

# Contribution of Indian Knowledge System in Town Planning

Presentation By

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**When you think of cities,  
what comes to your mind?**





Congestion



Unhygienic living conditions



Flood: drainage issues



Landfill sites



Draught: dried up water bodies

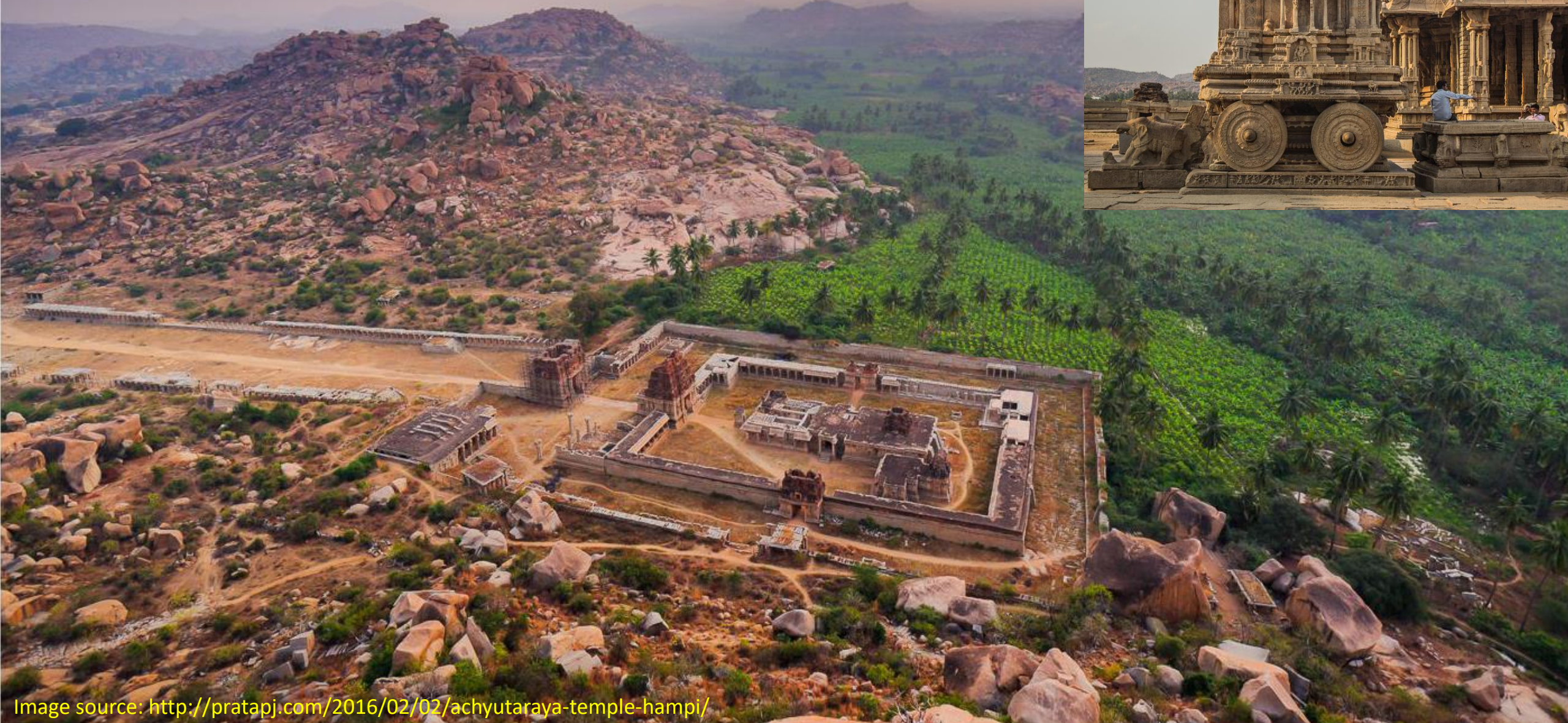


Slum formation & overcrowd



# PRE - COLONIAL CITIES

Achyutraya Temple with market street, Hampi, Karnataka (1560CE)



Vitthala Temple: Chariot





## Need for order and aesthetics:

### Tiruvannamalai, Tamil Nadu

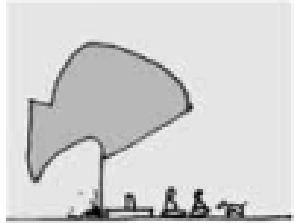


- Architecture and planning is a combination of arts, aesthetics, and design coming together to create **beautiful spaces** that awaken our **conscience** and bring us closer to **divinity**.
- *Aesthetics-Saundarya-Vismaya*
- *Satyam-Shivam-sundaram*
- Temple as an urban catalyst, nurturing habitats around it.
- Temple sustains the town and the town works as a temple habitat: symbiotic relation

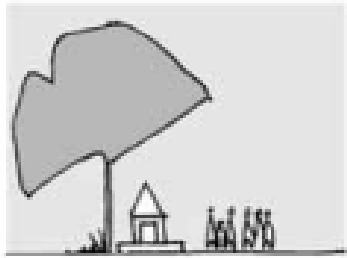


# Evolution of town around Temple:

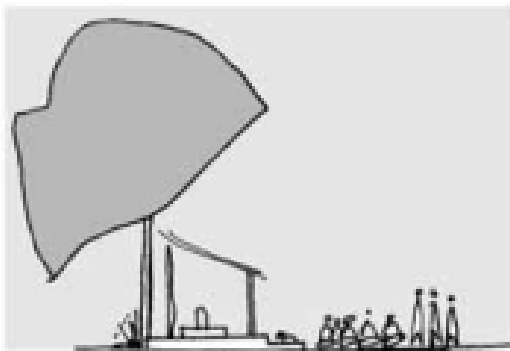
Role of temple: religious, economic, social, cultural, and educational centre



i. anonymous sacred insignia under tree



ii. Insignia transforms in diminutive shrine



iii. Shrine enlarged as temporary structure, while the spot transforms into a community node



iv. Shrine grows into rudimentary temple



v. Even after the tree dies, the spot remains sacred, and in time the small temple is enlarged and canonized while the surroundings simultaneously urbanize

Figure 2.8 Sacred metamorphosis. Drawings by Bharne & Komal Panjwani.

The deity and the community are inseparable.



# **Indian Knowledge System in Town Planning**



# **What is Vastu Vidya and Vastu Shastra**

## Vastu Vidya: root word vas (to dwell)

*Vastu Vidya* is a body of knowledge related to architecture and planning. It can be illustrated in words, as in a *vastu shastra*, and also in built form.

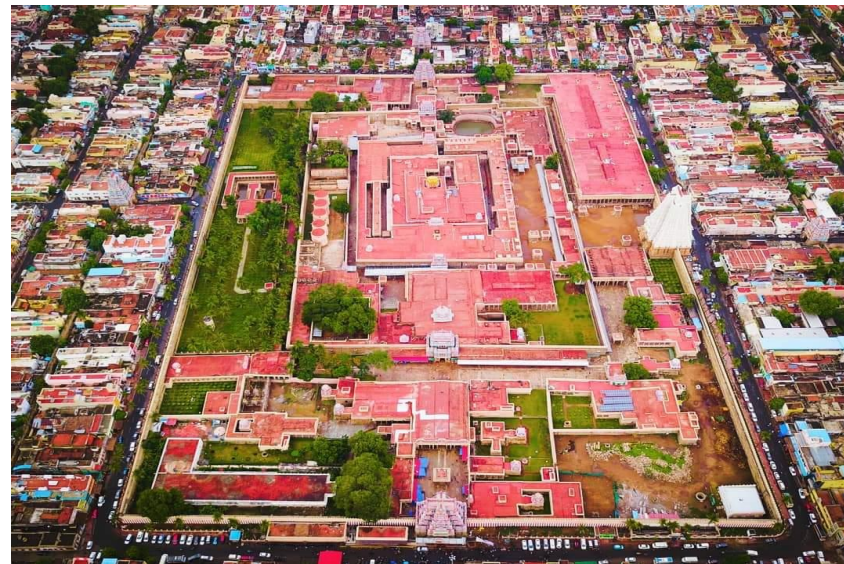
## Vastu Shastra:

Traditional Indian system of architecture based on **ancient texts** describing principles of design, layout, measurements, site selection, space arrangement, and spatial geometry.

**Intent:** Providing an **order** for construction; creating **sacredness**  
Integrating architecture with nature and the cosmos  
utilizing geometrical alignment, geometric patterns, rhythm, and symmetry.



