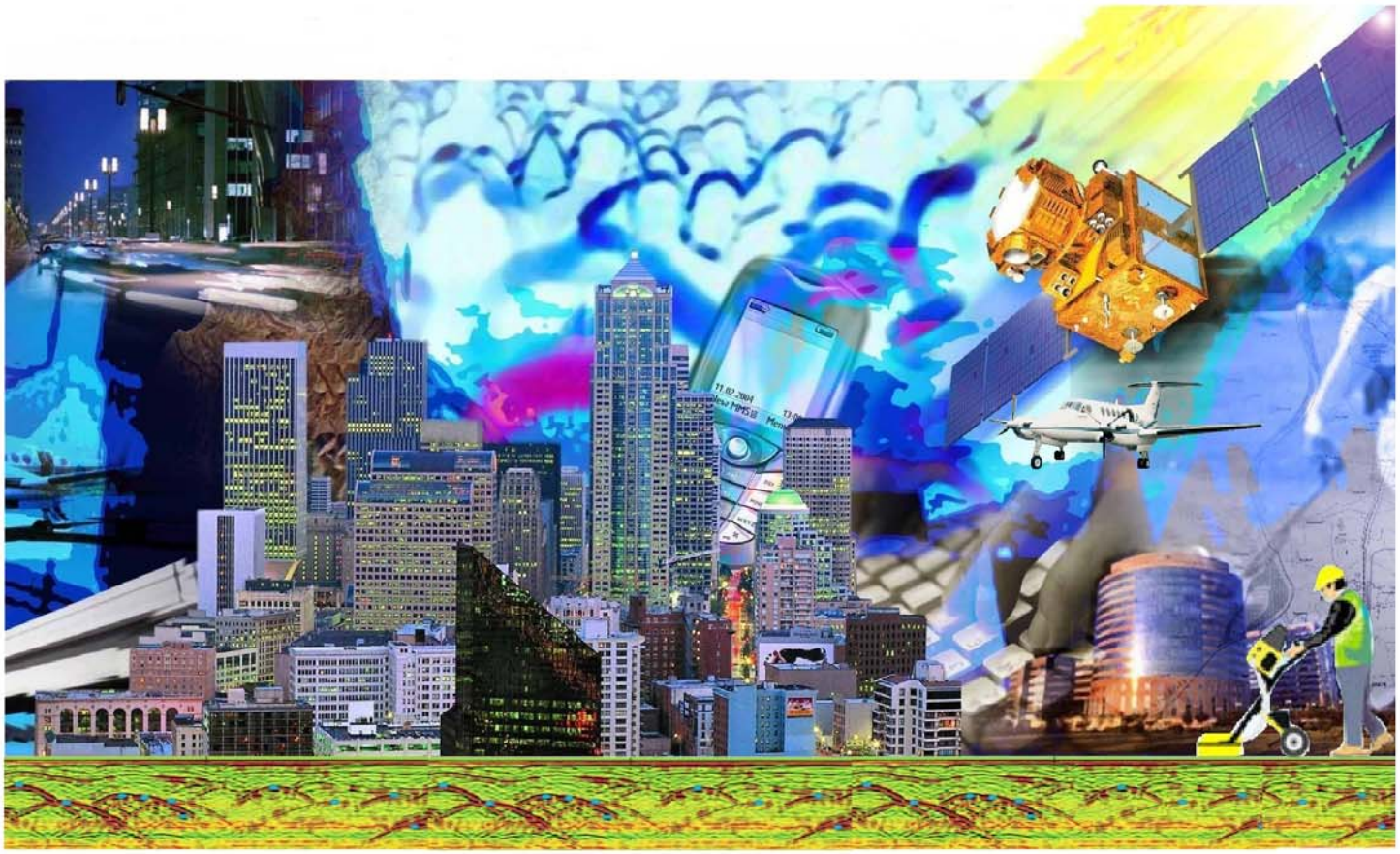
National Urban Information System (NUIS)
Design and Standards



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1.0 INTRODUCTION

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The Planning Commission (PC), Government of India set up the National Natural Resources Management System (NNRMS) in 1983 to facilitate optimal utilization of the country's natural resources through a proper and systematic inventory of the resource availability and reduce regional imbalances through effective planning under the guidance of the Department of Space (DOS). Ten Standing Committees corresponding to various sectors/ministries support the NNRMS programme. The Standing Committee on Urban Management (SC-U) under NNRMS is to coordinate the application of remote sensing data and GIS techniques in the context of urban planning and management. The SC-U is chaired by the Secretary, Ministry of Urban Development (MOUD), New Delhi.

The SC-U in its inter-agency Peer Review meeting held on February 01, 2000 agreed that development of National Urban Information System (NUIS) on a national scale should be taken up on priority on mission mode. This Meeting was chaired by Secretary, Urban Development and Poverty Alleviation, and attended by Chairman and Secretary, Indian Space Research Organisation (ISRO), Dept. of Space (DOS); besides officers from DOS, MOUD, Town and Country Planning Organisation (TCPO), Mumbai Metropolitan Regional Development Authority (MMRDA), Housing and Urban Development and Corporation (HUDCO), Kolkata Metropolitan Development Authority (KMDA), National Capital Regional Planning Board (NCRPB), Chennai Metropolitan Development Authority (CMDA) and School of Planning and Architecture (SPA) New Delhi. As a follow-up, a Sub-Committee (SC) under the Chairmanship of Chief Planner, TCPO, was constituted to address the implementation and phasing of NUIS Scheme with broad objectives to - a) generate spatial data in terms of maps and images, b) introduce use of modern data sources and methods and c) develop and implement the information system concept to aid as a decision support system in planning and management of urban settlements. The Sub Committee prepared the proposal and submitted the document in May, 2001 and a revised document in September 2002 to the SC-U.

The proposal envisaged coverage of 564 cities/towns including state capitals and Union Territories, 23 Million plus cities, NCR towns and one town from each class (from class II to

class VI) from each State and UT under phase-I of the NUIS Scheme. Ministry of Urban Development (MOUD) has submitted this proposal to the Planning Commission for inclusion of the Scheme under the 10th Five Year Plan. The PC in its review agreed in principle to the proposal, and suggested converging all related schemes like – National Urban Observatory (NUO) and Urban Mapping Scheme into NUIS Scheme. The NUIS proposal was accordingly revised by the Sub Committee to establish town-level GIS database under a single National (Central) Scheme.

Accordingly a centrally sponsored National Urban Information System Scheme was approved by Government of India to be taken up on National Mission Mode. It comprises of broadly two major components - (a) Urban Spatial Information System (USIS) to meet the Spatial (maps / images) data requirements of urban planning and management functions, (b) National Urban Data Bank & Indicators (NUDB&I) to develop town-level urban database to support development of indices through a network of Local Urban Observatories (LUOs) under the National Urban Observatory (NUO) programme.

As a sequel to the proposal, to define and develop the NUIS Scheme Design and Standards, a NUIS Standards Committee (NSC) was constituted on June 12, 2002 by the MOUD (Annexure-I). The Authoring Group of NUIS Design and Standards prepared draft report and revised it in June and September 2005 . The report essentially outlines the content at 1:10000 / 1:2000 / 1:1000 scales, Design standards framework, USIS, NUDB&I and NUO data elements to be adopted as National NUIS Standards.

2.0 TOWARDS NUIS STANDARDS

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Standards are important elements of the NUIS Scheme and are of direct relevance to database standardisation, which makes application and technology work together. Standards encourage efficiency and effectiveness, help reduce costs, protect investments in data against technological change, and can lead to increased availability of more accurate, complete and current data. The data and related activities can be considered at the conceptual, logical and physical levels and standards may be needed at each level.

2.1 Need For Standards

A major problem across the country in application of methods and procedures in urban planning, plan monitoring/implementation and governance has been use of rigid conventional systems varying between various agencies and States with little scope to adapt to the demands of dynamic situations. Consequently in view of availability of modern, efficient data sources and developments in Information and Communication Technology (ICT), and governance, ULBs are unable to optimally utilise the existing technologies in the face of highly varying data classifications, accuracies, scales etc,. Therefore, it has become a prerequisite that the systems and procedures be standardized at a national level and also integrate the databases at various levels starting from sub settlement (Urban / Rural) upwards to district /state/ interstate regions etc.; as conceived under the National Natural Resource Management Systems (NNRMS) Standards. Besides, standards are important not only to facilitate data sharing, increase interoperability but also in development of customized application for planning, monitoring and governance functions.

In continuation of the NUIS initiative, the SC-U decided to develop guidelines and methodologies in terms of development of the NUIS Standards – encompassing standardization of content design, exchange and metadata for the NUIS Scheme. The standards address the different levels of planning and management and have now come out a comprehensive document for the implementation of NUIS Scheme.

The draft NUIS Scheme Standards document was widely circulated and discussed in detail with State Governments, selected urban local bodies and other central agencies in two NUIS

Scheme workshops held during November 19-20, 2003 at New Delhi and November 29-30, 2004 at Bangalore. The deliberation endorsed the following recommendations and these recommendations have been incorporated in document:

- Content Standard for the 3 levels of NUIS Scheme database must be clearly listed/stated. The content can be categorized into most essential and desirable and efforts be made to develop a minimum level database at the respective level.
- NUIS Scheme must incorporate data/layers from all possible sources of mapping/survey, including ground surveys.
- Cadastral data integration is critical and must be included as content in NUIS.
- Similarly, incorporating ward boundaries is important and must form content of NUIS.
- A systematic spatial framework needs to be defined to enable seamless integration of GIS and providing a "holistic" picture of towns/cities.
- Establishment of control points in urban areas is essential to register and link the spatial framework for the GIS.

2.2 Elements of Standards

The NUIS Scheme Repository will have images, thematic maps, GIS database and outputs/services, as per NNRMS Repository Standards (Table 7.1). In NUIS Scheme Standards, a total end-to-end process standardisation has been adopted. Thus, for the Repository to be successfully established and utilised, images are basic inputs and must be generated and made available as per defined standards. These images are used to generate thematic information – the Repository Content and the thematic maps also need to be as per defined standards. If the maps are as per standards, the organisation of the GIS database would be possible without any difficulty. If the GIS database is standardised, then extracting outputs and providing services will also be possible.

In the NUIS Scheme Standards, about 45 parameters (including basic and quality parameters) have been identified for different scales and the values (at 3-sigma limits). The USIS Standard parameters correspond to image, thematic maps, GIS database and outputs/deliverables.

2.2.1 Image Standards

Images, either from satellites or aerial surveys, are the primary input and the starting point for the NUIS Scheme Repository. The images are used to generate the basic content of the USIS – the different thematic and cartographic quality maps.

Eight basic parameters are identified for the USIS Image Standards, including Generic/Standard Resolution, IRS Image Resolutions, National Spatial Framework, Projection & Datum for image outputs, Image Frames, Image Position (Planimetric) Accuracy, and Band-to-Band Registration for XS data.

2.2.2 Thematic Mapping Standards

Thematic Maps result from the interpretation and analysis of images, either from satellites or aircrafts, and are the primary input for the GIS database of the NUIS Scheme Repository. The stringency in parameter values in mapping is to be maintained to enable a good GIS establishment.

Eleven primary parameters are identified for the USIS Thematic Map Standards including National Spatial Framework, Image Registration accuracy, Projection for Maps, Datum for image products, Position (Planimetric) Accuracy, Minimum Mappable Unit (MMU), DEM Z-Spacing, DEM Z-Accuracy, Accuracy of Classification and Map Formats.

2.2.3 GIS Database Standards

GIS database is the core of the NUIS Scheme Repository and results from the digitisation and ingest of thematic maps, either from satellites or aircrafts. The stringency in the parameter values in images and mapping have considerable bearing on the precision achievable at GIS database end. Further, the accuracies of the outputs/services from the NUIS Scheme would depend upon the GIS database Standards.

Thirteen basic parameters are identified for the USIS GISDB Standards, including National Spatial Framework, Tie-Point Intervals for Spatial Framework, Coordinate units, Projection

for GISDB, Datum for image products, Coordinate Precision, Minimum Frame size, GIS DB Tic Registration Accuracy, Position (Planimetric) Accuracy, Coordinate Movement Tolerance (CMT), Weed Tolerance (WT), Sliver Polygon Tolerance (SPT), and Grid Size (for Image/Raster/DEM Layers).

2.2.4 Output Standards

The GIS database would be the core for USIS Output and Services. Seven basic parameters are identified for the USIS Output/Service Standards, including Output Formats, Output Framework, Output Media, Output Projection, Output Datum, Output Formats and Output Symbology.

2.2.5 Quality Certification Standards

As the NUIS Scheme Standards have been developed as a process standard – involving various elements, the Quality Certification (QC) of the NUIS Scheme products would be a function of the Quality Assurance (QA) at the individual process level and the final Quality Evaluation of the product that would be given to the user. The NUIS Metadata would have all the Quality Assurance and Certification parameters – where the concept will be to integrate the individual Quality Evaluation parameters for the total process.

The QC of the final deliverable product would, thus include, an assessment of the individual QA reports and a separate evaluation of the following parameters: National Spatial Framework Accuracy, Position (Planimetric) Accuracy, Accuracy of Classification/Mapping, Minimum Map Unit (MMU), and Scale Distortion Factor for Analog Outputs.

3.0 OBJECTIVES OF NUIS STANDARDS

3

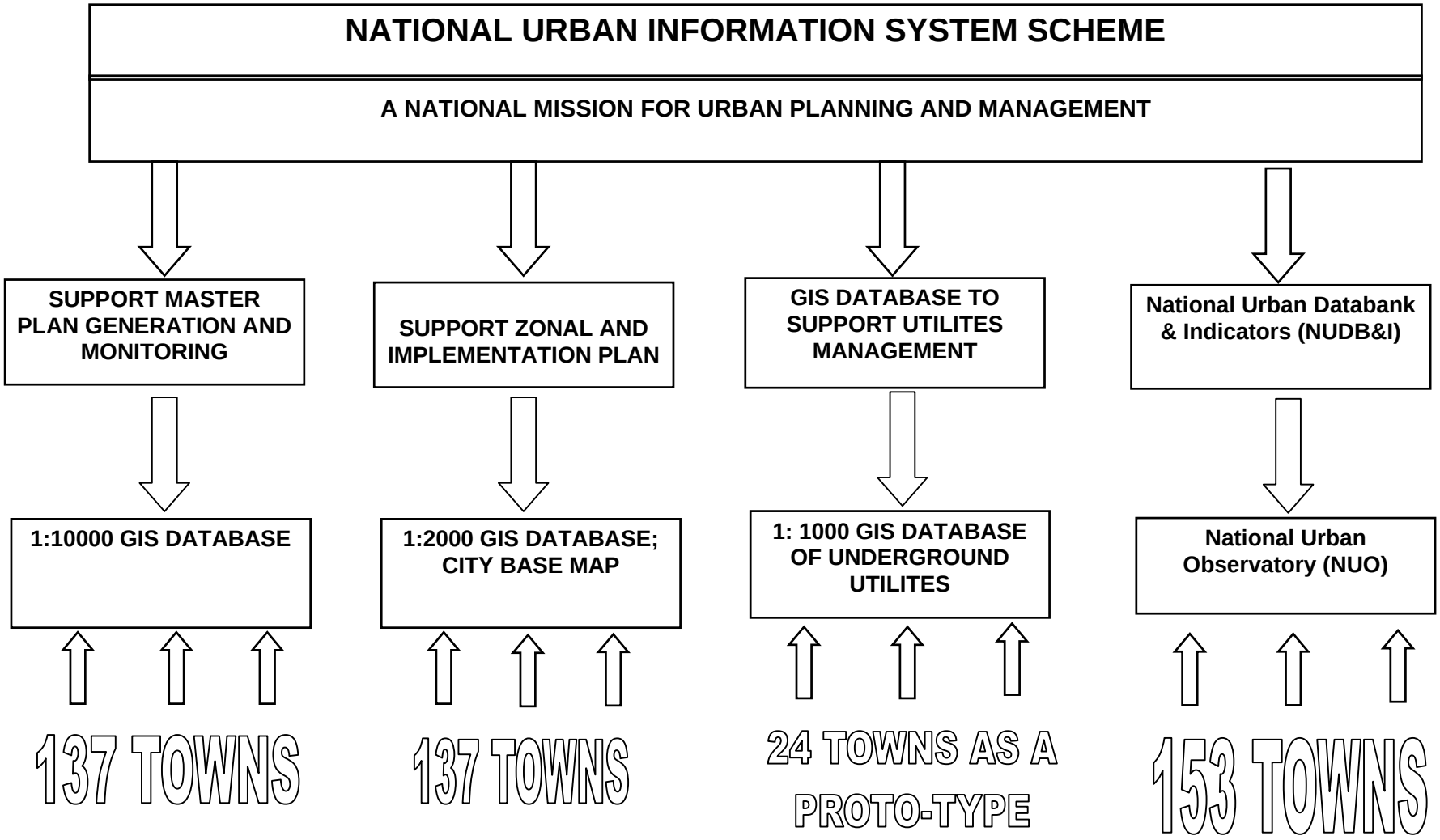
The broad objectives of NUIS Scheme are to design, organise and demonstrate an information system to support urban planning in the country. In particular, they focus on;

a. To identify the volume of data and parameters required for the urban planning, frequency of updating, level of redundancy, level of compilation and nature of processing at different hierarchical levels of urban planning.
b. To standardize the classification system for various thematic layers required for different levels of urban planning.
c. To design a comprehensive urban information system useful to meet the needs of various hierarchical levels of urban planning viz. Perspective, Development and Zonal (TP schemes) plan exercises.
d. To design a comprehensive spatial database as a link for urban planning and management.
e. To develop data (spatial and attribute) integration procedures for spatial planning for the purpose of sustainable development of urban areas.
f. To develop applications, decision support system for area specific planning at different levels (Hierarchy) i.e., Perspective, Development and Zonal level plan exercises.
g. To suggest the hardware/software requirements for NUIS Scheme.

3.1 Urban Spatial Information System (USIS) Objectives

a. Generate a comprehensive 3-tier GIS database of each town/city for urban planning and management.
b. Generate 1:10000 scale GIS-compatible spatial and attribute data to support Master Plan / Development Plan
c. Generate 1:2000 scale GIS-compatible spatial and attribute information to support Municipal Plan / Zonal Plan and detailed Town Planning schemes.
d. Establish a 1:1000 scale utilities GIS mapping using GPR data on a pilot basis to include water-supply and sewerage,
e. Develop integrated urban application driven GIS Packages to be utilized by urban / town planners and municipal / local bodies.

FIGURE-3.1 : Activities of NUIS- Phase-I



3.2 National Urban Databank and Indicators (NUDB&I) Objectives

- Data to be collected by ULBs to support planning, and municipal functions listed in the 12th Schedule of the 74th Constitution Amendment Act (CAA) as part of NUDB&I for each urban settlement.
- Design a database for the NUDB&I towns, which can also be linked to USIS database by ULBs.
- Enable the establishment of a Local Urban Observatory (LUO) in each ULB, which will integrate the NUDB&I databases for all towns within the State through State Nodal Agency.
- Support the National Urban Observatory (NUO) by integrating the NUDB&I database of all towns and States.

3.3 Expected Outputs from NUIS Scheme

Implementation of National Urban Information System (NUIS) Scheme with above objectives is expected to achieve the following results.

- Planning and Management of urban settlements will be based on updated and scientific database as a decision support system, using modern planning techniques
- Data generation, storage and manipulation using spatial and attribute data base supporting development of urban indices for NUO.
- Standardised GIS database, methodologies and procedures to enable easy integration and sharing of information and replicability of procedures.
- Build capacity among town planning and allied departments and create a cadre of professionals for the use of modern automated methods.

The above objectives would meet the requirements of urban planning in the existing organizational setup under the State Town & Country Planning Deptts. This implies that preparation of Master plans and Zonal plans are to be primarily supported for which Urban Information System should mandatorily be developed. However, basic spatial data such as base map, land use map and thematic maps generated may be used by various city governance/management departments as well for further generation of their own department/sector specific information system e.g. utilities, infrastructure etc.

4.0 HARDWARE AND SOFTWARE CONFIGURATIONS OF NUIS SYSTEMS

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The Design Standards Authoring Group has estimated the requirement of hardware and Software for State Nodal Agencies and Urban Local Bodies as per the quantum of data to be generated from USIS and NUDB&I. The Computer System that will host the NUIS Scheme in each town and State Nodal Agency has been identified.

- State Nodal Agency Level
    - A Medium-end Workstation; Plotter and other peripherals
    - Image Analysis Software and GIS Software
- Town Level
    - High-end PC based Systems; Digitizer; Plotter and other peripherals
    - Image Analysis Software and GIS Software

All State Nodal Agencies irrespective of whether they are NUIS Scheme towns or not, shall be provided with higher configuration of computer Hard Ware/ Software. The Deliverables of NUIS is also includes core trained personnel along with computer systems with appropriate GIS software. The draft configurations of Hardware & Software are at Annexure II.

5.0 USIS DATABASE DESIGN STANDARDS AND ISSUES

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Standards are of direct relevance to database standardization – datum, projection, formats, exchange and interoperability; Network Gateways and Protocols, Communication equipment, software standards enabling application and technology to work together.

There are a few important technical considerations for the Process Standardisation – which are foundation of the USIS.

5.1 Datum

The Datum for Standards is an important issue. In India, till now the Everest Datum has been prevalent and widely used as SOI toposheets were mainly available across this datum. Of late, the World Geodetic System 1984 (WGS 84) is seen as a commonly accepted and absolute global geodetic positioning system where coordinates are defined with reference to the centre of Earth. WGS 84 datum is currently accepted as the best-defined mathematical model to describe the earth's surface – though its values are being further fine-tuned. The possibility that the earth's equator is an ellipse rather than a circle and therefore that the ellipsoid is triaxial has been a matter of scientific controversy for many years. The orbital data coming from various satellites indicate more complex geometric phenomena. They indicate additional flattening at the South Pole accompanied by a bulge of the same degree at the North Pole. These theories, when irrefutably proven, may yield a much different model. All these developments indicate that the datum standards are contemporary and for the purpose of NNRMS Standards the datum chosen is WGS 84 datum (IRS Data Products Committee Report, 2001; RRSSC-N, 2002). The SOI Open Series Maps are also on WGS 84 datum and thus complete inter-compatibility would be achieved. At the same time, it is necessary to periodically review the standards and suggest modifications as necessary.

5.2 Map Projections

Map Projections are equally important parameter in the standardisation process – especially when different process elements are involved – images, thematic and cartographic maps, GIS databases, outputs in digital or analog formats and so forth. When defining spatial data

standards, the problem of choosing the most suitable Map Projection becomes important – though, today with the availability of automated tools, it is easy to re-project spatial information from one Map Projection to another. The choice of Map Projection can be subdivided based on 3 important factors:

- Factors characterizing the region being mapped are placed in the first group. These include the geographical position of the region, its dimensions, the shape of its outline (configuration) and the degree to which adjacent regions are also to be represented.
- Factors characterizing the map being designed and the methods and conditions of its use, viz. the purpose and special features of the map, scale, contents, accuracy requirements and the display or projecting medium (paper, screen etc)
- Factors characterizing the impact of the map projection itself - type of distortion and its distribution and acceptable levels of distortion of distance, angles, and areas etc; ability of the projection to represent the entire region etc.

A Committee in ISRO/DOS has evaluated these Map Projection factors for India and also considering various content and scales has recommended the choice of LCC and TM Projections for the different States of India (IRS Data Products Committee Report, 2001; RRSSC-N, 2002) for images and maps. As far as GIS database is concerned, archival of the spatial elements in Geographic Coordinates would be the best choice as they are free from projections and allow flexibility for seamlessness and also for providing outputs in any desired Map projection of choice of user.

Seamlessness (either real or virtual) is critical in the total standardization process – allowing –both geographical and multi-scale seamlessness definition. The two-dimension seamlessness will enable electronic access to the Repository – making spatial frameworks and scales transparent to the user but at the same time maintaining the internal “rigidity” and accuracies of the GIS database. The USIS Standardisation has considered and embedded this important Chrematistics in the definition.

Thus, the NUIS Scheme Standards needs to address the above important technical issues, and it is felt that the total process standardization is essential and founding principle for the NRR.

6.0 INFORMATION NEEDS IN URBAN PLANNING AND MANAGEMENT

6

The city is a corporate entity. The local government of the city has a great deal of influence on the nature, extent and manner of development of the city. The local government has to co-ordinate various decisions, which affect physical development of the community. Consequently, the local government needs technical inputs for making decisions. It will require legal and technical instruments to establish long-term as well as short-term policy. In this regard, the master/development plans for city development are prepared and updated every 5 years. These plans are prepared at different hierarchical levels of urban planning with specific definition, aim and information needs. The details pertaining to the definition, aim and information needs for different hierarchical levels of urban planning as suggested in the Urban Development Plan Formulation & Implementation (UDPFI) Guidelines (1996) by the Ministry of Urban Development are presented in Table-6.1.

NUIS Scheme is an integration of spatial and attribute databases:

- **Spatial data:** It consists of thematic, urban and utility maps prepared from remotely sensed (satellite / aerial) data, other collateral & legacy map data, and ground data from Ground Profiling/ Penetrating Radar (GPR).

- **Attribute data**: It consists of attribute data collected from field / site, natural resources, census, socio-economic characteristics, infrastructure by ULBs under NUDB&I.

