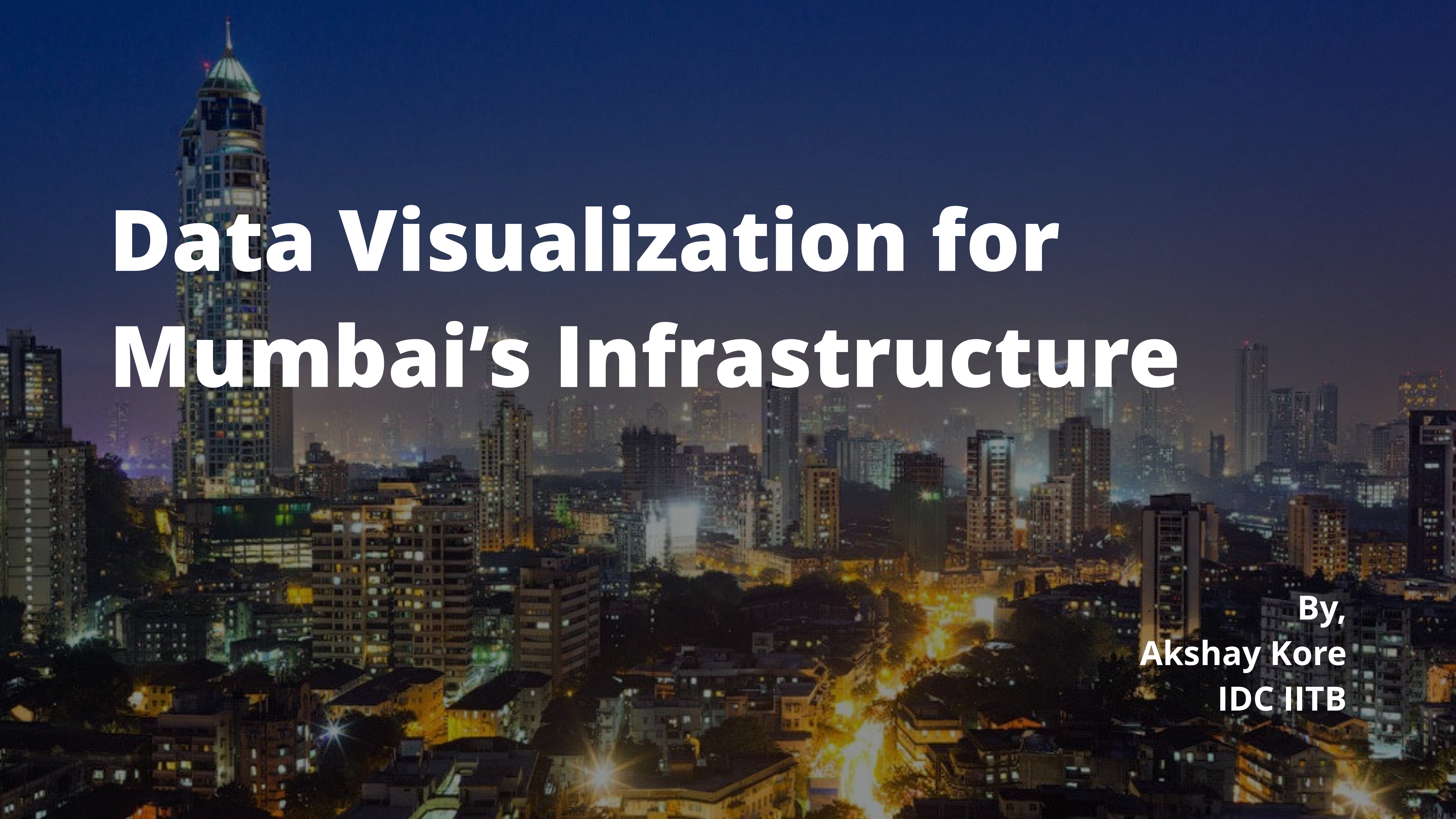
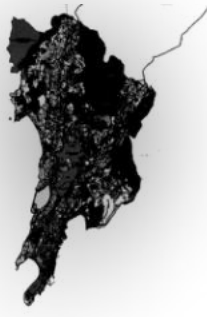
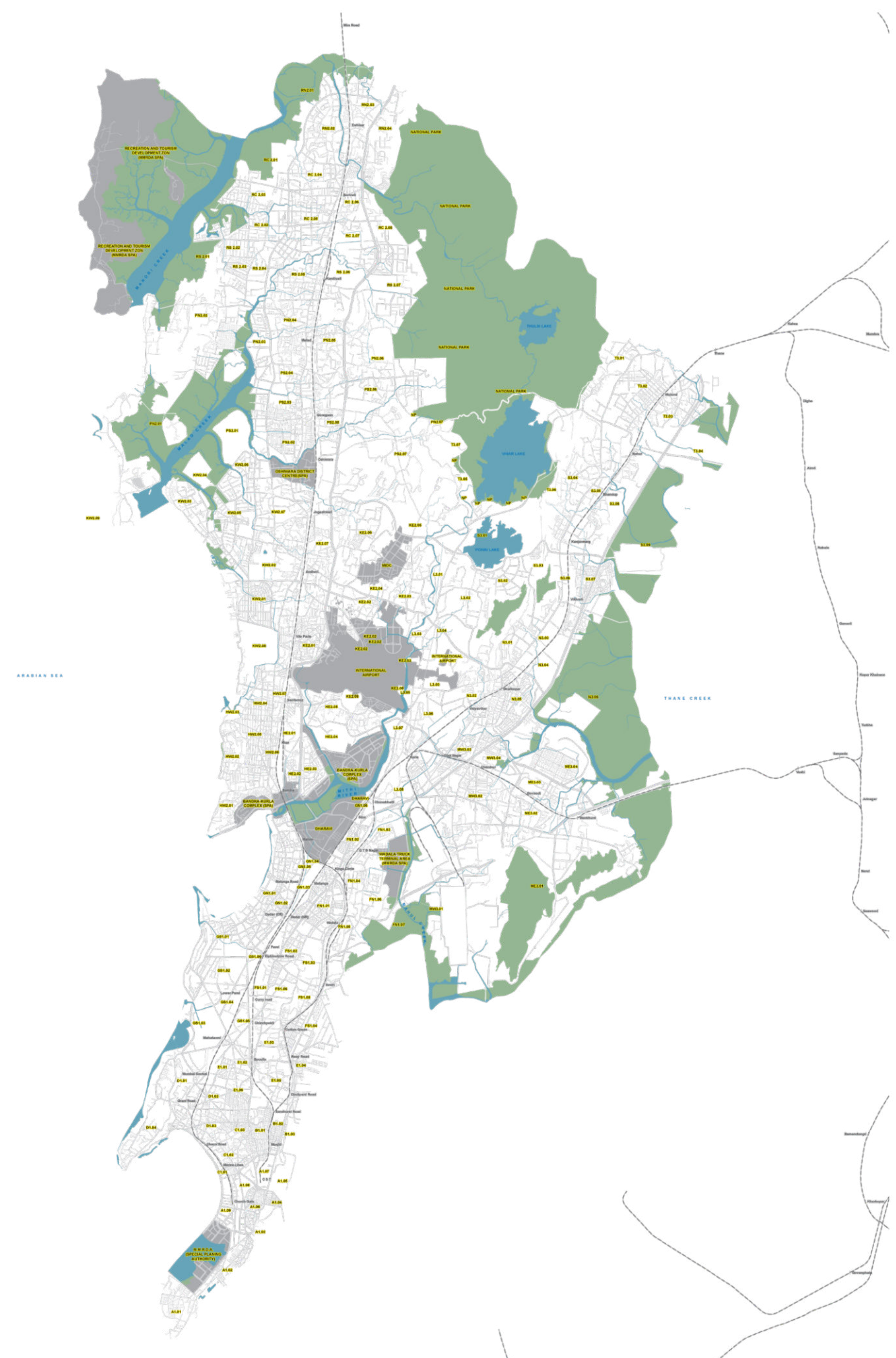


