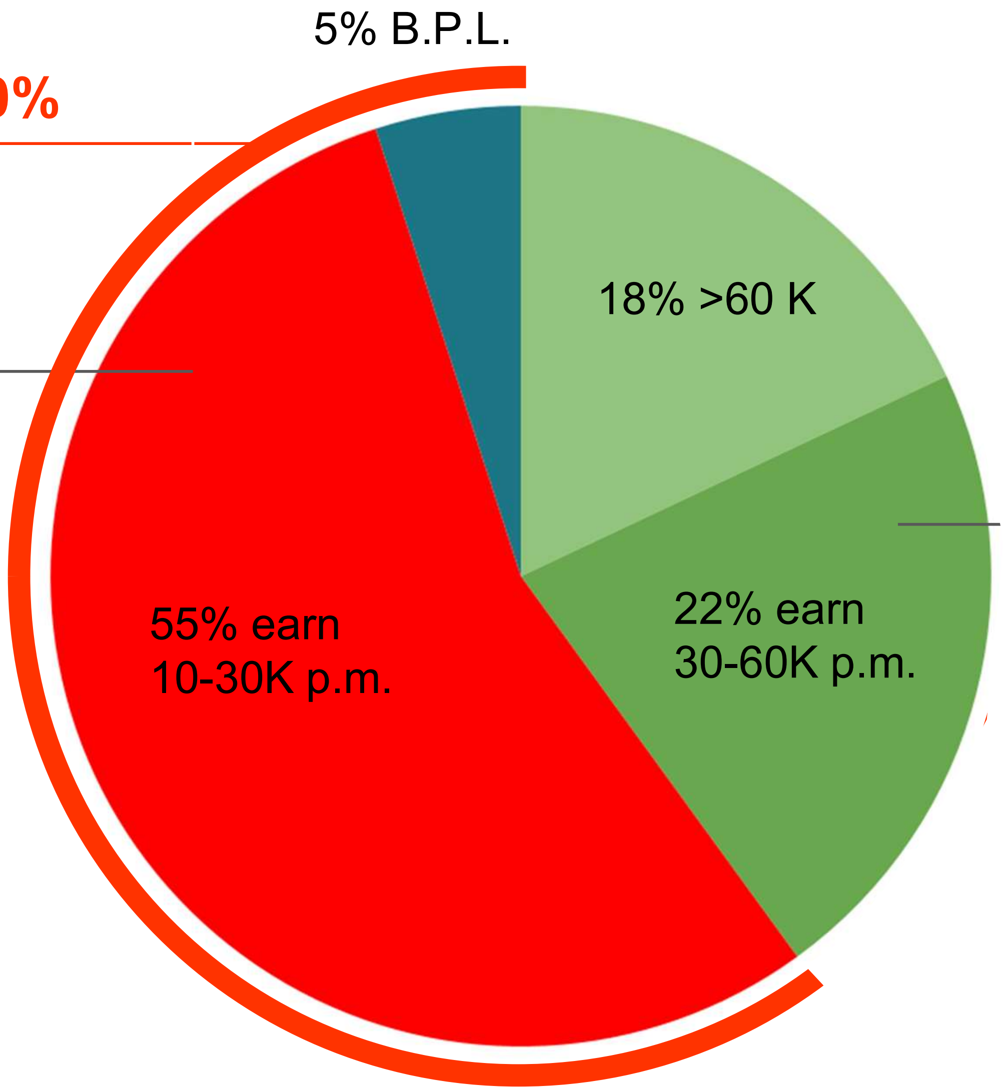
| | | | |
|---|---|---|---|
| For Policy Makers | Plot Area | 40000 | sq.m. |
| | Location | Dwarka | |
| | Circle Rate | 6300 | Rs./sq.m. |
| | FAR | 200 | |
| | Housing Loan Rate of Interest | 7.00% | |
| | Housing Loan Tenure | 25 | years |
| | Parking ECS | 1 | per 100sq.m. |
| For Common Man | My monthly Income | ₹400,000 | |
| | What can I afford? | 4 room Aptt. | |

| TYPOLOGIES | | |
|---|---|---|
| AREA | | TYPE |
| sqm from | sqm to | |
| 11 | 17 | Dormitory with Shared kitchen |
| 18 | 24 | Single Room Hostel |
| 25 | 40 | 1 room Aptt. |
| 41 | 65 | 2 room Aptt. |
| 66 | 100 | 3 room Aptt. |
| >100 | | 4 room Aptt. |



| INCOME BRACKETS OF INDIANS | | | | WHAT I CAN AFFORD? | |
|---|---|---|---|---|---|
| Monthly Income (in 1000s) (Rs.) | % of Delhi Population | Affordable rent/ EMI (= 30% of Income) (Rs.) | Affordable Unit Price (approx.) | | |
| | | | | sq.m. | Type |
| 15 | 35% | ₹6,000 | ₹849,000 | 18 | Single Room Hostel |
| 25 | 25% | ₹10,500 | ₹1,486,000 | 31 | 1 room Aptt. |
| 40 | 20% | ₹12,000 | ₹1,698,000 | 36 | 1 room Aptt. |
| 60 | 15% | ₹21,000 | ₹2,971,000 | 62 | 2 room Aptt. |
| 80 | 5% | ₹35,000 | ₹4,952,000 | 104 | 4 room Aptt. |

# e.g. In Delhi, let’s see what can we afford?



**UNAFFORDABLE for 60%**

CAN AFFORD:

Buy 1 RK / Rent 1BHK in East Delhi
Rent 1BHK in Dwarka
Nothing in North Delhi
Nothing in South Delhi

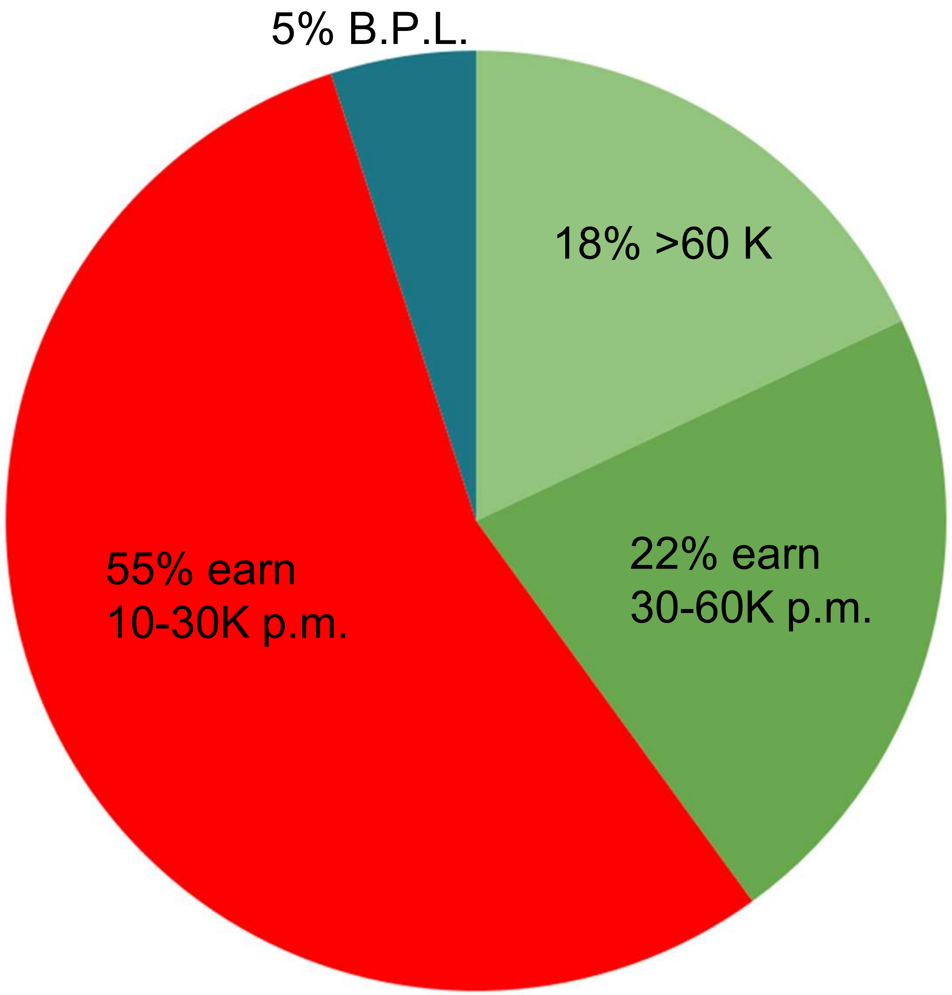
CAN AFFORD:

Buy 1 BHK/ Rent 2-3 BHK in East Delhi
Buy 1 RK / Rent 1-2 BHK in Dwarka
Rent Dorm bed in South Delhi
Rent 1 BHK in North Delhi

1. Source: Consumer Pyramids, Centre for Monitoring Indian Economy P Ltd.
2. Global standard for affordability of housing - Monthly budget for Housing is ≦ 30% of income.

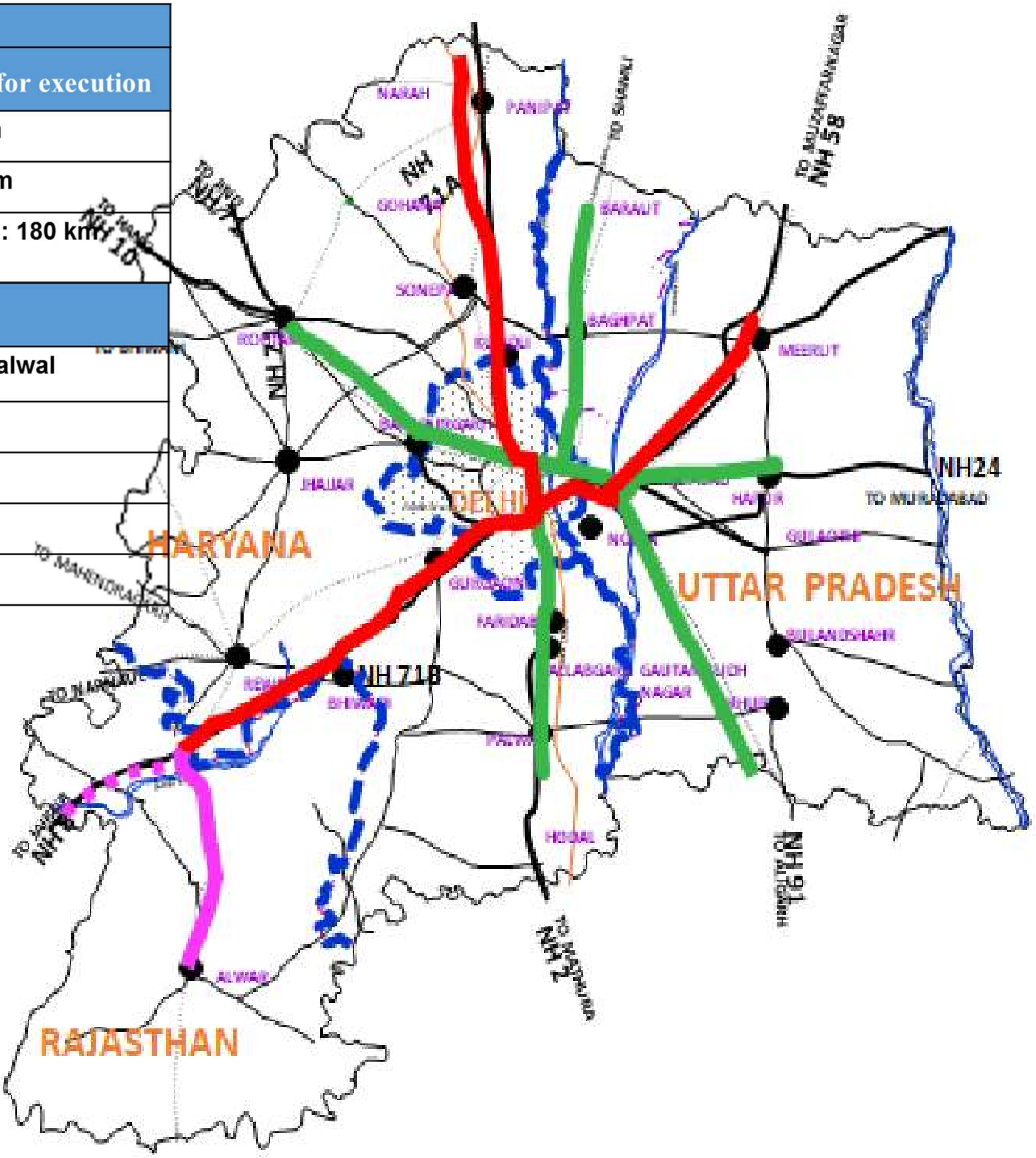
# The Middle/ lower-middle Class is left unserved

Affordability for Middle class needed through private sector



1. Source: Consumer Pyramids, Centre for Monitoring Indian Economy P Ltd.
2. Global standard for affordability of housing - Monthly budget for Housing is ≦ 30% of income.

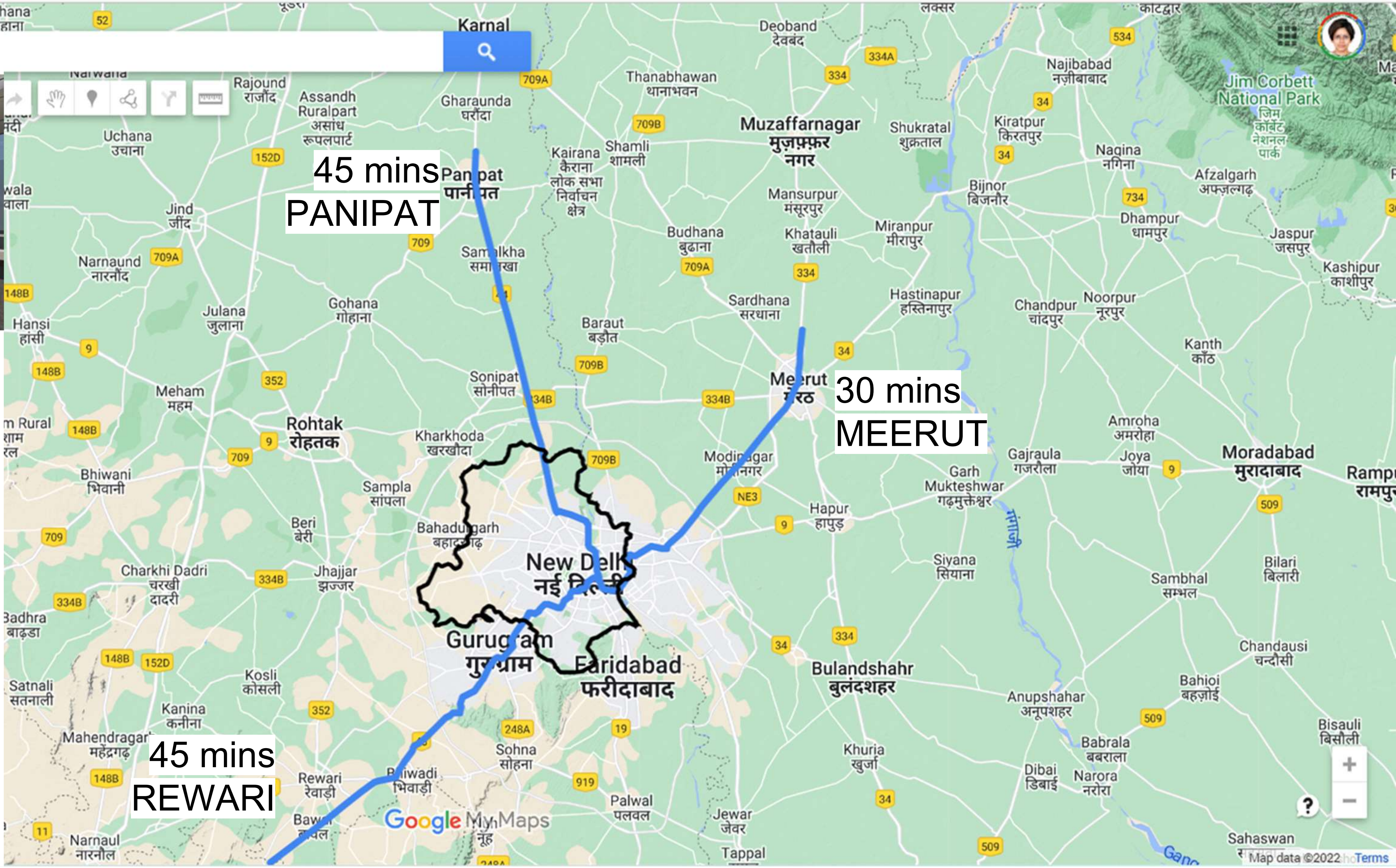
| Sl. No. | RRTS Corridors |
|---|---|
| | **Prioritised Corridors Identified for execution** |
| 1 | Delhi – Sonipat – Panipat : 111 km |
| 2 | Delhi - Ghaziabad -Meerut : 90 km |
| 3 | Delhi - Gurgaon – Rewari - Alwar : 180 km |
| | **For Second Phase** |
| 4 | Delhi – Faridabad – Ballabgarh - Palwal |
| 5 | Ghaziabad – Khurja |
| 6 | Delhi - Bahadurgarh - Rohtak |
| 7 | Ghaziabad-Hapur |
| 8 | Delhi-Shahadra-Baraut |


NARAH
PANIPAT
TO SHAMLI
TO MUZAFFARNAGAR
NH 58
NH 71A
GOHANA
BARAUT
TO JIND
NH 71
TO HANSI
NH 10
SONEPAT
BAGHPAT
ROHTAK
MEERUT
NH 71
TO BHIWANI
JHAJJAR
DELHI
HAPUR
NH24
TO MURADABAD
GULAOTHI
HARYANA
UTTAR PRADESH
GURGAON
FARIDABAD
TO MAHENDRAGARH
BULANDSHAHR
NH 71B
REWARI
BHIWADI
BALLABGARH
GAUTAM BUDH NAGAR
KHURJA
TO NARNAUL
PALWAL
TO JAIPUR
NH 8
HODAL
NH 91
TO ALIGARH
NH 2
TO MATHURA
ALWAR
RAJASTHAN

# Possible solution

## ➢ Rapid Rail Transit System - 1.5x speed of Rail

GHAZIABAD
MEERUT
ncrtc


Karnal
Panipat
पानीपत
Sonipat
सोनीपत
Meerut
मेरठ
New Delhi
नई दिल्ली
Gurugram
गुरुग्राम
Faridabad
फरीदाबाद
Rohtak
रोहतक
Muzaffarnagar
मुज़फ़्फ़रनगर
Bulandshahr
बुलंदशहर
Moradabad
मुरादाबाद
Rewari
रेवाड़ी
Bhiwadi
भिवाड़ी
Google My Maps
Map data ©2022
Terms

45 mins
PANIPAT

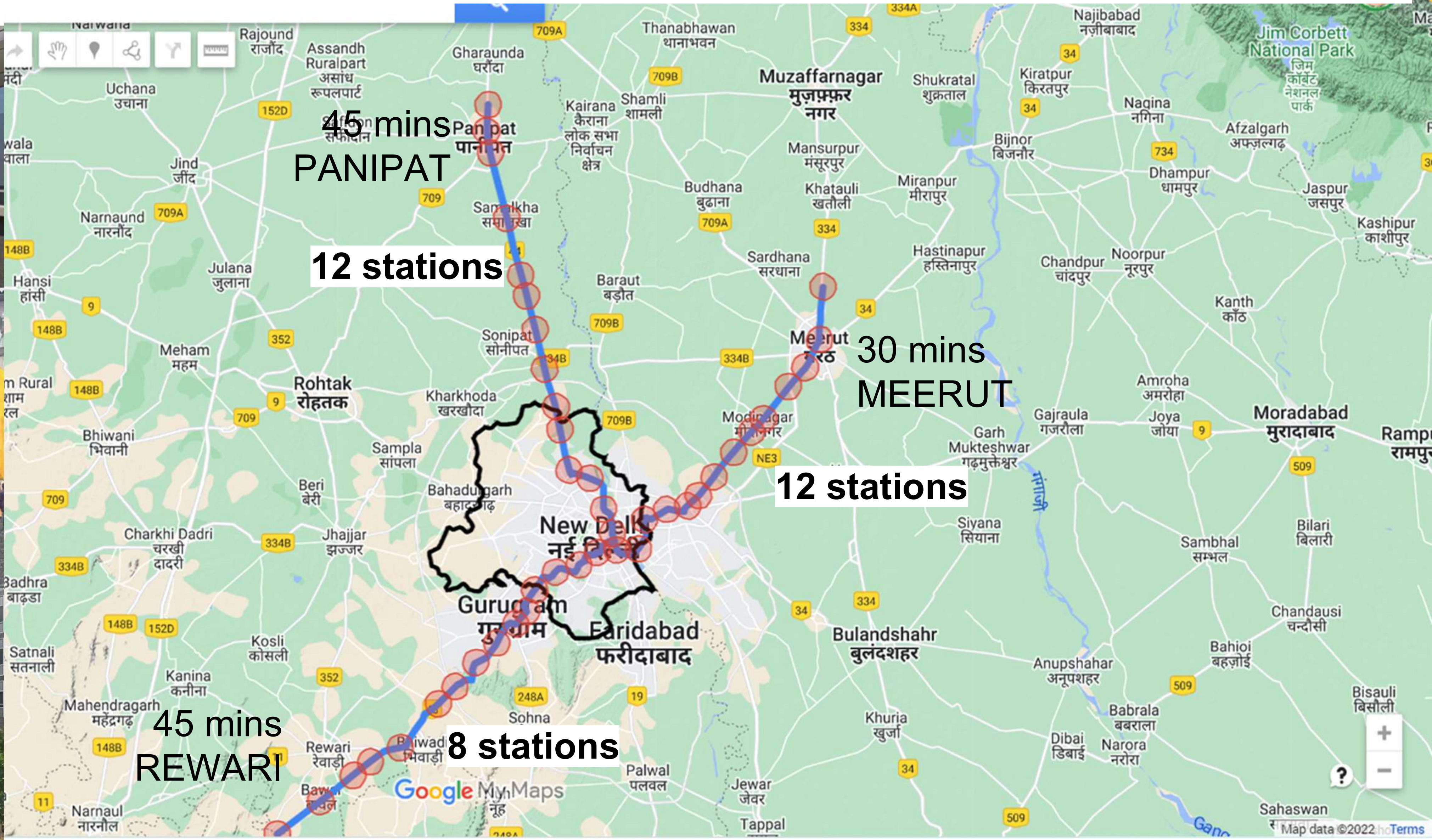
30 mins
MEERUT

45 mins
REWARI

# ➢ New compact TOD-towns near RRTS stations

GHAZIABAD
MEERUT
ncrtc

RTS CENTRAL STATION
marta
MARTA TAKES YOU THERE


45 mins
PANIPAT

12 stations

30 mins
MEERUT

12 stations

45 mins
REWARI

8 stations

Panipat
Samalkha
Sonipat
Meerut
Modinagar
New Delhi
Gurugram
Faridabad
Rewari
Bawal
Rohtak
Muzaffarnagar
Bulandshahr
Moradabad
Jim Corbett National Park
Google My Maps
Map data ©2022
Terms

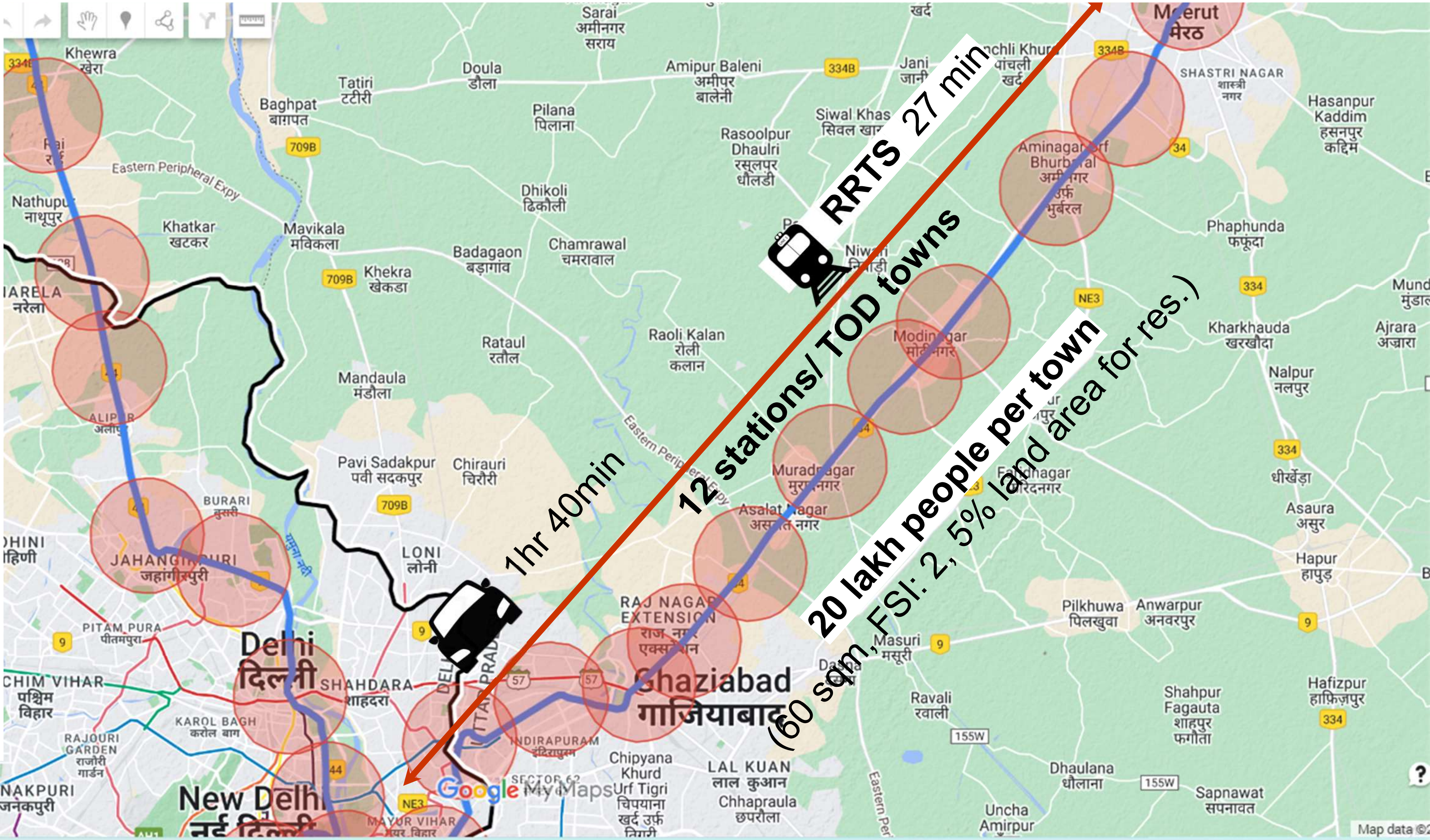
# ➢ TOD-towns can absorb the Affordable Housing Deficit & Generate localized Jobs - i.e. decentralization

**IN TOD TOWNS: LOWER MIDDLE CLASS CAN AFFORD:**

**Buy 1 BHK/ Rent 2 BHK** in Modinagar

**Buy 1 Room/ 1.5 BHK Rent** in Meerut

**Dorm/ 1 BHK Rent** in Delhi


RRTS 27 min
12 stations/ TOD towns
20 lakh people per town
(60 sqm, FSI: 2, 5% land area for res.)
1hr 40min
Meerut
मेरठ
Modinagar
मोदीनगर
Muradnagar
मुरादनगर
Ghaziabad
गाजियाबाद
Delhi
दिल्ली
New Delhi
नई दिल्ली
Google My Maps
Map data ©

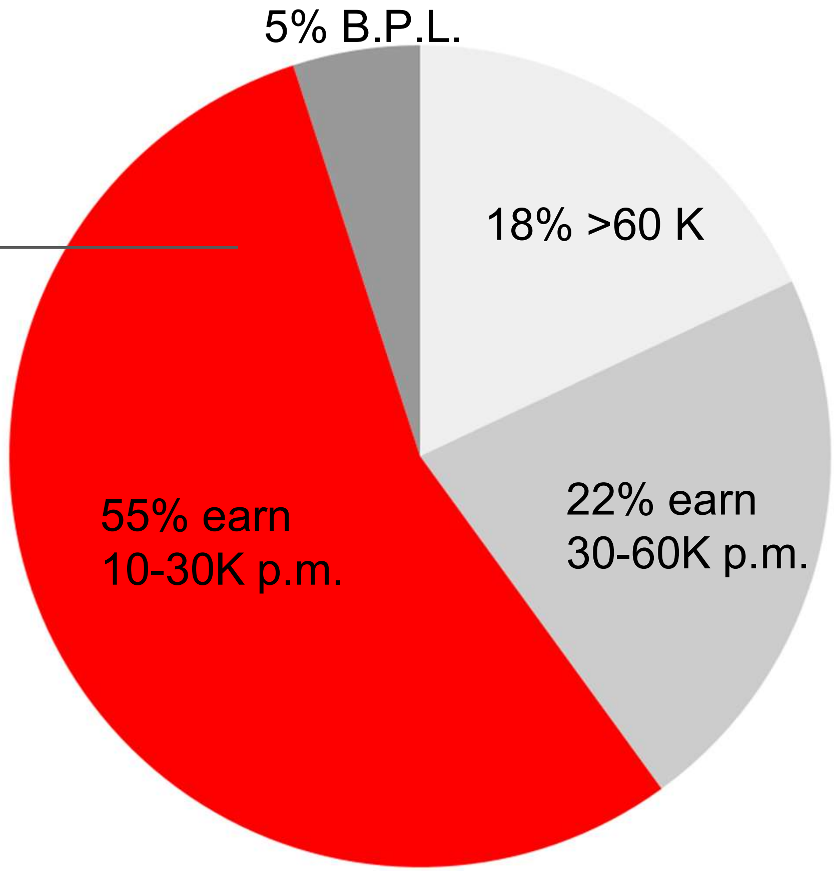
# ➢ Regional Cities offer Housing & Lifestyle Choices if
# - invested in & planned as per TOD principles

**IN TOD TOWNS: LOWER MIDDLE CLASS CAN AFFORD:**

**Dorm/ 1 BHK Rent** in Delhi

**Rent 1.5 BHK Rent** in Meerut

**Buy 1 BHK or Rent 2 BHK** in Modinagar



# The Indian Dream

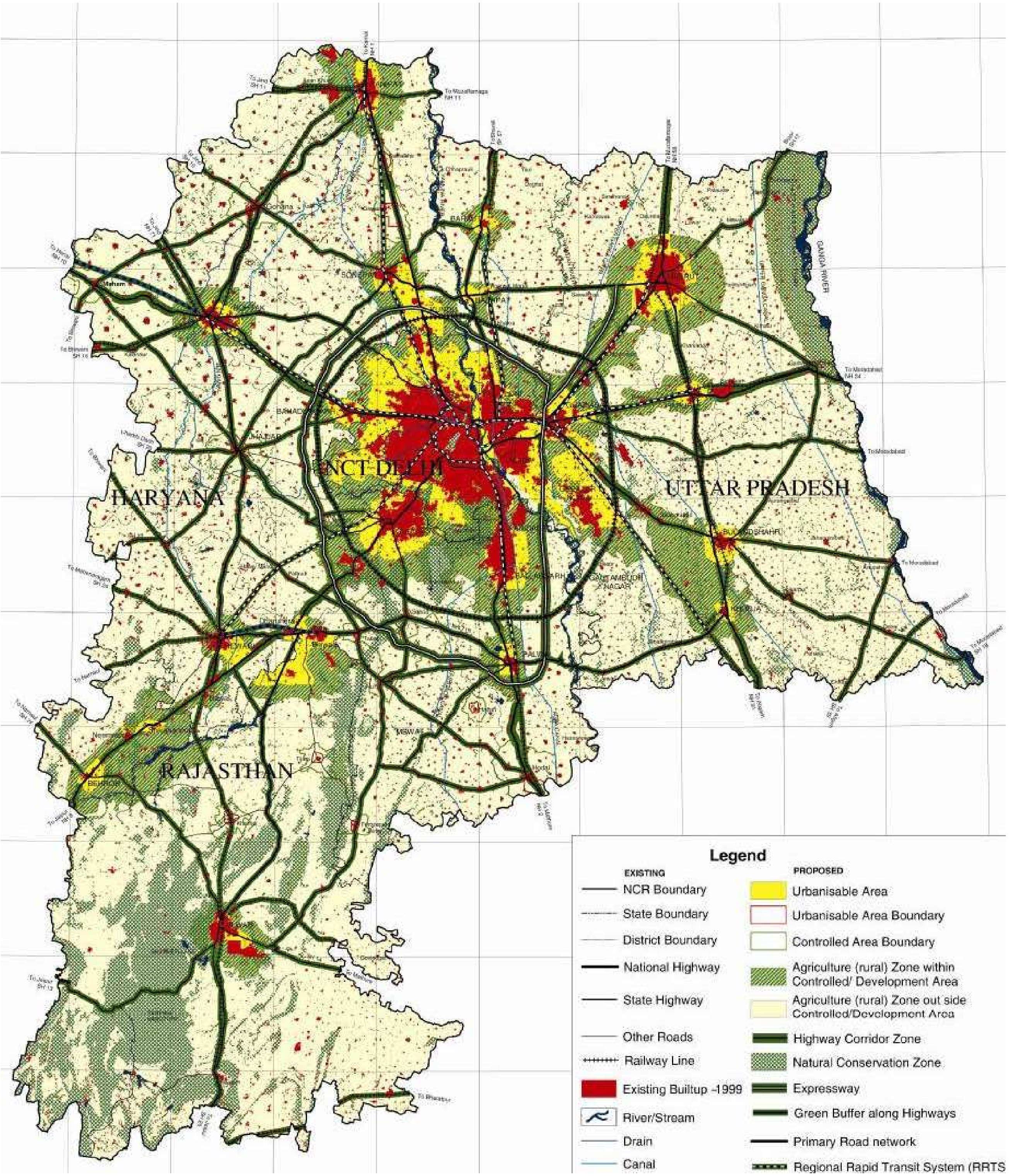
# Sprawl – ribbon Development

Planned and unplanned Sprawl leads to unending consumption of Resources.

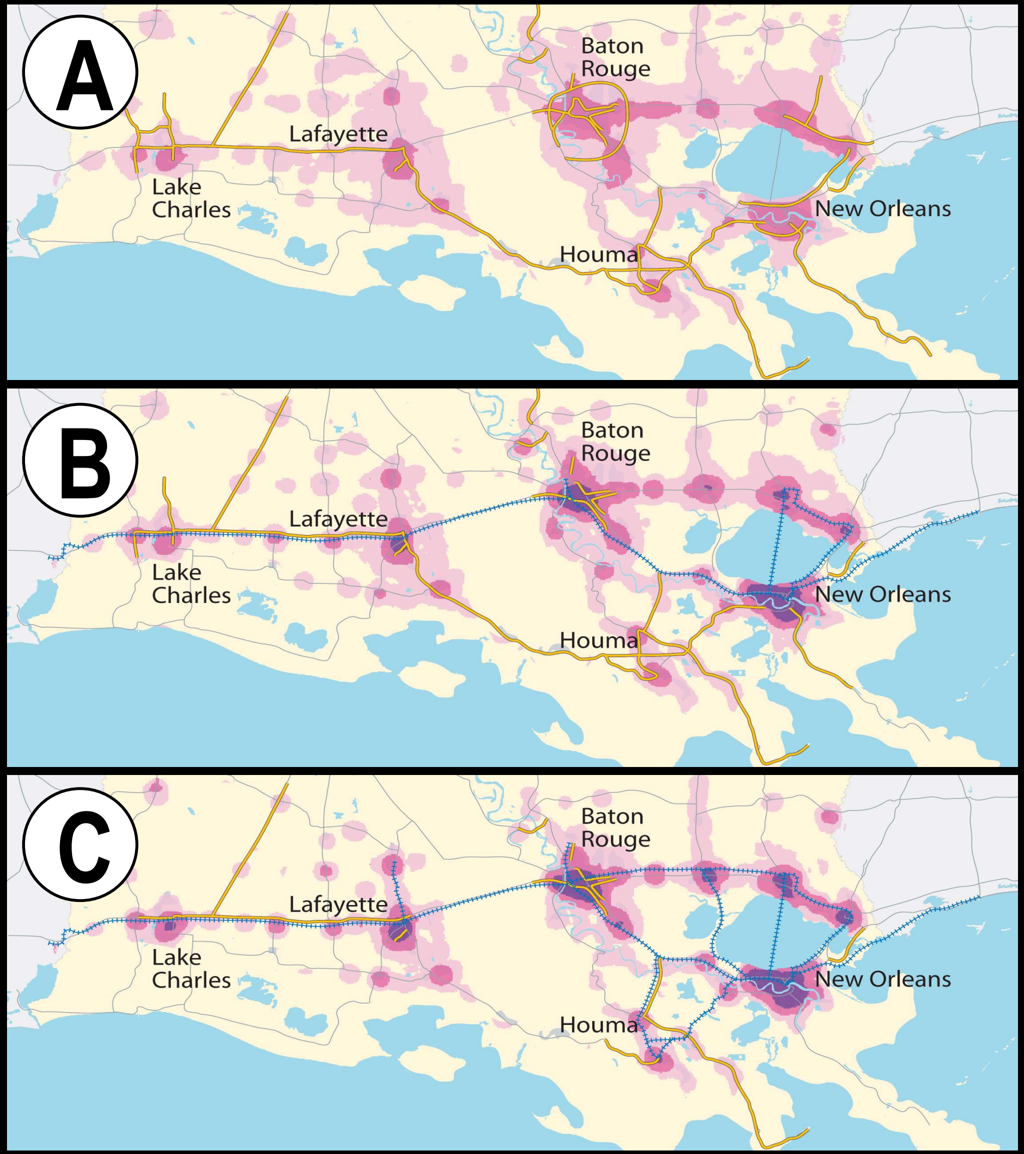
# Transit Oriented Development

1. Various lifestyle choices
2. Preservation of natural resources and built heritage
3. Better access to city level green areas

NCR Region to be re-planned based on TOD principles


HARYANA
NCT DELHI
UTTAR PRADESH
RAJASTHAN
GANGA RIVER
Legend
EXISTING
NCR Boundary
State Boundary
District Boundary
National Highway
State Highway
Other Roads
Railway Line
Existing Builtup -1999
River/Stream
Drain
Canal
PROPOSED
Urbanisable Area
Urbanisable Area Boundary
Controlled Area Boundary
Agriculture (rural) Zone within Controlled/ Development Area
Agriculture (rural) Zone out side Controlled/Development Area
Highway Corridor Zone
Natural Conservation Zone
Expressway
Green Buffer along Highways
Primary Road network
Regional Rapid Transit System (RRTS

# Modeling the Scenarios to Provide Options

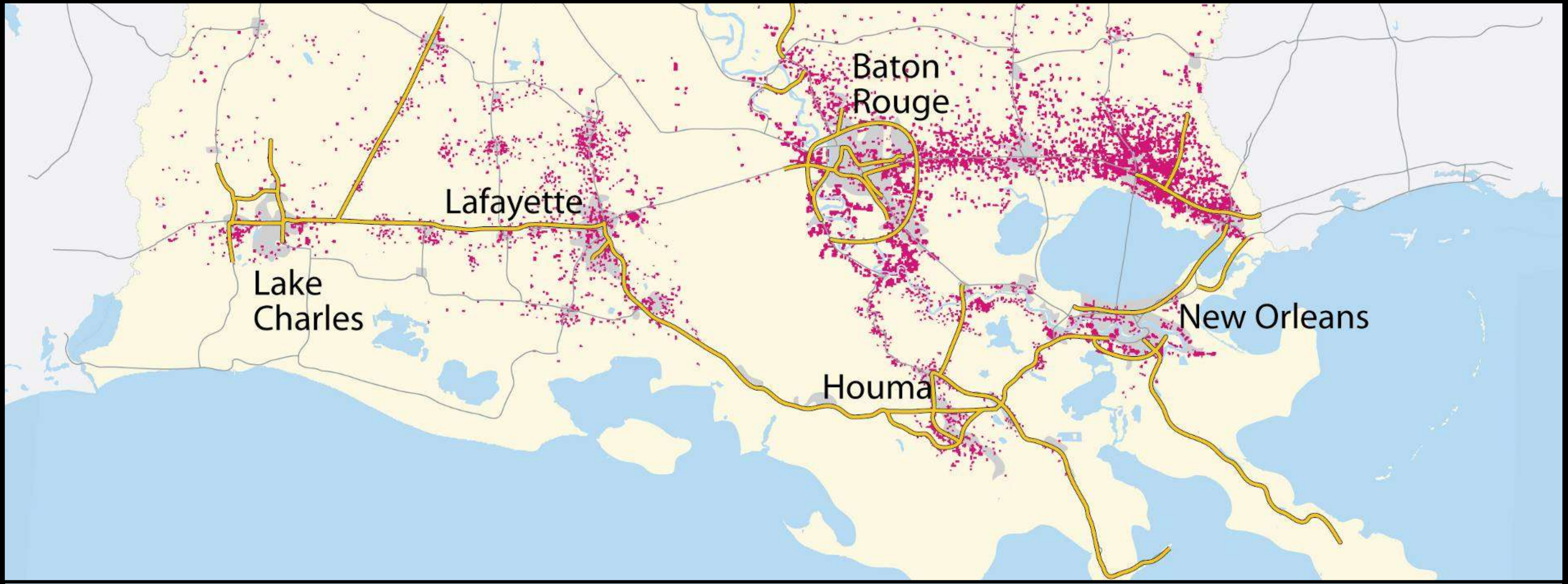

A
Baton Rouge
Lafayette
Lake Charles
New Orleans
Houma
B
Baton Rouge
Lafayette
Lake Charles
New Orleans
Houma
C
Baton Rouge
Lafayette
Lake Charles
New Orleans
Houma

## Three Potential Options

*Each has the same number of people and jobs, arranged in different ways around different kinds of transportation infrastructure*

# Modeling the Scenarios to Provide Options

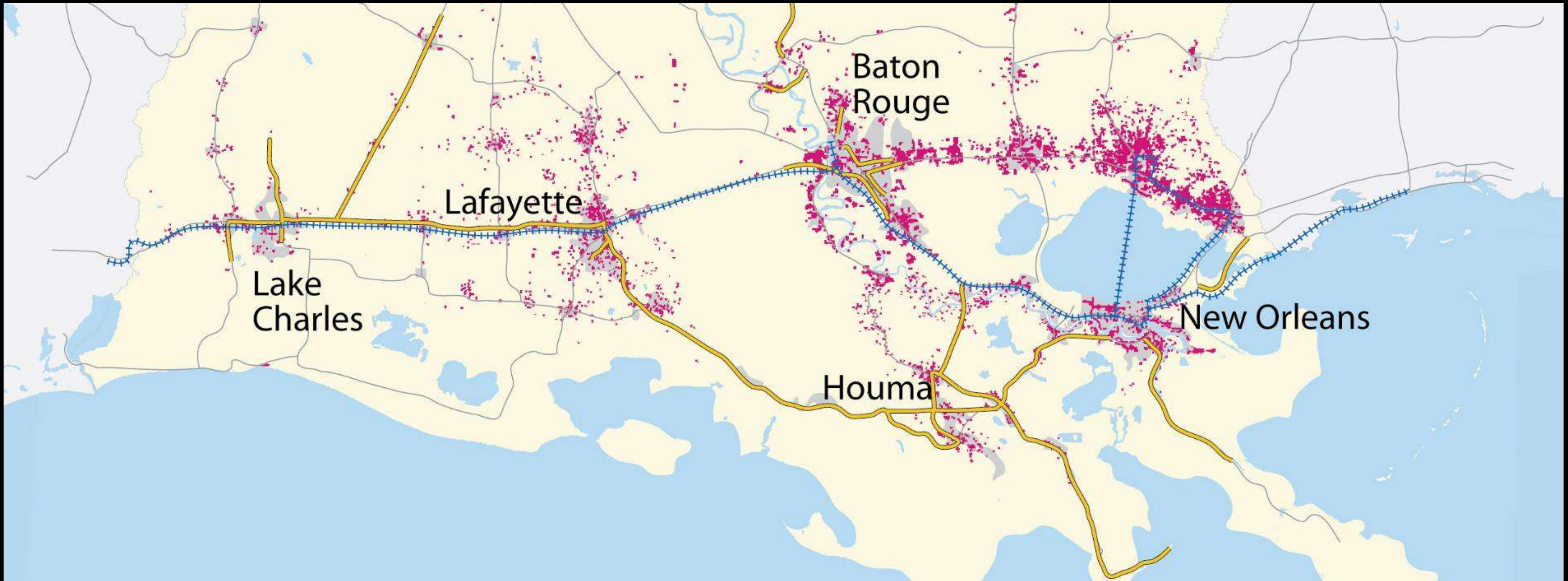
## Ⓐ Keep Building and Developing As We Are


