

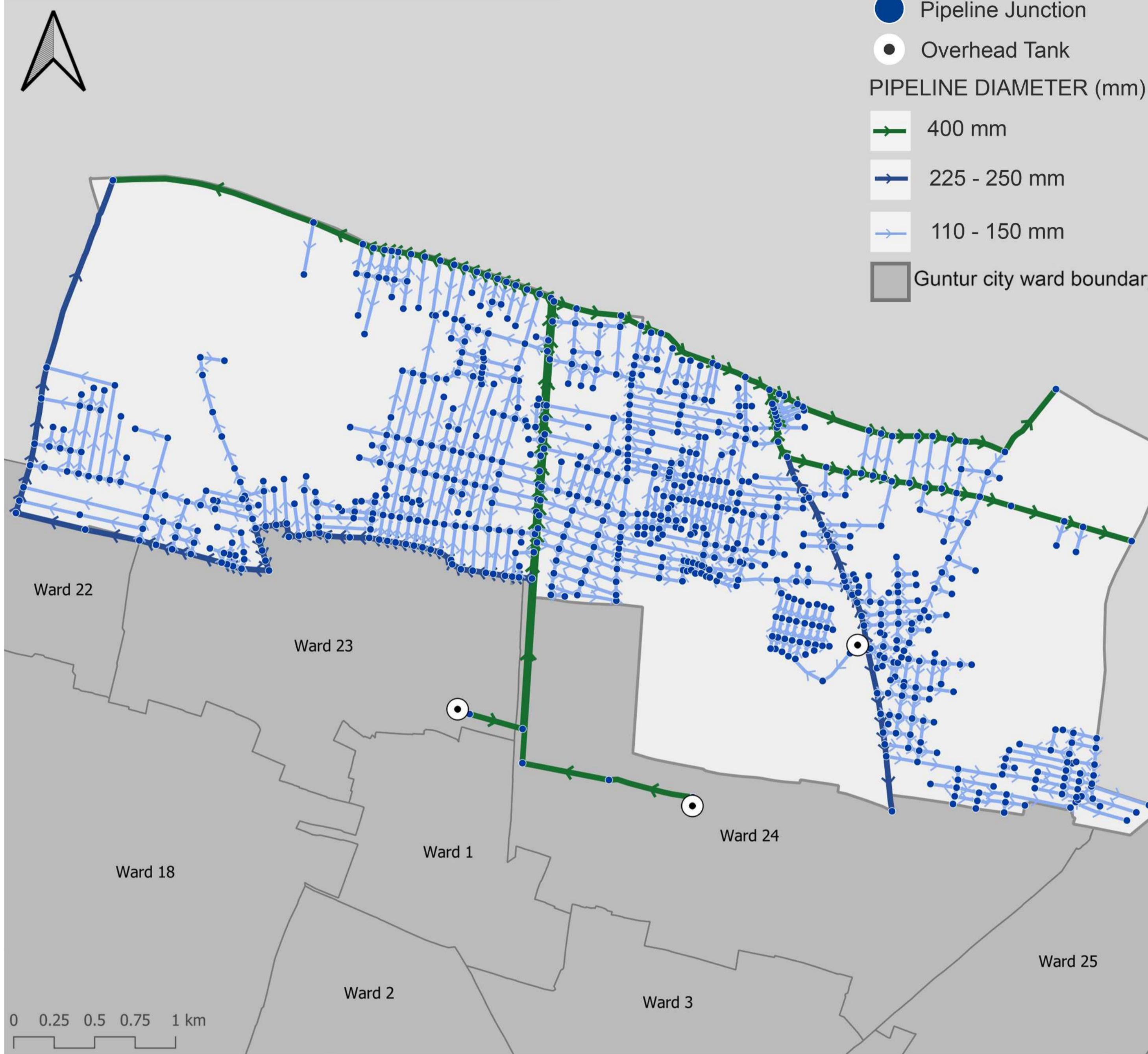


INFRASTRUCTURE ANALYSIS

WATER SUPPLY INFRASTRUCTURE

WATER SUPPLY DEMAND MODELLING

WATER SUPPLY NETWORK



Digitizing Water network

Preparing Elevation

assigning the diameter and pipe length values

Preparing Elevation

Assigning elevation values to node/ water nework junction

USGS SRTM DEM

Prepare QWater model builder

Uploading the DEM file for elevation driven stimulation

Estimating the flow through peak flow demand calculation

Values fill- generated output

Max.,Min & Avg.flow rate

Generated Demand Flow

Demand wrt junctions

Demand between 2021-31

Max.,Min & Avg.flow rate

Demand Calculation & SLB

EXISTING AND FORECASTED

- Comparing the data retrieved from primary/secondary source to SLBs
- Calculate the gap from existing water supply
- Forcasting future water demand for 2031

Analyzing if current water network sufficient to cater the future demand (2031)

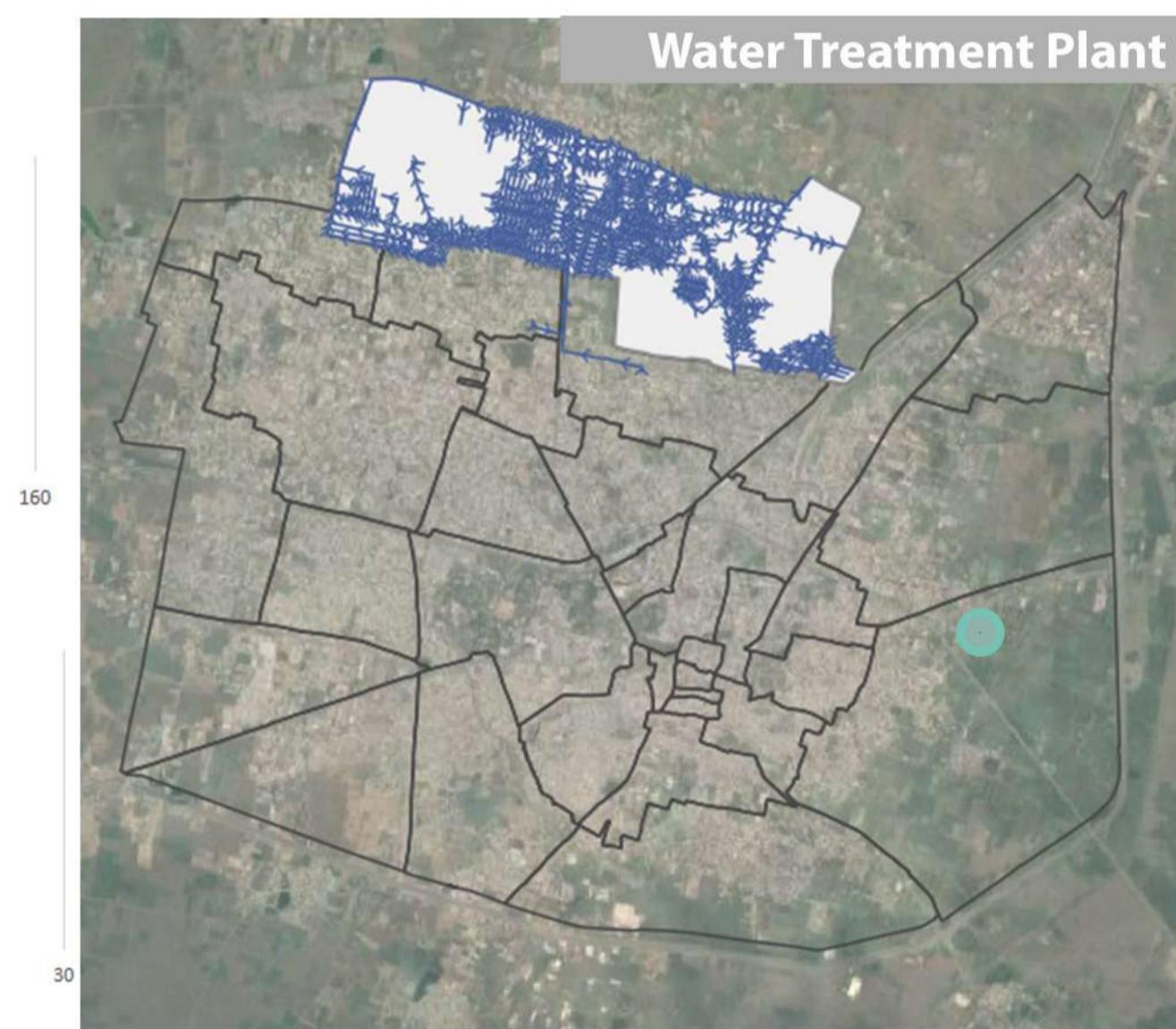
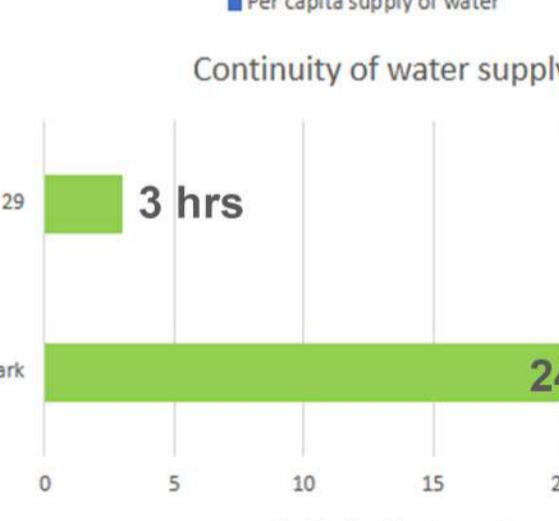
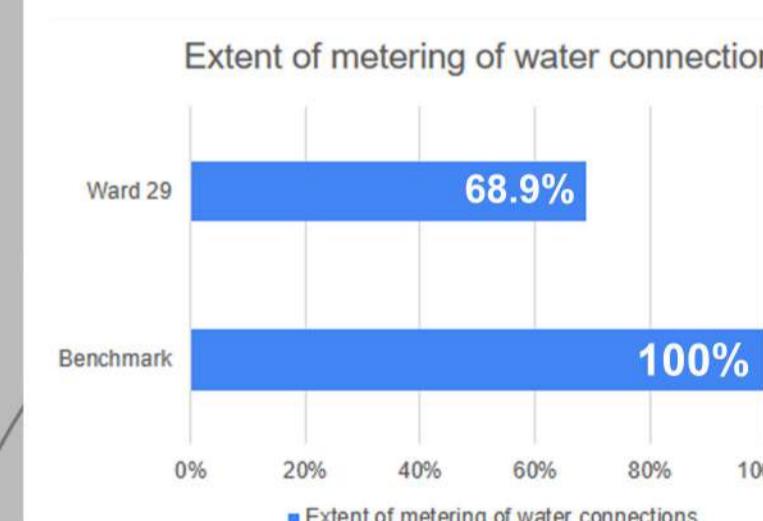
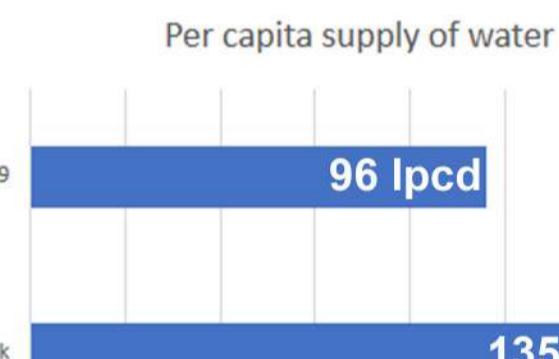
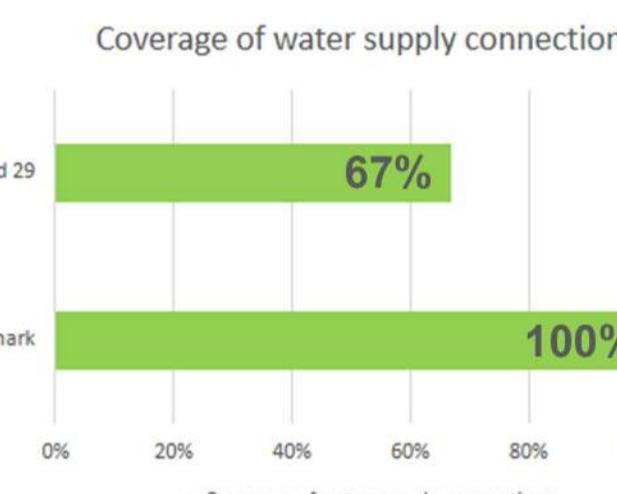
Identifying the junctions with relatively low demand flow

Source SLB-MoUD,

Census data + GMC

Address through Proposals

SERVICE LEVEL BENCHMARKING



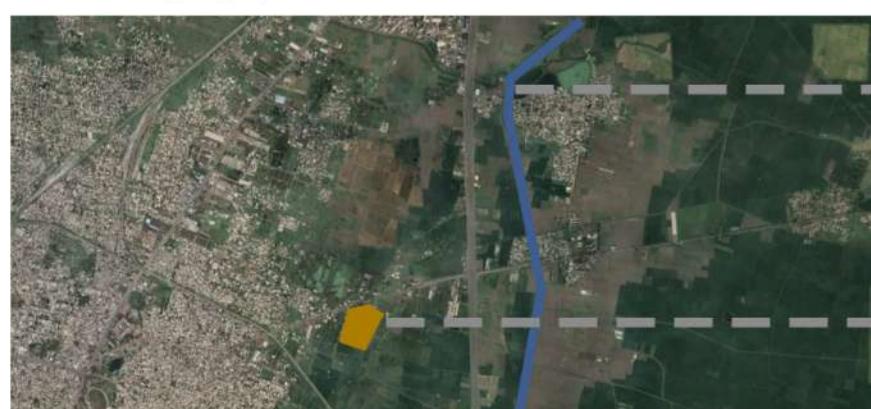
Water Infrastructure is vital to asses & to be prioritized for wards in periphery