Madurai



Srirangam



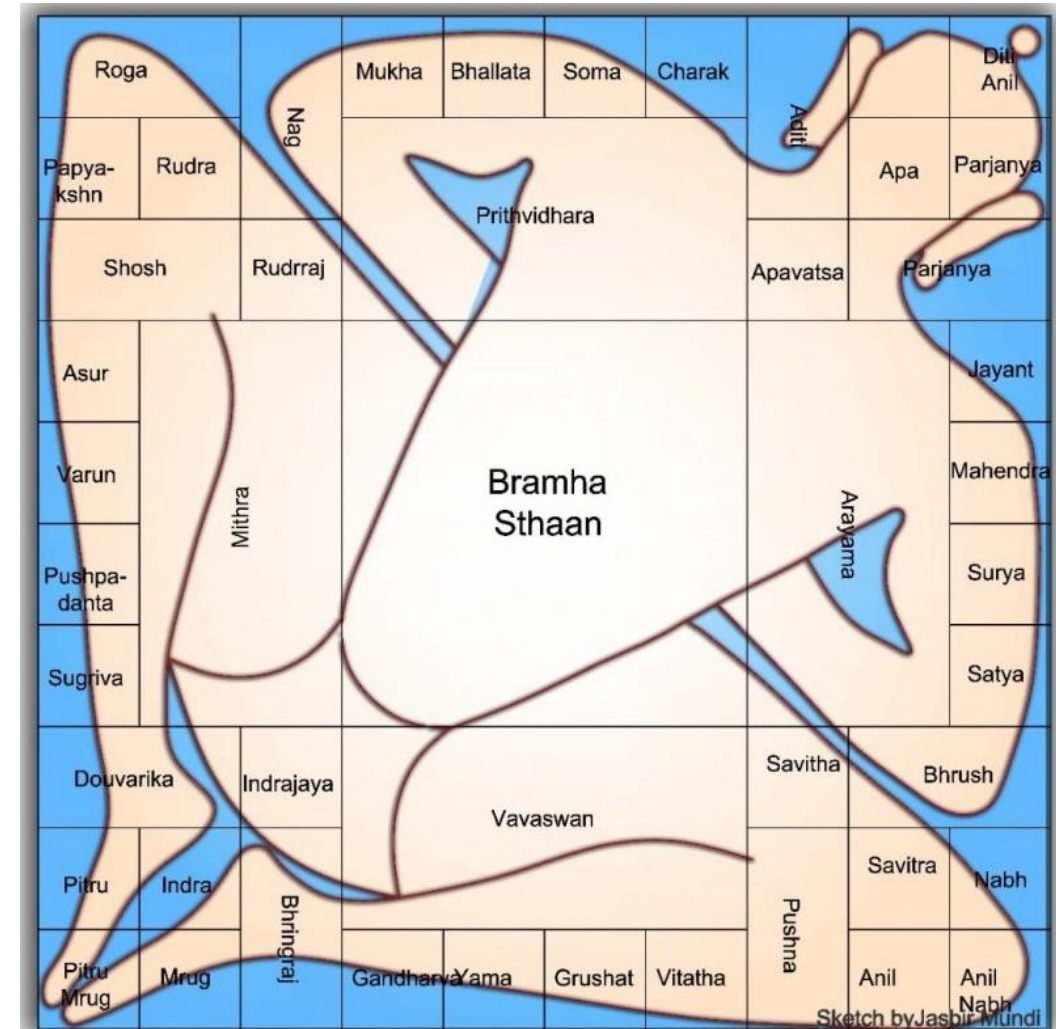
Varanasi



## Indic Literature in Architecture and Town Planning

- *Kautilya's Arthashastra* (3rd c. BCE)
- *Mansara* (500-700 CE) and Agamas
- *Brihatsamhita* of Varahamihira (6th c. CE)
- *Shilpa-ratnakosha*, Odishan treatise on architecture (7th c. CE)
- *Samarangana sutradhara* (11th c. CE) of Raja Bhoja
- *Tantrasamuccaya* (15th c. CE) of Narayajan Nambudiri
- *Aparajitapriccha* of Bhuvanadeva, a dialogue between Visvakarma and his son Aparajita (12<sup>th</sup> c. CE)
- *Prasada-mandana-vastu-sastra* by a king of Mewar (15th c. CE)

S.No.	Text	Topics Covered
1.	<i>Kasyapa Silpashastra</i>	Treatise on <b>architecture and iconography</b>
2.	<i>Narada Silpa Sastra</i>	Roads, Water resources, Village and Town Planning, 14 types of towns, <b>Fortification, Palace Complex</b> , Interior Planning, Architecture
3.	<i>Visvakarma Prakasa</i>	<b>Site orientation</b> , Vastu Examination, Levelling of site, Planning of villages, towns, forts, and roads, plan of temples, architecture and iconography
4.	<i>Manasara</i>	<b>System of measurement</b> , Classification of Architecture, examination and selection of soil. Planning: Village, Towns, Ports. Joineries
5	<i>Mayamata</i>	Treatise of Dwellings: Deals with all facets of <b>god's and men's dwellings</b> . From the choice of site to iconography, description of villages and towns, temples, houses, mansions and palaces, Selection of orientation, dimensions and materials
6	<i>Samrangana Sutradhara</i>	<b>Town Planning</b> ; Residential architecture; Temple Architecture; Sculptural Arts
7	<i>Manusyalaya Candrika</i>	7 architectural chapters: <b>Investigation and selection of land</b> , Site analysis, Houses, Parts of a House, Elements of roof, Ancillary structures

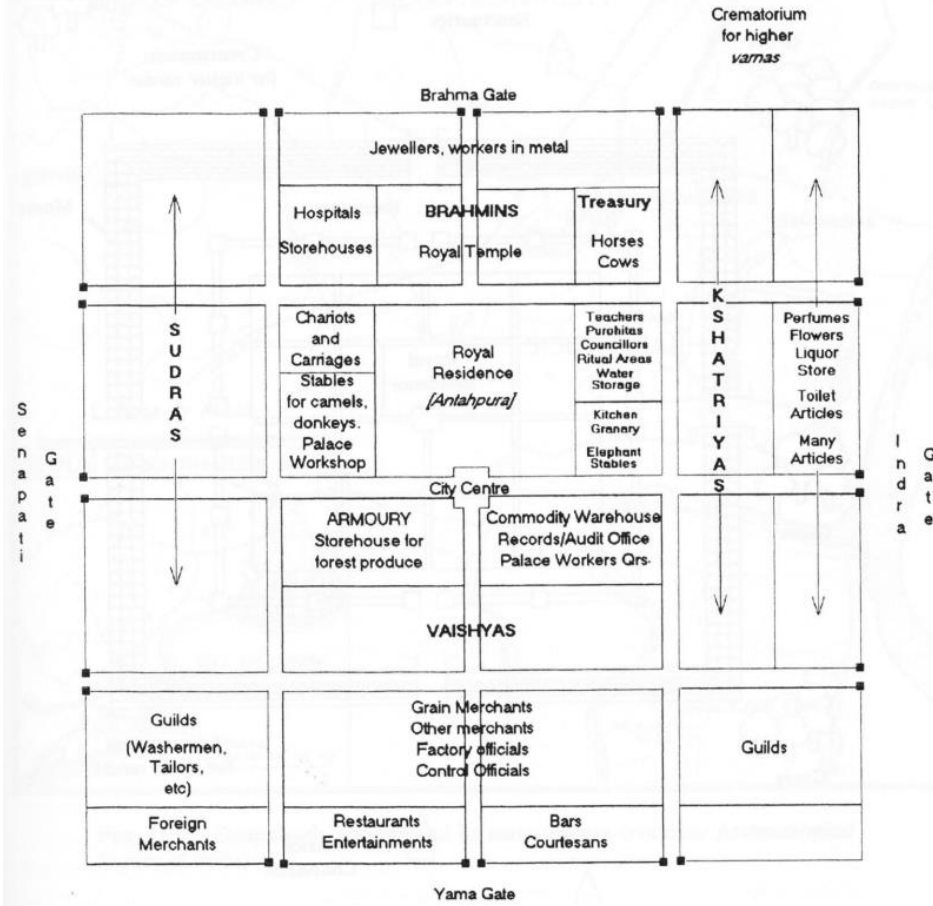


100 Divisions - Dasashiti Padavinyasa

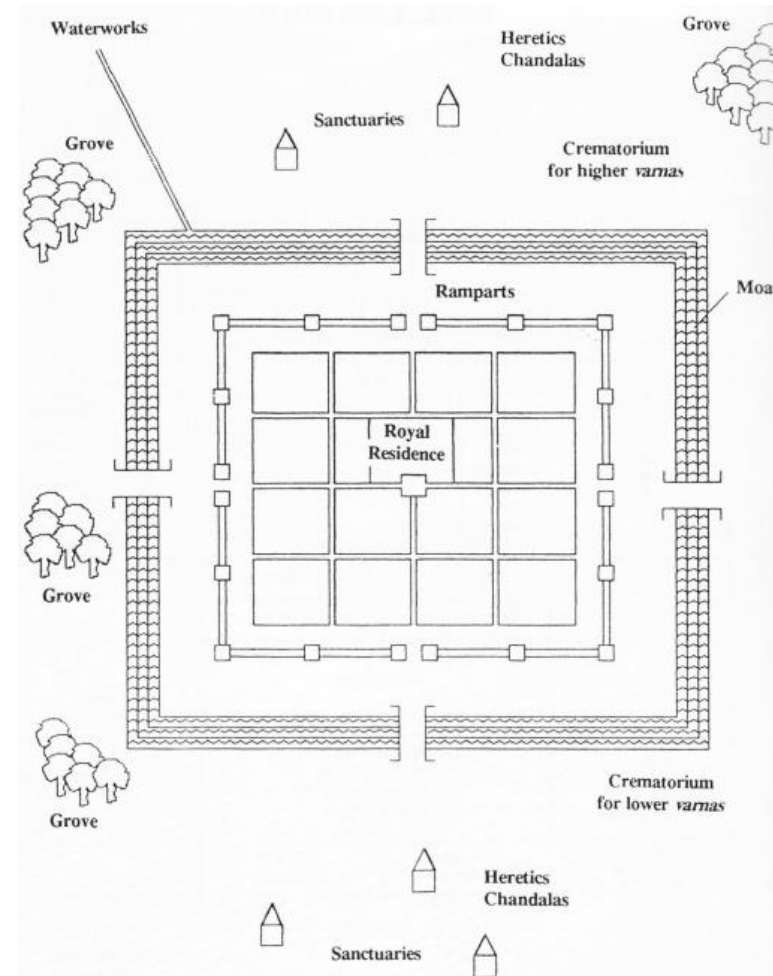


# Kautilya's Arthashastra (300 BCE)

- City to be located at the centre of the country, on the **perennial water source, well laid out and fortified**
- Where agriculture is not feasible near villages, **locate Pasture lands**
- **Roads of different types:** depending upon nature of traffic
- Rivers and lakes to have **dams** to facilitate agriculture
- **Types of forests:** Recreational use like hunting and Economical use for forest produce like timber



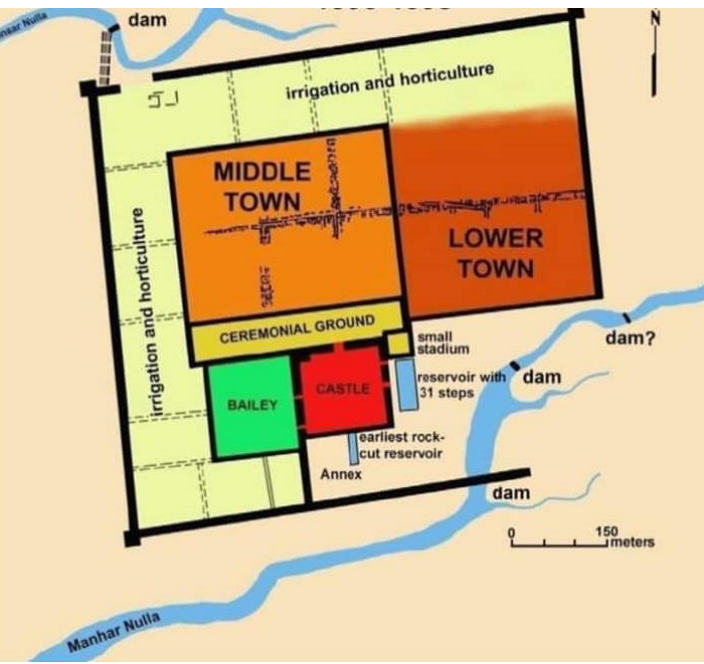
Layout of a fortified settlement, as per Arthashastra (2.4.8-16)



A city and its surroundings, as per Arthashastra



# Ancient knowledge of planning. Eg of Dholavira 2500 BCE





# Construction as per ancient Indian treatise



Utilization of an existing water body- Ganga ghats



Construction of a stepwell (vav) for the community



City Walls act as a defense mechanism



Design using topographical context





CURRENT SCENARIO...





