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1 TOWN PLANNING AND HISTORY OF TOWN PLANNING ACTS

1.1 General:

The term 'Town Planning' is used to indicate the arrangement of various components or units of a town in a very organized manner. It also includes ways to improve and develop the existing town or for the extension of towns. Thus, the knowledge of town planning helps in achieving the best possible advantages of the town with respect to its land and the surrounding environment.

Town planning demands active imagination and sharp common sense of understanding various needs of the society. A town planner has to prepare the layout plans in such a way that the final results are appreciated by all the sectors of public, therefore, the town planning is a science as well as an art too. The science consists in collecting, correlating and analysing the facts about the town. The art lies in arranging the components of town in such a way that the final result is in the form of a beautiful, convenient, economical and efficient unit. The difference between town planning and architecture should be noted. The town planning expresses the life of a town. The architecture reveals the spirit of the town.

1.1 Objects of Town Planning:

The four essential objects of town planning are beauty, convenience, environment and health.

1.1.1 Beauty:

The beauty is achieved by taking the advantages of the natural conditions surrounding the town and also by giving architectural finishes to the various components of the town. It includes the preservation of tress, natural greenery, architectural control on public buildings, temples, churches, mosques, and buildings of historical significance.

1.1.2 Convenience:

It means providing social and recreational amenities to the public. These amenities (facility) include cheap power and electricity, proper sites for industries, transport facility, adequate water supply, easy disposal of sewage and industrial wastes, etc. The recreational amenities include open spaces, parks, playgrounds, town halls, malls, multiplexes, community centers, stadiums, etc.

1.1.3 Environment:

It is an important factor in town planning. The environment of the town should be in such a way that people can lead their normal activities with least difficulty. The complex problems of

modern society such as tiresome travel to work, long hours of work, limited time spent within the family and community, etc. has led to serious problems in the lifestyle of the people living in the towns. Therefore, town planning is mainly concerned with brining about a better relation between man and his environment.

1.1.4 Health:

Health is accommodated in town planning by providing health centers, parks and playgrounds for the public, by maintaining the pollution of various forms to the lowest level, etc. It is achieved by dividing the land into zones such as residential, commercial, industrial, etc. and maintaining orderly development of the town in future.

It is, however, necessary for the town planner to maintain a proper balance between the four objects mentioned above.

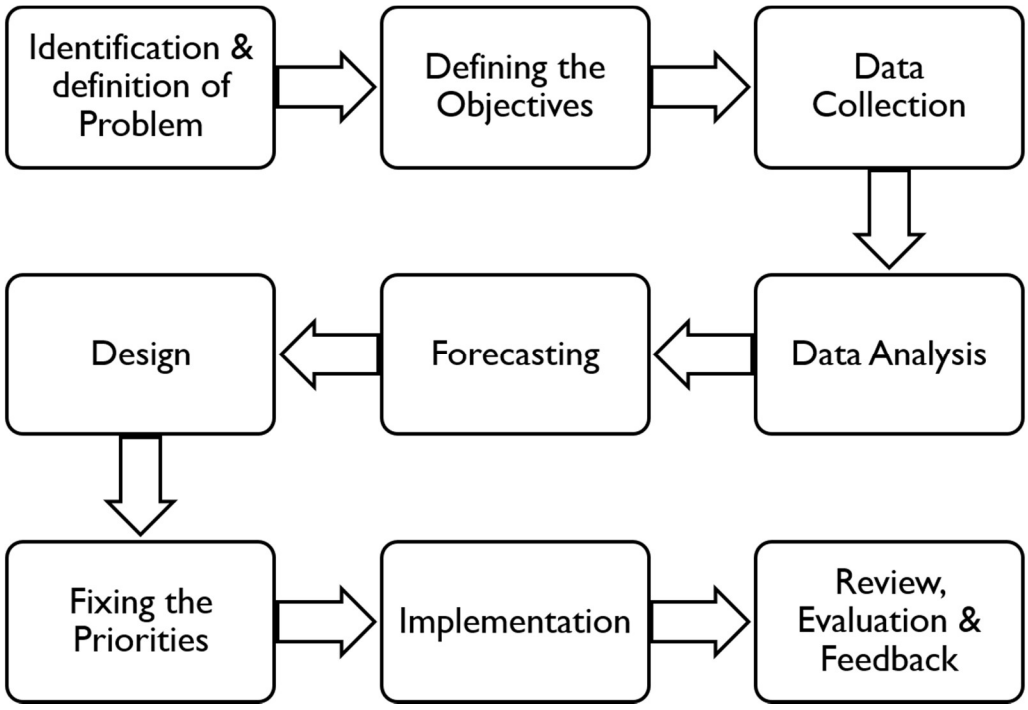


Figure 1-1 Planning Process

1.2 Principles of Town Planning:

The subject of town planning demands knowledge of various professions, especially those of engineering, architecture and surveying. The town should be designed to satisfy the future growth and development, therefore avoiding development of town in any haphazard fashion. Some of the guiding principles of town planning are as follows:

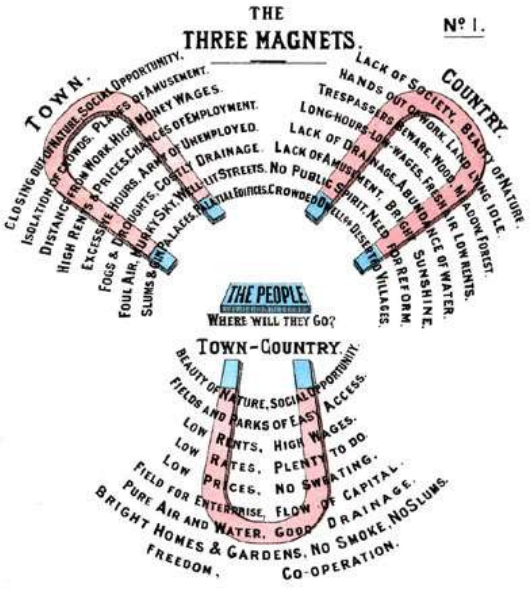
1. Green belt:

The provision of a green belt on the border of the town results in the limitation of its size and hence,

- The man behind the birth of Garden City Movement was born in London.
- He was sent to schools in Suffolk and Hertfordshire, and had several clerical jobs.
- In 1871, Howard emigrated with two friends to America to practise farming.
- He then relocated to Chicago and worked as a reporter for the courts and newspapers.
- In the U.S. he became acquainted with, and admired, poets Walt Whitman and Ralph Waldo Emerson. Howard began to ponder ways to improve the quality of life.

2.1.2 **The 'Three Magnets' theory…**

- He illustrated the idea with his famous hypothesis called *Three Magnets* diagram, which addressed the question 'Where will the people go?', the choices being 'Town', 'Country' or 'Town-Country' - the Three Magnets.
- In planning the garden town, he wanted to exploit the best features of town and country side to ensure their combination for healthy living of the people.



TOWN	COUNTRY	TOWN-COUNTRY
• Social opportunity. • Places of amusement. • High money wages. • Chances of employment. • Well-lit streets. • Losing out on nature.	• Lack of society. • Lack of amusement. • Long hours, low wages. • Low employment chances. • Lack well-lit streets.	• Social opportunity. • Places of amusement. • High money wages. • Chances of employment. • Well-lit streets. • Beauty of nature.

• Isolation of crowds. • Distance from work. • High rents and prices. • Fogs and droughts. • Costly drainage. • Foul air. • Murky sky. • Slums.	• Beauty of nature. • Deserted lands. • Idle lands, no work. • Low rents and prices. • Abundance of water. • Lack of drainage. • Fresh air. • Clear bright sky. • Overcrowded dwellings.	• Deserted lands. • Idle lands, no work. • Low rents and prices. • Abundance of water. • Efficient drainage. • Fresh air. • Clear bright sky. • Overcrowded dwellings.

