

Andhra Pradesh Municipal Development Project [APMDP]

Terms of Reference

PREPARATION OF GIS BASE MAPS FOR 113 ULBs of ANDHRA PRADSH.

1. BACKGROUND

1.1 The Andhra Pradesh Municipal Development Project (APMDP) is a US \$ 350 Million project being implemented by the Municipal Administration & Urban Development Department (MA &UD), Government of Andhra

Pradesh (GoAP) with support from the World Bank (loan of US\$ 300 Million, Loan No. 7816 IN).

1.2 The Commissioner & Director of Municipal Administration (CDMA) is the nodal agency under MA&UD, who will manage the implementation and monitoring of the project. A Municipal Strengthening Unit (MSU) under CDMA is headed by Project Director and supported by Technical Support wing will oversee the implementation of the project.

1.3 The Project aims at various improvements at three different levels: State, ULB, and Subprojects. The Project focuses more on improvements at lower levels. Reforms and Capacity Building at ULBs require Technical Assistance and Local Policy Actions, whose design and implementation need sustained support. Financing of urban investments would not only alleviate urban service deficiencies but also provide an incentive and concrete platform for local Capacity Building, with detailed monitoring and support.

1.4 Water supply and Sanitation provisions are the most conspicuous of municipal activities. However, lack of planned capital investment and inadequate operation and maintenance, combined with a growing population demanding higher service levels has reduced the effectiveness of water supply and sanitation services in many municipalities.

1.5 The project has four major components, namely, i) State Level Policy and Institutional Development Support, ii) Municipal Capacity Enhancement, iii) Urban Infrastructure Investment and iv) Project Management Technical Assistance.

1.6 In Andhra Pradesh, the municipalities are governed by the Andhra Pradesh Municipalities Act of 1965. The corporations are governed by the Hyderabad Municipal Corporation Act of 1955. Inadequate Water Supply, Sanitation and wastewater Management has been an essential issue in many urban local bodies. In order to address this, GoAP has received a Loan from the World Bank for Andhra Pradesh Municipal Development Project.

1.7 The Project development objectives of APMDP are to help improve high-priority urban services in selected cities of Andhra Pradesh, and build the capacity of Urban Local Bodies to develop and manage urban services. The Project will support improvements in the Financial, Technical, and Management

Capacities of all ULBs of Andhra Pradesh, in addition to infrastructure financing.

1.8 These are required to ensure the effectiveness of urban planning in the context of current and future economic expansion in the State. The conventional procedure of preparing statutory urban development plans is seen to be devoid of effective participation, unconcerned about financing implications and time consuming. A concurrent but separate study seeks to establish the reformed legislation, simplified land use planning procedure and lay down guidelines for town planners of ULBs in preparing the city plans.

1.9 For efficient, economical and meaningful municipal administration, including the tax administration, a comprehensive and integrated data set through GIS application has become essential. To achieve the goal of electronic governance for all the services of the ULBs, large scale and detailed GIS base maps are required. APMDP intends to appoint a Consultancy agency / firm to carry out the work of preparation of GIS base maps for the group of **31/45/37 ULBs** using Geographic Information Systems (GIS) platform.

2. OBJECTIVE OF THE STUDY

2.1 The objective of the assignment is to Prepare GIS Base Maps for Urban Local Bodies (ULB) in Andhra Pradesh (AP) using Geospatial technologies to assist the ULBs in strategic planning and resource utilization, management function and planning & management of day to day operations . The area of the ULB to prepare Base Map includes the area upto the present administrative boundary as indicated in Annexure-I.

3. BRIEF DESCRIPTION OF TASK

3.1 Andhra Pradesh Municipal Development Project (APMDP) intends to appoint Consultancy Firm for “Preparation of GIS–Base Maps for **31/45/37 Urban Local Bodies (ULBs)** of Andhra Pradesh as detailed in annexure- I on 1:1000 scale using latest high resolution Quick Bird satellite imagery and survey of all physical features of the town, collection and superimposition of town survey maps / cadastral maps, existing administrative boundaries, slum boundaries, localities/colonies/area boundaries, infrastructure details, water bodies, landmarks and contours at 1.0 metre interval etc. The selected Consultancy Firm

shall be required to generate all the data sets as per the design standards of National Urban Information System (NUIS). Following activities are to be covered under the project:

1. Review of existing situation, collection of all available data from ULBs, in soft copy and or hard copy including municipal boundary, Town survey maps, Cadastral maps, ward boundary maps, slum related data, colony boundary maps and Environment data;
2. Data evaluation: Source and reliability, positional accuracy, attribute authenticity;
3. Design of proper grid and projection in the Universal Transverse Mercator (UTM-WGS 84) coordinates based on the transverse Mercator projection system for the whole town;
4. Geo-referencing of satellite imagery using sufficient number of Ground Control Points (GCPs) collected through Differential Global Positioning System (DGPS) survey;
5. Interpretation and digitization of all physical features from satellite imagery. The digitization process shall include vectorization, symbolization, layering, edge matching, topological integrity, and data base linking;
6. Geo-referencing and digitization of Cadastral Maps;
7. Generation of contour overlay at 1.0 metre interval with construction of Permanent Benchmark (PBM) at 2 km interval;
8. Incorporation of locality, ward, zone and municipal boundaries;
9. Database structure and design;
10. Integration of existing environmental, slum related and other data with base map.

4. PROJECT AREA

4.1 Andhra Pradesh is the 5th largest state of India lies in southern part of India. The present Assignment covers 31/45/37 ULBs as detailed below:

Group-1	
A	Visakhapatnam Region
1	Srikakulam (VUDA) Municipality
2	Ichapuram Municipality
3	Palasa-Kasibugga Municipality
4	Amadalavalasa (VUDA) Municipality
5	Rajam (VUDA) Municipality
6	Vizianagaram (VUDA) Municipality

7	Bobbili Municipality
8	Parvathipuram Municipality
9	Saluru Municipality
10	Anakapalle (VUDA) Municipality
11	Bheemunipatnam (VUDA) Municipality
B	Rajahmundry Region
12	Pithapuram Municipality
13	Samalkot Municipality
14	Peddapuram Municipality
15	Mandapet Municipality
16	Ramachandrapuram Municipality
17	Amalapuram Municipality
18	Tuni (VUDA) Municipality
19	Palacole Municipality
20	Narsapur Municipality
21	Nidadavole Municipality
22	Kovvur Municipality
23	Tadepalligudem Municipality
24	Tanuku Municipality
25	Bhimavaram Municipality
26	Eluru Municipal Corporation
27	Nuzvid Municipality
28	Gudivada Municipality
29	Pedana Municipality
30	Machilipatnam Municipality
31	Jaggayyapet Municipality

Group-2	
A	Guntur
1	Tenali (VGTM UDA)
2	Mangalagiri (VGTM UDA)
3	Tadepalli (VGTM UDA)
4	Repalle
5	Bapatla
6	Vinukonda
7	Piduguralla
8	Narasaraopet
9	Chilakaluripet
10	Ponnur
11	Sattenapalle
12	Macherla
13	Markapur
14	Ongole
15	Chirala
16	Kandukur
17	Kavali

18	Gudur
19	Venkatagiri
20	Nellore
B	Ananthapur
21	Chittoor
22	Palamaneru
23	Madanapalli
24	Punganur
25	Nagari
26	Srikalahasthi (TUDA)
27	Puttur (TUDA)
28	Ananthapur
29	Tadipatri
30	Hindupur
31	Dharmavaram
32	Kadiri
33	Rayadurg
34	Guntakal
35	Kadapa
36	Pulivendula
37	Jammalamadugu
38	Proddutur
39	Budvel
40	Rayachoty
41	Rajampeta
42	Nandyal
43	Adoni
44	Yemmiganur
45	Dhone

Group-3	
A	Warangal
1	Warangal
2	Jangaon
3	Kothagudem
4	Manuguru
5	Khammam
6	Sathupalli
7	Yellandu
8	Palwancha
9	Sircilla
10	Ramagundam
11	Jagitial
12	Karimnagar
13	Korutla

14	Metpalli
15	Adilabad
16	Bhainsa
17	Kagaznagar
18	Mandamarri
19	Mancherial
20	Nirmal
B	Hyderabad
21	Gadwal
22	Mahaboobnagar
23	Narayanpet
24	Wanaparthy
25	Miryalaguda
26	Suryapet
27	Nalgonda
28	Vikarabad
29	Tandur
30	Bodhan
31	Kamareddy
32	Armoor
33	Nizamabad
34	Zaheerabad
35	Medak
36	Siddipet
37	Sadasivapet

4.2 The Area of Interest (Aoi) for each town /ULB is the present administrative area of the ULB as indicated in Annexure-I.

