



URBAN AND REGIONAL DEVELOPMENT PLANS FORMULATION AND IMPLEMENTATION (URDPFI) GUIDELINES

Volume II A and II B
Appendices to URDPFI Guidelines, 2014

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Town and Country Planning Organisation

**URBAN AND REGIONAL DEVELOPMENT PLANS
FORMULATION AND IMPLEMENTATION
(URDPFI) GUIDELINES**

Volume II A

Appendices to URDPFI Guidelines, 2014

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1 Implications of 73rd & 74th Constitution Amendment Act, 1993

1.1. Provisions of 74th Constitution Amendment Act

The 73rd Constitutional Amendment Act (73rd CAA) came in effect from 24th April, 1993 and 74th Constitution Amendment Act (74th CAA), in effect from 1st June 1993, ushered a new era in the history of urban local government in the country. The Constitution of India has detailed provisions for ensuring protection of democracy in Parliament and State Legislatures; however, it did not make local self-government in urban areas a clear cut constitutional obligation. Even though there was provision for organisation of village *Panchayats* in the Directive Principles of State Policy, there was no reference to municipalities except implicitly in Entry – 5 of the State List, which places the subject of local self-government as a responsibility of the State. The 74th CAA (referred to as part IXA of Constitution) made provisions for decentralisation, thereby, ensuring democracy in the establishment and operation of local self-government. It bestows power to the people to plan for themselves and participate in the decision making process. The main provisions introduced by the Act are as under:

1) Constitution of Panchayats and Municipalities:

Article 243 B of 73rd CAA, provides for the constitution of *Panchayats* at three levels in a state:

- a) Village,
- b) Intermediate (may not be constituted in a State having a population not exceeding twenty lakhs) and
- c) District.

Article 243 Q of 74th CAA, provides for constitution of Municipalities in every State as given under:

- a) Nagar Panchayat for transitional area, that is to say, an area in transition from rural to urban in character.
- b) Municipal Council for a smaller urban area, and
- c) Municipal Corporation for a larger urban area.

2) **Constitution of Ward Committees:** Article 243 S provides for constitution of ward committees, consisting of one or more wards, within the territorial area of a Municipality having a population of 3, 00,000 or more.

3) **Duration of Municipalities:** Article 243 E of 73rd CAA and 243 U of 74th CAA, provides a fixed term of 5 years of a *panchayat* and municipality respectively, from the date appointed. Elections to constitute a *panchayat* or municipality are required to be completed before the expiration of the duration of the municipality.

- 4) **Powers, authority and responsibilities of Panchayats and Municipalities:** Article 243G of 73rd and 243W of 74th CAA provides powers, authority and responsibilities of Municipalities subject that legislature of the State by law endow:
- a) The Panchayats and Municipality with such powers and authority those are necessary to enable them to function as institutions of self-government. The law prepared by the state government may contain provisions for the devolution of powers and responsibilities upon Municipalities, with or without conditions with respect to-
 - i. the preparation of plans for economic development and social justice;
 - ii. the performance of functions and implementation of schemes as may be entrusted to them including those in relation to the matters listed in the Eleventh and Twelfth Schedule;
 - b) The Committees with such powers and authority as may be necessary to enable them to carry out the responsibilities conferred upon Municipalities them including those in relation to the matters listed in the Twelfth Schedule.

Table 1.1: Items listed in Eleventh and Twelfth Schedule

S.No.	29 Items of the 11 th Schedule	S.No.	18 Items of the 12 th Schedule
1	Agriculture, including agricultural extension	1	Urban planning including town planning
2	Land improvement, implementation of land reforms, land consolidation and soil conservation	2	Regulation of land-use and construction of buildings
3	Minor irrigation, water management and watershed development	3	Planning for economic and social development
4	Animal husbandry, dairying and poultry	4	Roads and bridges
5	Fisheries.	5	Water supply for domestic, industrial and commercial purposes
6	Social forestry and farm forestry	6	Public health, sanitation conservancy and solid waste management
7	Minor forest produce	7	Fire services
8	Small scale industries, including food processing industries	8	Urban forestry, protection of the environment and promotion of ecological aspects
9	<i>Khadi</i> , village and cottage industries	9	Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded
10	Rural housing	10	Slum improvement and up-gradation
11	Drinking water	11	Urban poverty alleviation
12	Fuel and fodder	12	Provision of urban amenities and facilities such as parks, gardens, playgrounds
13	Roads, culverts, bridges, ferries, waterways and other means of	13	Promotion of cultural, educational and aesthetic aspects

S.No.	29 Items of the 11 th Schedule	S.No.	18 Items of the 12 th Schedule
	communication		
14	Rural electrification, including distribution of electricity	14	Burials and burial grounds; cremations, cremation grounds and electric crematoriums
15	Non-conventional energy sources	15	Cattle pounds; prevention of cruelty to animals
16	Poverty alleviation programme	16	Vital statistics including registration of births and deaths
17	Education, including primary and secondary schools	17	Public amenities including street lighting, parking lots, bus stops and public conveniences
18	Technical training and vocational education	18	Regulation of slaughter houses and tanneries
19	Adult and non-formal education		
20	Libraries.		
21	Cultural activities		
22	Markets and fairs		
23	Health and sanitation, including hospitals, primary health centres and dispensaries		
24	Family welfare		
25	Women and child development		
26	Social welfare, including welfare of the handicapped and mentally retarded		
27	Welfare of the weaker sections, and in particular, of the Scheduled Castes and the Scheduled Tribes		
28	Public distribution system		
29	Maintenance of community assets		

Source: 73rd & 74th Constitutional Amendment Act

- 5) Finances of *Panchayats* and Municipalities: As per Article 243 H of 73rd & 243 X of 74th CAA it has been left to the legislature of the State to specify the imposition of taxes.

Table 1.2: Finances of *Panchayats* & Municipalities

Revenue Sources	Responsibility of
Taxes, Duties, fees etcetera	Levied and collected by <i>Panchayats</i> & Municipalities
Taxes, Duties, fees etcetera	Levied and collected by State Government
Grant-in-aid	Given to municipalities from the State Government
Funds	For crediting and withdrawal of money by <i>Panchayats</i> & Municipality

Source: 73rd & 74th Constitutional Amendment Act

- 6) **State Finance Commission:** Article 243 I of 73rd CAA give provision of State Finance Commission (SFC). Article 243 Y of 74th CAA extends duty/power of SFC

to review the financial positions of municipalities apart from *Panchayati Raj* Institutions and make recommendations to the Governor.

- 7) **Committee for District Planning:** Article 243 ZD provides for constitution of District Planning Committee at district level in every state, to consolidate the plans prepared by the *Panchayats* and the Municipalities in the district and to prepare a draft development plan for the district as a whole.
 - a) A close study of this article provides a reasonable inference that each municipality is expected to prepare a plan for its area and undertake the task of urban planning including town planning, regulation of land uses, construction of buildings and phasing of the programme for economic and social development as envisaged in the Twelfth Schedule.
 - b) The DPC would provide interaction with the municipal bodies and *panchayati Raj* institutions, in addition to planning and conflict resolutions.
- 8) **Committee for Metropolitan Planning:** Article 243 ZE provides for constitution of a Metropolitan Planning Committee (MPC) for planning a metropolitan area having a population of 10 lakh or more, comprising one or more districts and consisting of one or more municipalities or *panchayats*.
- 9) **Scheduled Areas:** In terms of Article 243 M of 73rd&243ZC of 74th CAA, these provisions shall not apply to Scheduled areas and Tribal areas as referred to in Article 244 of the Constitution (i.e Scheduled areas and scheduled tribes in the States of Assam, Meghalaya, Tripura and Mizoram.) However, Parliament may by law, extend the provisions of Part IXA to these areas subject to such exceptions and modifications as may be specified in that law.

In order to provide time to State Governments to allow changes to be made in the then existing State Municipal laws which were inconsistent with the provisions of the 74th CAA, a transition period of one year was provided, up till 31st May 1994.

1.2. New Roles and Functions of State Town and Country Planning Department

The new role of Town and Country Planning Departments that emerges out of the provisions of the 73rd&74th CAA shall, among others, include¹:

- a) Advice and technical assistance to the State Government on matters pertaining to spatial planning and development as well as implementation of state programmes;
- b) Initiation of action pertaining to provision of legal support in relevant Acts for socio-economic, spatial planning and development processes; and on the suggested Regional and Urban Development Planning system;

¹UDPFI Guidelines, 1996 & MM

- c) Assistance to the State Urban and Regional Planning Board in formulation of the State Perspective Plan and strategy of spatio-economic development of the State, having regard to proposals contained in district and metropolitan area development plans;
- d) Division of the State into various planning regions taking into account the physical, socio cultural, economic and climatic considerations and formulation of plans of their spatio-economic development to serve as a guide for resolving inter-district developmental issues and provide basis for inter-district co-operation and co-ordination with a view to prepare district development plans more harmonious;
- e) Scrutiny of the district and metropolitan area development plans for approval of State Government, taking into account the State perspective plan, spatio-economic development strategy and proposals of relevant planning region covering the district of the metropolitan area;
- f) Ensuring that respective settlement Development Plans prepared by local authorities are within the framework of the approved perspective plan of the State/settlement;
- g) Technical assistance to local authorities if so requested at the cost of the concerned body;
- h) Preparation of the development plan in case of default by the local authority, district planning committee or the metropolitan planning committee, if so directed by the State Government, at the cost of the concerned planning body;
- i) Provision of necessary research input directly or through the help of consultants in formulation of policies, strategies, norms, standards, laws, regulations and rules pertaining to urban and regional planning and development matters;
- j) Provision of manpower training facilities;
- k) Establishment of an Urban and Regional Information System and dissemination of information.

1.3. Status of the Provisions of 74th Constitution Amendment Act on Urban Local Bodies

The 74th CAA envisages that the District and Metropolitan Planning Committees consolidate plans prepared by the *Panchayats* and the Municipalities in the district/metropolitan region. It shall prepare a draft development plan for the district/metropolitan region as a whole and send the “draft” District and Metropolitan Plans to the State Government. The implication is that these plans are to be integrated with the State Plans. As per the Constitutional mandate, the District and Metropolitan Development Plans have to ensure coordinated spatial planning, sharing of natural

and other resources, integrated provision of infrastructure and environmental conservation. The approach has been maintained for regional planning in Chapter 4 of Volume 1.

The constitution of DPC and MPC in 74th CAA is an approach for the States to address regional planning issues. However, these provisions have not been adopted at all-India level. The study carried out by National Institute of Urban Affairs (NIUA) 'Impact of the Constitution (74th) Amendment Act on the Urban Local Bodies: A Review, April 2007' and MOUD 'Strategic Plan of Ministry of Urban Development for 2011-2016' reveals that only few States have undertaken constitution of MPC, DPC and Ward Committees (WCs), whereas there are large number of states who are yet to integrate these provision in their legislative framework. The table below shows the state wise compliance of 74th CAA provisions as on October 2004.

Table 1.3: State wise Compliance with 74th CAA as on October 2004

Sr. No.	State/ UT	Constitu- tion of ULB's	Reservation of Seats	Regular Conduct of Elections	Constitution of			
					WC's	DPC's	MPC's	SFC's
1.	Andhra Pradesh	✓	✓	✓	✓			✓
2.	Arunachal Pradesh #					✓		✓
3.	Assam	✓	✓	✓		✓		✓
4.	Bihar	✓	✓	✓		✓		✓
5.	Chhattisgarh	✓	✓		✓	✓		✓
6.	Delhi	✓	✓	✓	✓			✓
7.	Goa	✓	✓	✓				✓
8.	Gujarat	✓	✓	✓				✓
9.	Haryana	✓	✓	✓		✓		✓
10.	Himachal Pradesh	✓	✓	✓				✓
11.	Jharkhand	✓	✓					✓
12.	Karnataka	✓	✓	✓	✓	✓		✓
13.	Kerala	✓	✓	✓	✓	✓		✓
14.	Madhya Pradesh	✓	✓	✓	✓	✓		✓
15.	Maharashtra	✓	✓	✓	✓			✓
16.	Manipur	✓	✓	✓				✓
17.	Meghalaya *							
18.	Mizoram *#							
19.	Nagaland *							
20.	Orissa	✓	✓	✓		✓		✓
21.	Punjab	✓	✓	✓				✓
22.	Rajasthan	✓	✓	✓		✓		✓
23.	Sikkim #							✓
24.	Tamil Nadu	✓	✓	✓	✓	✓		✓
25.	Tripura	✓	✓	✓				✓
26.	Uttaranchal	✓	✓	✓				✓
27.	Uttar Pradesh	✓	✓	✓				✓
28.	West Bengal	✓	✓	✓	✓	✓	✓	✓

Source: NIUA - update table # There are no municipalities in State

* The provisions of 74th CAA are not applied to certain schedule areas and tribes of India

It can be observed that only 10 states have provision for constituting DPCs and only 1 state has provision for constituting MPC. However, other States like Maharashtra and Andhra Pradesh now have provision for constituting MPCs.

According to Indian Institutes of Public Administration (IIPA) report - 'Urban Sector Feedback for Metropolitan Planning Committees, IIPA', the status of the Metropolitan Planning Committees constituted so far or those which are in the process of being constituted as in 2011 are given in table below:

Table 1.4: Status of MPC's in various States

S.No.	Name of State	Metropolitan City	Status of MPC
1.	West Bengal	Kolkata	Constituted
2.	Maharashtra	Mumbai	Constituted
3.	Maharashtra	Nagpur	Constituted
4.	Maharashtra	Pune	Constituted
5.	Andhra Pradesh	Hyderabad	At initial stage of constitution.
6.	Karnataka	Bengaluru	At initial stage of constitution.
7.	Madhya Pradesh	Bhopal	Necessary legislation is yet to be passed
8.	Uttar Pradesh	Kanpur	State Government is considering to issue a notification under Section 57 A of UP Municipal Corporations Act, 1959 for constitution of MPC
9.	Gujarat	Ahmedabad	To be constituted
10.	Rajasthan	Jaipur	To be constituted
11.	Haryana	Faridabad	Constituted

Source: IIPA

As per the IIPA Report, the States are reluctant to expedite follow up with regard to implementation of the constitutional provisions and most of them are lagging behind in the preparation of Metropolitan Development Plan. Some of the reasons for not operationalizing the provisions of the Constitutional Amendment Act may be:

- The preparation of Metropolitan Development Plan is a professionally led spatial exercise and is not mere consolidation of the sectoral plans. The MPCs **lack adequate / requisite professional capacities** to prepare it.
- **Lack of technical expertise** in the Metropolitan Planning Committee or lack of directions/guidance for constituting the same.
- Prior to preparing a Metropolitan Development Plan (MDP), it is imperative to delineate the **metropolitan region based on certain criteria**. Barring a few mega cities like Kolkata, Mumbai, Chennai, Hyderabad and Bengaluru, none of the other metropolitan cities have delineated their respective metropolitan regions.
- For preparing Metropolitan Development Plan, a **multi-disciplinary team** comprising of Town & Country Planners as an urban planner and/or regional planner, environmental planner, transport planners and infrastructure planner as the core team and a team of experts as per requirement of the study is essentially a multi-disciplinary exercise.
- **Lack of will** among the State Governments to take action for delineating the metropolitan area as well as preparing the plan for the same.

- **Lack of incentives/initiatives** for taking appropriate action for preparation of Metropolitan Development Plan which may not be the priority for some of the State Governments.

As per NIUA study, in Karnataka, Kerala and Tamil Nadu, DPCs have been constituted and technically they are functioning. However, it is learnt that in Karnataka they have not been functioning as expected. In case of Madhya Pradesh, it is learnt that DPC has no executive powers. In Chhattisgarh, the DPC's are not functioning at all and no meetings of DPC's are being held. In fact, Kerala is the only state in the south where DPC's are active and functional.

It is apparent that many states are yet to integrate 74th CAA in terms of constituting DPC and MPC as a part of decentralized planning process in order to address the issues at all levels. Report of the Working Group on Urban Strategic Planning prepared by MoUD, has also emphasized a major thrust to Regional and Urban Planning and preparation of District, Metropolitan and City Spatial and Development Plans through strategic guidelines and financial support.

1.4. Recommendations

For promotion of stronger public private partnership, it is essential to implement 73rd and 74th CAA. Quality of development largely depends upon how direct and free participation is incorporated for development projects in local areas, this requirement is almost essential. Further, Guidelines recommend review and revision of Regional Plans and Development Plans every 5 years. This review is critical mechanism for guiding development meaningfully and can only be done through direct involvement of local communities (their representatives), concerned local authorities and experts. Therefore URDPFI Guidelines recommends that States should implement the 73rd and 74th CAA at the earliest. All legal and administrative hurdles in implementation should be addressed and actions should be taken. Some States have already shown examples in this regard. For implementation of the provisions of 73rd and 74th CAA, the recommendations on the existing setup of Development Authorities are as under:

- a) The existing State Regional and Town Planning Board, constituted under State Town Planning Act may continue.
- b) The current planning role and function of Metropolitan Regional Planning and Development Authorities and Boards constituted for planning and development of metropolitan regions may be in conflict with the role and functions of Metropolitan Planning Committee (MPC) when constituted as mandatory requirement of the provisions of the 74th CAA. Considering this and also that an established institution need not be demolished, it is suggested that these bodies be reorganised to serve as MPC itself or alternatively serve as technical arm of MPC. The Kolkata MPC model is given in Section 4.5.1 of volume 1.

- c) The Area Planning and Development Authorities constituted to prepare and enforce development plans of urban centres under the State Town and Country Planning Act or other Acts may have a conflict of role and functions with the Urban Local Authorities constituted under modified State Municipalities Act.
- d) It is suggested that, taking into consideration the spirit of 74th CAA, these bodies should be merged or work as technical wings of the MPC and DPC wherever the case may be. Administrative amalgamation process should be effectively decided by the state governments.
- e) The existing single function boards/ undertakings like Housing Board, Electricity Board, Refuse Collection and Disposal Board, Transport Corporation/ Undertaking, which were constituted under various Acts for the purpose of discharging the specifically assigned function, may continue, if so required by the council of the local authority.
- f) Training programmes for awareness building about development process and related issues among the elected representatives is important. Such programmes should be conducted by the state governments with the help of T&CP Department and outside experts.
- g) Extra attention shall be paid on the development and administration of peri-urban areas through local self-governments so that ground developments of outer fringes of large settlements are consistent with proposals of planning activities.

The Constitution (73rd& 74thAmendment) Act, 1992 is appended with its web URL in Appendix 'O' of Volume II B.

2 The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation & Resettlement Act, 2013

2.1. Basis of the new Act

The Land Acquisition Act of 1894 was created with the purpose of facilitating acquisition of privately held land by the government for public purposes. “Land Acquisition” plainly means the acquisition of land for some public purpose by a government agency from individual landowners, as authorised by the law, after paying a government-fixed compensation to cover losses incurred by landowners from surrendering their land to the concerned government agency.

Over a period of time numerous issues were highlighted in the 1894 Act, such as; cumbersome and costly procedure delaying the land acquisition, determination of public purpose contestable at law, property valuation techniques were flawed resulting in a heavy strain on public finances and restrictions on the scale of development and redevelopment project. It was also argued that land was acquired for number of projects with no public purpose attached, as in the case of SEZs, at well below the market value of the properties. Additionally, relocation and rehabilitation of land owners displaced by the actions of the Act, was not covered comprehensively and adequately.

It is for these and other reasons that government proposed to replace the said Act with a New Act - ‘The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013’ (effective from 1st January 2014).

This Law was proposed due to the following basic reasons:

- Public concern on land acquisition issues and absence of National law to provide for the Rehabilitation and Resettlement (R&R) and compensation for loss of livelihoods.
- Multiple amendments were made to the original Act, but principal law continued to be the same i.e. the Land Acquisition Act, 1894 which was an outdated Law.
- Need for balance was felt for addressing concerns of farmers and those whose livelihoods were dependent on the land being acquired as well as facilitating land acquisition for industrialization, infrastructure and urbanization.

2.2. Key Features

Salient features of ‘The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013’, are as following:

- As the title of the said Act suggests, it favours fair compensation rather than fast acquisition of land. Minimum compensation for land acquisition is detailed out in the Act and Indian states are even empowered to provide benefits and safeguards that go over and above the provisions of this law to the affected family.
- 'Affected families' have been defined as 'land owners' and 'livelihood losers'.
- Safeguard for 'food security' has been included by stating that multi-crop irrigated land will be acquired only as last resort under exceptional circumstances. Still, if such areas are acquired, equivalent area of culturable wasteland is to be developed for agricultural purposes or an amount equivalent to the value of the land acquired shall be deposited with the appropriate government for investment in agriculture for enhancing food-security.
- Minimum rehabilitation and resettlement (R&R) entitlements package has been introduced. Affected families will have choice of availing options given in the Act.
- Special provisions, in addition to the R& R package, have been given for SCs/STs.
- Role of *Panchayati Raj* Institutions especially *GramSabh*as has been enhanced in the Act. Consent of *GramSabha* is mandatory for acquisition in Scheduled Area.
- Special Provisions have been provided to the farmers like, farm land will be acquired only when no unutilised land is available, enhances compensation, prior consent of land losers, increased share in sale of acquired land and exemption from income tax and from stamp duty, damage to crops will be included in compensation price, 20% of the developed land (if land was acquired for urbanization purpose) will be offered to the farmers.
- Under the new Act, land can be returned to original owners if the State so decides, with the condition that land is not used within 5 years in accordance with the purpose for which it was acquired.
- Role of the District Collector has been reduced in the new Act as compared to the old one, where collector had complete authority to decide what activity constituted 'public purpose'. Under the new law, these roles of the collector are not prescribed. Under the old Act, collector could decide what quantum of compensation could be paid to those displaced while the new law has a formula for deciding the quantum of compensation.
- In the new Act, benefits for tenants and share croppers have been introduced. The law covers all tenants and share-croppers, artisans; who will not just bear the rehabilitation and resettlement benefits but will also have a share in the compensation.
- In the Resettlement area, 25 infrastructural amenities have to be provided to minimise the impact of relocation. Few of such amenities are roads, proper drainage and sanitation, safe drinking water, grazing land, fair price shops, post offices, storage facility, transport facility, burial or cremation ground etcetera.
- The provision of the New Law has been made compliant with other laws such as; The *Panchayats Act, 1996*, The *Schedule Tribes and Other Traditional Forest Dwellers Act, 2006* and land transfer regulations in Schedule 'V' area. This act has

gone one step further by providing 'consent' of *GramSabhas* rather than just 'consultation' as in the above mentioned Acts.

- Diverse safe guards have been provided against indiscriminate acquisition of land. Such as, social impact assessment has been made mandatory except for irrigation projects and it has to be completed within 6 months. Use of acquired land cannot be changed from the purpose specified in the land use plan submitted at time of land acquisition.
- Transparency provisions have been provided in Act, few of which are, *GramSabha* has to be consulted in Social Impact Assessment (SIA) process, SIA document to be made available for public scrutiny, all documents mandatory to be made available in the public domain and on the website etcetera.
- Timelines have been specified in Act to make the process of land acquisition time bound. Like compensation has to be given within a period of three months from the date of the award. Monetary R&R entitlements are to be provided within a period of six months from the date of the award.
- Provisions of the New Law do not apply to the activities covered under other 13 Government of India Laws which permits land acquisition for specific purposes (like, legislations relating to National Defence, National Highway, and Railway). Though the provisions of the New Law relating to compensation, rehabilitation and resettlement will apply by a notification of the Centre Government.

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 is a legislation that regulates land acquisition and provides laid down rules for granting compensation, rehabilitation and resettlement to the affected persons. The Act has provisions to provide fair compensation to those whose land is acquired permanently or temporarily, brings transparency to the process of acquisition of land to set up factories or buildings, infrastructural projects and assures rehabilitation of those affected. The Act establishes regulations for land acquisition as a part of India's massive industrialization driven by public-private partnership.

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 is appended with web URL in Appendix O of Volume II B.

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3 Model Regional and Town Planning and Development Law, 1985

3.1. Key features

Town and Country Planning Organisation (TCPO) formulated the Model Town and Country Planning Law in the year 1960. This model Act was revised by TCPO in year 1985 as “Model Regional and Town Planning and Development Law” to enact a comprehensive urban and regional planning legislation in all the States and UT’s. It is in the form of guidelines which ensures better overseeing and coordination of planning with implementation, so that a single agency can undertake both these functions. In the model, the planning and development authority to be constituted has been equipped with full planning and development powers to discharge the task of planning and implementation.

The Model Regional and Town Planning and Development Law, 1985 provides for the following:

- 1) Constitution of State Regional and Town Planning Board by the State Government for the purpose of advising on the delineation of the region for the planned development,
- 2) Directing the preparation of metropolitan, regional and area plans by the metropolitan, regional and area planning and development authorities,
- 3) Setting up of metropolitan, regional and area planning and development authorities for different urban and rural areas within the State to undertake preparation of development plans and to enforce and implement them,
- 4) Co-ordinating the planning and implementation of physical development programmes,
- 5) The Model Law provides 3 steps for the administration of this law, the steps are following:
 - a) Preparation of existing land use map,
 - b) Preparation of an outline development plan and comprehensive development plan and their enforcement, and
 - c) Preparation of detailed schemes of development or redevelopment as envisaged in the plans and their implementation.

The Model Regional and Town Planning and Development Law was prepared in 1985, almost 30 years ago, since then many legislative and ideological changes have taken place in the developmental approach of GoI. Also to incorporate the provisions of 74th CAA, the Model Regional and Town Planning and Development Law requires a complete revision and restructuring. Accordingly, the suggested changes in the Model law are described in the following sections:

3.2. Suggested modifications in the law

- **Replacing old Land Acquisition Act with the LARR Act (2013):** Land Acquisition Act of 1894 is suggested to be replaced by The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
- **Mandatory Implementation of 73rd and 74th CAAs:** It should be mandatory by all Urban Local Bodies (ULBs), to follow 74th CAA, for making ULBs a strong and effective body through devolution of power and functions. On the same line, Kerala Town and Country Planning Department implemented – Kerala Town and Country Planning Ordinance 2013, which came into effect following the 73rd and 74th amendments to the Constitution. The ordinance constitutes the District Planning Committee (DPC) at district level and Metropolitan Planning Committee (MPC) at Metropolitan level.
In MPC/DPC, full time dedicated urban and regional professionals for better assessment, preparation and execution or implementation of plan at both levels are required. In the DPC, an average of 1 Planner for 1 million population is suggested by the TCPO, while in MPC 1 Town Planner is required for population of 5 lakh.
- **Inter-state Planning** – provisions, organization structure, roles and responsibilities

The main objective for setting up Inter-State Planning concept is to promote economic growth and balanced development of the Region (two or more than two states) for providing suitable infrastructural development through inter rail and road based transportation networks, minimizing the adverse environmental impact, developing selected urban settlements with urban infrastructure facilities. In India a number of Inter-State planning organizations have been established to achieve the above said objectives.

In 1985, Enactment of the National Capital Region Planning Board Act by the Union Parliament, with the concurrence of the participating States of Haryana, Rajasthan and Uttar Pradesh, NCR Planning Board was constituted.

Under section 8 of the NCRPB Act, the powers of the Board shall include the powers to:

- Call for reports and information from the participating States and the Union territory with regard to preparation, enforcement and implementation of Functional Plans and Sub-regional Plans ;
- Ensure that the preparation, enforcement and implementation of Functional Plan or Sub-Regional Plan, as the case may be, is in conformity with the Regional Plan;
- Indicate the stages for the implementation of the Regional Plan;

- Review the implementation of the Regional Plan, Functional Plan, Sub-Regional Plan and Project Plan;
- Select and approve comprehensive projects, call for priority development and provide such assistance for the implementation of those projects as the Board may deem fit;
- Select, in consultation with the State Government concerned, any urban areas, outside the National Capital Region having regard to its location, population and potential for growth, which may be developed in order to achieve the objectives of the Regional Plan; and
- Entrust to the Committee such other functions as it may consider necessary to carry out the provisions of this Act.

Similar interstate development regions may be necessary to be planned in other parts of India especially involving fast changing urban regions which fall in more than one State. The Law is suggested to be modified to include provisions for not only DPC and MPC but also for interstate authorities as stated above.

- **Joint Area Committee:** Kerala Town and Country Planning Ordinance, 2013 provides constitution of Joint Area Committee for an area of more than one Municipal Corporation, Municipal Council, Town Panchayat or Village Panchayat either in full or in part. For the purpose of planning of the area in which they are jointly interested or for which they are responsible.
- **Innovative Systems of Land Assembly:** There are various techniques to develop small or fragmented land parcels into usable land through transfer of ownership. Some of these techniques are suggested to be included in the Law.
 - **Town Planning Scheme:** Town Planning Scheme has emerged as a successful model of land development; it is suggested to include the provision in the Law. The Maharashtra Regional and Town Planning (MRTP) Act, 1966, The Gujarat Town Planning and Urban Development Act (GTPUDA), 1976 and now Kerala Town and Country Planning Ordinance, 2013, have included provisions for Town Planning Scheme.
 - **Land Pooling and Development Schemes²:** Land Pooling scheme aims to prevent, selling of land without the owner's consent. Under Delhi Land Pooling Policy, land owners can surrender their land holding into the central pool and be stake holder to the development proposed in their land. Once the land is pooled, the landowner would get back certain amount of land of their total land surrendered land as developable land.
 - **Transferable Development Rights (TDR),** TDR is a technique of land development which separates the development potential of a particular

²Source: Master Plan of Delhi, 2021.

parcel of land from and allows its use elsewhere within the defined zones of the city. TDR is taken away from the zone and it is tradable. The Law shall define its use as a technique for redevelopment and reconstruction of inner city zones.

- **Accommodation Reservation:** The concept of Accommodation Reservation allows the land owners to develop the sites reserved for an amenity in the development plan using full permissible FSI/FAR on the plot subject by agreeing to entrust and hand over the built up area of such amenity to the local authority free of all encumbrances and accept the full FSI/FAR as compensation in lieu thereof. This mechanism has considerably relieved the local authorities from incurring huge expenses for the purpose of acquisition of such lands and can be considered in the Law with certain conditions.
- **Encouraging Private and Joint Sector Participation:** The current policies of economic liberalization in the country and the emphasis on private sector participation in planning and development process should be provided with the appropriate legal support. It is suggested that private sector participation in certain sectors shall be allowed and encouraged by the law in light of the FDI policy. Local Self Government has to consult non-governmental institutions, organizations and professional bodies in the preparation of Perspective Plan for the District and Metropolitan Area.
- **Time Line:** Regional Plans and Development Plans should be for 20 years with the provisions for review / revision every 5 years to be co-terminus with the State Five Year plan. Different plans suggested:
 - Regional Plan (Inter-state/ Inter-district/ district)
 - Development Plan (planning area including the Municipal area)

Currently different time line is followed for review of regional and city or metropolitan development plans by different states which should be standardised as far as possible.

Tamil Nadu, Mizoram and Gujarat have provision of revising Developmental Plan once in 5 years of plan preparation. Karnataka provides for revision only after ten years and Maharashtra in twenty years. Himachal Pradesh provides for revision but gives no minimum time frame. Bihar has no provision of plans revision.

- **State Regulatory Body** - The Urban-Regional Planning & Development Regulatory Authority (Town Planning Board/ Town Planning Committee (Kerala)) suggested by the URDPFI Guidelines, 2014 to be established by State Governments through statutory support. The role of this State Body would be to regulate and monitor the functioning of Development bodies. The regulatory

authority at the state level may function as an appellant authority to address the grievances redressal. It shall also list of authorities and roles and responsibilities to avoid multiplicity. Regulatory body should review the smooth functioning of the agencies to overcome the multiplicity, duplication or gaps. The establishment of this authority would require amendment of State Town and Country Planning Acts.

This State level apex regulatory body for appropriate functioning should be chaired, preferably, by the Chief Minister of the state with other members decided by the State government. The role of State authority to be referred from Volume I (section 3.6).

- **Disaster Risk Management:** Disaster risk management with specific reference to climate change impact and appropriate response for it should be incorporated as an important component of plan formulation with focus on better energy use, water management, green balance and reduction of vulnerability to disaster.
- **City Infrastructure Fund:** A City Infrastructure Fund should be established at urban centers by the Executive order of State Government. It should be other than the Budget fund and dedicated only for the Urban and Regional Infrastructure development. The possible sources of funding for the infrastructure fund must be defined and streamlined in consultation with State Finance Commission by the State Government.
- **Planning for Green Cities:** In view of the need for accelerated urban development and to guide cities to eco-friendly, Green city development approach should be given priority especially in green field development. Planning for such cities should be encouraged and provisions for the same to be included in the Act.

The changes in the Model Law should be considered based on the above mentioned points, provision from various State Town and Country Planning Acts and detailed study by Town and Country Planning Organisation. The Model Regional and Town Planning and Development Law, 1985 is appended with its web URL in Appendix O of Volume II B.

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4 Model Municipal Law, 2003

4.1. Key features

The Model Municipal Law, 2003 prepared by Ministry of Urban Development and Poverty Alleviation (the erstwhile undivided Ministry) is an initiative to implement the provisions of the 74th CAA for empowerment of urban local bodies and provide legislative framework for implementation of the Urban Reform Agenda. The Law is expected to enhance the capacities of ULBs to leverage public funds for development of urban sector and provide an environment so that urban local bodies can play their role more effectively and ensure better service delivery.

The salient features of the Model Municipal Law are:

- 1) Constitution of the Municipal Area based on population, classification of the three levels of Municipalities and its constitution.
- 2) All the executive actions of the Empowered Standing Committee shall be taken in the name of Municipality.
- 3) Indirect election of Mayor or Chairperson for a five year term.
- 4) Constitution of Wards and Ward Committees.
- 5) State Level Municipal Establishment Audit Commission to review the staff status.
- 6) Classification of Municipal functions into:
 - a) Core municipal functions- including water supply, drainage and sewerage, solid waste management, roads, etcetera;
 - b) Functions assigned by Government³; and
 - c) Other functions.
- 7) State government can dissolve an elected body if it shows default in performance or abuse of powers, after giving due notice and review by a committee.
- 8) Provision to implement recommendations of the State Finance Commission.
- 9) "Municipal fund" with separate accounts for various services.
- 10) Preparation of budget estimation of Municipality.
- 11) Preparation of State Municipal Accounting Manual and appointment of the Municipal Accounts Committee.
- 12) State Government can appoint a professional chartered accountant as auditor. ULBs to prepare balance sheet of the assets and liabilities annually.
- 13) Municipalities to prepare an inventory of properties each year.

³The "functions assigned by Central/ State Government" may be undertaken subject to the underwriting of the costs by the concerned levels of government.

- 14) State Government to frame a Comprehensive Debt Limitation Policy laying down the general principles of borrowings of loans with regard to Municipalities' financial capacity.
- 15) Power of municipalities to raise loans.
- 16) Internal revenues of Municipality and power to levy taxes, user charges, fees and fines, development charge, advertisement, other taxes and tolls.
- 17) Enable participation of private sector and NGOs in construction, financing and delivery of services including billing and collection.

- 18) Enable setting up of State Municipal Regulatory Commission that will determine user charges and standard of services suggest avenues of private sector participation and ensure fair deal to citizens.
- 19) Agenda for urban environment management. Municipalities to prepare annual environmental and subsidy reports
- 20) Provides for the representation of Municipalities in District and Metropolitan Planning Committees.
- 21) Provision for improvement in existing area such as removal of congested buildings
- 22) Constitution of Municipal Streets Technical Committee and other aspects related to streets
- 23) Unique Premises Numbering System
- 24) Provisions for buildings
- 25) Municipal Licenses
- 26) Maintenance of Statistics
- 27) Management of Disasters

4.2. Suggested changes in the Law

The Model Municipal Law (MML) was introduced more than a decade back; it is pertinent that the provisions of MML need to be updated to bring it in harmony with the recent developments in the Municipal Law. MoUD study undertaken by NUIA to review the MML, suggested various points for revision of the provisions given in MML, based on their status of implementation.

There are various provisions in the current scenario that are vital for MML to bring it in line with the new developments in municipal governance. Provisions like reservations of seats for Women/SC/ST/BC in Municipality, Local Bodies/Municipal Ombudsman, functions and duties of *Area Sabha* Representative, disclosure of various documents relating to municipal affairs, accrual based double entry system of accounts, defining functions and

responsibilities of DPCs and MPCs are suggested to be detailed out under the MML.

The above mentioned NUIA study has also highlighted lack of critical provisions in MML, such as, municipal ombudsman, accrual based double entry system; public disclosure of budget, financial and accounts of municipality; public private partnership (PPP) in the delivery of basic services of the municipality, and in performance of infrastructure projects.

4.2.1. Clause(s) for inclusion in the present MML

- Definitions of “area *sabha*” and “area *sabha* representatives” shall be defined in the MML.
- MML to be the Model Law for States to follow. It should clearly have a clause defining “Annual Rateable Value” / “Capital Value” / “Unit Area Value” / “Annual Letting Value.”
- Definition of “Local Bodies or Municipal Ombudsman”/ under jurisdiction of *LokAyukta* should be defined. According to 13th Central Finance Commission, the state government must put in place a system of independent local body Ombudsman. However, it is left to the States to decide which system to follow.
- **Provision on reservation:** Article 243 T of the Constitution of India provides for reservation of women, SC, ST, and BC. Since MML supplement the aims of 74th CAA, it should be incorporated in MML.
- **Provisions relating to Local Bodies/Municipal Ombudsman:** The Second Administrative Reforms Commission and the 13th Finance Commission have recommended that a separate Ombudsman for local bodies be constituted to look into the complaints of corruption and mal-administration against the functionaries of local bodies.
This may also include Staff’s review on the Non- Ethic practises and provision for the protection of whistle blowers. In case, the municipality opts to create a position of local bodies’ ombudsman, it is necessary to add provisions relating to appointment, functions, powers, term of office, conditions of service, procedure of disposal of complaint filed to his office etcetera.
- **Formulation of citizen’s charter** – provision for Citizen’s Charter formulation under “Action Plan for Effective and Responsive Government” (1997) to be suggested in the MML. Citizen's Charter and Grievance Redressal Bill, 2011 is also under consideration in Parliament, which will support the amendment in MML. The role of the charter to be well defined including Grievance Redressal other than those handled by Local Bodies/Municipal Ombudsman and focus on development of e-governance mechanisms for Public accountability, Duties of the staff, Transparency and People’s participation.

- **Accrual Based Double Entry Accounting System:** Currently double entry accounting system is followed by most of the Municipalities in the country. However, as per the mandate of the JnNURM, accrual based accounting system should be followed as it estimates the future generation of revenue and expenditure of the Municipality. MML does not mention this provision. Since it is one of the important reforms undertaken through JnNURM scheme, it is important that a corresponding provision is incorporated in the MML.
- **Action taken report:** The Municipal Authorities must send an action taken report to the State Government on the defects detected by the government auditor. It is imperative that this provision should be included in MML for other states to follow.
- **Establishment of Escrow Account for any particular project:** An escrow account for particular projects helps the municipality to maintain their accounts clear in terms of borrowing and in terms of future borrowings needs of the municipality. It will increase transparency for the lenders/stakeholders. Considering few states have already established an escrow account, such provision may be added to MML as an option for the municipalities that wish to opt for it.
- **Property Tax assessment:** MML should have a provision regarding manner of assessment of property tax. Municipal Acts must specify whether an assessee would file a Self-assessment or a bill would be presented to him by the municipality.
- **Functions and Responsibilities of DPC & MPC:** MML only speaks of constitution of these committees, which does not suffice the purpose. Therefore, it is suggested to define the provisions relating to composition, role and responsibilities of MPC/DPC as well as their jurisdictions as envisaged under the constitutional provisions including specifying the organization which will function as the technical and administrative secretariat of the MPC/DPC.
- **Fire hazard and disaster risk response:** One of the conditions of the 13th Central Finance Commission was that all the municipal corporations must put in place a fire hazard response and mitigation plan for million plus cities. Therefore, MML should contain a provision with respect to fire hazard response plan, if not for all the Disaster managements. URDPFI recommends fire hazard disaster risk response to be incorporated focusing on reduction of vulnerability.
- **State Regulatory Body** - The Urban and Regional Development Regulatory Authority suggested by to be established by State Governments through statutory support should play a crucial role to regulate and monitor the functioning of Development bodies. Grievances redressal system, roles and responsibilities of authorities to be integrated with the State Regulatory Body. Therefore, functions of State Regulatory Body to be incorporated in the Model Municipal Law.

4.2.2. Additional Provisions

4.2.2.1. State Property Tax Board / Act

The 13th Central Finance Commission recommended for a State Property Tax Board to put in place an independent and transparent procedure for assessing property tax.

MML provides for a provision mentioning the State Property Tax Board, however, it does not clearly state the provisions relating to its establishment, composition, functions, powers, accounts, budget, etc. It could be a useful provision since property taxation is an important source of revenue and this would help improve the valuation of the property in a systematic and transparent way.