2.1.3 **The 'Garden City' concept…**

- Derived from the Three Magnets theory, Howard conceptualized a self-contained town where industrial, agricultural, residential areas are efficiently planned and occupying land sufficient to provide garden surrounded homes for at least 32,000 persons as well as a wide belt of open fields as 'Garden City'.
- Components of Howard's Garden City…
  - Planned dispersal of population and industry in towns of sufficient size.
  - Limitation of town size.
  - Amenities like garden, playground, parks etc. woven into the town pattern.
  - Planning control for the whole town framework, road schemes and functional zoning etc.
  - Division into neighbourhoods or wards of preferably $1/6^{Th}$ of town for each unit.
  - Unified land ownership.
  - Each stage of growth must have unity, symmetry and completeness. Limited number of shops for better service and high ground rent.
  - Howard's vision involved the development of a system whereby a number of independent garden cities would surround a central city.
  - The central city would have a maximum population of approximately 58,000, while the garden cities would each be expected to grow to a population of about 32,000.
  - Together, they would form an urban system that would have a combined population of about 350,000.

3 Town Planning In Ancient India:-

Towns are probably the most complex things that human beings have ever created. In ancient times, they were the wellsprings of culture, technology, wealth and power. People have a love hate relationship with cities. Town planning has always been of chief concern since times immemorial. Evidence of planning has been unearthed in the ruins of cities in China, India, Egypt, Asia Minor, the Mediterranean world, and South and Central America. Early examples of efforts towards planned urban development include orderly street systems that are rectilinear and sometimes radial; division of a city into specialised functional quarters; development of commanding central sites for palaces, temples and civic buildings; and advanced systems of fortification, water supply, and drainage.

India has characteristically drifted with history, rising periodically to accomplish great things. In no field has this been truer than in town planning. From prehistoric Mohenjo-Daro, to the imperial city of New Delhi, to Corbusier's Chandigarh, India has pioneered in town building.

3.1 Town Planning System Of Indus Valley Civilization (Harappan Civilization):-

Indus Valley Civilisation is also referred to as Harappan civilization and Saraswati Sindhu Civilization. It was situated between Indus River and the Ghaggar - Hakra River (Pakistan and North Western India). Mohenjo Daro was one of the major settlements in this area.

3.1.1 Main Features Of Town Planning In Indus Valley Civilisation:-

The main features of town planning in Indus Valley Civilisation are as follows:-

- Streets in perfect grid patterns in both and Harappa.
- World's first sanitation system.
- Individual wells and separate covered drains along the streets for waste water.
- Houses opened to inner courtyards and smaller lanes.
- Impressive dockyards, granaries, warehouses, brick platforms and protective walls.
- Massive citadels protected the city from floods and attackers.
- City dwellers were mainly traders and artisans.
- All the houses had access to water and drainage facilities.

3.1.2 Development Of Cities:-

- Cities grew out of earlier villages that existed in the same locality for less than 100 years.

- Grew in size and density and were surrounded by various towns and villages.
- Cities interlinked with trade and economic activities, religious beliefs and social relations etc.
- Vast agricultural lands, rivers and forests by pastoral communities, fisher folks and hunters surrounded each city.

3.1.3 Town Planning In Mohenjo-Daro :-

- No fortification.
- Major streets In North South direction.
- Intersection at right angles.
- Streets within built up areas were narrow.
- Distinct zoning for different groups.

In Mohenjo-Daro, Settlement Divisions Were As Follows :-

- North – agriculture & industries
- South – administration, trade & commerce.
- Religious, institutional &cultural areas – around monastery & great bath in the western part.

3.1.4 CONSTRUCTION TECHNIQUES IN MOHENJO-DARO:-

- Buildings – masonry construction by Sun dried bricks.
- Ranging from 2 rooms to mansions with many rooms.
- Underground sewerage & drainage from houses.
- Helical pumps for pumping water in Great bath.
- Principal buildings – monastery & bath - indicating religious culture.

Mohenjo-Daro - Great Bath :-

The main features of Great Bath are as follows:-

- 12x7x3 m in dimensions.
- Earliest public water tank in ancient world.
- Ledge extends for the entire width of pool.
- Watertight floor – thick layer of bitumen.

15	Lewis Mumfurd	Neighborhood Concept
16	Otto H. Konigsberger	Bhubaneswar
17	B V Joshi	Jaipur
18	Chandigarh	Le Corbusier,
19	Jaipur (India's first planned city ever.)	'Pink City'
20	Gandhinagar	H.K. Mewada and his assistant Prakash M Apte
21	Jamshedpur (first well-planned industrial city)	

3.5 Shilpa Shastra

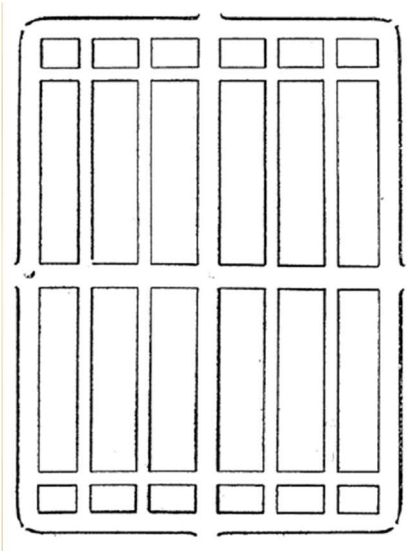
The characteristics of the cities fit for the habitation of kings, merchants, Brahmins and other classes of people. The following are the different types of town plans evolved and practised according to Manasara.

1. Dandaka
2. Sarvathobhadra
3. Nandyavarta
4. Padmaka
5. Swastika
6. Prastara
7. Karmuka
8. Chaturmukha

3.5.1 **Dandaka**

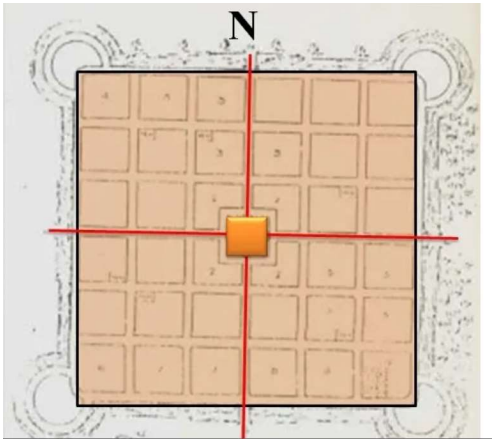
- two main entrance gates and is generally adopted for the formation of small towns and villages
- village offices were generally located in the east.

- female deity of the village or the *Gandevata* will generally be located outside the village and the male deities in the northern portion
- In the second type of town plan the whole town should be fully occupied by houses of various descriptions and inhabited by all classes of people.
- The streets run parallel to the central adjoining streets with the temple of the presiding deity in the centre of the town.



3.5.2 **Sarvatobhadra**

- This type of town plan is applicable to larger villages and towns, which have to be constructed on a square sites.
- According to this plan, the whole town should be fully occupied by houses of various descriptions and inhabited by all classes of people.
- The temple dominates the village



4 Planning Process

4.1 Scope and purpose of various plans

The need and roles for the specific plan category, namely, Perspective Plan, Regional Plan, Development Plan, Master Plan, Local Area Plan, Special Purpose Plan and Annual Plan, thereby resolving gaps in the planning system is detailed in the following section.

4.1.1 Perspective Plan

Developing a vision for region is essential for policy framework. The vision stipulates direction of growth and identification of resource potential and innovations to be adopted for the thrust areas of development. It integrates broad level plan with the regional or development plan. A realistic vision helps policy formulation and preparation of Perspective plan.
Perspective plan defines the vision and focuses on the spatio-economic development policies, strategies and programmes towards the intended development of the State. The Perspective Plan of a State could include - State Urbanisation Policy and State Land Utilisation Policy. The plan is based on state resource mapping and analysis and assessment of potential resources. It addresses the long term policies regarding development of infrastructure and resource mobilisation. The scope of this plan covers the social, economic, environmental and spatial development goals, policies and priorities relating to the activities that have spatial and financial implications.
The purpose of a perspective plan is to provide an overall framework for preparation of detailed plans. Therefore it serves as a guide for urban local authorities and regional development authorities in preparation of the regional and development plans.