## Indian Knowledge System of Town Planning Considered:

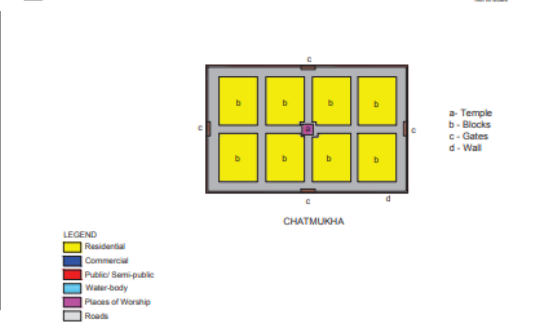
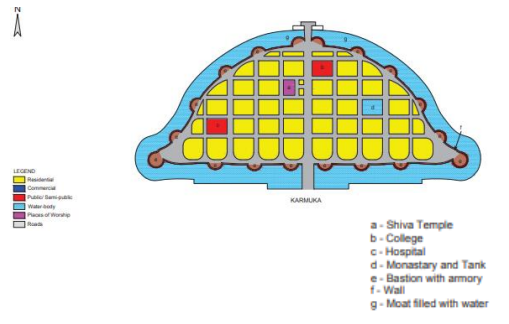
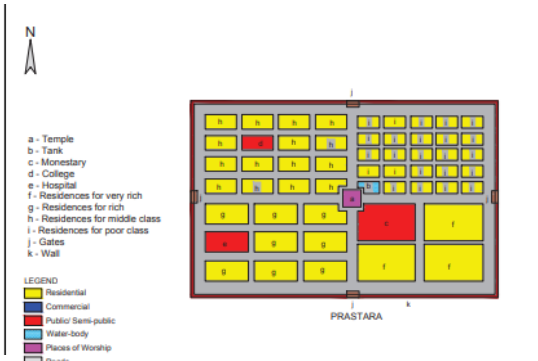
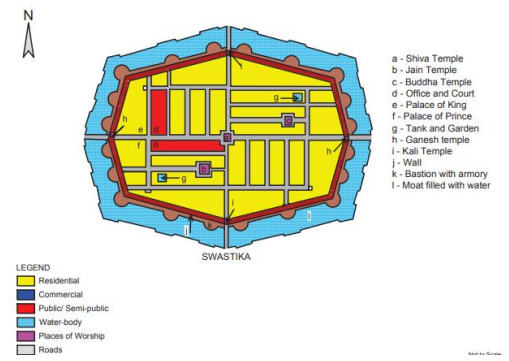
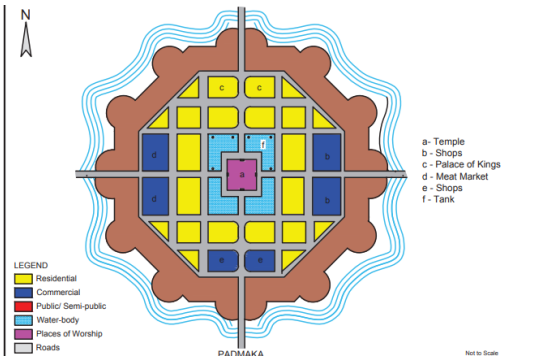
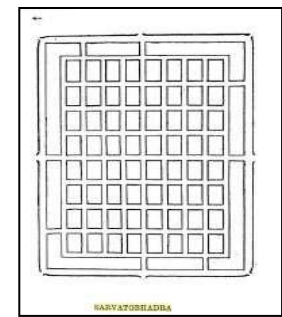
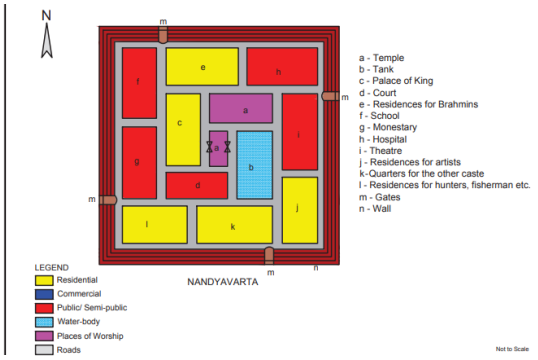
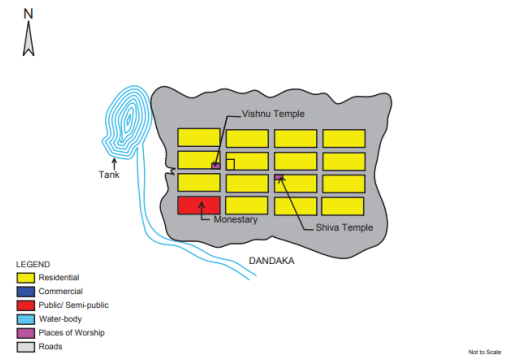
Ancient Indian Town Planning included **all relevant requirements of a healthy civic life**.  
Included description of temples, community spaces, defence systems like moats, fort wall

- Geography- context-specific
- Physical Features
- Defence and Governance
- Cosmological Considerations
- Community Living
- Socio-Cultural Spaces

## Modernist Town Planning Approaches:

- Universalization at the expense of local needs
- Maximum Profit, Leveraging resources

Name	Nature of Design
Dandaka	Parallel set of streets crossing each other at 90 degree. Lesser density of houses
Nandyavarta	1 to 5 carriage roads with surrounding streets.
Sarvatobhadra	1 to 5 roads; town is secured by a wall or ditch with 4 large gates on sides and 4 on corners
Padmaka	Lotus shaped: 5 varieties of this design. Gates at cardinal directions. Length and the breadth are equal while enclosing wall can be circular, quadrangular, hexagonal or octagonal.
Swastika	Swastika shaped: Temple at the centre; has 8 gates
Prastara	Space divided in 4,9 or 16 wards. Chessboard system of roads. Town has enclosed walls and ditches with 4 principal gates on sides and 4 subsidiary on corners.
Karmuka	Semi-circular like a bow; Design is best for seashore.
Chaturmukha	Especially meant for traders; 4 car streets on 4 sides; 2 large streets crossing at right angles in the center dividing the site in 4 blocks. Each ward has smaller roads.



Alternative **Designs for Town Planning Found in Manasara**



An aerial photograph of Jaipur, India, showcasing its characteristic grid-like street layout. The city is built on a plateau, with the grid pattern extending across the urban area. In the background, the Aravalli hills are visible, adding to the city's scenic beauty. The overall tone of the image is a soft, hazy blue, giving it a historical and serene feel.

# JAIPUR- A Shastric City

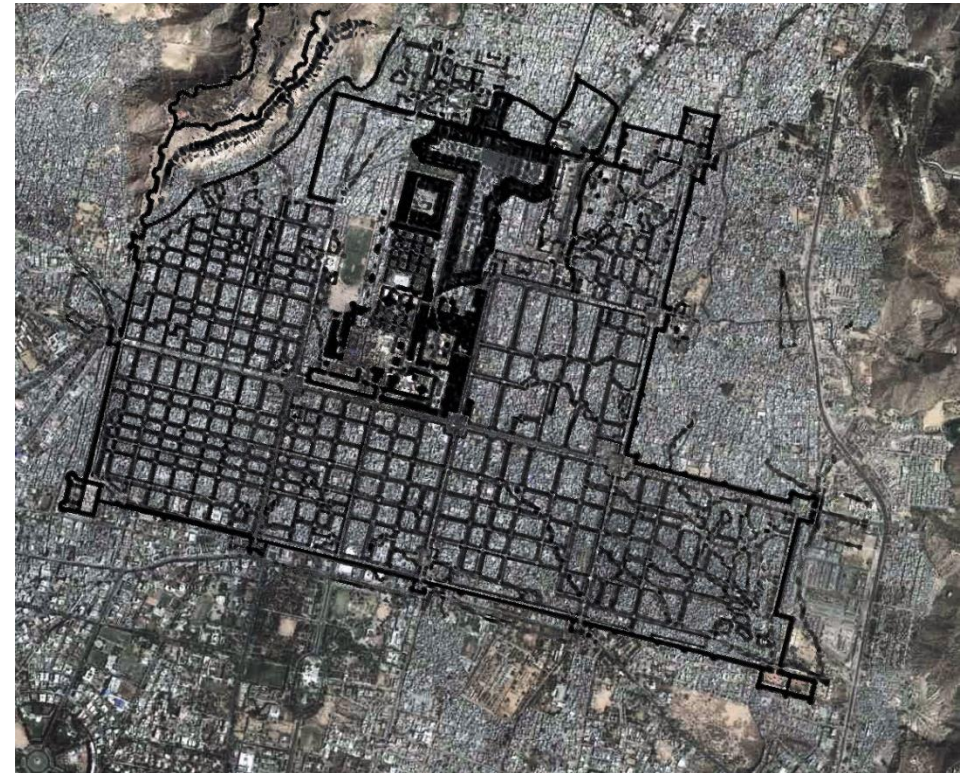




**Jaipur (The pink city )** is the capital and largest city of Rajasthan

- Founded in 1727 by Maharaja Jai Singh II, the ruler of Amer
- Shifted his capital 11 km South to establish a trade city
- Population: 36 lakhs, it is the 10th most populous city in India.