5. SCOPE OF WORK

5.1 The selected consultancy firm is expected to provide technical and management support during the planning, design and implementation phases of GIS base maps preparation activity as described below but not limited to, for satisfactory performance of the services within the Contractual framework.

5.2 Preparation of GIS Base Maps

The main objective of the project is to develop detailed GIS Base maps on a scale of 1:1000 for **the group of 31/45/37 ULBs** of the Andhra Pradesh state as listed in Annexure-I. The details of features to be interpreted are given in **Annexure II**. The preliminary interpreted map should be ground verified and the final map is to be prepared by incorporating the ground truth data. These detailed maps consisting of the planimetric details, Cadastral boundaries, micro level land use and utility services need to be generated using the latest

technologies like DGPS, image processing and digital data capture using Quick bird data with 61 cm resolution, Pan Sharpened colour imagery supplemented by the ground truth collection.

5.2.1 Procurement of Satellite Imagery:

- (a) . The Client (Director of Town and Country Planning, Hyderabad) will supply cloud free Quick bird Pan Sharpened color satellite imagery data of 0.61m resolution for the ULBs as given in the list (Annexure-I). The data products would be digital and hard copy images. The images shall cover the administrative boundary of the ULBs. Thus the Area of Interest (AOI) will be the present area of the ULBs.
- (b) All the required clearances for obtaining the data have to be taken care by the consultants. The client/ DTCP and/ or ULB will provide the necessary authorization letters.
- (c) On supply of satellite imagery by the client, the Consultant will verify the correctness of the imagery and data with truth data of field. The imagery that does not conform to the correctness must be reported and returned within one week.
- (d) Only the supplied imagery must be used for the preparation of Base Maps. Use of data from alternative online sources such as Google Earth/ Google Maps is strictly prohibited as this is strictly against the usage policies of the respective services. The consultant will be solely liable for any legality and any such deviations will lead to disqualification of the consultant.

5.2.2 Collection of Various Maps & Data From Municipal & Government Agencies

The Consultant shall collect maps and secondary data from various authorities. A set of such maps that will form a part of the spatial database is illustrated below:

- (a) Master Plan / General Town Planning Schemes showing proposed land use zoning, transport network and sites designated for various public purposes.
- (b) Maps showing administrative boundaries of ULB jurisdiction, administrative and electoral wards, area/ block units used by census.
- (c) *Base Map/ Revenue Maps showing Cadastral Boundaries.*

- (d) Maps/ Engineering drawings of utilities like water supply, sewerage, storm, water drainage, solid waste disposal, roads and street lights along with the data available with ULB/ any other concerned Department.
- (e) Data regarding services like Fire Protection, Cremation and Burial Grounds, Slaughter Houses, Cattle Ponds, Parks, Gardens and Swimming Pools etc. In case such data is missing, this will form a part of the field survey/ verification.
- (f) Location of State and Central Government offices, railways and highways, all roads along with centerlines, post and telegraph offices, police stations, primary & high schools, colleges, universities, primary health centers, hospitals, banks, theatres etc. also need to be located on the maps through field verification.
- (g) Existing land use categories like residential including slums, industrial, commercial and healthcare, educational, sports and recreation facilities.
- (h) Property boundaries along with slum boundaries (Notified and Non-Notified). In case such data is missing, this will form a part of the field survey/ verification.
- (i) All features should be collected along with the necessary attributes that will be later used for annotation.
- (j) Preparation of survey proformae for each of the layers to be generated.

5.2.3 DGPS Survey & Geo Referencing

To correct various Geometric Anomalies in Raw Satellite Imagery , Ground Control Points (GCP) collected through Differential Global Positioning System (DGPS) Survey will be used for Geo referencing of the imagery. Geo Referencing and Geo-coding of data should be on WGS-84 with projection on UTM. For the DGPS Survey, GCPs should be selected at well defined sharp points both on the ground and on imagery. A minimum of one point per square kilometer should be considered and these should be evenly distributed over the ULB area.

5.2.4 Digitization and Map Preparation

Proper grid and projection shall be designed for the whole of the town. This is essential for proper representation of graphical data and location related unique

Ids for each property, which shall form part of GIS for the spatial analysis. In the case of digitization, the data is checked for dimensional accuracy, completeness, displacement, edge matching, symbology, and layering. All undershoots/overshoots, dangling vertices shall get removed in the process. The method to be adopted for digitization shall confirm as per the standards discussed below:

- i) Minimum map able unit on Maps – 1 mm on scale
- ii) Location accuracy in GIS – 1 mm on scale
- iii) Minimum spatial unit in GIS – 2 mm on scale
- iv) Registration Error threshold in GIS – 0.25 mm on scale
- v) Coordinate movement / Weed tolerance – 0.25 mm on scale

All features like Buildings, Vacant Plots, Roads (National Highways, State Highways, City Roads and Streets), Bridges (Flyovers, Railway Bridges, etc), Railway Tracks, Parks, Gardens, Stadiums, Slums, Traffic Squares, Water Bodies (River, Lake, Pond, Drainage, Canal etc), Over Head Tanks, etc should be extracted from imagery through on screen / Heads on digitization technique. The hard copy of the maps with all the above digitized features is to be prepared on 1:750 scale for updating of base map through field survey.

5.2.5 Auto Level Survey for Contouring

Contour overlays of 1.0 metre contour interval are to be generated by Auto level survey using a height mesh of 20m apart or as required. Permanent bench marks are to be established at every 2 km interval for future reference and taking a digital picture for linking in GIS data. The contours are to be interpolated and superimposed on to the base map by taking proper controls. These are to be digitized to generate as digital overlay. Cross section of all drains with clear width and depth taking levels at every 20m should be also taken at the time of contour survey. Details about drains/ channels/ nallah passing through the town indicating the following details:- i) Location and alignment of drain/ channels/ nallah, ii) Invert level / L-Section of the drain/ channels/ nallah indicating slope, iii) Cross-section of the nallah/ channels/ drain for every 20m. The survey is to be initiated at local SOI Benchmark, R&B., Irrigation, or any other bench mark which has been connected to GTS bench mark of SOI to establish the elevation. It will be basis for all subsequent measurement. The accuracy for survey should

be $4\sqrt{K}$ mm, where K is total distance of the cross section in Km. Change in errors is to be separately listed as discrepancy list.

5.2.6 Permanent Benchmark

Benchmark should be established at interval of 2 Km. The pillar shall be made of cement concrete of grade M-15 (1:2:4), rectangular in shape and size of 300 mm x 80 mm x 80mm. A rod of 20 mm diameter and 350 mm long of Mild Steel shall be provided at the center of pillar to mark location and each pillar shall be painted to mark its number.

5.3 Survey and Updating of Base Map

The consultant will be responsible for integration of available data with Base Maps in GIS relating to slum data, environmental data, infrastructural data and vendor zoning data sets in addition to the data collection during the preparation/ updating of base maps. The consultant will collect the data in the proposed field data sheet format for the data collection. The base maps hard copy prepared through on screen digitization of imagery as discussed above is to be used for ward wise survey for the updating purpose and finalization of layer wise Base Maps with the attributes, as per Annexure II (a).

5.4 Final Base Map

Final base maps are to be prepared incorporating the data collected from survey and the data for different entities. Hard copy base maps are to be prepared at 1: 1000 scale ward wise. The base maps will be prepared in various layers for ease of operation in GIS. Layer and data structures can be modified depending on the local requirements of ULB after approval from APMDP /(DTCP). The details of the layers for base map are given at Annexure III.

6. DATA, SERVICES AND FACILITIES TO BE PROVIDED BY THE CLIENT

- i. **The Client (Director of Town and Country Planning, Hyderabad) will supply cloud free Quick bird Pan Sharpened color satellite imagery data of 0.61m resolution for the ULBs.. The Convener (Director of Town and Country Planning, Hyderabad) of Review Committee will assist the consultant in seeking access to documents and data, organizing interviews with concerned officials for conducting surveys and studies etc. The Convener will provide 'Letters of Introduction' and shall assist in establishing contact with other State Government Departments and Planning Agencies.**
- ii. The client will supply the available imagery, datasets, maps as indicated in **Annexure-IV.**
- iii. The Client may provide suitable office space free of rent for the project period at the ULBs and at one of the office in a Region.
- iv. The client will attach one town planning staff (in the cadre of Town Planning Supervisor) from each ULB with the consultant for effective coordination.