4.2.2.2. State Finance Commission

The 13th Central Finance Commission suggests that the States Governments must prescribe through an Act qualification of persons eligible for appointment of the State Finance Commission (SFC). Therefore, MML is suggested to prescribe a provision for establishment of permanent SFC cell.

4.2.2.3. Notification with Respect to Service Levels

The 13th Central Finance Commission suggests that State Government must notify or cause all municipalities to notify at the end of the fiscal year - the service standards for four service sectors (Water Supply, Storm Water Drainage, Sewerage and SWM). For a step towards the compliance of such reforms, MML must contain this provision.

4.2.2.4. Human Resources Policy Reform

Services provided by local bodies for SWM, Sewage, Water Channels and Electricity plays a crucial role in maintaining environmental standards of city and as well quality of life of residents. Municipal law looks at only the performance of this function. However, the most neglected part of this function is the health hazards of the employees, who are directly related to perform this function. For mitigating health hazards to the employees of the Municipality dealing in the works relating to sewerage, garbage collection, etc. - Municipality should provide proper gear to its employees like uniforms, gloves, gum boots, masks, first-aid kit etc. Even though human contact cannot be avoided in the performance of these tasks, the only minimal requirement of proper equipment and gear should be

provided to employees. Inclusion of this provision is important to realize the vision of smart, sustainable and responsible cities.

4.2.2.5. Exemptions as incentive

It is essential to provide for the extent of Exemption in the property taxation on defined conditions. Property tax exemption can be provided for following or implementing certain desirable projects like, Green development, Rain water harvesting, solar power installation in building and Green building etc. as an incentive. As per the NUIA study, Municipal Acts of Bihar has no provision mentioning the exemptions from property taxation, but many other states have already provided for exemptions. It is suggested that MML provide for any such provision.

4.2.2.6. Rain Water Harvesting Mandatory

It is one of the optional reforms under JnNURM. Looking at the urban growth, rainwater harvesting should be a mandatory provision in all the Acts to recharge groundwater and augment overall water availability. Such provisions in the Municipal Act may ensure its application in the Local Area Plans and Special Purpose Plan. It is suggested to include this in the MML and places where it can be made mandatory within the building bye laws depending upon enforcement capabilities and local conditions.

The Model Municipal Law, 2003 is appended with URL in Appendix O of Volume II B.

5 State Level Legal Framework – Comparative Analysis Overview

Urban and regional planning legislation controls the planning and development activity in a State. Some states have comprehensive Town and Country Planning legislation which provides for urban planning and development from a regional perspective beyond the city limits and coordinated with the overall framework of economic development, priorities and resource availability. Some of these states are Goa, Gujarat, Himachal Pradesh, Karnataka, Kerala, Nagaland, Orissa, Punjab, Rajasthan, Tripura and Uttar Pradesh.

Town and Country Planning Organisation (TCPO) with the direction from MoUD conducted brainstorming session throughout the country during 2008 to 2010. Further, during the formulation of URDPFI Guidelines, various workshops were conducted in both the studies to share knowledge on urban development practices and development policies / strategies of respective States and recommendations / advice were provided to all the States. TCPO has analysed the status of T&C planning Acts of the States. An overview of the States in terms of implementation of T&C Planning Acts in their jurisdiction is given in **Table no. 5.1**. This table has been updated as per the latest information available as on 31st July 2013 from TCPO with respect to the cities who have prepared Statutory Master Plans.

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Table 5.1: Comparison of Town and Country Planning Acts & implementation across Nation

Sr.No	Name of State	Whether Town and Country Planning Dept. Exists	Whether T & CP Act enacted	No of Towns as per Census 2011	No. of Census Towns	No. of Statutory Towns (ULBs)	Statutory Towns (%)	No. of Master Plan Approved	No. of Master Plans Under Preparation	Towns having Master Plan (%)
1	Andhra Pradesh	Directorate of Town & Country Planning	Andhra Pradesh Town and Country Planning Act, 1920	353	228	125	35	89	60	25
2	Arunachal Pradesh	Department of Town & Country Planning	Arunachal Pradesh Urban and Country Planning Act, 2007	27	1	26	96	1	3	4
3	Assam	Directorate of Town & Country Planning	Assam Town and Country Planning Act, 1959	214	126	88	41	36	42	17
4	Bihar	Department of Town & Country Planning	Bihar Urban and Regional Planning and Development Act, 2011	199	60	139	70	9	20	1
5	Chhattisgarh	Department of Town & Country Planning	Chhattisgarh Town and Country Planning Act, 1973	182	14	168	92	28	64	15
6	Goa	Department of Town & Country Planning	Goa Town and Country Planning Act, 1974	70	56	14	20	13		19
7	Gujarat	Department of Town & Country Planning	Gujarat Town Planning & Urban Development Act, 1976	348	153	195	56	125	14	33

Table 5.1: Comparison of Town and Country Planning Acts & implementation across Nation

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8	Haryana	Department of Town & Country Planning	Haryana Development & Regulation of Urban Areas Act, 1975.	154	74	80	52	66		20
9	Himachal Pradesh	Department of Town & Country Planning	Himachal Pradesh Town and Country Planning Act, 1970	59	3	56	95	19	0	31
10	Jammu & Kashmir	Department of Town & Country Planning	Jammu & Kashmir Development Act, 1970	122	36	86	70	2		2
11	Jharkhand	Department of Town & Country Planning	Jharkhand Town Planning and Improvement Trust Act, 1954 (adopted from Bihar)	228	188	40	18	5		2
12	Karnataka	Department of Town & Country Planning	Karnataka Town and Country Planning Act, 1961	347	127	220	63	159	7	46
13	Kerala	Department of Town & Country Planning	Kerala Town Planning Act, 1939	520	461	59	11	49	15	9
14	Madhya Pradesh	Department of Town & Country Planning	Madhya Pradesh Nagar Thatha Gram NiveshNiyam, 1975	476	112	364	76	93	63	18
15	Maharashtra	Directorate of Town Planning &	Maharashtra Regional and Town	534	278	256	48	275		51

Table 5.1: Comparison of Town and Country Planning Acts & implementation across Nation

Sr.No	Name of State	Whether Town and Country Planning Dept. Exists	Whether T & CP Act enacted	No of Towns as per Census 2011	No. of Census Towns	No. of Statutory Towns (ULBs)	Statutory Towns (%)	No. of Master Plan Approved	No. of Master Plans Under Preparation	Towns having Master Plan (%)
		Valuation	Planning Act, 1966							
16	Manipur	Department of Town and Country Planning	Manipur Town and Country Planning Act, 1975	51	23	28	55	19	0	37
17	Meghalaya	Directorate of Urban Affairs	Meghalaya Town and Country Planning Act, 1973	22	12	10	45	15	4	68
18	Mizoram	Department of Town and Country Planning	Mizoram Urban & Regional Development Act, 1990	23	0	23	100	15		65
19	Nagaland	Department of Town and Country Planning	Nagaland Town and Country Planning Act, 1980	26	7	19	73	10	1	38
20	Orissa	Department of Town and Country Planning	Orissa town Planning and Improvement Trust Act, 1956	223	116	107	48	72	22	32
21	Punjab	Department of Town and Country Planning	Punjab Regional Town Planning and Development Act, 1995	217	74	143	66	32	27	6
22	Rajasthan	Department of Town and Country Planning	Rajasthan Urban Improvement Act, 1959	297	112	185	62	183	46	62
23	Sikkim	No independent Town and Country Planning	The Sikkim Urban and Regional Planning and	9	1	8	89	4	17	44

Table 5.1: Comparison of Town and Country Planning Acts & implementation across Nation

Sr.No	Name of State	Whether Town and Country Planning Dept. Exists	Whether T & CP Act enacted	No of Towns as per Census 2011	No. of Census Towns	No. of Statutory Towns (ULBs)	Statutory Towns (%)	No. of Master Plan Approved	No. of Master Plans Under Preparation	Towns having Master Plan (%)
		Department, however Town Planning cell exists under Urban Development and Housing	Development Act, 1998							
24	Tamil Nadu	Department of Town and Country Planning	Tamil Nadu Town and Country Planning Act, 1971	1097	376	721	66	123	50	11
25	Tripura	Department of Town and Country Planning	Tripura Town and Country Planning Act, 1975	42	26	16	38	13		2
26	Uttar Pradesh	Department of Town and Country Planning	Uttar Pradesh Urban Planning and Development Act, 1973	915	267	648	71	207	25	23
27	Uttarakhand	Department of Town and Country Planning	Uttarakhand Urban Planning and Development Act, 1973	115	41	74	64	42	0	37
28	West Bengal	Town and Country Planning Cell functioning under Urban Development Department	West Bengal Town and Country (Planning and Development) Act, 1979	909	780	129	14	126	85	5
29	A & N Islands.	No independent Town and Country	Andaman & Nicobar Town and	5	4	1	20	1	Not reported	20

Table 5.1: Comparison of Town and Country Planning Acts & implementation across Nation

Sr.No	Name of State	Whether Town and Country Planning Dept. Exists	Whether T & CP Act enacted	No of Towns as per Census 2011	No. of Census Towns	No. of Statutory Towns (ULBs)	Statutory Towns (%)	No. of Master Plan Approved	No. of Master Plans Under Preparation	Towns having Master Plan (%)
		Planning Department exists as on date. A small Town and Country Planning unit is working under the Comm-cum-Secy(PWD/UD) & Chief Engr as part of APWD.	Country Planning Regulations, 1994							
30	Chandigarh	Department of Urban Planning	The Capital of Punjab (Development and Regulation) Act, 1952	6	5	1	17		2	0
31	Delhi	Town Planning Department, MCD	Delhi Development Act, 1957	113	110	3	3	1	0	1
32	Dadra & Nagar Haveli	Department of Town and Country Planning	Dadra & Nagar Haveli Town and Country Planning Act, 1974	6	5	1	17	6	0	100
33	Daman & Diu	Department of Town and Country Planning	Daman & Diu Town and Country Planning Act, 1974	8	6	2	25	1	0	13

Table 5.1: Comparison of Town and Country Planning Acts & implementation across Nation

Sr.No	Name of State	Whether Town and Country Planning Dept. Exists	Whether T & CP Act enacted	No of Towns as per Census 2011	No. of Census Towns	No. of Statutory Towns (ULBs)	Statutory Towns (%)	No. of Master Plan Approved	No. of Master Plans Under Preparation	Towns having Master Plan (%)
34	Lakshadweep	No Town and Country Planning Department, However the works are handed by PWD	Yet to be enacted	6	6	0	0			0
35	Puducherry	Department of Town and Country Planning	Puducherry Town and Country Planning Act, 1969	10	4	6	60	4	0	40
Grand Total				7933	3892	4041	51	1843	567	23

Source: TCPO, MoUD 2011

As reflected in table above, barring UT of Lakshadweep, all States and UTs of India have Town and Country Planning Acts and Departments. It has been noticed that all the new States including Chhattisgarh, Jharkhand and Uttarakhand have their own Town and Country Planning Acts. However, these Acts are same as enacted by their original State from where they were bifurcated.

There are few States which have enacted or are in process to enact new laws with respect to Urban Development and Town Planning. Bihar has enacted Bihar Urban Planning and Development Act, 2012.

Based on the understanding from existing UDPFI guidelines, it is essential to identify gaps and best practices which are adopted by States with respect to Urban and Regional Development. Comparison of some of the States as case studies has been undertaken for the review T&CP Acts of country. The States have been chosen in such a manner so that it covers almost all the region, i.e. North, West, South and East, of the country. Moreover, for review purpose, various parameters such as Regional Development, Land Acquisition Mechanism, affirmation with 74th CAA, institutional setups are considered. These States are:

- **North:** Himachal Pradesh
- **South:** Tamil Nadu and Karnataka
- **East:** Bihar and Mizoram
- **West:** Maharashtra and Gujarat

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
1	State Planning Committee/Board/Authority	Provision of State Planning board	Provision of State Planning Board	Directorate of Town and Country Planning, headed by the Director, appointed by State	Mizoram Urban Planning and Development Board/committee	Bihar Urban Planning and Development Board The Government may also constitute Urban Arts and Heritage Commission	No provision for State Level Planning Committee or Board or Authority.	No provision for State Level Planning Committee or Board or Authority.
2	Functions Of State Planning Board	<ul style="list-style-type: none"> ▪ To guide, direct and assist the planning authorities ▪ Advise the State Government on planning matters ▪ Direct the preparation of Development Plans by Planning Authorities ▪ Prepare and furnish reports relating to the working T&C Act 	Not Applicable	Not Illustrated	<ul style="list-style-type: none"> ▪ To prepare and enforce Integrated Interim Development Plan, District or Regional Development Plan, Rural or Sectoral Plan, Urban Development Plan and Action ▪ To prepare Development Scheme ▪ To prepare Regional and 	<ul style="list-style-type: none"> ▪ To guide, direct and assist the Planning Authority ▪ Advise on the delineation of the Planning Area(s) and direct the preparation of Development Plan ▪ Undertake, assist and advise on the coordination of planning and implementation of physical development programmes ▪ Direct the 	Not Applicable	Not Applicable

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
					Rural Centre Development Plan and integrating Urban and Rural Development schemes and Development Plans prepared by the Municipalities or Village Councils or any Local authority and assist the State Government to co-ordinate development activities at all levels within the Planning Area or Region	<ul style="list-style-type: none"> preparations of one or more Regional Development Plan, Regional Transportation Plans, Town Development Plans Direct the preparations of one or more regional natural resources and environmental Conservation Plans 		
3	Metropolitan Development /Planning Authority/Committee	Establishment of Chennai Metropolitan Development Authority Functions and Powers : <ul style="list-style-type: none"> To prepare a Master Plan or a detailed 	Separate Provision in Bangalore Metropolitan Region Development Authority Act, 1985	No provision to constitute	No provision to constitute MPC	The act doesn't have provision for constituting the Metropolitan Planning Authority or Committee, however it defines the function of MPC to prepare Development Plan for Metropolitan Area	No provision, however a separate act makes mandatory to constitute Mumbai Metropolitan Regional Development Authority under	No provision to constitute

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
		Development Plan or a new Town Development Plan <ul style="list-style-type: none"> To prepare a new Town Development Plan for the area concerned to secure the laying out and development of the new town in accordance with the new Town Development Plan 					Bombay Metropolitan Region Development Authority Act, 1974	
4	Planning Area	<ul style="list-style-type: none"> Regional Planning area - based on Population and type of development Local Planning Area - based on Population and type of development and provision in Regional Plan New Town Area - based on Population and 	State has got power to declare any area in the State to be a Local Planning Area.	State to declare Planning area	State government in consultation with Board or Committee may declare the limit of Town or Urban area in the State	State on advice of Board may declare or withdraw the regions or areas, including a Metropolitan Area or area for development of new towns in the State to be a Planning Area	Criteria for delineation of planning area is not described	Development area and Urban Development area to be declared by State Government

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
		type of development and provision as new town in Regional Plan						
5	Planning Authorities	<p>Planning Authorities to be constituted at different level as:</p> <ul style="list-style-type: none"> ■ The Regional Planning Authority ■ The Local Planning Authority ■ The New Town Development Authority 	<p>The State Government in consultation with the Board may constitute Planning Authority after declaration of planning area</p>	<ul style="list-style-type: none"> ■ Town and Country Planning Authority to constitute by the State ■ Special Area Development Authority to be established for special areas as identified by State or in Regional Plan 	<ul style="list-style-type: none"> ■ District Planning and Development Committee ■ City or Town Planning and Development Committee 	<p>State to constitute the Planning Authority and it shall be known by such name as the Government may determine</p>	<ul style="list-style-type: none"> ■ Regional Planning Board ■ Special Planning Authority ■ New Town Development Authority 	<ul style="list-style-type: none"> ■ Area Development Authority ■ Urban Development Authority
6	Function and powers of Planning Authority	<p>The Regional Planning Authority to:</p> <ul style="list-style-type: none"> ■ carry out a survey and prepare reports on the surveys ■ prepare an existing land use map 	<p>Planning Authority (as mentioned in section above) Preparation of a map showing present land use</p> <p>The planning authority to:</p> <ul style="list-style-type: none"> ■ Prepare 	<p>Special Area Development Authority</p> <ul style="list-style-type: none"> ■ To prepare Development Plan for the special area; ■ to implement the Development Plan 	<p>Function and powers of Planning Authority or board are described (same as in row 2)</p>	<ul style="list-style-type: none"> ■ Planning Authority shall carry out such functions and exercise such powers as may be prescribed by the Rules ■ Planning Authority may carry out or cause to be carried out surveys of its Planning Area and to 	<p>Regional Planning Board to:</p> <ul style="list-style-type: none"> ■ carry out a survey of the region, and prepare reports on the surveys so carried out ■ prepare an 	<p>Area Development Authority to undertake:</p> <ul style="list-style-type: none"> ■ Preparation of Development Plans ■ preparation of Town Planning

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
	Local Planning Authority to:	<ul style="list-style-type: none"> carry out a survey of the Local Planning Area prepare reports on the surveys prepare a Master Plan and a Detailed Development Plan 	<p>Outline Development Plan prior to the preparation of Master Plan</p> <ul style="list-style-type: none"> Carry out the survey as soon as the planning area declares Preparation of Master Plan. Prepare Town Planning Scheme 	<ul style="list-style-type: none"> to provide for the municipal management of the special to otherwise perform all such functions with regard to the special area as specified by State Government from time to time. 		<p>prepare report or reports of such surveys</p> <ul style="list-style-type: none"> Every planning authority will prepare a present Land Use Map and a Land Use Register Planning Authority to prepare a Development Plan after declaration of Planning Area 	<p>existing-land-use map for the purpose of preparing a Regional Plan;</p> <ul style="list-style-type: none"> prepare a Regional plan <p>Special Planning Authority to:</p> <ul style="list-style-type: none"> carry out a survey and prepare an existing land-use map of the area, and prepare and publish the draft proposals for the lands 	<p>Schemes to carry out surveys in order to prepare Development Plans</p> <ul style="list-style-type: none"> control the development activities <p>Urban Development Authority to undertake:</p> <ul style="list-style-type: none"> Preparation of Development Plans preparation of Town Planning Schemes carry out surveys in order to prepare Development Plans control the development activities guide, direct
	New Town Development Authority to:	<ul style="list-style-type: none"> prepare a new Town Development Plan carry out building and other operations 	<p>Implementation of plan , Once the Master Plan is approved by the State,</p>					

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
								and assist the local authorities
7	Preparation of Plans	<ul style="list-style-type: none"> ■ Regional ■ Master Plan ■ New Town Development Plan ■ Detailed Development plan 	Master Plan	<ul style="list-style-type: none"> ■ Regional Plan ■ Development Plan and Sectoral Plan 	<ul style="list-style-type: none"> ■ District or Regional Development Plan, ■ Urban Development Plan, ■ Rural or Sectoral Plan, ■ Action Plan 	<ul style="list-style-type: none"> ■ Development Plan ■ Metropolitan area Development plan 	<ul style="list-style-type: none"> ■ Regional Plans ■ Development Plan ■ Preparation of Development Plan for additional area 	Development Plan
8	Scope/Objectives/Contents of Plans	Objectives of each type of plan is defined	Contents of Master Plan are elaborated	Contents of Development Plan and Sectoral Plan are elaborated	Contents of each type of plan as mentioned in act are elaborated	Scope and Contents of Development Plan are illustrated	Contents of Regional Plan and Development Plan are elaborated	Contents for Draft Development Plan are elaborated
9	Affirmation with 74th Amendment Act	DPC and MPC are not incorporated	DPC and MPC are not incorporated	DPC and MPC are not incorporated,	State to constitute District Planning and Development Committee and City or Town Planning and Development Committee. Chairman of the committee to be appointed by State whereas other members to be	No provision for constituting DPC and MPC. However it elaborates some functions of MPC	No provision for DPC and MPC.	No provision for MPC and DPC

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
					selected at district level and city level in compliance with the Act.			
10	Provision for Regional Planning	Provision of Regional Planning to be done by Regional Planning Authority	No provision for Regional Planning	Provision for preparation of Regional Plan	Provision for preparation of District or Regional Plan	The Act doesn't have specific provision for Regional Development Plans, however it defines basic scope of Development Plans which also include Regional Plans	The Act has provision for Regional Planning Board and elaborates its function with respect to regional development	No provision for Regional Planning. Though the Act provides for Development Area however it does not elaborate on the spatial extent and criteria for declaration of such area.
11	Town Planning/Development Scheme	Detailed Town Planning Schemes prepared under the Tamil Nadu Town Planning Act, 1920,	Planning Authority, for the purpose of implementing the proposals, may make one or more town planning schemes for the area within its jurisdiction	The Town and Country Development Authority may, at any time, declare its intention to prepare a town Development Scheme and provisions are define to incorporate in Town Planning	For the purpose of implementing the proposals contained in the Development Plan, prepare one or more Development Scheme for five years or for one year. Development Scheme to be	The planning authority may invite area Development Schemes from developers. An Area Development Scheme may be made in respect of any land which is:- (a) in the process of development, (b) likely to be used for any development including building	A Planning Authority may for the purpose of implementing the proposals in the final Development Plan, prepare one or more Town Planning Schemes for the area within its jurisdiction. Contents of draft	Appropriate authority may make one or more Town Planning Scheme for the respective development area. Town Planning Scheme may be made in respect of any

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
				scheme. State has power to give directions to frame/modify or revoke the scheme	developed in respect of: (a) in the course of development, (b) likely to be used for building purposes or (c) already built up.	purposes, or (c) already built upon.	scheme is elaborated	land in the course of development, likely to be used for building purposes and already built upon. Content of draft scheme are defined in the act.
12	Periodic Revision of Plans	Provision of reviewing the Regional Plan once in 10 years and the Master Plan may be reviewed once in 5 years.	At least once in every ten years from the date on which the Master Plan has come into force	Provision for review the Plans at any time; however minimum timeframe has not provided.	District or Regional Development Plan shall be reviewed at least once in every 10 years whereas, Interim Development Plan, Urban Development Plan and Rural or Sector Plan shall be reviewed at least once in every 5 years	No provision	<ul style="list-style-type: none"> ■ The State Government can revise at any time after a Regional plan has come into operation, but not earlier than ten years ■ The revision shall be at least once in twenty years from the date on which a Development Plan has come into operation, 	<ul style="list-style-type: none"> ■ At least once in ten years. ■ Area Development Authority shall revise Development Plan

Table 5.2: Comparison of Town and Country Planning Acts of seven States

S.No.	Criteria	Tamil Nadu	Karnataka	Himachal Pradesh	Mizoram	Bihar	Maharashtra	Gujarat
13	Land Assembly/Mechanism/Acquisition	<ul style="list-style-type: none"> Power to acquire land under the Land Acquisition Act Acquisition of land by agreement, however if the value of such land exceeds fifty thousand rupees, appropriate Planning Authority shall not enter into such agreement without previous approval of the Government 	<ul style="list-style-type: none"> Power to acquire land under the Land Acquisition Act or Acquisition of land by agreement, 	<ul style="list-style-type: none"> Power to acquire land under the Land Acquisition Act or Acquisition of land by agreement, 	<p>Land can be acquired by following ways:</p> <ul style="list-style-type: none"> compulsorily ; by agreement ; or by taking an application to the collector for acquiring such land under the Land Acquisition Act, 1894 	<p>Acquisition of Land by Way of</p> <ul style="list-style-type: none"> Transferable Development Right Accommodation Reservation Purchase of Land by way of Negotiated Settlement Power to Acquire land under the Land Acquisition Act, 1894 or any other Land Acquisition Act 	<p>Acquisition of Land by Way of</p> <ul style="list-style-type: none"> Transferable Development Right Accommodation on Reservation Purchase of Land by way of Negotiated Settlement Power to Acquire land under the Land Acquisition Act, 1894 or any other Land Acquisition Act 	<ul style="list-style-type: none"> Acquisition of Land either by agreement or Under Land Acquisition Act 1894 by Area Development Authority

Source: Respective Acts

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Various criteria are identified for making the comparisons of T&CP Act of the States. It has been observed in the table above that there is no provision of constituting State level Planning Board or Committee in the States of Gujarat and Maharashtra. But in Bihar, the recently enacted Urban Planning and Development Act in 2012 gives provision to constitute Urban Planning and Development Board at State level. This Act also recommends constituting the Urban Arts and Heritage Commission in order to (a) preserve and conserve archaeological and historical sites, (b) restore and conserve urban design in planning area. Karnataka and Himachal Pradesh have provision of constituting the State Level Planning Boards; however functions of these boards are not specified in their respective T&CP Acts.

The State may notify Planning Area in consultation with Planning Boards. However, in many States such as Karnataka, Himachal Pradesh, Maharashtra and Gujarat, the State Government without any consultation with the Planning Boards can notify Planning or Development Area for the region. Tamil Nadu is the only State which elaborates the criteria for delineating the Planning Boundary whereas other States have not considered any such criteria in their respective Acts.

The role of Planning Board is significant for constituting the Planning Authorities for Notified Planning Area. It has been observed that every State has its own hierarchy for constituting Planning authorities / Committees for the planning area. States of Tamil Nadu and Maharashtra have a provision to constitute the Regional Planning Authority, whereas in Gujarat, Area Development Authority and Urban Development Authority are to be constituted for development of settlements. Though, the extent of Development Area is not defined in the Gujarat TP&UD Act which may create confusion in deciding the region's boundary. The constitution of District Planning Committee (DPC) is almost left by every State except Mizoram. The Mizoram Urban and Regional Development Act, makes mandatory to constitute DPC and City or Town Planning Committee in accordance with 74th CAA, however function and power of DPC are not specified. Mizoram Urban and Regional Development Act, have provision for constituting Local Authorities such as Village Councils and Municipalities to participate in planning process.

On the same line, Tamil Nadu, Karnataka and Maharashtra have also made a provision with respect to constitution of Metropolitan Development Authority. However this provision is limited to Chennai, Bangalore and Mumbai. All other Metropolitan cities in these States such as Pune, Nagpur and Mangalore etcetera have been ignored. It has been noticed that States such as Maharashtra and Himachal Pradesh have special provision to constitute Special Area Development/Planning Authority in order to develop Notified Area.

In order to prepare Plans at different levels, most of the States have provision for Development Plan or Master Plan which is to be developed for Notified Planning Area,

whereas Tamil Nadu and Maharashtra have specific provision to formulate Regional Plans in identified region.

Town Planning or Development scheme is an important tool to develop land; every State has made provision to develop Planning/Development Scheme. Land acquisition is an important aspect for implementation of plans. States empowers Planning Authorities through T&CP Acts to acquire land, however mechanism for land acquisition vary amongst States. In every State, land acquisition is mentioned to be either as per Land Acquisition Act, 1894 or through agreement with the owner. Maharashtra and Bihar have additional mechanism i.e. Town Planning Schemes and Transfer of Development Right to acquire land for development purposes.

5.1. Maharashtra

In Maharashtra, Town Planning is a statutory function of all the Municipal Authorities even before the Constitution (74th) Amendment Act. In view of this, no separate provision was considered necessary by the State Government to amend the 1966 Act. This Act, amended up to 5th August 1992 was considered a comprehensive Act. The Act provided that the Development Plan prepared by Planning Authority shall indicate the manner of land use, allocation of land for various purposes, and prescribe the time period for steps in the plan preparation process with extended time if required.

The Maharashtra Regional and Town Planning (MRTP) Act has given emphasis on Regional Planning. It enables State Government to constitute Regional Planning Boards to prepare Regional Plans. *The Act, however, does not have any provision to constitute MPC or DPC, thus it is not entirely compliant with 74th CAA.* It is, Bombay Metropolitan Region Development Authority Act which makes it mandatory to constitute MPC and elaborated the procedure to be followed by MPC in order to prepare Development Plans for Metropolitan Area.

The Special Planning Authority to be constituted by the States for certain Notified Areas. The Special Planning Authorities will have all the powers of a Planning Authority to acquire land for special purpose in Notified Areas. In Maharashtra, there is a special provision to constitute New Town Development Authority for the purpose of acquiring, developing and disposing of land in the area of a new town.

For implementation of the plan, compulsory acquisition of land is regarded as a pre-requisite under the Land Acquisition Act, 1984. In view of the exorbitant market rates of land to be paid for compensation, opposition to compulsory land acquisition by land owners, etcetera has compelled the authorities to explore collaborative approaches within the existing legal framework. As a result, the alternatives to compulsory land acquisition in the form of Transferable Development Rights (TDR) and Accommodation Reservation have been explored in Maharashtra.

However, in both these cases i.e. Accommodation Reservation and TDR, the Local Authority reserves its right to compulsorily acquire the land if the land owner does not come forward. Further, the Town Planning Scheme (TPS) as an alternative model for urban land development has been provided in the MRTTP Act as one of the tools for implementing the proposals contained in the Development Plan and had been used most extensively in the State of Maharashtra.

The draft scheme is prepared by the Planning Authority and finalisation of development scheme is done by the Arbitrator/ Assistant Director of Town Planning and then it is submitted to the government for approval. However the procedure of TPS formulation and approval consumes lot of time and requires to be simplified.

5.2. Himachal Pradesh

In the State of Himachal Pradesh, The Himachal Pradesh Town and Country Planning Act, 1977 is in force. It is a comprehensive planning and development act and provides for the preparation of Regional Plans; Urban Area Plans, Zonal Plans, and prescribes controls on use and development of land. The legislation also provides for levy of development charges.

Under the Act, the Planning Areas are constituted and the Director of Town Planning is entrusted with the task of preparation of Development Plan which will be followed by Sectoral Plans in consultation with the Local Authorities concerned. The Interim Development Plan is submitted to the State Government who notifies approved Interim Development Plan in the official gazette and the Local Authorities are required to follow the plan. The Act also contains provision for the constitution of Town and Country Development Authorities for preparation of Town Development Schemes.

The act has provision for the preparation of Regional Plan and Development Plan, which will be prepared by the Director, Town and Country Planning of the state. The content of Regional Plan and Development Plan have been provided in the Act and a brief methodology to formulate the plans is given. The final approval of the plan is to be provided by the State.

The Town and Country Development Authority may, at any time, declare its intention to prepare a Town Development Scheme. State has power to give directions to frame/modify or revoke the schemes.

The Act has provision to review the plans at any time after a Regional/Development Plan has come into operation. The State can undertake the review and evaluation of the plan, however the minimum time frame has not been provided by which the Plan is to be revised or reviewed.

Provisions to declare any area as Special Area which is to be notified by State are given in the Act. The Plan for such areas will be controlled and regulated by Special Development Authority (SDA). SDA will prepare the Development Plans for such areas and implement it. Other than special areas, Town and Country Planning Authorities in the State will prepare and implement the plan.

5.3. Tamil Nadu

The Tamil Nadu Town and Country Planning Act, 1971 is currently in force in the State. The legislation was brought in after repealing the Town Planning Act, 1920. It is a comprehensive piece of legislation and contains provisions for the preparation of Regional, Metropolitan, Master Plan, New Town and Detailed Development Plans. Besides, the Act envisages the constitution of Regional, Local and New Town Planning Authorities and a Town and Country Planning Board at the apex empowered with implementation powers.

The Town and Country Planning Act, 1971 has been amended so as to have separate provision for the constitution of Madras Metropolitan Development Authority and preparation and implementation of Master Plan for the Madras Metropolitan Planning Area.

The scheme of the Act is that the planning process starts with decentralisation of Regional Planning Area and Local Planning Area under section 10 of the Act which is notified in the gazette, defining the limits of the area. After this, the Town and Country Planning Authority are constituted in consultation with the Director of Town Planning for performing the function of preparing a Regional/Master Plan and detailed Development Plan. Once the Plan is prepared and submitted to the government, State government can give its consent to the Planning Authority to the publication of a notice of the preparation of plan with or without modification.

In case of Tamil Nadu, the Town Planning Scheme (TPS) of Maharashtra or Gujarat has been re-designated as Detailed Development Plans under the Act. These can be prepared on any land located in the Planning Area.

The Tamil Nadu Town and Country Planning Act, 1971, has laid down the procedure for plan preparation and approval but, unfortunately, there is no time frame within which the planning process should be completed.

5.4. Gujarat

Gujarat has a fairly good and robust legislative framework for urban planning as compared to other States in India. The Gujarat Town Planning and Urban Development Act (GTPUDA) was enacted in 1976 by the State Government. The Act stems from early 20th century planning law devised by the British to improve and

manage Indian cities. It also has been amended from time to time to keep pace with the changing requirements.

The Act mandates the delineation of a “Development Area” around a city or a town for planning purposes. It encompasses a much larger area around the city or town that is likely to see development. This ensures and allows for better planning and for guiding development in the area. A village is the basic spatial unit and every development area is an agglomeration of numerous villages, or may also include portions of villages.

The GTPUDA also mandates the creation of a Special Planning Authority—the Urban/Area Development Authority (UDA/ADA)—which is charged with the task of undertaking planning within the delineated Development Area.

Urban planning in Gujarat is a two-step process and is prescribed in the Act and its Rules. The first step is to prepare a “Development Plan” for the entire city or development area. The second step is to prepare “Town Planning Schemes” (TPSs) for smaller portions of the development area for which the Development Plan is prepared.

The Act does not have provision for Regional Planning. Though it says development area however it has not elaborated extent and criteria for declaration of such area. The preparation of Area Plan is done by Area development Authority. Whereas Development Plan for urban areas is done by Urban Development Authority. The Development Plan is revised every 10 years and is updated in the interim whenever a need arises to respond to the changing context.

The planning process also includes limited public participation. After a Draft Development Plan is prepared by the Development Authority it is published and kept open for public inspection for a period of two months and objections and suggestions are invited. Each objection and suggestion is responded to and, if required, the DP is modified. It is published again to invite further objections and suggestions. These are again taken into account and the plan is modified. It is then sent to the State Government of Gujarat for approval and oversight. The State Government may suggest modifications, keeping the overall public good in view if required, before approving the Development Plan.

Appropriate authority can make one or more TPS for the respective development area. TPS may be made in respect of any land which is in the course of development, likely to be used for building purposes and already built upon. The Public Planning Authorities/Development Agencies acquire large areas of land under the Land Acquisition Act of 1894 or by agreement. Then a Master Plan of the area is prepared, laying out the roads, plots for social amenities, and plots for sale. Roads and infrastructure are then built, using government funds or loans. Serviced plots are then

sold for urban uses at market rates, which are most often much higher than the rate at which land is acquired.

5.5. Karnataka

The Karnataka Town and Country Planning (KTCP) Act provides for the regulation of planned growth of land use and development, for the making and execution of Town Planning Schemes, in the State of Karnataka, which came into force in 1965. *The Act mandates constitution of State Planning Board, which consult and direct the Local Planning Authorities after notifying the Planning Area. The detailed functions of State Planning Board have not been elaborated.*

In Karnataka, the KTCP Act does not have any provision to constitute Metropolitan Planning Authority, however a separate Act i.e. Bangalore Metropolitan Regional Authority Act, 1985 has been established for Bangalore Metropolitan Area.

Emphasis has been given on preparation of Master Plan, the contents for the same have been elaborated, *however the concept of Regional Planning has completely ignored in KTCP Act.* After notifying the Planning Area by State in consultation with Board, the Planning Authority is to prepare Outline Development Plan, prior to the preparation of Master Plan. As soon as the Master Plan is approved by the State, the Planning Authority prepares the TPS for the implementation of Plan. The Planning Authority may prepare one or more TPS for the area within its jurisdiction. A TPS may be made in accordance with the provisions of KTCP Act in respect of any land which is in course of development, or likely to be used for building purposes, or already built upon.

There is a provision for revision of Master Plan at least once in every ten years from the date on which the Master Plan came into force.

The KTCP act has laid down the procedure to acquire land for Master Plan and Schemes for public purposes. The Planning Authority may acquire any land designated in a Master Plan for a specified purpose or for public purpose by agreement or under the Land Acquisition Act, 1894.

5.6. Bihar

Bihar Urban Planning and Development (BUPD) Act, 2012 was enacted to make provision for promotion of planned growth and development of urban areas and such rural areas having potential of urbanization and regulation thereof including land use. The act empowers the State of Bihar to constitute Bihar Urban Planning and Development Board to perform certain functions which mainly includes to guide, (a) direct and assist the Planning Authority; (b) to advise on the delineation of the Planning Area(s) and direct the preparation of Development Plan; (c) undertake,

assist and advise on the coordination of planning and implementation of physical development programmes; (d) direct the preparations of one or more Regional Development Plan, Regional Transportation Plans, Town Development Plans and (e) direct the preparations of one or more Regional Natural Resources and Environmental Conservation Plans.

The Board is empowered to constitute one or more committees under BUPD Act, to assist Board in exercising its powers, discharging its duties or performing its functions. This Act also empowers the State to constitute Urban Arts and Heritage Commission in order to preserve and conserve archaeological and historical sites, restore and conserve urban design in Planning Area.

The Act has given provision to prepare Development Plan for Metropolitan area by Metropolitan Planning Committee (MPC), and the criteria for constitution of MPC will be in accordance with Article 243ZE of the Constitution of India; however such criteria have not been discussed in detail. The power and function of Planning Authorities as well as MPC has been elaborated.

The contents and scope of Development Plan and Metropolitan Development Plan have been elaborated in the Act. *Regional Planning aspects have been addressed however specific content to Regional Plans have not been discussed in the Act.*

After the receipt of the Development Plan, together with the report of the Committee, the Government may either approve the Development Plan, with or without modifications, or may return the Development Plan to the Planning Authority to modify the plan or to prepare a fresh plan in accordance with such directions as the Government may issue in this behalf. Immediately after the Development Plan has been approved by the Government, the Planning Authority shall publish a public notice in the Official Gazette and in a local newspaper, of the approval of the Development. The Development Plan shall come into operation from the date of publication.

The Planning Authority may invite Area Development Schemes from developers. An Area Development Scheme may be made in respect of any land which is in the process of development, or likely to be used for any development including building purposes, or already built upon.

Any land required, reserved or designated in any Development Plan and Area development Scheme can be for a public purpose by Way of TDR or Accommodation Reservation or purchase of land by way of negotiated settlement or under the Land Acquisition Act, 1894. The act has also given the provision to create and maintain a land bank, in which all lands acquired, allotted, purchased and obtained, will be monitored and maintained and position reviewed periodically by respective Planning Authorities.

5.7. Mizoram

The Mizoram Urban and Regional Development Act, 1990 was enacted to make provision for the regulation of planned growth and development of urban and rural areas and regions in relation to economic growth and protection and preservation and development of natural setting and urban environment and archaeological monuments and historical places in Mizoram.

The Act empowers the State to constitute Urban Planning and Development Board for the State and for the district or town or a city to advise State Government in regard to the Spatial and Economic Planning and development and also for determining principles and policies under the Act with a view to achieve balance and co-ordinated development of the cities, towns and regions as a whole; and to assist the Board in matters of Development Plan preparation and its implementation.

The act has also elaborated the procedure to constitute District Planning and Development Committee in compliant with 74th CAA.

The functions of Planning Board or Committee are to prepare and enforce following plans, prepared by the Municipalities or Village Councils or any Local authority and assist the State Government to co-ordinate development activities at all levels within the Planning area or region.

- Integrated Interim Development Plan,
- District or Regional Development Plan,
- Rural or Sectoral Plan,
- Urban Development Plan and Action,
- Preparation of Development Scheme,
- Preparation of Regional and Rural Centre Development Plan and
- Integrating Urban and Rural Development schemes and Development Plans

The hierarchy of Development Plans with elaborated content has been established by the Act. The comments and suggestions are invited from any person within 30 days from the publication of notice for publishing the Development Plan, as soon as may be, but not later than 6 months after the submission of the Development Plan the State Government in consultation with the Board or Committee may either Approve the Development Plan in full or Approve with such modifications or return it for further improvement. Once the State has approved the Development Plan, the official notice is published to invite objection and suggestion. After considering objections and suggestions and after giving hearing to the persons desirous of being heard the State Government may confirm the modification in the Development Plan.

For the purpose of implementing the proposals contained in the Development Plan, The Government in consultation with the Board or Committee is empowered to entrust any Government Agency or Local authority or Board to prepare one or more

Development Scheme for efficient implementation of Development Plans. Development scheme can be developed in respect of land which is in the course of development, likely to be used for building purposes, or already built up.

Land can be acquired either by compulsorily; or by agreement; or by taking an application to the District Collector for acquiring such land under the Land Acquisition Act, 1894 for Development Schemes.

There is a provision of review and evaluation of Development Plan at any time by the State after Development plan has come into operation and make such modification, however District or Regional Development Plan shall be reviewed at least once in every 10 years whereas, Interim Development Plan, Urban Development Plan and Rural or Sector Plan shall be reviewed at least once in every 5 years.