The information content will vary for the 3 levels (1:10000 / 1: 2000 / 1:1000) of USIS with reference to identified urban planning and their functions as given in Table-6.2. The feature list on 1:10000 scale is given Annexure-III and the feature list on 1:2000 scale is given in Annexure-I

Table-6.1 Data Requirements for Different Levels of Urban Planning

PLANS	PERSPECTIVE	MASTER/ DEVELOPMENT PLAN	ANNUAL PLAN	ZONAL PLAN, PROJECT/ SCHEMES
Definition	It is a policy document, supported by illustrations and maps, containing spatio-economic development policies, strategies and general programmes of the local authority.	It is conceived within the framework of the approved perspective plan providing to the people the comprehensive proposals for socio-economic and spatial development of the urban center.	It is conceived within the framework of the development plan containing the details of new and ongoing projects that the local authority intends to implement during the financial year. This plan is as an important link with the budgetary process.	It is conceived within the framework of the development plan, containing working layouts supported by written report, providing all necessary details for execution including finance development, administration and management.
Aims	To provide a policy framework for further detailing and serves as a guide for urban local authority in preparation of the development plan.	To provide further necessary details and intended actions in the form of strategies and physical proposals for various policies given in the perspective plan depending upon the economic and social needs and aspirations of the people, available resources and priorities.	To identify the new schemes/projects which the authority will undertake for implementation during the year taking into account the physical and fiscal performance of the preceding year, the priorities, the policies and the proposals contained in the approved development plan.	To provide all the required planning, architectural, engineering, financial and administrative details in drawing and written form for execution.

PLANS	PERSPECTIVE	MASTER/ DEVELOPMENT PLAN	ANNUAL PLAN	ZONAL PLAN, PROJECT/ SCHEMES
Needs	Existing characteristics and potentials of the town, Projected requirements and assessment of deficiencies, Development aims, objectives and policies, Strategies and priorities.	Assessment of the current issues, prospects, priorities and proposals for development of the urban center including employment generation, economic base, transportation and land use, housing and other matters like environment, conservation and ecology. Implementation strategies, agency wise schemes/projects, development promotion rules, resource mobilization plans.	Aims and objectives, Fiscal requirements and physical targets, Skill up gradation, Actions and initiatives of local authority in implementing development plan.	Location, site planning, environmental impact assessment, spatial impact assessment, financing plan, project administration and legal support.
Time period	Long term plan (20-25 years)	Medium term plan (10-20 years)	1 year	--
Approval Authority /Time	State Government maximum 10 months	Municipal Council/ Corporation maximum 7 months	Municipal Council/ Corporation 3 months	Municipal Planner 1 month

Table-6.2 Content of USIS at Three Levels

MASTER PLAN (1:10000 SCALE)		ZONAL PLAN (1:2000 SCALE)		UTILITY MAPPING (1:1000 SCALE)	
SPATIAL	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE**
(A) From Remote Sensing Imagery/ Topomaps / Ground Truth: 1. Urban land use / land cover 2. Physiography 3. Geomorphology (outside city area) 4. Geological structures (outside city area) 5. Lithology (outside city area) 6. Drainage 7. Soil (outside city area) 8. Surface water bodies 9. Road 10. Rail 11. Canal 12. Transportation nodes		**(A) From Aerial Photos / Ground Truth:** 1. Urban land use of point features 2. Urban network layer of line features 3. Urban land cover layer of polygon features **(B) Maps From Municipalities / ULBs / SNA:** 4. City planning zone / Municipal / ward / Locality boundary maps	1. Developmental attributes (on ward basis) obtained from **Municipalities / ULBs / SNA** 2. Following information also to be incorporated from **Municipalities / ULBs / SNA** records:	**(A) From Aerial Photo Derived 1:2000 Scale Maps:** 1. Urban land use of point features 2. Urban network layer of line features 3. Urban land cover layer of polygon features **(B) Maps From GPR Surveys /City / Town Records:** 4. Water supply networks 5. Sewerage networks 6. Power networks 7. Telecommunication network	**Attributes as applicable – but containing all details of each of the utility / amenities.** (This has to update the information in consultation

MASTER PLAN (1:10000 SCALE)		ZONAL PLAN (1:2000 SCALE)		UTILITY MAPPING (1:1000 SCALE)	
SPATIAL	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE**
(B) Incorporated Maps to be obtained from UDA / ULB / TP / SNA and Others: 1. Admn. Boundaries (Metro. Region / DP Areas, Municipal / Corporation / Cantt. / Planning Zones) etc. 2. Locational details of Slums, Heritage Buildings / Sites, Industries, Infrastructure maps etc. 3. Details of MP / DP proposal maps etc. 4. Details on new layouts / plotted areas and land use regulation and controls etc.	**1. Developmental Attributes Obtained From UDAs / ULBs / TPs / SNA:** • Administrative Boundaries • Regional Setting • Demography • Socio-Economic Development • Industry • Land Use • Housing And Slums • Traffic & Transportation • Facilities and Utilities • Environment • Governance (Proposals & Policies)		• Land Use Development Controls / Zoning Regulations • Authorization / Approval records & documents • Land requirement for Schemes • Available infrastructure details • Available facility/ amenity details • Details of Housing / Localities / Plots		with TCPO/ SOI.

7.0 USIS GIS DATABASE ORGANIZATION

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7.1 Techniques And Methodology

NUIS Scheme will be based on advanced state-of-art technology, including:

- High-resolution, multi-spectral satellite images (mono & stereo) will form the core of the 1:10000 scale mapping activity.
- Aerial photograph, Ground Survey (Total Station for towns with small area) will be the main source for 1:2000 scale mapping.
- Ground Penetrating Radar (GPR) data will form the base for mapping underground utilities. The GPR survey will be carried out in selected towns for the core areas and the utilities mapped onto the 1:1000 scale GIS database.
- Geographical Information System (GIS) will form the core of NUIS Scheme and will be used to prepare digital database. The GIS techniques will be used to develop the customized packages to generate outputs required for urban planning and management.
- Ground Control Points (GCP) from Ground Control Points Library (GCPL) will be used for geometric corrections of the images.

At a broad level, the steps for the NUIS Scheme establishment include the following:

NUIS 1:10000 scale/1:2000 scale	NUIS 1:1000 scale
• Identify NUIS Scheme team in each town/state • Discuss/plan NUIS Scheme implementation with NUIS team of town/State Nodal Agency • Identify area for 1:10000 & 2,000 around town • Obtain clearances for aerial survey • Aerial - Ground Survey • GPS based precision corrections • Mapping of themes as per NUIS Scheme standards • Adopt GIS framework for town as per NUIS Scheme standards • Creation of GIS database for town as per NUIS Scheme standards • Development of NUDB&I database by ULBs as per data formats. • Development of GIS application tools • Training of town personnel	• Discuss/plan NUIS Scheme implementation with NUIS team of town/ State Nodal Agency • Identify area for GPR survey in selected town • GPR survey • Mapping of utility themes as per NUIS Scheme standards • Obtain available utility data from town • Adopt GIS framework for town as per NUIS Scheme standards • Development of NUDB&I database by ULBs. • Creation of GIS database for town as per NUIS Scheme standards • Development of GIS application tools • Training of town personnel • Porting of GIS database and application to NUIS Scheme system of town

NUIS 1:10000 scale/1:2000 scale	NUIS 1:1000 scale
• Porting of GIS database and application to NUIS Scheme system of town • Generation of Town Plans • Town updates and maintain NUIS Scheme database and system • Review and monitoring	• Town updates and maintain NUIS Scheme database and system • Review and monitoring

7.2 Design Standards

Detailed design parameters for USIS have been evolved within NUIS framework. The spatial framework, to be adopted for the two different levels of USIS - Master Plan (1:10000) and Zonal Plan / Detailed Town Planning Schemes (1:2000) scales, is given in Table-7.1.

Table- 7.1 USIS Design Standards

Sl. No.	Parameter (All values at 3 σ)	1:10000	1:2000
A] IMAGE STANDARDS			
1.	Generic/Standard Resolution	• 5m XS or better	• 0.2 m
2.	IRS Image Resolutions recommended	• 5.8 multi Spectral • 2.5 m (P+Mx)	• Aerial B/W
3.	NSF	State	Local
4.	Projection for image outputs	UTM	UTM
5.	Datum for image products	WGS 84	WGS 84
6.	Image Frames (geometrically corrected; important for seamlessness)	3’ X 3’	36” X 36”
7.	Image Position (Planimetric) Accuracy (0.5 mm of scale) in m	5	0.5 (0.25mm of scale)
8.	Band-to-Band Registration for XS data (0.25 pixel) in m	~1.5	~0.1
B] THEMATIC MAPPING STANDARDS			
1.	NSF	State	Local
2.	Minimum Map Frame size for incorporation to NRR	3’ X 3’	1’ X 1’
3.	Image Registration accuracy @ 0.5 pixel (RMS)	1.25m	0.1m (0.25 pixel)
4.	Map Projection	UTM	UTM
5.	Datum	WGS 84	WGS 84

Sl. No.	Parameter (All values at 3 σ)	1:10000	1:2000
6.	Position (Planimetric) Accuracy (1mm of scale) in m	10	0.50 (0.25mm of scale)
7.	Minimum Mappable Unit (MMU) (3 x 3 mm of scale) in sq mts	900	4 (1mm X 1mm)
8.	DEM Z-Spacing as 1mm of scale in m	10	2
9.	DEM Z-Accuracy in m	5	1
10.	Thematic Accuracy of Classification/Mapping	90/90	90/90
11.	Map Formats	• Digital GIS Compliant • Paper	• Digital GIS compliant • Paper
C] GIS DATABASE STANDARDS			
1.	Spatial framework	Seamless – National	Seamless – Local
2.	Tie-Point Intervals for Spatial Framework	36” X 36”	18” X 18”
3.	Coordinate units for Precision	Decimal-Seconds	Decimal-Seconds
4.	Projection	Geographic	Geographic
5.	Datum	WGS 84	WGS 84
6.	Precision	Single	Double
7.	Minimum Frame size for NRR	3’ X 3’	36” X 36”
8.	GIS DB Tic Registration Accuracy (0.25mm of scale) (RMS) in m	2.5	0.5
9.	Position (Planimetric) Accuracy (1mm of scale) in m	10	0.5 (0.25mm of scale)
10.	Coordinate Movement Tolerance (CMT) (0.125mm of scale) in m	1.25	0.25
11.	Weed Tolerance (WT) (0.125mm of scale) in m	1.25	0.25
12.	Sliver Polygon Tolerance (SPT) (LESS-THAN MMU) in m	<900	<4
13.	Grid Size (for Image/Raster Layers) (0.5mm of scale) in meters	5	1
D] OUTPUT STANDARDS			
1	Output Formats (Filter as defined by National map Policy)	• Digital GIS compliant • Digital web-compliant • Paper	• Digital GIS compliant • Digital web-compliant • Paper

Sl. No.	Parameter (All values at 3 σ)	1:10000	1:2000
2	Output Framework	• Admin Units –State, District, Taluk, Villages, Urban Local Body Boundaries • Cantonment • Local Planning Area, Master Plan Boundaries • Cadastre Reference • Forest Boundary • Natural Regions • User defined region polygon • Spatial Framework grids	• Admin Units –Villages, Wards/Blocks • Cantonment • Master/Zonal Plan/TP Scheme Boundaries • Cadastre Reference • Forest Boundary • Natural Regions • User defined region polygon • Spatial Framework grids
3	Output Media	• On-line download • Off-line Download • CD-ROM/DVD	• On-line download • Off-line Download • CD-ROM/DVD
4	Output Projection	UTM/ Polyconic/ user defined	UTM / Relative / User Defined
5	Output Datum	WGS 84	WGS 84
6	Output Formats	GIS format, GeoTIF, Shape file, Jpeg, NSDE and others	GIS format, GeoTIF, Shape file, Jpeg, NSDE and others
7	Output Symbology	As per Layer Legend	As per Layer Legend
E] THEMATIC ACCURACY STANDARDS			
1	National Framework Quality/Accuracy – Tolerable limits for area of standard admin units	<0.1% of taluk or village or tile areas	0.3% of tile areas
2	Framework Verification • CMT and Weed Tolerance • Bound Box	• < 1.25 • As per 1:50 NSF	<0.25
3	Planimetric Accuracy Better than (or equal to) 1.5 mm of scale in m	15 m Output to be sampled and certified for position accuracy quality	3m Output to be sampled and certified for position accuracy quality
4	Thematic Accuracy of classification / Mapping (To be reported from Metadata)	90/90	90/90
5	Minimum Map Unit (MMU)-Not less than or equal to (3 x 3 mm of scale) in sq meters.	900	4(1mmx1mm)
6	Scale Distortion Factor for Analog Outputs only-Not more than (or equal to)	3%	3%

7.3 Image Standards

Images, either from satellites or aerial surveys, are the primary source of input and the starting point for the NUIS Scheme Repository. The images are used to generate the basic content of the NUIS Scheme – the different thematic and cartographic quality maps.

Eight basic parameters are identified for the NUIS Image Standards:

a. **Generic/Standard Resolution** – The generic resolution is mostly suited for a particular scale application. This is an ideal requirement for the scale, however, data/image may not always be available at that generic resolution.

b. **IRS Image Resolutions**. The most suited IRS image resolution is recommended for the particular scale applications. The resolution range 5.8 multi spectral and 2.5 m XS and other better resolutions from aerial data is also recommended.

c. **National Spatial Framework** – defines the framework to be used for the images.

d. **Projection for image outputs**. This indicates most suited Map Projections for NUIS Scheme and needs to be applied for generating images by the users. The Projection recommended is UTM for 1:10000 at State framework and 1:2000 at Local framework.

e. **Datum for image products**. The recommended datum for the Image Products is WGS-84.

f. **Image Frames:** Image frames for various scales has been recommended for seamlessness.

g. **Image Position (Planimetric) Accuracy** – Indicating the limits of precision of position tolerance of the images is taken as 0.5 mm of scale in m and thus ranges from 5m to 0. 5 m for largest scales. This parameter can cascade into larger errors downstream at mapping and GIS database, if stringency is not maintained for tolerable precision.

h. **Band-to-Band Registration for XS data** – This indicates the tolerable registration accuracy for multi-spectral images. This parameter is important as it can impact the interpretability and classification of images – especially in the digital domain and result in errors of classification. The tolerable limit for this parameter is defined at 0.25 pixel in m and thus this parameter ranges form ~1.5m to ~0.1m at largest scales.

7.4 Thematic Mapping Standards

Thematic Maps are a result from the interpretation and analysis of the images, either from satellites or aircrafts, and are the primary source of input for the GIS database of the NUIS Scheme Repository. The stringency in the parameter values in the mapping is maintained to enable a good GIS establishment. Eleven basic parameters are identified for the NUIS Scheme Thematic Map Standards:

a. National Spatial Framework – defining the framework to be used for mapping.

b. Minimum Map Frame size for incorporation in NRR. This defines the minimum frame-size for a map to be incorporatable into NRR – thus small area maps, not conforming to this frame-size, would not be candidates for NRR.

c. Image Registration accuracy – defines the tolerable limits of registration of image to NSF (1:10000 or 1:2000) and also defines how accurately images match the framework and thus how the generated maps would register to the framework. This is defined at 0.5 pixel (RMS) in m and thus ranges from 1.25m to 0.1m at large scales.

d. Projection for Maps- This indicates most suited Map Projection for thematic maps and is based on the images used. The Projection recommended is UTM for 1:10000 at State framework and 1:2000 at Local framework.

e. Datum for image products. The recommended datum for the Map generation is WGS-84.

f. Position (Planimetric) Accuracy–indicates the limits of Precision of position tolerance of the maps. This is taken as 1 mm of scale in mt and thus ranges from 1m to 0.5 m for largest scales. This parameter can cascade into larger errors downstream at GIS database if stringency is not maintained for tolerable precision (1mm of scale) in m.

g. Minimum Mappable Unit (MMU) – defining the smallest size that would be mapped at that scale and is defined at 3mm x 3 mm of scale in sq mts. This also means that features that are smaller than this size would generally not be mapped and would be acceptable for the Repository.

h. DEM Z-Spacing – mainly for DEM and defining the horizontal spacing at which elevation is sampled and determines the density of the DEM. This is defined at 1mm of scale in mt.

j. DEM Z-Accuracy – A DEM parameter defines the tolerable accuracies in elevation and the resolution of the DEM. This is defined in metres.

k. Thematic Accuracy of Classification/Mapping – defines the accuracy of mapping – both classification accuracy and mapping accuracy. This is defined in %age and probability.

m. Map Formats – Defines the map formats to be generated and acceptable to the Repository. This is mainly digital format but in exceptional cases scanned paper would also be incorporated.

7.5 Spatial Framework Standards

7.5.1 NSF Parameters For 1:10000 & Larger Scale State Database

The second level of the NSF is the state-level "seamless" framework for the 1:10000 and larger scales of Repository of the NNRMS. As has been mentioned earlier, all scales larger than 1:10000 would use the 1:10000 NSF so that a systematic correlation exists across scales at this level.

The 1:10000 NSF will have the following characteristic:

- Datum would be WGS-84.
- Projection for images and maps would be Lambert Conformal Conic (LCC) for most of the states, which has low latitudinal difference – LCC is the most suitable projection for individual states for mapping activity, which uniformly distributes position and area errors across latitudes. The LCC has also been recommended by the ISRO-level Committee on Map Projections and Datum for future IRS Data Products (IRS Data Products Committee Report, 2001).
- 2 Standard Parallel defined with a K=6 factor for each state
- A Central Meridian definition and a Latitude for Origin definition for each state – both together defining the origin of the coordinate system for the state
- State-specific False Easting and false Northing to bring all coordinates for the state into positive real numbers.
- NNRMS recommends 4 coordinate points of a "bounding box" that envelopes each state

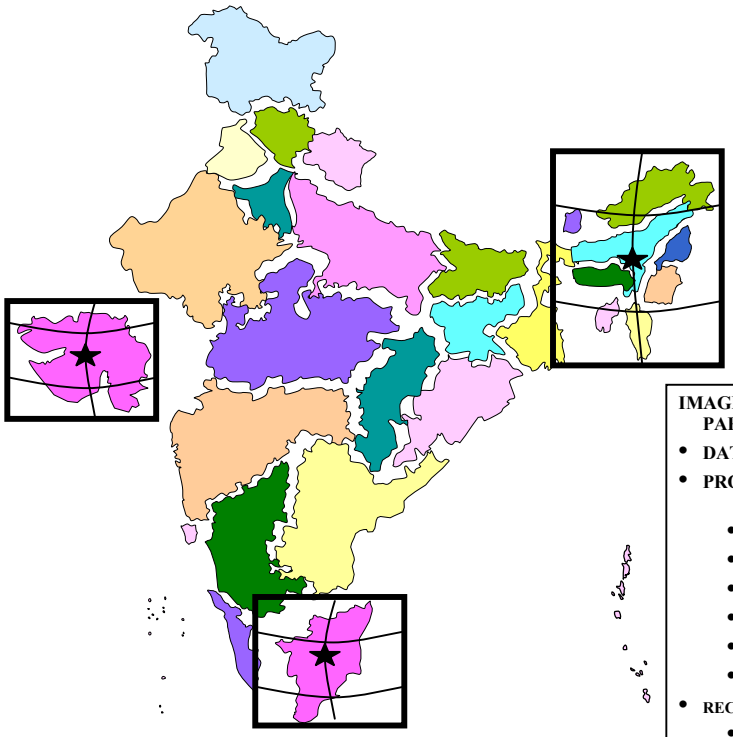
boundary – which mainly defines the bounding limits for the state framework and which is extended to cover a full 3’45” X 3’45” tile at the boundary.

- Projection of Transverse Mercator (TM) for states where the latitudinal difference is high (greater than 6 degree) – which is the most suited for the individual states mapping activity and uniformly distributes position and area errors across latitudes. The LCC has also been recommended by the ISRO-level Committee on Map Projections and Datum for future IRS Data Products (Map Projections Committee Report, 2001).
    - NUIS recommends 4 coordinate points of a “bounding box” that envelopes each state boundary – which mainly defines the bounding limits for the state framework and which is extended to cover a full 3’ X 3’ tile at the boundary.
    - A Reference Meridian definition and Latitude for Origin definition for the state– both together defining the origin of the single coordinate system for the nation.
    - A Scale factor for the Projection
    - State-specific False Easting and false Northing to bring all coordinates for the state into positive real numbers.
    - Projection for GIS database would be Geographic.
    - Studies have been conducted on projection error estimation for 1:10000 scale maps using 1:10000 NSF parameters and projection errors are seen to be within tolerance limits.

Figure-7.1 shows the details of the 1:50000 NSF with the standard state boundary template and relevant LCC parameters.

FIGURE – 7.1: National Spatial Framework for 1:50000

(For Each State Separate Framework; State Boundaries to be Adapted from 1:50000 SOI Supplied GIS Data)



IMAGES/MAPPING FRAMEWORK PARAMETERS:

- **DATUM** — **WGS84**
- **PROJECTION** — **LCC/TM –STATE BASIS (AS IN TABLE)**
  - **SP1 GEOG**
  - **SP2 GEOG**
  - **CENT MER GEOG**
  - **ORIGIN LAT GEOG**
  - **FALSE EASTING**
  - **FALSE NORTHING**
- **RECOMMENDED BOUND BOX FOR STATES**
  - **X1,y1**
  - **X1,y2**
  - **X2,y2**
  - **X2,y1**

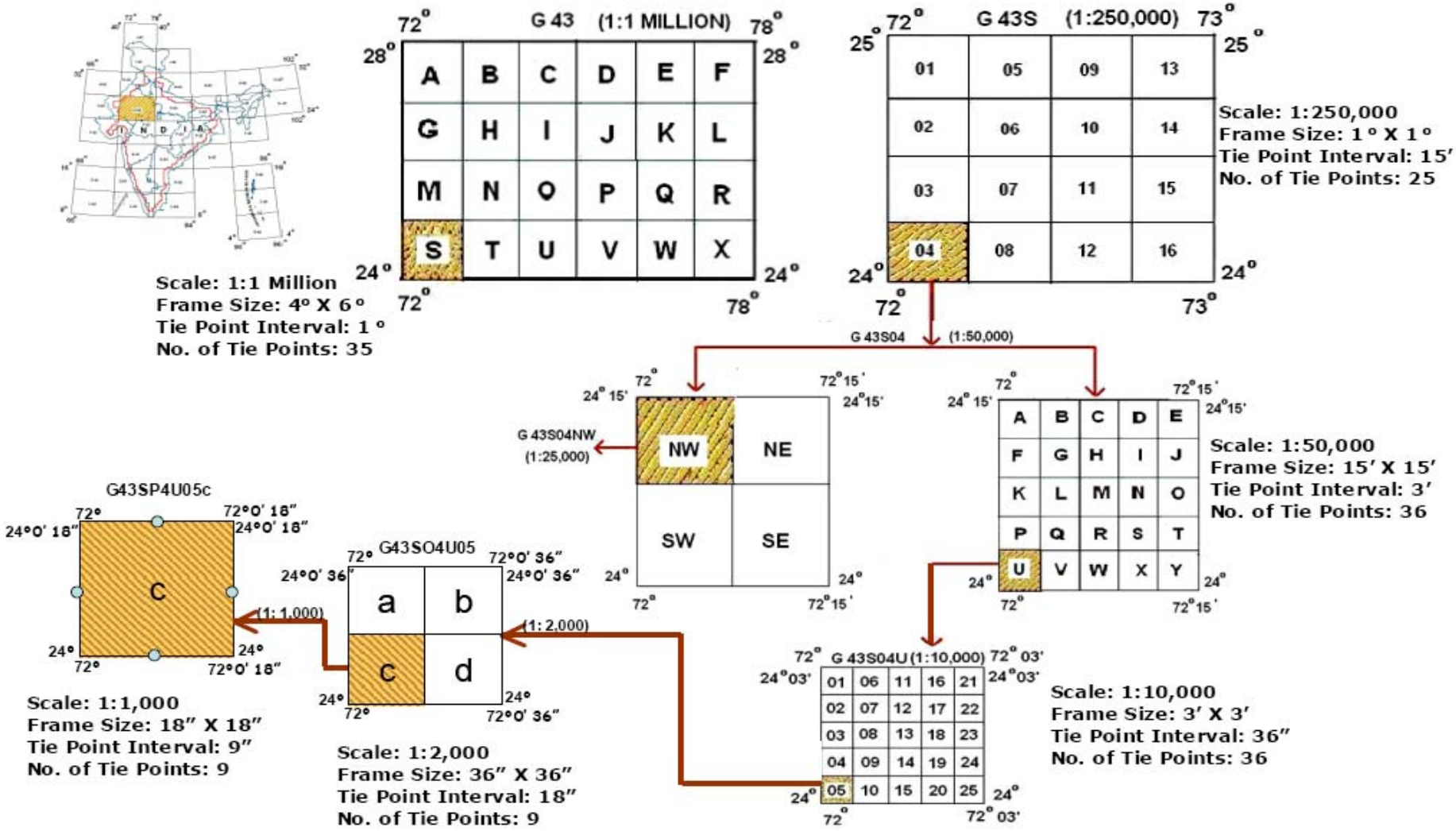
REFER STATE FRAMEWORK PARAMETER TABLES

7.5.2 Geographical Tie- Points for NSF

The requirement of tie-points is for selection of scheme, which facilitates unique identification number for every tie point all across Indian Territory. The suggested approach is on the basis of Latitude/ Longitude co-ordinates. The scheme proposes selection of multi-layer registration points as the Latitude-Longitude intersections as follows (and shown in Figure – 7.2):

Lat/Long (Tie point) Intersections upto 36 Second Interval, depending upon the level of details, as the Registration/ Tie points. This will take care of the map elements at a variety of scales ranging from 1:10000 to 1:2000 as envisaged under NNRMS standards.

Figure-7.2: Schematic Representation of Map Frame and Tie Points for NUIS-NSF



Unique assignment of ID for each point all over India. There will be 12-digit identification number for each registration point so as to make it unique. The 12-digit scheme would be as follows:

DDMMSSddmmss, where DDMMSS = latitude values for the tie point co-ordinates in degree, minute and seconds and ddmmss = Longitude values for the tie point co-ordinates in degree, minute and seconds.

7.6 Classification Content & Codification Standards

Standardisation of Content categories is extremely important. There are two ways of addressing the content categories:

- Ideally, it would be good if there is a single "all-encompassing" classification for all layers and these are adopted by all users as a Standard Classification system. Thus, there could be a Standard Land use classification – which could be adopted, in totality or in part, for national land use inventory or for urban applications or for any other applications. This would enable a common understanding of content and would be most suited from GIS database point of view. However, this requires generation of a national consensus of all agencies, a good effort at harmonising content requirement of applications (content categories are related to applications and end use and these will have to be standardised), standardisation of a hierarchy across scales and so on. This process is a long-drawn process and would be an "arduous task".