WATER SOURCE

WATER TREATMENT PLANT

- Guntur Channel
- Drawal at Takkellapadu raw water pump house
- Distance 4 km from corecity
- Max drawal capacity - 45.50 MLD

- Treatment Treatment plant location- Takkellapadu
- Capacity-45.50 MLD
- Condition- Good



PUMPING STATION

- Pumping Station Location Saradha Colony
- Pumping system efficiency- overall 65%
- Condition- Good

OVERHEAD TANK

- Total water overhead tanks connected- 3 Nos
- Twin Tanks Locations Sowbhagaya Nagar Kavitha Nagar Reddy Palem lake

CONSUMER HOUSEHOLD



Census data secondary data-GMC & primary survey

Analysis of Infrastructure Urban -Periphery Site Area

Urban Infrastructure Planning Planning & design Construction Operation & Maintenance

Water supply Guntur Municipal Corporation & Public Health Engg Department

Infrastructure provision Prioritization

Guntur Municipal Corporation & Public Health Engg Department

Bridging Gaps- with Forecasting Demand

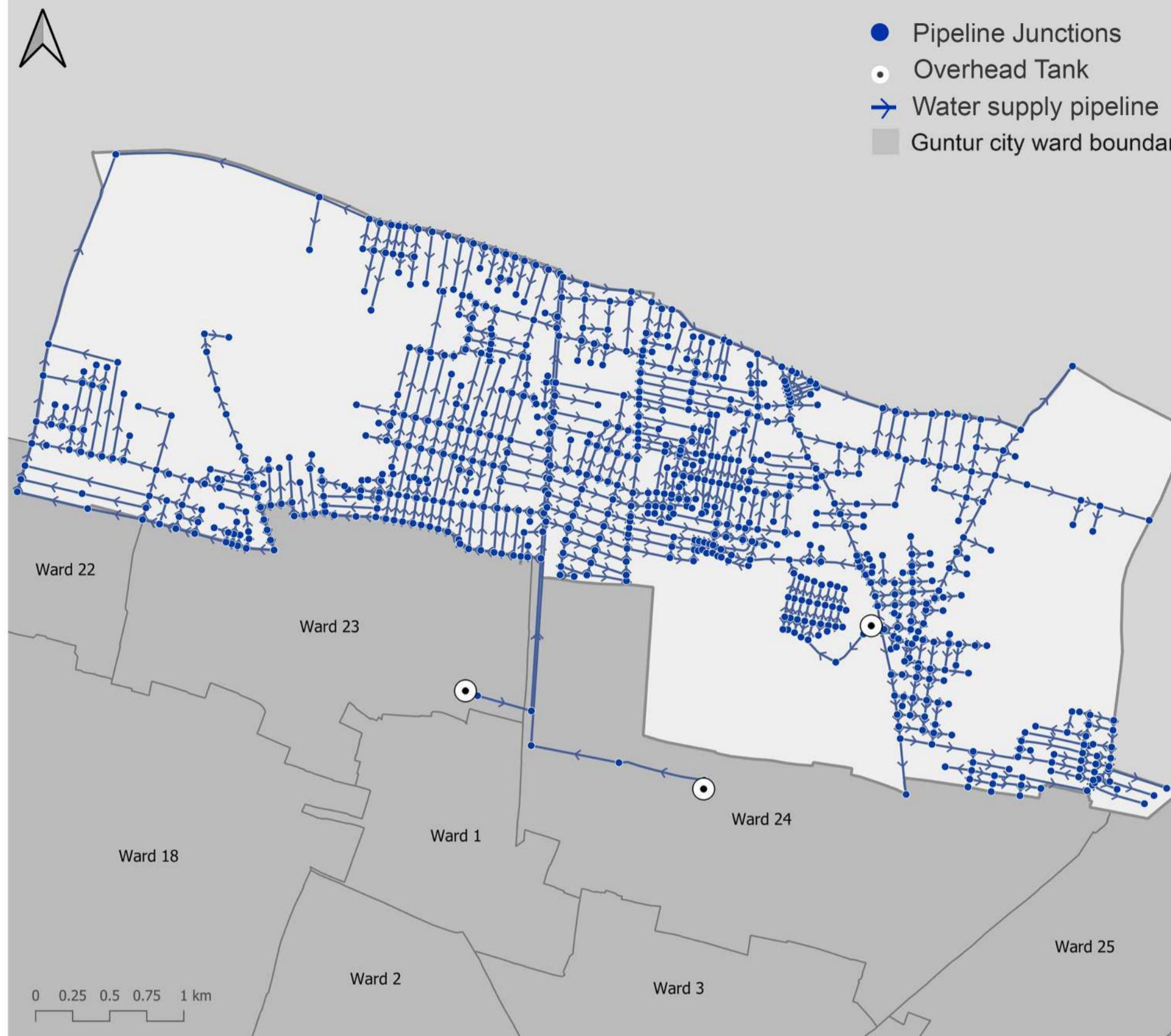
Guntur Municipal Corporation

SOURCE: Guntur Municipal Corporation

WATER SUPPLY INFRASTRUCTURE

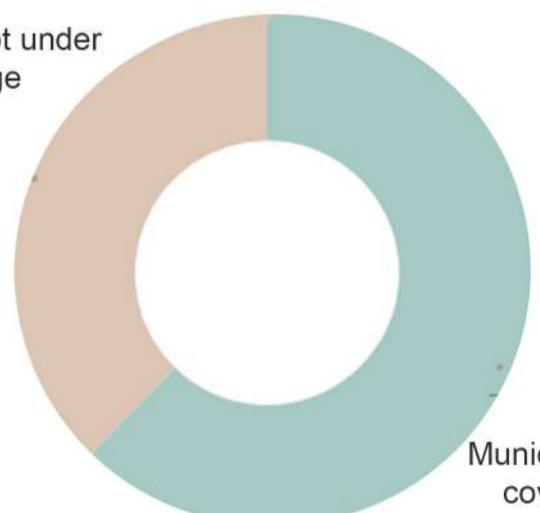
ANALYSING WATER NETWORK FOR PEAK FUTURE DEMAND

WATER SUPPLY NETWORK



Ward Level Municipal water network distribution

Area not under coverage (39%)



Demand Junction/Nodes Count in water network-793 nos

Transmission losses (from WTP)- 25%

Tool Used to calibrate Demand Flow (q)- system QGis 3.16 QWATER-EPLANET

Drinking Water source

Tankers/others (3.6%) Handpump (5.4%)

Municipality (91.1%)

Municipal Water Supply

Ward 29 supply (3.4%)

Guntur city supply (96.6%)

Metered Connection

Not Metered (31.1%)

Metered (68.9%)

Within Premises (86%)

Drinking Water Source Location

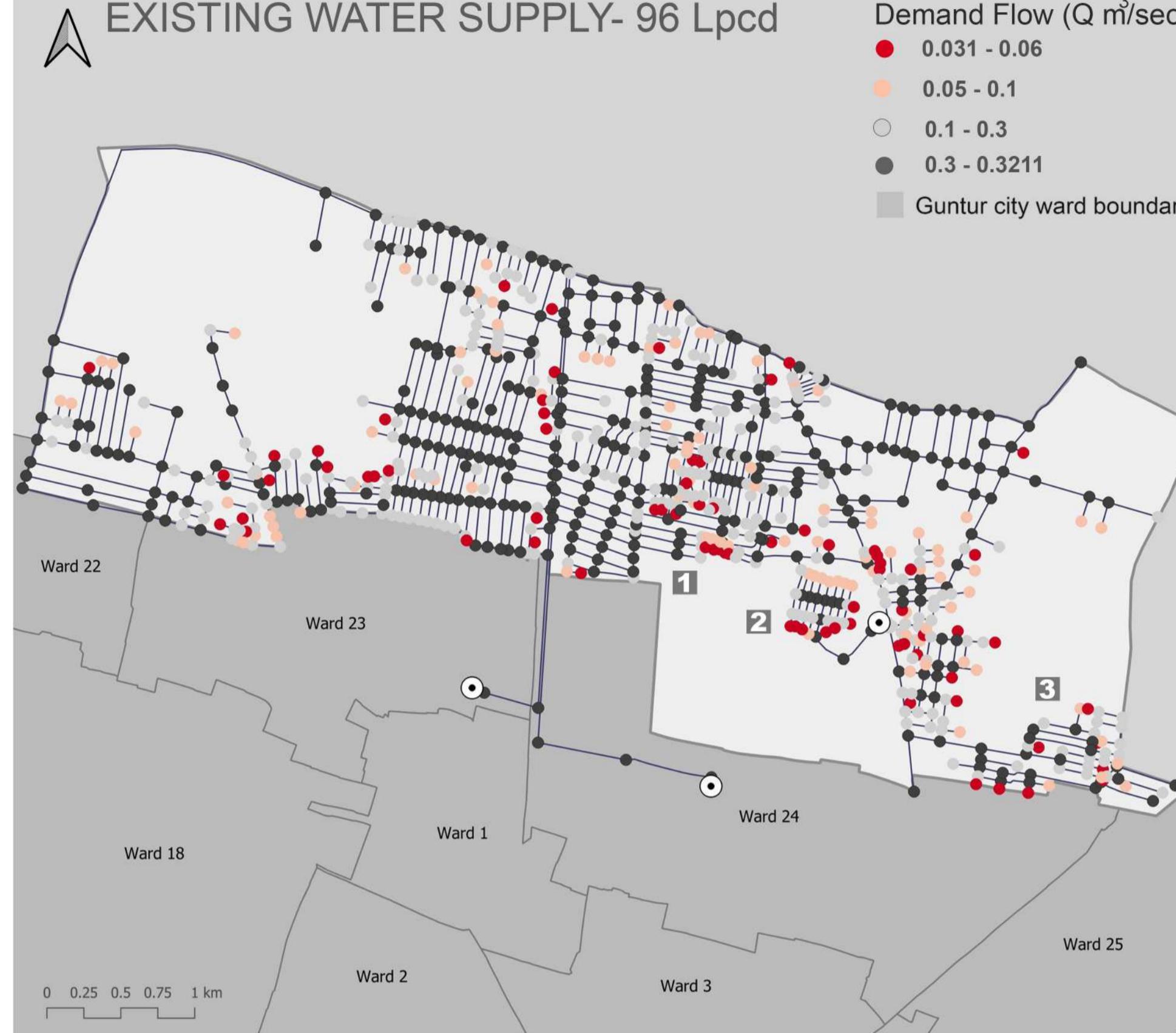
Near Premises <=5m (9%)

Away from Premises > 5 m (5%)

- Nearly 31% of Household utilizing municipal water supply & not metered
- Higher proportion of pipeline junction in low lying areas- have lower water supply relative to water demand with existing 96lpcd water supply.

