National Urban Information System (NUIS) Scheme

Guidelines for Implementation

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Town & Country Planning Organisation
Government of India
Ministry of Urban Development

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1.0 Introduction

The 4378 Urban Agglomerations (UAs)/towns comprising 5161 towns and cities in the country (Census 2001) house 286 million urban population. While the share of urban population, employment and contribution to the urban economy has continued to grow, towns and cities suffer from multiple problems concerning planning, management and governance.

Almost 75% of the UAs and towns lack systematic city development plans or access to updated map information. Planning activities involving spatial databases are not correlated with the sectoral/departmental data generated and as a result, the data generated at various levels for urban planning and management remains uncoordinated and redundant to support decision-making.

Spatial information like images and maps, form the foundation and basis for most planning and implementation of developmental activities; infrastructure development; disaster management support; environmental monitoring; natural resources management and many other national activities.

The Planning Commission, Government of India set up the National Natural Resources Management System (NNRMS) in 1983 supported by nine Standing Committees, including the Standing Committee on Urban Management (SC-U) to provide guidelines on major issues related to urban applications, identification of new areas for research and advice on taking up of specific national programmes.

The Ministry of Urban Development (MOUD), hosts the NNRMS Standing Committee on Urban Management (SC-U), chaired by the Secretary, Urban Development and the proposal to develop holistic National Urban Information System (NUIS) Scheme was mooted by the SC-U to be taken up in a National Mission Mode.

The NUIS Sub-Committee submitted a report on NUIS focusing on spatial database to the Standing Committee and the Planning Commission for consideration under the Tenth Five Year Plan. The Planning Commission after review suggested that several Schemes and proposals related to development of information system in the urban sector need to be converged into NUIS Scheme.

Accordingly the proposal was revised with a view to establishing town-level GIS databases and National Urban Data Bank and Indicators (NUDB&I) under a single Scheme of NUIS endorsed by the NNRMS (SC-U). The Scheme is to be taken up as a Centrally Sponsored Scheme.

This proposal was also discussed with States, selected urban local bodies and other central agencies and endorsed in two NUIS Scheme Workshops held during November 19 -20 2003 at New Delhi and November 29 -30, 2004 at Bangalore. Recommendations from the deliberations of the Workshop held in November 2004 are given in Annexure-I.

Recognizing that standardization is key to NUIS, a Sub-Committee has prepared a NUIS Scheme Design Standards Document for implementation of NUIS outlining the content, design and spatial framework to be eventually adopted as a national Standard.

2.0 Components of NUIS Scheme

The NUIS Scheme comprises two major components as given under:

- **Urban Spatial Information System (USIS)** – includes development of GIS based multi-hierarchical database, with application tools, to support Master/Zonal plan preparation; Urban Local Bodies (ULB) administration and utilities management.

- **National Urban Databank and Indicators (NUDB&I)** – includes designing and establishing a comprehensive data bank and integration of these parameters to support planning and derive indicators for National Urban Observatory (NUO) for monitoring the health of urban settlements.

Conceptualisation of NUIS is shown in the Annexure-II.

3.0 Objectives of NUIS Scheme

The objective of NUIS Scheme is to establish a comprehensive information system in the urban local bodies for planning, management and de-centralised governance in the context of provisions of scientific planning and implementation of the 74th Constitution Amendment Act (CAA) and to this end the specific objectives are as follows:

- Develop attribute as well as spatial data base for various levels of urban planning and decision support (Annexure-III) to meet requirements of urban planning and management by

    - Enabling preparation of Master/ Zonal plans.
    - Creating a database at Urban Local Body level for monitoring and management of at least relevant functions enlisted in the 12th schedule of 74th CAA.
    - Use modern data sources such as Satellite and Aerial platforms to generate a comprehensive 3-tier GIS database in the scale of 1:10,000 for Master Plan and 1: 2,000 for detailed town planning Schemes and 1:1000 for Utilities planning.

- Develop a model in Utility mapping on pilot basis using Ground Profiling/Penetrating Radar (GPR) technology.
- Integrate conventional data sources with modern data sources to develop GIS database.
- Develop standards for USIS as well as NUDB&I with regard to database, methodology, equipment software, data exchange format etc.
- Develop automated integration/application techniques in GIS to provide inputs for Master/Zonal Planning and utilities management – to be utilised by the urban planners/administrators/decision makers.
- To create a town level repository of urban database through National Urban Databank and Indicators (NUDB&I) Unit which would also assist development of urban indicators for National Urban Observatory (NUO) on pilot basis.

- Build capacity among town planning professionals in the use of modern automated methods.
- Decentralize data generation, storage and manipulation at various levels of planning.

Component wise details of the objectives are given in the Annexure-IV.

4.0 Targeted Achievements

Implementation of National Urban Information System (NUIS) Scheme with above objectives are expected to result in following achievements:

- Planning and Management of urban settlements will be based on updated and scientific database as a decision support system, employing modern planning methods using Geographic Information System (GIS) technology.
- Data generation, storage and manipulation using spatial and attribute information 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.

5.0 Scope and Coverage of NUIS Scheme

The NUIS Scheme is proposed to be taken up in a National Mission Mode commencing during the Tenth Five Year Plan. Ideally, the Scheme envisages covering all the 4378 Urban Agglomerations and towns in the country. While this Scheme is planned for initiation in the Tenth Plan, it is realized that this Scheme will spill over into the Eleventh Plan for its full implementation and coverage of all towns. At a tentative estimate, budget for development of USIS in all 4378 Urban Agglomerations and towns of the country would be around Rs 2000 crore (@ average of Rs. 48 lakh per town – derived from the USIS costing for 137 towns).

Critical to implementation of NUIS is the development of Standards and procedures that can evolve as a model to be replicated to cover larger number of urban settlements over three phases as given under:

- **Phase-I** covers 137 priority towns to develop GIS database as well as Urban Data Bank. Further, develop indicators under National Urban Observatory (NUO) for 153 towns, and Utility Mapping using Ground Profiling/Penetrating Radar (GPR) for 24 towns.

  The efforts during this phase for about 18 months period in the Tenth Plan (up to March, 2007) would largely focus on developing test-bed procedures and standards to facilitate implementation for later phases.

- **Phase-II** expand the scope to cover another 1500 towns from April 2007 to March 2009.

- **Phase-III** expand and cover the balance towns (about 3000) in the remaining period of Eleventh Plan – April 2009 to March 2012.

The phasing of NUIS Scheme is shown in Annexure-V.

5.1 Selection criteria

During Phase – I, 137 UAs and towns have been identified in consultation with the State Govts. with due consideration to equitable representation from all States and UTs in the country.

The selection of number of towns in each State has been based upon a) the number of urban settlements in the State, b) the work already undertaken in each State (excluding towns of Urban Mapping Scheme and also those covered under State initiatives) and c) coverage of at least 10% of the total NUIS towns from North Eastern States.

The States in the country have been grouped into four State classes and the number of towns selected per State class is as given under for selection (number) of towns.

Sl. No.	State Class	No. of States/UTs	Average no. of Towns in the State	No. of Towns selected *per State*	Total No. of Towns covered
1	Large	11	285	6	66
2	Other	10	94	5	50
3	NE	7	18	2	14
4	UT	7	4	1	7
	Total	**35**			**137**

The classification made above by and large follows a relationship between the size (geographical area) and number of towns; with some exceptions.

Some of the States (based on the number of towns) have been included in the appropriate category of States to normalize the data so as to facilitate equitable allocation of resources/provisions under the Scheme. The details of the criteria for selection of towns is given in Annexure-VI.

The final list of 137 towns selected for NUIS phase-I is given in Annexure - VII.

Further selection of 24 towns (Annexure-VIII) for Utility Mapping GIS is based on the following criteria:

- The NUIS Standards Committee suggested to cover 24 towns for Utility Mapping on pilot basis under NUIS Scheme.
- Of the 24 towns, 12 towns were chosen from Urban Mapping Scheme
- Remaining 12 towns were chosen from States other than those already covered under Urban Mapping Scheme

Under NUDB&I, it is proposed to cover all 137 towns selected under NUIS Scheme for generating the databank. For the NUO however, in addition to all 137 towns, 16 Global sample Cities out of the 25 towns (Annexure-IX) selected by the UNCHS under the

Millennium Development Goals have been included (remaining 9 of the 25 towns coincide with the 137 NUIS towns). Thus the total number of towns covered under the NUO would amount to 153 towns. The number of towns to be covered under NUDB&I and NUO Pilot studies per State class is given in the table below.

S.No.	State Class	No. of States/UTs	NUDB&I/NUO Pilot Towns to be covered per State	Total No. of NUDB&I towns	Total No. of NUO towns
1.	Large	11	6	66	66
2.	Others	10	5	50	50
3.	NE	7	2	14	14
4.	UT	7	1	7	7
5.	Global Sample Cities - UNCHS	-	-	-	16
	Total	**35**		**137**	**153**

6.0 Methodology

Keeping in view the primary objective of developing an urban database to build an information system, NUIS Scheme envisages to establish a methodology (Figure 1) based on advanced state-of-art technology.

The steps for the NUIS Scheme establishment are given in Annexure-X. The source and methods in the development of spatial database would involve the following:

- Multispectral satellite images for 1:10,000 mapping.
- Aerial Survey and Imaging as main source of images for 1:2,000 maps.
- The images for mapping will be corrected/registered using Global Positioning System (GPS) from the ISRO/DOS GPS library points.
- Ground Profiling/Penetrating Radar (GPR) techniques will form the base for mapping underground utilities at 1:1,000 from 1:2,000 databases in selected towns for core-area planning.
- Geographic Information System (GIS) will form the core of NUIS Scheme spatial database. The GIS techniques will be used to develop integration/application software that will generate outputs for planning and management. The design standards framed by the Standards Committee are given in Annexure-XI.
- Standardized GIS-based application packages that will allow users in Towns/States to extract specific inputs for their planning process.
- Application packages that will be linked to the NUIS Scheme database of each town and ported onto the NUIS Scheme system of the town (some of the tools and utilities anticipated are given in Annexure-XII).

The source and methods in the development of National Urban Databank and Indicators (NUDB&I) would involve the following:

- The NUDB&I database for each town to support planning and management in relation

to actual departmental functions as identified in Annexure-XIII will be generated/compiled by the ULB to be linked to the spatial database.

- The data so generated will be processed to derive indicators (Annexure-XIV) to support NUO.
- Application packages for these indicators extraction will be developed so that they can be aggregated at national level to support country level urban indices in turn to be transmitted in the Global Urban Observatory (GUO) of UNCHS**.**

7.0 Deliverables

The end product of the NUIS Scheme deliverables would amount to the following:

- An urban, standardized GIS database of 1:10,000 to enable preparation of development/master plan and 1:2,000 GIS database to monitor and implement most of urban local body functions specified in the 12th schedule of 74th CAA and 1:1000 Utility GIS database for utilities planning. The product components shall include;

    - One set of contact prints of Images of NUIS Scheme towns mapped.
    - One set of copy of the digital orthophotos of NUIS Scheme towns mapped.
    - One set of Image data example photo index, date of images and GCPs etc.
    - Global Positioning System (GPS) data.
    - 1:1,000 utilities maps using Ground Penetrating Radar (GPR) techniques from 1:2,000 database.
    - One set of Town level mosaic base map (line maps) for each of two scales mentioned above in digital as well as hard color copy format.
    - One set of GIS data sets containing all layers as specified in the Standards Document

- Core trained personnel along with computer systems with appropriate GIS software.
- A set of user-friendly application utilities that will allow extraction of outputs from the NUIS Scheme databases for planning and management activities.

The final deliverables of NUIS Scheme are shown in Annexure – XV.

In order to manage the above-mentioned deliverables, computer system that will host the NUIS Scheme in each town and State Nodal Agency has been identified.

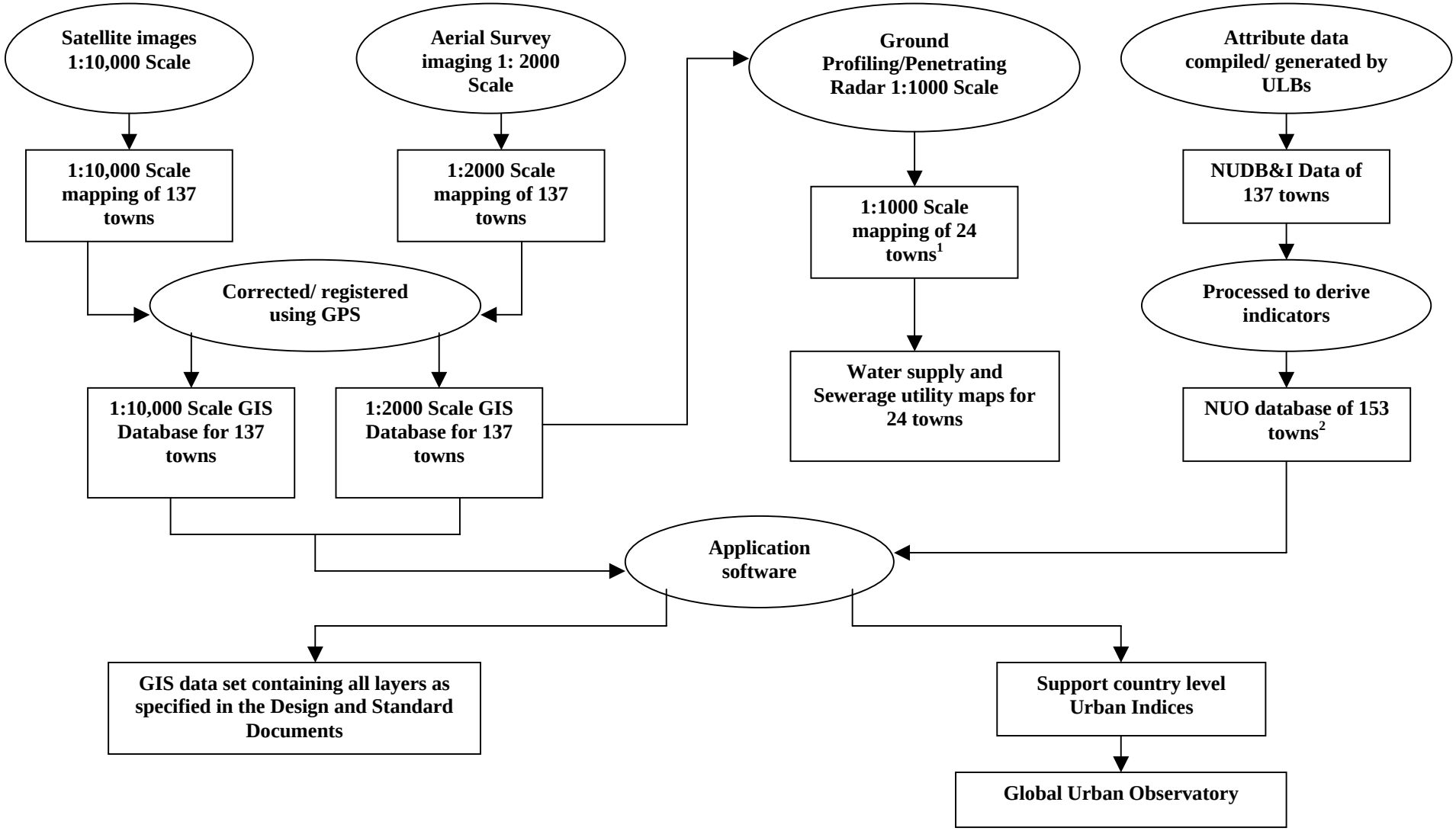
- **State Nodal Agency Level**

    - 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

Figure 1: METHODOLOGY



Note: **1** Out of 24 towns selected for Utility Mapping 12 towns have been chosen from the list of 137 NUIS towns and rest 12 towns have been selected from the list of 53 towns covered under Urban Mapping Scheme (as recommended by the NUIS Scheme Standards Committee).