Practically, enable content layers to be standardised and recommend the most practical categories in a hierarchy of scales (say, Land use at 1:10000 or Geomorphology at 1:10000 and so on). Using this as a starting point, allow flexibility for improvement/modifications – leading to a step-by-step national content category standardisation. This process is easy and evolutionary and would be in tune with the "consensus" generation process. This approach is adopted for NNRMS Content Standards.

The Content Classification needs to be seen from the perspective of the NNRMS Content categories that are included, as follows:

Base Layers Content Classification: The classification system for Base Layers (mainly adapted from published sources) is determined by the class categories as defined by the respective agencies.

Heritage Layers Content Classification: The classifications for these heritage layers have been defined in the past projects and maybe with RS datasets that were different and processes that were different. However, the content categories can be retained as they have no effect at "rationalising" the content.

Thematic Layers of NUIS Scheme: These are layers that are defined for the Repository and most would get generated fresh using the NUIS Scheme "process" Standards. The content categories for these layers should reflect the present day state-of-art and could be adopted by different users.

7.7 Geospatial Database Standards

Traditionally, GIS databases are created using conventional GIS data models, which store geographic features as generic lines, nodes, polygons, and points. It often involves complex linkages between external database tables. With these GIS data models, defining a real world feature such as roadway edge, water line, land use or soil using generic line / polygon becomes complex. Therefore, it requires joining of a series of related tables, columns and numeric codes while designing the database. Further, emerging technologies like – Object Oriented Design and Object Oriented Languages, XML, RDBMS, Integrated Development Environment tools, Network storage, and Internet & Intranet web technologies, have benefited the following areas in GIS:

- Data representation
- Different data sets (raster, vector) integration
- Data storage efficiency and Interoperability
- Data Portability
- Centralized management of Geospatial data
- Customisation
- Quality Assurance

Therefore, it is proposed to create the USIS Geospatial database in Object Oriented GIS database structure using Open GIS Standards. Feature codes are also included as a part of feature list to have compatibility with the NNRMS standards (Committee Report ISRO:NNRMS: TR: 112:July, 2005).

GIS database are the core of the Repository and result from the digitalisation and ingest of thematic maps, either from satellites or aircrafts, into the GIS database of the NNRMS Repository. The stringency in the parameter values in the images and mapping have considerable bearing on the precision achievable at GIS database end. Further, the accuracies of the outputs/services from the NNRMS would depend upon the GIS database Standards.

The basic parameters identified for the NUIS Scheme GISDB Standards are as under:

a. National Spatial Framework – defines the framework to be used for the GIS database.
b. Tie-Point Intervals for Spatial Framework – This is generally part of the NSF itself.
c. Coordinate units – defines the coordinate values in the GIS database. As the GISDB will have Geographic coordinates, the precision is maintained at DDMMSS (degree, minutes, seconds). Coordinate Precision defines either Single Precision or Double Precision for storage in the GIS.
d. Projection for GISDB. This indicates most suited Map Projection for GIS Database and is based on Geographic Coordinate system.
e. Datum for image products. The recommended datum for the GIS DB is WGS-84.
f. Precision- it will be single for 1:10000 and double for 1:2000 Scale.
g. Minimum Frame size – defines the minimum limits of tiling in the GIS database and the framing achieved.
h. GIS DB Tic Registration Accuracy - defines the tolerable precision of Tic-Points Registration – while thematic map is incorporated into the GISDB. This determines the precision with which features “located’ in feature-space of the NSF and is defined as 0.25mm of scale in mt.
i. Position (Planimetric) Accuracy – indicating the limits of Precision of position tolerable in the GISDB (anything worse than this would be non-conformal to standard). Thus, this determines the limits of feature movement tolerance during GIS operations and determines the rigidity of precision in the GISDB. This is taken as 1 mm of scale in m and thus ranges from 250m to 1 m for largest scales. This parameter can impact into larger errors downstream at Output/Service, if stringency, is not maintained for tolerable precision (1mm of scale) in m.

j. Coordinate Movement Tolerance (CMT) – linked to Position accuracy and defines the limits up to which features in the GISDB can move during various GIS operations – thus, impacting position. This is defined as 0.125mm of scale in m and has to be orders better than Position Accuracy tolerable limits.
k. Weed Tolerance (WT) – is linked to position precision and indicates the minimum distance between 2 adjacent vertices would collapse and get weeded out. This could impact shape and also position. This is defined as 0.125mm of scale in m
m. Sliver Polygon Tolerance (SPT) – defines the limits for removal of small sliver polygons generated in GIS during various GIS operations. This is generally related to MMU and is defined at orders better than MMU limits. The maximum limit for SPT is defined as that it has to be less than MMU in m, so that MMU is conformed.
n. Grid Size (for Image/Raster/DEM Layers) – defining at what pixel-size or grid-size raster layers images, DEM etc) would be maintained. This is generally related to scale and is maintained at orders better than MMU too. It is defined as 0.5mm of scale in mt.

7.9 Quality Certification Standards

As the NUIS Scheme Standards have been developed as a process standard – involving various elements, the Quality Certification (QC) of the NUIS Scheme products would be a function of the Quality Assurance (QA) at the individual process level and the final Quality Evaluation of the product that would be given to the user. The NUIS Scheme Metadata would have all the Quality Assurance and Certification parameters – where the concept will be to integrate the individual Quality Evaluation parameters for the total process.

Thus, it is expected that each process of the NUIS Scheme activity would generate a process Quality Assurance report – which would evaluate all the parameters of the Standards at that process level. For example, the image generation process would evaluate Seven standard parameters; the mapping process would evaluate Ten standard parameters; the GIS database process would evaluate twelve standard parameters and the Output/Service process would evaluate Seven standard parameters.

Each of these process standard parameters would be evaluated and achieved in the Metadata database. The evaluation would measure the level of compliance to the process standard parameter values and deviation/variation, if any.

A final Quality Certification before delivery of the NUIS Scheme product would be conducted to certify the compliance of the product to the NUIS Standards and also identify deviation/variation, if any.

The QC of the final deliverable product would, thus include, an assessment of the individual QA reports and a separate evaluation of the following five parameters:

a. National Spatial Framework Accuracy – A measure of the tolerable limits for deviation in area of standard administrative units (national area, state area, district area, taluk area, etc) – as against the standard tables of the NSF administrative unit values.
b. Framework Verification- it <1.25 in case of 1:10000 and <0.25 in case of 1:2000 Scale.
c. Position (Planimetric) Accuracy – A measure of the location accuracy of the product – which should be better than (Or equal to) 1.5 mm (this is 1.5 times of the nominal position accuracy of the image, thematic map and GIS database and assuming that the total process would not degrade the position by more than 0.5 mm of the scale) in metres.
d. Accuracy of Classification/Mapping – A measure of the classification accuracy as evaluated by the mapping process and reproduced from the Metadata.
e. Minimum Map Unit (MMU) – A measure of the smallest unit in the database output – which will be Not Less than (Or Equal to) (3mm x 3mm of scale) in sq mts
f. Scale Distortion Factor for Analog Outputs only – A measure of the scale distortion in the final product which should be Better than (Or Equal to) the specified limits.

The procedure of the QC for the above parameters would be subject to a random sample check on the final product and document the parameter values for the user.

7.9 Output / Deliverables Standards

The GIS database would be the core for NUIS Outputs and Services. Seven basic parameters are identified for the NNRMS Output/Service Standards, including:

a. Output Formats – basically digital/analog/web outputs and this would be a filter as defined by National Map Policy

b. Output Framework – which are user-defined. A large number of frameworks - geographic, administrative, cadastral, SOI tiles referenced are possible because of the vertical and horizontal seamlessness of the GISDB.

c. Output Media – is user-defined and could include CD, DVD, ftp, paper-print etc.

d. Output Projection – as the GISDB is in Geographic coordinate system, the output projection could be user-defined and a wide variety of projections can be standardised.

e. Output Datum – limited by the GISDB datum – WGS 84.

f. Output Formats – defining the exchange format – either compliant to a GIS format or a free-form open source formats.

g. Output Symbology – any layer-specific symbology to be used for the layer is left to be standardised by the respective projects (NRC, LSM) and in the version updates this can be formalised.

7.10 Metadata Standards

NUIS Scheme -NNRMS has already defined the spatial Metadata Standards document and this Chapter contains the extracts from the document (NSDI Metadata, 2003).

A major difficulty in the spatial data community is the lack of information that helps prospective users to determine what data exist, the fitness of existing data for planned applications, and the conditions for accessing existing data, and to transfer data to a user's system. Today's large distributed geographic databases require some form of cataloguing in order to document the types of data held by the database, the entities and attributes, the spatial reference and location, the quality and many other descriptive elements that makes the database unique from others and provide the information that determines its fitness for use.

The objectives of the NUIS Scheme -NNRMS Metadata Standard are to provide a common set of terminology and definitions for the documentation of digital spatial data. The standard establishes the names of data elements to be used for these purposes, the definitions of these and data elements, and information about the values that are to be provided for the data elements.

The Metadata standard specifies the following elements needed to support establishment of a NUIS Scheme -NNRMS Metadata and also for major uses of metadata:

- To maintain a catalogue of a NUIS Scheme -NNRMS Agencies spatial data holdings
    - To provide information to users of the holdings and catalog of information
    - To provide information needed to process and investigate spatial data holdings for access by users
- To standardize the exchange format of the spatial data.

The standard defines the following information required by a prospective user:

- To determine the availability of a set of spatial data,
- To determine the compliance of a set of spatial data for an intended use,
- To determine the means to access the set of geo-spatial data, and
- To access and obtain spatial data successfully.

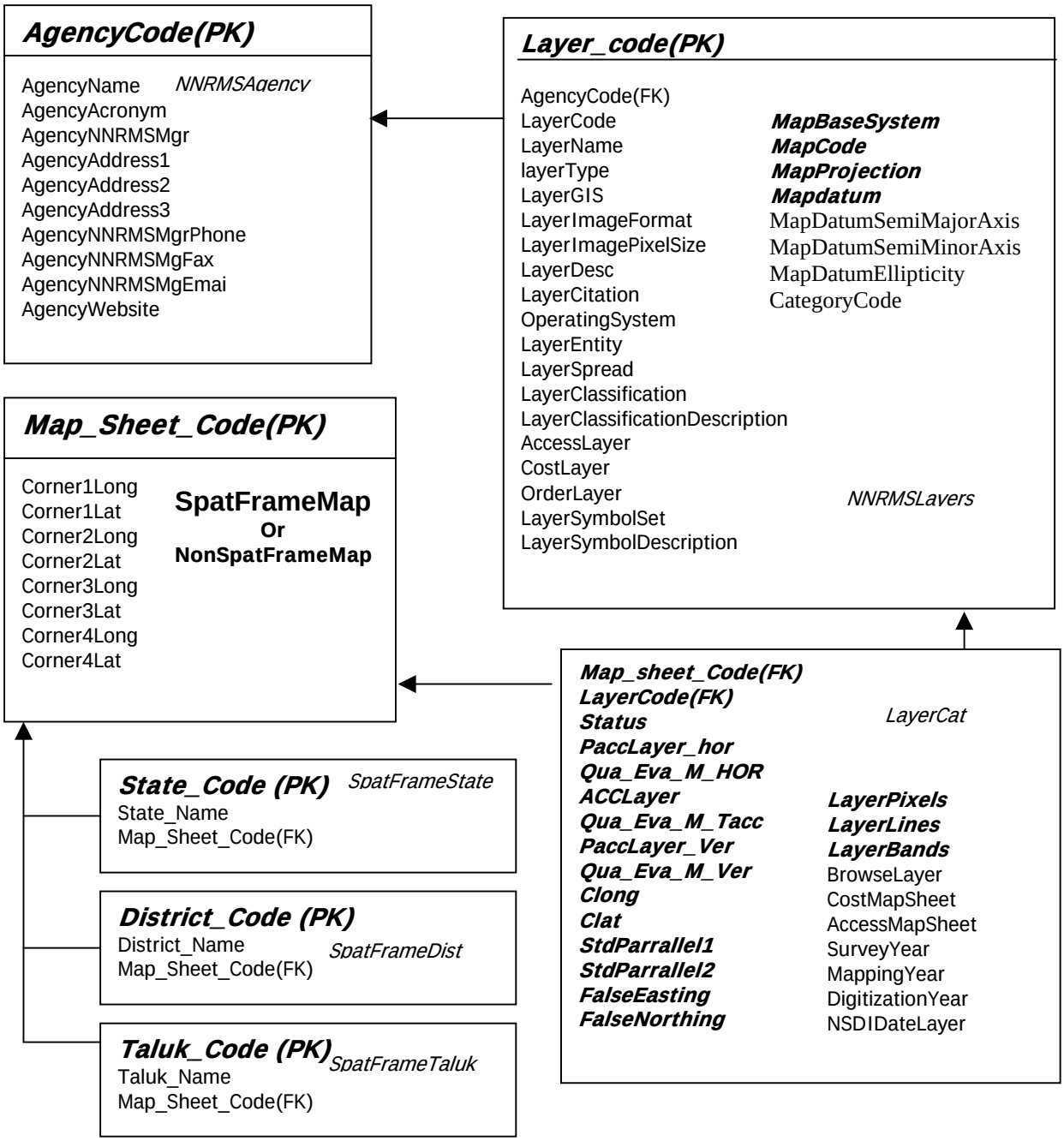
NUIS Scheme -NNRMS metadata essentially provides three key functions – provision of an overview of NUIS Scheme -NNRMS data content, ability to compare multiple geographic data sets, collections, or series, and thirdly, provision of detailed descriptions of individual data items. First and foremost requirement for Natural Resource Data Base (NDBS) would be the development of a Metadata – a process by which the information of the available spatial data is organised into a systematic database so that users can locate and find the data that they require (Annexure-V).

The fundamental aspects of the NUIS Scheme -NNRMS Metadata will be:

- Consisting of Framework Spatial data – map and image data from different NNRMS agencies. This could be at different scales – 1:10000 to 1:2000.
- Consisting of Non-Framework Spatial data, cadastral data and other data like attribute information, ground survey data, reports etc.,
- The Metadata format must be GIS independent but will be compliant to most (if not all) GIS packages. Thus the NUIS-NNRMS database engine has to be an independent one.
- Web-enabled so that on-line access on www.nnrms.gov.in is possible. This has opened up information about spatial data availability.

The entity relation between the various tables is given in Figure-7.3 followed by the details of various tables of metadata content.

FIGURE-7.3 Entity Relation between the Various Tables



8.0 NUDB&I DATABASE DESIGN STANDARDS

8

Urban areas may be more developed when compared to rural areas, but it should not be forgotten that there are wide disparities in development among the cities and towns. In order to get a clear picture with regard to urban scenario, it is needless to say that compilation of urban indicators has to be given overriding priority. Urban indicators will help to assess the quality of life in urban areas by revealing the position of various services and facilities available in urban areas. The data pertaining to urban indicators will help to improve targeting and operational performance of services, to make inter-town comparisons and will go a long way in making appropriate physical and economic plans. In short, urban indicators will immensely help in evolving proper urban policies and programmes.

The Steering Group on URIS set up in 1971 proposed the minimum critical data to initiate URIS into operation with the data organisation grouped under three broad categories viz. (1) physical, (2) socio-economic, and (3) basic infrastructure, services and amenities. Accordingly, a detailed effort to identify the parameters for planning and monitoring the functions identified under the 12^{th} schedule of 74^{th} CAA has been made and the data is to be collected in two sets of formats a) is applicable where data from census on decadal basis available and format b) is applicable for data collected from ULBs departmental sources.

8.1 Standards of National Urban Observatory (NUO)

A major commitment of the NUDB&I would be towards establishment of a network of Local Urban Observatories (LUOs) in the State to support development of indices to monitor the health of the urban settlements under National Urban Observatory (NUO).

The Urban Indicators Program (UIP) of the UNCHS identified 23 Indicators (clustered under six heads) as universal priorities from the commitments and strategies adopted in Istanbul, (Habitat-II, 1996) which are as follows:

(i) Shelter

1. Tenure Types
2. Evictions
3. Housing Price to Income Ratio
4. Land Price to Income Ratio
5. Mortgage to Non-Mortgage
6. Access to Water
7. Household Connections

(ii) Social Development and Eradication of Poverty

8. Under Five Mortality
9. Crime Rates
10. Poor Households
11. Female – Male Gaps

(iii) Environmental Management

12. Urban Population Growth
13. Water Consumption
14. Price of Water
15. Air-Pollution
16. Waste Water Treated
17. Solid Waste Disposal
18. Travel Time
19. Transport Modes

(iv) Economic Development

20. Informal Employment
21. City Product
22. Unemployment

(v) Governance

23. Local Government Revenue and Expenditure

(vi) International Cooperation

All 137 towns selected under NUIS Scheme have been included for generating the NUDB&I database. The list of towns with coding is at Annexure-VI. Twenty five Global sample cities have been selected from India by the UNCHS under the Millennium Development Goal of the Urban Indicators Programme. Of the 25 cities 9 have been included in 137 NUIS town list. Rest 16 Global sample cities have also been considered for NUO database that makes a total of 153 towns (Annexure-VII).

8.2 National Urban Databank And Indicators (NUDB&I)

The focus of the NUDB&I is to collate and analyze data for various key areas such as socio-economic development, land use, transportation, housing, infrastructure, environment and governance. The number of urban indicators as per the NUO and developed based on guidelines of UNCHS are very large. The areas and sectors covered are also many in number. In order to integrate NUDB&I indicators with USIS spatial data, the number of elements, which are suitable for mapping, have been identified and indicated which are mostly suitable for NUIS Scheme towns. The periodicity of the data may not be the same for all variables and for all the towns. The year of the data can be indicated while inputting the data.

A major objective of the NUIS is to set up National Urban Databank And Indicators (NUDB&I) unit within each State Town Planning Department and Head Quarters will be NUIS Secretariat in TCPO/MOUD. The ULBs with the assistance of State Nodal Agencies would develop town level urban database for all 137 towns will be linked to the spatial database generated under USIS. The focus of the database would be primarily to address the urban planning and management functions of the Deptts. and support the Urban local body functions related to spatial decision making identified under the 12th schedule (Annexure - VIII) of the 74th CAA.

The data and content of the NUDB&I have been identified by the Standards committee (Annexure-IX), which would be collected from various sources of the respective Urban Local Bodies. This data would form the database of the NUDB&I at the NUDB&I cell in the State Nodal Agency

8.3 Coding Scheme for Primary Non-Spatial Data Element

The list of primary non-spatial data with its naming, conventions, sources of the data and the update frequency is given in Table 8.1, whereas the detailed coding scheme with its description part at different aspects for all the elements followed by its structure are given in the Annexure-X (Tables-01 to Tables-22). The Standardized Proforma for collection of the information for NUDB&I is at Annexure-XI. Guidelines along with definitions for filling up of the Proforma is at Annexure-XII

Table 8.1 Primary Non-Spatial Elements - Periodicity And Sources Of Data

Sl. No.	Subject	Table No & Name	Source	Periodicity of Updating
1	LOCATION	1. PHYSICAL *nn*.DBF	Master Plan and Meteorological Department	10 years
2	DEMOGRAPHY	2. DEMO *nn*.DBF 3.OCCU nn.DBF	Census	10 years
3	ECONOMY	4. INDUSTRIAL *nn*.DBF	District Planning Office/Industrial Centers	5 Yeras
4	LANDUSE	5. LANDUSE *nn*.DBF	Master Plan	10 years

Sl. No.	Subject	Table No & Name	Source	Periodicity of Updating
5	AMENITIES & SERVICES	6. WATER *nn*.DBF 7. POWER *nn*.DBF 8. COMM *nn*.DBF 9. EDFAC nn.DBF 10. MEDFAC nn.DBF 11. SEWAGE nn.DBF 12. S_WASTE nn.DBF 13. COMUNITY nn.DBF 14. LAW nn.DBF	Municipal records Electricity Board Telephone Exchange District Education Office District Medical Office State Pollution Control Board Police Stations	Yearly
6	HOUSING	15. HOUSE nn.DBF	Housing Boards Town Planning Departments	5 Year
7	PUBLIC PRIVATE PARTNERSHIP	18. PPP nn.DBF	Municipal records/ Municipal Board	5 Year
8	LAND OWNERSHIP	16. LOWNER nn.DBF	Town Planning Departments	5 years
9	ENVIRONMENT	17. CALAMITY nn.DBF 21. ENVI nn.DBF	State Pollution Control Board	Yearly
10	SLUMS	19. SLUM nn.DBF	Municipal Board	5 years
11	TRANSPORT	20.TRANSPORT nn.DBF	RTO	Yearly
12	GOVERNANCE	22. GOVT nn.DBF	Local Boady	5 years

Note: nn - Year of Census/Data Collection
DBF - File Extension Name

Annexure-I

NUIS Design and Standards Committee

(Vide Ministry of UD, Office order No. K-14011/42/97-UDIII/UDII (Vol. III) dated 20th May 2002)

1.	Shri K.T.Gurumukhi, Chief Planner, TCPO, New Delhi	Chairman
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23.	Shri.Purushottam Reddy, Director, House Numbering, Hyderabad	Member
24.	Shri.J.Premnath Singh, T&CP (URIS), TCPO, New Delhi	Member-Secretary

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13. Shri L.R. Rudraiah, Town Planning Consultant, BDA, Bangalore

Annexure-II

1. Hardware Configuration for NUIS Scheme

i. High End Server with Mass Storage Device

Product	HP Storage Works Modular Smart Array 1510i Mini bundle of MSA1510i with MSA20 SATA enclosure
Protocol support	Wide Ultra3 SCSI support, SAN Attach – IP
SCSI ports	2-ports per Dual Channel SCSI I/O Module, up to 4 modules total
Drives supported	Supports 96 SATA hard drives in 8 MSA20 SATA enclosures or 56 SCSI hard drives in 4 MSA30 enclosures
Maximum capacity	48 TB SATA HDD, or 16.8 TB SCSI HDD maximum capacity
Logical drives	Up to 32 logical drives
RAID levels (fault tolerance	RAID 6 with ADG (Advanced Data Guarding) RAID 5 (Distributed Data Guarding) RAID 1 + 0 (Mirroring + Stripping) RAID 1 (Mirroring) RAID 0 (Stripping)
Cache memory	Up to 512 MB Read/Write (256 MB modules) cache memory. If redundant controllers are used they must have equally configured cache
Storage enclosures	Includes one MSA20 SATA drive enclosure

ii. Medium End Workstation

Parts	**Configuration**
Processor	(1) Intel® Xeon™ Processor 3.2GHz standard (up to 2 supported) or Higher
Memory	1GB (2 x 512MB) PC2-3200 DDR2 SDRAM running at 400MHz (Standard), expandable to 12GB
Standard memory	1GB (2 x 512MB) PC2-3200 DDR2 SDRAM running at 400MHz, with Advanced ECC and online spare memory capabilities
Maximum memory	12GB
Cache memory	Integrated 2MB Level 2 cache
Chipset	Intel® E7520 Chipset with 800MHz Front Side Bus
Hard drives	None ship standard (up to 6 supported)
Optical drive	48X IDE (ATAPI) CD-ROM Drive, DVD writer
Network controller	Embedded NC7761 PCI 10/100/1000T Gigabit network adapter
Storage controller	Integrated Dual Channel Ultra320 SCSI adapter, Smart Array 641
Internal storage	2.4TB maximum hot plug SCSI (with optional hard drives & drive cage)
External storage	1.44MB Diskette Drive, 48X IDE (ATAPI) CD-ROM Drive
I/O interfaces	1 x Parallel, 1 x Serial (optional 2nd serial port available), 1 x Pointing Device (Mouse), 1 x Graphics, 1 x Keyboard, 2 x External SCSI knockouts, 2 x Network RJ-45 (1 dedicated for iLO), 2 x USB Ports

Parts	Configuration
Industry standard compliance	ACPI V2.0 Compliant, PCI 2.2 Compliant, PXE Support, WOL Support, PCI-X 1.0 Compliant, Novell Certified, Microsoft® Logo certifications, USB 2.0
Manageability tools	Integrated Lights-Out Standard, Integrated Lights Out Advanced Pack (optional), Remote Insight Lights-Out Edition ll (optional), HP Systems Insight Manager, SmartStart, Redundant ROM, System Firmware Update, ROMPaq, ProLiant RBSU (ROM-Based Setup Utility), Automatic Server Recovery-2 (ASR-2), Dynamic Sector Repairing (with Smart Array Controller), Drive Parameter Tracking (with Smart Array Controller), Pre-Failure Warranty (covers processors, memory and hard drives)
Power supply	725 Watts, Power Factor Correction (PFC), Hot Plug 100 to 240 VAC Rated Input Voltage (Auto-sensing), CE Mark Compliant; Optional 2nd Power Supply for hot-pluggable 1 + 1 redundancy
Server power cords	Ships standard with a 10' IEC cable (some countries include a 12' NEMA cord)
Upgradeability	Upgradeable to dual processing
Expansion slots	I/O (6 Total - 1 x 64-Bit/133MHz PCI-X, 2 x 64-Bit/100MHz PCI-X, 1 x 64-Bit/66MHz PCI-X, 1 x PCI-Express X8, 1 x PCI-Express X4)
System fans	1 fan ships standard, 2 fans total supported (does not include power supply or processor heatsink fans)
Graphics	Integrated ATI RAGE XL Video Controller with 8MB SDRAM Video Memory VGA connector; up to 1600 x 1200 resolution supported
Form factor	Rack (5U)
Diskette drives	1.44MB
Dimensions (H x W x D)	21.87 x 48.26 x 60.96 cm
Weight	27.24kg (without hard drives)
Preinstalled Software	Windows NT server edition, MS Office, Anti Virus
Monitor	17” TFT Monitor

iii. High End PC PIV

Parts	Configuration
Microprocessor	Intel Pentium IV 530 Processor 3 GHz with 1 MB L2 cache Memory or better, supporting
Mother board	Intel 915 G or better on Intel or equivalent OEM Motherboard
Bus architecture	Integrated Graphics, 2 PCI, 1 PCI Express x1 and 1 PCI Express x16
Memory	1 GB RAM 400 MHz DDR2 RAM upgradeable up to 4.0 GB on DIMM
HDD	80 GB Serial ATA HDD
FDD	1.44 Floppy Disk Drive (3.5”) Internal
Monitor	43cm (17”) SVGA Digital Colour Monitor
Keyboard	104 keys keyboard
Mouse	Optical Mouse
Bays	6 bays (4 External and 2 Internal)