JUNCTION DEMAND FLOW- 2021

EXISTING WATER SUPPLY- 96 Lpcd



DEMAND FROM EXISTING SUPPLY OF WATER

DOMESTIC

Domestic per capita demand (in lpcd) 96 Lpcd

Population (2021) 26800

Water demand calc = per capita * population 2572800 Lpcd

2.5728 MLD

COMMERCIAL & INSTITUTIONAL

Per Capita demand 20 lpcd

Commercial Total Demand 1320 Lpcd

Institutional Total Demand 340 Lpcd

Total Commercial & Institutional Demand 1660 Lpcd

INDUSTRIAL

Per Capita demand 11 lpcd

Total Demand 242 Lpcd

Total Water Demand= Domestic + Comm.+ Institutional + Industrial

Total Water Demand= 2572800+1660+242 Lpcd

(Litres per Capita/Day) = 25,74,702 Lpcd= 2.57 MLD

DEMAND FROM SUPPLY OF WATER AS PER CPHEEO

DOMESTIC

Domestic per capita demand (in lpcd) As per standards CPHEEO 135

Population (2021) 26800

Water demand calc = per capita * population 3618000 Lpcd

3.618 MLD

COMMERCIAL & INSTITUTIONAL

Per Capita demand 30 lpcd

Total Demand 1980 Lpcd

Institutional Total Demand 510 Lpcd

Total Commercial &

Institutional Demand 2490 Lpcd

INDUSTRIAL

Per Capita demand 11 lpcd

Total Demand 242 Lpcd

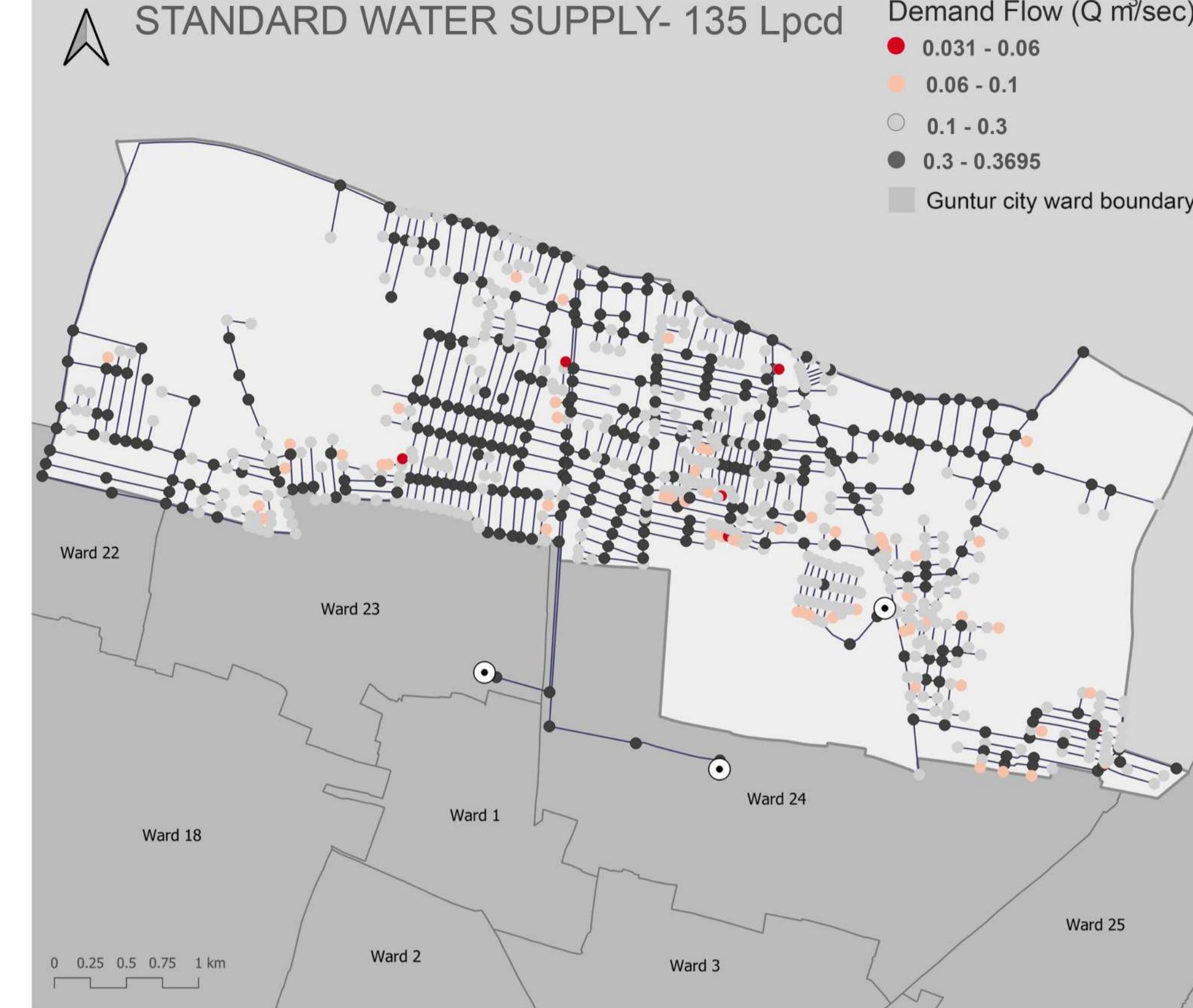
Total Water Demand= Domestic + Comm.+ Institutional + Industrial

Total Water Demand= 3618000+2490+242 Lpcd

(Litres per Capita/Day) = 36,20,732 Lpcd= 3.62 MLD

JUNCTION DEMAND FLOW- 2021

STANDARD WATER SUPPLY- 135 Lpcd



EXISTING WATER SUPPLY GAP CALCULATION

GAP Calculation= Demand of water (CPHEEO) - Supply of water

GAP Calculation= 36,20,732 Lpcd - 25,74,702 Lpcd

= 10,46,030 Lpcd = 1.046030 MLD

ESTIMATING FORCASTED WATER DEMAND FOR 2031

Domestic per capita demand (in lpcd) As per standards

CPHEEO

Population (2031)

Water demand calc = per capita * population

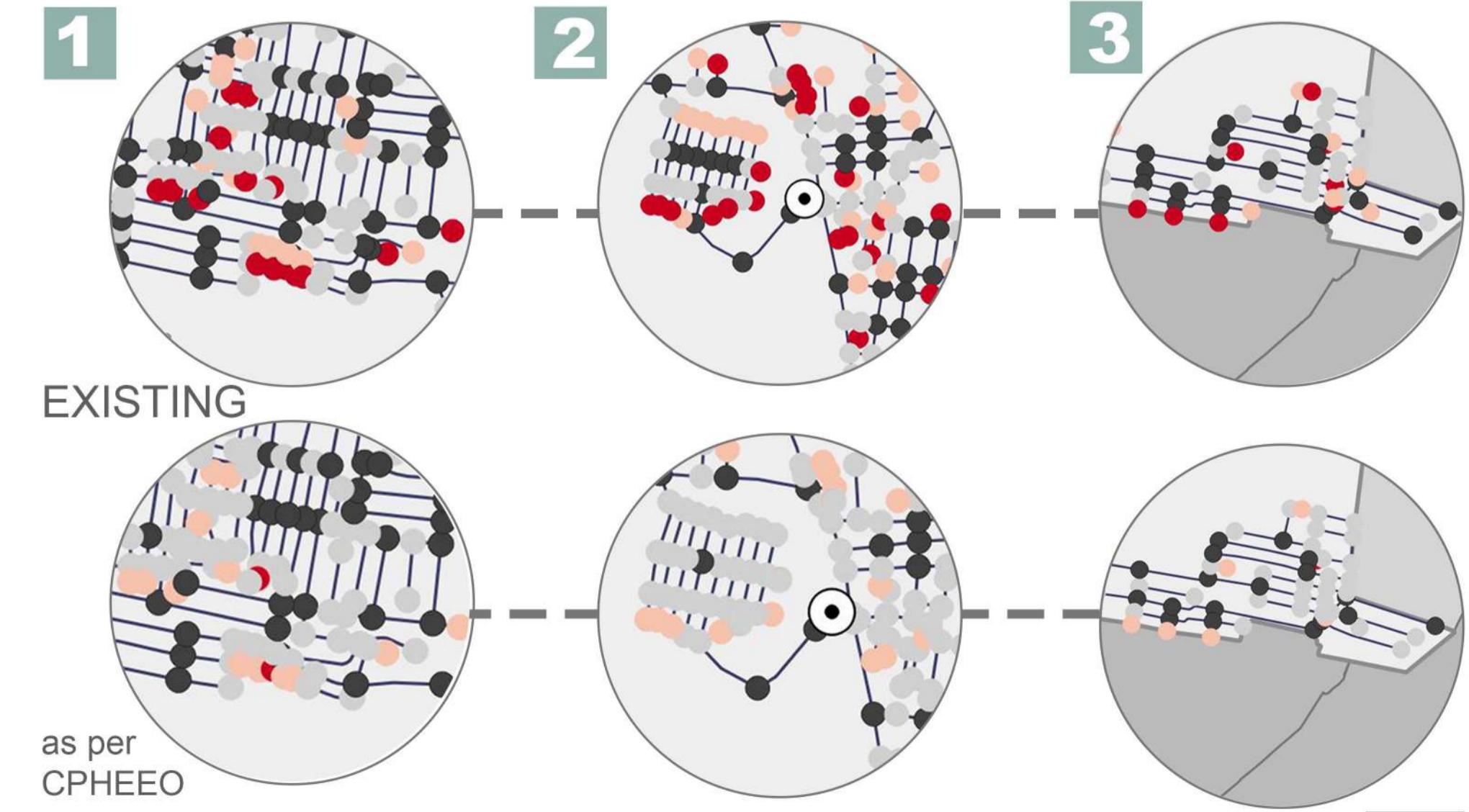
Water demand (MLD)

135 Lpcd

71,385

96,36,975 Lpcd

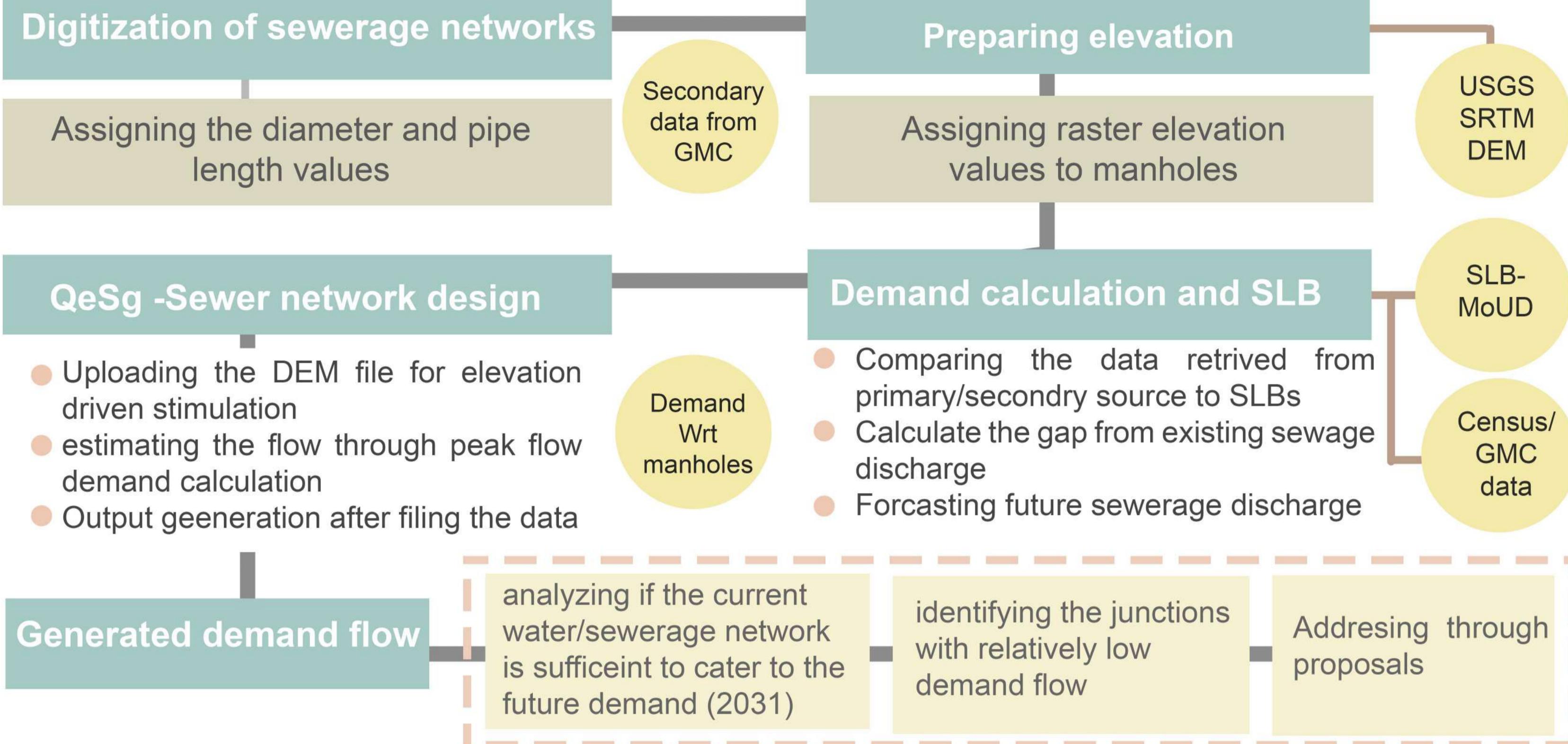
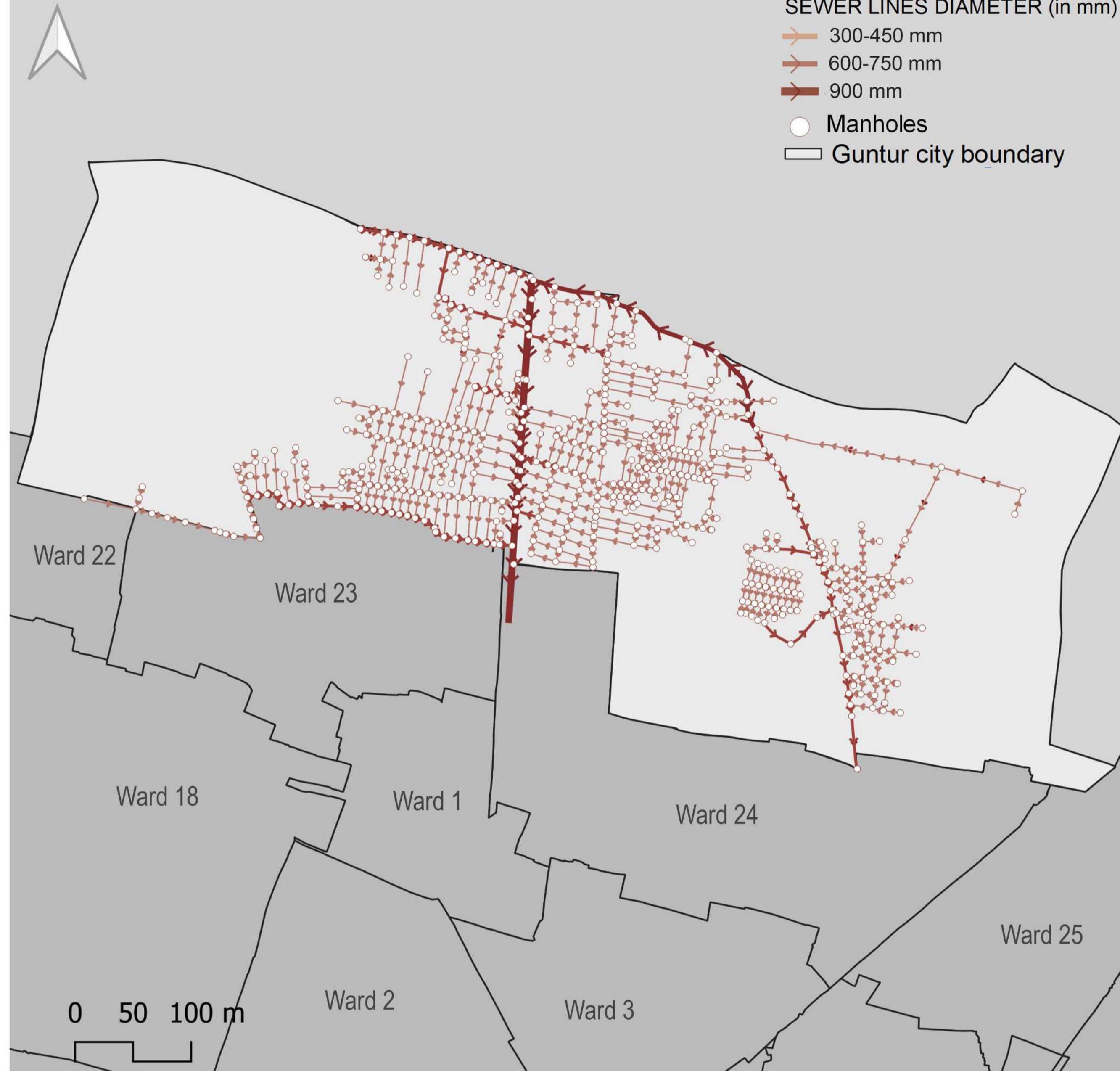
9,636975 MLD