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6 Legal Requirements for Industrial Development

6.1. Industries (Development and Regulation) Act, 1951

The Industries (Development and Regulation) Act, 1951 provides for development and regulation of certain industries. The Act has been amended time to time. The last amendment in the said Act was - The Industries (Development and Regulation) Amendment Act, 1984. It provides for Establishment of the Central Advisory Council and Development Councils; regulation of the industries through the processes of registration, licensing and investigation into industries liquidation or reconstruction of companies and miscellaneous provisions. The Act gives a list of industries which requires compulsory licensing.

6.2. Industrial Policy, 1991

The first Industrial policy of the Government of India was announced in year 1948. The 1991 Industrial policy aims to maintain sustainable growth in productivity, enhance gainful employment, achieve optimal utilisation of human resources, attain international competitiveness and transform India into a major partner in the global arena. The policy is focussed on the following:

- Industry de-regulation
- Market responsive industrial development
- Provision of a policy regime for facilitation and growth of Indian industry.

The major provisions of the policy are as given below:

1) Liberalization of Industrial Licensing Policy

a) Industries requiring compulsory licensing

As per the Industries (Development and Regulation) Act, 1951, industries required compulsory licensing. As of year 2014, only five types of industry sectors require compulsory licensing on account of environmental, safety and strategic considerations, these are:

- Distillation and brewing of alcoholic drinks
- Cigars and cigarettes of tobacco and manufactured tobacco substitutes
- Electronic aerospace and defence equipment
- Industrial explosives including detonating fuses, safety fuses, gun powder, nitrocellulose and matches.
- Specified hazardous chemicals i.e (i) Hydrocyanic acid and its derivatives, (ii) Phosgene and its derivatives, (iii) Isocyanates & di-isocyanates of hydrocarbon.

b) Industries under public sector

Since, 1991 only two industry sectors have been reserved for public sector. They are:

- Atomic Energy – Production, separation or enrichment of special fissionable materials and substances and operation of the facilities, specified in the Department of Industrial Policy and Promotion.
- Railway transport

2) Industrial Entrepreneurs’ Memorandum (IEM)

The industries which are exempted from compulsory licensing require filing an Industrial Entrepreneurs’ Memorandum (IEM) with the Secretariat for Industrial Assistance (SIA). No industrial approval is required for the exempted industries.

6.3. Policy for Foreign Direct Investment (FDI)

URDPFI Guidelines provide the sections of the Consolidated FDI Policy, 2013 which have relevance to the preparation of Regional or Urban Development Plans and its implementation.

Promotion of Foreign Direct Investment (FDI) forms an integral part of Industrial Policy. It helps in accelerating economic growth by means of infusion of capital, technology and modern management practices. The FDI policy is announced through issue of Consolidated FDI Policy Circulars. The latest Circular is effective from April 2013. As per the circular the sectors which have been liberalised are mentioned in **Error! Reference source not found..**

Table 6.1: Liberalised Sector for Foreign Direct Investment (Related to Urban and Regional Planning)

Sr. No.	Sector	Maximum FDI % allowed
1.	Agriculture and Animal Husbandry, covering the following sectors: a) Floriculture, Horticulture, Apiculture and Cultivation of Vegetables & Mushrooms under controlled conditions; b) Development and production of Seeds and planting material; c) Animal Husbandry (including breeding of dogs), Pisciculture, Aquaculture, under controlled conditions; and d) services related to agro and allied sectors	100%
2.	Tea sector including teaplantation	100% subject to 26% divestment in 5 years
3.	Mining, subject to the Mines and Minerals (Development & Regulation) Act, 1957 a) Coal and lignite mining b) Coal processing plants	100%

Sr. No.	Sector	Maximum FDI % allowed
	c) Mining and mineral separation of titanium bearing minerals and ores, its value addition and integrated activities	
4.	Petroleum and Natural Gas a) Exploration activities and infrastructure for marketing b) Petroleum refining by PSU's	100% 49%
5.	Airports : Greenfield and existing projects	100%
6.	Construction Development: Townships, Housing, Built up infrastructure	100% (subject to conditions) Minimum area to be developed under each project would be as under: (i) In case of development of serviced housing plots, a minimum land area of 10 hectares (ii) In case of construction-development projects, a minimum built-up area of 50,000 sq.mts (iii) In case of a combination project, any one of the above two conditions would suffice
7.	Industrial park; New and Existing	100%
8.	Power Exchange : Power Exchanges registered under the Central Electricity Regulatory Commission (Power Market) Regulations, 2010	49%
9.	Manufacturing for production in Micro and Small Enterprises	Conditions apply
10.	Defence Industry	26%

Source: Consolidated FDI Policy, 2013

Foreign Investment Implementation Authority (FIIA) has been established to strengthen the foreign investment. As per the Consolidated FDI Policy (effective from April, 5th 2013) salient features relevant to FDI in industrial parks (cited in section 6.2.12, page no. 59) and manufacturing (from section 6.2.5, page no. 45 of the Consolidated FDI policy, 2013) have been mentioned below:

- **Industrial Parks:** FDI allowed in industrial parks is 100%, provided the following conditions are satisfied:
 - The Industrial park shall comprise minimum of 10 units and none shall occupy more than 50% of the allocable area.
 - Minimum percentage of area to be allocated for industrial activity shall not be less than 66% of the total allocable area.

- Manufacturing: FDI in MSE (Micro, Small and Medium Enterprises) is subject to sectoral regulations. Any organization other than MSE but manufactures items reserved for MSE sector and has foreign investment in capital of more than 24% would have to come through Government Route. Additionally, such organization shall require industrial license for manufacturing. It has to achieve minimum 50% export of the MSE products within a period of three years.

6.4. Manufacturing Policy for Cluster Developments

The Government of India has announced the National Manufacturing Policy in year 2011 with the objective to enhance the share of manufacturing in GDP upto 25% within a decade and creating 100 million jobs. The National Manufacturing Policy outlines creation of clusters. The clusters play a critical role in technological propagation by facilitating technological learning and manufacturing through the presence of an entire ecosystem in the same geographical location. The XII Five Year Plan of Planning Commission also suggests a cluster approach for promotion of manufacturing industries.

URDPFI Guidelines provides the following Acts / Policies / Guidelines in relevance to the preparation of Regional, Industrial or Urban Development Plans and its implementation:

- National Manufacturing Policy, 2011
- National Investment and Manufacturing Zones (NIMZs) Guidelines
- Special Economic Zone (SEZ) Act, 2005
- Various schemes for cluster development under Ministries
- Provisions for Micro Small and Medium Enterprises (MSME)

National Manufacturing Policy, 2011 and NIMZ Guidelines, SEZ Act, 2005 and Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 are appendices listed with their respective web URL at Appendix 'O' of Volume II B.

6.4.1. National Manufacturing Policy, 2011

The policy is based on the principle of industrial growth in partnership with the States. The Central Government will create the enabling policy frame work, provide incentives for infrastructure development on a Public Private Partnership (PPP) basis through appropriate financing instruments, and State Governments will be encouraged to adopt the instrumentalities provided in the policy.

Under the policy (section 1.11), the industry verticals which will be given special attention are: employment intensive industries, capital goods, industries with strategic significance like aerospace; shipping; IT hardware and electronics; telecommunication equipment; defence equipment; and solar energy, industries

where India enjoy a competitive advantage, Small and Medium Industries and Public sector Enterprises. The policy presents specific action points in the areas identified as constraints that require immediate policy attention

For rationalisation and simplification of business regulations (section 2, page no. 8), several provisions of different acts may be rationalised or implemented in cooperation with public or private institutions under the control of statutory authorities. The provisions are:

- a) Central and State Government may provide exemptions subject to fulfilment of conditions.
- b) Mechanisms to be developed for cooperation of public or private institutions with government inspection services.
- c) In respect of environment laws, it is proposed to delegate the powers as allowed by the relevant statutes to an official of the State Pollution Control Board posted in the NIMZ.
- d) State Pollution Control Boards to evolve mechanisms for third party inspection (by notified private agencies) for compliance monitoring
- e) State Environment Impact Assessment Authorities to expedite prior environment clearances for 'B' category projects under the provisions of EIA notification 2006
- f) Defining the timelines in respect of all clearances – the clearance to be 'deemed' to have been given on expiry of timeline.
- g) Development of Combined Application Form and a Common Registrar for granting various consents and authorisations under various statutes.

The Planning Commission has identified concomitant policy interventions (page no. 1 of Policy document) which impact the manufacturing sector (but which have not been addressed in the National Manufacturing Policy), these are : digitization of land and resource maps and creation of land banks by states; water zoning; offset policy; fiscal and exchange rate measures; strategic acquisitions; development of world class manufacturing management capabilities; trade policy especially boosting India's exports; and reforming the role of public sector enterprises.

6.4.2. National Investment and Manufacturing Zones (NIMZs) Guidelines

The NIMZs are important instrumentality of the National Manufacturing Policy. The NIMZs are envisaged as integrated industrial townships with land use on the basis of zoning, clean and energy efficient technology, necessary social infrastructure, skill

development facilities etc. to provide a productive environment for persons transitioning from the primary to the secondary and tertiary sectors.

The key features of the NIMZ Guidelines are:

- 1. The approval process is in two stages:** In principal approval and final approval for the NIMZ. After the in-principal approval, as soon as a substantial part of the land area is in possession of State Government, application for obtaining final approval shall be made which will be granted at the level of Ministry of Commerce and Industry. After obtaining the approval, each NIMZ will be notified by the DIPP in the official gazette.
 - a.** For planning the NIMZ, maps shall be prepared and submitted along with the application for final approval. The maps shall consist of following:
 - Administrative and physical map: indicating the districts, villages, townships, water bodies, high lands, low lands and forests etc. which are located within its boundaries.
 - Existing land use map: At least 30% of the total land area proposed for the NIMZ will be utilized for location of manufacturing units.
 - External and existing internal linkages map of proposed NIMZ.
 - b.** Preparation of Techno-economic feasibility report cum development plan and presentation by the State for final approval. It shall include the following:
 - Overview of the region and adjoining areas
 - External linkages
 - Existing internal infrastructure in NIMZ area
 - Land including status and time frame of land acquisition
 - Assessment of industrial and commercial potential
 - Preliminary environment impact assessment
 - External and technical infrastructure requirement
 - Financial implications
 - Proposed management structure
 - Zone development plan
 - Regulatory environment
- 2. Formation of an agreement of implementation between State Government and DIPP:**
 - a.** Constitution of Special Purpose Vehicle to discharge the functions: There shall be a provision for suitable representation of a nominee of the Government of India (DIPP), and of the allottees and subsequently of the industrial units on the Board of the SPV.
 - b.** Preparation of Master Plan and designing by SPV
 - c.** Preparation of a strategy of development of zone and action plan for self-regulation within 3 months from constitution of SPV.

3. **Land Allotment:** Land shall be allotted on leasehold basis by SPV. The SPV will ensure that land is utilised as per the permissible purpose within the specified period of time as indicated in the land allotment letter otherwise, it shall revert back to the SPV.
4. **Land for NIMZs:** NIMZs would be large developed land, with the requisite ecosystem for promoting world class manufacturing activity. They would be different from SEZs in terms of size, level of infrastructure planning, and governance structures related to regulatory procedures and exit policies. Following are the land requirements for NIMZ:
 - a. Size of land for NIMZ – An NIMZ would have an area of at least **5000 hectares** in size.
 - b. Availability of land- The State Government will be responsible for selection of land suitable for development of the NIMZ including land acquisition, if necessary. The land may constitute:
 - i. Government owned land;
 - ii. Private lands falling within the proposed NIMZ, to be acquired by the State Government;
 - iii. Land under existing industrial areas/estates/sick and defunct units including PSUs.

Following guiding principles will be applied by the State Government for the purpose of acquiring land for NIMZ sites:

- i. Preferably in waste lands; infertile and dry lands not suitable for cultivation;
 - ii. Use of agricultural land to the minimum;
 - iii. All acquisition proceedings to specify a viable resettlement and rehabilitation plan;
 - iv. Reasonable access to basic resources like water;
 - v. It should not be within any ecologically sensitive area or closer than the minimum distance specified for such an area.
5. **Rationalisation and simplification of regulatory processes:**
 - High priority shall be given to Environment Clearance under EIA Notification, 2006
 - The entire process of clearances by State authorities will be made web-enabled.
 - Timelines will be defined in respect of all clearances and there is provision of deemed approval of clearances.
 6. **Role of Central Government:** the Central Government shall perform the following tasks:
 - a. Bearing the cost of Master Planning

- f. maintenance of sovereignty and integrity of India, the security of the State and friendly relations with foreign States.
3. Section 6 of SEZ Act states that areas falling within the SEZ may be demarcated as:
 - a. the processing area for setting up Units for activities such as manufacture of goods, or rendering services;
 - b. the area exclusively for trading or warehousing purposes; or
 - c. the non-processing areas for activities other than those specified under clause (a) and (b)
4. Any goods or services exported, imported or procured from the domestic tariff area by a unit in the SEZ or the developer is exempted from the payment of taxes, duties or cess.
5. According to section 17 (page 20) of the Act, the application for setting up and operation of an Offshore banking unit in a SEZ may be made to the Reserve Bank.
6. The SEZ can be deemed to be a port, inland container depot, land station and land customs station as per notification of Central Government under section 7 of the Customs Act, 1962.
7. The Modifications to the Income Tax Act, 1961; Insurance Act, 1938; banking Regulation Act, 1949; the Indian Stamp Act, 1899 applicable to the SEZ are given in the Act.
8. For computation of total income of an assessee, a deduction of the following is allowed:
 - a. Hundred % of profits and gains derived from exports for a period of first five years
 - b. Fifty % of profits and gains derived from exports for further five assessment years and thereafter
 - c. An amount upto fifty % of the profits shall be credited to a Reserve Account for the next five consecutive assessment years for the purpose of acquiring plant and machinery or for creation of any asset.

6.4.3.1. Minimum land area requirements for setting up of SEZ

- **Area of the SEZ:** As per the amendment (12th August, 2013) of SEZ rules (2006), to address the problem of aggregating large tracts of uncultivable land for setting up SEZs, while conforming to vacancy and contiguity norms, the minimum land area requirements for setting up of SEZ in various categories has been reduced by half. This is also aimed at permitting optimum utilization of land by the existing SEZs.
- **Multi-product SEZ:** can be established with minimum land area of 500 hectares instead of 1,000 hectares. Similarly, a sector specific SEZ can be set-up with a minimum land area requirements of 50 hectares instead of 100 hectares.
- **Agro Sector:** In order to encourage agro-based industries in SEZs, a new sector 'agro-based food processing' sector has been introduced. A sector specific SEZ would require a minimum land area of 10 hectares.

- **IT /ITES Sector:** No minimum land area requirement for IT/ITES SEZs is prescribed, but these will have to conform to a minimum built up area requirement.
 - The minimum built up area requirement of 1,00,000 square meters will now be insisted upon for seven major cities viz: Mumbai, Delhi (NCR), Chennai, Hyderabad, Bangalore, Pune and Kolkata,
 - For the other set of Category B cities 50,000 square meters norm will be applicable and
 - For the remaining cities / locations 25,000 square meters of minimum built up area will be insisted upon.

6.4.4. Schemes for cluster development under Ministries

The schemes proposed for promotion of cluster/ park development by respective Ministries till the fiscal year of 2013 are as mentioned below; however any other latest scheme and the policy shall be referred while planning.

Table 6.2: Schemes proposed for promotion of Cluster/ Park Development

Sr. No.	Ministry	Department	Scheme / Policies	Implementation/Approval Year
1.	Ministry of Chemicals and Fertilisers	Department of Chemicals and Petrochemicals	Policy Resolution for Promotion of Petroleum, Chemicals and Petrochemical Investment Regions	2007
2.	Ministry of Communications and Information Technology (MoCIT)	Department of Electronics and Information technology	Software Technology Parks	1991
3.	MoCIT	Department of Electronics and Information Technology	Electronics Hardware Technology Park/ Export Oriented Unit Scheme	--
4.	Ministry of Food Processing Industries		Mega Food Parks Scheme	--
5.	Ministry of Commerce and Industry	Department of Industrial policy and promotion	Mega Leather Cluster Scheme	2012
6.	Ministry of Micro, Small and Medium Enterprises		Micro and Small Enterprises Cluster Development Programme	2007 (Renamed)
7.	Ministry of Textiles		Modified Comprehensive Power loom Cluster Development Scheme	2013
8.	Ministry of Textiles		Comprehensive Handloom Cluster Development Scheme	2008

Sr. No.	Ministry	Department	Scheme / Policies	Implementation/Approval Year
9.	Ministry of Textiles		Comprehensive handicraft Cluster Development Scheme	2008
10	Ministry of Textiles		Scheme for Integrated Textile parks	2005

Source: Ministry websites

6.4.5. Provisions for Micro Small and Medium Enterprises (MSME)

MSME sector's contribution to Indian economy is considerable with 4 percent share of GDP and largest employment provider after agriculture. Micro, Small & Medium Enterprises (MSMED) Act, 2006 defines Micro Enterprises, Small Enterprises, and Medium Enterprises for the Manufacturing Sector and service sector. About 21 items are reserved for manufacturing under Small Scale Industries. The MSME as defined by the Act are:

Table 6.3: Micro, Small and Medium Enterprises Classification

For the Manufacturing Sector	
Enterprises	Investment in plant & machinery
Micro Enterprises	Does not exceed Rs. 25 lakh
Small Enterprises	More than Rs. 25 lakh but does not exceed Rs. 5 crore
Medium Enterprises	More than Rs. 5 crore but does not exceed Rs. 10 crore
For the Service Sector	
Enterprises	Investment in plant & machinery
Micro Enterprises	Does not exceed Rs. 10 lakh
Small Enterprises	More than Rs. 10 lakh but does not exceed Rs. 2 crore
Medium Enterprises	More than Rs. 2 crore but does not exceed Rs. 5 crore

Source: Micro, Small and Medium Enterprises Development (MSMED) Act, 2006.

The details of the Micro, Small & Medium Enterprises (MSMED) Act, 2006 are appendices in Appendix 'O' of Volume II B.

6.4.5.1. Inter-Ministerial Committee for Accelerating Manufacturing in Micro, Small & Medium Enterprises Sector, 2013

Ministry of Micro, Small and Medium Enterprises (MoMSME) had constituted 'Inter-Ministerial Committee for Accelerating Manufacturing in Micro, Small & Medium Enterprises Sector' in year 2013 to suggest short and medium term measures for accelerating manufacturing in the MSME sector. Following are few of the recommendations made by the committee:

- **Land:** State governments may urgently streamline and simplify internal processes and allot over 30,000 vacant plots lying vacant in established industrial estates across the country.
- **Mid-sized Industrial Estates:** State governments should urgently identify mid-sized land parcels close to urban areas, which may be developed with public funding, for allotment to MSMEs.
- **Harmonising Urban Plans with Economic Activity:** Ministries of Urban Development, Urban Poverty Alleviation and MSME, backed by sufficient resources may incentivize State governments and local bodies to designate adequate areas for manufacturing and industrial activity in the urban centres or emerging urban areas.

6.4.5.2. Prime Minister's Task Force on Micro, Small and Medium Enterprises, 2010

The said task force was constituted to consider various issues raised by the Association of MSMEs. After stakeholders' consultation to overcome the issues raised by MSME sector following recommendations were made by the Task Force:

- For new industrial parks/areas being developed under various programmes of different Ministries, where there is no specific provision for locating Micro and Small Enterprises (MSEs), it may be made mandatory to earmark at least 40-45% (preferably 60%) of available land for MSEs. It was advised that all Ministries/Departments shall take action regarding it within 3 months.
- Local bodies may be encouraged to set aside substantial part of the collections derived from industrial estates, to upgrade infrastructure such as roads, drainage, sewage, power distribution, water supply distribution, etc. for the existing industrial estates. Alternatively, industrial estates could be notified as separate local bodies as envisaged in the Constitution and entrusted with municipal functions that shall include levy of taxes, responsibility to maintain the infrastructure within the Industrial Estate, etc.
- Flatted Factory Complexes may be set up, particularly in and around large cities for MSEs on PPP mode. On similar lines, dormitories for industrial workers in industrial estates may be set up.
- Encourage setting up/earmarking of at least one industrial estate in each block for MSEs. Wherever possible, private sector participation may be encouraged.

6.4.5.3. Micro & Small Enterprises - Cluster Development Programme (MSE-CDP)

The Ministry of Micro, Small and Medium Enterprises (MSME), Government of India (GoI) has adopted the 'Cluster Development Approach' as a key strategy for enhancing the productivity and competitiveness as well as capacity building of Micro and Small Enterprises (MSEs) and their collectives in the country.

The essential characteristics of enterprises in a cluster are:

- a. Similarity or complementarity in the methods of production, quality control and testing, energy consumption, pollution control, etc.
- b. Similar level of technology and marketing strategies/practices
- c. Channels for communication among the members of the cluster
- d. Common challenges and opportunities.

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7 Other National Level – Legal Requirements

7.1. National Heritage Conservation

The sections of the Ancient Monuments and Archaeological Sites and Remains Act, 2010, which have relevance to the preparation of Regional, or Urban Development Plans and their implementation have been provided in the URDPFI Guidelines for reference.

7.1.1. The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010

The Ancient Monuments and Archaeological Sites and Remains Act, 1958 was amended in 2010. This Act provides prohibited and restricted areas around protected monuments as a buffer in which construction activities are prohibited and restricted. According to the Act prohibited and restricted areas are defined as follow:

As per the section 20 A of the Act, **Prohibited Areas:** Every area, beginning at the limit of the protected area or the protected monument, as the case may be, and extending to a distance of one hundred meters in all directions shall be the prohibited area. Government of India can specify an area even more than hundred meters. Construction activities in such areas are prohibited.

Section 20 B defines **Regulated Area:** Every area, beginning at the limit of the prohibited area in respect of ever ancient monument and archaeological site and remains, declared as of national importance, extending to a distance of two hundred meters in all directions shall be the regulated area in respect of such protected area or protected monument. Government of India can specify an area even more than two hundred meters. Construction activities in such areas are regulated.

The said Act in section 20 F provides for the constitution of National Monuments Authority, by Central Government through notification in the Official Gazette. Some of the functions granted to the Authority are:

- To make recommendations to the Central Government for grading and classifying protected monuments and protected areas,
- To consider the impact of large-scale developmental projects, including public projects and projects essential to the public which may be proposed in the regulated area.

The details of The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 are appended in Appendix O of Volume II B.

7.2. National Environmental Legal Requirements

The key National level environmental legal requirements, which have relevance to planning and implementation, are briefly explained in this section. These are:

- Environment Impact Assessment Notification 2006,
- Environment Protection Act, 1986,
- Forest Conservation Act, 1980,
- Coastal Regulation Zone, 2011
- Eco-Sensitive Zone

7.2.1. Environment Impact Assessment Notification 2006

Considering recent developments, and to ensure that the economic growth and development in our country is in conformity with regulations for environmental conservation, the Ministry of Environment & Forests has notified the Environmental Impact Assessment Notification, 2006. The environmental clearance (EC) process under implementation prior to 2006 highlighted the need to introduce specific processes /categories/ activities and also the need for new sectors such as coal washery to be brought in the ambit of the EC process due to their extent of impact on environment. The EIA Notification 2006 has notified 39 developmental sectors which require prior EC.

The MoEF has prepared EIA guidelines on each sector as identified by EIA notification 2006, which elaborates the procedure and mandatory requirements of EIA with respect to the sector. For example Manual on norms and standards for environment clearance of large construction projects has been prepared by MoEF to assist developers and project proponents' measure and quantify environmental impacts of proposed construction, and derive mitigation options to minimise impacts.

EIA is an exercise to be carried out before any project or major activity is undertaken to ensure that it will not in any way harm the environment on a short term or long term basis. Any developmental endeavour requires not only the analysis of the need of such a project, the monetary costs and benefits involved but most important, it requires a consideration and detailed assessment of the effect of a proposed development on the environment. EIA should provide information to decision makers at early stage of the project planning cycle. It should be initiated as early as possible before the commencement of projects. If the projects secure approval, EIA should include a provision to cover the audit of the project. Following is the general list of projects that require Environmental clearance from the central government:

- Nuclear Power and related projects such as heavy water plants, nuclear fuel complex, rare earths.

- River Valley projects including hydel power, major irrigation & their combination including flood control.
- Ports, Harbours, Airports (except minor ports and harbours).
- Petroleum Refineries including crude and product pipelines.
- Chemical Fertilizers.
- Pesticides.
- Petrochemical complexes.
- Bulk drugs and pharmaceuticals.
- Exploration for oil and gas and their production, transportation and storage.
- Synthetic Rubber.
- Asbestos and Asbestos products.
- Hydrocyanic acid and its derivatives.
- (a) Primary metallurgical industries, (b) Electric arc furnaces (Mini Steel Plants).
- Chlor alkali industry.
- Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints.
- Viscose staple fibre and filament yarn.
- Storage batteries integrated with manufacture of oxides of lead and lead antimony alloys.
- All tourism projects between 200m—500 metres of High Water Line and at locations with an elevation of more than 1000 metres with investment of more than Rs.5 crore.
- Thermal Power Plants.
- Mining projects with leases more than 5 hectares.
- Highway Projects.
- Tarred Roads in the Himalayas and or Forest areas.
- Distilleries.
- Raw Skins and Hides.
- Pulp, paper and newsprint.
- Dyes.
- Cement.
- Foundries (individual)
- Electroplating
- Meta amino phenol

7.2.2. Environment Protection Act, 1986

The Environment Protection Act, 1986 (EPA) has notified various rules under EPA for protecting the environment which are mentioned below:

- The Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organism Genetically Engineered Organism or Cells Rules, 1989
- The Hazardous Wastes (Management and Handling) Rules, 1989
- The Manufacture, Storage and Import of Hazardous Chemicals Rule, 1989

- Scheme of Labeling of Environment Friendly Products (ECO-MARK)
- Restricting certain activities in special Specified area of Aravalli Range
- The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
- The Bio -Medical Waste (Management and Handling) Rules, 1998,
- The Recycled Plastics Manufacture and Usage Rules,1999
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- The Noise Pollution (Regulation and Control) Rules, 2000
- The Ozone Depleting Substances (Regulation) Rules, 2000
- The Batteries (Management and Handling) Rules, 2001

Along with the above rules as identified in EPA 1986, The Air (Prevention and Control of Pollution) Act, 1981 and the Noise-Pollution (Regulation and Control) 2000 shall also be referred to formulate norms and standards while preparing development plan for a city. The various statutory obligations for different clearances are mentioned in table below:

Table 7.1: Statutory Obligations of Environment Clearances

Type of Clearances	Statutory obligations
Environment Clearances	As per EIA notification, 2006
Forest Clearances	As per Forest Conservation Act, 1980
GEAC Clearances	Rules for Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells 1989, under EPA 1986
GEAC Clearances	Rules for Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells 1989, under EPA 1986

The Act may be referred from the web URL provided in Appendix O, Volume II B.

7.2.3. Forest Conservation Act, 1980

With the rising rate of deforestation and the resulting environmental degradation, the Central Government enacted the forest (conservation) Act in 1980. The Act prohibits the deletion of a reserved forest or the diversion of forestland for any non-forest purpose, and prevents the cutting of trees in a forest without the prior approval of the Central government. The salient features of the act are given below:

- This Act has five Sections which deal with conservation of forests.
- The Act was enacted with the twin objectives under Section 2 of restricting the use of forest land for non-forest purposes, and preventing the de-reservation of forests that have been reserved under the Indian Forest Act, 1927. However, in 1988 the Act was further amended to include two new provisions under Section 2, where it sought to restrict leasing of forest land to private individuals, authority, corporations not owned by the Government, and to prevent clear felling of naturally grown trees.

- The Act empowers the Central Government to constitute a committee to advise the Government with a grant of approval under Section 2, as also on any other matter connected with the conservation of forest and referred to it by the Central Government.
- The Act provides for the punishment of imprisonment, extendable to fifteen days for the contravention of the provisions of the Act.
- The Act provides for punishment of offenders from the Government Departments, including Head of the Departments and authorities.

The Act can be referred from the web URL provided in Appendix O, Volume II B.

7.2.4. Coastal Regulation Zone, 2011

Central Government declared the following areas as CRZ and imposed restrictions on the setting up and expansion of industries, operations or processes and the like in the CRZ through the Coastal Regulation Zone Notification, 2011:

- The land area from High Tide Line (HTL means the line on the land up to which the highest water line reaches during the spring tide) to 500 meters on the landward side along the sea front.
- CRZ shall apply to the land area between HTL to 100 meters or width of the creek whichever is less on the landward side along the tidal influenced water bodies that are connected to the sea and the distance upto which development along such tidal influenced water bodies is to be regulated shall be governed by the distance up to which the tidal effects are experienced which shall be determined based on salinity concentration of 5 Parts Per Thousand (ppt) measured during the driest period of the year and distance upto which tidal effects are experienced shall be clearly identified and demarcated accordingly in the Coastal Zone Management Plans (CZMPs).
- The land area falling between the hazard line and 500 meters from HTL on the landward side, in case of seafront and between the hazard line and 100 meters line in case of tidal influenced water body the word 'hazard line' denotes the line demarcated by Ministry of Environment and Forests (MoEF) through the Survey of India (SoI) taking into account tides, waves, sea level rise and shoreline changes.
- Land area between HTL and Low Tide Line (LTL) is termed as the intertidal zone.
- The water and the bed area between the LTL to the territorial water limit (12 Nm) in case of sea. The water and the bed area between LTL at the bank to the LTL on the opposite side of the bank, of tidal influenced water bodies.

The following activities have been declared prohibited under the CRZ notifications:

- i. Setting up of new industries and expansion of existing industries with some exception,
- ii. Manufacture or handling oil storage or disposal of hazardous substance, with some exception,

- iii. Setting up and expansion of fish processing units including warehousing except hatchery and natural fish drying in permitted areas
- iv. Land reclamation, bunding or disturbing the natural course of seawater with some exception,
- v. Setting up and expansion of units or mechanism for disposal of wastes and effluents with some exception,
- vi. Discharge of untreated waste and effluents from industries, cities or towns and other human settlements. The concerned authorities shall implement schemes for phasing out existing discharge of this nature, if any, within a time period not exceeding two years from the date of issue of this notification.
- vii. Dumping of city or town wastes including construction debris, industrial solid waste, fly schemes for phasing out any existing practice, if any, shall be phased out within a period of one year from date of commencement of this notification.
- viii. Port and harbour projects in high eroding stretches of the coast, except those projects classified as strategic and defence related in terms of EIA notification, 2006 identified by MoEF based on scientific studies and in consultation with the State Government or the Union territory Administration.
- ix. Reclamation for commercial purposes such as shopping and housing complexes, hotels and entertainment activities.
- x. Mining of sand, rocks and other sub-strata materials.
- xi. Drawl of groundwater and construction related thereto, within 200mts of HTL; with some exception.

(Source: Coastal Regulation Zone Notification; 6thJanuary, 2011)

7.2.5. Eco-Sensitive Zones

Wild Life Protection Act, 1972 gave provision for the creation of National Parks, Sanctuaries and Closed Area. Further, for the purpose of buffers around these protected areas as shock absorber, Eco-sensitive Zones were declared. Eco-sensitive Zones would also act as transition zone from areas of high protection to areas involving lesser protection. The activities in the eco-sensitive zones are regulatory in nature rather than prohibitive nature.

By the time this guideline was declared, many of the protected areas had undergone tremendous development in close vicinity to their boundaries. Therefore, defining the extent of Eco-sensitive zone around protected areas was kept flexible and protected area specific.

The width of Eco-sensitive Zone and type of regulations differ from one protected area to another. However, as a general principle the width of the Eco-sensitive Zone could go up to 10 kms around a Protected Area as provided in the Wildlife Conservation Strategy, 2002. In case where sensitive corridors, connectivity and ecologically important patches, crucial for landscape linkage, are even beyond 10Kms

width; these should be included in the Eco-sensitive Zone. Further, in context of a particular protected area, the distribution of an area of Eco-sensitive Zone and the extent of regulation may not be uniform all around and it could be of variable width and extent.

Table 7.2: Activities Prohibited, Regulated or Permitted in Eco-sensitive Zone

S.No.	Activity	Prohibited	Regulated	Permitted	Remarks
1	Commercial Mining	Y			Regulation will not prohibit the digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing for personal consumption
2	Felling of tress		Y		With permission from appropriate authority
3	Setting of saw mills	Y			
4	Setting of industries causing pollution (Water, Air, Soil, Noise, etc.	Y			
5	Establishment of hotels and resorts		Y		As per approved master plan, which takes care of habitats allowing no restriction on movement of wild animals
6	Commercial Use of fire wood	Y			For hotels and other business related establishment
7	Drastic change of agriculture systems		Y		
8	Commercial use of natural water resources including ground water harvesting		Y		As per approved master plan, which takes care of habitats allowing no restriction on movement of wild animals
9	Establishment of major hydroelectric projects	Y			Promote underground cabling
10	Erection of electrical cables		Y		
11	Ongoing agriculture and horticulture practices by local communities			Y	However, excessive expansion of some of these activities should be regulated as per the master plan
12	Rain water harvesting			Y	Should be actively promoted
13	Fencing of premises of hotels and lodges		Y		
14	Organic farming			Y	Should be actively promoted
15	Use of polythene bags by shopkeepers		Y		
16	Use of renewable energy sources			Y	Should be actively promoted
17	Widening of roads		Y		This should be done with proper EIA and mitigation measures
18	Movement of vehicular		Y		For commercial purpose

Other National Level- Legal Requirements

S.No.	Activity	Prohibited	Regulated	Permitted	Remarks
	traffic at night				
19	Introduction of exotic species		Y		
20	Use or production of any hazardous substances	Y			
21	Undertaking activities related to tourism like over flying the national park area by any aircraft, hot air balloons	Y			
22	Protection of hill slopes and river banks		Y		As per the master plan
23	Discharge of effluents and solid waste in natural water bodies or terrestrial area	Y			
24	Air and vehicular pollution		Y		
25	Sign boards and hoardings		Y		As per the master plan
26	Adoption of green technology for all activities			Y	Should be actively promoted

Source: Guidelines for the Declaration of Eco-sensitive Zones around National Parks and Wildlife Sanctuaries; dated 9th February, 2011

7.3. Cantonment Act, 2006

Following provisions of The Cantonment Act, 2006 have been identified by URDPFI guidelines that have relevance to the preparation of Regional or Urban Development Plans and their implementation. The detailed Act can be referred from Appendix O of Volume II B.

1. The Central Government can declare any place or places along with boundaries in which the Forces is quartered or which is required for the service of such forces, to be a cantonment and can also declare that any such area shall cease to be a cantonment, by notification in the Official Gazette.
2. The Central Government can define the limits of any cantonment for the aforesaid purposes, by a like notification.
3. The Central Government can, by notification in the Official Gazette, direct that in any place declared a cantonment under this Act, the provisions of any enactment relating to local self-government other than this Act shall have effect only to such extent, as may be specified in the notification.

For the alteration of limits of cantonments, The Contentment Act, 2006, prescribes:

4. The Central Government can declare to include or to exclude the cantonment any local area, by notification in the Official Gazette.

5. Any inhabitant of a cantonment or local area in respect of which notification has been published under subsection (1) may, within eight weeks from the date of notification, submit in writing to the Central Government through the General Officer Commanding-in-Chief, the Command, an objection to the notification, and the Central Government shall take such objection into consideration.
6. The Central Government considers the objections which have been submitted, after the expiry of eight weeks from the date of the notification, by notification in the Official Gazette, include or exclude the local area in respect of which the notification was published or any part thereof, in the cantonment.

**URBAN AND REGIONAL DEVELOPMENT PLANS
FORMULATION AND IMPLEMENTATION
(URDPFI) GUIDELINES**

Volume II B

Appendices to URDPFI Guidelines, 2014

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1 Appendix A – Making of the Guidelines

1.1. Background and Objective

The first National level planning guidelines ‘The Urban Development Plans Formulations and Implementation Guidelines’ (UDPFI) were framed in 1996. Since then, many changes have taken place in the field of urban development especially in view of emerging needs and requirements of urban settlements due to rapid population growth and other reasons like globalization and liberalization. The towns and cities have been more dynamic in nature and are subject to unprecedented changes in terms of requirements of infrastructure and other basic services/amenities. Besides, new emerging aspects like inclusive planning, sustainable habitat, land use and transport integration at planning stage, preparation of Comprehensive Mobility Plans (CMP) for urban transport, Service Level Benchmarks, disaster management, environmentally sustainable transport and urban reforms have given a new dimension to the planning process. Therefore, it necessitated to revisit the UDPFI Guidelines, 1996.

The Ministry of Urban Development (MoUD), through the standard tendering procedures, awarded the task to revise the guidelines to Mott MacDonald (referred to as Consultant) in August 2013. The time frame was 9 months. The objective was to revise ‘The Urban Development Plans Formulation & Implementation (UDPFI) Guidelines, 1996’ and formulate-

“The Urban and Regional Development Plans Formulation & Implementation (URDPFI) Guidelines, 2014”

1.2. Terms of Reference (ToR)

Ministry of Urban Development proposed to formulate the URDPFI Guidelines, 2014 to accommodate the future needs of the ever growing population coupled with urbanization with the following Terms of Reference (ToR):

- Review the UDPFI Guidelines, 1996, revise and prepare the URDPFI guidelines;
- Undertake stakeholder consultation with all relevant stakeholders;
- Consult key Ministries and the Planning Commission, NCRPB, MMRDA and other relevant State and Central Ministries, Bodies or Authorities;
- Study relevant Central and State Laws , rules and regulations;
- Address to the data available with *BHUVAN*, ISRO, NESAC, NUIS Census 2001 and 2011, Survey of India and GIS database of NIC;
- Integration of different types of plans;
- Identify the gaps where new set of norms and standards for plan formulation are required;
- Suggest a clear-cut framework for plan formulation in view of the emerging scenario of the country’s urbanization and overall vision;
- Suggest the new set of norms and standards, zoning regulations including integrated development of peri-urban areas which are easily comprehensible and user-friendly;
- Suggest framework and standards, for transit oriented development, affordable housing projects and slum redevelopment and incorporate principles of inclusive development;
- Suggest set of norms and standards for land use and transport integration at planning stage itself, integration of CMP with the master plan of the planning area;
- Suggest planning, regulatory and enforcement mechanisms for effectively dealing with challenges of urbanization;
- Suggest set of norms and standards for earthquake prone areas, environmentally fragile zones such as CRZ areas and hazard prone areas etc.;

- Suggest mechanism for improving economic opportunities of cities;
- Include framework for Crisis/Disaster Management Plans as part of Development Plan;
- Suggest mechanism and avenues for participatory planning; and
- Suggest various resource mobilization options and institutional supporting systems for urban development.
- Assess the Legal Implications and framework for plan preparation, monitoring and impact assessment of the Master Plans.
- Evolve participatory plan approach including planning at ULBs, planning for peri-urban areas and provide for integration between different levels of plan.

1.3. Scope of Work (SOW)

While formulating the URDPFI Guidelines, 2014 the following issues was to be focussed upon as was indicated by the MoUD:

1. The service level benchmarks developed by the MoUD.
2. A broad based consultation process by developing a discussion portal and disseminating the Guidelines in regional language.
3. Integration between different levels of plans including integration of City Development Plan and Comprehensive Mobility Plan (CMP) with statutory Master Plan.
4. Integrated land use transport planning with priority to public transport and non-motorised transport.
5. A separate volume on legal aspects.
6. Need for assessing the impact of the plan on growth, employment etc. in a quantifiable manner to make it more acceptable to various stakeholders.
7. A separate chapter should be included on redevelopment of inner city areas as well the city as a whole, with densification along mass transit corridors.
8. A separate Chapter on Urban Transport Impact Assessment for different land use scenarios in terms of overall travel demand, average trip length Maximum time of travel by public transport (for 80% of the trips) in peak time.
9. Guidelines for regional planning including for interstate region that would require cross cutting interventions from zonal administration.
10. Norms and standards for earthquake prone areas, environmentally fragile zones such as CRZ areas and hazard prone areas etc.
11. Framework to make Crisis/Disaster Management Plans a part of Development Plan.
12. Use of GIS technologies for plan formulation including integration with *Bhuvan* and Google Map etc.
13. Dovetailing the guidelines with various statutory provisions as also the recommendations of 2nd Administrative Reforms Commission and the Working Group on Urban Planning.
14. Measures to tackle the problems arising out of the transition of rural areas into peri urban and urban areas.
15. Include guidelines for special purpose cities, industrial towns, smart cities, port cities, sport cities, heritage cities, medicities, IT corridors, corridor (main and subsidiary), SEZ, Hi tech cities, greenfield towns, hill towns etc.
16. Focus on land suitability and urban renewal norms.
17. One National Workshop and three Regional Workshops to be organized with at least one workshop in the eastern region with State T&CP Department, Urban Development Department, Transport Department, Traffic Police, Development Authorities, UMTAs and Local Bodies.
18. Links with the National Building Code and parameter under National Mission for Sustainable Habitat.
19. Include plans for water, sanitation and drainage.