Parts	Configuration
Ports	8 USB ports (2 front, 1 serial, 1 parallel, 1 PS/2 key board and 1Ps/2 Mouse port
Cabinet	Desktop/Mini tower
DMI	DMI 2.0 compliance and support
CD ROM	52x or better CD ROM drive
Networking	10/100/1000 Network card with remote booting facility, remote system installation, asset tracking and security management, remote wake up
OS	Windows XP pro reloaded with media and documentation and certificate of authenticity
OS certifications	Win logo for windows os and linus certifications
Power management	Energy star qualified, screen blanking, hard disk and system idle mode in power on, set up password
Preloaded software	Norton, mcafee, e-trust or equivalent antivirus (latest version) with 60 days license
Combo Drive	Combo i.e. 16x10x40 CD r/w and 12xDVD in lieu of 48xCD ROM/DVD writer
Monitor	15” TFT monitor in lieu of 17”colour monitor
Modem	Internal 56 KBPS modem
Speaker	Speakers 5W RMS set of two
Graphic Card	Graphic accelerator card pci express 128 MB
RAM	DDR2 RAM 256 MB 400 MHz for PIV

iv. AO Size Plotter: 16MB memory, drivers for Microsoft® Windows® 95/98, NT 4.0 & 2000, drivers for AutoCAD 2000 & releases 12, 13, 14; bin & stand, roll feeder, USB and parallel connection or Higher

v. AO Scanner Crystal XL 42"

Configuration	Specifications	BASE	PLUS
Maximum Resolution:	(in dpi)	800	2400
Optical Resolution:	(in dpi)	508	508
Scan Accuracy:	0.1% +- 1 pixel	✔	✔
Variable Resolution Setting:	from 50 dpi in one dpi Increments	✔	✔
Scanning Speed inch/sec. :	(400 dpi turbo, 24 - bit RGB) (400 dpi turbo, 8 - bit Index) (400 dpi turbo, B/W)	0.6"/sec 3.0"/sec 5.0"/sec	0.6"/sec 3.0"/sec 10.0"/sec
Media Maximum Width:		44"	44"
Maximum Thickness:	0.6" (15 mm)	✔	✔
Scan Width:		42"	42"
Scan Length:	not limited by scanner	✔	✔

Configuration	Specifications	BASE	PLUS
Digital Image Processing Embedded in hardware:	Dual 2D-Adaptive Enhancement Dual 2D-Adaptive Gray ADL+Error Diffusion Halftoning 2D-Sharpening, 2D-Softening and 2D-Blur Filter Color Feature Extraction 2D-Adaptive Thresholding	✔	✔
Scan Modes:	24 bit color 8 bit Feature extraction/Indexed color 8 bit Graytone Copy modes with grayshades 1 bit black-and-white B/W Dual 2D-Adaptive Modes	✔	✔
Color Adjustment:	3x3 matrix multiplier Independent RGB tone curves(Gamma) Independent black-and-white point setting	✔	✔
3C Auto-Maintenance System:	Auto-alignment to fraction of a pixel Auto-stitching to fraction of a pixel Basic calibration Precision Color calibration Auto monitoring and correction (stitching, black-and-white point)	✔	✔
Sensors:	4-linear CCDs(RGB triplets+Panchromatic BW) Number of pixels 42 bits of color data capture 14 bits graytone date capture All-Digital cameras	3 22500 ✔	3 22500 ✔
One Touch Scanning:	(Scan, Copy & Email)	✔	✔
Advanced Power Manager:	Temperature Control, Low power mode Programmable power up timer	✔	✔
All-Wheel-Drive:	Contour adjustment Precision rollers	✔	✔
Light Source:	Color matched fluorescent lamps - Color Rendering index (CRI) > 95	✔	✔
Optics:	Torsion stabilized for portability	✔	✔
Interface:	FireWire (SCSI20), Ultrafast SCSI STI (Still Image Interface) support	✔	✔
Dimensions:	**W**-width **H**-height **B**-breadth	W-54.8" H-7.3" B-18.3"	W-54.8" H-7.3" B-18.3"
Weight:		60 kgs	60 kgs
Power:	110/220/240V,60/50cs, 180W	✔	✔
Interface Board (Included):		✔	✔
WIDE System Kit (Included):	Drivers, Scan Client application, Maintenance - Software, Sheet	✔	✔
Copy Software	JETimage LITE	✔	✔

Configuration	Specifications	BASE	PLUS
(Included):			
Scan Software (Included):	WIDEimage NET	✔	✔
Floor Stand (Optional):	Includes document basket	✔	✔
Host Platforms:	Windows 98, 98SE, ME, NT4, 2000, XP with SCSI Windows ME, 2000, XP with FireWire Power Macintosh	✔	✔

2. Software for NUIS Scheme (Image Analysis & GIS softwares)

Sl. No.	Types of Software	Name of Software
1	GIS	Arc Info 9.1
2		Arc Editor
3		Arc 3D Extension
4		Arc Spatial Extension
5		Arc Scan Extension
6		MicroStation V8
7		Autodesk Map 3D
8	Image Analysis	ERDAS Imagine/Easy Pace

2. Requirement of HW/SW at different levels

A. Town and Country Planning Organisation, New Delhi

Suggested HW/SW and quantity for TCPO is as under

Sl. No.	Configuration	Qty.
1	**Hardware**	
i.	High End Server (PIV) *with Mass Storage Device with 16.2 TB, SCSI HDD, 32 Logical drives, with cache memory of 512 MB or higher*	1
ii.	Medium End Workstation (PIV) *with 1 GB RAM (2x512) upto 12 GB, 2.4 TB SCSI HDD, with cache memory of 2 MB or higher*	4
iii.	High End PC (PIV) *with 1 GB RAM, 120 GB HDD, 530 processor 3 GHz with 1 MB L2 Cache Memory or higher*	12
iv.	Laptop (PIV) *with 1 GB RAM, 120 GB HDD, 530 processor 1 GHz with 2 MB L2 Cache Memory or higher*	5
2	**Software**	
i.	Arc Info	1
ii.	Arc Editor	2
iii.	AutoDesk Map 3D	5
iv.	MicroStation	3
v.	MSOffice	30

Sl. No.	Configuration	Qty.
3	**Peripherals**	
i.	A3 Color Laser Printer *with 27 ppm, 600x600 dpi, network card*	1
ii.	A3 B/W 5100tn *A4 22ppm, A3 11ppm, 32 MB Memory with Network Card*	1
iii.	A4 B/W Laser Printer *28 ppm, 1200x1200dpi,*	10
iv.	A4 LaserJet B/W Printer with Fax, Scanner, and Copying, 15ppm 600x600 dpi	1
v.	UPS 15 KVA online	
vi.	UPS 500 VA	

Note: The TCPO may amend the configurations as per their requirement.

B. State Nodal Agency

Suggested HW/SW and quantity for SNA is as under

Sl. No.	Configuration	Qty.
Hardware		
1	Medium End Workstation (PIV) *with 1 GB RAM (2x512) upto 12 GB, 2.4 TB SCSI HDD, with cache memory of 2 MB or higher*	1
2	High End PC (PIV) *with 1 GB RAM, 120 GB HDD, 530 processor 3 GHz with 1 MB L2 Cache Memory or Higher*	1
3	42" Plotter (Color) *16 MB Memory, Bin, Stand, Roll feeder, USB port*	1
4	AO Scanner *42"*	1
5	5 KVA online UPS	2
Software		
6	Arc Info	1
7	ERDAS	1
8	MSOffice	2

Note: The SNA may amend the configurations as per their requirement.

C. ULBs

Suggested HW/SW and quantity for ULBs are as under

Sl. No.	Configuration	Qty.
Hardware		
1	High End PC (PIV) *with 1 GB RAM, 120 GB HDD, 530 processor 3 GHz with 1 MB L2 Cache Memory or higher*	2
3	A4 B/W Laser Printer *28 ppm, 1200x1200dp,*	1
4	1 KVA online UPS	1
Software		
6	MicroStation (Bentley)/Arc View (ESRI)	1
7	AutoDesk Map 3D	1
8	MS Office	2

Note: The SNA may amend the configuration as per the requirement of ULBs.

Annexure-III

Feature List for Master Plan at 1:10000 Scale

Primary Layers : Remote Sensing Imagery/ SOI Maps/ Ground Data

Table – 1.1: Urban Land Use/ Land Cover

Applicable for layer: Luse10NUISYear

URBANLULC-CODE	LEVEL – I	LEVEL – II	LEVEL – III	LEVEL – IV*	LEVEL –V*
01-00-00-00-00	Built Up				
01-01-00-00-00		Built Up (Urban)			
01-01-01-00-00			Residential		
01-01-01-01-00				High density residential	
01-01-01-01-01					High rise apartments/Flats
01-01-01-01-02					Medium rise apartments /Flats
01-01-01-01-03					Low rise apartments /Flats
01-01-01-01-04					Low rise Row houses
01-01-01-01-05					Low rise Group Houses / Tenaments
01-01-01-01-06					Slums/Clusters
01-01-01-01-07					Others
01-01-01-02-00				Medium density residential	
01-01-01-02-01					High rise apartments /Flat
01-01-01-02-02					Medium rise apartments /Flats
01-01-01-02-03					Low rise apartments /Flats
01-01-01-02-04					Low rise Row houses
01-01-01-02-05					Low rise Group Houses / Tenaments
01-01-01-02-06					Slums/Clusters
01-01-01-02-07					Others
01-01-01-03-00				Low density residential	
01-01-01-03-01					High rise apartments /Flats
01-01-01-03-02					Medium rise apartments /Flats
01-01-01-03-03					Low rise apartments /Flats
01-01-01-03-04					Low rise Row houses
01-01-01-03-05					Low rise Group Houses / Tenements
01-01-01-03-06					Slums/Clusters

URBANLULC-CODE	LEVEL – I	LEVEL – II	LEVEL – III	LEVEL – IV*	LEVEL –V*
01-01-01-03-07					Others
01-01-02-00-00			Industrial		
01-01-02-01-00				Service Industry	
01-01-02-02-00				Light Industry	
01-01-02-03-00				Extensive Industry	
01-01-02-04-00				Heavy Industry	
01-01-02-05-00				Hazardous Industry	
01-01-02-06-00				Others	
01-01-03-00-00			Mixed Built Up area		
01-01-04-00-00			Recreational		
01-01-04-01-00				Parks/Gardens	
01-01-04-02-00				Stadium	
01-01-04-03-00				Playgrounds	
01-01-04-04-00				Golf Course/Race course	
01-01-04-05-00				Zoological parks / Botanical gardens	
01-01-04-06-00				Historical monuments/ Fort	
01-01-04-07-00				Planetarium	
01-01-04-08-00				Major Function hall	
01-01-04-09-00				Swimming pool	
01-01-04-10-00				Major Cinema halls /Theatres	
01-01-04-11-00				Others	
01-01-05-00-00			Public and Semipublic		
01-01-05-01-00				Major Educational Institutes	
01-01-05-02-00				Cantonment	
01-01-05-03-00				Major Hospitals	
01-01-05-04-00				Cremation/buried ground	
01-01-05-05-00				Social and Cultural center	
01-01-05-06-00				Religious Places	
01-01-05-07-00				Major Government Offices	
01-01-05-08-00				Petrol /Gas filling stations	
01-01-05-09-00				Police Station	
01-01-05-10-00				Fire Station	
01-01-05-11-00				Rest / Circuit House	
01-01-05-12-00				Electric sub-station	
01-01-05-13-00				Jail	
01-01-05-14-00				Major Banks	
01-01-05-15-00				Others	
01-01-06-00-00			Communications		
01-01-06-01-00				Major Post Offices	
01-01-06-02-00				Telephone Exchange	
01-01-06-03-00				Telegraph Office	

URBANLULC-CODE	LEVEL – I	LEVEL – II	LEVEL – III	LEVEL – IV*	LEVEL –V*
01-01-06-04-00				Radio/TV Station	
01-01-06-07-00				Others	
01-01-07-00-00			Public Utilities & Facility		
01-01-07-01-00				Water Treatment Plant	
01-01-07-02-00				Landfill / Dumping Ground	
01-01-07-03-00				Electric Power plant	
01-01-07-04-00				Sewerage Treatment Plant	
01-01-07-07-00				Others	
01-01-08-00-00			Commercial		
01-01-08-01-00				Retail and General Business	
01-01-08-03-00				Community center	
01-01-08-04-00				Wholesale and Warehousing	
01-01-08-05-00				Major shopping centers/ Malls	
01-01-08-06-00				Major Hotels	
01-01-08-08-00				Parking area	
01-01-08-09-00				Market yards	
01-01-08-10-00				Others	
01-01-09-00-00			Transportation		
01-01-10-01-00				Bus Terminus	
01-01-10-02-00				Railway stations	
01-01-10-03-00				Air port / Air strips	
01-01-10-04-00				Sea port/ Harbour	
01-01-10-05-00				Bridges / Flyovers	
01-01-10-06-00				Roads	
01-01-10-07-00				Railway line / Sidings	
01-01-10-08-00				Truck terminus	
01-01-10-09-00				Berth / Jetties / Breakwaters	
01-01-10-10-00				Others	
01-01-11-00-00			Reclaimed land		
01-01-12-00-00			Vacant land		
01-01-12-01-00				Layouts / Plotted land	
01-01-13-00-00			Vegetated Area		
01-02-00-00-00		Built Up (Rural)			
02-00-00-00-00	Agriculture				
02-01-00-00-00		Cropland			
02-02-00-00-00		Fallow land			
02-03-00-00-00		Plantation			
03-00-00-00-00	Forest				
03-01-00-00-00		Dense Forest			
03-02-00-00-00		Open Forest			
03-03-00-00-00		Plantations			
03-04-00-00-00		Mangroves			
04-00-00-00-00	Grazing land				

URBANLULC-CODE	LEVEL – I	LEVEL – II	LEVEL – III	LEVEL – IV*	LEVEL –V*
05-00-00-00-00	Wastelands				
05-00-00-00-01		Salt-affected			
05-00-00-00-02		Gullied / Ravinous			
05-00-00-00-03		Land with / without scrub			
05-00-00-00-04		Barren / Rocky			
05-00-00-00-05		Sandy area			
06-00-00-00-00	Wetlands				
06-01-00-00-00		Marshy / Swampy			
06-02-00-00-00		Mudflats			
06-03-00-00-00		Waterlogged			
06-04-00-00-00		Salt pans			
07-00-00-00-00	Water bodies				
07-01-00-00-00		River			
07-02-00-00-00		Canal			
07-03-00-00-00		Lakes/ Ponds			
07-04-00-00-00		Reservoirs			
07-05-00-00-00		Tanks			
07-06-00-00-00		Cooling Pond/ Cooling Reservoir			
07-07-00-00-00		Abandoned quarries with water			
09-00-00-00-00	Others				
09-01-00-00-00		Quarry / Brick Kilns			
09-02-00-00-00		Dam / Barrage			
09-03-00-00-00		Coral reef / Atoll			

Note:

Level –III mapping and classification will be done using satellite imagery and features at Level _IV/ Level –V classification will be incorporated by Urban Local Bodies (ULBs) in coordination with mapping agency.

To facilitate the field data collection with reference to Level-IV and Level-V spatial features, geo-referenced satellite image print or the derived vector map will be updated/incorporated by the ULBs. The collected field data based on the geo-referenced image or map should be provided in electronic form either in excel or access format. Any delay in providing the filed data from ULBs in the required form may effect the delivery of the spatial database.. Incorporation of all the field data collected by the ULBs into the GIS database will be taken up as separate exercise. The ULBs may be identified as nodal agencies for providing the above information including field data collected under NUDB&I for classification of spatial data upto Level IV and Level-V as given in Table –1 for each of the identified towns.

Table – 1.2: Physiography

Applicable for layer: PhysioNUISYear

PHY-CODE	DESCRIPTION
01	Hilly terrain
02	Dissected plateau
04	Undulating plain with mounds
05	Plain
06	Valley

Table – 1.3: Geomorphology

Applicable for layer: Geom10NUISYear

GEOM-CODE	TYPE	DESCRIPTION
01-00-00	**Structural /Tectonic origin**	
01-01-00		Highly Dissected Structural Hills
01-02-00		Moderately Dissected Structural Hills
01-03-00		Low Dissected Structural Hills
01-05-00		Structural Valley
01-06-00		Linear Ridge
02-00-00	**Denudational origin**	
02-01-00		Highly Dissected Denudational Hill
02-02-00		Moderately Dissected Denudational Hill
02-03-00		Low Dissected Denudational Hill
02-04-00		Residual Hill
02-06-00		Pediment-Inselberg complex
02-07-00		Pediment
02-08-00		Pediplain
02-09-00		Upper Plateau (>1000m)
02-10-00		Middle Plateau (1000 – 300 m)
02-11-00		Lower Plateau (<300 m)
02-12-00		Valley
02-13-00		Intermontane valley
03-00-00	**Fluvial origin**	
03-02-00		Alluvial plain (upper)
03-03-00		Alluvial plain (lower)
03-04-00		Flood plain
04-00-00	**Deltaic/Coastal origin**	
04-01-00		Deltaic plain (upper)
04-02-00		Deltaic plain (lower)
04-03-00		Coastal plain (upper)
04-04-00		Coastal plain (lower)
04-05-00		Coral Reef
05-00-00	**Aeolian origin**	
05-01-00		Aeolian plain (Desert / Coastal)
05-02-00		Sand Dunes (Desert / Coastal)

Note *: Higher order classification features under Geomorphology are not considered as they are not relevant to urban mapping.*

Table-1 4 : Geological Structures

Applicable for layer: Geostructure10NUISYear

CODE	STRUCTURE	DESCRIPTION
01	Lineament	
		Faults/fractures
02	Fault	
		Confirmed fault with displacement of rock formations
03	Fault inferred	
		Displacement of rock formations inferred (where evidences are not very clear)
04	Fracture	
		A rupture not causing any displacement of rock formation
05	Fracture/Fault line valley	
		Valleys formed along fractures/faults
06	Folds	
		A trace of structural feature in arcuate/circular/ folded nature
08	Escarpment/ Cliff	
09	Hogback	
10	Cuesta	
12	Anticline/Syncline	
17	Ridge crest	

Table – 1.5: Lithology

Applicable for layer: Litho10NUISYear

LITHOLOGY-CODE	ROCK GROUP	LITHOLOGICAL UNIT/ ROCK TYPE
01-00	Un-consolidated Sediments	
01-01		Gravel Sand Silt
01-02		Clayey Sand
01-03		Sandy Clay
01-04		Clay
01-05		Sand and Silt
01-06		Clay with Sand
01-07		Colluvium
02-00	Residual Cappings (Lateritic / Duricrust)	
02-01		Laterite (Ferricrete)
02-02		Bauxite (Alecrete)
02-03		Kankar (Calicrete)
02-04		Chert (Silicate)
03-00	Volcanic Flows & Inter-trapeans (Basaltic)	
03-01		Massive Basalt
03-02		Vesicular Basalt
03-04		Tuffaceous Basalt
04-00	Semi-Consolidated Sediments	
04-01		Sandstone & Conglomerate
04-03		Sandy Shale
04-04		Shale
04-05		Shell Limestone
04-06		Sandstone with Shale
05-00	Consolidated Sediments	
05-03		Shale with Limestone
05-04		Massive Limestone
05-05		Compact Shale
05-06		Massive Sandstone/ Quartzite

LITHOLOGY-CODE	ROCK GROUP	LITHOLOGICAL UNIT/ ROCK TYPE
06-00	Intrusive Rocks	
06-01		Quartz Reef/ Quartzite
06-02		Basic Dyke
06-04		Quartz/ Pegmatite/
07-00	Crystalline / Metamorphic Rocks	
07-01		Massive Granite & Plutonic Rocks
07-02		Granite and Gneissic Complex
07-04		Quartzite with Shale/ Phyllite bands
07-05		Phyllite Schist and Slate
07-06		Gneiss
07-07		Schist and Gneiss mixed
07-09		Khondalite
07-10		Charnockite
07-11		Khondalite/ Charnockite
07-12		Marble

Table –1.6: Drainage

Applicable for layer: Drainage10NUISYear

CODE	DESCRIPTION
01	Perennial
02	Dry (Non-Perennial)
03	Tidal Waters
06	Tidal creek
07	Water channel in dry river

Table –1.7a : Soils

Applicable for layer: Soil10NUISYear

CODE	DESCRIPTION
01	Red Soil
02	Black (Regur) Soil
03	Mixed Red & Black Soil
04	Laterite and Lateritic Soils
05	Alluvial Soil (River / Deltaic / Coastal)
06	Peaty and Marshy Soils
07	Desert Soils
08	Saline and Alkaline Soil
09	Forest and Hill Soils

Note: Major Soils of India (Pedology: Concepts and Applications) by J Sehgal

Table-1.7b : soil texture

Applicable for layer: SoilTex10NUISYear

CODE	DESCRIPTION
01	Fragmental
02	Sandy Skeletal
03	Loamy Skeletal
04	Clayey Skeletal
05	Sandy
06	Loamy
07	Coarse Loamy
08	Fine Loamy
09	Coarse Silty
10	Fine Silty
11	Clayey
12	Fine
13	Very Fine

Note:

1. *For mineralogy and soil regime details refer Table: 6.2.2.6 (NNRMS Standards report, 2005)*
2. *The Soil Phase (1:10000 scale) details would be populated from Series details of 1:50000 scale.*

Table –1.7c : Soils Depth

Applicable for layer: SoilDep10NUISYear

CODE	DESCRIPTION
01	Very deep (> 150 cms)
02	Deep (100-150 cms)
03	Deep to Moderately deep (50 to 100 cms)
04	Shallow (25 to 50 cms)
05	Very shallow (< 25 cms)

Table – 1.8 :Surface Water Bodies

Applicable for layer: Swater10NUISYear

CODE	DESCRIPTION
01	River
02	Canal
03	Lakes/ Ponds
04	Reservoirs
05	Tanks
06	Cooling Pond/ Cooling Reservoir
07	Abandoned quarries with water

Table – 1.9: Road

Applicable for layer: Road10NUISYear

CODE	TYPE	DESCRIPTION
01-00	Metalled – Black Topped (BT) or Bitumen Roads	
01-01		National Highway

CODE	TYPE	DESCRIPTION
01-02		State Highway
01-03		District Road
01-04		Village Road
01-05		City Road – Major
01-06		City Road – Minor
01-07		Ring Road
01-08		Bye pass
01-09		Expressway
02-00	Unmetalled - Water Bound Mecadem (WBM)	
06-00	Others	
06-01		Earthen/Gravel
06-05		Concrete / Cement

Note: To be provided by ULB's under NUDB&I scheme

Table – 1.10: Rail

Applicable for layer: Rail10NUISYear

CODE	DESCRIPTION
01-00	Broad gauge
01-01	Broad gauge (double)
02-00	Other (Meter) gauge

Table – 1.11: Canal

Applicable for layer: Canal10NUISYear

CODE	DESCRIPTION
01	Main Canal
02	Branch Canal
03	Drain

Table – 1. 12: Transportation Nodes

Applicable for layer: Transportnode10NUISYear

CODE	DESCRIPTION
01-00	Bus Terminus
02-00	Railway station
03-00	Airport
04-00	Seaport / Harbour

Table: 1.13: Attribute Table for Administrative Boundaries

Applicable for Layers: Admin50SOIyear
Admin25SOIyear

Admin50SOIyear		Admin25SOIyear	
Admin Code	Description	Admin Code	Description
As per Census 2001 State Code	State Boundary	As per Census 2001 State Code	State Boundary
As per Census 2001 District Code	District Boundary	As per Census 2001 District Code	District Boundary
As per Census 2001 Taluk Code	Taluka / Tehsil Boundary	As per Census 2001 Taluk Code	Taluka/ Tehsil Boundary

Admin50SOIyear		Admin25SOIyear	
Admin Code	Description	Admin Code	Description
As per Census 2001 Mandal / Block Code	Mandal / Block Boundary	As per Census 2001 Mandal / Block Code	Mandal / Block Boundary
As per Census 2001 Village Code	Village Boundary	As per Census 2001 Village Code	Village Boundary

Table: 1.14: Attribute Table for Forest Boundary

Applicable for Layers: Forest50SOIyear
Forest25SOIyear
Forest50FSIyear

Forest50SOIyear		Forest25SOIyear	
Forest Code	Description	Forest Code	Description
01	Notified /Reserve /Protected Forest Boundary	01	Notified /Reserve /Protected Forest Boundary
02	National Park Boundary	02	National Park Boundary
03	Sanctuary Boundary	03	Sanctuary Boundary

Table: 1.15: Attribute Table for Settlement & Village Locations / Names

Applicable for Layers: Settlement50Censusyear
Settlement25Censusyear
Villages50Censusyear
Villages25Censusyear

Settle50/25Censusyear		Villages50/25Censusyear & Villbound50/25year	
Settlement / Village Code	Description	Settlement / Village Code	Description
As per Census 2001 Village Code	Settlement Locations / Names	As per Census 2001 Village Code	Village Locations/ Names
As per SOI Maps (Recent)	Settlement Locations / Names	As per SOI Maps (Recent)	Village Locations/ Names

Table: 1.16: Attribute Table for City / Town Boundaries

Applicable for Layers: CTBoundNUIS10year

CTBoundNUIS10year	
Boundary Code	Description
01	UDA Boundary
02	Municipal Boundary
03	Cantonment Boundary
04	Zone Boundary
05	Block / Ward Boundary
06	Locality Boundary