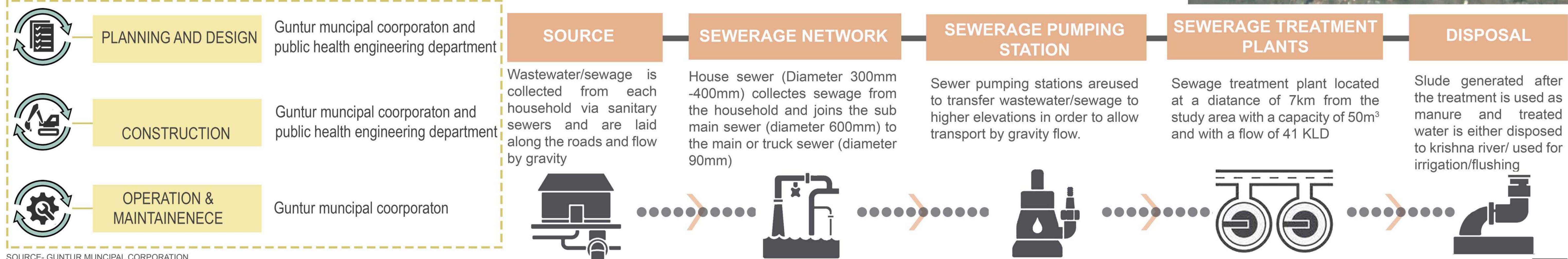
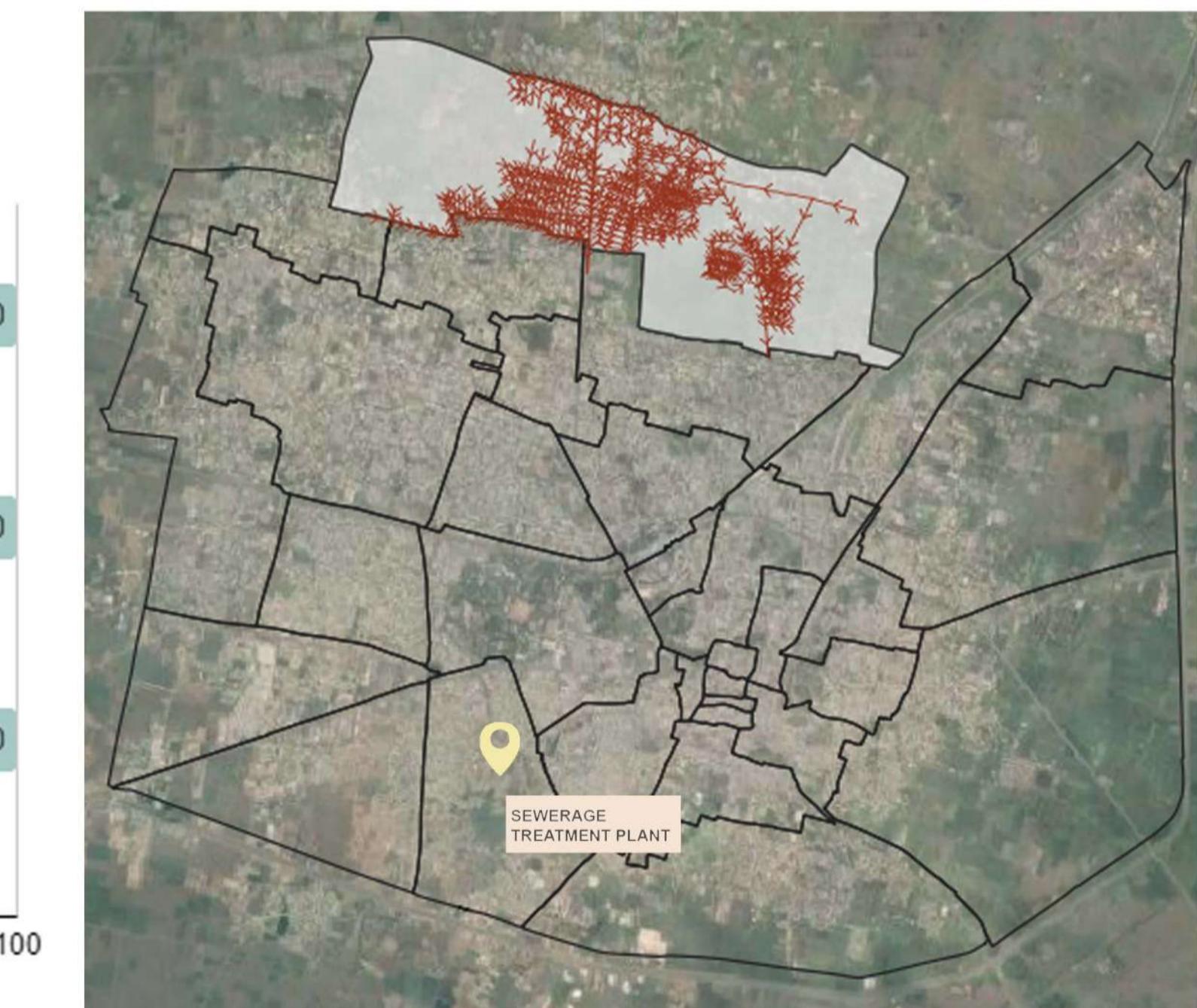
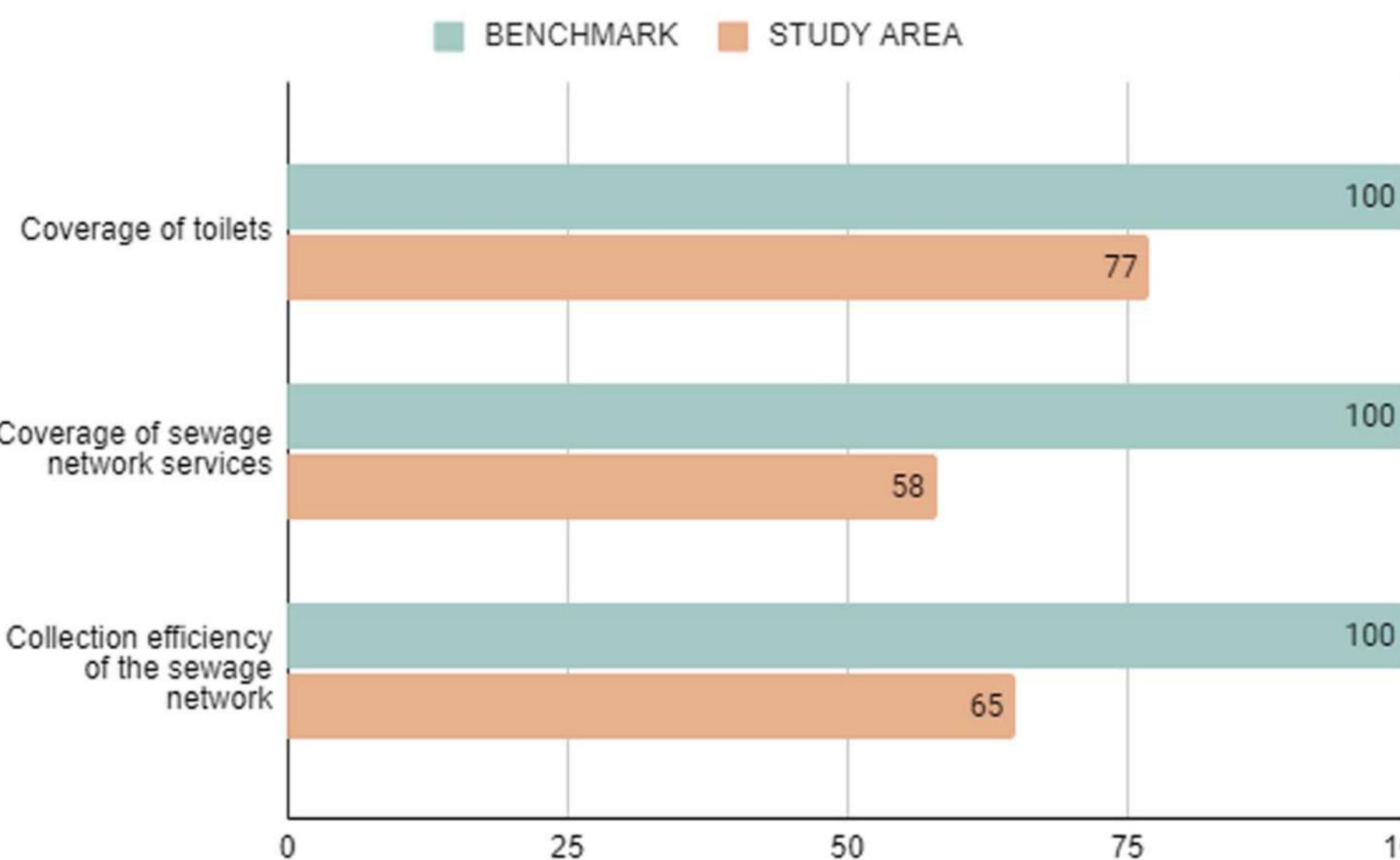
SEWERAGE INFRASTRUCTURE