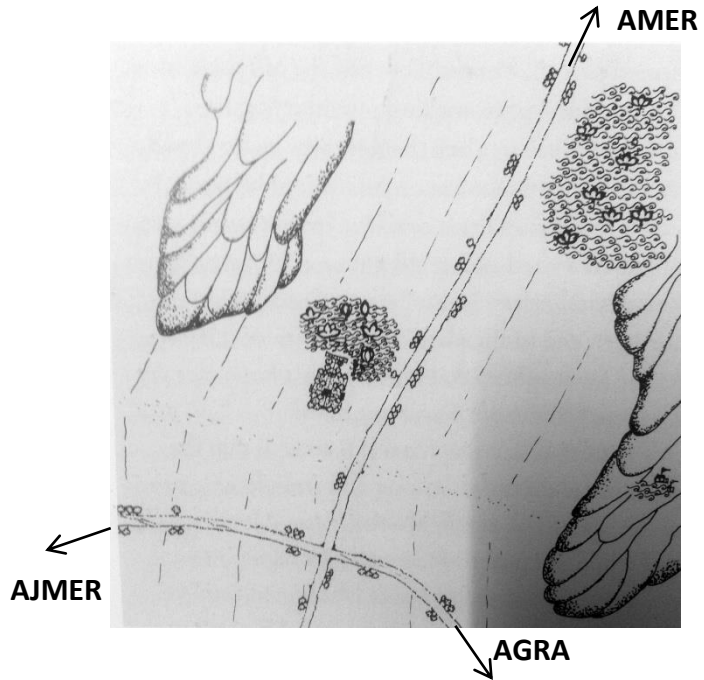
- Architect: Vidyadhar Bhattacharya (1693-1751)
- Plan in line with Vastu Vidya
- Built as a Walled city with 7 entry gates.
- **Grid-Iron plan** with the city divided into **9 quarters**