20. Principles for determination of the costs (capital & recurring) to implement the different aspects of the plan along with specific measures to meet such costs.
21. Uniform/ standardisation of colour code
22. Framework for implementation of the plan, including governance of the same.
23. Ultimately, the URDPFI guidelines should culminate in a responsive planning system.

1.4. Deliverables

The project was delivered in six stages as tabulated below:

Table 1.1: Deliverables of the project

Stages	Description	Deliverables
Stage I- Inception	Finalization of road map for completion of the project	Inception Report
Stage II- Review	Review of UDPFII Guidelines, 1996 and Gap Identification	Report on reviews of existing UDPFII guidelines, 1996
Stage III- Consultation	Regional Workshops	Recommendations of regional workshops at major cities
Stage IV- Draft	Framing of new guidelines, including the legal document	Revised UDPFII Guidelines – Draft Stage
Stage V- National workshop	National Workshop to deliberate on the first Draft Report	Report of recommendations in the Workshop
Stage VI- Final	Incorporation of the final recommendations	Final Report- UDPFII Guidelines, 2013

Source: Terms of reference of the project

1.5. Approach and Methodology for the Revision Study

1.5.1. Approach

With the vision to encompass and provide for the holistic urban and regional development for the entire land cover of India, the approach followed in the formulation of URDPFI Guidelines, 2014 comprised of a participatory consultation of the various stakeholders through the following pathways, viz:

- 1) Formulation of Technical Core Group (TCG):** TCG was formed by MoUD for this revision. The consultant held periodic interactions with the TCG members formally and informally for getting inputs. The role of TCG members included:
 - Co-ordination with the consultant on technical aspects
 - Technical inputs & area specific recommendations
 - Review the consultant's work at various stages
 - Guide & support - data collection, stakeholder consultation and workshops
- 2) Google Discussion Group:** An online group was facilitated by TCPO which allowed interface of various planners and practitioners for the following:
 - Technical inputs & area specific recommendations
 - Sharing of information
 - Technical feedback & interaction
- 3) Monthly Review Meetings with MoUD:** Monthly review meetings were held by MoUD for the consultant to appraise the progress of the project and highlight the key issues for inclusion in the guidelines.

4) **Key Consultations:** The foremost criteria adopted in provisions of the URDPFI guidelines, 2014 were to make them in concomitance with the provisions of the Policies/ Guidelines/ Acts/ Bills of various other Ministries and Departments.

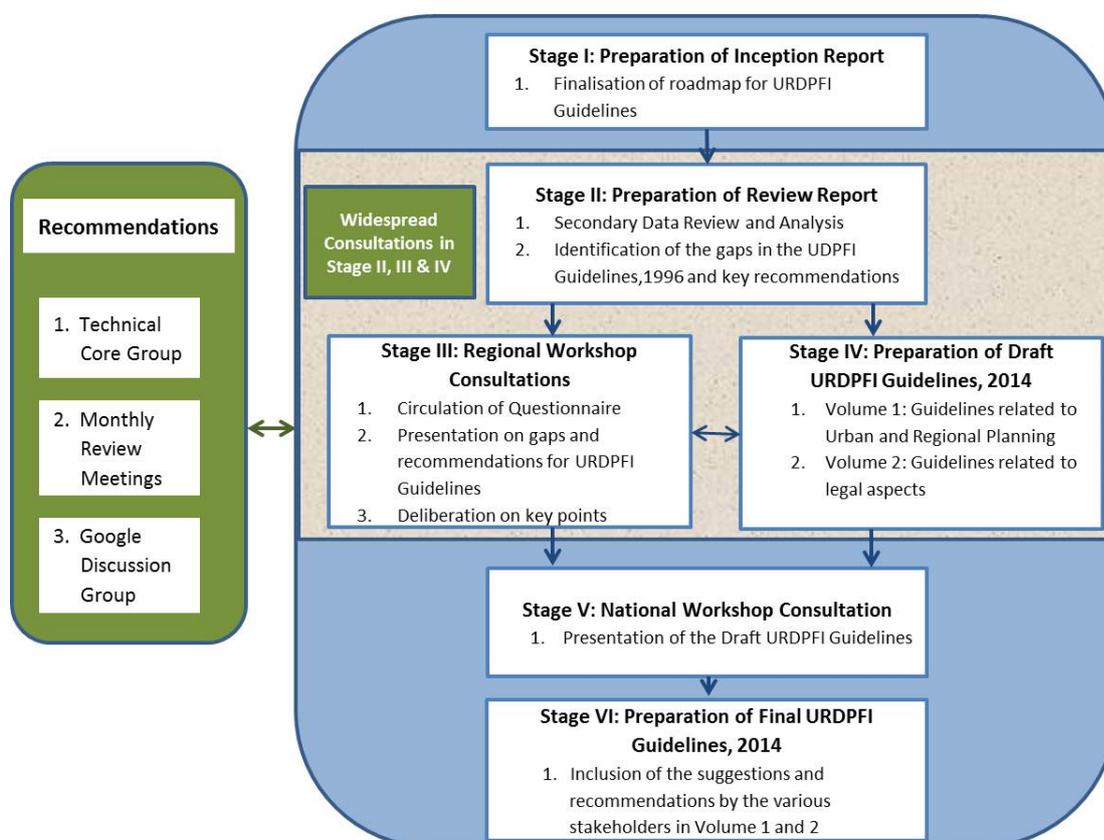
5) **Regional workshops and National Consultative meeting:** A total of five Regional workshops were conducted to invite comments from all the 35 States and Union Territories of India. Regional workshops were organised wherein the planning aspects varying across States were discussed and approach to planning in future was directed. Regional workshops were held at Panchkula, Mysore, Goa, Guwahati and Bhubaneswar. The National Consultative meeting was organised in New Delhi on the 4th of April 2014 to deliberate on the aspects of the guidelines to holistically consult with National and State level stakeholders.

All the key suggestions, comments and provisions obtained from the legal documents, authentic reference and the consultations held have been comprehensively incorporated in the URDPFI Guidelines, 2014 amongst other inclusions upon appraisal at various stages.

1.5.2. Methodology

The methodology adopted for formulation of the guidelines is described in the figure below:

Figure 1.1: Methodology of preparation of URDPFI Guidelines, 2014



Source: MM

1.5.2.1. Stage I - Inception

The Inception stage comprised of brainstorming sessions for finalisation of road map of URDPFI Guidelines and a kick off meeting with the MoUD. The major aspects covered in the inception study/report were:

- Finalisation of methodology and work plan.
- Framework and locations for regional workshop,
- List of stakeholders to be consulted including Ministries & Departments, ULBs, Experts and Institutes and issue of authorisation letter,
- Suggestions on data to be referred.
- Selection of the State Town & Country Planning Acts, cities for case studies
- Formation of the Technical Core Group as suggested by the consultant.
- Discussion on the overall National consultation framework and stakeholders & set up of “Google Discussion Group”.

1.5.2.2. Stage II - Review & Analysis

The second stage undertook secondary data review & analysis of the UDPI guidelines, 1996. During this stage the stakeholder consultations were initiated which followed through the Stages III and IV.

Secondary Data Review: The secondary data of various Ministries, Departments, Institutions and Professional Bodies uploaded on websites such as of Planning Commission; Ministry of Urban Development; Ministry of Drinking Water Supply and Sanitation; Ministry of Environment and Forests; Department of Land Resources, Ministry of Rural Development, etc. and various City Master/ Development Plans were identified for review and analysis. Some of the important references included - Report of the Working Group on Urban Strategic Planning, Twelfth Five Year Plan, Public Private Partnership Toolkit of ADB and MoUD, JNNURM CDP Toolkit, The Land Acquisition, Rehabilitation and Resettlement Act, 2013, Handbook on Service Level Benchmarking, National Urban Sanitation Policy, NDMA Guidelines for Disaster Management, State Town and Country Planning Acts of Tamil Nadu, Karnataka, Himachal Pradesh, Mizoram, Bihar, Maharashtra and Gujarat, The Kerala Town and Country Planning Ordinance, 2013 etc.

Based on the secondary data review, analysis and consultations; the gaps in the UDPI guidelines, 1996 were identified. As an output of analysis, the recommendations for formulation of URDPFI guidelines were listed. The gaps and updations were finalised in close consultation with the TCG and MoUD.

Stakeholder consultations: After secondary data review, consultations were through telephonic conversation/ email/ face to face meetings. This undertook in depth interview and assisted in crystallisation of the vision of the URDPFI guidelines. The major consultations corresponding to the information obtained were:

Table 1.2: Major Stakeholder Consultations and Key Inputs (in addition to MoUD)

Sr. No.	Particulars	Consultations
1.	Planning Process	a) Planning Commission b) Registrar General of India c) Survey of India (Sol) d) Town and Country Planning Organisation, Delhi (TCPO) e) Ahmedabad Urban Development Authority (AUDA) f) Delhi Development Authority (DDA) g) Association of Municipalities and Development Authorities (AMDA) h) Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

Sr. No.	Particulars	Consultations
		i) School of Planning & Architecture, Delhi (SPA, Delhi)
2.	Urban Planning Approach	a) Ministry of Shipping b) Ministry of Tourism Indian Green Building Council (IGBC) c) Directorate General of Defence Estates d) Delhi Urban Arts Commission (DUAC) e) Institute of Town Planners (ITP) f) EMBARQ, India g) Hyderabad Metropolitan Development Authority (HMDA)
3.	Regional Planning	a) Delhi Mumbai Industrial Corridor Development Corporation (DMICDC) b) Mumbai Metropolitan Region Development Authority (MMRDA) c) National Capital Regional Planning Board (NCRPB) d) Urban Development & Urban Housing Department, Government of Gujarat e) Town and Country Planning Department, Goa f) Town and Country Planning Department, Kerala g) School of Planning & Architecture, Delhi (SPA, Delhi)
4.	Sustainability & Disaster Management	a) Ministry of Environment and Forests (MoEF) b) Central Pollution Control Board (CPCB) c) National Disaster Management Authority (NDMA) d) National Institute of Disaster Management (NIDM) e) Indian Green Building Council (IGBC)
5.	Planning Techniques	a) Geological Survey of India (GIS) b) National Remote Sensing Centre (NRSC) c) National Urban Information System (NUIS) d) Survey of India (SoI) e) Hyderabad Metropolitan Development Authority (HMDA) for GIS mapping
6.	Transport Planning	a) Ministry of Road Transport and Highways (MoRTH) b) Central Road Research Institute (CRRI) c) Institute of Urban Transport (IUT) d) Airport Authority of India (AAI) e) Indian Institute of Technology, Delhi (IIT- Delhi) f) School of Planning & Architecture, Delhi (SPA, Delhi) g) Centre for Environment Planning and Technology (CEPT)
7.	Water, Drainage, Waste Management & Social Infrastructure Planning	a) Ministry of Water and Sanitation b) Central Ground Water Board c) Central Public Health & Environmental Engineering Organisation (CPHEEO) d) Bureau of Indian Standards (BIS)
8.	Development Promotion Regulation	a) Bureau of Indian Standards (BIS) b) Ministry of Social Justice and Empowerment c) Airport Authority of India (AAI)
9.	Resource Mobilisation	a) Ministry of Rural Development b) Town and Country Planning Organisation, Delhi (TCPO) c) Centre for Good Governance d) Delhi Development Authority (DDA)

An exhaustive contact list is given in Section 1.7, Table A.7.

1.5.2.3. Stage III – Regional Workshop Consultation

The preparation of the Draft URDPFI Guidelines and organisation of Regional Workshops at five locations were held. The agenda of the regional workshop consultations were:

- Learning from State specific best practices and planning innovations

- Identification of the sources to bridge data gaps
- Sharing of guidelines/ policies and other data

The agenda was attained by a three step procedure followed in the workshops:

- a) Circulation of questionnaire:** the questionnaire consisting section on information sharing and data sharing was circulated in advance to the identified stakeholders for receiving their comments
- b) Presentation:** presentation of the identification of gaps in UDPFI guidelines, 1996 and major recommendations for the URDPFI Guidelines, 2014
- c) Deliberations on key points**

During the workshops most of the States responded to the questionnaire circulated and provided database for reference. Alongwith this, some States gave presentations on chosen best practices such as Planning in Hilly Areas by Shimla, Himachal Pradesh; Regional planning process by Goa, Plan preparation process by Kerala, Village level planning in Rajasthan etc. The Regional Workshops provided a good platform for communication of URDPFI vision and dovetailing the expectations of the various stakeholders and also getting inputs on best practices.

States and UTs of Andhra Pradesh, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Puducherry, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, Goa, Sikkim, Tripura, Odisha shared comments on UDPFI Guidelines, 1996 and suggestions for the URDPFI Guidelines, 2014 in writing. Ministries including Ministry of Defence, Directorate General of Defence Estates, Ministry of Shipping, Ministry of Railways, Ministry of Rural Development, Ministry of Road, Transport and Highways, Ministry of Water Resources extended great help in the formulation of the Guidelines.

Further suggestions were invited from the States & Institutes on “Google Discussion Group”. Some academic institutions such as Indian Institute of Technology, Kharagpur; School of Planning and Architecture, Vijaywada, College of Engineering, Pune, Department of Architecture and Planning, College of Engineering, Trivandrum shared their comments.

Recommendations from Regional Consultation: At this stage an analysis of the suggestions was made and a concise recommendation report of all the workshops was prepared. The key points from the recommendation report were appropriately addressed in the URDPFI Guidelines upon consultation with MoUD and TCG.

1.5.2.4. Stage IV – Drafting of URDPFI Guidelines

Drafting of Volume I- Guidelines related to Urban and Regional Planning

Based on the inputs from stage I to III and the gaps in the existing UDPFI guidelines, the Draft URDPFI guidelines were prepared containing the following points. In preparation of the guidelines, some of the sections of UDPFI Guidelines were retained which were applicable in the current planning scenario.

- Reclassification of the urban settlements
- Recommended planning system, Planning process including the inter relationships between various plans and their contents
- Resource mobilisation and options for land assembly, fiscal resource mobilisation and institutional set up.
- A separate chapter on Regional Planning including peri-urban area and land use classification
- Revised urban planning approach and planning based on city typologies such as hilly, inner city, industrial, heritage/ religious/ tourism, port, medical and sport cities. An introduction to the

planning aspects of compact city covering TOD and Mixed use, green city/ township and Smart city.

- Inclusion of mandatory aspects of sustainability- sustainable transportation viz a viz landuse planning, disaster management, environment statutory obligations etc.
- Techniques for plan preparation including GIS based planning through use of *Bhuvan* and allied portals.
- Guidelines for assessment of infrastructure demand for the newer kind of integrated developments
- Dovetailing with various statutory provisions including recommendations of 2nd Administrative Reforms Commission, Working Group on Planning, 73rd and 74th CAA.
- A chapter on recommendations and action plan based on rationality.

Drafting of Volume II- Guidelines related to National Level legal aspects

A separate volume on Legal aspects was formulated, especially focussing on:

- Implications of 73rd&74th CAA
- The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013
- Suggestions on the revision of Model Regional and Town Planning and Development Law, 1985 and Model Municipal Law, 2006
- Some of the State level Legal framework were compared to bring out advantages and disadvantages
- Legal requirements for industrial developments
- Other National level legal requirements for heritage and environment conservation

The draft URDPFI guidelines including its chapterisation structure was prepared in consultation with the various stakeholders. Further draft technical sections were shared with respective agencies for their inputs such as NRSC, NDMA, AAI, various departments of SPA, Delhi etc. who confirmed the provisions with reference to their statutory requirements/ key suggestions. The glossary of the reference is given in Appendix A.5.

The draft URDPFI guideline was widely circulated on MoUD website, Google Discussion Group, web links and to all Ministries, inviting comments and suggestions for inclusion/ making modifications in the guidelines. Comments were received from more than 20 sources before and 22 sources after the National Workshop, which were sorted, examined and considered for inclusion.

1.5.2.5. Stage V & Stage VI: National Consultative Meeting and formulation of Final URDPFI Guidelines, 2014

National Consultative was held on 4th April, 2014 in Delhi to have holistic consultation on the Draft Guidelines. Stakeholders for the workshop were finalised in close consultation with MoUD.

Total of 174 participants attended the National Workshop, including the following:

- Ministries participated – Ministry of Water Resources, Ministry of *Panchayati Raj*, Ministry of Shipping, Ministry of Defence
- Participating States & Union Territories (about 16) -Andhra Pradesh (HMDA), Assam, Chandigarh, Chhattisgarh, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Maharashtra, NCT Delhi, Orissa, Puducherry, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal.
- Other agencies participated- AIA, CPCB, CPHEEO, CSO, CPWD, Delhi Metro, Department of Post and Telegraph, Geological Survey of India, IUT, INTACH, Indian Port Association,

International Boundary Directorate, National Disaster Management Authority, RGI, and Survey of India.

- Participating Planning Institutes- College of Engineering Trivandrum, IIT Roorkee, Mysore Institute of Development Studies, NIT Warangal and SPA Delhi.

Based on the comments and recommendation on the Draft Guidelines and outputs of consultative meeting including monthly review meetings with MoUD, the Draft Guidelines was updated as Final URDPFI Guidelines, 2014.

1.6. Organisation of the Research Study

1.6.1. Project Team

As constituted by the appointed Consultant according to the RFP approved by the Ministry of Urban Development.

1.6.2. Technical Core Group Team

As per MoUD, Office Memorandum, dated 2nd September, 2013.

Joint Secretary (UD), MoUD, Chairperson

Chief Planner, TCPO, Member Convenor

Consultative Members

India Urban Space Foundation

Town Planner, TCPO

Chief Regional Planner, NCRPB

Director, NIUA

Director General, Institute of Urban Transport, MoUD

Director, Centre for Research, Documentation & Training (CRDT),
Institute of Town Planners India

Head, Department of Physical Planning,
School of Planning & Architecture, New Delhi

Head, Department of Transport Planning,
School of Planning & Architecture, New Delhi

1.7. Contact List

Table 1.3: Contact list for consultation and data collection

S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
1	Ahmedabad Urban Development Authority	Ms. NeelaMunshi, Chief Town Planner	Sardar Vallabhbhai Patel Sankul, Usmanpura, Ashram Road, Ahmedabad - 380 014 Phone - +91-79-27545051 - 54	Face to face meeting, Mail	<ul style="list-style-type: none"> • Sustainable Development Plan Strategy, • Use of TDR, • Urban Water Bodies Redevelopment • Local Area Plan
2	Airport Authority of India	Ms. KalpanaSethi	Executive Director (Planning) "C" Block, Rajiv Gandhi Bhawan, Safdarjung Airport, New Delhi - 110003 Phone - 011-24654084 Email - edplg@aai.aero	Face to face meeting, Mail	<ul style="list-style-type: none"> • Zone within which NOC is required from AAI for construction. • Height restrictions. • Minimum distance of airport from Green areas. • Suggestions from AAI. • Restrictions in the aerodrome buffer zone,
		Mr.Pawan Kumar Nagpal	Executive Director (Engg.) - 1 B Block - III Floor, Corporate Head Quarters Phone 011-24693697 Email - edengg@aai.aero	Face to face meeting, Mail	
3	Association of Municipalities and Development Authorities	--	7/6, Sirifort Institutional Area, August Kranti Marg, New Delhi-110 049, India Phone - 91-11-26494486, 26497973	Library research	<ul style="list-style-type: none"> • Municipal Ward as the Basic Urban Planned Development Area, • Changing Urban Scenario for Good Governance
4	Bureau of Indian Standards	Mr. Sanjay Pant, Scientist & Director (Civil Engineering)	Bureau of Indian Standards ManakBhavan 9 Bahadur Shah Zafar Marg New Delhi 110 002 (INDIA) Phone: 011-23230131 Extn 4402 Fax: 011-23235529 e-mail: sanjaypant@bis.org.in	Face to face meeting, Mail, Telephonic	<ul style="list-style-type: none"> • Special Requirements for Urban Planning in Hilly Areas • National Building Codes, 2005 • City typology
5	Central Ground Water Board, Ministry of Water Resources	Mr. S. K. Suneja	Central Ground Water Board, Bhujal Bhawan, NH-IV, Faridabad, 121001, Ph.: +91-129-2419075,	Face to face meeting, Mail	<ul style="list-style-type: none"> • Artificial recharge unit • Aquifer Mapping • Salient features of Provision of Rainwater Water Harvesting, Central Ground Water Board' for artificial
		Mr.Sushil, Chairman	Email: chmn-cgwb@nic.in	Face to face meeting, Mail, Telephonic	

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S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
					recharge techniques.
6	Central Pollution Control Board	Mr.Sudhakar Mr. Anand Kumar Ms. Piyali	Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, Delhi - 110 032	Face to face meeting, Mail	<ul style="list-style-type: none"> State Zoning Atlas manual Manual on preparation of Zoning atlas at district level
7	Central Public Health & Environmental Engineering Organisation	Mr. V.K Chaurasia, Joint Adviser (PHEE)	Room No. 660 A, NirmanBhavan, Maulana Azad Road, New Delhi – 110011. Phone: (o) 011-23061144, (R) 0120-2417613 Email: vijchaurasia@yahoo.co.in	Face to face meeting, Mail, Telephonic	<ul style="list-style-type: none"> CPHEEO manual for- Sewerage and Sewage Treatment Rain Water Harvesting (RWH) Drainage Storm Water Toilets
		Dr. M. Dhindhyan (Joint Advisor) Deputy Adviser (PHE)	Neerman Bhawan, Room Number- 658 'A', New Delhi. Phone: 011-23061571, Email: mdheen@gmail.com	Face to face meeting, Mail, Telephonic	<ul style="list-style-type: none"> Allocation of land for water infrastructure, STP, Provisions for Septic Management, Regional landfill, Treated sewage and its reuse Decentralised waste water management
8	Centre for Good Governance	Mr.KarunakarReddy.R., Knowledge Manager , CGG,	Dr. MCR HRD Institute of A.P. Campus), Road No. 25, Jubilee Hills, Hyderabad 500033 Andhra Pradesh	Telephonic	<ul style="list-style-type: none"> Land-based Resource Mobilisation, Innovative Practices of Local Resource Mobilisation
9	Central Road Research Institute	Dr.Errampalli Madhu, Principal Scientist, Transportation Planning Division	Central Road Research Institute (C.R.R.I.), Mathura Road New Delhi-110025, INDIA Tel:+91-11-26312268 (Off) +91-99580 80643 (Mobile) +91-11-26923114 (Res) Email: madhu.crrri@nic.in , errampalli.madhu@gmail.com	Face to face meeting, Mail, Telephonic	<ul style="list-style-type: none"> Travel Demand Modelling
10	Delhi Development Authority	Mr. J.B Ksirsagar, Chief Planner, TCPO & Commissioner Planning DDA	Town & Country Planning Organization Government of India Ministry of Urban Development E- Block, Vikas Bhawan, I.P. Estate, New Delhi-110002	Face to face meeting	<ul style="list-style-type: none"> Land Pooling Techniques Land use planning study
11	Delhi Mumbai	Mr Abhishek Chaudhary,	Room No. 341B, 03rd Floor, Hotel	Face to face	<ul style="list-style-type: none"> Perspective Plan and Master Plan of DMIC

S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
	Industrial Corridor Development Corporation	Vice President - Corporate Affairs & Company Secretary	Ashok, Diplomatic Enclave, 50B Chanakyapuri, New Delhi - 110021 Email: abhishekchaudhary@dmicdc.com Ph.: 9810027336	meeting, Mail	<ul style="list-style-type: none"> A technical discussion with DMICDC on regional planning aspects
12	Delhi Urban Art Commission	Mr. Raj Rewal, Chairman, DUAC	duac74@gmail.com	Mail	<ul style="list-style-type: none"> Guidelines/ points for inclusion/ revision of UDPII guidelines
13	Directorate for Spatial Planning and Water, Government of the Netherlands	Henk Snoeken, Acting Director for Spatial Development	Henk.Snoeken@minienm.nl	Mail	<ul style="list-style-type: none"> Public participation & Participation process Participation in official environmental impact assessments Dutch national urban planning policy document
14	Embarq, India	Mr. Amit Bhatt, Strategy Head, Urban Transport	87, 2nd Floor, New Mangala Puri, MG Road, New Delhi 110030, abhatt@embarqindia.org +91 9868453595	Face to face meeting, Mail	<ul style="list-style-type: none"> Land & transport integration, TOD Issues and challenges in planning Street Vendors as Pedestrian Infrastructure
		Ms. Sonal Shah	sshah@embarqindia.org sshah@embarqindia.org	Mail	<ul style="list-style-type: none"> Gender Consciousness in Urban Planning and Regulations
15	Geological Survey of India	Mr Gurprit Singh Jaggi, Director, GSI	Geological Survey of India, A-II, Pushpa Bhawan, Madangir Road, New Delhi-110 062. Tel: 011- 29053777 (0) FAX : 011-29962671, 29051328	Face to face meeting	<ul style="list-style-type: none"> Integration of GSI with Bhuvan maps, Geo-environmental profile in the Metadata base (procedure)
16	Hyderabad Metropolitan Development Authority	Mr.Sarma, Consultant, Hyderabad Metropolitan Development Authority	HMDA, Hyderabad	Face to face meeting, Mail	<ul style="list-style-type: none"> Development plan preparation in GIS platform, Site analysis strategies
17	Indian Green Building Council	Mr Praveen Kumar Soma, Senior Counsellor	CII-Sohrabji Godrej Green Business Centre, Survey No. 64, Kothaguda Post, Near HITEC City, R. R. Dist., Hyderabad -500 084, Ph.: +91 40 4418 5121, Email: praveen.soma@cii.in	Face to face meeting, Mail	<ul style="list-style-type: none"> Work done in the field of the Green Buildings, Green Townships and Green SEZs by Indian Green Building Council. NBC, 2005 Codes for sustainable Development
		Mr Ritabrata Sen, Engineer	ritabrata.sen@cii.in		
		Mr V Nagesh Gupta,	nagesh.gupta@cii.in		

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S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
		Counsellor			
18	Indian Institute of Technology (IIT) Delhi	Prof. Geetam Tiwari, Professor, Department of Civil Engineering	TRIPPS, Indian Institute of Technology, Room MS 815 (Main Building) HauzKhas, New Delhi Ph.: 011-26858703 Email: geetamt@gmail.com	Face to face meeting	<ul style="list-style-type: none"> Travel Demand Modelling Freight complex Non Motorised Transport modal split Transit Oriented Development Sampling size of various transport surveys Design standards related to Urban Expressways Urban Road Design Standards
19	Indian Institute of Technology (IIT) Kharagpur	Dr. B.K. Sengupta, professor, Department of Architecture and Regional Planning	B-185, IIT campus, 03222-255303, 282700, 277190	Mail, Face to face meeting during regional workshop at Bhubneshwar	<ul style="list-style-type: none"> Comments on UDPFI Guidelines, 1996
20	Institute of Town Planners, India	Dr. Meshram, President, ITPI	4-A, Ring Road, I.P. Estate, New Delhi – 110002	Face to face meeting	<ul style="list-style-type: none"> City typologies, Hill cities consideration
		Dr. Kulsheshta		Face to face meeting	<ul style="list-style-type: none"> Regional Planning Plan process concept Plan formulation 74th CAA provision Participatory approach
21	Institute of Urban Transport	Mr. C. L. Kaul, Executive Secretary (IUT), Mr. M. L. Chotani, Consultant, IUT	Institute of Urban Transport (India) 1st Floor, Anand Vihar Metro Station Building, Entry adjacent to Gate No 1, Delhi - 110 092 (INDIA), Ph.: (+91) 11 66578700 – 709, Fax.: (+91) 11 66578733/44, Email: info@iutindia.org	Face to face meeting, Mail, Telephonic	<ul style="list-style-type: none"> Revised toolkit for CMP Sampling Size Travel Demand Modelling
22	Jawaharlal Nehru National Urban Renewal Mission	Mr. Anand Mohan, Director, JnNURM	Room No: 340 C, Ph.: 23062194, Email: anandmohan2006@hotmail.com	Face to face meeting, Mail	<ul style="list-style-type: none"> General information regarding Project Tool kits provided by JnNURM CDPs of various cities

S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
23	Ministry of Defence, Directorate General of Defence Estates	Dr. D. K Malik, Additional Directorate General	Ph: 011-25674976 Email: dkmalik1958@gmail.com	Face to face meeting, Mail, Telephonic	<ul style="list-style-type: none"> Integration of GIS in planning Suggestions for inclusions in UDPPFI Guidelines
		Mr. Ajay Kumar Sharma, IDES, Deputy Director General	Ph: 011-25676979, 9990699002 Email: ajayced@gmail.com	Face to face meeting	<ul style="list-style-type: none"> The Cantonment Act, 2006
		Mr. N. V Satyanarayana, Dy. Director General (Cantts)	Ph: 011-25676979, 9968608234 Email: nvsatya2008@gmail.com	Face to face meeting, Mail	<ul style="list-style-type: none"> Review of the Cantonment section in the Guidelines
24	Ministry of Environment and Forest	Mr. Maninder Singh, Joint Secretary (EIA)	Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi - 110003, Email: jsicmoef@gmail.com	Mail, Telephone	<ul style="list-style-type: none"> Technical aspects of environmental obligations and planning requirements by MoEF
		Mr. Susheel Kumar, Additional Secretary	C-II/51, Shahjahan Road, Ph.: 24362285, 24363918 (F), 23073953 Email: asmefsusheel@gmail.com	Mail	
25	Ministry of Road Transport and Highway	Mr. R.K. Pandey, Chief Engineer (Planning)	Room No. 249, Office of Minister for Road Transport & Highways, Ph.: 23739085	Face to face meeting, Telephonic	<ul style="list-style-type: none"> Urban road design standards
26	Ministry of Rural Development, Land Department	Mr. Charanjit Singh, Director, Land Reforms, Department of Land Resources	Nirman Bhawan, NBO Building, G- Wing, Maulana Azad Marg New Delhi-110011 T +91 11 23062456 Email: da-dolr@nic.in	Face to face meeting, Telephonic	<ul style="list-style-type: none"> Draft National Land Policy, National Land Record Modernization Programme (NLRMP)
27	Ministry of Social Justice & Empowerment	Dr. Vikram Sima Rao Director (DD-III & National Awards)	Ministry of Social Justice and Empowerment, Room. No. 740, 'A', Wing, Shastri Bhawan, Dr. Rajendra Prasad Road, New Delhi - 110001 (India) Ph: 011 23383464 Email: vickybotha@hotmail.com	Telephonic, Mail	<ul style="list-style-type: none"> The Persons with Disabilities Act, 1995, Guidelines Space Standards for Barrier Free Built Environment for Disabled and Elderly Persons

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S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
28	Ministry of Shipping	Dr.Vishwapati Trivedi, Secretary	Transport Bhawan, Room No. 401, SansadMarg,New Delhi,110001 Phone: 011-23714938 Email: secyship@nic.in	Mail, Letter	<ul style="list-style-type: none"> • Consultation with Ministry of Shipping
29	Ministry of Tourism	Mr.S.K.Mohanta, DPA Grade "B"	Phone: 91-11-23013072 Email: mohanta@nic.in	Face to face meeting, Mail	<ul style="list-style-type: none"> • Eco-tourism guidelines for tourism cities
30	Ministry of Water & Sanitation	Mr Pankaj Jain, Secretary	Room No. 247, A Wing, NirmanBhavan, New Delhi – 110001, Ph.: 23061207, Email:ppsdws@nic.in	Face to face meeting, Mail	<ul style="list-style-type: none"> • Technical aspects on Water supply standards, Water quality standards, Service level benchmarking, Sewerage System, Effluent quality standards etc.
31	Mumbai Metropolitan Regional Development Authority (MMRDA)	Ms. Uma Adusumilli, Chief Planner.	E Block, MMRDA Building, Opposite Driven in Theatre, BandraKurla Complex, Bandra East, Mumbai, Maharashtra 400051 Ph: 022-26594060, 022- 26591237 Email: umaplanner@gmail.com	Mail, Telephonic	<ul style="list-style-type: none"> • Regional plan of MMR
32	National Capital Region Planning Board	Mr. J.N. Barman, Director, Planning Wing	National Capital Region Planning Board, Core-IV B,First Floor, India Habitat Centre, Lodhi Road, New Delhi- 110003. Ph.: 24628179 Email: ncrpb-jd1@nic.in		<ul style="list-style-type: none"> • Revised Regional plan, GIS based Plan
33	National Disaster Management Authority	Dr. Anita Bhatnagar Jain, JS (Policy & Plan)	Email: 'anita.bhatnagar@nic.in	Mail, Telephonic	<ul style="list-style-type: none"> • Sensitive Landuse Planning document, • National Plan for Disaster
		Mr. Rajesh Kumar Singh (Director)	Room no. 326, NDMA Bhawan,A-1, safdarjung enclave new delhi- 110029, singhkrajesh@hotmail.com	Face to face meeting, mail	<ul style="list-style-type: none"> • Disaster Management guidelines • District Disaster Management Plan • Sensitive land use planning document
34	National Institute of Disaster Management	Dr. Anil K. Gupta, Associate Professor	5-B, IIPA Campus, I.P. Estate, M.G. Road, New Delhi – 110002 Ph.: 23724311 Email: anil.nidm@nic.in	Face to Face Meeting	<ul style="list-style-type: none"> • National Mission on Sustainable Habitat, National Building Code Of India 2005 (covering hazard components), • Disaster Management Guidelines, Chennai master plan (sensitive to urban flood)
35	National Remote Sensing Centre	Dr.K.Venugopala Rao, Group Head Urban	ISRO, Department of Space,Balanagar, Hyderabad-	Face to face meeting, Mail	<ul style="list-style-type: none"> • Bhuvan database and services • GIS application of Bhuvan in Master plan preparation (

S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
		Studies & Geo Informatics Group, NRSC Mr. Arul Raj, Bhuvan, NRSC, Ms. Reedhi, Engg. SD, Geo Informatics Group	500037, A.P. Tel: +914023884556 Fax: +914023884259 Venu_koppaka@nrsc.gov.in		including pilot project of Nalgonda) <ul style="list-style-type: none"> • Consultation with Hyderabad Metropolitan Development Authority (HMDA) for understanding the process of Hyderabad Metropolitan Development Plan formed in GIS platform • NUIS landuse layers for the core city area
36	National Urban Information System	Dr.Debjani Ghosh, Mr.Sandeep Thakur, Mr.Jagan Shah	Indian habitat Centre, Core 4B, Lodhi Road, 110003 Tel: 91-11 24617517/43 dghosh@niua.org	Mail	<ul style="list-style-type: none"> • NUIS mapping, • Latest status and utilisation for planning
		Mr.Mohd.Monis Khan, Town & Country Planner	Town & Country Planning Organization Government of India Ministry of Urban Development Email: khanmonis@yahoo.com	Face to face meeting	<ul style="list-style-type: none"> • Status of NUIS on 18.02.13
37	Planning Commission	Mr.RakeshRanjan, Advisor, HUD	Yojana Bhawan, New Delhi-110001	Face to face meeting	<ul style="list-style-type: none"> • Considering the economic aspects while preparation of plans • Consider the factors of migration into urban areas • Emphasis of 'Mixed Land Use ' • Optimum Use of Land • planning of urban areas more economically optimum
38	Registrar General of India	Dr. D.K. Dey, Additional Director	Office of The Registrar General and Census Commissioner, 2/A, Man Singh Road, New Delhi -110011, Tel: +91-11-23070629, 23381623,23381917, 23384816, Email: rgoffice.rgi@nic.in	Face to face meeting	<ul style="list-style-type: none"> • Census database, • PCA data for social-economic development, • Census Atlas, • National Commission on Population
39	School of Planning and Architecture	Ms. SanjuktaBhaduri HoD Urban Planning	Email: sanjukta.bhaduri@gmail.com , s.bhaduri@spa.ac.in	Face to Face Meeting	<ul style="list-style-type: none"> • Mixed uses of land, Alternative to Master Plan approach – Two slides
40	School of Planning and Architecture	Mr.Sewaram, HoD, Transport Planning	Department of Transport Planning, School of Planning and Architecture, 4-Block-B, Indraprastha Estate, New Delhi	Face to Face Meeting	<ul style="list-style-type: none"> • Transport Planning

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S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
			110002		
41	School of Planning and Architecture	Mr.Mahaveer, HoD, Transport Planning	4-Block-B, Indraprastha Estate, New Delhi 110002	Face to Face Meeting	<ul style="list-style-type: none"> Regional Planning
42	Survey of India	Maj. Gen. RC Padhi, Additional Surveyor General, SOI	Indian Institute of Surveying and Mapping, SOI, Uppal, Hyderabad-500039, Tel: 040-27201181, 040-27202059	Telephone	<ul style="list-style-type: none"> NUIS mapping, District Planning Series
43	Town and Country Planning Organisation, Delhi	Mr. J.B. Kshirsagar Chief Planner, Town and Country Planning Organisation Mr.R.Srinivas Town and Country Planner, Head, Metropolitan & Union Territories Division, Town and Country Planning Organisation Mr.Sudeep Roy, Asstt Town and Country Planner Town and Country Planning Organization	Town & Country Planning Organization Government of India Ministry of Urban Development E- Block, Vikas Bhawan, I.P. Estate, New Delhi-110002 Ph-23370837(O),9810636758(M) 0120- 4297227(R) Email: srinimetro@gmail.com	Face to Face Meeting, Mail, Telephonic	<ul style="list-style-type: none"> Zoning regulations, Institutional requirement, Master plan studies Various studies and interactions during the project
44	Urban Development & Urban Housing Department, Government Of Gujarat	Mr.G.R.Aloria, Principal Secretary	Email: us-ud@gujarat.gov.in	Mail	<ul style="list-style-type: none"> Metropolitan plan formulation Empowering the ULB
<ul style="list-style-type: none"> Consultation during Regional Workshops and comments shared 					
45	Town & Country Planning, Government of Karnataka	Mr Shantappa. B. Honnur, Director	Office of the Director of Town & Country Planning, M. S. Building, Gate No. 3, Bangalore – 500 001 Ph.: 984515 0829	Mail	<ul style="list-style-type: none"> Views and information pertaining to Department of Town and Country Planning, Government of Karnataka

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S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
			Email: shanthonnur@gmail.com		
46	Town Planning & Valuation Department, Maharashtra	Mr K. S. Akode, Director	Town Planning & Valuation Department, Central Office, Pune-411 001	Mail	<ul style="list-style-type: none"> Review, study and recommendations for applying Planning Standards for various urban area in the State of Maharashtra
47	Town & Country Planning Organization, Puducherry	Mr S. Ragunathan Chief Town Planner - cum - Secretary, SLNA, JNNURM	Town and country Planning Department, Puducherry (SLNA for JNNURM) Puducherry	Mail	<ul style="list-style-type: none"> Puducherry Bye-Law Amendment 2013, Puducherry City Development Plan, Puducherry Master Plan, Puducherry Master plan document, Puducherry TCP Act, 1969, Yanam Master Plan
48	Town Planning Organisation, Government of Tripura	--	TCPO, 3rd floor of Khadya Bhawan, Pandit Nehru Complex, Gurkhabasti, Agartala, Tripura	Mail	<ul style="list-style-type: none"> Comments on the UDPFI Guidelines, 1996
49	Town Planning Department, Government of Uttarakhand	Mr S. K. Pant, Senior Planner	Town Planning Department, 53, Tomar Complex, Dehradun, Uttarakhand	Mail	<ul style="list-style-type: none"> Comments on the UDPFI Guidelines, 1996
50	Indian Institute of Technology (IIT) Kharagpur	Dr. Jaydip Barman, Professor and Head of Department	Department of Architecture and Regional Planning, Indian Institute of Technology, Kharagpur- 721 302	Mail	<ul style="list-style-type: none"> Observation on review of UDPFI Guidelines, 1996
51	Government of Sikkim	Ms Devika Sharma Chettri, Additional Chief Town Planner	Urban Development & Housing Department, GoS, Gangtok, Ph: 03592-202900	Mail	<ul style="list-style-type: none"> Comments on the UDPFI Guidelines, 1996
52	College of Engineering, Pune	Prof. Pratap Raval, Professor	College of Engineering, Pune, Maharashtra Ph.: 9422506124, Email: pushpak20@yahoo.co.uk	Mail	<ul style="list-style-type: none"> Views regarding revision of UDPFI and inclusion in new guidelines.
53	Town Planning Department Rajasthan	Mr. Praveen Jain, Chef Town Planner, Government of Rajasthan	Town Planning Department, opp. Birla Temple, JLN Marg, Jaipur -04 Telephone no.: 0141-2563702, email: cto-ri@nic.in	Face to face meeting in the regional workshop	<ul style="list-style-type: none"> Comments on the UDPFI Guidelines, 1996 Suggestions on Infrastructure fund, planning norms, Small town level planning
		Mr. Pradeep Kapoor, Town Planning Department, Government of Rajasthan	p.kapoor57@gmail.com	Face to face meeting in the regional workshop and mail	<ul style="list-style-type: none"> Planning provision in the State Affordable Housing Policy and Integrated Township Policy of Rajasthan