WARD 29, GUNTUR

SEWERAGE NETWORK

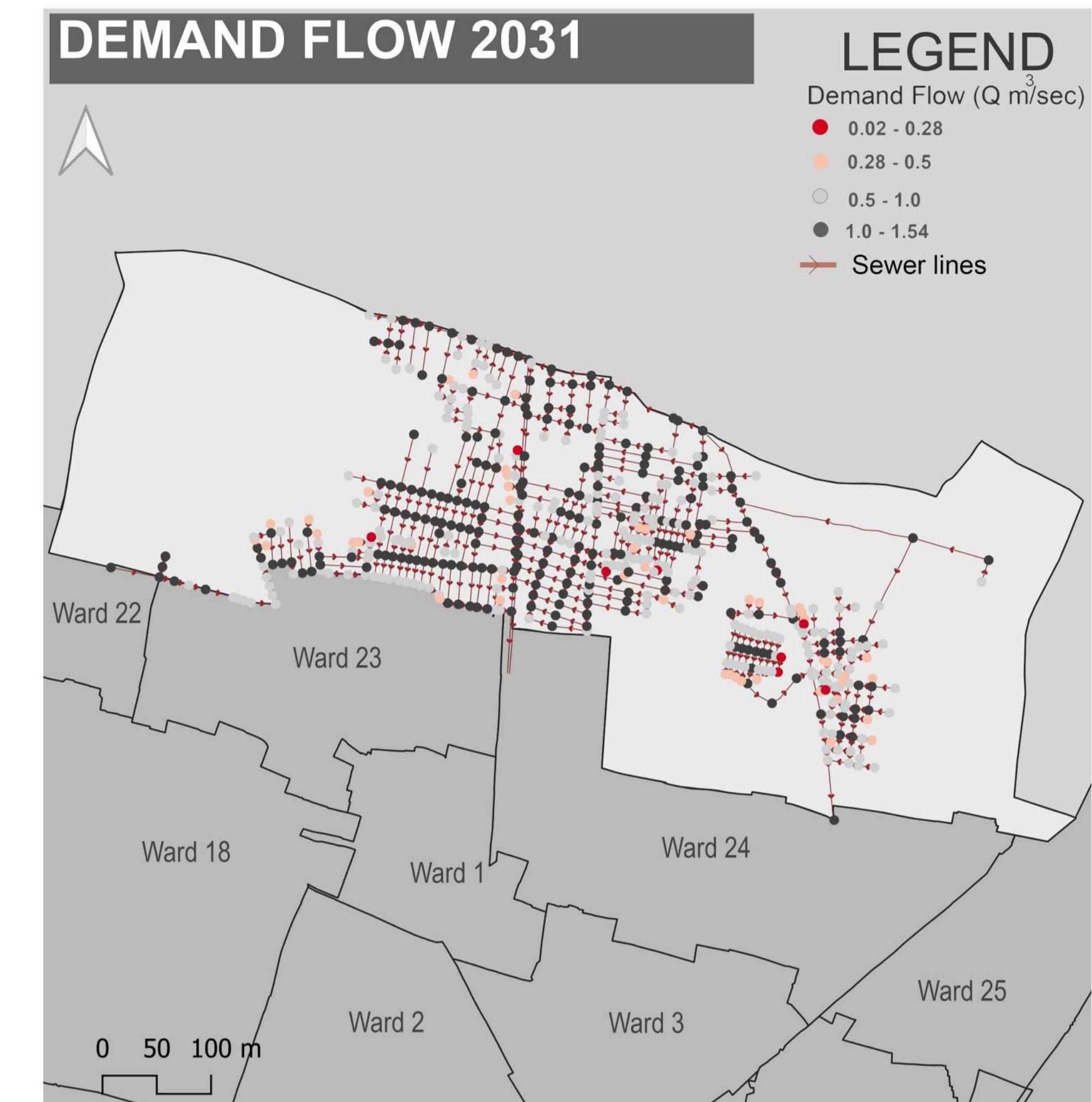
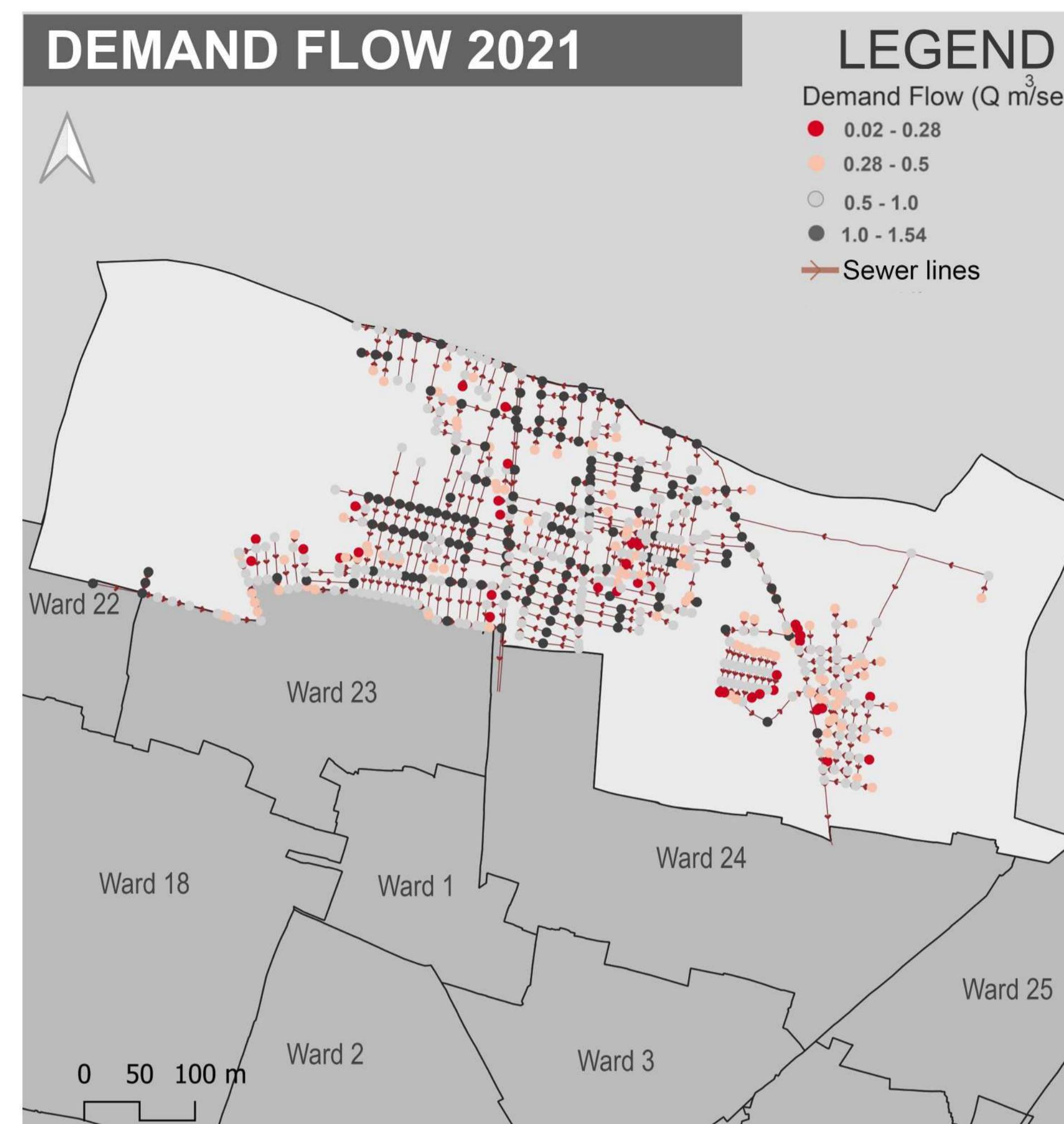
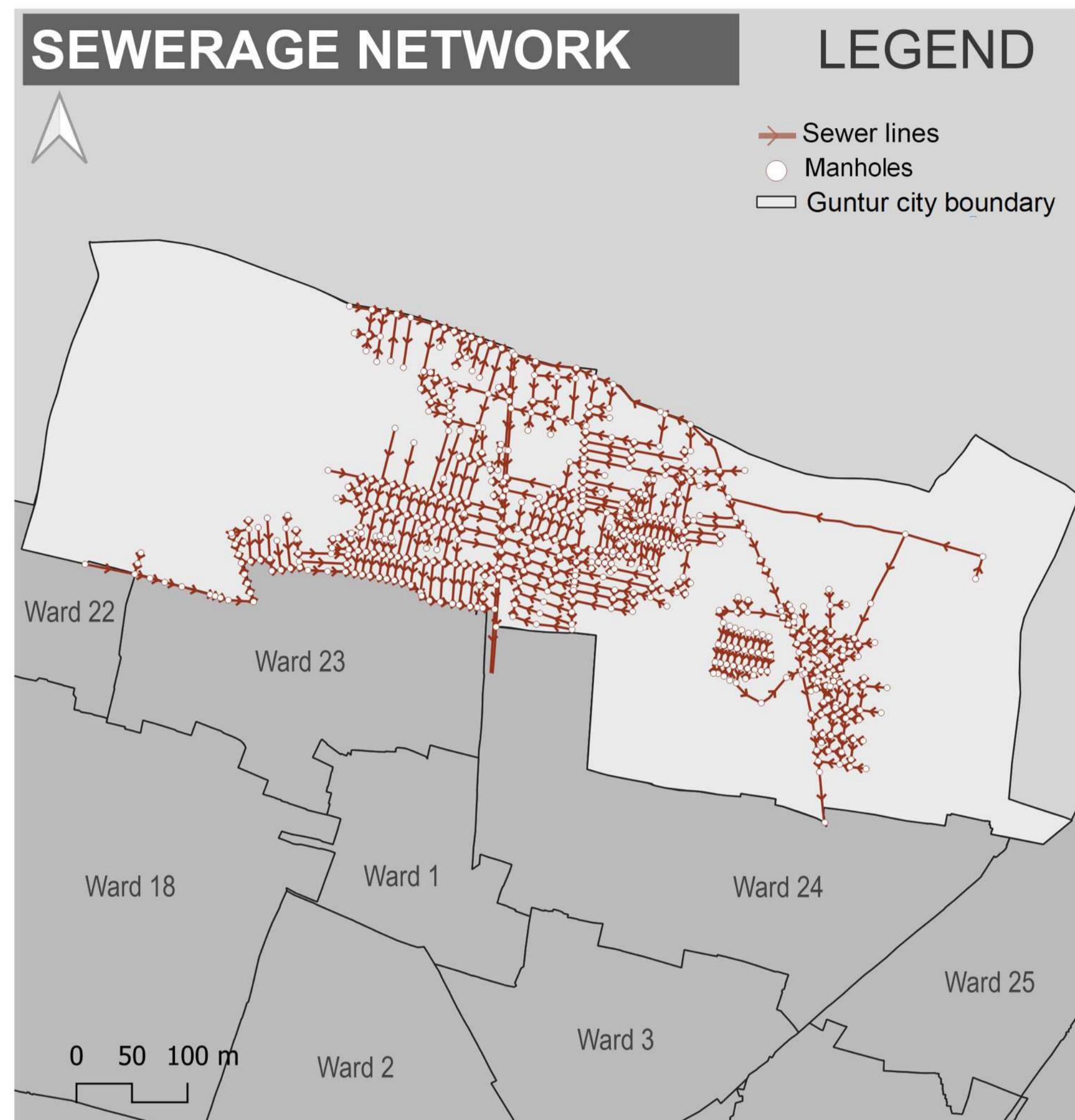


SERVICE LEVEL BENCHMARK

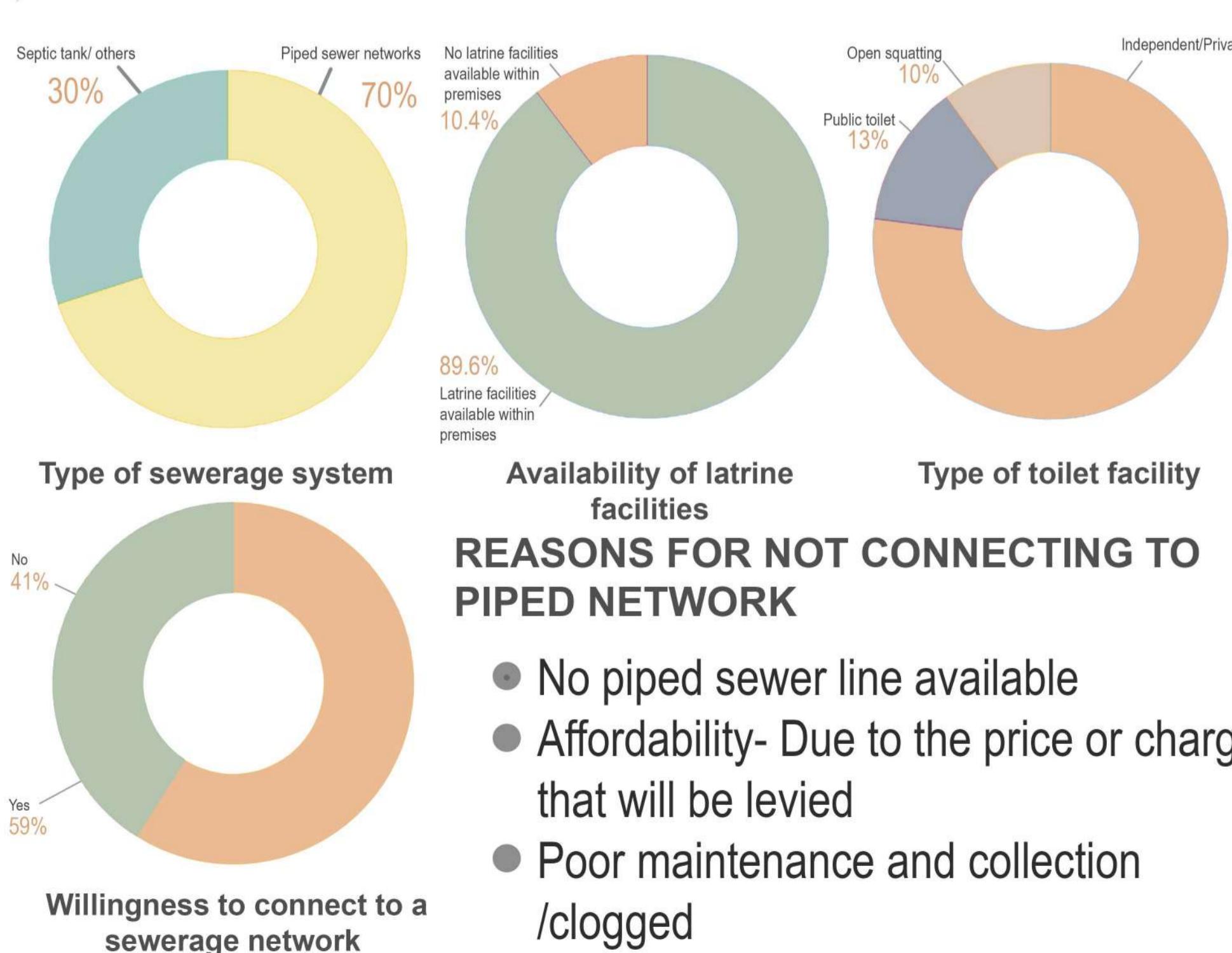


SEWERAGE INFRASTRUCTURE

ANALYSING SEWERAGE NETWORK FOR FUTURE DEMAND



Velocity (m/sec)	CPHEEO	Analysis
Minimum	0.6	0.4
Maximum	3	2.2



EXISTING SEWAGE GENERATION

EXISTING	
Population (2021)	26800
Water demand (in lpcd)	96
Calculate unit sanitary load	
Generated (In MLD)	2.06
Unit load per ha (l/day)	3211