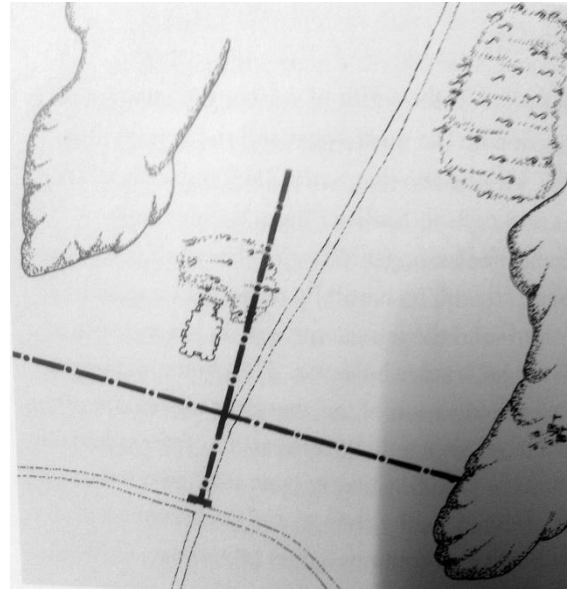
Extent of the city planned in 1727



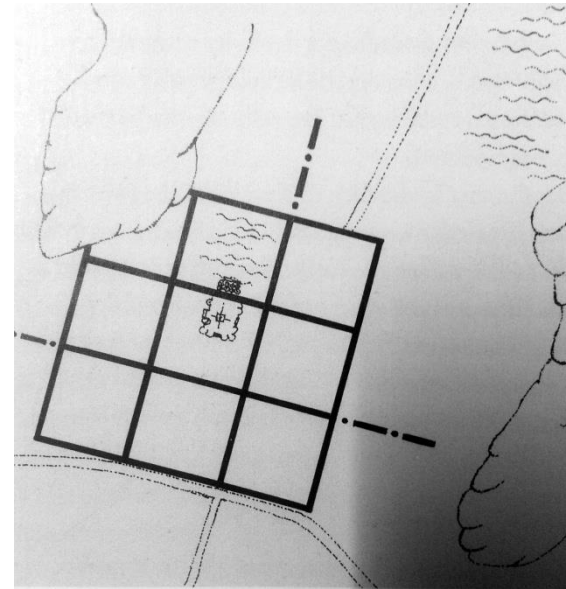
## SITE and PLANNING



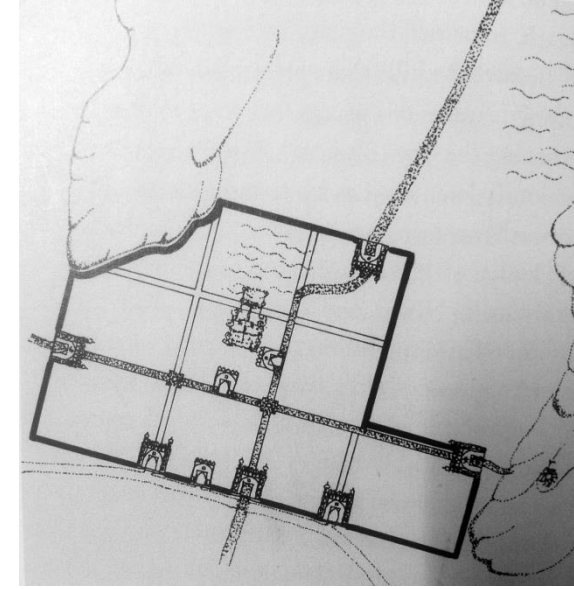
*Selection of the site*



*Establishing the city axes on site*

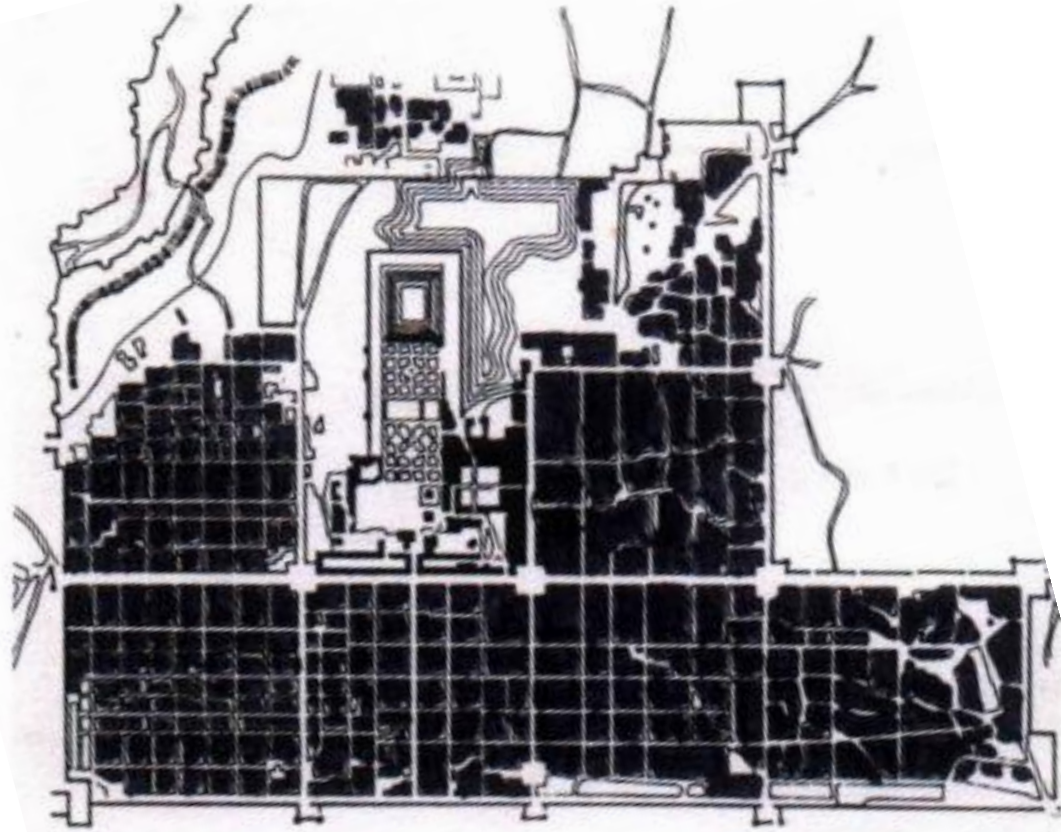


*Developing the site as a Mandala*

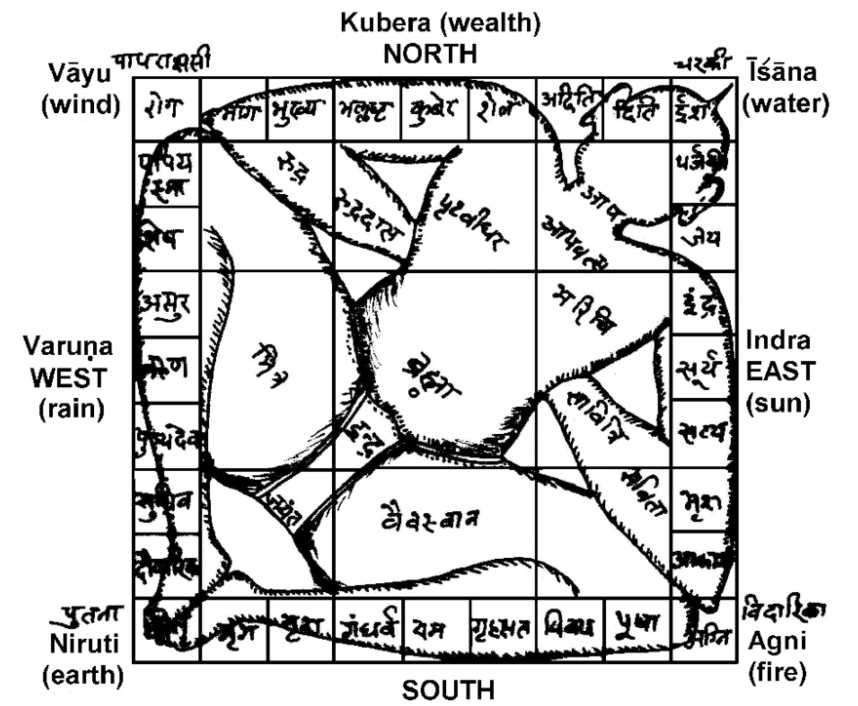


*Accommodating Western & Eastern Adjustments*

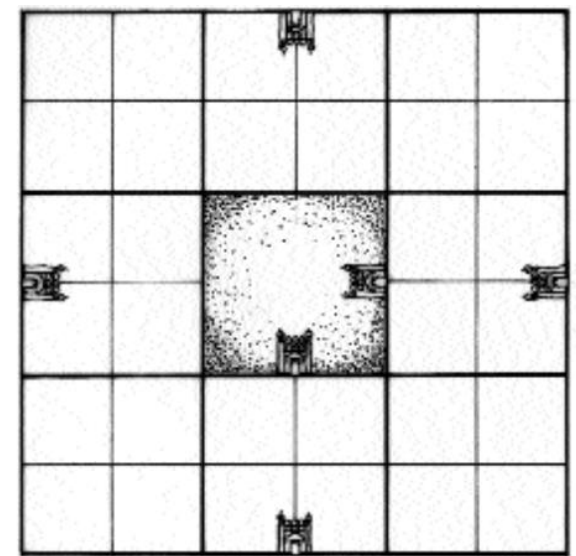
- Trade capital: important trade route
- Orientation as per cardinal directions
- Protected from hills: environment and physical features
- Water body
- Temple



Plan of Jaipur City as built



Base 3 Vastu purusha mandala

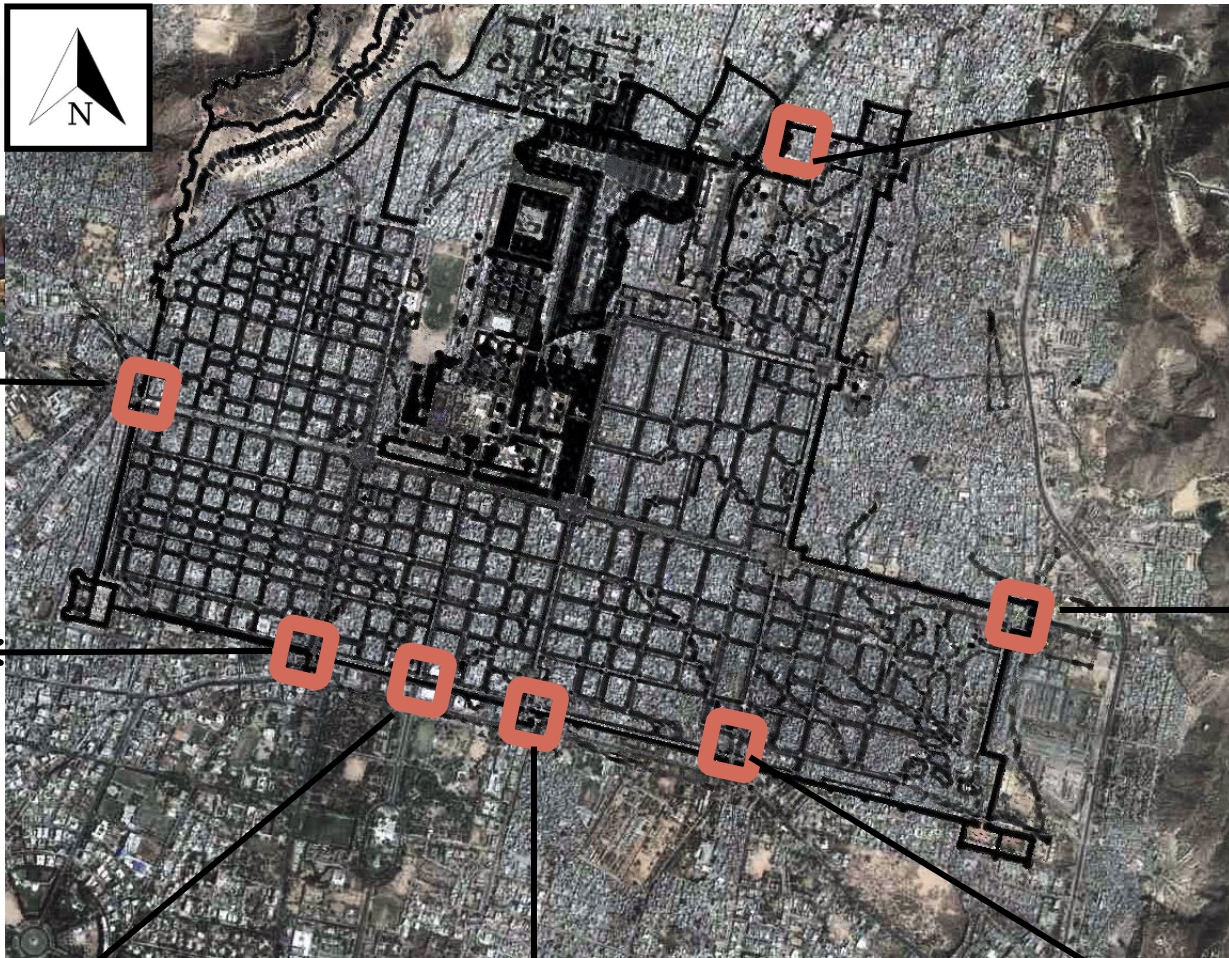


Representation of a Capital city as per Shastric description





# Gates to Walled city



**G1- Chand Pol**

**G2-Kishan Pol/  
Ajmeri Gate**

**G3-New Gate**

**G4-Shiv Pol/ Sanganeri Gate**

**G5-Suraj Pol**

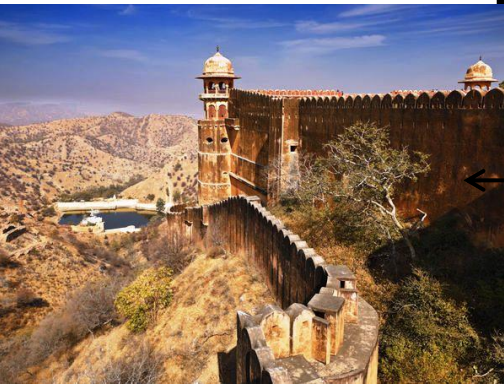
**G5- Ghat Gate**

**G7-Dhruv Pol/  
Jorawar Singh Gate**

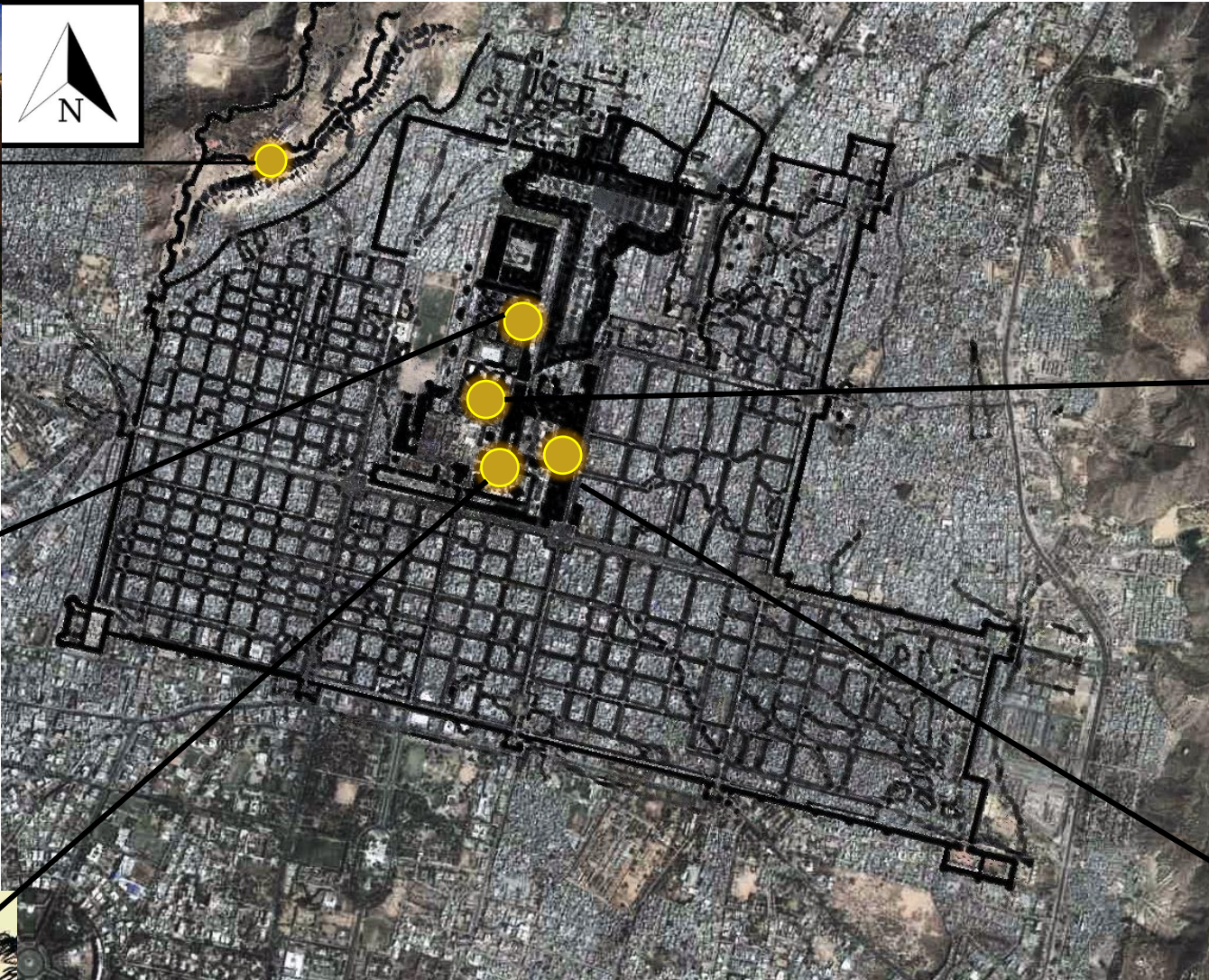
The image displays an aerial map of the walled city of Jaipur, India, with seven gates marked by red squares. Arrows point from these markers to photographs of the gates. A north arrow is located in the top-left corner of the map. The gates are: G1-Chand Pol (top-left), G2-Kishan Pol/Ajmeri Gate (middle-left), G3-New Gate (bottom-left), G4-Shiv Pol/Sanganeri Gate (bottom-center), G5-Suraj Pol (middle-right), G5-Ghat Gate (bottom-right), and G7-Dhruv Pol/Jorawar Singh Gate (top-right).