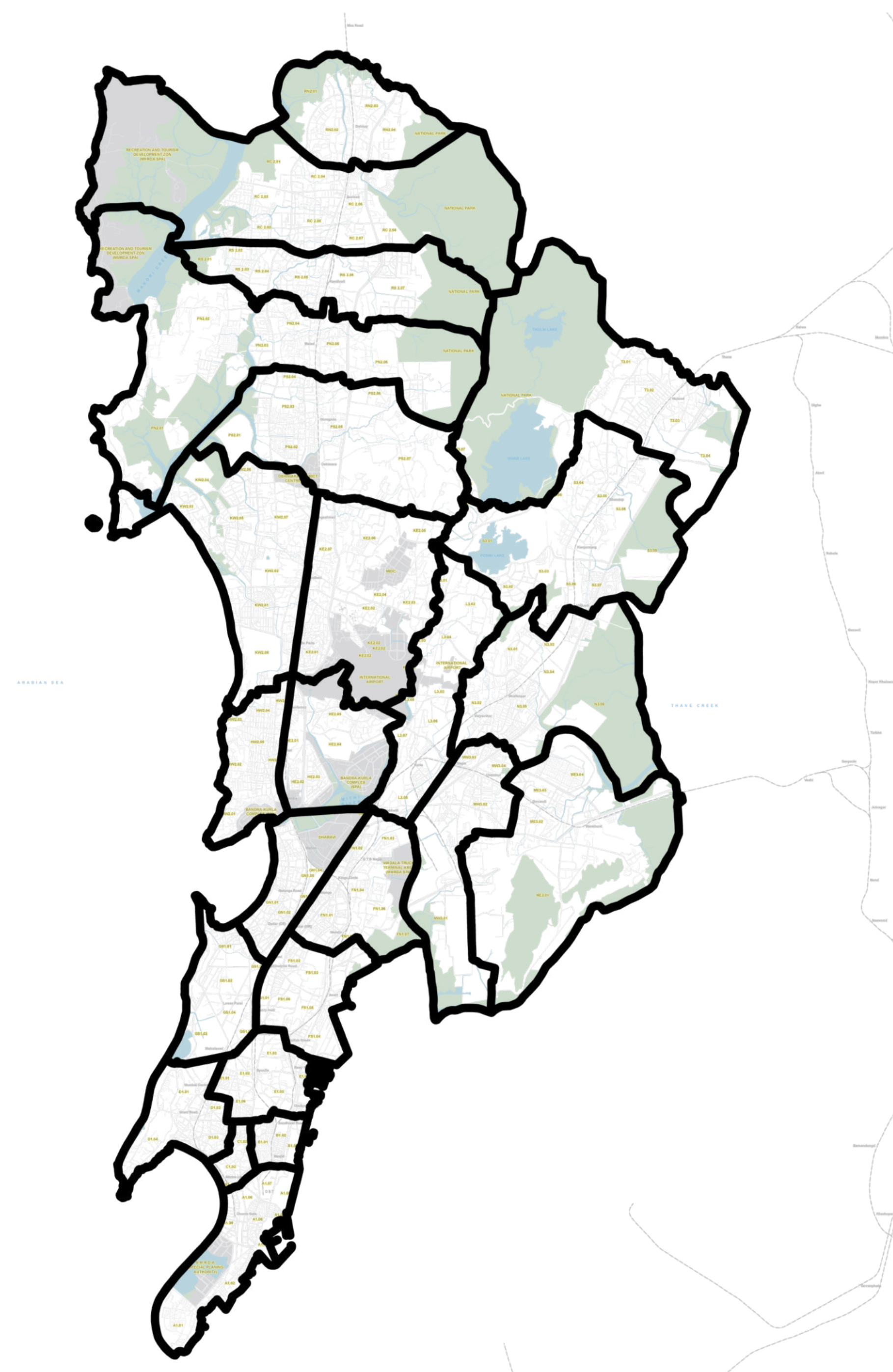
A nighttime aerial view of Mumbai, India, featuring the Copernicus Tower on the left and a dense urban landscape with numerous lit-up buildings and streets.

