



Sanitation Mapping, Visakhapatnam

Capacity Building for Swachh Bharat Mission (Urban) – Sanitation Mapping Visakhapatnam

Data Analysis Report



September 2016

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Appendix I: Thematic maps and Ward Atlas

Appendix II: Survey data, Dashboard and Profiles of OD spots and Public Conveniences

Appendix III: Secondary Data

Appendix IV: GIS database, KM Database tool and its user manual



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Disclaimer

This report is an outcome of (a) secondary data collected from Greater Visakhapatnam Municipal Corporation (GVMC), and assessment of this data with respect to the system of maintenance, and (b) Primary survey of open defecation spots, public and community toilets, focus group discussions in slums, and key informant interviews with specific categories of people, and pertains to the larger intent of a roll-out and service delivery under the Swachh Bharat Mission (SBM) in the city.

The report refers information collected during Urban Management Centre's (UMC) team's site visits, secondary information provided by the staff of various departments of the Greater Visakhapatnam Municipal Corporation (GVMC) and Water and Sanitation for the Urban Poor-Advisory (WSUP-A).

During the course of the study and report preparation we were provided with both written and verbal information. We also supplemented the study with hand drawn sketches and digital drawings. Nothing has come to our attention to cause us to believe that the data or maps provided by various sources are not true or not correct. We believe this information to be authentic and therefore has not conducted an independent audit of the same. No investigations of the title of the tangible and intangible assets has been made and matters of a legal nature relating to the title of the assets have not been considered.

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Abbreviations

ADC	Additional Commissioner
AE	Assistant Engineer
AEE	Assistant Executive Engineer
AKP	Anakapalle
API	Application Program Interface
APL	Above Poverty Line
ARI	Acute Respiratory Infection
BIS	Bureau of Indian Standards
BML	Bheemunipatnam
BPL	Below Poverty Line
Cap-Ex	Capital Expenditure
CCP	Chief City Planner
CEE	Centre for Environment Education
CPHEEO	Central Public Health and Environmental Engineering Organization (India)
CT	Community Toilet
DPR	Detailed Project Report
EE	Executive Engineer
FRU	First Referral Unit
GIS	Geographic Information System
GLA	Greater London Authority
GPS	Global Positioning System
GVMC	Greater Visakhapatnam Municipal Corporation
IHHT	Individual Household Toilets
IS	Indian Standard
IT	Information Technology
KM Tool	Knowledge database Management Tool
kml	keyhole markup language
lpcd	litres per capita per day
Ltd.	Limited
LTP	Licensed Technical Person
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding
MS Excel	Microsoft Excel
MS Word	Microsoft Word
NA	Not Applicable
NBC	National Building Code
ND	No Data
NRSC	National Remote Sensing Centre
NUEPA	National University of Educational Planning and Administration
NUHM	National Urban Health Mission
OD	Open Defecation
ODF	Open Defecation Free
OPD	Out Patient Department
Op-EX	Operating Expenditure
PF	Piped Flow
PMAY	Pradhan Mantri Awas Yojana

POI	Point of Interest
PPP	Public Private Partnership
PRA	Participatory Rural Appraisal
PT	Public Toilet
Pune WISE	Pune Ward Infrastructure Services and Environment
Pvt.	Private
RAY	Rajiv Awas Yojana
SAC	Swachh Andhra Corporation
SBM	Swachh Bharat Mission
SLB	Service Level Benchmark
SMOH	Senior Medical Officer of Health
SOP	Standard Operating Procedure
SRC	School Report Card
STPs	Sewage Treatment Plants
SVM	Swachh Visakha Mission
SWD	Storm Water Drainage
SWM	Solid Waste Management
TA	Technical Assistance
TPBO	Town Planning and Building Officer
TPO	Town Planning Officer
UCD	Urban Community Development
UGD	Under Ground Drainage
UHC	Urban Health Centre
ULBs	Urban Local Bodies
UMC	Urban Management Centre
URDPFI	Urban and Regional Development Plans Formulation and Implementation
USAID	United States Agency for International Development
VMR	Visakhapatnam Metropolitan Region
VUDA	Visakhapatnam Urban Development Authority
WC	Water Closet
WI	Works Inspector
WSUP-A	Water & Sanitation for the Urban Poor
WTP	Water Treatment Plant

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Executive Summary

With around 60% of the world's open defecators, India is considered to be a prime example of the global sanitation challenge (Elledge & McClatchey, 2013). In India, historically, the focus on sanitation has been largely rural-specific. Focus on sanitation for the urban areas in India can be called relatively new since it was only in 2009 that, in a first, the Government of India formalized a National Urban Sanitation Policy (NUSP). But our service delivery on the sanitation front has not been able to keep pace with the rapid urbanization. According to Census 2011, around 19% of urban households in India lacked access to individual household toilets; nearly 6% of the total households used community toilets and 12% of them defecated in the open (Indian Institute for Human Settlements, 2014). In this context, the Swachh Bharat Mission (SBM)'s aim to improve sanitation and mandate to the ULBs to become open defecation free calls for commitments from the city governments to achieve the same.

Visakhapatnam's jump from 205th rank in 2015, to 5th position in 2016¹ is laudable. However, it is acknowledged across the country that sanitation needs a lot of improvements even in the country's best performing cities. GVMC has made an objective of making the city Open Defecation Free (ODF), on a priority basis, and realizes that a lot needs to be done to curb the wide-spread practice of open defecation in the city. The city has a high proportion of its population living in slums (35%, according to Census 2011). Also, according to the Census 2011, 26.5% of households in GVMC, Anakapalle and Bheemunipatnam combined, did not have individual household toilets (IHHT).

Urban Management Centre (UMC)'s survey of 204 open defecation spots in 2016 found that there are more than 20,000 open defecators in the city. Nearly half of these are slum-dwellers lacking access to toilets (IHHT or PT/CT) and daily commuters that either do not use the nearby public toilets or are not aware about one near them. The reasons reported for open defecation can be grouped into three categories- lack of IHHT or PT/CTs (40%), various issues with existing PT/CTs (32%), and Habit (28%). It was found from the FGDs, that the lack of IHHT in the city is due to the following reasons- lack of funds or delay of the scheme money, rejection of IHHT applications, and lack of willingness to construct. Further, it was found that 26% of the slum households have member(s) in their family that defecate in the open despite having an IHHT. The reasons for this are- personal preference, large household sizes, inadequate water supply, and fear of the septic tank or soak-pit getting filled up early.

According to GVMC's own assessment of IHHT coverage done in 2014, there were nearly 31,000 households that do not have IHHTs. Against this, GVMC's IHHT construction target under SBM is 16,658 toilets². Since it estimates that around 11,000 households already depend upon the 269 PT/CTs (215 community and 54 public toilets) in the city, it has proposed to add 11 new public toilets (PTs) and 31 new community toilets (CTs) containing

¹ Visakhapatnam's 205th rank in the 2014-15 survey was out of the 476 Class-I cities with a population of above 1 lakh people (Ministry of Urban Development, Government of India, 2016), while the 2016 ranking was based on 73 cities with a population of above 10 lakh people (India Today, 2016).

² Source: data presented for GVMC, Anakapalle and Bheemunipatnam on the Swachh Andhra Corporation (SAC) website.

176 seats, to the existing 269 toilets³. During the survey of public conveniences carried out for this project, it was found that only 197 PT/CT blocks (153 community, and 44 public toilets) consisting of 3033 toilet seats of these 269 PT/CTs were functional; the rest were closed (54), under construction or under-repair (14), or demolished (4). Even with these 197 functional PT/CTs, it was found that there are issues that include design flaws, poor maintenance, inadequate infrastructure, insufficient seats, and anti-social activities as well as lack of privacy and hence lack of safety for women.