Baton Rouge
Lafayette
Lake Charles
New Orleans
Houma

**Open Land Developed : 460 Square Miles**

# Modeling the Scenarios to Provide Options

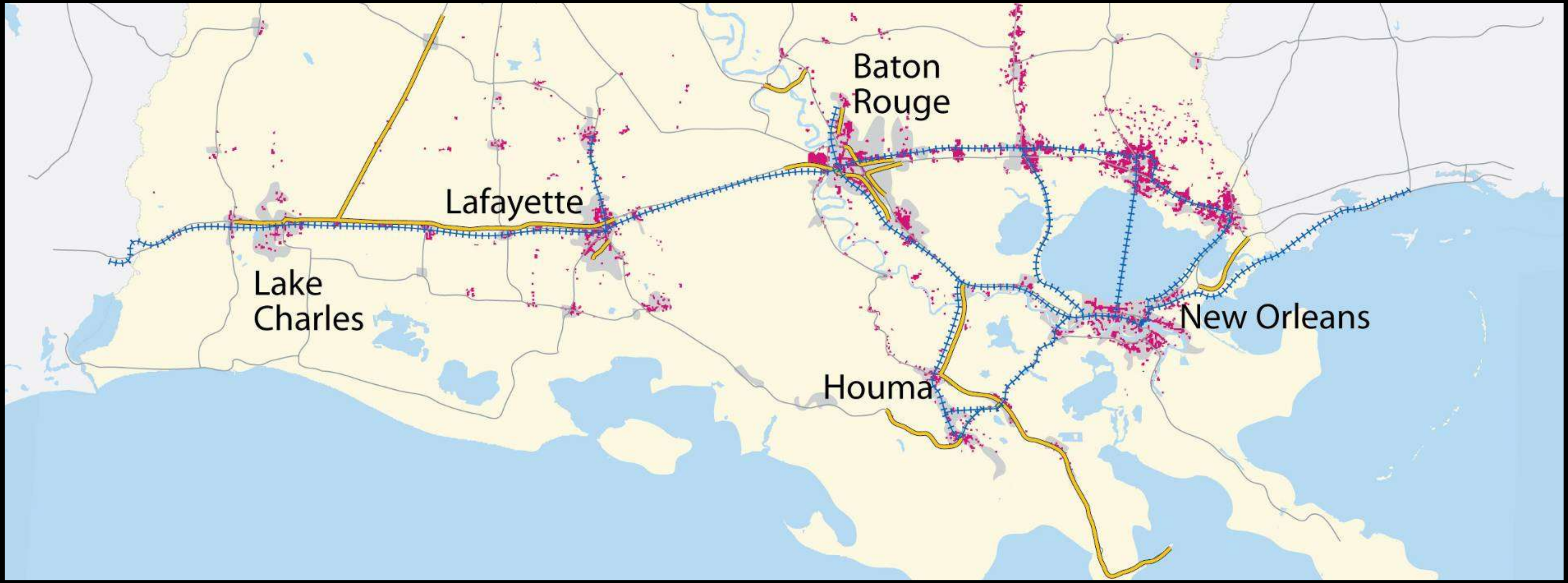
## Ⓑ Modify Development Patterns


Baton Rouge
Lafayette
Lake Charles
New Orleans
Houma

Open Land Developed : 260 Square Miles

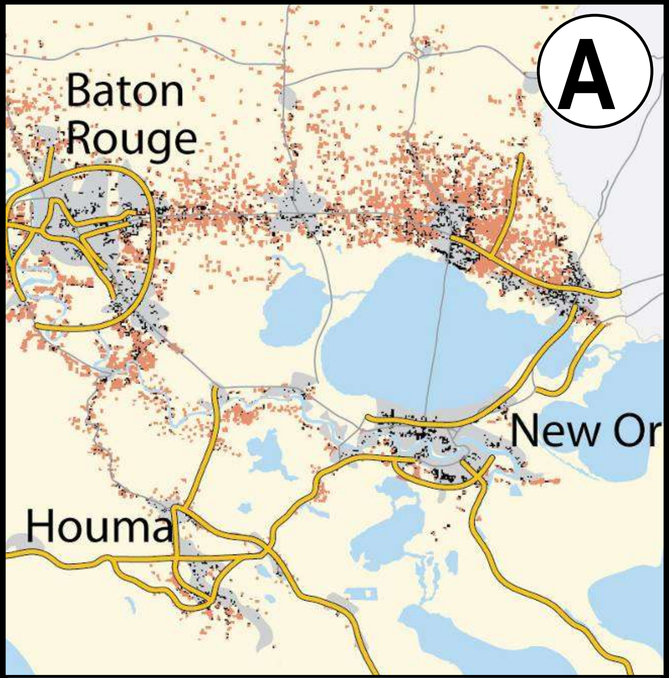
# Modeling the Scenarios to Provide Options

## Ⓒ Focus Development in Existing Cities & Towns


Baton Rouge
Lafayette
Lake Charles
New Orleans
Houma

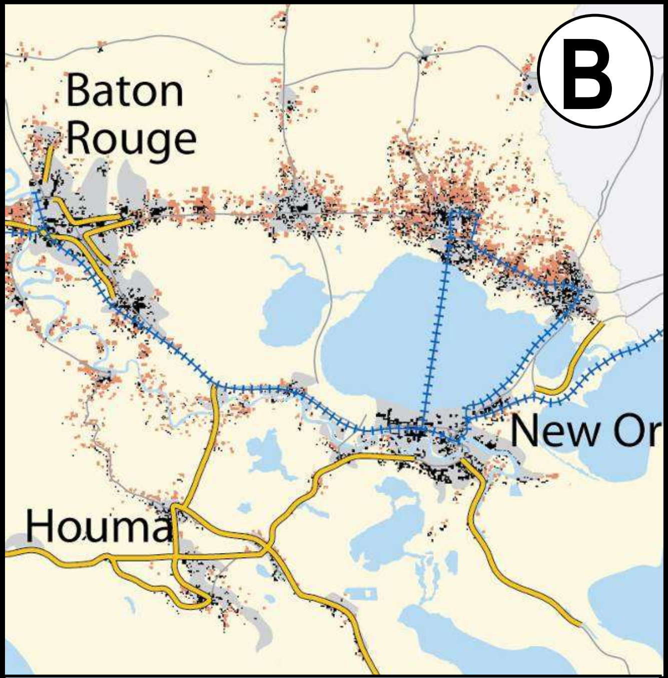
Open Land Developed : 130 Square Miles

# Modeling the Scenarios to Provide Options


A
Baton Rouge
New Or
Houma

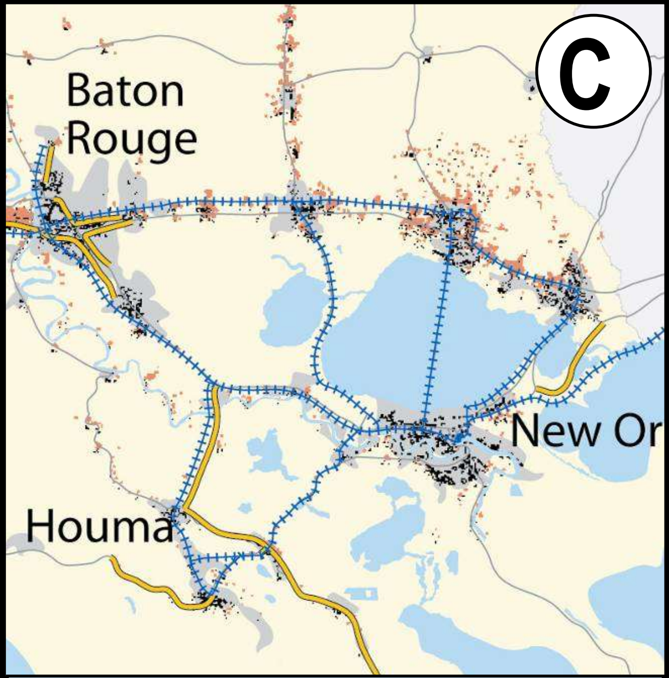
Open Land : 90%
Existing Communities : 10%

Open Land Developed
460 Sq. Miles


B
Baton Rouge
New Or
Houma

Open Land : 63%
Existing Communities : 37%

Open Land Developed
260 Sq. Miles

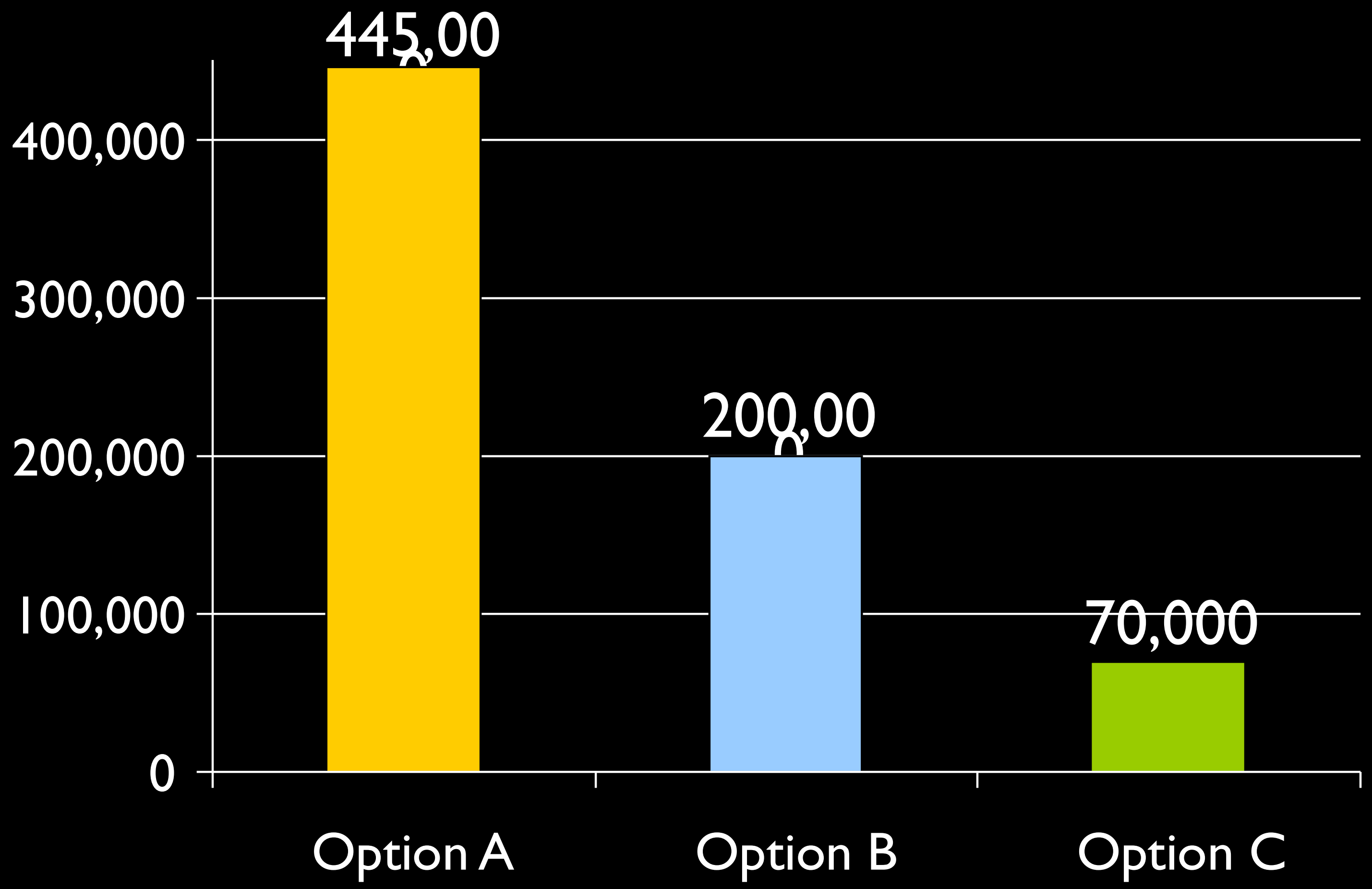

C
Baton Rouge
New Or
Houma

Open Land : 42%
Existing Communities : 58%

Open Land Developed
130 Sq. Miles

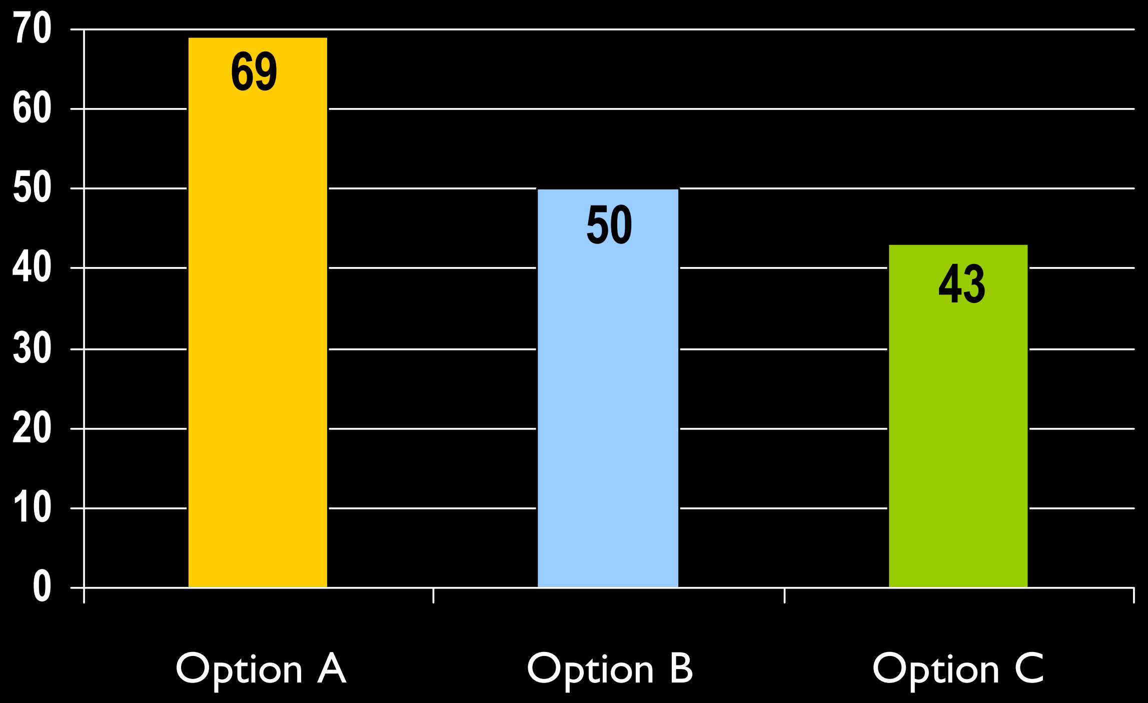
# Communicating the Consequences

New Population Located in Floodplain

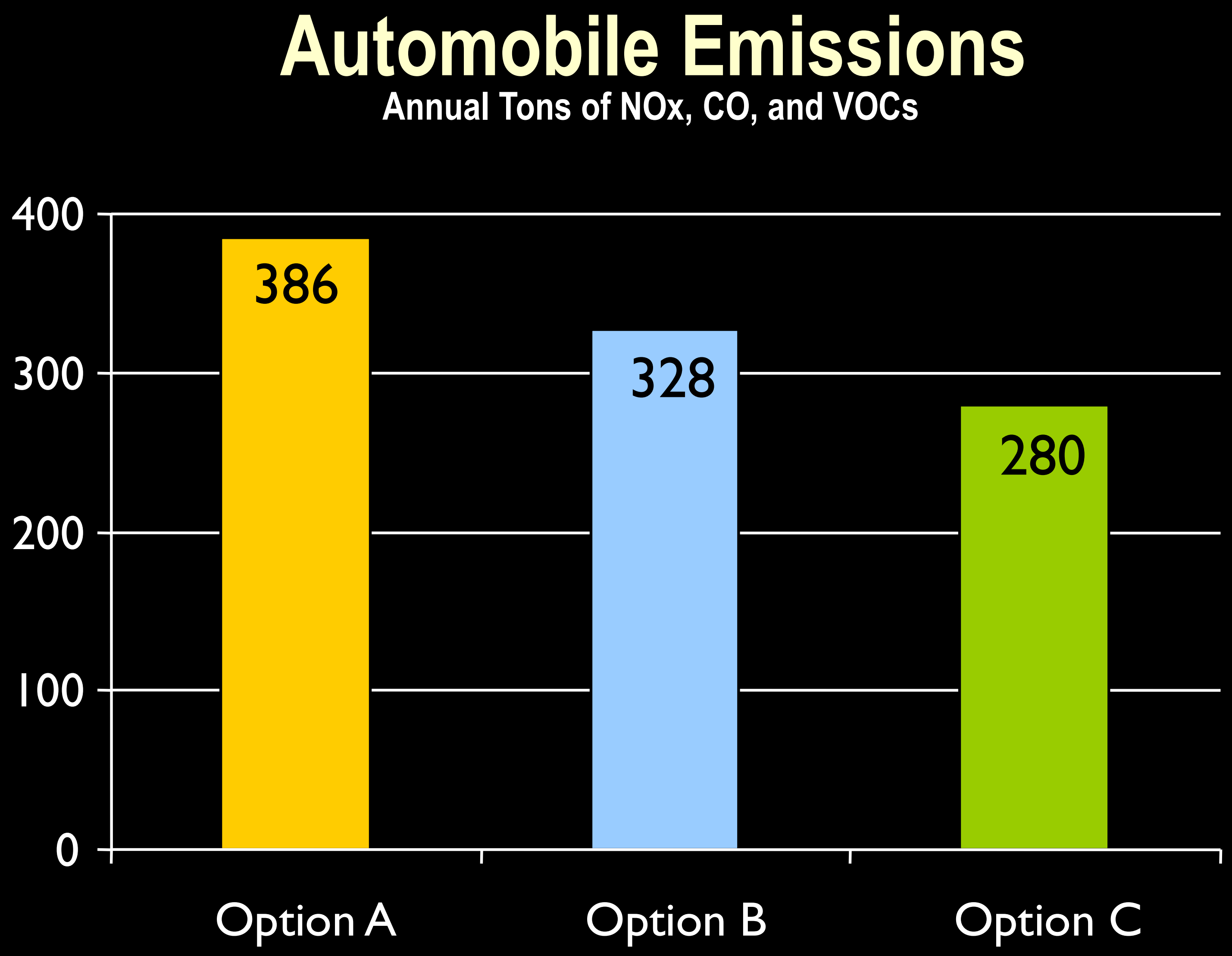


# Communicating the Consequences

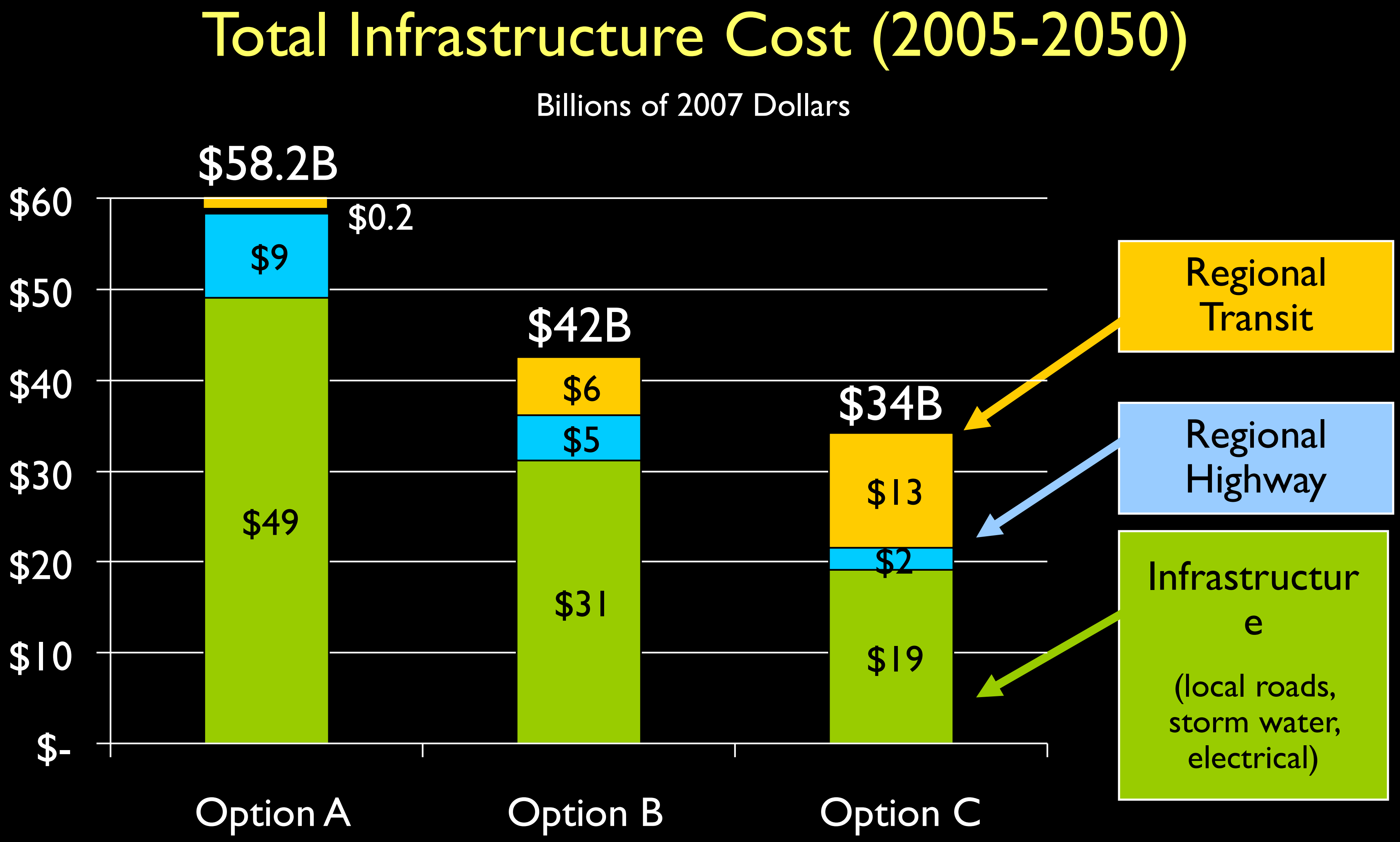
## Daily Auto Vehicle Miles Traveled Per Household



# Communicating the Consequences



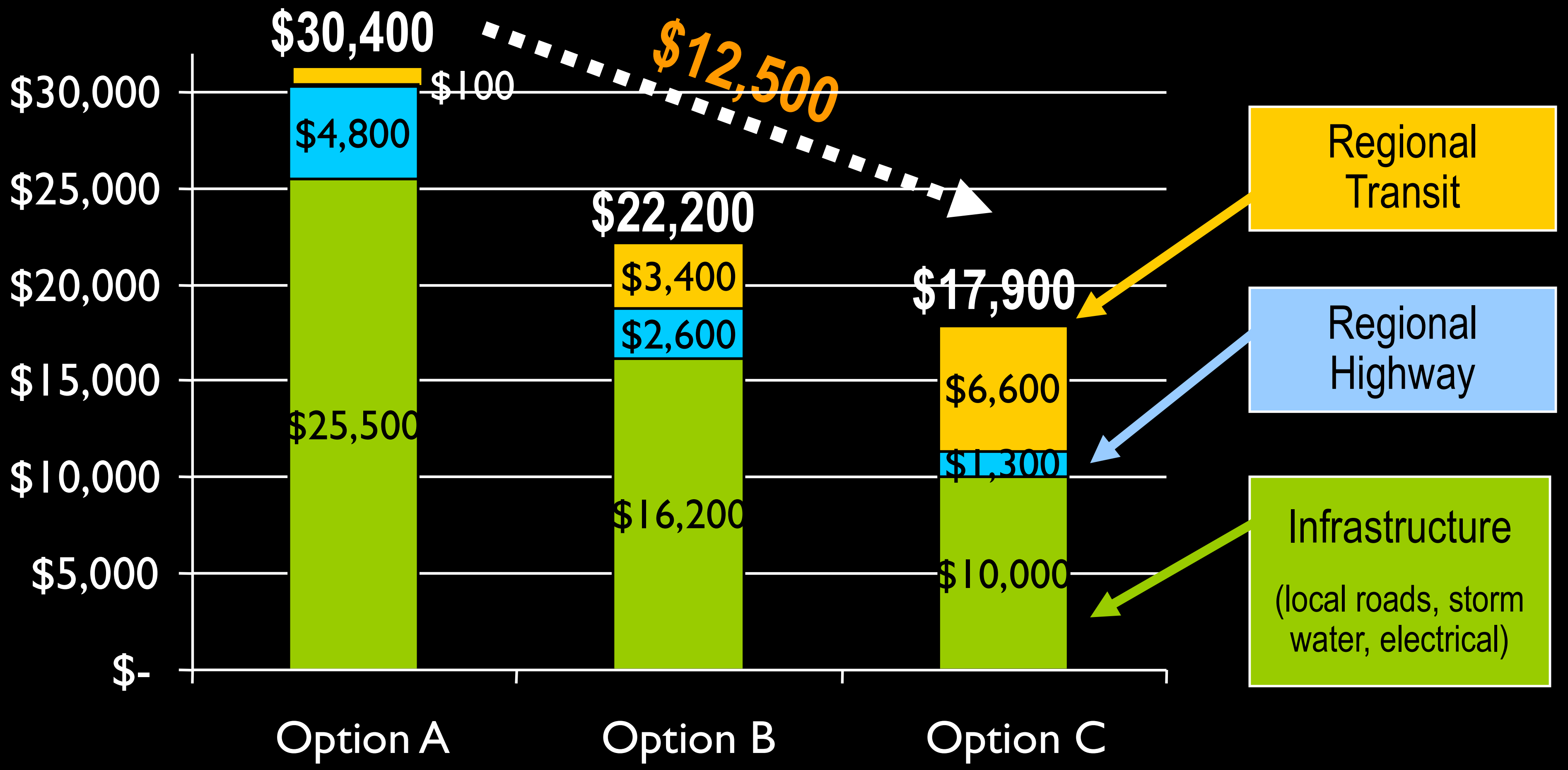
# Communicating the Consequences



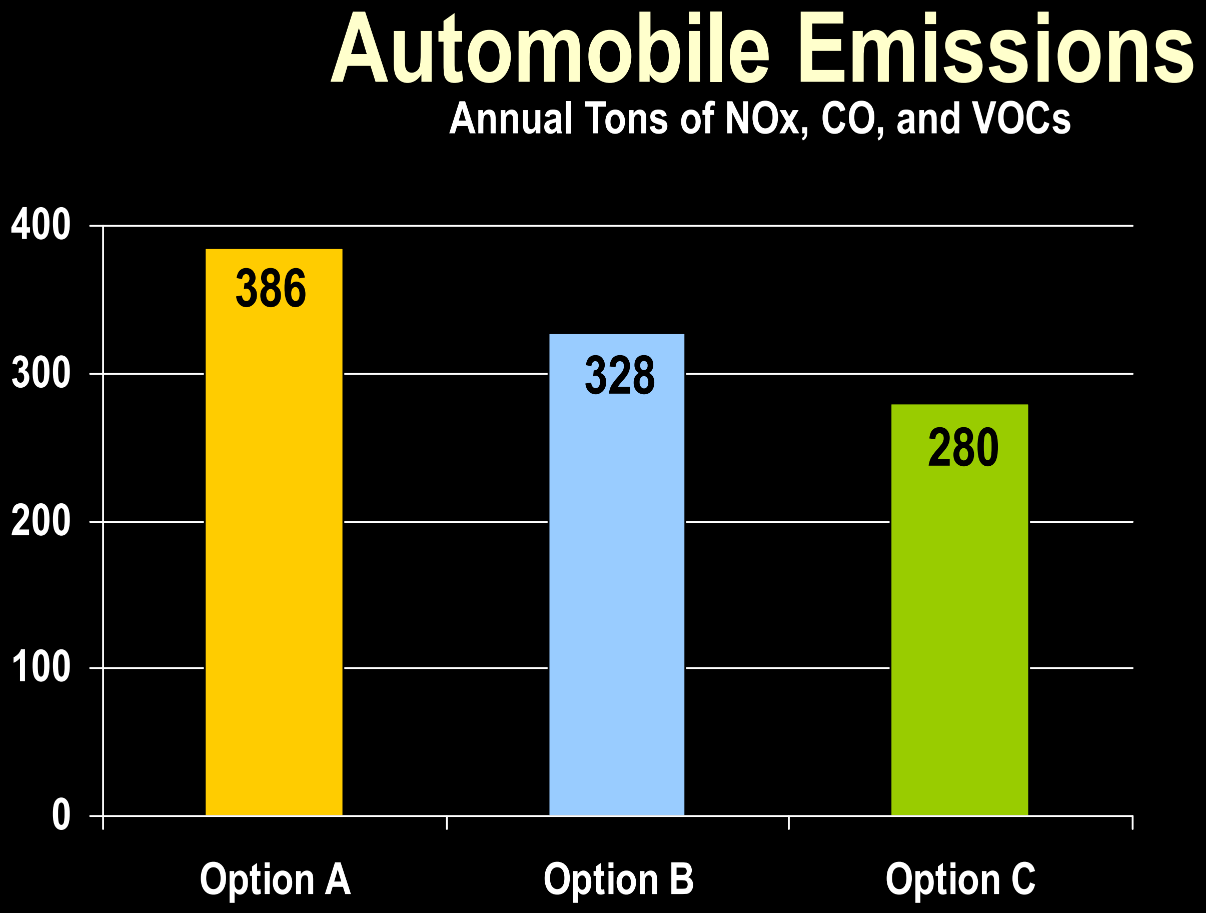
# Communicating the Consequences

## Total Infrastructure Cost per Household (2005-2050)

(2007 Dollars)