4.1.2 **Regional Plan**

For planned and sustainable development of the human settlements, the regional planning approach needs to be promoted. The planning regions could be classified under three heads:
(a) Administrative Regions, which can be District Regions or Metropolitan Regions as per the recommendations of the 73rd & 74th Constitutional Amendment Act,
(b) Investment Regions, which can be new investment manufacturing zones, industrial and freight corridors, special investment regions etc. They could be identified under National Acts/ policies,
(c) Special regions, which are sensitive in terms of environment/ socio economic or political aspects.

4.1.3 **Development Plan**

Development plan is a statutory plan prepared (under relevant Act) within the framework of an approved perspective plan. The objective of a development plan is to provide further necessary details and intended actions in the form of strategies and physical proposals for various policies given in the perspective plan and regional plan depending upon the economic and social needs and aspiration of the people, available resources and priorities.
Proposals of a development plan should be definite, supported by an implementation strategy and evaluation criteria. It makes known publicly the intention of the local authority regarding physical, social and economic development, the facilities and the services that are proposed to be provided in the near future. The approved development plan allows the local authority to implement development of the land area specified under the plan with the help of local area plans and projects.
The time frame of the existing Development Plans is for a period of 20 years by most of the Urban Development Authorities/ULBs. For greenfield cities, a longer planning period can be considered, aligned with the infrastructure life of 30 years.

These plans should be in phases of 5 years, to make it convenient for periodic reviews and revision. This 5-year cycle could also be usefully coincided with the State Five Year plans and State Finance Commissions' recommendations, though such an alignment need not be made mandatory. The targets set for each phase can be assessed as the mid-term review against the achievements at the end of each phase. For Greenfield area, phasing could include a 'Zero' period for approvals, institutional set-up, initial land polling and revisiting any strategy.

4.1.4 Master Plan to be referred as Development Plan

The term "Development Plan" is used differently in States. Some States use it for an integrated multi-sector plan, such as the District Development Plan. In some other States, it is a statutory land use plan, approved and adopted by the local authority and its proposals are precise and definite, notifying the property owners the manner in which their properties will be affected. The examples of the later type are the Delhi Master Plan, Chennai Master Plan, Guwahati Master Plan, Ahmedabad Development Plan, Hyderabad Metropolitan Development Plan and Bhopal Development Plan. Here, both the plans, Development plans and Master plans have the same functions and impose similar controls, with variation in the use of nomenclatures by States. Many states prefer and there is a growing consensus to replace the terminology of 'Master Plan' with 'Development Plan'.

In areas under the Schedule 6 of the Constitution, land is not directly State subject such as in the North-Eastern (NE) States, where land title is based on community ownership. The approach to land aspects of the Development Plan may be different in such cases. Therefore, a **Structure Plan** approach to land management may be appropriate in order to allocate land for different land uses in urban infrastructure etc.

In such cases or otherwise, **Structure Plan** is to serve as a planning tool which directs the growth and zones of planning, but is not as precise as the development plan (such as the Structure Plan for Bangalore Metropolitan Region). Structure Plans may be considered as an overarching Development plan for Metropolitan Regions, allowing broad framework and flexibility.

4.1.5 Local Area Plan

The thrust of micro-planning should shift to local area plans, which could encourage decentralization and improve implementation of Development Plans. In view of the 73rd and 74th CAA, planning decision and implementation of plans should be disaggregated in order to bring the process closer to the local people. This would enhance the significance of Local Area Plans.

Local area plans are to be prepared to guide the development or re-development of land, conservation of buildings and physical features, providing improvements in the physical layout, making infrastructure and amenities available and managing the area to enhance health and safety of the residents to support economic development as well as to enhance the quality of living, environment, and for area specific regulatory for the area covered.

Local area plans need to specify the implementation details to comply with the Government Policies, such as housing, hi-tech townships, rainwater harvesting, energy, disaster management, industrial and service sector investment, barrier-free environment for the elderly and the physically disabled, e-Governance, tourism and other policies and facilitate formulation of specific projects.

The plan should delineate reservation of land for roads and other public purposes, for construction, reclamation etc. The plan should provide a framework for recovery of the associated costs for public projects, by mechanisms like levy of betterment charges, charges on additional development rights, and appropriate user charges.

4.1.6 Special Purpose Plan

6 Metropolitan Regional Plan

6.1 Classification of Urban Settlements

The Census of India 2011 classifies urban settlements as follows:

6.1.1 1. Statutory Towns

All places with a:

- Municipality
- Corporation
- Cantonment Board
- Notified Town Area Committee, etc.

These towns are notified by law by the State/UT Government and have local governing bodies, irrespective of population size or characteristics (as on 31st December 2009).

6.1.1.1 2. Census Towns

Other areas that satisfy all three conditions:

- Minimum population of 5,000
- At least 75% of male main workers engaged in non-agricultural pursuits
- Population density of at least 400 persons per sq. km

6.1.2 URDPFI Classification of Urban Settlements

This classification is based on:

- Census 2011
- Master Plan practices in states
- Emerging urban agglomerations

S.No.	Classification	Subcategory	Population Range	Governing Local Authority	No. of Cities (2011 Census)
1	Small Town*	Small Town I	5,000 – 20,000	Local Authority	
		Small Town II	20,000 – 50,000	Nagar Panchayat / Municipal Council	
2	Medium Town	Medium Town I	50,000 – 1,00,000		7,467
		Medium Town II	1 lakh – 5 lakh	Municipal Council	
3	Large City	–	5 lakh – 10 lakh	Municipal Council	372

S.No.	Classification	Subcategory	Population Range	Governing Local Authority	No. of Cities (2011 Census)
4	Metropolitan City	Metropolitan City I	10 lakh – 50 lakh	Municipal Corporation / Metropolitan Planning Committee	43
		Metropolitan City II	50 lakh – 1 Crore	Same	45
5	Megapolis	–	More than 1 Crore	Same	–

Points to Remember:

- **Small Towns** (even with <5,000 population) can be **Statutory Towns** if given official status.
- Census follows **six-fold classification** based on **population size**.
- **Transitional towns** (mentioned in the 74th Constitutional Amendment) are often governed by **Nagar Panchayats**.
- **Urban Agglomerations** are seen in Metropolitan City II (e.g., Chennai, Bengaluru, Hyderabad, Ahmedabad).
- **Conurbation**: Massive clusters with population >5 Crore, involving several large and metro cities.
- Although URDPFI focuses on **Statutory Towns**, its concepts are adaptable to any settlement (SEZs, Ports, Villages, etc.).

6.1.3 Urban Planning Approach

Urban planning involves different levels and types of settlements, each playing a unique role in regional development. The settlements may be existing or planned, forming part of a structured hierarchy.

6.1.3.1 1. Counter Magnets

- These are potential and growing sub-nodal centres developed outside the influence of main nodal centres.
- Objective:
  - To intercept migratory flows to nodal centres.
  - To promote balanced regional development.
- Examples: Hissar, Gwalior, Patiala, Kota (within NCR context).

6.1.3.2 2. Satellite Towns

- Located near metropolitan cities.
- Depend on the main city for employment and services.
- Examples: Gurgaon and Noida (Delhi), Navi Mumbai (Mumbai), Salt Lake City (Kolkata).

6.1.3.3 3. Priority Towns

- Identified based on their strategic relationship with regional nodal centres.