Data Visualization for Mumbai's Infrastructure

**By,
Akshay Kore
IDC IITB**

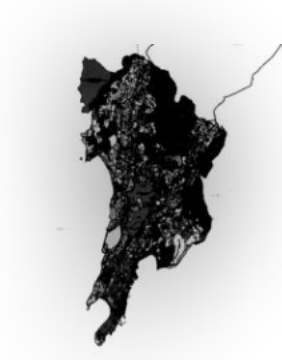
Mumbai Divisions

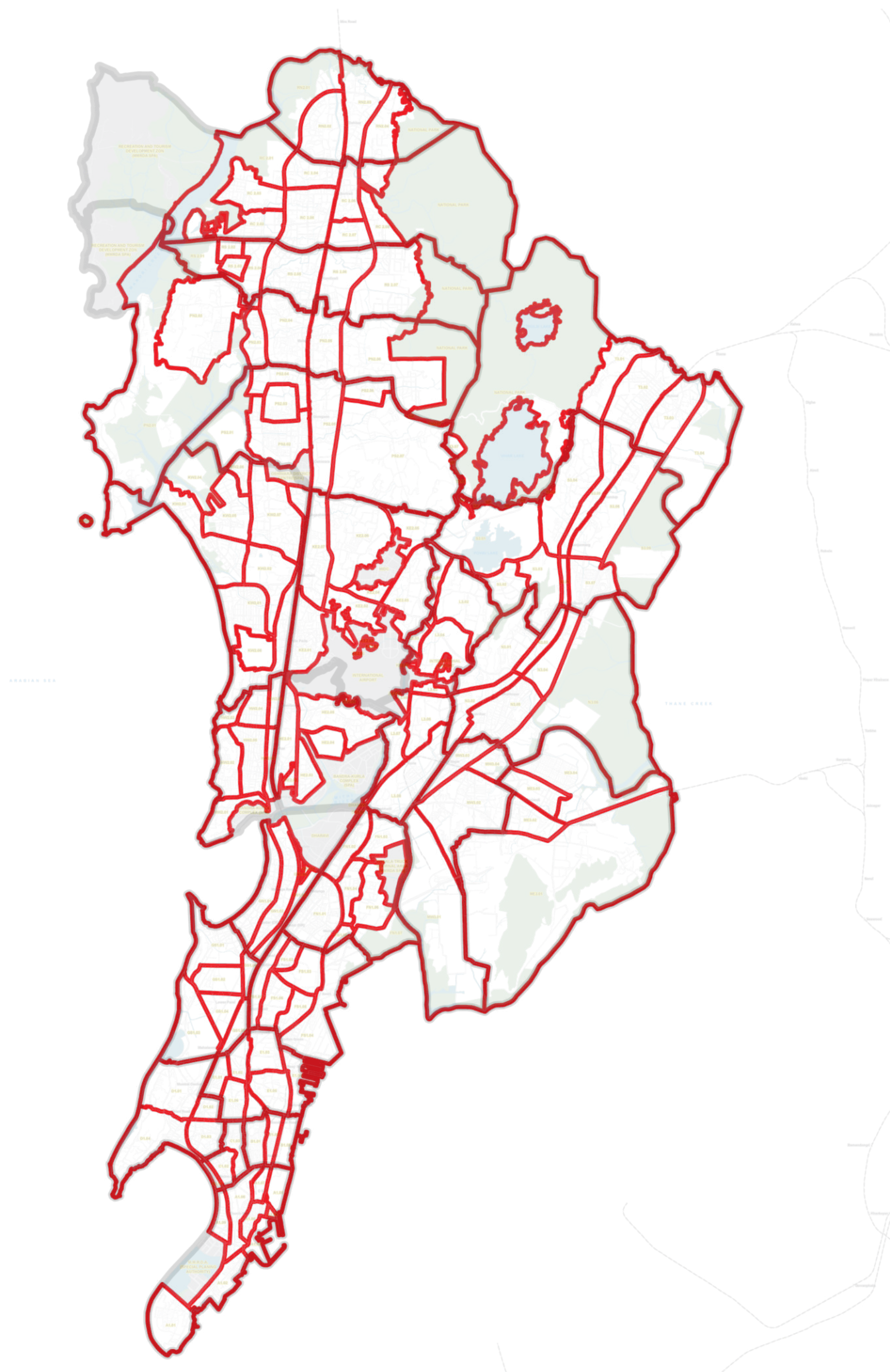




Mumbai Divisions

24 Wards

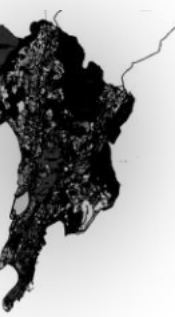




Mumbai Divisions

24 Wards

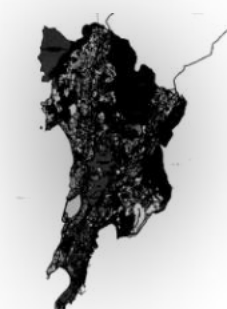
151 Planning Sectors



GREATER MUMBAI – BROAD LAND USE CATEGORIES

EXISTING LAND USE CATEGORIES#		ENTIRE CITY	ISLAND CITY									WESTERN SUBURBS									EASTERN SUBURBS						
			WARDS																								
			A	B	C	D	E	F/N	F/S	G/N	G/S	H/E	H/W	K/E	K/W	P/N	P/S	R/N	R/C	R/S	L	M/E	M/W	N	S	T	
Area (in ha)		41505.7	884.0	265.8	191.3	822.3	727.4	1108.5	978.8	573.1	929.4	657.9	811.2	1676.0	2403.5	4105.2	2471.7	1417.9	3362.3	1831.3	1408.3	3308.3	1740.4	2568.6	2975.2	4287.5	
Percentage (%)		100.0	2.1	0.6	0.5	2.0	1.8	2.7	2.4	1.4	2.2	1.6	2.0	4.0	5.8	9.9	6.0	3.4	8.1	4.4	3.4	8.0	4.2	6.2	7.2	10.3	
#		Ward Wise Area Distribution (in ha)																									
Residential	Area	10333.4	80.8	44.5	77.2	377.8	192.8	402.6	233.8	216.8	220.9	282.7	421.7	685.4	825.1	1027.2	499.1	416.8	626.4	614.0	544.9	571.1	391.9	550.1	622.6	406.9	
	%	24.9	0.8	0.4	0.7	3.7	1.9	3.9	2.3	2.1	2.1	2.7	4.1	6.6	8.0	9.9	4.8	4.0	6.1	5.9	5.3	5.5	3.8	5.3	6.0	3.9	
Commercial	Area	903.9	47.8	30.2	27.4	34.0	47.7	9.6	50.1	13.3	42.1	21.7	30.0	57.2	74.0	69.9	82.6	7.2	66.9	16.2	52.6	8.3	25.7	20.0	46.9	22.3	
	%	2.2	5.3	3.3	3.0	3.8	5.3	1.1	5.5	1.5	4.7	2.4	3.3	6.3	8.2	7.7	9.1	0.8	7.4	1.8	5.8	0.9	2.8	2.2	5.2	2.5	
Offices	Area	360.2	52.6	1.2	1.3	12.8	15.6	9.2	9.4	4.5	27.8	9.4	5.1	43.1	14.5	25.9	35.0	7.7	12.7	9.9	7.7	3.9	10.4	5.1	26.5	8.7	
	%	0.9	14.6	0.3	0.4	3.6	4.3	2.6	2.6	1.3	7.7	2.6	1.4	12.0	4.0	7.2	9.7	2.1	3.5	2.8	2.1	1.1	2.9	1.4	7.4	2.4	
Industrial	Area	2258.3	5.6	0.0	0.2	12.1	108.4	12.4	180.7	22.9	95.6	15.7	2.6	134.1	30.8	35.2	133.3	14.6	26.8	84.6	179.7	264.2	423.0	153.7	214.9	106.9	
	%	5.4	0.2	0.0	0.0	0.5	4.8	0.6	8.0	1.0	4.2	0.7	0.1	5.9	1.4	1.6	5.9	0.6	1.2	3.7	8.0	11.7	18.7	6.8	9.5	4.7	
Natural Areas and Open Spaces	Area	13075.5	78.2	2.0	13.5	151.0	42.8	222.4	57.2	47.7	209.0	31.5	66.1	97.1	560.8	1819.4	262.1	629.7	2050.6	603.9	126.3	615.9	392.7	1399.0	764.4	2832.0	
	%	31.5	0.6	0.0	0.1	1.2	0.3	1.7	0.4	0.4	1.6	0.2	0.5	0.7	4.3	13.9	2.0	4.8	15.7	4.6	1.0	4.7	3.0	10.7	5.8	21.7	
Educational Amenities	Area	852.3	20.1	3.2	2.7	17.8	18.3	39.9	26.7	18.3	10.9	97.6	22.5	50.1	58.5	33.0	33.0	13.3	20.1	16.5	34.9	23.3	16.6	25.2	232.4	17.6	
	%	2.1	2.4	0.4	0.3	2.1	2.2	4.7	3.1	2.1	1.3	11.4	2.6	5.9	6.9	3.9	3.9	1.6	2.4	1.9	4.1	2.7	1.9	3.0	27.3	2.1	
Medical Amenities	Area	316.8	10.9	2.2	5.4	32.2	46.1	18.3	41.9	5.7	19.4	2.8	9.6	16.4	20.4	10.7	8.3	4.9	5.9	4.1	7.5	9.9	5.6	10.3	7.9	10.2	
	%	0.8	3.4	0.7	1.7	10.2	14.5	5.8	13.2	1.8	6.1	0.9	3.0	5.2	6.4	3.4	2.6	1.5	1.9	1.3	2.4	3.1	1.8	3.3	2.5	3.2	
Social Amenities	Area	361.3	17.0	6.9	9.1	16.6	14.9	13.4	10.7	10.0	15.8	5.9	12.9	20.3	30.8	22.6	23.8	8.7	14.2	12.6	11.6	27.4	13.5	12.6	18.6	11.4	
	%	0.9	4.7	1.9	2.5	4.6	4.1	3.7	3.0	2.8	4.4	1.6	3.6	5.6	8.5	6.3	6.6	2.4	3.9	3.5	3.2	7.6	3.7	3.5	5.2	3.2	
Public Utilities and Facilities	Area	693.8	1.6	1.6	0.1	1.5	3.1	8.4	4.0	9.5	14.4	5.0	5.6	17.8	23.8	25.8	4.8	1.5	28.7	8.4	3.9	133.1	78.4	30.3	162.3	119.8	
	%	1.7	0.2	0.2	0.0	0.2	0.5	1.2	0.6	1.4	2.1	0.7	0.8	2.6	3.4	3.7	0.7	0.2	4.1	1.2	0.6	19.2	11.3	4.4	23.4	17.3	
Transport and Communication Facilities	Area	5319.5	280.8	168.5	50.7	144.9	203.9	223.2	283.7	198.3	162.7	117.4	171.0	257.6	409.6	353.1	275.1	147.5	265.6	188.0	245.0	243.9	210.5	239.1	272.7	207.0	
	%	12.8	5.3	3.2	1.0	2.7	3.8	4.2	5.3	3.7	3.1	2.2	3.2	4.8	7.7	6.6	5.2	2.8	5.0	3.5	4.6	4.6	4.0	4.5	5.1	3.9	
Urban Villages	Area	319.7	13.4	0.0	0.0	0.0	0.0	1.9	2.1	5.3	13.1	0.0	19.6	8.2	66.3	94.0	17.2	4.4	5.7	5.8	9.6	17.2	19.2	2.1	9.3	5.5	
	%	0.8	4.2	0.0	0.0	0.0	0.0	0.6	0.7	1.6	4.1	0.0	6.1	2.6	20.7	29.4	5.4	1.4	1.8	1.8	3.0	5.4	6.0	0.7	2.9	1.7	
Primary Activity	Area	1594.8	0.0	0.0	0.3	0.6	0.2	42.3	0.5	0.0	9.3	0.4	2.7	101.1	19.2	27.3	705.4	0.8	4.0	5.6	12.0	0.6	0.2	0.2	300.8	361.1	
	%	3.8	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.6	0.0	0.2	6.3	1.2	1.7	44.2	0.1	0.3	0.4	0.8	0.0	0.0	0.0	18.9	22.6	
Unclassified	Area	1835.5	270.9	0.0	0.0	0.0	0.0	0.5	2.9	0.0	5.5	26.6	0.0	9.5	66.8	70.6	0.0	0.0	0.0	61.4	13.2	1179.5	15.9	18.3	94.0	0.0	
	%	4.4	14.8	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	1.4	0.0	0.5	3.6	3.8	0.0	0.0	0.0	3.3	0.7	64.3	0.9	1.0	5.1	0.0	
Vacant Land	Area	3280.6	4.1	5.5	3.4	20.9	33.4	104.5	75.1	20.7	82.8	41.3	41.8	178.0	203.0	490.5	391.9	160.8	234.7	200.2	159.2	210.0	136.7	102.4	201.8	178.0	
	%	7.9	0.1	0.2	0.1	0.6	1.0	3.2	2.3	0.6	2.5	1.3	1.3	5.4	6.2	15.0	11.9	4.9	7.2	6.1	4.9	6.4	4.2	3.1	6.2	5.4	

