Contents

CHAPTER 1. URBAN DESIGN

WEIGHTAGE & TIPS (URBAN DESIGN)

Please refer to the weightage of this topic (Chapter 1: Urban Design of Book 6) from GATE 2011 to GATE 2023 tabulated below:

GATE YEAR	WEIGHTAGE (Marks)
2023	2
2022	6
2021	3
2020	5
2019	4
2018	2
2017	1
2016	1
2015	3
2014	2
2013	2
2012	2
2011	6
Average	**3 Marks**

Students are advised to remember the following points, before you start studying this Chapter:

- Important area of focus from exam point of view: Urban Design Theories and terminologies associated with them (for example: terms like node, path, etc were given by Kevin Lynch)
- While studying Urban Squares and spaces: Focus on their features and visual characteristics. Questions have been asked in GATE where pictures of various urban squares will be given, and you are supposed to identify them.
- Numerical Type Questions in Urban Design are mainly related to the concept of 'Degree of Enclosure'. So, remembering various thresholds of enclosure and their corresponding ratios is also important.
- From 'Conservation': it is important to remember various charters and agencies, both international and national.

Scan the QR Code to Watch the Video:
Introduction to Chapter 1 – Urban Design

1.1 INTRODUCTION TO URBAN DESIGN

1.1.1 What is Urban Design?

Urban Design is the process of designing and shaping cities and towns. In contrast to architecture which focuses on the design of individual buildings, urban design deals with the larger scale of groups of buildings, streets and public spaces, whole neighborhoods and districts, and entire cities, with the goal of making urban areas functional, attractive, and sustainable.

The *2013 Urban Design Compendium* (an internationally renowned publication by government of UK) set out the key aspects of urban design as:

- **Places for People:** For places to be well-used and well-loved, they must be safe, comfortable, varied and attractive. They also need to be distinctive, and offer variety, choice and fun. Vibrant places offer opportunities for meeting people, playing in the street and watching the world go by.
- **Enrich the Existing:** New development should enrich the qualities of existing urban places. This means encouraging a distinctive response that arises from and complements its setting. This applies at every scale – the region, the city, the town, the neighbourhood, and the street.
- **Make Connections:** Places need to be easy to get to and be integrated physically and visually with their surroundings. This requires attention to how to get around by foot, bicycle, public transport, and the car – and in that order.
- **Work with the Landscape:** Places that strike a balance between the natural and man-made environment and utilise each site's intrinsic resources – the climate, landform, landscape, and ecology – to maximise energy conservation and amenity.
- **Mix Uses and Forms:** Stimulating, enjoyable and convenient places meet a variety of demands from the widest possible range of users, amenities and social groups. They also weave together different building forms, uses, tenures and densities.
- **Manage the Investment:** For projects to be developable and well cared for they must be economically viable, well managed and maintained. This means understanding the market considerations of developers, ensuring long term commitment from the community and the local authority, defining appropriate delivery mechanisms, and seeing this as part of the design process.
- **Design for Change:** New development needs to be flexible enough to respond to future changes in use, lifestyle, and demography. This means designing for energy and resource efficiency, creating flexibility in the use of property, public spaces and the service infrastructure and introducing new approaches to transportation, traffic management and parking.

1.1.2 Evolution of Urban Design Through Ages

The history of urban design can broadly be categorized into pre-industrial and post-industrial eras with the Greek and Renaissance period forming the interphase.

In Pre-Industrial (Period prior to the 19th Century) Cities were structured in a comprehensible and legible manner, reflecting the cultures that created them. Layout of cities was mainly based on ritual and cosmological symbols ordered around ceremonial procession routes, or military, religious, and civic landmarks. Communication was face-to-face. Public life took place in public places (ref. classical 'Forum' in Roman Civilization). Public realm included: Public thoroughfares, Commercial avenues and marketplaces, social promenades and Meeting places (ref. 'Agora' of Ancient Greece)

Cities as centres of civilization were always complex and dynamic, of larger cultural dimensions and housing grand public ceremonies. Most towns did not follow predetermined plans but intuitively responded to ecological choice, land ownership structures and evolution of road and urban infrastructure.

Different eras of Urban Design and town planning are described below:

A. Pre-historical Era (6000 BC):

- The very first cities were founded in Mesopotamia after the Neolithic Revolution, around 7500 BCE. Mesopotamian cities included Eridu, Uruk, and Ur.

- Early cities also arose in the Indus Valley and ancient China. Distinct characteristics of urban planning from remains of the cities of Harappa, Lothal, Dholavira, and Mohenjo-daro in the Indus Valley Civilisation (IVC) lead archaeologists to interpret them as the earliest known examples of deliberately planned and managed cities. The concept of the centre, the cardinal orientation, scale, the axis, and the wall were important features of IVC cities.