# Major Landmarks



**Nahargarh Fort**



**City Palace**



**Govind Dev Temple**



**Jantar Mantar**  
(World Heritage Site)



**Hawa Mahal**



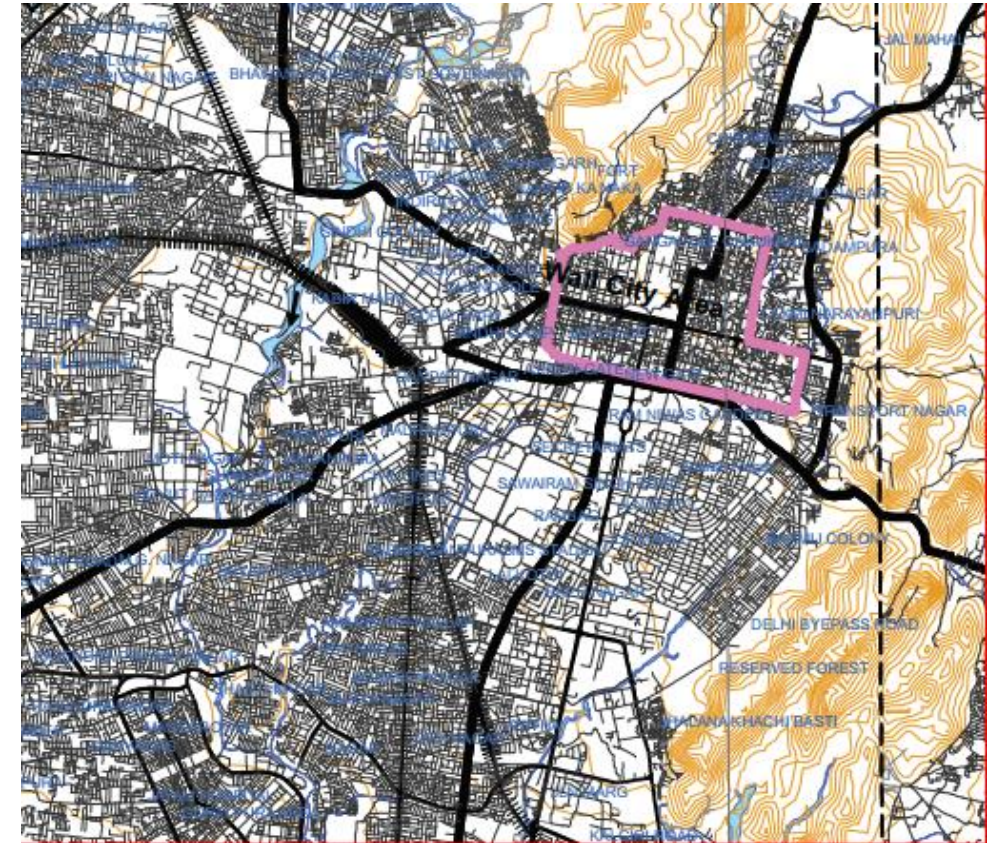
# Grid: Nine Wards





## Design for each Ward:

- Sector size 800m X 800m: suited for pedestrians
- **Walkability**
- Residential is inward and commercial in the periphery: **avoids traffic**
- Dense built form considering the extreme climate of the region
- Road design as per traffic: main market 110' & subsequent markets 55'
- **Geometric pattern: Easier of Utility Planning and Expansion**



10% (3.6lakh) people in 2% of area of City



# MADURAI





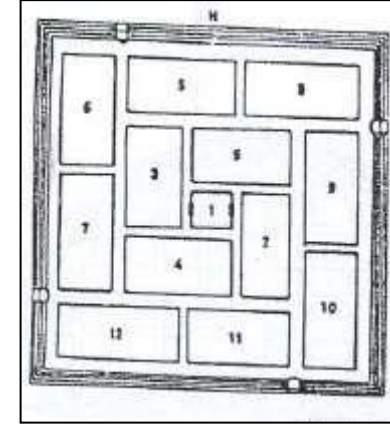
# MADURAI



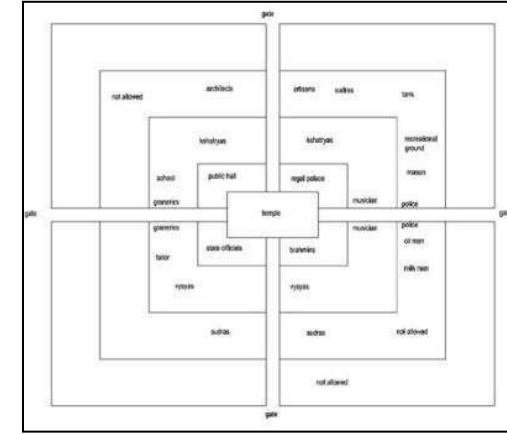
Location



Satellite Map



Nandyavarta Layout

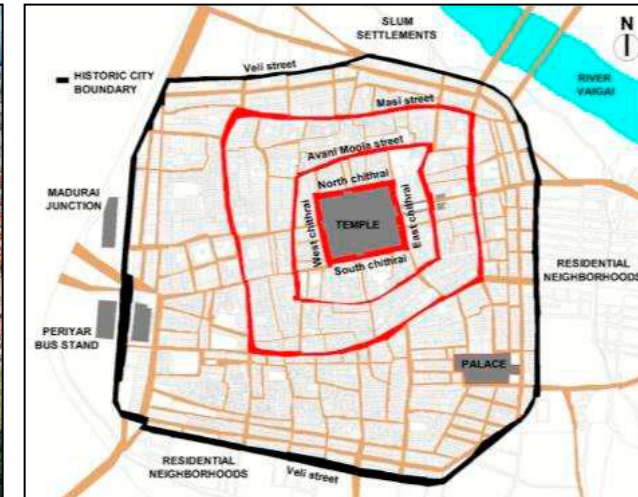


Settlement Pattern of Madurai

- Madurai was the site of the Pandya capital (4th–11th century CE). Later it was conquered by Chola, Vijayanagar, Sultanate, Maratha, and British rulers.
- The city is renowned for tourism, festivals and vibrant cultural life in general and is considered to be the states **cultural capital**.