Annexure-IV

Feature List for Zonal Plan 1:2000 Scale

Primary Layers (From Aerial Photos)

Table –2.1: Urban Layer of Point Features

URBPT-CODE	POINT FEATURES	LEVEL – V	REMARKS
00-00-01-00	**Topographical Features**		
00-00-01-01		Bench Mark	
00-00-01-02		Boulders	More than 2m will be depicted
00-00-01-03		Cliff	
00-00-01-04		Spot Height	Selective
00-00-01-05		Surveyed Tree	
00-00-02-00	**Landmarks (Religious)**		
00-00-02-01		Chhatri	
00-00-02-02		Church	
00-00-02-03		Grave	
00-00-02-04		Mosque	
00-00-02-05		Temple	
00-00-02-06		Idgah	
00-00-03-00	**Landmarks (Infrastructure)**		
00-00-03-01		Chimney	
00-00-03-02		Govt. Dispensary	
00-00-03-03		Fountain	
00-00-03-04		Ground Level Reservoir	
00-00-03-05		Major Hospital	
00-00-03-06		Permanent Hut	
00-00-03-07		Temporary Hut	
00-00-03-08		Over Head Tank	
00-00-03-09		Combined Office	Major Govt. / Private
00-00-03-10		Petrol Pump	
00-00-03-11		Power Pole	11KV and above
00-00-03-12		Post Office	
00-00-03-13		Pylon	
00-00-03-14		Culvert on Rail	
00-00-03-15		Culvert on Road	
00-00-03-16		Telegraph Office	
00-00-03-17		All types of towers	
00-00-03-18		Tube well	
00-00-03-19		Watch Tower	
00-00-03-20		Lined well	
00-00-03-21		Unlined well	
00-00-04-00	**Landmarks (Others)**		
00-00-04-01		Palm Tree	
00-00-04-02		Coconut Tree	
00-00-04-03		Date Palm	
00-00-04-04		Fort	
00-00-04-05		Other Tree	
00-00-04-06		Palmyra	

Table – 2.2: Urban Network Layer of Line Features

URBPL-CODE	LINE FEATURES	LEVEL – V	REMARKS
00-00-01-00	**Transport**		
00-00-01-01		Black top road	
00-00-01-02		Bridge	
00-00-01-03		Bridge on Rail	
00-00-01-04		Cart Track	
00-00-01-05		Fly Over	
00-00-01-06		Foot Over Bridge	
00-00-01-07		Foot Path	
00-00-01-08		Metalled roads	
00-00-01-09		Pack Track	
00-00-01-10		Railway Crossing	
00-00-01-11		Railway Line – Broad gauge	
00-00-01-12		Railway Line – Meter gauge	
00-00-01-13		Road Divider	
00-00-01-14		Road Layout	
00-00-01-15		Road width is less than 3m, where both the edges are not visible	Lanes / Sub-lanes
00-00-01-16		Unmetalled roads	
00-00-02-00	**Infrastructure**		
00-00-02-01		Aquaduct	
00-00-02-02		Canal	
00-00-02-03		Compound Wall	
00-00-02-04		Earthwork Dam	
00-00-02-05		Embankment upto 3m ht.	Above ground
00-00-02-06		Embankment-Above 3m ht.	Above ground
00-00-02-07		Fence	
00-00-02-08		Main Power Line (HT)	
00-00-02-09		Masonry Dam	
00-00-02-10		Open Drain single	
00-00-02-11		Open drain double	
00-00-02-12		Major Pipeline	Over surface
00-00-02-13		Quarry	
00-00-02-14		Salt Pan	
00-00-02-15		Sluice	
00-00-02-16		Tree line	
00-00-02-17		Other Features	
00-00-02-18		Weir	
00-00-03-00	**Topographical Features**		
00-00-03-01		Cliff	
00-00-03-02		Contour	2 m interval
00-00-03-04		Cutting – Above 3m ht.	Above ground
00-00-03-05		Cutting – upto 3m	
00-00-03-06		Form Line	
00-00-03-07		Rocky slopes	
00-00-04-00	**Drainage**		
00-00-04-01		River (Perennial) outline	

URBPL-CODE	LINE FEATURES	LEVEL – V	REMARKS
00-00-04-02		Stream double	
00-00-04-03		Stream single	
00-00-04-04		Stream undefined	
00-00-04-05		River (Non-perennial)	

Table – 2.3: Urban Land Use / Cover Layer of Polygon Features

URBPO-CODE	POLYGON FEATURES	LEVEL – V	REMARKS
00-00-01-00	**Built-up (Residential)**		
00-00-01-01		Building layout	
00-00-01-02		Building under Construction	
00-00-01-03		Group of Building	
00-00-01-04		Single Building	
00-00-01-05		Slums	
00-00-02-00	**Built-up (Non-Residential)**		
00-00-02-01		Fort Area	
00-00-02-02		Industrial Building	
00-00-02-03		Institutional Building	
00-00-02-04		Jetty	
00-00-02-05		Official Building	Major Govt. / Private
00-00-02-06		Open Shed	
00-00-02-07		Palace Boundary	
00-00-02-08		Parking Building	If defined
00-00-03-00	**Religious**		
00-00-03-01		Chhatri	
00-00-03-02		Church area	
00-00-03-03		Crematorium	
00-00-03-04		Grave Yard	
00-00-03-05		Gurudwara	
00-00-03-06		Idgah	
00-00-03-07		Mosque Area	
00-00-03-08		Temple Area	
00-00-04-00	**Transportation**		
00-00-04-01		Major Bus Depot	
00-00-04-02		Major Bus Terminus	
00-00-04-03		Railway station	
00-00-04-04		Railway Platform	
00-00-04-05		Road Island	
00-00-05-00	**Recreational**		
00-00-05-01		Park	
00-00-05-02		Parking Area	
00-00-05-03		Playground	
00-00-05-04		Stadium	
00-00-06-00	**Administrative**		
00-00-06-01		Forest Boundary	
00-00-06-02		Municipal Boundary	

URBPO-CODE	POLYGON FEATURES	LEVEL – V	REMARKS
00-00-06-03		Cantonment	
00-00-06-04		Zone Boundary	
00-00-06-05		Ward / Block Boundary	
00-00-07-00	**Water bodies**		
00-00-07-01		Pond	
00-00-07-02		River	
00-00-07-03		Tank Square	
00-00-07-04		Tanks dry limit	
00-00-07-05		Tanks with water limit	
00-00-08-00	**Public / Semi-public**		
00-00-08-01		Govt. Dispensary Area	
00-00-08-02		Electric Sub Station	
00-00-08-03		Fire Station	
00-00-08-04		Fountain	
00-00-08-05		Ground Level Reservoir	
00-00-08-06		Hospital Area	
00-00-08-07		Petrol Pump Area	
00-00-08-08		Pump House	
00-00-08-09		Well by Shape	
00-00-08-10		Cultivation Limit	
00-00-08-11		Marshy Boundary	
00-00-08-12		Plantation with limits	
00-00-08-13		Brick Kiln	
00-00-08-14		Boulder Line	
00-00-09-00	**Other Land Uses**		
00-00-09-01		Brick Kiln	
00-00-09-02		Boulder Line	
00-00-09-03		Cultivation Limit	
00-00-09-04		Marshy Boundary	
00-00-09-05		Open Space / Vacant Land	
00-00-09-06		Plantation with Limits	
00-00-09-07		Scrub	

Note : i) Bank, ATM, Man hole and Taps are removed as they require lot of field survey.

ii) The administrative boundaries like Forest / Municipal / Cantonment / Zone / Ward & Block , and any other required administrative boundaries are be provided by the TCPO or respective ULBs

iii). Level-V details from ground data collection and data obtained from ULBs in coordination with mapping agency.

Annexure-V

NUIS-NNRMS Metadata Definitions / Terms

The standard specifies the information content for a set of digital geo-spatial data. The standard establishes a common set of terminology and definitions for concepts related to NNRMS Metadata, as follows :

- **NUIS** means the National Urban Information System
- **NUIS Agency** means Ministry of Urban Development or other agencies, which is part of the NNRMS or any other organization that has commits the spatial data holdings to NNRMS
- **NUIS Meta data** means the information about spatial data available in NNRMS
- **Metadata Name** means the Name of a NNRMS Metadata Table that specifies the schema of the table
- **Metadata Purpose** means the purpose for which the Metadata Table is organised
- **Metadata Generator** means the person who generates and populates the Metadata table – either through a standard NNRMS process or through the NNRMS Agency
- **Metadata Form** which describes the form for entry of the Metadata
- **Update Condition** which describes how any update would happen to the metadata.
- **Modify Condition** which covers the mechanism for modification that happens to this metadata table
- **Metadata Locale** means the place where the Metadata would reside – either on the NNRMS.GOV.IN server or at the NNRMS Agency server
- **Metadata Structure** means the listing of the schema of the Metadata Table – containing a set of Metadata elements
- **Element** means the individual parameter-types of the Metadata Table – together forming a Table
- **Element Type** means the type of the element – whether it is a Key, unique or individual. Key elements are used to link Metadata Tables to other tables in extracting information
- **Data Type** means the type of data defining the Element – whether it is "Integer", "Real", "Text", "Date", “Currency” or "Time"
- **Data Size** means the definition of allotted size for the Element
- **Schema Description** means the pre-defined set of valid values that can be assigned or allotted to the Element
- **Pointer** means a pointer to a defined URL for further access.
- **URLs** will be defined as service : // hostname : port / path / filename
- **Coordinates** will always be defined as decimal fraction of degrees
- **Dates** will always be defined as Days -Months-Year in dd/mm/yyyy format
- **Time** will always be 24-hours time of hh:mm:ss of Indian Standard Time
- **Network Locator** values for file names, network addresses for computer systems, and related services should follow the Uniform Resource Locator convention of the Internet when possible.

Annexure-VI

List of Towns (with code) Selected for NUIS Scheme Phase-I

Sl. No.	Town Code	Town	State	Population 2001	Status	Class
1	01001	Port Blair	Andaman & Nicobar Islands	99984	Town	II
2	02001	Adilabad	Andhra Pradesh	129403	Town	I
3	02002	Dharmavaram	Andhra Pradesh	103357	Town	I
4	02003	Madanapalle	Andhra Pradesh	107449	Town	I
5	02004	Nalgonda	Andhra Pradesh	111380	Town	I
6	02005	Srikakulam	Andhra Pradesh	117320	Town	I
7	02006	Tadepaligudem	Andhra Pradesh	102622	Town	I
8	03001	Along	Arunachal Pradesh	17033	Town	IV
9	03002	Daporijo	Arunachal Pradesh	15756	Town	IV
10	04001	Dibrugarh	Assam	137661	UA	I
11	04002	Nagaon	Assam	123265	UA	I
12	04003	Silchar	Assam	184105	UA	I
13	04004	Tezpur	Assam	105377	Town	I
14	04005	Tinsukia	Assam	108123	UA	I
15	05001	Arrah	Bihar	203380	Town	I
16	05002	Bhagalpur	Bihar	350133	UA	I
17	05003	Darbhanga	Bihar	267348	Town	I
18	05004	Muzaffarpur	Bihar	305525	Town	I
19	05005	Patna	Bihar	1697976	UA	Metro
20	06001	Chandigarh	Chandigarh	808515	UA	I
21	07001	Bhilai Nagar	Chattisgarh	927864	Town	I
22	07002	Bilaspur	Chattisgarh	335293	Town	I
23	07003	Durg	Chattisgarh	232517	Town	I
24	07004	Korba	Chattisgarh	315690	Town	I
25	07005	Raipur	Chattisgarh	700113	UA	I
26	08001	Silvassa	Dadra & Nagar Haveli	21893	Town	III
27	09001	Daman	Daman & Diu	35770	Town	III
28	10001	Delhi U.A.	Delhi	12877470	UA	Metro
29	11001	Cuncolim	Goa	15860	Town	IV
30	11002	Curchorem Cacora	Goa	21407	Town	III
31	11003	Mapusa	Goa	40487	Town	III
32	11004	Margao	Goa	94383	UA	II
33	11005	Mormugao	Goa	104758	UA	I
34	12001	Bhavnagar	Gujarat	517708	UA	I
35	12002	Jamnagar	Gujarat	556956	UA	I
36	12003	Nadiad	Gujarat	196793	UA	I
37	12004	Rajkot	Gujarat	1003015	UA	Metro
38	12005	Surat	Gujarat	2811614	UA	Metro
39	12006	Vadodara	Gujarat	1491045	UA	Metro
40	13001	Faridabad	Haryana	1055938	Town	Metro

Sl. No.	Town Code	Town	State	Population 2001	Status	Class
41	13002	Hisar	Haryana	263186	UA	I
42	13003	Karnal	Haryana	221236	UA	I
43	13004	Panipat	Haryana	354148	UA	I
44	13005	Rohtak	Haryana	294577	UA	I
45	14001	Dharamsala	Himachal Pradesh	19124	Town	IV
46	14002	Mandi	Himachal Pradesh	26873	Town	III
47	14003	Nahan	Himachal Pradesh	26053	Town	III
48	14004	Shimla	Himachal Pradesh	144975	UA	I
49	14005	Solan	Himachal Pradesh	34206	Town	III
50	15001	Anantnag	Jammu & Kashmir	97896	Town	II
51	15002	Baramula	Jammu & Kashmir	71896	Town	II
52	15003	Jammu	Jammu & Kashmir	612163	UA	I
53	15004	Sopore	Jammu & Kashmir	59624	Town	II
54	15005	Srinagar	Jammu & Kashmir	988210	Town	I
55	16001	Bokaro Steel City	Jharkhand	497780	UA	I
56	16002	Dhanbad	Jharkhand	1065327	UA	Metro
57	16003	Jamshedpur	Jharkhand	1104713	UA	Metro
58	16004	Mango	Jharkhand	166125	Town	I
59	16005	Ranchi	Jharkhand	863495	UA	I
60	17001	Bellary	Karnataka	316766	Town	I
61	17002	Bidar	Karnataka	174257	Town	I
62	17003	Bijapur	Karnataka	253891	Town	I
63	17004	Davanagere-Harihara	Karnataka	364523	UA	I
64	17005	Kolar	Karnataka	113907	M	I
65	17006	Raichur	Karnataka	207421	Town	I
66	18001	Alappuzha	Kerala	282675	UA	I
67	18002	Kollam	Kerala	380091	UA	I
68	18003	Kozhikode	Kerala	880247	UA	I
69	18004	Palakkad	Kerala	197369	UA	I
70	18005	Thrissur	Kerala	330122	UA	I
71	19001	Kavaratti	Lakshadweep	10119	Town	IV
72	20001	Dewas	Madhya Pradesh	231672	Town	I
73	20002	Gwalior	Madhya Pradesh	865548	UA	I
74	20003	Jabalpur	Madhya Pradesh	1098000	UA	Metro
75	20004	Sagar	Madhya Pradesh	308922	UA	I
76	20005	Satna	Madhya Pradesh	229307	UA	I
77	20006	Ujjain	Madhya Pradesh	431162	UA	I
78	21001	Aurangabad	Maharashtra	892483	UA	I
79	21002	Bhiwandi	Maharashtra	621427	UA	I
80	21003	Nashik	Maharashtra	1152326	UA	Metro
81	21004	Pimpri Chinchwad	Maharashtra	1012472	Town	Metro
82	21005	Pune	Maharashtra	3760636	UA	Metro
83	21006	Thane	Maharashtra	1262551	Town	Metro
84	22001	Imphal	Manipur	250234	UA	I
85	22002	Kakching	Manipur	28724	Town	III

Sl. No.	Town Code	Town	State	Population 2001	Status	Class
86	23001	Jowai	Meghalaya	25057	MB	III
87	23002	Tura	Meghalaya	58978	M	II
88	24001	Champhai	Mizoram	26465	Town	III
89	24002	Lunglei	Mizoram	47137	Town	III
90	25001	Dimapur	Nagaland	98096	Town	II
91	25002	Mokokchung	Nagaland	31214	Town	III
92	26001	Baleshwar	Orissa	156430	UA	I
93	26002	Baripada	Orissa	100651	UA	I
94	26003	Brahmapur	Orissa	307792	Town	I
95	26004	Cuttack	Orissa	587182	UA	I
96	26005	Raurkela	Orissa	484874	UA	I
97	26006	Sambalpur	Orissa	226469	UA	I
98	27001	Kraikal	Pondicherry	74438	M	II
99	28001	Amritsar	Punjab	1003917	Town	Metro
100	28002	Bhatinda	Punjab	217256	Town	I
101	28003	Jalandhar	Punjab	714077	Town	I
102	28004	Ludhiana	Punjab	1398467	Town	Metro
103	28005	Pathankot	Punjab	168485	UA	I
104	28006	Patiala	Punjab	323884	UA	I
105	29001	Bandikui	Rajasthan	16295	M	IV
106	29002	Bijainagar-Gulabpura	Rajasthan	24362	M	III
107	29003	Dungarpur	Rajasthan	43108	M	III
108	29004	Karauli	Rajasthan	66239	M	II
109	29005	Makrana	Rajasthan	91853	UA	II
110	29006	Sawai Madhopur	Rajasthan	101997	UA	I
111	30001	Rangpo	Sikkim	3709	Town	VI
112	30002	Singtam	Sikkim	5432	Town	V
113	31001	Coimbatore	Tamil Nadu	1461139	UA	Metro
114	31002	Madurai	Tamil Nadu	1203095	UA	Metro
115	31003	Salem	Tamil Nadu	751438	UA	I
116	31004	Tiruchirappalli	Tamil Nadu	866354	UA	I
117	31005	Tirunelveli	Tamil Nadu	433352	UA	I
118	31006	Tiruppur	Tamil Nadu	550826	UA	I
119	32001	Dharmanagar	Tripura	30790	Town	III
120	32002	Radhakishorepur (Udaipur)	Tripura	21758	NP	III
121	33001	Allahabad	Uttar Pradesh	1042229	UA	Metro
122	33002	Ghaziabad	Uttar Pradesh	968256	UA	I
123	33003	Kanpur	Uttar Pradesh	2715555	UA	Metro
124	33004	Lucknow	Uttar Pradesh	2245509	UA	Metro
125	33005	Meerut	Uttar Pradesh	1161716	UA	Metro
126	33006	Varanasi	Uttar Pradesh	1203961	UA	Metro
127	34001	Bageshwar	Uttaranchal	7803	Town	V
128	34002	Kotdwar	Uttaranchal	24947	Town	III
129	34003	Mussourie	Uttaranchal	29329	UA	III
130	34004	Pithoragarh	Uttaranchal	44964	Town	III

Sl. No.	Town Code	Town	State	Population 2001	Status	Class
131	34005	Roorkee	Uttaranchal	115278	UA	I
132	35001	Bhatpara	West Bengal	442385	UA	I
133	35002	Durgapur	West Bengal	493405	Town	I
134	35003	Kamarhati	West Bengal	314507	Town	I
135	35004	Kulti	West Bengal	289903	Town	I
136	35005	Panihati	West Bengal	348438	Town	I
137	35006	Rajpur Sonarpur	West Bengal	336707	Town	I

Annexure-VII

List of Global Sample Cities (With Code)

Sl. No.	Town Code	Town / UA	State	Population 2001
1	**02007**	Hyderabad	Andhra Pradesh	5533640
2	**02008**	Vijaywada	Andhra Pradesh	1011152
3	21009	Rajahmundry	Andhra Pradesh	408341
4	**07003**	**Durg-Bhilainagar**	Chattisgarh	923559
5	**10001**	**Delhi**	Delhi	12791458
6	13006	Yamunanagar	Haryana	306640
7	**13002**	**Hisar**	Haryana	263070
8	**13003**	**Karnal**	Haryana	222017
9	**15005**	**Srinagar**	Jammu & Kashmir	971357
10	17007	Gadag-Betigeri	Karnataka	154849
11	18006	Kochi	Kerala	1355406
12	21007	Mumbai	Maharashtra	16368084
13	**21005**	**Pune**	Maharashtra	3755525
14	21008	Akola	Maharashtra	399978
15	21009	Jalna	Maharashtra	235529
16	**27002**	Pondicherry	Pondicherry	505715
17	28001	**Amritsar**	Punjab	1011327
18	**29007**	Jaipur	Rajasthan	2324319
19	**29008**	Jodhpur	Rajasthan	856034
20	31001	**Coimbatore**	Tamil Nadu	1446034
21	**32003**	Agartala	Tripura	189327
22	**33003**	**Kanpur**	Uttar Pradesh	2690486
23	35007	Kolkota	West Bengal	13216546
24	35008	Kharagpur	West Bengal	296323
25	35009	Krishnanagar	West Bengal	148645

Note: *Towns/UAs highlighted are already included in the list of NUIS Scheme towns.*

Annexure-VIII

12th Schedule of The 74th Constitutional Amendment Act (Caa).

12th Schedule Municipal Functions (defined under 74th CAA)

1. Water Supply for Domestic, Industrial and Commercial Purposes;
2. Public health, Sanitation, Conservancy, and Solid Waste Management
3. Roads and Bridges;
4. Provision of Urban amenities and facility such as parks, gardens, playgrounds;
5. Burials and burial grounds, cremations and cremation grounds and electric crematoriums;
6. Public amenities including street lighting, parking lots, bus stops and public conveyance;
7. Promotion of Cultural education and aesthetic aspects;
8. Planning for Social and Economic Development;
9. Urban Forestry, protection of environmental aspects and promotion of ecological aspects;
10. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded;
11. Slum improvement and up gradation;
12. Urban Poverty alleviation;
13. Cattle ponds, prevention of cruelty to animals;
14. Vital statistics including registration of Births and Deaths;
15. Regulation of Slaughter Houses and Tanneries;
16. Urban Planning including Town Planning;
17. Regulation of Land-use and construction of Buildings;
18. Fire Service.

Annexure-IX

Data Contents For Major Urban Planning Functions

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
I	**PREPARATION OF DEVELOPMENT PLAN OF LOCAL PLANNING AREA (1:10000 Scale)**		
	• **Physical Characteristics And Natural Resources**	Maps of • Drainage, • Soils, • Slopes, • Topography / Relief, • Hydro- geomorphology, • Geology. • Natural Vegetation (forest),	• Natural Drainage (Stream Order, river systems), • Soil Types, • Slopes, • Topography / Relief, • Hydro geomorphology, • Geology, • Climate, • Natural Vegetation (forest), • Minerals, • Water resources, • Water Potential and Demand.
	• **Location And Regional Setting**	• Map showing the location of the town in regional setting	• Value of longitude and latitude (XY minimum and XY Maximum of study area), • Transportation linkage to other settlements
	• **History of Development**	• Settlement Morphology	• Historical facts and events in the growth of the settlement.
	• **Climate**	• Rainfall • Wind direction, • Temperature, • Humidity	• Wind direction • Average /maximum/ minimum temperature, • Humidity, • Rainfall duration and its quantity
	• **Land use Assessment**	• Existing Land Use • Proposed Land Use	• Different types of land uses • Area under specific land use class • Deviations from the proposed land use Actions taken for implementation and regulation.

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Environment And Ecologically Sensitive Areas** *(i) Physical Environment*	• Thematic Map depicting Air, Water and Noise Pollution, Location of Pollution generating Industries/activities.	• **Unit of Measurement** • **Air Pollution:** • Types of Industrial Units (pesticides, glass etc) • Pollutants: Lead, Methane, Carbon Monoxide etc) Types of Vehicles. • **Water Pollution**: No. of WTP, % of Sewerage Coverage, no. of STP • **Noise Pollution:** Decibel Limit of Noise generated by Different Types of Vehicles, Industries etc. • **Land Degradation.**
	(ii) Man Made Environment	• Map depicting the location of Slums, Squatters and other blighted area.	• No. of Slums, Squatters, area, access to services etc.
	• **Conservation of Environment**	• Thematic Map depicting hazards zones polluting activities.	• Levels of pollution, • Measures for mitigation of pollution..
	• **Heritages Sites, Buildings and Areas**	• Map showing the location of all heritage, sites, building and areas	• Background information of heritage sites and building and areas from the record of ASI and NGOs, listed building.
	• **Tourism**	• Tourism Dev. Map	• No. of tourist spots, • No. of tourists, • Truism infrastructure.
	• **Flood Control**	• Map showing the drainage of the city.	• Past Flood Records • Types of Preventive Methods

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Demography**	• Map showing the distribution of existing and proposed population, migration trends	• Existing population, • Natural increase • Birth and death rate, • Mortality, • Migration and socio-economic characteristics, • Age sex ratio, • Literacy, • Life expectancy
	• **Economic and Social Development** *(i) Formal Sector*	• City Ward/District map	• Per capita income, • Occupational structure, • Taxation, • Industrial product, • Commercial activities, • Institutional activities, • Development control regulations
	(ii) Informal Sector		• Informal sector, • Poverty alleviation, • Informal trade, • Commerce, • Transport, • Household industries.

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Housing and Shelter**	• Distribution of Residential Land Use • Base map containing building / property boundaries • Building material map • Building Age map • Land value map	• No. Of households, • No. Of dwelling units, • Age, • Distribution of houses by predominant material of roof, wall and floor, • Distribution of households by type of (a) fuel used for cooking (b) by source of drinking water, • Availability of electricity and toilet facility, • Distribution of households by tenure status, size and no. Of rooms occupied, • Housing structure, • Housing stock, • Demand and supply
	• **Transportation** *(i). Road*	• Road Network Map (existing and proposed roads with hierarchy)	• Types of roads, • Length of roads, • No. Of bus depots, • Terminals, • Parking space, • No. and types of vehicles, • Survey reports on traffic and transportation planning.
	(ii). Rail	• Rail Network Map (existing and proposed)	• No of railway zones, • Types of rail gauge; viz broad, narrow and meter gauge, • Length of rail route network, • Type of network, • No. of platforms, • No. of yards.