- One of the earliest settlements was Catal Huyuk (present day Turkey). Here the houses were made of mud brick. Houses were built touching against each other. They did not have doors and houses were entered through hatches in roofs. Presumably having entrances in the roofs was safer than having them in the walls. (Catal Huyuk was unusual among early towns as it was not surrounded by walls).

B. Classical Era (3500 BC):

- Development of concepts like; scale, proportion, lines of movement, focal points, and visual linkage took place during this era.

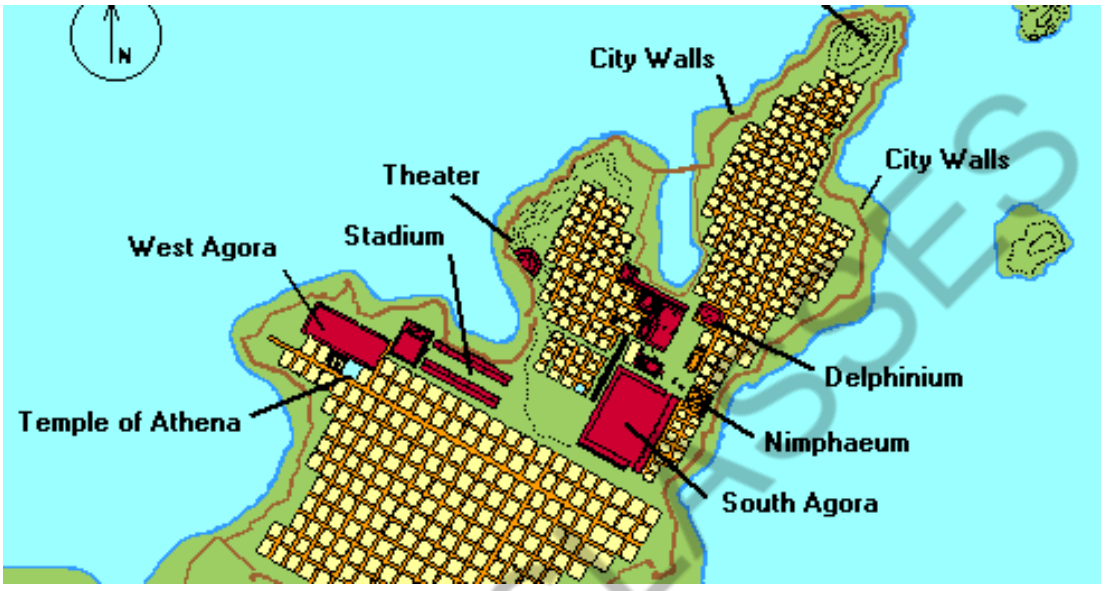
- The ancient Greek civilization had established principles for planning and designing cities. City form were mainly of two types: Old cities such as Athens had **irregular street plans** reflecting their gradual organic development. New cities, especially colonial cities established during the Hellenistic period, had a **grid-iron street plan**.

- Certain things were common among cities: The overall division of spaces in 3 parts: acropolis, agora and the town. The fortification etc.

- Greek City Planning and Design Principles:
  - Towns had fixed boundaries and some were protected by fortifications.
  - Much of the town was devoted to public use.
  - The Greek City was usually divided into three parts; the acropolis, the agora and the town. (Acropolis – Portion of city on elevated ground; Agora – Central public space; Town – Houses for public)

- Site planning and design was centred on the appreciation of buildings from the outside.
- The location of buildings was therefore such that it could command a good view to it. (Ex: Parthenon in Athens is a part of "Acropolis" located above a hill)

- The invention of formal city planning with "Grid-iron Planning" was attributed to Hippodamus of Miletus. Hence, grid-iron planning is also termed as "Hippodamian Planning". Hippodamus helped to design the new harbour town of "Piraeus" (Shown in the image below)



- Town planning, with straight streets intersecting to form quadrilateral city blocks, had just been popularized in Greece by the architect Hippodamus. Aristotle objected that at least part of every city should preserve the haphazard arrangement of earlier times to make it more difficult for invaders to fight their way in.

- Hippodamus arranged the buildings and the streets of Miletus around 450 BC such that the winds from the mountains and the sea close to Miletus could flow optimal through the city.

- Miletus, which is another fine example of the grid plan, comprises houses on blocks created by streets and side streets crossing at right angles, with public buildings in the city centre. This plan retained in the Hellenistic period, however in the Roman period it began to deteriorate gradually and inevitably.

- The Greeks were the first to use solar architecture. They oriented their houses to make use of the sun during winter, while obscuring its rays during summer and entire cities were built this way as early as 400 BC.