2 25 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 the 137 NUIS town list. Rest 16 Global sample cities have also been considered for NUO database that makes a total of 153 towns (137+16 = 153)

8.0 Financing Pattern

The NUIS Scheme is envisaged as a Centrally Sponsored Scheme with a funding pattern on the basis of matching grant in the ratio of 75% from the Centre and 25% from the State. However, share of Systems component will be 64% Central share and 36% State share as given in structure of Fund Management, para 8.1.1 below. Further the funding under the Scheme shall not include any recurring costs. Besides the cost of operationalising the State level NUIS Scheme Cell shall not include cost towards augmentation of site and staff component.

The major budget components under the Scheme are:

a) System (HW&SW)
b) Base Map & GIS Data Base 1: 10,000 Scale; GIS Data Base1: 2,000 Scale
c) Capacity Building
d) Utility Mapping (24 towns)
e) Application Development
f) Miscellaneous and Project Management
g) NUDB&I including NUO

The budget for NUIS Phase-I is estimated to be about Rs. 66.28 crore which includes both the components *viz.* USIS (Rs. 62.89 crore) and NUDB&I (Rs. 3.39 crore) (Annexure-XVI). The total outlay on the basis of the share of the Centre and State translates to Rs. 49.71 crore and Rs. 16.57 crore respectively. This includes over 10% allocation of Central Share to North Eastern States.

The component wise calculation of the Centre/State share have been derived on the basis of certain weightage criteria based on the parameters *viz.* a) Town Class, b) Town geographic area and c) State Class. The details of NUIS Scheme Phase-I Budget as well as the criterion for calculation of the Centre and State share, component wise is given in Annexure-XVII.

8.1 Structure of Fund Management

The utilisation and release of the Centre share under the above mentioned components would be directed as follows:

8.1.1 Centre

- Funds related to GIS Data Base (for 1:10,000,1:2,000), Utility Mapping (1:1000 Scale), Capacity Building, Application Development, Project Management, System (HW/SW), NUDB&I and National and Regional Workshops under NUDB&I will be managed and released at the Central level by TCPO/MOUD.
- Funds related to GIS Data Base would be released by MOUD to the agency undertaking the job in three instalments i.e. 50%, 40% and 10% of the Central Share as first, second and third instalments respectively. MOUD shall retain the third/ final instalment till the work is completed and handed over to MOUD or its agents by the agency undertaking the job. The balance 25% of the State

share will be paid by the respective State Governments to the agency under taking the job.

- Funds under Capacity Building, Project Management and Miscellaneous expenditure, which are common cost components, shall be managed by the MOUD with a contribution of State share calculated on the basis of weightage adopted (Annexure-XVI).
- As the expenditure of the common cost components is a lump sum estimate set aside with no defined pattern of expenditure in relation to amount and period, the State share of these components will be secured by the Centre by loading 25% of this cost upon one component *viz*. the Systems (HW/SW) component. Consequently the Central share of common components shall remain 100%, while the share of Systems component will change to 64% Central share and 36% State share. The total overall State share of NUIS components shall remain at 25%.
- The unutilised/under utilised amount of the common costs components shall be released to the GIS database costs and accordingly the amount of release of State share to these costs shall be reworked with the approval of Technical Advisory Committee (TAC).
- Besides, the MOUD would release funds for procurement of the Systems based on the approved specifications of the Technical Advisory Committee of NUIS Scheme, which will be released to the States for procurement and installation in the State Nodal Agencies *viz*., State Town Planning Departments (STPD) and Urban Local Bodies (ULB).

8.1.2 State/State Nodal Agency

- Would receive an amount earmarked from Central share for procurement of Systems (HW/SW) on the basis of the specifications finalised by the NUIS Scheme Technical Advisory Committee to the extent of 64% as mentioned above in 8.1.1.
- Would receive funds for NUDB&I and NUO in accordance with the State class as specified in the table below:

S.No.	**State Class**	**No. of States/UTs**	**NUDB&I Cell Allocation per State (in Rs. Lakhs)**	**Total Allocation NUDB&I Cell (in Rs. Lakhs)**	**NUO Pilot Towns to be covered per State**	**Total Allocation NUO (**in Rs. Lakhs**) @ Rs.1 lakh per town**
1	Large	11	6	**66**	6	**66**
2	Others	10	6	**60**	5	**50**
3	NE	7	3	**21**	2	**14**
4	UT	7	3	**21**	1	**07**
5	Global Sample Cities – UNCHS	**-**	**-**	**-**	**16**	**16**
	Total	**35**		**168**		**153**

- Where the State Nodal Agency and the NUIS Scheme town are same, the Computer HW/SW Unit of NUIS Scheme town will also be provided to the State Nodal Agency.
- The States shall receive the Central share (to the tune of 75% of the components), which shall be the maximum amount to be released as estimated in the budget. Any additional expenditure incurred by the States for the defined quantum of work or additional work at States discretion shall be borne by State funds/sources.

8.1.3 Urban Local Bodies

- Would receive the systems (HW/SW) and the funds for conducting the pilot study for NUO through State Nodal Agency.

8.2 Conditions for Release of Funds

8.2.1 Release of Central Assistance

- The sanction of Central share will be subject to release/sanction of State share.
- The entire costs of the Scheme for the Union Territories without legislature will be borne by the Centre.
- The share of selected components *viz* Systems, NUDB&I and NUO from the Central Government under the NUIS Scheme would be passed on to the State Nodal Agency as non-recurring grant.
- The amount released as Central grant will be routed through the State Government Nodal Agency identified by the State Govt. to ensure accountability.
- Actual releases from Central Government will depend on (a) Physical and financial performance of the project and (b) submission of utilisation certificate against the funds released earlier (c) review and recommendation of the NUIS Scheme State Coordination Committee (SCC) (d) availability of State Share.
- The Central share for NUO would be released in two equal instalments. Whenever State matching share is made available, 50% of the Central share will be released as first instalment and the second instalment will be released on recommendation of SCC only after the collection and compilation of the data as per the NUDB&I proforma.
- The NUIS Scheme State Coordination Committee (SCC) shall identify and notify the State Nodal Agency, which would maintain the funds at the State level and pass on to the local bodies/implementing agencies.
- The Central share will be released component wise in two instalments. Initial release from Central Government will depend upon the Approval and Sanction of the State share by the NUIS Scheme State Coordination Committee (SCC). The later release of instalments shall however be subject to the following:
  I. Project performance including utilisation of funds released earlier,
  II. Conformity of proposed project with Scheme guidelines,
  III. Further the release of subsequent installments will also be subject to
    - The qualifying expenditure exceeding 70% of the Central assistance and State share released.
    - Submission of utilization certificates within 12 months from the date of release of Central assistance.

- The NUIS Scheme is envisaged as an enabling tool (NUIS database) for implementation of the 74th Constitutional Amendment, consequently some of the policy provisions as contemplated in the 74th CAA under para 243W (Annexure-XVIII) shall be implemented by the States.
- Of the ten identified functions referred in the Annexure XVIII at least five of the highlighted functions shall use the NUIS Scheme database.
- The funds for the NUIS Scheme Phase-I would be managed by TCPO/MOUD. All expenditure will be effected as per the recommendation of the TCPO. The actual amount expended on Items that are contracted/procured will be based on work contract/work orders/purchase orders etc.

8.2.2 Release at the State/UT level

- The NUIS State Coordination Committee (SCC)/ NUIS Union Territory Coordination Committee (UTCC) shall sanction the 25% of the estimated State share of the NUIS.
- The State share may also be raised/generated from the willing NUIS identified ULBs to partially or fully substitute institutional finance.
- The costs resulting due to augmentation of the NUIS Scheme cell in terms of civil, electrical works etc., land and building (site and services) shall be borne by the States in full.

9.0 Capacity Building

One of the important requirements of NUIS Scheme is the availability of trained manpower in towns and States. The training is anticipated at 3 levels:

- **Operators and Technicians level** – which will be mainly to train State/Town personnel on how to generate inputs, maintain and operate the NUIS Scheme and database. Details of design of NUIS Scheme will also be covered. This will be of 4-weeks duration.
- **Planning level** – mainly to train State/Town personnel on using the NUIS Scheme and database for generating inputs for urban planning and management. This will be of 2-weeks duration.
- **Administrators level** – mainly as an orientation on NUIS Scheme. This will be of 3-days duration.

Annexure-XIX shows some details of the Capacity Building programme under NUIS Scheme. It is expected that each of the 137 towns will have 4 trained personnel for NUIS and that sufficient capacity would be generated through this mechanism.

Based on 4 persons from each town and 2 persons from State Nodal Agency about 600 personnel would have to be trained in to about 30 training programmes over a period of 2 years with 20 participants per programme. To encourage commitment for participation in capacity building, the travel cost would be met from the Scheme funds. The training is proposed to be decentralised on a networking basis through training institutes such as IIRS Dehradun, IRS Chennai, STI Hyderabad, RRSSCs and State Remote Sensing Centers.

Besides, it will be necessary to create/update resources in terms of skills and knowledge of the personnel in the TCPO (NUIS Secretariat) to evaluate and monitor the quality of the deliverables and training capability through trainers training and orientation training programmes.

10.0 Mode of Implementation

Given the widely varying range of tasks in the NUIS Scheme involving multiple agencies including Central, State, Local Bodies and Private Sector, the implementation mechanism becomes fairly complex. The magnitude of the work being very large, there will be need to involve not only multiple government agencies, with technical expertise, but also the involvement of competent private sector, who can contribute specific services in the field of GIS and Remote Sensing.

The structure of implementation and management can be broadly grouped under Central, State, local bodies and private sector defining specific roles in the Scheme as given below:

10.1 National/Central

10.1.1 Ministry of Urban Development (MOUD)

- The NNRMS SC-U would be the apex coordinating, guiding and reviewing body for the NUIS Scheme chaired by the Secretary (UD), to provide necessary policy and technical direction.
- The Town and Country Planning Organisation (TCPO), under the Ministry of Urban Development would be the nodal agency, which will function as NUIS Secretariat with full responsibility to implement National Urban Information System (NUIS) Scheme with identified NUIS Scheme Coordinator as the head and other appropriate technical and administrative staff to manage the mission.

10.1.2 Support Agencies

- A NUIS Technical Advisory Committee (TAC) comprising of Deptt. of Space, Survey of India, National Informatics Centre, selected State Nodal Agencies etc. would be constituted by MOUD for coordinating the technical implementation and resolve technical and managerial issues (standards, system specification, Quality Assurance procedures, reviews/ evaluation etc). The NUIS Technical Advisory Committee may establish necessary sub-committees to address specific technical issues if required.

  The broad scope of the TAC would be:

  - To recommend technologies and methodologies to be applied in the NUIS Scheme.
  - Evaluate and approve the NUIS Scheme Standards document
  - Evaluate and recommend cost effective solutions

- Evaluate and approve Hardware and software solutions for procurement.
- Evaluate technical specifications and capabilities for contracting the NUIS Scheme jobs.
- Evaluate and direct/channelise the Application Development.
- Evaluate and approve the strategies for capacity building in terms of identification of training institutions and curriculum for training at various levels for NUIS Scheme town officials.
- Review and suggest modifications in the methodologies in database-development in view of changing technologies as well as the lessons learnt.

The tentative Composition of TAC is given in Annexure XX**.**

- The responsibility of delivering the final job will rest with the agency assigned the job under the coordination of TCPO/MOUD.
- The NUIS Scheme implementing agencies shall also be responsible for hand holding with the State Nodal Agencies for a period of twelve months after transfer of the database. The cost of handholding shall be part of the cost of database generation stipulated as a condition in the contract document.
- IIRS Dehradun, IRS Chennai, STI Hyderabad, RRSSCs and State Remote Sensing Centers etc. would be involved in the capacity-building activity for conducting and designing NUIS Scheme course curriculum, under the coordination of TCPO.

10.2 State

As part of NUIS Scheme implementation, the respective State Governments will have the following obligations:

- Establish a NUIS Scheme State Coordination Committee (SCC), at State level (including the Union Territories) in consultation with MOUD as a monitoring / reviewing agency to

  - Consider the appraisal reports submitted by the State Level Nodal Agency.
  - Approve and recommend the release of Central assistance to the Ministry of Urban Development through TCPO.

