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Designing E-Governance for Municipalities in India Executive Summary

Final Report

Indo-USAID Financial Institutions Reform and Expansion Project—Debt & Infrastructure Component (FIRE-D Project)

USAID-TCGI Contract No. 386-C-00-04-00119-00

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PREFACE

Government of India has recently approved the National e-Governance Plan (NeGP) that seeks to lay the foundation for the long term growth of e-Governance in the country.

e-Governance in Municipalities is one of the important Mission Mode Projects under the National e-Governance Plan (NeGP). A comprehensive programme for introducing e-Governance in municipalities is expected to result in significant improvement in the service delivery provided to the citizens by local governments. i.e. the Urban Local Bodies (ULBs).

Local governments serve as the first interface between the citizen and the government and e-Governance across these institutions will help better address the needs of citizens by bringing in efficiency, transparency and improvement in service delivery.

This report, prepared by *Price Waterhouse Coopers* supported under the INDO-USAID FIRE (D) Project, is designed to assist the Ministry of Urban Development (MoUD), GoI, in implementing the National Mission Mode Project for e-Governance in Municipalities (NMMP) based on the philosophy of a centralized initiative coupled with decentralized implementation.

The primary objective of the design document is to provide guidance to the various stakeholders under the NMMP i.e. MoUD, State Governments and municipalities, on key aspects of designing, implementing and monitoring the programme for e-Governance in municipalities.

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I Design Phase Study

I.1 Objective of the Design Phase Study

With a view to leverage Information and Communication Technology (ICT) opportunities as part of its agenda for "Good Governance", Government of India (GoI) has recently announced the National e-Governance Plan (NeGP). NeGP intends to institute and enable mechanisms for Government to deliver services using ICT. It is an ambitious program of the GoI aimed at improving the quality, accessibility and effectiveness of government services for citizens and businesses implemented with the help of ICT. This is proposed to be achieved by:

- Rapid deployment and scale-up of select "mission mode projects" (MMPs - projects government services) with significant citizen interface
- Creation of a national IT backbone for fast, reliable and efficient connectivity, data storage and access
- Integrated service centres for delivery of citizen services and
- Creation of web portals for 24x7 access to government information and services.

NeGP has identified the formulation of various Mission Mode Projects in e-Governance, including one for municipalities under the responsibility of the Ministry of Urban Development, in collaboration with the Department of IT (DIT).

National Mission Mode Project for e-Governance in Municipalities (NMMP) is one of the Mission Mode projects that have significant citizen interactions as they provide a large number of basic civic services to millions of citizens living in urban areas.

National Mission Mode Project for e-Governance in Municipalities (NMMP) is one of the Mission Mode projects that have significant citizen interactions as they provide a large number of basic civic services to millions of citizens living in urban areas. Introduction of e-Governance on a massive scale would hence, lead to better services. It is also envisaged that the Municipality Mission Mode Project would provide a major fillip to the urban reform programme that has been initiated by Ministry of Urban Development, GoI.

In order to conceptualize the NMMP, MoUD has been assisted by USAID under Indo-USAID Financial Institutions Reform Expansion Project (Debt) (FIRE (D)). As part of this process, FIRE (D) had initiated a project Assessment Study to amalgamate the learnings arising out of the various individual e-Governance initiatives in seven ULBs spread across four Indian States and therefore, provide a guide for conceptualization of the NMMP. The study also highlighted the need for undertaking a comprehensive design study.

With this background, and in order to comprehensively conceptualize, design and implement the NMMP, The Ministry of Urban Development and Department of IT (DIT), GoI supported by Indo-USAID FIRE (D) had appointed PricewaterhouseCoopers to help

define and design the overall framework of implementing NMMP, including the scope and institutional mechanism.

The intended purpose of the Design Phase report is to help MoUD finalize a comprehensive project proposal for implementing Municipality Mission Mode Project as part of the NeGP. The document not only helps define the scope of the project, it also provides guidance to State Governments and Urban Local Bodies (ULBs) in addressing key issues that are likely to arise during the planning and implementing of NMMP.

I.2 Scope of Work

The scope of work[1] for the assignment has been structured across four key areas relating to:

1. Designing the functionality of e-Governance modules and Business Process Reengineering (BPR) - The nine modules proposed under the NMMP are:
   - Property tax
   - Accounting
   - Water supply and sewage
   - Birth and death registration
   - Building plan approval
   - Health programmes
   - Procurement and monitoring of projects
   - Personnel management system and
   - Citizens' grievances monitoring
2. Establishing data standards and conventions
3. Designing of e-Governance architecture, and
4. Program implementation and management modalities.

I.3 Limitations of the Study

Significant differences exist across municipalities and hence the Design Phase report is not intended to prescribe "firm and fixed rules" but as "guidance notes".

Indicated below are some of the key limitations of the study and approach to the assignment that have implications on the recommendations contained in the Design Phase report and also on the implementation of the NMMP.

- The extent of detailing captured in this report needs to be evaluated against a six week time frame provided to PwC for the study.
- There exist significant differences in municipalities across India and within states and thus the output of the design phase is not intended to decide on "firm and fixed rules" but as "guidance notes". The implementation consultants/software vendor would

[1] It may be noted, that the mentioned scope of work is a summary prepared by PwC of the original scope of work

need to finalize the FRS/SRS based upon the scope defined in the design phase and take a sign-off from respective ULBs before taking up the application deployment /customisation as the case may be.

- A typical approach to Business Process Reengineering (Process Reform) is driven by a detailed as-is process and to-be process mapping, which is outside the scope of work.
- "Standards" is one of the core NeGP components, and a core group on standards including those for municipalities has been set up by DIT. Recommendations relating to common standards that are laid down as part of this report would need to be finalized based upon the recommendations of the core group on standards set-up by Department of Information Technology under NeGP, which is yet to finalize the same.

I.4 Structure of the Report

The Design Phase report has been structured across four different sections besides this executive summary. In doing so, we have followed the approach of providing linkages to strategy, structure and processes/systems, in that order.

Accordingly, **Section 1** of the report dwells into the strategic elements of the programme design relating to:

- Vision & objectives of the programme
- Coverage of the programme
- Outcomes
- Strategic considerations
- Institutional structure
- Cost estimates and funding, and
- Implementation approach.

The Design Phase report has been structured across four different sections. The report follows the approach of strategy defining the structure and processes.

This section also presents the draft scope of work for various agencies that are likely to be engaged during the implementation phase of NMMP. The agencies include: implementation phase consultants; application developer; facilities management agencies; state implementation consultants etc.

Section 2 of the report details recommendations for the design of the functionality for the nine e-Governance modules proposed under NMMP. The functionality has been detailed to encompass software development across the modules.

Section 3 of the report details recommendations on e-Governance architecture and standards and guidelines designed to serve as inputs to the actual field level design and implementation.

Section 4 of the report details the implementation roadmap for the NMMP. It dwells into the importance of some of the key design elements of the NMMP relating to capacity building, change management and PPP.

II Programme Vision & Strategy

II.1 Vision and Objectives of the Municipalities NMMP Programme

The **vision** for the e-Governance in municipalities is to leverage ICT opportunities for **sustained improvement** in efficiency and effectiveness with respect to the delivery of municipal service to citizens.

In line with its vision, the programme has defined a number of **objectives** that include:

- Citizen Facing: Significantly improving the **Quality of Service (QoS)** provided by the Urban Local Bodies (ULBs)
- Municipalities: Bringing about improvements in **efficiency and effectiveness** of business processes/functions of the ULBs
- Instituting a mechanism of **result based monitoring and evaluation**
- Ensuring economy (**cost efficiency)** in the design and implementation of the programme
- Improving the system for **decision making** with respect to planning and delivery of municipal services and
- Ensuring effective **programme management to track progress.**

The NMMP for e-Governance in Municipalities proposes the use of ICT for sustained improvement in efficiency and effectiveness with respect to delivery of services to citizens.

II. 2 Coverage of the Programme

The coverage of the Programme can be viewed across two dimensions, namely
A. Geographic coverage and
B. Business process coverage.

A. Geographic Coverage:
The NMMP in Municipalities seeks to cover the entire nation over a period of time. As a first step, as part of the programme, 423 class I cities in the country are proposed to be covered over a period of five years. These cities comprise of over 55% of the urban population of the country.

The focus of the first phase (year 1) of implementation within the programme would be to cover 35 cities, having population of over 1 million, spread across 17 Indian states.[2]

B. Coverage of the Processes:
In order to meet its vision and objectives, NMMP envisages implementation of various application modules[3] covering the following services/business processes within ULBs:

[2] The scheme envisages support to the other States not a part of the already mentioned 17, but within the universe of 423 class I cities within the first phase, based upon specific requests and commitments shown by the particular State.

1. Registration and issue of birth and death certificate
2. Payment of property tax, utility bills and management of utilities that come under the jurisdiction of ULBs
3. Grievances and suggestions
4. Building approvals
5. Procurement and monitoring of projects
6. Heath programme
7. Accounting system and
8. Personnel Information System.

II.3 Outcomes

In order to ensure that the objectives of the programme result in measurable outcomes, specific measures have been envisaged for the programme.

Table 1 below summarizes the proposed measurable outcomes against the key objectives of the programme. Detailed service levels have been defined for each of the services [4]included under the NMMP in Section 1 of the report.

Table1: Key measures against objectives and Outcomes

Stakeholders & Objectives	Key Measures	Illustrative Targets
Citizens (Quality of Service)	• Minimizing the number of customer visits • Reducing the time required to request the service • Reducing the time required to deliver a service • Reducing the fees and charges associated with a service • Reducing the time spent by the customer to follow-up and track the progress of the requested service	• Six monthly independent citizen survey/ feedback for a period of five years from the time of go-live with 95% satisfaction level with respect to meeting specified service levels • 95% resolution of grievances received through the Grievances Redressal Model within the defined service level
Municipalities (Process efficiency and effectiveness)	• Enhancing existing revenues • Setting up new revenue streams • Reducing cost of processing transactions • Delivering intangible benefits (Boosting image of municipalities as a service oriented organization)	• Growth in municipality own revenues by at least 25% on a year to year basis for first three years • Banning of manual records

[4] The services mentioned are based upon the scheme finalized by MoUD in its note to the Planning Commission highlighting its coverage of the Municipalities NMMP

		• Accrual based accounting system
Stakeholders & Objectives	**Key Measures**	**Illustrative Targets**
Service providers/suppliers (Monitoring & Evaluation of Quality of Service)	• Service Level Agreements (Internal & External)	• Deployment of a system for meeting the requirements contained in the Right to Information Act
Funding agencies/PPP players (Economy)	• Sustainability and Government investment optimization through PPP models • Return on Investment(ROI) • Cost benefits	• Revenue surplus
Policy makers (Decision making support system)	• Integrated view of performance of Municipalities at the Central & State Govt. level	• Integrated State Wide Municipal Information Management System
Programme Office (Progress tracking)	• %age of customers of each type using e-Governance services • %age of municipal services transformed into e-Governance • %age of municipal service information published over e-Governance • %age of transactions of each service executed electronically	• Over 75% citizens using alternate channels for accessing services of ULBs • Over 75% citizen facing services delivered using ICT

Service Levels

Citizen / Business Service	**Benchmarked Service Levels**
Web Site	Online state portal information updated within 1 working days
Availability of forms	100% forms relating to municipal services available online; Also available at service points; Updated for any changes within 1 working day
Online Submission of Forms	Submission online & at service centres (< 15 mins)
Birth and Death Registration – • Registered Hospitals, • Others	• Online & through service centres (15 minutes) • < 5 days
Calculation & payment of property tax	Online Tax Calculator; Payment online & through service centres (< 15 mins)
Payment of utility bills – Water supply and sewerage	e-Bills to be available online; Payment online, < 15 minutes through service centres
Building Approvals – (1) Residential (2) Commercial and Others	< 7 working days < 15 working days
Citizen / Business Service	**Benchmarked Service Levels**

Health Programme – (1) New license (2) Renewal	 (1) < 5 working days, (2) < 30 minutes
Financial Accounting System	Double Entry Accounting, Finalization of accounts < 3 months
Information on Ongoing Development Projects – (1) Approved projects & fund allocations by wards, (2) Physical & financial progress, (3) Request for public comments before closure	 - Online & at service centres, < 1 days of project approvals - Online & at service centres, updated < 15 days - Online & at service centres, 7 days after completion
Grievances Handling, including implementation of the elements of the Right To Information Act - Acknowledgement - Resolution monitoring	Online & through service centres, Immediate Acknowledgement / Reference No.; Response Time < 2 working days; Redressal of Complaint < 7 working days

II. 4 Design Considerations

In designing the strategic element of the NMMP, the following key considerations have been taken into account.

1. **Implementation Framework of the National e-Governance Plan** (NeGP) – The NMMP is being undertaken under the overall NeGP of GoI. The NeGP programme has a number of components that have a bearing on the overall programme design of NMMP. While there are many components of NeGP that impinge on the overall NMMP design, (detailed in section 1 of the Design Phase report) the key elements are as follows.
   - *Core Policies* – As part of the NeGP, standards and guidelines have been proposed across key e-Governance areas such as technology, local language, gateways etc. Accordingly, the design of NMMP would need to be in line with those proposed under NeGP.