7 Urban and Regional Planning in India:

7.1 Eco Sensitive Zone:

- Eco-Sensitive Zones or Ecologically Fragile Areas are areas within 10 kms around Protected Areas, National Parks and Wildlife Sanctuaries.
- ESZs are notified by MoEFCC, Government of India under Environment Protection Act 1986.
- In case of places with sensitive corridors, connectivity and ecologically important patches, crucial for landscape linkage, even area beyond 10 km width can also be included in the eco-sensitive zone.
- The basic aim is to regulate certain activities around National Parks and Wildlife Sanctuaries so as to minimise the negative impacts of such activities on the fragile ecosystem encompassing the protected areas.

7.1.1 Activities Allowed in ESZs

- Prohibited activities: Commercial mining, saw mills, industries causing pollution (air, water, soil, noise etc), establishment of major hydroelectric projects (HEP), commercial use of wood, Tourism activities like hot-air balloons over the National Park, discharge of effluents or any solid waste or production of hazardous substances.
- Regulated activities: Felling of trees, establishment of hotels and resorts, commercial use of natural water, erection of electrical cables, drastic change of agriculture system, e.g. adoption of heavy technology, pesticides etc, widening of roads.
- Permitted activities: Ongoing agricultural or horticultural practices, rainwater harvesting, organic farming, use of renewable energy sources, adoption of green technology for all activities.

7.1.2 Significance of ESZs

- To minimize the impact of urbanization and other developmental activities, areas adjacent to protected areas have been declared as Eco-Sensitive Zones.
- The purpose of declaring eco-sensitive zones around protected areas is for creating some kind of a 'Shock Absorber' for the protected area.
- They also act as a transition zone from areas of high protection to areas involving lesser protection.
- ESZs help in in-situ conservation, which deals with conservation of an endangered species in its natural habitat, for example the conservation of the One-horned Rhino of Kaziranga National Park, Assam.
- Eco-Sensitive Zones minimize forest depletion and man-animal conflict. The protected areas are based on the core and buffer model of management, through which local area communities are also protected and benefitted.

7.2 Polluter Pay Principal

The polluter pays principle (PPP) was first mentioned in the recommendation of the OECD of 26th May 1972 and reaffirmed in the recommendation of 14th November 1974.

In the 1972 Declaration of the United Nations Conference on the Human Environment in Stockholm the principles did not feature, but in 1992 in Rio PPP was laid down as Principle 16 of the UN Declaration on Environment and Development.

The European Community took up the OECD recommendation in its first Environmental Action Program (1973-1976) and then in a Recommendation of 3 March 1975 regarding cost allocation and action by public authorities on environmental matters. Since 1987 the principle has also been enshrined in the Treaty of the European Communities and in numerous national legislations world-wide

"The polluter pays principle demands that the financial costs of preventing or remedying damage caused by pollution should lie with the undertakings which cause the pollution, or produce the goods which cause the pollution. Under the principle it is not the role of government to meet the costs involved in either prevention of such damage, or in carrying out remedial action, because the effect of this would be to shift the financial burden of the pollution incident to the taxpayer."

Economists have cited four reasons to question the viability of the polluter pays principle:

- The application of the principle in urban areas where the industrial sector is dominated by medium, small and tiny enterprises operating in a highly competitive market is risky as any higher costs from emission or other effluent clean up charge might adversely affect their competitiveness in relation to large firms that are capable of affording the installation of necessary equipment.
- Even though the polluter pays principle does not prohibit the polluter from passing on the additional costs that he might incur in terms of increased costs, thereby increasing price of his product, the reality in developing nations may not always be this way. These nations which rely heavily on exports of primary commodities for which demand in the international market is elastic may find that the costs are entirely borne by the producers in the form of damage to human health, property and ecosystems.
- Representing a larger objection to the inclusion of polluter pays principle in Indian law is the consequences it will have in the realm of the common property resource. The application of the principle will lead to the appropriation of rights by wealthy landlords to the disadvantage of the small land owners, if curbs are imposed on the manner in which a resource can be used, in this instance land.

P_f = Future population.P_p = Population of previous decade.

Ia = Average increase in population per decade.

I_{ai} = Average incremental increase in population per decade

N = No. of decades.

8.5.1.4 Graphical Method

As per the graph to be drawn.

8.6 Classification of Towns As per Act

Types of Urban Areas according to the Municipal Acts in			
Type of Local bodies		**Population Criteria**	**Type of Local Body**
Larger Urban Area		Population more than 300,000	Municipal Corporation
Smaller Urban Area	Class 'A' Municipal Council	Population more than 100,000	Municipal Council
	Class 'B' Municipal Council	Population of more than 40,000 but not more than 100,000	
	Class 'C' Municipal Council	Population of 40,000 or less but more than 25,000	
Transitional Area		10,000 to 25,000	Nagar Panchayat

8.7 Classification of Towns & Cities (By Census of India)

Class	**Class of Range of Population**
Class I	100,000 and above
Class II	50,000 to 99,999
Class II	20,000 to 49,999
Class IV	10,000 to 19,999
Class V	5,000 to 9,999
Class VI	Below 5,000

8.8 Types of Surveys

While planning regional or urban area, diverse studies are done which use various sets of information to analyse existing situation and make future projections. Thus, keeping in mind the range of data required in planning, following survey types have been undertaken.

8.8.1 **Socio-Economic Survey**

Demographic survey is concerned with collection of socio-economic data regarding characteristics of human populations, such as size, growth, density, distribution, and vital statistics. This survey forms base for not only understanding current socio demographic characteristics of specific area but also projections of future population and related infrastructure. However this survey is to be done in rare cases only as Census of India provides detailed information of demography.

8.8.2 **Land use/utilisation Surveys**

Land use survey is commonly undertaken with the purpose to identify developed and undeveloped areas for analysis of physical distribution and condition of existing development for future projections. In case of ground verification of the land use map prepared by remote access or by various secondary sources, land use of a defined land parcel can be observed by undertaking a well-planned exercise.

8.8.3 **Density Surveys**

Density surveys are done to understand the relationship between built-up area and population density. It is taken up for assessment of infrastructure requirements, to reduce congestion, appropriate availability of land for specific activities and services required by residents for good quality of life.

As accommodation density and population density are calculated for same unit of area, these can be compared to reach at number of persons (occupancy rate) per habitable room. Thus it is used to determine whether particular area is underutilized or over-utilised. This information can be used in future planning to decide which areas are to be decongested and in which areas density can be increased. The following formulas are used for the calculation:

$$\text{Accommodation density} = \frac{\text{Number of habitable rooms in the study area/sub-division}}{\text{Net area of the study area/sub-division}}$$

9 Urban infrastructure services and amenities

The planning of infrastructure shall be based on the hierarchy of urban development. This chapter of URDPFI guidelines suggest the infrastructure planning norms for an Urban/ Regional space; the norms are suggested under five categories, namely:

1. Transportation Planning
2. Physical Infrastructure
3. Social Infrastructure
4. Commercial Infrastructure
5. Miscellaneous Infrastructure

9.1 Why Set of Standards for Planning?

It is a powerful instrument for reshaping the forms and functions of cities and regions in order to generate endogenous economic growth, prosperity and employment, while addressing the needs of the most vulnerable, marginalized or underserved groups:

- To develop applicable reference framework to guide policy reforms
- To raise the urban and territorial dimensions of the development agendas of national, regional and local governments
- To capture principles from national and local experience that could support the development of diverse planning approaches adapted to different contexts and scales
- Planning is also an intricate and constantly evolving concept, which is a reflection of its historical response to prevailing environmental, economic and socio-cultural challenges
- It is important to understand the chronological processes of planning and the analysis of how the ideas seeks to find out what actually happened and how it all came about
- By knowing the development process, as well as the ideas that informed planning at each epoch, and the outcomes of these ideas, can result in future improvements to the planning practice