7. OUTPUTS AND DELIVERABLES

Under this contract the Consultant's payments will be output and deliverables based. It is very important to note clearly and in detail the exact outputs required and what they should contain. The desired outputs & deliverables under this contract are as shown below.

7.1 Satellite Data

1. Rectified satellite data along with GCP file
2. Soft copies of images in .img, .jpeg or .tiff formats

7.2 DGPS Survey

1. The raw and processed data of the DGPS survey with a photograph of each GCP
with monument
2. A neat sketch of each DGPS point showing the location on A4 size drawing
3. Contour maps of one metre interval at 1:1000 scale.

7.3 Topographical survey

The following details shall be submitted on completion of the survey

1. All original field books
2. All the survey details in AutoCAD format on a CD / DVD and 2 draft prints of the same

7.4 Base Map

1. Digital base map of all the thematic layers excluding building / plot on 1:1000 scale in 3 sets

in hard copy (A0 Paper) and one set in soft copy in GIS format.

2. Digital data of base map in DXF /DWG, SHP file format along with soft copy of base map to a

scale of 1:5000 and 1:10000 (soft copy) for the total town area in DXF/DWG SHP format which shall contain locality/colony/area boundaries, slum boundary ward wise, roads, nalas, Canals, railway lines, bridges, water bodies duly incorporating cadastral information, Locality, ward, block, slum, and municipal boundaries with contour information at 1.0 Metre interval.

3. Ward wise check prints in Hard copy on 1:750 scale (Two sets on A0 Paper)

4. Ward wise Final Base Maps (Hard Copy) on 1:1000 scale (Five sets of multi color plotted maps on A0 paper)

5. Base maps on 1:5000 in hard copy (Five sets of multi color plotted maps on A0 Paper)

6. Base maps on 1:1000 in hard copy (Five sets of multi color plotted maps on A0 Paper)

7.5 Reports

1. Inception Report for the Project highlighting review of supplied imagery, collected available maps and related data , identification of existing data gaps and proposal how to bridge data gaps and describe the detailed methodology and work schedule should be submitted within one month from the date of signing contract -- 5 sets and 2soft copies.

2. Project Interim Progress Reports (to be submitted on 25th day of each calendar month after

submission of Inception report) –soft copies 2 sets.

3. Detailed Project Report at the end of the Project including the System Design Report and User Manual – 10 sets and soft copies 5 sets.

At each report submission, the consultant must give power point presentation to the review committee and note the comments of the review committee members and incorporate in the next report.

All the reports are to be prepared ULB wise.

8. SCHEDULE FOR COMPLETION OF TASKS

The assignment is to be completed in **11 months**. The detailed timeline for different activities is as below:

Sl. No.	Activities	Activity to be completed by
1.	Procurement of Satellite Imageries	by client
2.	Collection of existing data and Inception Report (System study & GIS system design)	1 month
3.	Processing of data (DGPS Survey for Georeferencing & Rectification of Satellite Images), Contour survey, Survey for Base Maps	4 month
4.	Map preparation for all thematic layers	5 month
5.	Base Maps- Check prints	9 month
6.	Final Base Map Incorporating Feedback and Final Report including the System Design Report and User Manual	11 month

9. COMPOSITION OF REVIEW COMMITTEE TO MONITOR CONSULTANTS WORK:

For supervising the progress of the study and guiding the consultant, a Review Committee is constituted as follows:

The Composition of the Review Committee shall be

- The Commissioner and Director of Municipal Administration or his nominee - Chairman
- The Director of Town and Country Planning – Convener
- The Project Director, APMDP or his nominee
- Representative from MEPMA
- Representative from NRSC/ DG, APSRAC
- Representative from Engineer-in-Chief, Public Health
- Project Manager of GIS cell at DT&CP - Co-Convener.

- (h) Commissioner, Town Planning Officer (TPO) and Municipal Engineer of the ULBs.
- (i) Director, Spatial Information Technology, JNTU or his Representative
- (j) Regional Director of Town Planning, Rajahmundry/ Visakhapatnam/ Nellore/ Anantapur/ Warangal/ Hyderabad.

10. REVIEW OF PROGRESS REPORTS

The Consultant should submit all reports to the Director of Town and Country Planning, Hyderabad under intimation to APMDP. All correspondence pertaining to the Assignment must be addressed to The Director of Town and Country Planning under intimation to APMDP. The Director of Town and Country Planning, Hyderabad will have the responsibility and authority, on behalf of the Review Committee to issue clear interpretation and instructions to the Consultant.

Progress report on each task/ each month shall be reviewed by the Review Committee and the Convener (The Director of Town and Country Planning) shall organize a presentation by the consultant to the Review Committee **on monthly basis and also after completion of each sub task**. The Review Committee minutes shall be communicated within one week of such presentation, to the Consultant.

11. APPRAISAL OF PROJECT

The final GIS Base Maps along with reports will be appraised technically by The Director of Town and Country Planning (DTCP). The Director, Town & Country Planning, then convene the Review Committee meeting for review. Get the feedback incorporated by the consultant. Then put up to the Project Appraisal Committee (PAC) for appraisal. Process for approval by the Steering Committee for implementation.

12. EXPERTISE AND INPUTS

List of Key professionals position whose Curriculum Vitae (C.V) and Experience would be evaluated:

Sl. No.	Key Position	No. of Persons	Area of Specific Expertise desired	Minimum Qualifications and professional experience desired
1	Team Leader	1	Experience in Urban planning and related fields like GIS, Remote Sensing Utility maps etc.	Masters in Geography / Remote sensing / Geology / Social science / Urban

			with leadership qualities to lead the team effectively is desirable.	planning/ Graduate in Civil/Municipal/ Environmental engineering , with 15 years of experience
2	Urban Planner	2	Experience in Planning with GIS expertise- Preparation of Base Maps, Master Plans, Area Plans, Urban Town Planning schemes.	Masters in Urban Planning with 10 years of experience
3	Municipal Engineer	2	Experience in design / construction / maintenance of light traffic roads, water supply system, sewerage and drainage systems.	Graduate Civil Engineer With 10 years of experience
4	GIS / Remote Sensing Specialist	6	Experience in managing or developing databases including data collection, entry and maintenance is essential. Strong practical experience in using Digital Image Processing and Geographic Information System (GIS) software tools is essential, for example: ESRI products such as Arc View, ArcGIS, ERDAS Imagine and other platforms Programming in GIS application development in desktop/ web environment is desirable.	Masters in Geography / Agriculture/Remote sensing / Geology /Social science / Urban planning/ Graduate in Civil Engineering , with 8 years of experience

1. The team of key professionals shall be adequately supported by junior professionals in the required disciplines including GIS and IT.
2. The consultant will work according to the deadlines provided in the Terms of Reference.
3. The consultant will conduct itself in a professional and ethical manner, and will ensure that none of its actions have an adverse effect on the Project.

4. The consultant will set up a project office in Project area with complete infrastructure, – Computers, Software, Printer, Furniture etc.

5. The consultant will appoint a Project Coordinator and other staff for field activity and data entry at each ULB site office, who will work in close liason with the local ULB office, project office in Project area and GIS cell at DTCP office / APMDP.

**Annexure –I
Group-1**

Sl. No	Name of the Region/ ULB	Area of ULB (in Sq.kms)	Grade	District	Population as per 1991 census	Population as per 2001 census	Growth Rate	Population Density	Area of Interest
1	2	3	4	5	6	7	8	9	10
A	Visakhapatnam								Present area of the ULB mentioned in column 3.
1	Srikakulam (VUDA)	14.12	Special	SRK	88883	117320	32.0	8321	
2	Ichapuram	25.28	Third	SRK	29654	32662	10.1	1291	
3	Palasa-Kasibugga	32.75	Third	SRK	33057	49899	50.9	1521	
4	Amadalavalasa (VUDA)	19.64	Third	SRK	34395	37931	10.3	1925	
5	Rajam (VUDA)	4.57	Nagar Panchayat	SRK	14285	23424	64.0	2928	
6	Vizianagar (VUDA)	20.73	Selection	VIZ	177022	176023	-0.6	9106	
7	Bobbili	25.60	Second	VIZ	43249	50096	15.8	1957	Present area of the ULB mentioned in column 3.
8	Parvathipuram	11.24	First	VIZ	43497	49714	14.3	4423	
9	Saluru	19.55	Second	VIZ	43435	48354	11.3	2473	
10	Anakapalle (VUDA)	28.00	First	VIS	84356	85486	1.3	3669	
11	Bheemunipatnam (VUDA)	18.18	Second	VIS	42061	48664	15.7	2575	