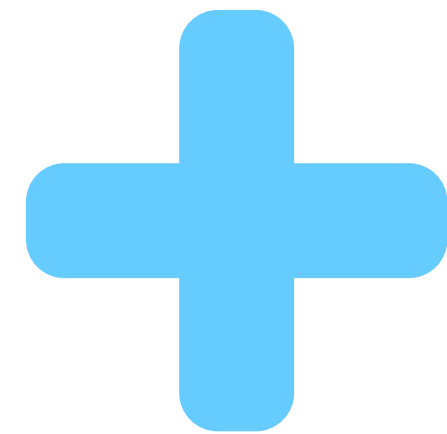
Source: ELU Survey, 2012, Groupe SCE India Pvt. Ltd



Categories for visualization



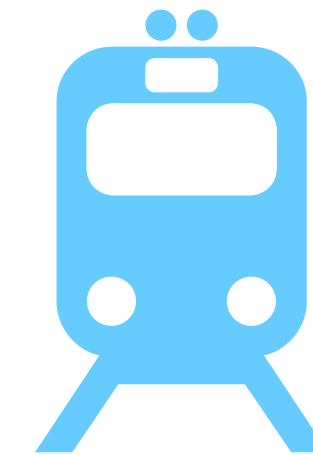
Housing



Health



Education



Transportation



**Water and
Sanitation**



Livelihood



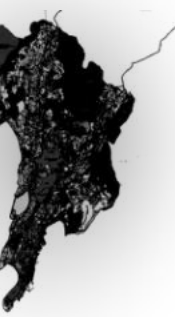
Open Spaces



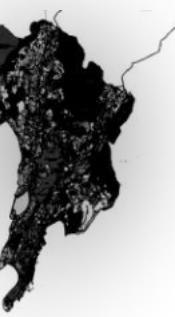
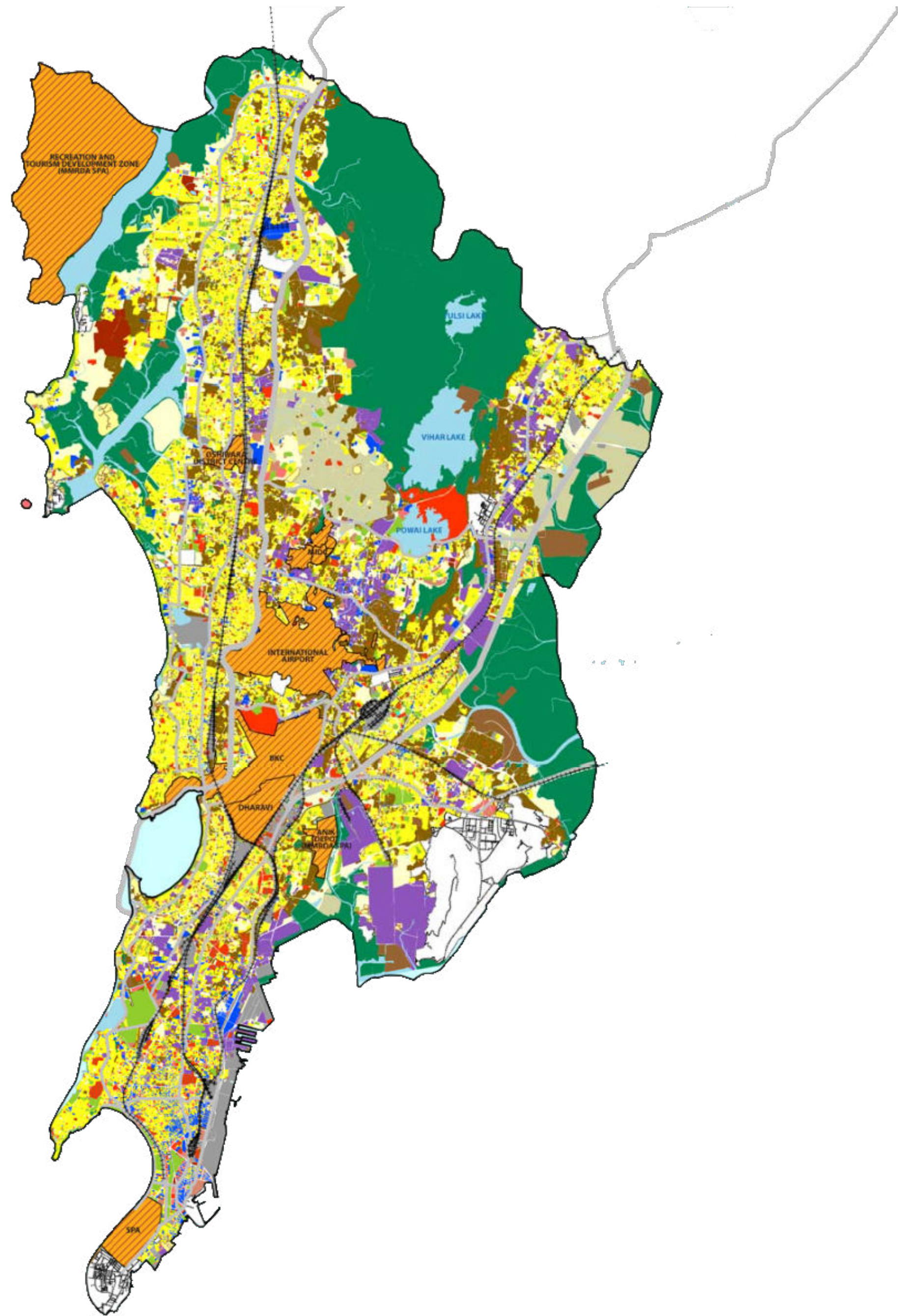
Environment