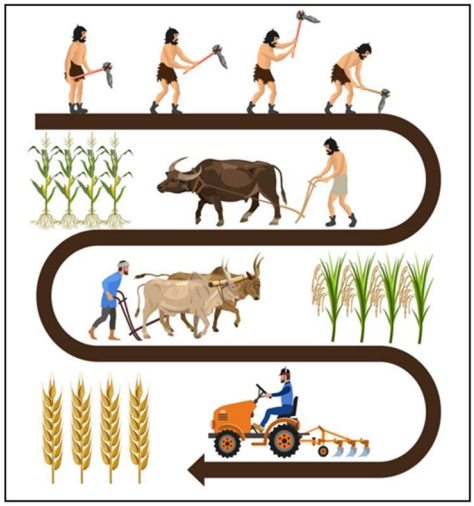
9.2 Objective

The objective of this study is to analyze and correlate the evolution of Planning standards with

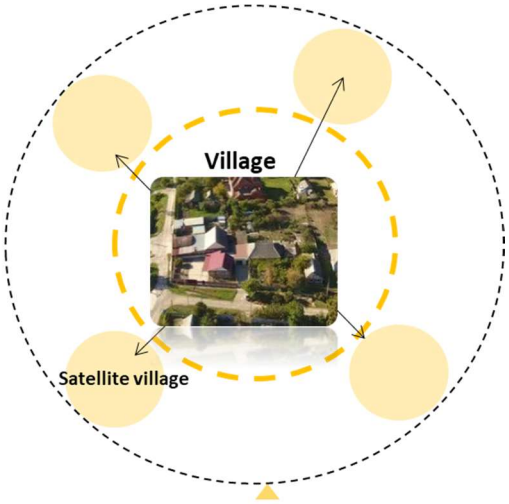
the need of development and further devise improvements and suggestions needed for 21st century Cities.

9.3 Primitive Development of Human Settlement

9.3.1 Settlement Followed By the Need Of The People



Primitive development



Cadastral boundary

- Formation of villages from tiny conglomeration of houses
- Self-sufficiency model accommodating places for all occupation and profession.
- Appropriate places were accommodated according to the religion, professional/occupational needs of the people

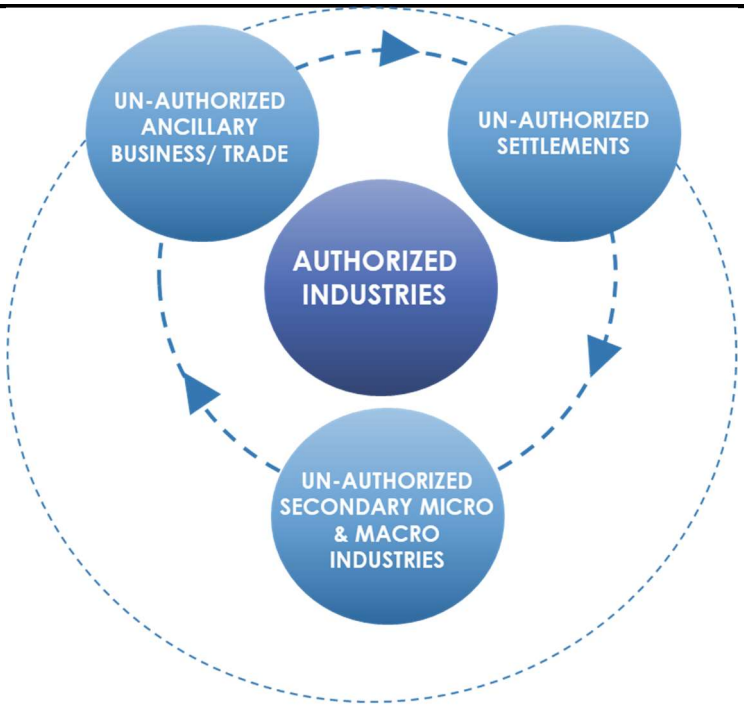
9.3.1.1 NATURAL GROWTH RESULTED IN-

Expansion into satellite villages in the form of Pada's & Wadi's within the cadastral boundaries of the same village

9.3.1.2 THE EVOLUTION NEED WAS –

- To devote more time to protect and grow the agriculture and ancillary development
- To accommodate the extended families

9.4 Towns Evolved Out of Aspiration of The People



VICIOUS CIRCLE CREATED FROM THE ASPIRATIONS-

The growth and development of town was following the determinants-

- Natural population growth
- The Migration of population in search of jobs/ trade / business

RESULTED IN-

- Exhausted space and decreasing land availability in the towns
- As a result of which formation of unauthorized colonies, Juggi- zopdi's, slums, chawls, were seen on the outskirts of the town
- These settlements were more likely found near the public transport stations or along the transport corridors
- With increasing land demand people moved to NDZ, CRZ, Forest, Hill slopes, hill tops etc. leading towards most vulnerable and disaster-prone settlements

- **UN-Habitat (2020)** mentions spatial sustainability, as a concept. It suggests that the spatial conditions of a city can enhance its power to generate social, economic and environmental value and well-being.

- **Paris Agreement**: India's National Determined Contributions (NDCs) includes the goals to reduce the emission intensity of the country's GDP by 33 to 35% by 2030.

9.9.3 National and State Standards

Earlier town planning was a piecemeal process but after Independence the city planning experienced tremendous growth and challenges for resettlement. For this purpose, the national planning standards were introduced in the country, as follows:

- **Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines:** The first guidelines were prepared in 1966 and a lot of changes have taken place in terms of application of latest technology along with spatial growth of cities and towns. Then after the successive revisions URDPFI Guidelines, 2014 is finalized and if of great help to State Town and Country Planning Dept.

- **National Building Code (NBC):** The approach to sustainability is founded on the principles consistent with this code, to adequately protect public health, safety and welfare. These standards are widely followed throughout the nation.

9.10 Water Supply

S.No.	Classification of Town/Cities	Recommended Maximum Water Supply Levels (LPCD)
1	Towns with piped water but no sewerage	70 LPCD
2	Cities with piped water and existing/contemplated sewerage	135 LPCD
3	Metropolitan and Mega Cities with piped water and existing/contemplated sewerage	150 LPCD

9.10.1.1 *Notes:*

i. Where water is provided through public stand posts, use 40 LPCD.
ii. Unaccounted-for Water (UFW) = Supplied Water - Metered Consumption
- (a) Physical losses from leakage
- (b) Administrative losses (illegal use, under-registration)
- Limit UFW to 15% for new systems

iii. Total requirement for towns: 135–150 LPCD, with institutional provisions separately
iv. Promote Rain Water Harvesting in all buildings
v. Figures include water for commercial, institutional, and minor industries
vi. Supply should be 24x7 under Smart City grid supply system
vii. Minimum residual pressure at ferrule point:

11 Disaster Management

11.1 What is Disaster?

A disaster is defined as a **disruption on a massive scale**, either **natural or man-made**, occurring in short or long periods of time. Disasters can **lead to human, material, economic or environmental hardships**, which can be beyond the bearable capacity of the affected society

According to Law:

"disaster" means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, 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 degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area;

According to UN

Occurrence of sudden or major misfortune which disrupts the basic fabric and normal functioning of a society or community and cause human, material , environment and economic losses that exceed the community's ability to cope using its own resource.