- The composition of the NUIS Scheme State Coordination Committee (SCC) at the State/UT level will be as follows:

Secretary, Urban Development /Urban Local Bodies/Public Works	Chairman
Secretary, Finance of the State/UT Govt	Member
Secretary, Planning of the State/UT Govt.	Member
Secretary, IT State/UT Govt.	Member
Engineer-in-Chief Of PWD /Public Health Engineering Water Supply and Sewerage, Electricity, Telecom Departments of State/UT	Member
Representative of TCPO & MOUD.	Member

Representative of Planning Commission	Member
Representative Central Statistical Organisation/National Sample Survey Organisation	Member
Representative State/UT Revenue Department of the Unified Scheme in the State/UT	Member
Director, State Town & Country Planning Department	Member
Representative/ nominated professionals of major Stakeholders	Invitee
Chief of the Sate Nodal Agency	Member Secretary

- The State Governments may make changes in the composition of the State Government representatives as required.
- The head of the Nodal Agency shall the Nodal Officer for the scheme in the state.
- The MOUD will nominate representative from Ministry of UD/ TCPO.

10.3 State Nodal Agency

- Normally the State Town Planning Departments (STPD) would act as the State Nodal Agency unless an alternate is recommended by the NUIS Scheme State Coordination Committee (SCC) for the implementation and monitoring of the NUIS Scheme in the respective State.
- The State Nodal Agency would provide the necessary guidance and mechanisms for the urban settlements in the State to implement and adopt the GIS databases for planning and management in co-ordination with the NUIS Scheme Secretariat (TCPO).
- The State Nodal Agency would set up State NUIS Scheme Cells with clearly identified personnel (Annexure-XXI) for USIS and NUDB&I units.
- As part of NUIS Scheme, the respective State Nodal Agency will have the following obligations:

    - Identify a Nodal Agency for implementing NUIS Scheme in the State besides the Head of Nodal Agency.
    - Establish NUIS Scheme Cell with an identified physical space for augmentation of the cell.
    - Establish NUDB&I database and Local Urban Observatory (LUO) for the State and link this to the NUO.
    - Establish a corps of trained manpower on NUIS Scheme for its promotion and usage.
    - Supervise, oversee and guide the Urban Local Bodies to develop, maintain and utilize NUIS Scheme.
    - Provide routine and regular report and access to the NUIS Scheme activities of the State to MOUD.

- The NUO pilot study towns may be selected by the State Nodal Agency from among the NUIS Scheme towns and be carried out under the NUDB&I component.
- The NUO study may be undertaken either by State Planning Departments/ULBs/Outsourced Agencies.

10.4 Urban Local Body (ULB)

10.4.1 Towns

While the State NUIS Nodal Agency through its NUIS Cell will coordinate the activities of the selected towns, the success of the database development will depend upon the commitment and cooperation of the Urban Local Bodies particularly with reference to NUDB&I where regular and periodic data is to be collected and compiled.

- As part of the NUIS Scheme, each town/city will have the following obligations:
    - Identify a focal point / Agency (Corporation, Municipality, Development Authority etc. as consented by the State in the town for the NUIS Scheme activity of that town.
    - Support the NUIS Scheme development by providing appropriate level of manpower support to develop, accept and run the NUIS Scheme
    - Agree to train persons to maintain and utilize NUIS Scheme
    - Identify a suitable place to house the NUIS Scheme system and database
    - Agree to maintain and upkeep the NUIS Scheme system and database
    - Collect and compile NUIS Scheme attribute data from various city deptts.
    - Agree to prepare/revise Master/Zonal Plan; administer town and manage utilities (where the town is selected for utility mapping) using the NUIS Scheme database.
    - Update further the NUIS on their own efforts.
    - Provide routine and regular report and access to the NUIS Scheme activities of the town to the State Nodal Agency.

10.5 Private Sector

The State Governments/ NUIS Scheme State Coordination Committee (SCC) may recommend and encourage involvement of the private sector or adopt public-private partnerships to the extent possible.

- Private sector could mainly provide services and products for the NUIS Scheme. It may have a major role to play, especially when a large amount of human resources are required.
- The NUO study may also be undertaken by competent private and autonomous agencies at the discretion of the State Nodal Agency.

Thus, the implementation of NUIS Scheme must be an inter-agency effort, under the lead of MOUD and the involvement of all the above. A broad project organisation is given in Annexure-XXII.

10.6 Review and Monitoring

The NUIS activities are proposed to be reviewed on a regular basis, as follows:

- Annually by the NNRMS SC-U – especially to monitor/ review overall progress and achievements and address any inter-agency issues.
- Quarterly once, by the
    - NUIS Scheme Technical Advisory Committee – especially to oversee the progress of technical issues and also to oversee the technical implementation.
    - The NUIS Scheme State Coordination Committee (SCC) shall meet every quarter and the terms of reference will include the following:
        a. Periodically monitor the progress of funds mobilization and implementation of various projects taken up under the Scheme;
        b. Minor changes within approved projects maybe permitted by the NUIS Scheme State Coordination Committee (SCC) during the course of implementation. Every such change should be intimated to the MOUD/TCPO.
        c. Review the implementation of the Scheme keeping in view its broad objectives and ensure that the programmes taken up are in accordance with the guidelines laid down.
        d. Consider issues raised by the implementing agencies from time to time and take appropriate action; if necessary obtain the advice of MOUD/ TCPO.
        e. Recommend to Ministry of Urban Development through the State Government and TCPO for release of Central assistance.
- Monitoring, review and Progress of the NUIS Scheme will be carried out by the TCPO, which will be the NUIS Scheme Secretariat.
- Progress reports should be submitted by the State Nodal Agencies to Chief Planner, TCPO in the prescribed formats.
- TCPO in turn shall apprise the Ministry with regard to the progress under the NUIS Scheme.
- Inspections of Scheme would be carried out by officers of TCPO who will:
    - Monitor allocation of jobs with regard to generation of databases and physical progress in the States including the NUO pilot study, which will mean regular site, visits.
    - TCPO will be responsible for preparing a Status Report on the Scheme in consultation with MOUD every year (by 30th May).

- Consultant approach to undertake independent evaluation of technical, managerial and planning process.

11.0 Policy Issues

The NUIS Scheme as a government initiative shall operate within the framework and comply with appropriate national policies for mapping, GIS and spatial data with due consideration to National Security issues (Annexure-XXIII).

Annexure-I

National Urban Information System (NUIS) Scheme Workshop

November 29-30, 2004 Bangalore

Recommendations

The 156 participants, including representatives of cities/towns, State Town Planning Departments, State Remote Sensing Centres, Ministry of Urban Development (MOUD), Town and Country Planning Organisation (TCPO), Indian Space Research Organisation (ISRO), Survey of India (SOI), Industries and Academia, of the National Urban Information System (NUIS) Workshop organized by MOUD and ISRO on November 29-30, 2004 in Bangalore and commend and appreciate the efforts of the National Natural Resources Management System (NNRMS), through the MOUD and ISRO, in organizing this NUIS Scheme Workshop and in making serious attempts at the much needed standardization and initiation of a national mission of organizing Urban GIS, through the Scheme of National Urban Information System (NUIS), which would support the local bodies and town/urban authorities in better planning and management of urban areas.

Considering the draft project document of NUIS Scheme and the draft NUIS Scheme standards document circulated in the Workshop and also considering the detailed technical discussions in the various sessions of the Workshop and adopt the following recommendations:

1. The NUIS Scheme, as detailed in the draft scheme document, is hereby endorsed and MOUD is requested to incorporate the following:

    - NUIS Scheme must be projected as an “integrated” tool that will support various planning levels/ scales for urban areas. NUIS Scheme is much more than base maps and includes base maps, thematic maps (spatial), non-spatial data etc and thus should be developed as a “one-stop” resource for urban planning and management in each city.
    - A need analysis of all stakeholders may be carried out to provide inputs to the longevity of NUIS Scheme.
    - The NUIS Scheme must enable the positioning and operation of the National Urban Observatory (NUO).
    - The NUIS Scheme database at 3 levels be standardized to:

        - 1:10,000 scale for supporting Concept Plan and/or Master Plan and monitoring urban areas. High-resolution satellite images and available data could be the major inputs for this.
        - 1:2,000 scale for supporting zonal/Site Plan and Municipal GIS. The aerial photos and ground surveys would be major inputs for this.
        - Utility GIS be standardized to 1:1000 scale. The specialized surveys of GPR and available data, including ground surveys, would be major inputs for these.

- It is the integrated database approach at the 3 levels mentioned above and that will support the end-to-end requirements of urban planning and management.

2. The draft NUIS Scheme Standards, as circulated in the Workshop, is also hereby endorsed with the following recommendations that could be added:

    - 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 levels.
    - 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 Scheme.
    - Similarly, incorporating ward boundaries is important and must form content of NUIS Scheme.
    - 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.

3. As far as National Urban Databank and Indicators (NUDB&I) is concerned, the concept is hereby endorsed, as it will provide an integrated picture of individual town/city’s health. The following suggestions are made:

    - The NUDB&I parameters need to be prioritized and initially characterized into those that are essential, desirable and optional. The approach of developing a minimum-level of NUDB&I for each city/town is essential.
    - The integrated analysis for application and software development must be standardized for the indicators.
    - States must be encouraged to establish the Local Urban Observatory and linked to the NUO. Towards this, NUIS Scheme Cells may be established in every city/town.
    - The flow of data/ parameters from Urban Spatial Information System (USIS) to NUDB&I must be clearly defined.

4. It is essential to pool capability/ capacity available in the country for implementing NUIS Scheme and thus the proposed management structure under the NNRMS Standing Committee on Urban Management (SC-U) – including MOUD/TCPO; State T&CPDs and State Remote Sensing Centres; and town/city authorities; ISRO/DOS and SOI; Industry and Academia, as given in the project document, is considered appropriate. However, the following suggestions are made:

    - A NUIS Scheme Technical Advisory Committee may also be included in the management structure, which could advise on technical and implementation aspects of NUIS Scheme. The Committee may include professionals and experts from government, non-government sector, industry and academia.

MOUD and State T&CPDs are urged to formally establish this management structure for the NUIS Scheme implementation at the earliest.

5. Capacity Building and Awareness of NUIS Scheme is extremely critical to generate the critical mass of trained personnel – not only to operate and use NUIS Scheme but also for support to planning and management.

    - State T&CPDs are urged to organise State-level local workshops and spread the awareness of NUIS Scheme. MOUD must encourage States to take up such activities.
    - Capacity Building/ training programmes need also to be standardized and IIRS is urged to consider regional programmes and even adopt distance-learning approaches for a larger outreach in training.

6. The concern of the need for appropriate national policies for map and spatial data is under-scored by the delegates. MOUD is urged to take up the positioning of appropriate policies and ensure that NUIS Scheme goals and objectives, as envisioned in the Scheme document, can be achieved.

7. The NUIS Scheme database must be “common asset” and efforts must be made to promote sharing of GIS data amongst agencies/users within the Town/ City/ State/ Centre and others, as required.

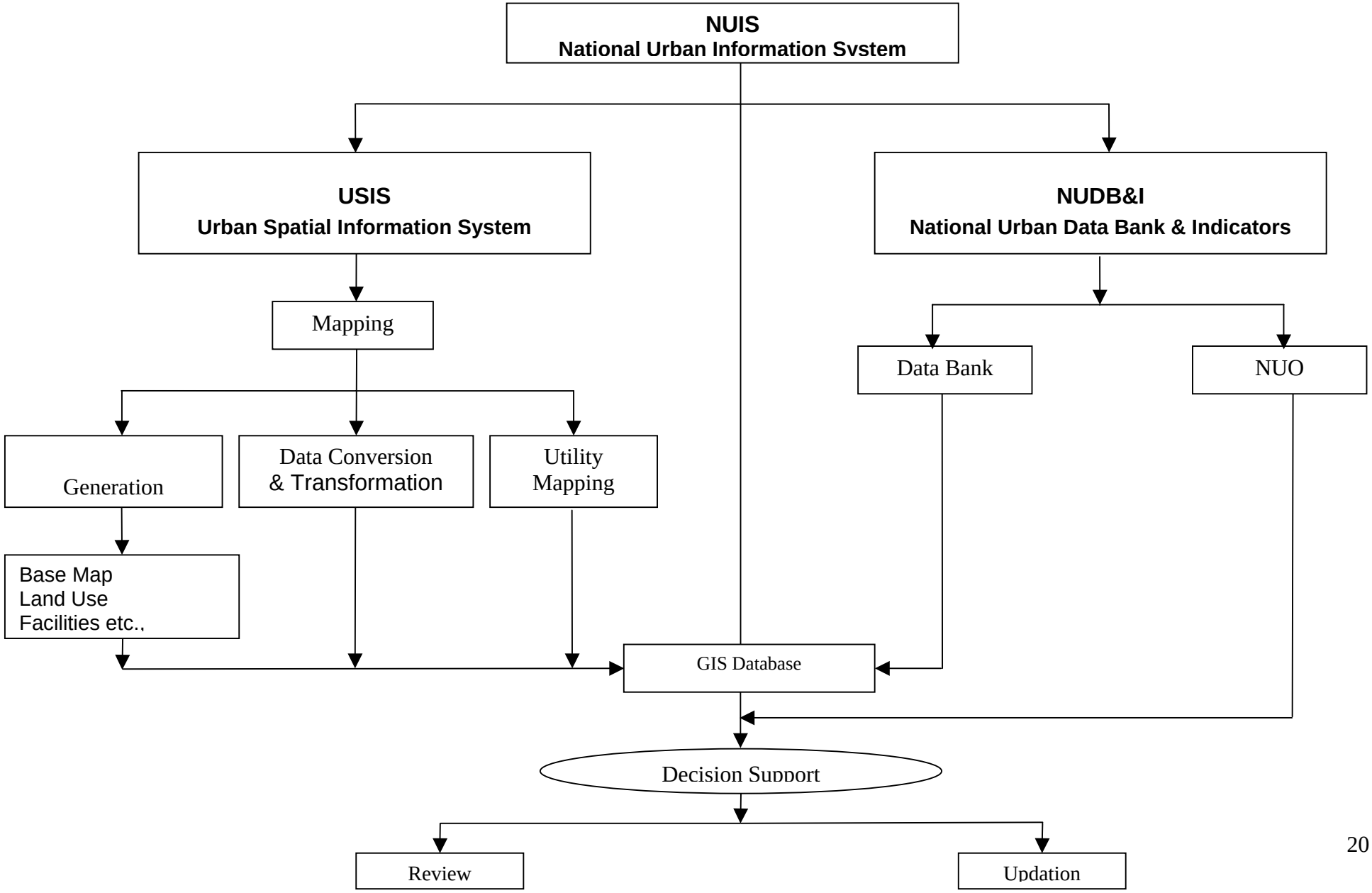
8. The concept of such a common platform achieves a lot in sharing of information and standardization. The delegates urge MOUD to standardize such a Workshop as an annual feature and enable the systematic development of NUIS Scheme and its standardization.