Sewage generated= Population*water demand *0.8

Unit load per hectare= Sewage generated/ area (ha)

Sewage generated through piped sewer network
=1.44 MLD

Total generation = 2.05824 MLD

GAP= Sewage generated (Total -piped sewer network)

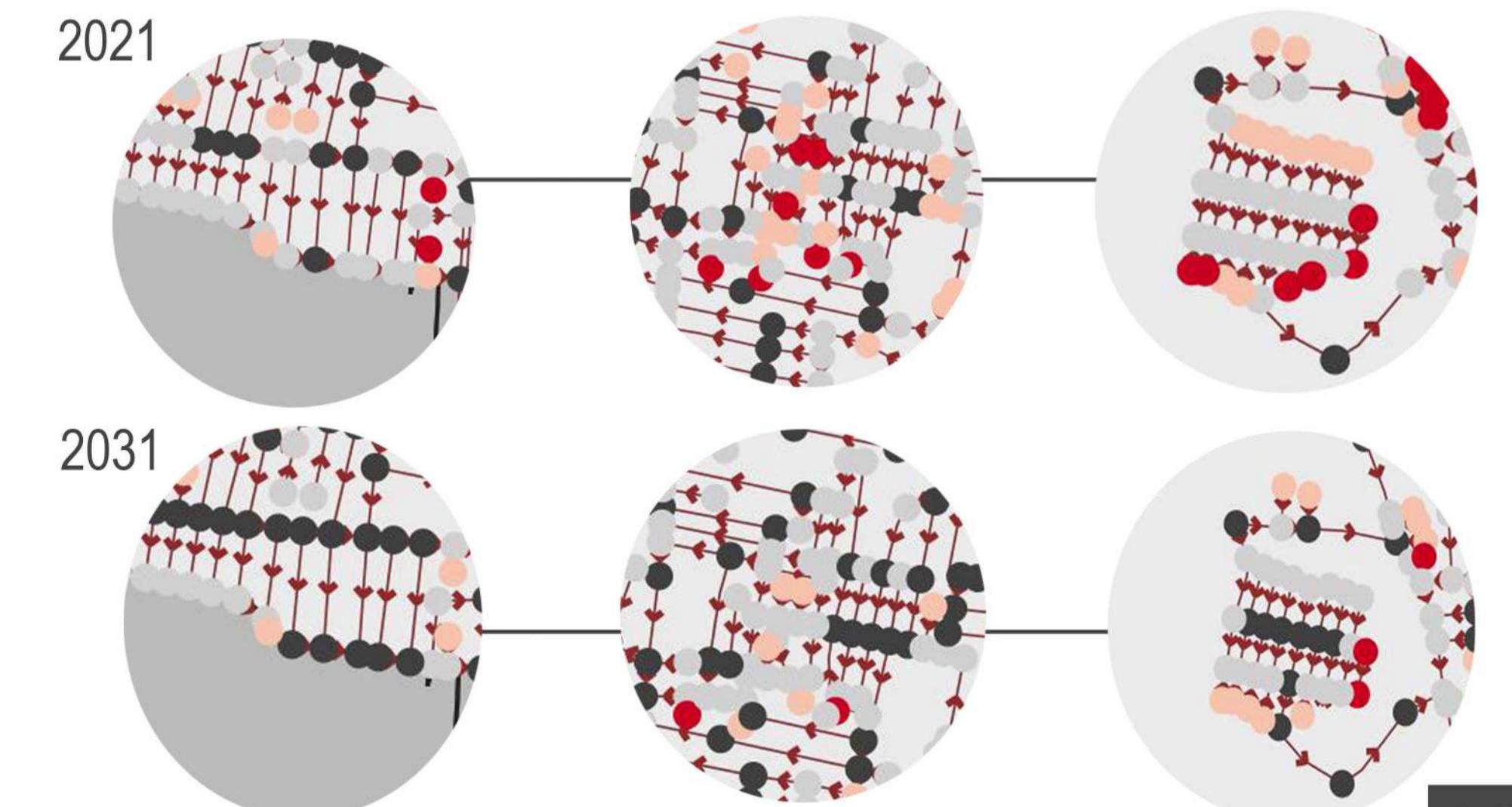
The current gap due to insufficient sewer pipe connections is filled by septic tanks

FUTURE SEWAGE GENERATION

Calculate unit sanitary load	
Generated (In MLD)	7.71
Unit load per ha (l/day)	12027

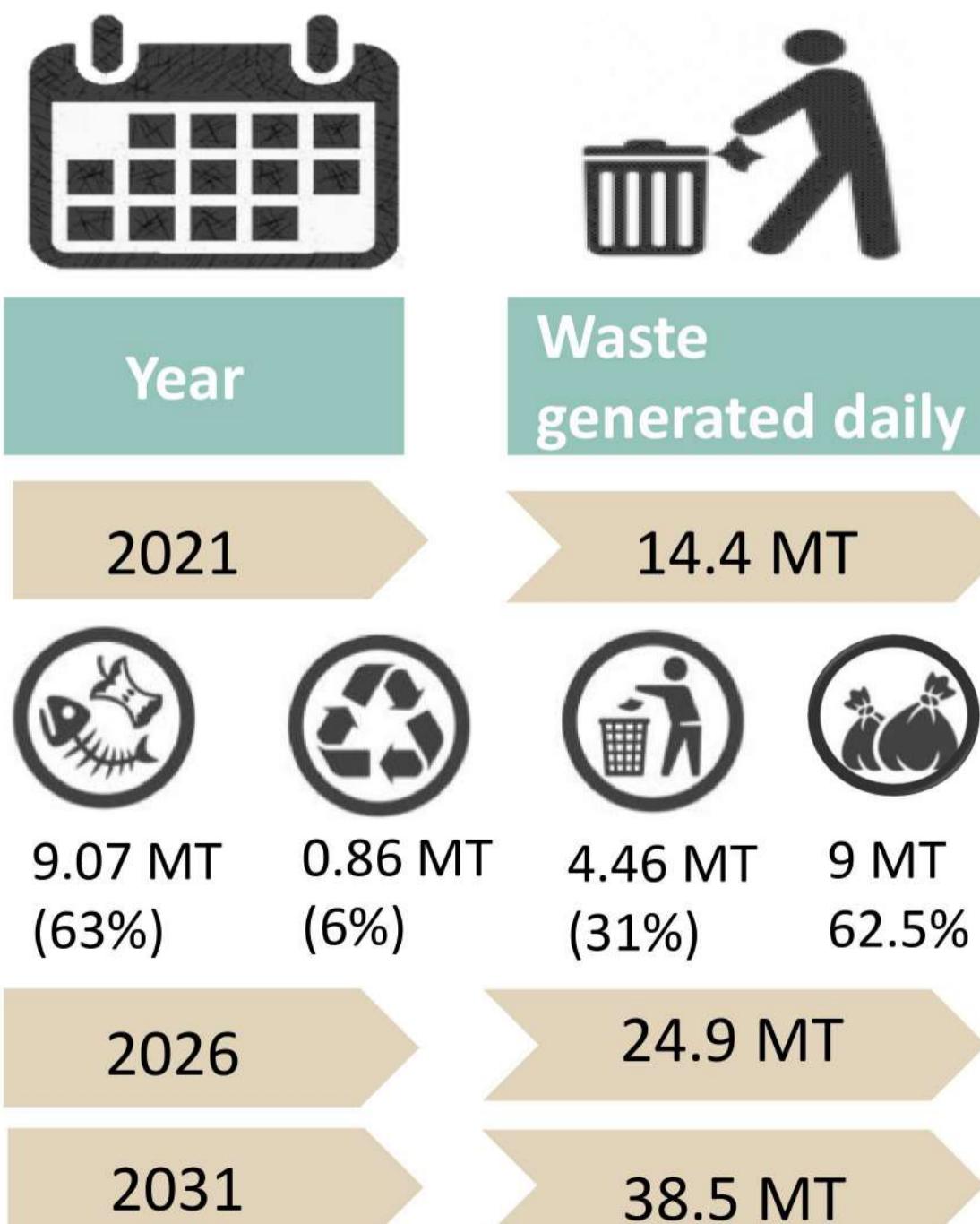
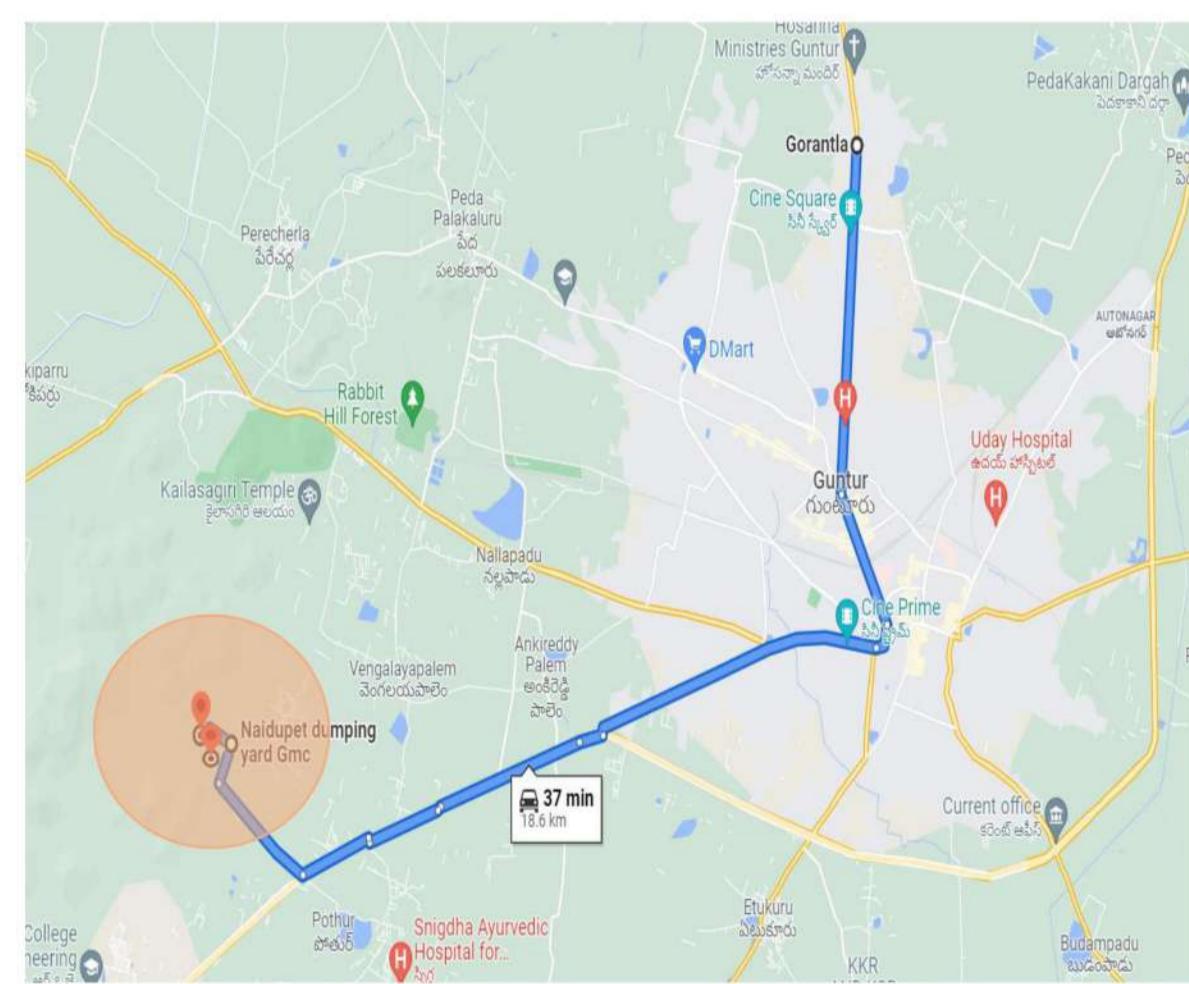
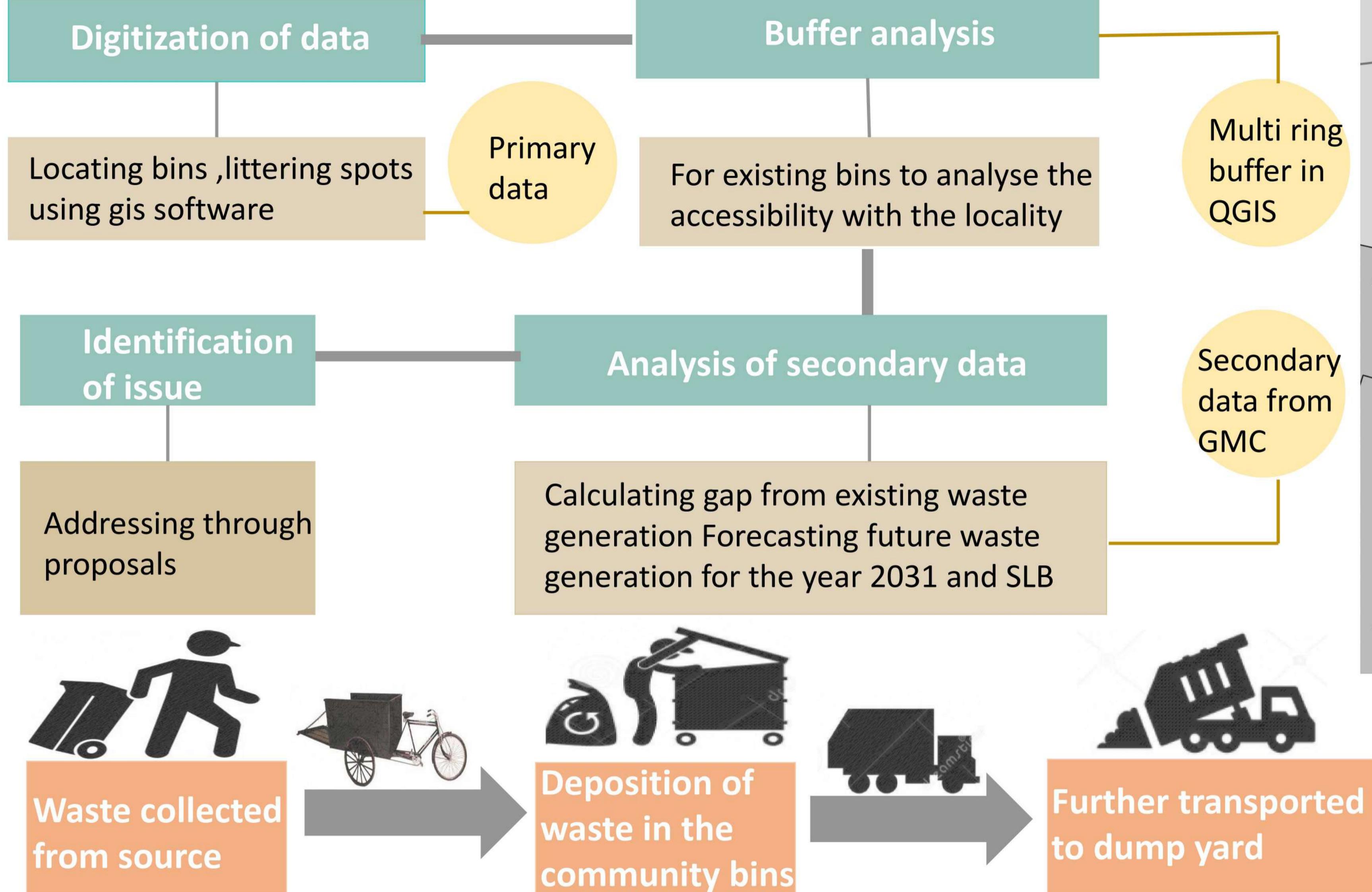
ESTIMATED GAP = Sewage generated (existing- future)
= 2.06-7.71= 5.65 MLD