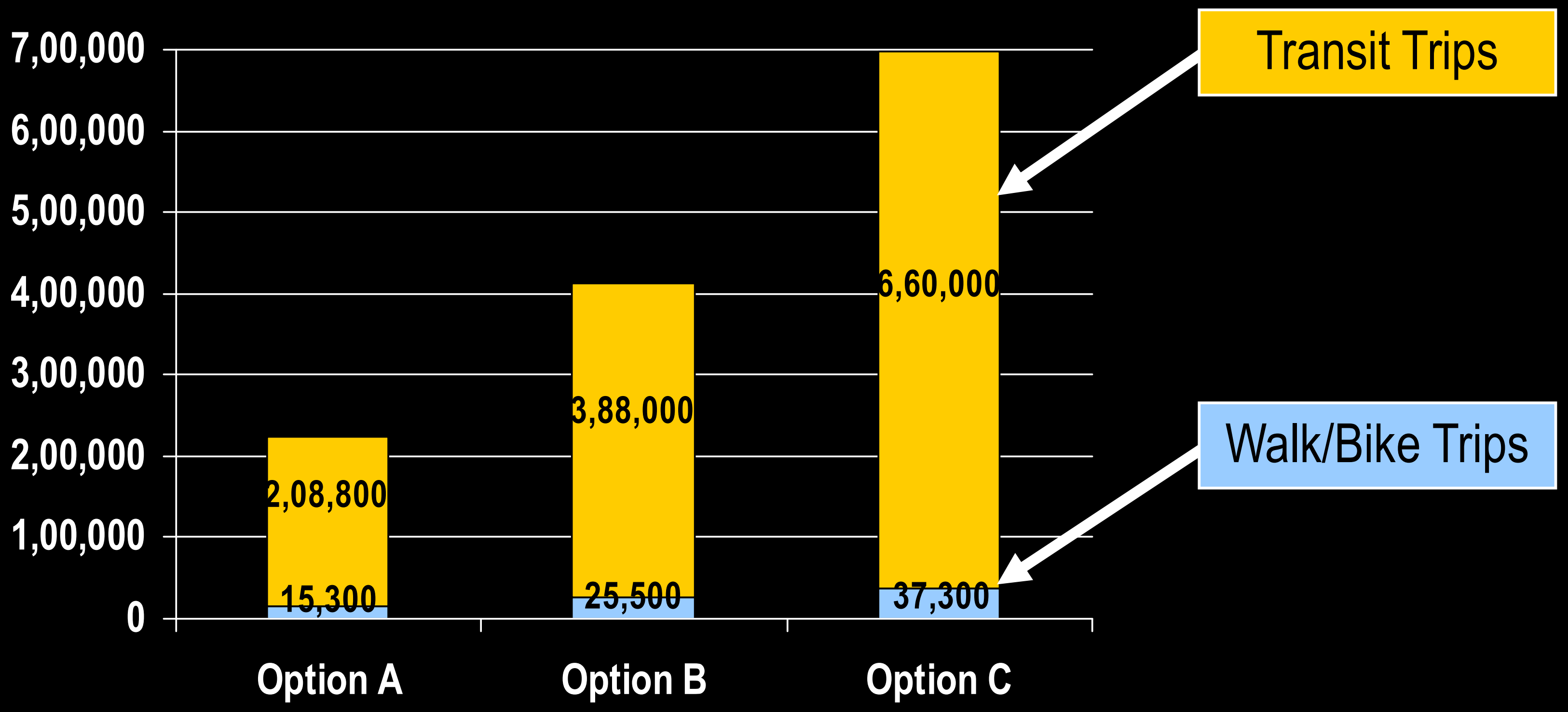


# Communicating the Consequences



# Communicating the Consequences

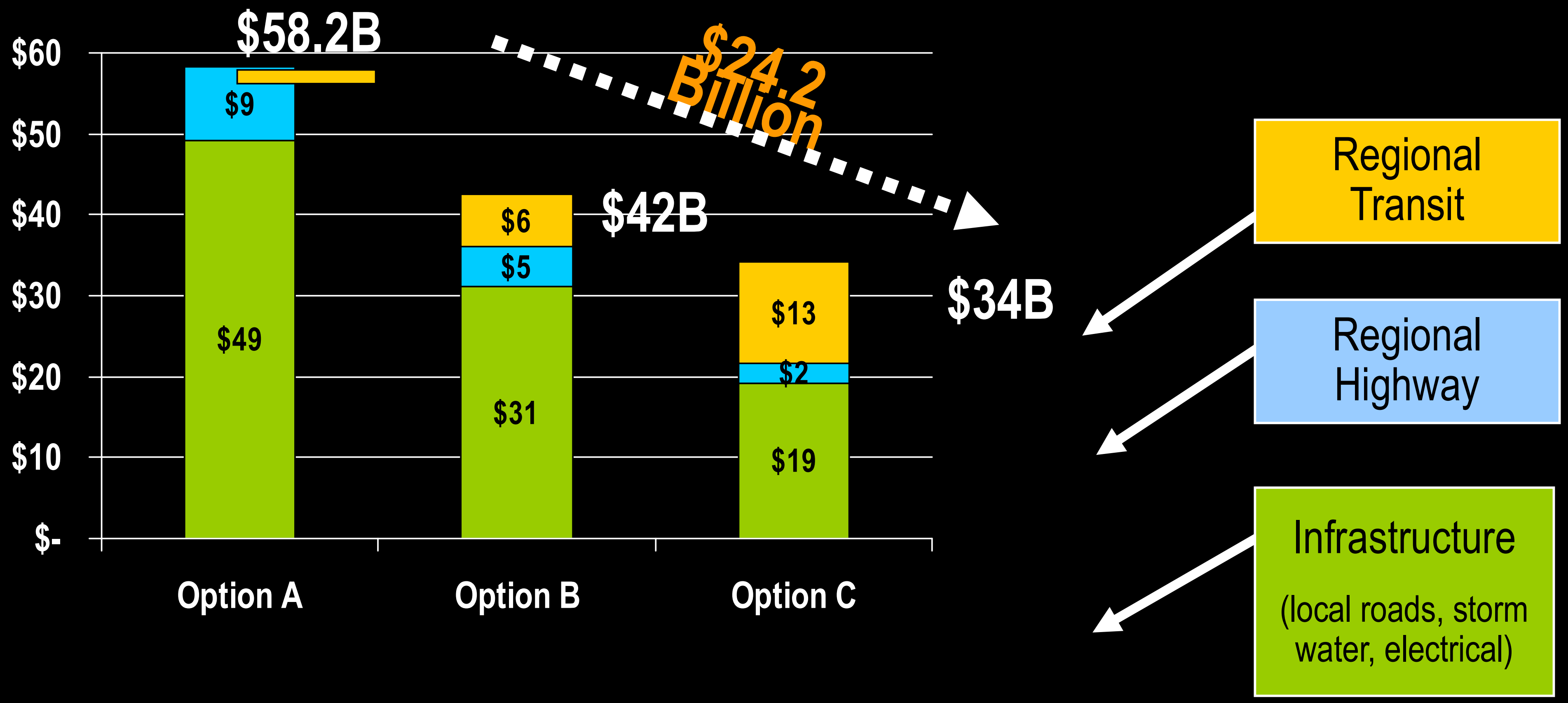
## Daily Non-Automobile Trips



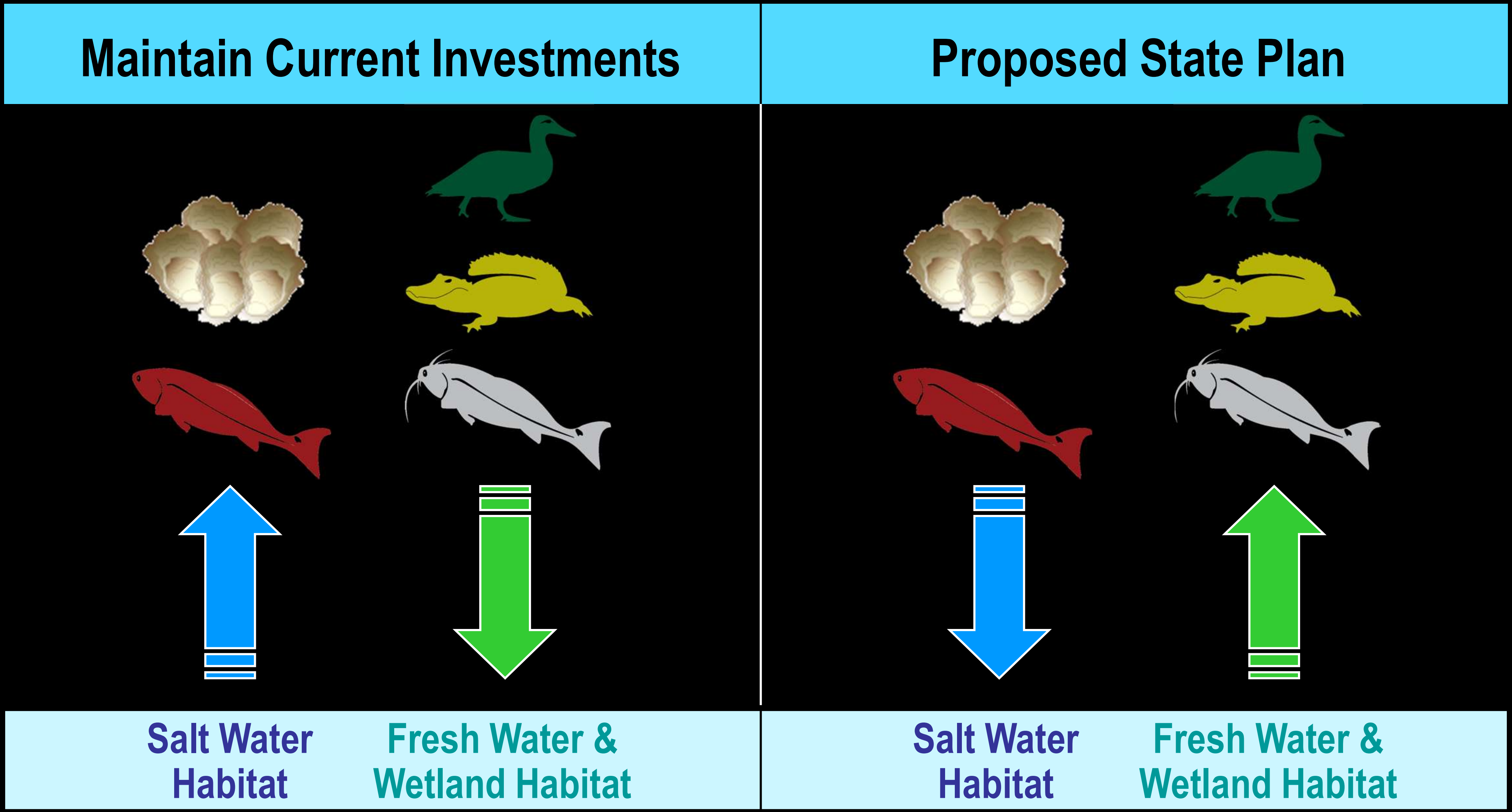
# Communicating the Consequences

## Total Infrastructure Cost (2005-2050)

Billions of 2007 Dollars



# Communicating the Consequences



**Maintain Current Investments**

Salt Water Habitat

Fresh Water & Wetland Habitat

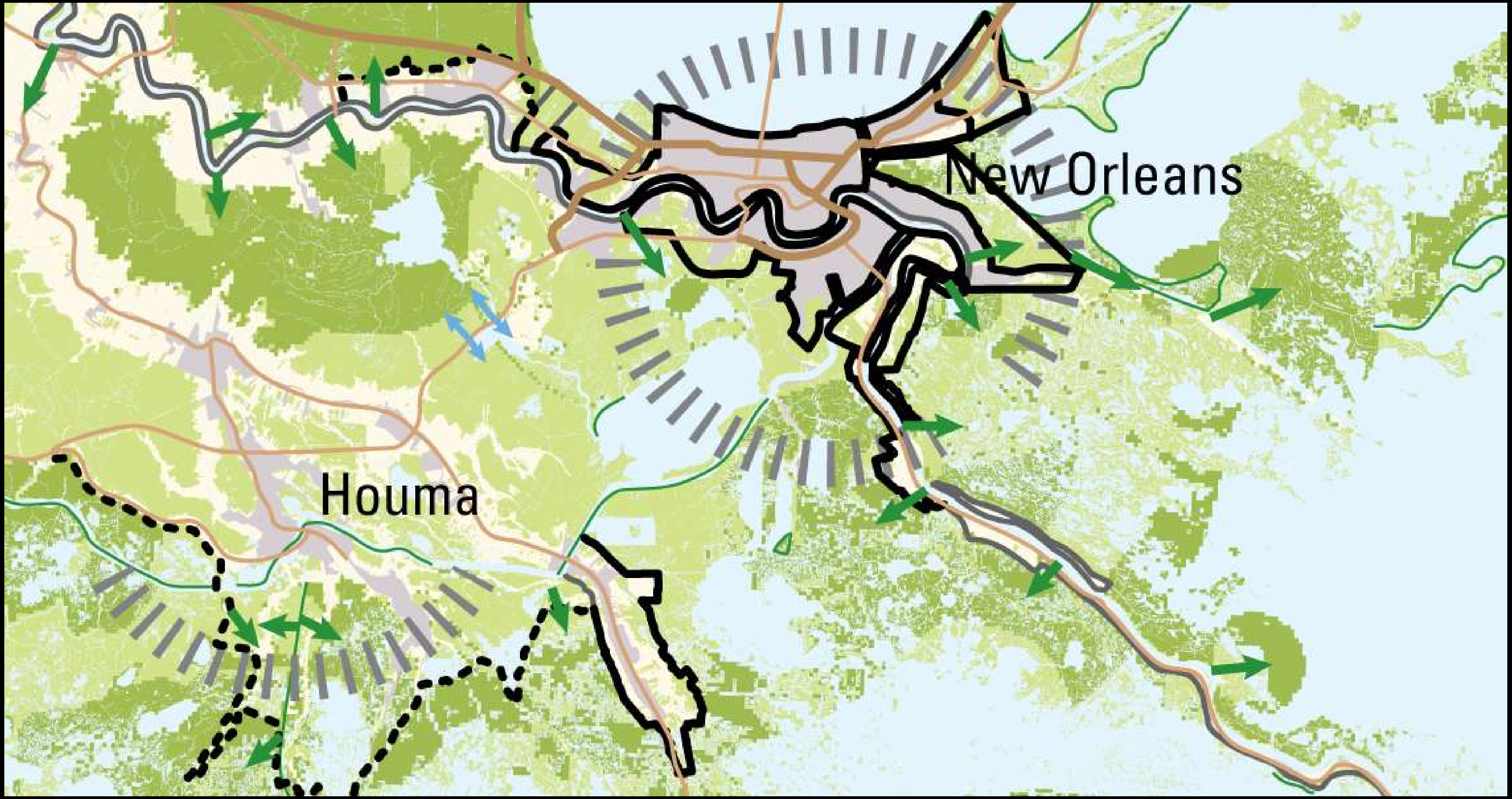
**Proposed State Plan**

Salt Water Habitat

Fresh Water & Wetland Habitat

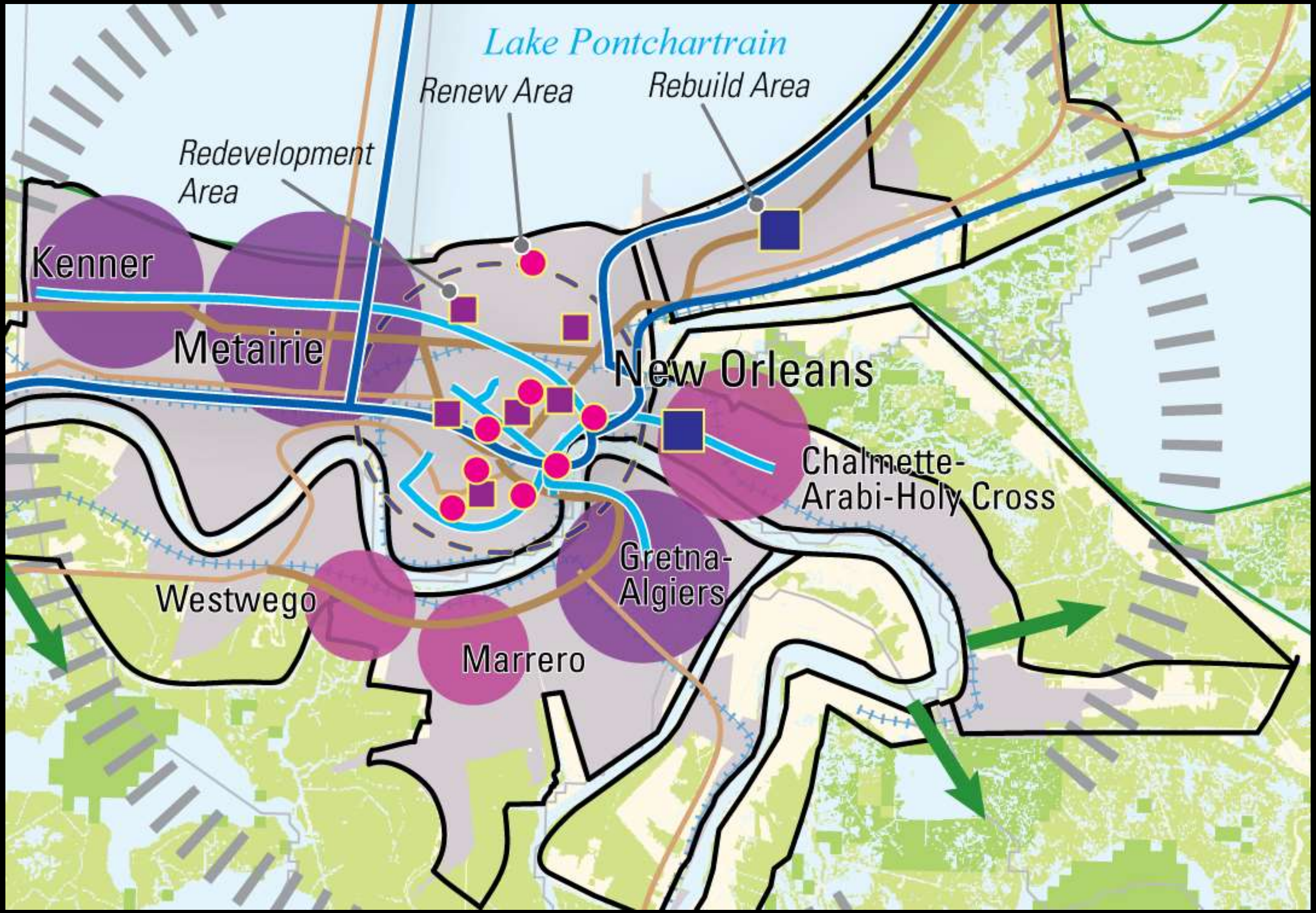
# Comprehensive Risk Management

## Coastal Restoration and Protection Investments


New Orleans
Houma

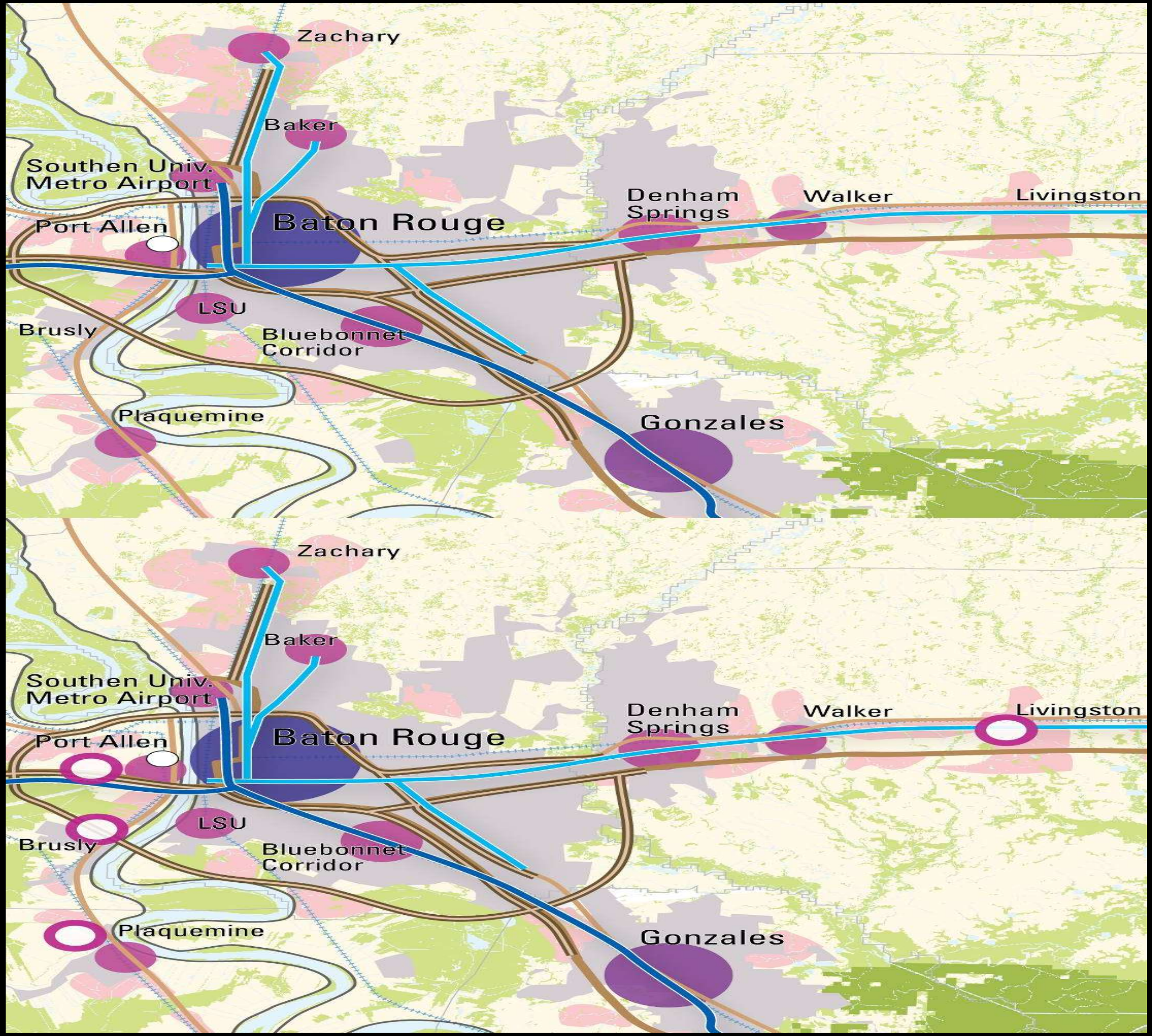
# The Louisiana Speaks Regional Vision:

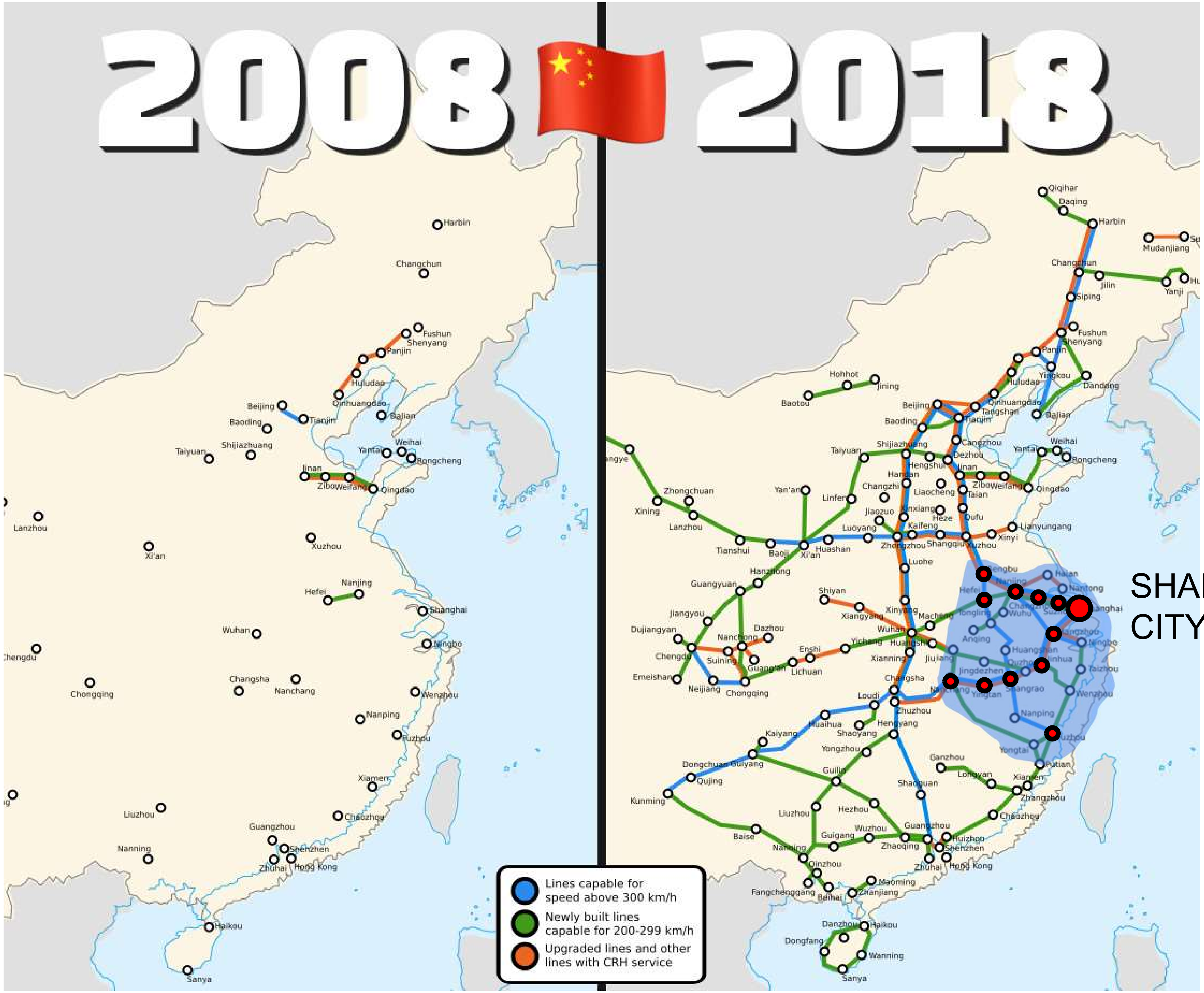
# Reinvestment Areas within existing Urban Areas


Lake Pontchartrain
Renew Area
Rebuild Area
Redevelopment Area
Kenner
Metairie
New Orleans
Chalmette-Arabi-Holy Cross
Gretna-Algiers
Westwego
Marrero

# The Louisiana Speaks Regional Vision:

## Planning & Investment in minimal New Growth Areas


Zachary
Baker
Southen Univ.
Metro Airport
Port Allen
Baton Rouge
Denham Springs
Walker
Livingston
LSU
Brusly
Bluebonnet Corridor
Plaquemine
Gonzales

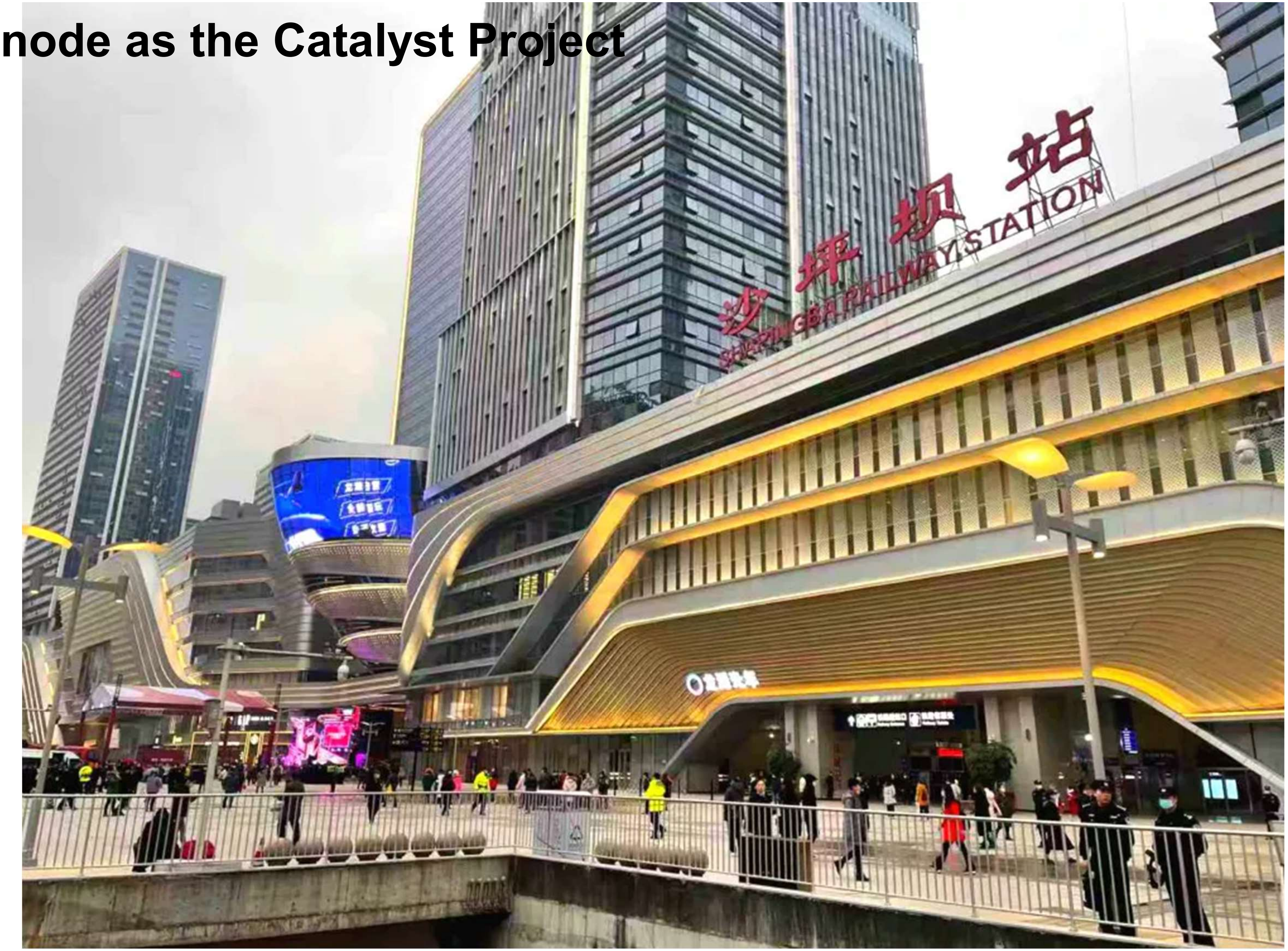

2008
2018
Harbin
Changchun
Fushun
Shenyang
Panjin
Huludao
Qinhuangdao
Dalian
Beijing
Tianjin
Baoding
Shijiazhuang
Taiyuan
Yantai
Weihai
Rongcheng
Jinan
Zibo
Weifang
Qingdao
Lanzhou
Xi'an
Xuzhou
Hefei
Nanjing
Shanghai
Wuhan
Ningbo
Chengdu
Chongqing
Changsha
Nanchang
Wenzhou
Nanping
Fuzhou
Xiamen
Liuzhou
Chaozhou
Guangzhou
Shenzhen
Nanning
Zhuhai
Hong Kong
Haikou
Sanya
Lines capable for speed above 300 km/h
Newly built lines capable for 200-299 km/h
Upgraded lines and other lines with CRH service

SHANGHAI CITY REGION

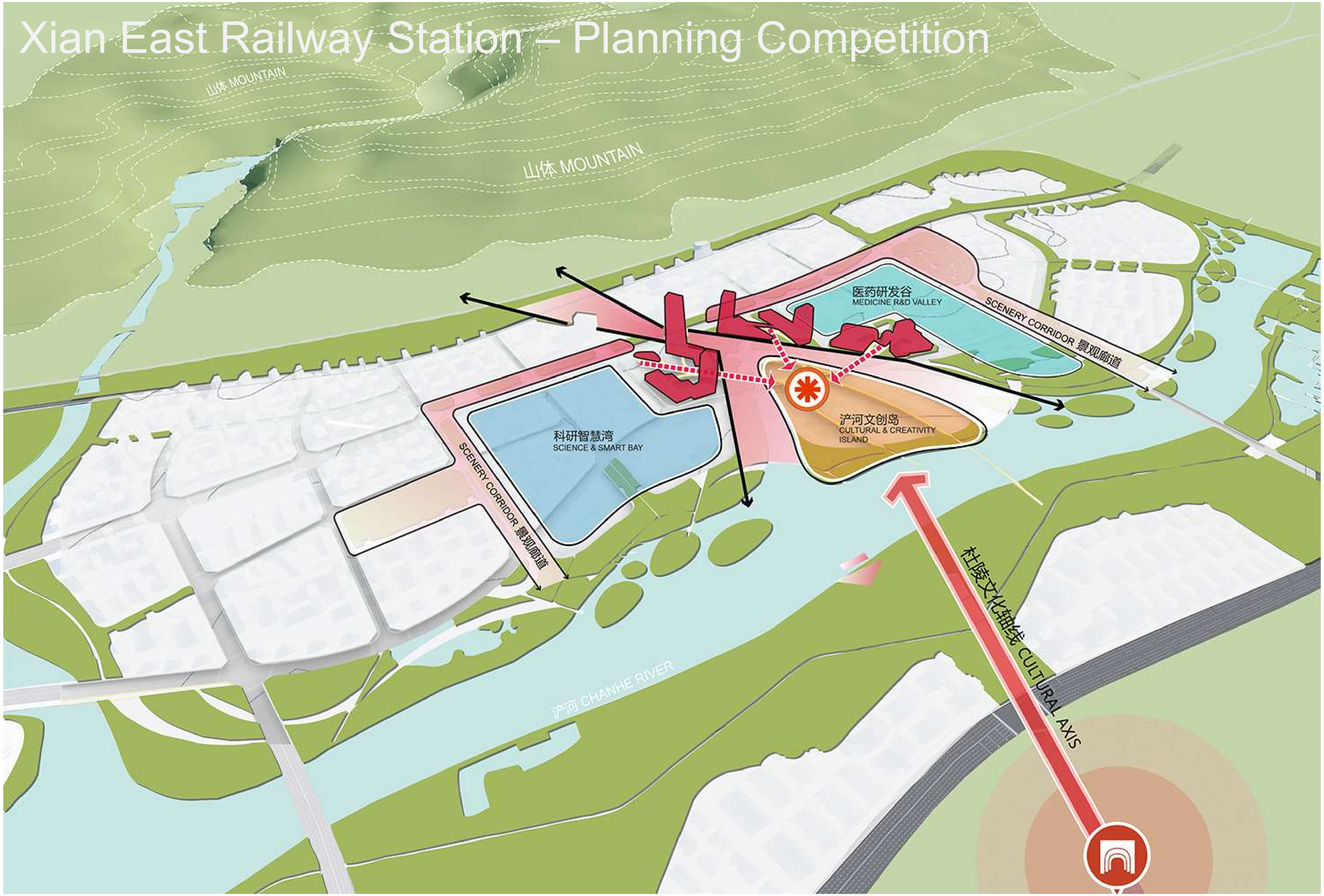
# Development of Tier-2 & Tier 3 cities

## Xian East Railway Station – Planning Competition

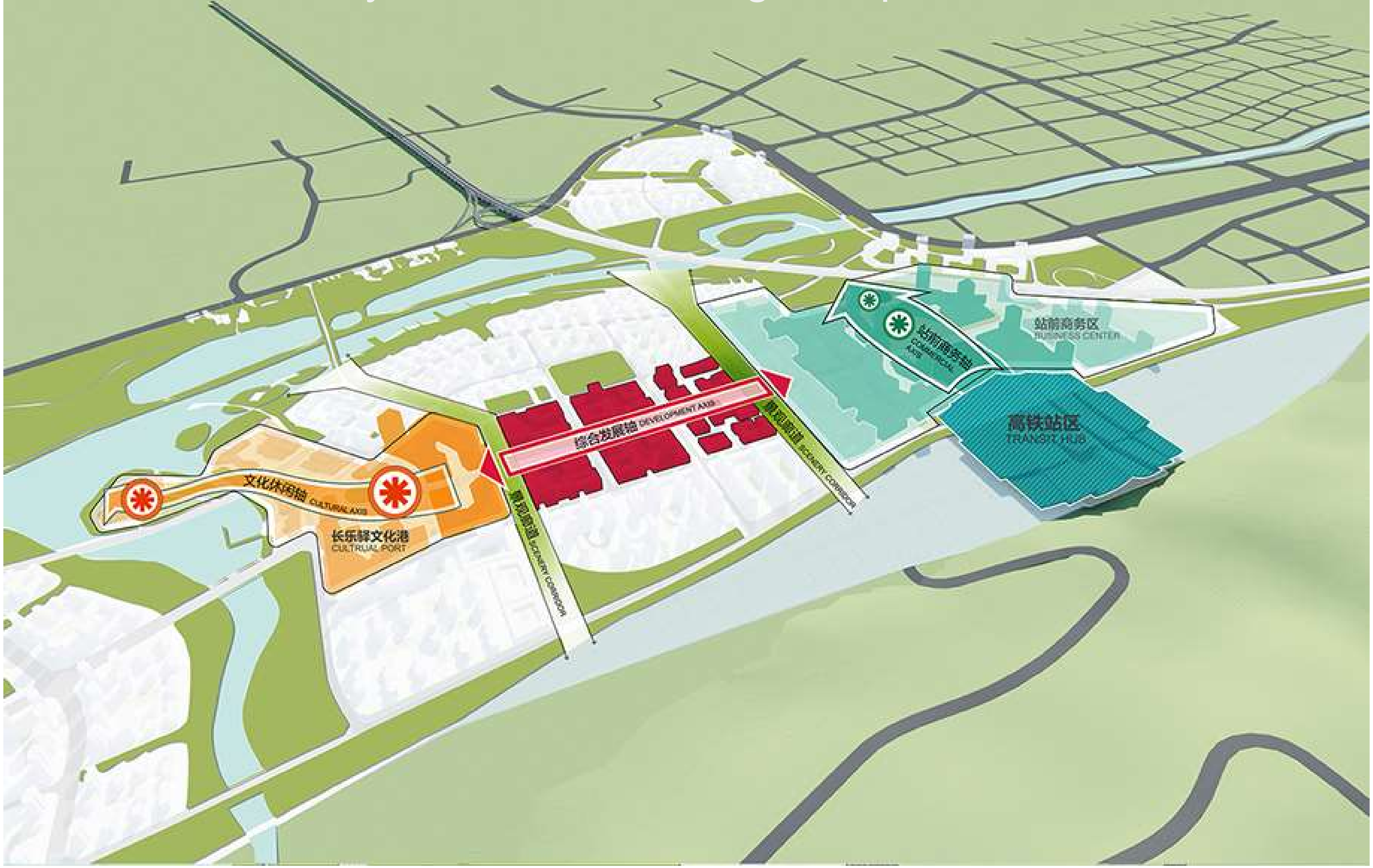
# Station node as the Catalyst Project


沙坪坝站
SHAPINGBA RAILWAY STATION

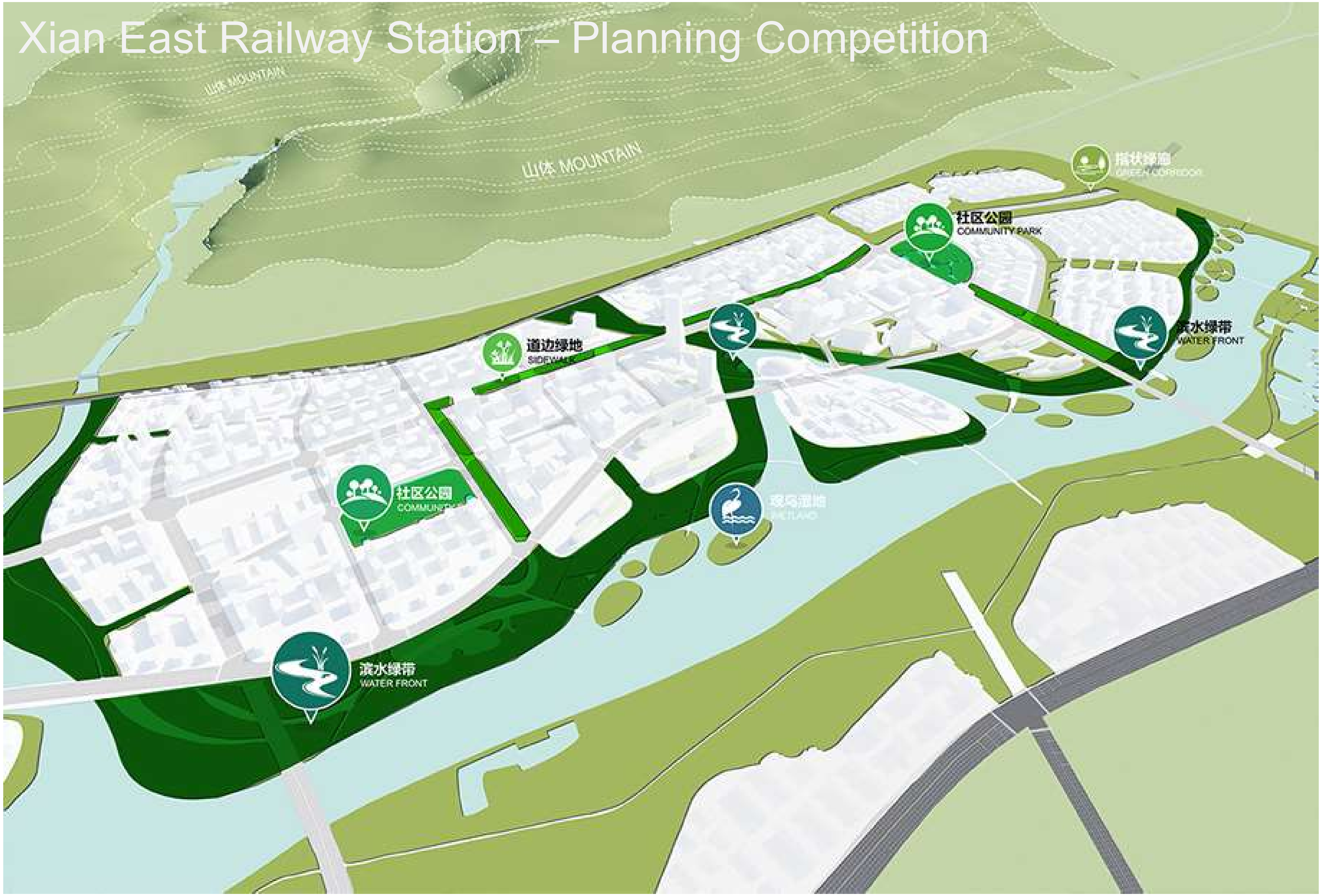
# Xian East Railway Station – Planning Competition


山体 MOUNTAIN
山体 MOUNTAIN
医药研发谷
MEDICINE R&D VALLEY
SCENERY CORRIDOR 景观廊道
浐河文创岛
CULTURAL & CREATIVITY ISLAND
科研智慧湾
SCIENCE & SMART BAY
SCENERY CORRIDOR 景观廊道
杜陵文化轴线 CULTURAL AXIS
浐河 CHANHE RIVER

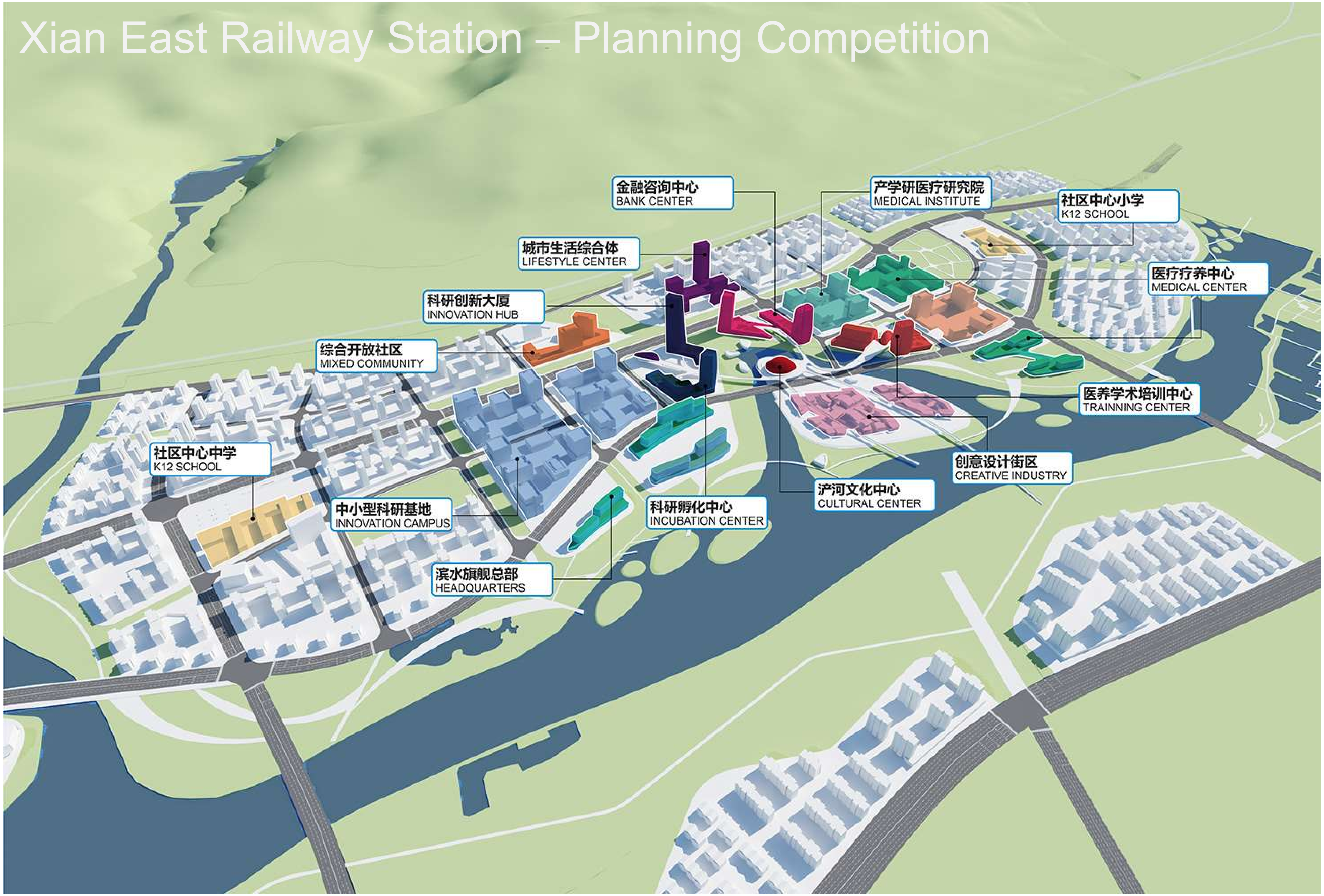
# Xian East Railway Station – Planning Competition


文化休闲轴
CULTURAL AXIS
长乐驿文化港
CULTRUAL PORT
景观廊道
SCENERY CORRIDOR
综合发展轴
DEVELOPMENT AXIS
景观廊道
SCENERY CORRIDOR
站前商务轴
COMMERCIAL AXIS
站前商务区
BUSINESS CENTER
高铁站区
TRANSIT HUB

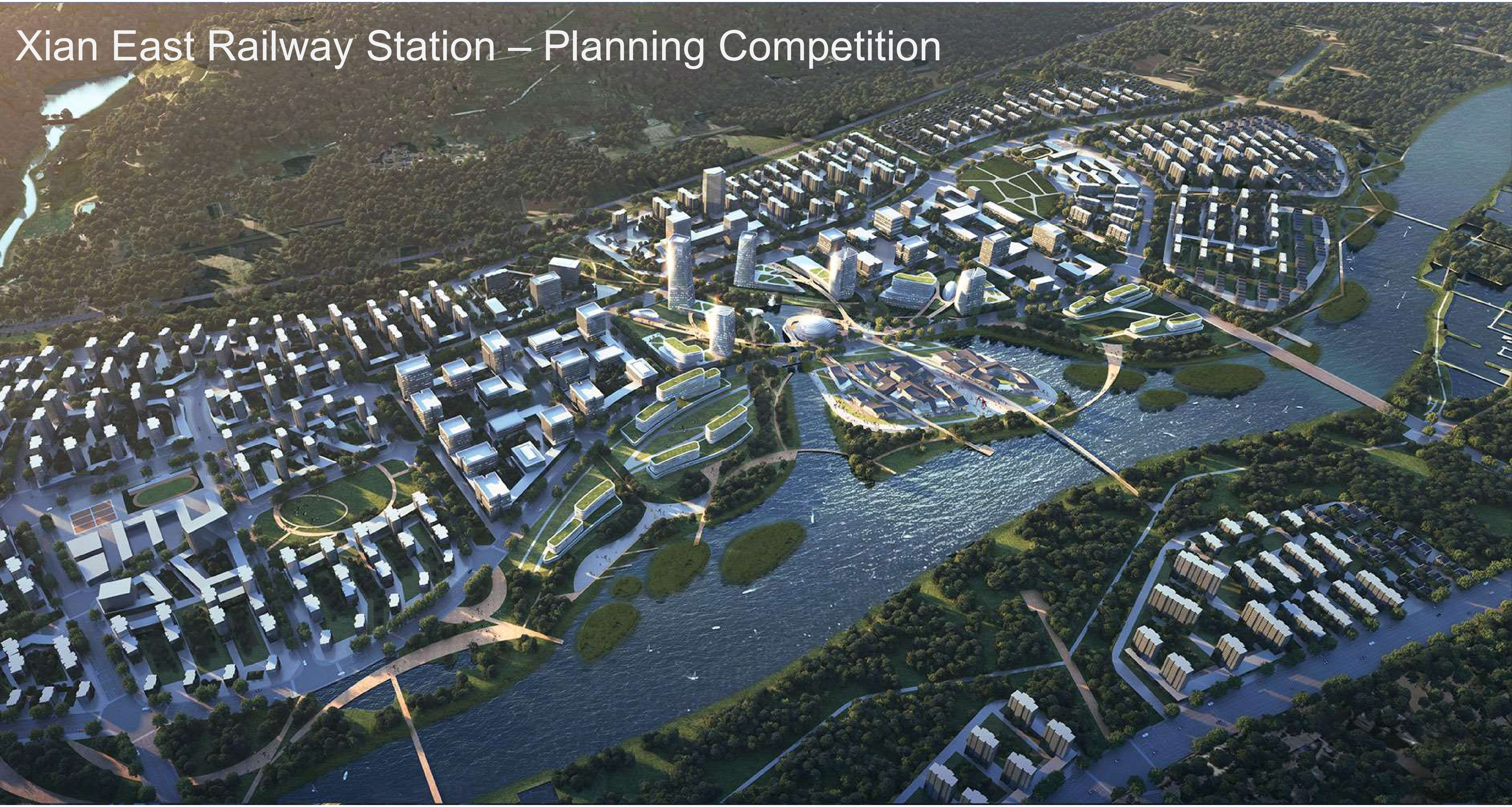
# Xian East Railway Station – Planning Competition


山体 MOUNTAIN
山体 MOUNTAIN
指状绿廊
GREEN CORRIDOR
社区公园
COMMUNITY PARK
滨水绿带
WATER FRONT
道边绿地
SIDEWALK
社区公园
COMMUNITY
观鸟湿地
WETLAND
滨水绿带
WATER FRONT

# Xian East Railway Station – Planning Competition

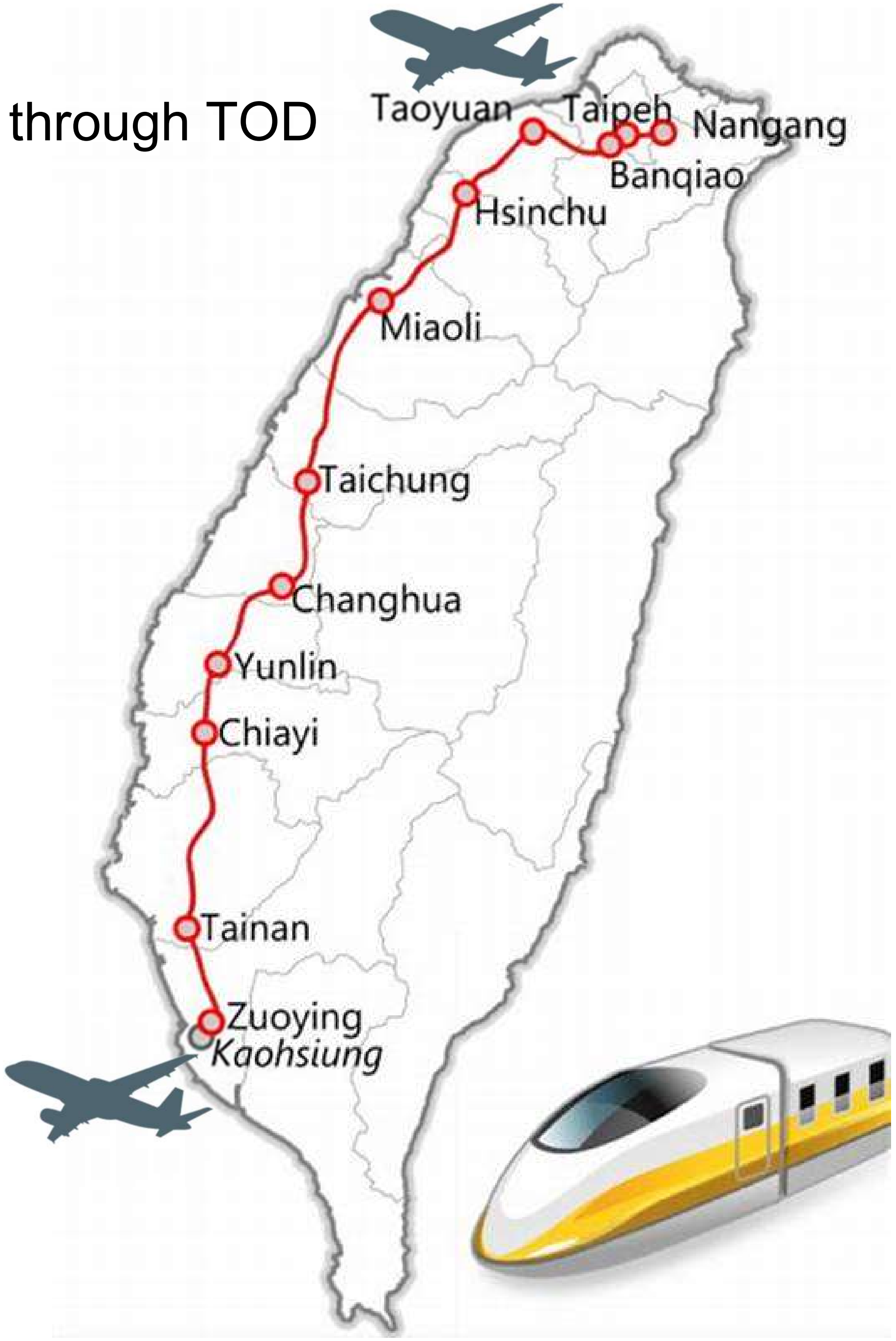

金融咨询中心
BANK CENTER
产学研医疗研究院
MEDICAL INSTITUTE
社区中心小学
K12 SCHOOL
城市生活综合体
LIFESTYLE CENTER
医疗疗养中心
MEDICAL CENTER
科研创新大厦
INNOVATION HUB
综合开放社区
MIXED COMMUNITY
医养学术培训中心
TRAINNING CENTER
社区中心中学
K12 SCHOOL
创意设计街区
CREATIVE INDUSTRY
浐河文化中心
CULTURAL CENTER
中小型科研基地
INNOVATION CAMPUS
科研孵化中心
INCUBATION CENTER
滨水旗舰总部
HEADQUARTERS