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S.No.	Agency Name	Name & Designation	Address and Contact number	Mode of Contact	Key points consulted
54	Urban Development & Housing Department, Sikkim	Mr.Dinek Gurung, Sr.Architect-cum-Town Planner	Urban Development & Housing Department, Government of Sikkim, Gangtok-737101 Ph: 9933032718 gurungdinker@gmail.com	Face to face meeting in the regional workshop and mail	<ul style="list-style-type: none"> • Comments on the UDPFI Guidelines, 1996
55	Directorate of Town Planning, Odisha	Mr. Mishra	Chief Town Planner, Directorate of Town Planning, "Block IV, Unit 5", Bhubaneswar-751001 (Tel:0674-2392294, Fax:0674-2395574) E-mail: dtpodisha@gmail.com	Face to face meeting in the regional workshop	<ul style="list-style-type: none"> • Comments on the UDPFI Guidelines, 1996 • Orissa Development Authority Manual, • OTP & IT Act, 1956

1.8. Glossary

1.8.1. List of reference made in the guidelines (as sources, footnotes, references in the volumes)

Table 1.4: List of reference made in the guidelines (as sources, footnotes, references in the volumes)

S. No.	Particulars	Sources
1	73rd & 74 th Constitutional Amendment Act	http://indiacode.nic.in/coiweb/amend/amend73.htm http://indiacode.nic.in/coiweb/amend/amend74.htm
2	A Gendered Perspective of the Shelter-Transport-Livelihood Link: The Case of Poor Women in Delhi. Transport Reviews, Volume 26 (1), p 63-80	Wilson, Anand, Anvita and Tiwari, Geetam;1987
3	Advisory Note – Septage Management in Urban India, 2013	Ministry of Urban Development (MoUD)
4	Affordable Housing Policy, 2009	Government of Rajasthan
5	Ahmedabad CDP	Jawaharlal Nehru National Urban Renewal Mission (JnNURM)
6	Ahmedabad Draft Comprehensive Development Plan 2021 (Second Revised) Ahmedabad Urban Development Authority Part III: General Development Regulations - Draft	Ahmedabad Urban Development Authority (AUDA)
7	Airport Development Reference Manual, 9th edition	International Air Transport Association (IATA)
8	Aizawl Master Plan	Aizawl Development Authority
9	Alternative Modes of Assembly And Development of Land and Housing in the NCT of Delhi	Association of Municipalities and Development Authorities (AMDA)
10	Ancient Monuments and Archaeological Sites and Remains Act, (Amendment and Validation) 2011	Archaeological Survey of India (ASI)
11	Approach to the Twelfth Five Year Plan	Planning Commission
12	Arizona Department of Commerce	
13	Basic Statistics for Local Level Development (BSLLD)	Ministry of Statistics & Programme Implementation (MoS&PI)
14	BBMP Model of SWM	www.bbmp.gov.in
15	Bihar Urban Planning and Development Act 2012	Patna Municipal Corporation
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Table 1.5: References for the Guidelines (read, understood and/or analysed for the preparation of the guideline)

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2 Appendix B – Basic Planning Definition

Table 2.1: Chapterwise Basic Planning Definitions

Sr. No.	Particular	Definitions	Source
Chapter 3: Plan Formulation			
1	Agriculture	Includes horticulture, farming, raising of crops, fruits, vegetables, flowers, grass, fodder, trees or any other kind of cultivation, dairy, animal husbandry, breeding and keeping of live-stock, including cattle, horses, donkeys, mules, pigs, fish, poultry and bees; and use of land which is ancillary to the farming of land or any other agriculture purposes, but shall not include the use of land attached to a building for the purposes of a garden to be used alongside such building.	Model Regional and Town Planning and Development Law
2	Amenities	Include roads and streets, open spaces, parks, recreational grounds, playgrounds, water and electric supply, street lighting, sewerage, drainage, public works and other utilities, services and conveniences.	Model Regional and Town Planning and Development Law
3	Development	The carrying out of building, engineering, mining or other operations in, on, over or under land or the making of any material change, in any building or land, or in the use of any building or land and includes sub-division of any land.	Model Regional and Town Planning and Development Law
4	Development Plan	A plan for the development or redevelopment or improvement of an area within the jurisdiction of a Planning Authority and includes a Regional Development Plan, a Metropolitan Development Plan, Area Development Plan, Town Development Plan, Zonal Development Plan, District Development Plan, or any other plan or scheme prepared under relevant Act by whatsoever name known.	Bihar Urban Planning and Development Act, 2012
5	Disposal	Discharge, deposition or dumping of any liquid or solid waste onto land or water so that it may enter the environment.	National Urban Sanitation Policy, City Sanitation Plan Manual
6	Domestic sewage	All forms of wastewater derived from residential properties, as well as black water and grey water from commercial and institutions buildings.	National Urban Sanitation Policy, City Sanitation Plan Manual
7	Floor Space Index	The quotient or the ratio of the Total Covered area of all floors to the total area of the plot, multiplied by 100.	Bihar Urban Planning and Development Act, 2012
8	Infrastructure	Any project, public amenity or public utility or service, which is required for smooth, productive and efficient functioning of the Planning Area such as trunk infrastructure, access from or to the nearest major road, bulk supply of drinking water (surface water and ground water with trunk line), power (electric substation and network), health, education facilities, transport (major roads such as national highways, state highways, major district roads, other district roads, , bridges, bypasses and underpasses), common effluent treatment plants (CETP), sewage treatment plant (STP), solid waste disposal system and receptacles, communication network, sectorial shopping markets, institutional buildings, malls and multiplexes, cinema halls, community halls, open air theatres, playgrounds, civic and cultural facilities, public parking areas etc.	Bihar Urban Planning and Development Act, 2012
9	Land Use	The major use for which a land is being used on any specified date.	Bihar Urban Planning and Development Act, 2012
10	Local Authority	A municipal corporation or committee or board or district board or other authority legally entitled to, or entrusted by the government with the control or management of a municipal or local fund or which is permitted by the government to exercise the powers of a local authority, and includes a town improvement trust; and a local authority is a "Local Authority Concerned" if any land within its local limits falls in the area of a plan prepared or to be prepared under relevant Act.	Model Regional and Town Planning and Development Law
11	Plan	The statement of proposals, policies and development briefs for securing, promoting and regulating development in a Planning Area, and includes a map or maps or sets of documents or all of them.	Bihar Urban Planning and Development Act, 2012

Appendix B- Basic Planning Definition

Sr. No.	Particular	Definitions	Source
12	Planning Area	A territorial unit demarcated and declared by the Government for the purposes of planning under <i>relevant</i> Act and shall be known by such name as the Government may decide.	Bihar Urban Planning and Development Act, 2012
13	Public Place	Any place or building which is open to the use and enjoyment of the public whether it is actually used or enjoyed by the public or not and whether the entry is regulated by any charge or not.	Bihar Urban Planning and Development Act, 2012
14	Residence	Includes the use for human habitation of any land or building or part thereof, the use of gardens, grounds, garages, stables and out-houses, if any, appertaining to such land or building, and "Residential" shall be construed accordingly.	Model Regional and Town Planning and Development Law
15	Sanitation	Interventions (usually construction of facilities such as latrines) that improve the management of excreta and promote sanitary (healthy) conditions.	National Urban Sanitation Policy, City Sanitation Plan Manual
16	Scheme	A Development scheme and includes a plan or plans together with the descriptive matter, if any, relating to such a scheme.	Model Regional and Town Planning and Development Law
17	Septage	Mixture of wastewater and sludge removed from a septic tank during cleaning operations.	National Urban Sanitation Policy, City Sanitation Plan Manual
18	Septic tank	A form of on-plot sanitation for the anaerobic treatment of sewage/black water.	National Urban Sanitation Policy, City Sanitation Plan Manual
19	Sewage	A mixture of wastewater from all urban activates from residential, commercial properties. It may also contain a component of industrial wastewater.	National Urban Sanitation Policy, City Sanitation Plan Manual
20	Sewerage	A network of interconnected sewers in an area, district or town.	National Urban Sanitation Policy, City Sanitation Plan Manual
21	Utility	Services such as roads including approach roads, bridges, bypasses and underpasses, street lights, water supply system, sewerage system, storm water drainage system, electrical network, communication network, sewage treatment plants, percolation wells, solid waste disposal system, collection, treatment, discharge and disposal of industrial, institutional and township waste, gas pipeline, common effluent treatment plants (CETP), spaces for informal services, and any other as may be delineated by the Government.	Bihar Urban Planning and Development Act, 2012
22	Wastewater	Liquid waste from households or commercial or industrial operations, along with any surface water/storm water.	National Urban Sanitation Policy, City Sanitation Plan Manual
23	Wastewater treatment	A combination of physical, chemical and biological processes to remove suspended solids, dissolved pollutants, and pathogens and render the water harmless to the environment.	National Urban Sanitation Policy, City Sanitation Plan Manual
Chapter 4: Resource Mobilisation			
1	Accommodation Reservation	Allows the land owners to develop the sited reserved for an amenity in the development plan using full permissible FSI/FAR on the plot subject to agreeing to entrust and handover the built-up area of such amenity to the local authority free of all encumbrances and accept the full FAR/FSI as compensation in lieu therefore.	UDPFI Guidelines
2	Accrual Concept	Occurrence of claims and obligations in respect of incomes or expenditures, assets or liabilities based on happening of any event, passage of time, rendering of services, fulfilment (partially or fully) of contracts, diminution in values, etc., are recorded even though actual receipts or payments of money may not have taken place.	Administrative Staff College of India, (Regional Capacity Building Hub)
3	Bilateral Organizations	Government agencies or non-profit organizations based in a single country while the agencies provide aid in other countries.	--
4	Bio-medical waste	any waste generated during diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals.	Municipal Bill

Sr. No.	Particular	Definitions	Source
5	Budget grant	The total sum entered on the expenditure side of a budget estimate under a major head and adopted by the Municipality, and includes any sum by which such budget grant is increased or reduced by transfer from or to other heads in accordance with the provisions of this Act and the rules and the regulations made thereunder.	Municipal Bill
6	Building	a structure constructed for whatever purpose and of whatever materials, and includes the foundation, plinth, walls, floors, roofs, chimneys, fixed platforms, verandas, balconies, cornices or projections or part of a building or anything affixed thereto or any wall (other than a boundary wall of less than three metres in height) enclosing, or intended to enclose, any land, sign or outdoor display-structure but does not include a tent, shamiana or tarpaulin shelter.	Municipal Bill
7	Citizen's charter	The document declaring the functioning, obligations, duties and commitments of a public authority for providing goods and services effectively and efficiently with acceptable level of standards, time limits and designation of public servants for delivery and grievance redress.	Citizen's Bill
8	Dwelling House	A masonry building constructed, used, or adapted to be used, wholly or principally for human habitation.	Municipal Bill
9	e-Government	Use Information Communication Technology to organize and manage the government administrative processes, specifically the interactive procedures between government and public.	e-Government: Singapore Study
10	FDI	Investment by non-resident entity/ person resident outside India in the capital of an India economy.	FDI Circular
11	Grants-in-aid	Grants-in-aid are payments, transfers or devolution of funds, in cash or in kind, in the nature of donations or contributions by one government (grantor) to another government, body, institution or individual (grantee).	Indian Government Accounting Standard (IGAS), 2007
12	Industrial township	Such urban area or part thereof as the Governor may, having regard to the size of the area and the municipal services being provided or proposed to be provided by an industrial establishment in that area and such other factors as he may deem fit, by notification, specify to be an industrial township.	Municipal Bill
13	Land	"Land" includes benefits to arise out of land, and things attached to the earth or permanently fastened to anything attached to the earth.	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
14	Land Acquisition	The acquisition of land for some public purpose by a government agency from individual landowners as, authorised by the law, after paying a government-fixed compensation to cover losses incurred by landowners from surrendering their land to the concerned government agency.	Wikipedia
15	Local Bodies	<i>Panchayati Raj</i> Institutions and Urban Local Bodies under the provisions of Article 243 and Article 12 of the Constitution.	Indian Government Accounting Standard (IGAS), 2007
16	Multilateral organisations	International organisations whose membership is made up of member governments, who collectively govern the organisation and are its primary source of funds and spend it on projects in various countries.	--
17	Service	All goods and services, including functions, obligations, responsibility or duty, to be provided or rendered by a public authority.	Citizen's Bill
18	Transferable Development Right (TDR)	A process of making available certain amount of additional built up area in lieu of the area relinquished or surrendered by the owner of the land whose land or a part thereof, is required for public purposes such as construction and widening of roads, development of parks, playgrounds, green area civic amenities, recreational uses, urban infrastructure, implementation of development control and Zoning Regulations and conservation of heritage sites or such other purposes as Government may notify so that he can use the extra	Bihar Urban Planning and Development Act, 2012

Appendix B- Basic Planning Definition

Sr. No.	Particular	Definitions	Source
		built up area either himself or transfer it to another person for a consideration.	
Chapter 7: Sustainability Guidelines			
1	Accessibility	The ability to reach desired goods, services and activities.	Ministry of Urban Development, 2008
2	Buffer Zone	Buffer zones are areas created to enhance the protection of a conservation area, often peripheral to it, inside or outside. Within Buffer zones, certain legal and/or customary restrictions are placed upon resource use and/or is managed to reduce the negative impacts of restrictions on the neighbouring communities	http://www.biodiversity-a-z.org/areas/10/ A-Z of Areas of Biodiversity Importance
3	Climate Change	A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer.	Global Warming Policy Foundation, IPCC
4	Coastal Area/ Zone	The coast is a unique environment where land, sea and atmosphere interact and interplay continuously influencing a strip of spatial zone defined as coastal area/ zone. Coastal area/zones are the areas having the influence of both marine and terrestrial processes.	Coastal Zones of India, ISRO, 2012
5	Deforestation	The direct human-induced conversion of forested land to non-forested land.	http://www.cbd.int/doc/publications/cbd-ts-43-en.pdf UNFCCC – Marrakech Accords
6	Disaster	A catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made cause, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or destruction of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.	The Disaster Management Act, Ministry of Law and Justice, 2005
7	Disaster Management	A continuous and integrated process of planning, organising, coordination and implementing measures which are necessary or expedient for- prevention of damage or threat of any disaster; mitigation or reduction of risk of any disaster or its severity or consequences; capacity-building; preparedness to deal with any disaster; prompt response to any threatening disaster situation or disaster; assessing the severity or magnitude of effects of any disaster; evacuation, rescue and relief; rehabilitation and reconstruction	The Disaster Management Act, Ministry of Law and Justice, 2005
8	Ecological Sanitation	A form of dry sanitation that involves separation of faeces and urine in order to facilitate recycling of nutrients in local agricultural systems.	Manual City Sanitation Plan Preparation (CSP), National Urban Sanitation Policy
9	Mitigation	"Mitigation" means measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation	The Disaster Management Act, Ministry of Law and Justice, 2005
10	Eco-Sensitive Zones	The extent of eco-sensitive zones as following: Many of the existing protected areas have already undergone tremendous development in close vicinity to their boundaries. Some of the protected areas actually lying in the urban setup (Eg. Guindy National Park, Tamil Naidu, Sanjay Gandhi National Park, Maharashtra, etc.). Therefore, defining the extent of the eco-sensitive zones around protected areas will have to be kept flexible and protected area specific. The width of the eco-sensitive zone and type of regulations will differ from protected area to protected area. However, as a general principle the width of the eco-sensitive zone could go up-to 10 Kms around a protected area as provided in the	Guidelines for declaration of Eco-Sensitive Zones Around National Parks and Wild Life Sanctuaries, MoEF, 2011

Sr. No.	Particular	Definitions	Source
		Wildlife Conservation Strategy-2002. In case where sensitive corridors, connectivity and ecologically important patches, crucial for landscape linkages, are even beyond 10 Kms width, these should be included in the eco-sensitive zone. Further, even in context of a particular protected area, the distribution of an area of eco-sensitive zone and the extant of regulation may not be uniform all around and it could be of variable width and extent.	
11	Environmentally sensitive zone/ area	Environmental sensitive zones may be defined as areas with identified environmental resource with 'incomparable values' which require special attention for their conservation. All Earthquake/landslide prone, cliffs and environmentally hazardous area, areas adjacent to fault lines, areas with slope higher than 45 degree (NBC, 2005), flood plain, wetlands and areas adjacent to major drainage lines for general guidance, other areas identified by State Disaster Management Authority to be included in the environmentally sensitive areas.	National Environmental Policy, 2006 ; NBC, 2005, and Aizwal Master Plan
12	Preparedness	"Preparedness" means the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof	The Disaster Management Act, Ministry of Law and Justice, 2005
13	Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.	Brundtland Commission, 1987
Chapter 8: Simplified Planning Techniques			
1	GIS (Geographical Information System)	A system which provides computerized mechanisms for integrating various geo information data sets and analysing them in order to generate information relevant to planning needs in a context.	Indian Space Research Organisation
2	Mapping	Representation of earth's pattern as a whole or part of it on a plane surface with conventional signs, drawn to a scale and projection so that each and every point on it corresponds to the actual terrestrial position.	UDPFI Guidelines
3	Primary Data	Data collected for the first time and is always given in the form of raw material and original in character.	--
4	Remote Sensing	Science of acquiring information about the Earth's surface without actually being in contact with it.	National Remote Sensing Centre
5	Secondary Data	Second hand data initially collected by some other investigator for other purpose but used by an investigator for his/her own purpose later.	--
Chapter 9: Infrastructure			
1	Adult Education Centre	A premise having the facility of formal education and training to adults with flexible timings.	Master Plan for Delhi, 2021
2	Anganwari	Anganwari as space provision at residential housing/ neighbourhood level is a centre to provide service for children of 0-6yrs age, pregnant women, feeding mothers, etc. under the Integrated Child Development Scheme (ICDS).	Master Plan for Delhi, 2021
3	Artificial Recharge	Artificial recharge to ground water is a process by which the ground water reservoir is augmented at rate exceeding that under natural conditions of replenishment.	Rain water Harvesting Techniques, Ministry Of Water Resources Central Ground Water Board, 2003
4	Banquet hall	A premise to hold small public gatherings, community functions, marriages etc.	Master Plan for Delhi: 2021
5	Burial ground	A premise with facilities for burying of dead bodies.	Master Plan for Delhi: 2021
6	Bus Terminal	A premise used by public transport agency to park the buses for short duration to serve the population. It may include the related facilities for passengers.	Study on Zoning Regulation, TCPO, 2004

Appendix B- Basic Planning Definition

Sr. No.	Particular	Definitions	Source
7	Central/State Government Office	A premise used for the offices of Central/State Government.	Study on Zoning Regulation, TCPO, 2004
8	Civil defence and home guards etc.	A premise having facilities for offices and other functions of civil organization for internal defence.	Master Plan for Delhi: 2021
9	Continuous Water Supply/ 24-7 Water Supply	24-7 supply is achieved when water is delivered continuously to every customer of the service 24 hours a day, every day of the year, through a transmission and distribution system that is continuously full and under positive pressure throughout all of its pipelines and networks.	Guidance Notes for Continuous Water System, MoUD, 2009
10	Convenience Shopping centre	A group of shops in residential area serving a population of about 5000 persons and if required for 2,000 persons in hill residential areas	Master Plan for Delhi: 2021 & Study on Zoning Regulation, TCPO, 2004
11	Crèche and Day care Centre	A premise having nursing facilities for young children during day time. The center may be managed by an individual or an institution on commercial or non-commercial basis.	Study on Zoning Regulation, TCPO, 2004
12	Cremation ground	A premise with facilities of performing last rites of dead bodies by burning.	Master Plan for Delhi: 2021
13	Crematorium	A premise with facilities for last rites of the deceased.	Master Plan for Delhi: 2021
14	Decentralised Wastewater Management	The collection, treatment, and disposal/reuse of wastewater from individual homes, clusters of homes, isolated communities, industries, or institutional facilities, as well as from portions of existing communities at or near the point of waste generation	Guidelines For Decentralized Wastewater Management, MoUD, 2012
15	Dharamshala and its equivalent	A premise providing temporary accommodation for short duration on no profit basis.	Master Plan for Delhi: 2021
16	Dhalla and Dustbin	A premise used for collection of garbage for its onward transportation	Study on Zoning Regulation, TCPO, 2004
17	District Centre	A group of shops in residential area serving a population of about 500000 persons.	Master Plan for Delhi: 2021
18	District Meter Area	The term district metering is used to describe the method whereby flow meters are installed on all major supply lines and strategic points within the distribution system.	O & M Manual, Kolkata Metropolitan Water & Sanitation Authority
19	Disaster management centre	A premise having facility of disaster emergency, backup, hospital facility, training centre for disaster preparedness, wireless communication etc.	Master Plan for Delhi: 2021
20	Dispensary	A premise having facilities for medical advice and provision of medicine, managed by public or charitable institutions.	Master Plan for Delhi: 2021
21	Dispensary for pet animal and birds	Premises having facilities for medical advice and provision of medicines to pet animals and birds, managed by public/ private or charitable institutions.	Master Plan for Delhi: 2021
22	District police office and battalion	A premise having facilities for the offices and paramilitary forces.	Master Plan for Delhi: 2021
23	Electric Sub-Station	A premise having electrical installation and transformer for distribution of power.	Study on Zoning Regulation, TCPO, 2004
24	Effluent	The wastewater that flows out of a treatment system (in this case septic tank) or supernatant liquid discharged from the septic tank.	Advisory Note: Septage Management In Urban India, MoUD, 2013
25	Exhibition-cum Fair Ground	A premise having facilities for the exhibition and display and other cultural activities for a group of participants.	Master Plan for Delhi: 2021
26	Farm house	A dwelling house on a farm.	Master Plan for Delhi:

Appendix B- Basic Planning Definition

Sr. No.	Particular	Definitions	Source 2021
27	Fire post	Premises with lesser degree of facilities for firefighting. The post may be attached to specific premises with fire prone activities.	Master Plan for Delhi: 2021
28	Fire station	A premise having facility for firefighting for a catchment area assigned to it. It may include residence of essential staff.	Master Plan for Delhi: 2021
29	Fire training institute	A premise having facilities of training for emergency times in case of fire, building collapse etc.	Master Plan for Delhi: 2021
30	Gas Godown	A premise having the facility of wholesale storage of LPG, godown, etc.	Master Plan for Delhi: 2021
31	GauShala/ Dairy farm	A premise with facilities for rearing and processing of dairy products. It may have temporary structure for sheds of animals and birds.	Study on Zoning Regulation, TCPO, 2004
32	General and head post office with administrative office	A premise with facility for postal and telecommunication to and from a number of post offices attached to it.	Master Plan for Delhi: 2021
33	Government Land	Land owned by the Central/State/Local Govt.	Study on Zoning Regulation, TCPO, 2004
34	Hospital	A premise providing medical facilities of general or specialised nature for treatment of indoor and outdoor patients. It may be managed by public, private or charitable institution.	Master Plan for Delhi: 2021
35	Hotel	A premise used for lodging of 15 persons or more.	Master Plan for Delhi: 2021
36	Informal Unit	Retail/service unit, stationary or mobile, work place without roof including small Khokhas on roadside	Study on Zoning Regulation, TCPO, 2004
37	International convention centre	A premise having all facilities for international /national conferences, meetings, symposium etc.	Master Plan for Delhi: 2021
38	Jail	A premise with facilities for detention, confinement and reform of criminals under the law.	Master Plan for Delhi: 2021
39	Library/ reading room	A premise having a large collection of books for reading and reference for general public or specific class.	Study on Zoning Regulation, TCPO, 2004
40	Local shopping centre	A group of shops in residential area serving population of 15,000 persons.	Master Plan for Delhi: 2021
41	LPG godown including booking office	A premise for the booking, storing and supply of LPG to local population.	Master Plan for Delhi: 2021
42	Multipurpose community hall, barat ghar	A premise having an enclosed space for various social and cultural activities.	Master Plan for Delhi: 2021
43	Municipal Solid Waste	According to MSW Rules 2000, MSW includes commercial and residential wastes generated in municipal or notified areas in either solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes.	Toolkit for Solid Waste Management, Ministry of Urban Development, 2012
44	Night Shelter	A premise having the facility for providing the night accommodation to individuals without any charges. It may be run by local government or voluntary agencies.	Master Plan for Delhi: 2021
45	Nursing Home/ Maternity home/ Polyclinic	A premise having medical facilities for indoor and outdoor patients having upto 50 beds. It may be managed by a doctor or a group of doctors. In case of polyclinic, it shall be managed by a group of doctors.	Master Plan for Delhi: 2021
46	Old Age Home/ Care Centre for	A premise having the facility of caring and training boarding and lodging of the elderly/ physically/ mentally challenged.	Master Plan for Delhi: 2021

Appendix B- Basic Planning Definition

Sr. No.	Particular	Definitions	Source
	Physically/ Mentally Challenged		
47	Observatory & Weather Office	A premise with facilities for research and development of data relating to weather and forecasting thereof.	Master Plan for Delhi: 2021
48	Orphanage	A premise having the facility of boarding of children who are bereaved of parents. It may or may not have educational facilities.	Master Plan for Delhi: 2021
49	Park	A premise used for recreational/leisure activities. It may have on it related landscaping, parking facilities, public toilet, fencing etc. It will include lawns, open spaces, green etc.	Study on Zoning Regulation, TCPO, 2004
50	Play Ground	A premise used for outdoor games. It may have on it landscaping, parking facilities, public toilet, etc	Study on Zoning Regulation, TCPO, 2004
51	Police firing range	A premise having facilities for firing practice of the paramilitary forces.	Master Plan for Delhi: 2021
52	Police Line	An area having facilities for work and residential accommodation of paramilitary forces.	Master Plan for Delhi: 2021
53	Police post	A premise having facility for a local police post of a temporary nature or on smaller scale as compared to a police station.	Master Plan for Delhi: 2021
54	Police station	A premise having facilities for offices of local police post.	Master Plan for Delhi: 2021
55	Police training institute/college	A premise having facilities for training of paramilitary forces.	Master Plan for Delhi: 2021
56	Primary health centre/family welfare centre/Diagnostic Centre	A premise having facilities for treating indoor and outdoor patients having upto 10-15 beds. It may be managed by a public or charitable institution on non-commercial basis. It includes family welfare centre and maternity home.	Master Plan for Delhi: 2021
57	Primary School	A premise having educational and playing facilities for students upto V standard.	Study on Zoning Regulation, TCPO, 2004
58	Radio and TV Station	A premise with facilities for recording, broadcasting and transmission of news and other programmes through the respective medium. It may include some hostel accommodation for guest artists, transmission facilities like towers, etc.	Study on Zoning Regulation, TCPO, 2004
59	Rain Water Harvesting	Rain water harvesting is the technique of collection and storage of rain water at surface or in sub-surface aquifers, before it is lost as surface run-off.	Rain water Harvesting Techniques, Ministry Of Water Resources Central Ground Water Board, 2003
60	Recreational Club	A premise having the facility for recreation with indoor sports, swimming pool, outdoor sports, socializing and gathering space for small functions with restaurant.	Master Plan for Delhi: 2021
61	Regional MSW Facility/Management	A 'Regional MSW Facility' means a waste management facility or system of any kind (whether in relation to collection, transportation, treatment or disposal of MSW or a combination of any or all of them), which collects, manages or receives or disposes (as the case may be) MSW from more than one Authority.	Municipal Solid Waste Management on a Regional Basis, Ministry of Urban Development
62	Retail Shop	A premise for sale of commodities directly to consumer with necessary storage	Study on Zoning Regulation, TCPO, 2004
63	Research and Development Center	A premise providing facilities for research and development in any specific field.	Study on Zoning Regulation, TCPO, 2004
64	Restaurant	A premise used for serving food items on commercial basis including cooking facilities. It may have covered or open space or both for sitting arrangement.	Master Plan for Delhi: 2021

Sr. No.	Particular	Definitions	Source
65	Street	Any means of access, namely, highway, street lane, pathway, alley, stairway, passageway, carriageway, footway, square, place or bridge, whether a thoroughfare or not, over which the public have a right of passage or access or have passed and had access uninterrupted for a specified period, whether existing or proposed in any scheme, and includes all bunds, channels, ditches, storm-water drains, culverts, sidewalks, traffic islands, roadside trees and hedges, retaining walls, fences, barriers and railings within the street lines.	National Building Code: 2005
66	Secondary School	A premise having educational and playing facilities for students from VI to X standard.	Study on Zoning Regulation, TCPO, 2004
67	Senior Secondary School	A premise having educational and playing facilities for students from X to XII standard.	Study on Zoning Regulation, TCPO, 2004
68	Septage	The settled solid matter in semi-solid condition usually a mixture of solids and water settled at the bottom of septic tank. It has an offensive odour, appearance and is high in organics and pathogenic microorganisms.	Advisory Note: Septage Management In Urban India, MoUD, 2013
69	Septic tank	An underground tank that treats wastewater by a combination of solids settling and anaerobic digestion.	Advisory Note: Septage Management In Urban India, MoUD, 2013
70	Sludge	The settled solid matter in semi-solid condition – it is usually a mixture of solids and water deposited on the bottom of septic tanks, ponds, etc.	Advisory Note: Septage Management In Urban India, MoUD, 2013
71	Technical Training Centre/ Institute, Nursing and Paramedic Institute	A premise with facilities for training in discipline of technical nature. It includes technical school and industrial training institute.	Master Plan for Delhi: 2021
72	Traffic and police control room	A premise of temporary structures having facilities for managing of traffic and law & order related issues.	Master Plan for Delhi: 2021
73	Transit Oriented Development	“Transit Oriented Development is essentially any development, macro or micro that is focused around a transit node, and facilitates complete ease of access to the transit facility, thereby inducing people to prefer to walk and use public transportation over personal modes of transport.	UTTIPEC, Delhi Development Authority, 2012
74	Unaccounted-for Water / Non-Revenue Water	Unaccounted-for Water (UFW) is the difference between the quantity of water supplied to a city's network and the metered quantity of water used by the customers.	Manual on Water Supply and Treatment, CPHEEO, 1999
75	University Campus	A premise having an educational institution designed for instruction, examination, or both, of students in many branches of advanced learning, conferring degrees in various faculties, and often embodying colleges and similar institutions.	Master Plan for Delhi: 2021
76	Veterinary hospital for pet animal and birds	A premise having medical facilities for indoor and outdoor treatment of pet animal and birds. It may be managed by a public or charitable institution or on community basis.	Master Plan for Delhi: 2021
77	Veterinary Institute	A premise having educational and playing facilities for students of undergraduate and post graduate in veterinary courses along with research facilities under a university.	Master Plan for Delhi: 2021
78	Weekly market	An area used once in a week by a group of informal shop establishments in the form of a market. These markets shift from one area to another on different days of the week.	Master Plan for Delhi: 2021
79	Wholesale Trade	A premise from where goods and commodities are sold and delivered to retailers. The premise includes storage, godown and loading & unloading facilities.	Study on Zoning Regulation, TCPO, 2004

Appendix B- Basic Planning Definition

Sr. No.	Particular	Definitions	Source
Chapter 10: Simplified Development Promotion Regulations			
1	Clinic	A premise with facilities for treatment of outdoor patients by a doctor.	Master Plan for Delhi : 2021
2	Floor Area Ratio (FAR)	The quotient obtained by dividing the total covered area (plinth area) on all floors by the area of the plot, FAR = Total covered area of the floors/Plot area	National Building Code: 2005
3	Group Housing	Housing for more than one dwelling unit, where land is owned jointly (as in the case of cooperative societies or the public agencies, such as local authorities or housing boards, etc) and the construction is undertaken by one agency.	National Building Code: 2006
4	Habitable Room	A room occupied or designed for occupancy by one or more persons for study, living, sleeping, eating, and kitchen, if it is used as a living room, but not including bathrooms, water-closet compartments, laundries, serving and store pantries, corridors, cellars, attics, and spaces that are not used frequently or during extended periods.	National Building Code: 2007
5	Open Spaces	An area, forming an integral part of the plot, left open to the sky.	National Building Code: 2008
6	Parking Space	An area enclosed or unenclosed, covered or open, sufficient in size to park vehicles, together with a drive-way connecting the parking space with a street or alley and permitting ingress and egress of the vehicles.	National Building Code: 2009
7	Post office	A premise with facility for postal communication for public use	Master Plan for Delhi : 2021 & Study on Zoning Regulation, TCPO, 2004
8	Poultry farm	A premise with facility for rearing and processing of poultry products. It may have temporary structures for sheds of birds.	Master Plan for Delhi : 2021
9	Residential Flat	Residential accommodation for one family/ household as part of group housing.	Master Plan for Delhi : 2021
10	Residential plot- Housing	A premise for one or more than one dwelling unit and may have on it one main building block and one accessory block for garages and service personnel.	Master Plan for Delhi : 2021
11	Service Apartment	A premise fully furnished, serviced and self-contained with meal preparation used for short-term corporate and accommodation	Master Plan for Delhi : 2021
12	Mumty	A structure with a roof over a staircase and its landing built to enclose only the stairs for the purpose of providing protection from weather and not used for human habitation	National Building Code: 2005
13	Tower like structures	Structures shall be deemed to be tower like structures when the height of the tower like portion is at least twice the height of the broader base at ground level.	National Building Code: 2005

Source: As given

3 Appendix C – PPP Models in existing scenario

3.1. Introduction

Public Private Partnership (PPP) is infusion of private capital and management in provision of services that have traditionally been provided by the government. Adequate risk transfer from the government to the private sector is a key feature of PPPs along with the delivery of high-quality and cost-effective services to consumers and the government¹.

3.2. Existing scenario

Reforms of 1990 brought/started economic liberalisation in India. The role of government underwent transformation from provider to facilitator as a result. Initially it was in the form of privatisation but after following international experiences PPP was introduced in India. The tendency of the private sector to undervalue social infrastructure, and the large sunk costs associated with providing much economic infrastructure, has been obstacle to privatization. Thus PPPs began to emerge significantly as a means of obtaining private sector capital and management expertise for infrastructure investment (both to carry on where privatization had left off and as an alternative where there had been obstacles to privatization).

It has emerged as one of the leading PPP markets in the world, due to several policy and institutional initiatives taken by the central as well as many state governments. Over the years an elaborate ecosystem for PPPs has developed, including institutions, developers, financiers, equity providers, policies and procedures².

The growing role of PPP in India has led for the requirement of national policy. As a result Government of India in 2011 published a draft National PPP Policy which is under public consultation currently.

3.3. Public Private Partnership: Alternate Definitions

- **Government of India:**

'PPP means an arrangement between a government or statutory entity or government owned entity on one side and a private sector entity on the other, for the provision of public assets and/ or related services for public benefit, through investments being made by and/or management undertaken by the private sector entity for a specified time period, where there is a substantial risk sharing with the private sector and the private sector receives performance linked payments that conform (or are benchmarked) to specified, pre-determined and measurable performance standards.'

- **The International Monetary Fund (IMF):**

'Public-private partnerships (PPPs) refer to arrangements where the private sector supplies infrastructure assets and services that traditionally have been provided by the government.' (IMF 2004,)

¹Sources: Public Private Partnership, IMF, 2004

²Source: National PPP Policy 2011 - Draft for Consultation

■ **The World Bank:**

'PPP programs are projects that are for services traditionally provided by the public sector, combine investment and service provision, see significant risks being borne by the private sector, and also see a major role for the public sector in either purchasing services or bearing substantial risks under the project.' (World Bank 2006)

■ **The Asian Development Bank (ADB):**

'PPPs broadly refer to long-term, contractual partnerships between the public and private sector agencies, specifically targeted towards financing, designing, implementing, and operating infrastructure facilities and services that were traditionally provided by the public sector (ADB 2006)

■ **The European Union:**

'A PPP is the transfer to the private sector of investment projects that traditionally have been executed or financed by the public sector' (European Commission 2003).

3.4. Public Private Partnership (PPP) in India

PPP in India has evolved in the past decade and several projects of PPP have been completed in infrastructure sector apart from residential/commercial development and these can be considered for understanding the critical aspects of such project implementation in future.

Some of the case studies are as follow:

1. Alandur Underground Sewerage Project
2. Timarpur Okhla Integrated Municipal Solid Waste Management Project
3. Hyderabad Metro
4. Vadodara Halol Toll Road

These projects were considered owing to the key learning and observations derived from them, some to be emulated and others to be mitigated. Each of the case studies belongs to different sectors.

Alandur Underground Sewerage Project:

The Alandur Sewerage Project (ASP) was initiated in the year 1996. The ASP was the first project in the municipal water sector to be taken through the Public Private Partnership route in India. The proposed sewerage system was to be designed for the estimated population of about 300,000 in 2027 and was planned to be completed within a five-year period from its inception date.

Alandur Municipality (AM), located adjacent to Chennai, forms a part of the Chennai Metropolitan Area. With a population of around 165,000 (Census of India, 2011), the municipality is a residential suburb of Chennai with predominantly residential and commercial activities. Approximately one-fourth of its population lives in slums. Prior to 1996, the town did not have an underground sewerage system and all sewage was managed with individual septic tanks. In 1996, AM announced an ambitious plan to construct an underground sewerage system and wastewater treatment facility with the participation of the private sector, contribution from the public, and payment to be provided by the city.

The Alandur Municipality worked in partnership with the Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL), the state asset management company and with USAID’s Financial Institution Reform and Expansion (FIRE) Project.

The construction of the underground sewerage system in Alandur town was done on a BOQ (Bill of Quantities) basis, and the sewerage treatment plant (STP) on a BOT (Build, Operate and Transfer) basis. Besides the construction responsibility, the contractor was also required to undertake the operation and maintenance of the sewerage system for a period of five years from the date of completion of the construction, on a fixed fee basis. The collection of tariff and provision of new connections during the O&M phase was to be undertaken by the municipality directly. Key features of the project are given below:

Table 3.1: Alandur Sewerage Project Details

Alandur Underground Sewerage Project	
PPP Project Structure & Concession Period	O&M Contract (5 Years) BOT Annuity (14 Years)
State and year PPP contract signed	Tamil Nadu 2005
Project Cost	INR 41.28 Crore
Salient Features	<ul style="list-style-type: none"> • The construction of the underground sewerage system in Alandur town, involving the laying of pipes, construction of pumping station, etc., was done on a BOQ (Bill of Quantities) basis, and the Sewerage Treatment Plant (STP) on a BOT (Build, Operate and Transfer) basis. • Besides the construction responsibility, the contractor was also required to undertake the operation and maintenance of the sewerage system for a period of five years from the date of completion of the construction, on a fixed fee basis. • The collection of tariff and provision of new connections during the O&M phase was to be undertaken by the municipality directly
Key Learning	<ul style="list-style-type: none"> • Beneficiary participatory approach • Stakeholder involvement and interdepartmental coordination • Political will and strong decision making, especially at the grass-root level • Acceptance of fiscal discipline • Implementing an effective fee system • Assurances on payment to the Private Sector Participant • Access to finance for the municipality • Technical and financial assistance from other institutions • Transparency in bidding and contracting procedures

Source: Public Private Partnership Projects in India, Compendium of Case Studies, Department of Economic Affairs, Ministry of Finance, Government of India

Public Private Partnership Projects in India, Compendium of Case Studies, Department of Economic Affairs, Ministry of Finance, Government of India

Timarpur Okhla Integrated Municipal Solid Waste Management Project

Delhi generates 7,000 metric tonnes (MT) of Municipal Solid Waste (MSW) daily, which is expected to increase to 18,000 MT by 2021. The present landfill sites that are being utilized for disposing the garbage are approaching their full capacity. Municipal Corporation of Delhi (MCD) has thus embarked on a project to reduce the amount of MSW being disposed in the landfill sites and utilizing the waste for productive purposes such as generation of power from waste. MCD has identified two locations, namely Timarpur and Okhla, for implementing this project. The project has been undertaken on Built, Own, Operate and Transfer (BOOT) basis.

The project is registered with the United Nations Framework Convention on Climate Change (UNFCCC) for the Clean Development Mechanism (CDM) to earn 2.6 million Certified Emission Reductions (CERs) over a ten-year period.

Table 3.2: Timarpur-Okhla Integrated MSWM Project details

Timarpur Okhla Integrated Municipal Solid Waste Management Project	
PPP Project Structure & Concession Period	BOOT (25 Years)
State and year PPP contract signed	Delhi 2008
Project Cost	INR 200 Crore
Salient Features	<ul style="list-style-type: none"> Infrastructure included plants for converting MSW to Refuse Derived Fuel (RDF), capable of processing 1300 TPD at Okhla and 650 TPD at Timarpur, a bio-methanation plant capable of handling of 100 TPD of green waste at Okhla, a water recovery plant capable of handling up to 6 MLD of treated sewage at the Okhla site for recycling into process water and cooling water and a Power plant with a generation capacity of 16 MW at Okhla The salient features included - Solid and liquid waste can be treated in the same complex. The treatment process is well integrated in terms of inputs and output. The complex generates compost and methane from the Bio-methanation process, fuel from the RDF plant and power from the RDF fluff and methane.
Key Learning	<ul style="list-style-type: none"> Project Preparedness Government Support Innovative Use of Technology Consumer Education

Source: [Public Private Partnership Projects in India, Compendium of Case Studies, Department of Economic Affairs, Ministry of Finance, Government of India](#)

Hyderabad Metro

Hyderabad is a growing city that covers 625 square kilometres of municipal corporation area and 6,852 square kilometres of metropolitan area. The burgeoning population has put Hyderabad's transportation system under immense pressure. To address this need, the Government of Andhra Pradesh (GoAP) has planned a Mass Rapid Transit system (MRTS) covering three high traffic density corridors of Hyderabad. The project is planned to be developed on a PPP basis through the Build Operate Transfer (BOT) mode.