Sl. No	Name of the Region/ ULB	Area of ULB (in Sq.kms)	Grade	Distri ct	Populati on as per 1991 census	Populati on as per 2001 census	Growth Rate	Populatio n Density	Area of Interest
1	2	3	4	5	6	7	8	9	10
B	Rajahmundry								
12	Pithapuram	19.57	Second	EG	44061	50103	13.7	2556	
13	Samalkot	23.97	Second	EG	48760	53602	9.9	3802	
14	Peddapuram	42.31	Second	EG	42806	45520	6.3	1107	
15	Mandapet	21.65	Second	EG	42453	47638	12.2	2195	
16	Ramachandrapuram	14.07	Second	EG	36788	41370	12.5	2955	
17	Amalapuram	7.02	First	EG	46029	51444	11.8	7145	
18	Tuni (VUDA)	7.02	Third	EG	43904	50368	14.7	7195	
19	Palacole	4.69	First	WG	56969	76308	33.9	16236	
20	Narsapur	11.32	First	WG	56362	58604	4.0	5186	
21	Nidadavole	10.36	Second	WG	41101	43143	5.0	4148	
22	Kovvur	16.05	Third	WG	36061	39372	9.2	1600	
23	Tadepalligudem	20.71	First	WG	88878	102622	15.5	4958	
24	Tanuku	15.55	First	WG	62913	72970	16.0	4343	
25	Bhimavaram	26.14	Special	WG	121314	142064	17.1	5443	
26	Eluru	14.55	Municipal Corporation	WG	212866	215804	1.4	14781	
27	Nuzvid	28.69	Second	KRI	42685	50354	18.0	5794	
28	Gudivada	12.67	Special	KRI	101656	113054	11.2	8923	
29	Pedana	20.72	Third	KRI	27497	29613	7.7	1429	

Sl. No	Name of the Region/ ULB	Area of ULB (in Sq.kms)	Grade	District	Population as per 1991 census	Population as per 2001 census	Growth Rate	Population Density	Area of Interest
1	2	3	4	5	6	7	8	9	10
30	Machilipatnam	26.67	Special	KRI	159110	179353	12.7	6725	
31	Jaggayyapet	34.11	Second	KRI	36122	40373	11.8	1718	

Group-2

List Of Towns For Which Base Maps Are To Be Prepared									
Sl. No	Name of the Region/ ULB	Area of ULB (in Sq.kms)	Grade	District	Population as per 1991 census	Population as per 2001 census	Growth Rate	Population Density	Area of Interest
A	Guntur								Present area of the ULB mentioned
1	Tenali (VGTM UDA)	15.11	Special	GNT	143726	153756	7.0	10183	
2	Mangalagiri (VGTM UDA)	17.53	Third	GNT	59152	63349	7.1	6211	

3	Tadepalli (VGTM UDA)	12.44	Nagar Panchayat	GNT	28942	41699			d in column 3.
4	Repalle	10.97	Second	GNT	36943	42539	15.1	3867	
5	Bapatla	17.97	Second	GNT	62536	68397	9.4	3821	
6	Vinukonda	2.59	Third	GNT	34607	52519	51.8	1401	
7	Piduguralla	31.12	Third	GNT	35040	50127			
8	Narasaraopet	7.65	First	GNT	88726	95349	7.5	12383	
9	Chilakaluripet	19.28	First	GNT	79142	91656	15.8	5064	
10	Ponnur	26.14	Second	GNT	54363	57640	6.0	2208	
11	Sattenapalle	21.88	Third	GNT	45442	51404	13.1	2347	
12	Macherla	10.36	Second	GNT	43987	49221	11.9	3646	
13	Markapur	28.77	Second	PKM	45563	58462	28.3	2553	
14	Ongole	25.00	Selection	PKM	128648	153829	19.6	5655	
15	Chirala	13.29	First	PKM	108467	129242	19.2	3497	
16	Kandukur	60.92	Second	PKM	41336	50326	21.7	699	
17	Kavali	22.95	Second	NLR	65910	85616	29.9	3722	
18	Gudur	9.42	Second	NLR	55984	68782	22.9	7317	
19	Venkatagiri	8.16	Third	NLR	27637	31341	13.4	2957	
20	Nellore	48.39	Municipal Corporation	NLR	316606	404775	27.8	4605	
B	Ananthapur								
21	Chittoor	33.47	Selection	CHI	133462	152654	14.4	4543	
22	Palamaneru	26.24	Third	CHI	35531	43493			
23	Madanapalli	15.41	First	CHI	73820	107449	45.6	8596	
24	Punganur	15.46	Third	CHI	33882	44314	30.8	1372	
25	Nagari	5.96	Third	CHI	20485	24372	19.0	4062	
26	Srikalahasthi (TUDA)	24.50	Second	CHI	61578	70854	15.1	5493	
27	Puttur (TUDA)	8.55	Third	CHI	25158	29436	17.0	3423	
28	Ananthapur	16.34	Municipal Corporation	ATP	174924	243143	39.0	5118	
29	Tadipatri	7.45	First	ATP	71068	86843	22.2	11579	
30	Hindupur	38.16	Selection	ATP	104651	125074	19.5	3274	

31	Dharmavaram	40.45	Second	ATP	78961	103357	30.9	2552	
32	Kadiri	43.72	Second	ATP	63378	76252	20.3	2944	
33	Rayadurg	49.73	Second	ATP	40845	54125	32.5	1089	
34	Guntakal	51.93	First	ATP	107592	117103	8.8	2863	
35	Kadapa	67.66	Municipal Corporation	KDP	140660	148039	4.0	4318	
36	Pulivendula	87.17	Nagar Panchayat	KDP	28317	38566			
37	Jammalamadugu	24.82	Nagar Panchayat	KDP	46133	40514	-12.2	1634	
38	Proddutur	7.12	Special	KDP	133914	150309	12.2	21170	
39	Budvel	6.31	Third	KDP	13679	15282			
40	Rayachoty	39.78	Third	KDP	51931	72297	39.2	1817	
41	Rajampeta	20.60	Nagar Panchayat	KDP	26181	45597			
42	Nandyal	15.42	Special	KUN	119813	157120	31.1	10137	
43	Adoni	28.27	Special	KUN	136182	162458	19.3	5470	
44	Yemmiganur	14.50	First	KUN	65089	76411	17.4	5270	
45	Dhone	2.59	Nagar Panchayat	KUN	33434	56450			

Group-3

List Of Towns For Which Base Maps Are To Be Prepared									
Sl. No	Name of the Region/ ULB	Area of ULB (in Sq.kms)	Grade	District	Population as per 1991 census	Population as per 2001 census	Growth Rate	Population Density	Area of Interest
A	Warangal								Present area of the ULB mentioned in column 3.
1	Warangal	70.00	Municipal Corporation	WGL	461123	579216	25.6	5984	
2	Jangaon	15.54	Third	WGL	34305	43996	28.2	5866	
3	Kothagudem	16.06	First	KMM	86951	86306	-0.7	5361	
4	Manuguru	28.91	Third	KMM	30076	32893	9.4	1138	
5	Khammam	25.52	Special	KMM	149077	198620	33.2	10736	
6	Sathupalli	2.50	Nagar Panchayat	KMM	20054	28049			
7	Yellandu	6.04	Third	KMM	38675	42421	9.7	3892	
8	Palwancha	26.38	Second	KMM	53102	69088	30.1	2617	
9	Sircilla	12.50	Second	KRM	50048	65314	30.5	5225	
10	Ramagundam	93.87	Municipal Corporation	KRM	214384	237686	10.4	2521	
11	Jagitial	30.00	Second	KRM	67591	85521	26.5	4805	
12	Karimnagar	23.82	Municipal Corporation	KRM	148583	218302	46.9	9172	
13	Korutla	22.79	Second	KRM	40080	54012	34.8	2370	
14	Metpalli	38.85	Third	KRM	31712	41224	38.85		
15	Adilabad	16.47	First	ADB	84255	109529	30.0	6638	
16	Bhainsa	39.01	Third	ADB	29715	41331	39.1	1178	
17	Kagaznagar	12.87	Third	ADB	57535	59734	3.8	4631	
18	Mandamarri	38.85	Third	ADB	66145	66596	0.7	1686	
19	Mancherial	41.44	First	ADB	52657	70381	33.7	1959	
20	Nirmal	14.25	Second	ADB	57761	75254	30.3	5263	