NeGP programme has a number of programme components that have bearing on the overall programme design of NMMP.

   - *Core Infrastructure* – As part of the NeGP, most state governments are setting up 2mbps connectivity upto the block level and State Data Centre. This common infrastructure would not only allow the implementation of centralized application architecture, it would also impact in bringing down individual project cost.
   - *Institutional Structure* – Recently, capacity building guidelines have been issued under NeGP that provide for creating institutional structures at state and department level to enable the state to participate within NeGP. The institutional arrangements proposed under NMMP cannot be in variance with these arrangements.

2. **Urban Development Responsibilities in India and implications of 74th Constitutional Amendment Act –** After the passing of the 74th Constitutional Amendment Act, the administrative structure of India was divided in terms of a 3-tier setup. The constitution of India has assigned the subjects pertaining to the urban areas to the various state legislatures. Therefore, the complete administration of the municipalities rests with the various state legislatures. However, the central Ministry of Urban Development exercises administrative powers of legislations like the 74th Amendment Act. This has important implications for design and includes the following important points.
   - The programme ownership would have to rest with state Governments and ULBs.
   - MoUD would play the role of strategic advisor that would include formulating strategy and monitoring benefits.
   - The programme would be run on the philosophy of "centralized planning and decentralized implementation".

3. **Sustainability –** Very often, a number of well designed projects fail because of sustainability issues. These issues need to be understood and defined at three levels – institutional, financial and managerial. Special attention has therefore been taken in defining an institutional response to the issue of sustainability.

The programme ownership would have to rest with state Governments and ULBs. MoUD would play the role of strategic advisor – formulating strategy and monitoring benefits

4. **"Outcome" Oriented Approach -** In recent times, GoI has laid considerable stress on designing programmes that focus on outcomes and not on outlays. This is in line with widely accepted programme design principles for development projects. This approach has particular significance for NMMP. By clearly defining and monitoring outcomes, MoUD can hope to achieve the programme objectives, even though it has limited control over the implementation.

5. **Linkage to National Urban Information System (NUIS) –** MoUD has recently initiated a holistic proposal to develop National Urban Information System (NUIS), which seeks to develop a comprehensive information system in ULBs. NUIS has linkages to the NMMP, especially with respect to information system proposed to be created under the e-Governance programme.

II.5 Strategic Considerations

Based upon the Programme vision, objectives and outcomes specified above, the strategic considerations in the design and implementation of the Programme are highlighted below:

Alignment of Municipalities NMMP Programme with State roadmap for e-Governance in Municipalities – It is important to ensure that the NMMP is integrated in the state e-Governance roadmap for municipalities in terms of strategy, priority, institutional arrangements and technology. Accordingly, the Design Phase report recommends the state to prepare a state municipalities e-Governance roadmap as the first step towards implementing the NMMP. The roadmap to be defined (taking into account the guidance provided in this design document) would help all ULBs in the state to arrive at a common understanding with respect to the key elements of the programme i.e. technology, portal strategy, business process reengineering, funding requirements, capacity building requirements, legislative changes, etc.

Alignment of Municipalities NMMP Programme with State roadmap for e-Governance – It is important to ensure that the NMMP is integrated in the state e-governance roadmap, since some initiatives are planned at a state-level (such as state wide area network, state data centre, state-wide technology architecture and standards etc.). Accordingly, the Design Phase report recommends the municipalities e-governance plans to be aligned with State e-governance plans as an important step towards implementing the NMMP.

Emphasis on project appraisal and project report preparation – Given the fact that NMMP needs to be implemented in a decentralized mode, MoUD needs to ensure that project proposals are scrutinized in detail so that the objectives of the programme and recommendations contained in this design document are adequately addressed and detailed in the project proposal. Towards this end, a Municipalities Programme Management Unit (MPMU) has been proposed that can be supported by the implementation phase consultants.

State Wide Approach to Software Acquisition – While the NMMP provides for e-Governance in municipalities, state Governments also have a key role to play. State Government support in undertaking legislative reforms, project proposal review, project monitoring, financial support etc are important for effective implementation. Further, the design document recommends an important role of the state with respect to identifying and implementing a common application software so as to minimize cost and reduce the time frame of implementation.

Lifecycle approach to costing – There are umpteen examples of projects failing because operation and maintenance costs were not considered. This is especially true for IT projects, which have a short life cycle (5 years) and wherein operation and maintenance cost over a five year period can be greater than the capital cost. Accordingly, the Design Phase report recommends that project costing and funding arrangements be agreed upon for a cost comprising of capital cost and 5 year operation and maintenance costs.

Performance based release - Focus and adherence to outcomes can only be achieved in case fund allocation and release is linked to specific and measurable milestones. To address this, the Design Phase report recommends a strong monitoring and evaluation framework to be observed by the municipalities programme management unit.

Competition for funds – As significant funds are proposed under NMMP, MoUD can consider creating competition between participating states and ULBs based upon interest shown by states for pursuing reforms in the urban sector. The Design Phase report recommends that the fund allocation to state/ULBs should not be earmarked or automatic, but should be based upon initiative shown by state Governments, e-readiness of the state/ULBs, preparation of a comprehensive project proposal, agreement to initiate urban reforms, etc.

We recommend that the fund allocation to state/ULBs should not be automatic, but should be based upon the initiative shown by state Governments, e-readiness of the state/ULBs & preparation of a project proposal and agreement to initiate urban reforms.

Independent assessment – To effectively implement a result based monitoring and evaluation framework, it is important to develop a system for independent evaluation of the project progress and impact assessment. The Design Phase report recommends that this be one of the important responsibilities of the MPMU through the implementation consultants.

Implementation in waves – Most ULBs and state Governments have had limited success in implementing large and complex e-Governance initiatives because of lack of managerial and technical capacities. Accordingly, the Design Phase report recommends that modules proposed under NMMP be implemented in waves rather than in one go. This is likely to significantly improve the chances of successful implementation.

Capacity building and training – The need and importance for capacity building cannot be emphasized enough. This is required not only for implementing the project but more importantly, for sustaining the initiative. The Design Phase report endorses the recommendations presented by the National Institute of Smart Government (NISG) and Centre for Good Governance (CGG), with respect to the strategy proposed for building capacity and training under NMMP. With respect to the Organization structure at the State Municipalities Level, the design phase report recommends that the Municipalities follow the NeGP recommended structures at the Municipalities level, the details of which, are provided in section I of this report.

Public awareness and communication – One of the important strategies for ensuring long term success of projects is to create enough demand pull that forces institutional support. The Design Phase report stresses on the need for a comprehensive awareness and communication strategy aimed at the citizens and conveying the benefits of the programme.

III Programme Components

There are four key components of the Programme, namely:

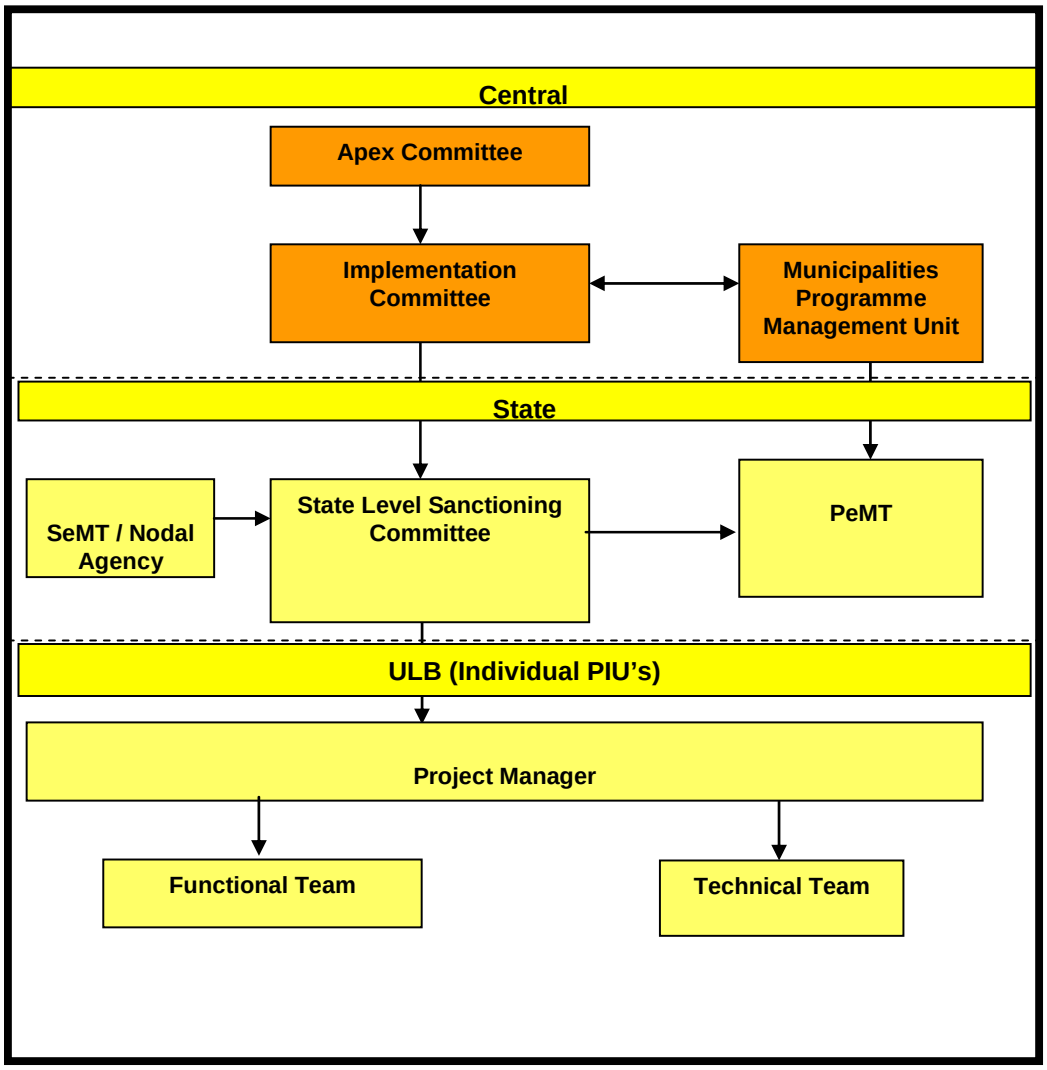
(i) Institutional Structure of the Programme
(ii) Funding Assessment & Arrangements
(iii) Project Appraisal & Approval Mechanisms and
(iv) Cost Benefit Analysis.

These components are covered in the following sections:

III.1 Institutional Structure of the Programme

Figure 1 below captures the proposed institutional structure for implementing NMMP.

Figure 1: Institutional Structure



SeMT: State e-Governance Mission Team – as defined under NeGP
PeMT: Project e-Governance Mission Team – as defined under NeGP

The salient features of the institutional structure proposed for implementing the NMMP are summarized below.

- The overall structure for NMMP has been divided into three tiers i.e. centre, state and implementation (ULB) level.
- At the centre, Apex Committee is responsible for NeGP monitoring, of which NMMP is a component. The implementation committee at MoUD would be responsible for the overall implementation of the NMMP.
- State level sanctioning committee would be responsible for coordinating the projects at the state level and finalizing funding arrangements and project proposals for submission and approval to MoUD
- Project Implementation Unit (PIU) would be responsible for implementation at ULBs in line with the design objectives of NMMP and the approved project proposals.

The roles, responsibilities and functions of the various constituents of the Implementation Structure at the programme level are summarized in **Table 2**.

Table 2: Roles and responsibilities at the programme level

Unit	Constituents (Recommended - Minimum)	Key Role(s)	Key Activities
Apex Committee	• As defined under NeGP • Headed by Cabinet Secretary	NeGP policy, strategy and implementation monitoring including defining of service levels	▪ NeGP program approval including process for program implementation ▪ Approve changes to NeGP program components ▪ Finalize funding strategy and fund management principles for NeGP ▪ Monitor program progress ▪ Resolve inter-ministerial issues ▪ Facilitate legal changes for effective implementation, if required
Implementation Committee	▪ Ideally headed by Secretary (UD) ▪ At least four state UD Secretaries ▪ Representative of DIT (PMU) - GoI, ▪ Representative of DARPG-GoI ▪ Representative of Planning Commission ▪ NISG/CGG ▪ 2 Municipal Commissioners ▪ Mission leader – NMMP (convener)	Time bound implementation of NMMP and adherence to NeGP objectives The committee should meet at least once every quarter	▪ Policy setting ▪ Guidelines approval ▪ Fund allocation ▪ Project Approval to States/ULBs based upon NMMP design ▪ Programme monitoring ▪ Issue resolution ▪ Impact assessment ▪ Benefits management
Municipality Programme	▪ Headed by the mission leader for NMMP ▪ Director (UD)	Technical secretariat to the	▪ Programme coordination ▪ Implementation of policy, leadership and institutional

Management Unit	▪ Nominated MoUD officials ▪ Implementation consultants	implementation committee	development programme ▪ Independent progress monitoring and standard setting ▪ Financial management ▪ Assistance in procurement and contract management at the national level ▪ Monitoring and evaluation ▪ Knowledge and project management ▪ Quality assurance and oversight ▪ Policy and strategic direction to states and ULBs

III.2 Funding Assessment & Arrangements

The recommended funding arrangement is aimed at building commitment to NMMP and also ensuring adherence to the design principles. Thus, funding arrangements would need to ensure that:

- Funds are available on time
- Funds are earmarked and yet fungible
- Incentives for undertaking projects are provided and
- Operations are transparent.