Hyderabad Metro Rail Ltd, a fully owned Public Sector Undertaking of GoAP is currently implementing the Hyderabad Metro Rail Project. The project is to be developed under a concession agreement on BOT basis. Under the concession agreement, the operator has to design, finance, construct, operate, and maintain the 3 corridors and transfer the assets at the end of the concession period.

Table 3.3: Hyderabad Metro Details

Hyderabad Metro Project	
PPP Project Structure & Concession Period	BOT (35 Years)
State and year PPP contract signed	Andhra Pradesh 2008
Project Cost	INR 200 Crore
Salient Features	<ul style="list-style-type: none"> Under the concession agreement, the operator has to design, finance, construct, operate, and maintain the 3 corridors and transfer the assets at the end of the concession period. In addition, the operator would also have access to the commercial development of land available at the depots (212 acres) and 10% of the carpet area of the station sites identified in the concession agreement. This aggregates to a cumulative maximum of 12.5 million square feet in the case of depots and a cumulative maximum of 6 million square feet in the case of stations.

Hyderabad Metro Project

- The SPV would also be allowed to undertake real estate development over the parking and circulation areas at stations.

Key Learning

- Real Estate Development along with metro project
- Transfer of Traffic Risk
- Creation of Right of Way
- Issues of Promoter Backing

Source: Public Private Partnership Projects in India, Compendium of Case Studies, Department of Economic Affairs, Ministry of Finance, Government of India

Vadodara Halol Toll Road

VHTR was an initiative commissioned as a part of the Vision 2010 – an infrastructure master plan developed by the Government of Gujarat (GoG). The project involved widening and strengthening of 32 kilometres (km) of the existing two-lane State Highway (SH 87) connecting Vadodara to the industrial town of Halol into a four-lane tolled expressway.

The Vadodara Halol Toll Road (VHTR) was one of the first State Highway widening projects developed on a Public Private Partnership basis in India and it has subsequently paved the way for a large number of projects to be undertaken on a similar format in Gujarat and the rest of India.

The VHTR project is developed under the Built, Own, Operate and Transfer (BOOT) basis.

Table 3.4: Vadodara Halol Toll Road Details

Vadodara Halol Toll Road Project

PPP Project Structure & Concession Period	BOOT (30 Years)
State and year PPP contract signed	Gujarat 1998
Project Cost	INR 161 Crore
Salient Features	<ul style="list-style-type: none"> • Under the concession agreement, construction aspects included design and completion of the road, including the pavement, cross drainage system, bridges, toll facilities, medians, separators, road furniture, and horticultural aspects. • The O&M aspects included the toll collection, operating the toll plaza, traffic regulation and maintenance of the facility. It also includes special maintenance activities such as eliminating potholes in the pavements, replacing drainage structures, road markings and signage, cleaning lanes, shoulders, right-of-way strips, structures, maintaining operational installations and drainage facilities.
Key Learning	<ul style="list-style-type: none"> • The criticality of pre development market assessment • Competitive bidding can ensure a better deal • Need to create a balanced risk return profile • Conflicts of Interest should be identified early and avoided • Innovative Financing Mechanisms • Environmentally and socially responsive development framework

Source: Public Private Partnership Projects in India, Compendium of Case Studies, Department of Economic Affairs, Ministry of Finance, Government of India

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4 Appendix D – List of ITPI recognised Institutes

Table 4.1: List of Institutes offering various courses in Town Planning and recognised by ITPI

Sr. No.	State	Institute
1	Punjab	Guru Ramdas School of Planning, Amritsar
2	Haryana	Amity University*,Gurgaon
3	NCT Delhi	School of Planning and Architecture , New Delhi Institute of Town Planners, India
4	Uttarakhand	Indian Institute of Technology, Roorkee
5	Uttar Pradesh	GautamBudh University*, Greater NOIDA Amity University* , NOIDA
6	Madhya Pradesh	Maulana Azad National Institute of Technology (MANIT), Bhopal School of Planning and Architecture, Bhopal
7	Uttar Pradesh	GautamBudh University*, Greater NOIDA Amity University* ,NOIDA
8	Madhya Pradesh	Maulana Azad National Institute of Technology (MANIT), Bhopal School of Planning and Architecture, Bhopal
9	Jharkhand	BIT*, Mesra, Ranchi
10	West Bengal	IIT, Kharagpur Bengal Engineering and Science University, Shibpur
11	Bihar	NIT, Patna
12	Gujarat	CEPT University, Ahmedabad Sardar Vallabhbhai Patel National Institute of Technology, Surat Bhai Kaka Centre for Human Settlements, Arvind Bhai Patel Institute of Environmental Design,VallabhVidhyanagar
13	Maharashtra	Government College of Engineering, Pune Vishvesharaiya National Institute of Technology, Nagpur
14	Rajasthan	Malviya National Institute of Technology *
15	Andhra Pradesh	JNTU, Hyderabad School of Planning & Architecture , Vijaywada
16	Karnataka	Institute of Development Studies, Mysore
17	Tamil Nadu	School of Architecture& Planning, Chennai
18	Kerala	College of Engineering, Thiruvananthapuram

Source: Planning and Development, 2025: Professional and Academic Challenges, TCPO

*Applicants under recognition process by ITPI

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5 Appendix E – Biodiversity Index Indicator

Table 5.1: Biodiversity Index Indicators

S.No.	Indicators	Calculation	Score Range
1	Proportion of Natural Areas in the city	$(\text{Total Area of Natural Areas}) \div (\text{Total Area of the City}) \times 100$	0 point: <1% 1 point: 1%-6% 2 points: 7%-13% 3 points: 14%-20% 4 points: >20%
2	Connectivity measures or ecological networks to counter habitat fragmentation	$(1 / A \text{ total})(A12 + A22 + A32 + \dots + A_n2)$	1 point <0.787 2 points 0.787-0.883 3 points 0.884-0.979 4 points >0.979
3	Native bird species in built up areas (other than natural areas)	Number of bird species in built-up areas	1 point < 10 2 points 11-23 3 points 24-53 4 points >53
4	Change in number of native species ³	Net change in number of native species	1 point: No loss of species 2 points: 1 species increase 3 points: 2 species increase 4 points: 3 species or more increase
5	Proportion of natural protected areas	$(\text{Area of protected or secured natural areas}) \div (\text{Total area of the city}) \times 100$	N.A.
6	Proportion of invasive alien species of vascular plants (as opposed to native species)	$(\text{Number of invasive alien species}) \div (\text{Number of native species}) \times 100$	0 point: >30% 1 point: 21%-30% 2 points: 11%-20% 3 points: 1%-10% 4 points <1%
7	Regulation of quantity of water	$(\text{Total permeable area}) \div (\text{Total terrestrial area of the city})$	1 point <0.307 2 points 0.307-0.4785 3 points 0.4786-0.65 4 points >0.65
8	Climate regulation: carbon storage and cooling effect of vegetation	$(\text{Tree canopy cover}) \div (\text{Total terrestrial area of the city}) \times 100$	1 point <0.07454 2 points 0.07454-0.160 3 points 0.160-0.339 4 points >0.339
9	Tree canopy cover on terrestrials area	Tree Count and Tree Cover Mapping	N.A.
10	Recreational and education services (areas of park with natural areas and protected or secured natural areas per 1000 persons)	$(\text{Parks Area with natural areas and protected or secured natural areas}) \div 1000 \text{ persons}$	0 point: <0.1 ha/ 1000 persons 1 point: 0.1-0.3 ha/ 1000 persons 2 points: 0.4-0.6 ha/ 1000 persons 3 points: 0.7-0.9 ha/ 1000 persons 4 points: >0.9 ha/ 1000 persons
11	Recreational and education services (Number of formal educational visit per child per park)	Number of visits per year	0 point: 0 formal educational visit/ year 1 point: 1 formal educational visit/ year 2 points: 2 formal educational visit/ year 3 points: 3 formal educational visit/ year 4 points: >3 formal educational visit/ year 4

³Indicators 4-8 (Vascular plants, Birds, Butterflies, Reptiles, Freshwater fish)

Appendix E- Biodiversity Index Indicator

S.No.	Indicators	Calculation	Score Range
12	Budget allocation for biodiversity	(Amount spent on biodiversity related administration) ÷ (Total budget of city)	1 point <0.74 2 points 0.74-2.50 3 points 2.51-4.26 4 points >4.26
13	Number of biodiversity projects implemented in the city per year	Number of biodiversity projects implemented in the city per year	1 point <4 2 points 4-9 3 points 10-14 4 points >14
14	Rules, regulations and policy – existence of local biodiversity strategy and action plan	Existence of local biodiversity strategy and action plan (LBSAP), National Biodiversity Strategy and Action Plan (NBSAP)	0 point: No LBSAP 1 point: LBSAP not aligned with NBSAP 2 points: LBSAP incorporates elements of NBSAP, but does not include any CBD initiatives 3 points: LBSAP incorporates elements of NBSAP, and includes 1-3 CBD initiatives 4 points: LBSAP incorporates elements of NBSAP, and includes more than 4 CBD initiatives
15	Institutional capacity – Essential biodiversity - related function	Number of essential biodiversity related functions includes biodiversity centres, botanical gardens, herbaria, zoological gardens or museums, insectariums, etc.	1 point: 1 function 2 points: 2 function 3 points: 3 function 4 points: > 3 function
16	Institutional capacity – Inter Agency Cooperation	Number of city or local government agencies involved in inter-agency corporation pertaining to biodiversity matters	0 point: 1 or 2 agencies cooperate on biodiversity matters 1 point: 3 agencies cooperate on biodiversity matters 2 points: 4 agencies cooperate on biodiversity matters 3 points: 5 agencies cooperate on biodiversity matters 4 points: More than 5 agencies cooperate on biodiversity matters
17	Participation and partnership: public consultation process	Existence and state of formal or informal public consultation process pertaining to the biodiversity related matters	0 point: No routine or informal process 1 point: Formal or informal process being considered as part of the routine process 2 points: Formal or informal process being planned as part of the routine process 3 points: Formal or informal process in the process of being implemented as part of the routine process 4 points: Formal or informal process exists as part of the routine process
18	Participation and partnership: Institutional partnership	Number of institutional partnerships	0 point: No formal/ informal partnership 1 point: City in partnership with 1-6 other national or sub-national agencies/ private company/ NGO/ academic institutions/ international organizations 2 points: City in partnership with 7-12 other national or sub-national agencies/ private company/ NGO/ academic institutions/ international organizations

S.No.	Indicators	Calculation	Score Range
			<p>3 points: City in partnership with 13-19 other national or sub-national agencies/ private company/ NGO/ academic institutions/ international organizations</p> <p>4 points: City in partnership with 20 or more other national or sub-national agencies/ private company/ NGO/ academic institutions/ international organizations</p>
19	Is biodiversity or nature awareness included in the school curriculum?	Based on the query "Is biodiversity or nature awareness is included in the school curriculum?"	<p>0 point: Biodiversity or elements of it are not covered in the school curriculum</p> <p>1 point: Biodiversity or elements of it are being considered for inclusion in the school curriculum</p> <p>2 points: Biodiversity or elements of it are being planned for inclusion in the school curriculum</p> <p>3 points: Biodiversity or elements of it are in the process of being implemented in the school curriculum</p> <p>4 points: Biodiversity or elements of it are included in the school curriculum</p>
20	Education and awareness: public awareness events	Number of natural awareness and Biodiversity events in the city	<p>0 point: 0 outreach events/year</p> <p>1 point: 1-59 outreach events/year</p> <p>2 points: 60-149 outreach events/year</p> <p>3 points: 150-300 outreach events/year</p> <p>4 points: > 300 outreach events/year</p>

Source: Greater Hyderabad City Biodiversity Index, Greater Hyderabad Municipal Corporation, 2012

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6 Appendix F – Transport Survey Format

6.1. Review of Existing Studies, Reports and Plans

Name of studies / reports / Plans	Major Problems / Issues addressed	Major Strategies	Major Proposed Projects / Plans

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.3. Outline of Road Network

		Metropolitan Area	Municipal Area	City Core
Road Length	National Highway length (km)			
	State Highway length (km)			
	Other Arterial Road length (km)			
	Secondary Road length (km)			
Road Density by road type	Road Density of Arterial Road (km/km ²)			
	Road Density of all roads (km/km ²)			
Major Road Infrastructure	Number of Rotaries			
	Number of signalised Inter sections			
	Number of Flyovers			
	Number of Railway Overbridge			
	Number of Railways Underpass			
	Number of Railway Railway Level crossing			

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.5. Inventory of Flyovers and Underpasses

Name of Flyover / Underpass	Location / direction of flyover / underpass	Length (m)	Width (m)	No. of Lanes	Width of footpath (m)		Traffic Volume (PCU/Day)
					Left	Right	

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.8. Inventory of Traffic Control Facilities

	Metropolitan Area	Municipal Area	City Core
Number of traffic signals			
Existence of area traffic control system			
Type of signal operation (automatic or manual by Police)			

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.12. Availability of Public Transport Types / Para-Transit Modes

	City Core	Urban Area	Sub-urban Area
	(Available or not available)		
Inter city bus			
Large Bus			
Mini Bus			
Taxi			
Auto Rickshaws			
Cycle Rickshaws			
Hand pull Rickshaws			

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.16. Summary of Traffic Accidents

	5 years ago	4 years ago	3 years ago	2 years ago	1 year ago
Total number of accidents					
involving pedestrians					
involving cyclists					
Involving cars					
Involving buses					
Number of injured or dead					
Number of dead					
Number of injured					
Identification of hazardous locations					
Major accident causes					

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.17. Summary of Enforcement

	Municipality Area	Metropolitan Area
Number of Traffic Police		
Existing Traffic Regulations		
Costs and types of violations		
Fines for traffic violations		
Number of police trap activities		
Manner of enforcement		
Organizational structure of enforcement body		

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.18. Inventory of Agencies / Organizations Relating to Urban Transport

Name of agency/department	Function and responsibility of agency/department	Relationship to other agency	Organization chart	Number of staffs	Annual Budget	Profitability and financial sustainability (only for operators)
State Government						
Transport Department						
Public Works Department						
Regional Transport Authority						
State Transport Company						
Municipality						
Metropolitan Development Authority						
State Government						
Transport Department						
Bus Operators						
Associations of Rickshaws or Taxis						
Ferry Operators						
Other relevant agencies (if any)						

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.19. Assessment of Planning, Implementation and Coordination Capacity

	Assessment
Planning and Implementation Capacity:	
Staffing capacity for urban transport planning	
Data capture capability e.g. systems for periodic traffic data collection	
Financial resources to implement planned transportation projects	
Experience in Public-Private Partnerships (PPP)	
Coordination Capability:	
Control over small private developers in planning supporting infrastructure	
Systems or processes to integrate transport and urban planning agencies	
Systems or process to integrate land use plans with transport plans	
Role and impact of workers/transport operator’s unions	
Division of duties between State Government and Urban Local Bodies (ULB)	
Planning and Implementation Capacity:	

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.20. Inventory Environmental Monitoring Data

	Standard	Location 1	Location 2	Location 3	Location 4	Location 5
Ambient for Air Quality Data						
NO _x						
SO _x						
Pb						
Noise						
Water Quality						

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.21. Typical Urban Transport Issues

Issue	Severity
Traffic Congestion	
City-Wide Traffic Congestion	
Traffic Congestion on Major Roads at Peak Hours	
Narrow Streets Contributing to Congestion	
Waiting or Parked Vehicles Contributing to Congestion	
Slow Vehicles (Bicycle, Cycle Rickshaw, Auto Rickshaw, Two wheeler)	
Contributing to Congestion	
Existing Bus System	
Lack of (Public) Bus Operator	
Lack of Bus Routes (i.e. bus routes are far from residence/commercial area)	
Lack of Bus Vehicles	
Poor Maintenance of Publicly Operated Bus Vehicles (e.g. level of breakdowns and pollution generation)	
Poor Maintenance of Privately Operated Bus Vehicles	
Proliferation of Disorganized Private Bus Services (including mini buses)	
Low Profitability of Bus Operators	
Lack of Bus Driver Training	
Parking	
Major Streets are too Narrow for Parking	
Problems Caused by Parking of Private Vehicles	
Problems Caused by Parking/Waiting of Rickshaws and Auto-Rickshaws	
Lack of Parking Areas at Station/Bus Terminals	
Lack of Land for Off-Street Parking Lots	
Lack of Regulations for Parking Measures (including development control standards)	

Issue	Severity
Parking Policy and Guidelines	
Safety	
Vehicle-Vehicle Accidents	
Accidents Involving Pedestrians	
Accidents Involving Cyclists	
Accidents Involving Auto/Cycle Rickshaws	
Level of Driver Education Training/Licensing	
Lack of approach to make women's travel by Public Transport and NMT safer, affordable, comfortable and convenient.	
Enforcement	
Enforcement of Illegal Traffic Movements or Speeding	
Enforcement of Illegal Traffic Parking	
Enforcement of Unlicensed Private Vehicle Motorists	
Enforcement of Illegal Bus/Para-Transit Operators	
Lack of Enforcement Resources (traffic police and equipment)	
Environmental	
Air Pollution	
Traffic Noise	
Planning and Implementation Capacity	
Guidance for Making City Transport Policy/Plans	
City Master Plans Do Not Reflect Actual Situation on the Ground	
Lack of Sufficient Urban Transport Planners within the City Government	
City Officials Dealing with Transport Planning Lack Experience or Training in Transport Planning	
Lack of Data Collection Capability e.g. Periodical Traffic Surveys (inc. traffic volume survey)	

Issue	Severity
Lack of Financial Resources to Implement Planned Transportation Projects	
Lack of Knowledge of Public-Private Partnerships (PPP)	
Lack of understanding of the gendered aspects of travel	
Lack of gender specific transport data	
Lack of women Urban Transport Planners at mid and senior levels within city government.	
Coordination Capability	
Small Private Developers Do Not Make Strategic Provision for Transport Infrastructure	
Transport and Urban Planning Agencies Do Not Coordinate or Integrate Plans and Processes	
Land Use Plans are Not Coordinated with Transport Plans	
Workers/Transport Operator’s Unions Obstruct Improvements	
Division of Duties between State Government and Urban Local Bodies (ULB) is Not Clear	
Transport/Traffic Regulations	
Bus/Paratransit (Auto-Rickshaw, Cycle Rickshaw) Operators are Not Adequately Regulated	
Para Transit Vehicles are Not Adequately Regulated	

6.22. Population and Socio-economic Situation

	Metropolitan Area			Municipality Area			Ward 1	Ward 2	Ward 3	Ward 4
Population										
Number and size of household										
Population growth trend										
Population density										
	Male	Female	Total	Male	Female	Total				
Number of Workers by category										
Main Workers										
Cultivator										
Agriculture										
Labour										
Household Industry										
Others										
Marginal Workers										
Non Workers										
Average Personal Income										
Average Household Income										

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.23. Vehicle Ownership Data

	Total in Metropolitan Area	Total in Municipality Area				Ward 1	Ward 2	Ward 3	Ward 4
Number of Registered Vehicles by Type									
Passenger Vehicle									
Small Passenger Vehicle									
Small Truck									
Heavy Truck									
Auto Rickshaws									
Cycle Rickshaws									
Buses									
Mini Bus									
Motorcycles (two wheeler)									
			Number of users						
			Male	Female	Total				
Number of households having Bicycle									
Number of households having Scooter, Motorcycle, Mope									
Number of households having Car, Jeep, Van									
Number of Licensed Drivers by License Type									

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.24. Traffic Count Surveys (Screen Line Survey and Cordon Survey)

Location:	Section(To/From):	Date / Month / Year:
Count Station No.:	Direction:	Day:
	Road Name & No.:	

	Passenger Vehicles								Good Vehicles			Grand Total	
	Heavy Fast	Light Fast				Slow			Heavy Fast	Light Fast			Total
		Bus	Mini Bus	Car	2-Wheel	3-Wheel	Cycle	Others		Total	Truck		
6-7 AM													
7-8 AM													
8-9 AM													
10-11 AM													
11-12 AM													
12-1 PM													
1-2 PM													
2-3 PM													
3-4 PM													
4-5 PM													
5-6 PM													

6.25. Traffic Count Survey (Intersection Turning Movement Survey)

Location:	Direction From:	Date / Month / Year:
Count Station No.:	Direction:	Right Turn/Straight/Left Turn:
Road Name & No.:		Day:

	Passenger Vehicles								Good Vehicles			Total	Grand Total
	Heavy Fast	Light Fast				Slow			Heavy Fast	Light Fast			
		Bus	Mini Bus	Car	2-Wheel	3-Wheel	Cycle	Others		Total	Truck		
6-7 AM													
7-8 AM													
8-9 AM													
10-11 AM													
11-12 AM													
12-1 PM													
1-2 PM													
2-3 PM													
3-4 PM													
4-5 PM													
5-6 PM													

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.27. Travel Speed and Time Survey

Name of Road:	From:	To:
From Km:	To Km:	No. of Trip:
		Date:
		Time:

Sl.No.	Distance		Control Points	First Stop Watch		Second Stop Watch		Cause of Delay
	Km	M		Journey Time		Delay Time		
				Min.	Sec.	Min.	Sec.	

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	<i>Optional / ITEM (Italic Font)</i>

6.28. Household O-D Survey

Household Summary										
Date: / Day:				Enumerator:					Sample No.:	
1. Address				2. Head of the Household:						
				3. Numbers of Family Members						
				4. Vehicles Owned:			Passenger Car	2-Wheeler	Bicycle	Aut o
						5 Years Ago				Other s
						Present				
5. Details of Household Members:										
Member No.	Sex (M/F)	Age	Occupation*	Monthly Income (Rs.)		Monthly Export on Transport (Rs.)		Availability of Driver License	Working / School Location	
				5 Years ago	Present	5 Years ago	Present			

* Occupation, 1-Govt. Service, 2-Pvt. Service, 3-Business, 4-Student, 5-House-wife, 6-Retired Person, 7-Unemployed

	Essential/ITEM A (Bold font)
	Preferable (ITEM B)
	Optional / ITEM (Italic Font)

6.29. Household O-D Survey

Trip Summary

6. Details of each trip

Sl. No.	Member No. ¹	Traffic Mode ²	No. in vehicle	Where did this trip begin ³	Where did this trip end ³	Trip purpose ⁴	Travel Time	Travel cost

Note: ¹Referring to the numbers described in “5. Details of Household Members”

²1-Bus, 2-Mini Bus, 3-Car, 4-Two-wheeler (motorcycle). 5-Three-wheeler (Auto-rickshaw), 6-Bicycle, 7-Railway, 8-Walk

³ Put zone number

⁴ 1-Going to work, 2-Going to school, 3-Going home, 4-Shopping, 5-Leisure, and 6-Business

Essential/ITEM A (Bold font)
Preferable (ITEM B)
<i>Optional / ITEM (Italic Font)</i>

7 Appendix G – Standard Layout of Map

7.1. Introduction

The layout of map should facilitate convenient reading of the map and location of essential information as given below:

Margin

- A trimming margin of 10 mm all around for the purpose of trimming and edge binding.
- A second margin with thick firm line indicating the outer limits of the drawing. Such margin of filing edge could be 25 mm while on other three sides it could be 15 mm for all sizes of maps.

Title

The title of the map should be as short as possible and should include the general title as well as sub-title. Size of letters used for the sub-titles should be generally one to two sizes smaller than the size of letters used for the main title.

Normally, the title block should contain the following particulars:

- Name of the office
- Drawing number and the title of the drawing
- Signature of the dealing officer
- Date of preparation / revision / alteration

Title block should be located at the bottom right hand corner of the sheet in a simple manner.

Recommended size of title block is 150 mm X 100 mm for sizes A2 and larger and 150 mm X 75 mm for sizes A3 and A4.

North Point

Indication of north point is essential on the drawing and it could be located immediately above the title block. Wherever possible, north point should be shown along with the windrose. The north point on a map should, as far as possible, point upwards.

Scale

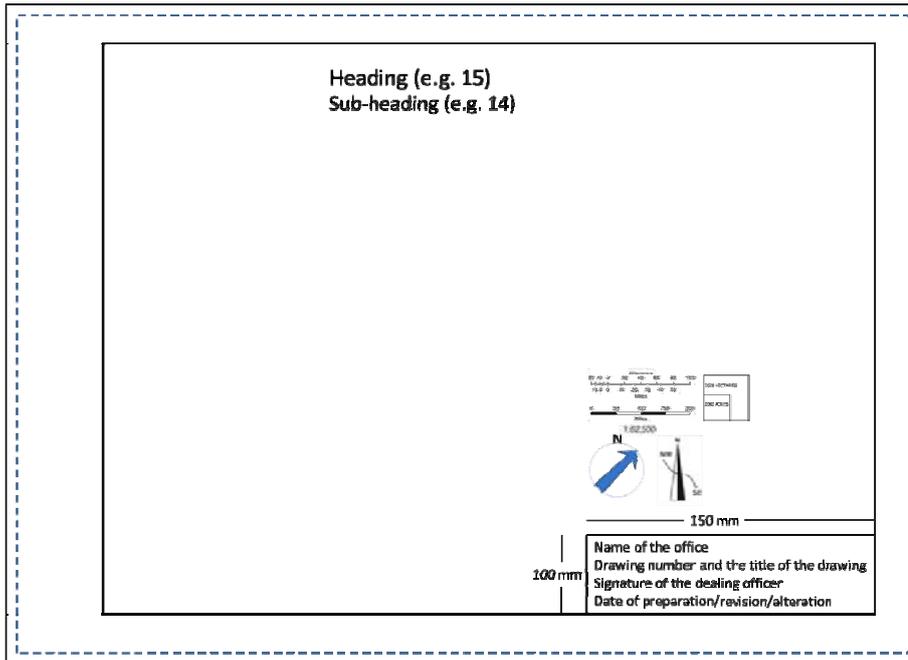
- Graphic scale: Graphic scale is one of the essential requirements of map and preferably it should be given in metric system for the convenience of reproduction. The graphic scale could be drawn above the title block.
- Spatial scale: In addition to graphic scale, the spatial scale should also be given on all plans. The spatial scale should consist of square with metric sides and the area covered by the square should be given inside the square. Such spatial scale could be located above the graphic scale in the drawing.
- Numeric scale: A numeric scale giving representation fraction (R.F.) e.g. 1:10,000 should be given below the graphic scale.

Numbering

A systematic numbering of maps / drawings would be convenient for reference. Respective department/ organization may allow its own numbering system based on standardised methods such as:

- Systematic numbering
- Consecutive numbering
- Sectional numbering

Figure 7.1: Representation of Standard layout of the map



Source: Compilation & representation of various source and UDPFI Guidelines

7.2. Map Enlargement and Reduction

Maps are generally available in different size and scales from different sources. All these maps could be brought in a required uniform scale by employing any of the following methods:

- Square method
- Similar triangle method
- Pantograph (mechanical method)
- Optical pantograph method
- Photographic method (optical)
- Digital method

The last three methods require sophisticated equipment, but they produce more accurate maps.

7.3. Map Notation

Planning exercise of settlements require preparation of maps to depict on ground conditions and variety of data relating to physical and socio-economic aspects which play crucial role in decision making and showing plans in spatial context. Broadly, these maps could be grouped under 2 categories.

- Survey and study maps
- Development plan maps/Proposal maps

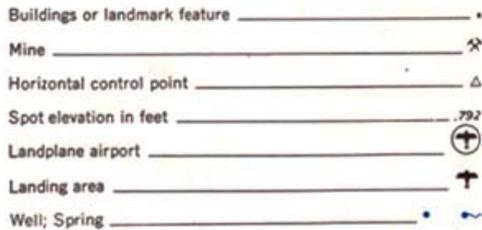
It is important that the manner of preparing survey and study maps must be closely related and in many cases identical to the preparation of proposal maps to facilitate the quick correlation of proposals with the existing conditions. Therefore, the notations and symbol used in both sets of maps should be similar as far as possible. Notations and symbols are language by themselves and need to be designed properly for easy understanding. For uniformity of presentation, it is also necessary to establish uniform practices in regard to the information to be included in these maps. Taking into consideration the standardisation of notations and information content of the maps, type of notations to be adopted can be grouped in three broad categories as following:

- Point
- Line
- Polygon

Point

Point data on map shall be used for depicting prominent feature, like building or highest point. Details that could be shown as point feature, varies depending on the scale of map. Following are some examples of point features that could brought under standard frame work on State level.

Figure 7.2: Survey of India Toposheet



Source: Survey of India

Figure 7.3: International Study inputs

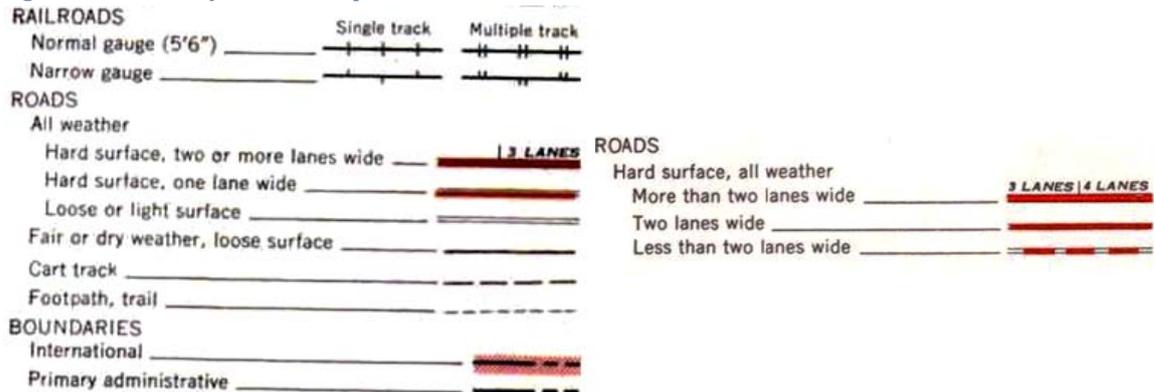


Source: Activity Centre Zone Mapping Style Guide, State Government Victoria

Line

Linear features could be boundaries, transportation network or water bodies' etc. Standardisation in linear features, specifically administrative boundaries shall be made at States' level. Boundary symbols as used by Survey of India organisation can be used by states as it will bring uniformity in boundary features at national level.

Figure 7.4: Survey of India Toposheet



Source: Survey of India

Polygon

A calibration in colour, notation and font used in maps should be made by state departments so that maps of a State depict information in uniform manner and are relatively easy for comparison and study by public. Mode of preparation of map on different platforms has impact on colour and notation. Thus, a standardised format of legend shall be made. RGB (Red Green Blue) colour specification can be provided for computer based platforms like GIS or CAD etc. Following are examples of such RGB colour specifications:

- Red : 255:51:0
- Purple : 102:0:204
- Yellow : 255:255:0
- Green : 0:153:0
- Orange : 255:153:0

Font's specifications can also be provided in terms of style, size and colour. Though these provisions will vary as per the scale and site of the sheet and be accordingly provided.

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8 Appendix H – Cadastral Map Overlay

8.1. Introduction

The process of preparing base map by overlaying satellite imagery over cadastral maps has been referred from chapter-6 of 'Space based information support for decentralized planning (SIS-DP) Manual: Preparation of Geo-spatial layers using (Cartosat – 1 Pan + LISS-IV Mx) Orthorectified Satellite Imagery' of ISRO. The manual (part -2) is available for public and can be downloaded from the link: <http://www.bhuvan-panchayat.nrsc.gov.in/assets/Manual-Part2.pdf>.

8.2. Process of base map formulation by overlaying Satellite images over cadastral maps

For overlaying cadastral map with satellite image it is required that cadastral map to be generated in vector mode. In this process the main tasks are acquisition of cadastral maps, scanning and digitization of cadastral maps and generation of vector data. Once the cadastral maps in vector mode are available, geo-referencing of these maps can be done. The geo-referencing of digital cadastral maps and overlaying with satellite image consists of the following steps:

- Acquisition of GCP's
- Transformation model development and assessment
- Geo-referencing of cadastral maps
- Validation of Geo-referenced map, in Isolation
- Validation of Geo-referenced map, with neighbourhood
- Mosaic generation at revenue inspector (RI), *taluka* and district level

8.2.1. Acquisition of ground control points:

Sufficient numbers of GCP's shall be identified on the vector cadastral map and on satellite image. The characteristics of the GCP's are intersections of parcel boundaries, river/stream with parcel boundary, of roads with parcel boundaries, roads with rivers and corners of water tanks. The GCPs should spread uniformly in the entire map.

8.2.2. Transformation model assessment:

Transformation model is applied for geo-referencing the cadastral map. The area of the village, number of sheets covered in a single village, condition of the cadastral map sheets, number and characteristics of GCPs collected and terrain conditions the affect polynomial model. The transformation model is accepted when the actual root mean square and residual errors arrived are less than the threshold values i.e. 6 m in either direction.

8.2.3. Geo-referencing of cadastral maps:

Once the transformation model is accepted, the vector cadastral map is geo-referenced through affine transformation⁴ in GIS environment. The outputs are further validated both visually and mathematically.

⁴Affine Transformation: A geometric transformation that scales, rotates, skews, and/or translates images or coordinates between any two Euclidean spaces. It is commonly used in GIS to transform maps between coordinate systems. In an affine transformation, parallel lines remain parallel, the midpoint of a line segment remains a midpoint, and all points on a

8.2.4. Validation of Geo-referenced map, in isolation:

Output product validation is an essential element in development of land information system. The geo-referenced vector file of each village is validated with reference to the merged product. The geo-referenced vector file is overlaid on the reference image and initial validation is carried out through visual checking. If the parcel boundaries coincide with the image features and deviations/displacements are not observed, the geo-referencing is successful. Feature matching is checked in the following order of priority; tanks, water bodies, tank bunds, ponds, road, rail, canal, stream, *nalla*, river, field bunds, forest boundary / vegetation boundary, *abadi* (village settlement).

8.2.5. Validation of Geo-referenced map, with neighbourhood reference:

This validation is carried out to ensure that the village boundary is matching with all adjoining village boundaries. The boundary should match perfectly. However, in accordance with the terrain conditions, the boundary (overlap/under lap) error tolerance in undulating terrains is kept around 15 m and in hilly areas, the tolerance is around 25 m (Srinivasa Rao et al., 2003b).

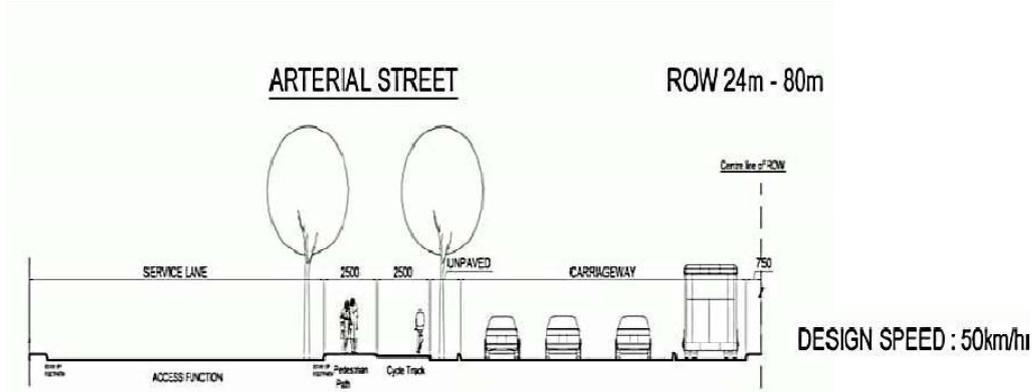
8.2.6. Mosaic generation at Revenue, taluka and district level:

After geo-referencing the cadastral maps to the required accuracy standards, a number of maps are mosaiced at the next higher administrative level. While mosaicing, feature continuity as well as attribute accuracy is to be maintained. These are the final products of geo-referencing of cadastral maps and can be used as base map. These products are directly linked to LIS and GIS databases.

straight line remain on a straight line.

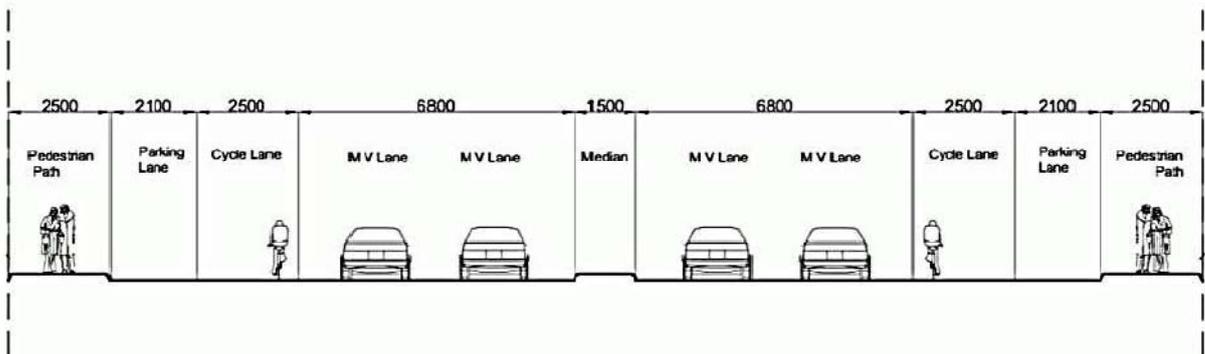
9 Appendix I – Road Cross Sections

Figure 9.1: Cross Section Distributary Road



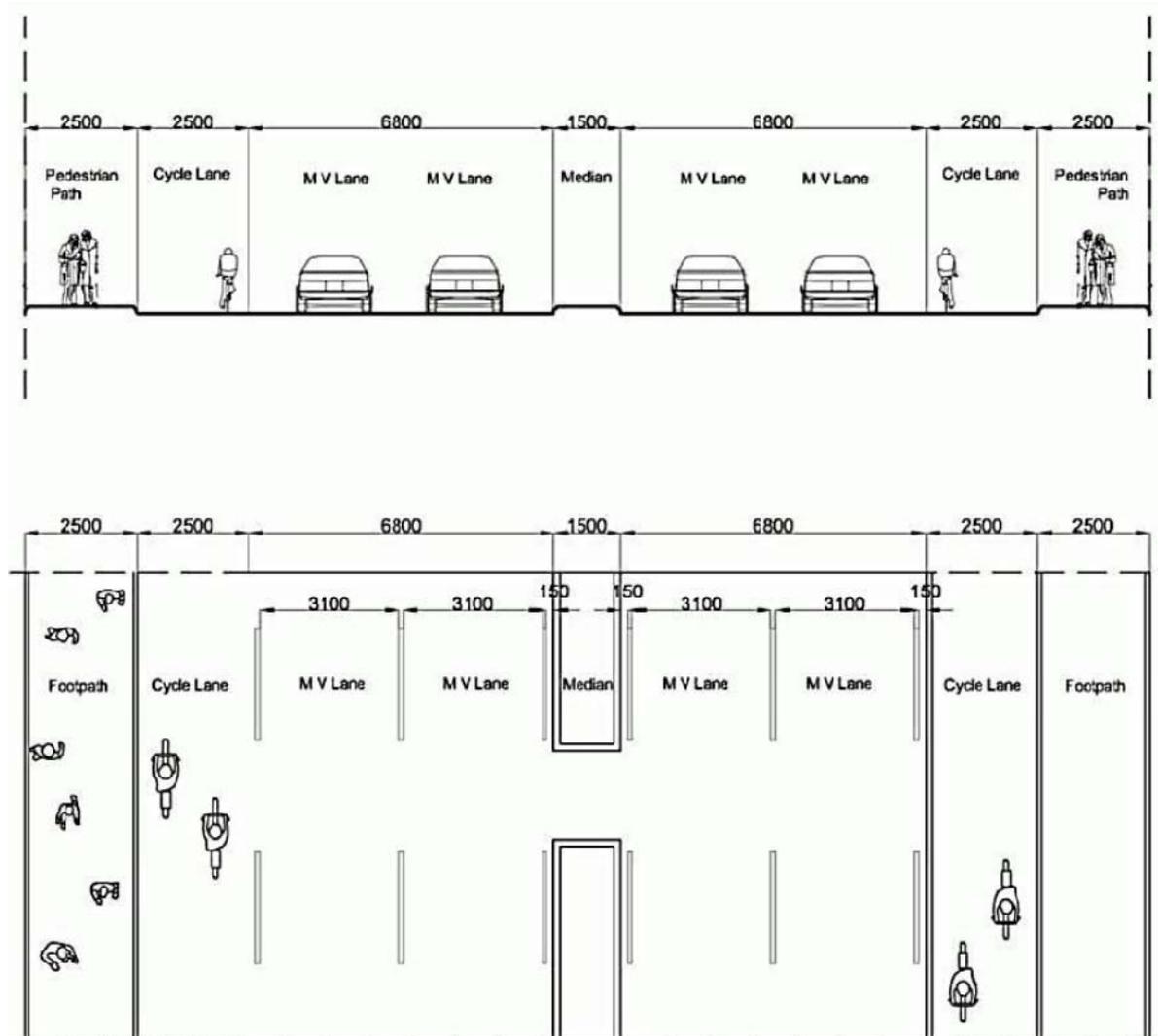
Source: Code of Practice Part-1, MoUD, 2012

Figure 9.2: Cross Section Distributary Road



Source: Code of Practice Part-1, MoUD, 2012

Figure 9.3: Cross section of Access road



Source: Code of Practice Part-1, MoUD, 2012

10 Appendix J – Travel Demand Modelling Process

10.1. Trip Generation

The first step in travel forecasting is trip generation. In this step, information from land use, population, and economic forecasts are used to estimate how many trips will be made to and from each zone.