# Xian East Railway Station – Planning Competition

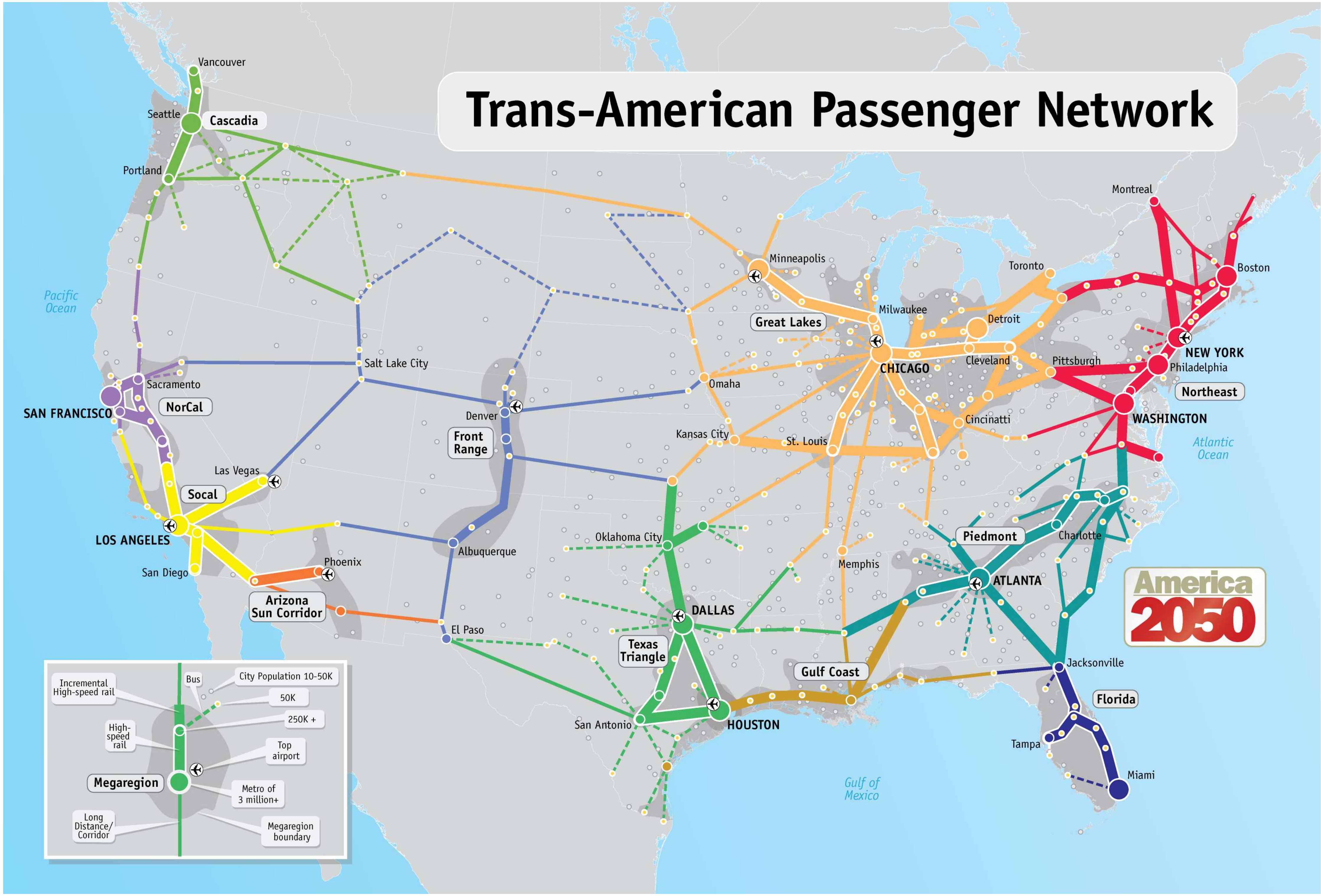


# Taiwan High Speed Rail

- Development of smaller Towns as counter-magnets through TOD

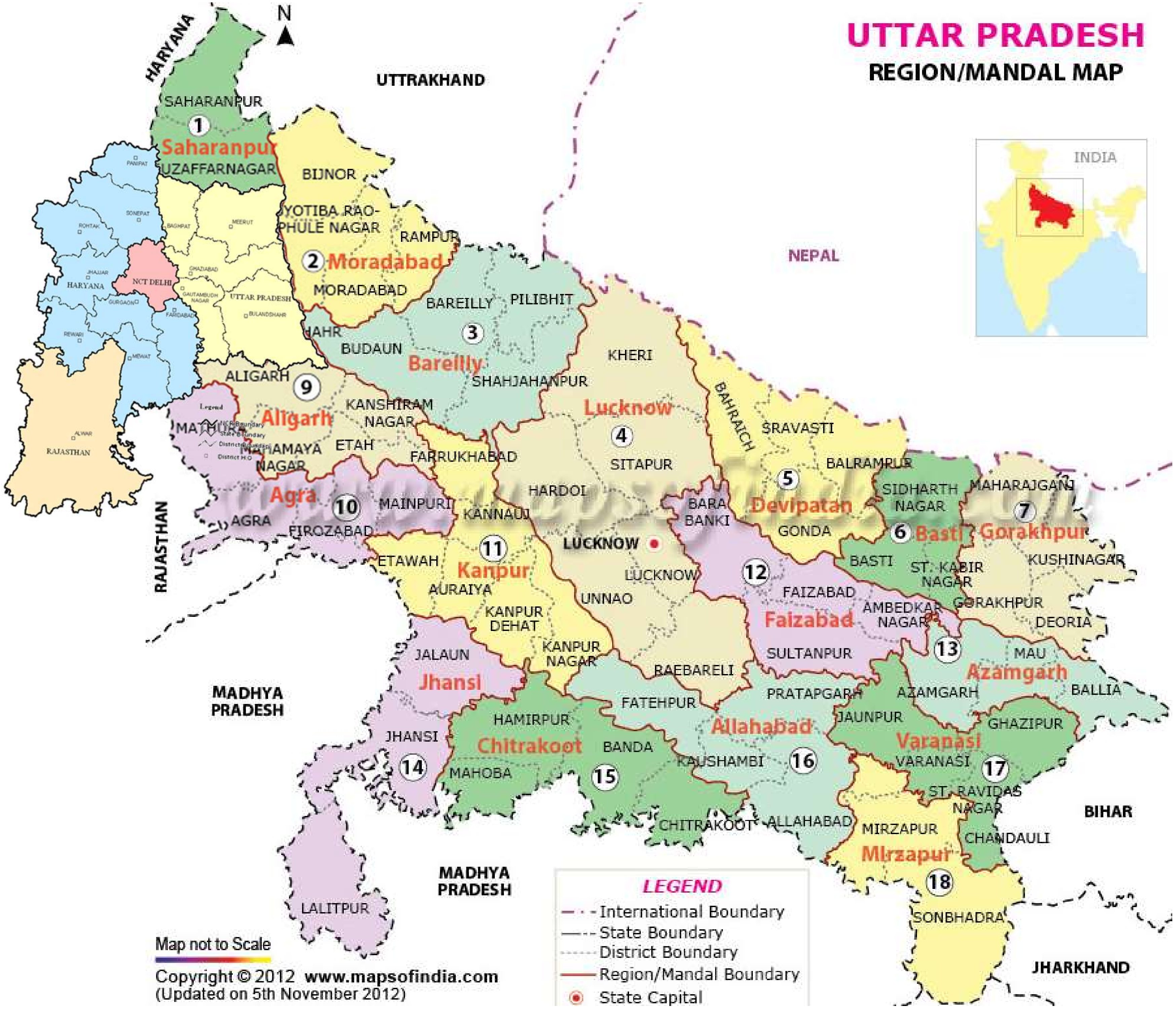

Taoyuan
Taipeh
Nangang
Banqiao
Hsinchu
Miaoli
Taichung
Changhua
Yunlin
Chiayi
Tainan
Zuoying
Kaohsiung

# Trans-American Passenger Network


Vancouver
Seattle
Cascadia
Portland
Pacific Ocean
Sacramento
SAN FRANCISCO
NorCal
Las Vegas
Socal
LOS ANGELES
San Diego
Phoenix
Arizona Sun Corridor
Salt Lake City
Denver
Front Range
Albuquerque
El Paso
Minneapolis
Great Lakes
Milwaukee
CHICAGO
Omaha
Kansas City
St. Louis
Toronto
Detroit
Cleveland
Pittsburgh
Cincinatti
Oklahoma City
Memphis
DALLAS
Texas Triangle
San Antonio
HOUSTON
Gulf Coast
Gulf of Mexico
Montreal
Boston
NEW YORK
Philadelphia
Northeast
WASHINGTON
Atlantic Ocean
Piedmont
Charlotte
ATLANTA
Jacksonville
Florida
Tampa
Miami
America 2050
Incremental High-speed rail
Bus
City Population 10-50K
50K
250K +
High-speed rail
Top airport
Megaregion
Metro of 3 million+
Long Distance/ Corridor
Megaregion boundary

# THE ROADMAP

Marketing
Strategy
Plan
?



UTTAR PRADESH

REGION/MANDAL MAP

N
HARYANA
UTTRAKHAND
NEPAL
INDIA
SAHARANPUR
1
Saharanpur
MUZAFFARNAGAR
BIJNOR
JYOTIBA RAO-PHULE NAGAR
RAMPUR
2
Moradabad
MORADABAD
PANIPAT
SONEPAT
ROHTAK
BAGHPAT
MEERUT
JHAJJAR
HARYANA
NCT DELHI
GHAZIABAD
GAUTAMBUDH NAGAR
UTTAR PRADESH
GURGAON
FARIDABAD
BULANDSHAHR
REWARI
MEWAT
ALWAR
RAJASTHAN
BAREILLY
PILIBHIT
3
Bareilly
JAHR
BUDAUN
SHAHJAHANPUR
KHERI
ALIGARH
9
Aligarh
KANSHIRAM NAGAR
MATHURA
MAHAMAYA NAGAR
ETAH
FARRUKHABAD
Lucknow
4
SITAPUR
BAHRAICH
SRAVASTI
BALRAMPUR
5
Devipatan
GONDA
HARDOI
BARA BANKI
Agra
10
AGRA
MAINPURI
FIROZABAD
KANNAUJ
LUCKNOW
LUCKNOW
11
Kanpur
ETAWAH
AURAIYA
KANPUR DEHAT
UNNAO
KANPUR NAGAR
12
FAIZABAD
Faizabad
SULTANPUR
RAEBARELI
SIDHARTH NAGAR
6
Basti
BASTI
ST. KABIR NAGAR
MAHARAJGANJ
7
Gorakhpur
KUSHINAGAR
GORAKHPUR
DEORIA
AMBEDKAR NAGAR
13
Azamgarh
MAU
AZAMGARH
BALLIA
RAJASTHAN
MADHYA PRADESH
JALAUN
Jhansi
JHANSI
14
LALITPUR
HAMIRPUR
Chitrakoot
BANDA
MAHOBA
15
CHITRAKOOT
FATEHPUR
PRATAPGARH
Allahabad
KAUSHAMBI
16
ALLAHABAD
JAUNPUR
Varanasi
VARANASI
17
GHAZIPUR
ST. RAVIDAS NAGAR
CHANDAULI
MIRZAPUR
Mirzapur
18
SONBHADRA
BIHAR
JHARKHAND
MADHYA PRADESH
Map not to Scale
www.mapsofindia.com

*LEGEND*

- International Boundary
- State Boundary
- District Boundary
- Region/Mandal Boundary
- ● State Capital

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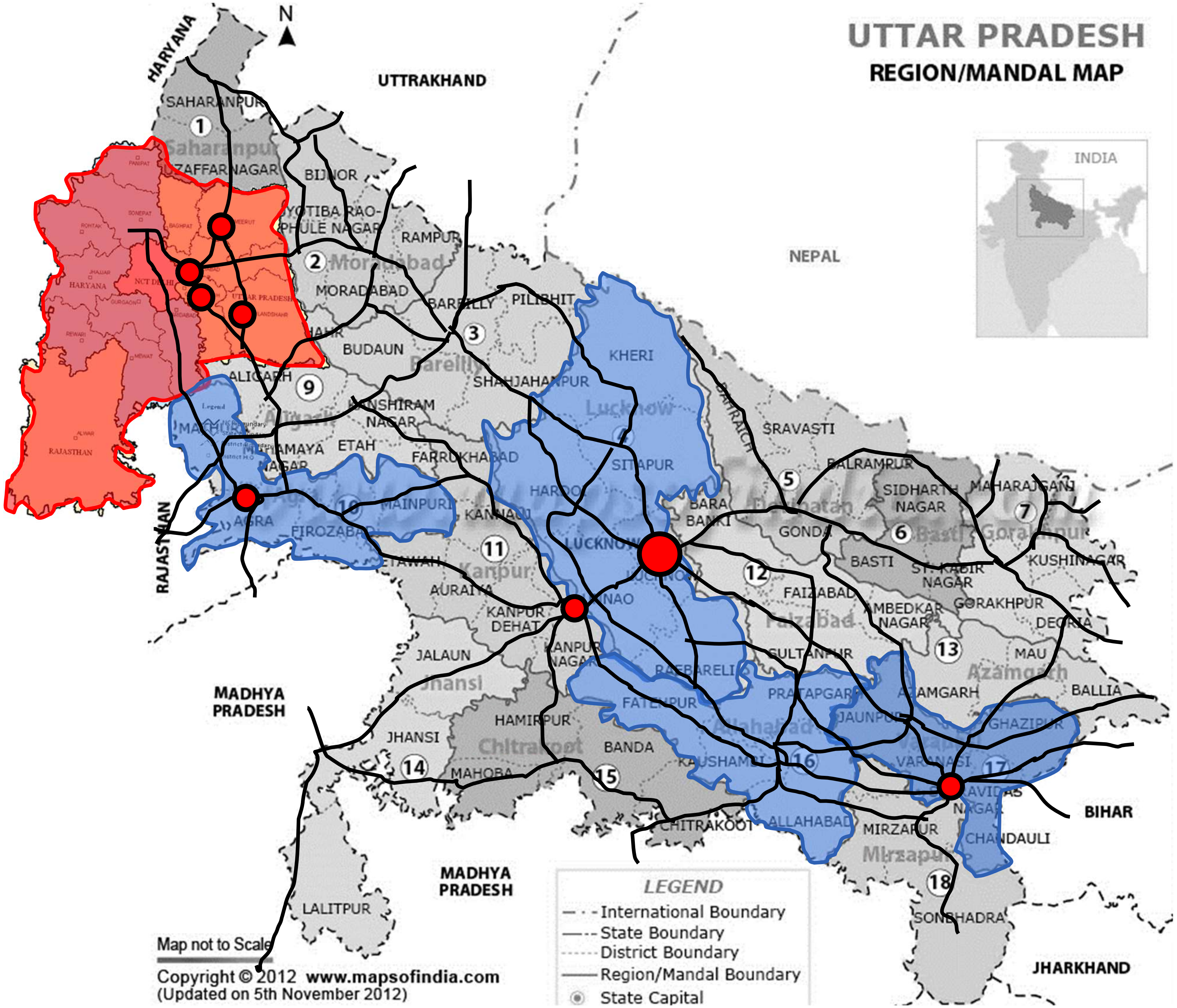
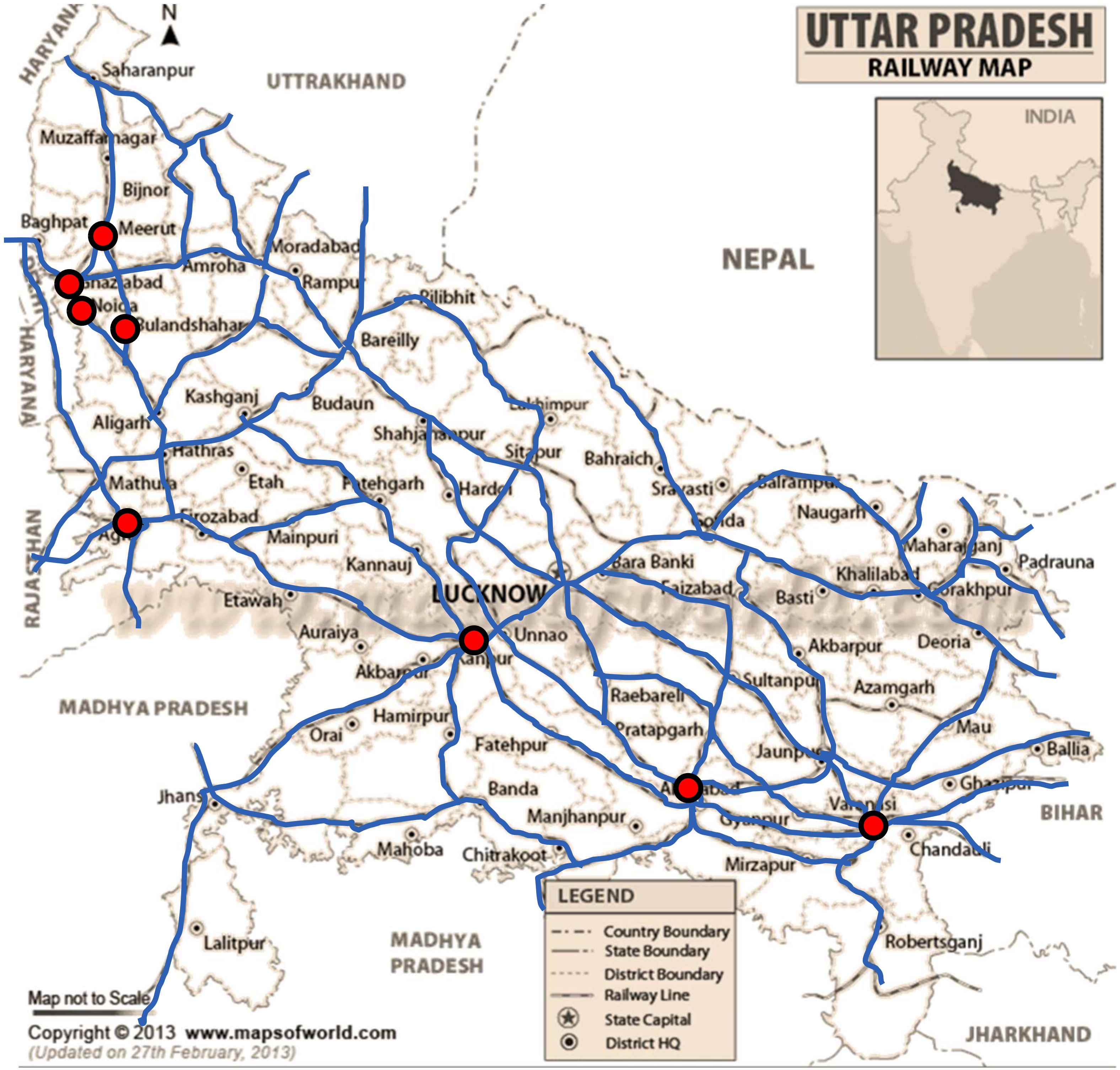
(Updated on 5th November 2012)


UTTAR PRADESH
REGION/MANDAL MAP
N
INDIA
HARYANA
UTTRAKHAND
NEPAL
RAJASTHAN
MADHYA PRADESH
MADHYA PRADESH
BIHAR
JHARKHAND
SAHARANPUR
1
Saharanpur
MUZAFFARNAGAR
BIJNOR
JYOTIBA RAO-PHULE NAGAR
RAMPUR
2
Moradabad
MORADABAD
BAREILLY
PILIBHIT
3
Bareilly
BUDAUN
SHAHJAHANPUR
KHERI
Lucknow
ALIGARH
9
Aligarh
KANSHIRAM NAGAR
ETAH
MATHURA
MAHAMAYA NAGAR
FARRUKHABAD
SITAPUR
HARDOI
AGRA
FIROZABAD
MAINPURI
10
KANNAUJ
ETAWAH
11
Kanpur
AURAIYA
KANPUR DEHAT
KANPUR NAGAR
LUCKNOW
UNNAO
BARABANKI
SRAVASTI
BAHRAICH
5
Devipatan
BALRAMPUR
GONDA
SIDHARTH NAGAR
MAHARAJGANJ
7
Gorakhpur
6
Basti
BASTI
SANT KABIR NAGAR
KUSHINAGAR
12
FAIZABAD
Faizabad
AMBEDKAR NAGAR
GORAKHPUR
DEORIA
SULTANPUR
13
MAU
Azamgarh
AZAMGARH
BALLIA
RAEBARELI
PRATAPGARH
JAUNPUR
GHAZIPUR
FATEHPUR
Allahabad
JALAUN
Jhansi
HAMIRPUR
JHANSI
Chitrakoot
BANDA
KAUSHAMBI
16
Varanasi
VARANASI
17
SANT RAVIDAS NAGAR
14
MAHOBA
15
CHITRAKOOT
ALLAHABAD
MIRZAPUR
Mirzapur
CHANDAULI
18
SONBHADRA
LALITPUR
PANIPAT
SONEPAT
ROHTAK
BAGHPAT
MEERUT
JHAJJAR
NCT DELHI
HARYANA
UTTAR PRADESH
GURGAON
BULANDSHAHR
FARIDABAD
REWARI
MEWAT
ALWAR
RAJASTHAN
Legend
Map not to Scale
Copyright © 2012 www.mapsofindia.com
(Updated on 5th November 2012)
LEGEND
International Boundary
State Boundary
District Boundary
Region/Mandal Boundary
State Capital


UTTAR PRADESH
RAILWAY MAP
INDIA
N
HARYANA
UTTRAKHAND
NEPAL
RAJASTHAN
MADHYA PRADESH
BIHAR
JHARKHAND
Saharanpur
Muzaffarnagar
Bijnor
Baghpat
Meerut
Moradabad
Amroha
Rampur
Ghaziabad
Noida
Bulandshahar
Pilibhit
Bareilly
Kashganj
Budaun
Aligarh
Hathras
Lakhimpur
Shahjahanpur
Sitapur
Bahraich
Mathura
Etah
Fatehgarh
Hardoi
Shravasti
Balrampur
Gonda
Naugarh
Agra
Firozabad
Mainpuri
Kannauj
Bara Banki
Maharajganj
Padrauna
Khalilabad
Faizabad
Basti
Gorakhpur
LUCKNOW
Etawah
Auraiya
Unnao
Kanpur
Akbarpur
Akbarpur
Deoria
Sultanpur
Azamgarh
Raebareli
Hamirpur
Orai
Pratapgarh
Mau
Fatehpur
Jaunpur
Ballia
Jhansi
Banda
Allahabad
Ghazipur
Varanasi
Manjhanpur
Gyanpur
Mahoba
Chitrakoot
Mirzapur
Chandauli
Robertsganj
Lalitpur
LEGEND
Country Boundary
State Boundary
District Boundary
Railway Line
State Capital
District HQ
Map not to Scale
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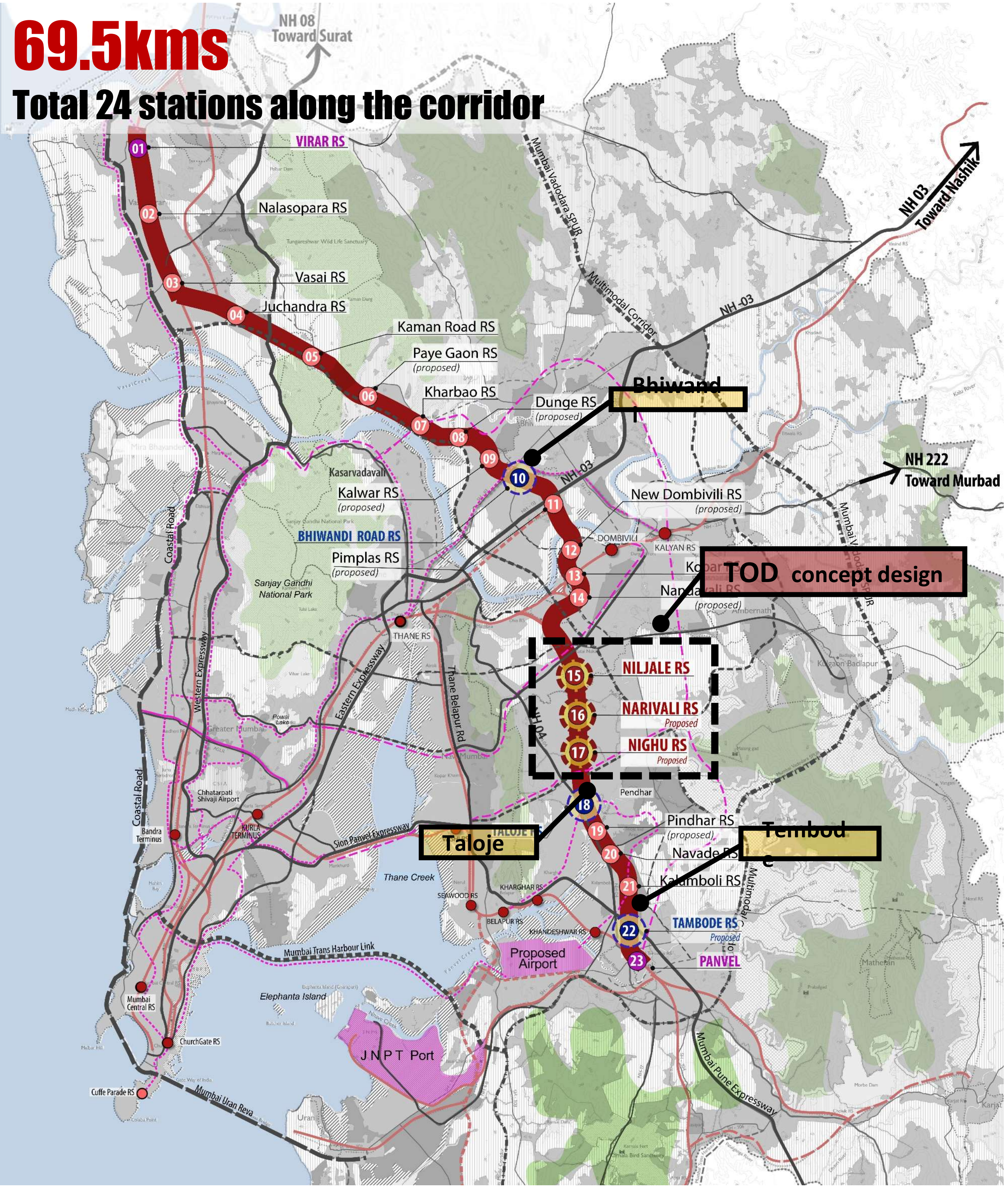
(Updated on 27th February, 2013)

GOMTINAGAR
GOMTINAGAR

# 69.5kms

## Total 24 stations along the corridor


NH 08
Toward Surat
01 VIRAR RS
02 Nalasopara RS
03 Vasai RS
04 Juchandra RS
05 Kaman Road RS
06 Paye Gaon RS
(proposed)
07 Kharbao RS
08 Dunge RS
(proposed)
09 Kalwar RS
(proposed)
10 BHIWANDI ROAD RS
Kasarvadavali
11 Pimplas RS
(proposed)
12 New Dombivili RS
(proposed)
DOMBIVILI
KALYAN RS
13 Kopar RS
14 Nandivali RS
(proposed)
15 NILJALE RS
16 NARIVALI RS
Proposed
17 NIGHU RS
Proposed
18 TALOJE RS
Pendhar
19 Pindhar RS
(proposed)
20 Navade RS
21 Kalamboli RS
22 TAMBODE RS
Proposed
23 PANVEL
Bhiwandi
TOD concept design
Taloje
Tembode
NH 03
Toward Nashik
NH-03
NH 222
Toward Murbad
NH 04
Mumbai Vadodara SPUR
Multimodal Corridor
Sanjay Gandhi National Park
Coastal Road
Western Expressway
Eastern Expressway
Thane Belapur Rd
THANE RS
Sion Panvel Expressway
Mumbai Trans Harbour Link
Thane Creek
Proposed Airport
KHARGHAR RS
BELAPUR RS
SEAWOOD RS
KHANDESHWAR RS
Kulgaon Badlapur
Ambernath
Matheran
J N P T Port
Elephanta Island
Mumbai Pune Expressway
Mumbai Uran Reva
Bandra Terminus
KURLA TERMINUS
Chhatarpati Shivaji Airport
Mumbai Central RS
ChurchGate RS
Cuffe Parade RS
Uran

# VIRAR-PANVEL SUBURBAN RAIL CORRIDOR

## THE WORLD BANK STUDY

**E&Y – OASIS consortium**

**World Bank Study on Transit Oriented Development** for Mumbai Metropolitan Region 69.5 kms long suburban rail corridor from Virar to Panvel in Mumbai.

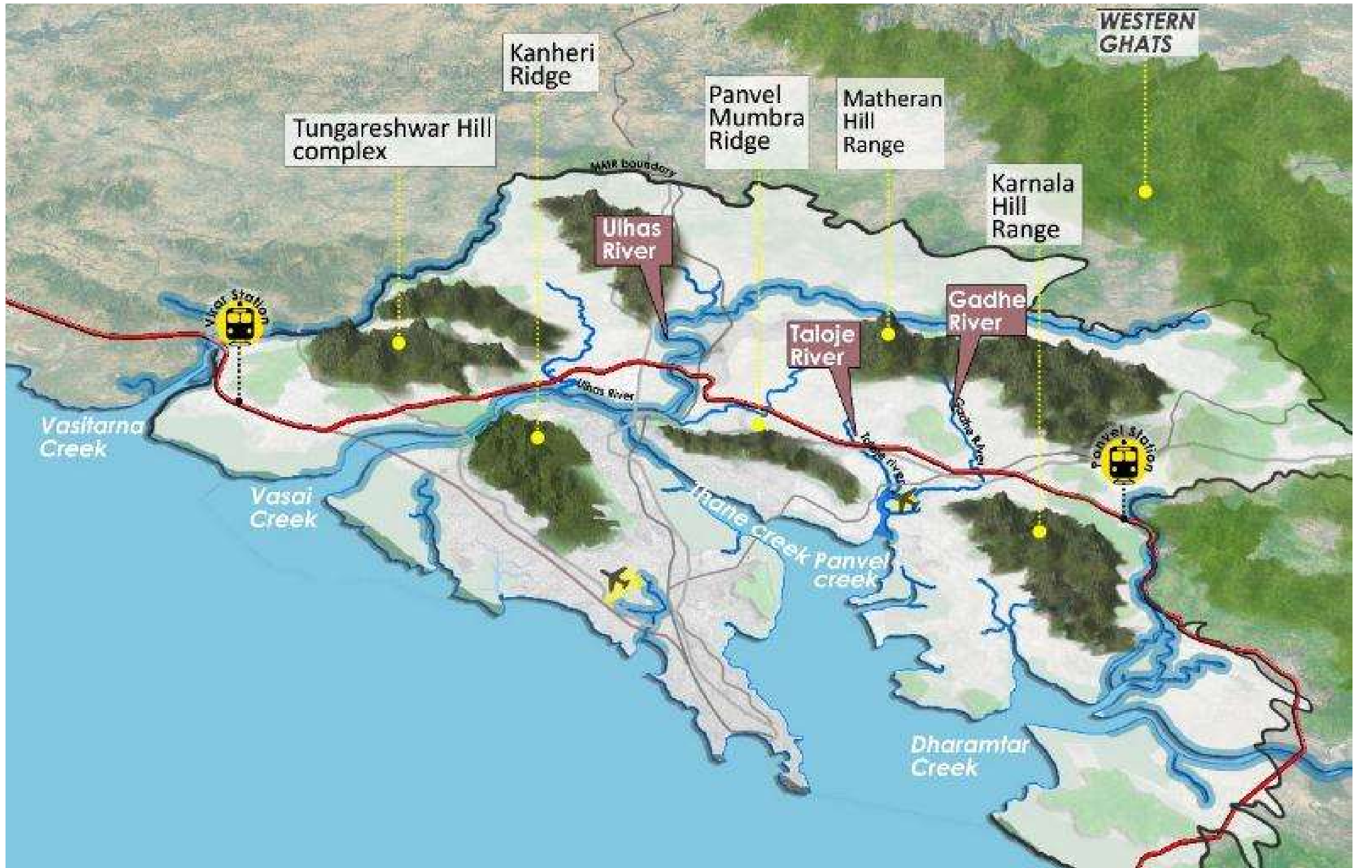
① **69.5Kms Corridor**

② **24 Stations study**
- -13 Existing
- -11 Proposed Stations

③ **Influence area across**
- -5 Municipalities
- -4 Special Planning Areas

④ **5 Metro Interchanges**

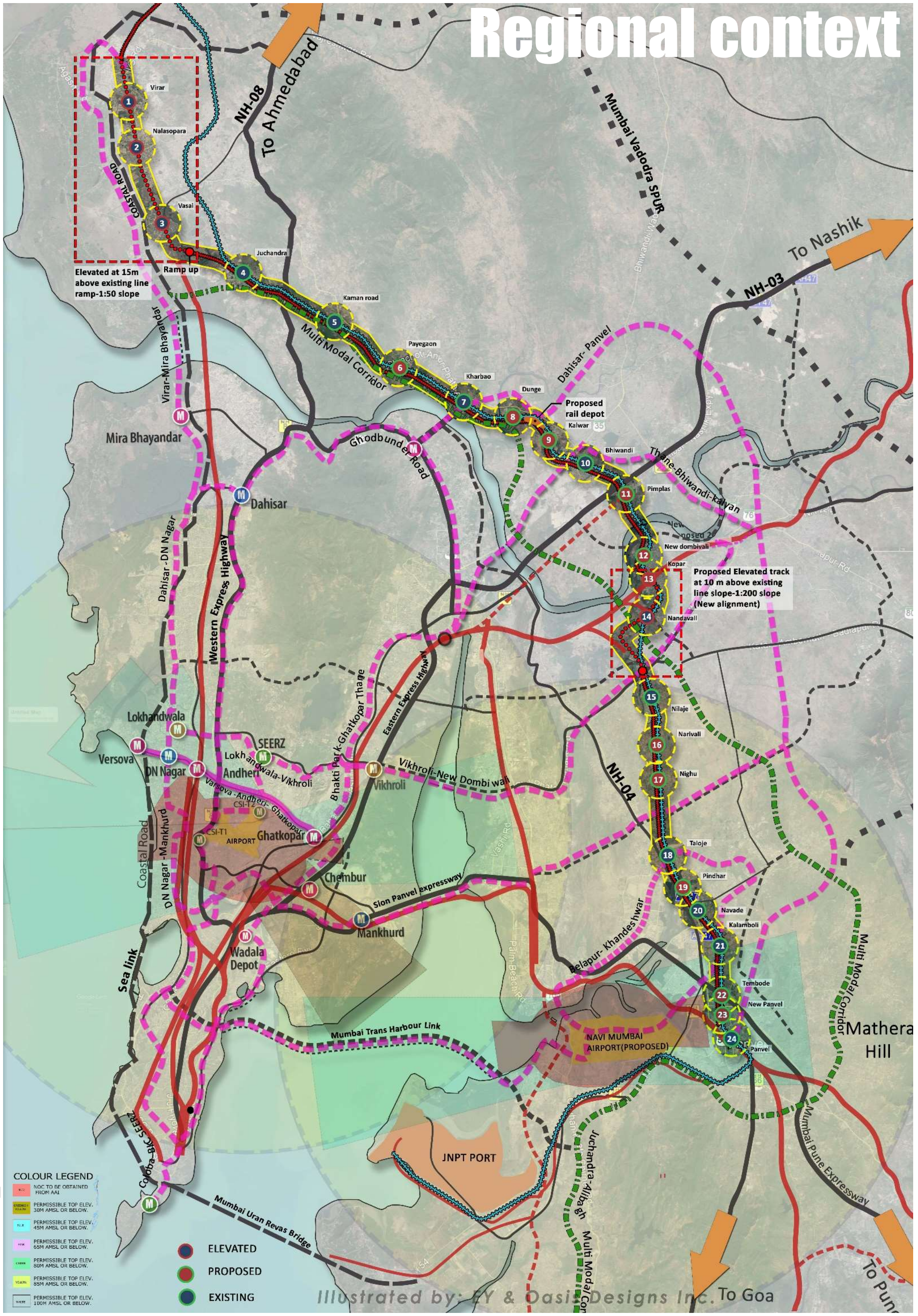
⑤ **6 focus areas**
- -Nilaje
- -Narivali
- -Nighu
- -Bhiwandi
- -Taloje
- -Tembode


Kanheri Ridge
Tungareshwar Hill complex
Panvel Mumbra Ridge
Matheran Hill Range
WESTERN GHATS
Karnala Hill Range
Ulhas River
Virar Station
Taloje River
Gadhe River
MMR boundary
Ulhas River
Vasitarna Creek
Vasai Creek
Thane creek
Panvel creek
Panvel station
Dharamtar Creek

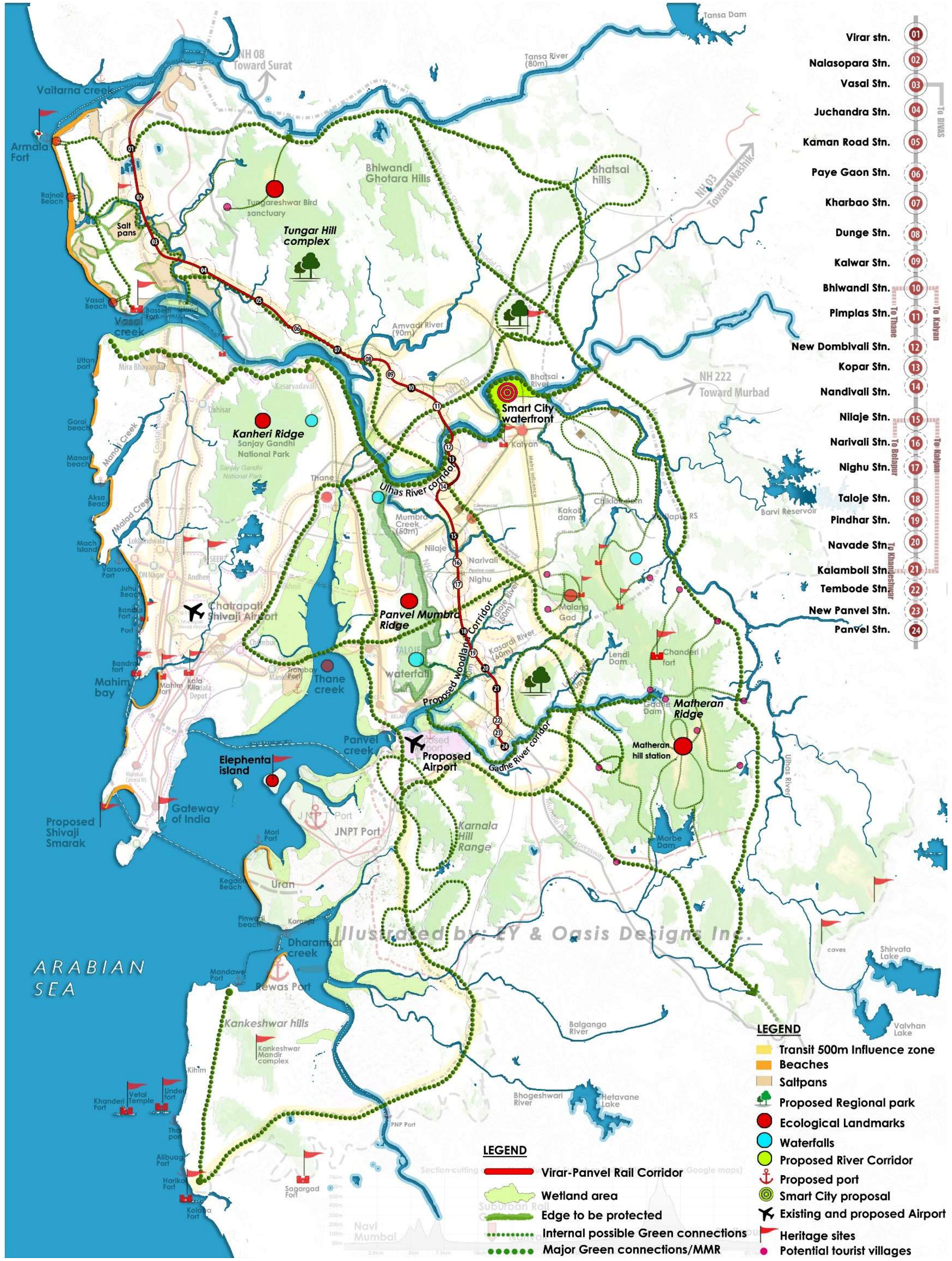
Locational setting

# Regional context

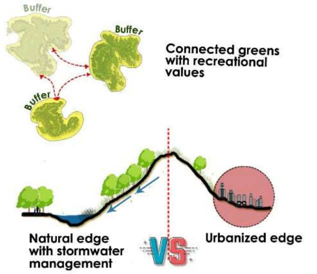
**Transport**


Virar
Nalasopara
Vasai
Juchandra
Kaman road
Payegaon
Kharbao
Dunge
Kalwar
Bhiwandi
Pimplas
New dombivali
Kopar
Nandavali
Nilaje
Narivali
Nighu
Taloje
Pindhar
Navade
Kalamboli
Tembode
New Panvel
Panvel
Elevated at 15m above existing line ramp-1:50 slope
Ramp up
Proposed rail depot
Proposed Elevated track at 10 m above existing line slope-1:200 slope (New alignment)
Multi Modal Corridor
NH-08
To Ahmedabad
Mumbai Vadodra SPUR
To Nashik
NH-03
Dahisar- Panvel
Thane-Bhiwandi-Kalyan
Ghodbunder Road
Virar-Mira Bhayandar
Mira Bhayandar
Dahisar
Dahisar - DN Nagar
Western Express Highway
Eastern Express Highway
Lokhandwala
Versova
DN Nagar
SEERZ
Andheri
Lokhandwala-Vikhroli
Versova - Andheri - Ghatkopar
Bhakti Park-Ghatkopar Thane
Vikhroli-New Dombiwali
Vikhroli
Ghatkopar
CSI-T1
CSI-T2
AIRPORT
Chembur
Sion Panvel expressway
Mankhurd
Coastal Road
DN Nagar - Mankhurd
Wadala Depot
Sea link
NH-04
Belapur- Khandeshwar
Mumbai Trans Harbour Link
NAVI MUMBAI AIRPORT(PROPOSED)
JNPT PORT
Juchandra -Alibagh
Multi Modal Corridor
Mumbai Pune Expressway
Matheran Hill
Colaba-BKC-SEERZ
Mumbai Uran Revas Bridge
To Goa
To Pune
COLOUR LEGEND
NOC TO BE OBTAINED FROM AAI
PERMISSIBLE TOP ELEV. 30M AMSL OR BELOW.
PERMISSIBLE TOP ELEV. 45M AMSL OR BELOW.
PERMISSIBLE TOP ELEV. 65M AMSL OR BELOW.
PERMISSIBLE TOP ELEV. 80M AMSL OR BELOW.
PERMISSIBLE TOP ELEV. 85M AMSL OR BELOW.
PERMISSIBLE TOP ELEV. 100M AMSL OR BELOW.
ELEVATED
PROPOSED
EXISTING
Illustrated by: EY & Oasis Designs Inc.