The key aspects of the Funding arrangements relate to:

- Fund assessment and allocation
- Admissible components under the proposed funding
- Fund flow
- Rules of access and
- Monitoring and audit arrangements.

Fund assessment, allocation and admissible components - The total fund requirement for undertaking the NMMP for coverage of 434 cities is expected to be ~Rs.1187 crores as summarized in Table 3 below:

Table 3: Funding assessment and allocation

S.No	Cost Item	Cat – I	Cat - II	Cat - III	Cat - IV
1	Hardware - Network, System and Peripherals	34,746,600	25,926,950	8,820,250	2,935,000
2	System Software	12,810,000	12,390,000	3,205,000	1,180,000
3	Data Digitization (Entry)	8,000,000	2,000,000	800,000	200,000
4	Capital Cost per Location (1+2+3)	55,556,600	40,316,950	12,825,250	4,315,000
5	No. of Locations (423)	6	29	34	354
6	Total Capital Cost per Category of Location (4*5)	333,339,600	1,169,191,550	436,058,500	1,527,510,000

7	Recurring Costs (Annual)	19,136,228	14,472,656	4,701,370	1,786,800
8	Maintenance Period	5	5	5	5
9	No. of Locations	6	29	34	354
10	Total Recurring Cost (7*8*9)	574,086,840	2,098,535,120	799,232,900	3,162,636,000
11	Total Project Capital Cost - Sum (6)				3,466,099,650
12	Total Project Recurring Cost - Sum (10)				6,634,490,860
13	Application Software Cost, 29 locations, Per Location Cost = Rs270,000,000				783,000,000
14	Training Cost - as per assumption				250,120,000
15	Consultancy Cost at Programme Level - as per assumption				94,100,000
16	Consultancy Cost at State Level - as per assumption				626,400,000
Total Cost					**11,854,210,510**

Table 4: Admissible components under the proposed funding of NMMP

Cost Head	Cost Item
Capital Cost	• Cost of hardware • Cost of application software • Cost of system software • Networking cost [horizontal connection up to PoP (SWAN)] • Cost of data digitization • Programme level set-up cost. • State Implementation Cost • Training Cost - 1st Year
Operation and Maintenance Cost	• Annual Maintenance Cost – h/w and s/w • Cost of external consultants/Facilities Management Services • Cost of horizontal connectivity • Other communication cost • Cost of dedicated employees – other than external consultants • Stationary/consumable costs • Set-up and administration cost of PeMT/State implementation consultants.

While the detailed fund assessment assumptions are contained in Section 1 of the report, indicated below are some of the key assumptions:

- Application software to be procured at the state-level, with necessary customizations for development to be undertaken by specific ULBs
- State Wide Area Network (SWAN), one of the mission mode projects under NeGP, to be used for interconnecting the municipalities in the state
- Central funding shall include
    - 90 % of the capital cost and 90 % of annual cost for the first two years (For 35 locations)
    - 100 % of Capital Cost and 90 % of annual cost for the first two years (For other locations)
- State/ULB funding shall include
    - 10 % of capital cost and 10 % of annual cost for the first two years and 100% for the balance three years (For 35 locations)

  - 0 % of capital cost and 10 % of annual cost for the first two years and 100% for the balance three years (For other locations)
- The current infrastructure at the identified 423 municipalities has not been taken into consideration while budgeting the computerization costs. Currently, some of these municipalities are at a very advanced state of computerization and actual requirement of further computerization will have an impact on the project cost estimates shown in this document.
- Site preparation cost is excluded from the project funding, which shall be borne by the individual states.
- 423 ULBs have been categorized under the following four categories for the purpose of costing estimates
  - Category I - Cities with population over 100 lakhs, 6 Nos.
  - Category II - Cities with population between 10 and 100 lakhs, 29 Nos.
  - Category III - Cities with population between 5 and 10 lakhs, 34 Nos. and
  - Category IV - Cities with population between 1 and 5 lakhs, 354 Nos.

Programme cost is based upon lifecycle cost approach. Lifecycle of the programme has been assumed to be five years.

Accordingly, the funds commitment required from MoUD for the Municipalities NMMP and the contribution from the states is as shown in Table 5.

Table 5: Fund commitment required from MoUD and States

Programme Cost (in crores)	Year 1 (35 ULBs)	Year 2 (69 ULBs)	Year 3 (106 ULBs)	Year 4 (106 ULBs)	Year 5 (107 ULBs)	Beyond Year 5
Scenario 1: 5 year MoUD Support						
Central Share						
Capital Cost	199	109	63.4	63.8	63.4	-
Recurring Cost	-	48.1	68.1	85.2	102.4	245
State Share						
Capital Cost	16.8	1.8	1.8	1.8	1.8	-
Recurring Cost	-	5.3	7.6	9.5	11.4	27.2
Scenario 2: 2 year MoUD Support						
Central Share						
Capital Cost	199	109	63.4	63.4	63.4	
Recurring Cost	-	48.1	68.1	37.1	34.3	34.3
State Share						
Capital Cost	16.8	1.8	1.8	1.8	1.8	-
Recurring Cost	-	5.3	7.6	57.6	79.5	291.7

Funds flow

The Design Phase report recommends two primary options for managing funds flow to the participating agencies.

Option 1: Creation of a State Nodal Agency

It has been suggested that the funds earmarked for state wide rollout (after Phase I) can be routed through the state nodal agency for e-Governance, established under the NeGP. The nodal agency can release funds directly to the project based upon the request of the PIU and after getting concurrence from the PeMT (who would be in-charge of the Project Monitoring and Evaluation). In this case, a separate bank account in a specified scheduled bank may be maintained by the PIU (to be operated by the designated project manager) to receive funds from the state Government and Government of India. Funds would be provided by MoUD to the nodal agency, after review of project progress by MPMU.

Option 2: Transfer of Funds to States through a Central Agency:

Under this option, money allocated to the NMMP is transferred to an identified national nodal agency based upon the project approved. Thereafter, nodal agency to transfers funds directly to a specified bank account of the ULB based upon

- Recommendations of the MPMU under the MoUD
- Request received from PeMT together with progress report milestones.

Option 3: Hybrid of the above two options:

Option three is a combination of both the above options. Herein, option 2 can be followed for municipal corporations and option 1, for smaller ULBs.

In line with the strategy for the NMMP i.e. creating competition amongst states/ULBs for receipt of funds, it has been suggested that while budgeting for the programme, entire coverage for 423 cities be taken into account. However, at the starting of the year, in case funds are left unallocated (after allocating to the project proposals received) they can be put together as incentive funds for participating ULBs. These ULBs can access these funds (on a first come first serve basis) for undertaking additional e-Governance modules (over and above the 9 modules suggested) provided they have met the project objectives of the NMMP.

Table 6 below presents details of the proposed fund release.

Table 6: Proposed Fund Release Milestone

Milestone	Amount
Project Development Expenses (Advance)	A token money will be released to the States on EFC approval and on request of the State Level Sanctioning Committee to put in place the institutional structure, preparing of the State e-Governance Municipality strategy and Detailed Project report. The amount of token money will be provided as per the Guidelines
Ist Installment	20% of capital cost on approval of the project by SLSC, signing of the Memorandum of Understanding between the ULB, State Government , MoUD and after the selection of the Application

	vendor subject to provision of matching state share if applicable
2nd Installment	50% of the capital cost on approval of the hardware specifications to be procured by the ULB and utilization certificate(UC) for 70% of the 1st installment, subject to provision of matching state share if applicable
3rd Installment	Balance of the capital cost on installation of Hardware and application at the sites and submission of UC for 70% of grants released so far, subject to provision of matching state share if applicable
Half yearly Installment for the Annual costs	The Central share of annual cost shall be released in four equal half-yearly installments (Scenario 2).

Rules of Access

Mentioned below are the key eligibility criteria, which ULBs/state Government should agree/comply with before they can be considered for funding under the NMMP. The objective of specifying the rules of access is to ensure that NMMP does not become yet another funding vehicle that does not lead to "outcomes". These include:

- State Governments and ULBs would need to enter into Memorandum of Understanding (MOU) with MoUD, Government of India
- There should exist, a commitment of the state Government/ULB to agree to the key objectives and goals of the NMMP and the funding arrangements for meeting the lifecycle costs should be clearly articulated and detailed
- There should exist, a commitment of the state Government/ULB to achieve the stated service levels proposed under the NMMP
- Each state Government would be required to clearly indicate state vision, identified road map and milestones through the preparation of the state e-Governance municipal roadmap
- In the MOU, emphasis should be placed on adherence to the reform principles defined by MoUD through other programmes such as NUIS and NURM and their linkages
- States should have initiated efforts for setting up a state wide area network.

Monitoring and Audit Arrangements

The design phase report suggests that the annual audited project accounts shall be submitted to state Government and MoUD (MPMU), Government of India. The PIU would submit the audited accounts along with project progress report. The audit report should cover the following issues:

- Number of bank accounts being maintained by the implementing agency (a single and separate bank account should be maintained for the scheme)
- Funds held in fixed deposits, if any (the programme funds are allowed to be kept only in savings account)
- Whether interest accrued in savings account has been taken as received and utilized for the project
- Delay, if any, in crediting the accounts of the implementing agency by the receiving bank - if so, the period of delay

- Whether bank reconciliation in respect of cash book balance and pass book balance is being done fortnightly. The bank reconciliation should also cover interest accruals. The bank reconciliation statement as on 31st March should be attached to the audit report
- Proper maintenance of cash book by the implementing agency
- Actual expenditure against the approved budget head
- Clarification of project financial statements
- Inadmissible items of expenditure, if any
- Diversion of funds, if any
- PIU will submit monthly progress reports to PeMT within 10 days of the succeeding month; and for every financial year on or before 25th April of the succeeding financial year
- PeMT would send a consolidated progress report to MPMU at MoUD before 15th of every month
- Government of India will field a multi disciplinary review mission comprising of officers of Government of India and the respective state/UT Government and subject matter specialists/experts once in 6 months or as often as may be necessary, to review the implementation and recommend remedial action. The mission is to guide the PIUs for process implementation
- MPMU to undertake review mission and look into the physical and financial progress of the project and indicate specifically mid course improvement, if any
- Project closure definition: A project in ULB will be considered as **completed** on fulfillment of the following conditions:
    - All the modules proposed to be taken up under the project have been fully completed (Go-live is achieved)
    - The audited project that accounts for the entire expenditure has been received and taken on record in the Government of India,
    - Asset register is completed for assets created out of the Grant-in-Aid from MoUD and
    - The balance Government of India funds has been fully refunded.
    - A report on completion of the project at a ULB under NMMP will be placed before the implementation committee for observation and comments, which would be duly communicated to the state Government for further action, if any.

III.3 Project Appraisal & Approval Mechanisms

The Design Phase report recommends preparation and approval of project proposals in a two stage process:

Stage1: Preparation of e-governance in ULBs roadmap by state government
Stage 1 would follow immediately on formal announcement of the scheme by MoUD. At this stage, in line with the fund release milestone, state Governments desirous of participating in the programme would need to initiate preparation of a state roadmap for e-Governance in municipalities.

The state municipalities' e-Governance roadmap would be submitted to MPMU, which would look into the report for adherence to the design principles contained in this document. The format of the roadmap is presented in section 4 of the report.

Stage 2: Submission of DPR by the state Government and approval thereof by MoUD
Approval of the state DPR and initiation of project preparatory activity would lead to stage 2. At stage 2, the State/ULB would prepare a Detailed Project Report (DPR) in line with the format indicated in this Design Phase Document, which shall be reviewed and approved by MoUD.

III.4 Cost Benefit Analysis

The Design Phase report undertakes a cost benefits analysis by evaluating and assigning relative numeric values to the tangible and intangible benefits for comparison purposes. The first step however, is to identify these benefits. Some of the benefits that would flow out of the NMMP for the citizens are:

- Improved service levels (i.e. reduction in time taken to provide services)
- Reduction in waiting time (using FIFO, "Customer Flow Management Systems" etc.)
- Addition of service channels (e.g. Online services through the internet)
- Decrease in dependence on intermediaries
- Better quality documents provided (fewer errors in documents, clearer print, better quality paper etc.)
- Better ambience at service counters/centres

The benefits mentioned above have been quantified using a scale (like time, money etc.), which would then be assigned numeric values in rupee terms so as to carry out an effective cost benefit analysis. Quantification of per annum savings in time has been calculated as the product of time saved {in hours} (difference between proposed and current service levels), coverage of population (whether all, per family or G2B), usage (services used per year) and opportunity cost of time.

The detailed analysis of cost benefit is presented in Section 1 of the Design Phase report. As per the calculations, the total per annum savings (in rupee terms) due to savings in time is around Rs. 636 crores. If we add a 5% component for reduction in dependence on intermediaries, the savings is around Rs. 668 crores. If we add another 5% component for provision of better quality documents and ambience, the savings turn out to be Rs. 701 crores.