Existing issues with public and community toilets in Visakhapatnam:

1. **Adequacy:** Out of the 269 PT/CTs surveyed, there were only 197 PT/CTs that are found functional. These functional toilets, combined, have around 3033 seats. There are 18 wards where there are no PT/CTs at present. Also, a GIS based spatial analysis done by UMC found that out of the 793 notified and non-notified slums in GVMC, 395 slums did not have a PT/CT within a distance of 500 metres. Key Informant Interviews (KIIs) conducted by GVMC revealed that daily commuters at transit nodes and customers in markets urinated in the open because of lack of public toilets.
2. **Design shortcomings:** There were only three PT/CTs that had grab-bars to assist the differently abled, elderly and pregnant women. Western toilet seats are available for the men at four PT/CTs, and at three PT/CTs for women. None of the facilities was found to be able to cater to the physically disabled- there were two PT/CTs with ramps, but neither of them was conducive for a free movement of a wheel-chair inside the cubicles. Only one CT was child-friendly. Poor ventilation and day-light was found in many PT/CTs. During KIIs, it was found that most of the commuters did not know about the nearest public toilet since there were no signage leading people to the nearest public toilet.
3. **Infrastructure gaps:** These issues include inadequate water supply, plumbing issues due to which there is no water inside the cubicles, dysfunctional doors in cubicles, poor electrical lighting, and lack of washbasins. Municipal water supply was available at only 39 PT/CTs. Majority of toilets depend upon bore-wells. Many PT/CTs depend on multiple sources since municipal water supply was inadequate. In one-fourth PT/CTs users have to fetch water from a tank outside. Reportedly, municipal sewer connection was available at only 20% of the PT/CTs; 65% depended on septic tanks or soak-pits. The rest discharged waste water into open drains. Around 13% of PT/CTs don't have washbasins, and where they are provided, at 85% PT/CTs they have a single basin for both men and women. Electrical lighting was rated 'good' only in 14% of the PT/CTs.
4. **Obstructions to access:** Nearly 1/4th of PT/CTs have some kind of obstruction at the main access. These included garbage, stray animals, anti-social activities, and water-logging. Open defecation was found within or in immediate vicinity of 56 PT/CTs.
5. **Operation and Management:** Around 33% PT/CTs have 'bad' cleanliness of the toilet building, and 37% have 'bad' cleanliness condition inside the cubicles. Almost 39% of PT/CTs were not cleaned at least twice a day. Only six PT/CTs maintained a register for cleaning supplies. At none of the PT/CTs was it reported that a register was kept to note users and charges paid. More than 80% of toilets were reported not operational 24x7. GVMC operated toilets were not kept as clean as the privately run toilets. 50% of GVMC toilets, as compared to 70% of privately run toilets were rated 'good' on cleanliness of toilet blocks. Similarly, free-to-use toilets (44%) were not as clean as pay and use toilets (72%).

³ Source: List of proposed public and community toilets provided by the Public Health Department, GVMC

Having adequate and well maintained PT/CTs is critical to GVMC from two aspects: (a) findings of the OD survey indicate that lack of toilets, and issues with the PT/CTs constitute 70% of the reasons reported for open defecation, and (b) GVMC envisages that around 50% of the households that do not have IHHTs would be provided with a community toilet near them.

In addition to this, there is also a need in GVMC for a system by which not only vital information would be managed properly, but also by which it would be possible to plan keeping in view sustenance of efforts. During the secondary data collection, UMC observed that the existing GIS database lay unutilized. The present SBM activities of IHHT and PT/CT construction are resulting in a generation of substantial amount of information on geo-tags

Some shortcomings in existing data management linked to SBM's application:

1. IHHT construction:

- Third party inspection of toilets is not done. At present, site inspection and verification by Assistant Engineer (works) or the Works Inspector is the only mechanism by which quality check takes place.
- Reportedly, information on sewer connections to the SBM IHHTs is not passed on to the underground drainage department
- IHHTs built under SBM choose septic tank for disposal of waste even where the proposed toilet lies within 30 metres of an existing sewer network. This is in conflict with SBM Guideline (section 4.2.1).

2. PT/CTs:

- The process of identifying location of PT/CTs was reportedly ad hoc to a certain extent.
- Regular monitoring of maintenance information not done.

3. Open defecation spots:

- Geo-spatial database created by Sanitary Inspectors' use of the SAC's Mobileapp facility to update OD spots not utilized for spatial representation
- Penalty framework for penalizing open defecators yet not in place

4. Building permission process:

- Neither the Licensed Technical Person (LTP), nor the Town Planning Building officer (TPBO) are asked to verify if the proposed building has a safe waste-disposal mechanism, before the construction commences.
- Geo-spatial database generated by the use of the Pre-DCR software can capture the aforementioned details.

(geographical locations) that could be pooled into the GIS database for future spatial assessments with suitable additions.

Recommendations: Based on UMC's own understanding of the sector, field surveys and discussions with officials in GVMC during secondary data collection, UMC recommends the following in order to buttress the existing activities in GVMC to achieve its ODF objectives:

1. Generating demand for IHHTs through local-level IEC: to dispel notion amongst many people who find shelling out money on toilet construction financially burdening, or who still have expressed no interest in the scheme. This should also include ensuring that there are no unnecessary delays in disbursement of SBM funds to the beneficiaries at any stage.

2. Behaviour change campaigns to stop people from defecating in the open: Behaviour change campaigns are already being conducted in various parts of the city. Despite this, there are people who prefer defecating in the open out of habit. With the help of ODF Coordination Committee, GVMC needs to identify such people, and ensure that suitable tactics for behaviour change activities are employed.

3. Capturing them young: At around 70% of the OD spots in the city, children (below 5 years) defecate in the open. Since, arresting this behaviour can be done best at young age, it is suggested that behaviour change activities target children. Also since SBM emphasises on the need to procure declaration from schools about children using toilets at home and in schools, schools in the city should ensure safe and healthy sanitary practices are taught to the children.

4. Enforcing public health by-laws stringently: Constituting a penalization framework to penalize open defecators has been indicated as pivotal in the ODF guidelines under SBM. GVMC needs to create this at an early basis so that people are discouraged to defecate in open before declaring any of its wards ODF.

5. Ensuring toilets are designed properly: PT/CTs in the city had many flaws, for which the following further suggestions are made:

- i. Ensure all PT/CTs have ramps with sufficient width inside its cubicles for wheel-chairs, grab-bars inside the cubicles. Also, every PT/CT should have at least one western toilet seat for both men and women. Additionally, it needs to ensure that proper design consideration is given to day-light and ventilation.
- ii. Quality of construction is key to the success of PT/ CT. Poor quality toilets even if built as per the standards may fail if, say, the slopes are faulty and water gets accumulated on the floors or, faulty waste water outlet design/ location leading to frequent clogging. This should be kept in mind while design and implementation of the toilets.
- iii. Install adequate signage at all public places so that people know about their nearest public toilet, instead of defecating or urinating in the open.

6. Ensuring toilets are built at the right locations: It is very important that provision of public conveniences, both community and public, is made through a rational assessment of demand which would entail micro-planning exercise including parameters such space requirements, availability, distance within which a user without IHHT would be willing to walk to the toilet and existing coverage of IHHTs. For public toilets UMC recommends that GVMC undertakes an exercise of creating an inventory of public places and conducting a footfall count at these places with the help of sanitary inspectors. This is elaborated in the advisory note presented in the annexure.

7. Maintaining PT/CTs right: Issues about improper O&M of toilets collectively sum up as the third major reason for open defecation. In order to ensure that O&M is done well, UMC recommends the following:

- i. Survey data reveals that private operators run the PT/CTs better than GVMC. However, since it has also been observed that private operators lack capacity to manage multiple PT/CTs well, it is recommended that GVMC assesses capacity of the private sector for O&M of PT/CTs. If required, it can also explore possibilities of (a) building capacity of existing local private sector and encourage incubation of new private sector firms, (b) introduce bulk performance-based O&M contracts that attract national facilities management companies that includes provision for a strict and transparent monitoring regime and capturing user feedback.
- ii. To ensure that all PT/CTs are well managed, GVMC should initiate a system whereby each PT/CT is checked for its infrastructural adequacy (if repairs are required), cleanliness and other maintenance issues, and to ensure that they are resolved. This should be done regularly.
- iii. GVMC should undertake a structural assessment of these toilets in order to decide if they need to be demolished or if they could be still retrofitted
- iv. Prepare a plan to cover all the PT/CTs by a municipal water supply and sewer connections.