**Environmental**


Virar stn. 01
Nalasopara Stn. 02
Vasai Stn. 03
Juchandra Stn. 04
Kaman Road Stn. 05
Paye Gaon Stn. 06
Kharbao Stn. 07
Dunge Stn. 08
Kalwar Stn. 09
Bhiwandi Stn. 10
Pimplas Stn. 11
New Dombivali Stn. 12
Kopar Stn. 13
Nandivali Stn. 14
Nilaje Stn. 15
Narivali Stn. 16
Nighu Stn. 17
Taloje Stn. 18
Pindhar Stn. 19
Navade Stn. 20
Kalamboli Stn. 21
Tembode Stn. 22
New Panvel Stn. 23
Panvel Stn. 24
To DIVAS
To Thane
To Kalyan
To Belapur
To Kalyan
To Khandeshwar
Tansa Dam
Tansa River (80m)
NH 08 Toward Surat
Vaitarna creek
Arnala Fort
Tungareshwar Bird sanctuary
Tungar Hill complex
Bhiwandi Ghotara Hills
Bhatsai hills
NH 03 Toward Nashik
Salt pans
Vasai creek
Amvadi River (90m)
Smart City waterfront
NH 222 Toward Murbad
Kanheri Ridge
Sanjay Gandhi National Park
Ulhas River corridor
Barvi Reservoir
Chatrapati Shivaji Airport
Panvel Mumbra Ridge
Proposed Woodland Corridor
Malang Gad
Chanderi fort
Matheran Ridge
Matheran hill station
Thane creek
Mahim bay
Elephanta island
Panvel creek
Proposed Airport
Gadhe River corridor
Gateway of India
Proposed Shivaji Smarak
JNPT Port
Karnala Hill Range
Morbe Dam
Uran
Dharamtar creek
Rewas Port
Kankeshwar hills
ARABIAN SEA
Balganga River
Bhogeshwari River
Hetavane Lake
Valvhan Lake
Illustrated by: EY & Oasis Designs Inc.
LEGEND
Virar-Panvel Rail Corridor
Wetland area
Edge to be protected
Internal possible Green connections
Major Green connections/MMR
LEGEND
Transit 500m Influence zone
Beaches
Saltpans
Proposed Regional park
Ecological Landmarks
Waterfalls
Proposed River Corridor
Proposed port
Smart City proposal
Existing and proposed Airport
Heritage sites
Potential tourist villages

## 1 Linking Regional greens & creating buffers to protect Hill edge

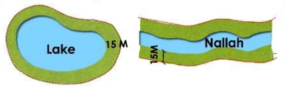

Buffer
Buffer
Buffer
VS

Connected greens with recreational values

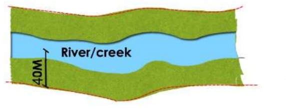
Natural edge with stormwater management

Urbanized edge

## 2 Buffer along the Waterbodies

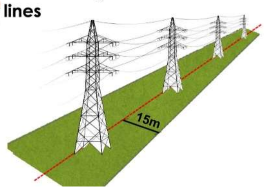

Lake
15 M
Nallah
15M

15 M Buffer along the waterbodies as per NAINA DCR


River/creek
40M

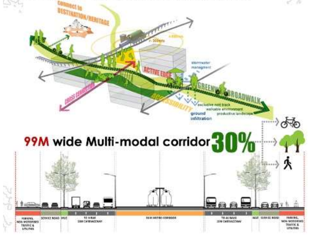
Min.50 M/width of the river/creek as buffer as per CRZ notification for CRZ influenced

## 3 Buffer along the Transmission lines

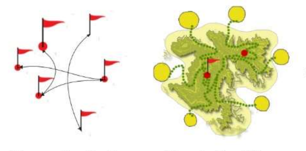


## 4 Greenways along the road and river

Greenway along River/Creek/Nallah

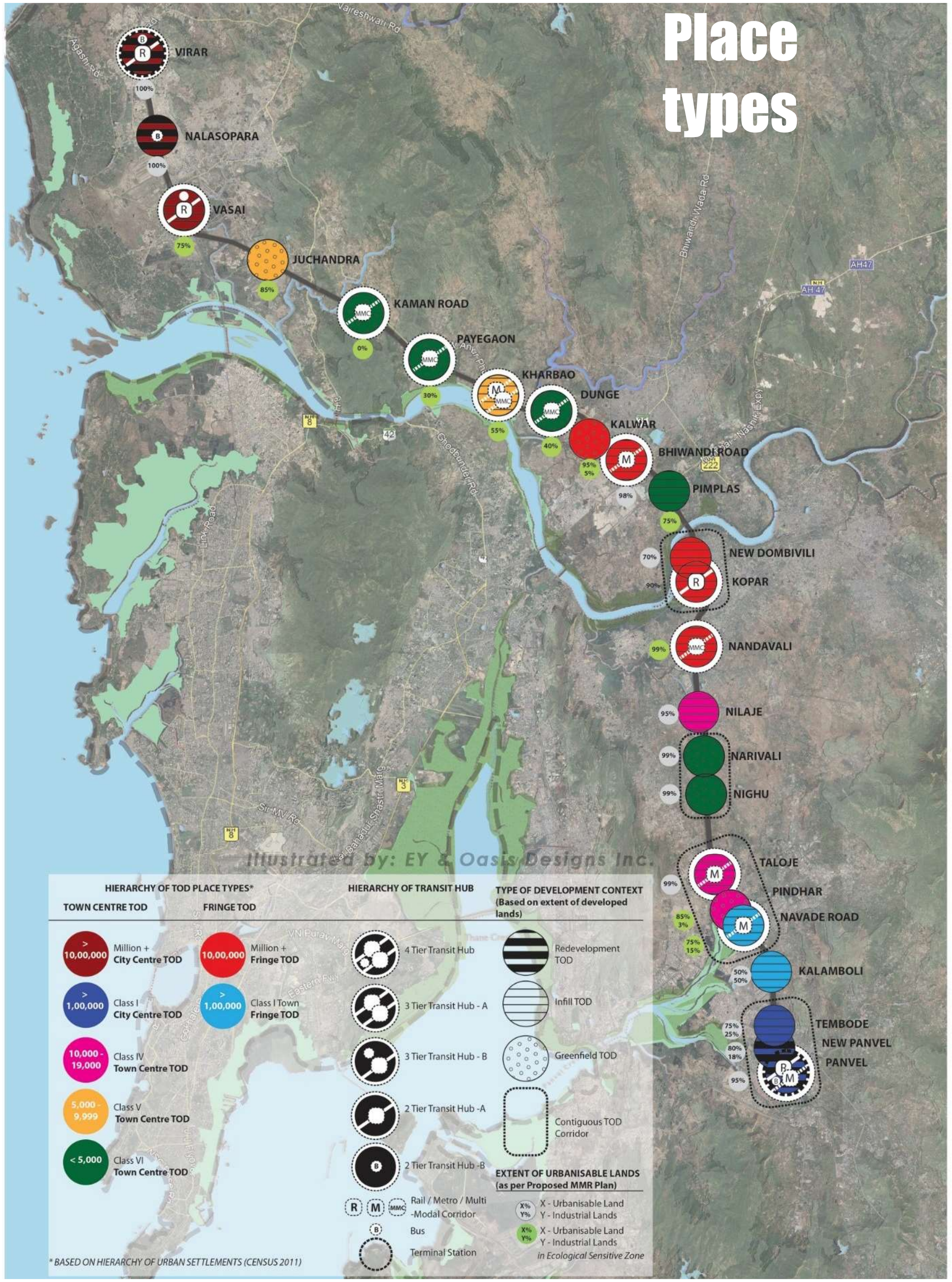

Connect to DESTINATION/HERITAGE
ACTIVE EDGE
CROSS CONNECTION
GREENWAY BROADWALK
ACCESSIBILITY
stormwater management
ground infiltration
99M wide Multi-modal corridor
30%

## 5 Tourism potential



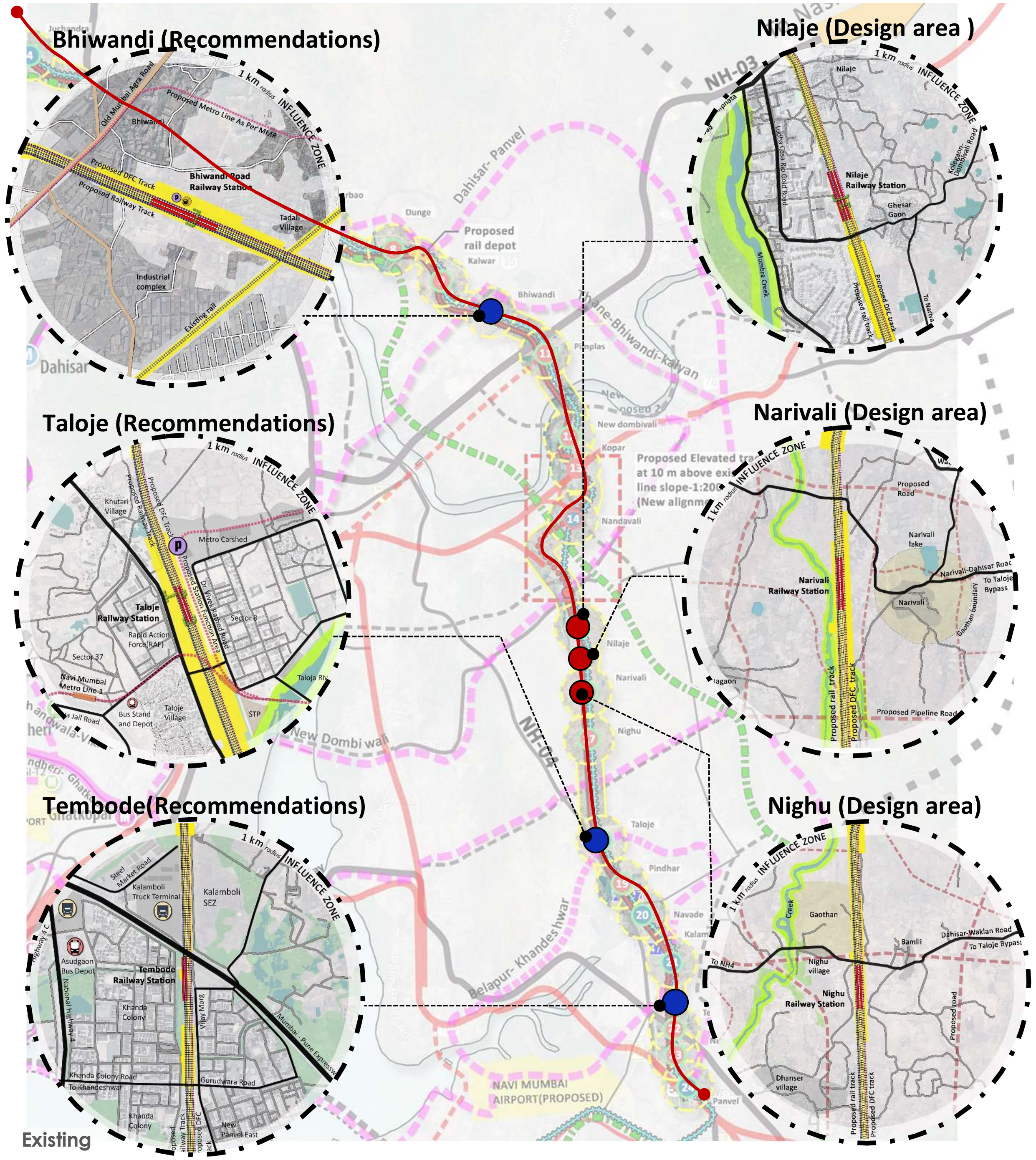
Connecting Heritage sites together

Developing Villages with Tourism potential

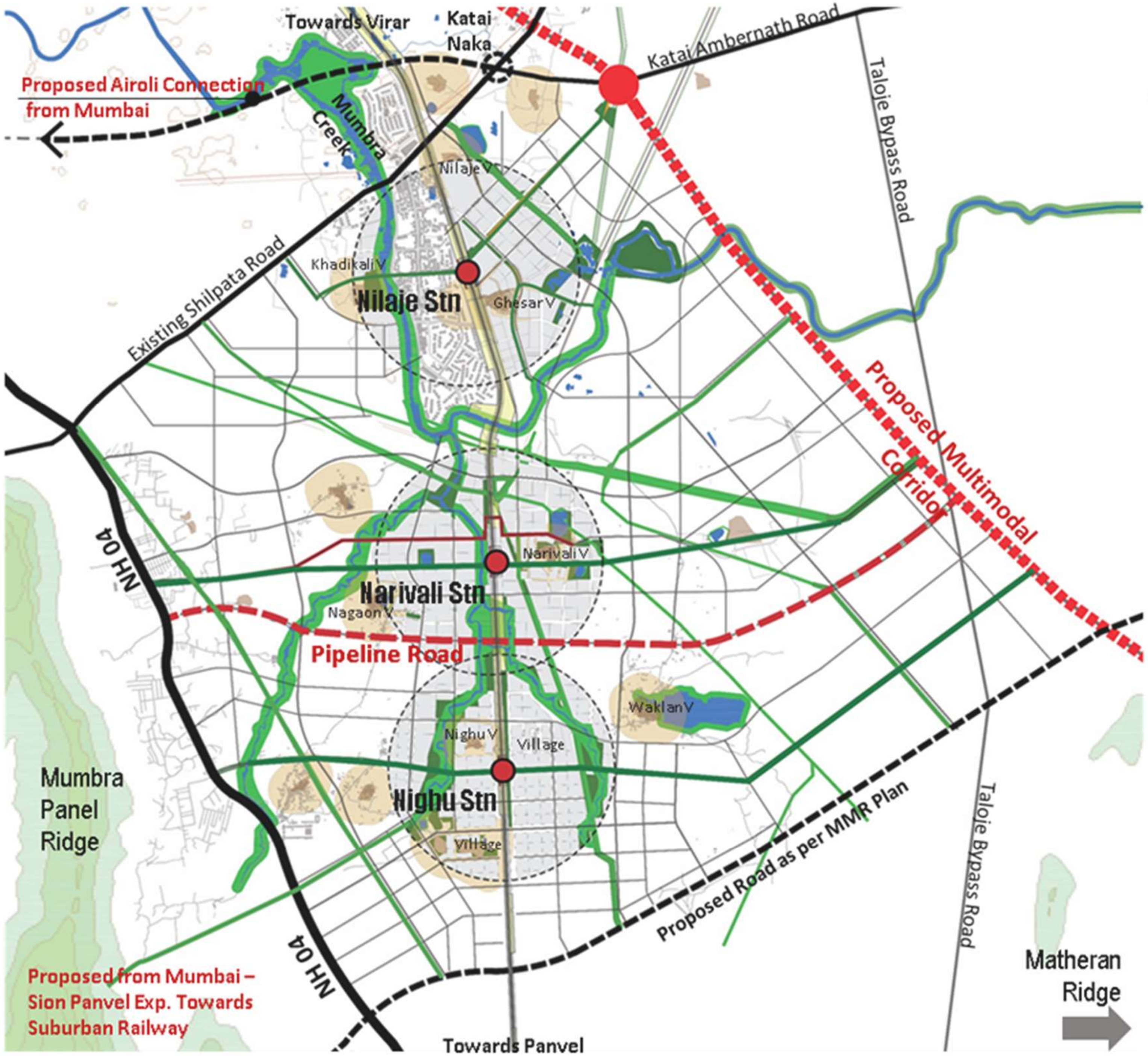

Place types
VIRAR
NALASOPARA
VASAI
JUCHANDRA
KAMAN ROAD
PAYEGAON
KHARBAO
DUNGE
KALWAR
BHIWANDI ROAD
PIMPLAS
NEW DOMBIVILI
KOPAR
NANDAVALI
NILAJE
NARIVALI
NIGHU
TALOJE
PINDHAR
NAVADE ROAD
KALAMBOLI
TEMBODE
NEW PANVEL
PANVEL
Illustrated by: EY & Oasis Designs Inc.
HIERARCHY OF TOD PLACE TYPES*
TOWN CENTRE TOD
FRINGE TOD
> 10,00,000 Million + City Centre TOD
10,00,000 Million + Fringe TOD
> 1,00,000 Class I City Centre TOD
> 1,00,000 Class I Town Fringe TOD
10,000 - 19,000 Class IV Town Centre TOD
5,000 - 9,999 Class V Town Centre TOD
< 5,000 Class VI Town Centre TOD
HIERARCHY OF TRANSIT HUB
4 Tier Transit Hub
3 Tier Transit Hub - A
3 Tier Transit Hub - B
2 Tier Transit Hub -A
2 Tier Transit Hub -B
R M MMC Rail / Metro / Multi -Modal Corridor
B Bus
Terminal Station
TYPE OF DEVELOPMENT CONTEXT (Based on extent of developed lands)
Redevelopment TOD
Infill TOD
Greenfield TOD
Contiguous TOD Corridor
EXTENT OF URBANISABLE LANDS (as per Proposed MMR Plan)
X% Y% X - Urbanisable Land Y - Industrial Lands
X% Y% X - Urbanisable Land Y - Industrial Lands in Ecological Sensitive Zone
* BASED ON HIERARCHY OF URBAN SETTLEMENTS (CENSUS 2011)

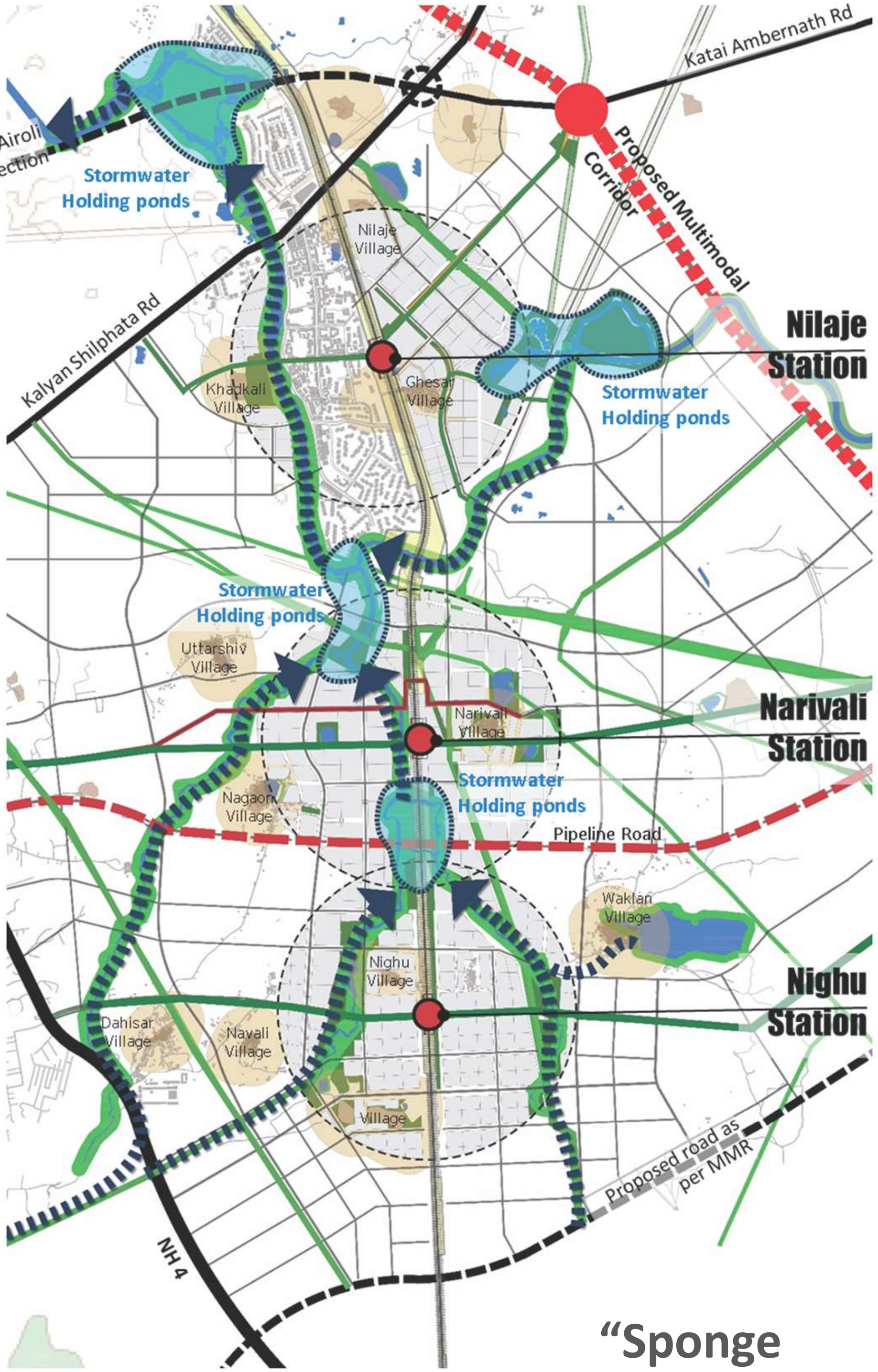
**6 Focus areas-**

- **Recommendations for Bhiwandi,Taloje & Tembode**
- **TOD concept for Nilaje, Narivali & Nighu**


Bhiwandi (Recommendations)
Nilaje (Design area )
Taloje (Recommendations)
Narivali (Design area)
Tembode(Recommendations)
Nighu (Design area)
1 km radius INFLUENCE ZONE
Bhiwandi Road Railway Station
Proposed DFC Track
Proposed Railway Track
Proposed Metro Line As Per MMR
Industrial complex
Existing rail
Nilaje Railway Station
Taloje Railway Station
Metro Carshed
Navi Mumbai Metro Line 1
Narivali Railway Station
Narivali lake
Proposed Pipeline Road
Kalamboli Truck Terminal
Kalamboli SEZ
Tembode Railway Station
Khanda Colony
Nighu Railway Station
Gaothan
Dhanser village
Proposed rail depot Kalwar
Proposed Elevated track at 10 m above existing line slope-1:200 (New alignment)
Dahisar- Panvel
Shil-Bhiwandi-Kalyan
New Dombivali
NH-03
NH-04
Belapur- Khandeshwar
NAVI MUMBAI AIRPORT(PROPOSED)
Existing

# Environmental framework

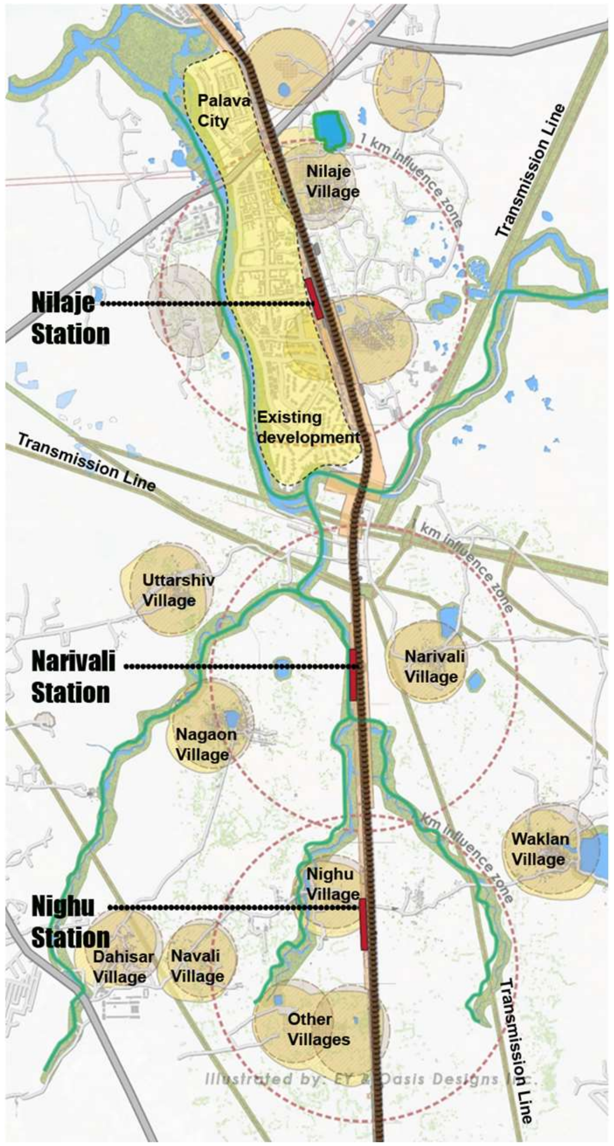

Towards Virar
Katai Naka
Katai Ambernath Road
Proposed Airoli Connection from Mumbai
Mumbra Creek
Taloje Bypass Road
Nilaje V
Khadikali V
Nilaje Stn
Ghesar V
Existing Shilpata Road
Proposed Multimodal Corridor
NH 04
Narivali V
Narivali Stn
Nagaon V
Pipeline Road
Waklan V
Nighu V
Village
Nighu Stn
Village
Mumbra Panel Ridge
Proposed Road as per MMR Plan
Taloje Bypass Road
Matheran Ridge
Proposed from Mumbai – Sion Panvel Exp. Towards Suburban Railway
NH 04
Towards Panvel


Katai Ambernath Rd
Proposed Airoli connection
Stormwater Holding ponds
Proposed Multimodal Corridor
Nilaje Village
Kalyan Shilphata Rd
Nilaje Station
Khadkali Village
Ghesar Village
Stormwater Holding ponds
Stormwater Holding ponds
Uttarshiv Village
Narivali Village
Narivali Station
Nagaon Village
Stormwater Holding ponds
Pipeline Road
Waklan Village
Nighu Village
Nighu Station
Dahisar Village
Navali Village
Village
Proposed road as per MMR
NH 4

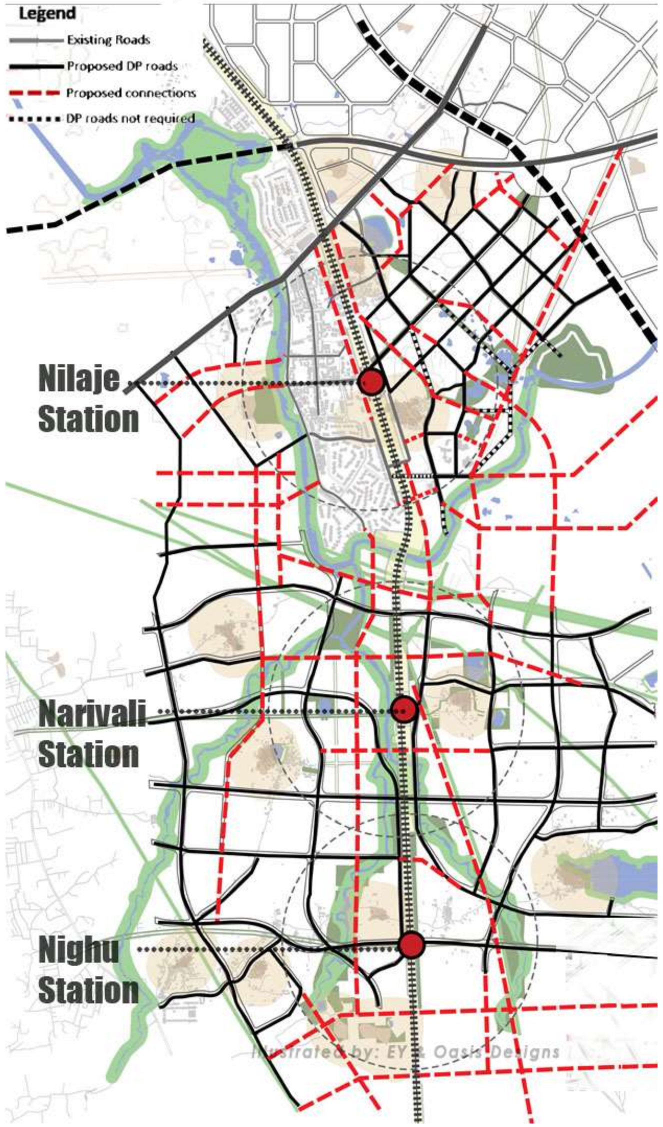
“Sponge City”

# Sub-regional strategies

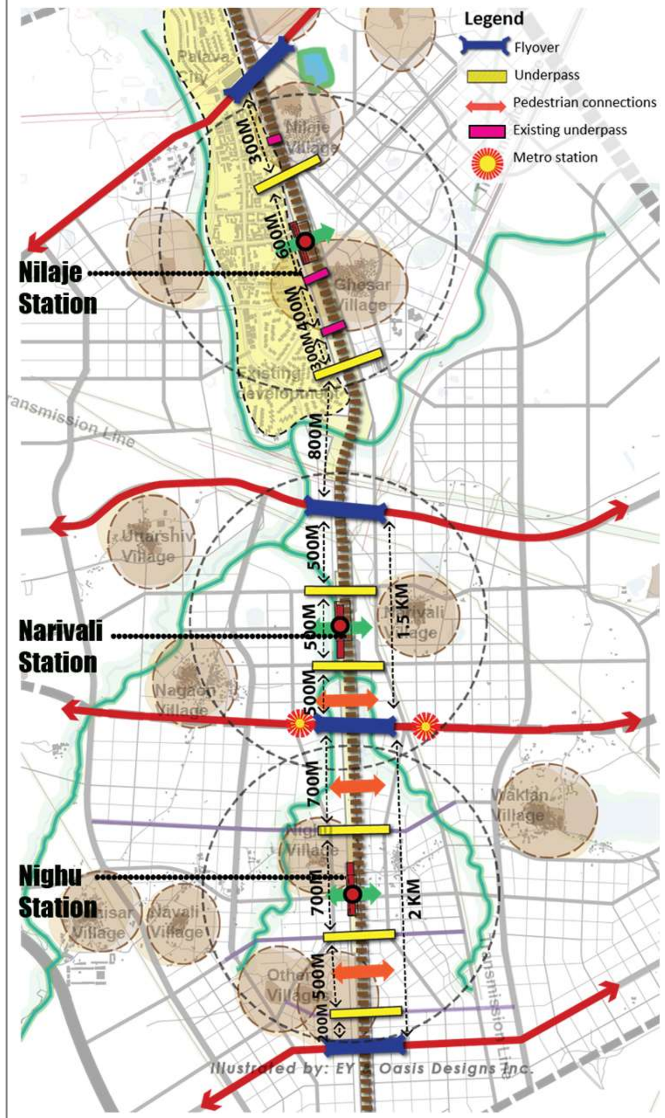
### Study **Existing** & extract ecology


Palava City
Nilaje Village
1 km influence zone
Transmission Line
Nilaje Station
Existing development
Transmission Line
km influence zone
Uttarshiv Village
Narivali Station
Narivali Village
Nagaon Village
Waklan Village
km influence zone
Nighu Village
Nighu Station
Dahisar Village
Navali Village
Other Villages
Transmission Line
Illustrated by: EY & Oasis Designs

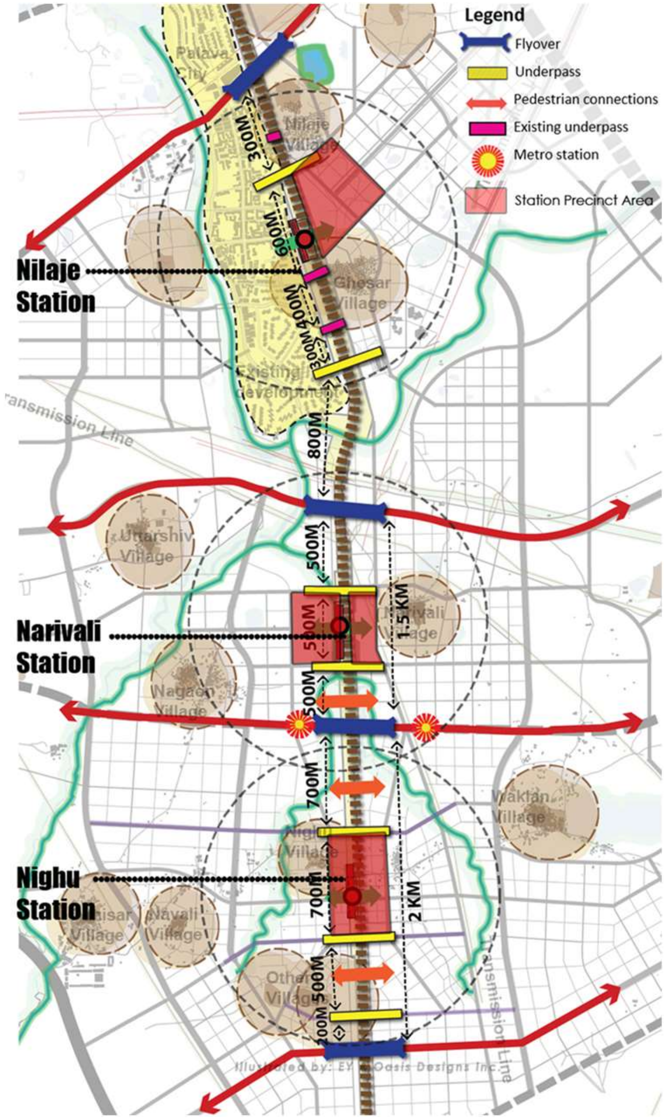
### Incorporate proposed DP and add **missing links**


Legend
Existing Roads
Proposed DP roads
Proposed connections
DP roads not required
Nilaje Station
Narivali Station
Nighu Station
Illustrated by: EY & Oasis Designs

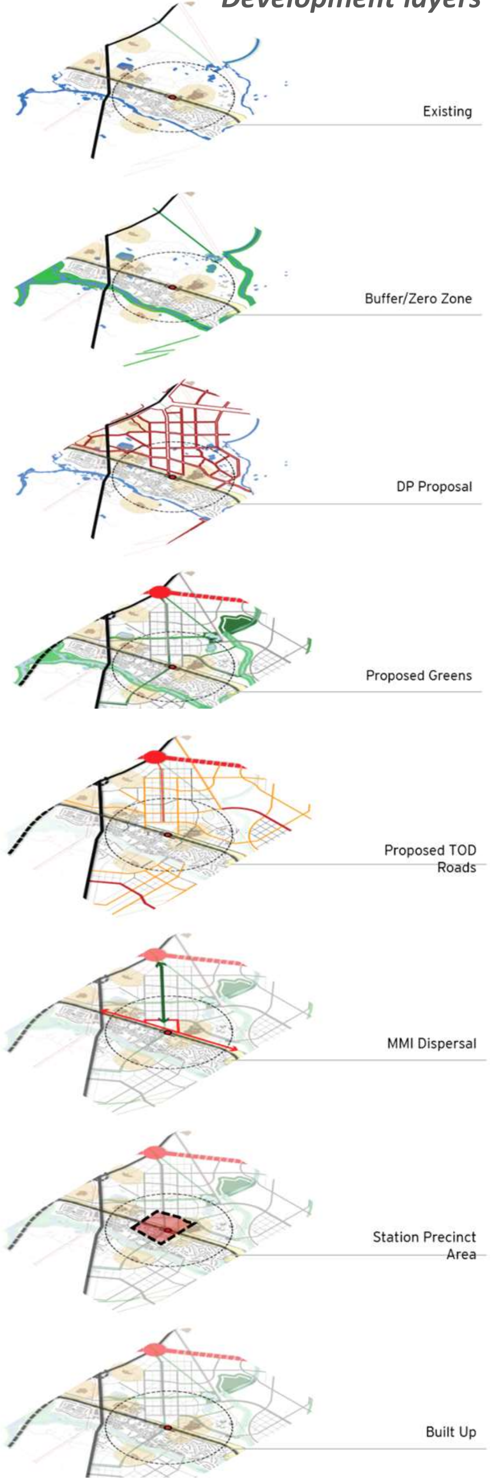
### Creating **connections** across the railway preferably at every 500m


Legend
Flyover
Underpass
Pedestrian connections
Existing underpass
Metro station
Palava City
Nilaje Village
Ghesar Village
Existing development
Transmission Line
300M
600M
400M
300M
800M
500M
500M
500M
500M
700M
700M
500M
1.5 KM
2 KM
Nilaje Station
Uttarshiv Village
Narivali Station
Narivali Village
Nagaon Village
Waklan Village
Nighu Station
Nighu Village
Dahisar Village
Navali Village
Other Villages
Transmission Line
Illustrated by: EY & Oasis Designs Inc.

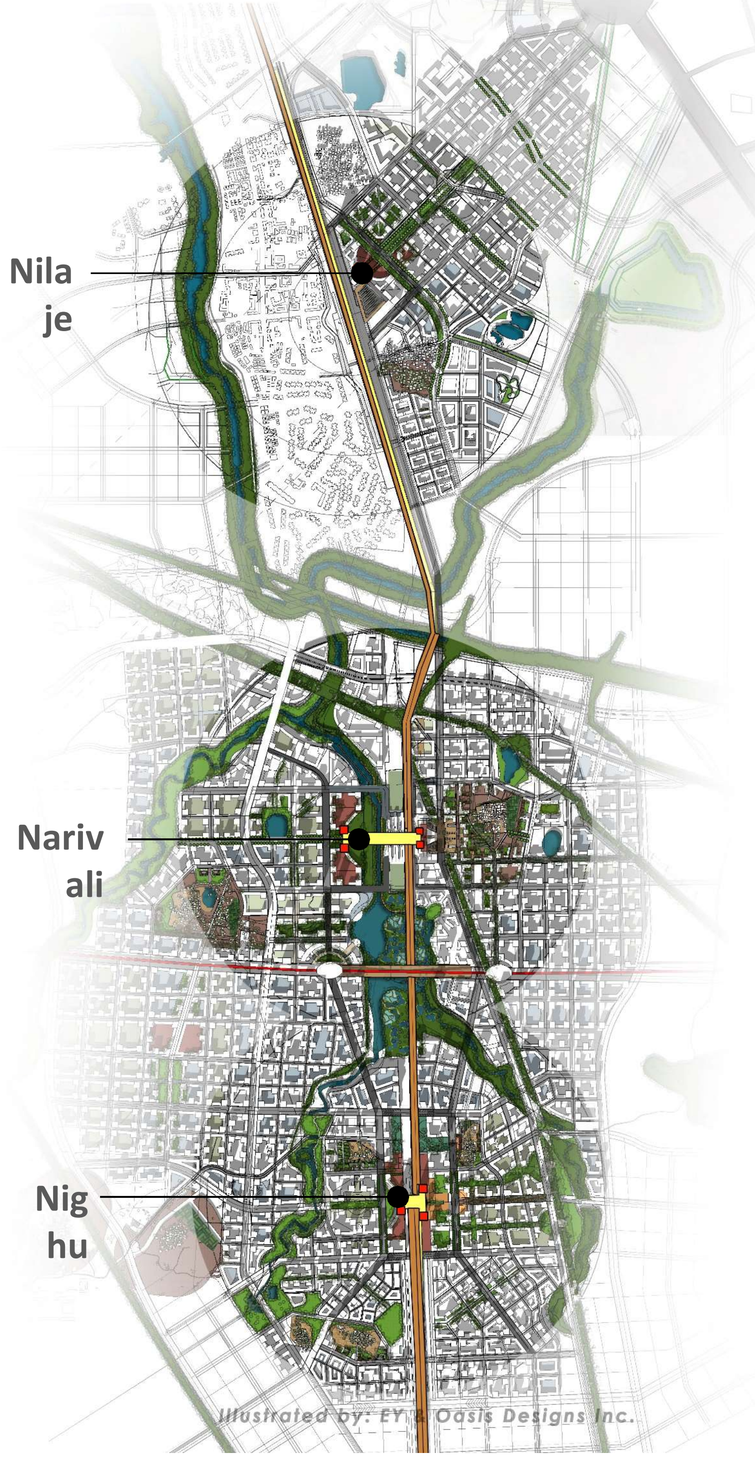
### Defining **Station Precinct**

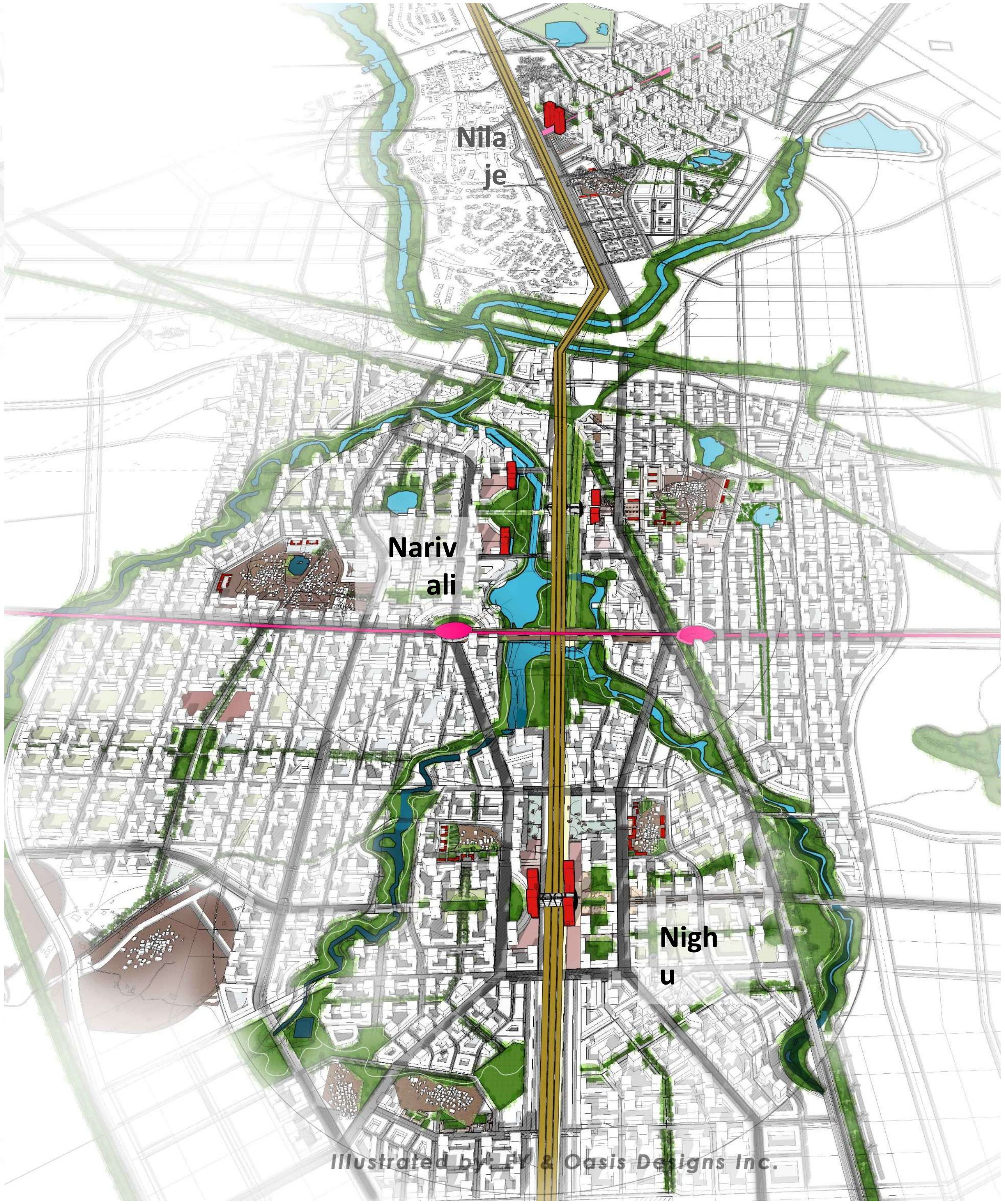

Legend
Flyover
Underpass
Pedestrian connections
Existing underpass
Metro station
Station Precinct Area
Palava City
Nilaje Village
Ghesar Village
Existing development
Transmission Line
300M
600M
400M
300M
800M
500M
500M
500M
700M
700M
500M
1.5 KM
2 KM
Nilaje Station
Uttarshiv Village
Narivali Station
Narivali Village
Nagaon Village
Waklan Village
Nighu Station
Nighu Village
Dahisar Village
Navali Village
Other Villages
Transmission Line
Illustrated by: EY & Oasis Designs Inc.

## *Development layers*


Existing
Buffer/Zero Zone
DP Proposal
Proposed Greens
Proposed TOD Roads
MMI Dispersal
Station Precinct Area
Built Up

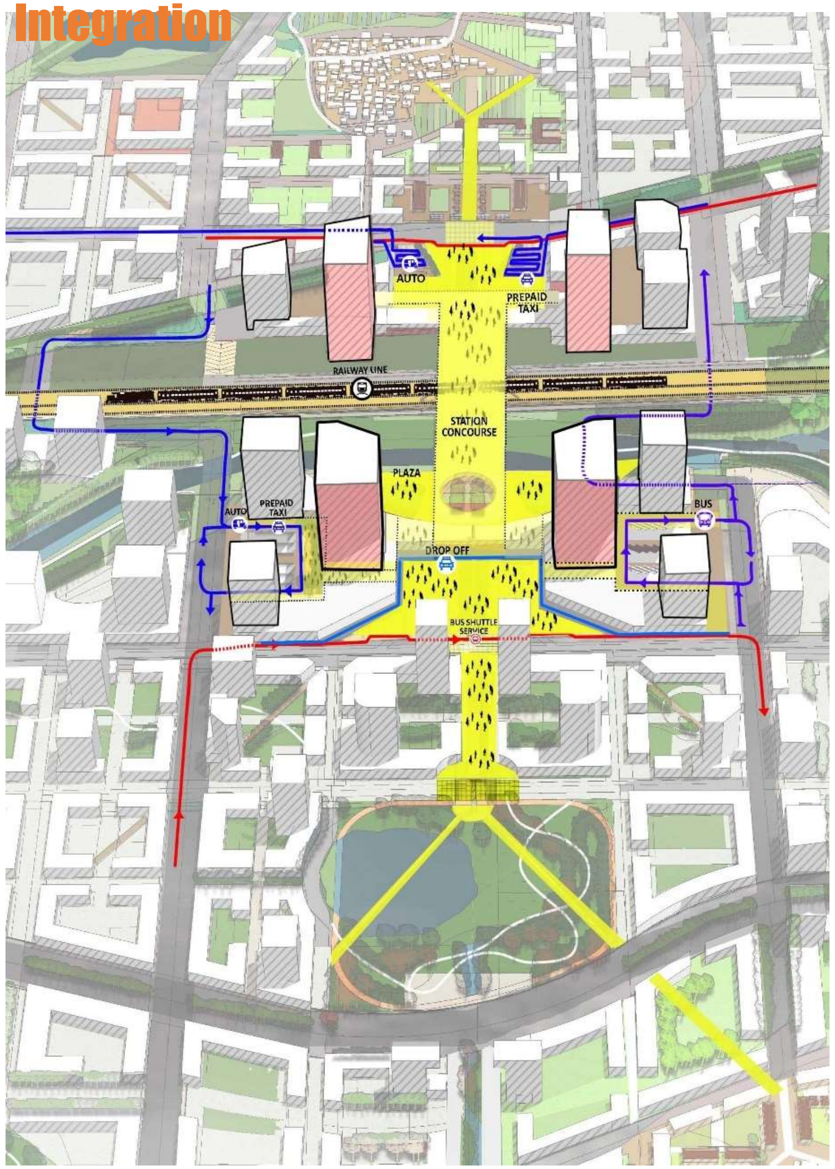
## *Proposed Three station Masterplan*


Nilaje
Narivali
Nighu
Illustrated by: EY & Oasis Designs Inc.