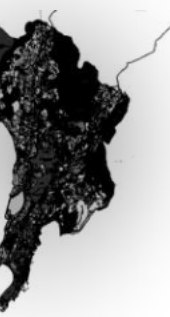
Governance



Existing Land Use

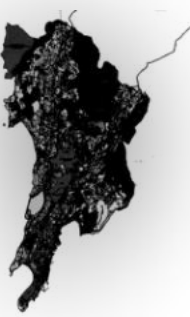
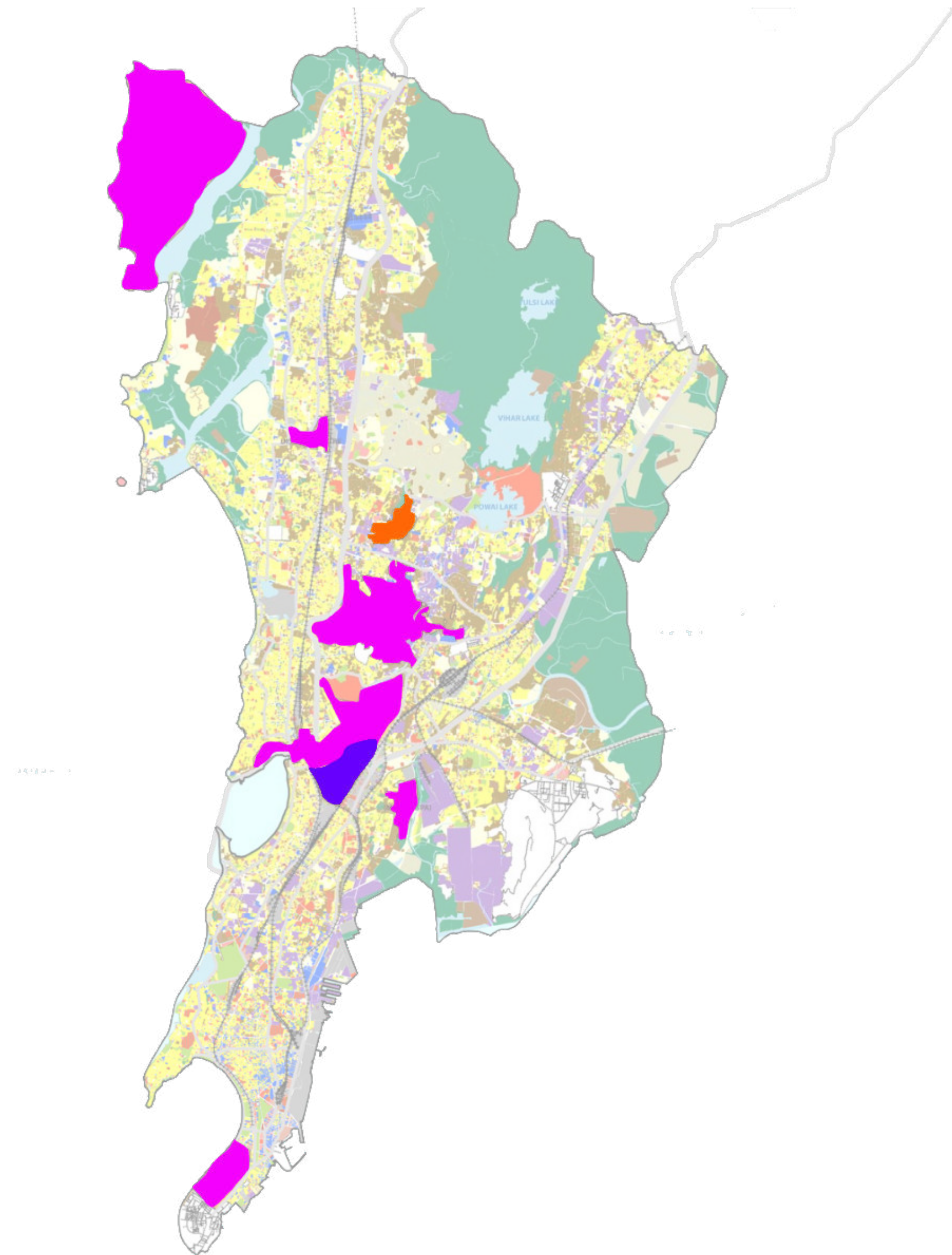


Existing Land Use Area Under MCGM



Existing Land Use

Special Planning Areas (SPA)



Existing Land Use

Special Planning Areas (SPA)

MMRDA

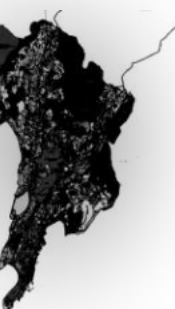
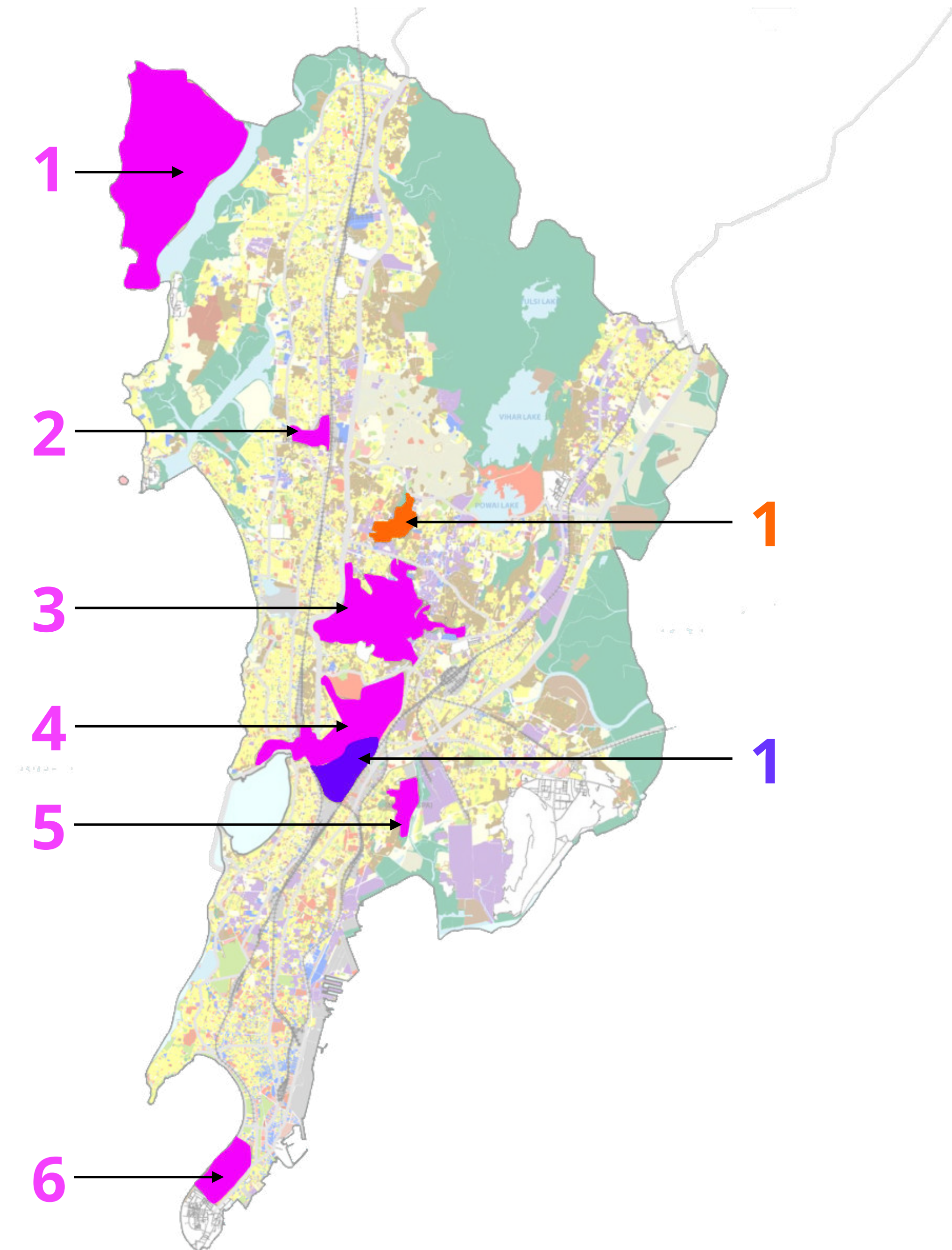
1. Gorai-Manori Tourism zone
2. Oshiwara District Centre (ODC)
3. Airport
4. Bandra Kurla Complex (BKC)
5. Wadala Truck Terminal
6. Backbay Reclamation Area