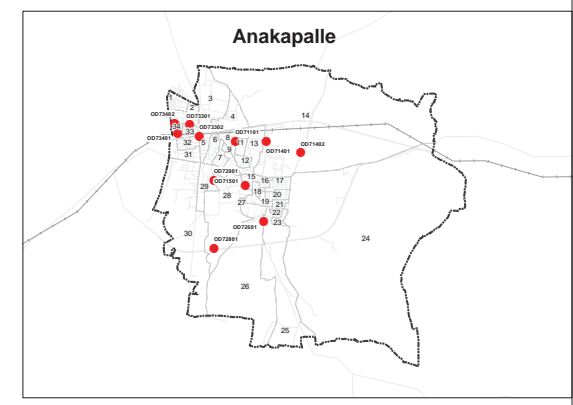
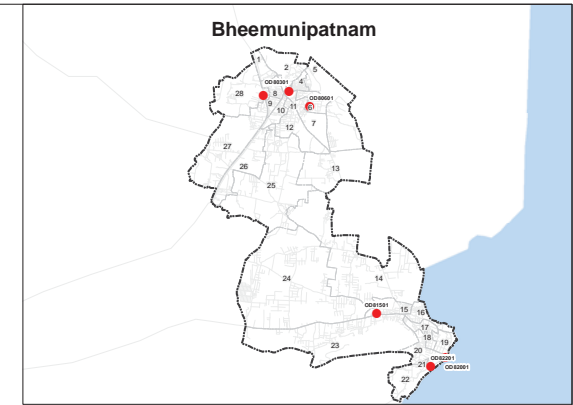
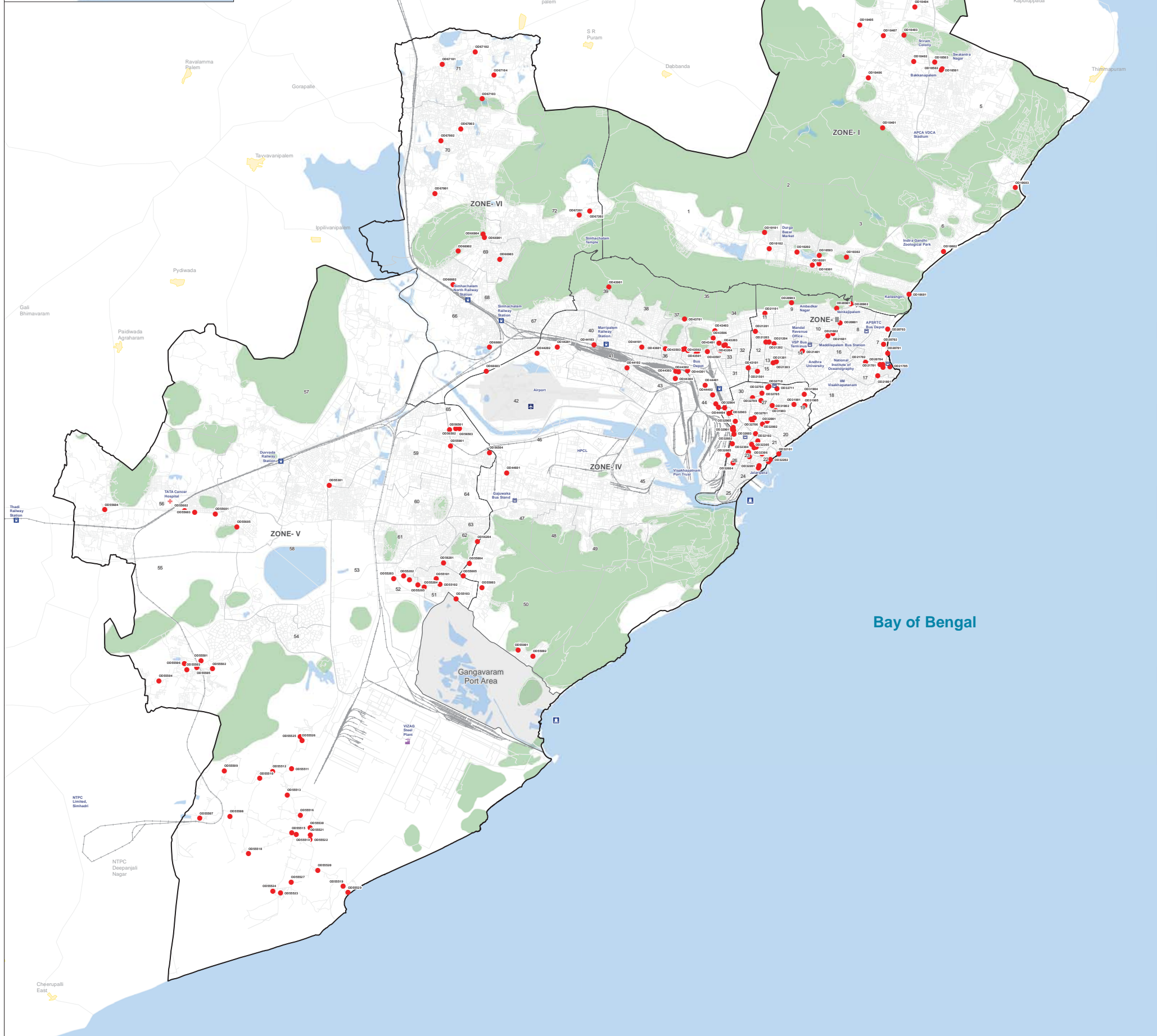
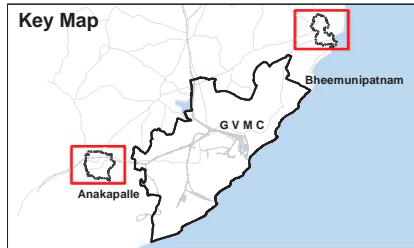
8. Optimal utilization of semi-public toilets: Constructing public toilets along all the roads and every public hotspot to try to cater to the needs of every person is practically not feasible. Hence, GVMC should bring the semi-public toilets (from shopping complexes, street-shops, petrol-pumps, restaurants etc.) into use for commuters. For this:

- i. Citizens need to be made aware about such toilets and should be educated about the necessity of proper etiquettes of using the toilets.
- ii. Owners of these semi-public toilets can choose to charge per use to encourage bringing more such toilets into public realm and so that maintenance expenditure of these toilets can be met.