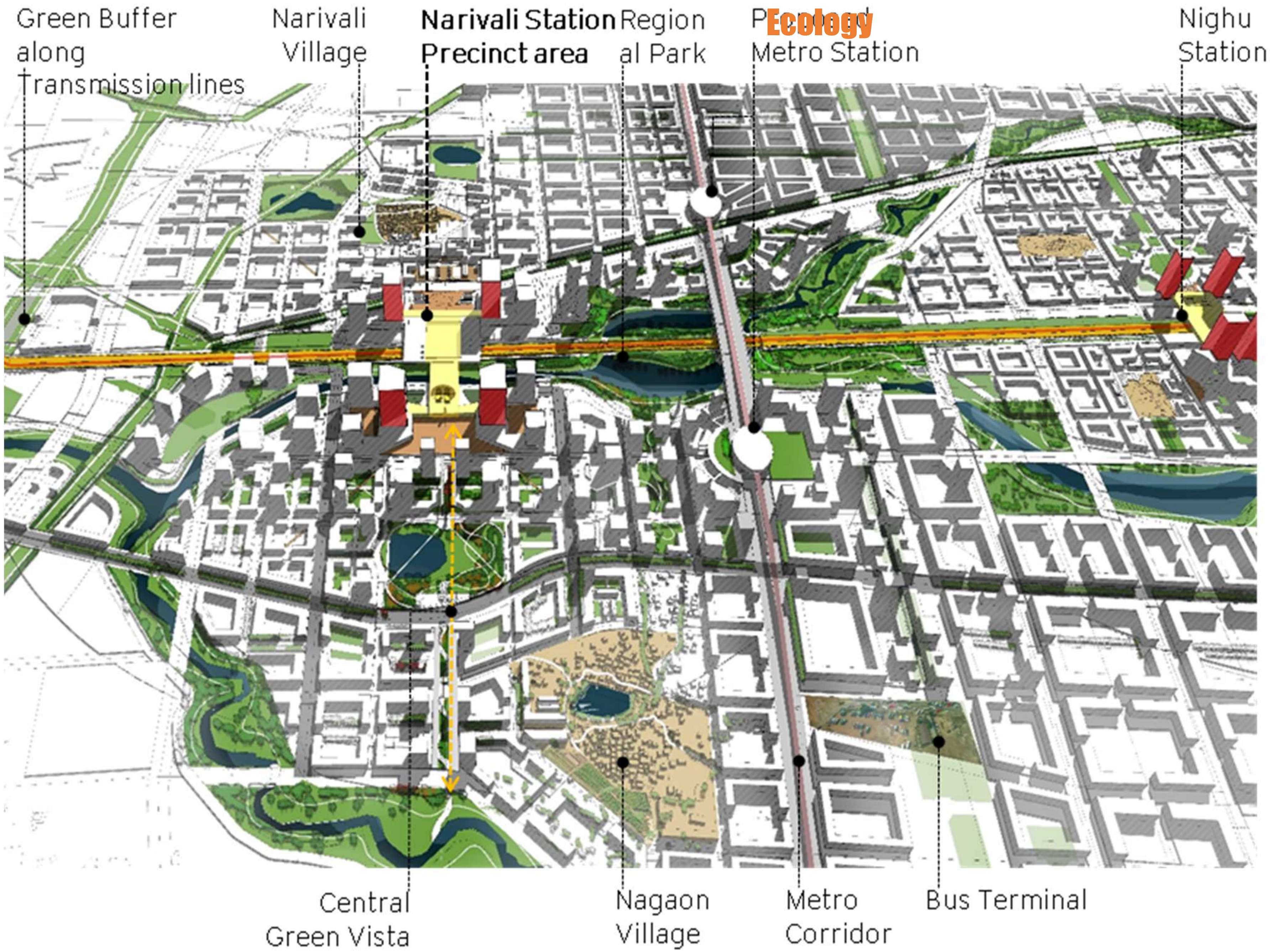

Nilaje
Narivali
Nighu
Illustrated by: EY & Oasis Designs Inc.

# Narivali Station area

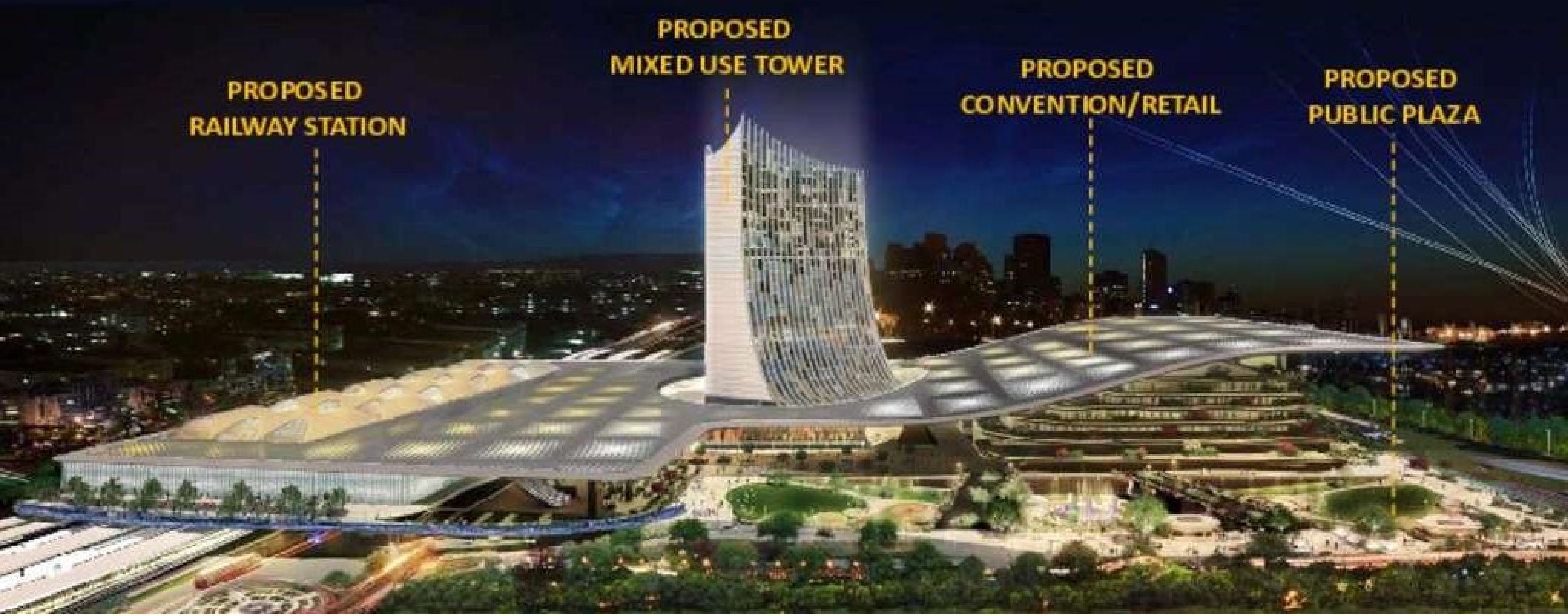
**Multimodal Integration**

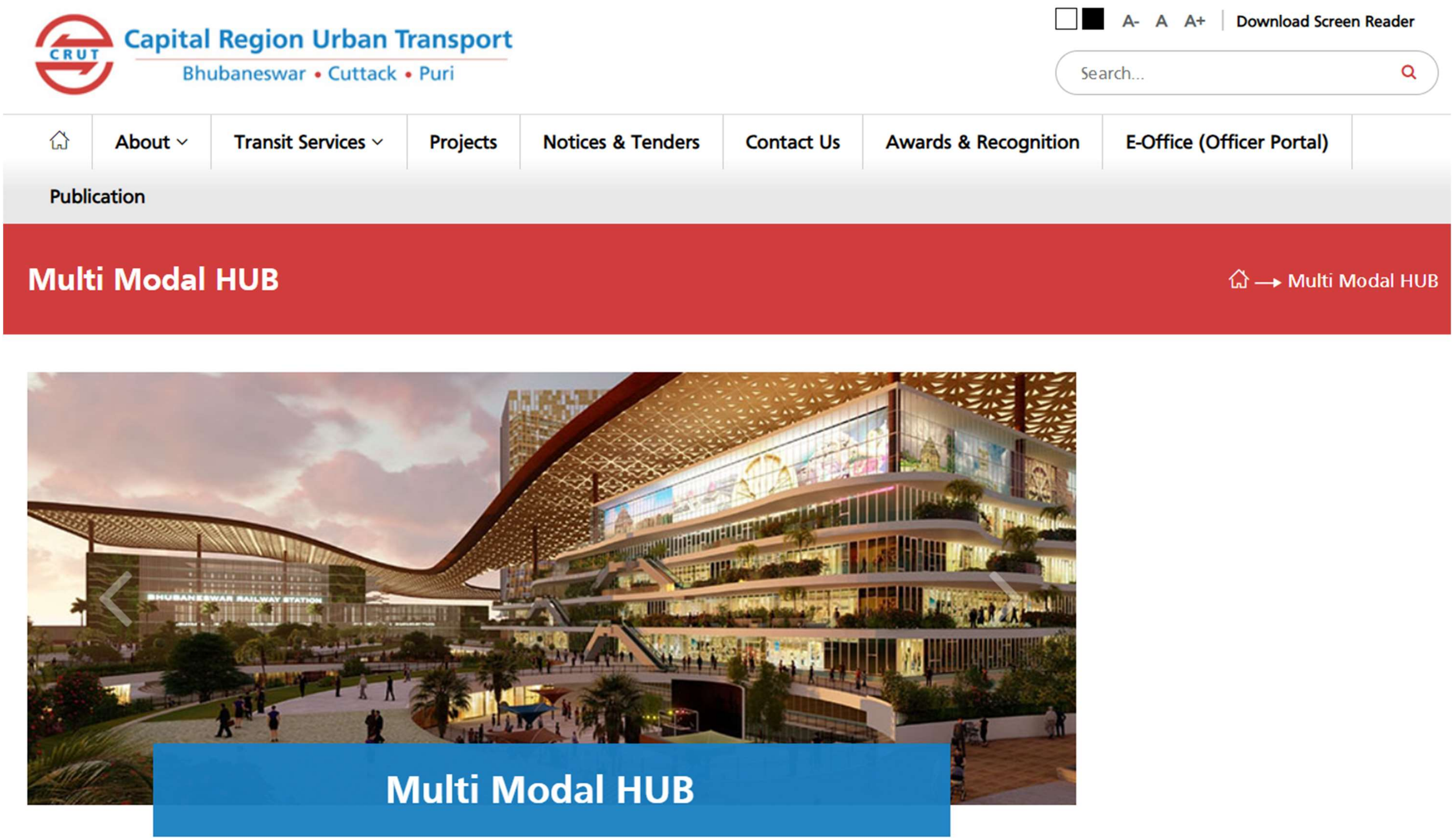

AUTO
PREPAID TAXI
RAILWAY LINE
STATION CONCOURSE
PLAZA
PREPAID TAXI
AUTO
BUS
DROP OFF
BUS SHUTTLE SERVICE

**Station area with integrated Ecology**


Green Buffer along Transmission lines
Narivali Village
Narivali Station Precinct area
Regional Park
Proposed Metro Station
Nighu Station
Central Green Vista
Nagaon Village
Metro Corridor
Bus Terminal

# Railway Station Multimodal Hub Project, Bhubaneswar


PROPOSED RAILWAY STATION
PROPOSED MIXED USE TOWER
PROPOSED CONVENTION/RETAIL
PROPOSED PUBLIC PLAZA



Capital Region Urban Transport
Bhubaneswar • Cuttack • Puri

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Projects
Notices & Tenders
Contact Us
Awards & Recognition
E-Office (Officer Portal)
Publication
Multi Modal HUB
BHUBANESWAR RAILWAY STATION

# Multi Modal HUB

Multi Modal HUB

# Karkardooma – First TOD Project in Delhi

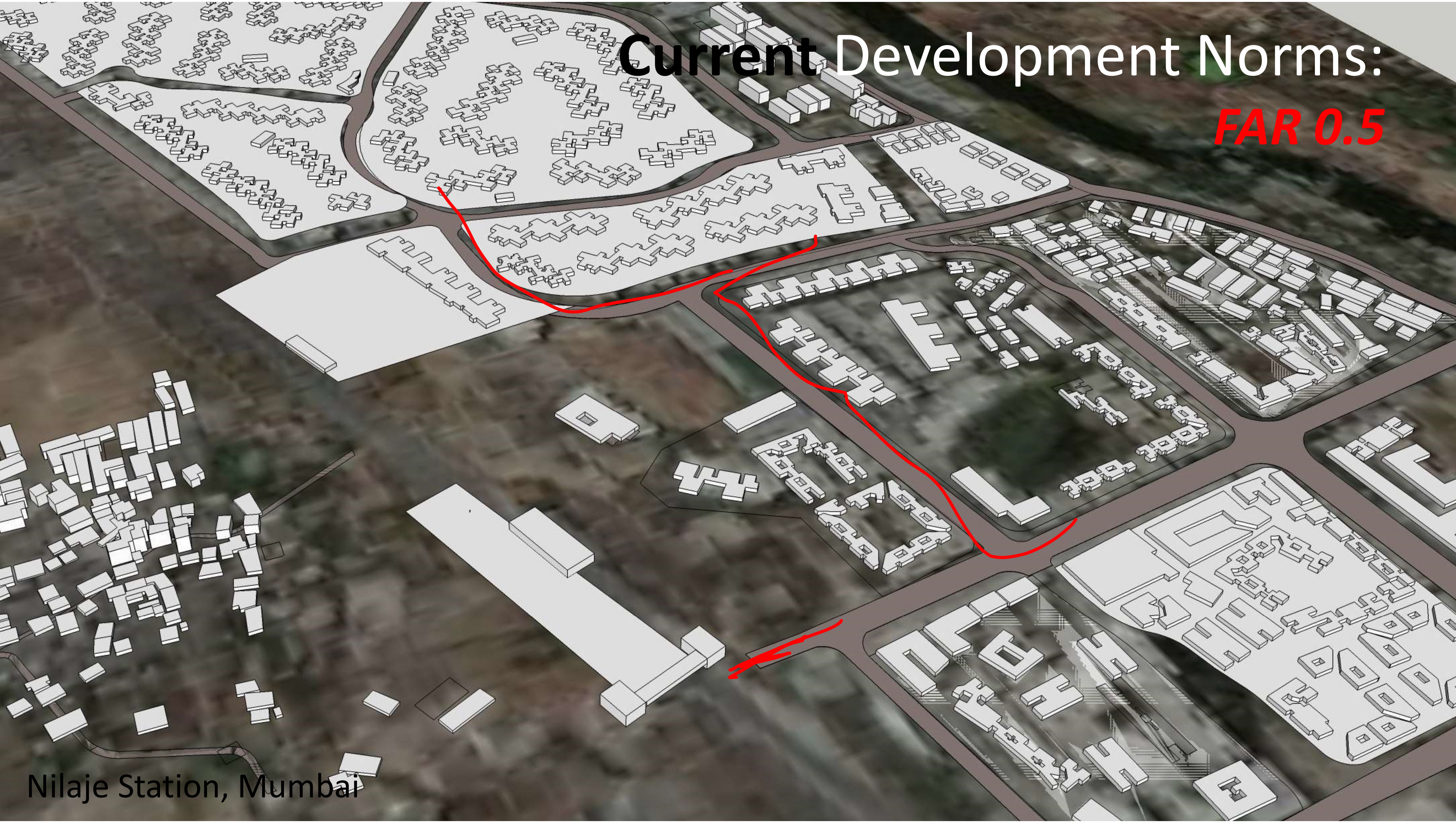
# Karkardooma – First TOD Project in Delhi

# Form Based Codes

## TOD regulation
## for Transit Oriented Communities

# Why Bother?

If **Current Development Norms:**
continue to guide Densification….



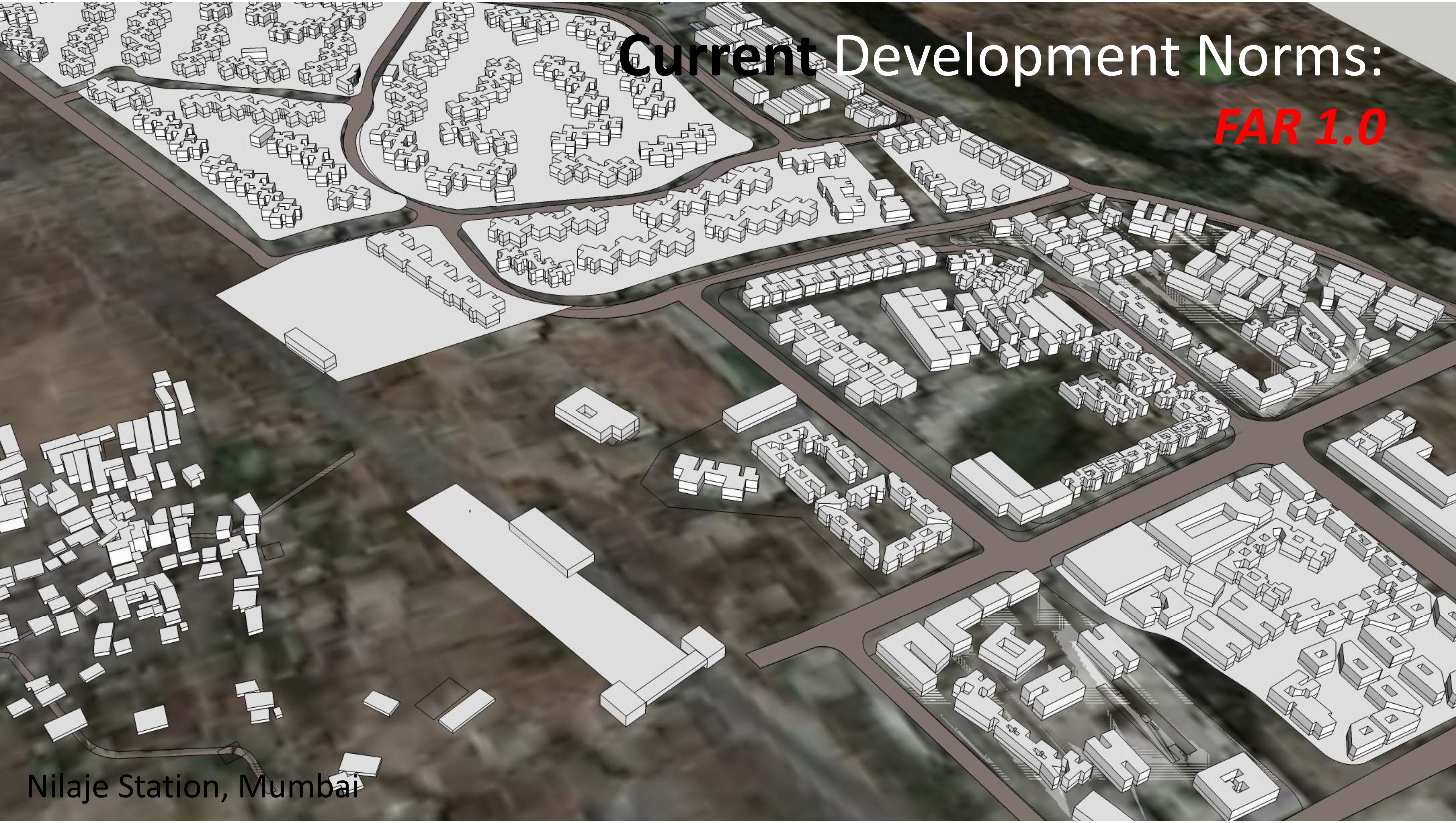
# **Current** Development Norms:

***FAR 0.5***

Nilaje Station, Mumbai

# Current Development Norms:

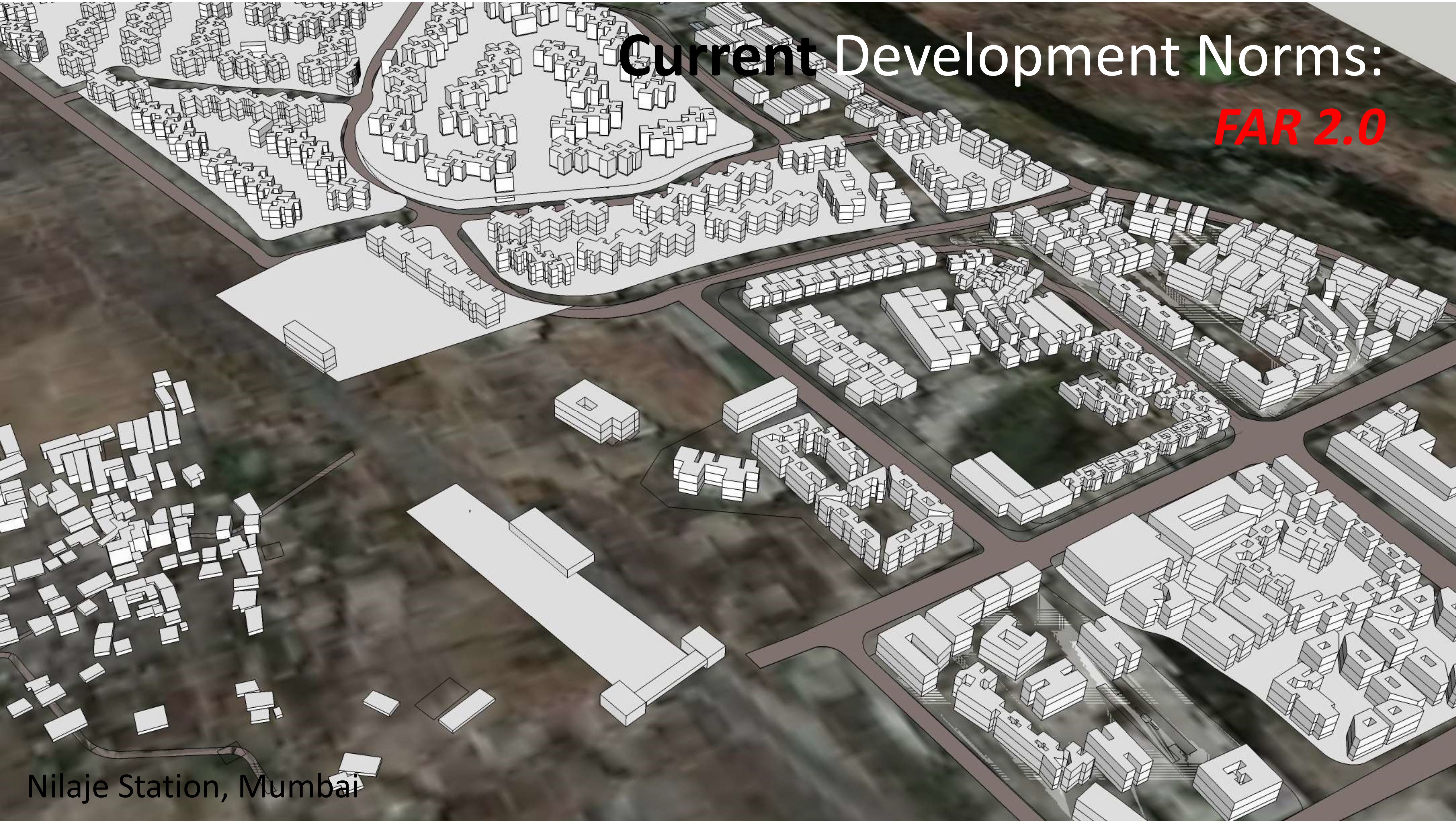
## *FAR 1.0*



Nilaje Station, Mumbai

# **Current** Development Norms:

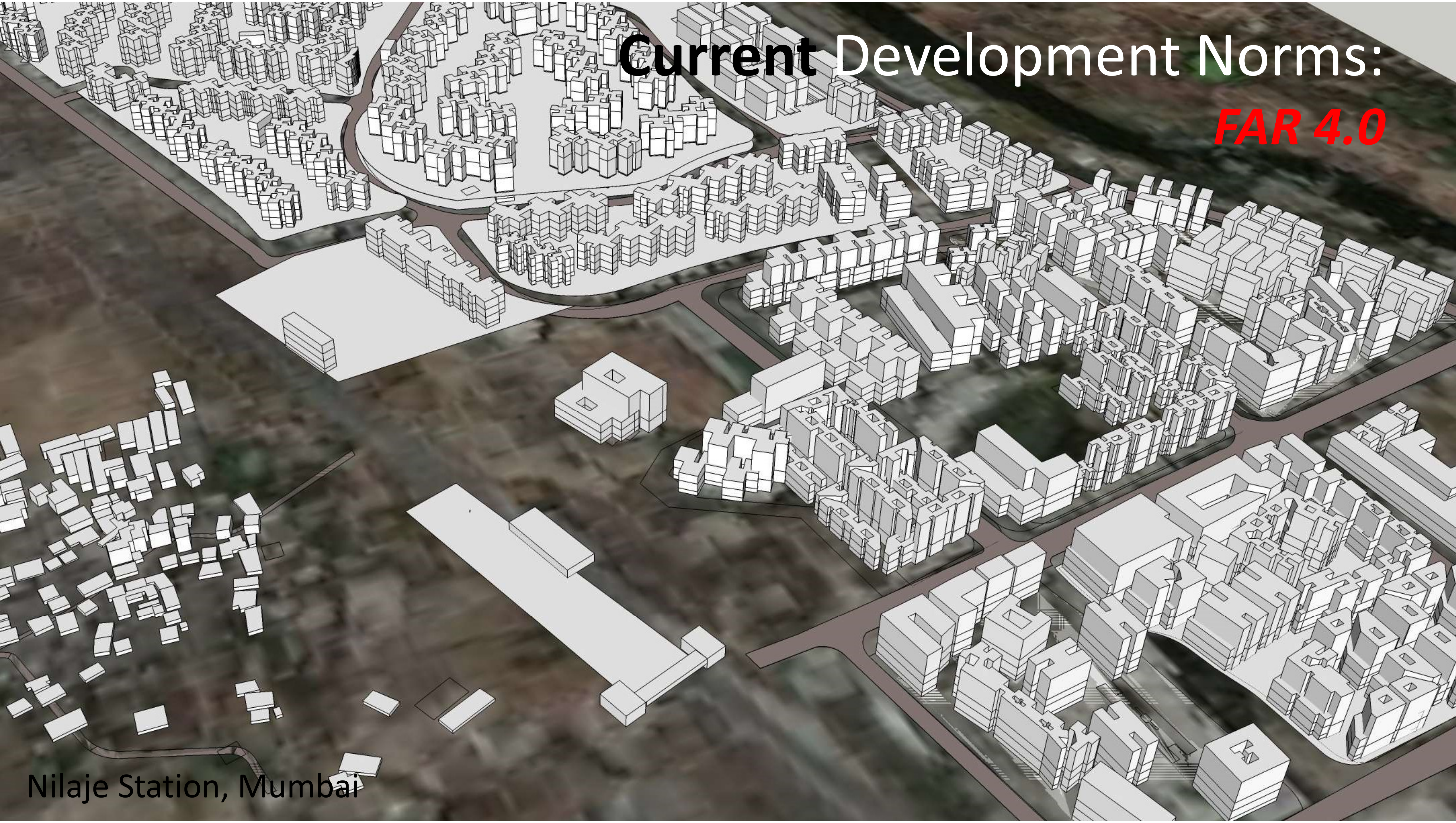
## *FAR 2.0*



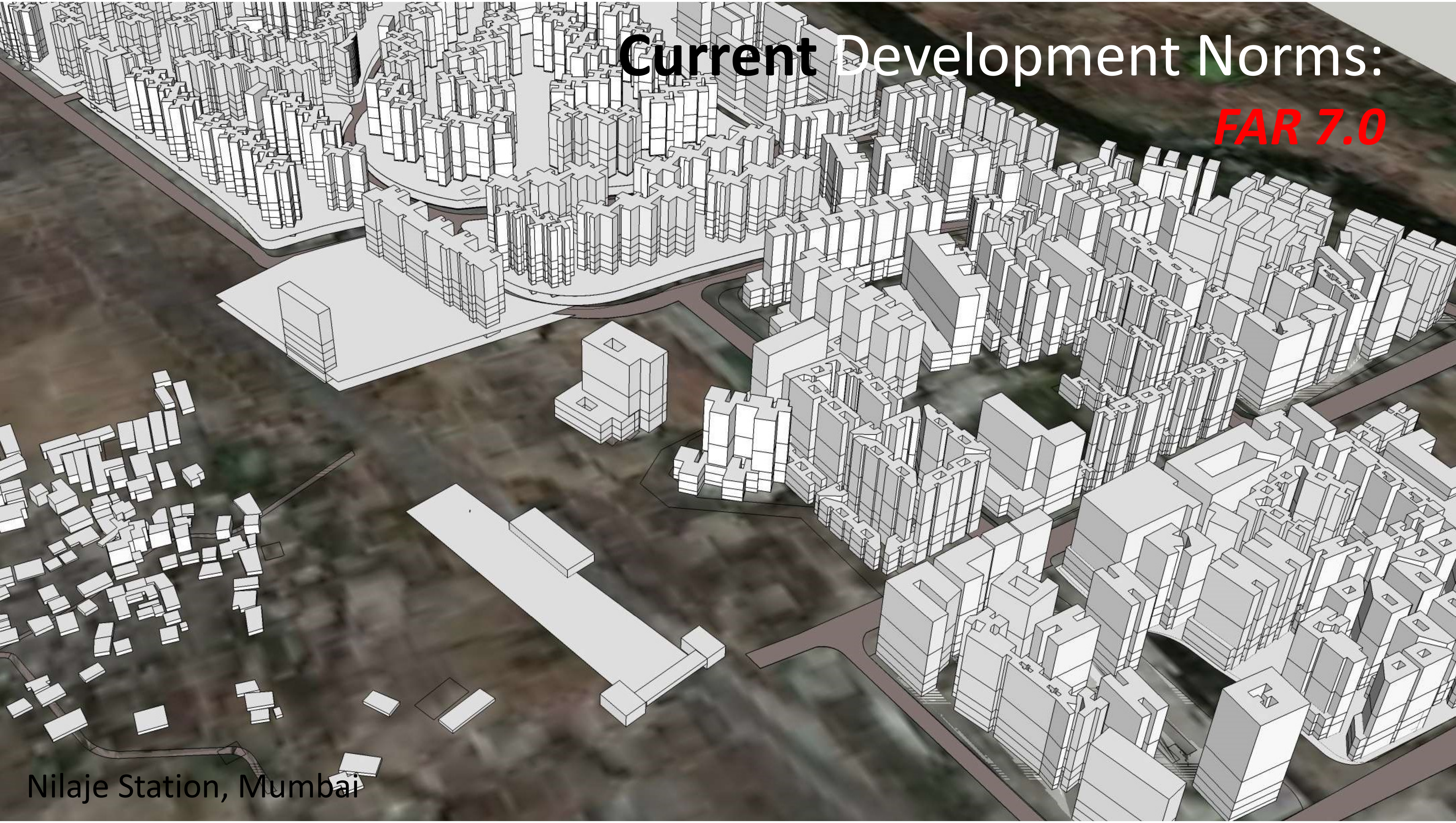
Nilaje Station, Mumbai

# **Current** Development Norms:

***FAR 4.0***



Nilaje Station, Mumbai



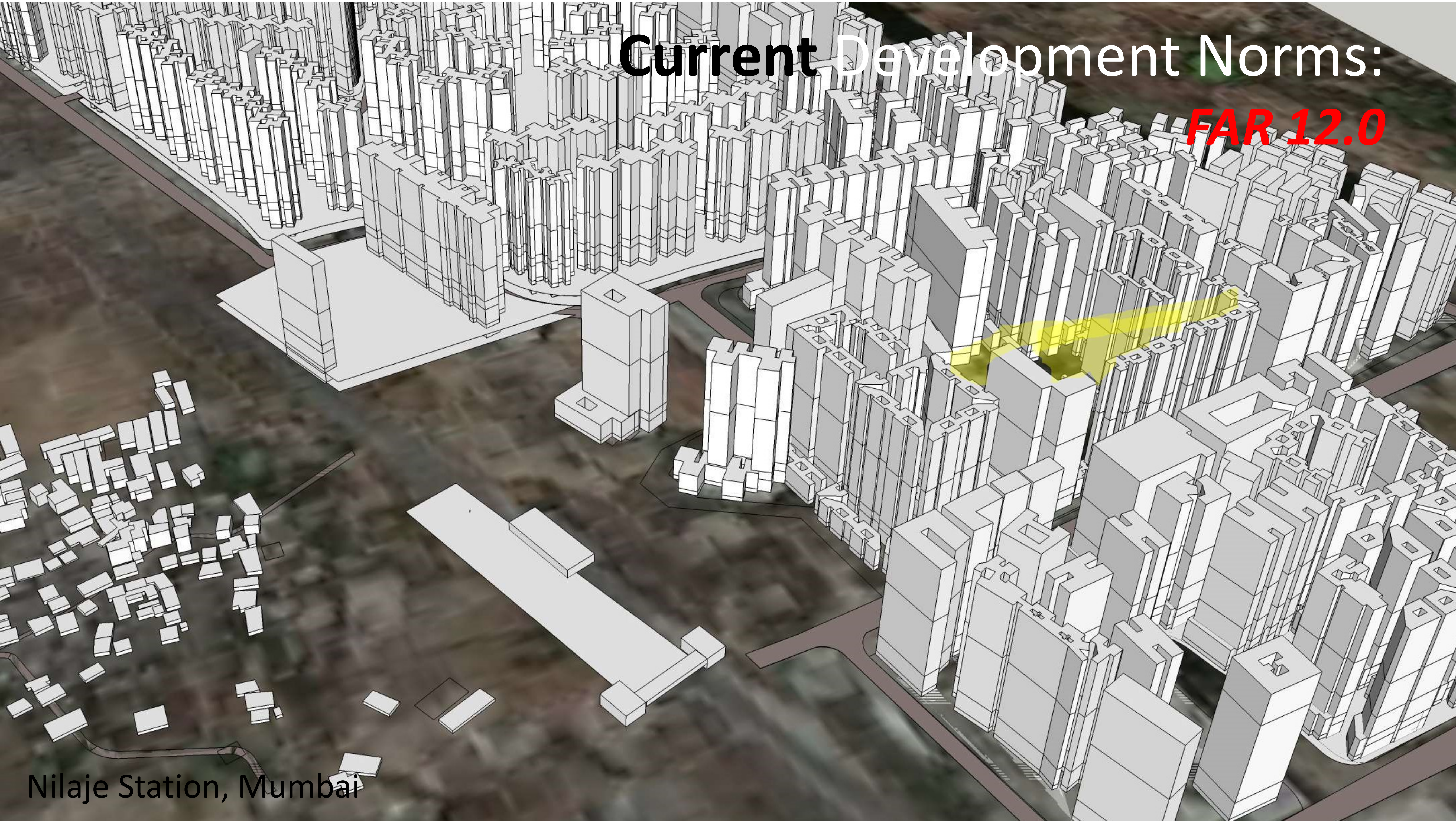
# **Current** Development Norms:

***FAR 7.0***

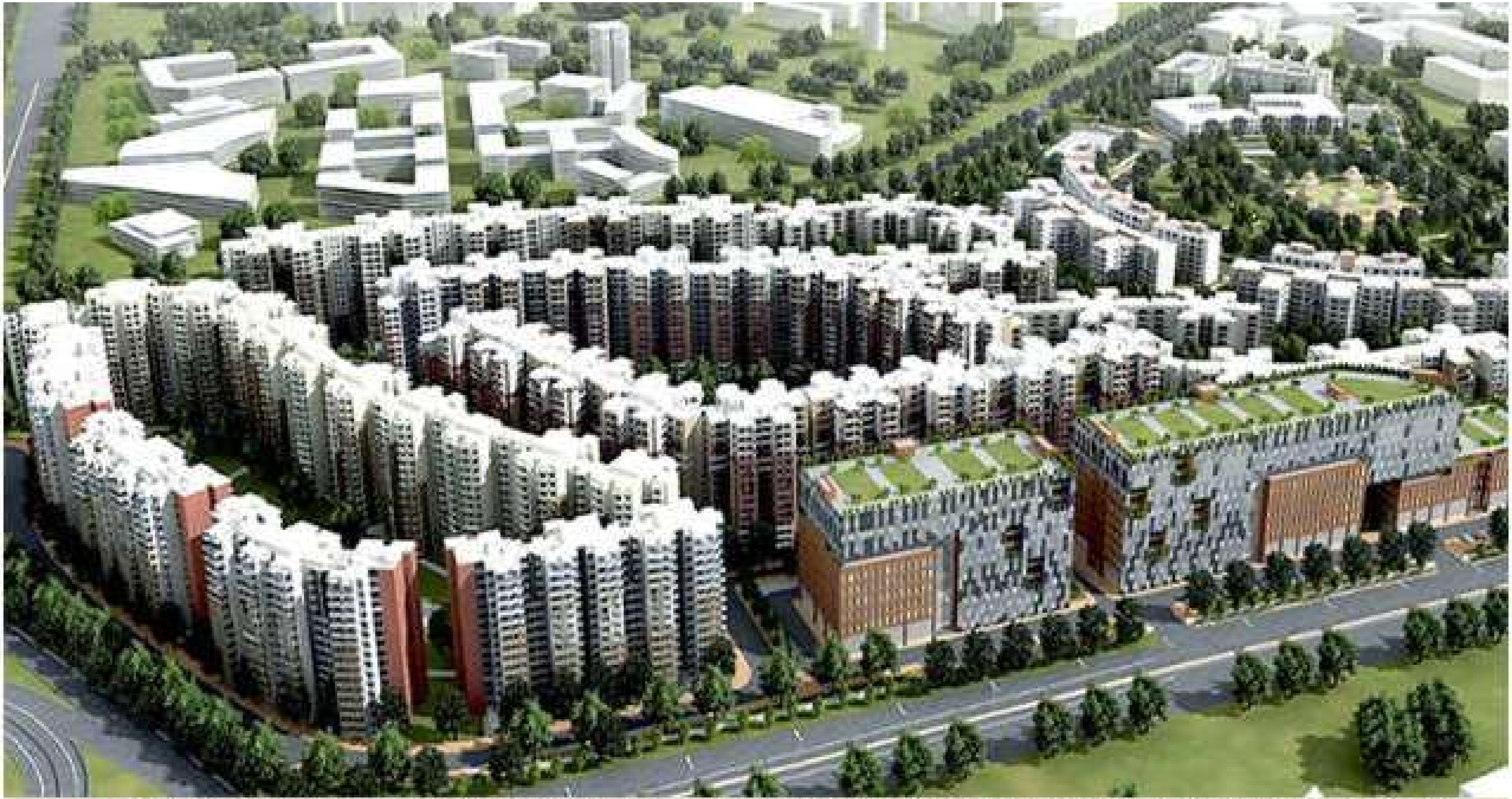
Nilaje Station, Mumbai

# **Current** Development Norms:

***FAR 12.0***



Nilaje Station, Mumbai

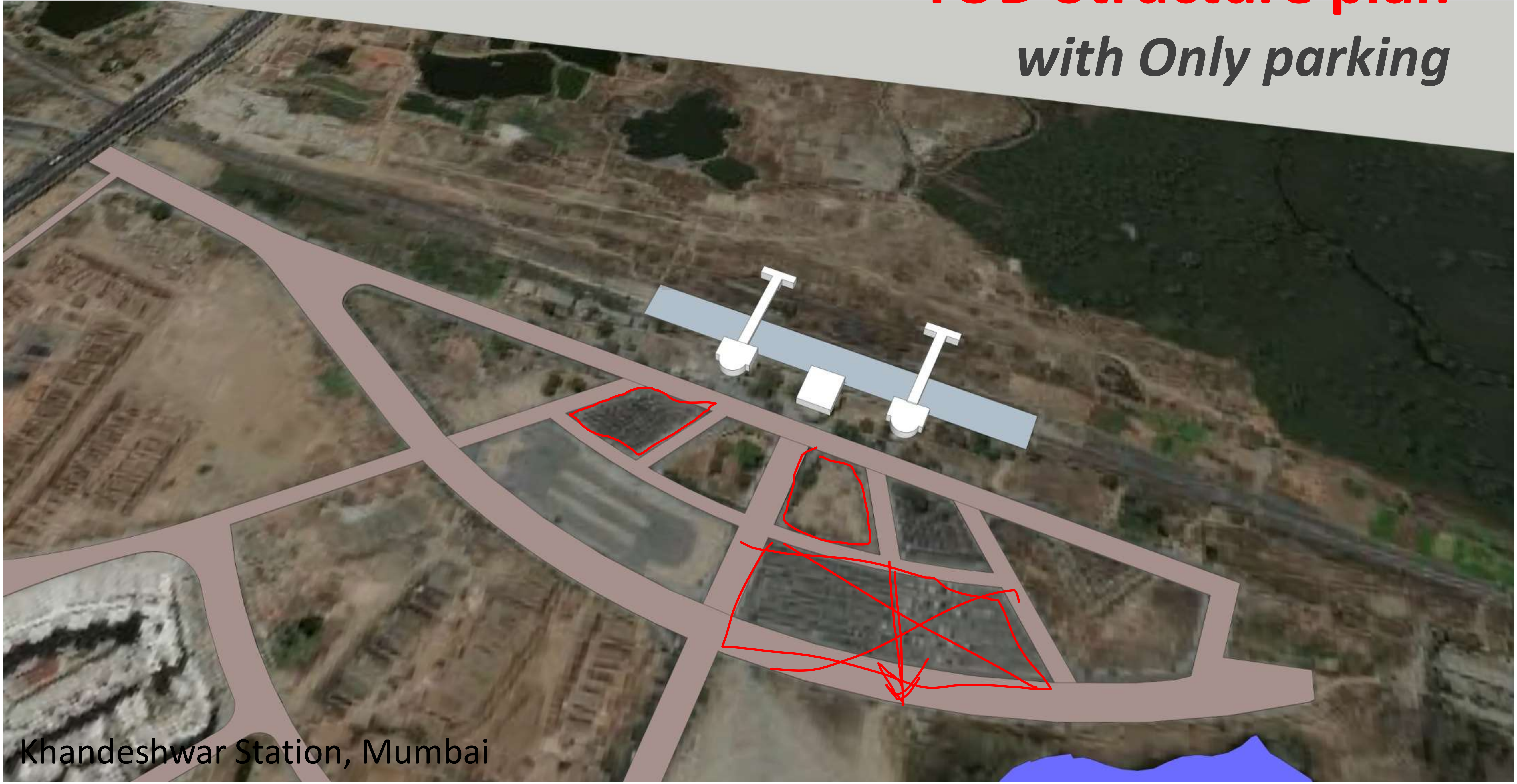


STAFF QUARTERS FOR GORVERNMENT OFFICIALS UNDER CONSTRUCTION AT EAST KIDWAI NAGAR DEVELOPED AS A GATED ENCLAVE WITH NO CONNECTION TO ADJOINING AREAS OF INA MARKET AND SOUTH EXTENSION MARKET. COMMERCIAL BLOCKS ON THE RIGHT FACE INNER RING ROAD.