- Tough often caused by nature, disaster can have human origin also.
- **October 13** is designated as **International Disaster Risk Reduction** to promote global culture towards **risk awareness and Disaster Reduction in 1989 by UN General Assembly.**
- This(2019) year's theme is: **"Substantially reduce disaster damage to critical infrastructure and disruption of basic services,** among them health and educational facilities, including through developing their resilience by 2030".
- The Indian sub-continent is most the world's most disaster prone area.
- As per the current **seismic zone map** of the country, **over 59 percent of India's land area** is under threat of **moderate to severe seismic hazard.**
- In fact, the entire **Himalayan Belt is considered prone to great earthquakes of magnitude exceeding 0.8**
- In India, Out of the total geographical area **of 329 Million Ha**, more **than 40 Mha is flood prone**

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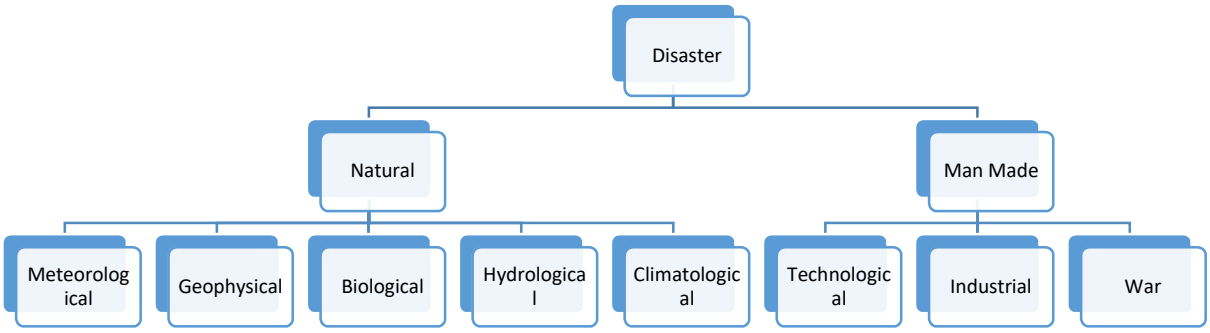
11.2 Vulnerability

- Vulnerability is the **inability to resist a hazard or to respond when a disaster has occurred**. For instance, people who live on plains are more vulnerable to floods than people who live higher up.
- In actual fact, vulnerability depends on several factors, such as people's age and state of health, local environmental and sanitary conditions, as well as on the quality and state of local buildings and their location with respect to any hazards.
- Families with low incomes often live in high-risk areas around cities, because they can't afford to live in safer (and more expensive) places. This is what we call **economic vulnerability.**
- Similarly, a wooden house is sometimes less likely to collapse in an earthquake, but it may be more vulnerable in the event of a fire or a hurricane. This is what we call **physical vulnerability.**

Disaster are of two types



Geophysical Disasters

- Event Originating from solid Earth
- They Include
- Earthquake
- Volcano
- Rock Fall
- LandSlide
- Avalanche

Hydrological Disasters

- Event caused by deviation in normal water cycle
- Flood
- Flash Flood

Climatological Disasters

- Event caused by long intra seasonal to multi-decadal climate variability
- Extreme Temperature
- Heat Wave
- Cold Wave
- Drought
- Wildfire

Biological Disasters

- Disaster caused by to living organisms and toxic substance
- Epidemics
- Viral Infection Disease
- Bacterial
- Fungal

Meteorological Disasters

- Event caused by short lived mesoscale atmospheric
- Cyclone
- Local storm

12 Town Planning Scheme and Land Pooling Technquies

12.1 Evolution of current Town Planning Scheme mechanism:

The current system of planning evolved in late 19th and early 20th century during British rule as a response to the challenges of rapid urbanization fueled by industrialization and migration. The industrialization caused clustering of economic activities and opportunities, and attracted a large number of people to migrate to the cities and towns with industries for economic opportunities. The industries were typically set up on the edges of the existing old cities and towns, near the railway stations or intercity connections. Based on the spread of these industries put additional burden on the old cities and towns developed in medieval pattern, and resulted in unplanned growth and congested living conditions in and around the existing cities.

Organized efforts to improve such urban situations began in late 1800s with formation of Sanitary Commissions, and Improvement Trusts in bigger cities during British Period. However, it was realized that a more organized town planning approach was required to improve the quality of development in the rapidly populating cities. This led to enactment of the Bombay Town Planning Act in 1915, which empowered the local authorities to prepare Town Planning Schemes for various areas of the city or town. This model of planning, which was first formalized and enacted in Germany, allowed the authorities to readjust plots and gain land for providing roads and infrastructure for improving urban areas. Even though this German model of land readjustment was not incorporated in Britain due to various reasons, the British understood its importance and incorporated the mechanism in the planning act passed for Bombay Presidency in 1915.

Under the provision of this act, multiple areas were planned through T P Schemes in Ahmedabad, Bombay, and Pune.

12.2 Why T P Scheme mechanism works:

Among the many reasons behind success of the T P Scheme mechanism; below are some key positive aspects:

1. T P Scheme mechanism is a **great micro level planning tool to implement the macro level plan** (Development Plan) at local level.
2. T P Scheme allows the authority to obtain land for public purposes without compulsory land acquisition. It is proven to be an **alternative to the conventional land acquisition approach.**

3. The conventional approach to land acquisition, even for public purpose, has become time consuming, expensive and messy. Frequently it leads to long, unending litigations or become instruments of power politics and conflicts. The acquisition process also becomes cost prohibitive while on the other hand the owners, whose lands are acquired, feel that they have not been adequately compensated. Therefore, there is inequity in distribution of costs and benefits for the land owners.

4. The T P Scheme is a very good alternative to assemble land for providing infrastructure and amenities to facilitate planned urban development in a faster and financially affordable manner, without taking recourse to compulsory acquisition.

5. The T P Scheme mechanism is **considered fair and equitable** as almost equal proportion of land area is taken from each plot, and pooled together at appropriate locations in planned manner to provide for roads, infrastructure and amenities.

6. It **creates 'win-win'** situation for both - the authorities and the land owners - as the land value of the area subsequently increases due to availability of infrastructure and amenities, and the authority is able to recover the cost of infrastructure by monetizing on a part of the increased value of land.

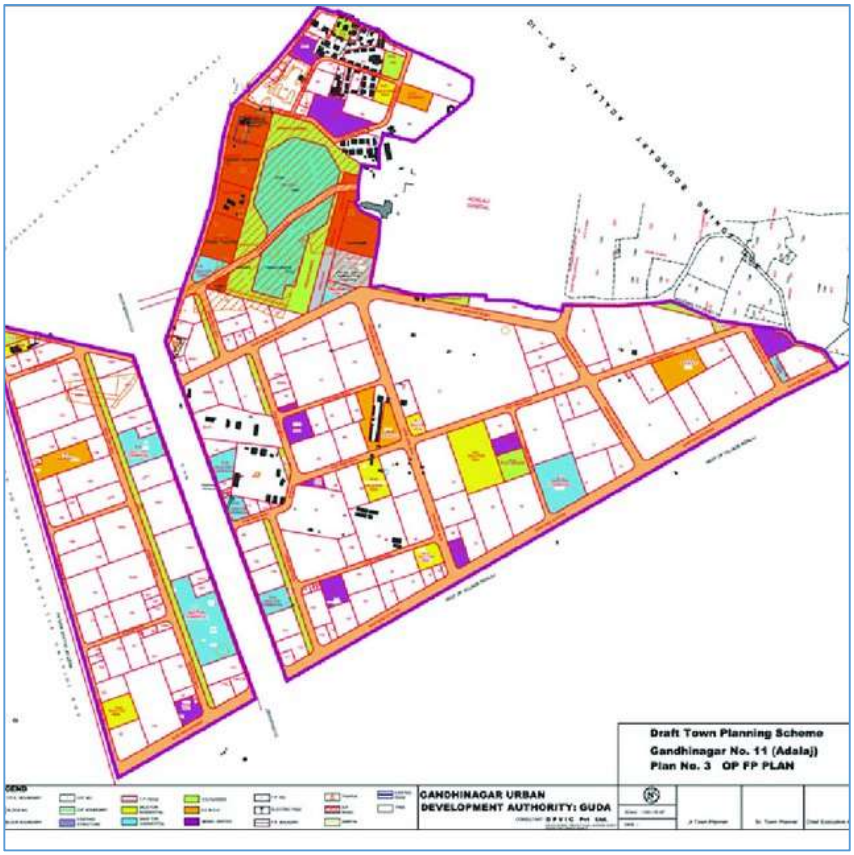
7. The mechanism is generally considered **fair and transparent** due to **stakeholder engagements at multiple stages** of T P Scheme preparation. The process is **participatory and democratic** as the owners are consulted at various stages of the preparation process and are allowed to put forward their suggestions and objections regarding their land and the future development in the area. All individual plot owners are heard and they can meaningfully participate.