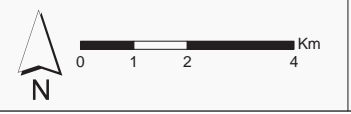
9. Prepare a faecal-sludge management plan: At present, GVMC does not provide Faecal Sludge Management (FSM) services for waste disposal into septic tanks or soak pits. Also one of the reasons mentioned for not using IHHT where households have one, was the fear of getting the septic tank/soak pit filled up early. In order that GVMC may be able to monitor and ensure that all such waste water disposal facilities are cleaned regularly, it will have to take the following steps:

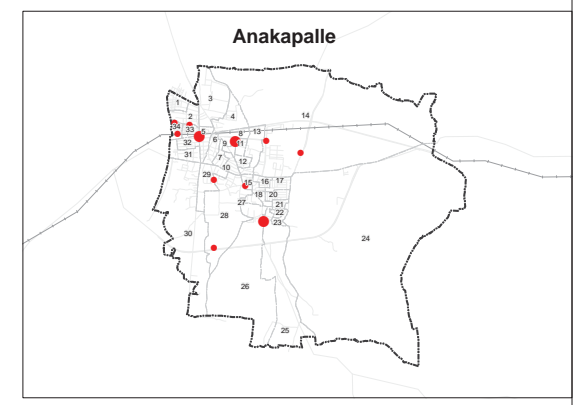
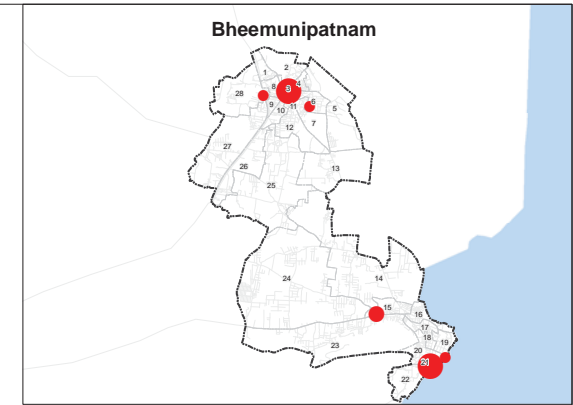
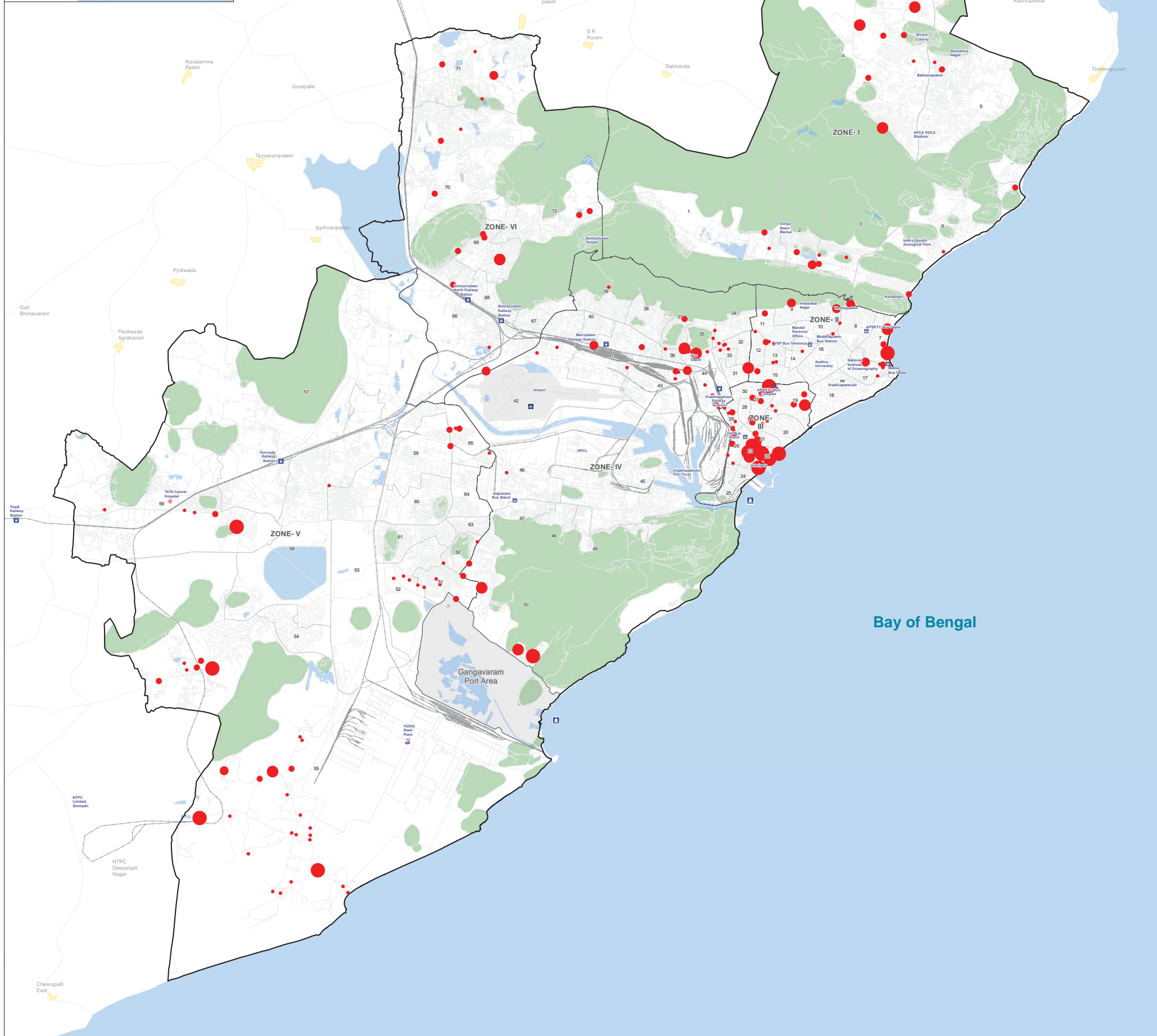
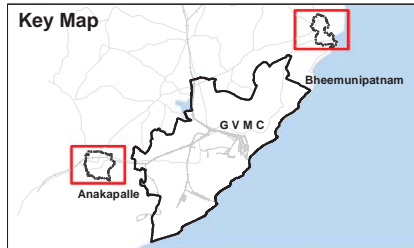
- i. Ensure all new buildings have a safe and adequate waste water disposal facility. For this it is necessary that the Pre-DCR software makes it mandatory to submit detailed information regarding it during submission of building plans. Site inspection reports submitted by the TPO/TPBOs should also mandatorily should also include verification of the same.

- ii. Undertake property tax assessment, which has been long over-due since 2014. While that is done, GVMC should also collect information on the type of water and waste disposal facility available with each property. This will bring to it, information on illegal/unregistered connections.
 - iii. Utilize the geo-tag information collected through the PreDCR software of the TPOs/TPBOs during their site verification to collect information on the category of waste disposal facility. GVMC could then monitor these buildings whether they undertake sludge removal activity at regular intervals.
 - iv. Utilize the geo-tag information of IHHTs on GIS platform to be able to make spatial assessments such as those IHHTs with septic tanks/ soak-pits that might come under eventual implementation of UGD master plan.
10. **Prepare a Web-GIS for sanitation using KM tool:** the KM tool prepared by UMC has organized data that would guide future development into a web-GIS based platform. In the next phase of development, the tool should be available online, on a web-page and on a mobile app/mobile compatible interface. This would enable anybody to view data from anywhere. User IDs for municipal officials to access the tool individually on a computer/mobile, allowing them to manage relevant data for their respective departments. The online tool should allow the user to view the data over Google Maps, Bing, ESRI or other popular easy to use open source maps. The tool should also enable running queries and generation of reports.