Using a 10% discount rate and a life cycle period of 10 years, the present value of total savings (in rupee terms) turns out to be around Rs. 3,215 crores. In comparison to the total present value of estimated costs of around Rs. 1,048 crores, it is safe to say that the benefits envisaged for the citizens certainly outweigh the costs of implementing the municipalities NMMP.

IV Project Components

IV.1 Institutional Structure

The institutional structure (shown in figure 1) for the NMMP at project level specifies two levels:

- **State Level**, dealing with the requirements of programme monitoring of multiple projects (at the ULBs) and ensuring consistency of approach and adherence to programme guidelines
- **ULB Level**, aimed at ensuring adequate guidance and existence of capacity to implement the e-Governance Initiative, at the implementation unit (PIUs).

The roles and responsibilities of the various components of the institutional structure at the project level (state and ULBs) are presented in Table 7 & 8:

Table 7: Roles and responsibilities at the State Level

Unit	Constituents (Recommended - Minimum)	Key Role(s)	Key Activities
State Level Sanctioning Committee	• Headed by Secretary – UD/Minister - UD • Secretary – IT/e-Governance • Secretary – Finance • Secretary – Administrative Reforms • Secretary - Planning • Representative from select ULBs • Select Mayors • Representative from MoUD • Representative of the SeMT • SIO - NIC • Director – urban administration (Convener and head of PeMT)	Implementation of the NMMP in the state The committee should meet at least once in two months	▪ Finalize state e-Governance roadmap for municipalities ▪ Approve projects (received from ULBs) for funding by MoUD under NMMP ▪ Finalize the state rollout plan ▪ Monitor progress ▪ Resolve and manage issues ▪ Facilitate legislative changes for process reforms ▪ Approve state-wide PPP projects under NMMP ▪ Finalize the procurement strategy ▪ Finalize the application developer for implementing the e-Governance modules under NMMP
State e-Governance Mission Team	• As defined under the capacity building guidelines of DIT under NeGP (details available in section 1 of the report)	Review of the project proposal prepared by the PeMT for adherence to the state e-Governance roadmap under NeGP	▪ Review the project proposal for adherence to NeGP standards and guidelines ▪ Assist with the preparation of project proposals, if required (prior to setting up of PeMT)
PeMT (Supported by State	• As defined under the Capacity building guidelines of DIT under	Serve as the technical secretariat to	▪ Prepare the state e-Governance strategy for municipalities

Implementation Consultants)	NeGP (details available in Section 1 of the report)	the state level sanctioning committee Serve as a source of internal capacity for implementing the NMMP in the state	▪ Finalize project proposals for approval of the state municipalities mission implementation committee ▪ Develop financial sustainability models including analysis of PPP options ▪ Assist in the finalization of the FRS for application development ▪ Finalize the procurement strategy ▪ Finalize H/w requirements ▪ Prepare RFP and manage the bid process for appointment of application vendor and data digitization vendor ▪ Issue guidance note on issues such as legislative changes, technology standards ▪ Test for User acceptance ▪ Monitor projects across ULBs ▪ Finalize the capacity building and change management plan for the state

Project e-Governance Mission Team

The nodal agency (which in most cases would be the urban administration department) identified by the state Government for implementing the NMMP in the state would require a full time and dedicated Project e-Governance Mission Team (PeMT). This team would exist at the department level and would:

- Typically comprise of 2-3 core people from the departments supported by a team of State Implementation Consultants (SIC) providing a well-balanced mix of domain expertise (possessing detailed knowledge about the department and its processes and functions) and technical expertise (i.e. technology, process re-engineering, change management, project management).
- Manage the process of tasking (i.e. outsourcing) the appropriate agencies (to undertake preparation of the project proposals, business process re-engineering, change management, financial structuring for sustainability, design and architecture, bid process management, etc.) with the help of and in accordance with the overall advice of the SeMT.
- Be primarily responsible for managing the implementation, dealing with technology, process and change management related issues internally, quality assurance etc.
- Undertake the appointment of the State Implementation Consultant. However, to standardize processes and reduce the time taken for the selection of the consultant, MoUD (through MPMU) can prepare a panel of 6-8 consultants with national and regional reach, that can be engaged by PeMT.

As projects in a state would be taken up in phases, the department may take necessary support from SeMT for handling initial stages of the project i.e. at the project proposal formulation and early stages of the bid process.

Table 8: Roles and responsibilities at ULBs

Unit	Constituents (Recommended - Minimum)	Key Role(s)	Key Activities
Project Implementation Unit	• Headed by the Project Champion (preferably either the Mayor or the administrative head) ▪ Heads of Department – Administration, Engineering, Planning, Revenue and Accounts • Nominated Chief Information Officer (Convener)	Project implementation at the ULB	▪ Finalize the requirement specification ▪ Monitor the project activities ▪ Prepare Site ▪ Monitor the data entry activities ▪ Support deployment of the application ▪ Design training strategy for the end users ▪ Test for User acceptance ▪ Report project progress to the state implementation team. ▪ Manage change at the ULBs ▪ Support hardware procurement and installation
Application Vendor	• Application development team	Application development for the core nine modules	▪ Review the user requirements ▪ Design the system requirement specifications ▪ Design the MIS requirements ▪ Develop the application with the nine core modules ▪ Test the application ▪ Deploy the application ▪ Maintain the application
ULB Level IS Organization	• Details available in Section 1 of the report	Implementation assistance Ownership of the new system Meeting MIS requirements at the ULB level	▪ Coordinate between Various HoDs, statutory bodies, parastatals, at the State Level ▪ Assess Performance ▪ Monitor and review ▪ Report to the PeMT ▪ Coordinate training at ULB level ▪ Generate MIS at the ULBs for the state ▪ Assess Performance using MIS reports ▪ Regular training and trouble shooting

IV.2 e-Governance Modules

As indicated earlier, the NMMP envisages implementation of various application modules covering the following services/management functions within the ULBs

- Payment of property tax,
- Building plan approvals
- Water supply and other utilities
- Registration and issue of birth and death certificate
- Procurement and monitoring of projects
- Heath programme
- Accounting system and
- Grievances and suggestions
- Personnel information system.

As required under the scope of work for the Design Phase, the report (section 2) provides detailed functionality requirements for the various modules. In line with the scope of work for the study, the objective of this detailing is two fold. Firstly, it can help STQC[5] in evaluating applications with respect to availability of functionality. Secondly, it can also help application developers develop software that meets the basic requirements of the various modules.

- While a detailed Functional Requirement Specification (FRS) has been presented based upon the processes currently in place across most ULBs, the following should be considered while reviewing the FRS and finalizing the application software.
- Most of the municipalities in different states administer various functions in a manual mode. However, some of the municipalities have attempted and adopted computerization of the key revenue generating modules in varying maturities, to meet their internal requirements. Given the diversity of the functionality and platforms of the existing applications, it should be recognized that there would be a need for the states to customize these requirements, before attempting to carry out the fitment analysis of various products, available off-the shelf. For example, assessment of property tax in India is largely on unit area basis through self assessment. Such unit area computations may be either on basis of 'Capital Value Method' or 'Rental Value Method' and there is no uniformity across states in this area.

Structures of urban management, responsibility and allocation between State and ULBs and processes at the ULB level are not the same throughout the country. Hence the generalized FRS for the modules would require customization for every state.

As part of the detailing of the functional requirements, the design phase report recommends:

[5] Standardisation, Testing and Quality Certification (STQC) directorate is an attached office under the Department of Information Technology, Government of India. STQC provides cost-effective international level assurance services in quality and security to Indian industry and users.

- Development of a single and integrated view of ULB information across all ULBs within the states
- Higher utilization of existing infrastructure and technology investments
- Providing timely & reliable management information relating to municipal administration for effective decision making
- Integration with other related applications
- Provision of 'single window' services to citizen
- Providing user-friendly environment accessible over browser
- Providing anytime, anywhere payment of taxes
- Increasing the efficiency and productivity of the employees

Given this background and also to ensure effective civic governance in the state and guide, monitor and supervise the ULBs, the design phase recommends that state/municipalities should develop

- UMIS Engine (ULB Management Information system) – to be integrated with NUIS
- Transaction engines UAS(ULB Administrative System) for effective implementation of e-Governance in ULBs

ULB Management Information System (UMIS)
The primary role of the Municipal Administration Department (MAD) of a state is to ensure effective civic governance in the state and guide, monitor and supervise the ULBs. To achieve this objective, the UMIS engine would capture the key parameters, which would provide the municipal administration department with effective management information system from all the ULBs, based on which, the municipal administration department would be in a position to take appropriate decisions in an integrated manner. The integrated view will enhance the decision-making capabilities and reduces the lead-time in service delivery.

ULB Administrative System (UAS)
The executive functions of the civic governance are carried out by the ULBs. These functions are similar in nature irrespective of the size of the ULB. Hence a common application software, UAS, covering all functions of ULB would bring uniformity in the operations and provision of civic amenities. UAS hold immense potential in terms of effectively and efficiently leveraging information technology to standardize and govern its municipal administration functions.

The various modules detailed in the Design Phase (Section 2) report capture:
- Process overview and its functions
- Description of the key sub-processes involved
- Process parameters for each of these sub-processes(inputs, outputs and controls)
- Interface requirements with other modules
- Detailed functionality & MIS requirements
- Indicative data standards

Table 9 below summarizes the various modules and its coverage:

Table 9: Modules and their description

Module	Description
Property Tax	Property tax is one of the main sources of revenue for the ULB. This module covers all the aspects of assessing the property for tax. Residential and commercial properties, situated within the limits of ULB, are to be assessed for tax. Based on such assessments, all the assesses are expected to pay the property tax. The information regarding all the new constructions, existing construction and other extensions/ modifications, if any, will be provided by the Town Planning Department for tax assessment. The main features of the property tax module include • Assessment of the building for property tax based on the parameter such as residential status, annual rental value, rates of taxes, depreciation and the age of the building • Serving of the demand notices for assessments and collection of taxes • Acceptance, disposal and monitoring of the revision petitions received • Monitoring of the appeals filed • Collection of the taxes and maintenance of appropriate records etc
Building Permissions	In the local bodies, the town planning section issues permission for construction of buildings, based on specific set of rules and regulations. The building permission module facilitates quick processing, disposal of building plan permissions, standardization of collection of building fee & other charges, to automate the technical scrutiny, effective monitoring of file processing and have transparency, accountability and accessibility to the information and status of the building applications, retrieval of data at any future date The main features of the building permissions module are • Approval of building proposals of various types and nature of buildings • Approval of layout proposal • Processing and disposal of Government references, court cases, Chief Minister cell reference, Lok Ayukta references etc. • Planning and implementation of developmental activity such as road widening, junction improvements, development of parks, play grounds, subways, parking lots, bus bays etc • Calculation of various fees such as admission fee, developmental charges, regularization charges, building license fees, scrutiny fees, demolition charges etc • Collection of the fees and maintenance of appropriate records
Water Utility and Tax	The water utility module deals with • Receipt of application, inspection, processing and issue of water tap connection • Levy of tax for the water used based on the type of connection • Issue of demand notices • Collection and monitoring of taxes and regularization charges • Disconnection in cases of non-payment and illegal connections
Births and Deaths	The registration of birth and deaths is one of the major functions of public health section. The births and deaths, which take place in the hospital are recorded and reported to the municipalities. For non-hospital events, the concerned parties can make necessary applications to the municipalities. Delay in registration of the events requires clearances from various authorities. Once the event is registered, ULB issues the necessary certificate. In the case of non-hospital event, the certificate is issued after necessary scrutiny and inspection.