9. Noting the statement of Secretary (UD) on the next steps for NUIS Scheme, the Workshop delegates whole-heartedly welcome and urge the MOUD to ensure that the NUIS Scheme is to be launched in January 2005.

Adopted on this thirtieth day of November 2004, in the concluding session of the NUIS Scheme Workshop, the delegates urge the MOUD to coordinate and consider the above recommendations for implementation.

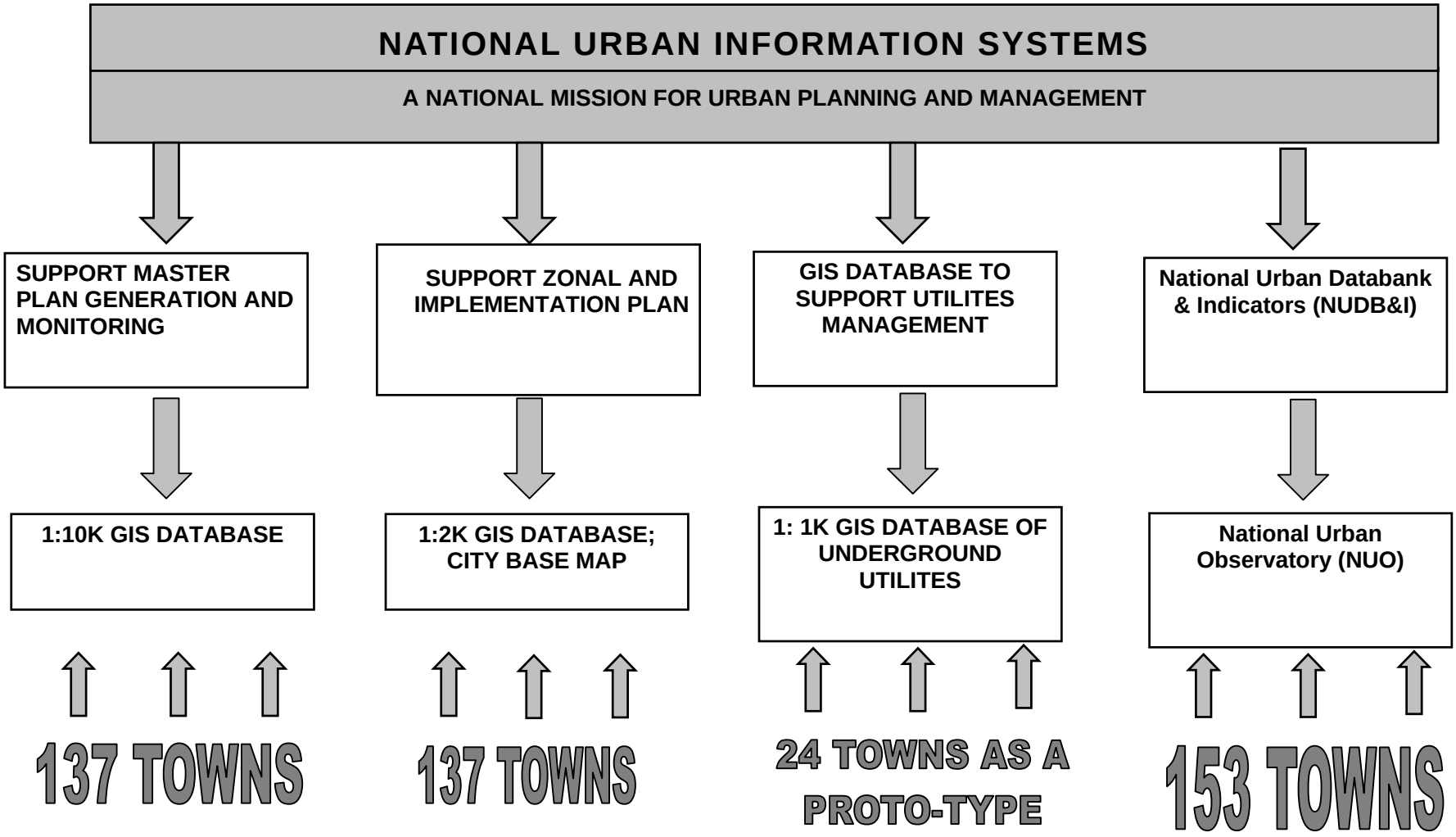
Annexure-II

Conceptualisation of National Urban Information System (NUIS) Scheme



Annexure – III

Activities of NUIS Phase-I



Annexure-IV

Component wise details of the objectives

The NUIS Scheme will have 2 important elements and their detailed objectives are as follows:

- **Urban Spatial Information System (USIS)**

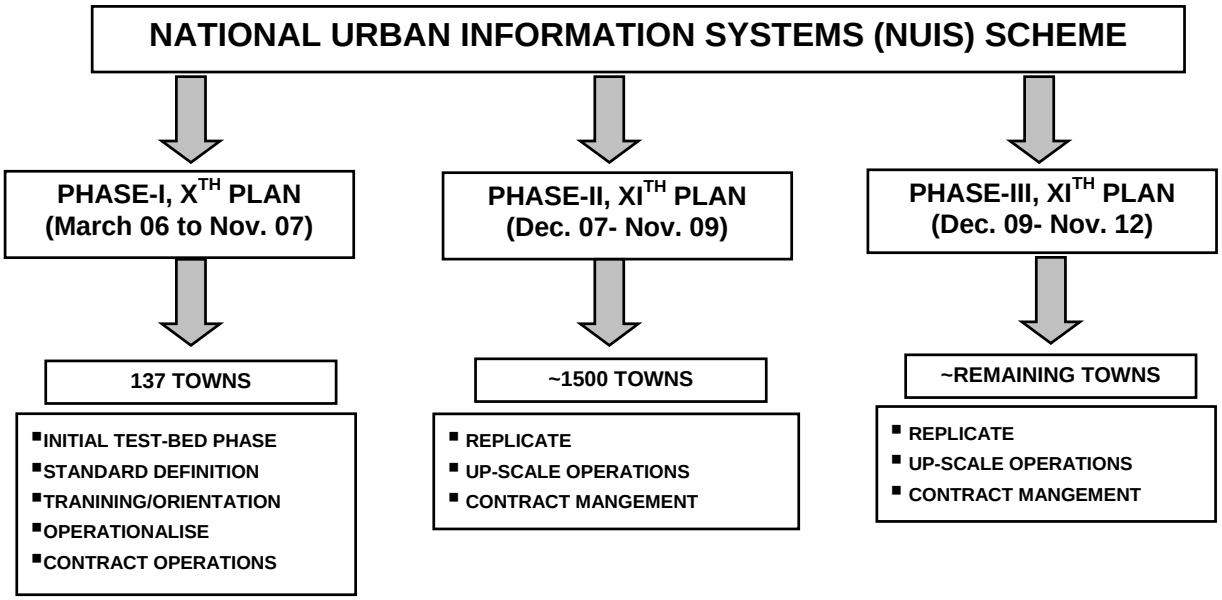
  - Generate a comprehensive 3-tiered GIS database for each town/city that will be able to support the main objective of Urban Planning and management.
  - 1:10,000 scale GIS with parameters of spatial and attribute information that will be the core of Master Planning and Zonal Planning exercises in urban settlements
  - 1:2,000 scale GIS database with parameters of spatial and attribute information in support of detailed town planning Schemes and urban administration.
  - Establish a 1:1000 scale utilities GIS on a pilot basis with inclusion of power, water-supply, sewerage and other utilities that will support Utilities Planning and Management in urban settlements.
  - Develop automated integration/application techniques in GIS to provide inputs to Master/Zonal level Planning and utilities management – to be utilised by the urban planners/ administrators.

- **National Urban Databank and Indicators (NUDB&I)**

  - Design a standard set of data parameters to be collected to support planning, and routine municipal functions listed in the 12th Schedule of the 74th CAA as part of NUDB&I for each urban settlement. The guidelines of TCPO/MOUD will be useful for this design.
  - Design a database for the NUDB&I and also develop front-end and integration software that will provide the indices. This design can also link the USIS and NUDB&I database, as required.
  - Develop town level NUDB&I databases for each town
  - Enable the establishment of a Local Urban Observatory (LUO) in each State which will integrate the NUDB&I databases for all towns within the State.
  - Support the National Urban Observatory (NUO) by integrating the NUDB&I database of all States and for each town at TCPO/MOUD.
  - Provide necessary inputs/ report on the health of urban settlements to MOUD, Planning Commission, States etc

Annexure-V

Phasing of NUIS Scheme



Annexure-VI

Criteria for selection of towns

The primary conditions for selection of the towns are as given below:

- Six UAs and towns each from Large States, five UAs and towns each from others (other than large, NE and UTs) States, Two UAs and towns each from North Eastern States and one UA and town each from each Union Territory.
- The number of towns per State class have been decided more or less based upon the proportion of towns in each State class, e.g. the percentage of towns in the Large States account for over 75% of the total UAs and towns (4378 UAs and town as per census 2001) among all State classes. Accordingly the number of towns selected from the Large States i.e. 66 towns account for about 50% of the total 137 NUIS towns.
- However though the proportion of towns in the North Eastern States account for only 3% of the total urban settlements, following the Planning Commission directives during the Tenth Five Year Plan, just over 10% of the total NUIS towns have been included from NE.
- All cities/towns not mapped by any other source of funding within five years (as on March 2003). This condition would help the States to choose an alternate town as against the towns proposed in the Scheme.
- All metros and State Capitals/cities (except Delhi, & Chandigarh UTs) already mapped (refer table given below) may be excluded to include the next largest city/ town in terms of population.
- 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.
- All cities/ towns not covered under the Centrally sponsored Urban Mapping Scheme have been selected.

Metropolitan Cities covered under Different Schemes for Mapping

Sl. No.	Urban Agglomeration/ City	State	Civic Status	Covered Under			
				Proposed Under NUIS	Urban Mapping Scheme	NRSA Initiatives	State Initiatives
1	Hyderabad UA	Andhra Pradesh	UA			*	
2	Visakhapatnam UA	Andhra Pradesh	UA				*
3	Vijayawada UA	Andhra Pradesh	UA				*
4	Patna UA	Bihar	UA	*			
5	Delhi UA	Delhi	UA	*			
6	Ahmedabad UA	Gujarat	UA			*	
7	Surat UA	Gujarat	UA	*			
8	Vadodara UA	Gujarat	UA	*			
9	Rajkot UA	Gujarat	UA	*			
10	Faridabad M.Corp.	Haryana	M.Corp.	*			
11	Jamshedpur UA	Jharkhand	UA	*			
12	Dhanbad UA	Jharkhand	UA	*			
13	Bangalore UA	Karnataka	UA			*	
14	Kochi UA	Kerala	UA		*		
15	Indore UA	Madhya Pradesh	UA		*		
16	Bhopal UA	Madhya Pradesh	UA		*		
17	Jabalpur UA	Madhya Pradesh	UA	*			

Sl. No.	Urban Agglomeration/ City	State	Civic Status	Covered Under			
				Proposed Under NUIS	Urban Mapping Scheme	NRSA Initiatives	State Initiatives
18	Greater Mumbai UA	Maharashtra	UA			*	
19	Pune UA	Maharashtra	UA	*			
20	Nagpur UA	Maharashtra	UA		*		
21	Nashik UA	Maharashtra	UA	*			
22	Ludhiana M.Corp.	Punjab	M.Corp.	*			
23	Amritsar UA	Punjab	UA	*			
24	Jaipur M.Corp.	Rajasthan	M.Corp.	*			
25	Chennai UA	Tamilnadu	UA				*
26	Coimbatore UA	Tamilnadu	UA	*			
27	Madurai UA	Tamilnadu	UA	*			
28	Kanpur UA	Uttar Pradesh	UA	*			
29	Lucknow UA	Uttar Pradesh	UA	*			
30	Agra UA	Uttar Pradesh	UA		*		
31	Varanasi UA	Uttar Pradesh	UA	*			
32	Meerut UA	Uttar Pradesh	UA	*			
33	Allahabad UA	Uttar Pradesh	UA	*			
34	Kolkata UA	West Bengal	UA				*
35	Asansol UA	West Bengal	UA		*		