- According to Hippodamus, an ideal city was composed of 10,000 citizens divided into three parts – One of artisans, one of farmers, and a third of armed defenders of the state. He also divided the land into three parts, one sacred, second public, the third private: the first was set apart to maintain the customary worship of the Gods, the second was to support the warriors, the third was the property of the farmers.

- According to Aristotle, ideal 'polis' would have had a territory of about 60 sq.km, with a population of 500 to 1000 households. It was about 2% to 3% the size of Athens at that time. (*Pg. 312 of The Household as the Foundation of Aristotle's Polis by D. Nagle*). Aristotle proposed that very large population in a city would make effective administration difficult.

C. Islamic Era (~ 800 AD):

Character of Urban Design: clusters, cul-de-sacs, building heights, visual linkage, privacy, labyrinth street form (including the cul-de-sac), and focal points (nodes).

- THE MAIN MOSQUE: It occupied the heart of the town and was usually surrounded by the Souq (market). Attached to it there was the Madrassa providing religious and scientific teaching.
- SOUQS: Located outside the main mosque provided the economic activity in the town. Goods sold were usually spatially distributed corresponding to their nature. The central area was also the gathering of other public activities such as social services, administration, trade, arts and crafts and baths (Hammam) and hotels (Funduq and Waqala).
- CITADEL: Also known as Casbah, representing the palace of the governor, the citadel was surrounded by its own walls and constituted a district on its own with its own mosque, guards, offices, and residence.
- RESIDENTIAL QUARTERS: clusters of households of particular quality of life based on closeness (Qaraba) which is manifested in personal ties, common interests and shared moral unity. They were usually dense and each quarter had its own mosque used only for daily prayers, Quranic school (Madrassa), bakery, shops and other first necessity objects. They even had their own gates which were usually closed at night after last prayers and opened early morning at early prayers time such was the case of Algiers and Tunis.
- STREET NETWORK: Connecting between these quarters and to the central place was a network of narrow winding streets consisting of public and private and semi-private streets and cul-de-sacs.
- WALL: A well-defended wall surrounded the town with a number of gates.
- EXTERIOR: there were the cemeteries (Muslim and Jews cemeteries), a weekly market just outside the main gate where most animal souqs were held in addition to private gardens and fields.

D. Renaissance Era (~ 1500 AD) :

- Cosmic forces were displaced by scientific theories and observations. Urban design ceased to be a natural expression of community life became a much more conscious artistic self-expression.
- Renaissance urban design was mainly on aesthetics as perceived by the user of public places. Thus, it has been argued that mainstream urban design was born in the renaissance age.
- Following were the important Design features of the Renaissance:
  - Regular geometric spaces (entire cities or parts of it)
  - The primary street
  - The public places/ squares/ piazzas with sculptures and fountains (sometimes Egyptian Obelisks)
  - Sequence and perspective.
- Around 1486 – after a pestilence that killed half the population in Milan; Leonardo turned his thoughts to urban planning problems. Following a typical Renaissance trend, he began to work out an "ideal city" project, which – due to its excessive costs – would remain unfulfilled; new city along the Ticino River, designed for the easy transport of goods and clean urban spaces.

- Leonardo wanted a comfortable and spacious city, with well-ordered streets and architecture. He recommended "high, strong walls", with "towers and battlements of all necessary and pleasant beauty", and felt the place needed "the sublimity and magnificence of a holy temple" and "the convenient composition of private homes".
- His plans for a "modern" and "rational" city were consistent with Renaissance ideals. Leonardo included several innovations in his urban design. Leonardo wanted the city to be built on several levels, linked with vertical staircases. This design can be seen in today's high-rise buildings, but was absolutely unconventional at the time.
- While in the upper layers of the city, people could walk undisturbed between elegant palaces and streets, the lower layer was the place for services, trade, transport and industry.
- But the true originality of Leonardo's vision was its fusion of architecture and engineering. Leonardo made designs for extensive hydraulic plants to create artificial canals throughout the city. The canals, regulated by locks and basins, were supposed to make it easier for boats to navigate inland and transport goods.
- Leonardo also thought that the width of the streets ought to match the average height of the adjacent houses: a rule still followed in many contemporary cities across Italy, to allow access to sun and reduce the risk of damage from earthquakes.

- In *De architectura* (Ten Books on Architecture); Vitruvius also mentions that in planning; influence of the wind flow and its direction should be considered.
- At the time of the Renaissance Italy was governed by a number of powerful city-states. These were some of the largest and richest cities in all of Europe. Some of the more important city-states included Florence, Milan, Venice, Naples, and Rome.
- Urban design characteristics: Streets, squares (piazzas), and markets in an elegant geometry