Module	Description
	At any given point of time, corrections to birth/death details can only be done by the Registrar of births & deaths. Necessary records are maintained by the health section
Projects and works	The municipalities execute various maintenance and developmental work through the engineering wing. All civil engineering works such as building of roads, bridges, culvert, storm water drains, buildings, parks and playgrounds etc. are carried out with proper planning, authorizations and allocation of the funds. The main features of this module are • Preparation of cost estimation for the projects • Assist in preparation of tender document • Monitor the tendering process and award of work • Monitor the progress of work in term of measurements, material issues, execution time etc. • Monitor the budget allocation and perform a variance analysis • Assist in preparation of the bills • Monitor the bill payments and release of EMDs/Security Deposits
Projects	The municipalities assist various departments of the State Government in implementing the departmental schemes for the welfare of the people in the municipalities. The schemes need to be monitored to achieve the desired objective and the fund allocated are utilized for the said purpose The main features of the module are • Recording and accounting of the grants/funds received for implementation of the schemes • Preparing of budget for the implementation of the schemes • Allocation of work and fund required for implementation • Recording and accounting for the expenditure incurred for the implementation of the project • Generating necessary reports needed for monitor the implementation of the schemes
E-procurement	E-Procurement combines the use of Internet technology with procurement best practices to streamline the purchasing processes of the ULBs and reduce costs. The e-procurement module aims to automate the activities related to the procurement of works as well as goods. Under the works procurement the module aims to automate the following functions of the ULBs: • Creation and approval of indent • Internet enabling of the competitive bidding (tendering) process • Internet enabling of the dynamic pricing (Auction) process • Digital contract management • Supplier registration Under the goods procurement scenario, the module aims to automate the following functions in addition to those listed above: • Rate contract management • Online RC catalogue based procurement • Order fulfilment cycle

Module	Description
Trade Licenses	The establishment, such as shops, mills, factories, hotels intending to commence trade, should obtain a trade license from their respective municipalities The main features of trade licenses module are • Receipt of application for trade license, inspection of the business premises, processing and issue of the licenses. • Issue of notices for renewal of licenses • Renewal of licenses • Collection of license fee • Closure of licenses • Maintenance of appropriate records
Solid Waste Management	ULB's employ various methods for removal of garbage and debris under the supervision of health wing. The solid waste is collected and transported to the dumping grounds. As solid waste management involves cleaning, transporting and dumping, this module deals with the following **Solid waste Management covering** • Allocation of manpower for sweeping and garbage removal, monitoring and recording of the work executed • Allocation of the vehicles for garbage removal, monitoring and recording of the movement of vehicles. • Planning of the resource for effective utilization of manpower and vehicles • Monitoring and recording of the garbage collection and dumping at the dumping grounds **Vehicle Management covering** The transport wing of the municipalities plays a major role in solid waste management apart from providing service to department/ administration. More than 60% of transport activity is allocated for garbage removal. The activity of transport department includes maintenance of the vehicles, allocation of the vehicles, monitoring of the performance of vehicles, procurement of spares, etc. The main features of the sub Module are • Maintenance of the vehicle history • Maintenance of vehicle repair history including third party repairs • Maintenance of supply of fuel, oils and spares • Monitoring of procurement of vehicles, spares and auction of the vehicles.
Financial Accounting	The accounting system being followed in Municipalities is different from the normal accounting systems followed in commercial practice. The accounting system is designed to seamlessly record all the financial transactions taking place in various departments of the municipalities The main features of the financial accounting module are: • Accrual accounting • Assets/Liability recording

Module	Description
	• To record all receipts from different modes of payment • To record all payments • To generate all records required under the law • To generate statements required by various authorities for budgeting and decision making • To maintain accounts required under the law
Grievance Redressal	As municipalities provide various public utility services, they receive a large number of complaints / suggestions pertaining to its services. Grievance redressal module is basically meant for redressing the grievances of citizens in a "timely and effectively" manner The main features of the module are • Registration of the complaint / suggestion • Issuance of acknowledgement • Capturing of status of the complaint till it is resolved • Generation of necessary reports for proper monitoring
Personnel Information System	The employees form a major asset base of all state departments including the municipalities. Efficient and effective utilization of this asset viz. the available human resources, is important to ensure effective administration of these departments. The state Governments, being the single largest employers in most states, recognize the need for an integrated information technology solution to address the needs and streamline its complex and dispersed payroll and human resource management system. The key functions under proposed human resources management system module are • Recruitments/Appointments • Promotions of non-gazetted staff • Regularization of staff • Department promotional committee meetings • Increments • Seniority matters • Processing of annual confidential reports • Processing of transfer of charge • Probation • Deputations (Foreign/Others) • Compulsory waits • Processing of Leave Travel Concession (LTC) requests • Medical reimbursements • Travel & tour management • Leave Management • Retirements • Resignations • Government provident fund • Processing of bills • Service Register

IV.3 Linkages with NUIS

The National Urban Information System (NUIS) scheme has been proposed by the Standing Committee on Urban Management (SC-U), formed along with the National Natural Resources Management System (NNRMS) by the Planning Commission,Government of India. The aim is to provide guidelines on major issues related to urban applications, identification of new areas for research and advice regarding execution of specific national programmes. The NUIS scheme aims to establish town-level Geographical Information System (GIS) databases and National Urban Data Bank and Indicators (NUDBI) under the scheme. The scheme would be taken up as a centrally sponsored scheme.

As mentioned above, the NUIS scheme comprises of two major components described below:

- **Urban Spatial Information System (USIS)**: This component includes development of GIS based multi-hierarchical database, with application tools to support master/zonal plan generation, Urban Local Bodies (ULB) administration and utilities management.
- **National Urban Databank and Indicators (NUDBI)**: This includes designing and establishing a comprehensive data bank, integration of these parameters to support planning and deriving indicators for National Urban Observatory (NUO) to monitor the health of urban settlements.

The Design Phase report recognizes that there exist linkages between NUIS and NMMP. These have been addressed at three levels:

- Data – At module levels, common data elements have been identified and tabulated
- Information Generation – Common MIS elements have been identified and incorporated in the UMIS
- Architecture – The overall architecture for NMMP is taken into account and linkages are provided to the NUIS- especially NUDBI

As far as Urban Spatial Information System is concerned, the report does not address this component directly. Further, defining the standards for the GIS system and its databases is not a part of this assignment. However, current standards and the technical architecture of the solution at the municipalities provide some guidelines towards integration of the municipal applications with the GIS systems under the NUIS scheme.

IV.4 Business Process Reform and Legislative Changes

IV.4.1 Business Process Reengineering (BPR)

BPR is an important objective of the NMMP, as without redesigning existing processes, significant improvement in service levels cannot be achieved. The key objective of BPR should be to eliminate the non-value adding/redundant processes from the perspective of the citizens, ULBs and state by undertaking radical process redesign exercise and thereby ushering in improvements in the services levels and delivery mechanisms. BPR should enable the following

- Reduction in processing time of the services to the citizens
- Increased productivity and throughput levels of the ULBs
- Lower cost structure
- Increased stakeholder(citizens, NGO's etc) satisfaction

The Design Phase report recognizes the importance of BPR and lays considerable stress on the same. However, it also recognizes that detailed recommendations on BPR with respect to each of the nine modules cannot be undertaken without a detailed study of as-is processes on a state- to- state basis to ensure a representative sample. Accordingly, while the report covers generic best practices across the various modules, it also provides a detailed approach and methodology for undertaking business process reform that can be used by the PeMT/state implementation consultants in detailing BPR strategy during the preparation of the state municipality e-Governance roadmap.

At this stage, it would also be pertinent to highlight the strategy for BPR that is proposed under the NMMMP. The strategy hinges on the following three key elements:

1. **Process improvement through automation** – A certain amount of process improvement has already been built into the designing of the e-Governance modules wherein automation of the process would lead to significant reduction in duplication of work (compared to manual processes). To implement this, the state Government would need to incorporate changes to rules/regulations. These changes would be relatively easier to implement and in most cases may not require significant legislative reforms.
2. **Service level led process improvement** – As has been explained in the preceding paragraphs, considerable differences exist between processes followed by ULBs from state to state. Further, the power to legislate rests with the state Governments and hence it may be difficult and also not desirable for MoUD to specify "a single best practice". In such as scenario, the Design Phase report lays considerable stress in defining clear and measurable service levels (refer section 1) to be achieved by state/ULBs as a consequence to the implementation of e-Governance initiative. It is believed that achieving the proposed service levels would necessarily force state/ULBs to undertake significant BPR. This strategy would not only help emphasize on BPR, but also not being prescriptive, regarding the issue of business reforms, as these can only be undertaken at the local/State Govt. level.
3. **State Municipality e-Governance roadmap** - The design phase document recommends state Governments prepare a comprehensive state municipality e-

Governance roadmap. One of the key components of the roadmap is the state – wide strategy for e-Governance in municipalities and specific measures aimed at achieving the proposed service levels. Detailing of these elements within the roadmap has been proposed as a pre-condition for approval of a project proposal.

IV.4.2 Legislative Changes:

Ensuring legislative changes in a time bound manner is an integral part of the NMMP's strategy to ensure Government reforms form part of the e-Governance initiative in Municipalities. At this Design Phase, it is not possible to provide a comprehensive list of legislative changes that would be required for successful implementation. This is primarily on account of the following two reasons:

- Urban development in India is not governed by any single central legislation. Rather, it is under the ambit of a state legislation, in some cases more than one.
- For effecting legislative changes, the envisioned scenario is also required to be known. Any standardization of process at the central level would go contrary to the overall philosophy of the NeGP i.e. "centralized initiative and decentralized implementation".
- Changes in legislation are contingent upon changes to business processes to a great extent, which are to be decided upon at the State level.

However, the Design Phase report provides an approach/framework for adoption of the implementation phase consultants – both at state and centre, to facilitate legislative changes during implementation. The approach/framework proposes the following six steps:

Step 1: Review of the objectives and performance metric of the NMMP as defined under the MoU that the ULB needs to achieve

Step 2: Mapping of the performance metrics (outcomes) to present levels within the ULB

Step 3: Assessment of whether deficiencies in service metrics can be met through changes in the current set-up, especially those relating to process, structure and delegation of power

Step 4: Identifying whether changes in the above require changes in the rules or acts and identify the agency responsible for administration of the rules/acts.

Step 5: Prepare a case for the proposed change in rules/acts, detailing the benefits to citizens/business (supported by examples of similar initiatives in other states/ departments)

Step 6: Prepare a contingency plan for the next best option for undertaking process changes in case the proposed changes cannot be achieved.

Based upon the above approach, requisite reforms would fall under both the national and state categories. National reform agenda could be prepared in two stages – stage 1 would include inputs from the national implementation consultants at the outset and stage 2 would include compilation by national implementation consultants of inputs received from the state e-Governance municipality. State reform agendas should be prepared by each state implementation consultants as part of the state e-Governance municipality strategy.

IV.5 e-Governance Architecture for NMMP

The Design Phase report details the various options for designing e-Governance architectures for NMMP and identifies best practices. It would be pertinent to highlight that the eventual architecture to be followed by the state for implementing the NMMP would have to be decided by the State keeping in view the state e-Governance roadmap being prepared as part of NeGP.

The design phase document provides detailed guidance regarding the design of the e-Governance architecture while evaluating various options available with respect to the following twelve architecture components as mentioned in Table 10.

Table 10: Architecture Components

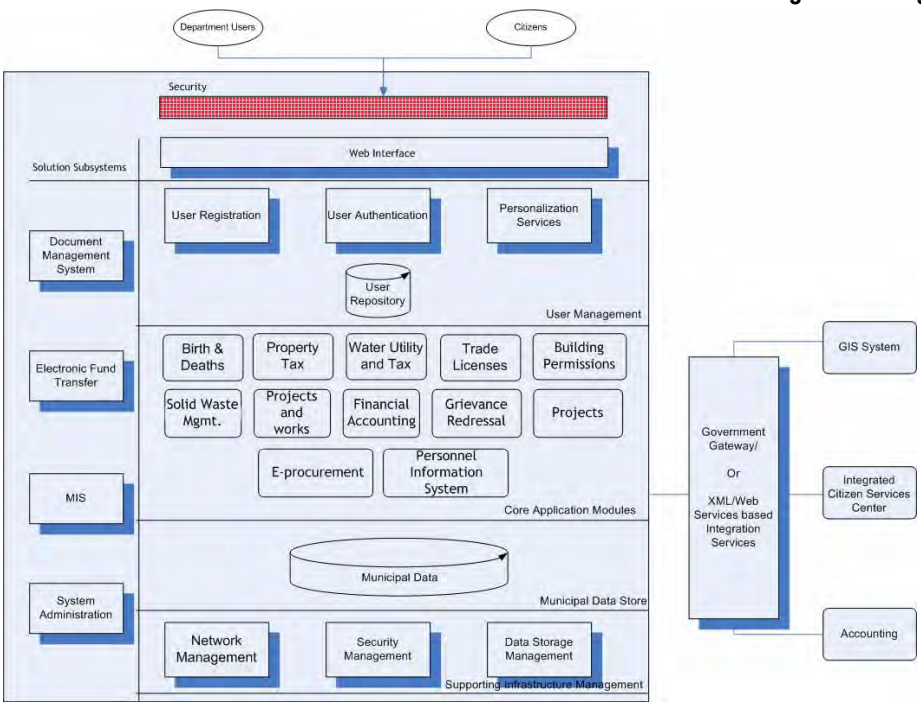
Application	Application software is the key component of the overall solution, which provides the suite of automated business processes and related services of the ULB to the employees, citizens and other related departments/service providers. The application architecture identifies criteria and techniques associated with the design of application software for the ULBs' information systems that can be easily modified to respond quickly to the changing business needs, as well as to the rapidly evolving information technologies available to support those needs of the ULB. The section 3 of the report discusses the application architecture options for the proposed solution and the recommended architecture, standards and guidelines for development and implementation of the solution.
Data	Data is the essence on which the information systems are developed for processing, storing and retrieving the data. The ULB currently processes and manages large volumes of the citizens' data in both manual and electronic format. Moving towards such an initiative of computerizing the entire ULBs business processes need adequate planning and care for managing the ULBs data. The sections 'database standards & guidelines' and 'metadata standards & data digitization guidelines' in the main report discusses key aspects of database Management system, data digitization & migration process and meta data standards.
Integration	The services of the ULB are provided through various channels, which are both internal and external to the ULB. In addition, ULBs planning to continue their existing information systems deployed for various process automation requirements need to exchange the necessary data with the new information systems, which may be implemented at a later date. Thus exchange of data between the current and new application systems and with the information systems deployed by other departments/external service providers requires integration of these various application/data resources in an effective manner. The section 'Standards & Guidelines for Information Systems Integration' in the main report (Section 3) discusses the key aspects to be considered for integration of ULB Information Systems with others, guidelines and standards for integration technologies.