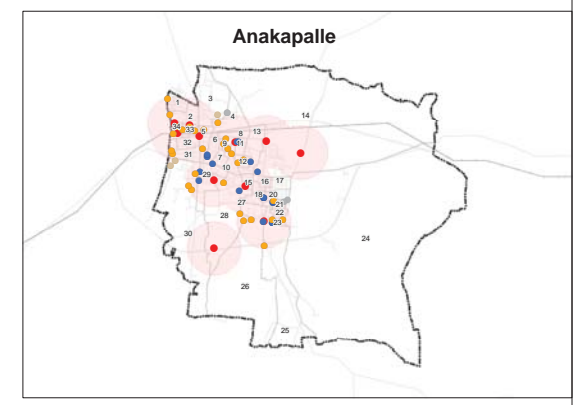
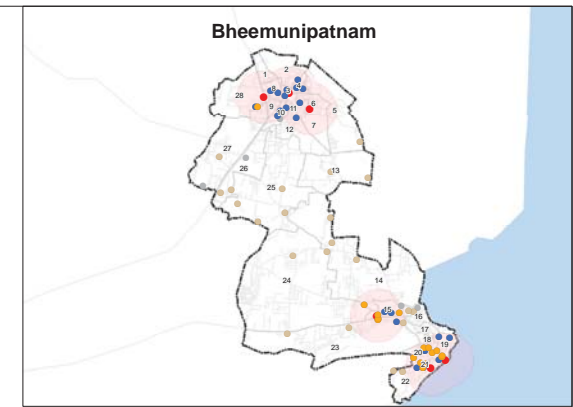
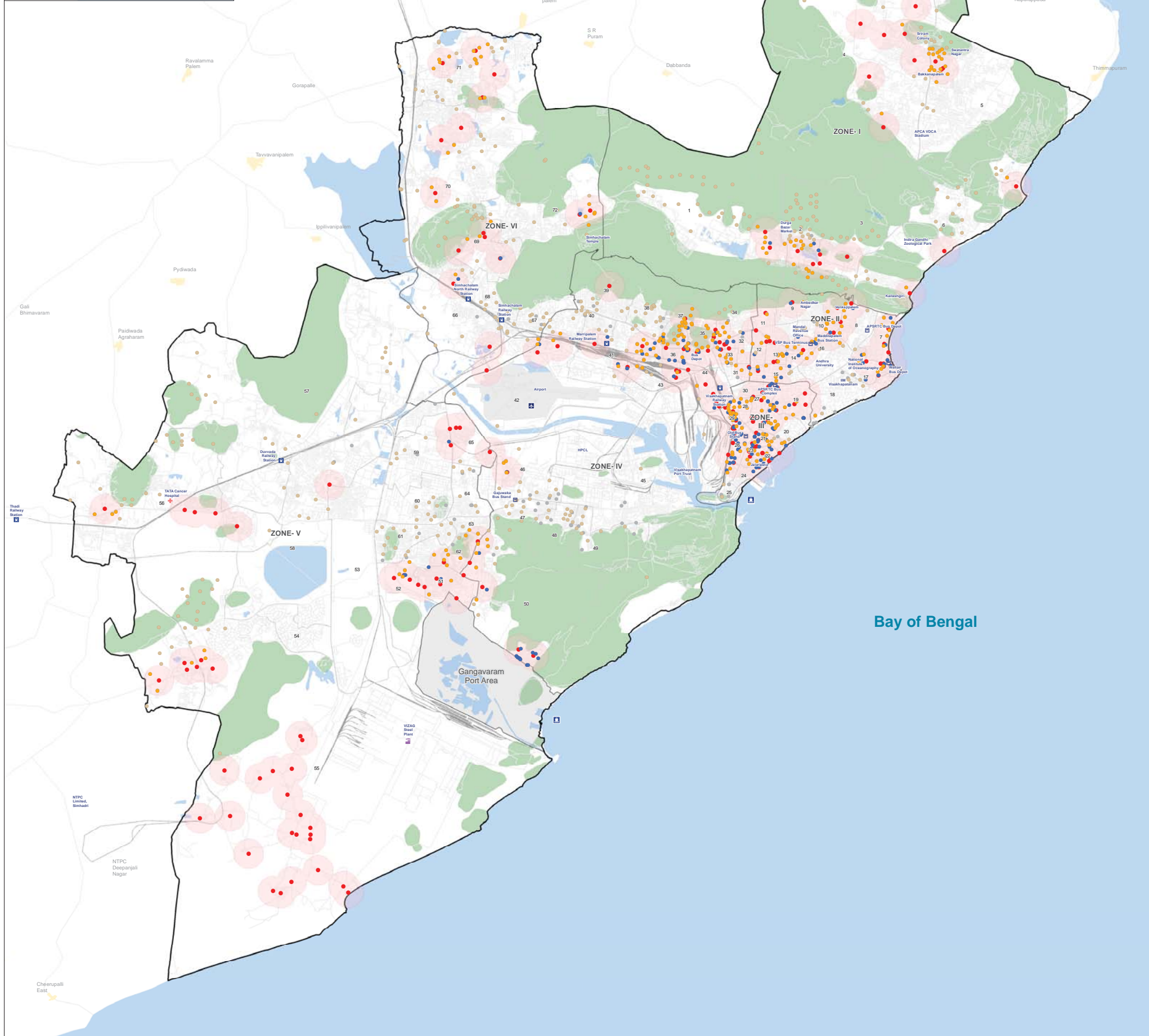
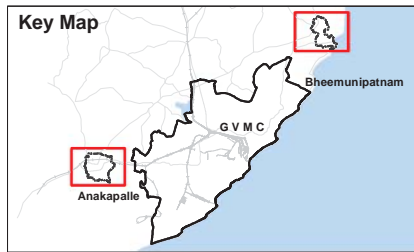
- Legend**
- Open Defecation Spot
 - Railway Line
 - Road Network
 - Waterbody
 - Village
 - Hills
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary



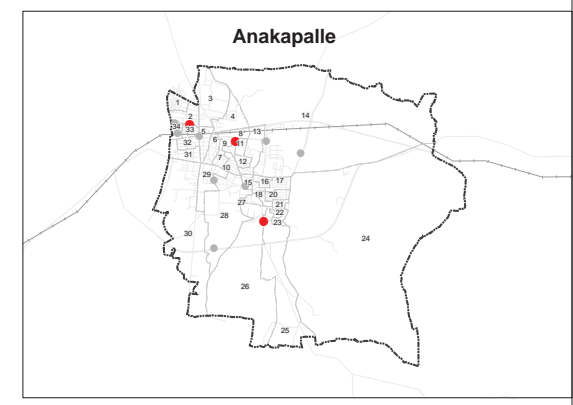
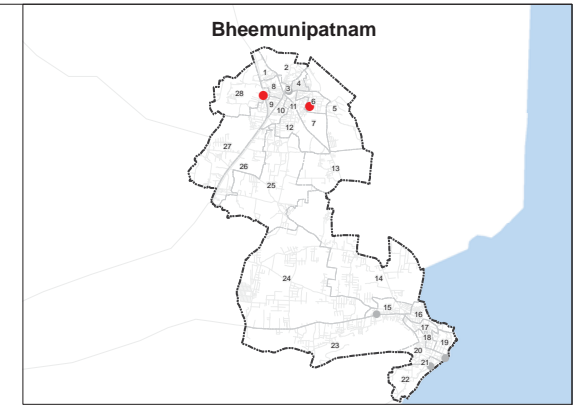
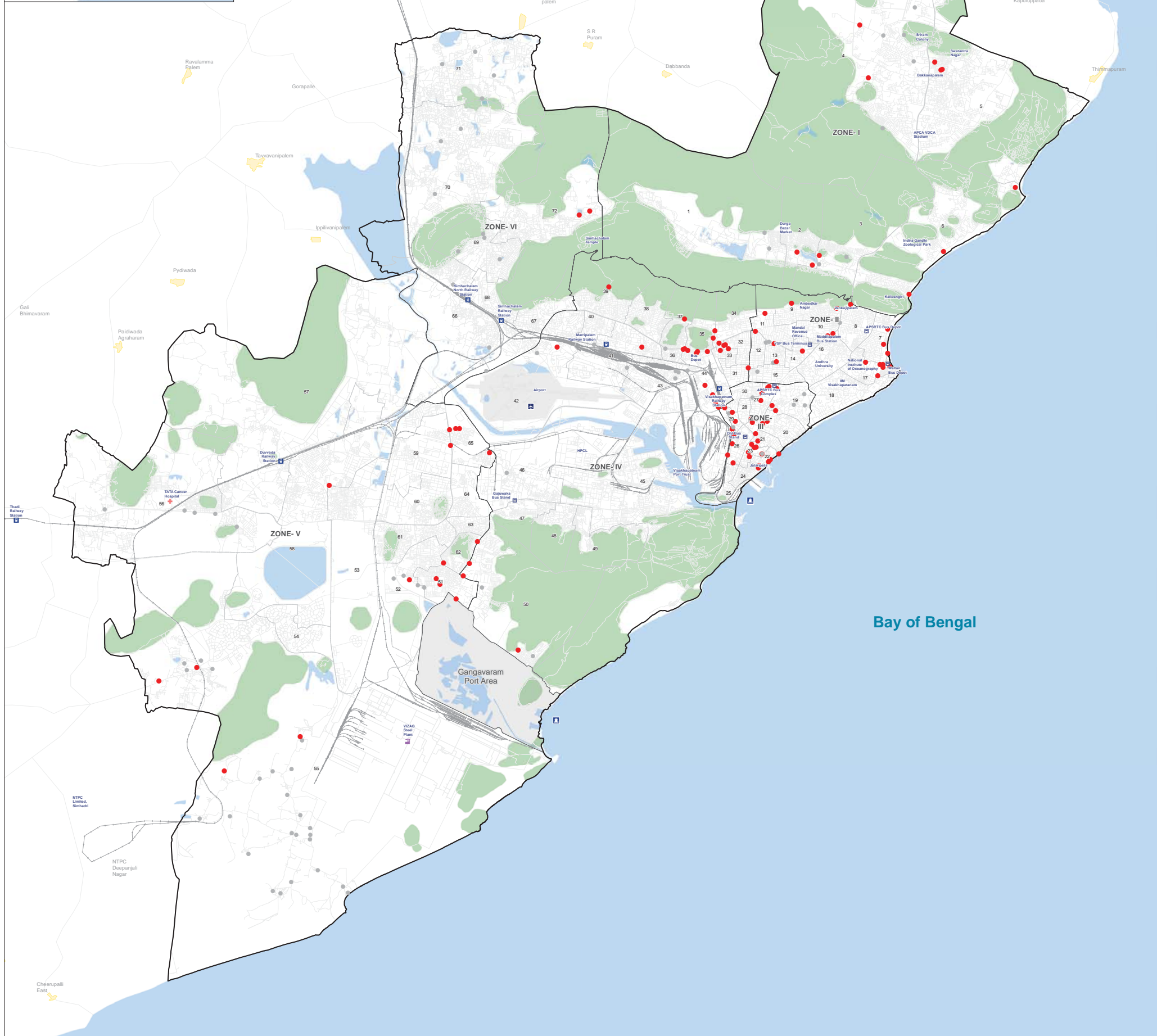
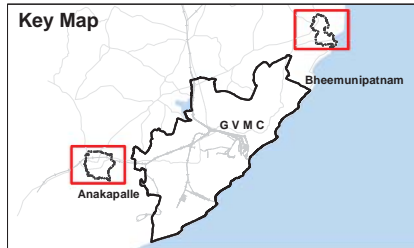