Annexure-VII

List of NUIS Scheme Phase-I Towns with Tentative area for mapping

Sl. No.	Town	State	Population 2001	Status	Class	Tentative area for mapping in Sq. Km.		
						Census Area 1991*	Area 91 + 500 % (For 1:10,000 Scale)	Area 91 + 20 % (For 1:2000 Scale)
1	Port Blair	Andaman & Nicobar Islands	99984	Town	II	14.14	70.70	16.97
2	Adilabad	Andhra Pradesh	129403	Town	I	20.76	103.80	24.91
3	Dharmavaram	Andhra Pradesh	103357	Town	I	40.45	202.25	48.54
4	Madanapalle	Andhra Pradesh	107449	Town	I	14.20	71.00	17.04
5	Nalgonda	Andhra Pradesh	111380	Town	I	22.00	110.00	26.40
6	Srikakulam	Andhra Pradesh	117320	Town	I	14.10	70.50	16.92
7	Tadepaligudem	Andhra Pradesh	102622	Town	I	20.71	103.55	24.85
8	Along	Arunachal Pradesh	17033	Town	IV	20.00	100.00	24.00
9	Daporijo	Arunachal Pradesh	15756	Town	IV	20.00	100.00	24.00
10	Dibrugarh	Assam	137661	UA	I	16.00	80.00	19.20
11	Nagaon	Assam	123265	UA	I	9.22	46.10	11.06
12	Silchar	Assam	184105	UA	I	15.75	78.75	18.90
13	Tezpur	Assam	105377	Town	I	7.10	35.50	8.52
14	Tinsukia	Assam	108123	UA	I	33.27	166.35	39.92
15	Arrah	Bihar	203380	Town	I	30.97	154.85	37.16
16	Bhagalpur	Bihar	350133	UA	I	30.84	154.20	37.01
17	Darbhanga	Bihar	267348	Town	I	19.18	95.90	23.02
18	Muzaffarpur	Bihar	305525	Town	I	26.43	132.15	31.72
19	Patna	Bihar	1697976	UA	Metro	128.61	643.05	154.33
20	Chandigarh	Chandigarh	808515	UA	I	333.00	1665.00	399.60
21	Bhilai Nagar	Chattisgarh	927864	Town	I	89.87	449.35	107.84
22	Bilaspur	Chattisgarh	335293	Town	I	46.47	232.35	55.76
23	Durg	Chattisgarh	232517	Town	I	50.80	254.00	60.96
24	Korba	Chattisgarh	315690	Town	I	35.07	175.35	42.08
25	Raipur	Chattisgarh	700113	UA	I	64.29	321.45	77.15
26	Silvassa	Dadra & Nagar Haveli	21893	Town	III	0.78	3.90	0.94
27	Daman	Daman & Diu	35770	Town	III	5.60	28.00	6.72
28	Delhi U.A.	Delhi	12877470	UA	Metro	1437.00	7185.00	1724.40
29	Cuncolim	Goa	15860	Town	IV	28.69	143.45	34.43
30	Curchorem Cacora	Goa	21407	Town	III	22.55	112.75	27.06
31	Mapusa	Goa	40487	Town	III	11.32	56.60	13.58
32	Margao	Goa	94383	UA	II	22.04	110.20	26.45
33	Mormugao	Goa	104758	UA	I	39.55	197.75	47.46
34	Bhavnagar	Gujarat	517708	UA	I	90.16	450.80	108.19
35	Jamnagar	Gujarat	556956	UA	I	35.50	177.50	42.60
36	Nadiad	Gujarat	196793	UA	I	28.48	142.40	34.18
37	Rajkot	Gujarat	1003015	UA	Metro	84.60	423.00	101.52
38	Surat	Gujarat	2811614	UA	Metro	153.16	765.80	183.79
39	Vadodara	Gujarat	1491045	UA	Metro	136.97	684.85	164.36
40	Faridabad	Haryana	1055938	Town	Metro	178.24	891.20	213.89
41	Hisar	Haryana	263186	UA	I	49.43	247.15	59.32
42	Karnal	Haryana	221236	UA	I	23.60	118.00	28.32

Sl. No.	Town	State	Population 2001	Status	Class	Tentative area for mapping in Sq. Km.		
						Census Area 1991*	Area 91 + 500 % (For 1:10,000 Scale)	Area 91 + 20 % (For 1:2000 Scale)
43	Panipat	Haryana	354148	UA	I	20.82	104.10	24.98
44	Rohtak	Haryana	294577	UA	I	28.38	141.90	34.06
45	Dharamsala	Himachal Pradesh	19124	Town	IV	10.63	53.15	12.76
46	Mandi	Himachal Pradesh	26873	Town	III	4.26	21.30	5.11
47	Nahan	Himachal Pradesh	26053	Town	III	8.78	43.90	10.54
48	Shimla	Himachal Pradesh	144975	UA	I	35.34	176.70	42.41
49	Solan	Himachal Pradesh	34206	Town	III	6.18	30.90	7.42
50	Anantnag	Jammu & Kashmir	97896	Town	II	46.00	230.00	55.20
51	Baramula	Jammu & Kashmir	71896	Town	II	46.00	230.00	55.20
52	Jammu	Jammu & Kashmir	612163	UA	I	46.00	230.00	55.20
53	Sopore	Jammu & Kashmir	59624	Town	II	15.00	75.00	18.00
54	Srinagar	Jammu & Kashmir	988210	Town	I	7.77	38.85	9.32
55	Bokaro Steel City	Jharkhand	497780	UA	I	183.43	917.15	220.12
56	Dhanbad	Jharkhand	1065327	UA	Metro	201.44	1007.20	241.73
57	Jamshedpur	Jharkhand	1104713	UA	Metro	99.75	498.75	119.70
58	Mango	Jharkhand	166125	Town	I	19.45	97.25	23.34
59	Ranchi	Jharkhand	863495	UA	I	182.09	910.45	218.51
60	Bellary	Karnataka	316766	Town	I	65.90	329.50	79.08
61	Bidar	Karnataka	174257	Town	I	47.05	235.25	56.46
62	Bijapur	Karnataka	253891	Town	I	75.36	376.80	90.43
63	Davanagere-Harihara	Karnataka	364523	UA	I	48.46	242.30	58.15
64	Kolar	Karnataka	113907	M	I	7.91	39.55	9.49
65	Raichur	Karnataka	207421	Town	I	75.24	376.20	90.29
66	Alappuzha	Kerala	282675	UA	I	84.48	422.40	101.38
67	Kollam	Kerala	380091	UA	I	67.65	338.25	81.18
68	Kozhikode	Kerala	880247	UA	I	232.95	1164.75	279.54
69	Palakkad	Kerala	197369	UA	I	59.05	295.25	70.86
70	Thrissur	Kerala	330122	UA	I	88.42	442.10	106.10
71	Kavaratti	Lakshadweep	10119	Town	IV	3.63	18.15	4.36
72	Dewas	Madhya Pradesh	231672	Town	I	100.22	501.10	120.26
73	Gwalior	Madhya Pradesh	865548	UA	I	303.18	1515.90	363.82
74	Jabalpur	Madhya Pradesh	1098000	UA	Metro	224.45	1122.25	269.34
75	Sagar	Madhya Pradesh	308922	UA	I	52.07	260.35	62.48
76	Satna	Madhya Pradesh	229307	UA	I	86.77	433.85	104.12
77	Ujjain	Madhya Pradesh	431162	UA	I	92.94	464.70	111.53
78	Aurangabad	Maharashtra	892483	UA	I	148.12	740.60	177.74
79	Bhiwandi	Maharashtra	621427	UA	I	28.21	141.05	33.85
80	Nashik	Maharashtra	1152326	UA	Metro	321.94	1609.70	386.33
81	Pimpri Chinchwad	Maharashtra	1012472	Town	Metro	87.05	435.25	104.46
82	Pune	Maharashtra	3760636	UA	Metro	423.42	2117.10	508.10
83	Thane	Maharashtra	1262551	Town	Metro	143.76	718.80	172.51
84	Imphal	Manipur	250234	UA	I	36.55	182.75	43.86
85	Kakching	Manipur	28724	Town	III	7.02	35.10	8.42
86	Jowai	Meghalaya	25057	MB	III	7.80	39.00	9.36
87	Tura	Meghalaya	58978	M	II	18.30	91.50	21.96

Sl. No.	Town	State	Population 2001	Status	Class	Tentative area for mapping in Sq. Km.		
						Census Area 1991*	Area 91 + 500 % (For 1:10,000 Scale)	Area 91 + 20 % (For 1:2000 Scale)
88	Champhai	Mizoram	26465	Town	III	52.00	260.00	62.40
89	Lunglei	Mizoram	47137	Town	III	44.00	220.00	52.80
90	Dimapur	Nagaland	98096	Town	II	25.54	127.70	30.65
91	Mokokchung	Nagaland	31214	Town	III	32.00	160.00	38.40
92	Baleshwar	Orissa	156430	UA	I	41.82	209.10	50.18
93	Baripada	Orissa	100651	UA	I	29.98	149.90	35.98
94	Brahmapur	Orissa	307792	Town	I	79.80	399.00	95.76
95	Cuttack	Orissa	587182	UA	I	152.99	764.95	183.59
96	Raurkela	Orissa	484874	UA	I	157.17	785.85	188.60
97	Sambalpur	Orissa	226469	UA	I	89.50	447.50	107.40
98	Kraikal	Pondicherry	74438	M	II	35.17	175.85	42.20
99	Amritsar	Punjab	1003917	Town	Metro	114.95	574.75	137.94
100	Bhatinda	Punjab	217256	Town	I	114.00	570.00	136.80
101	Jalandhar	Punjab	714077	Town	I	80.41	402.05	96.49
102	Ludhiana	Punjab	1398467	Town	Metro	134.67	673.35	161.60
103	Pathankot	Punjab	168485	UA	I	22.10	110.50	26.52
104	Patiala	Punjab	323884	UA	I	31.20	156.00	37.44
105	Bandikui	Rajasthan	16295	M	IV	3.18	15.90	3.82
106	Bijainagar-Gulabpura	Rajasthan	24362	M	III	10.00	50.00	12.00
107	Dungarpur	Rajasthan	43108	M	III	10.24	51.20	12.29
108	Karauli	Rajasthan	66239	M	II	35.00	175.00	42.00
109	Makrana	Rajasthan	91853	UA	II	3.43	17.15	4.12
110	Sawai Madhopur	Rajasthan	101997	UA	I	60.38	301.90	72.46
111	Rangpo	Sikkim	3709	Town	VI	20.00	100.00	24.00
112	Singtam	Sikkim	5432	Town	V	20.00	100.00	24.00
113	Coimbatore	Tamil Nadu	1461139	UA	Metro	314.84	1574.20	377.81
114	Madurai	Tamil Nadu	1203095	UA	Metro	115.48	577.40	138.58
115	Salem	Tamil Nadu	751438	UA	I	93.31	466.55	111.97
116	Tiruchirappalli	Tamil Nadu	866354	UA	I	165.81	829.05	198.97
117	Tirunelveli	Tamil Nadu	433352	UA	I	86.87	434.35	104.24
118	Tiruppur	Tamil Nadu	550826	UA	I	43.52	217.60	52.22
119	Dharmanagar	Tripura	30790	Town	III	7.77	38.85	9.32
120	Radhakishorepur (Udaipur)	Tripura	21758	NP	III	64.28	321.40	77.14
121	Allahabad	Uttar Pradesh	1042229	UA	Metro	114.00	570.00	136.80
122	Ghaziabad	Uttar Pradesh	968256	UA	I	74.64	373.20	89.57
123	Kanpur	Uttar Pradesh	2715555	UA	Metro	266.74	1333.70	320.09
124	Lucknow	Uttar Pradesh	2245509	UA	Metro	337.50	1687.50	405.00
125	Meerut	Uttar Pradesh	1161716	UA	Metro	177.58	887.90	213.10
126	Varanasi	Uttar Pradesh	1203961	UA	Metro	83.05	415.25	99.66
127	Bageshwar	Uttaranchal	7803	Town	V	5.00	25.00	6.00
128	Kotdwar	Uttaranchal	24947	Town	III	2.59	12.95	3.11
129	Mussourie	Uttaranchal	29329	UA	III	64.75	323.75	77.70
130	Pithoragarh	Uttaranchal	44964	Town	III	8.99	44.95	10.79
131	Roorkee	Uttaranchal	115278	UA	I	7.74	38.70	9.29

Sl. No.	Town	State	Population 2001	Status	Class	Tentative area for mapping in Sq. Km.		
						Census Area 1991*	Area 91 + 500 % (For 1:10,000 Scale)	Area 91 + 20 % (For 1:2000 Scale)
132	Bhatpara	West Bengal	442385	UA	I	15.85	79.25	19.02
133	Durgapur	West Bengal	493405	Town	I	154.20	771.00	185.04
134	Kamarhati	West Bengal	314507	Town	I	10.96	54.80	13.15
135	Kulti	West Bengal	289903	Town	I	32.57	162.85	39.08
136	Panihati	West Bengal	348438	Town	I	19.40	97.00	23.28
137	Rajpur Sonarpur	West Bengal	336707	Town	I	114.00	570.00	136.80
		Total				**11151.09**	**55755.45**	**13381.31**

***** Area of the town to be mapped is indicative and the final area will be subject to the actual urban area of the town at the time of survey.

Annexure-VIII

List of Towns for Utility Mapping

A. Urban Mapping Phase-II					
Sl. No.	**Name**	**States**	**Class**	**Avg. Area Linear km**	**Cost @ Rs.6,000/linear km.**
1	Itanagar-Naharlagun	Arunachal Pradesh	III	100	600000
2	Gaya	Bihar	I	350	2100000
3	Chandigarh	Chandigarh	I	350	2100000
4	Gurgaon	Haryana	I	350	2100000
5	Mysore	Karnataka	I	350	2100000
6	Kochi	Kerala	I	350	2100000
7	Bhopal	Madya Pradesh	METRO	900	5400000
8	Aizwal	Mizoram	I	350	2100000
9	Pondicherry	Pondichery	I	350	2100000
10	Ajmer	Rajasthan	I	350	2100000
11	Gangtok	Sikkim	III	100	600000
12	Asansol	Wes Bengal	I	350	2100000
	Total			**4250**	**25500000**
B. National Urban Information System (NUIS) Scheme					
Sl. No.	**Name**	**States**	**Class**	**Avg. Area linear km**	**Cost @ Rs. 8500/linear km.**
13	Nalgonda	Andhra Pradesh	I	350	2100000
14	Raipur	Chattisgarh	I	350	2100000
15	Mormugao	Goa	I	350	2100000
16	Surat	Gujarat	I	350	2100000
17	Shimla	Himachal Pradesh	I	350	2100000
18	Jamshedpur	Jharkhand	I	350	2100000
19	Pune	Maharashtra	METRO	900	5400000
20	Cuttack	Orissa	I	350	2100000
21	Ludhiana	Punjab	I	350	2100000
22	Coimbatore	Tamil Nadu	METRO	900	5400000
23	Kanpur	Uttar Pradesh	METRO	900	5400000
24	Roorkee	Uttaranchal	I	350	2100000
	Total			**5850**	**35100000**
	Grand Total (A+B)			**10100**	**60600000**

Selection Criteria:

1. The NUIS Scheme Standards Committee suggested that in all, 24 towns may be covered for Utility Mapping on pilot basis under NUIS Scheme.
2. Of the 24 towns mentioned above the NUIS Scheme Standards Committee, recommended 12 towns at 'A' to be taken up for Utility Mapping from Urban Mapping Scheme
3. Remaining 12 towns at 'B" have been chosen from other States.
4. The costing for Utility Mapping has been calculated based on the average linear length in Kms. of roads derived from the data from the pilot studies conducted by TCPO under NUO for 34 towns and class of town based on the population size.
5. The average areas derived from the pilot studies were 900 linear kms. for Metro cities, 350 linear kms. for Class-I towns and 100 linear kms. for other towns.
6. The cost Rs. 6,000/linear km has been provided by SOI to cover two utilities i.e. water supply and sewerage.