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	(iii). Water	• Land use maps/layouts of Jetties and Ports	• No. of major and minor ports, • Length of the coastline and area of navigable waterways, • No. of navigable rivers and canals, • Major ports used for export and import of goods, • Total no. of sailing boats, • Ships, • Oil tankers, • Vessels • Total tonnage of items carried by ships/tankers etc, • No. of shipping yards
	(iv). Air	• Maps with location of Airports, Aerodromes • Air Funnel maps	• No. of Airports, • Aerodromes, • Traffic volume and passenger data.
	• **Infrastructure** (i). Physical Infrastructure	Map showing • Water supply network, • Power supply line network, • Telecommunication network, • Sewerage and solid waste management	• **Water:** sources, demand and supply, treatment capacity, no. of connections, area covered, major reservoirs, duration of supply. • **Electricity:** No. of power station, type of power station, no. of connections, supply and demand, • **Telecommunication:** No. of telephone connection, telephone exchange, • **Sewerage** network**,** No. of connections , area covered, location and capacity of STPs • **Solid Waste Management:** methods of disposal, quantity, land fill sites etc.

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	(ii). Social Infrastructure	Map showing the location of • Health centers, • Educational institutes, • Fire station, • Post offices, • Police stations • Banks, • Community centres, • Socio-cultural and religious centres.	• No. Of educational institute (primary, Middle, secondary, colleges, technical institute), • Health centers (dispensary, hospital, others), • Fire stations, • Police stations, • Post offices and banks, • Community centres, • Socio-cultural and religious centres.
	• **Review, revision and preparation of fresh development plan of the local planning area.**	• Updated base map, • Existing land use map • Proposed plan of various sectors	• Data from the development Plan
II	**SPECIAL AREA PLANNING AND DEVELOPMENT AUTHORITY AND PLANS FOR SPECIAL AREA DEVELOPMENT (1:2000 Scale)**		
	• **Declaration of special Area.**	• Revenue/Urban Cadastre map, • Detailed land use map	• Development Control Regulation
	• **Incorporation of special area planning and development authority.**		
III	**CONTROL OF DEVELOPMENT AND USE OF LAND (1:2000 Scale)**		
	• **Use and development of land to be in conformity with the development plan or development scheme or land-pooling scheme.**	• Land use map, • Zonal development plan • Layout/site map	• Development Control Regulation • Property / cadastral records • Authorization / Approval records / documents
	• **Prohibition of development.**		

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Permission for development.**		
	• **Obligation to acquire and on refusal of or on grant of permission certain cases.**		
	• **Removal or discontinuance of unauthorized temporary development summarily.**		
	• **Interim Provision pending preparation of plan.**		
	• **Planning and development authority to include special area planning and development authority.**		
IV	**INITIATE DEVELOPMENT SCHEMES**		
	• **Preparation of development schemes.**	• Land use map, • Zonal development plan • Layout/site map	• Land requirement, • Available infrastructure, • Development control regulation,
V	**LAND POOLING SCHEMES**		
	• **Contents of land pooling scheme.**	• Land use map, • Zonal land use map, • Layout/site map, • Revenue map	• Land owner ship, • Compensation, • Land requirement for the scheme, • Development control regulation, • Past land pooling schemes • Name of owner • More than one owner • Tenure
	• **Reconstitution of original plots into final plots.**		
	• **Declaration of intention to prepare land-pooling scheme.**		
	• **Preparation of land pooling scheme.**		
	• **Consideration of objections and submission of final land pooling scheme to government for approval.**		

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Effect of scheme.** • **Restrictions on use and development of land after declaration of intention to prepare a land-pooling scheme.** • **Cost of land pooling scheme.** • **Contribution towards cost of land pooling scheme.** • **Compensation in respect of property or right injuriously affected by land pooling scheme.** • **Exclusion or limitation of compensation in certain cases.** • **Provision for cases in which the owner is not provided with a plot in the final land-pooling scheme.** • **Payment of net amount due to planning and development authority.** • **Recovery of arrears.** • **Execution of works in the land-pooling scheme by planning and development authority.**		• Revenue Survey number • Original Plot number • Area of Original Plot (Sq. Mt.) • Value of Original Plot without reference to value of Structure(in Rs.) • Value of Original Plot inclusive of structure(in Rupees) • Final Plot number • Area of Final Plot(Sq. Mt.) • Value of Final Plot undeveloped without reference to value of structure(in Rupees) • Value of Final Plot undeveloped inclusive of structure(in Rupees) • Value of Final Plot developed without reference to (in Rupees) value of structure • Value of Final Plot developed inclusive of structure (in Rupees) • Value of Final Plot undeveloped inclusive of structure(in Rs.) less Value of Original Plot inclusive of structure • Increment Value of Final Plot developed excluding value of structure less Value of Final Plot undeveloped excluding value of structure • Contribution 50% of Increment • Addition to or Deduction from contribution to be made under other section. • Net Demand
VI	**PRIVATE AND JOINT SECTOR PARTICIPATION IN DEVELOPMENT (1:2000 Scale)**		
	• **Development works by promoters.**		• Development work done by promoters, • Zoning regulations • Building controls

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Additional provisions where cost of development work is to be realized in advance.**	• Land use map, • Zonal development plan, • Layout/site map and revenue map	• Development cost
	• **Provisions for economically weaker sections.**		• Distribution of EWS plots, • No. of persons under EWS, • Cost of plots allotted, • Sites and services schemes.
	• **Recovery of capital or maintenance cost of amenities.**		• Recovery of user charges from promoters, • Capital and maintenance cost, • User charges for utility services.
	• **Private sector land pooling scheme by Association of Original Plot Owners.**		• Land pooling scheme, • Area of plots, • Compensation
VII	**ACQUISITION, ASSEMBLY AND DISPOSAL OF LAND**		
	• **Acquisition of Property by Planning and Development Authority.**	• Zonal Development Plan • Layout/Site map, • Property maps • Land value maps	• Development costs, • Details of acquisition property, • Compensation paid to person for acquisition, • Land acquisition acts.
	• **Transfer of government land to the Planning and Development Authority.**		• Zoning regulations, • Details of developed/undeveloped land
	• **Acquisition of land by way of Negotiated Settlement.**		• Land acquired by negotiated settlement, • Land acquisitions norms, • Compensation
	• **Acquisition of land by way of according Transferable Development Right.**		• Transfer development right, • Compensation

Sl. No.	PLANNING FUNCTIONS / ACTIVITIES	SPATIAL DATA	ATTRIBUTE DATA
	• **Acquisition of land and built space by way of Accommodation Reservation.**		• Available amenities to be transferred to Development Authority, • Compensation
	• **Disposal of land and other property by the planning and development authority.**		• Land disposal details done by the authority, • Disposal cost, • Disposal rules, • Time required for disposal
VIII	**LEVY, ASSESSMENT AND RECOVERY OF DEVELOPMENTAL CHARGES**		
	• **Levy of Developmental Charges.** • **Assessment of developmental charges.**	• Zonal Development Plan • Layout/Site map, • Property maps • Land value maps	• Development charges, • Development cost, • List of agencies on whom development charges are levied for use of land, • Increase in value of land etc.
IX	**SUPPLEMENTAL AND MISCELLANEOUS PROVISION**		
	• **Provisions of the perspective plan to stand modified in certain cases.**	• Land Use Map	• Development plan/ perspective plan, • Land use regulations

Source: *UDPFI Guidelines, Ministry of Urban Affairs & Employment, Government of India, New Delhi, 1996*

Annexure-X

National Urban Data Base Indicators (NUDB&I)
Structure For Non-Spatial Data Organisation
Primary Elements

Table-1 Structure For Physical Aspects PHYSICAL *nn*.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
TNAME	Character	30	Name of the town
DNAME	Character	30	Name of the District
SNAME	Character	30	Name of the State
TS	Character	5	Town status/size
CS	Character	10	Civic Status of the Town
ARAIN	Numeric	5	Annual rainfall in millimeters
TEMP	Numeric	5	Temperature in centigrade
AREA91	Numeric	5	Area of the town in 1991(in Sq.Kms.)
AREA01	Numeric	5	Area of the town in 2001(in Sq.Kms.)
DSHQ	Numeric	5	Distance in kms from State Head Quarters
DDHQ	Numeric	5	Distance in kms fromDistrict Head Quarters
DTHQ	Numeric	5	Distance in kms from Tahsil/Taluk/Mandal Head Quarters
DNC	Character	5	Nearest city (having 1 lakh and above population)
DNRS	Numeric	5	Nearest Railway Station
DMR	Numeric	5	Nearness/Distance of Major River/Canal

Note: (*) nn indicates year of data.

Table -2: Structure for Demography Database: DEMO *nn*.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" Code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
WAREA	Numeric	7	Ward area
NOH	Numeric	5	No. of households
ORH	Numeric	5	Occupied residential houses
HLP	Numeric	5	Houseless population
WHH	Numeric	5	Women headed households
MP	Numeric	6	Male population
FP	Numeric	6	Female population
TOTP	Numeric	8	Total Population
SCM	Numeric	6	Schedule caste male
SCF	Numeric	6	Schedule caste female
SCT	Numeric	6	Total Schedule Caste
STM	Numeric	6	Schedule tribe male

Field Name	Type	Width (Dec.)	Description
STF	Numeric	6	Schedule tribe female
STT	Numeric	6	Total Schedule Tribe
LM	Numeric	5	Literate male
LF	Numeric	5	Literate female
LT	Numeric	5	Total Literates
BRM	Numeric	5	Birth rate Male
BRF	Numeric	5	Birth rate Female
IMR	Numeric	5	Infant Mortality Rate
LEB	Numeric	5	Life Expectancy at birth
PBPL	Numeric	5	Population Below poverty line

Note: (*) nn indicates year of data.

TABLE –3 : Structure For Occupation Database: OCCU nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
MWTS	Numeric	5	Total no. of male main workers
FWTS	Numeric	5	Total no. of female main workers
TTS	Numeric	5	Total no. of main workers
MWPS	Numeric	5	No. of male workers in Primary sector
FWPS	Numeric	5	No. of female workers in Primary sector
TPS	Numeric	5	Total workers in Primary sector
MWSS	Numeric	5	No. of male workers in Secondary sector
FWSS	Numeric	5	No. of female workers in Secondary sector
TSS	Numeric	5	Total workers in Secondary sector
MWTS	Numeric	5	No. of male workers in Tertiary sector
FWTS	Numeric	5	No. of female workers in Tertiary sector
TTS	Numeric	5	Total workers in Tertiary sector
MWM	Numeric	5	Marginal workers male
MWF	Numeric	5	Marginal workers female
TMW	Numeric	5	Total marginal workers
NWM	Numeric	5	Non workers male
NWF	Numeric	5	Non workers female
TNW	Numeric	5	Total non workers
TWM	Numeric	5	Total workers male
TWF	Numeric	5	Total workers female
TW	Numeric	5	Total workers

Note: (*) nn indicates year of data.

Table-4 Structure for Industrial Aspects INDUSTRIAL *nn*.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
YEAR01	Numeric	5	Total No. of industries as on 2001
YEAR02	Numeric	5	Total No. of industries as on 2002
YEAR03	Numeric	5	Total No. of industries as on 2003
YEAR04	Numeric	5	Total No. of industries as on 2004
YEAR05	Numeric	5	Total No. of industries as on 2005

Field Name	Type	Width (Dec.)	Description
LI	Numeric	5	No. of Large industry
MI	Numeric	5	No. of Medium industry
SI	Numeric	5	No. of Small industry
HHI	Numeric	5	No. of Household industry
HI	Numeric	5	No. of Hazardous industry
MANF	Character	25	Most important commodities Manufactured
EXPORT	Character	25	Most important commodities exported
IMPORT	Character	25	Most important commodities Imported

Note: (*) nn indicates year of data.

Table-5 Structure for Land Use in Sq.Km. LANDUSE *nn*.DBF*

Field Name	Type	Width (Dec.)	Description (Area in Hecters)
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
LU91	Numeric	5	Land use as on 1991
LU01	Numeric	5	Land use as on 2001
LU_P11	Numeric	5	Proposed land use 2011
LU_P21	Numeric	5	Proposed land use 2021
RES	Numeric	5	Residential Area
COM	Numeric	5	Commercial Area
IND	Numeric	5	Industrial Area
REC	Numeric	5	Recreational Area(parks, Play grounds, Open)
P&SP	Numeric	5	Area under Public and semipublic
TRANS	Numeric	5	Area under Transportation
PU	Numeric	5	Area under Public Utilities
VACANT	Numeric	5	Vacant land/ grass/grazing
RURAL	Numeric	5	Vegetated/Rural Area/Agricultural land
FOREST	Numeric	5	Forest area
WASTE	Numeric	5	Area under Wastelands
WET	Numeric	5	Area under Wetlands
WATER	Numeric	5	Area under Water bodies
OTHER	Numeric	5	Area under Other categories such as Mining,

Note: (*) nn indicates year of data.

Table-6 Structure Utilities-Drinking water WATER *nn*.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
SDW	Character	20	Important Source of drinking water(Well, Tank, Hand Pump, Piped water, River, Others)
WS	Numeric	5	Water supply in MLD
WC	Numeric	5	No. of Water Connections
LPCD	Numeric	5	Liter Per Capita Consumption per Day (LPCD)

Field Name	Type	Width (Dec.)	Description
AC	Numeric	5	Area Covered
CWTP	Numeric	5	Capacity of WTPs (MLD)
TW	Numeric	5	Treated water percentage
GWT	Numeric		Ground water Table in Meters
RS	Yes/No	1	Is there any recycling scheme of waste water in the town.
WTP	Yes/No	1	Is there any water treatment plant in the town

Note: (*) nn indicates year of data.

Table-7 Structure Utilities-Electricity POWER *nn*.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
DPP	Numeric	4	Distance in Kms from the Power plant
ES	Numeric	5	Electric supply in MW
TC	Numeric	5	Total consumption in MKWH
ECR	Numeric	5	No. of Electric Connections in residential
ECC	Numeric	5	No. of Electric Connections in commercial
ECI	Numeric	5	No. of Electric Connections in industrial
ECO	Numeric	5	No. of Electric Connections in others fields
RC	Numeric	5	Residential consumption in MKWH
CC	Numeric	5	Commercial consumption in MKWH
IC	Numeric	5	Industrial consumption in MKWH
OC	Numeric	5	Other Consumption in MKWH

Note: (*) nn indicates year of data.

Table-8 Structure Utilities-Tele communications COMM *nn*.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
TE	Numeric	2	No. of telephone exchanges
TC	Numeric	5	No. of Telephone connections
PT	Numeric	5	No. of public telephones
PO	Numeric	5	No. of Post offices
MC	Numeric	5	Number of mobile connections

Note: (*) nn indicates year of data.

TABLE- 9 : Structure For Educational Facility Database: EDFAC nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
AS_G	Numeric	4	No. of Government Anganwadi Schools
AS_P	Numeric	4	No. of Private Anganwadi Schools
PS_G	Numeric	5	No. of Government Primary Schools
PS-P	Numeric	5	No. of Private Primary Schools

Field Name	Type	Width (Dec.)	Description
MS_G	Numeric	5	No. of Government Middle School
MS_P	Numeric	5	No. of Private Middle School
SS_G	Numeric	5	No. of Government Secondary School
SS_P	Numeric	5	No. of Private Secondary School
SSS_G	Numeric	5	No. of Government Senior Secondary School
SSS_P	Numeric	5	No. of Private Senior Secondary School
CG_G	Numeric	5	No. of Government general colleges
CG_P	Numeric	5	No. of Private general colleges
CM_G	Numeric	5	No. of Government Medical colleges
CM_P	Numeric	5	No. of Private Medical colleges
CE_G	Numeric	5	No. of Government Engineering colleges
CE_P	Numeric	5	No. of Private Engineering colleges
CL_G	Numeric	5	No. of Government Law colleges
CL_P	Numeric	5	No. of Private Law colleges
CO_G	Numeric	5	No. of Other Government colleges
CO_P	Numeric	5	No. of Other Private colleges
VT_G	Numeric	5	No. of Govt. vocational training institutions
VT_P	Numeric	5	No. of Private vocational training institutions
AE_G	Numeric	5	No. of Government adult education Centres
AE_P	Numeric	5	No. of Private adult education Centres
ASENR_G	Numeric	5	No. of enrolment in Government Anganwadi Schools
ASENR_P	Numeric	5	No. of enrolment in Private Anganwadi Schools
PSENR_G	Numeric	5	No. of enrolment in Government Primary Schools
PSENR_P	Numeric	5	No. of enrolment in Private Primary Schools
MSENR_G	Numeric	5	No. of enrolment in Government Middle School
MSENR_P	Numeric	5	No. of enrolment in Private Middle School
SSENR_G	Numeric	5	No. of enrolment in Government Secondary School
SSENR_P	Numeric	5	No. of enrolment in Private Secondary School
SSSENR_G	Numeric	5	No. of enrolment in Government Senior Secondary School
SSSENR_P	Numeric	5	No. of enrolment in Private Senior Secondary School
CGENR_G	Numeric	5	No. of enrolment in Government General colleges
CGENR_P	Numeric	5	No. of enrolment in Private General colleges
CMENR_G	Numeric	5	No. of enrolment in Government Medical colleges
CMENR_P	Numeric	5	No. of enrolment in Private Medical colleges
CEENR_G	Numeric	5	No. of enrolment in Engineering colleges
CEENR_P	Numeric	5	No. of enrolment in Private Engineering colleges
CLENR_G	Numeric	5	No. of enrolment in Government Law colleges
CLENR_P	Numeric	5	No. of enrolment in Private Law colleges
VTENR_G	Numeric	5	No. of enrolment in Government vocational training institutions
VTENR_P	Numeric	5	No. of enrolment in Private vocational training institutions
AEENR_G	Numeric	5	No. of enrolment in Government adult education centers
AEENR_P	Numeric	5	No. of enrolment in Private adult education

Field Name	Type	Width (Dec.)	Description
			centers
AST_G	Numeric	5	No. of Teachers in Government Anganwadi Schools
AST_P	Numeric	5	No. of Teachers in Private Anganwadi Schools
PST_G	Numeric	5	No. of Teachers in Government Primary Schools
PST_P	Numeric	5	No. of Teachers in Private Primary Schools
MST_G	Numeric	5	No. of Teachers in Government Middle School
MST_P	Numeric	5	No. of Teachers in Private Middle School
SST_G	Numeric	5	No. of Teachers in Government Secondary School
SST_P	Numeric	5	No. of Teachers in Private Secondary School
SST_G	Numeric	5	No. of Teachers in Government Senior Secondary School
SST_P	Numeric	5	No. of Teachers in Private Senior Secondary School
CGT_G	Numeric	5	No. of Teachers in Government general colleges
CGT_P	Numeric	5	No. of Teachers in Private general colleges
CMT_G	Numeric	5	No. of Teachers in Government Medical colleges
CMT_P	Numeric	5	No. of Teachers in Private Medical colleges
CET_G	Numeric	5	No. of Teachers in Government Engineering colleges
CET_P	Numeric	5	No. of Teachers in Private Engineering colleges
CLT_G	Numeric	5	No. of Teachers in Government Law colleges
CLT_P	Numeric	5	No. of Teachers in Private Law colleges
VTT_G	Numeric	5	No. of Teachers in vocational training institutions
AET_G	Numeric	5	No. of Teachers in adult education institutions

Note: (*) nn indicates year of data.

TABLE 10 : Structure For Medical Facility Database: MEDFAC nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
HAL_G	Numeric	5	No. of Government Allopathic hospital
HAL_P	Numeric	5	No. of Private Allopathic hospital
HHO_G	Numeric	5	No. of Government Homeopathic hospital
HHO_P	Numeric	5	No. of Private Homeopathic hospital
HAY_G	Numeric	5	No. of Government Ayurvedic hospital
HAY_P	Numeric	5	No. of Private Ayurvedic hospital
HUN_G	Numeric	5	No. of Government Unani hospital
HUN_P	Numeric	5	No. of Private Unani hospital
HM_G	Numeric	5	No. of Government Maternity hospital
HM_P	Numeric	5	No. of Private Maternity hospital
HO	Numeric	5	No. of Other hospital
DAL_G	Numeric	5	No. of Government Allopathic dispensaries
DAL_P	Numeric	5	No. of Private Allopathic dispensaries
DHO_G	Numeric	5	No. of Government Homeopathic dispensaries
DHO_P	Numeric	5	No. of Private Homeopathic dispensaries
DAY_G	Numeric	5	No. of Government Ayurvedic dispensaries
DAY_P	Numeric	5	No. of Private Ayurvedic dispensaries
DUN_G	Numeric	5	No. of Government Unani dispensaries
DUN_P	Numeric	5	No. of Private Unani dispensaries
DM_G	Numeric	5	No. of Government Maternity dispensaries
DM_P	Numeric	5	No. of Private Maternity dispensaries
DO	Numeric	5	No. of Other dispensaries
PHC	Numeric	5	No. of Primary health center
NH	Numeric	5	No. of Nursing Home
HBED_G	Numeric	5	No. of beds in Government Hospital
HBED_P	Numeric	5	No. of beds in Private Hospital
DBED_G	Numeric	5	No. of beds in Government Dispensaries
DBED_P	Numeric	5	No. of beds in Private Dispensaries
PHCBED	Numeric	5	No. of beds in Primary Health centers
NHBED	Numeric	5	No. of beds in Nursing Homes
HDOC_G	Numeric	5	No. of Doctors in Government Hospital
HDOC_P	Numeric	5	No. of Doctors in Private Hospital
DDOC_G	Numeric	5	No. of Doctors in Government Dispensaries
DDOC_P	Numeric	5	No. of Doctors in Private Dispensaries
PHCDOC	Numeric	5	No. of Doctors in Primary Health centers
NHDOC_G	Numeric	5	No. of Doctors in Nursing Home
HNUR_G	Numeric	5	No. of Nurses in Government Hospital
HNUR_P	Numeric	5	No. of Nurses in Private Hospital
DNUR_G	Numeric	5	No. of Nurses in Government Dispensaries
DNUR_P	Numeric	5	No. of Nurses in Private Dispensaries
PHCNUR	Numeric	5	No. of Nurses in Primary Health centers
NHNUR	Numeric	5	No. of Nurses in Nursing Home
HPMS_G	Numeric	5	No. of Paramedical Staff in Government Hospital
HPMS_P	Numeric	5	No. of Paramedical Staff in Private Hospital
DPMS_G	Numeric	5	No. of Paramedical staff in Government Dispensaries
DPMS_P	Numeric	5	No. of Paramedical staff in Private Dispensaries

Field Name	Type	Width (Dec.)	Description
PHCPMS	Numeric	5	No. of paramedical staff in Primary Health centers
NHPMS	Numeric	5	No. of paramedical staff in Nursing Home
PT_G	Numeric	5	No. of Patients treated in Government Hospital
PT_P	Numeric	5	No. of Patients treated in Private Hospital
PTA_G	Numeric	5	No. of Patients treated in Ayurvedic Government Hospital
PTA_P	Numeric	5	No. of Patients treated in Private Ayurvedic Hospital
PTO_G	Numeric	5	No. of Patients treated in Other Government Hospital
PTO_P	Numeric	5	No. of Patients treated in Other Hospital
PTD_G	Numeric	5	No. of Patients treated in Government Dispensaries
PTD_P	Numeric	5	No. of Patients treated in Private Dispensaries
PTPHC	Numeric	5	No. of Patients treated in Primary Health centers
PTNH	Numeric	5	No. of Patients treated in Nursing Home
PDL	Numeric	5	Predominant disease Leprosy
PDP	Numeric	5	Predominant disease Phylaria
PDT	Numeric	5	Predominant disease Tuberculosis
PDC	Numeric	5	Predominant disease Cholora
PDO	Numeric	5	Predominant disease Others

Note: (*) nn indicates year of data.

TABLE 11 : Structure For Sewage Facility Database: SEWAGE nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System “link” code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
SSHH	Numeric	5	No. of HH connected with Sewerage system
QG	Numeric	5	Quantity of Sewage generated (MLD)
QT	Numeric	5	Quantity of Sewage treated (MLD)
STP	Numeric	2	No. of sewerage treatment plants
LOSD	Numeric	5	Length of Open surface drains in Kms.
AOSD	Numeric	5	Area served (sq.kms) by Open surface drains
LCSD	Numeric	5	Length of Covered drains in Kms.
ACSD	Numeric	5	Area served (sq.kms) by Covered surface drains
LUGS	Numeric	5	Length of underground sewerage in Kms.
AUGS	Numeric	5	Area served (sq.kms) by underground sewerage
LCO	Numeric	3	Length of Covered others in Kms.
ACO			Area served (in sq.kms) Others
PT	Numeric	3	Public toilets (in no.)
UPT	Numeric	5	Users per toilet daily (in No)
AEM	Numeric	5	Average expenditure maintenance (Rs. in Lakh)

Note: (*) nn indicates year of data.

TABLE 12 : Structure For Solid Waste Facility Database: S_WASTE nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
SWG	Numeric	5	Average Solid waste generation (Tons/day)
SWC	Numeric	5	Average Solid waste collection (Tons/day)
HHC	Numeric	5	No. of Houses cover for House to House Collection
DMSW	Character	20	Disposal method of solid waste
LF	Numeric	2	No. of Sites used for Land Fill
LFA	Numeric	5	Total Area Used for Land Fill (sq. Km)
MPD	Numeric	5	Manpower deployed
VD_L	Numeric	3	Vehicles deployed for Collection and Disposal (Trucks/Lories)
VD_T	Numeric	3	Vehicles deployed for Collection and Disposal (Tippers)
VD_D	Numeric	3	Vehicles deployed for Collection and Disposal (Dumpers/Placers)
VD_TR	Numeric	3	Vehicles deployed for Collection and Disposal (Tricycles)
VD_O	Numeric	3	Vehicles deployed for Collection and Disposal (Others)

Note: (*) nn indicates year of data.