MIDC

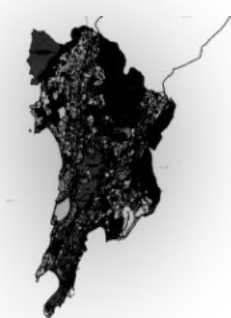
1. Marol Industrial Area, SEEPZ SEZ

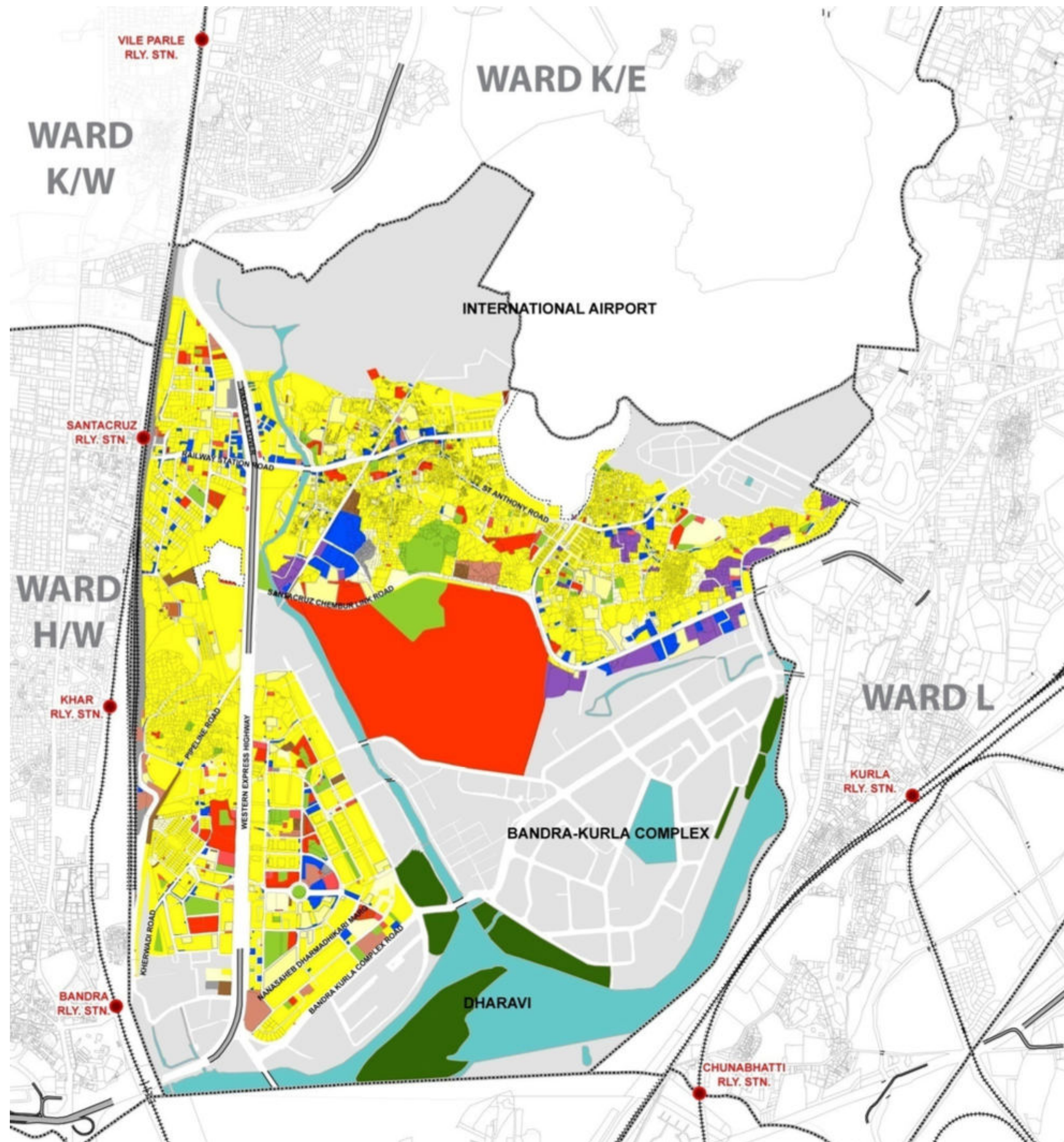
MHADA

1. Dharavi



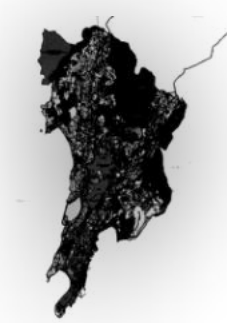
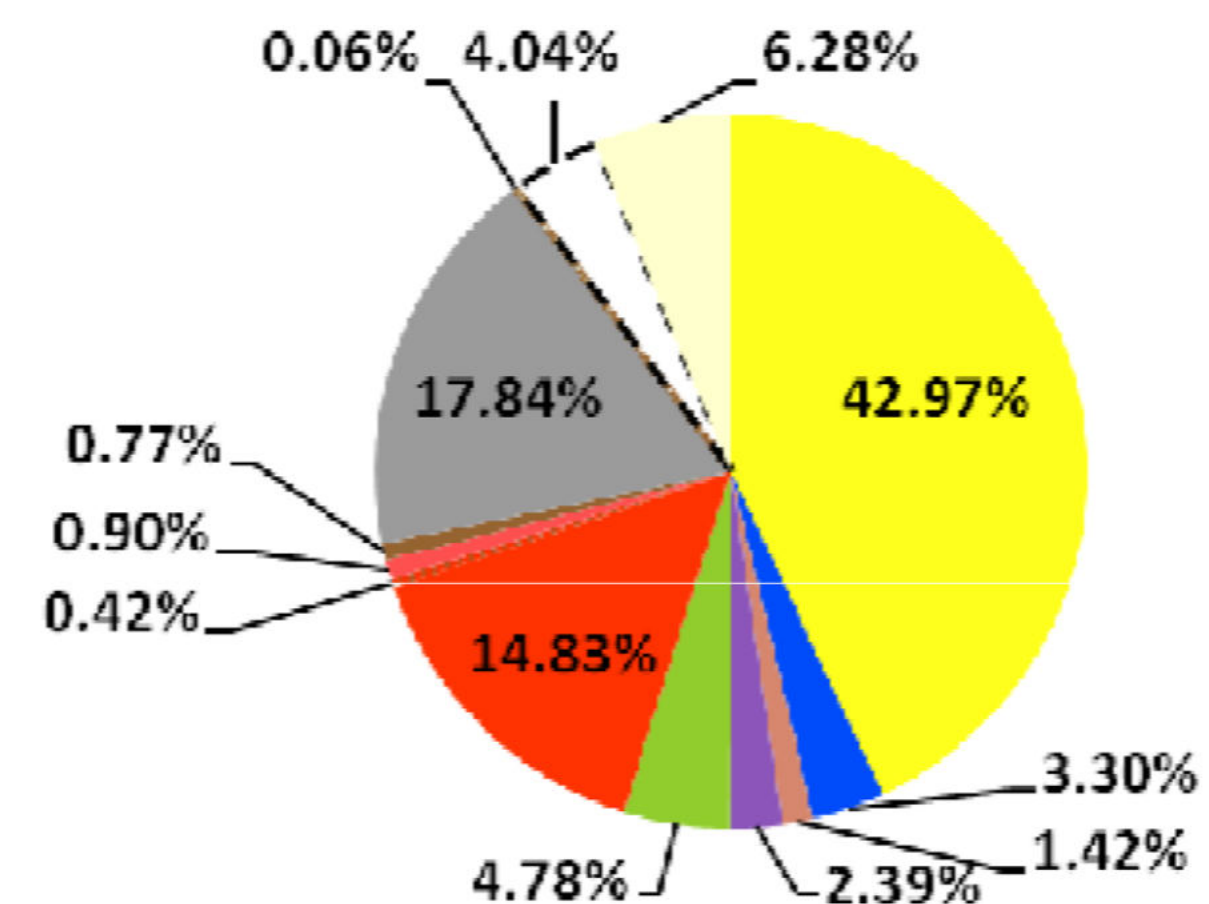
Incomplete Datasets