8. The T P Scheme is a very good mechanism to **ensure micro-level implementation of the macro level Development Plan**, as it is designed to follow the road network, zoning and other features of the DP.

9. It **allows flexibility** and freedom of development for land owners as it does not segregate areas by specifying plot-by-plot uses for each parcel (unlike zonal plan-layout plan mechanism). Instead, it allows all types of permissible uses as per the DP and facilitate development by providing infrastructure and amenities.

10. It **enables inclusive development**, as it **provides land for EWS housing** along with the same amenities and services provided to the whole T P Scheme.

11. It permits **Land Value Capture (LVC).**



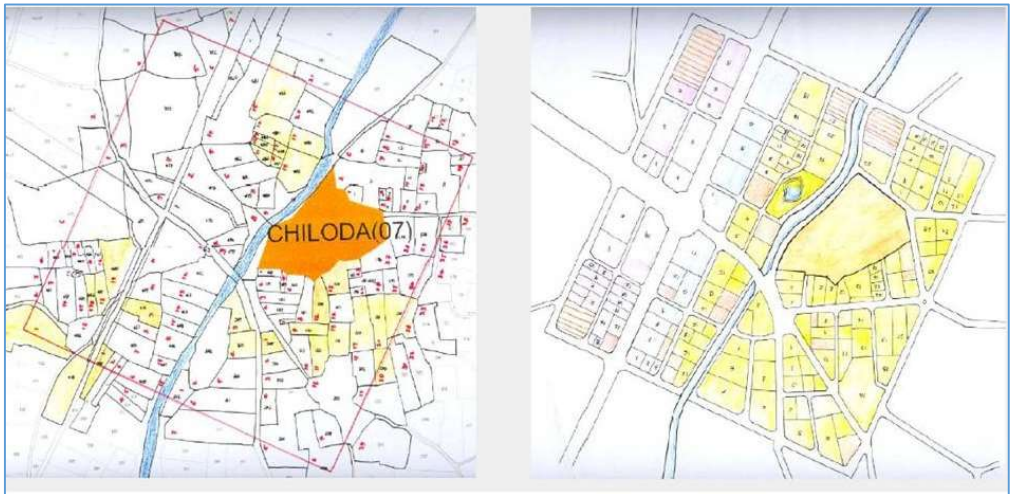


Figure 1: Example of a TPS: 'before' and 'after' scenario

12.3 Other examples of Land Pooling, Readjustment and Reconstitution:

Beyond the T P Scheme mechanism of Maharashtra and Gujarat, there are other similar examples of Land Pooling, Reconstitution and Readjustment mechanism used both in India and abroad. Magarpatta Township, a satellite township in Pune is developed privately by a group of land owners through the land pooling and readjustment mechanism Similarly, Delhi has prepared a Land Pooling policy on the privately pooled land development model in 2013. This was subsequently revised in 2018. The policy seems to have generated considerable interest,

16 POLICIES IN INDIA

16.1 NATIONAL URBAN TRANSPORT POLICY 2014

16.1.1 BACKGROUND

Present scene

- There is an urgent need to conserve energy and land, control pollution and 'greenhouse gas emissions', and to alleviate poverty. Urban transport (UT) is a significant cause and also a solution to these issues. Hence planning and management of UT services and infrastructure require immediate attention. The growth story of India shall be written on the canvass of planned urban development and scripted with the instrument of planned urban mobility solutions.
- All categories of road users are facing problems in commuting. The pedestrians do not get a safe, conflict-free and obstruction free path to walk. The cyclists have to fight for the right of way with fast moving motorized modes of transport, many a times risking their lives. The users of Public Transport (PT) face long waiting periods, uncertainty in travel time and difficult conditions of travel. The movement of personal motorized modes of transport is slowed down by the slow moving passenger and goods traffic and face significant delays at traffic signals and road junctions. Road users get restless leading to road rage, rash driving and accidents.

16.1.2 VISION

- To recognize that people occupy center-stage in our cities and all plans would be for their common benefit and well-being.
- To make our cities the most liveable in the world and enable them to become the "engines of economic growth" that power India's development in the 21st century.
- To allow our cities to evolve into an urban form that is best suited for the unique geography of their locations and is best placed to support the main social and economic activities that take place in the city.
- To encourage growth of urban transport along low carbon path

16.1.3 OBJECTIVES

- The objective of this policy is to plan for the people rather than vehicles by providing sustainable mobility and accessibility to all citizens to jobs, education, social services and recreation at affordable cost and within reasonable time. This will involve:
    - Incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement.
    - Bringing about a more equitable allocation of road space with people, rather than vehicles, as its main focus
    - PT should be citywide, safe, seamless, user friendly, reliable and should provide good ambience with well-behaved drivers and conductors.
    - Walk and cycle should become safe modes of UT.
    - Introducing Intelligent Transport Systems for traffic management
    - Addressing concerns of road safety and trauma response
    - Raising finances, through innovative mechanisms
    - Establishing institutional mechanisms for enhanced coordination in the planning and management of transport systems.
    - Building capacity (institutional and manpower) to plan for sustainable urban transport and establishing knowledge management system that would service the needs of all urban transport professionals, such as planners, researchers, teachers, students, etc.

16.1.4 **NEED FOR A NATIONAL POLICY**

Although the responsibility for management of urban areas (including UT) rests with the State governments, a Central policy is considered necessary as:

- Several key agencies such as Town & Country Planning Organization (TCPO), Central
- A need exists to guide State level action plans within an overall National framework.
- A need exists to guide Central financial assistance towards improving urban mobility.
- A need exists to build capacity for UT planning and management, as also develop it as a professional practice.
- A need exists to take up research and development in UT.

Challenges in the sector:

- **Deficient public transport**: The state of public transport in India is deplorable. **India has hardly 12-13 buses per lakh population.** This number should be around 100 per lakh, for adequate movement of the people. Apart from that, the **condition of buses** in India is unacceptable, which leads to a predilection in the favour of private transport.
- **Infrastructure deficit**: The **lack of good quality, all-weather roads and infrequent maintenance** means that increasing the number of buses is not viable as it would only intensify the congestion in the cities.
- **Impact of COVID**: Mass transit systems like Metro rail have suffered from a scornful attitude since the arrival of COVID. There is a penchant for personal transport as it is believed that the congestion in public transport can be a factor in the **spread of corona-virus**.
- **Lack of Safety**: India has one of the highest fatality rate related to road accidents globally. It accounts for **about 5 lakh road accidents annually, in which 1.5 lakh people die** and another 3 lakh become crippled.

  - Major factors for this include **scant regard for safety and poor road design**. There is a need for better enforcement of laws and better engineering of roads to enhance road safety in India.

- **Lower Allocation to Transport infrastructure**: Major cities in India have dedicated hardly 6-10% (barring Delhi, which has allocated almost 20% to transport infrastructure) of their total land **allocation to the construction of transport infrastructure**, which has led to inadequate transport infrastructure in the cities with reference to the population and its requirements.
- **Charging Infrastructure for Electric Mobility:** To boost the chances of faster expansion of electric vehicles, there is a need for establishing charging infrastructure at frequent intervals of travel. This would counter the current **impairment of battery technology** and reassure future buyers.
- **Socio economic Conditions**: It is imperative to designing the urban mobility system with an eye on socio-economic conditions prevalent in the society, as the present state of society would **require inexpensive modes of travel**, rather than making huge investments in expensive, unviable projects. For e.g., many experts have pointed out to the need for more metro rail projects rather than investing the same amount in bullet trains.