TABLE 13 : Structure For Community Facility Database: COMUNITY nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
CG	Numeric	3	No. of Corporation Gardens
CH	Numeric	3	No. of Community Hall
SP	Numeric	3	No. of Swimming Pool
CP	Numeric	3	No. of Corporation Playgrounds
G	Numeric	3	No. of Gymnasia
CS	Numeric	3	No. of Corporation Stadium
CT	Numeric	3	No. of Cinema Theaters
OT	Numeric	3	No. of Open Air Theatres
Z	Numeric	3	No. of Zoo
PL	Numeric	3	No. of Public libraries
AG	Numeric	3	No. of Art Galleries
M	Numeric	3	No. of Museum
FS	Numeric	3	No. of Fire stations
FT	Numeric	3	No. of fire tenders
FP	Numeric	3	No. of fire Personnel
BG	Numeric	3	No. of Cremation/Burial Ground
PP	Numeric	3	No. of Petrol pumps/Gas Station
H	Numeric	3	No. of Hotels and Eating Places
B	Numeric	3	No. of Banks
ACS	Numeric	3	No. of Agricultural credit societies
NACS	Numeric	3	No. of Non- agricultural credit societies

Note: (*) nn indicates year of data.

TABLE 14 : Structure For Law and Order Database: LAW nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
T	Numeric	5	No. of Theft
R	Numeric	5	No. of Robbery
M	Numeric	5	No. of Murder
CAW	Numeric	5	No. of Crime against women
FA	Numeric	5	No. of Fatal Accidents
NFA	Numeric	5	No. of Non- fatal Accidents

Note: (*) nn indicates year of data.

TABLE 15 : Structure For Housing Database: HOUSE nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
OHH	Numeric	5	No. of Owned households
RHH	Numeric	5	No. of Rental households
SLHH	Numeric	5	No. of Sub-letting households
RFHH	Numeric	5	No. of rent free households
SWORHH	Numeric	5	No. of Squatter with out rent households
SWRHH	Numeric	5	No. of Squatter with rent households
NPOHH	Numeric	5	No. of Persons Living in Owned households
NPRHH	Numeric	5	No. of Persons living in Rental households
NPSLHH	Numeric	5	No. of Persons living in Sub-letting households
NPRFHH	Numeric	5	No. of Persons living in rent free households
NPSWOR	Numeric	5	No. of Persons living in Squatter with out rent households
NPSWRHH	Numeric	5	No. of Persons living in Squatter with rent households
PHRCC	Numeric	5	No. of Pucca with RCC Roof and flooring
PHT	Numeric	5	No. of Pucca with Tiles Roof and Kaccha floor
SPH	Numeric	5	No. of Semi pucca
KH	Numeric	5	No. of Kaccha
OH	Numeric	5	No. of Other houses
SHI	Character	25	Source of Housing Investment

Note: (*) nn indicates year of data.

TABLE 16 : Structure For Land Ownership: LANDOWNER nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
DU_P	Numeric	5	No. of Dwelling Units in Public sector
DU_DP	Numeric	5	No. of Dwelling Units in Developers & Promoters
DU_AI	Numeric	5	No. of Dwelling Units in Authorized Individuals
DU_UAI	Numeric	5	No. of Dwelling Units in Unauthorized Individuals
DU_O	Numeric	5	No. of Dwelling Units in Other
ADU_P	Numeric	5	Area covered in Public sector (Sq. km)
ADU_DP	Numeric	5	Area covered in Developers & Promoters (Sq. km)
ADU_AI	Numeric	5	Area covered in Authorized Individuals (Sq. km)
ADU_UAI	Numeric	5	Area covered in Unauthorized Individuals (Sq. km)
ADU_O	Numeric	5	Area covered in Other sector (Sq. km)
CDU_P	Numeric	5	Average cost of Dwelling units per sq. mt in Public sector
CDU_DP	Numeric	5	Average cost of Dwelling units per sq. mt in Developers & Promoters
CDU_AI	Numeric	5	Average cost of Dwelling units per sq. mt in Authorized Individuals
CDU_UAI	Numeric	5	Average cost Dwelling units in per mt in Unauthorized Individuals
CDU_O	Numeric	5	Average cost per sq. mt in Others
LPPA	Numeric	5	Land Price (Rs./Sq.mt.) of Planned area
LPUPA	Numeric	5	Land Price (Rs./Sq.mt.) of Unplanned area
ARDU	Numeric	5	Annual Rent of Dwelling Unit in Rs.
TMLCB	Numeric	5	Total Mortgage/ Loans in Commercial Banks (Rs. In lakhs)
TMFI	Numeric	5	Total Mortgage/ Loans in Financial Institutions (Rs. In lakhs)
TMPL	Numeric	5	Total Mortgage/ Loans as Personal loans (Rs. In lakhs)
TMLO	Numeric	5	Total Non Mortgage/ Loans other Institutions (Rs. In lakhs)
TNMLCB	Numeric	5	Total Non Mortgage/ Loans in Commercial Banks (Rs. In lakhs)
TNMFI	Numeric	5	Total Non Mortgage/ Loans in Financial Institutions (Rs. In lakhs)
TNMPL	Numeric	5	Total Mortgage/Loans as Personal loans (Rs. In lakhs)
TNMLO	Numeric	5	Total Non Mortgage/ Loans other Institutions (Rs. In lakhs)
TOLC	Numeric	5	Total Outstanding Loans in Commercial field (Rs. In lakhs)
TOLFI	Numeric	5	Total Outstanding Loans in Financial institutions (Rs. In lakhs)
TOLFI	Numeric	5	Total Outstanding Loans as Personal loans (Rs. In lakhs)
TOLFI	Numeric	5	Total Outstanding Loans in Other institutions (Rs. In lakhs)

Note: (*) nn indicates year of data.

TABLE 17 : Structure For Housing Calamities: CALAMITY nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
TC	Character	18	Type of calamity
YEAR	Numeric	5	Year of disaster
HD	Numeric	5	No. of Houses damaged
PA	Numeric	5	No. of persons affected
LOSS	Numeric	5	Loss of Property in Rupees

Note: (*) nn indicates year of data.

TABLE 18 : Structure For Public –Private -Partnership: PPP nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
HU_P	Numeric	5	No. of Housing units constructed in public partner ship (area in sq.kms)
HU_PR	Numeric	5	No. of Housing units constructed in private partner ship (area in sq.kms)
HU_PPP	Numeric	5	No. of Housing units constructed in PPP (area in sq.kms)
WS_P	Numeric	5	Water supply (MLD) in Public partner ship
WS_PR	Numeric	5	Water supply (MLD) in Private partner ship
WS_PPP	Numeric	5	Water supply (MLD) in PPP
SW_P	Numeric	5	Solid Waste (area covered in Sq.Kms under Public partner ship)
SW_PR	Numeric	5	Solid Waste (area covered in Sq.Kms under Private partner ship)
SW_PPP	Numeric	5	Solid Waste (area covered in Sq.Kms under PPP)
S_P	Numeric	5	Sewerage (Length in Kms) under Public partner ship
S_PR	Numeric	5	Sewerage (Length in Kms) under Private partner ship
S_PPP	Numeric	5	Sewerage (Length in Kms) under PPP
R_P	Numeric	5	Roads (Length in Kms) under Public partner ship
R_PR	Numeric	5	Roads (Length in Kms) under Private partner ship
R_PPP	Numeric	5	Roads (Length in Kms) under PPP
EG_P	Numeric	5	Public partner ship in Electricity Generation
EG_PR	Numeric	5	Private partner ship in Electricity Generation
EG_PPP	Numeric	5	PPP in Electricity Generation
ED_P	Numeric	5	Public partner ship in Electricity Distribution
ED_PR	Numeric	5	Private partner ship in Electricity Distribution
ED_PPP	Numeric	5	PPP in Electricity Distribution
EM_P	Numeric	5	Public partner ship in Electricity Maintenance
EM_PR	Numeric	5	Private partner ship in Electricity Maintenance
EM_PPP	Numeric	5	PPP in Electricity Maintenance
IS_P	Numeric	5	Improvement of Slum (Area in Sq.kms) under Public Partnership
IS_PR	Numeric	5	Improvement of Slum (Area in Sq.kms) under Private Partnership
IS_PPP	Numeric	5	Improvement of Slum (Area in Sq.kms) under PPP
SSR_P	Numeric	5	Slums and Squatters resettlement (Area in Sq.kms) under Public Partnership
SSR_PR	Numeric	5	Slums and Squatters resettlement (Area in Sq.kms) under Private Partnership

Field Name	Type	Width (Dec.)	Description
SSR_PPP	Numeric	5	Slums and Squatters resettlement (Area in Sq.kms) under PPP
CB_P	Numeric	5	City Beautification & Park maintenance (Area in Sq.kms) under Public partnership
CB_PR	Numeric	5	City Beautification & Park maintenance (Area in Sq.kms) under Private partnership
CB_PPP	Numeric	5	City Beautification & Park maintenance (Area in Sq.kms) under PPP
OA_P	Numeric	5	Other Activity under Public partnership
OA_PR	Numeric	5	Other Activity under Private partnership
OA_PPP	Numeric	5	Other Activity under PPP

Note: (*) nn indicates year of data.

TABLE 19 : Structure For Slum: SLUM nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
SUPAL	Numeric	5	No. of Slum HHs units in Public Authorized Land
SUPRAL	Numeric	5	No. of Slum HHs units in Private Authorized Land
SUPNL	Numeric	5	No. of Slum HHs units Public Notified land
SUPRNL	Numeric	5	No. of Slum HHs units Private Notified land
SUPUAL	Numeric	5	No. of Slum HHs units in Public Unauthorized Land
SUPRUAL	Numeric	5	No. of Slum HHs units in Private Unauthorized Land
SUPSL	Numeric	5	No. of Slum HHs units Public Squatters land
SUPRSL	Numeric	5	No. of Slum HHs units Private Squatters land
TSUPL	Numeric	5	No. of total HHs Slum units in Public Land
TSUPRL	Numeric	5	No. of total Slum HHs units in Private Land
SPPAL	Numeric	5	Slum Population in Public Authorized Land
SPPRAL	Numeric	5	Slum Population in Private Authorized Land
SPPNL	Numeric	5	Slum Population in Public Notified land
SPPRNL	Numeric	5	Slum Population in Private Notified land
SPPUAL	Numeric	5	Slum Population in Public Unauthorized Land
SPPRUAL	Numeric	5	Slum Population in Private Unauthorized Land
SPPSL	Numeric	5	Slum Population in Public Squatters land
SPPRSL	Numeric	5	Slum Population in Private Squatters land
TSPPL	Numeric	5	Total Slum Population in Public Land
TSPPRL	Numeric	5	Total Slum Population in Private Land
ACPAL	Numeric	5	Area covered in Sq.Km in Public Authorized Land
ACPRAL	Numeric	5	Area covered in Sq.Km in Private Authorized Land
ACPNL	Numeric	5	Area covered in Sq.Km in Public Notified land
ACPRNL	Numeric	5	Area covered in Sq.Km in Private Notified land
ACPUAL	Numeric	5	Area covered in Sq.Km in Public Unauthorized Land
ACPRUAL	Numeric	5	Area covered in Sq.Km in Private Unauthorized Land
ACPSL	Numeric	5	Area covered in Sq.Km in Public Squatters land
ACPRSL	Numeric	5	Area covered in Sq.Km in Private Squatters land
TACPL	Numeric	5	Total Area covered in Sq.Km in Public Land
TACPRL	Numeric	5	Total Area covered in Sq.Km in Private Land
WSCSA	Numeric	5	No. of Hhs covered Water supply in slum area
ECSA	Numeric	5	No. of Hhs covered Electricity in slum area
TCSA	Numeric	5	No. of Hhs covered Community toilets in slum area
OCSA	Numeric	5	No. of Hhs covered other Community facilities in slum area

Note: (*) nn indicates year of data.

TABLE 20 : Structure For Transportation: TRANSPORT nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
HVTP	Numeric	5	No. of Heavy Vehicles (Trucks) in Public sector
HVTPR	Numeric	5	No. of Heavy Vehicles (Trucks) in Private sector
HVBP	Numeric	5	No. of Heavy Vehicles (Bus) in Public sector
HVBPR	Numeric	5	No. of Heavy Vehicles (Bus) in Private sector
LVTW	Numeric	5	No. of Light Vehicles (Two wheeler)
LVC	Numeric	5	No. of Light Vehicles (Car)
LVJ	Numeric	5	No. of Light Vehicles (Jeep)
LVTHW	Numeric	5	No. of Light Vehicles (Three wheeler)
LVOB	Numeric	5	No. of Light Vehicles (Omini Buses)
LVTAXI	Numeric	5	No. of Light Vehicles Taxies/Cabs
NMC	Numeric	5	Non motorized (Cycle)
NMR	Numeric	5	Non motorized (Rickshaw)
NMT	Numeric	5	Non motorized (Tonga)
NMO	Numeric	5	Non motorized (Others)
WTPV	Numeric	5	Work Trips per day private vehicles
WTPTV	Numeric	5	Work Trips per day Public transport vehicles
WTTRAIN	Numeric	5	Work Trips per day Public transport vehicles (Train)
WTNMV	Numeric	5	Work Trips per day Non motorized vehicles
SRL	Numeric	5	Surface road length in Km
USRL	Numeric	5	Unsurface road length in Km
TRL	Numeric	5	Total road length in Km
FPL	Numeric	5	Footpath length in Km
CTL	Numeric	5	Cycle tracks length in Km
RS	Numeric	5	No of railway Stations
TRG	Character	20	Types of rail gauge; viz broad, narrow and meter gauge
LRRN	Numeric	5	Length of rail route network (in km)
PF	Numeric	5	No of platforms
RY	Numeric	5	No of Railway yards
PORT	Numeric	5	No. of major and minor ports
CL	Numeric	5	Length of the coastline (in Kms)
NRC	Numeric	5	No. of navigable rivers and canals
TSB	Numeric	5	Total no. of boats
S	Numeric	5	No. of Ships
OT	Numeric	5	Oil tankers
V	Numeric	5	Vessels
TTS	Numeric	5	Total tonnage of items carried by ships/tankers etc
AP	Numeric	2	No. of Airports
ATV	Numeric	5	Air Traffic volume and passenger data

Note: (*) nn indicates year of data.

TABLE 21 : Structure For Environment: ENVIRONMENT nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System "link" code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
SO2RA	Numeric	5	SO2 level of Residential area in (µg/m3)
NORA	Numeric	5	NO level of Residential area in (µg/m3)
SPMRA	Numeric	5	SPM level of Residential area in (µg/m3)

Field Name	Type	Width (Dec.)	Description
CORA	Numeric	5	CO level of Residential area in (µg/m3)
OPRA	Numeric	5	Other Pollutant level in Residential area in (µg/m3)
SO2IA	Numeric	5	SO2 level of Industrial area in (µg/m3)
NOIA	Numeric	5	NO level of Industrial l area in (µg/m3)
SPMIA	Numeric	5	SPM level of Industrial area in (µg/m3)
COIA	Numeric	5	CO level of Industrial area in (µg/m3)
OPIA	Numeric	5	Other Pollutant level in Industrial area in (µg/m3)
SO2CA	Numeric	5	SO2 level of Commercial area in (µg/m3)
NOCA	Numeric	5	NO level of Commercial l area in (µg/m3)
SPMCA	Numeric	5	SPM level of Commercial area in (µg/m3)
COCA	Numeric	5	CO level of Commercial area in (µg/m3)
OPCA	Numeric	5	Other Pollutant level in Commercial area in (µg/m3)
NLR	Numeric	5	Level of Noise in Residential area in (Db)
NLI	Numeric	5	Level of Noise in Industrial area in (Db)
NLC	Numeric	5	Level of Noise in Commercial area in (Db)
BODLW	Numeric	5	BOD level of water (mg/l)
CLW	Numeric	5	Coliform level (mg/l)
PH	Numeric	5	PH value

Note: (*) nn indicates year of data.

TABLE 22 : Structure For Governance: GOVT nn.DBF*

Field Name	Type	Width (Dec.)	Description
SCODE	Character	5	System “link” code
TCODE	Numeric	5	Town Code
WCODE	Numeric	4	Ward Code
ELE_YEAR	Numeric	1	Year of the last election held
RR	Numeric	5	Revenue Receipt in lakhs
RE	Numeric	5	Revenue Expenditure in lakhs
RLE	Numeric	5	Revenue less expenditures in lakhs
RM	Numeric	5	Resource Mobilization in lakhs
DS	Numeric	5	Debt service charges in lakhs
THHI	Numeric	5	Total City/Town HH Income (Rs. in Lakh)
GNP	Numeric	5	GNP at National Level (Rs. in Lakh)
HHINL	Numeric	5	Total HH Income at National Level (Rs. in Lakh)

Note: (*) nn indicates year of data.

Annexure-XI

National Urban Data Base Indicators (NUDB&I)
Proforma for Data Collection at
Town/Ward Level

(Before filling up the Proforma please refer Guidelines/Definitions attached)

TABLE 1 : PHYSICAL ASPECTS AND LOCATIONAL PARTICULARS

1.1. Name of Town

1.2. Name of the District

1.3. Name of the State

1.4. Physical aspects of the town

Size/class of Town	Civic Status	Annual average rainfall in millimeters	Annual average Temperature in degree centigrade	
			Minimum	Maximum

1.5 Area of the Town in (Sq.kms.)

Ward	Area in (Sq.kms.)	
	1991	2001
1		
2		
.		
Town total		

1.6 Distance in Kms. from Town

Sl.No	Description	Name	Distance km.
i	State Head Quarters		
ii	District Head Quarters		
iii	Tahsil/Taluk/Mandal Head Quarters		
iv	Nearest city (having 1 lakh and above population)		
v	Nearest Railway Station		
vi	Nearest Air port		
vii	Nearest Port		

1.7 Nearness/Distance of Major River/Canal from the Town

Sl.No.	River name	Distance in Kms.	Canal name	Distance in Kms.

TABLE 2: DEMOGRAPHIC DATA

2.1 Demographic data (*For Ward/Town)*

Ward	No. of House holds	No. of Occupied residential houses	No. of Houseless population	No. of Women headed Hhs	Population			SC Pop.			ST Pop.			Literates		
					Total	Male	Female	M	F	T	M	F	T	M	F	T
1																
2																
.																
Town Total																

2.2 Vital Statistics *(Townwise*)

Sl.No	Vital Statistics	Male	Female	Total
1	Birth rate (%)			
2	Infant Mortality (%)			
3	Life Expectancy at birth (years)			
5	Population Below Poverty Line			

TABLE 3: OCCUPATIONAL CLASSIFICATION

3.1 Occupational Classification

Ward	Main Workers			Marginal Workers			Other workers			Total Workers			Non-workers		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
1															
2															
.															
Town Total															

3.2 Classification of Main Workers

Ward	Primary Sector			Secondary Sector			Tertiary Sector			Total Main Workers		
	M	F	T	M	F	T	M	F	T	M	F	T
1												
2												
.												
Town Total												

TABLE 4: INDUSTRIAL ASPECTS (*For Ward/Town)*

Sl.No	Type of Industries	No. of units				
		2001	2002	2003	2004	2005
1	Large					
2	Medium					
3	Small					
4	House Hold					
5	Hazardous					

4.1 Most important commodities imported

4.2 Most important commodities manufactured

4.3 Most important commodities exported

TABLE 5: LAND USE (in Hectares)

S7l.No	Type of Land	1991	2001	Proposed 2011	Proposed 2021
1	Residential				
2	Commercial				
3	Industrial				
4	Recreational				
5	Public and semipublic				
6	Transportation				
7	Public Utilities				
8	Reclaimed land				
9	Vacant land				
10	Agricultural land				
11	Built Up area (Rural)				
12	Forest				
14	Wastelands				
15	Wetlands				
16	Water bodies				
17	Others				

TABLE 6: AVAILABILITY OF DRINKING WATER

6.1 Indicate the important sources of drinking water (Put the tick mark)*For Ward/Town)*

Ward	Well	Tube well	Tanks/ponds	Hand pump	Tap Water	River/ canal	Others
1							
2							
.							

Note: Indicate the distance in Kms. from the main source

6.2 Water Supply details (*For Ward/Town)*

Ward	**Source of Drinking water**	**Quantity of Water Supplied** (MLD)	**No. of Connections**	**Per Capita Consumption in liters (LPCD)**	**Area Covered (sq.kms)**	**Capacity of WTPs**	**Treatment of Total Water supply (%age)**
1							
2							
.							
Total Town							

6.2.1 Is there any scheme for recycling of waste water in the town.

Yes	No

6.2.2 Is the ground water table receding in the city?

If yes, please give present water table

Yes	No

6.2.3 Is there any separate water supply line for non-drinking purposes such as industry, parks etc.

If yes, give area covered under the scheme.

Yes	No

TABLE 7: ELECTRICITY (Town wise)

Source/distance (in Kms.) of Power plant	**Total Electricity Demand (MW)**	**Total electricity Supply (MW)**	**Total Consumption (MKWH)**

Type	Residential	Commercial	Industrial	Others	Total
No. of Electric Connections					
Electric Consumption (KWH)					

TABLE 8: TELECOMMUNICATIONS (Town wise)

No. of telephone Exchanges	
No. of telephone connections (land line)	
No. of Public Telephones	
No. of Mobile Connections	
No. of Post /telegraph office	

TABLE 9: EDUCATIONAL FACILITIES

Type of Institutions	No. of Institutions		No. of Class Rooms		Enrolment		No. of teachers	
School	**Govt.**	**Private**	**Govt.**	**Private**	**Govt.**	**Private**	**Govt.**	**Private**
Anganwadi								
Primary								
Middle								
Secondary								
Senior Secondary								
Colleges								
General								
Medical								
Engineering								
Law								
Others								
Vocational Training								
Adult Education program								
Others								

TABLE 10: MEDICAL FACILITIES

10.1 Number of hospitals, dispensaries, etc., doctors, nurses, paramedical staff and total number of beds available therein

Type of Hospital	No. of Units		No. of Beds		No. of Doctors		No. of Nurses		No. of Paramedical staff		Patients Treated	
Hospital	**Govt.**	**Private**	**Govt.**	**Private**	**Govt.**	**Private**	**Govt.**	**Private**	**Govt.**	**Private**	**Govt.**	**Private**
Allopathic												
Ayurvedic												
Homeopathic												
Unani												
Family welfare & maternity center												
Others												
Dispensary												
Allopathic												
Ayurvedic												
Unani												
Homeopathic												
Others												
Primary Health Centres												
Nursing Home												

Epidemic Details (Town wise)

Name of Predominant Diseases	No. of persons Affected
Leprosy	
Phylaria	
Tuber colosis	
Cholora	
Others (Specify)	

TABLE 11: AVAILABILITY OF SANITARY FACILITIES

11.1 Sewerage (Ward wise)

Ward	No. of HH connected with system	No. of sewage treatment plants	Quantity generated (MLD)	Quantity treated (MLD)	Open surface drains		Covered drains		Underground sewarage		Others	
					Length in Kms	Area served (sq.kms)	Length in Kms	Area served (sq.kms)	Length in Kms	Area served (sq.kms)	Length in Kms	Area served (sq.kms)
1												
2												
.												
Total Town												

11.2 Public Toilets

Public toilets (in no.)	
Users per toilet daily (in No)	
Average yearly expenditure on maintenance of Public Toilets (Rs. in Lakh)	

TABLE 12: SOLID WASTE MANAGEMENT (Ward wise data)

12.1 Solid waste generation

Ward	Average generation (Tons/day)	Average collection (Tons/day)	No. of Houses covered for House to House Collection	Total Area Used for Sanitary Land Fill (sq. Km)	Manpower deployed	No. of Sites used for Land Fill
1						
2						
.						
Total Town						

12.2 Disposal method of solid waste (Town wise) (Put a tick mark on appropriate column)

Sanitary land fill	Incinerated	Open dump	Recycled	Burned openly	Others

12.3 Vehicles deployed for Collection and Disposal of Solid waste

Type of Vehicles deployed	Trucks/ Lorrie	Tippers	Dumpers / Placers	Tricycle	Others

12.4 Is there any system of segregation of solid waste?

Yes	No

If yes, please furnish following details (%age of quantum)

Degradable	Biodegradable	Hospital waste

TABLE 13: AVAILABILITY OF RECREATIONAL, CULTURAL, BANKING AND CREDIT FACILITIES

13.1 Community Facilities (Town/Ward wise)

Sl.No	Facilities	Numbers
1	Corporation Gardens	
2	Community Hall	
3	Swimming Pool	
4	Corporation Playgrounds	
5	Gymnasia	
6	Corporation Stadium	
7	Cinemas	
8	Open Air Theatres	
9	Zoo	
10	Public libraries	
11	Art Galleries	
12	Museum	
13	Other (specify)	
14	Fire Services	
	No. of Fire stations	
	No. of fire tenders	
	Personnel	
15	Cremation/Burial Ground	
16	Petrol/Gas Station	
17	Hotels and Eating Places	
18	Others	

13.2 Number of banks and credit societies

No. of Banks	Agricultural credit societies	Non- agricultural credit societies

TABLE 14: LAW AND ORDER CRIMES (No.)

Type	No.
Theft	
Robbery	
Murder	
Crimes against women	
Fatal Accidents	
Non- fatal Accidents	

TABLE 15: HOUSING (Ward wise)

15.1 Distribution of House Holds (HHs.), No. of persons and Tenure

Tenure Status	Number of		Distribution of Persons by living rooms				
	HHs	Persons	One room	Two rooms	Three rooms	Four rooms	Five & above
Owned							
Rental							
Sub-letting							
Rent free							
Squatter without Rent							
Squatter with Rent							
Others							
Total							

15.2 Categories of Houses

Type of Houses	No. of Houses
Pucca with RCC Roof and flooring	
Pucca with Tiles Roof and Kaccha floor	
Semi pucca	
Kaccha	
Others	
Total	

TABLE 16: LAND OWNERSHIP AND COST (Ward wise)

16.1 Land Ownership

Type of ownership		No. of Dwelling Units(DU)	Area covered (Sq. km)	Average cost of DU per sq. mt (Rs.)
Public				
Private	Developers & Promoters			
	Authorized Individuals			
	Unauthorized Individuals			
Others (Specify)				
Total				

16.2 Land Prices (Ward wise)

Ward	**Land Price in Planned Area (Rs./Sq.mt.)**	**Land Price in Unplanned Area (Rs./Sq.mt.)**	**Annual Rent of Dwelling Unit (Rs.)**
1			
2			
Town Total			

16.3 Mortgage to credit ratio for housing (Rs. in Lakh)

Institutions	Total Mortgage/ Loans (Rs. In lakhs)	Total Non Mortgage/ Loans (Rs. In lakhs)	Total Outstanding Loans (Rs. In lakhs)
Commercial Banks			
Financial Institutions			
Personal Loans			
Others			

16.4 Housing Finance

Source of financial in flow in the Housing Sector				
Banks	Financial Institutions	Personal Loans	Cooperative Societies	Others

TABLE 17: HOUSING CALAMITIES (No.)