Considering water demand to be 135 lpcd and population for the year 2031 to be 71385



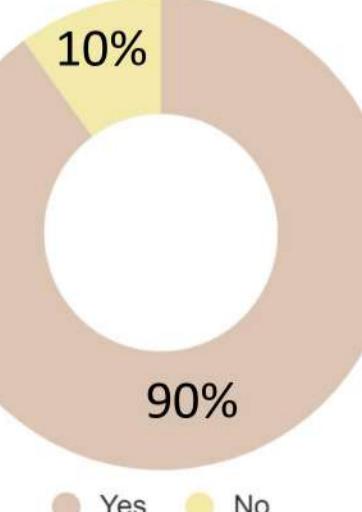
SOLID WASTE MANAGEMENT

WARD 29, GUNTUR

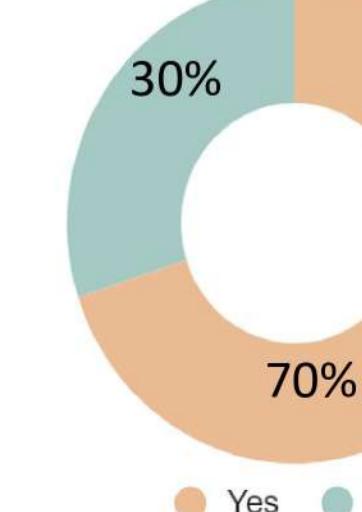


Planning and design, construction, operation and maintenance related to Solid waste management are regulated by Guntur municipal Corporation.

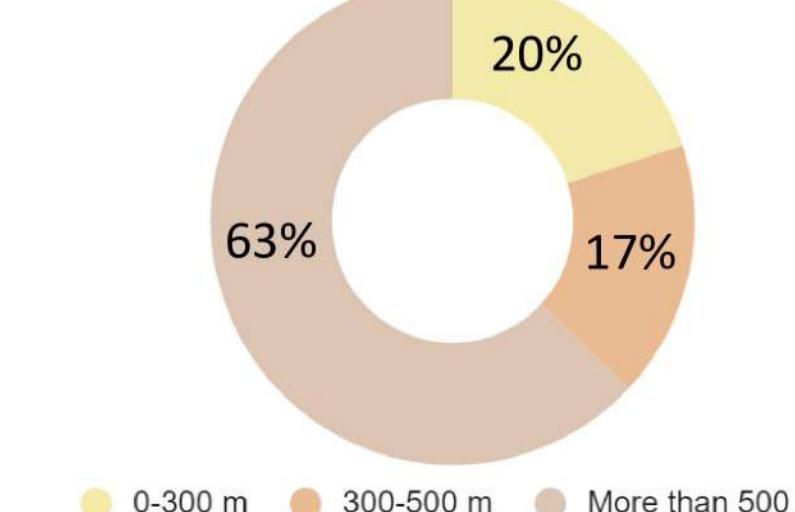
Do you recycle the waste?



Is it segregated in to dry and wet waste



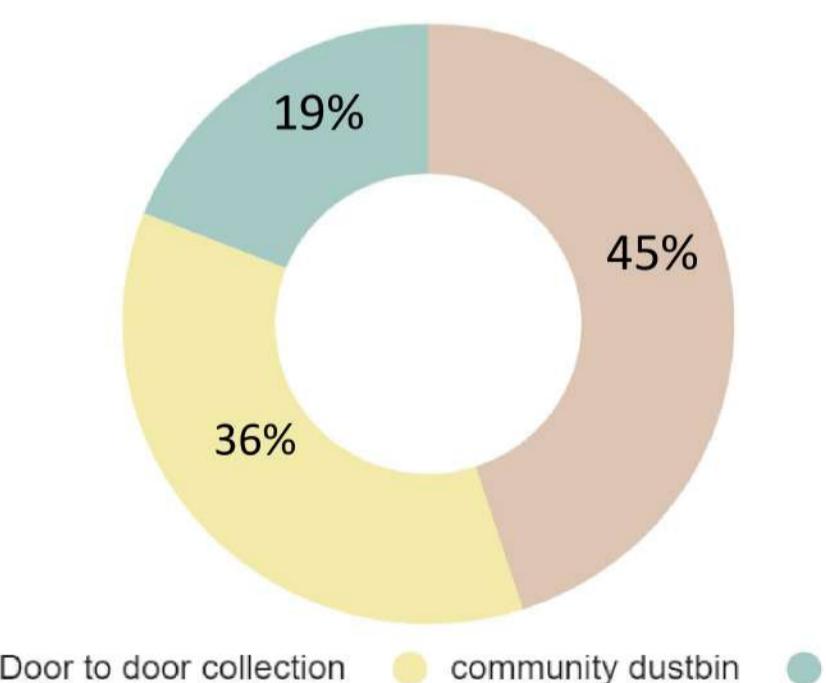
Distance from the nearest community



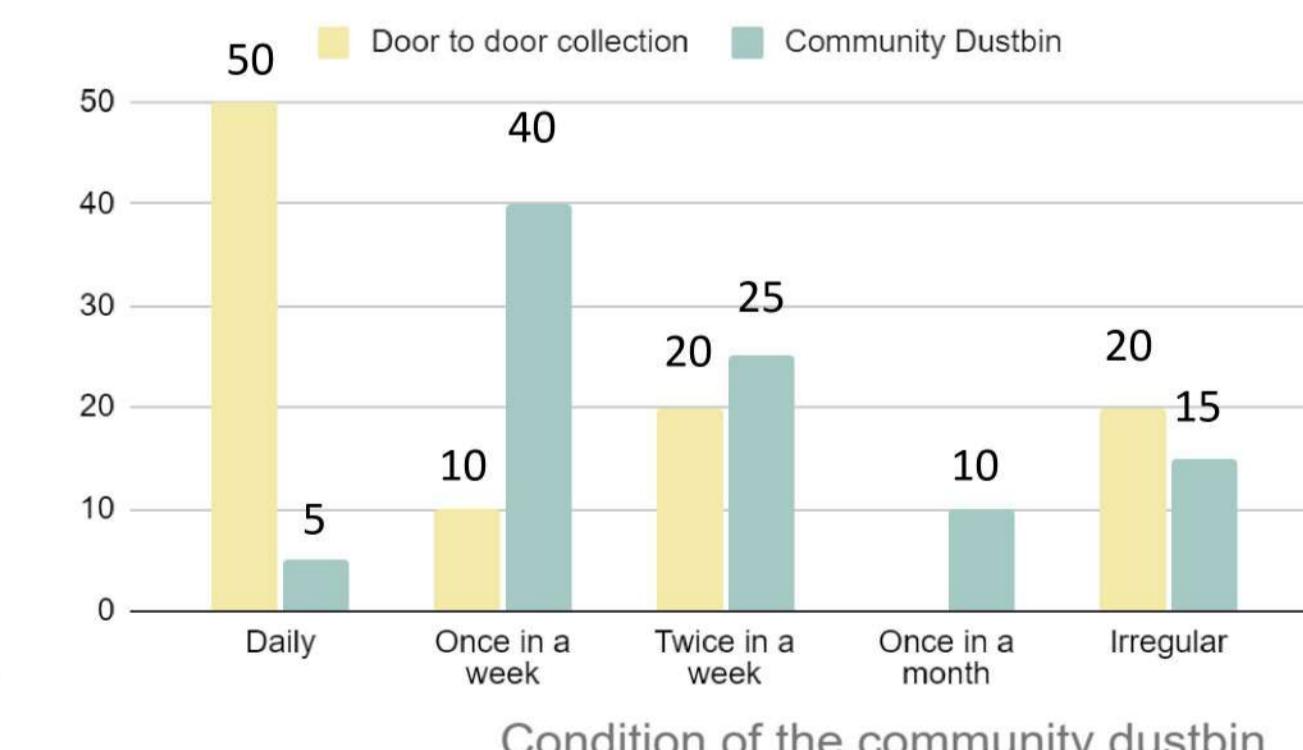
Year	Waste generated	No. of bins required
2021	14.4 MT	20
2026	24.9 MT	31
2031	38.5 MT	42

Number of existing dustbins - 15 **GAP 2021→20-15=5 2026→31-15=16 2031→42-15=27**

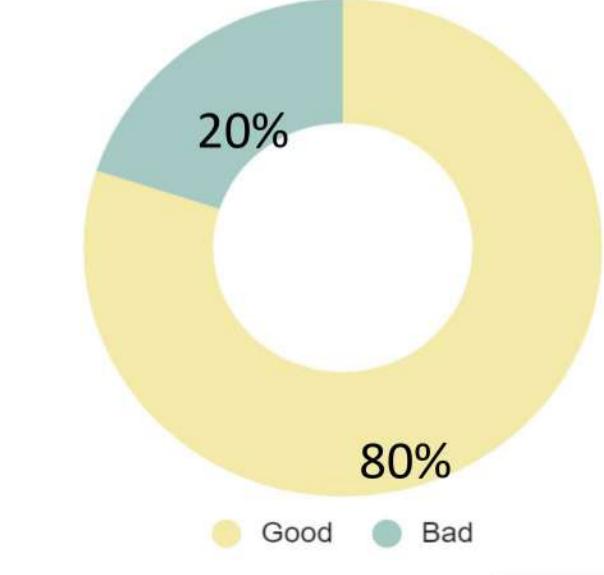
How is the waste being collected?