Types of Most Commonly Used Trip Generation Models

- Regression models: equations such as:
 - Total trips = 1.1*population,
 - Home-based work trips = 1.5*total employment, etc;
- Cross-classification tables based on: household size, number of workers, income class, vehicle ownership, etc.;
- Special generator models: used for generators such as airports, colleges, amusement parks, green spaces, etc.;
- Separate rates for peak and off-peak trips.

Assumptions and limitations:

- Pedestrian and bicycle trips are usually excluded from trip generation models.
- Commercial vehicles need to be generated separately.
- Care should be taken before interchanging vehicle trip rates with person trip rates.

Validation and Reasonableness Checking for trip generation

- Compare trips per household to the regional average. There should be a valid explanation if numbers are too high or too low.
- Review trips per household by purpose.
- Ensure that trip productions and trip attractions balance well. Check trip rates and adjust if they do not balance
- Create GIS color-coded maps of productions and attractions to review for errors. Use special generators for facilities such as schools, hospitals, malls, and recreational facilities such as parks, playgrounds, etc.
- Make model external trips and visitor trips using external cordon and visitor surveys.
- Make sure Commercial Vehicle and Freight Travel is included in the model

10.2. Trip Distribution

The trip distribution model estimates number of trips travelled from one zone to another. Trip generation only finds the number of trips that begin or end at a particular zone. The process of trip distribution links the trip ends to form an origin-destination pattern. Trip distribution is used to represent the process of destination choice (i.e. "I need to go shopping, but where should I go to meet my shopping needs?").

The most commonly used procedure for trip distribution is called the gravity model. The gravity model takes the trips produced at one zone and distributes to other zones based on both the size of the other zones (as measured by their trip attractions) and the composite cost (travel time, distance or cost for all modes available) to other zones. A zone with many trip attractions (say, a large

shopping center) will receive a greater number of distributed trips than one with few attractions (a small shopping center). The mathematical formula for a gravity model is shown below:

$$T_{ij} = P_i \left(\frac{A_j F_{ij} K_{ij}}{\sum_{k=1}^{\text{zones}} A_k F_{ik} K_{ik}} \right)$$

Where,

T_{ij} = the number of trips from zone i to zone j,

P_i = the number of trip productions in zone

A_j = the number of trip attractions in zone j,

F_{ij} = the friction factor relating the spatial separation between zone i and zone j, and

K_{ij} = an optional trip-distribution adjustment factor for interchanges between zone i and zone j.

Distance to possible destinations is the other factor used in the gravity model. The number of trips to a given destination decreases as the distance to the destination increases (it is inversely proportional). This is represented in a factor called friction factor. It is inversely proportional to the distance or travel time between two zones. Friction factors are used to calibrate trip lengths from the model to observed data. The most common formulation of friction factors is through a gamma function as shown below:

$$F_{ij} = a \times t_{ij}^b \times e^{c \times t_{ij}}$$

Where,

F_{ij} = the friction factor between zones i and j,

a, b, and c = model coefficients; both b and c should, in most cases, be negative; a is a scaling factor and can be varied without changing the distribution,

t_{ij} = the travel time between zones i and j, and

e = the base of the natural logarithms.

Validation and Reasonableness Checking for trip distribution

- Compare trip length frequency from model and survey data.
 - Do this for every purpose
 - Do this for distance and time
 - If different, adjust friction factors in the model
 - Maximum of 5-10% difference in observed and modelled.
- Compare trip patterns from the model to data from O-D Surveys.
 - Aggregate data into districts and compare trips
 - Look at north-south and east-west trips

10.3. Modal Split

Mode choice is one of the most critical parts of the demand modelling process. It is the step where trips between a given origin and destination are split into trips using available modes such as two-wheeler, car, private vehicle, public transport, etc. Calculations are conducted that compare the attractiveness of travel by different modes to determine their relative usage. All proposals to improve public transport or to change the ease of using private vehicles are passed through the mode split/private vehicle occupancy process as part of their assessment and evaluation. It is important to understand what factors are used and how the process is conducted in order to plan, design, and

implement new systems of transportation. The most common mathematical formulation of a mode choice model is a logit model and is as follows:

$$P_i = \frac{e^{u_i}}{\sum_{i=1}^k e^{u_i}}$$

Where,

P_i = the probability of a traveller choosing mode i ,

u_i = a linear function of the attributes of mode i that describe its attractiveness, also known as the utility of mode i , and

$\sum_{i=1}^k e^{u_i}$ = the summation of the linear functions of the attributes of all the alternatives, k , for which a choice is available

The utility function is calculated based on the following equation:

$$u_i = a_i + b_i + IVTT_i + c_i \times OVTT_i + d_i \times COST_i$$

Where,

$IVTT_i$ = the in-vehicle travel times for mode i ,

$OVTT_i$ = set of variables measuring the out-of-vehicle travel times for mode i —walk, wait, and transfer times—may all be kept separate or combined, depending on the calibrated structure of the model,

$COST_i$ = the cost of mode i ,

a_i = mode-specific coefficient (constant) to account for mode bias not measurable with the level of service variables,

b_i = coefficient for the $IVTT$ variables of mode

c_i = a set of coefficients for $OVTT$ variables of mode i , and

d_i = coefficient for $COST$ variable of mode i

Key Points about Mode Split

- Mode split is done by a comparison of the "disutility" of travel between two points for the different modes that are available.
- "Disutility" is a term used to represent a combination of the travel time, cost, and convenience of a mode between an origin and a destination.
- Travel time is divided into two components: in-vehicle time to represent the time when a traveller is actually in a vehicle and moving, and out-of-vehicle time, which includes time spent travelling outside of the vehicle (time to walk to and from bus/rail stops, waiting time, transfer time).
- Out-of-vehicle time is used to represent "inconvenience" and the coefficient for out-of-vehicle time is typically several times larger than for in-vehicle time, reflecting the fact that travellers do not like to wait or walk long distances to their destinations. The size of the multiplier will be different depending upon the purpose of the trip.
- For public transport trips, the cost of the trip is usually measured as the average public transport fare for that trip, while for private vehicle trips, cost is found by adding the parking cost to the length of the trip and multiplying by cost per kilometer. Private vehicle cost is based on a "perceived" cost per kilometer (on the order of 5-10 cents/kilometer), which only includes fuel and oil costs and does not include ownership, insurance, maintenance, and other fixed costs (total costs of private vehicle travel are much higher).
- Disutility equations also contain a "modal constant", represents other characteristics or travel modes that are not explicitly captured by the variables in the model, but that may influence the choice of mode (such as a difference in comfort between public transport and private vehicles). A model will have $n-1$ constants with 'n' being the number of modes.

- Once disutilities are estimated for the various choices between an origin and a destination, the trips are split among various modes based on the relative differences between disutilities. A large advantage will mean a high percentage for that mode.

All model coefficients are estimated using actual traveller data.

Types of Mode Choice Models:

- Factoring of vehicle trips** - In this model, fixed factors are used to factor total trips into trips by mode. This is based on fixed data from surveys. This is not recommended for long-term projects with high investment
- Binomial logit model** - In this model, only two modes are considered: private vehicle and public transport. This is a simpler model and should be used when short on time and data.
- Multinomial logit model** - This is the most common type of model used to compare a number of modes. Variations of the model include nested logit and hierarchical logit, which splits total trips first into public and private vehicles, and then into categories such as two- and four-wheelers, bus, rail, etc.

Table 10.1: Factors Affecting Mode Choice

Factor	Private Vehicle	Public Transport
In-Vehicle Time	Congested driving Time	Time riding public transport
Out-of-Vehicle Time	Walk to Vehicle from parking	Walk to stop, wait/transfer time, walk from stop to destination
Cost	Cost of fuel, parking, tolls	Fare

Source: Development of Training Material under Sustainable Urban Transport Project, Reference Guide Volume 2 Demand Assessment, MoUD

Validation and Reasonableness Checking for modal split

- Compare observed modal split to estimated modal split
 - Do this for every purpose
 - Maximum of 5-10% difference in observed and modelled.
- A typical range for value of in-vehicle time coefficient is between -0.015 and -0.02.
- A typical range for value of out-of-vehicle time coefficient is 2- 3 times the in-vehicle coefficient.
- Constant terms should not be too high or low.
- Perform sensitivity tests to make sure model is stable.
 - Increase/decrease travel times/fares of highway and PT
 - Change socioeconomic data

The first three steps of modelling generate total person trips in the region. Before assigning them to road network, person trips need to be converted into vehicle trips. The first step in this process is to split private vehicles trips into private vehicle driver and private vehicle passenger trips. Private vehicle occupancy analysis is often a highly simplified process that uses fixed private vehicle occupancy rates for a given trip purpose or for household size and private vehicle ownership categories.

Trips are then converted into an origin-destination format for conducting daily assignments. Traffic varies considerably throughout the day and during the week. The travel demand forecasts are made on a daily basis for a typical weekday and then converted into peak-hour conditions. Daily trips are multiplied by an "hour adjustment factor", for example, 10%, to convert them into peak-hour trips. The number assumed for this factor is very critical. A small variation, say, plus or minus one percent, will make a significant difference in the level of congestion that would be forecast on a network. Most models are unable to represent how travellers tend to cope with congestion by changing the time they make their trips, although advanced travel demand models and activity models represent time of travel explicitly.

10.4. Traffic Assignment

Once trips have been split into highway and public transport trips, the specific route that they use to travel from their origin to their destination must be found. These trips are then assigned to that route in the step called traffic assignment. Traffic assignment is conducted differently for highway trips and public transport trips.

The process first involves the calculation of the shortest path from each origin to all destinations (usually the minimum time path is used). Trips for each O-D pair are then assigned to the links in the minimum path, and the trips are added up for each link. The assigned trip volume is then compared to the capacity of the link to see whether it is congested. If a link is congested, the speed on the link needs to be reduced to result in a longer travel time on that link. When speeds and travel times are changed, the shortest path may change. Hence, the whole process must be repeated many times (iterated) until there is an equilibrium between travel demand and travel supply. Trips on congested links will be shifted to uncongested links until this equilibrium condition occurs. There are a variety of ways in which the calculations are done to reach network equilibrium. One way to get a feel for the accuracy of the models is to look at the resulting speeds on the network. These should be realistic after equilibrium.

Public transport trip assignment is done in a similar way, except that public transport headways are adjusted rather than travel times. Public transport headways (minutes between vehicles) affect the capacity of a public transport route. Low headways mean that there is more frequent service and a greater number of vehicles. Public transport supply and demand are also recalculated to reach equilibrium between supply and demand.

It is important to understand the concept of equilibrium. If a highway or public transport route is congested during peak hours, its excess trips will be shifted to alternative routes. If the alternative routes are also congested, the final results will show congestion over a wide part of the network. In the real world, this congestion will eventually dissipate overtime.

Another important step in assignment is the time of day analysis. Daily trip patterns need to be converted into peak-time period traffic. A key assumption needed is the portion of daily travel that occurs during the peak period. This is normally used as a constant, and conventional travel models have very limited capability to describe how travellers will shift their trips to less congested times of the day.

Validation and Reasonableness checking for traffic assignment

The following summaries should be prepared:

- Compare traffic volumes with observed counts.
 - Volumes by road class
 - Volumes by area type
 - Volumes by screenlines
 - Volumes at external cordons
 - Observed vs. estimated speeds
- Compare PT ridership from the model with observed ridership.
- Ridership by route groups should be within +/- 15%

10.5. Model Forecasts

Forecasting is the process of using a fully calibrated and validated model to estimate future year traffic volumes and public transport ridership.

Inputs for Forecasts

- Socioeconomic data, such as population, income class, and employment forecasts;
- List of approved highway and public transport projects and a list of projects to be evaluated.

Transportation forecasting processes should consider a broad range of alternatives. There can be alternative modes of transportation, alternative locations of different systems, alternative levels of capacity, or alternative policies. This would include the following:

- **A no-build alternative:** This is basically the status quo with continuing maintenance and operation of the current transportation system. It may include substantial efforts to improve the efficiency and utilization of existing transportation systems. These are considered as an alternative to building new systems. Developing a no-build alternative is a must for evaluating other alternatives. Every new investment alternative has to be compared to the no-build alternative to see if the improvement justifies the cost.
- **Travel demand management policies:** Transportation services require a broad range of policies to function. Travel demand management involves efforts to make the current system more efficient and to use techniques to reduce demand during critical periods. This is not unlike programs that utility companies have used to promote energy conservation among their customers. Some of the techniques that could be used include: use of priority techniques for high occupancy vehicles, parking regulation, efforts to shift when travel occurs, promotion of telecommuting, public transport service improvements, use of pricing techniques, etc.
- **Land use alternatives:** Different land use patterns and policies can be used to affect travel demand and to affect the use of natural resources. These could include concentrated urban development patterns, increased suburban growth, or some combination.
- **Modal alternatives:** Different modes of transportation such as highway, public transport, ride sharing, freight, etc. should be considered. Generally, transportation plans are concerned with picking the best combination of modes to deal with a particular problem. Single-mode plans such as a highway plan, public transport plan, etc. should not be done without first considering other modes. All options should be considered in order to develop a balanced transportation system.
- **Capacity changes:** The capacity of each mode (number of lanes, how often public transport vehicles operate) can be varied in different alternatives. Highway capacity depends on many factors besides the number of lanes, such as intersection characteristics, traffic signal systems, and the characteristics of access along the highway.
- **Alternative locations:** Proper location of public transport and highway facilities is an important part of their success. Facilities should be located to serve travel markets and to facilitate land development patterns that are good for the community.

11 Appendix K – Road Safety Checklist

11.1. Introduction

To encourage road safety, checklists have been provided in this section which can be utilised at various stages of project life cycle.

Table 11.1: Road Safety Checklists

Checklist No.	Checklist
1	Audit : Stage:1 During feasibility study
2	Audit: Stage:2 Completion of preliminary design
3	Audit: Stage:3 Completion of detailed design
4	Audit : Stage:4 During construction stage
5	Audit : Stage:5 Completion of construction/pre-opening
6	Audit: Stage:6 On existing roads or during Operation & Management
7	Planning
8	Alignment
9	Cross-section
10	Junctions
11	Road signs
12	Road markings
13	Lighting
14	Roadside hazards
15	Roadside facilities
16	Vulnerable road users
17	Development proposals
18	Maintenance work

Source: Manual on Road Safety Audit, IRC: SP: 88-2010, Page 67

11.2. CHECKLIST 1 –Audit: Stage 1 (During Feasibility Study)

1. What is the category of road for which the feasibility study has been carried out e.g., Expressway, National Highway, State Highway or Other Roads?
2. Is the road intended to carry high-speed traffic or serve local access needs only?
3. What kind of traffic is likely ranging from high speed mixed traffic or for more general use, including bicycles and significant pedestrian traffic?
4. Do the chosen type of road and the standards, alignment and cross-section offer optimum road safety to all groups of road user including disabled in combination with the expected traffic density and speeds?
5. Does the project follow existing roads or is it a 'green field project' and what are the effects of this?
6. Check whether appropriate design standards have been used having regard to the scope of the project, and its function in relation to the traffic mix.
7. Check the appropriateness of the designs for the design volume and traffic characteristics.
8. Has access control been proposed?
9. Will the proposed scheme be compatible with the standard of conjoining road sections?
10. Will there be sufficient opportunities for overtaking?

11. Are the number and distribution of intersections appropriate in relation to:
 - a. The desired function of the new road?
 - b. Impact on the surrounding, adjacent and/or off-loaded road network (does the project simply move present problems)?
 - c. Accessibility for public transport and emergency vehicles?
12. Are junction types shown the safest available at each location, in relation to the expected turning volumes?
13. Are the proposed horizontal and vertical alignments consistent with visibility requirements both along the road and junctions?
14. Has lighting been planned? If so, does the lighting offer maximum safety, both on links and at junctions?
15. Will the project have any effect on existing pedestrian and cycle routes?
16. Does the project include measures for vulnerable road-users and if so, do these measures offer maximum safety?
17. Do the available accident data for the existing/adjacent road network give reason to expect particular road safety problems in the proposed project?
18. Whether non-motorised traffic is expected to cause problems?
19. What is the likelihood of future widening?
20. Do the gradients, curves and general design approach fit in with the class of terrain and likely weather or environmental aspects?
21. Check any special events creating unusual or hazardous conditions and any other matter, which may have a bearing on safety.
22. Other checks pertinent to the project at discretion of auditor or client.

11.3. CHECKLIST 2 - Audit: Stage 2 (Completion of Preliminary Design)

1. Have all recommendations from the previous stage been followed? If not, why not?
2. Is the desired speed compatible with the cross-section and other design elements and is the desired speed realistic?
3. Cross-section:
 - a. Has delineation of the carriageway with a kerb been proposed?
 - b. Is there adequate space for all groups of road users?
 - c. Is there appropriate separation between various groups of road users?
4. Horizontal and Vertical alignment and visibility:
 - a. Does the proposed alignment satisfy any demands on visibility at junctions and sight distances on free sections?
 - b. Will sight distances/visibility be blocked by traffic signs, guardrails, bridge parapets, buildings, rigid obstacles or plantations (now and in the future)
 - c. Can parts of the project constitute a risk, especially in combination (e.g. peaks in the vertical alignment plus sharp horizontal bends, crests of hills plus traffic signals)?
5. Are the lane widths, shoulders, medians and other cross-section features in accordance with standard design and adequate for the function of the road?
6. Check whether there are undesirable variations in cross-section design. Check cross-falls, which could affect safety, particularly where sections of existing highway have been utilized, or where there have been compromises to accommodate access to abutting properties.
7. Check the safety aspects of shoulder provision, including the provision of paved and earthen shoulders, the width and treatment on embankments and cross-fall of shoulders? Are the shoulders likely to be used by slow-moving vehicles or cyclists?
8. Check for the provision of climbing lanes in hilly sections where vertical gradients are steep for considerable length of the highway?

9. Junctions, interchanges and their design:
 - a. Will road users coming from all directions (including side roads) be able to see that they are approaching a conflict area? Are give-way lines, stop lines, turning lanes and ramps clearly visible?
 - b. Are existing conjoining and intersecting roads appropriately adjusted and matched to the new road (without sharp bends and gradients)?
 - c. Do the routes of road users through the junction seem clear for all directions and manoeuvres?
 - d. Is there sufficient space for all types of vehicles to undertake all manoeuvres?
 - e. Are the crossing facilities for pedestrians and non-motorised traffic adequate and safe?
 - f. Can parking cause problems?
 - g. Have roundabouts been considered?

(In urban areas, ghost markings and left-turning lanes with islands are safest; they prevent overtaking and assist pedestrians and cyclists who are crossing the road.)
10. Decide whether or not old, unrecovered section of road can give undesired optical directions.
11. Special points at roundabouts:
 - a. Are all entrance lanes curved and is speed adequately reduced?
 - b. Will the central island be visible?
 - c. Are the measures taken for the benefit of pedestrians from a safe stopping distance and cycle traffic adequate?
12. At the junction/transition to existing roads (especially from multi-lane to two-lane, dual to single carriageway):
 - a. Are there sudden changes of alignment?
 - b. Does the road standard change too rapidly, or can road users clearly see and recognize the transition in good time?
 - c. Would a roundabout be able to mitigate any sudden changes in standards and alignment?
13. Are existing junctions and intersections adjusted and matched to the new road appropriately (without sharp bends and gradients)?
14. Are there any constructions that will be difficult to drain and are the cross-fall and any gutter gradient adequate at the critical spots?
15. Are there places where there is a risk of flooding?
16. Will overtaking be prevented at critical places (not simply by restrictions, but also by making it quite apparent that overtaking is prohibited)?
17. If signs and road markings have been proposed:
 - a. Are the markings consistent and are they adequate?
 - b. Has the quantity of information been kept at a reasonable level?
18. If markings have not been proposed: will special markings be necessary?
19. Is there any risk that cannot be "marked out of existence"?
20. Will there be any large sign constructions? If so; will guardrails or breakaway safety devices protect them?
21. Has it been proposed that lighting be located on the outside or inside of bends?
22. Will it be possible to carry out maintenance work (on lighting, gantries, plantations, etc.) safely and without using the carriageway or cycle path?
23. Is the landscaping design or plantation likely to lead to a lowering of safety with mature or seasonal growth? Is frangible vegetation appropriate?
24. Are there arrangements for safe access by emergency vehicles? Check the design of medians and barriers, and the ability of emergency vehicles to stop without necessarily disrupting traffic?
25. Pedestrians
 - a. Have pedestrian needs been considered?
 - b. If footpaths are not specifically provided, is the road layout safe for use by pedestrians, particularly at blind corners and on bridges?

- c. Are pedestrian subways or footbridges sited to provide maximum use?
 - d. Is the avoidance of footbridges or subways possible by crossing the road at grade?
 - e. Has specific provision been made for pedestrian crossings, school crossings or pedestrian signals?
 - f. Are pedestrian refuges/kerb extensions needed?
 - g. Whether needs of disabled road users taken care of?
26. Have the needs of public transport users been considered? Are bus stops positioned for safety?
27. Is lighting envisaged in specified locations of the project? Are the difficulties of illuminating sections of the road caused by trees or over bridges, for example? Are there any aspects of the provision of the lighting poles, which would require consideration from the safety point of view in their being struck by vehicles?
28. Is adequate safe access to the work site available?
29. Are there any factors requiring specific road safety provision, including maintenance?
30. Are there any traffic management features, which would require special attention during construction or during the transition from construction to full operation?
31. Other checks made at discretion of auditor or client.

11.4. CHECKLIST 3 - Audit: Stage 3 (Completion of Detailed Design)

1. Have all recommendations from the previous stage been followed? If not, reasons thereof?
2. Visibility, sight distance
 - a. Are horizontal and vertical alignments consistent with the required visibility requirements?
 - b. Confirm whether the standard adopted for provision of visibility in the design is appropriate for the ruling design speed and for any unusual traffic mix.
 - c. Check whether sight lines are obstructed by:
 - i. Safety fences
 - ii. Boundary fences
 - iii. Street furniture
 - iv. Parking facilities
 - v. Signs
 - vi. Landscaping
 - vii. Bridge abutments
 - d. Check whether railway crossings, bridges and other hazards are conspicuous.
 - e. Will sight lines to be obstructed by temporary features such as parked vehicles in lay-byes or parked or queued traffic has been taken care of?
3. Check whether the design standards are appropriate for all the new requirements of the proposed project and check for consistency of general standards and guidelines such as lane widths, camber and cross-fall.
4. Cross-sections:
 - a. Are cross-falls appropriate?
 - b. Is there a suitable gutter gradient or is the carriageway laid at a suitable height above the shoulder?
5. Lighting columns, traffic signals, sign standards, etcetera:
 - a. Have requirements on safe distances to carriageway and cycle path been observed?
 - b. Have breakaway safety devices or such like been proposed?
6. Signs and markings:
 - a. Are markings consistent along the entire road section?
 - b. Is the information clear?
 - c. Are there enough signs?
 - d. Are there too many signs?
 - e. Will signs mask each other or traffic signals (be sure to include all plans for signs and markings in your assessment)?
 - f. Are the signs correctly positioned, without obstructing sight distances/visibility in anyway?
7. Are the proposed types of kerb stone/edge marking appropriate?
8. Lighting:
 - a. Is there any risk that the lighting can be optically misleading and will it have any detrimental effects on traffic signals and signs?
 - b. Are there any unlit areas that could conceal hazards?
 - c. Will an illuminated side road mislead road users on the planned, unlit road?
 - d. Are all pedestrian crossings illuminated (not merely the formally marked crossings, but also unmarked places where pedestrians could be expected to cross)?
 - e. Will powerful illumination of adjoining areas or strongly illuminated advertisements cause problems?
9. Junctions, interchanges and their design:

- a. Will road users coming from all directions (including side roads) be able to see that they are approaching a conflict area? Are give-way lines, stop lines, turning lanes and ramps clearly visible?
 - b. Are existing conjoining and intersecting roads appropriately adjusted and matched to the new road (without sharp bends and gradients)?
 - c. Do the routes of road users through the junction seem clear for all directions and manoeuvres?
 - d. Is there sufficient space for all types of vehicles to undertake all manoeuvres?
 - e. Are the crossing facilities for pedestrians and non-motorised traffic adequate and safe?
 - f. Can parking cause problems?
 - g. Have roundabouts been considered?
- (In urban areas, ghost markings and left-turning lanes with islands are safest; they prevent overtaking and assist pedestrians and cyclists who are crossing the road.)*
10. Decide whether or not old, unremoved section of road can give undesired optical directions.
 11. Special points at roundabouts:
 - a. Are all entrance lanes curved and is speed adequately reduced?
 - b. Will the central island be visible?
 - c. Are the measures taken for the benefit of pedestrians from safe stopping distance and cycle traffic adequate?
 12. At the junction/transition to existing roads (especially from multi-lane to two-lane, dual to single carriageway):
 - a. Are there sudden changes of alignment?
 - b. Does the road standard change too rapidly, or can road users clearly see and recognise the transition in good time?
 - c. Would a roundabout be able to mitigate any sudden changes in standards and alignment?
 13. Are existing junctions and intersections adjusted and matched to the new road appropriately (without sharp bends and gradients)?
 14. Guardrails, hedges and railings:
 - a. Are all vulnerable areas protected?
 - b. Are bridge pillars, steel posts and trees etc., protected by guardrails where necessary?
 - c. Are there places where hedges are necessary to prevent pedestrians from crossing?
 - d. Are the chosen hedges/guardrails "light" enough?
 - e. Does guardrails/road side furniture have any hazardous sharp protruding edges?
 15. Road surface:
 - a. Has a porous type of surface been chosen?
 - b. Will an exceptionally high-friction surface be necessary in especially exposed places?
 - c. Would a change of surface as a purely visual signal to road users be of benefit? Used in this way, could a change of surface be misunderstood by road users?
 16. At junction/transition to existing road network (especially from multi-lane to two-lane, end of central reserve)
 - a. Is there sufficient advance warning?
 - b. Are reflector posts correctly positioned?
 - c. Are ghost markings appropriate in connection with the merging of two lanes?
 - d. Is there continuity of edge markings?
 17. For two-lane sections prepared for expansion to four lanes with central reserve (e.g. expressways built as "semi-motorways"):
 - a. Will road users be clear everywhere that they are not on a one-way, two-lane carriageway?
 - b. Should night illumination of signs be of extra high standard?
 - c. Is overtaking prevented at all points where prevention is necessary?

- d. Should special measures be adopted at bridges built with a view to future expansion?
18. Examine adjoining areas for potential safety problems (airfield, signals for maritime traffic and railways, flying golf balls etc.).
 19. Additional temporary signs will be necessary for most new constructions. In this context consider:
 - a. Is the text, etc. comprehensible and correct?
 - b. Have all signs etc., been positioned safely?
 - c. When will they be removed?
- (Be sure also to use the separate checklists for specific facilities and measures.)*
20. Landscaping:
 - a. Is there advertising conflict between landscaping and visibility requirements? Has ultimate growth height been considered and potential obstructions to pedestrian visibility and potential for trees to become collision objects?
 - b. Will maintenance of soft landscaping be safe?
 21. Plantations:
 - a. Will plantations obscure visibility and has a maximum height been specified?
 - b. Are plantations likely to encroach on markings or lighting?
 - c. Will fully-grown trees constitute a hazard (have the requirements on distances to rigid obstacles be observed)?
 - d. Can maintenance be carried out safely?
 22. Lay byes:
 - a. Are there any lay-byes available in the section?
 - b. Is the bye properly located and it is not inconvenient to the drivers to stop the vehicles?
 - c. Is there any need to modify the lay-bye design (if yes, suggest the parameters that need modification)?
 - d. Are advance warning signs and markings properly guiding the driver about the lay-bye?
 - e. Is there any need of any additional signs and markings?
 23. Check provision for pedestrians to cross safely at intersections, signalised and pedestrian crossings, refuges, kerb extensions and at other locations.
 24. Are median barriers necessary and have they been properly detailed? Are there any design features such as end conditions which require special attention?
 25. Are there any poles located adjacent to moving traffic which could be sited elsewhere?
 26. Have frangible or breakaway poles been detailed?
 27. Is the unprotected median width adequate to accommodate lighting poles?
 28. Are there any obstructions, which are likely to create a safety hazard and can they be mitigated or relocated?
 29. Is a crash barrier provided wherever necessary and is it properly detailed?
 30. Check whether access to structures and road furniture is safe. Check that the road or utilities in the road reserve can be maintained safely. Both road users and maintenance personnel should be considered.
 31. Check that the requirements for the traffic management of the construction site and safety measures needed for workers and road users have been adequately spelled out from the safety point of view including the transition from the existing arrangements to the construction site and from the construction site to the final layout can be effected safely.
 32. Check for the arrangement for temporary and permanent traffic control devices, including possible signals, temporary diversion etc.
 33. Check that the design duly considers the needs of persons with disabilities.
 34. Other checks made at discretion of auditor or client.

11.5. CHECKLIST 4 - Audit: Stage 4 (During Construction Stage)

1. Have all recommendations from the previous stage been followed? If not, why not?
2. Whether information regarding the construction zone approaching has been provided well in advance or not?
3. Whether standard procedure and contract conditions provided for proper management of the construction site and road users are properly and safely accommodated?
4. Whether the transitions from the existing road to the site of works safely and clearly laid out?
5. Whether the width of the lanes is satisfactory for the traffic passing through the works area?
6. Whether sight and stopping distances adequate at site of works and at intersections?
7. Whether bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility.
8. Whether appropriate street lighting or other delineation provided at the road works to ensure that the site is safe at night? Check the night time visibility of traffic control devices.
9. Check for proper education and training programme for site operators and managers, which would assist in creating and maintaining safer environment for construction workers and road users.
10. For clear and sufficient information to the road user, advance warning signs installed or not?
11. Is there any provision of marked lanes for safe and clearly guiding road users?
12. Whether suitable measures provided through construction zones to control driver behaviour?
13. Check for the adequacy of traffic control devices (such as signs, markings, cones, drums, delineators, barricades, flashing lights etc.) required for each zone i.e., at advance warning zone, at approach transition zone and at work zone? Check for placement and visibility of these control devices.
14. Has permission been taken while changing the standard layouts from safety point of view?
15. Whether police and other emergency services been consulted?
16. Check for proper care and attention for pedestrian and non-motorised traffic at construction sites.
17. Check for adequate safety provisions for the elderly and persons with disabilities.
18. Whether construction workers provided with protective clothing etc. reflecting jackets, hard hats, gloves etc.?
19. Whether flagmen are available on duty at the appropriate places? Check for proper traffic management practice to avoid inhibiting traffic to pass clear of work site and necessary attention to roadside safety.
20. Whether the temporary diversion is provided at work zones in compliance with the contract and traffic management plan approved by the Engineer.
21. Whether the Traffic Management Plan at work site prepared and submitted by the Contractor to the Engineer for approval.
22. Is the Supervision Engineer ensuring the required quality of traffic management plan?
23. Whether arrangements of First Aid Box and other emergency care exist for persons getting injured.
24. Whether suitable speed reducing measures are provided at work zones.
25. Other checks made at discretion of auditor or client.

11.6. CHECKLIST 5 - Audit: Stage 5 (Completion of Construction/Pre-Opening)

1. Have all recommendations from the previous stages been followed? If not, why not? (*Involve the site engineer*)
2. Test the installations of traffic control devices as a road user: by car, by truck, by bus, by cycle and on foot - from disabled road user angle. Also in the dark/ night hours.
3. Examine the carriageway for defects, especially at junctions to existing roads.
4. Has the opening of the road facility been adequately publicized?
5. How will the transition phase proceed?
6. Check that provision for emergency vehicle access and stopping is safe?
7. Check that all delineators and pavement markings are correctly in place.
8. Check that all signs and other traffic control devices are correctly in place. Check that they are likely to remain visible at all times.
9. Check that the road markings as installed have sufficient contrast with the surfacing and are clear of debris.
10. Check that all lighting operating is effective from safety point of view.
11. Check that no roadside hazard has been installed or overlooked.
12. Check that the form and function of the road and its traffic management are easily recognised under likely operating conditions.
13. Check that all temporary arrangements, signing, etcetera have been removed and replaced by permanent arrangements.
14. Other checks made at discretion of auditor or client.

11.7. CHECKLIST 6 - Audit: Stage 6 (On Existing Roads or During Operation & Management)

1. Carryout inspection - do not forget to take the results of accidents analysis and relevant checklists with you.
2. Does the actual function of the road correspond to its intended function?
3. Are the prevailing speed levels within desirable limits?
4. Do the equipment and standard of the road correspond to its function, speed level and classification? (Use checklist 2 and 3, as well as any specific checklists, which are relevant.)
5. Do road users park in ways that could constitute hazards?
6. Do plantations obscure visibility or the view of signs?
7. Are the surface and carriageway markings in good condition?
8. Are there any signs that road users drive over islands or kerbs or that the routes taken by motorists through junctions and bends are less than ideal?
9. Are there signs of other conflict situations and minor accidents?
10. Are the specified distances to rigid obstacles maintained for all groups of road users?
11. Are medians and islands of adequate width for the likely users?
12. Are there signs of pedestrian traffic in places that seem hazardous to pedestrians?
13. Does there appear to be a need for more or better crossing facilities for pedestrians?
14. Does there appear to be a need for more or better facilities for cyclists?
15. Has due consideration been given to children, the elderly, persons with disabilities?
16. Are bus stops and bus bays safely located with adequate visibility and clearance to the traffic lane?
17. Any provisions for parking satisfactory in relation to traffic operations and safety?
18. Are all locations free of construction or maintenance equipment, and any signing or temporary traffic control devices that are no longer required?
19. Are overtaking opportunities available for heavy vehicles where volumes are high?
20. Are the road boundaries free of any activities that are likely to distract drivers?

21. Is the location of rest areas and truck parking areas along the route appropriate and adequate?
22. Is sufficient warning provided in advance of breaks in service roads and openings in medians for traffic using multilane highway?
23. Are there reasonable traffic calming measures in place for the road stretches passing through habitations and built up areas?
24. Other checks made at discretion of auditor or client.

11.8. CHECKLIST 7 - Planning

1. Is there a development plan or development strategy for the area and, if so, does the project conform to this?
2. Is the proposed design appropriate in relation to the forecast traffic volumes, traffic characteristics and the adjoining land use?
3. Does the route fit in with the physical constraints imposed by the topography? Does the route serve major generators of traffic in a safe and adequate manner?
4. Is the frequency of junctions and their type appropriate for the function of the road and its design speed?
5. Does the project road fit in well with the existing road network? (Check for potential problems at the connections - will changes in traffic volumes cause problems)
6. Does the project road relieve routes or sites with bad accident records? Does it have any harmful effects on safety on the surrounding road network?

11.9. CHECKLIST 8 - Alignment

1. Is the proposed design speed appropriate to the function of the road, the mix of traffic likely to use it, and the road environment? (Check whether different sections need different design speeds?).
2. If the speed is not up to the mark of design speed, whether proper cautionary sign have been provided?
3. Does the alignment (horizontal and vertical) give sufficient forward visibility for the selected design speed? (Check for inadequate stopping sight distances)
4. Check for consistency throughout the route; note any location where alignment standard changes abruptly and is not as would be expected by drivers.
5. Do the horizontal and vertical alignments fit together comfortably? (Check for bad combinations, such as a sharp bend immediately after a summit curve, and sag curve within a bend).
6. Does the alignment provide safe overtaking opportunities? Does it avoid creating situations where the forward visibility is marginal for overtaking (neither clearly adequate nor inadequate)?
7. Does the treatment at curves, proposed if any, make appropriate, adequate and safe provision for transition curves, super elevation and carriageway and formation widening?
8. Does the vertical alignment pose excessive demands on the power of heavy vehicles? Has it been designed so those maximum grades are interspersed with recovery grades? Are there passing places to enable faster vehicles to overtake slow-moving heavy vehicles?
9. Is the transition between project road and the existing road(s) i.e., access roads handled safely?

11.10. CHECKLIST 9 - Cross-Section

1. Are the widths of the carriageway, shoulders, medians (if any), service roads in accordance with standards and adequate for the function of the road and volume and the mix of traffic likely to use it?
2. Check whether bridges have footpaths and they have proper gradients/crash barriers.
3. Note any location where the cross-section standard changes abruptly along the route or is otherwise inconsistent with driver expectations.
4. Identify any locations where the capacity of the roadway is restricted and note locations of regular traffic congestion.
5. Have the shoulders and side slopes been designed to a safe standard and note any locations with inadequate shoulder width?
6. Have the side drains been designed to a safe standard? Are the batter slopes and drains safe for run-off vehicles to traverse?
7. Is the transition between the project road and the existing road(s) handled safely? (Check for major changes in standards).
8. Check whether the cross-section has adequate provision for the Vulnerable Road Users including persons with disabilities:
 - a. Pedestrians: Have paved footpath, adequate refuge width on median and proper ramps, up and down kerbs, where there is regular pedestrian traffic?
 - b. Bicyclists: Segregated areas (e.g. paved shoulders) where numbers are significant.

11.11. CHECKLIST 10 - Junctions

General

1. Is the general layout of junction caters safely for all road users including disabled road users? (Check whether there are other junctions too close to it. Check whether approaching drivers will get a clear view of it. Check with respect to pedestrians, cyclists and two wheelers etc.)
2. The type of junction (T-type, staggered, signal controlled, roundabout) suitable for the function of the two or more roads, the traffic volume, the traffic movements (pedestrians and vehicular) and the site constraints? Is it safest alternative?
3. Is the layout of the junction adequate for all permitted vehicular movements and for all types of vehicles?
4. Will the general type of junction, its layout and the priority rules be recognised by approaching drivers well in time? Is the route through junction as simple and clear as possible? (Check for unusual or over-complicated layouts? Check that signages and marking are correct and clear?)
5. Does the layout encourage slow controlled speeds at and on the approach to stop/ give way lines and other critical decision points? (Check for Y and skew junctions, which can be a problem. Also roundabout with inadequate deflection?)
6. Are the sight lines at and on the approach to stop/give way lines and other critical decision points adequate and unobstructed? (Check for Y and skew junction, which can be problem. Check signs, lighting columns, pedestrian guardrails etc.?)
7. Is there adequate provision for channelising the different streams of traffic? (Check the provision for right turn lanes, deceleration lanes and acceleration lanes?)
8. Is adequate provision made for pedestrians and non-motorised vehicles?
9. Is the provision of night time lighting adequate, if not what the deficiencies are?
10. Are junction(s) at that stretch having proper markings, signs and studs to avoid accidents?

Roundabouts

1. Is the geometry simple and easily understood? (Pay attention to roundabouts which are not circular, or which have awkward entry paths).
2. Are there too many entries for safe efficient operation? Are they sufficiently separated from each other to avoid confusion?
3. Does the design deflect entering traffic sufficiently to ensure entry speeds are safer? (Check entry path curvature, centre island size and positioning).
4. Is there visibility for entering traffic adequate? (Check if visibility is too good, if it encourages entry speeds which are too high)
5. Is the visibility for circulating traffic adequate?
6. Has the Central Island been designed to be forgiving to errant vehicles?
7. Has adequate provision been made for pedestrians to cross the arms of the junction?
8. Have the needs of cyclists and other non-motorised vehicles been considered?
9. Does the signing make the priorities clear? (Entering traffic must give way to circulating traffic).