B	Hyderabad							
21	Gadwal	6.14	Second	MBN	40742	53560	31.5	8780
22	Mahaboobnagar	13.70	Special	MBN	116833	139662	19.5	10194
23	Narayanpet	11.86	Third	MBN	33519	37563	12.1	3157
24	Wanaparthy	36.31	Third	MBN	38862	50114	29.0	1829
25	Miryalaguda	21.91	Second	NLD	65879	91359	38.7	4350
26	Suryapet	23.65	First	NLD	60630	94585	56.0	3941
27	Nalgonda	14.14	First	NLD	84910	111380	31.2	9399
28	Vikarabad	60.49	Second	RR	39215	42410	8.2	908
29	Tandur	19.12	Third	RR	45517	57941	27.3	9990
30	Bodhan	21.36	Second	NIZ	64406	71520	11.0	3342
31	Kamareddy	14.10	Second	NIZ	48666	64496	32.5	4574
32	Armoor	18.78	Third	NIZ	34379	4836		
33	Nizamabad	36.86	Municipal Corporation	NIZ	241034	288722	19.8	9466
34	Zaheerabad	5.19	Third	MDK	39613	44589	12.6	8575
35	Medak	16.20	Second	MDK	35775	41945	17.2	1907
36	Siddipet	13.34	Second	MDK	54091	61809	14.3	4633
37	Sadasivapet	19.86	Third	MDK	30915	36334	17.5	1674

Note: The extents of ULBs given are tentative, actual extent may vary slightly. The present extent of ULBs may be obtained from respective ULB/ Census 2001.

ANNEXURE II: FIELD SURVEY FORMATS FOR DATA COLLECTION
Field Survey Format for Data Collection of Buildings/Plots

Date of Survey:

--	--	--	--	--	--

Sheet ID:

--	--	--

Parcel ID:

--	--	--	--

Road ID*:

--	--	--	--

Ward No.:

--	--	--

Locality/Colony Name:

--

Road Name:

--

Land Use*:

--	--

Land Use Details:

--

Type of Construction#:

--	--

Remarks (If Any):

--

Signature of the Surveyor

Signature of Team Leader

***Land Use** - Residential - 01 ; Commercial - 02; Industrial - 03; Private Vacant Plot - 04; Agriculture Land - 05; Mix (Resd + Com) - 06; Mix (Resd + Ind) - 07; Mix (Com + Ind) - 08; Educational - 09; Religious - 10; Recreational¹ - 11; Garden/Park - 12; Historical Monuments - 13; Parking Space- 14; Bus Stand/Taxi Stand/Auto Stand - 15; Water Bodies - 16; Dense Tree Area - 17; Health Services² - 18; Community Toilet - 19; Basic Infrastructure³ - 20; electric Sub Station - 21; Market - 22; Hawkers Zone - 23; Forest - 24; Any other - 25; State Govt. Properties⁴ Building/Plot) - 26; Central Govt. Properties⁵ (Building/Vacant Land) - 27; Water Bodies (Ponds/Lake/Reservoir etc.) - 28; Green Belt - 29; Municipal Asset (Building/Vacant Land) - 30; Landfill site - 31; Hawkers Zone - 32; Railway Properties (Buildings/Land) - 33.

#Type of Construction - Pucca Building with RCC/RBC/Stone roof - 01; Pucca building with asbestos/corrugated sheet roof - 02; others - 03.

1 **Recreational:** Theatre, Club, Health Centre, Swimming Pool, Stadium and Play Ground

2 **Health Services** - Include Govt. Hospitals/Private Hospitals/Diagnostic Centres/ Clinic, Nursing Homes in one parcel

3 **Basic Infrastructure** - Includes Over head Tanks, Landfill sites, Water/Drainage/Sewerage Pumping Stations, Water Treatment Plant

4**State Government Properties** - Includes all type of State Government Properties (Quarter and Offices)

5 **Central Government Properties** - Include all type of State Government Properties (Quarter and Offices)

Date of Survey:

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Sheet ID:

--	--	--

Road ID*:

--	--	--	--

Road Name:

--

Road Type%:

--	--

Construction Material:

Conc rete WBM Asph alt Any Other

Remarks (In case of any other):

--

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DMA

Carr iage Way width h (In metr e):	

ROW width (In meter):

Maintained By:**

Muni cipal Body		R&B Dept.		NHAI		Other	
--------------------------------	--	--------------------------	--	-------------	--	--------------	--

Footpath Status:

Yes		No		Footpat h Width (In case of Yes, in metre)	
------------	--	-----------	--	---	--

Footpath Construction Material:

Sha hba d		Con cret e		Tile		Oth er	
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Consultant
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Field Survey Format for Data Collection of Road

Signature of the Surveyor

Signature of Team Leader

* **Road ID** – Road ID will change in case of junction of Roads/ Change in construction material/ change in width of carriage way/ROW/ change in footpath status/change in maintenance agency

% **Road Type** - Principal Main Road – 01; Main Road – 02; Other Private Street¹ – 03; Other Public Street² – 04; National Highway – 05; State Highway- 06; District Road – 07.

1Private Street: means any street, road, lane, gully, alley, passage or square which is not a public street, and includes any passage securing access to four or more premises belonging to the same or different owners, but does not include a passage provided in effecting a partition of any masonry building amongst joint owners where such passage is less than two metres and fifty cm wide;

2Public Street: means any street, road, lane, gully, alley, passage, pathway, square or courtyard, whether a thoroughfare or not, over which the public have a right of way.

** **Maintained By:** R&B Dept.; NHAI – National Highway Authority of India

Field Survey Format for Hoarding

Date of Survey:

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Sheet ID:

--	--	--

Hoarding ID:

--	--	--

Ward No. :

--	--	--

Road ID:

--	--	--	--

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DMA

Owned By:**Locality Name:****Road
Side:****On
Buildin
g:****Hoarding Category*:**

<input type="text"/>	<input type="text"/>
----------------------	----------------------

Hoarding Size:****Small****Mediu
m****Big****Hoarding Status:****Authori
zed****Unauth
orized**

Signature of the Surveyor

Signature of Team Leader

***Hoarding Category:**

Neon / Glow / Electric Display / Backlit Non-Hoarding type - 01; Slides – 02;; Illuminated Bus Shelters – 03; Bus Shelters advertisements with printed advertisements – 04; Banners – 05; Flags – 06; Pole Panels – 07; Shop Shutter – 08; Closed Circuit TV – 09; Short Films – 10; Medians Printed advertisement - 11; Traffic and Parking Stand – 12; Tree Guards – 13; Others – 14.

****Hoarding size**

Not Required for Hoarding Category no. 07 to 13.

Small - Area Less than 10 sq ft; Medium- Area 10 to 20 sq ft; Big - Area more than 20 sq ft;

Field Survey Format for Garbage Collection Points

Date of Survey:

--	--	--	--	--	--

Sheet ID:

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Pont ID:

--	--	--

Ward No. :

--	--	--

Road ID:

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DMA

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Locality:

--

Garbage Type:

Domestic	<table border="1"><tr><td></td></tr></table>		Market	<table border="1"><tr><td></td></tr></table>		Bio medical	<table border="1"><tr><td></td></tr></table>		Construction	<table border="1"><tr><td></td></tr></table>		Mixed	<table border="1"><tr><td></td></tr></table>	

Status:

Temporary	<table border="1"><tr><td></td></tr></table>		Permanent	<table border="1"><tr><td></td></tr></table>		Collection Point	<table border="1"><tr><td></td></tr></table>		Transfer Point	<table border="1"><tr><td></td></tr></table>	

Coverage Area (No. of Houses/colonies)

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Signature of the Surveyor

Signature of Team Leader

Consultant
DMA

Field Survey Format for Street Light

Date of Survey:

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Sheet ID:

--	--	--

SLID:

--	--	--

Ward No. :

--	--	--

Road ID:

--	--	--	--

Consultant
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Locality Name:

Pole Type:

Iron	<input type="text"/>	Concrete	<input type="text"/>	Other	<input type="text"/>
------	----------------------	----------	----------------------	-------	----------------------

Street Light Type:

HP MV/ Sodium Type	<input type="text"/>	Tube Light	<input type="text"/>	CFL	<input type="text"/>	High Mast	<input type="text"/>	Other	<input type="text"/>
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Source of Energy:

Electricity	<input type="text"/>	Solar	<input type="text"/>	Other	<input type="text"/>
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Signature of the Surveyor

Signature of Team Leader

Consultant
DMA

Field Survey Format for Bridges/Flyover

Date of Survey:

--	--	--	--	--	--

Sheet ID:

--	--	--

Bridge ID:

--	--	--

Ward No. :

--	--	--

Road ID:

--	--	--	--

Locality Name:

--

Bridge Type*:

--	--

Length (In Metre)

--	--

Width (In Metre)

--	--

Construction

Material:

**Conc
rete**

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Iron

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**Maso
nry**

--

**Any
other**

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--	--	--	--

Construction**Year :**

Signature of the Surveyor

Signature of Team Leader

* **Bridge Type:** Culvert – 01; Road Over Bridge – 02; Road Bridge Constructed Over Railway Line – 03; Bridge Across River or Nala – 04; Under Pass – 05; Foot Over Bridge – 06.