- Legend**
- Estimated number of daily open defecators**
- Less than 50
 - 51 - 100
 - 101 - 150
 - 151 - 200
 - More than 200
- Railway Line
 - Road Network
 - Waterbody
 - Village
 - Hills
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary

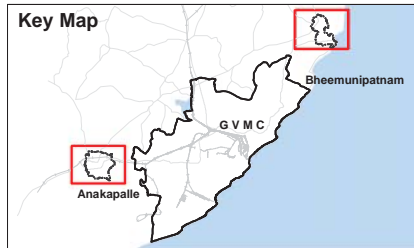
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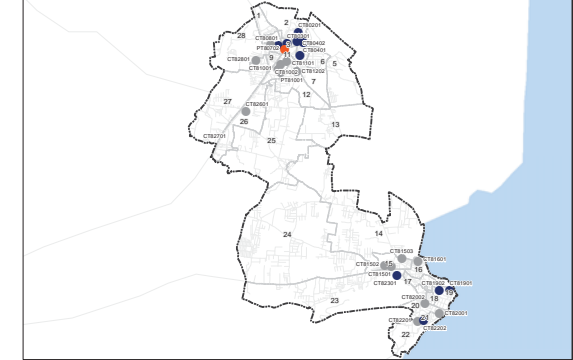
- Legend**
- Slums lies within premises of OD Spots
 - Other Slum
 - PTCT spots lies within premises of OD Spots
 - Other PTCT
 - Open Defecation Spot
 - Railway Line
 - Road Network
 - OD Spots 500mt Buffer
 - Village
 - Waterbody
 - Hills
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary



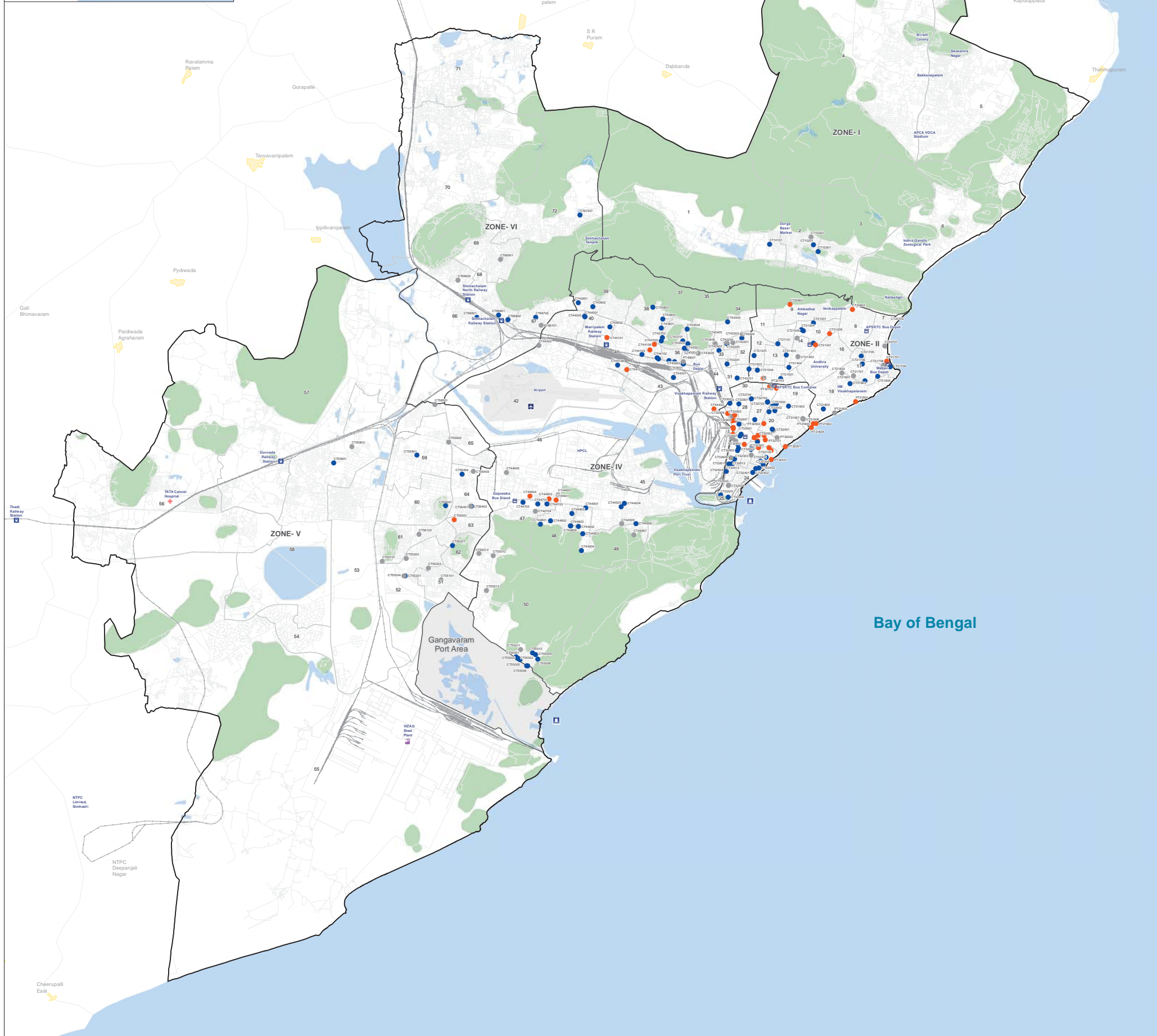
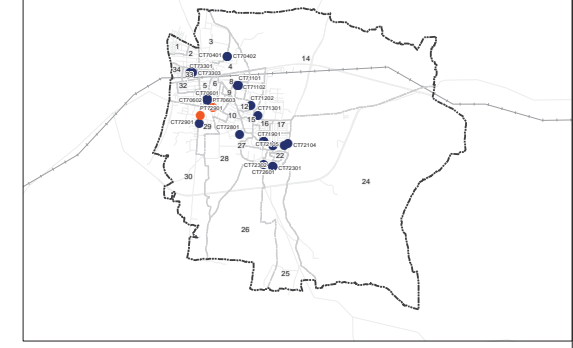
- Legend**
- Reasons behind defecating in open**
- By Habit
 - Others
 - Railway Line
 - Road Network
 - Village
 - Waterbody
 - Hills
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary