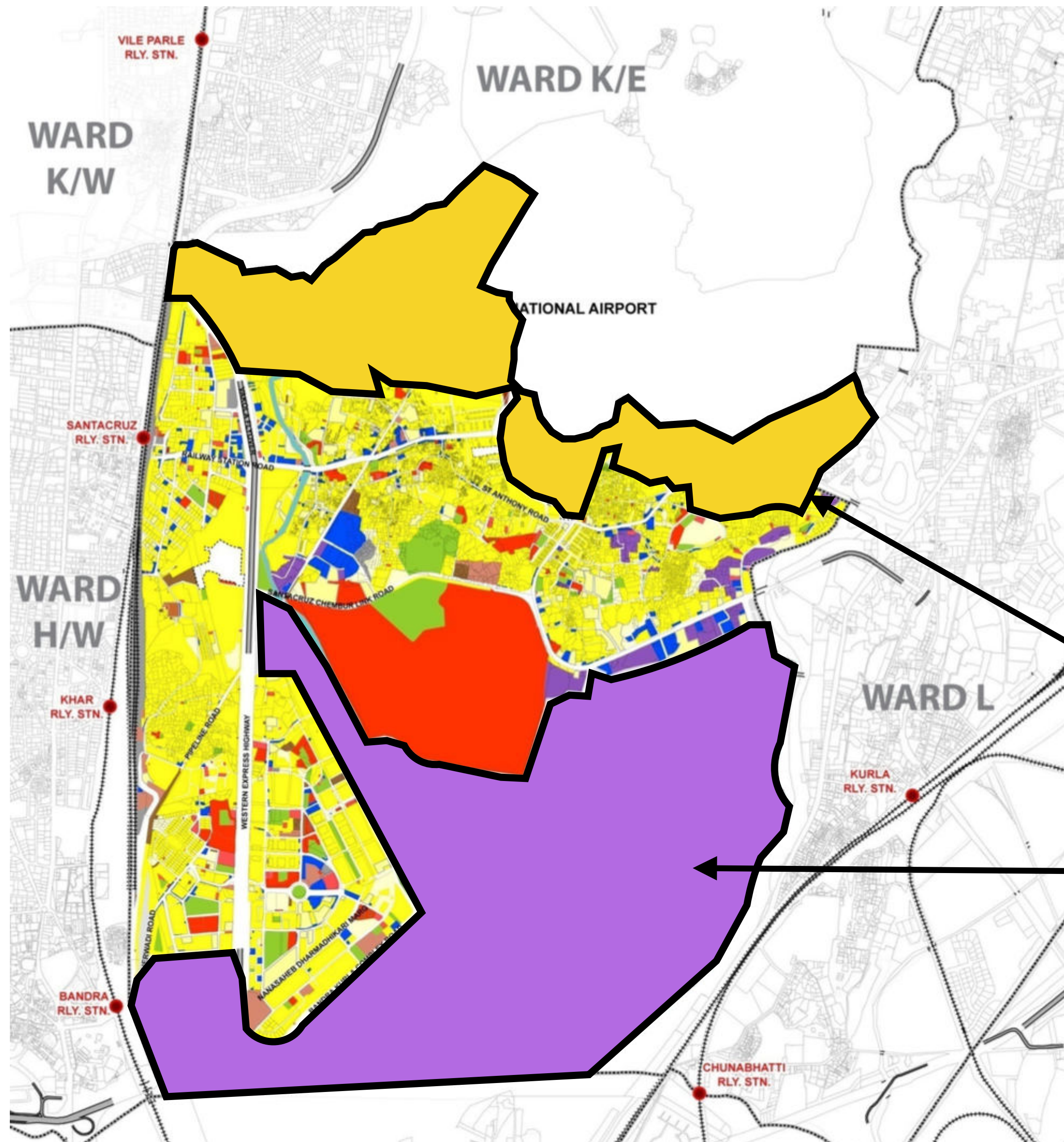




Incomplete Datasets

Eg. Ward H/E





Incomplete Datasets

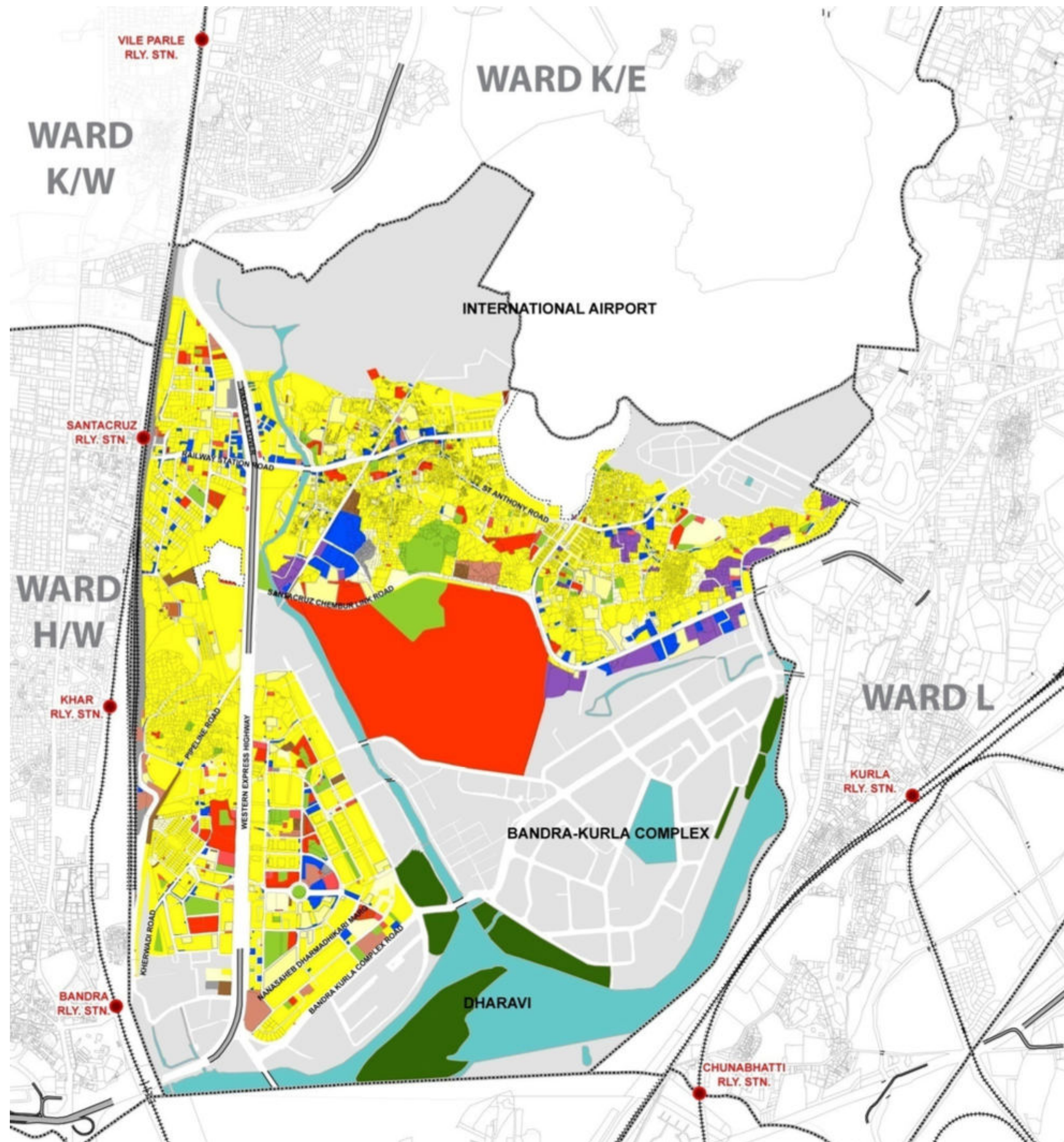
Eg. Ward H/E

Excluded Areas in Analysis

Airport

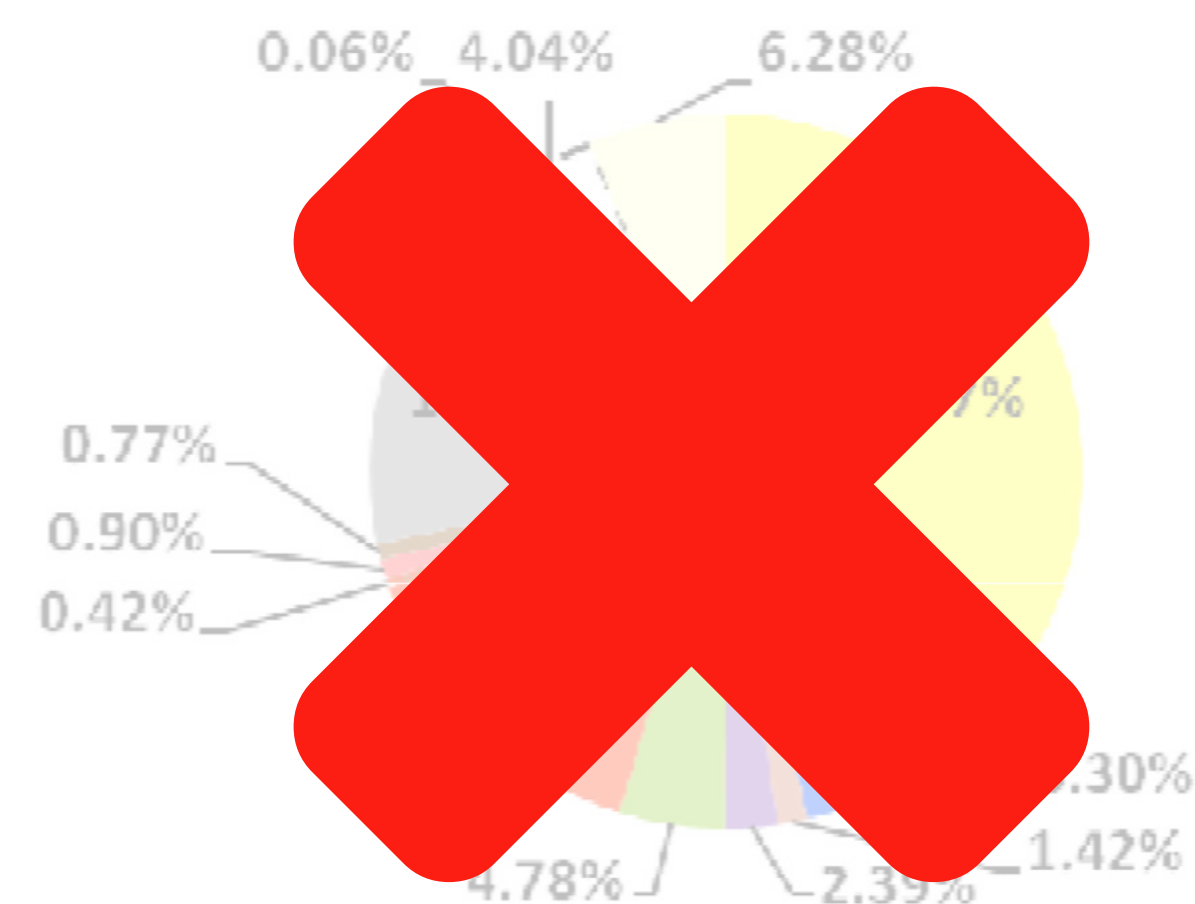
Bandra Kurla Complex





Incomplete Datasets

Eg. Ward H/E



Data Secured so Far

MCGM

1. ELU all Wards	✓
------------------	---

MMRDA

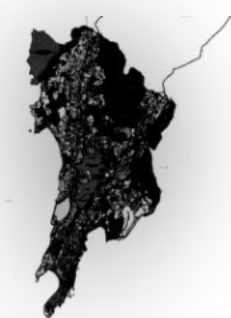
- | | |
|-----------------------------------|---|
| 1. Gorai-Manori Tourism zone | ✓ |
| 2. Oshiwara District Centre (ODC) | ✓ |
| 3. Airport | ✓ |
| 4. Bandra Kurla Complex (BKC) | ✓ |
| 5. Wadala Truck Terminal | ✓ |
| 6. Backbay Reclamation Area | ✓ |

MIDC

1. Marol Industrial Area, SEEPZ SEZ	✗
-------------------------------------	---

MHADA

1. Dharavi	✓
------------	---



Other Datasets

Housing

Cessed Buildings	✓
Heritage Sites and Buildings	Not sure
Ready Reckoner Rates (Housing prices)	✓
Slums	✓



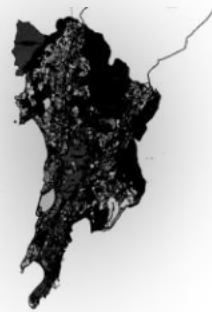
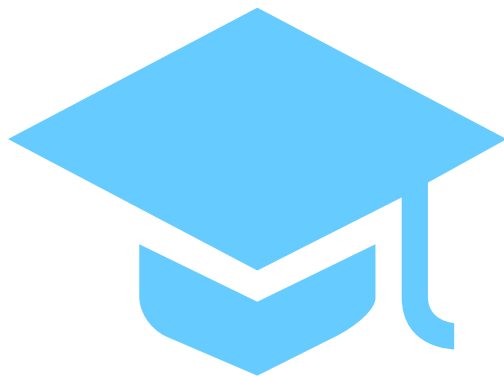
Health

Hospitals in wards	✗
Top 5 Diseases	✓
Top 5 Sensitive Diseases	✓



Education

Gender Ratio in Primary Education	✓