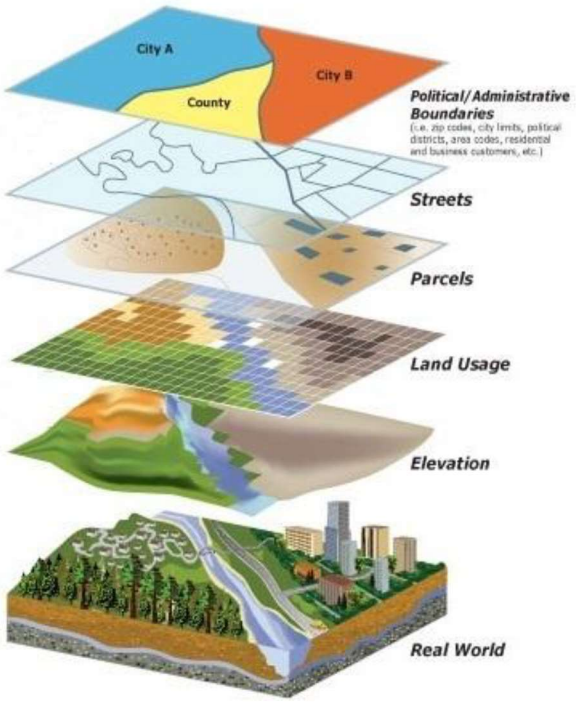
17 GIS, GPS and Remote Sensing

17.1 Geospatial Technology

- Geospatial technology relating to the collection or processing of data that is associated with location
- Remote sensing and the Global positioning system are methods for collecting information about Earth's surface.
- GIS is a mapping tool for organizing and analysing collected information.

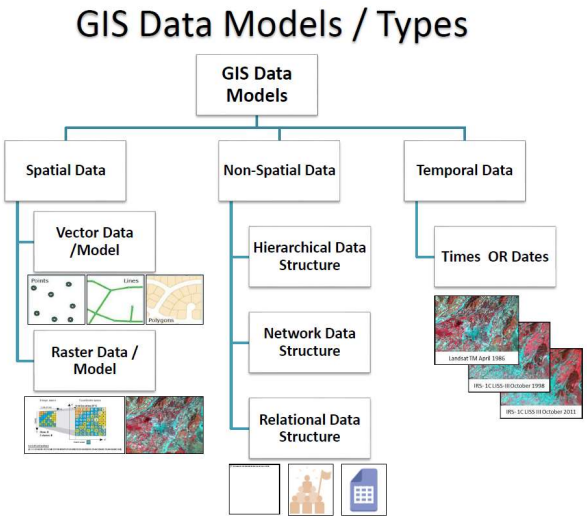
17.2 What is GIS?

Geographic information system is an interdisciplinary field of knowledge, comprising geography, global positioning system, remote sensing, digital cartography, computer science, mathematics, image processing, pattern recognition, and digital photogrammetry. It is a more popularly called as GIS.



GIS is defined as an information system that is used to input, store, retrieve, manipulate, analyse and out put geographically referenced data or geospatial data, in order to support decision making for planning and management of landuse, natural resources, environment, transportation, urban facilities, and other administrative records.

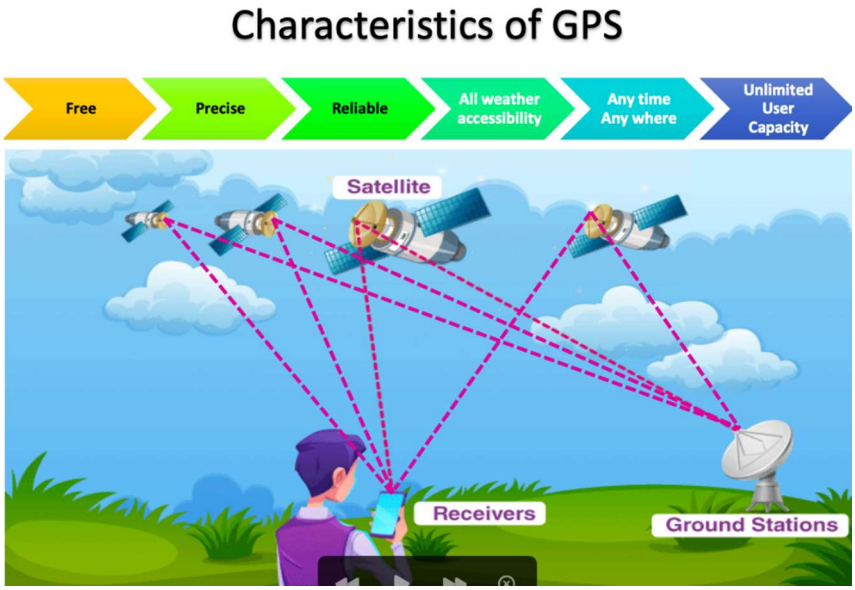
17.2.1 **GIS Data Model/Types**

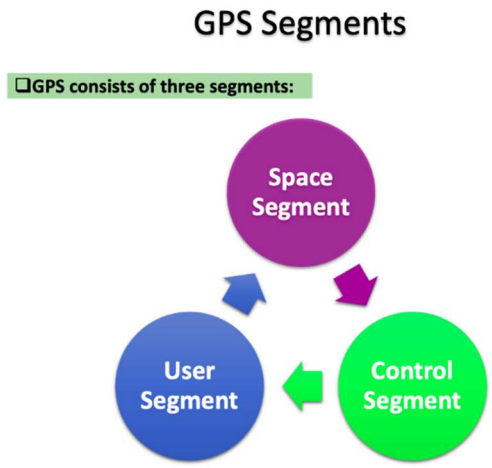


17.3 Global Positioning System

17.3.1 Introduction

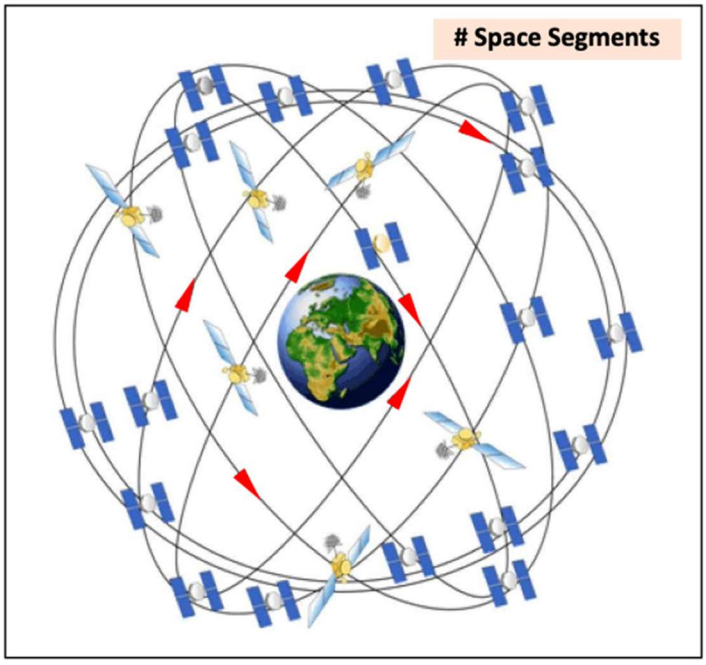
- The Global Positioning System (GPS) is a satellite-based navigation system, developed by the U.S. Department of Defence (DoD) in 1970s.
- Initially, GPS was developed as a military system to fulfil U.S. military needs.
- It was later made available to civilians, and is now a dual-use system that can be accessed by both military and civilian users.
- GPS provides continuous positioning and timing information, anywhere in the world under any weather conditions.
- GPS is a one-way-ranging (passive) system, that is, users can only receive the satellite signals.





17.4 Space Segments

- 6 orbital planes, 55 degrees to the equator
- 4 satellite orbital plane
- 21 satellite + 3 spares
- Satellite orbit every 12 hours
- Orbital trace repeated two time per day
- The satellite altitude of about 20,200 km above the Earth's surface



17.5 Control Segments

▪ It is also called as Ground Control Segment