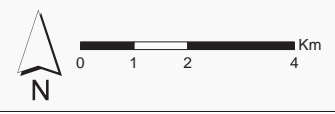
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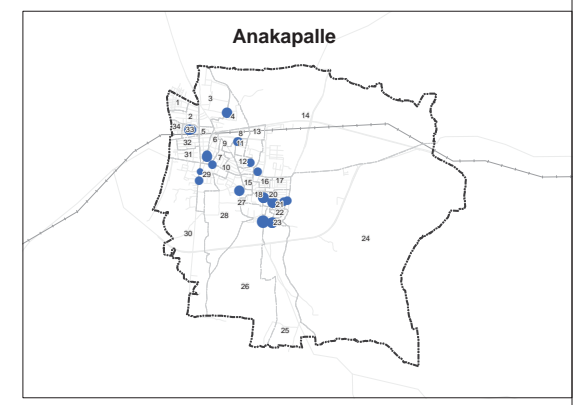
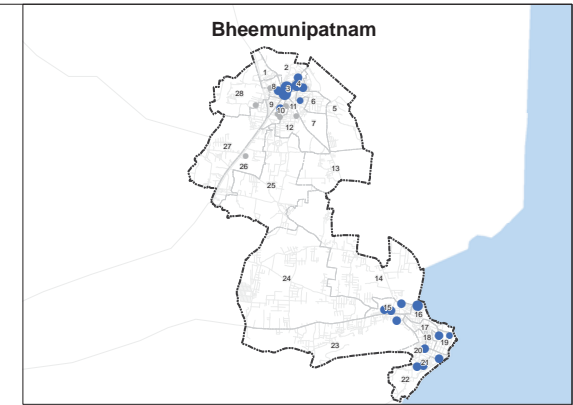
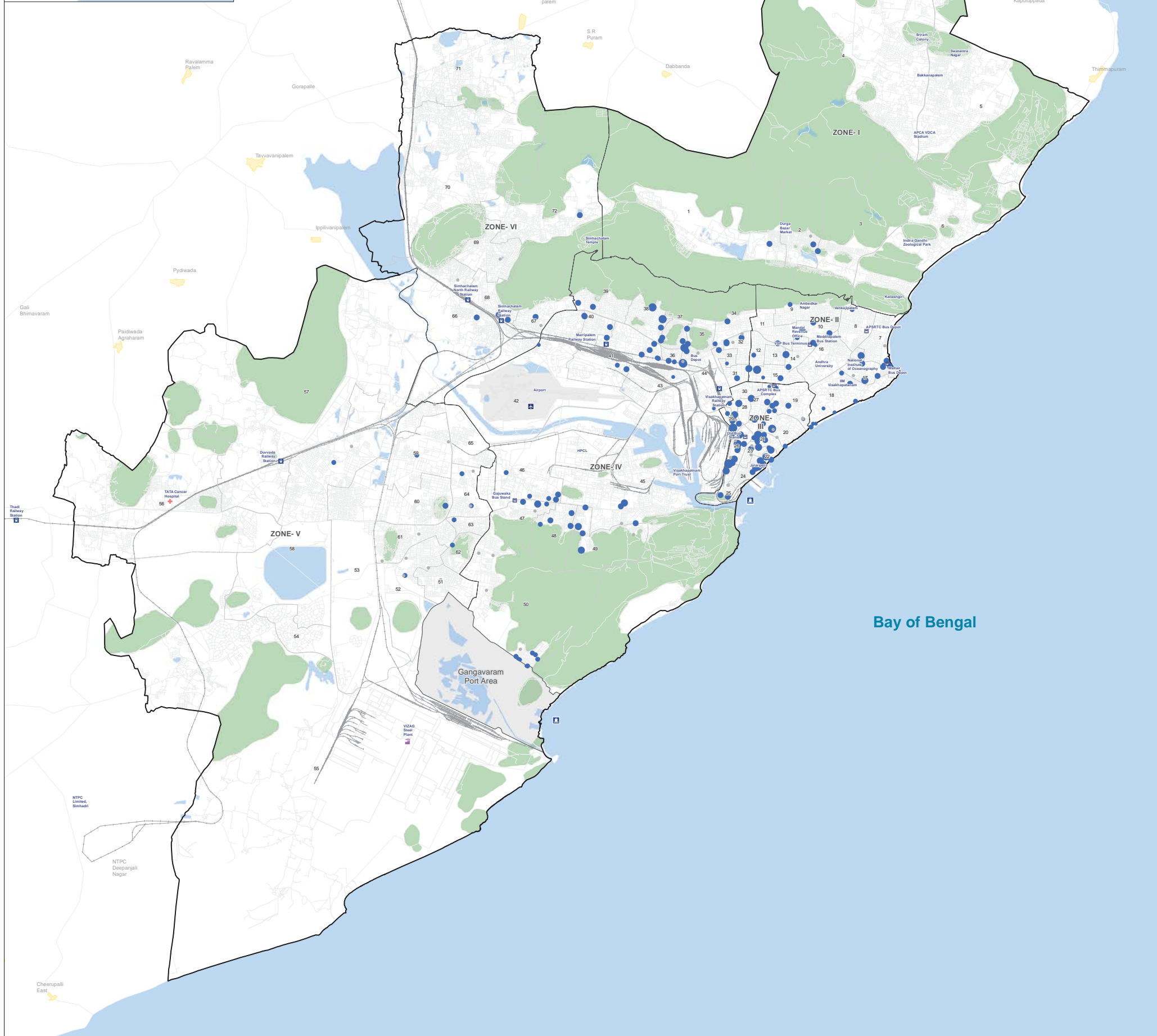
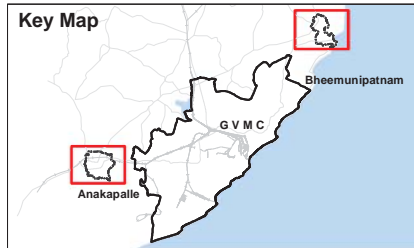