Annexure-IX

Global Sample of Cities – UNCHS - Sample Frame Trial

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

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

Annexure-X

Steps for the NUIS Scheme Implementation

NUIS Scheme 1:10K/1:2K	NUIS Scheme 1:1K
• Identify NUIS team in each town/State • Discuss/plan NUIS Scheme implementation with NUIS team of town/State • Identify area for 1:2k scale mapping around town • Obtain clearances for aerial survey • Aerial flying by Government Agency • Procure satellite images • 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 GIS application tools • Training of personnel • Porting of GIS database and application to NUIS Scheme system of town • Town generates plans • Town updates and maintain NUIS Scheme database and system • Review and monitoring.	• Discuss/plan NUIS Scheme implementation with team of town/State • 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 • 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 • Town updates and maintain NUIS Scheme database and system • Review and monitoring

Annexure-XI

NUIS Scheme Design Standards

Parameter	1:10,000	1:2000
A] IMAGE STANDARDS		
Generic/Standard Resolution	▪ 5m multi spectral or better	▪ -
IRS Image Resolution	▪ 5.8 m Multi-spectral or better ▪ 2.5 m XS	▪ Aerial Pan / multi spectral
Projection for image outputs	LCC/TM	LCC/TM
Datum for image products	WGS 84	WGS 84
Image Frames (geometrically corrected; important for seamlessness)	3’ 45”X 3’ 45”	45” X 45”’
Image Position (Planimetric) Accuracy (0.5 mm of scale) in m	5	0.5 (0.25mm of scale)
Band-to-Band Registration for XS data (0.25 pixel) in m	~1.5	~0.1
B] THEMATIC MAPPING STANDARDS		
Minimum Map Frame size for incorporation to NRR	3’ 45’”X 3’ 45”	1’ X 1’
Image Registration accuracy @ 0.5 pixel (RMS)	1.25m	0.5 pixel
Map Projection	UTM	UTM
Datum	WGS 84	WGS 84
Position (Planimetric) Accuracy (1mm of scale) in m	10	0.50 (0.25mm of scale)
Minimum Mappable Unit (MMU) (3 x 3 mm of scale) in sq mts	900	4 (1mm X 1mm)
DEM Z-Spacing as 1mm of scale in m	10	2
DEM Z-Accuracy in m	5	1
Thematic Accuracy of Classification/Mapping	90/90	90/90
Map Formats	▪ Digital GIS compliant ▪ Paper	▪ Digital GIS compliant ▪ Paper
C] GIS DATABASE STANDARDS		
Spatial framework	Seamless - National	Seamless – Local/National
Tie-Point Intervals for Spatial Framework	45” X 45”	15” X 15”
Coordinate units for Precision	Decimal-Seconds	Decimal-Seconds
Projection	Geographic	Geographic
Datum	WGS 84	WGS 84
Minimum Frame size for NRR	3.75’ X 3.75’	45” X 45”
GIS DB Tic Registration Accuracy (0.25mm of scale) (RMS) in m	2.5	0.5
Position (Planimetric) Accuracy (1mm of scale) in m	10	0.5 (0.25mm of scale)

Parameter	1:10,000	1:2000
Coordinate Movement Tolerance (CMT) (0.125mm of scale) in m	1.25	0.25
Weed Tolerance (WT) (0.125mm of scale) in m	1.25	0.25
Sliver Polygon Tolerance (SPT) (LESS-THAN MMU) in m	<900	<4
Grid Size (for Image/Raster/DEM Layers) (0.5mm of scale) in m	5	1
D] OUTPUT/SERVICES STANDARDS		
Output Formats (Filter as defined by National map Policy)	▪ Digital GIS compliant ▪ Digital web-compliant • Paper	▪ Digital GIS compliant ▪ Digital web-compliant • Paper
Output Framework	• Admin Units – District, Taluk, Villages • Cadastre Reference • Natural Regions • User defined region polygon • Spatial Framework grids	• Admin Units – Villages, Wards • Cadastre Reference • Natural Regions • User defined region polygon • Spatial Framework grids
Output Media	• On-line download • Off-line Download • CD-ROM	• On-line download • Off-line Download • CD-ROM
Output Projection	UTM / Polyconic / User defined	UTM / Relative / User Defined
Output Datum	WGS 84	WGS 84
Output Formats	GIS format, GeoTIF, TIF, Shape file, Jpeg, NSDE and others	GIS format, GeoTIF, TIF, Shape file, Jpeg, NSDE and others
Output Symbology	As per Layer Legend	As per Layer Legend
E] FRAMEWORK/LAYER ACCURACY STANDARDS		
National Framework Quality/Accuracy - Tolerable limits for area of standard admin units	0.3% of taluk or village or tile areas	0.3% of tile areas
Position (Planimetric) Accuracy (1mm of scale) in m	Output to be sampled and certified for position accuracy quality	Output to be sampled and certified for position accuracy quality
Thematic Accuracy of Classification/Mapping	To be reported from Metadata	To be reported from Metadata

Annexure-XII

Anticipated Tools and Utilities

Some of the tools anticipated are:

- Generate integrated outputs for Land use and Urban sprawl/ Direction of growth, Urban Land use Suitability assessment, Groundwater Assessment, Environmental Sensitivity assessment, Hazard Zonation etc – which individually are the basic inputs for Master Plan generation.
- Generation of allocation assessments for Site Plan and Zonal Plan
- Urban administration applications like property tax, revenue, traffic, roads, etc.
- Utility management and assessment software for power, telecom and traffic management.
- Other urban management query shells for easy retrieval of spatial and attribute data from NUIS Scheme databases.

Annexure-XIII

Content of NUIS Scheme at 3 Levels

MASTER PLAN (1:10000 SCALE)		ZONAL PLAN (1:2000 SCALE)		UTILITY MAPPING (1:1000 SCALE)	
SPATIAL	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE**
(A) FROM RS IMAGES/*TOPOSHEETS:* 1. Urban land use / land cover 2. Physiography 3. DEM (for outside city area) 4. Geomorphology (for outside city area) 5. Geological structures (for outside city area) 6. Lithology (for outside city area) 7. Drainage 8. Soil (for outside city area) 9. Surface water bodies 10. Road 11. Rail 12. Canal 13. Transportation nodes **(B)INCORPORATED MAPS TO BE OBTAINED:** 14. Slopes (city and outside city area) 15. Geomorphology (for city area) 16. Geological structures (for city area) 17. Lithology (for city area 18. Soils (for city area) 19. Location of all heritage sites	**1. Developmental Attributes Obtained from ULB/ State T&CPD:** ▪ Regional Setting ▪ Demography ▪ Socio-Economic Development ▪ Industry ▪ Land Use ▪ Housing And Slums ▪ Traffic & Transportation ▪ Facilities And Services ▪ Environment ▪ Governance	**(A) FROM AERIAL PHOTOS:** 1. Urban layer of point features 2. Urban network layer of line features 3. Urban land cover layer of polygon features **(B) MAPS OF:** 4. City planning zone / ward map 5. Urban property cadastre 6. Land value data **(C) DERIVED MAPS FROM NUIS SCHEME APPLICATION (GIS MODELS TO BE WORKED OUT):** 7. Urban land use/land cover 8. Urban land use change 9. Zonal plan	1. Developmental attributes (on ward basis) obtained from city administration/ T&CPD will be as given for 1:10000 scale 2. In addition the following is also to be incorporated from city/T&CPD records: ▪ Development Control Regulations ▪ Authorization / Approval records / documents ▪ Land requirement ▪ Available infrastructure ▪ Land owner ship ▪ Compensation ▪ Land requirement for the Scheme ▪ Past land pooling Schemes ▪ Urban cadastre ▪ Area: Original Plot with and without structure, Final Plot with and without structure. ▪ Value: Original Plot with and without structure, Final Plot developed & undeveloped with and without structure, Final Plot developed & undeveloped with and without structure less	**(A) FROM AERIAL PHOTOS:** 1. Urban layer of point features 2. Urban network layer of line features 3. Urban land cover layer of polygon features **(B) MAPS FROM GPR SURVEYS/CITY RECORDS:** 4. Water network 5. Sewerage network 6. Power network 7. Telecommunication network	Attrib utes as applicable – but containing all details of each utility. (This has to be worked out as attribute tables in consultation with ULB and any other Government Agency). These agreed-to attribute datasets for the utilities has to be provided by ULB/T&CPD

MASTER PLAN (1:10000 SCALE)		ZONAL PLAN (1:2000 SCALE)		UTILITY MAPPING (1:1000 SCALE)	
SPATIAL	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE**
20. Location of slums, squatters and other blighted area 21. City planning zone / ward map 22. Village revenue boundary 23. Cadastral map 24. Location of pollution generating industries/facilities 25. Earthquake epicenter data 26. Past flooding data 27. Land value 28. Soil depth 29. Soil texture 30. Location points of major utilities (water, post office, telecom, power, sewerage etc.) **(C)DERIVED MAPS FROM NUIS APPLICATION (GIS MODELS TO BE WORKED OUT):** 31. Land use change 32. Urban suitability 33. Environmental sensitivity 34. Hazards zonation (Earthquake, flood, erosion etc.) 35. Air pollution 36. Water pollution			value of Original Plot with structure, Increment Value of Final Plot developed excluding value of structure less Value of Final Plot undeveloped excluding value of structure ▪ Final Plot Number ▪ Net Demand ▪ Development costs ▪ Details of acquisition property ▪ Compensation paid to person for acquisition ▪ Land acquisition acts. ▪ Zoning regulations, ▪ Land acquisitions norms ▪ Compensation ▪ Transfer development right ▪ Compensation ▪ Available amenities to be transferred to Development Authority ▪ Compensation ▪ Land disposal details done by the authority ▪ Disposal cost ▪ Disposal rules ▪ Time required for disposal ▪ Development cost, ▪ List of agencies on whom development		

MASTER PLAN (1:10000 SCALE)		ZONAL PLAN (1:2000 SCALE)		UTILITY MAPPING (1:1000 SCALE)	
SPATIAL	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE ***	**SPATIAL**	**ATTRIBUTE**
(surface & ground water) 37. Tourism development 38. Transportation plan 39. Industrial plan 40. Trends of population 41. Planning scenarios 42. Ground Water Prospects 43. Slope 44. Road Buffer zone 45. Railway station Buffer zone 46. Water body and watershed buffer zones			charges are levied for use of land		

* Thematic attributes compatible to NNRMS Standards and generated by mapping activity. The Scheme for attribute data tables of NUIS Scheme database needs to be worked out, however the key field for linking of the attribute data to the spatial data (ward wise) has been worked out.