When we have a **TOD structure plan** in place, and **TOD Codes** guiding development

# TOD Structure plan

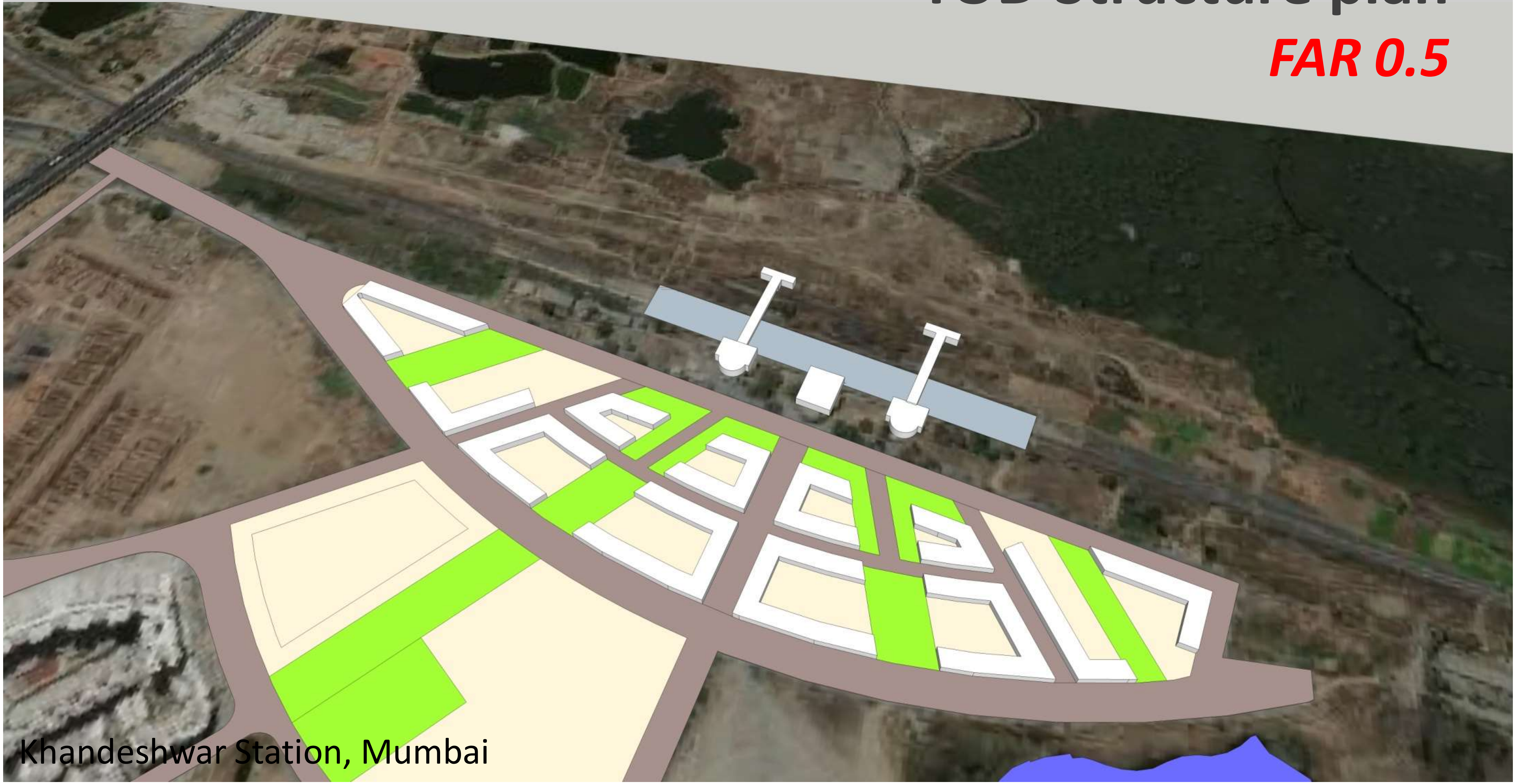
## *with Only parking*



Khandeshwar Station, Mumbai

# TOD Structure plan

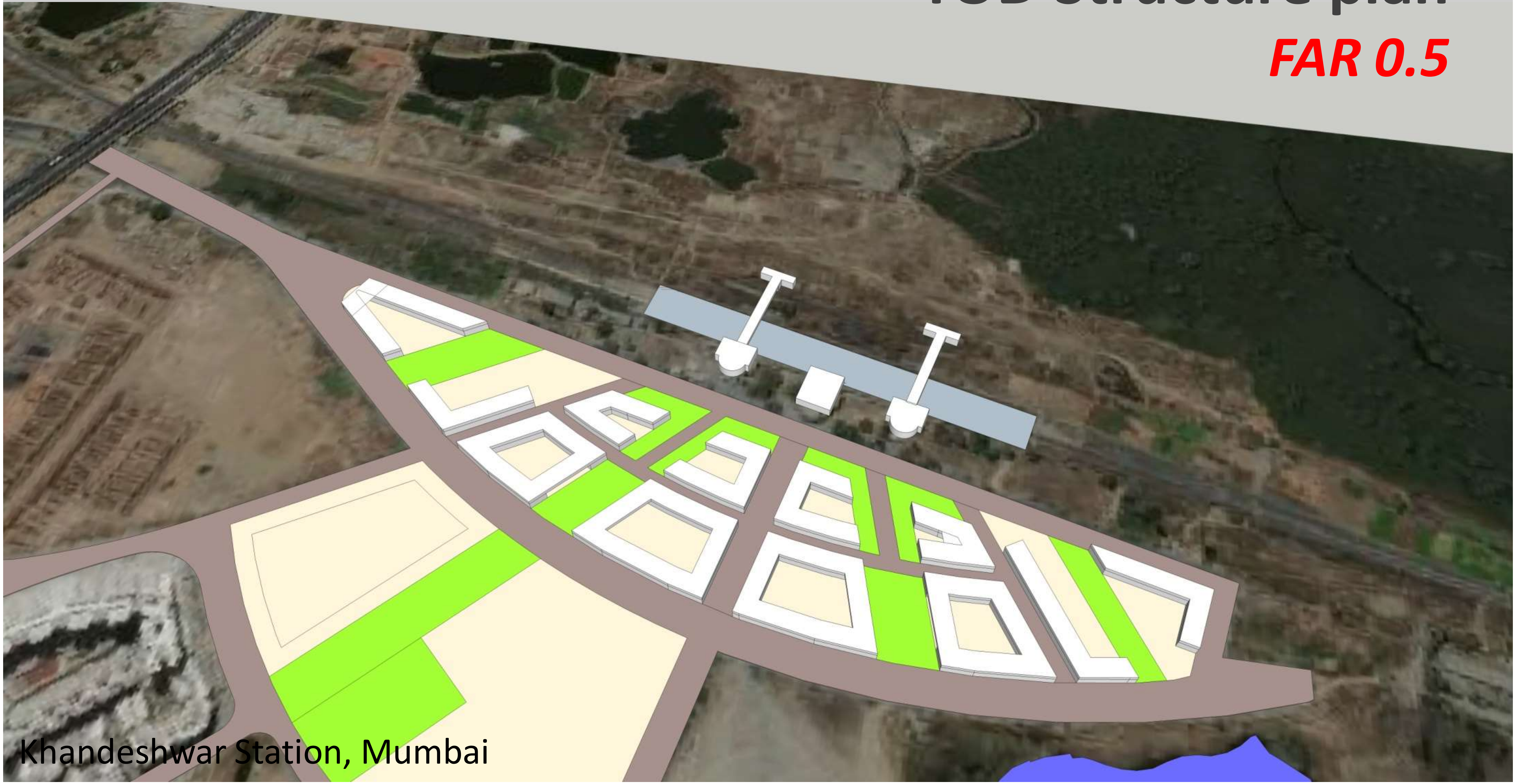
## *FAR 0.5*



Khandeshwar Station, Mumbai

# TOD Structure plan

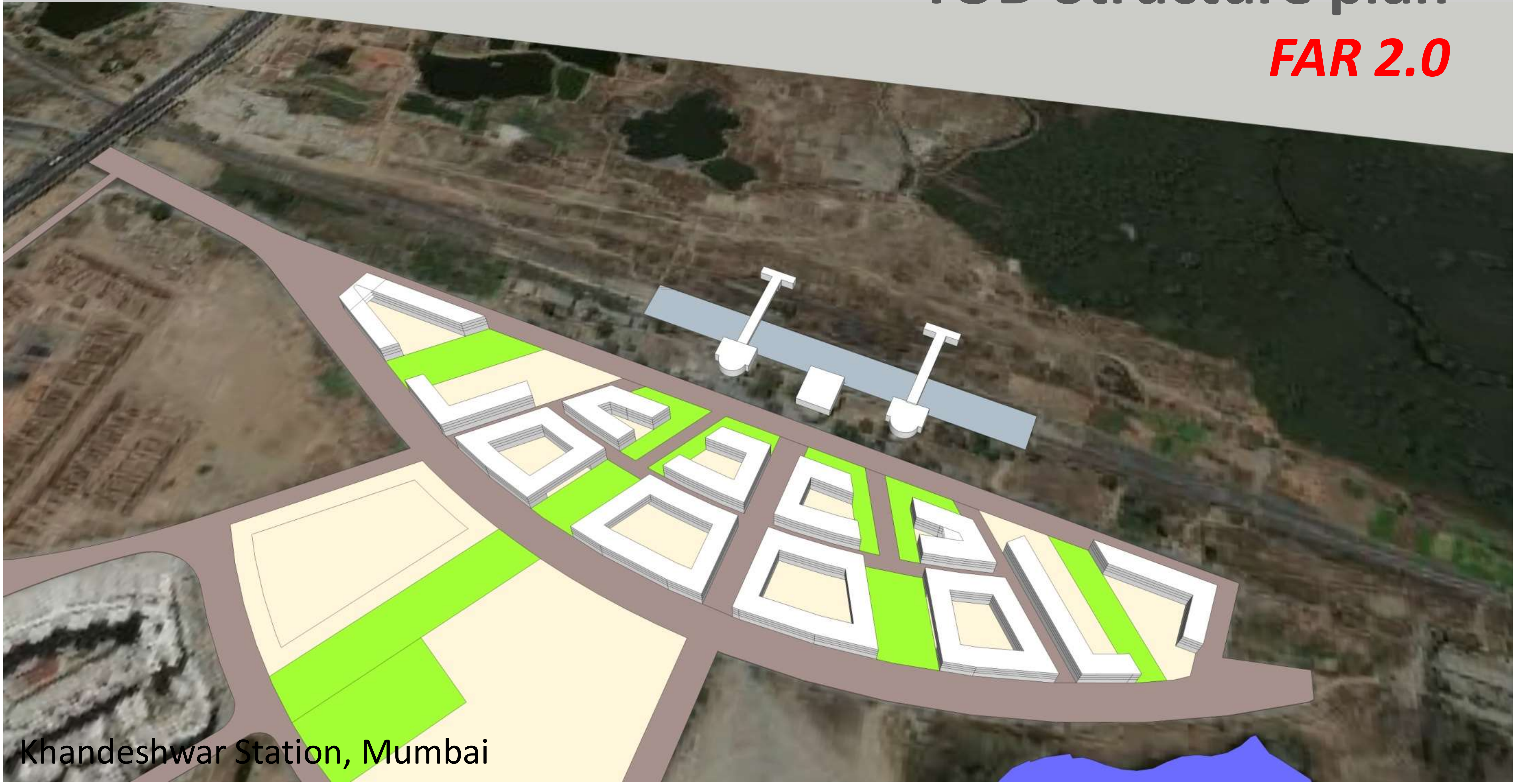
## *FAR 0.5*



Khandeshwar Station, Mumbai

# TOD Structure plan

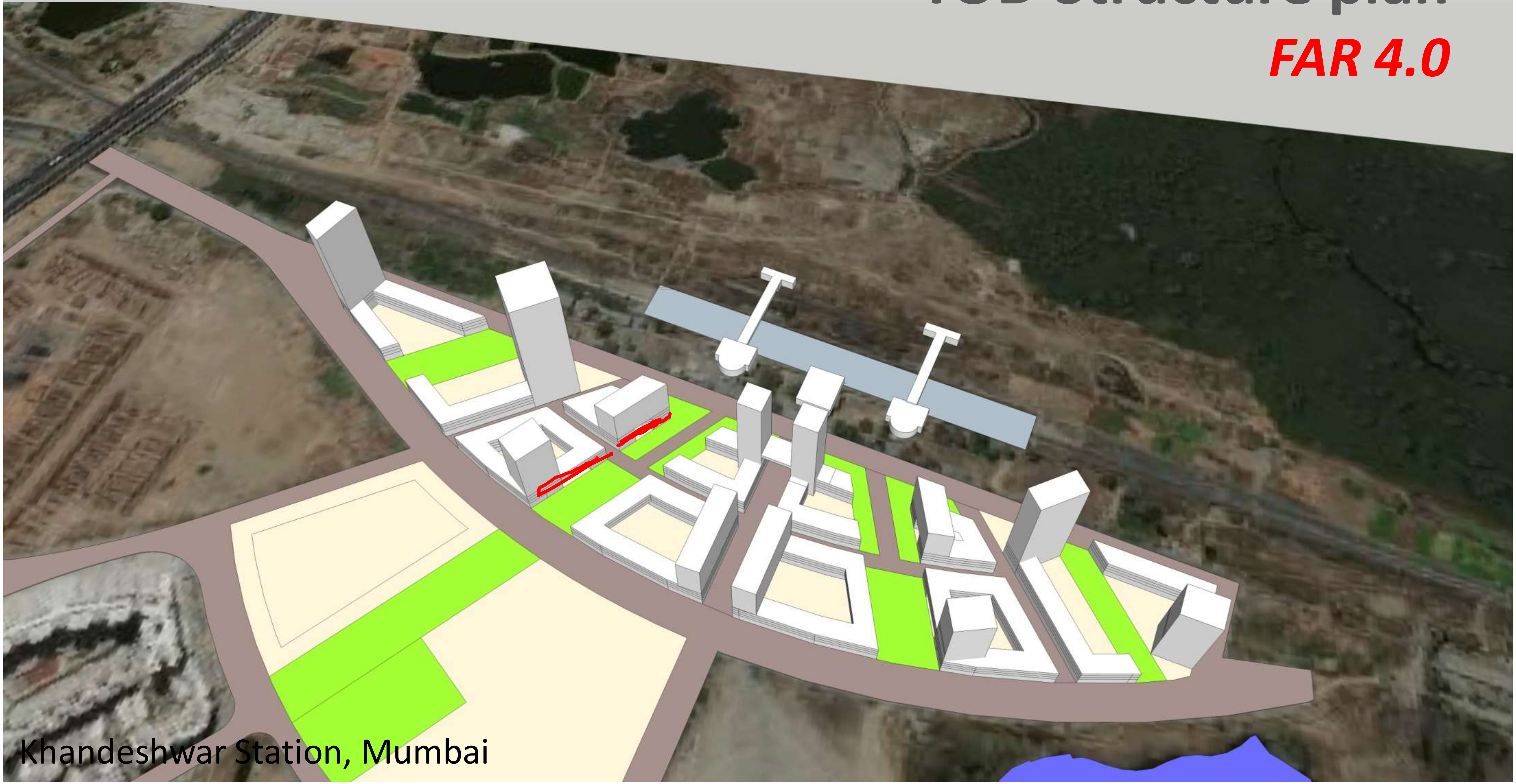
## *FAR 2.0*



Khandeshwar Station, Mumbai

# TOD Structure plan

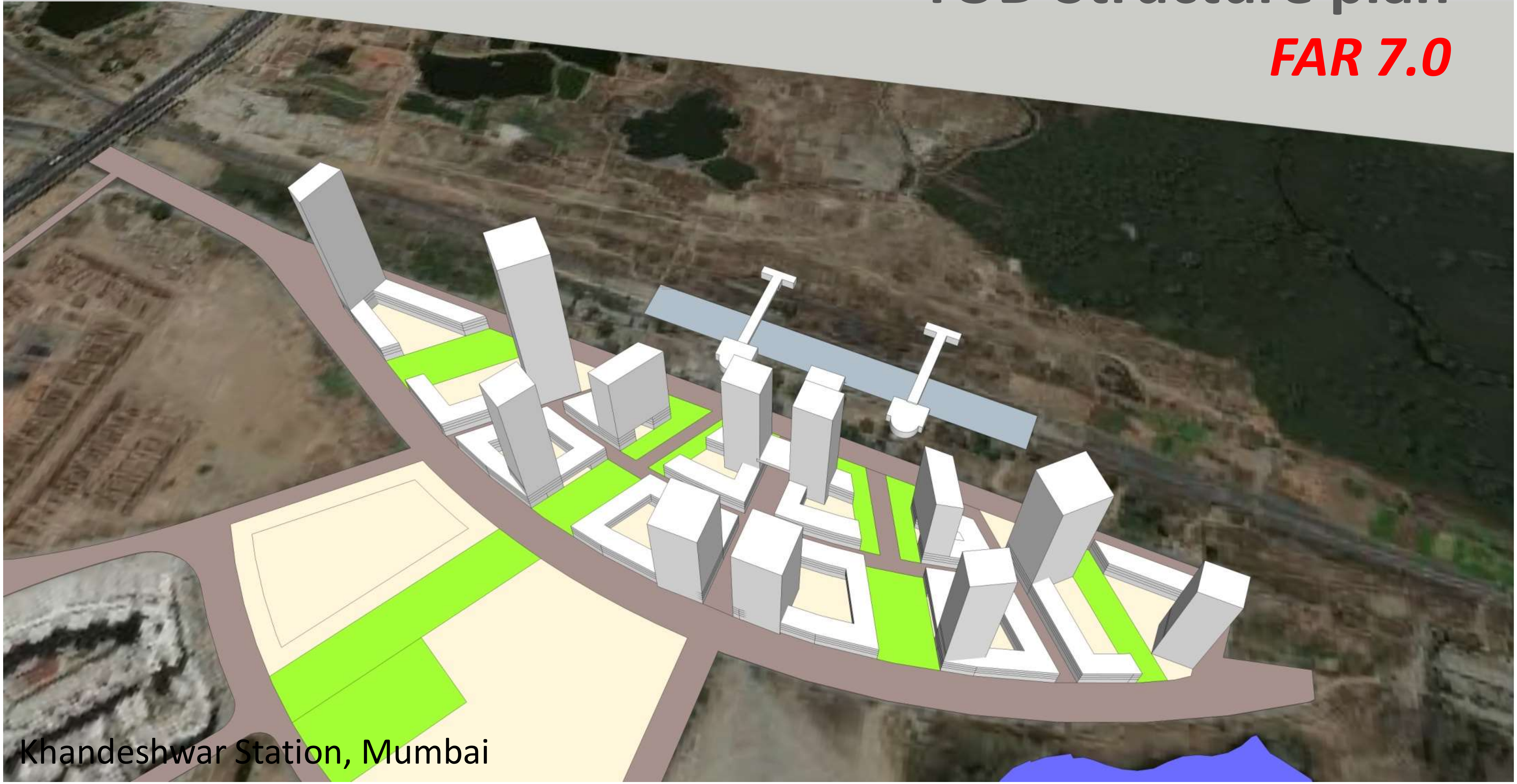
*FAR 4.0*



Khandeshwar Station, Mumbai

# TOD Structure plan

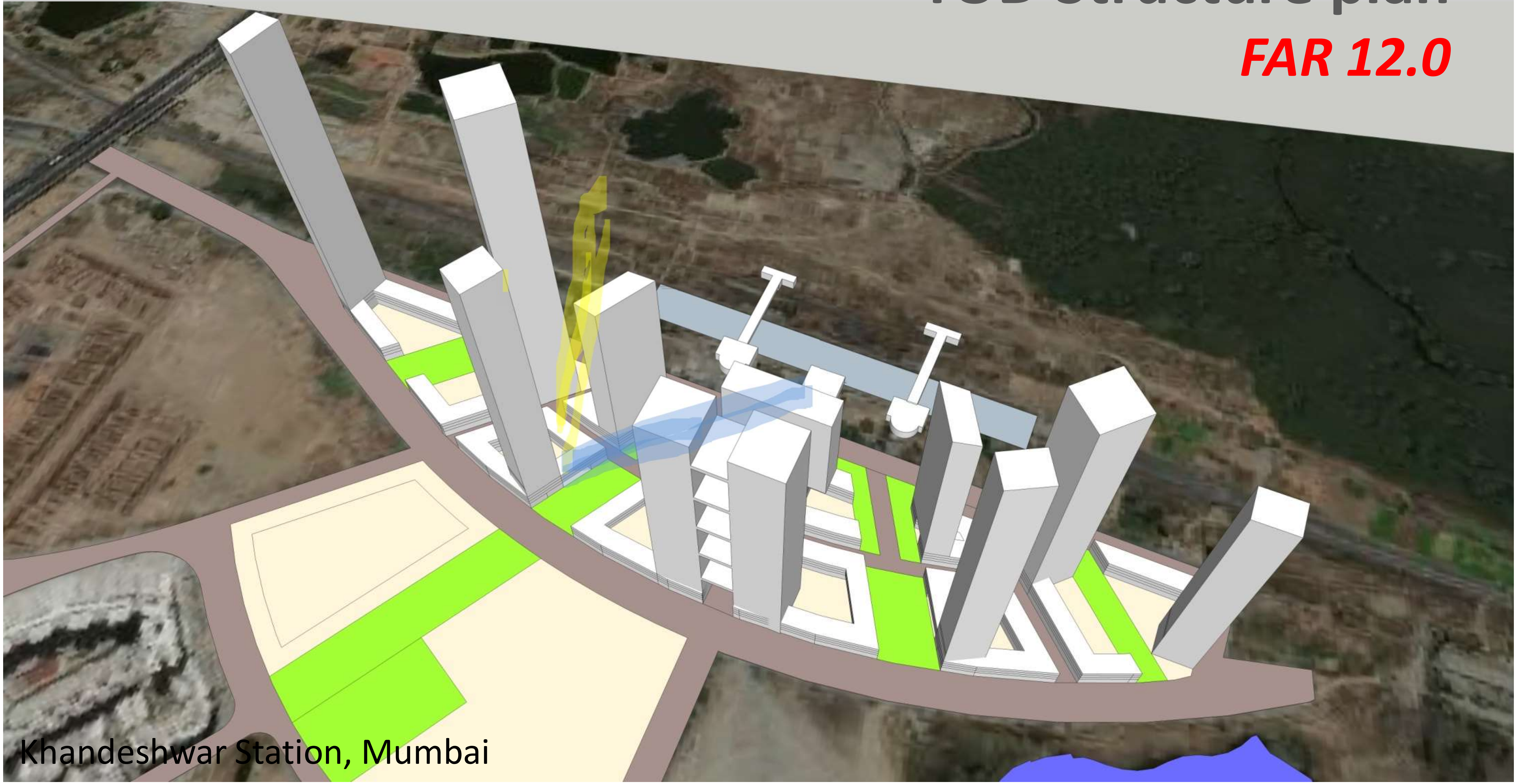
***FAR 7.0***



Khandeshwar Station, Mumbai

# TOD Structure plan

*FAR 12.0*



Khandeshwar Station, Mumbai

A city is like a film set –

The set defines the dreams & the lives of
the people living in it

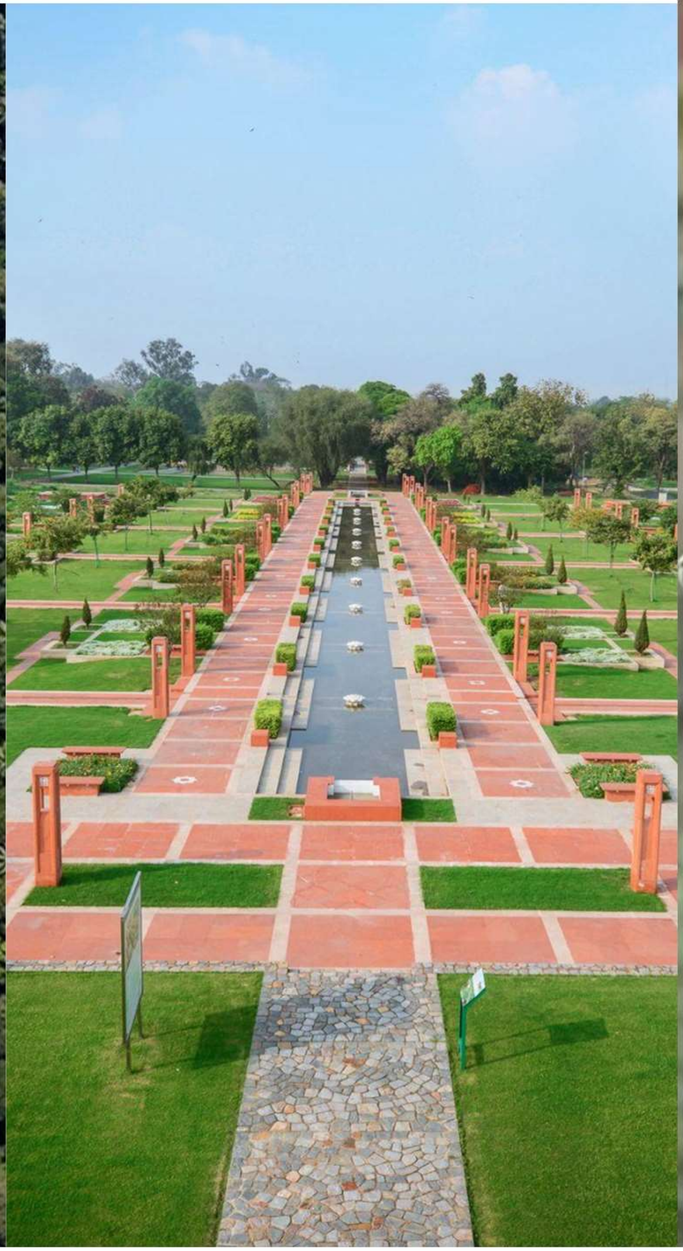
# BACK TO THE BASICS

So what do Common People Need?

Quality of Life

Choices

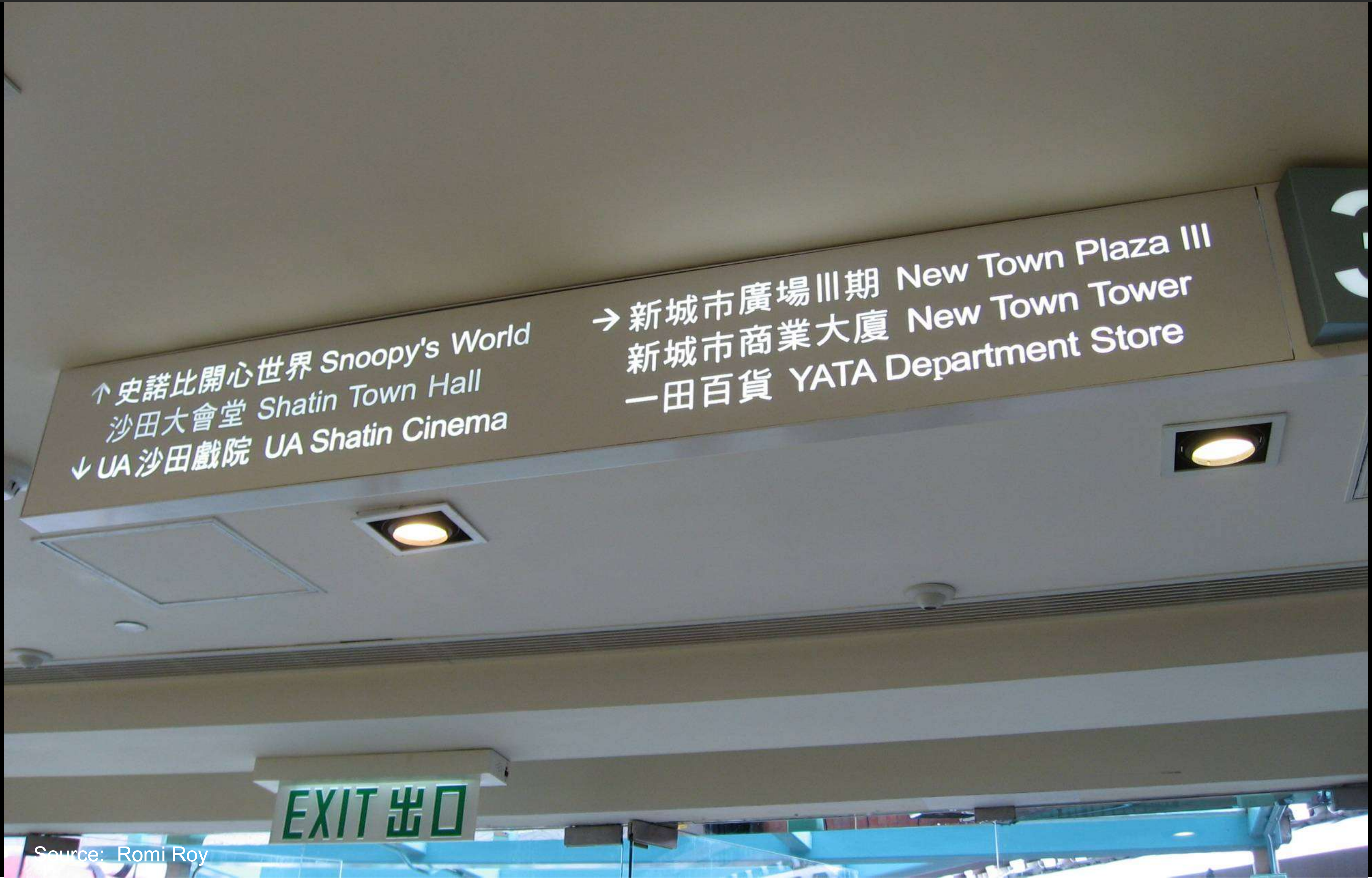
Civic Pride



Safety

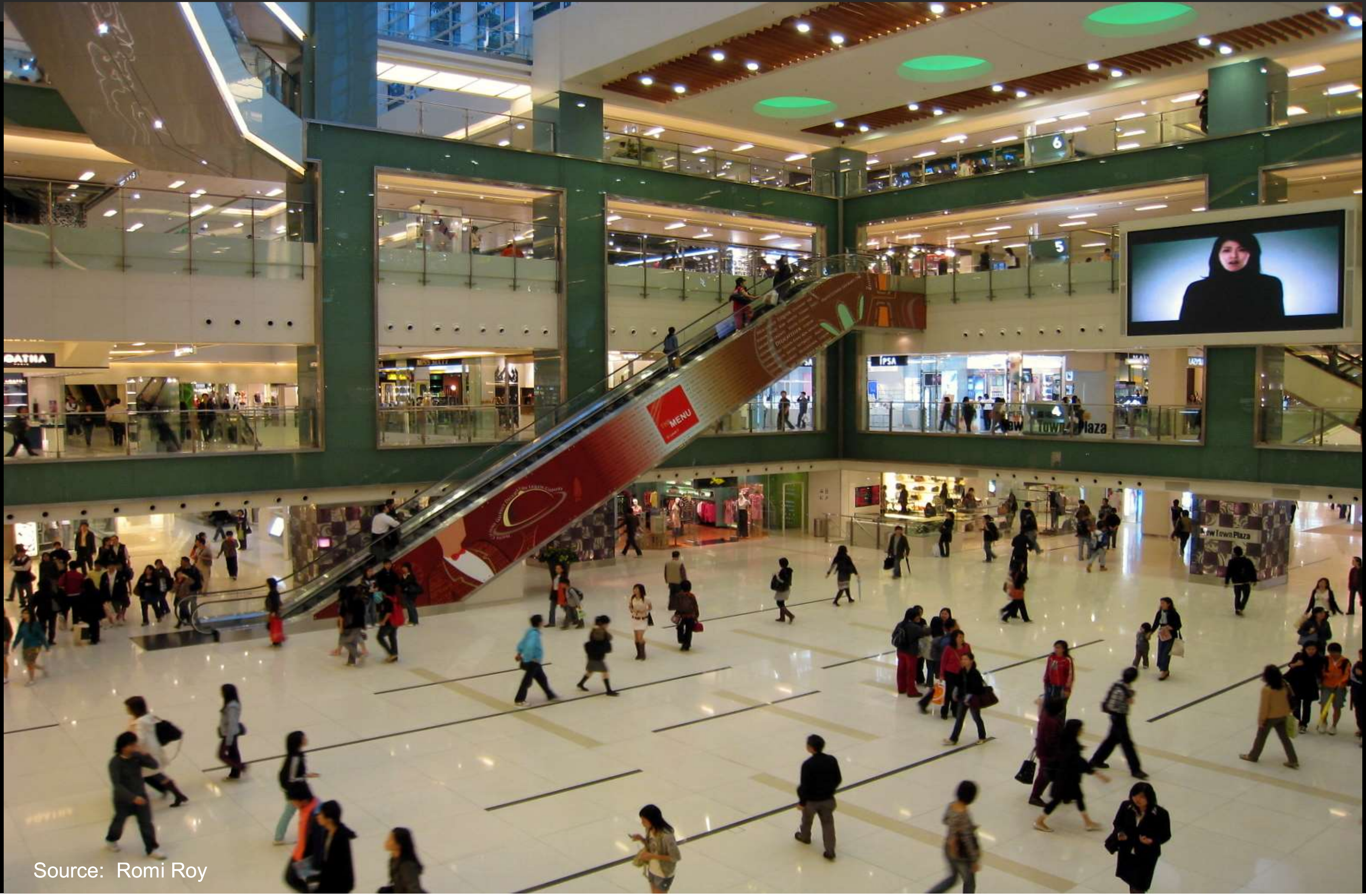
- Safety
- Open Space
- Jobs, Amenities & Schools
- Equal Opportunity & Universal access
- Walkability & self-reliance
- Travel choices
- Housing Choices

# *Case Study:* ***Sha Tin Station, Hong Kong***


↑ 史諾比開心世界 Snoopy's World
沙田大會堂 Shatin Town Hall
↓ UA 沙田戲院 UA Shatin Cinema
→ 新城市廣場III期 New Town Plaza III
新城市商業大廈 New Town Tower
一田百貨 YATA Department Store
EXIT 出口