Field Survey Format for Data Collection of Water Supply Network**Date of Survey:**

--	--	--	--	--	--

Sheet ID:

--	--	--

Water Supply Network ID:

--	--	--	--

Road Name:

--

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Locality Name:

Distance from Road (In Mts)

--	--

Construction Material#:

PSC D M RCC G A C PVC HDPE Othe
I S I I C I I r

Remarks (In case of any other)

Network Line Type:

Distri butio n Line	<input type="text"/>	Pump ing Line	<input type="text"/>	Servi ce Line	<input type="text"/>	Raw Water Main	<input type="text"/>
------------------------------	----------------------	---------------------	----------------------	---------------------	----------------------	----------------------	----------------------

Pipe Diameter (in mm)

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Consultant
DMA

Signature of the Surveyor

Signature of Team

Leader

#Construction Material: PSC- Pre-Stressed Concrete,- DI- ductile Iron ,MS- Mild Steel, RCC – Reinforced Cement Concrete; GI – Galvanized Iron; CI – Cast Iron; PVC - Polyvinyl chloride (Plastic Pipe), HDPE- High Density Poly ethylene .

Field Survey Format for Data Collection of Drainage Network**Date of Survey:**

--	--	--	--	--	--

Sheet ID:

--	--	--

Drainage ID:

--	--	--	--

Road Name :

--

Consultant
DMA

Locality Name:

--

Distance from Road (In Mts)

--	--

Drainage Construction Type :

**Box
Channe
l**

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**Open
Channe
l**

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Depth of Drainage: (in Mts)

--	--

Network Line Type :

**Main
Line**

--

**Draina
ge
Pumpi
ng line**

--

**Servic
e Line**

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Signature of Team Leader

Signature of the Surveyor

Field Survey Format for Data Collection of Sewerage Network

Date of Survey:

Consultant
DMA

--	--	--	--	--	--

Sheet ID:

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Sewerage Network ID:

--	--	--	--

Road Name :

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Locality Name:

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Construction Material#:

R		S		G		A		C		P		O	
C		W		I		C		I		V		t	
C		G								C		h	
												e	

Consultant
DMA

						r	
						s	

Remarks (In case of any other)

--

Network Line Type:

Sewer Line		Sewerage Pumping Line		Service Line	
-----------------------	--	--------------------------------------	--	-------------------------	--

Pipe Diameter (in mm)

--	--	--

Signature of the Surveyor

Signature of Team Leader

#Construction Material: RCC – Reinforced Cement Concrete; SWG- Stone Ware Glazed , GI – Galvanized Iron; CI – Cast Iron; PVC Polyvinyl chloride (Plastic Pipe).

Field Survey Format for Other Basic Infrastructure

Date of Survey:

--	--	--	--	--	--

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Sheet ID:

--	--	--

ID:

--	--	--

Road Name :

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Locality Name:

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Other Basic infrastructure*:

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Description if any :

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Capacity :**

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Status

Workin

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☐

Not

Workin

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☐

Signature of the Surveyor
Leader

Signature of Team

***Other Basic Infrastructure:** Telephone/Cell Phone Tower – 01; Electric Substation of 33 KVa or more – 02; Water Treatment Plant – 03; Drainage Pumping Station – 04; Water pumping Stations – 05; Over head Tanks – 06; Sewerage Treatment Plant – 07; Telephone Exchange – 08; Slaughter House – 09; Community toilet – 10; Fire Stations – 11; Tube Well – 12; Hand Pump – 13; Bus shelters – 14; Water Supply Valves – 16; Sluice Valve – 17; Hydrant – 18, Vent Shaft – 19; Sewerage Pumping Station – 20; Man Hole – 21

**** Capacity:** Should be filled only for Electric Substation of 33 KVa or more – 01; Water Treatment Plant – 02; Drainage Pumping Station – 03; Water pumping Stations – 04; Over head Tanks – 05; Sewerage Treatment Plant – 06. Sewerage Pumping Stations – 20.

ANNEXURE II (a): ATTRIBUTES FOR SURVEY AND BASE MAP

Finalization of layer wise base map with the following attributes:

i) Building, Plots/Vacant Lands

During the survey, a Unique ID should be marked for each building / plots and the data is to be collected as per the format given in Annexure II. Consultant will propose the methodology for generation of Unique ID structure for map features and GIS database in their technical proposal.

ii) Roads

All types of roads / streets within the AOI will be surveyed and incorporated in the base map as per the format given in Annexure II. It includes National Highway, State Highway, District Roads, Principal Main Road, Main Road, Street (Public and Private).

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Every road needs to be given a unique ID and the consultant will propose the methodology for its generation in their technical proposal.

iii) Drainage and Sewerage Network

Drainage and sewerage network within the AOI is to be marked and incorporated in the base map with support of ULB staff as per the format given in Annexure II. Manholes are also to be covered and marked with Drainage/Sewerage network.

iv) Water Supply Network

The water supply network is to be marked and incorporated on to the base map with support of ULB staff as per the format given in Annexure II.

v) Slum Boundaries

Each slum area is to be marked and digitized by image interpretation along with individual building footprints. Survey and the data for each slum available with client or concerned ULB should be integrated in GIS. The data on each individual dwelling unit is available for all slum areas in each ULB. The consultant will take the help of the data to update the base map and data collection as per the format given in Annexure II. The data collected and supplied is to be reconciled before linking in GIS environment.

vi) Street Lights

Street light within the AOI is to be surveyed and incorporated on to the base map. The field survey data collection format is given in the Annexure II.

vii) Hoardings

All the hoardings by the side of road, building and land (public/private) are to be surveyed and

data collected as per the format given in Annexure II.

viii) Bridges/ Flyovers

The data for bridges/flyover is to be collected as per the format given in Annexure II and incorporated in the base map.

ix) Garbage Collection Centres

The data for garbage collection centres is to be collected as per the format given in Annexure II

and incorporated in base map.

ix) Environmental Data Integration

The consultant needs to create contour maps from the environmental point source data supplied

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by the client for following:

- Air Quality
- Trees
- Water Quality
- Soil
- Noise
- Health

x) Other Features

Other features which are listed in the layer list provided at Annexure III, like traffic squares, water bodies, etc., are to be updated at the time of survey and incorporated in the base map with database. Important landmarks should also be taken correctly on the plots with proper information for the final base map. For other layers, for which format is not given, the data should be collected as specified in Table – Details of Layer for Base Map.

ANNEXURE III: DETAILS OF THE LAYERS FOR BASE MAP

S.N	Layer Name	Victor Represe ntation	Data Source	Attribute Data	Remarks
1	Municipal Boundary	Polygon	ULB and Field Survey	ID and ULB Name	Provided by concerned ULB
2	Area of Interest Boundary	Polygon	ULB and Field Survey	ULB Name	The Area of Interest (AoI) is the present administrative area of the

					ULB plus the vicinity area of atleast 5 KM radial distance out side the ULB
3	Ward Boundary	Polygon	ULB and Field Survey	ID, Ward No. Zone No. and Ward Name	Provided by concerned ULB
4	Zone Boundary	Polygon	ULB and Field Survey	ID, Zone No., Zone Name	Provided by concerned ULB
5	Tax Zone Boundary	Polygon	ULB and Field Survey	ID, Tax Zone No. Tax Zone Name	Provided by concerned ULB
6	Industrial Zones/Area	Polygon	ULB and Field Survey	ID, Locality	Provided by concerned ULB
7	Colony Boundary	Polygon	ULB and Field Survey	ID, Ward No, Name	
8	Slum Boundary	Polygon	ULB, Imagery and Field Survey	ID, Slum No., Locality	Provided by concerned ULB
9	Buildings/Plots etc.	Polygon	Imagery and Field Survey	Parcel ID, Ward No., Locality/Colony Name, Road ID, Road Name Land use, Land Use Details, Construction Type, Remarks	Unique ID for each buildings/Plots
10	Streams/Drainage/ Canal	Double Line	Imagery and Field Survey	ID, Type of water bodies	Canal, Drainage, River and Streams
11	Over Head Tanks	Polygon	Imagery, ULB and Field Survey	ID, Ward No., Locality, Road ID, Capacity, Status	