Information Security	ULBs' information and information systems are valuable assets that must be protected. The ULB must maintain compliance with legal requirements for confidentiality and integrity while enabling public access to appropriate information. Security architecture standards and guidelines discussed in this section identifies criteria and techniques associated with protecting and providing access to the ULBs' information resources. The ULBs' technological resources must be available to internal users, external service delivery channels and citizens regardless of location or platform. Therefore, the ULB must implement information security services in such a manner that the ULBs' information infrastructure is protected and accessible while, at the same time, its functionality is unimpeded and its business services are readily available. The section 'Information Security Standards & Guidelines' in the main report discusses the various aspects of Information Security, standards and guidelines for securing the information systems of the ULB.
Solution Deployment Models	The presence of Municipal Administration Department is spread across the entire state. Most of the department operations at the field level are performed at the urban local bodies or municipalities. The services of the application software developed for the department need to available for the department employees at the ULB level. The section 'Solution Deployment Models' in the main report discuses various options for deployment of the Information Systems for the department.
BCP & DRP Guidelines	In recent years, added emphasis has been placed on the continuation of business functions in the face of potential disasters. Such disruptive acts may be natural disasters such as earthquakes, severe storms, flooding or deliberately caused by man (bombings, arson and sabotage). The ULB is looking forward to improve the service delivery through business process reengineering and infusion of information technology into service delivery. ULB is also planning to use IT as the key enabler in providing the services to the citizens which leads to heavy dependence upon its information processing capabilities in order to support its service delivery. Only through effective advance planning and preparation can we ensure that critical service delivery functions and activities will continue in the event of a disaster. With such a strategic priority given to the IT, it is mandatory for the ULB to review and address all the issues and risks surrounding the IT and to plan for the continuity of the services in case of unforeseen events. The section 'Business Continuity & Disaster Recovery Guidelines' in the main report discusses the guidelines in designing the business continuity and disaster recovery plan for the ULB information systems.
Local Languages	India is a multilingual county with as many as 22 scheduled languages. Therefore any language computing solutions will have to be provided for all or most other languages too. Language computing, therefore, faces two major challenges – first, the development of appropriate language tools and technologies for its total language computing needs and secondly the multiplicity of Indian languages with different scripts, dictions and styles, each vying for a place in the computing roadmap. The ultimate goal of multilingual computing is to ensure that the technology reaches the common man at his doorstep in his own native language so that he feels more at home working with the new technology. The section 'Local Language Standards' in the main report discusses the current technology standards for usage of local languages in the application systems to be developed for ULBs.
Open Source Systems	Several open source software (OSS) applications are already in use in various Governments across the world. This document discusses the strategy to enable MoUD to evaluate the open source software for its information technology needs. OSS refers to software that is developed, tested, or improved through public collaboration and distributed with the idea that it must be shared with others, ensuring open future collaboration. OSS has emerged as a powerful new way of generating knowledge and economic value. It is available to anyone, usually at little or no cost, it does not attract proprietary license fees and it may be freely redistributed. The section 'Open Source Systems' in the main report discusses the key aspects of open source systems including benefits, key factors for evaluation and selection of OSS.

Information Privacy	Privacy protection is one of the most significant issues in the e-Governance and lack of adequate privacy policies, procedures and practices face challenges from legislators, regulators, and citizens. In e-Governance, the protection of personal data requires a new approach. Pressures for privacy come from technological innovations, from public concerns of their personal information use and distribution, and from national data protection laws. Data protection, privacy, and security are integral parts of e-governance and a challenge for ULBs in e-enabling their services. The section "Information privacy Standards & Guidelines" in the main report discusses the Key elements of information privacy and guidelines on building the privacy policies and procedures.

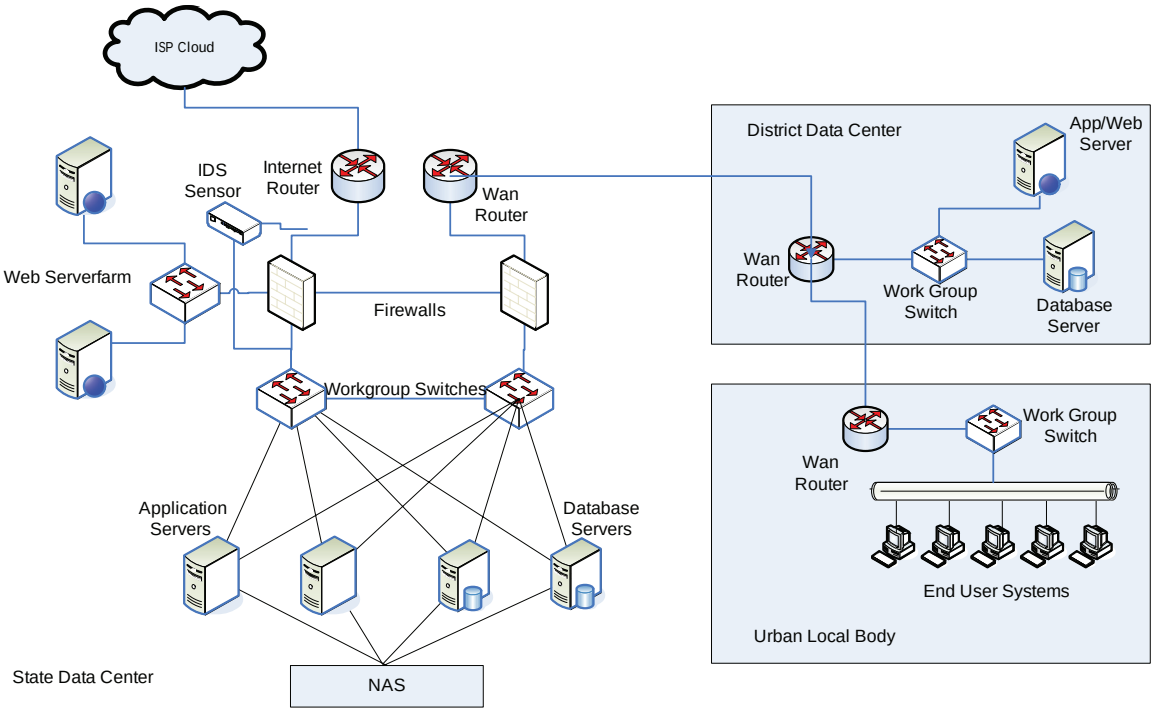
The diagram below presents the functional modules and other subsystems of the proposed solution to the ULB. The functional requirements and specifications of the individual functional modules are detailed in Section 2 of the report.

Figure 2: Logical View of NMMP



The diagram below presents an illustrative deployment view of the application solution envisaged for the ULBs.

Figure 3: Solution Deployment View



Highlighted below are some of the recommended best practices across some key architecture components described earlier:

Application Architecture

Following outlines the summary of guiding principles, recommendations and standards for application architecture recommended for the ULBs. The detailed recommendations and standards are discussed in Section 3 of the Repot.

Guiding Principles

- Design applications to support N-Tier architecture
- Design applications to be highly granular and loosely coupled
- Plan for extensibility, interoperability and scalability
- Design application to reuse components
- Select tools based on application architecture
- Design applications to operate in a resilient manner within a fault tolerant environment
- Document the architecture.

The following components need to be considered for effectively managing the applications

- *Instrumented applications*

Code in applications that provides information to or processes commands from the management environment

- *Agents*
  Programs that collect status from applications, filter it, and report it to the system management framework
- *Network and System Management framework*
  Monitors networks, systems, and applications by identifying alarms forwarded by agents.
- *Management Information Base (MIB)*
  A database that contains information about the application being managed, dependencies on systems, other applications, databases, software components, etc.

Application Architecture – Recommendations

- All applications need to be web enabled
- Use the same technologies for Intranet and Internet applications whenever possible
- Design Intranet applications to facilitate their portability to the Internet at a later time
- Design department portals to provide one click access to all major department data resources
- Pursue an object-oriented philosophy of encapsulation, reuse, and inheritance for new Internet applications
- Validate and verify all data before an application processes it
- All applications deployed must be designed to be managed by SNMP
- Instrument applications to facilitate administration.

Data Architecture – Metadata

Following discusses the summary of guiding principles, recommendations and standards for data architecture recommended for the ULBs. The detailed recommendations and standards are discussed in Section 3 of the report.

Centralised Metadata

- Common data elements are defined consistently even when they are stored in multiple databases and data can be shared between applications
- The data is described in the same way in each table where it is defined
- Definitions include traits such as name of the field, length, number format, data format, and the values it can have
- When the data has the same format, it is much easier to exchange data across system and organizational boundaries.

Recommendations for Centralised Metadata

- Use and actively maintain the centralised metadata repository to store centralised metadata definitions

- When designing or modifying a database, review the centralised metadata repository for existing standard and proposed data elements before implementing a new database to ensure data elements are defined according to standards
- Define existing databases in the centralised metadata repository
- Identify authoritative sources for centralised metadata
- Use centralised metadata exchange standards when exchanging data across departments.

Recommendations for Data Modeling

- Determine the initial business requirements using terms and tools that are familiar to business users
- Take the Entity-Relation (ER) model to the third normal form, then denormalize where necessary for performance
- In a dimensional model, use a star schema whenever possible
- Restrict free form data entry where possible
- Setup indexes and form relationships carefully
- Design the data model to allow for growth and/or change
- Each department should standardize on a common data modeling tool for designing and maintaining all new database instances.

Recommendations for Database Management System

- When using object oriented programming languages, use a relational database management system (RDBMS)
- When using a relational database with object-oriented programming, design the relational data model first
- Replicate stable data, based on business and performance requirements.

Integration Architecture - Application Integration

Following discusses the summary of guiding principles, recommendations and standards for integration architecture recommended for the ULBs. The detailed recommendations and standards are discussed in Section 3 of the report.

Application Integration can provide the following services

- Data translation and mapping - translates communications and data between applications
- Transaction explosion - one transaction is spawned into multiple transactions in remote applications
- Front ending other applications - a single front end for multiple applications.

This is achieved through:

- Direct program to program interface - possible when both systems are modifiable and applications provide for a connecting mechanism
- Interface engines - connectors or adaptors which facilitate interoperation of applications, requires little modification to the applications
- Middleware Systems - Configured and implemented to communicate between applications.

Application Integration - Recommendations

- Anticipate future usage while developing the integration approach
- Use application integration strategy for online transaction program (OLTP) application systems, not decision support systems (DSS)
- Design an integration solution that does not write directly to an operational database
- Recommended priority of using components of application integration are interface engine first, middle ware systems second, direct program to program interface as third and last alternative
- Use direct program-to-program interfaces for high transaction volumes
- When designing an application integration solution using an interface engine, give careful consideration to the design and planning of the application interfaces and connectivity
- Clearly define application interfaces.

Data Access Integration

- Data access is the accessing and sharing of data between legacy, new, and packaged applications. Techniques used to accomplish this are:

  Data Extraction

  Data is extracted and transferred to destination application at desired frequencies

  Data replication

  A copy of data is made using replication features of the database, this is often used to support distributed users who need local copies of data for processing

  Data Sharing

  Same data is shared by more than one application allowing them to view most current data, always.

Data Access Integration: Recommendations

- Use as few middleware layers as possible when implementing a database gateway
- Balance type of data access method implemented with performance needed by application end users and impact on existing operational databases
- Use a database gateway technology to combine queries of SQL data with non-SQL data
- Keep the integration strategy as simple as possible
- Code data integrity verification rules into DBMS whenever possible, particularly when external users and programs will be writing data directly to DBMS
- Separate decision support systems (DSS) from online transaction processing (OLTP) databases whenever feasible.

Integration Architecture - XML

- XML is a standard for exchange of structured data between applications
- XML constitutes of a number of components, the key ones are:

- DTD/Schemas - define structure of data.

Key tools necessary for implementing XML:

- Parsers - check the XML document
- Repositories - store DTD/Schemas of documents
- Authoring tools - necessary for creating large number of documents.

Integration - XML: Recommendations

- Choose XML as a preferred mode for all application integration for new systems, wherever possible
- Developing the DTD/schemas can be a top down as well as a bottom up approach
- Clearly define and publish DTD/schemas for XML.

Network Architecture - LAN: Key Recommendations

- Configure the topology (physical wiring) in a star pattern
- Standardize on Ethernet network protocol
  - 10/100 Ethernet is preferred for network installations
  - Giga Ethernet switching are high performance requirements
- Structured wiring shall be implemented at all levels
  - Based on UTP category 5/6/7 cabling
  - Fiber optic backbone between wiring closets
- IP addressing - IPv6 (backward compatible with IPv4)
- LANs will be based on switch technology (layer 2 and above)
- Support for both 10 and 100 Mbps Ethernet as well as gigabit and fiber ports
- The LAN infrastructure implemented in ULBs shall be manageable using Simple Network Management Protocol (SNMP)
- Intelligent switching to be used for segmenting the network logically to keep the cross traffic to minimum
- Routers shall be used for connectivity between logical network segments and disparate LAN topologies.

Network Architecture WAN: Key Recommendations

- Configure WAN using TCP/IP protocol
- ULB shall make use of State Wide Area Network for interconnecting various locations.
- IP addressing - IPv6 (backward compatible with IPv4)
- Dynamic IP addressing of clients for increased operational efficiency and security
- Routers shall be the core WAN access technology
- Based on the availability of the technology options in the ULB appropriate WAN backup options shall be used such as ISDN, VSAT or RF links
- The shared WAN links between the ULB shall be encrypted.