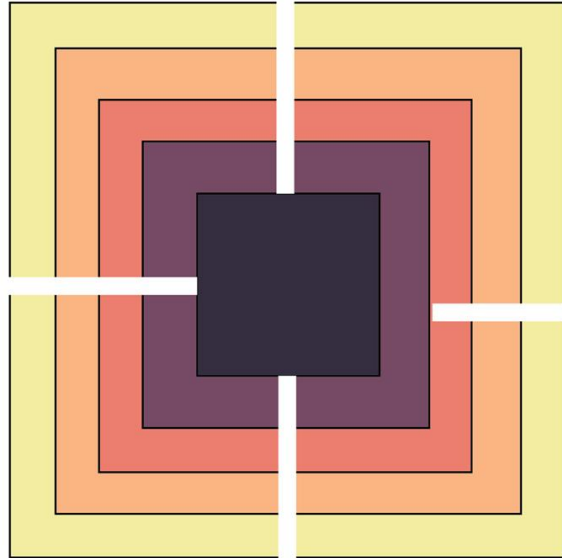
Aerial View of the City





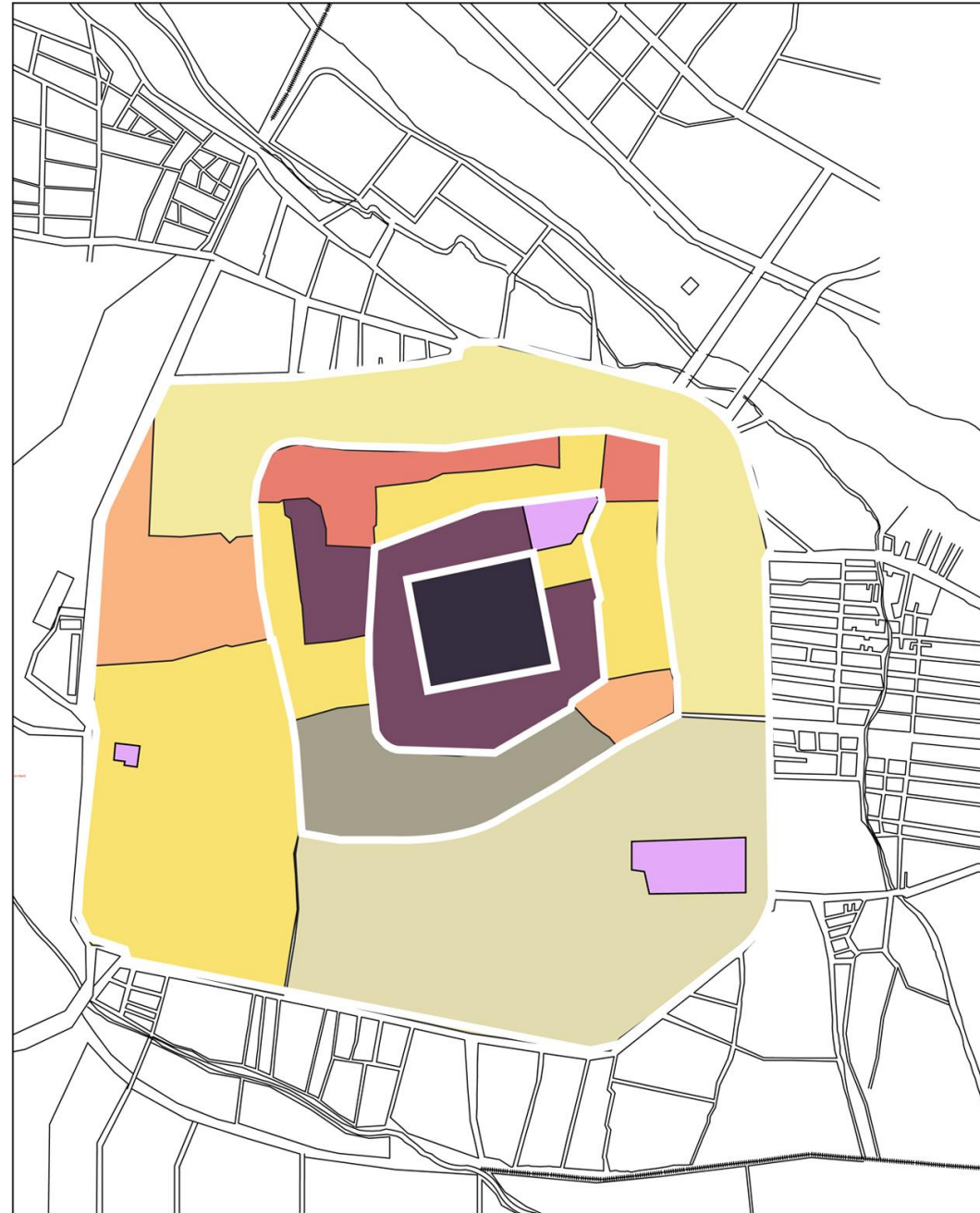
# Settlement Pattern in Madurai

## ANCIENT TOWN PLANNING



The settlement pattern of Madurai is planned according to the ancient system of town planning which is based on **work and occupational hierarchies**.

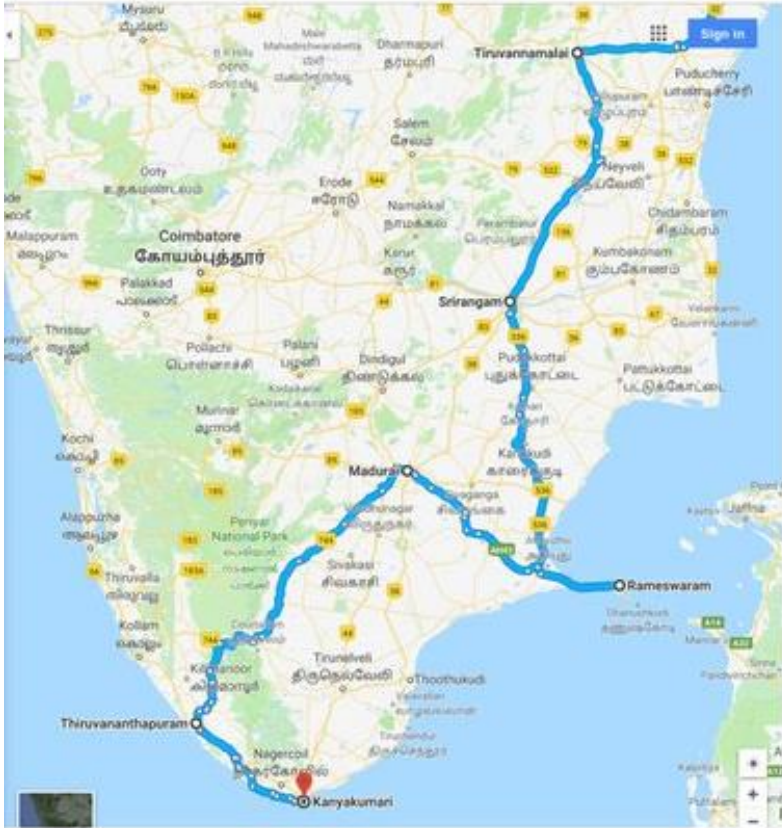
- TEMPLE
- BRAHMINS
- KSATRIYAS
- VAISHYAS
- SUTRAS
- VAISHNAVITES
- SOURASHTRİYANS
- JEWELLERY
- PALACES





# SRIRANGAM

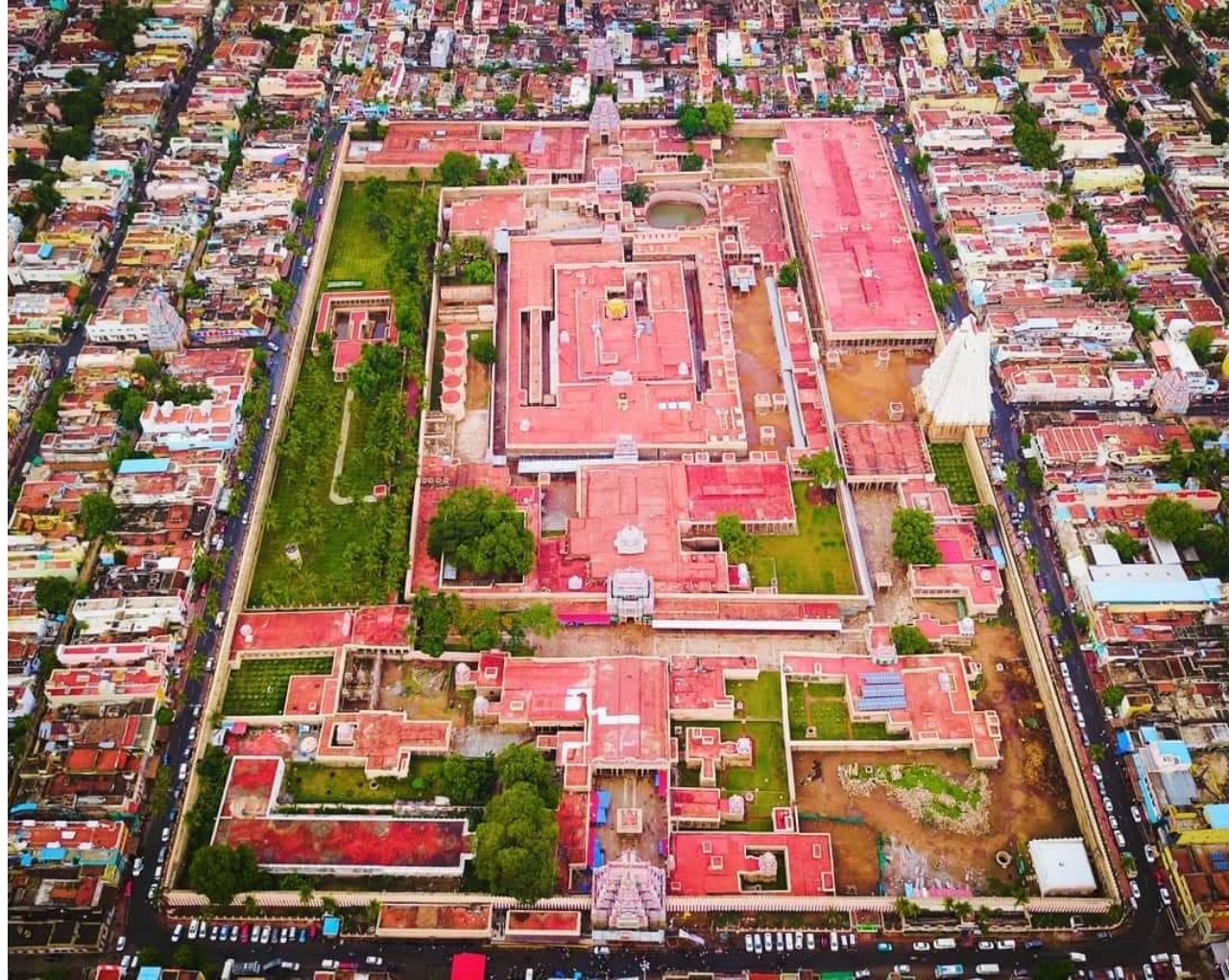
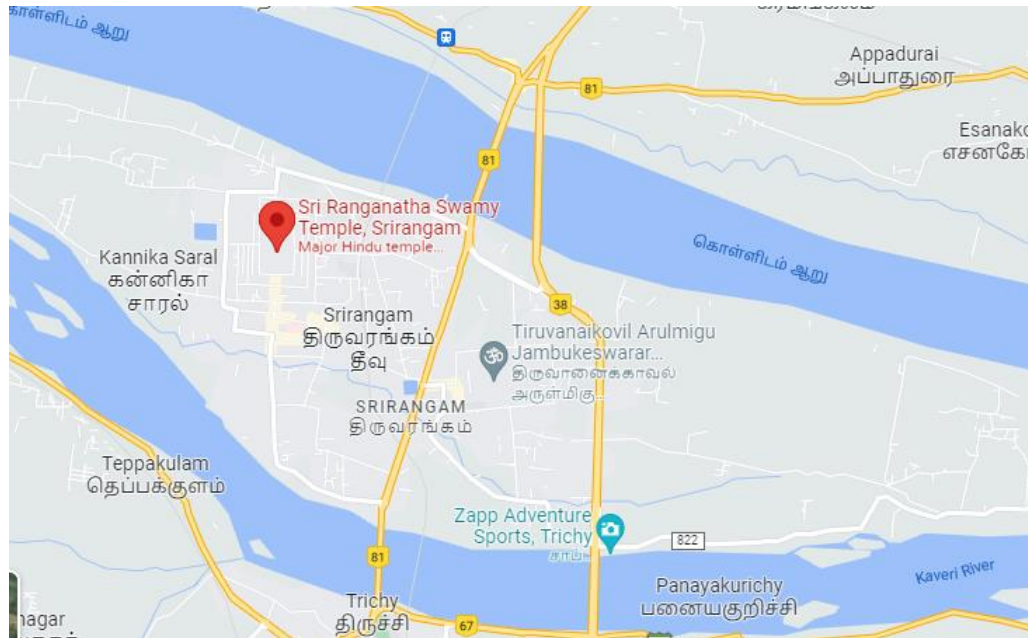
Srirangam (9th - 13th century) is an island of the city of Tiruchirappalli in Tamil Nadu.





## The Temple Town:

Ranganathaswamy Temple is an exceptional example of Temple-Town typology. **The temple is the nucleus and the life of people is centred around it.** Srirangam is a thriving town with a constant flow of devotees year round.