12	Landfill Site	Polygon	ULB and Field Survey	ID, Road ID, Ward No., Locality	
13	DGPS Points	Point	Field Survey	ID, Latitude, Longitude, Height	
14	Sewerage Network/Drainage Network	Line	PHED, ULB and Field Survey		It should be marked in the field with the help of ULB Staff of Water supply & Sewerage Department
15	Manholes	Point	PHED, ULB and Field Survey	ID, Road ID, Ward No., Locality	
16	Water Supply Network	Line	PHED, ULB and Field Survey	It should be as per format given in Annexure II	
17	Vent Shaft	Point	ULB and field Survey	ID, Road ID, Size, Ward No, Locality, Description, Status	
18	Hoardings	Point	Field Survey	ID, Road ID, Ward No., Owned By, Locality Name, Hoarding Category, Hoarding Size, Location Status (Road Side/ On Building) (Authorized/Unauthorized),	

S.N	Layer Name	Vector Representation	Data Source	Attribute Data	Remarks
19	Drainage Pumping Station	Point	PHED, ULB and Field Survey	ID, Road ID, Capacity, Ward, Locality, Description	
20	Water treatment plant	Point	PHED, ULB and Field Survey	ID, Road ID, Capacity, Ward, Locality, Description	Pumping Station, and Treatment Plant data can be collected from concerned ULB
21	Fire Stations	Point	Field Survey,	ID, Road ID, Capacity,	

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			ULB	Ward, Locality, Description	
22	Garbage Collection Points - Secondary	Point	Field Survey, ULB	ID, Road ID, Ward, Locality, Garbage Type, Status, Coverage Area (No. of Houses/ Colonies)	Garbage Collection Points and Transfer Points
23	Slaughter House	Point	Field Survey, ULB	ID, Road ID, Ward No, Locality	
24	Street Light	Point	Field Survey, ULB,	ID, Road ID, Ward No, Locality, Pole Type, SL Type, Source of Energy	
25	Bridges / Flyover	Line	Imagery and Field Survey	ID, Road ID, Ward No, Locality, Bridge type, Length, Width, Construction Material, Construction Year	Culverts, Fly over, all type of bridges
26	Parks/Garden	Polygon	Imagery, ULB and Field Survey	ID, Road ID, Ward No, Locality, Type, Name	Park, Garden, Zoological Park, Botanical Park
27	Tube Well	Point	ULB, PHED and Field Survey	ID, Road ID, Ward No, Locality, Description, Status	
28	Hand Pump	Point	Field Survey	ID, Road ID, Ward No, Locality, Description, Status	
29	Community Toilet	Point	Field Survey	ID, Road ID, Ward No, Locality, Description, Status	
30	Cell Phone Tower	Point	Field Survey	ID, Road ID, Ward No., Locality, Road, Description, Status	
31	Water Pumping Stations	Point	ULB and Field Survey	ID, Road ID, Ward No., Locality, Description, Status	
32	Traffic Square	Point	Imagery and Field Survey	ID, Road ID, Name	
33	Railway	Line	Imagery and Field Survey	ID, Type	Broad Gauge/Meter Gauge/.
34	Contours	Line	Field Survey	ID, Height	Generated at 1.0 metre interval
35	Power Supply	Line	Field Survey	ID, Type (11KVa/	

	Network			33KV _a	
--	---------	--	--	-------------------	--

S.N	Layer Name	Victor Representation	Data Source	Attribute Data	Remarks
36	Electric Transformers	Point	Field Survey	ID, Road_ID, Ward No., Location	
37	Landmarks	Point	Imagery and Field Survey	ID, Road ID, Ward, Locality, Type, Name, Description, Status	Major Hospitals, Govt. Buildings, Historical Monuments, Post Office, Police Stations, Major Industries, and Commercial Places, Electric Substations of 33 KVa or more, Telephone Exchange, etc. At least one Landmark should be marked at every 500 mts.
38	Road Network	Line	Imagery and Field Survey	Road ID, Type, Road Median (Yes/No); Construction	

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DMA

				Material, Name, Carriage Way width, ROW width, Maintained By, Footpath Status, Footpath Width, Footpath material,	
39	Carriage Way	Double Line	Imagery and Limited Field Survey	ID, Road ID, Width	
40	Footpath	Line	Imagery and Field Survey	ID, Type, Road ID, Construction Material, Width	
41	Sewage Treatment Plant and Sewage Pumping Station	Point	PHED, ULB and Field Survey	ID, Road ID, Type (STP/SPS) Capacity, Ward, Locality	
42	Cell Phone Tower/ Telephone Tower	Point	ULB and Field Survey	ID, Ward No., Locality, Road ID, Parcel ID, Description	
43	Bus Shelters	Point	ULB and Field Survey	ID, Ward No., Locality, Road ID, Description	
44	Cadastral Map/Town Survey Maps	Polygon	From ULB and Land Records Department	ID, Khasra No.	

DMA

						ages / Maps (Soft Copy)												
Sl. No	Region	Name of the Town	Grade	Maps to be updated	Maps to be Prepared	APU SP/ NUIS	Satellite Image	Year of Image	Final digitised map available ready for use Yes/ No	1:1000 maps available Yes/ No	1:5000 maps available Yes/ No	Mosaic maps available Yes/ No	Base Map 1:8000	Master Plan 1:8000	Year of sanction of MP	Extent of Municipal Limits (in sq.kmts.)	Extent of Master Plan Limits (in sq.kmts.)	

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DMA

						g e s a v a i l a b l e Y e s / N o												
1	Raja hmu ndry	Eluru	M p l · C o r p n ·	Yes	-	APU SP	Y E S	2004	YES	Y E S	YES	Y E S	-	-	1975	-	-	
2		Tadepalligud em	I	Yes	-	APU SP/ NUI S	-	-	-	-	-	-	YES	-	1988	-	-	
3		Gudivada	S p	Yes		APU SP	Y E	2004	YES	Y E	YES	Y E	-	-	1987	-	-	

Consultant

DMA

			I				S			S		S					
4		Machilipatnam	S p l	Yes	-	APU SP	Y E S	-	-	-	-	-	YES	YES	1978	26.67	39.1 2 (Revised)
5		Tanuku	I	Yes	-	-	-	-	-	-	-	-	YES	YES	2000		
6		Bhimavaram	S p l	Yes	-	APU SP	Y E S	2005	YES	Y E S	YES	Y E S			1987		
7		Palacole	I	Yes	-	-	-	-	-	-	-	-	YES	YES	2002		14.3
8		Narsapur	I	Yes	-	-	-	-	-	-	-	-	YES	YES	2002	11.32	14.88
9		Amalapuram	I	Yes	-	-	-	-	-	-	-	-	YES	YES	2004		11.1
10		Tuni (VUDA)	I I I	Comes under VUDA													
11		Pithapuram	2 n d	-	-	-	-	-	-	-	-	-	Yes	Yes	2004	19.56	-
12		Samalkot	2 n d	-	-	-	-	-	-	-	-	-	Yes	Yes	2002	23.97	-
13		Mandapet	2 n d	-	-	-	-	-	-	-	-	-	Yes	Yes	2000	21.64	12.74
14		Ramachandrapuram	2 n d	-	-	-	-	-	-	-	-	-	Yes	Yes	2000	13.97	-

Consultant

DMA

15		Peddapuram	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2003	38.23	-
16		Nidadavole	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2000	-	15.46
17		Kovvur	3rd	-	-	-	-	-	-	-	-	-	Yes	Yes	1996	16.05	-
18		Nuzvid	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2000	28.69	-
19		Jaggayyapeta	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2003	34.11	18.30
20		Pedana	3rd	-	-	-	-	-	-	-	-	-	Yes	Yes	1995	12.86	-
21	Visakhapatnam	Srikakulam (VUDA)	I	Yes	-	APU SP/ NUIS	-	-	-	-	-	-	Yes	Yes	2000	-	-
22		Parvathipuram	I	Yes	-	-	-	-	-	-	-	-	Yes	Yes	2005	-	-
23		Ichapuram	3rd	-	-	-	-	-	-	-	-	-	-	-	2008	11.24	-
24		Palasa-Kasibugga	3rd	-	-	-	-	-	-	-	-	-	-	-	-	-	32.75
25		Bobbili	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2005	25.60	-
26		Saluru	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2008	-	19.54
27		Amadalaval	3rd	Comes under													

Consultant

DMA

		asa (VUDA)	r d	VUDA								
28		Rajam (VUDA)	N . P .	Comes under VUDA								
29		Vizianagara m (VUDA)	S e l e c t i o n	Comes under VUDA								
30		Anakapalle (VUDA)	1 s t	Comes under VUDA								
31		Bheemunipatnam (VUDA)	2 n d	Comes under VUDA								

Note: The above data is available with The Director, Town and Country Planning, Hyderabad/ Concerned Urban Development Authority.