Signal-Controlled Junction

1. Does the signal sequence conform to the requirements of the regulations and standards?
2. Do the signals clearly indicate which movements are allowed at any one time? Are the timings of various phases of signal cycle adequate?
3. Are the signal heads positioned so that drivers can see them easily, and in time to react (stop or go)?
4. Are the signals for competing phases located in such a way that they are visible only to the traffic for which they are intended?
5. Are all right turning movements protected as far as possible?
6. Do the signing; marking and channelisation make it clear to drivers what path they should take through the junction?
7. Are pedestrian crossing places marked, and are pedestrians channelled to these crossings?
8. Are the pedestrian signals positioned so those pedestrians can see them?
9. Whether the pedestrian crossing signal controls are provided where appropriate? If so, there is a need for the crossing movements to be fully protected from conflicting traffic movements for example where there will be serious conflicts with turning traffic.

Vegetation and Plantation

1. Is the top of vegetation in the traffic island as well as channelisers, dividers less than 600 mm above the road top level for a length of 15 m from the end of the dividers?
2. Is the vegetation/plantation at the corners of the junction retracted for enough back from the edge of the shoulders to afford clear view of approaching traffic to the driver?
3. Are there no branches of trees projecting over the road berms/pavement at a height less than 7 m?

11.12. CHECKLIST 11 - Road Signs

1. Is the provision for road signs (regulatory, warning and informatory signs and delineators) adequate and in accordance with standards? (Check with respect to size, shape and placement etc.)
2. Check for any unauthorized traffic signs and use of non-standard signs (colour and shape).
3. Location and spacing of signs:
 - a. Note locations where there are too many signs placed.
 - b. Note the signs placed too close to each other.
4. Note if all traffic signs are clearly visible and are prominently displayed for the intended road users.
5. Find any instances where the legibility of the information on traffic signs is inadequate, bearing in mind the speed of vehicles and the amount of information displayed.
6. Determine effectiveness of traffic signs by observing them at night and identify any lack of reflectivity.
7. Examine type of sign posts used and record situations where sign posts constitute a fixed roadside hazard or where the use of frangible sign posts should be considered.
8. Are there any situations where traffic signs themselves are obstructing essential 'Line of Sight' for drivers and pedestrians.
9. Regulatory and Warning signs:
 - a. Are appropriate regulatory signs provided where necessary?
 - b. Are warning signs provided only where they are warranted?
10. Informatory signs:
 - a. Has signing been done on a systematic route or regional strategy that it is logical and meets needs of unfamiliar driver?
 - b. Are all important junctions provided with advance direction sign, distance information sign and intersection sign etc.?
 - c. Are these signs correctly positioned to enable the required timely action to be taken by the intended drivers?
 - d. Find instances of poor legibility and poor arrangement of information on signs.
 - e. Overhead signs - size, message information adequate, languages as per IRC standards.

11.13. CHECKLIST 12 - Road Markings

1. General adequacy and visibility of road markings, during day/night time and in wet/ dry weather conditions
2. Has correct type of markings been used in various situations (e.g. lane line, edge line etc.)?
3. Are correct colours used for laying road markings?
4. Is there any deficiency in the delineation of merge and diverge areas, including situations where 'through' traffic may inadvertently lead into auxiliary and turn lanes?
5. Are zebra crossing markings provided at junctions and mid-blocks of the sections (depending upon the movement of pedestrian)?
6. Is positioning of stop lines appropriate?
7. Are the directional arrows marked on the pavement guiding the driver or creating confusion to the driver?
8. Are there locations where there is a lack of 'Hazard markings' at approach end of island, medians and culverts/ bridges etc.?
9. Have retro-reflective markers been installed? Where coloured markers are used, have they been installed correctly?
10. If chevron alignment markers are installed, have the correct types of markers been used?

11.14. CHECKLIST 13 - Lighting

1. Is there any need of lighting on the project roads, or parts of it, to be lighted at night (particularly where there are pedestrians and parking along the road) important interchanges, bus bays, truck lay bays, toll plazas?
2. Are the proposed lighting scheme and illumination levels of an appropriate standard, consistent with the needs of the location, pedestrian and other factors?
3. Identify the locations where street lighting columns constitute a hazard to traffic (on the outside of sharp curves, on small islands, noses of medians) or which may conflict visually with traffic signals or signs?
4. Does the existing street lighting enhance as 'route guidance', rather than confuse the drivers' ability to 'see the direction of the route ahead'?
5. Are the appropriate types of poles used for all locations and correctly installed (e.g. slip-base at correct height, rigid poles protects if within clear zone)?
6. Has lighting for signs, particularly overhead signs, been provided where necessary?
7. Are there any lighting or telephone poles close to the edge of the berms so as to pose hazard to traffic?
8. Are there any lighting poles in the median unprotected by crash barriers?

11.15. CHECKLIST 14 - Roadside Hazards

1. Is a clear zone provided in accordance with the guidelines? Is the appropriate treatment or projection provided for any objects within the clear zone?
2. Are bridge and culvert parapets and other obstructions close to moving traffic? If so, can they be relocated? If not, are they adequately provided with signs and, where necessary, protected by safety barrier?
3. Are bridge parapets designed to contain errant vehicles, where the speed and volume of traffic warrants them?
4. Are the ends of bridge parapets, bridge railing and pedestrian guardrail/crash barriers of a safe design?
5. Are there any poles or columns along the road and comment on whether some or any of them can be removed, relocated to less hazardous positions etc.
6. Is there a degree of hazard associated with large trees, boulders, etc. and whether these can be treated to improve roadside safety?
7. Do the trees and other vegetation obstruct driver and pedestrian sight lines, which are essential for safe traffic operation?
8. Are there any 'fixed roadside objects', which occur within the roadway? Comment on the need to treat them in terms of road safety?
9. Is there an existence of roadside stalls and other roadside business activities within the right of way of the road?
10. Are the provided crash barriers suitable for the purpose?
11. Is the length of crash barrier at each installation adequate? Are the crash barrier installed correctly?
12. Is the provided barrier/fencing in the clear zone free of separate horizontal rails?
13. Is there adequate delineation/visibility of barriers and fences during night time?
14. Are there any thorny bushes by the roadside, whose branches are likely to hurt the passengers occupying the window seat of a vehicle, especially a non-AC bus?
15. Is any thick growth of vegetation by the roadside enough far back from the edge of the pavement to enable a driver to take protective steps in time if any human or animal should run across the road from behind or within the vegetation?

16. Are there any sharp edged or pointed fixtures or tops of supporting verticals on the median crash barriers or on dividers which can hurt a motor cyclist in case of a collision or crash or loss of balance.?
17. Are there any village name boards or direction boards by the roadside with pointed ends to hurt a passenger in a bus on window seat?
18. Bridges/Canal crossings: Are the open spaces by the side of ends of Parapets covered by protective crash barriers or walls to prevent vehicles going into the river or canal?
19. Have the roadside trees close to edge of berms, which cannot be removed for want of permission of tree authority, been made visible at night and day by white washing/ pasting reflective tape on them?
20. Is the height of vegetation in the median at breaks in median at junctions or for U Turns or for pedestrian crossings reduced to less than 60 cm for a length of 20 m to afford complete visibility to drivers?
21. Is the height of vegetation in the median less than 60 cm on curves?
22. Is the median clear of any trees with trunks with girth greater than 30 cm? If not, are such locations enveloped by protective crash barriers?
23. Are fixing details of pipe railing such that the entire length of pipe is smooth and continuous without any projection on roadward side?
24. Are entrances to abandoned roads properly fenced off?

11.16. CHECKLIST 15 - Roadside Facilities

1. Do the cross-section, alignment and signages encourage drivers to adjust their speed on entering the town or village and maintain it at an appropriate level? (Check that it will be quite clear to drivers that the road environment is changing and that they slow down).
2. Is there adequate and safe provision for pedestrians and non-motorised traffic to walk alongside the road and to cross it? (Check for provision of footpaths, shoulders and safe crossing places and whether pedestrian movements are controlled and channelled by guardrail in busy places?)
3. Are the design and provision of roadside parking and access to properties adequate, controlled and safe?
4. Has the opportunity been taken to improve the traffic and parking situation in the town and villages through which the road passes? (Check for junction improvements, access control, provision of service lanes, parking areas and bus stops).
5. Are bus stop locations safe and proper and whether the provision for buses to stand clear of traffic lanes has been made? Also is there need for lighting at these locations for the security and safety of passengers?
6. Is there any need for overtaking opportunities along the route at regular intervals on divided roads, particularly where traffic flows are high or in hilly terrain?
7. Consider the need for rest areas and other roadside stopping places e.g., truck stops, scenic view points, wayside picnic areas etc, and note any current 'unofficial' places where vehicles stop and the degree of hazard that this involves.

11.17. CHECKLIST 16 - Vulnerable Road Users

1. Has there been a survey of non-motorised vehicle and pedestrian flows?
2. Will there be any major conflicts between motorised traffic and pedestrians and other disabled / handicapped road users?
3. Have pedestrians need for crossing the road and walking safely alongside it been adequately provided for? (Check particularly in towns and villages and at all junctions - check shoulder width - check whether it is desirable and feasible to provide a segregated footway - check whether steps are provided where pedestrians will have to climb high embankments).

4. Is the provision for pedestrians and non-motorised vehicles at bridges and narrow sections adequate in relation to pedestrian and vehicular traffic volumes and traffic speeds?
5. Have measures been taken to reduce the accident risk for children going to and from roadside schools (Pedestrian guardrail may be needed to prevent children from running out into the road)?
6. Have the need of cyclists and other non-motorised vehicles been provided for (Check shoulder width - check the need and feasibility of segregated cycle/cycle rickshaw lanes, especially in towns)?
7. Are bicycle safe grates provided at drainage pits where necessary?
8. Does the volume of motorcycle traffic justify the provision of separate lanes? (Check in towns).
9. Are bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility?
10. Where necessary, is fencing installed to guide pedestrians and cyclists at crossings or overpasses?

11.18. CHECKLIST 17 - Development Proposals

1. Horizontal Alignment:
 - a. Is visibility satisfactory at proposed access, including that for pedestrians?
 - b. Are curve radii and forward visibilities satisfactory?
 - c. Are verge widths satisfactory?
2. Vertical Alignment:
 - a. Are gradients satisfactory?
 - b. Are sight and stopping distances maintained?
3. Parking Provision:
 - a. Is off-site parking adequate to minimise on street parking and associated risks?
 - b. Are parking areas conveniently located, with adequate turning facilities?
4. Servicing Facilities:
 - a. Are off street loading/unloading areas provided?
 - b. Are there any turning facilities for large vehicles?
 - c. Is emergency vehicles access provided for?
5. Landscaping:
 - a. Does landscaping affect visibility at junctions, bends or access points?
 - b. Is tree planting proposed where vehicles are most likely to run off road?
6. Traffic Signs and Road Markings:
 - a. Have necessary traffic signs and road markings been provided as part of development?
7. Other Traffic Control Devices - Road Side furniture, delineators, crash barriers, guard rails, etc.
8. Others:
 - a. Will there be area-wide effect on other roads?
 - b. Will design keep speeds down where necessary?
 - c. Are number of access points to busy roads minimised by layout?
 - d. Are footpaths (sidewalks) necessary and provided adequately?
 - e. Are cycle tracks required?
 - f. Is street lighting required/ adequate?
 - g. Are bus bays and stops safely located?
 - h. Are dropped crossings provided at preferred pedestrian route or crossing points?
 - i. Is pedestrian guardrail provided where walkways join the highway?
 - j. Are truck lay byes required?
 - k. Are toll plazas congestion free?

11.19. CHECKLIST 18 - Maintenance Work

1. Is it publicised to the necessary extent about road works, including applicable speed limits and diversions?
2. Are temporary traffic signals or road markings adequate and does the message reach all road users?
3. Has a temporary speed limit been suggested and is it proper?
4. Will the unaffected road users misunderstand temporary traffic signals?
5. Is the standard of proposed signs adequate?
6. Will it be necessary to illuminate critical points?
7. Will the work site, enclosing material, etc. behave as a rigid obstacle?
8. Will there be safe access to the work place?
9. Has a safety zone been proposed and is it adequate?
10. Has due consideration been given to all groups of road users in the layout of staggering and diversions?

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12 Appendix L – Waste Water Recycling Techniques

12.1. Waste Stabilisation Pond Systems (WSPS)

Key features of the technology

- Simple to construct, operate and maintain
- Does not involve installation of expensive electro-mechanical equipment
- Operates on a combination of solar energy and natural forces and thereby has very low O&M costs.
- Extremely robust and can withstand hydraulic and organic shock loads
- Effluents from maturation pond are safe for reuse in agriculture and aquaculture.

Performance

- Can reliably produce high quality effluent with low BOD, SS, Fecal Coliform and high DO levels.
- BOD reduction of the order of 90% and more
- Suspended solids reduction is somewhat less due to possible overflow of algae
- Coliform reduction could be upto 6 log units
- Total nitrogen removal between 70-90%
- Total phosphorus removal between 30-45%

Specific requirements

- In case of unlined ponds, soil and geo-hydrological survey during planning stage to assess risk of groundwater contamination.
- Sulphate concentration in raw wastewater under 300 mg SO₄/L to avoid odour nuisance.

Applicability

- Suitable under warm Indian climatic conditions
- For areas with easy availability of land
- In areas with social preference for aquaculture
- In areas with low, unreliable or expensive power supply.

12.2. Duckweed Pond System (DPS)

Key features of the technology

- Natural and simple wastewater system involving sheltered pond like culture clots
- A large pond subdivided into smaller cells through floating bamboo or other material to break the wave and wind action.
- Extremely rapidly growing floating duckweed vegetation serving as a dynamic sink for organic carbon, dissolved nutrients and minerals.
- Thick mat of duckweed out competing and inhibiting growth of other aquatic plants.
- Pond functioning as a facultative lagoon with deeper layers under anaerobic environment.
- Retention period in the system 7-21 days
- Continuous process requiring intensive management for optimum production.
- Yield of large quantities of proteinaceous matter as fish feed or as a supplement for animal feed.

Performance

- **Can meet Indian discharge standards for BOD and SS.** Removal of Ammonical nitrogen (N) and Dissolved Phosphates (P) is also substantial.
- For settled wastewater, BOD and SS below 30mg/L are attainable at 12 detentions.

- High nutrient and mineral removal due to uptake by duckweeds.

Specific requirements

- Primary treatment including screening, grease trap, grit removal and sedimentation.
- Preferably the influent BOD, SS and ammonia to be under 80 ppm, 100 pm and 50 ppm respectively.
- A series of smaller cells of around 10m x 10m to 10m x 30m to break the continuum in the pond (cell size as a function of wind speed, pond size and wave action).
- Cell borders made with floating bamboo mats or PVC profiles to shelter from wind and wave action
- Impermeable lining of clay or artificial liners in case of pervious and fractured strata
- Outlet structure with variable weir height
- Nitrogen loading of around 9 km/ha/day
- Small size culture ponds for duckweed seeding and as fish nursery ponds.
- Duckweed drying and processing unit in case of large harvest and for sale as animal feed
- In case of downstream aquaculture ponds – introduce suitable species of fishes e.g. Grass Carp., Common Carp, Silver Carp, Rohu, Mingal, Cattle and freshwater prawns.

Applicability

- Low strength domestic wastewater or after primary sedimentation with influent BOD – 80mg/l
- In combination with existing WSP
- **Rural and semi urban settlements** with easy land availability
- As a polishing pond for an existing activated sludge plant or other technology based STPs

12.3. Facultative Aerate Lagoon (FAL)

Key features of the technology

- Simple flow scheme without primary or secondary settling and sludge recirculation
- Deep lagoon with anaerobic bottom layer and aerobic top layer.
- Simultaneous degradation of sludge in the bottom and dissolved organics in the top layer.
- Lower energy input corresponding to requirement for maintaining only desired DO levels in the top layer and not for creating completely mixed conditions.

Performance

- As per the information in literature based on Indian experience the following performance is expected from a well-functioning aerobic lagoon:
 - BOD removal 70-90%
 - Suspended solids removal 70-80%
 - Coliform removal 60-99%

Specific requirements

- Typical hydraulic detention time 3 days or more
- Depth between 2-5 m depending on local soil and groundwater conditions
- Effective outlet structure with baffles and stilling basin to prevent solids overflow.

Applicability

- Standalone system for sewage treatment
- As a pre-treatment unit for WSP
- As an up-gradation option for overloaded WSPs.

12.4. Trickling Filter (TF)

Key features of the technology

- A proven 100 year old technology
- Rugged system with simple and silent operation
- Lower process monitoring requirement as compared to ASP
- Consistent effluent quality.

Performance

- Performance of a slow rate trickling filter is comparable to ASP

Applicability

- Standalone treatment for sewage if operated at slow rates
- As a high rate roughing filter for high BOD wastewater.
- In combination with ASP for good and consistent performance

12.5. Activated Sludge Process (ASP)

Key features

- Proven and tested for more than 7-8 decades all over world
- Several modifications possible to meet specific requirements.

Performance

- Very good performance in terms of BOD and SS. Treated effluent can most often **satisfy the current Indian effluent discharge standards**. Performance is critically dependent on sludge settling characteristics and design of secondary clarifier. Sludge settling characteristics are typically influenced by bio-flocculation which in turn depends on growth rate of micro-organisms. Growth rate is generally controlled by controlling biological solids retention time / food to micro-organism ratio.

Specific requirements

- Un-interrupted power supply for aeration and sludge recirculation
- Maintenance of biomass concentration in the aeration tank and proper settling in the secondary clarifier.

Applicability

- The most widely used option for treatment of domestic wastewater for **medium to large towns** where land is scarce.

12.6. Biological Filtration and Oxygenated Reactor (BIOFOR) Technology

Key features of the technology

- Enhanced primary treatment with addition of coagulants and flocculants.
- High rate primary tube settlers and integrated thickening offering space economy.
- Two stage high rate filtration through a biologically active media and with enhanced external aeration.
- Co-current up flow movement of wastewater and air enable higher retention and contact.
- Treatment scheme excluding secondary sedimentation but recycling of primary sludge.
- Deep reactors enabling low land requirements.

- A compact and robust system.

Performance

- Suspended solids and BOD removal of 90% and 70% respectively in the primary clarifier.
- High quality effluent with BOD 10mg/L and total system efficiency of 94-99.9%
- Low turbidity with suspended solids under 15 mg/L and total system efficiency of 98%
- Pathogen removal of 2 on the log scale.

Specific requirements

- Addition of alum as coagulant (~@60 ppm)
- Polyelectrolyte for high rate sedimentation (~@0.2-0.3ppm) in tube settlers.
- Special and patented granular filter media 'Bioloite' made of clay.
- Backwash of BIOFOR bed and recycle of the wastewater.
- Treatment (digestion) and disposal of sludge from clarifier (not provided at the STPs due to space limitations)

12.7. High rate Activated Sludge Biofor –F Technology

Key features

- In general, high level of mechanization and sophistication
- The flow scheme excludes primary sedimentation tank
- Superior aerated grit chamber and classifier
- Circular aeration tank with tapered air diffusion system
- Second stage aeration and rapid sand filtration through a biologically active filter media
- Dissolved air floatation for sludge thickening.
- Digester heating and temperature controller anaerobic sludge digestion.
- Mixing of digester contents through biogas.
- Dynamic cogeneration of electrical and thermal energy through gas engines.

12.8. Fluidized Aerated Bed (FAB)

Key features of the technology

- A compact and robust system involving extended aeration process with submerged aeration
- Biomass growth on fluidized bed of plastic media enabling retention of biomass and long solid retention time in the reactor leading to low food to 'micro-organism ratio' and higher organic removal.
- Two stage biological oxidation
- Flexibility in handling organic load by adjusting quantity of fluidized media
- Reactors upto 5 m deep enabling low land requirements
- Tube settlers again offer space economy
- Ability to withstand limited organic overload

Specific requirements

- Special grade plastic proprietary media custom made for offering high specific surface area
- Diffused aeration system
- Submerged stainless steel screens at the outlet of FAB reactors to prevent media overflow
- Tube settlers for compact clarifier.

Options

- Addition of coagulant and polyelectrolyte for compact plants
- Tertiary treatment of chlorination

- Sludge treatment through thickener and bag filter press or drying beds.

Performance

- High BOD removal with effluent concentration under 10mg/L
- High suspended solids removal with effluent concentration under 20mg/L
- Faecal coliforms removal of the order of 2-3 log scale at FAB-2 stage.

Applicability

- The FAB technology based system is particularly applicable for:
 - Small to medium flows in congested locations
 - Sensitive locations
 - Decentralized approach
 - Reliving existing overloaded STPs.

12.9. Submerged Aeration Fixed Film (SAFF) Technology

Key features of the technology

- Essentially a trickling filter with enhanced oxygen supply through submerged aeration
- Unconventional plastic media offering high void ratio and specific area compared to stone and aggregates.
- Large biomass and long solid retention time in the reactor leading to low 'food to micro-organism ratio' and higher organic removal.
- Two stage biological oxidation
- Treatment scheme excluding primary sedimentation and sludge digestion
- Reactors upto 6 m deep enabling low land requirements.
- Tube settlers again offer space economy.

Applicability

- The SAFF technology based system is particularly applicable for:
 - Small to medium flows in congested locations
 - Sensitive locations
 - Decentralised approach
 - Reliving existing overloaded trickling filters.

12.10. Cyclic Activated Sludge Process (CASP)

Key features of the technology

- Essentially activated sludge process operated in batches through auto control
- Aeration and settling in one tank leading to lower plant foot print
- Savings in air/oxygen supply and hence energy
- Two levels of treatment possible depending on the requirement
- Treatment scheme excluding primary sedimentation and sludge digestion

Specific requirements

- Complete reliance on auto control, uninterrupted power supply is a must
- Diffused aeration system
- Several moving parts

Performance

- High BOD removal of 98% with effluent concentration under 10mg/L
- High suspended solids removal with effluent concentration under 20mg/L

- Faecal coliforms removal of the order of 2-3 on log scale.

Applicability

- The Cyclic Activated Sludge Process (CASP) may be applicable for:
 - Small to medium flows in congested locations
 - Sensitive locations
 - Decentralized approach
 - Reliving existing overloaded trickling filters.

12.11. Upflow Anaerobic Sludge Blanket Process (UASB)

Key features

- No mechanical components or external energy requirements in the reactor, therefore process not vulnerable to power cuts
- No primary treatment, suspended solid in the wastewater serve as carrier material for microbial attachment.
- Recovery of gas with high calorific value
- Low sludge production
- Relatively simple routine operation and maintenance
- Biological activity can be restarted without any external seeding or special care after interrupted operations.

Performance

- An UASB reactor can bring down the BOD of the domestic wastewater to 70-100 mg/L and suspended solids (TSS) to 50-100 mg/L. However, sludge washout from the reactor is possible and effluent BOD and TSS is very high during such episodes. The effluent is strongly anoxic with high immediate oxygen demand (IOD). Should not directly discharged into water bodies or used for aquaculture or irrigation without re-aeration.

Specific requirements

- Use of anticorrosive materials / paints on exposed surfaces
- Frequent cleaning / de-sludging of distribution / division boxes and influent pipes
- Skilled supervision during start-up and for control of biomass levels within the reactor
- Post treatment of the UASB effluent is invariably required.
- Control of toxic materials and sulfates in the wastewater is required for efficient operation.

Applicability

- The suitability of this technology may be doubtful as a stand-alone secondary treatment option.

13 Appendix M – Solid Waste Management: Best Practises

13.1. Introduction

As mentioned in Introduction chapter number 1 of volume I, Zero waste is gaining ground as being practicably achievable in Indian cities, which have the advantage of significant recycling and reuse in the solid waste management system. Those can be improved and coordinated with the view to moving towards 'zero waste' scenarios. Further, in order to achieve the SLBs, waste management techniques can be improved in all types of settlements. Some of the solid waste best practises are covered in this section, these are:

- Vellore Municipality, 2000
- Pimpri-Chinchwad Municipal Corporation (PCMC)
- Amritsar Municipal Corporation

13.2. Case: Vellore Municipality, 2000⁵

A zero waste management (ZWM) project in Tamil Nadu's Vellore district is an example of a successful Solid Waste Management programme and its benefits. ZWM is a technique of handling solid wastes that attempts to recover, recycle and reuse maximum waste.

- **Waste segregation at source:** This practice leads to reduction of space requirement for waste segregation at later stage.
- **Minimizes pollution:** ground water, land and air pollution created at landfill sites is avoided by doing away with disposal of wastes at dumpsites and landfills.

In Vellore Municipality, citizens were informed about the concept of ZWM and taught how to segregate waste at the household or respective source. Red and green dust bins were provided to each household unit for initiating waste segregation. Teams with two street beautifiers each, were formed. Each team was assigned 300 households and provided a tricycle and a set of hand tools. The tricycle had two compartments, one green and the other red, to collect organic and inorganic waste respectively.

The street beautifiers collect domestic garbage in their allocated zones. The waste collected in the households in green and red dust bins are emptied in the colour-matching compartment of the tricycle and brought to the zero waste centre. Inorganic waste is separated into more than 25 items under categories like bottles, plastics, metals, cardboard, paper, PVC etc. They are then packed and sold to local waste collectors and recyclers every month. Mixed waste (10-15 percent), which cannot be recycled, is sent to landfills.

The organic waste is composted and treated in two stages: (a) cattle dung/bio-dung composting (b) vermi-composting.

- **Cattle dung composting:** the organic waste is laid in a composting yard in large compartments and spread in different layers. Each layer is treated with cattle dung microbial inoculums. When the height of a layer reaches 5 feet, it is covered with a polythene sheet. This first stage of composting takes 45 days. The polythene sheets trap the heat generated during anaerobic composting and increase the internal temperature to 70-75 degrees Celsius. This high temperature kills the pathogens. The moisture evaporates and condenses on the underside of the

⁵India Sanitation Portal: United Nations Children's Fund (UNICEF), P Amudha

polythene. The cyclic movement of water also cycles the bacteria aiding rapid decomposition and reducing the volume to about one third in 15 days. After 50 days, the compost can be harvested, sieved and packed in bags for sale.

- **Vermi-composting:** semi-decomposed organic waste is put into vermi-composting beds after 15 days. The vermi-compost can be collected after 45 days. The rich composted manure is sieved and packed for agricultural purposes and afforestation activities.

The Vellore solid waste management project is now managed by village *Panchayats* supported by Residential Welfare Associations and SHGs. Each household and shop pays for waste collection. The funds collected from monthly subscriptions and sale of inorganic waste and organic manure are used for paying the street beautifiers and supervisors. The pilots in Vellore district are successful because of informed communities and their participation. Equally crucial to the success is the full involvement of local bodies and their commitment.

Due to information technology in Municipal Solid Waste Management (SWM) sector has equipped this sector with better management of this crucial mandatory functions under the urban domain, as per 12th Schedule of 74th CAA. Better management of SWM includes GPS based vehicle tracking system, tracking clearance of secondary collection points, GIS based shortest route identification to landfill / dumping site etc.

13.3. Case: Pimpri-Chinchwad Municipal Corporation (PCMC)⁶

Pimpri-Chinchwad is one of the cities who has done pioneering task of monitoring its SWM services through the use of ICT.

The city of Pimpri-Chinchwad located northwest of Pune, has an area 171 sq. km. with an estimated population of over 12.5 lakhs. PCMC deployed GPS based vehicle tracking system due to low capital cost of deployment and ease of operation. A step by step implementation strategy was followed at PCMC:

- **Step 1:** Selection of technology partner
- **Step 2:** Installation of GPS system on waste collection vehicles
- **Step 3:** Geo Coding of bins across the city
- **Step 4:** Development of web based application and public information system
- **Step 5:** Stabilization of system and training to stake holders

Brief on Solid Waste Management – “GPS & GIS enabled”

Geo coding of the all the bins across the city were marked on the GIS mapping database and real time vehicle movement (GPS location of the vehicle on which a GPS device was installed) were monitored against them as per route. Overall city wide 75 different routes were identified and geo coded with GIS map. An intelligence algorithm/logic was developed in web based application to flag the bin as “Served”, when a waste collector vehicle stops near a bin within a specified distance for a sufficient period.

Table 13.1: Prior Conditions and Achievements of the Project

S. No.	Situation prior to proposed ICT based SWM system	Achievements
1	Monitoring of actual pick-up of the waste from the assigned bins/locality and the same was recorded purely on manual recording basis.	Monitor the actual movement and real time position of the vehicle.
2	Monitoring actual movement of the fleet and its productivity i.e. no. of bins picked by each vehicle on	Analyse the bin pick up status in real time.

⁶JnNURM: Best Practices in e-Governance, MoUD (http://www.innurm.nic.in/wp-content/uploads/2011/01/BP_SWM.pdf)

S. No.	Situation prior to proposed ICT based SWM system	Achievements
	schedule basis.	
3	Difficulty in tracking the non-compliance to the schedules.	Improve service delivery mechanism and achieve better information management.
4	Processes for validating the productivity of the fleet and payments were done purely based on manual records of no. of trips made by each vehicle.	Reducing the unwanted trips/detours/stoppages and enhance the productivity/utilization of the fleet.
5	Difficulty in locating the bins in a manual process.	Generate MIS and exception report to take informed decision.
6	Difficulty in monitoring actual pick up of the waste from the assigned bins/locality and dumping in the dumping yards and recoding of data is a manual process.	Greater accountability on field level staff.
7	Difficulty in preparing status reports as it is a manual process and takes a lot of time.	Timely completion of job with greater efficiency.
8		Measuring service level with benchmarks, making it compulsory to each ULB to achieve the benchmarks.
9		Improve public image and also offered a tool for RTI.

Source: JnNURM: Best Practices in e-Governance, MoUD (http://www.jnnurm.nic.in/wp-content/uploads/2011/01/BP_SWM.pdf)

13.4. Case: Amritsar Municipal Corporation⁷

Prior to the project, Amritsar city had no door-to-door collection of waste and heaps of garbage was seen in most of the localities. The sanitary conditions were very poor due to lack of unorganized system of collection and transportation. The Sanitation Zones of 4, 5, 6 and 7 were selected for collection and transportation of waste. The job was awarded to a private party in 2008 for operation and maintenance of the project facility.

The major activities under the project included:

- Provision of adequate machinery, equipment and staff for the project upgrading door to door services and SWM infrastructure.
- Vehicles have alarm system for house to house collection.
- Primary and secondary storage in bins.
- Prohibition of waste littering and arbitrary disposal of waste.
- Public awareness for better sanitation/ waste management.
- Provision of mobile covered bins and synchronized transportation mechanism, has removed *dhalaos* and *kudaghars*.
- Uniforms for the *safaisewaks*, drivers and supervisors etc.
- Transportation of waste through high capacity, covered vehicles.
- Provision of centralized complaint redressal system by the Contractor.
- Arrangement for processing facility with multiple product recovery (work is in progress through private participation)

Project Achievements:

- Improved door to door collection and efficient, hygienically safe transportation of waste to the landfill site.
- Improvement in the environmental conditions in the selected zones.
- Negligible littering in the streets due to awareness of the citizens, adequate bins, timely and effective collection of waste from the source and its regular transportation.

⁷JnNURM-Toolkit for Solid Waste Management

- Replacement of old *dhalaos/kudaghars* with colourful collection points, improving aesthetics of the area.
- Reduced manual handling of waste in collection and transportation.
- Greater awareness among citizens about cleanliness/ waste management.
- Reduction in expenditure on improving the waste collection/ transportation under SWM Rules.

14 Appendix N – Hierarchy of Social Infrastructure Development

Table 14.1: Hierarchy of Social Infrastructure Development

Planning Unit	Population	S.No.	Facilities	No.	Area per Unit (Ha)	Total area (Ha)
Housing Area	5000	1	Pre Primary	2	0.08	0.16
		2	Primary school(I to V)	1	0.40	0.40
		3	Aanganwari - Housing area/ cluster	1	200 to 300 sqm	200 to 300 sqm
		4	Community Room	1	750 sqm	750 sqm
		5	Religious Facility	1	400 sqm	400 sqm
		6	Housing Area Park	1	0.50	0.50
		7	Residential unit play area	1	5000 sqm	5000 sqm
		8	Milk Distribution	1	150 sqm	150 sqm
		9	Convenience Shopping	1	1500 sqm	1500 sqm
Neighbourhood	5000-15,000	1	Senior Secondary School(VI to XII)	1-2	1.80	3.60
		2	Dispensary	1	0.08 to 0.12	0.08 to 0.12
		3	Community hall, mangalkaryayala, barat ghar/ library	1	2000 sqm	2000 sqm
		4	Neighbourhood park	1	1.00	1.00
		5	Neighbourhood Play area	1	1.50	1.50
		6	Local shopping including service centre	1	4600 sqm	4600 sqm
		7	Post office counter without delivery	1	85 sqm	85 sqm
		8	Bank with extension counters with ATM facility	1		
		8a	Floor area for counters		75 sqm	75 sqm
		8b	Floor are for ATM		6 sqm	6 sqm
Community	1 Lakh	1	Integrated School Without Hostel facility(I to XII)	1	3.50	3.50
		2	Integrated School With Hostel facility(I to XII)	1	3.90	3.90
		3	School for physically challenged	2	0.70	1.40
		4	College	1	5.00	5.00
		5	Nursing home, child welfare and maternity centre	1	0.20 to 0.30	0.20 to 0.30
		6	Polyclinic	1	0.20 to 0.30	0.20 to 0.30
		7	Intermediate Hospital (Category B)	1	1.00	1.00
		8	Intermediate Hospital (Category A)	1	3.70	3.70
		9	Multi-Speciality Hospital (NBC)	1	9.00	9.00
		10	Speciality Hospital (NBC)	1	3.70	3.70
		11	Family Welfare Centre	2	500 to 800sqm	1000 to 1600sqm
		12	Diagnostic centre	2	500 to 800sqm	1000 to

Appendix N – Hierarchy of Social Infrastructure Development

Planning Unit	Population	S.No.	Facilities	No.	Area per Unit (Ha)	Total area (Ha)
						1600sqm
		13	Dispensary for pet animals and birds	1	300 sqm	300 sqm
		14	Music, dance and drama centre	1	1000 sqm	1000 sqm
		15	Recreational Club	1	10,000 sqm	10,000 sqm
		16	Meditation and spiritual Centre	1	5000 sqm	5000 sqm
		17	Community park	1	5.00	5.00
		18	Community level Multipurpose ground	1	2.00	2.00
		19	District Sports Centre	1	8.00	8.00
		20	LPG Godown/ Gas godown (inclusive of guard room)	2	520sqm	1040sqm
		21	Police Post	2	0.16	0.32
		22	Police Station	1	1.50	1.50
		23	Fire Station	1	1.00	1.00
		24	Community Centre with service centre	1	5.00	5.00
		25	Weekly Markets	1 to 2	0.40 to 0.80	0.40 to 0.80
		26	Organised Informal eating spaces	1	2000 sqm	2000 sqm
		27	Dhobi Ghat	1	5000 sqm	5000 sqm
		28	Telegraph Booking Counter	1	200 sqm	200 sqm
		29	Bank with locker, ATM and other banking facilities	1	2500 sqm	2500 sqm
District	5 Lakh	1	General Hospital (NBC)	2	6.00	12.00
		2	Veterinary Hospital for pets and animals	1	2000 sqm	2000 sqm
		3	Old age home	1	Max.1000 sqm	Max.1000 sqm
		4	District park	1	25.00	25.00
		5	District level multipurpose ground	1	4.00	4.00
		6	District Centre	1	40.00	40.00
		7	Cremation Ground	1	2.50	2.50
		8	Burial Ground	1	4.00	4.00
		9	Telephone exchange of 40,000 lines	1	4.00	4.00
		10	Telegraph booking and delivery office	1	1700 sqm	1700 sqm
		11	Head post office with delivery office	2	750 sqm	1500 sqm
		12	Head post office and administrative office	1	2500 sqm	2500 sqm
Zonal	10 Lakh	1	School for mentally challenged	1	0.20	0.20
		2	Technical Education Centre (A) – To include 1 Industrial Training Institute (ITI) and 1 Polytechnic	1	4.00	4.00
		3	Technical Education Centre (B) – To include 1 ITI, 1 Technical Centre and 1 Coaching Centre	1	4.00	4.00
		4	Engineering College	1	6.00	6.00

Appendix N – Hierarchy of Social Infrastructure Development

Planning Unit	Population	S.No.	Facilities	No.	Area per Unit (Ha)	Total area (Ha)
		5	Medical College	1	15.00	15.00
		6	Other Professional Colleges	1	2.00 to 6.00	2.00 to 6.00
		7	Nursing and Paramedical Institute	1	2000 sqm	2000 sqm
		8	Religious Facility	1	4.00	4.00
		9	Orphanage/ Children's Centre (One each)	1	Max.1000 sqm	Max.1000 sqm
		10	Care centre for physically mentally challenged	1	Max.1000 sqm	Max.1000 sqm
		11	Working women – men hostel	1	Max.1000 sqm	Max.1000 sqm
		12	Adult education centre	1	Max.1000 sqm	Max.1000 sqm
		13	Night Shelter	1	Max.1000 sqm	Max.1000 sqm
		14	Socio – Cultural centre/ Exhibition cum fair ground	1	15.00	15.00
		15	Science Centre	1	As per requirement	As per requirement
		16	Sub city park	1	100.00	100.00
		17	Sub city level multipurpose ground	1	8.00	8.00
		18	Divisional Sports Centre	1	20.00	20.00
		19	District office and battalion	1	4.80	4.80
		20	Police line	1	4.00 to 6.00	4.00 to 6.00
		21	District Jail	1	10.00	10.00
		22	Civil defence and home guards	1	2.00	2.00
		23	Local Wholesale Market / Mandi	1	10.00	10.00
Sub city centre	25 Lakh – 50 Lakh	1	Sub-city Centre	1	As per requirement	As per requirement
City	50 Lakh +	1	City Centre	1	As per requirement	As per requirement
		2	International Convention Centre	1	As per requirement	As per requirement
		3	Police Training Institute	1	5.00	5.00
		4	Police Firing Range	1	upto 10.00	upto 10.00
		5	Fire Training Institute/ College	1	3.00	3.00
Other Facilities		1	University Campus		10 to 60	10 to 60
		2	Veterinary Institute	As per Veterinary Council of India/ Ministry Norms		
		3	Petrol Diesel: Only filling station		30 m x 17 m	30 m x 17 m
		4	Petrol Diesel: Filling cum service station		36 m x 30 m	36 m x 30 m
		5	Petrol Diesel: Filling cum service station cum workshop		45 m x 36m	45 m x 36m

Appendix N – Hierarchy of Social Infrastructure Development

Planning Unit	Population	S.No.	Facilities	No.	Area per Unit (Ha)	Total area (Ha)
		6	Petrol Diesel: Filling station only for two and three wheelers		18m x 15m	18m x 15m
		7	CNG mother station		1080 sqm	1080 sqm
		8	Traffic and Police Control Room		As per requirement	As per requirement
		9	Police camp including Central Police Organisation/ Security Forces		upto 10.00	upto 10.00
		10	Sub fire station/ Fire Post		0.60	0.60
		11	Disaster Management Centre	One in each administrative zone	1.00 to 2.00	1.00 to 2.00
		12	Electric Crematorium	1 for large size towns	2.00	2.00
		13	Remote subscriber unit	1 for 3 km radius	300 sqm	300 sqm
		14	Reading room	City or sub city/District/Community/neighbourhood Centre	-	-
		15	Rehabilitation Centre	As per requirement	-	-
		16	Police booth	At major intersections	10-12 sqm	

Source: Chapter 8, URDPFI Guidelines, 2014

15 Appendix O – All other Planning related Acts

Figure 15.1: Planning related Acts and reference URLs

S.No.	Relevant Act / Law	Document web-Location for reference
1	The Constitutions 73 rd and 74 th Amendment Act, 1992	http://indiacode.nic.in/coiweb/amend/amend73.htm http://indiacode.nic.in/coiweb/amend/amend74.htm
2	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	http://indiacode.nic.in/acts-in-pdf/302013.pdf
3	The Model Regional and Town Planning and Development Law, 1985	www.ndmindia.nic.in/.../VOLUME%20I%20Prop_Am_Legi_Regu_Add
4	Model Municipal Law, 2003	www.ielrc.org/content/e0331.pdf
5	National Manufacturing Policy, 2011	http://dipp.nic.in/english/policies/national_manufacturing_policy_25october2011.pdf
6	The Special Economic Zones Act, 2005	http://sezindia.nic.in/writereaddata/pdf/SEZ%20Act,%202005.pdf
7	The Micro, Small and Medium Enterprises Development (MSMED) Act, 2006	www.msmeodisha.gov.in/PDF/MSMED_Act .pdf
8	The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	http://www.nma.gov.in/nma/downloads/Act/AMASR_Act2010_Gazette_Notification.pdf
9	The Environment (Protection) Act, 1986	www.aerb.gov.in/AERBPortal/pages/English/t/actsrules/rules/epa.pdf
10	The Forest Conservation Act, 1980	envfor.nic.in/legis/forest/forest2.html
11	The Cantonment Act, 2006	http://www.cbdelhi.in/documents/ca2006 .pdf
12		