Most revered **Vaishnavite pilgrim** centre of South India dedicated to Ranganathaswamy.

Bounded by the Kaveri River and its distributary Coleroon on 2 sides.

Kaveri is one of the most sacred river in South India: ***Dakshin Ganga*** .



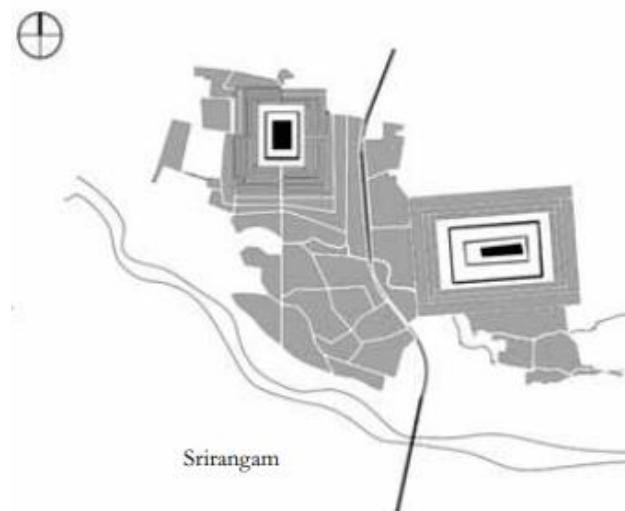
## Morphology of the island town of Srirangam:

Srirangam is unique in its *Sapta-Prakaram formation*, a temple-centered settlement pattern that comprises of Seven concentric rectangular enclosures

- inner five enclosures constitute the temple, the outer two has settlement.
- Activities become **increasingly holier as one moved within** – innermost ring contains shrines, 2nd includes priest's dwellings
- Jambukeshwara: same formal paradigm, less complete peer.



10<sup>th</sup> c. CE: Pandya Dynasty



13<sup>th</sup> c. CE: Vijayanagara dynasty

Figure 8.21 Plan of Srirangam. The temple proper is in black, the town is in gray. Drawing by Bharne & Sonal Kulkarni.

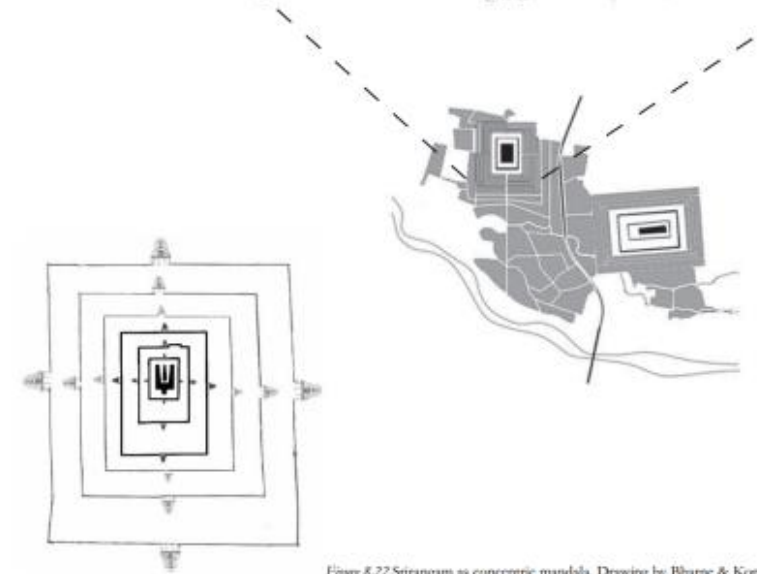
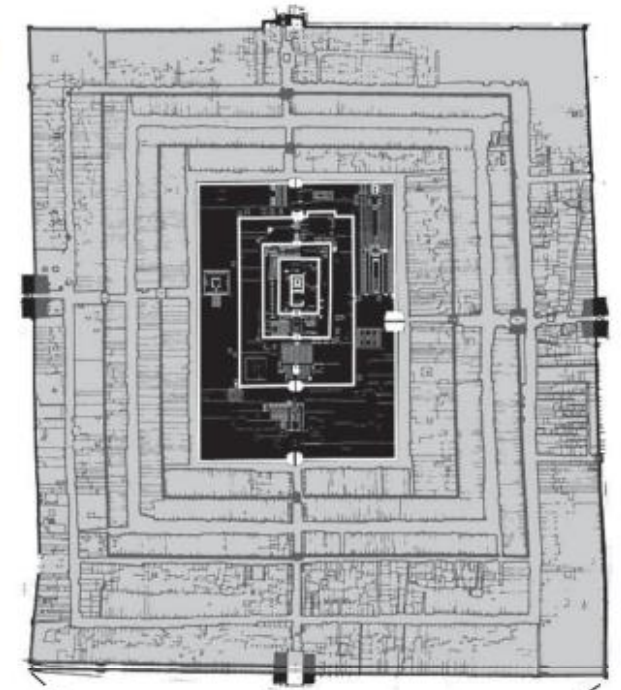


Figure 8.22 Srirangam as concentric mandala. Drawing by Bharne & Komal Panwani.



## Recognition

The Temple has been included in UNESCO's tentative list of World Heritage sites.

Temple Complex is massive in scale and spread over **156 acres**, making it the **largest *Functioning Temple in the World***

Angkor Wat temple has bigger area but it is not a functioning temple.

Some of the structures of temple have been renovated, expanded and rebuilt over the centuries as a **living temple**.

*Rajagopuram* ( entrance gateway) is said to be the tallest temple gopuram tower in Asia.



*Ranganath Swami Temple*



## Brihadeshwara Temple, Thanjavur

- Built during reign of Rajaraja Chola in 1010 CE
- 16-story Tallest vimana; 208 feet height
- Shikhara is resting on a granite block weighing 80 tons ???
- UNESCO World Heritage Site





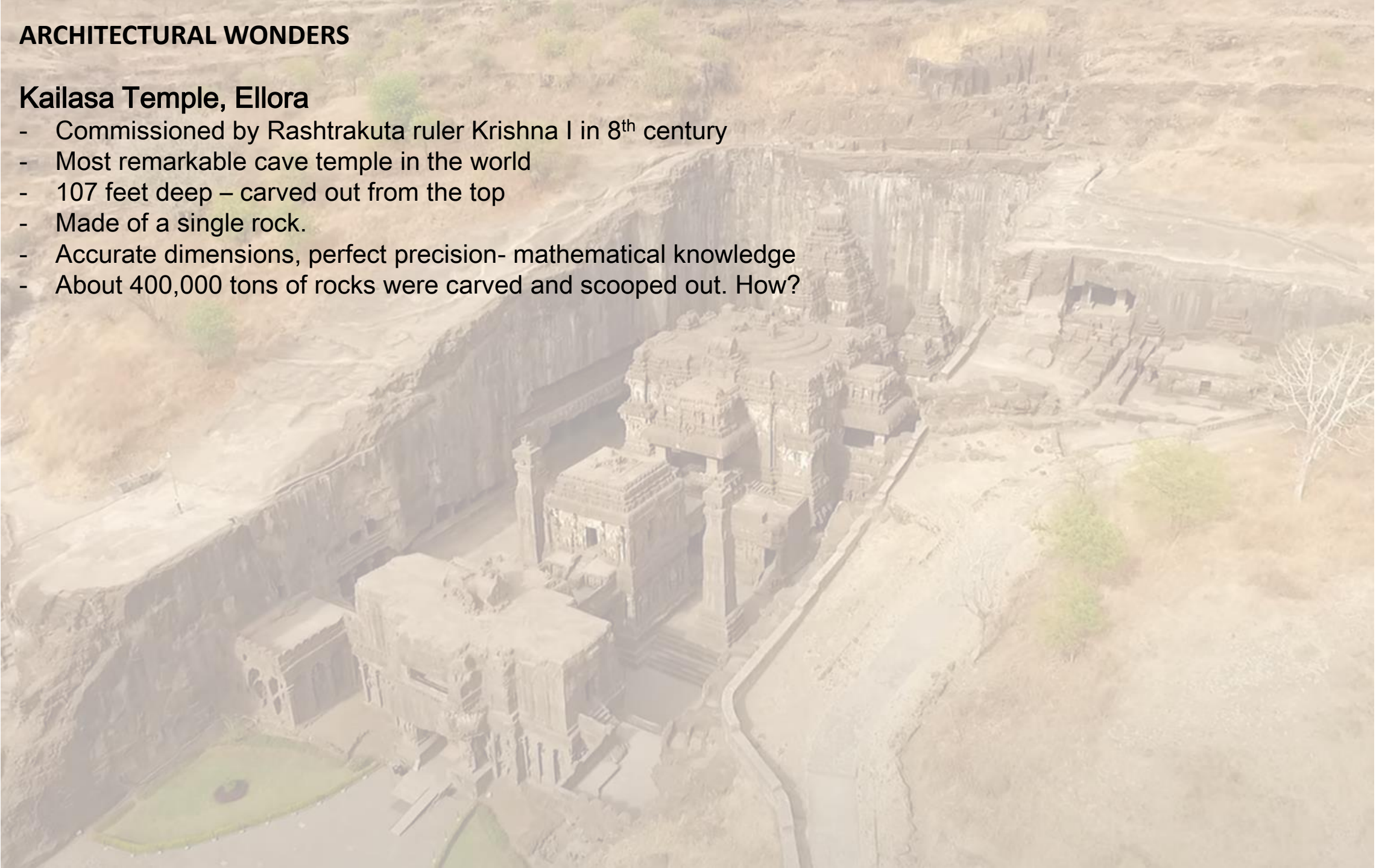




## ARCHITECTURAL WONDERS

### Kailasa Temple, Ellora

- Commissioned by Rashtrakuta ruler Krishna I in 8<sup>th</sup> century
- Most remarkable cave temple in the world
- 107 feet deep – carved out from the top
- Made of a single rock.
- Accurate dimensions, perfect precision- mathematical knowledge
- About 400,000 tons of rocks were carved and scooped out. How?





An aerial photograph showing a dense urban grid in the foreground, transitioning into a hilly, semi-arid landscape with a winding road and a body of water in the distance. The text "THANK YOU." is centered over the image.

**THANK YOU.**



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