Annexure-XIV

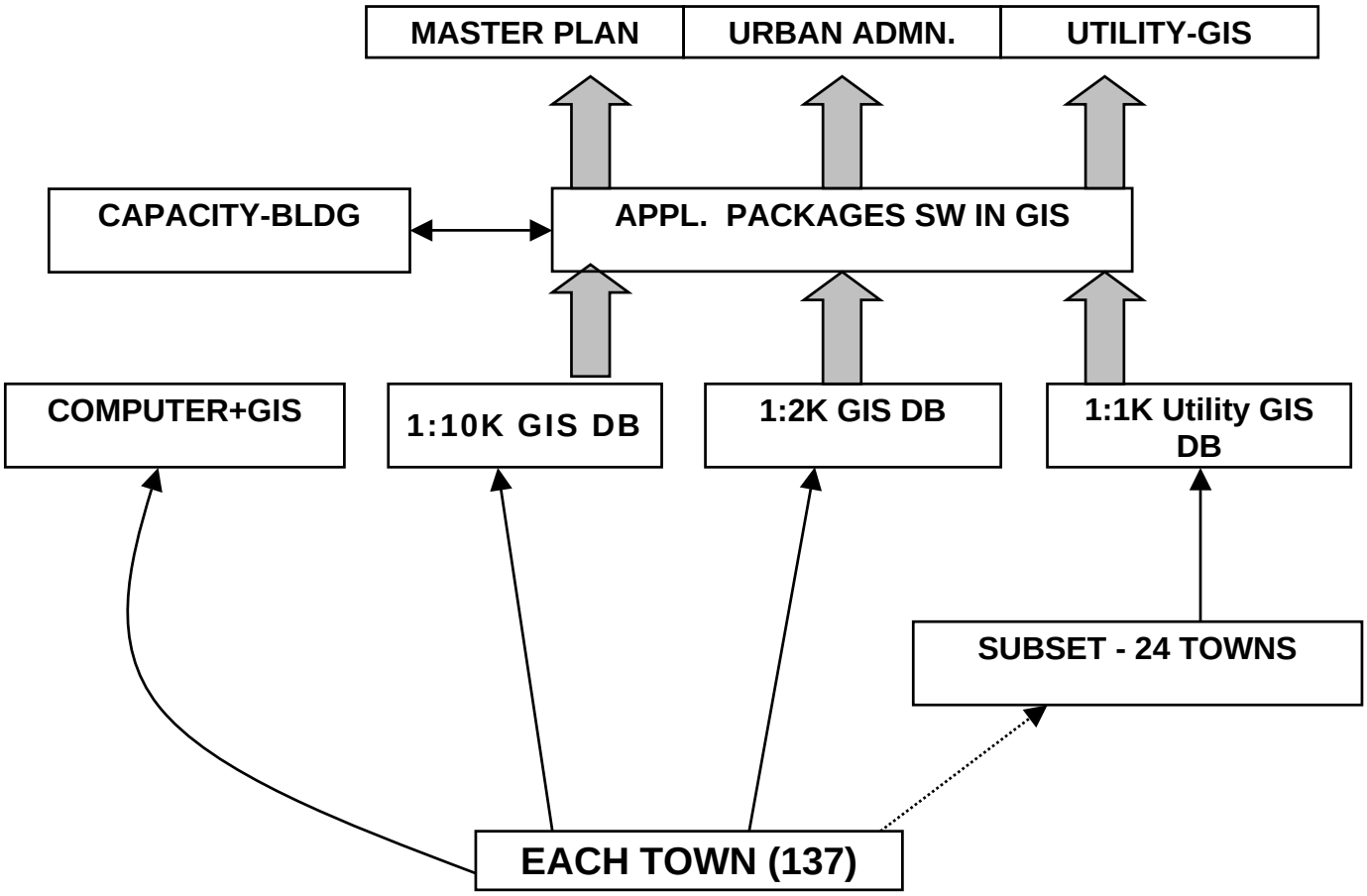
Indicators for NUO Database

MODULE NO.	MODULES AND INDICATORS
1	**Background data** D1. Land Use: Surface of land (sq. km) in the urban agglomeration and/or in the metropolitan area used for: a) residential formal; b) residential informal; c) business; d) agriculture; e) services; f) transport; g) other; h) total; I) % conservation area. D2. City population: Total Population by sex and age group in: a) the metropolitan area; b) the urban agglomeration. Residential density is calculated from Indicators D1 and D2. D3. Annual population growth rate: annual rate of population growth which includes net migration rates and natural growth rate in the city (metropolitan area and urban agglomeration). D4. Women-headed households: number of households headed by women in the City (Urban Agglomeration) and at the national level and percentage of women-headed households to total number of households. D5. Average household size: total population divided by total households. D6. Household formation rate: annual rate of growth of numbers of households. D7. Income distribution: annual household income by quintile, income range and average income at the city (UA) and national levels. D8. City product per person: city product divided by population (US$ per capita). D9. Housing tenure type: number of households in the following tenure categories: a) owned; b) purchasing; c) private rental: d) social housing; e) sub-tenancy; f) rent free; g) squatter no rent; h) squatter rent paid; i) other.
2	**Module 1 - Socio-economic development** 1. Poor households: percentage of women and men-headed households below the poverty line (locally-defined poverty line). 2. Informal employment: percentage of the employed population whose activity is part of the informal sector. 3. Hospital beds: number of persons per hospital bed. 4. Under-five mortality rate: percentage of children who die before reaching their fifth birthday. 5. Life expectancy at birth (in Global Urban Indicators Database 1998) 6. Adult literacy rate (in Global Urban Indicators Database 1998) 7. School enrolment rates (in Global Urban Indicators Database 1998) 8. School classrooms: number of school children per classroom per school in: a) primary schools; b) secondary schools. 9. Crime rates: number of reported crimes annually per 1000 population, for: a) murders; b) thefts; c) rapes.
3	**Module 2 - Infrastructure** 10. Household connection levels: percentage of households connected to: a) water; b) sewerage; c) electricity; and d) telephone. 11. Access to potable water: percentage of households with access to potable water. Access is defined as having safe or potable drinking water ***source*** located within 200 meters of the dwelling. 12. Consumption of water: average consumption of water in liters per day per person, for all uses. 13. Median price of water: median price paid per hundred liters of water in US dollars, at the time of year when water is most expensive.
4	**Module 3 - Transportation** 14. Modal split: proportion of work trips undertaken by: a) private car; b) train, tram; c) bus or minibus; d) motorcycle; e) bicycle; f) foot; g) other modes.

MODULE NO.	MODULES AND INDICATORS
	15. Mean travel time: average daily time in minutes for a work trip. 16. Expenditure on road infrastructure: per capita expenditure in US dollars on roads (three year average). 17. Automobile ownership: number of automobiles per 1000 population.
5	**Module 4 - Environmental management** 18. Wastewater treated : percentage of all wastewater undergoing some form of treatment. 19. Solid waste generated: solid waste generated per person, in tonnes per annum. 20. Disposal methods for solid waste: proportion of solid wastes disposed: a) to sanitary landfill; b) incinerated; c) to open dump; d) recycled; e) other. 21. Regular solid-waste collection: proportion of households enjoying regular solid waste collection service. 22. Housing destroyed: proportion (%) of the housing stock destroyed per thousand by natural or man-made disasters over the past ten years.
6	**Module 5 - Local authorities** 23. Local government per-capita income: total local government sources of funds in US dollars annually, both capital and recurrent, for the metropolitan area, divided by population (three year average). 24. Local government per-capita capital expenditure: capital expenditure in US dollars per person, by all local governments in the metropolitan area, averaged over the last three years. 25. Debt service charge ratio: total principal and interest repaid, including bond maturations, as a percentage of total expenditure by local governments. 26. Local government employees: total local government employees per 1000 population. 27. Personnel expenditure ratio: proportion of recurrent expenditure spent on wage costs. 28. Contracted recurrent expenditure ratio: proportion of recurrent expenditure spent on contracted activity. 29. Government level providing services 30. Control by higher levels of government
7	**Module 6 - Housing** 31. House price to income ratio: ratio of the median free-market price of a dwelling unit and the median annual household income. 32. House rent to income ratio: ratio of the median annual rent of a dwelling unit and the median annual household income of renters. 33. Floor area per person: median usable living space per person (m^2). 34. Permanent structures: percentage of housing units located in structures expected to maintain their stability for 20 years or longer under local conditions with normal maintenance. 35. Housing in compliance: percentage of the total housing stock in compliance with current regulations. 36. Land development multiplier: average ratio between the median land price of a developed plot at the urban fringe in a typical subdivision and the median price of raw, undeveloped land with planning approval in an area currently being developed. 37. Infrastructure expenditure: ratio of the total expenditure (operations, maintenance, and capital) by all levels of government on infrastructure services (roads, sewerage, drainage, water supply, electricity and garbage collection) during the current 38. Mortgage to credit ratio: ratio of total mortgage loans to all outstanding loans in both commercial and government financial institutions. 39. Housing production: total number of housing units (in both the formal and informal sectors) produced in the previous year per 1000 population. 40. Housing investment: total investment in housing (in both formal and informal sectors), as a percentage of gross domestic product.

Annexure-XV

Final Deliverables of NUIS Scheme



Annexure – XVI

NUIS Scheme Phase-I Budget

Sl No.	Urban Spatial Information System (USIS)															National Urban Databank Bank & Indicators (NUDB&I)						Grand Total (Rs. Lakhs)
	COVERAGE CLASS	No. of UAs and Towns	SYSTEM		GIS DATABASE 1:10,000 Scale		GIS DATABASE 1:2,000 Scale		CAPACITY BUILDING		UTILITY MAPPING	APPLICATION DEVELOPMENT	MISC.	PROJECT MANAGEMENT	GRAND TOTAL (Rs. Lakhs)	National level Seminar & reviews (Rs. Lakhs)	Regional Workshops (Rs. Lakhs)	State NUDB&I (Rs. Lakhs)	NUO-137 Towns (Rs. Lakhs)	NUO Database for 16 Global Sample Cities – UNCHS (Rs. Lakhs)	Total NUDB&I (Rs. Lakhs)	
			Unit Cost (Rs. Lakhs)	Total Cost (Rs. Lakhs)	Area to be Mapped (Sq. Km.)	Total Cost @ Rs. 3000/sq. km. (Rs. Lakhs)	Area to be Mapped (Sq. Km.)	Total Cost @ Rs. 15000/sq. km. (Rs. Lakhs)	Unit cost (Rs. In lakh)	Total Cost (Rs. Lakhs)	For 24 Towns @ 6,000/ lenior length km. for 10100 kms. (Rs. Lakhs)	(Rs. Lakhs)	(Rs. Lakhs) NUIS Data pulling, computer HW/SW and AMC etc. at the NUIS Secretariat.	For the entire NUIS Phase I Activities Technical Publications, Meetings, Conferences, Travel etc. (Rs. Lakhs)								
1	2	5	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	35 State Nodal Agency-Town Plng. Dept.		20	700																		
	137 NUIS Towns		5.0	685																		
2	Metropolitan Cities	22			24814.05	744.42	5955.37	893.31	1	22.00	606.00	350	50.00	100.00		10.00	8.00	168.00	137.00	16.00	339.00	
3	Class I Towns	77			26903.75	807.11	6456.9	968.54	1	77.00												
4	Class II to VI Towns	38			4037.65	121.13	969.04	145.36	0.5	19.00												
5	**Total**	137		**1385**	55755.45	**1672.66**	13381.31	**2007.20**		**118.00**	**606.00**	**350.00**	**50.00**	**100.00**	**6288.86**	**10.00**	**8.00**	**168.00**	**137.00**	**16.00**	**339.00**	**6627.86**
7	Percentage Distribution component wise			**20.90**		**25.24**		**30.28**		**1.78**	**9.14**	**5.28**	**0.75**	**1.51**	**94.89**	**0.15**	**0.12**	**2.53**	**2.07**	**0.24**	**5.11**	**100.00**

Annexure- XVII

Criteria For State Share In NUIS Scheme (component wise)

Sl. No.	Items of Expenditure	Provision/Unit For Estimation	Qty	Cost (Rs. Lakh)	State Share (Rs. Lakh) & % to Total Cost	Total Cost (Rs. Lakh)	Criteria For State Share component wise
(A) USIS							
1	**Computer System (HW&SW)**	Rs.5 lakh per town	137 systems	685.00	500.75 (36%)	1385.00	- 25% of *Total amount under each state derived from provision per town times* No. of towns in the particular state ie. - **Sum of provision of all towns in particular state X 0.25**
		20lakh per State Nodal Agency	35 systems	700.00			- 25% of the provision of Rs.20.00 Lakhs per state. ie. - **State Nodal Agency X Provision X 0.25**
2	**GIS Data Base1:10,000 Scale**	Geographical area of town times unit rate of Rs.3000/Sq. Kms.	Total area 55755.45 Sq. Kms - 137 towns	1672.66	418.17 (25%)	1672.66	- 25% of the total cost per state ie. - **Sum of Area of all the towns in particular state X 0.25**
3	**GIS Data Base1:2,000 Scale**	Geographical area of town times unit rate of Rs.15,000/ Sq. Kms.	Total area 13381.31 Sq. Kms. - 137 towns	2007.20	501.80 (25%)	2007.20	

Sl. No.	Items of Expenditure	Provision/Unit For Estimation	Qty	Cost (Rs. Lakh)	State Share (Rs. Lakh) & % to Total Cost	Total Cost (Rs. Lakh)	Criteria For State Share component wise
4	**Utility Mapping (24 towns)**	Ave. linear length Town class wise - Rs. 6000 / linear Km. Metro - 900Kms. Ave. linear length	4 Towns	216.00	151.50 (25%)	606.00	- 25% of cost of the provision (based on town class) aggregated to No. of towns in the particular state ie - **cost of mapping of town in particular state X 0.25**
		Class-I - 350 Kms. Ave. linear length	18 Towns	378.00			
		Others Towns - 100 Kms. Ave. linear length	2 Towns	12.00			
5	**Capacity Building**	Town Class wise Rs.1.00 lakh for Class I and above -	99 towns	99.00	Common Cost	118.00	- 25% of the provision (based on town class) aggregated to No. of towns in the particular state ie - **Sum of provision of all the towns in particular state X 0.25**
		Rs. 0.5 lakh for class II to VI	38 towns	19.00			
6	**Application Development**	% Amount under Application Development (corresponding to % Area of Town) to Total Amount under Application Development	137 Towns	350.00	Common Cost	350.00	- 25% of the aggregated amount of towns in a particular state corresponding to the total area of proportion of towns in a particular states. ie.

Sl. No.	Items of Expenditure	Provision/Unit For Estimation	Qty	Cost (Rs. Lakh)	State Share (Rs. Lakh) & % to Total Cost	Total Cost (Rs. Lakh)	Criteria For State Share component wise
7	**Miscellaneous**	% Amount under Miscellaneous (corresponding to % Area of Town) to Total Amount under Miscellaneous	137 Towns	50.00	Common Cost	50.00	- **total provision / total % area of sum of all towns in particular state**
8	**Project Management**	% Amount under Project Management (corresponding to % Area of Town) to Total Amount under Project Management	137 Towns	100.00	Common Cost	100.00	
	(A) TOTAL USIS				**1572.21**	**6288.86**	
(B) NUDB&I							
1	**National level Seminar & reviews**	% Amount under Workshop/Seminar (corresponding to % Area of Town) to Total Amount under Workshop / Seminar		10.00	4.50 (25%)	18.00	- 25% of the aggregated amount of towns in a particular state corresponding to the total area of proportion of towns in a particular states. ie. - **total provision / total % area of sum of all towns in particular state**
2	**Regional Workshops**			8.00			
3	State NUDB&I	Rs. 6 Lakh/Large & Other State	21 States	126.00	42.00 (25%)	168.00	- 25 % of the provision per state based on State Class. ie. - **provision per state X 0.25**
		Rs. 3.00 Lakh/NE States &UTs	14 States	42.00			

Sl. No.	Items of Expenditure	Provision/Unit For Estimation	Qty	Cost (Rs. Lakh)	State Share (Rs. Lakh) & % to Total Cost	Total Cost (Rs. Lakh)	Criteria For State Share component wise
	NUO (137 Towns)	Rs. 1.00 Lakh/Town	137 Towns	137.00	34.25 (25%)	137.00	- 25% of the provision per town aggregated to No. of towns in the particular state ie - **Sum of provision of all the towns in particular state X 0.25**
	Global Sample Cities–UNCHS	Rs. 1.00 Lakh/Town	16 Towns		4.00 (25%)	16.00	-
	(B) TOTAL NUDB&I				**84.75**	**339.00**	
	(A+B) TOTAL USIS & NUDB&I				**1656.96**	**6627.86**	

Annexure- XVIII

NUIS Scheme outcome relevant to 74th CAA Implementation

The reforms targeted under the 243 W Article of the 74th CAA in relation to the NUIS Scheme database are:

i) The preparation of plans for economic development and social justice; (physical development plans)

ii) The performance of functions and the implementation of Schemes as may be entrusted to them including those in relation to the matter listed in Twelfth Schedule;(only selected functions permitting use of spatial data as given below would be considered)

Selected Twelfth Schedule Municipal Functions Using NUIS Scheme Database

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 *facilities* such as parks, gardens, playgrounds;**
5. **Public amenities including street lighting, parking lots, bus stops and public conveyance;**
6. Urban Forestry, protection of environmental aspects and promotion of ecological aspects;
7. Slum improvement and up gradation;
8. **Urban Planning including Town Planning;**
9. **Regulation of Land-use and construction of Buildings;**
10. Fire Service.