Systems Management Architecture - Guiding Principles

- Systems management and network management need to be looked upon as a single area of focus for efficient and effective management of the ULBs information

processing environment in order to support and enhance the productivity of its automated business systems

- ULBs need to contain and surmount the complexity inherent in managing today's distributed systems by using tools capable of defining service level agreements (SLAs) and monitoring their compliance
- Use Simple Network Management Protocol (SNMP) for managing TCP/IP based networks
- RMON products for applications monitoring, report generation and bandwidth allocation
- Desktop Management Interface (DMI) standard for PCs, software, printers, and other devices to report on their behavior and condition and a means for remote configuration and control
- Incorporate automated error detection, reporting and recovery into Internet solutions
- Applications and middleware should permit remote manageability, where appropriate.
- Automated backup and recovery procedures are needed for every Internet and Intranet component
- Use version control facilities for web and application servers.
- Monitor key servers and communications components on an ongoing basis.

Information Security Standards & Guidelines

ULBs' information and information systems are valuable assets that must be protected. The ULB must maintain compliance with legal requirements for confidentiality and integrity while enabling public access to appropriate information. Security architecture standards and guidelines as discussed in Section 3 of the report identifies criteria and techniques associated with protecting and providing access to the ULBs' information resources. Following outlines some key guidelines discussed in the main report.

Guiding Principles

- Perform a business-driven risk assessment for automated systems
- Apply a level of security to resources commensurate to its value to the ULB and sufficient to contain risk to an acceptable level
- Resetting security assurance levels should not require modification of the architecture
- Base application security on open standards
- Locate security in the appropriate layer of a communications protocol to ensure maximum usability with minimum future modification
- An accurate system date and time are essential to all security functions and accountability and must be maintained.

Business Continuity & Disaster Recovery Planning Guidelines

With strategic priority given to the IT, it is mandatory for the ULB to review and address all the issues and risks surrounding the IT and to plan for the continuity of the services in case of unforeseen events. This section of the document highlights standards and guidelines in designing the business continuity and disaster recovery plan.

Guidelines for Development of BCP & DRP

The automation of ULBs business process and processing and storage of transactions through information systems have increased the greater dependence on information systems. As a result, information processing has become a nerve center for the success of any e-Governance initiative. As dependence on automated business processing increases, so does the risk associated with a loss of processing capability. Preparation of an overall business recovery plan gives ULB an excellent opportunity to alleviate or minimize potential problems that would disrupt the service delivery and operations.
Following outlines the guidelines for designing and implementing the business continuity and disaster recovery plan for the ULB

- Organize and manage the BC & DRP project
- Perform impact analysis
- Determine minimum processing requirements and Recovery Time Objectives (RTO)
- Identify and analyze risks
- Analyze alternatives and select strategy
- Shall develop a detailed plan based on the identified recovery strategy as discussed above
- Shall develop the appropriate test scenarios for verifying the effectiveness of the recovery plan and based on the test results, the recovery plan shall be updated
- Technological advances and changes in the business process and service delivery requirements of ULB will necessitate periodic revisions to policies, standards, and guidelines. The ULB shall be responsible for routine maintenance of these to keep them current. Major policy changes will require appropriate approval from the officials concerned.

V. Implementation Plan

V.1 Implementation Strategy

Setting a strategic direction and vision for Municipalities is an important starting point for the implementation of e-Governance initiatives in India. The vision typically directs all municipalities to leverage the power of the Internet and information technology to deliver services electronically through e-Governance. While MoUD through this document and its ongoing efforts has developed a comprehensive strategy for initiating e-Governance in municipalities, its effectiveness would largely be driven by how far those are reflected by the states in their own e-Governance strategies. Thus, the starting point of the implementation strategy for NMMP would be the development of the state-level municipality's e-Governance strategy and implementation roadmap.

The overall implementation strategy for NMMP has been discussed across three key areas relating to:

- Services
- Access channels
- Roll-out strategy for implementation of the programme.

Based upon the study of other successful initiatives, the Design Phase report recommendations for each of the three elements are summarized below:

Services

- Municipalities/ULB services can be classified into two main categories - informational & transactional
- Municipalities/ULBs should focus on those municipal services, which once delivered through e-Governance-related channels, will deliver the highest value to them and their customers. Municipalities should priorities their service based on identified frameworks
- Further, based on experience and analysis, we suggest that ULBs implement their e-governance initiatives in waves, as described below.
    - **Wave 1 (Raise Visibility):** This wave of services aims to quickly raise the visibility and image of municipalities/ULBs as an e-Governance organization by establishing a professional and effective web presence. Services implemented during this wave have a wide customer base (e.g. public and/or businesses) and relatively simple delivery operations
    - **Wave2 (Build Critical Transactional Services)**: This wave seeks to establish the core transactional services required to support the key customer segments and focuses on the services essential for effective customer relationship management and common transactional services. Services implemented as a part of this wave enjoy high visibility and relatively complex delivery operations
    - **Wave3 (Sustain Value):** This wave aims to sustain the value delivered to municipalities/ULBs and their customers through implementation of additional

critical transactional services. Services implemented as part of this wave generally possess low customer visibility.

The informational and transactional services to be provided by the ULBs need to be identified by the respective state governments in consultation with MoUD as part of the DPR. Table 11 describes the municipal services that should be ideally implemented with each wave.

Table 11: Implementation Strategy – Services

Wave 1	Wave 2	Wave 3
State Web Portal	Accounting	Trade Licenses
Property Tax	Building Plan Approval	Solid Waste Management
Citizen's Grievance Monitoring	Water Tax	Project/Ward Works
Birth & Death	Schemes	e-Procurement*
Call Centre	Others **	Personnel Management System*
		Others **
Other services proposed by municipalities can be taken up in any wave depending upon the state e-Governance municipality roadmap. However, for the purpose of the NMMP, only nine modules (other than web portal and call centre) are being considered		
E-Procurement and HRMS (personnel management) should be undertaken in line with the state initiative and the phasing would be dependent upon the same.		
* To be taken as State wide initiative	** To be identified by the State	

Access Channel

Based upon study of other successful initiatives, our recommendations for this element are summarized below:

- Municipalities/ULBs have five possible electronic channels to deliver e-Governance – these include internet (corporate web site), call center, kiosk, mobile computing (e.g. WAP phones) and digital TVs
- Municipalities/ULBs should pursue a phased and structured approach for deploying the various electronic channels to support e-Governance. This will ensure successful implementation and the protection of municipalities/ULBs investments. The following are recommended:
  - **Phase 1 – Primary Channels**. For the first two years, Municipalities/ULBs should focus on developing two key channels mainly, the Internet and call center. These two channels enjoy high public awareness, extended service applications and mature technologies. Furthermore, the investments required to establish these channels are fairly manageable
  - **Phase 2 – Extended Reach**. During the following two years (i.e. 3rd and 4th year), municipalities/ULBs should seek to integrate the two existing channels (i.e. Internet and call center) by addressing the issues of channel conflict and distributed customer access. Furthermore, municipalities/ULBs should expand coverage by establishing a network of kiosks and amending their corporate web site with mobile computing capabilities. Kiosks allow distributed and remote access to Municipalities/ULBs corporate web sites for those customers who do not own personal computers. Mobile computing capabilities allow customers to

access Municipalities/ULBs corporate web sites through their regular mobile phones

- **Phase 3 – Secondary Channels**. During the fifth year, municipalities/ULBs should have completed the integration all their basic channels (i.e. Internet, call center, kiosk and mobile computing). We believe that at this stage, municipalities/ULBs should consider establishing the digital TVs channel. This channel is expected to have a wide customer base and more reliable infrastructure in the years to come.

Table 12: Access Channels

Phase I	Phase II	Phase III
Primary channels (Year 1-2)	Extended reach (Year 3-4)	Secondary channels (Year 5 and beyond)
▪ Department counters ▪ Internet ▪ Call centre	▪ Shared service kiosks ▪ Mobile computing	▪ Digital TV

Roll-Out Strategy for implementation of the NMMP Programme:

The entire stage 1 implementation under NMMP is to be completed within a period of five years and should cover as much population as possible and as early as possible. In the first phase (Year 1) 35 municipalities have been included. The 35 municipalities have been selected as they have more than 1 million populations and cover a large proportion (approximately 20%) of India's urban population.

The entire NMMP is proposed to be rolled out over five years in five phases (waves) as presented below (Table 13). This phasing is largely indicative in nature and has been designed taking into account the following:

- The time taken for implementing the various e-Governance modules proposed under NMMP in ULBs during the initial years would be longer
- Managing implementation of larger number of ULBs in the initial years would be difficult
- Implementation during the initial years would provide significant lessons that need to be replicated as the implementation reaches balance ULBs and thus in the initial years limited number of ULBs should be taken up
- High visibility should be achieved so that enough demand pull for the programme can be achieved
- Year 1: Cities with population more than 10 lakhs
- Year 2: Cities with population more than 5 Lakhs and 10% of the balance 354 and
- Year 3 to 5: 30% each year of the balance.

Table 13: Implementation Phasing

Phases	ULBs Covered
Phase I – 1st Year	35
Phase II – 2nd Year	69

Phase III – 3rd Year	106
Phase IV – 4th Year	106
Phase V – 5th Year	107
Total	**423**

V.2 Capacity Building

The Design Phase report provides comprehensive guidelines for capacity building and change management. These recommendations are largely based upon the report submitted by NISG and CGG on capacity building for municipalities supported by our past experiences in similar projects, both at a national and international level.

The primary aim of capacity building in the context of NeGP and NMMP is to create a dedicated and suitable capacity to prioritize, conceptualize, develop and manage e-Governance projects. To address the issues of capacity constraints, NeGP has an integral component of "Capacity Building", as part of which, state Governments and implementing departments are required to build capacity (in terms of resources of people, process and tools) to conceptualize, develop and manage (and not implement) e-Governance projects under NeGP.

Under NeGP, the state Governments have been provided the flexibility to augment their capacities. Broadly, the capacity building would comprise of:

- **Change Management Expertise**: Dovetailing the objectives/standards/ infrastructure of the state Government with individual projects at the department level and manage change. In addition, the capacity to scale-up resources as and when required is also desirable.
- **Technology Expertise** : Conceptualizing and developing the information systems/ expertise in all sub-domains of information technology
- **Financial Management Expertise** : Conceptualizing financially viable/sustainable projects and managing finances, developing financially viable initiatives, specifying needs and managing procurement and vendors
- **Program Management Expertise**: Managing projects, catalyzing change and building the capacity to scale-up.

The capacity building requirement is proposed at two levels in the state Government to drive the e-Governance program in municipalities (aligned with NeGP capacity building framework). These are:

State e-Governance Mission Team (SeMT) - at the State Level
Dedicated capacity is required at the state level to provide an overall direction, standardization and consistency through program management of e-Governance initiatives of the state Government. All interdependencies, overlaps and conflicts across projects as well as core and support infrastructure shared across several projects would fall under the purview of this group. On a broad level, the capacity at the state level would:

- Function as a permanent advisory body to the state Government/NeGP state Apex committee (expectedly under chairpersonship of Chief Secretary) in undertaking e-Governance projects
- Institutionalize processes and tools for effective program management of e-Governance initiatives
- Provide inputs to the state Government during IT policy/roadmap making process
- Assist individual departments of the state Government in putting together a dedicated team for undertaking e-Governance projects in their departments and managing the process (i.e. building capacity at the department/project level) through the constitution of individual project groups (DEG).

Municipal Project e-Governance Mission Team (PeMT) at the Department/Project Level

Dedicated capacity is required by the urban administration department in the state Government for conceptualization and management of the NMMP. On a broad level, the department/project level would:

- Work in close consultation and co-ordination with the ULBs to conceptualize and prepare Project Reports
- Identify and plan the process for BPR (administrative, legal and process changes) required to improve the efficiency of the department through e-Governance
- Provide assistance to the ULBs for change management, financial sustainability, technology expertise
- Provide project management and implementation support
- Assist the ULBs in institutionalizing the processes and tools required for managing the program
- Engage agencies for hardware, networking, software development, data entry etc during the implementation of the projects.

The SeMT and PeMT would be a set of resources available to the state Government and its departments, to prioritize, conceptualize, develop and manage the e-Governance projects. These resources would be built on the following cornerstones:

- People (with relevant experience)
- Processes and
- Tools/systems/technology.