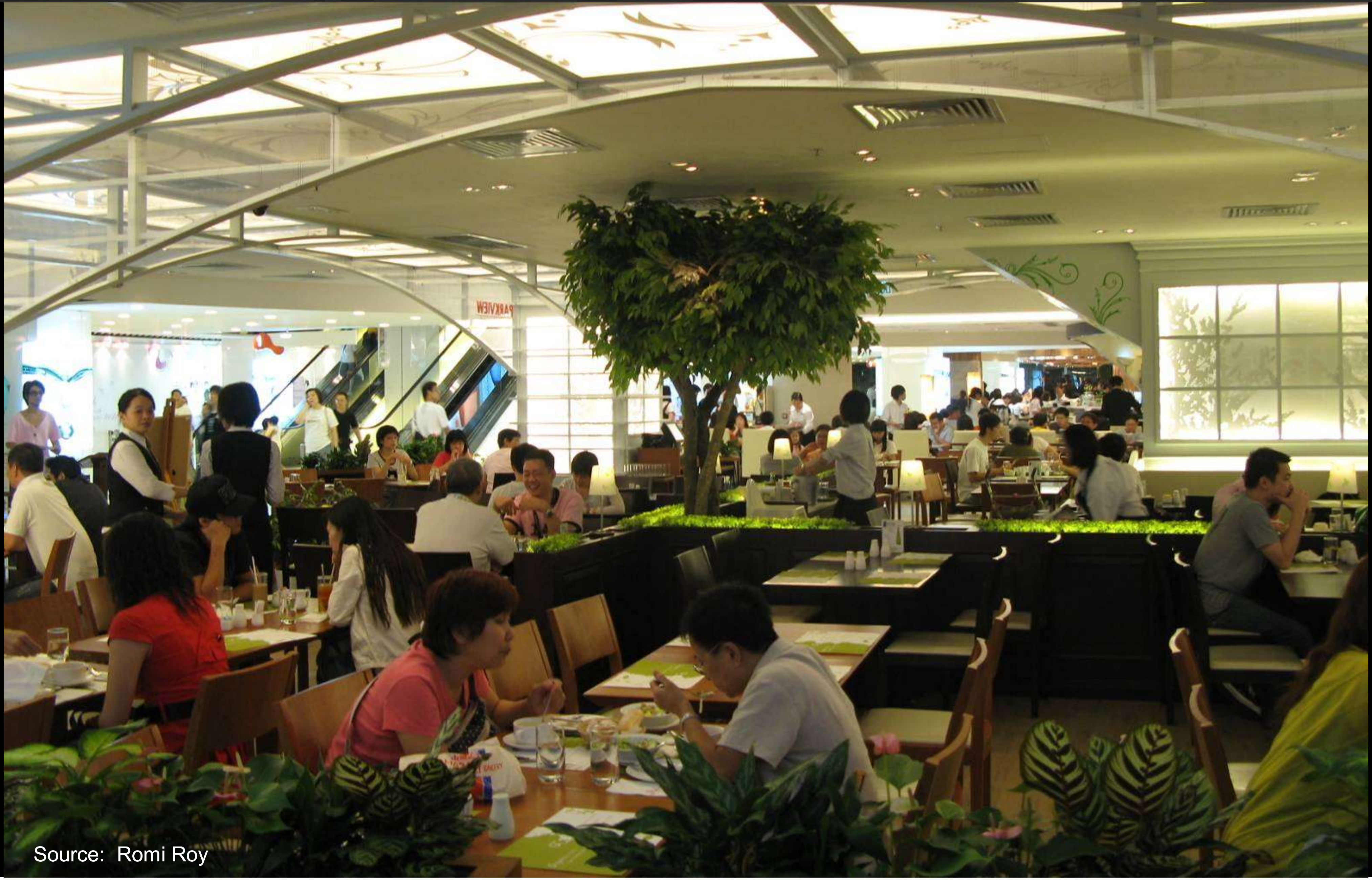
Source: Romi Roy

# Sha Tin Station: Mall


MENU
New Town Plaza
New Town Plaza
PSA
6
5

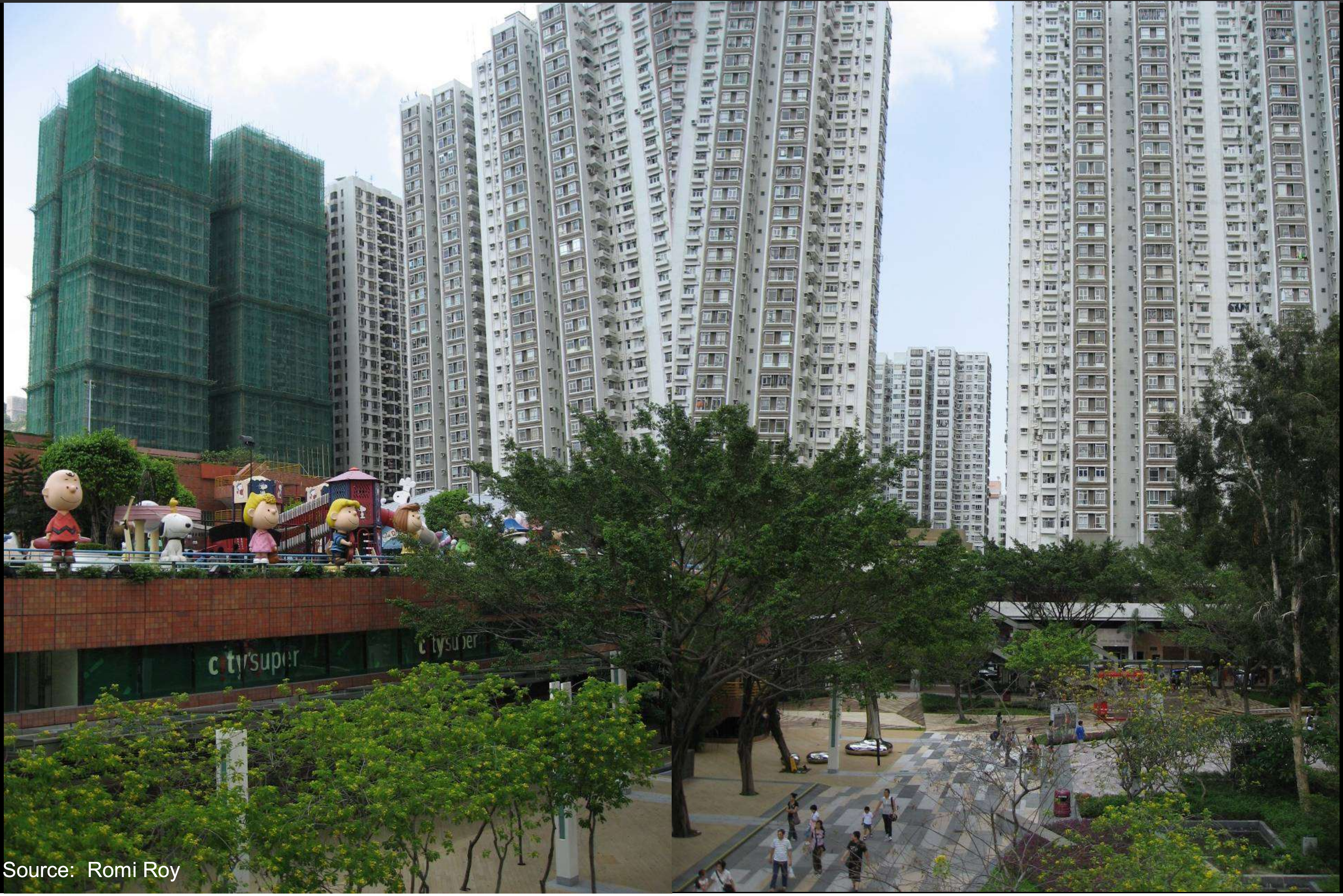
Source: Romi Roy

# Sha Tin Station: Restaurants, Cafes



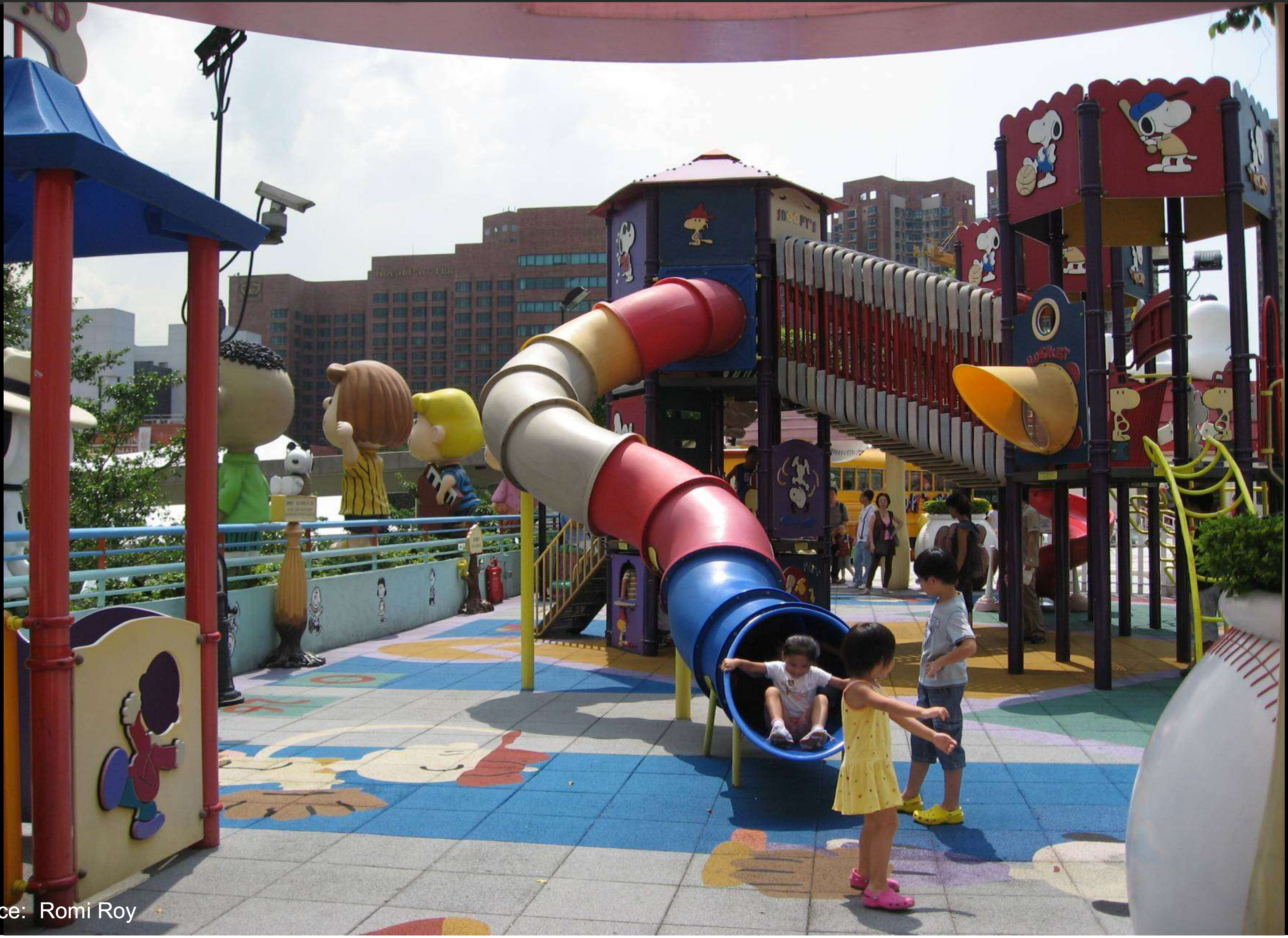
Source: Romi Roy

# Sha Tin Station: *High Density Residential, Parks*

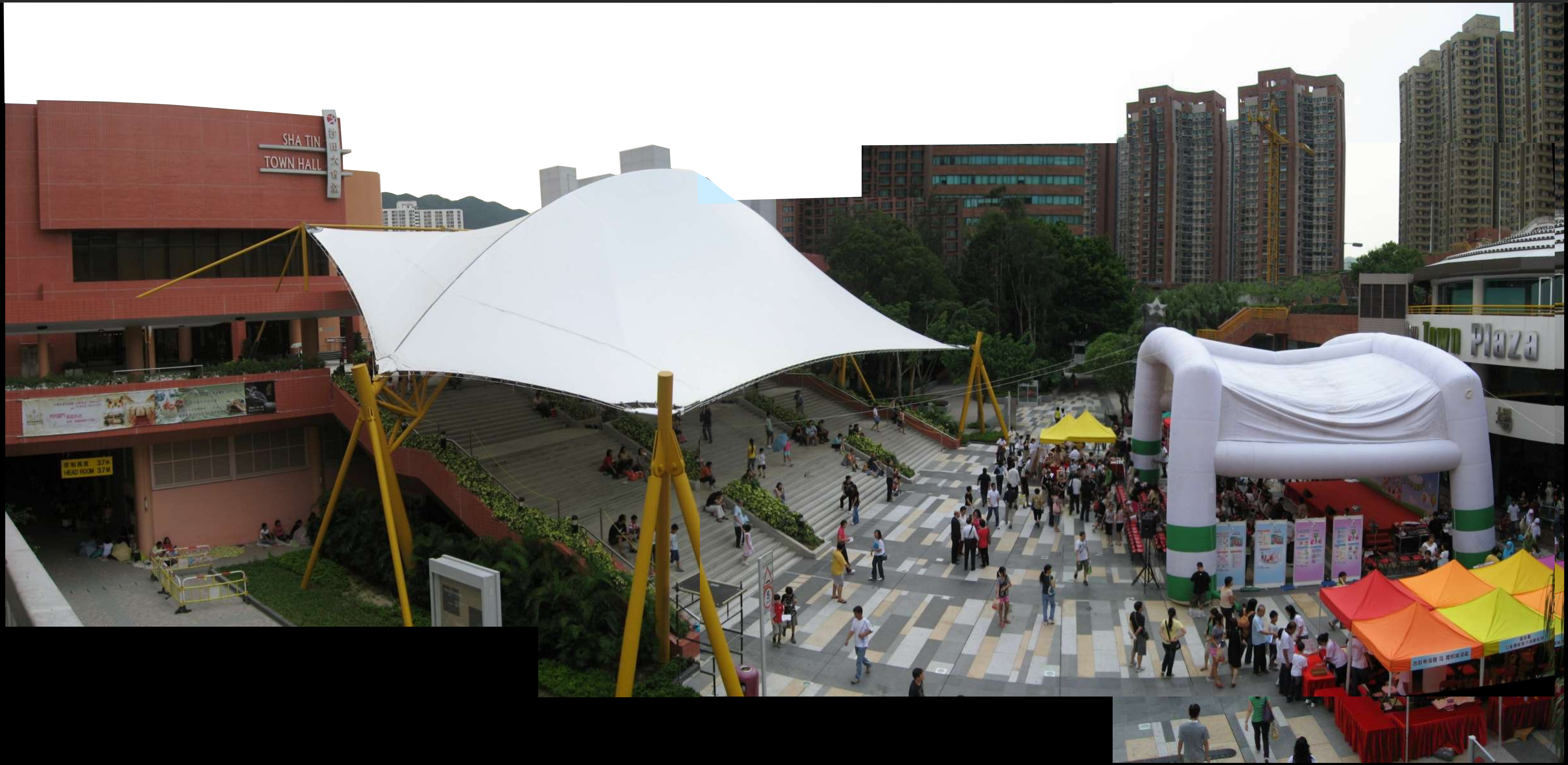

citysuper
citysuper

Source: Romi Roy

# Sha Tin Station: …. Snoopy World

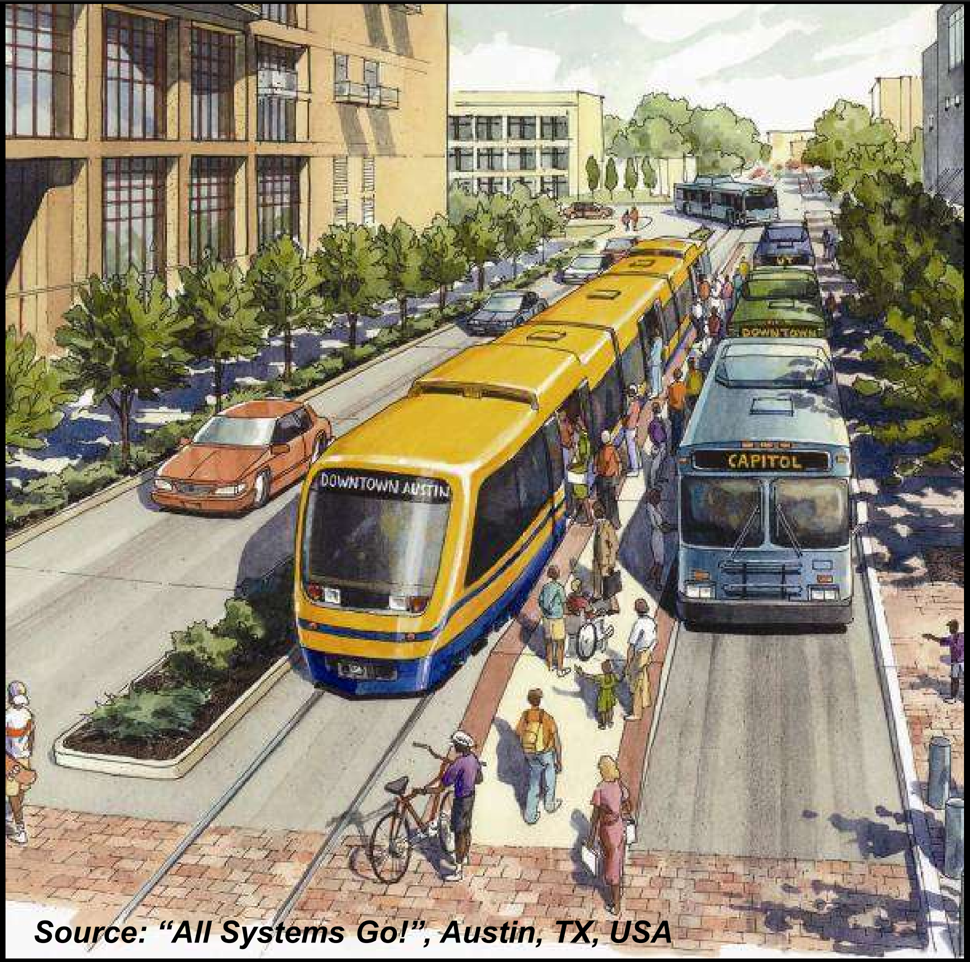

Source: Romi Roy

# Sha Tin Station: Town Hall, Plaza, Library


SHA TIN
TOWN HALL
Town Plaza

A complete Community destination

# 2) Make Transfers between modes "safe and easy"


DOWNTOWN AUSTIN
CAPITOL
DOWNTOWN

*Source: "All Systems Go!", Austin, TX, USA*

COLD SPRING
TheRide
RTD

**Must be safe, quick and easy to:**

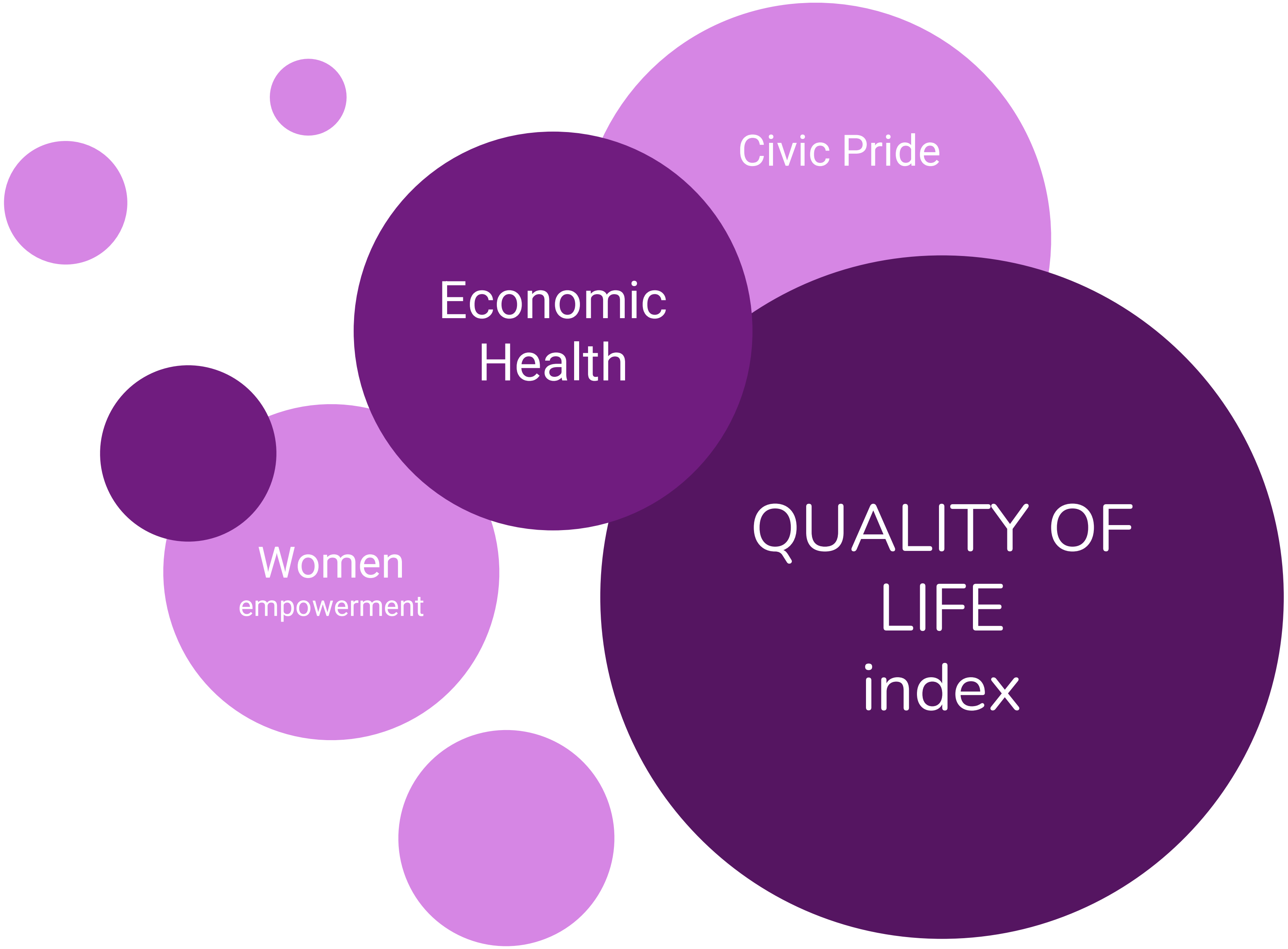
- **Access Train/ Bus Stations**
- **Change from one mode to the other**
- **Cross streets**
- **Park bikes and ride the train/BRT**
- **Rickshaws & vans to drop off at stations**

# BACK TO THE BASICS

## What do Investors Need?

- Minimize Risk
- Assurance that Govt is a partner – through investment in public spaces & appropriate incentives
- Minimize Cost of Money
- Assured buyers
- Flexibility in development codes

HR51CFD101
inDriver
inDriver



Civic Pride

Economic Health

Women empowerment

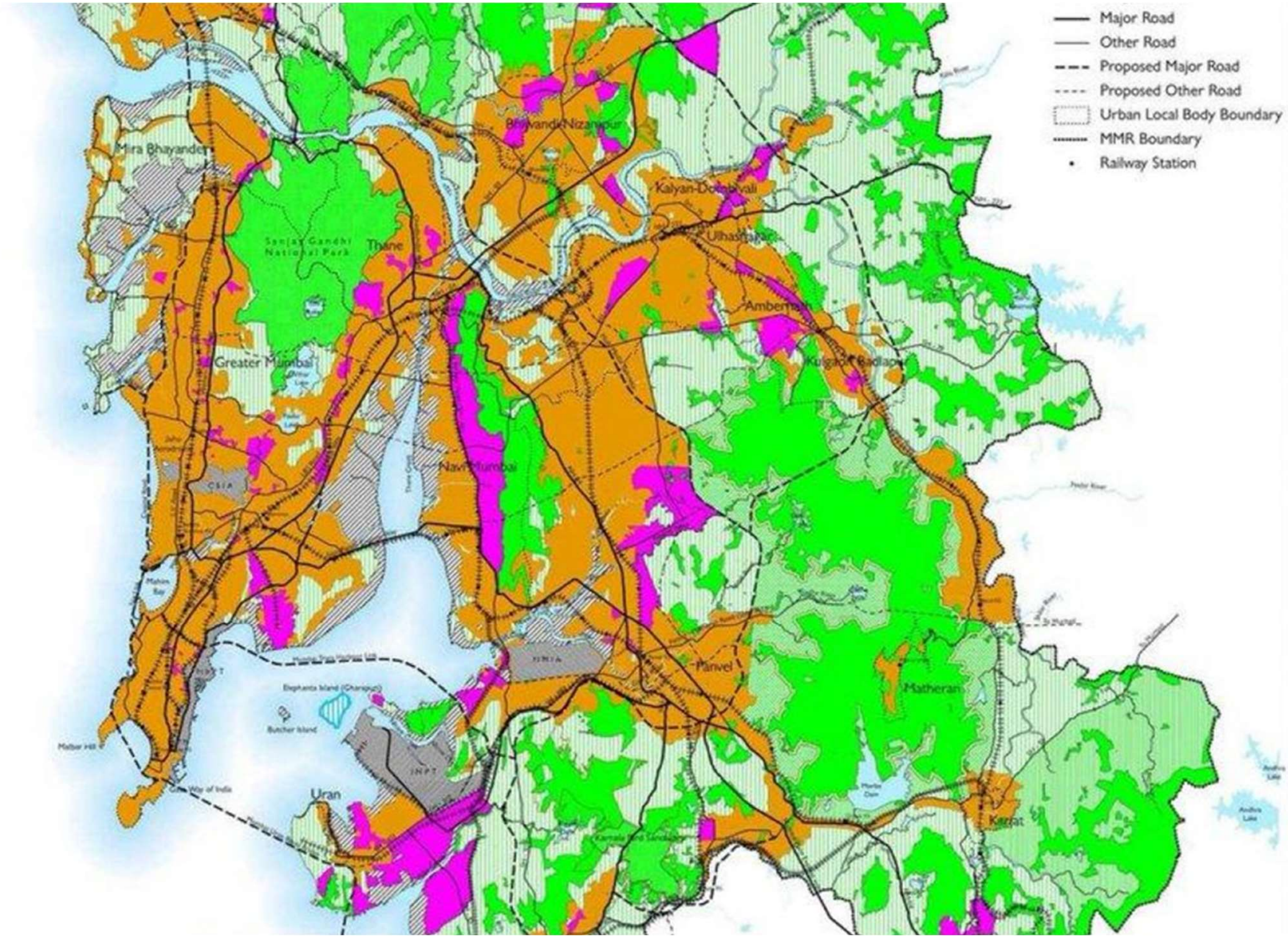
QUALITY OF LIFE index

# 10 PRINCIPLES

## THAT ACHIEVE MULTIPLE GOALS

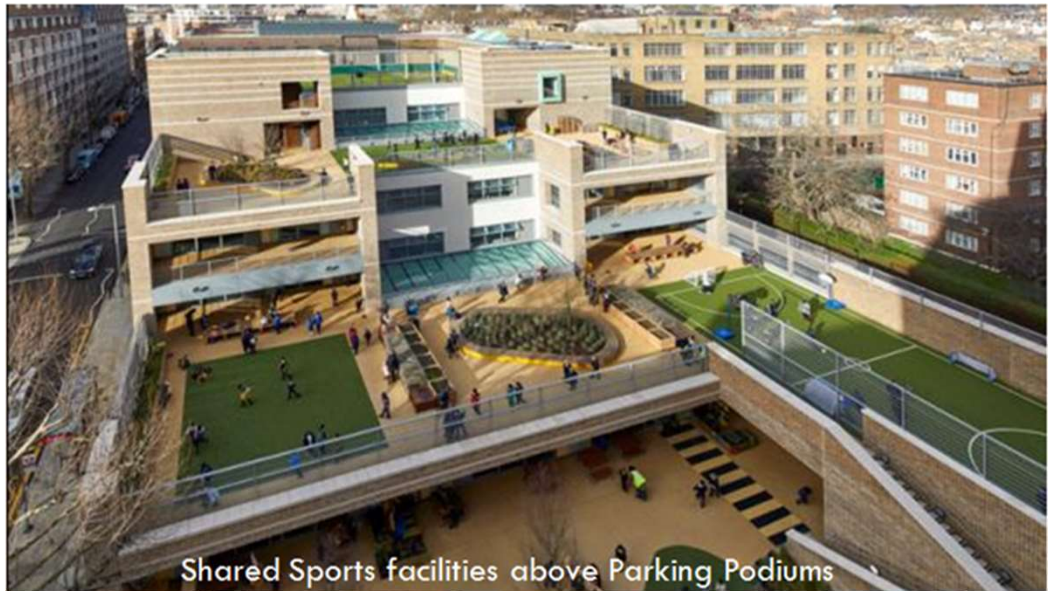
# 1 | City-Regions

- Vision for Regional Growth;
- Integration of Regional landuse with Regional Transit Systems (Rail/ HSR/ RRTS/ Metro, inter-state Bus)
- Comprehensive Landuse-Transport planning integrated with affordable housing policy
- Integrated Landuse-Transport Authority
- Jobs-Housing Balance in Regional Centres


Major Road
Other Road
Proposed Major Road
Proposed Other Road
Urban Local Body Boundary
MMR Boundary
Railway Station
Mira Bhayander
Bhiwandi-Nizampur
Kalyan-Dombivali
Sanjay Gandhi National Park
Thane
Ulhasnagar
Ambernath
Kulgaon Badlapur
Greater Mumbai
Navi Mumbai
CSIA
NMIA
Panvel
Matheran
Elephanta Island (Gharapuri)
Butcher Island
JNPT
Uran
Karjat
Malbar Hill
Mahim Bay

# 2 | Mixed Use Planning

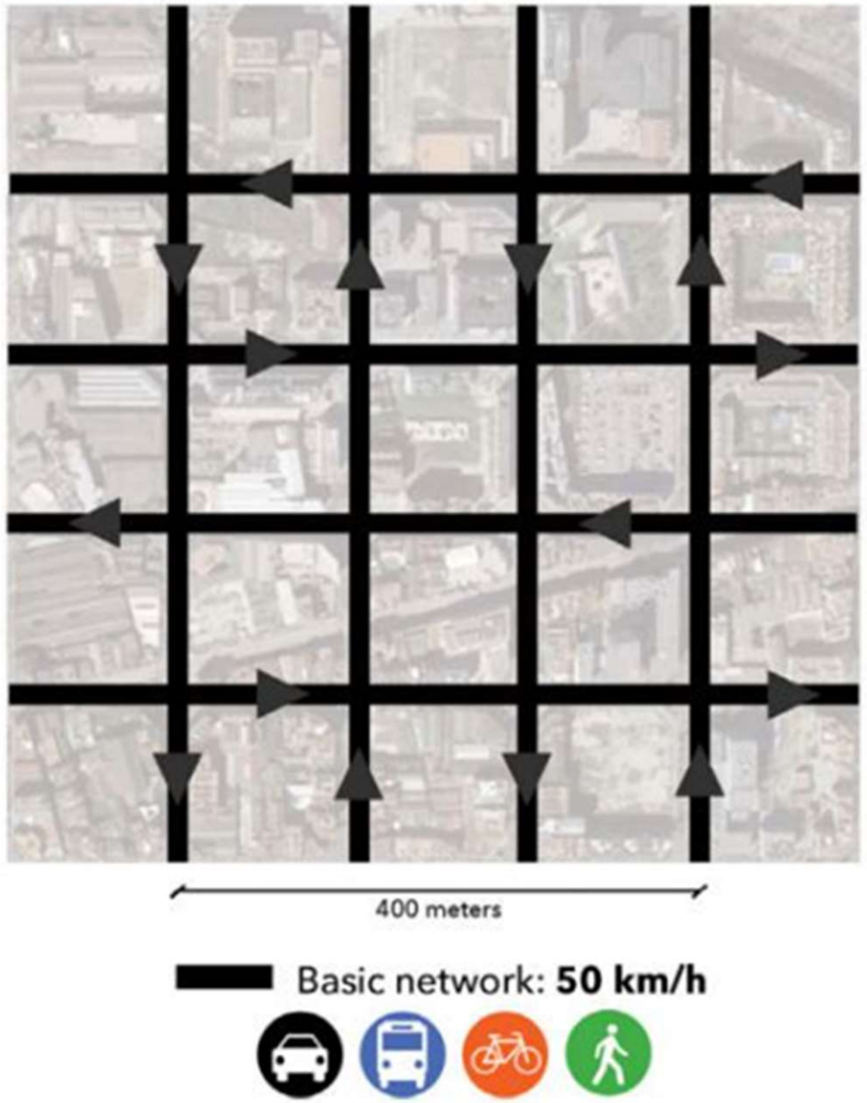
Mumbai



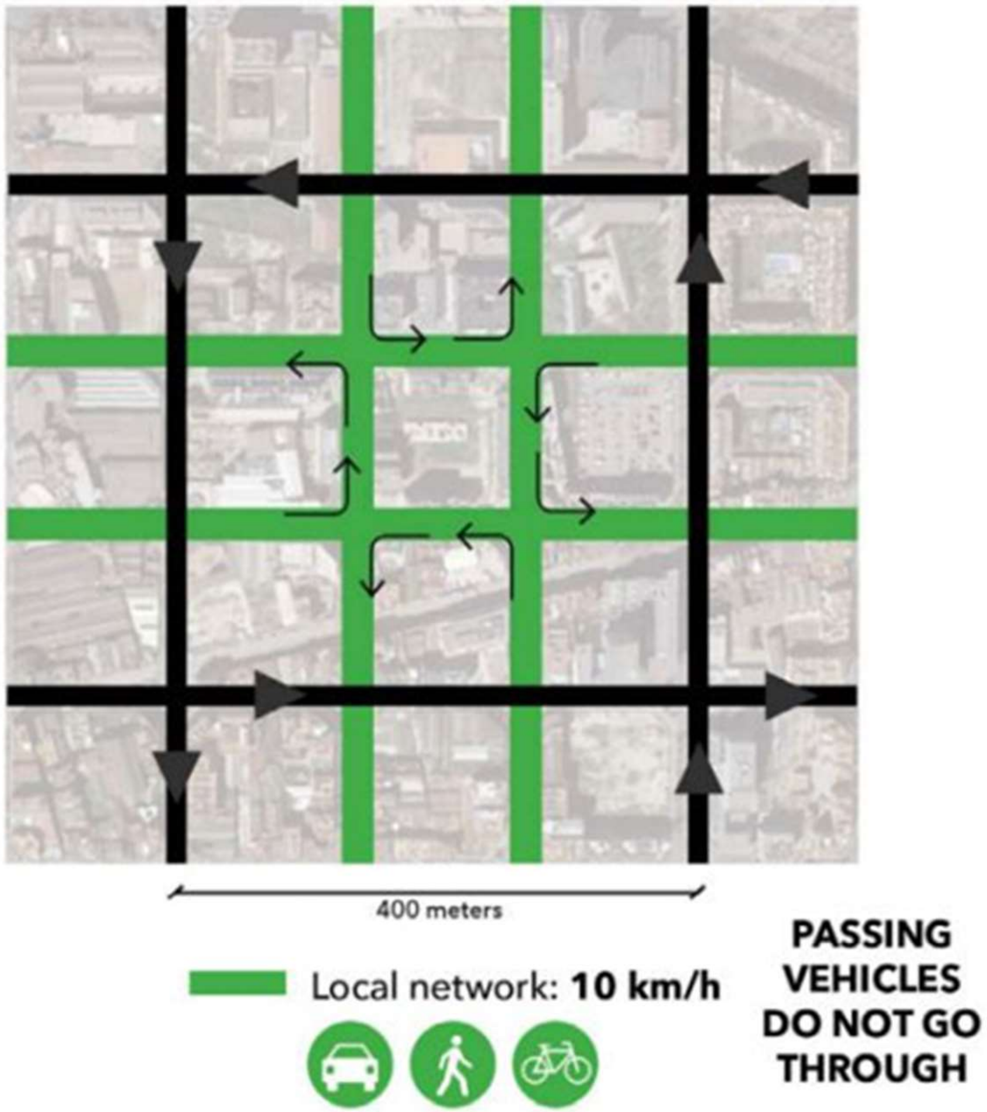
Shared Sports facilities above Parking Podiums

# 3 | Network Planning

- Pedestrian-network priority planning
- Updation of UBBLs to enable pedestrian access in buildings and campuses
- POD Policy (State and Municipal Level)
- Women Safety


400 meters
Basic network: 50 km/h

SOLE RIGHT: DISPLACEMENT.
HIGHEST AIM: PEDESTRIAN.


400 meters
Local network: 10 km/h
PASSING VEHICLES DO NOT GO THROUGH

EXERCISE OF ALL THE RIGHTS THAT THE CITY
OFFERS. HIGHEST AIM: CITIZEN.

# 4 | Multiple Mode Choices

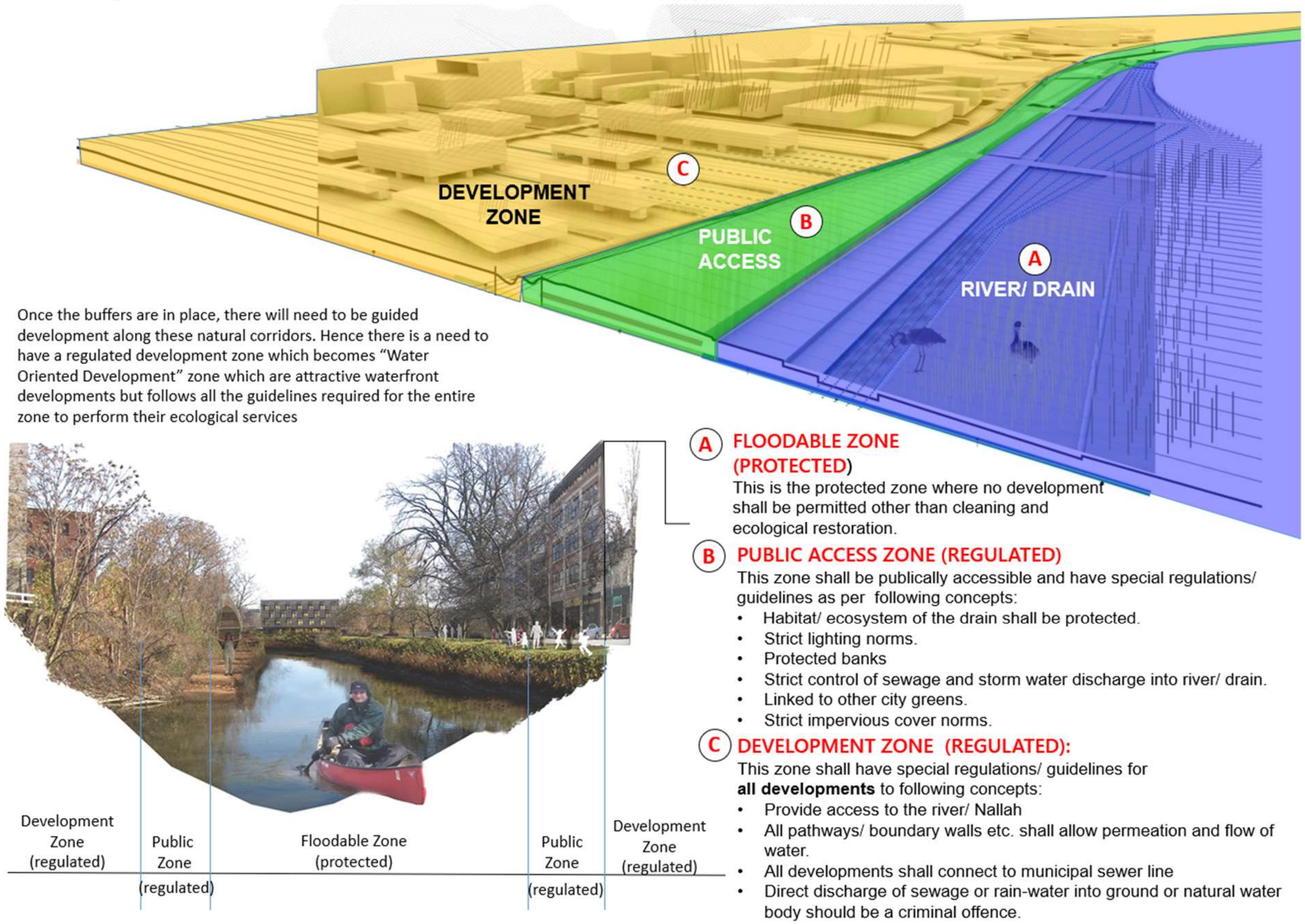
- Street Planning as per Pedestrian and Cycling priority.
- Mix of Transit options - Metro/ Tram/ Bus/ Funicular/ Cable Cars
- Continuous bicycle network

# 5 | Blue-Green Integration

# 6 | Water Oriented Development

- Planning to enable Value Capture at nodes and along waterfronts
- High density, mixed-use planning of stations with pedestrian connections.
- Waterfront planning to enable access to water and greens.
- Creation of public spaces at station nodes and along water edges

## Creating Value For The City – Water Oriented Development (W.O.D.)



Once the buffers are in place, there will need to be guided development along these natural corridors. Hence there is a need to have a regulated development zone which becomes "Water Oriented Development" zone which are attractive waterfront developments but follows all the guidelines required for the entire zone to perform their ecological services

**Ⓐ FLOODABLE ZONE (PROTECTED)**

This is the protected zone where no development shall be permitted other than cleaning and ecological restoration.

**Ⓑ PUBLIC ACCESS ZONE (REGULATED)**

This zone shall be publically accessible and have special regulations/ guidelines as per following concepts:

- Habitat/ ecosystem of the drain shall be protected.
- Strict lighting norms.
- Protected banks
- Strict control of sewage and storm water discharge into river/ drain.
- Linked to other city greens.
- Strict impervious cover norms.

**Ⓒ DEVELOPMENT ZONE (REGULATED):**

This zone shall have special regulations/ guidelines for **all developments** to following concepts:

- Provide access to the river/ Nallah
- All pathways/ boundary walls etc. shall allow permeation and flow of water.
- All developments shall connect to municipal sewer line
- Direct discharge of sewage or rain-water into ground or natural water body should be a criminal offence.
- Strict impervious cover norms.

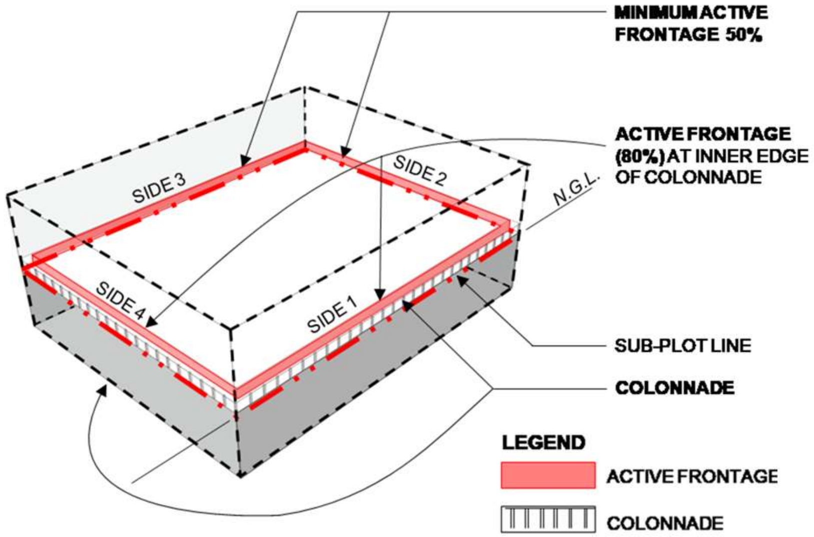
BUSINESS PLAN
CONCEPT

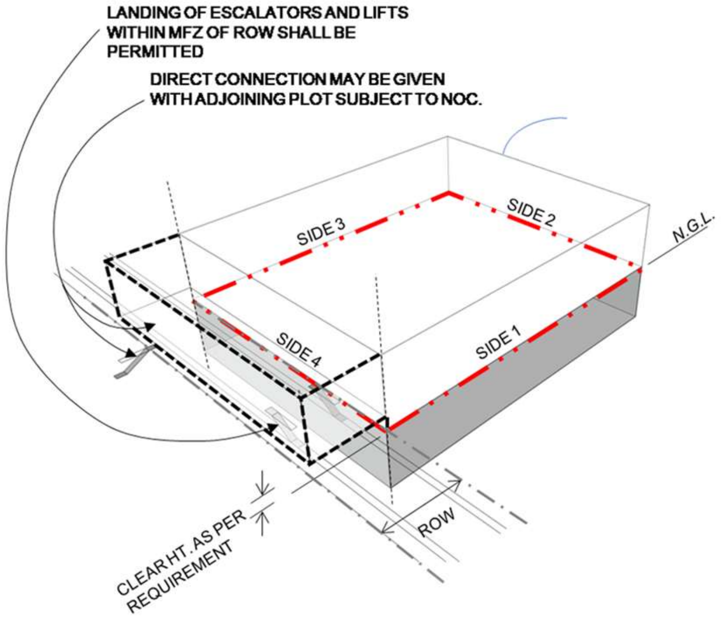
# 7 | Business Plans for cities

- Where to Invest?
- Where to Earn?
- How to Earn?
- What to cross-subsidize?

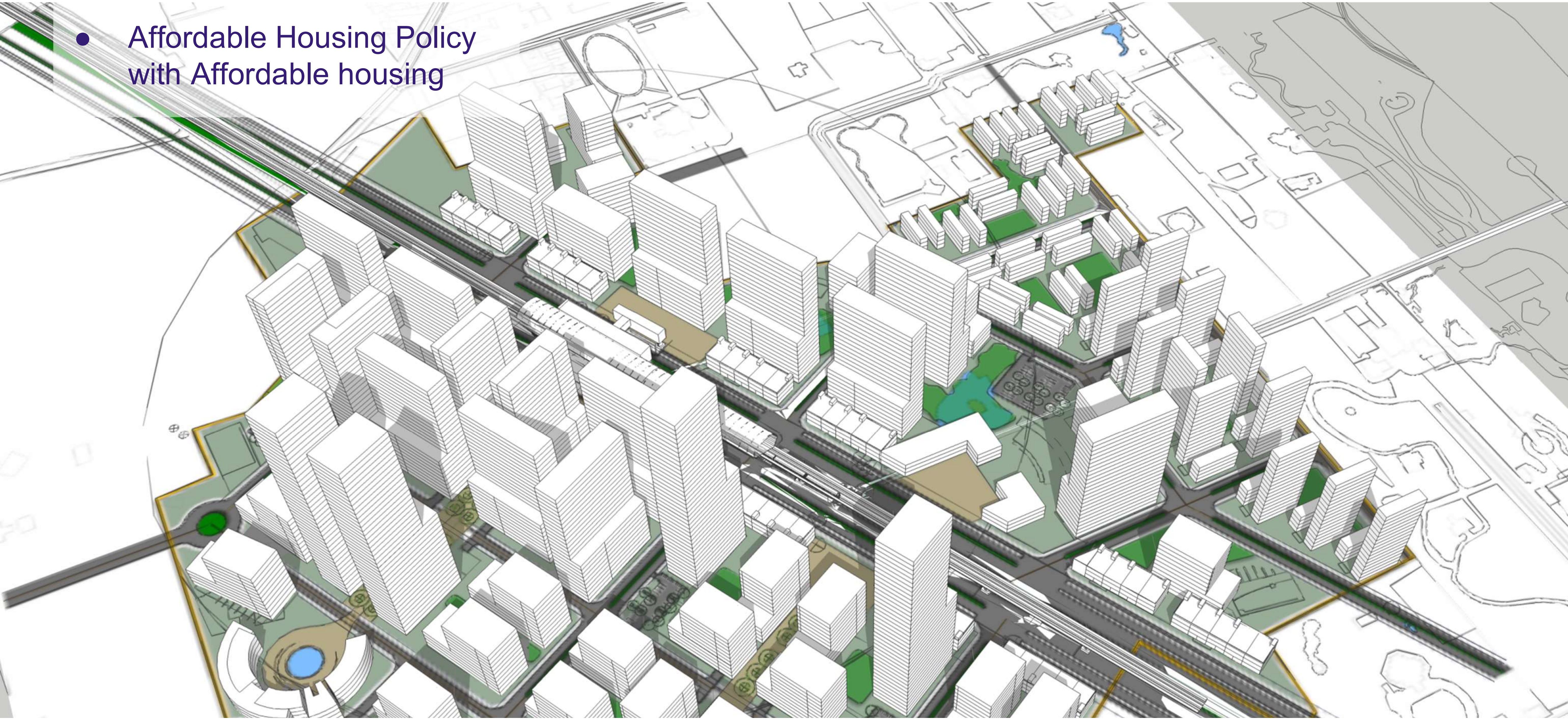
Chennai

# 8 | TOD with Form-based Codes


MINIMUM ACTIVE FRONTAGE 50%
ACTIVE FRONTAGE (80%) AT INNER EDGE OF COLONNADE
SIDE 3
SIDE 2
N.G.L.
SIDE 4
SIDE 1
SUB-PLOT LINE
COLONNADE
LEGEND
🟥 ACTIVE FRONTAGE
▥ COLONNADE


LANDING OF ESCALATORS AND LIFTS WITHIN MFZ OF ROW SHALL BE PERMITTED
DIRECT CONNECTION MAY BE GIVEN WITH ADJOINING PLOT SUBJECT TO NOC.
SIDE 3
SIDE 2
N.G.L.
SIDE 4
SIDE 1
ROW
CLEAR HT. AS PER REQUIREMENT

# 9 | Housing Choices for all



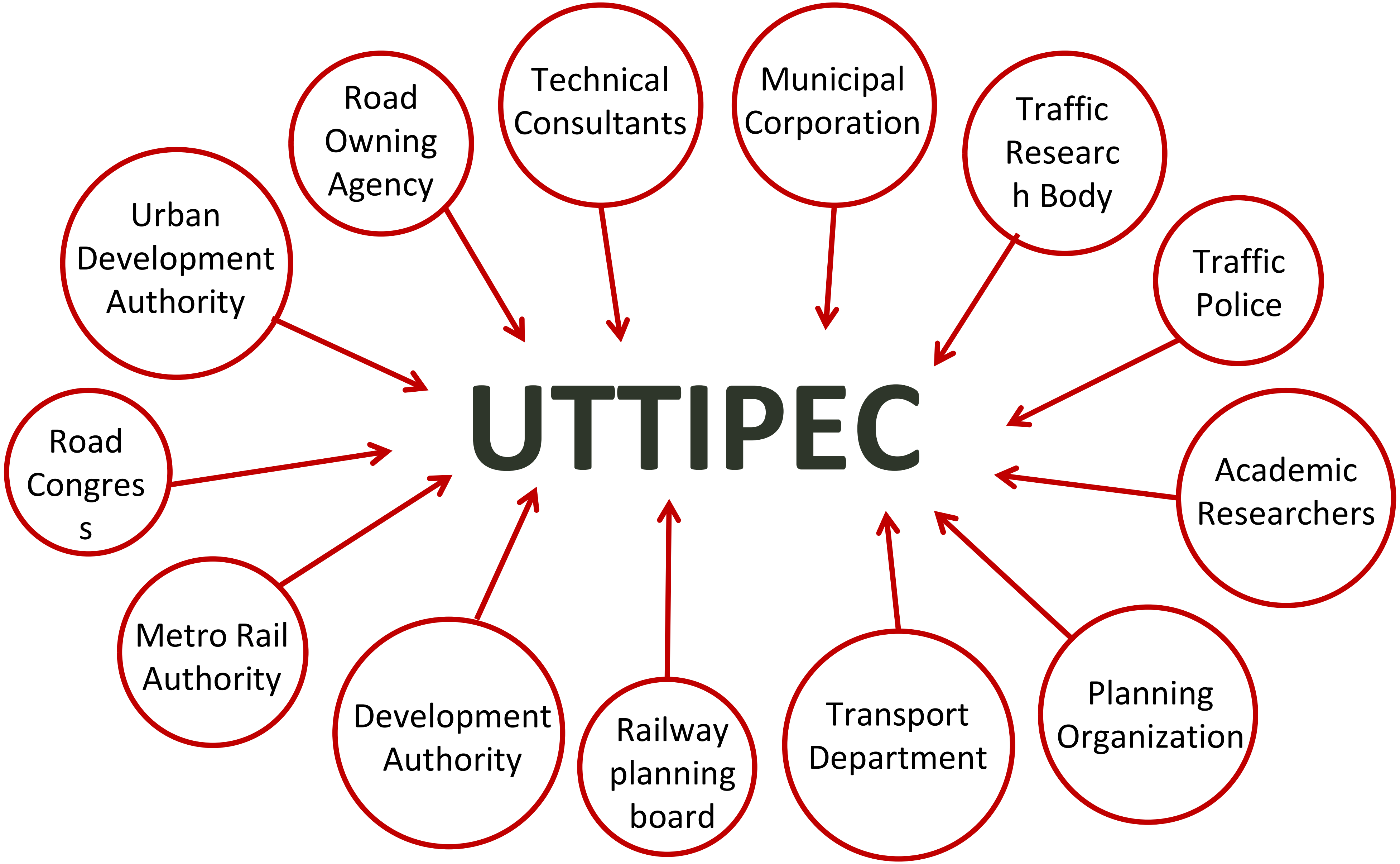
- Affordable Housing Policy with Affordable housing

# 10 | Transparency & Accountability

- Strengthening Public information systems of all Departments
- Linking of measurable performance to CR
- Practice-what-you-Preach approach
- Social media presence
- Shortening time of response/ redressal for all Departments
- Feedback loop system to be ingrained with implementation systems to reduce redressal and increase efficiency of delivery

# After creation of UTTIPEC

Work Culture



Road Owning Agency

Technical Consultants

Municipal Corporation

Traffic Research Body

Urban Development Authority

Traffic Police

UTTIPEC

Road Congress

Academic Researchers

Metro Rail Authority

Development Authority

Railway planning board

Transport Department

Planning Organization

**Concerned departments together to address interrelated issues**

# UTTIPEC team

# Ad-Hoc Solutions (medication)

B6
D
B5
B2
E
C
B6
A
K
B1

Engage Trained in-house Professionals to Deliver focussed & Phased Transformation from 0-20 years.