At least five of the above functions as highlighted in bold will be assigned to the ULBs by the State Govts. using NUIS Scheme database to promote 74th CAA implementation.

Annexure-XIX

Capacity Building Plan For NUIS Scheme

Course Details	**Course Code**		
	NNRMS NUIS-1	**NNRMS NUIS-2**	**NNRMS NUIS-3**
Course Title	Technical Orientation to NUIS	Planning Appraisal of NUIS	Orientation Course on NUIS
Target Group	WORKING LEVEL Junior/Assistant. Planners/Assistant. Directors/ Planning Assistant Officers and Analogous Posts	SUPERVISORY LEVEL. Senior/Associate Town Planners, Dy. Directors, Sr. Planning Officers and Analogous Posts	DECISION MAKERS Chief Planners/ Vice Chairmen/ Dy. Secretaries/ Administrators and Analogous posts Municipal Councillors
Duration	4 Weeks	2 Weeks	3 Days
Course content	AERIAL PHOTO/REMOTE SENSING: Fundamentals of Interpretation & Remote Sensing: Fundamentals of Image Interpretation Digital Image processing Techniques Applications in Urban & Regional Planning GIS: Concepts Data preparation Spatial data analysis Applications in Urban and Regional Planning GPS: Fundamentals Applications for Planning PROJECT WORK:	AERIAL PHOTO/ REMOTE SENSING: Fundamentals Applications to Regional and Urban Planning GIS: Concepts Data preparation Spatial data analysis Applications to Urban and Regional Planning GPS: Concepts	Fundamentals and Application of RS, GIS, GPS for Urban / Regional Planning
Possible Organisation to conduct NUIS courses	IIRS, Dehradun NRSA, Hyderabad IRS-AU, Chennai STI(SOI), Hyderabad RRSSCs	IIRS, Dehradun SAC, Ahmedabad IRS-AU, Chennai	IIRS, Dehradun IRS-AU, Chennai

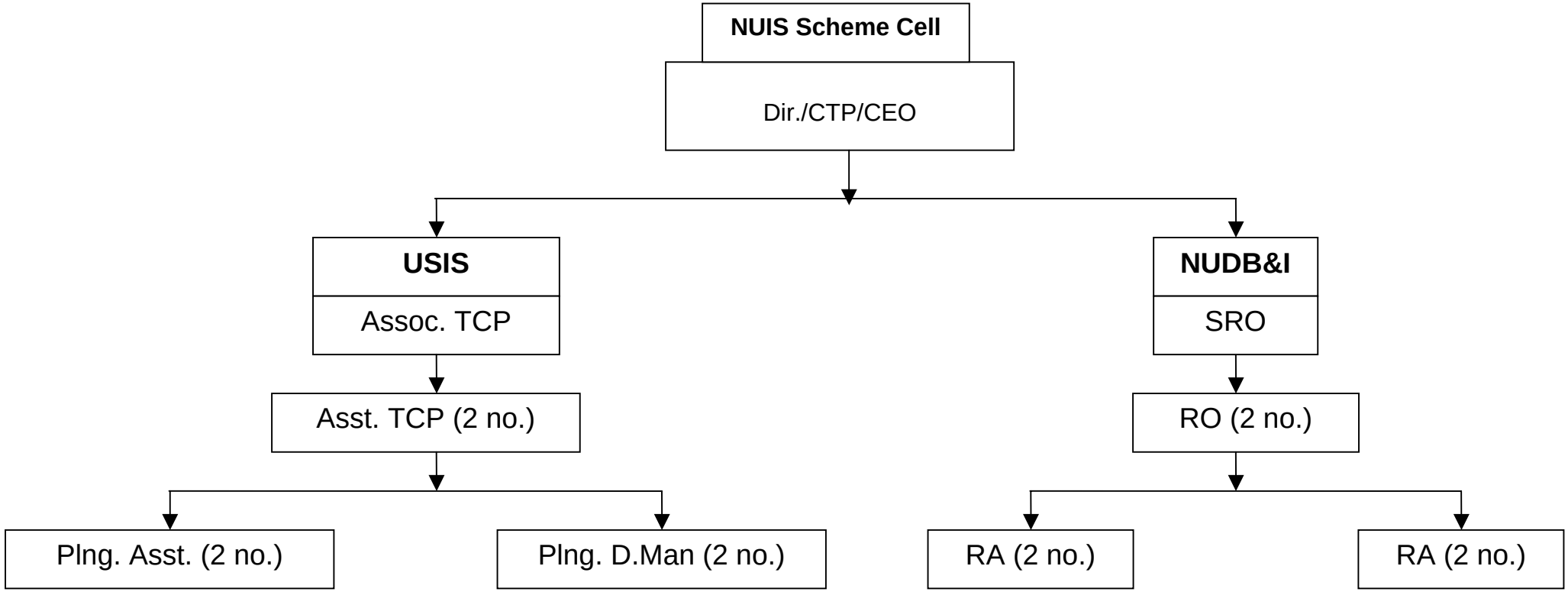
Annexure-XX

Tentative composition of Technical Advisory Committee (TAC)

SL. NO.	NAME	DESIGNATION
1.	Shri M. Rajamani, IAS	Joint Secretary(UD), Ministry of Urban Development, Nirman Bhawan, New Delhi-110001.
2.	Shri. Rajesh K. Chaturvedi	Director (IT), Ministry of Urban Development, Nirman Bhawan, New Delhi-110001.
3.	Shri K.T. Gurumukhi	Chief Planner, TCPO, Organisation (TCPO), 'E' Block, Vikas Bhawan, I.P. Estate, New Delhi-110002
4.	Shri S. Surendra	Town & Country Planner, Town & Country Planning Organisation (TCPO), 'E' Block, Vikas Bhawan, I.P. Estate, New Delhi-110002.
5.	Shri Jainder Singh	Advisor, Housing & Urban Development, Planning Commission, Yojana Bhavan, New Delhi-110001.
6.	Brig.Girish Kumar	Dy. Surveyor General, Survey of India, Dehradun
7.	Brig. M.V. Bhat	Additional Surveyor General (Northern Zone), Survey of India, Hathibarkala, Dehradun-248001.
8.	Dr. V. Raghavaswamy	Group Director, NRSA (DOS), Balanagar, Hyderabad-500037
9.	Dr. J. Krishnamurty	Programme coordinator, NRR, Indian Space Research Organisation (ISRO), Bangalore - 94
10.	Dr. S.K. Pathan	Head Land Use Planning & Photography, Division, SAP, ISRO, Ahmedabad
11.	B.S. Sokhi	Head, Human Settlement Analysis Group, Indian Institute of Remote Sensing, Dehradun
12	Prof. Mahavir	Professor of Planning, School of Planning &Architecture, 4-A, Ring Road, Indraprastha Estate New Delhi.-110002.
13.	Dr. B.K. Gairola	Deputy Director General (GIS), National Informatics Centre, Block CGO Complex, Lodhi Road, New Delhi-110003.
14.	Sh.S.D. Landge	Director, Town Planning & Valuation Department, Government of Maharashtra, Central Buildings, Pune-411001
15.	Sh.P.R. Bhaviskar	Sr. Geophysicist, Kolkata Metropolitan Development Authority, Kolkata.
16.	Shri V.M. Hegde	Director, Department of Town Planning, Government of Karnataka, M.S. Building Complex, 4th Stage, Ambedkar Veedhi, Bangalore.
17.	Shri S.C. Mhagaonkar	Chief Town Planner, Jaipur Development Authority, Nagar Niyojan Bhawan, Indira Circle, Jawaharlal Nehru Marg, Jaipur, Rajasthan – 302004
18.	Sh. V.R. Satish Chandra	Director, Town & Country Planning Deptt. 640, A.C. Guards, Hyderabad-500004.
19.	Shri N.R. Verma	Chief Town Planner, Town & Country Planning Department, 7, Bandaria Bagh, Lucknow-226001, Govt. of U.P.
20.	Sh. K.M. Panchal	Chief Town Planner, Town Planning & Valuation Department, Government of Gujarat, Block No. 14, 2nd Floor, Dr. Jeevraj Mehta Bhavan, Gandhinagar, Gujarat-382010
21.	Shri V. Gopalakrishna Pillai	Chief Town Planner, Greater Kochi Development Authority (GKDA), Kadavanthara Road, Kochi, Kerala-682020
22.	Sh. D.K. Sharma	Additional Director, Directorate of Town and Country Planning, Shed No. 1,T.T. Nagar (North), Government of MP, Bhopal.
23.	Sh. B.K. Panda	Director, Urban Affairs Department, Government of Meghalaya, Raitong Building, Shillong, Meghalaya.

Annexure-XXI

Indicative Structure of NUIS Cell at State Nodal Agency

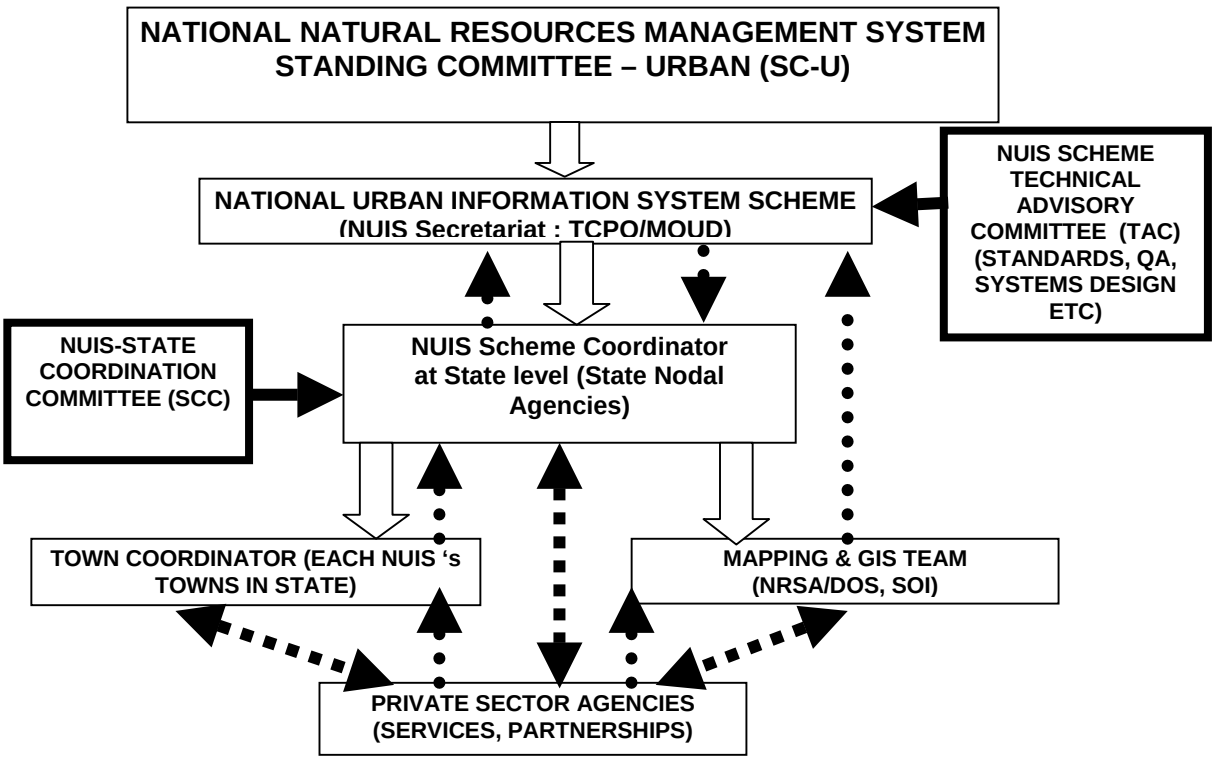


Dir./CTP/CEO = Director/Chief Town Planner/Chief Exec. Officer

Assoc. TCP	=	Associate Town & Country Planner	SRO	=	Senior Research Officer
Asst. TCP	=	Assistant Town & Country Planner	RO	=	Research Officer
Plng. Asst.	=	Planning Assistant	RA	=	Research Associate
Plng. D.Man	=	Planning Draftsman			

Annexure-XXII

Project Organisation



Supported by

Flow of guidelines, standards, advice and technical assistance

Interaction with the private sector for technical assistance and guidance

Flow of spatial and attribute database

Annexure-XXIII

Policy Issues

- Satellite images will be procured from the national agency authorised by the government.
- Aerial Survey will be executed by authorised government agency.
- Mapping will be done in government agency premises only.
- GIS database creation will be done in government agency premise only
- Private agencies contracted specific tasks of mapping and GIS database will be selected as per government criterion. These agencies will work in government agency premises only.
- All images, maps, GIS databases would be handled by authorised persons of government, urban local bodies only.
- Private access to NUIS will be as per policy of the Government
- Networking of NUIS Scheme databases will be done after clearance from appropriate government agencies (MOD etc)
- Any networking of NUIS will be on Government network only.
- Appropriate firewall and security will be built-into the NUIS Scheme at towns; State, TCPO/MOUD etc and secure entry will be developed. Only authorised persons would be able to enter the network.
- Public face of NUIS Scheme database (for public domain) will be kept separately and will have screened, cleared and have limited content.