To address the capacity gaps, the design phase report has identified areas of capacity building at various levels of ULBs, which are summarized in Table 14 below

Table 14: Capacity Building Gaps

Capacity Building Areas, Levels and Strategy				
Policy	**Cross-section of Functionaries at Different Levels**	**Legal and Institutional**	**Strategy for Capacity Building Organization**	**Human Resource Development/Training**
• e-Governance • e-Municipality	• Elected representatives	• e-Municipality policy	• Strengthening the MoUD on	• Sensitization regarding the principles of e-Gov

vision • Strategic decision making • Strategic direction • e-Governance standards • Monitoring • Evaluation.	• Senior officials of GoI, MoUD • Senior Officials of State MA & UD department • Commissioners of municipal corporations.	• Institutional framework for e-Governance in ULBs • National level Implementation committee & mission team for e Municipality • Policy for human resources sourcing • Policy for private sector & community sector participation.	e-Governance capacities • Creating a special sell dedicated to eGov in municipalities with linkages to other agencies • Resource mobilization and utilization plan • Sourcing of carefully selected personnel from Govt, PSUs or any state agency or central agency with required background & experience, or CIOs or Dy. CIOs. • Sourcing personnel from the private sector wherever required.	to disseminate a correct understanding of the subject • GPR • Project management & quality assurance standards • Government process Engineering and change management • Service level agreements & their enforcement • Learning from existing e- Government projects • Preparing RFPs • Selecting external agencies • Managing and getting the best out of external agencies • Internalizing the outputs/reports of the external agencies, quality assurance, doing cost-benefit analysis amongst various technological and other policy options • Working knowledge and skills on PPP models, IT architecture and standards • Learning from existing e- Government projects and case studies.
Implementation				
• GPR • Change management • Financial management • PPP models • Technology management • Project management • Procurement management • Preparation of scope of work.	• Senior officials of municipal administration department • Municipal commissioners of all grades • Municipal functionaries such as revenue officers, accountants, town planning officers, health officers, municipal engineers,	• State and ULB level steering committee and mission teams for eMunicipality • Policy for human resources sourcing • Policy for private sector and community sector participation.	• Strengthening the state MA& UD Dept. on eGov Cap. • Creating a special cell dedicated to eGov in Municipalities with linkages to other state agencies and Parastatals • Resource mobilization and utilization plan	• IT Skills covering hardware, software, networking, online and offline tools database management, basic programming, eApplications, etc. • Nuances of project management including PPP arrangements.

	community development officers, municipal managers, law officers, etc. • Experts with domain knowledge in the sector.		• Sourcing of carefully selected personnel from state Govt. with required background & experience. • Instituting the position of State Urban Information Officer (SUIO) at the state level and Municipal Information Officers (MIOs) for each ULB • Sourcing personnel from the private sector wherever required.	

Training and Change Management Needs

One of the most basic and yet important issue towards change management and training is that ULBs do not have structured training programmes. Even if they exist, they address only specific aspects of functional skills. Human resource development in urban local bodies (ULBs) needs to be considered in the current scenario of emerging urban challenges and must receive policy and top-management level, otherwise little will be achieved out of the reform efforts. Municipalities must rely on the quality of their staff as well as the technology they use to provide service. Training programmes need to target specific needs at different levels. In addition, induction training for new starters, development training of municipal officers and the introduction of new technologies should also be offered.

It has been suggested that the overall management of training in the urban sector could be under the state Secretary (UD) or director local bodies at the state level supported by a state Committee and PIUs.

An important element of the training strategy relates to the identification of training institutions with experience in training in specific areas and also with adequate infrastructure facilities. These include:

1. The **State Government Institutions** (ATIs) cater to the training needs of senior, middle and junior level government officials. Most of the training courses offered by these institutes relate to administrative matters, office procedures, change

management, disaster management, etc. In the IT domain, many ATIs have introduced training courses in computer basics, office automation tools like MS Office, usage of Internet, etc. In the context of capacity building for e-Governance in municipalities, separate cells should be set up in the ATIs to handle the capacity and training needs with respect to e-Governance in general and the ULBs in particular. Resource persons need to be taken on to handle courses on project development, preparation of RFPs, project management and other key skills. This would help the states in enhancing the capacity of the staff in the municipal administration department and ULBs to be able to handle e-Governance projects.

2. Municipal chief information officers (CIOs) and State Urban Information Officers (SUIOs) form the core of the e-Governance implementation team at the ULB level. Hence, they need to undergo rigorous training in all aspects of e-Governance starting from basic to advanced courses and e-applications. To facilitate this process, the State ATIs could handle this training need, more so because of the huge geographical spread of ULBs and availability of district level ATI (Administrative Training Institute) training centres.

3. At the central level, the National Institute of Urban Affairs (or MPMU in an expanded role) can be used to impart training to the senior level staff such as Secretaries and senior officials from the Government of India, Secretaries, heads of departments, senior officials, and Municipal Commissioners at the State and the ULB level. NIUA can develop linkages with the e-Governance training cells, to be established at the state ATIs. Training modules will be developed by NIUA and disseminated to the state Level ATIs for adoption. This ensures uniformity in the course content and avoids duplication of work.

4. Another important dimension for e-Governance training is the access to the pool of e-Governance experts, intellectual resources in terms of course modules and distance learning modules and specialized hardware and software, particularly for high-end trainings. In order to meet this requirement, it is important that NIUA (MPMU) along with the state-Level ATIs have a strategic tie up with autonomous institutions and corporate sector institutions specializing in the field of e-Governance applications.

5. Interactive Onsite Learning (IOL) can also be provided with a central instructor in the NIUA (MPMU) delivering the lecture and the participants attending the training in the ATIs. Reputed institutes like IIMs have tied up with broadband satellite based education providers and are offering courses through distance learning mode. The system allows large numbers of geographically dispersed participants to have a highly interactive, “one to one” exchange with a central instructor. This system incorporates live video, audio and data, all using the most convenient of all user interfaces – the PC, which is connected over a local area network to a satellite transceiver that in turn connects to the central studio. There are numerous benefits of this system – savings in terms of both cost & time and no loss of productivity. Additionally, participants get trained in their respective locations, simultaneously, by the same instructor.

V.3 Public-Private Partnership (PPP)

PPP is an important strategic element of the NMMP design. Recommendations on PPP options contained in the Design Phase report are based upon the detailed work undertaken by NISG and CGG for MoUD. For the purpose of arriving at a PPP strategy, the various modules proposed under NMMP have been categorized under three groups:

Group 1 consists of Citizen/Business facing functions such as –

- Property Tax
- Building regulations
- Registration of birth & death
- Redressal of grievances
- Issue of trade licenses.

Group 2 consists of internal functions like –

- Accounting
- Budgeting
- HR & payroll
- Performance management system
- Work-flow automation
- Monitoring of legal cases
- MIS.

Group 3 consists of "Business" Functions such as –

- e-Procurement
- Execution of works.

The above classification leads us to the following conclusions relating to the feasibility of adoption of PPP Models:

- Functions under Group 1 are the ones, where the implementation of PPP Models should be executed on a priority basis. This is on account of the fact that they are capable of generating streams of revenue linked to the transactions and that improvements in these will have a direct impact on the image of the ULBs and its governance
- PPP models cannot be implemented in functions falling under Group 2, on a stand-alone basis. This can be attributed to the fact that the results of the efforts in introducing e-Governance in these areas is not immediately visible and also that these functions are the core of the functions in ULBs. Hence, the introduction of private elements here is bound to kick up complex organizational issues and risks.
- E-Procurement in Group 3 is highly amenable to introduction of a PPP Model. However, as experience has shown, e-Procurement initiatives are better implemented in a centralized manner, cutting across all or majority of the departments and agencies of the government and not confined to the ULB sector or to particular ULBs

- Amongst the functions that are a part of Group 2, accounting and budgeting functions need to be dealt with on a high priority basis. This could be done in a centralized manner, at the state level, as it will help in aspects relating to financial discipline and also facilitate faster devolution of funds. It is also suggested that this be taken up as a national initiative which prescribes the standards and models to be followed uniformly across the country
- Though the functions have been classified into 3 groups for convenience, there are vital connections between the functions three groups. These need to be kept in mind while selecting a PPP model for implementation.

Based on the above factors the following are recommended:

- PPP Model is adopted in respect of category I functions on top priority
- E-Procurement initiative is taken up across the Government (including the ULB Sector) in terms of a state-level initiative; and
- Accounting & budgeting functions is handled in a centralized manner at the state-level.

V.4 Monitoring and Evaluation Framework

Monitoring and Evaluation (M&E) provides the link that would enable learning from experience on a continuous basis and help MoUD monitor the effectiveness of the NMMP. M&E (Table 15) tracks changes in services provided (outputs) and the desired results (outcomes), providing the basis for accountability with respect to the utilization of funds released under the programme.

Table 15: M&E Framework

Monitoring	Evaluation
▪ Clarifies program objectives	▪ Analyzes why intended results were or were not achieved
▪ Links activities and their resources to objectives	▪ Assesses specific causal contribution of activities to results
▪ Translates objectives into performance indicators and set targets	▪ Examines implementation process
▪ Routinely collects data on these indicators, compares actual results with targets	▪ Explores unintended results
▪ Reports progress to managers and alerts them to problems.	▪ Provides lessons, highlights significant accomplishment or program potential, and offers recommendations for improvement.

The M&E exercise can be carried out regularly by the project monitoring and facilitation committee at the state Level under supervision of the state Level sanctioning committee. The PIU, with the project champion and the CIO, would have to submit regular updates regarding their activities so as to allow the project monitoring and facilitation committee to work effectively. The timelines and mechanisms to be adhered to are provided in the following sections.

To provide credibility to the M&E exercise, an independent agency should be involved for data collection and analysis. This would allow fair and unbiased status reports to be made available. Such a mechanism would allow learnings and issues to come to the fore, which could then be implemented in the later phases of the MMP.

A regular (quarterly or annual) meeting of the project monitoring and facilitation committee and the programme steering committee with the central implementation committee can be conducted to apprise the central government of the status and achievements of the MMP.

As part of the M&E activity, it has also been suggested that Programme Monitoring Tool (PMT) be set up as an integral part of the MPMU in executing its role of project coordinator for NMMP. The PMT would help in:

- Setting up and administration of a project scope change control process
- Setting up and administration of process for communicating interdependencies between sub project plans across the project and highlighting deviations
- Documenting project risks and tracking the progress of planned mitigation measures
- Setting up and administration of a process for reporting progress on key project metrics and issue and escalation management process
- Setting periodic program status report templates
- Setting a master document index
- Setting up a process for facilitating documents for review/sign-off
- Setting up and maintaining standard documents, spreadsheets and project plan templates
- Obtaining requested resources necessary for the project team to complete their tasks. Identification of 'hot spots' and the provision of resources to review and address issues.

V.5 State Municipal e-Governance Roadmap

As part of the implementation strategy for NMMP, it has been recommended that each state, before implementing the NMMP, should draw out a roadmap for implementing e-Governance in their ULBs (with assistance from the state implementation consultants), for the reasons listed below:

- The state roadmap for e-Governance in municipalities would help in integrating e-Governance initiatives in the sector with the overall state e-Governance strategy, which have been mandated by Department of IT, GoI as part of the NeGP
- Build commitment to the project from the top
- Allow a mechanism for generating discussions within the state for the project and build consensus on the approach

- Allow a basis for projecting cost estimates for state wide rollout including phasing ensuring project leverages all common infrastructure costs – State Wide Area Network, State Data Centre etc
- Bring in focus the legislative and business process changes that are required to achieve service level goals defined as part of the project design
- Help finalize and put in place the governance structure required to implement a project of this magnitude.

V.6 Immediate Next steps

Mentioned below are the proposed key steps that States need to undertake immediately on announcement of the NMMP. These include:

- States will need to designate a state nodal organization for coordinating the NMMP
- The state Government should release funds for preparing the state municipality e-Governance roadmap and DPR to this designated state nodal organization
- The state Government needs to convey to the MoUD and the planning commission, Government of India, its selection of the designated state nodal organization
- Through the proposed roadmap, each state has to detail its "As-is" assessment of e-Governance projects (including the back-end infrastructure) and the plans for initiating e-Governance projects in ULBs
- Based on the plans, states should prepare a proposal for capacity building (PeMT) in accordance with the guidelines issued by DIT under NeGP. This proposal should be sent to MoUD.

LIST OF ABBREVIATIONS

ATI:	Administrative Training Institute
BCP:	Business Continuity Planning
BPR:	Business Process Re-engineering
CGG:	Centre for Good Governance
CIO:	Chief Information Officers
DIT:	Department of Information Technology
DRP:	Disaster Recovery Plan
FRS:	Functional Requirement Specification
GoI:	Government of India
ICT:	Information and Communications Technology
M&E:	Monitoring and Evaluation
MoU:	Memorandum of Understanding
MoUD:	Ministry of Urban Development
MPMU:	Municipalities Programme Management Unit
NeGP:	National e-Governance Plan
NIC:	National Information Centre
NISG:	National Institute of Smart Government
NMMP:	National Mission Mode Project
NUDBI:	National Urban Databank and Indicators
NUIS:	National Urban Information System
NUO:	National Urban Observatory
OLAP:	Online Analytical Processing
OSS:	Open Source Systems
PeMT:	Project e-Governance Mission Team
PIU:	Project Implementation Unit
PoP:	Point of Presence
PPP:	Public Private Partnerships
RFP:	Request for Proposals
ROI:	Return on Investment
RTO:	Recovery Time Objectives
SeMT:	State e-Governance Mission Team
SIC:	State Implementation Consultants
SLSC:	State Level Sanctioning Committee
SRS:	System Requirement Specification
STQC:	Standardization Testing Quality Certification
SWAN:	State Wide Area Network
UAS:	ULB Administrative System
ULB:	Urban Local Body
UMIS:	ULB Management Information system

USIS:	Urban Spatial Information System
XML:	eXtensible Mark up Language