Frequency of solid waste collection

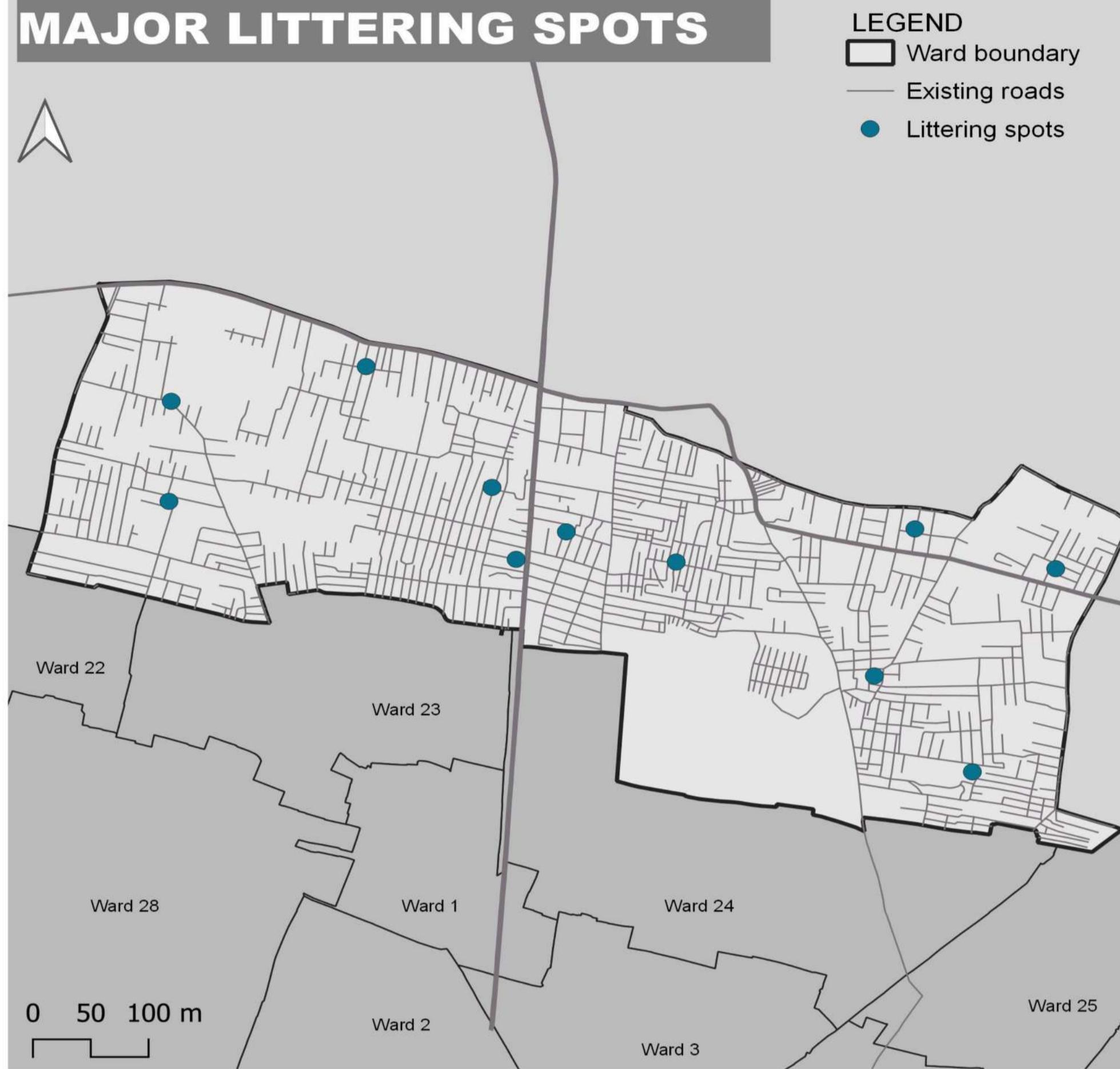


Condition of the community dustbin

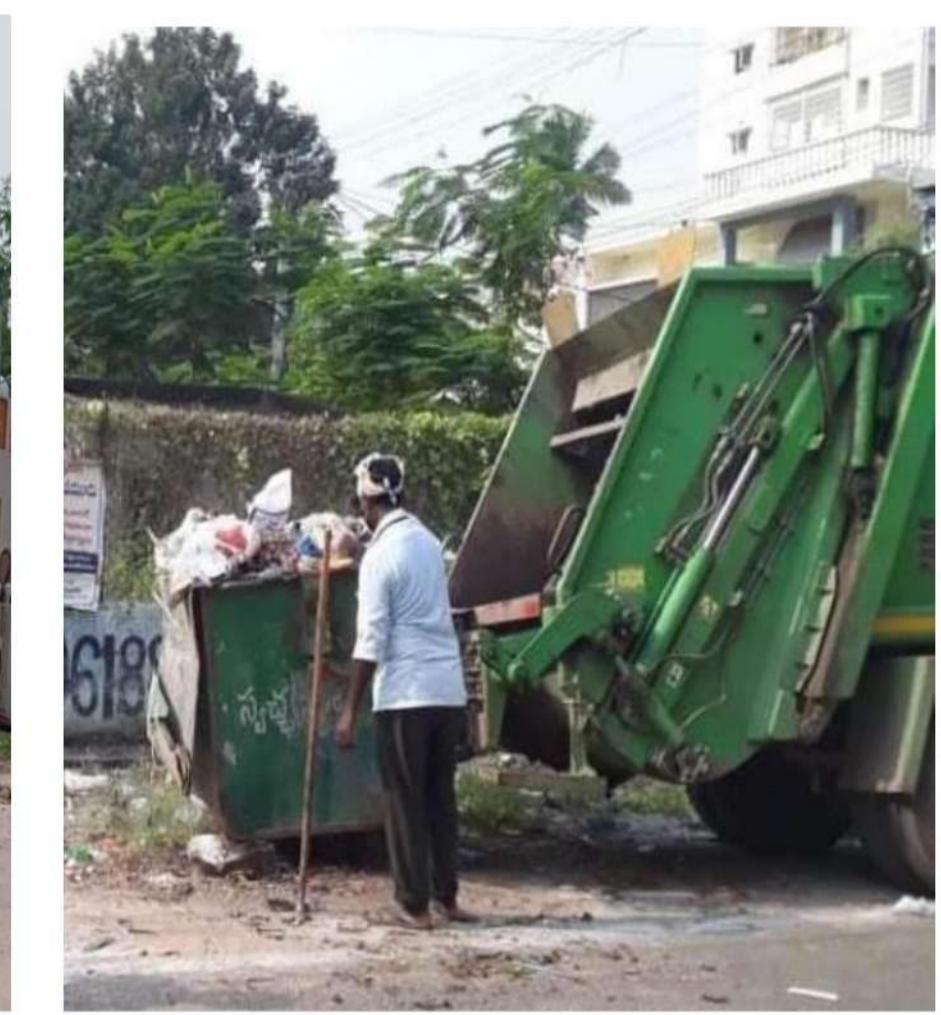
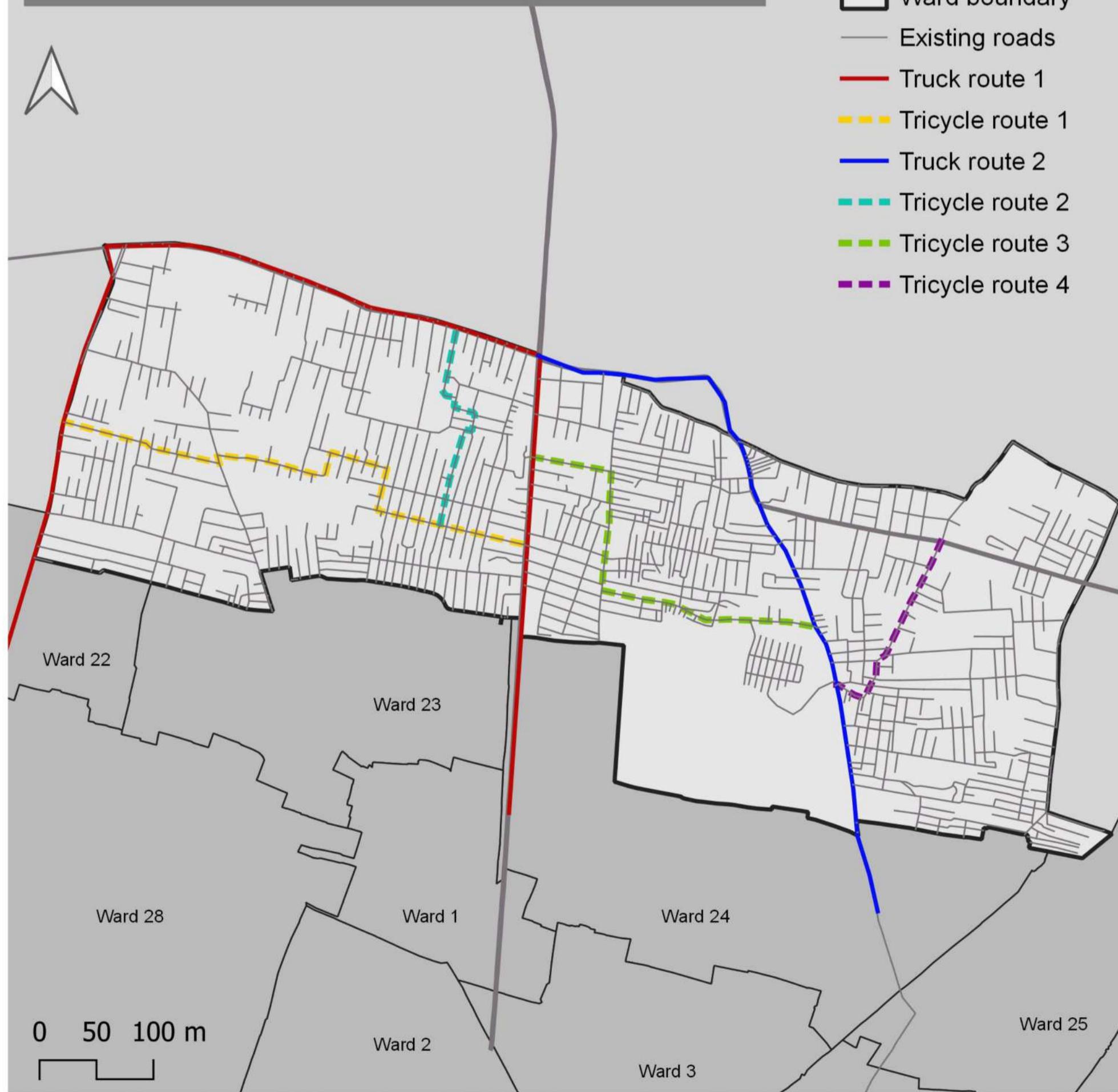


SOLID WASTE MANAGEMENT

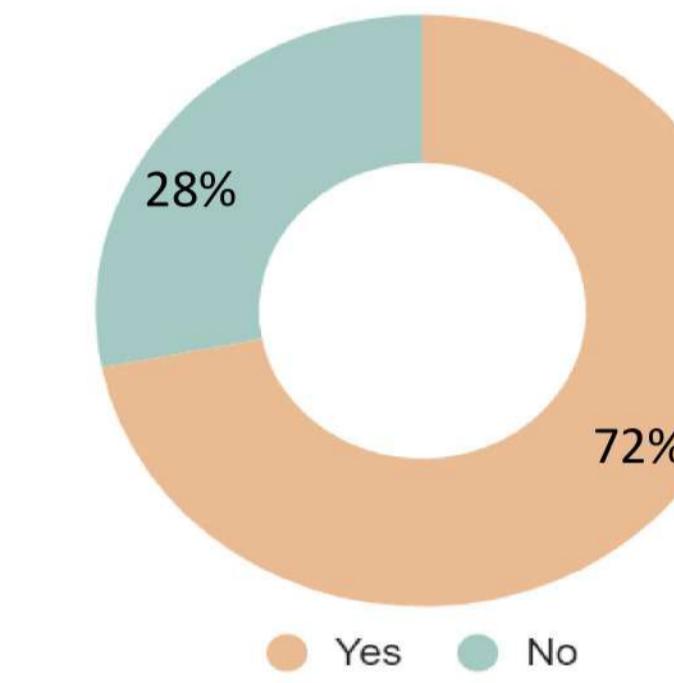
MAJOR LITTERING SPOTS



EXISTING ROUTE MAP



Do waste littering happens in the street?



S.NO	INDICATORS	BENCHMARK EXISTING
1	Household level coverage of solid waste management services	100% 65%
2	Efficiency of collection of municipal solid waste	100% 85%
3	Extent of segregation of municipal solid waste	100% 15%
4	Extent of municipal solid waste recovered	80% 0%
5	Extent of scientific disposal of municipal solid waste	100% 45%
6	Efficiency in redressal of customer complaints	80% 75%
7	Extent of cost recovery in SWM services	100% 0%
8	Efficiency in collection of SWM charges	90% 72%

VEHICLES	NUMBER AVAILABLE	AVERAGE CAPACITY	NUMBER OF TRIPS/DAY	TOTAL CAPACITY
Community plastic bins	10	1 MT		
community concert bins	5	0.3-0.6 MT		
wheel barrows	6			
tricycles	12	0.2 MT	2	
truck/ tractor	2	2.5 MT	1	5 MT
dumper placer	1	4 MT	1	4 MT
TOTAL	36			9 MT

EXISTING SCENARIO

PROBLEMS & ISSUES

- Lack of scientific disposal of garbage
- Recycling process though initiated, could not take off effectively.
- Segregation at source is not gaining momentum in the absence of proper recycling of segregated waste
- Inadequate machinery and man power resulting in ineffective collection and disposal of garbage
- Inadequate number of dust bins in residential localities resulting in waste from houses is thrown on roads.
- Only 63% of solid waste is lifted per day.
- Environmental impacts and public health hazard by obnoxious odours, fly nuisance and leachate causing water pollution.