Annexure -IV

DETAILS OF TOWNS FOR WHICH GIS IS TO BE PREPARED UNDER APMDP

Sl. No	Region	Name of the Town	Grade	Maps to be updated	Maps to be Prepared	APUS P/ NUIS	Availability of Satellite Images/Maps (Soft Copy)						Availability of Maps (Digitised)		Year of sanction of MP	Extent of Municipal Limits (in sq.kmts.)	Extent of Master Plan Limits (in sq.kmts.)
							Satellite Images available Yes/ No	Year of Image	Final digitised map available ready for use Yes/ No	1:1000 maps available Yes/ No	1:5000 maps available Yes/ No	Mosaic maps available Yes/ No	Base Map 1:8000	Master Plan 1:8000			
1	Anantapur	Adoni	Spl.	Yes	-	APUS P	YES	2004	YES	YES	YES	YES	-	-	1987	28.27	42.43
2		Nandyal	Spl.	Yes	-	APUS P	-	-	-	-	-	-	YES	YES	1990	15.21	42.88
3		Guntakal	I	Yes	-	APUS P	YES	2004	YES	YES	YES	YES	-	-	1986	26.39	40.85
4		Ananthapur	Mpl.C orpn.	Yes	-	APUS P	YES	2002	YES	YES	YES	YES	-	-	1981	16.34	-
5		Tadipatri	I	Yes	-	-	-	-	-	-	-	-	YES	YES	1996	7.86	32.98
6		Hindupur	Selecti on	Yes	-	APUS P	YES	2002	YES	YES	YES	YES	-	-	1993	39.18	37.6
7		Yemmiganur	I	Yes	-	-	-	-	-	-	-	-	YES	YES	2000	16.83	17.43
8		Dhone	N.P	Yes	-	-	-	-	-	-	-	-	YES	-	NEW MPLT	-	-

															Y			
9		Srikalahas thi (TUDA)	II	C o m e s u n d e r T U D A														
10		Puttur (TUDA)	III	C o m e s u n d e r T U D A														
11		Proddutur	Spl	Ye s	-	APUS P	YES	200 6	YES		YES	YES	Hard copy availa ble	1989		7.13	30.47	
12		Budvel	III	-	Yes	-	-	-	-	-	-	-	-	-	NEW MPLT Y	-	-	
13		Rayachoty	III	-	Yes	-	-	-	-	-	-	-	-	-	NEW MPLT Y	-	-	
14		Palamaner u	III	-	Yes	-	-	-	-	-	-	-	-	-	NEW MPLT	-	-	

															Y			
15		Rajampeta	N.P	-	Yes	-	-	-	-	-	-	-	Hard copy available	not yet prepared	NEW MPLTY	-	-	
16		Jammalamadugu	N.P	-	Yes	-	-	-	-	-	-	-	-	-	NEW MPLTY	-	-	
17		Kadapa	Mpl.C orpn.	Yes	-	APUS P	YES	2004	YES	YES	YES	YES	YES	draft MP(rev) u/p	1981	6.766	21.3	
18		Pulivendula	N.P	Yes	-	-	-	-	-	-	-	-	YES	YES	2009	87.17	113	
19		Chittoor	Selection	Yes	-	APUS P	YES	2002	YES	YES	YES	YES	YES	YES	1986	-	33.57	
20		Madanapalle	I	Yes	-	NUIS	-	-	-	-	-	-	YES	Hard copy available	2001	15.41	22.4	
21		Dharmavararam	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	1993	36.42	32.05	
22		Kadiri	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2001	43.72	44.47	
23		Rayadurg	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2001	39.00	44.52	
24		Punganur	3rd	-	-	-	-	-	-	-	-	-	Yes	Yes		15.46	17.04	
25		Nagari	3rd	-	-	-	-	-	-	-	-	-	-	-		-	-	
26	Gu ntu r	Narasaraopet	1st	-	-	-	-	-	-	-	-	-	Yes	Yes	1993	5.40	14.20	
27		Chilakaluri pet	1st	-	-	-	-	-	-	-	-	-	Yes	Yes	1996	19.28	-	
28		Bapatla	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	1996	-	17.92	
29		Ponnur	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	1993	26.15	12.16	
30		Repalle	2nd	-	-	-	-	-	-	-	-	-	Yes	Yes	2000	10.97	29.95	
31		Sattenapalle	3rd	-	-	-	-	-	-	-	-	-	Yes	Yes	1993	21.87	-	

[illegible]

		(VGTM UDA)		o m e s u n d e r V G T M U D A												
40		Ongole														
41		Vinukonda														
42		Piduguralla														
43		Chirala														
44		Nellore														
45		Venkatagiri														
Note: The above data is available with The Director, Town and Country Planning, Hyderabad/ Concerned Urban Development Authority.																

Annexure -IV

DETAILS OF TOWNS FOR WHICH GIS IS TO BE PREPARED UNDER APMDP

							Avai labil ity	Availability of Maps (Digitised)			
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							of Satil lite Ima ges/ Map s (Sof t Cop y)										
Sl. N o	Region	Name of the Town	Grade	Ma ps to be upd ate d	Maps to be Prepar ed	APU SP/ NUI S	Satte llite Imag es avail able Yes/ No	Yea r of Ima ge	Final digi tised map avail able read y for use Yes/ No	1:1000 maps availab le Yes/ No	1:5 000 ma ps ava ilab le Yes / No	Mosa ic maps avail able Yes/ No	Base Map 1:8000	Ma ste r PI an 1:8 00 0	Year of sanctio n of MP	Exten t of Munic ipal Limit s (in sq.km ts.)	Exten t of Mast er Plan Limit s (in sq.k mts.)
1	Waranga l	Adilab ad	I	Yes	-	APU SP/ NUI S	-	-	-	-	-	-	Hard copy availabl e	1988		16.47	
2		Nirmal	II	Yes	-		-	-	-	-	-	-	Yes	Yes	1990	-	-
3		Karim nagar	Mpl.C orpn.	Yes	-	APU SP	YES	200 4	YES	YES	YES	YES	Yes	-	1982	-	-
4		Jagitia l	II	Yes	-	-	-	-	-	-	-	-	Yes	Yes	1988	-	-
5		Kotha gudem	I	Yes	-	-	-	-	-	-	-	-	Yes	Yes	1975	-	57.47
6		Manug uru	III	-	Yes	-	-	-	-	-	-	-			NEW MPLTY		

[illegible]

21	Hyderab ad	Miryal aguda	II	Yes	-	-	-	-	-	-	-	-	YES	YE S	1987	44.47	-
22		Surya pet	I	Yes	-	-	-	-	-	-	-	-	Hard copy availabl e		1982	-	
23		Nalgo nda	I	Yes	-	APU SP/ NUI S	-	-	-	-	-	-	Hard copy availabl e		1987	-	
24		Nizam abad	Mpl.C orpn.	Yes	-	APU SP	YES	200 4	YES	YES	YE S	YES	Hard copy availabl e		1974		
25		Siddip et	II	Yes	-	-	-	-	-	-	-	-	Hard copy availabl e		1987	3.17	
26		Zahee rabad	III	Yes	-	-	-	-	-	-	-	-	YES	YE S	1987	5.6	13.06
27		Medak	II	Yes	-	-	-	-	-	-	-	-	YES	YE S	1992	16.52	25.57
28		Kamar eddy	II	-	-	-	-	-	-	-	-	-	Yes	Ye s	2000	14.10	-
29		Gadw al	II	Yes	-	-	-	-	-	-	-	-	YES	YE S	1990	6.14	17.48
30		Mahab oobna gar	Spl.	Yes	-	APU SP	YES	200 1	YES	YES	YE S	YES	YES	YE S	1978		32.27 (Revi sed)
31		Vikara bad	II	Yes	-		-	-	-	-	-	-	YES	un der pre -	2007	63.97	-
32		Tandur	3rd	-	-	-	-	-	-	-	-	-	es	Ye s	2000	5.82	18.25
33		Sadas i vapet	3rd	-	-	-	-	-	-	-	-	-	Yes	Ye s	2000	21.73	-

Note: The above data is available with The Director, Town and Country Planning, Hyderabad/ Concerned Urban Development Authority.