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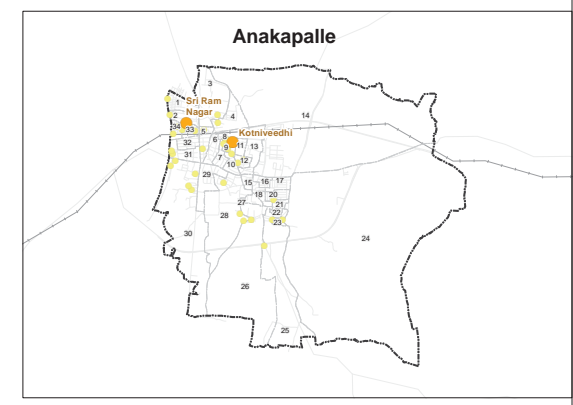
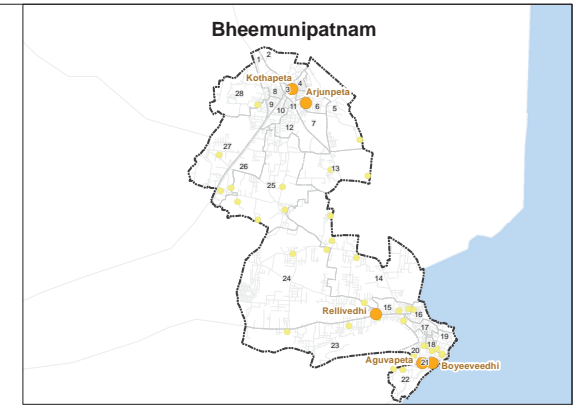
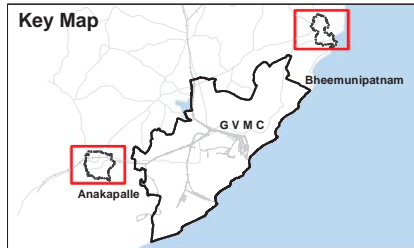
- Legend**
- Public Conveniences by type**
- Public Toilet
 - Community Toilet
 - Non-functional Toilet
 - Railway Line
 - Road Network
 - Waterbody
 - Village
 - Hills
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary





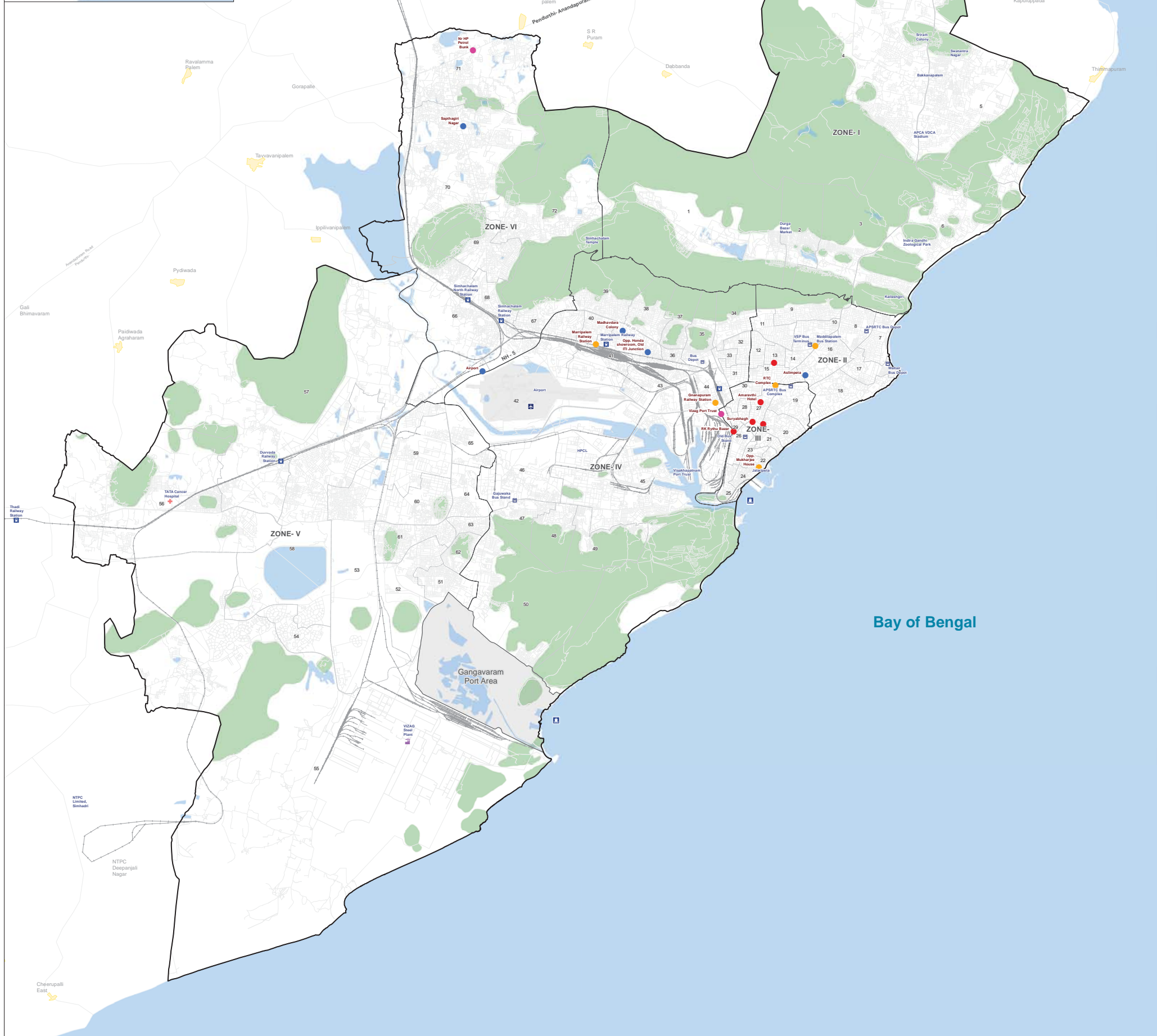
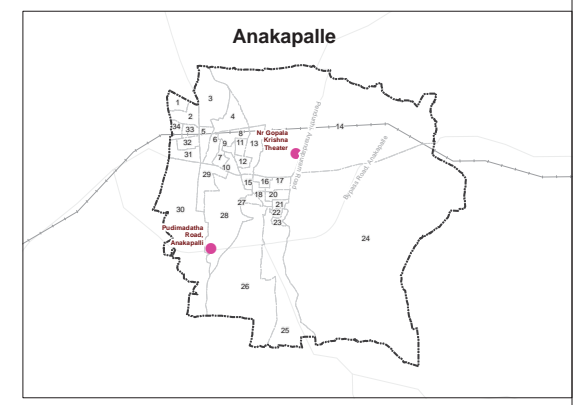
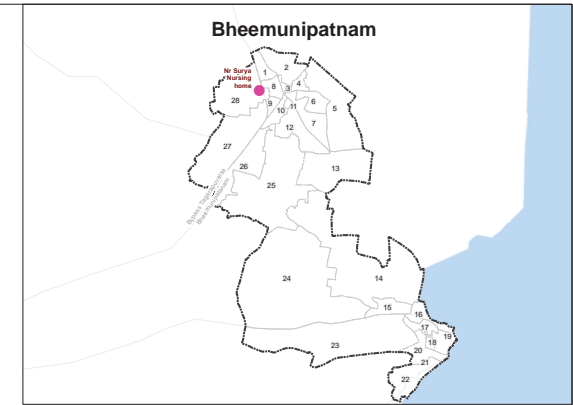
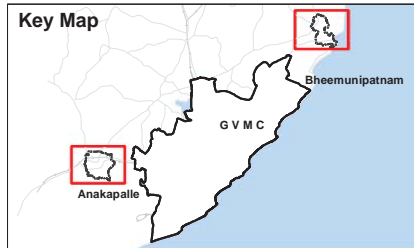
- Legend**
- Number of seats per toilet block**
- Non-functional toilet
 - 1 - 5
 - 6 - 10
 - 11 - 20
 - 21 - 30
 - 31 - 40
 - More than 40
- Railway Line
 - Road Network
 - Waterbody
 - Hills
 - Village
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary

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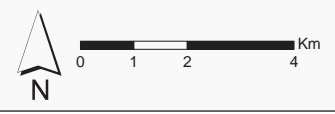


- Legend**
- Slum where FGD was conducted
 - Other Slum
 - Railway Line
 - Road Network
 - Waterbody
 - Hills
 - Village
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary





- Legend**
- Key Informant Interview with**
- Construction workers
 - Shopkeepers / Customers / Workers
 - Daily Commuters
 - Truck Drivers
- Railway Line
 - Road Network
 - Waterbody
 - Hills
 - Village
 - Ward Boundary
 - Zone Boundary
 - GVMC Boundary





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