Are there any houses which have been damaged by disaster during last ten ears? Yes/No

If yes, please give following details

Type of Disaster	Year of disaster	No. of Houses damaged	Persons affected	Property Loss (Rs. In Lakhs)	Action Taken
Earthquake					
Floods					
Cyclone					
Landslides					
Others (specify)					

TABLE 18: PUBLIC – PRIVATE –PARTNERSHIP PROJECTS IMPLEMENTED IN THE TOWN (PPP)

Agency	No. of Housing units (area in sq.kms)	Water supply (MLD)	Solid Waste (area covered in Sq.Kms)	Sewerage (Length in Kms)	Roads (Length in Kms)	Electricity			Community Development		City Beautification & Park maintenance (Area in Sq.kms)	Others
						Generation (MW)	Distribution	Maintenance (Rs.)	Improvement of Slum (Area in Sq.kms)	Slums and Squatters resettlement (Area in Sq.kms)		
Public												
Private												
PPP												

TABLE 19: SLUMS

19.1 Slum Concentration

	Authorized Slum		Notified land		Unauthorized Slum		Squatters		Total land	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
No. of Slum HH units										
Population										
Area covered (Sq.km)										

19.2 Availability of Basic Amenities in Slums

Type of Amenity	No. of HHs covered
Water Supply	
Electricity	
Community toilets	
Other (specify)	

19.3 Houseless Population

Is there any scheme functioning for promotion of housing for houseless population?

Yes	No

If yes, please give details as under

Name of Scheme	Dwellings constructed during last five years	Size of the dwelling unit in Sq.mt.	Price of house	Mode of payment	No. of households benefited

TABLE 20: TRAFFIC & TRANSPORTATION- Time Series Yearly Data

20.1 Registered Vehicles

Type of Vehicles		No. of Vehicles
Heavy vehicles:	Trucks Public Private Buses Public Private	
Light Vehicles:	Two wheeler Car Jeep Three wheeler Omni Buses Taxies / Cabs	
Non motorized	Cycle Rickshaw Tonga Others	

20.2 Work Trips Undertaken from Residence to Work Place

Type of vehicles	No. of Work Trips per day	Average Time taken for one way trip (in minutes / per day)
Private motorized • Private cars • Two wheelers • Buses / cabs / mini car		
Sub-Total		
Public Transport • Trains • Trams/metro • Bus/mini bus		
Sub-Total		
Non-motorised • Cycle / Rickshaw • Walking • Others		
Sub-Total		
Total		

20.3 Road length and Footpath (in Kms.)

Surfaced road (Kms.)	Unsurfaced road (Kms.)	Total road length (Kms.)	Foot paths (Kms.)	Cycle Tracks (Kms.)

20.4 Railway

Items	No.
No of railway Stations	
Types of rail gauge; viz broad, narrow and meter gauge	
Length of rail network (in km)	
No of platforms	
No of yards	

20.5 Inland Water ways

Items	No.
No. of major and minor ports	
Length of the coastline (in Kms)	
No. of navigable rivers and canals	
Total no. of boats	
Ships	
Oil tankers	
Vessels	
Total tonnage of goods carried by ships/tankers etc	
No. of shipping yards	

20.6 Air

Items	No.
No. of Airports (Domestic & International)	
Traffic volume and passenger data	

TABLE 21: ENVIRONMENT

20.1 Air Pollution Concentration (µg/m3)

Type of pollutant	Area			
	Residential	Industrial	Commercial	Others
SO2				
NO				
SPM				
CO				

20.2 Level of Noise Pollution (Db)

Residential	Commercial	Industrial	Silence zone

20.3 Water Pollution (Mg/l)

BOD level	Coliform level	PH value

TABLE 22: GOVERNANCE

22.1 Is the local body elected?

Yes	No

If yes, state the year of last election.

22.2 Functions entrusted to local bodies as per 12th Schedule appended to 74th Constitutional Amendment Act, 1992.

22.3 Revenue and Receipt of Local Body (Rs in Lakh)

Revenue Receipt	
Revenue Expenditure	
Revenue less expenditure	
Resource Mobilization	
Debt service charges	

22.4 City Product (Time Series Yearly Data)

Total City/Town HH Income (Rs. in Lakh)	
GNP at National Level (Rs. in Lakh)	
Total HH Income at National Level (Rs. in Lakh)	

22.5 Proposed Large Projects

Proposed Capital Projects	**Source of Finance**	**Investment**	**Project period**
Upgradation			
New Infrastructure			
Expansion / Diversification			

Annexure-XII

Guidelines For Filling the National Urban Data Base & Indicators (NUDB&I) Town/Ward Proforma

1. Introduction

The Proforma for collection of town level data for NUDB&I Component under NUIS Scheme consists of 22 Tables which cover key areas such as Demography, Physical & Locational aspects, Physical and Social Infrastructure, Environment, Housing and slums, Governance etc. In the first stage, the data has to be collected as per the NUDB&I Proforma (Annexure-XI) by the Urban Local Bodies and input the same as per the Non Spatial Data Organization Structure (Annexure-X) and Town Code (Annexure VI & VII). The Source of availability of the data is also furnished in Table 8.1, which may differ in the States.

1.1 Census Town

As per the Census definition, Towns comprise the following:

(a) All statutory towns, i.e., all places with a municipality, corporation, cantonment board, or a notified town area committee, etc.
(b) All other places which satisfy the following criteria:

- a minimum population of 5,000 ;
- at least 75% of the male working population engaged in non-agricultural activities; and
- a density of population of at least 400 persons per sq.km.

5161 towns/cities have been identified in Census, 2001. These towns have been grouped into six classes based on the population size of the town. As per the 2001 census, there are 441 Class I towns, 496 Class II towns, 1388 Class III towns, 1563 Class IV towns, 1041 Class V towns and 232 Class VI towns.

1.3 Urban Agglomerations

A number of these Towns are part of `Urban Agglomerations' which represent a continuous urban spread constituting a town and its adjoining urban outgrowths or two or more physically contiguous towns having a common boundary together with continuous well-recognised urban outgrowths, if any, of such towns. Very often, around a core city or statutory town, there are come up fairly large well recognized railway colonies, university campuses, etc. Even though these places lie outside the precincts of a statutory city or town or within the revenue limits of the village(s) which (are) contiguous to the town, such areas may not be themselves qualify to be treated as towns. But if they form a continuous spread with the town, they are outgrowths of the town and deserve to be treated as urban. Such towns, together with their outgrowths, have been treated as one urban unit called `Urban Agglomeration'. Thus, an urban agglomeration may constitute:

a. A city or a town with continuous outgrowth, the outgrowth being outside the statutory limits but falling within the boundaries of the adjoining village or villages; or
b. Two or more adjoining towns with their outgrowths, if any, or
c. A city and one or more adjoining towns with or without outgrowths all of which form a continuous spread

Definitions, explanations of the parameters (including abbreviations) used in different Tables of the Proforma are as follows:

Table 1 : Physical Aspects and Locational Particulars

1.1 Name of Town

Names of the town selected under NUIS Scheme.

1.2 Name of the District

Name of the district to which the town belongs

1.3 Name of the State

State name

1.4 Physical aspects of the town

Size/class of Town

As per the census, towns have been grouped into following six classes based on population size of the town :

Size-class	Population
I	1,00,000 and above
II	50,000 - 99,999
III	20,000 - 49,999
IV	10,000 - 19,999
V	5,000 - 9,999
VI	Less than 5,000

Civic status (in 2001)

The civic administration status is a determinant for categorisation of a place as urban which is to be indicated using the following abbreviations:

	Civic Status	Abbreviation
1.	Municipal Corporation/Corporation	M.Corp.
2.	Municipal Committee/Municipal Town Committee	MC
3.	Municipality	M
4.	Municipal Board	MB
5.	Municipal Council/Town Municipal Council/City Municipal Council	M Cl
6.	Cantonment Board/Cantonment	CB
7.	Notified Area/Notified Area Committee/ Notified Committee/Notified Town Area Committee	NAC
8.	Industrial Notified Area	INA
9.	Town Committee/Town Area Committee	TC
10.	Town Area	TA
11.	Municipal Township	MTS
12.	Township	TS
13.	Town Board	TB
14.	Panchayat Township	PTS
15.	Gram Panchayat/Village Panchayat	GP
16.	Mandal Panchayat	MP
17.	Nagar Panchayat/Town Panchayat	NP
18.	Panchayat	P
19.	Sanitary Board	SB
20.	Special Area	SA
21.	Special Area Development Authority	SADA
22.	Estate Office	EO
23.	Census Town/Non-Municipal Census Town	CT
24.	Non-Municipal/Non-Municipal Area	NM

Annual rainfall in millimeters and Temperature in degree centigrade

This information is to be given on the periodic average of the preceding ten years from 2004 or 2005 as per availability.

1.5 Area of the Town in (Sq.kms.)

The area figures of statutorily notified towns are to be indicated by the civic bodies/municipal committees based on available records.

1.6 Distance in Kms. from Town

State HQs., District HQs., Tahsil/Taluk/Mandal HQs., nearest city (having 1 lakh and above population) and nearest Railway Station along with distances

These columns provide details on locational particulars of the town with reference to names of the State Hqs., District Hqs., Tahsil/Taluk/Mandal Hqs., nearest city (having 1 lakh and above population) and nearest Railway Station, indicating their distances in km., from the town. In case the nearest city or the railway station is situated in a state other than the state to

which the town belongs, name of the nearest city or nearest railway station alongwith the name of the state may be indicated. In some north-eastern states, namely, Arunachal Pradesh, Assam and Nagaland where `Circle' is equivalent to Tahsil, etc., names of Circle Hqs., have to be reported whereas in Manipur and Sikkim, Sub-Division is the equivalent to Tahsil, etc., names of Sub-Division Hqs., have to be indicated. Apart from these in Bihar. Meghalaya, Mizoram and Tripura, Community Block/Rural Development Block is the equivalent of Tahsil, In both cases Block of Police Station may be indicated as Tahsil.

1.7 Nearness/Distance of Major River/Canal

This column provides details of navigable river/canal passing nearby (within a distance of 10 km.), or through the town.

Table 2: Demographic Data

2.1 Demographic data

Number of households

In Census, a household is defined as a group of persons who commonly live together and take their meals from a common kitchen. This Table provides information on the number of households (including institutional and houseless households) in the town at the time of 2001 Census.

Women-headed households*:* a household headed by a woman, i.e. who has the primary authority and responsibility for the household's affairs, usually as chief economic support. However, in most countries, women are not usually enumerated as heads of households unless they are either living alone (that is, in one-person household) or there is no adult male in the household.

Number of occupied residential houses

This Table gives the number of occupied residential houses in respect of each town. A Census house is a building or a part of building having a separate main entrance from the road or common courtyard or staircase etc., used or recognized as a separate unit.

Population

Total population, Male and female population of the towns as per the Census 2001 is to be furnished.

Scheduled Castes- Population

All such castes, races or tribes or parts of or groups within castes, races or tribes deemed as Scheduled Castes under Article 341 of the Constitution of India have to be taken into account.

Scheduled Tribes- Population

All tribes or tribal communities or parts of or groups within tribes or tribal communities as are deemed as Scheduled Tribes under Article 342 of the Constitution of India to be taken into account and to be furnished.

Number of literates age 7 years and above

A person who can both read and write with understanding in any language is taken as literate. It is not necessary that a person who is literate should have received any formal education or should have passed any minimum educational standard. In 2001 Census, all children between 0-6 years are treated as illiterate even, if the child is going to a school and may have picked up reading and writing a few odd words.

2.2 Vital Statistics

- ***Crude Birth Rate :*** The Crude Birth Rate (CBR) is defined as the number of live births in a year per 1,000 of the midyear population.

- ***Infant Mortality Rate*** : Infant Mortality Rate (or IMR) is defined as the number of infant deaths in a year per 1,000 live births during the year.

- ***Life expectancy at birth*** *= Total child births - death of Children at the time of birth.*

- **Population BPL:** Households whose total income is below the poverty line as defined by the national/state/local standards. Poverty line taken as the income necessary to afford a minimum nutritionally adequate diet plus essential non-food requirements for a household of a given size.

Table 3: Occupational Classification

Workers and Non-workers

A 'worker' is a person who mainly participates in any economically productive activity either physically or mentally. Work not only involves actual work but effective supervision and direction of work as well.

Total workers

The total workers = Main workers + Marginal workers.

3.1 Main workers

Main workers were those who had worked for the major part of the year preceding the date of enumeration i.e., those who were engaged in any economically productive activity for 183 days or six months or more during the year.

Marginal workers

Those who worked any time in the year preceding the date of enumeration but did not work for a major part of the year i.e., those who worked for less than 183 days or six months were classified as Marginal workers.

Non-workers

Those who had not worked any time at all during the year preceding the date of enumeration are non-workers. Non-workers include (i) those engaged in household duties at home, (ii) students, (iii) dependents, (iv) retired persons (v) beggars, (vi) inmates of institutions and (vii) other non-workers.

Classification of Main Workers

The main workers both male and female are classified in primary, secondary, tertiary sectors which is to be furnished here.

Table 4: Industrial Aspects

Number of units of different type of industrial units (Large, Medium, Small House Hold, Hazardous etc) of the town/ward for the last five years to be furnished.

4.1 Most important commodities imported

The names of the most important commodities decided in terms of estimated volume of commodities imported are to be indicated.

4.2 Most important commodities manufactured

The names of the most important commodities manufactured are to be indicated. This is decided in terms of the volume of total output of the commodities concerned.

4.3 Most important commodities exported

The names of the most important commodities decided in terms of estimated volume of commodities exported are to be indicated.

Table 5: Land Use (In Hectares)

Area of land distribution

Land use in Hectares for the years of 1991,2001,2011 (proposed) and 2021 (proposed) to be furnished. The classification of land use is given as follows:

Residential
High rise
Medium rise
Low rise
Group Housing
Slums

Commercial
Retail and General Business
C.B.D/Sub C.B.D.
Community center
Wholesale and Warehousing
Local shopping
Hotel/Restaurant

Industrial
Service Industry
Light Industry
Extensive Industry
Heavy Industry
Hazardous
Industrial Godowns

Recreational
Parks/Gardens
Stadium
Playgrounds
Golf Course/Race course
Zoological parks
Historical monuments

Wastelands
Salt affected land
Gullies/ Ravine land
Land with or without scrub
Sandy area
Mine dumps/Industrial waste
Barren Rocky/Stony waste
Mining
Quarry
Other mining areas
Brick kilns

Public and semipublic
Educational Institutes
Cantonments
Hospitals
Cremation/burial ground
Social and Cultural center
Religious places
Government Office
Post office
Telephone exchange
Petrol pump
Police Station
Fire station
Cinema hall
Television station
Jail
Bank

Transportation
Road
Bus Terminals/stands
Rail
Terminals/Tracks/Yards
Airport
Runway and Airport Terminal Area

Public Utilities & facility
Water Treatment Plant
Sanitary Landfill
Electric Power plant
Sewage Treatment Plant

Agricultural Land
Crop Land
Fallow
Plantation

Forest
Dense/Closed
Open

Water bodies
River/Stream
Canal/Drain
Lakes/ponds
Reservoir/Tanks
Industrial Ponds/Pits

Wetlands
Inland natural
Inland Manmade
Coastal Natural
Coastal Manmade

Table 6: Availability of Drinking Water

6.1 Important sources of drinking water

Indicate the important sources of drinking water and also indicate the distance in Kms. from the main source

6.2 Water Supply details

Ward wise details of the quantity of water supplied (MLD), No. of Connections, Per Capita Consumption (LPCD), Area Covered (sq.kms), Capacity of WTPs, percentage of treated water etc. to be furnished.

Table 7: Electricity

The information on electric supply to the town is presented in the form of number of connections under different consumption groups viz., domestic, industrial, commercial, and others which includes electricity for agricultural purpose and so on.

Table 8: Telecommunications

Details of number of telephone connections (land line), mobile connections, Post Office etc. to be furnished here.

Table 9: Educational Facilities

Pre-primary schools have been treated as Anganwadi, Schools upto Class IV have been treated as Primary, schools upto Class VIII as Junior secondary or middle schools, schools upto Class X as Secondary schools and schools or colleges upto XII as Senior secondary schools or at places Intermediate and Junior college.

If there are composite schools like middle schools with primary classes, or secondary schools with middle classes, these have been included in the number of primary and middle schools respectively. For example, if in a town, there are two primary schools and one middle school with primary classes, the number of primary schools in the town will be given as three and that of middle schools as one even though there are only three educational institutions. Same is the case with secondary or senior secondary schools.

Number of vocational training institutions

This includes vocational institutions like Applied Art/Painting College, Pharmacy College, B.Ed. College, Teachers Training Institutions, Govt./recognized polytechnics, Shorthand, Typewriting, Music/Dance Schools, etc.

Number of colleges

The number of different types of colleges offering various courses in the town is to be indicated under following sub-heads :

(1) General
(2) Medical
(3) Engineering
(4) Law

A general college means Arts, Science and Commerce colleges.

Table 7 : Number of adult Education centers

This aspect was first introduced in the Town Directory of 1981 Census keeping in view the Minimum Needs Programme of the Planning Commission. In this column the number of adult education centres conducting regular classes are to be indicated.

Table 10: Medical Facilities

10.1 Number of hospitals, dispensaries, etc., doctors, nurses, paramedical staff and total number of beds available therein

The particulars of various type of medical institutions in various system of medicines like Allopathic, Ayurvedic, Unani, Homeopaththic etc. and their numbers viz., Hospitals, Dispensaries, Health Centres, Family Planning Centres, Nursing Homes and other medical institutions and the capacity with reference to total beds, doctors, nurses, paramedical staff available is to be given. The data presented is limited for those institutions as are run by or aided by Govt./Private institutions.

10.2 Epidemic Details

No. of persons affected by common diseases like Leprosy, Phylaria, Tuber colossi, Cholera etc.

Table 11: Availability of Sanitary Facilities

Sewerage System

Sewerage system implies the network of mains and branches of underground conduits for the conveyance of sewage to the point of disposal. Sewers that carry only household and industrial wastage are called separate sewers; those that carry storm water from roofs, streets and other surfaces are known as storm water drains, while those carrying both sewage and storm water are called combined sewers. However, towns, which are not provided with such underground sewerage system normally, have open surface drain, covered drains, etc.

Table 12: Solid Waste Management

There are three major steps involved in the management of Solid waste viz. collection, transportation and disposal. Disposal of solid waste is generally done through land filling.

Municipal solid waste includes commercial and residential waste generated by a community

Collection means collection and removal of solid waste from different collection points

Disposal means final disposal of solid waste;

Recycling means the process by which waste is transformed into new products in such a manner that the original products lose their identity;

Land fill: Means disposal of solid waste by spreading it in layers over a lined surface or land, compacting it to the smallest volume and covering it by impervious soil layer at the end of the day or more frequently. A landfill is operated to prevent leachate for contaminating ground water and maintaining ambient air quality;

Incineration: Incineration is a process of controlled combustion for burning of waste and residue, containing material, Carbon dioxide, water vapour, ash and non-combustible end products.

Biodegradable substance means a substance that can be degraded by micro-organisms.

Hospital Waste: Waste generating from the hospitals is called hospital waste

Table 13: Availability of Recreational, Cultural, Banking and Credit Facilities

13.1 Community Facilities

The particulars of recreational facilities such as stadia, museum, cinema halls and auditoria/drama/community halls and their number in the town are to be recorded. The availability of cultural facilities in the form of the number of public libraries and reading rooms, if any, available in the town is to be indicated. If fire fighting facility is not available in the town, the name of the nearest place where this facility is available is to be indicated and the distance of the same is given in column.

13.2 Number of banks and credit societies

Banks

Number of banks, commercial as well as co-operative functioning in the town has to be indicated. It gives the number of banks both the head as well as branch offices of banks in each town, which actually transact banking business. The head or branch offices not actually transacting any banking business are not to be taken into account.

Credit Societies

The information on Agricultural Credit Societies and Non-Agricultural Credit Societies are to be furnished.

The agricultural credit societies include service, multipurpose, agricultural produce, marketing cooperative societies, etc. The non-agricultural credit societies include consumer cooperative societies and also credit co-operative societies of certain categories of persons like teachers, postal-workers, etc.

Table 14: Law and Order / Crimes (No.)

Table 15: Housing (Ward Wise)

Table 16: Land Ownership and Cost (Ward Wise)

16.3 Mortgage to credit ratio for housing (Rs. in Lakh)

Mortgage / loans

Percentage of dwellings purchased during the past year that are covered by mortgage and percentage of dwellings that are covered by non-mortgage.

Table 17: Housing Calamities (No.)

Table 18: Public – Private –Partnership Projects Implemented in the Town (PPP)

Table 19: Slums

All the inhabitants of the areas, which have been notified as slums by the state governments under any legal provisions or even recognized by them, are to be accordingly considered as slum population. Besides areas in cities/towns, which satisfy the usual criteria for declaring an area as slum have also been included.

As per Census of India, 2001, the slum areas broadly consist of :-

1. All specified areas notified as 'Slum' by State/Local Government and UT Administration under any Act;
2. All areas recognized as 'Slum' by State/Local Government and UT Administration which may not have been formally notified as slum under any Act;
3. A compact area of at least 300 population or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.

Table 20: Traffic & Transportation

20.3 Road length and Footpath (in Km.)

The road length to be shown in these columns pertains to Surfaced i.e., Pucca and Un-surfaced i.e., Kutcha roads and its total road length.

Table 21: Environment

Pollutant means any solid, liquid or gaseous substance present in such concentration as may be or tend to be, injurious to the environment and environmental pollution means the presence of pollutant in the environment.

20.1 Air pollution

Air pollution is the excessive concentration of foreign matter in the air, which adversely affects the well being of the individual or cause damage to property. The important air contaminants are SO2, NO, Suspended Particulate Matter (SPM), CO. Air pollutants are measures in μg/m3.

Sulfur dioxide (SO_2) : SO_2 is an irritant colourless gas, which affects the mucous membranes when inhaled. Exposure at low level can cause increased upper respiratory symptoms such as cough, sore throat and affects lung function.

Oxides of Nitrogen (NO): Of the seven oxides of nitrogen known to exist in the ambient air, Nitrogen dioxide is the main oxides affecting human health. Oxides of nitrogen are released in all the types of combustion as they are formed by the oxidation of atmospheric nitrogen at high temperature. Exposure to excessive NO_2 affects the defense mechanism of human body.

Suspended Particulate Matters (SPM): Particulate is a term given to the minute particle of solid or semi solid material dispersed in the atmosphere. SPM presence in the air cause respiratory diseases.

Carbon Monoxide (CO): Carbon monoxide is a colourless, odourless gas with relatively poor solubility in water. CO emission are due to incomplete combustion of fuel of vehicles. CO affects the central nervous system and also responsible for heart attacks and a high mortality rate.

20.2 Noise Pollution: Noise is an unwanted sound without agreeable musical quality. Noise levels are measured in decibels. One decibel is the threshold of hearing.

20.3 Water pollution: Water pollution is any physical or chemical change in water that can adversely affect organisms

Biochemical oxygen demand, or BOD : The amount of organic material that can decompose in the sewage is measured by the biochemical oxygen demand. BOD is the amount of oxygen required by micro-organisms to decompose the organic substances in sewage. Therefore, the more organic material there is in the sewage, the higher the BOD. Dissolved oxygen is an important factor that determines the quality of water in lakes and rivers. The higher the concentration of dissolved oxygen, the better the water quality. BOD level measured in mg/l.

Coliform level: Coliform level is an important index to measure pollution by human waste. Water pollution due to human excreta is caused mainly by the lack of proper municipal sewerage.

pH Value: A number used to express degrees of acidity or alkalinity in solution.

Table 22: Governance

22.3 Revenue and Receipt of Local Body (Rs in Lakh)

The actual revenue receipt and revenue expenditure figures of the administrative body governing the town are to be filled. Data is to be presented not only in respect of statutory bodies but also in respect of non-statutory bodies managing the civic administration of the towns if they have separate budgets and accounts of their own pertaining to the town.

22.4 City Product

Total product of the city as defined in national accounts procedures. It may either be taken as the total income or value-added (wages plus business surplus plus taxes plus imports), or the total final demand (consumption plus investment plus exports).

City Product = (GNP) x (number of households in the city) x (average household income in the city) (Total national household income, from national accounts)

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ACRONYMS

BMRDA	Bangalore Metropolitan Region Development Authority
CAA	Constitutional Amendment Act
CMDA	Chennai Metropolitan Development Authority
DOS	Department of Space
EOS	Earth Observation System
GCP	Ground Control Points
GCPL	Ground Control Points Library
GIS	Geographic Information System
GPR	Ground Penetrating Radar
HUDCO	Housing and Urban Development Corporation
IIRS	Indian Institute of Remote Sensing
ISRO	Indian Space Research Organisation
LUO	Local Urban Observatory
MMRDA	Mumbai Metropolitan and Regional Development Authority
MOUD	Ministry of Urban Development
NCRPB	National Capital Region Planning Board
NNRMS	National Natural Resources Management System
NRSA	National Remote Sensing Agency
NSC	NUIS Standing Committee
NUDB&I	National Urban Databank and Indicators
NUIS	National Urban Information System
NUO	National Urban Observatory
SC-U	Standing Committee on Urban Management
SPA	School of Planning and Architecture
STP	State Town Planning
TCPO	Town and Country Planning Organisation
ULB	Urban Local Body
UNCHS	United Nation Centre and Human Settlement
UA	Urban Agglomeration
URIS	Urban and Regional Information System
USIS	Urban Spatial Information System