Dropout numbers in Primary Eductaion	✓
No. of teachers	✓
Distribution of schools and colleges	✗



Other Datasets

Transportation

Existing transport networks



Proposed transport networks



Auto and Taxi stands



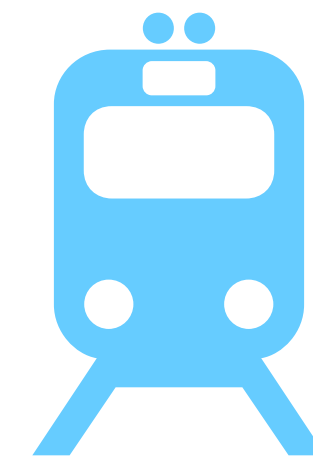
Peak time traffic roads



Heavy pedestrian congestion areas



Road Accident prone spots

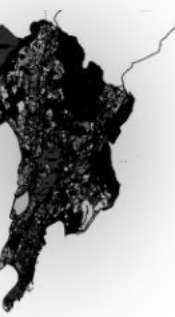


Water and Sanitation

Waste management facilities



Settlements not served by sewer lines



Other Datasets

Livelihood

Employment Rate ✓

Open Spaces

Wardwise Open space data ✓

Environment

Natural spaces and water bodies ✓

Flood and Cyclone prone areas ✓

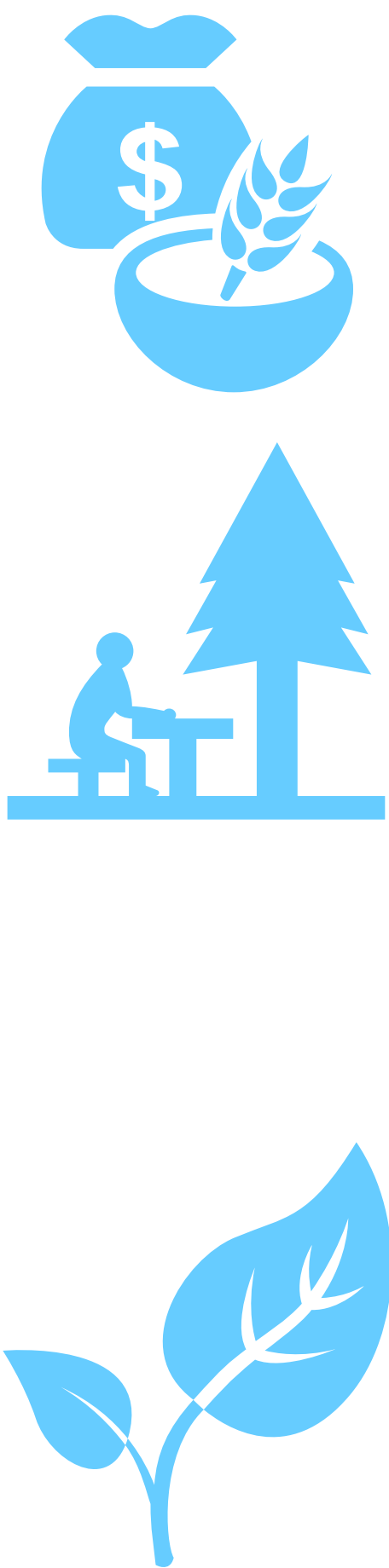
Intertidal Zones ✓

CRZ Boundaries ✓

Wardwise Tree cover ✓

Noise Pollution (Ambient noise) ✓

Air Quality ✓



Other Datasets

Governance

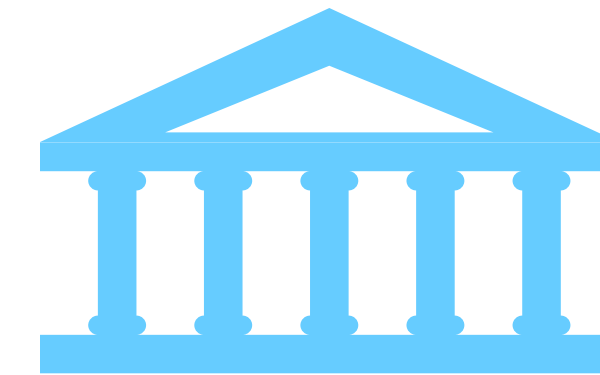
Police Stations and Jurisdiction ✓

Ward wise FIRs : Murders ✓

Ward wise FIRs : Crimes against women ✓

Ward wise FIRs : Rapes ✓

Ward wise FIRs 2011 - 2014 ✓



Population

Ward wise population Data 2001-2011 ✓

Declining Growth rate of Population ✓

Slum and Non-Slum population ✓

