

**URBAN RENEWAL OF A TEMPLE PRECINCT  
CASE APPLICATION IN MATHURA, UTTAR PRADESH**

**An urban design thesis report**

Submitted in partial fulfillment of the requirement for

The post graduate degree of

**Masters in Architecture (Urban Design)**

Under the Faculty of Engineering and Technology

**Jadavpur University, Kolkata**

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**August, 2022**

# JADAVPUR UNIVERSITY

KOLKATA – 700032

## CERTIFICATE

This is to certify that the thesis entitled “**Urban Renewal of a Temple Precinct, Case Application in Mathura, Uttar Pradesh**” submitted by **Sakshi Goyal** of **Registration No. 153936** of 2020-2022 is in partial fulfillment of degree of **Master of Architecture in Urban Design of Jadavpur University**.

This is an authentic work carried by him under our supervision and guidance. To the best of our knowledge, the matter embodied in the thesis has not been submitted to any other university/institute for the award of any degree.

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(Signature of Supervisor)

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

Development of historical urban areas are done over the years of time, evolving diversity of societies and their own sense of expression and traditional urban cultures. They make up a key part of the city centre's character and represent tangible links to the past.

As the problem of today, these areas are being threatened, physically degraded, damaged or even destroyed, by the impact of the urban development that follows industrialization in societies everywhere. There is a need to sensitively redesign these public areas for the betterment of the people living there and to boost local economy by creating environmentally friendly ecosystem for tourism sector.

Urban Renewal is one such tool that will significantly improve such historic realm and will transform the precinct into an attractive, highly desirable and pedestrian friendly place for a range of activities for both locals as well as tourists. It will also help to maintain the sense of place and keep its living function in its physical, social, administrative and economic aspects.



## 1.1.1 DEFINITIONS

### 1.1.1.1 Urban Renewal

- Main objective of Urban renewal program is to undertake the maximum amount of work in respect of conservation and rehabilitation of the various types of urban places.
- The existing environment are preserved or improved to serve as accommodation for living or working for a further reasonable length of time.
- Total demolition for redevelopment is resorted to only when individual buildings and large areas have deteriorated to such an extent that economical rehabilitation, thereof, is impossible.
- In Indian Context, Urban renewal generally refers to redevelopment of an area, usually located at the core of the city or in its close proximity for housing of medium and high-income group people and commercial and allied development and treat the symptoms of urban decay i.e., poor quality housing, environmental degradation and poor socio-economic conditions.

### 3 Corrective actions of Urban Renewal program

<b>1. Conservation</b>	It helps to <b>prevent</b> the spread of blight into decent areas of the town and arrest <b>the deterioration of the existing fabric</b> by enforcement byelaws and special ordinances, helps to correct and prevent unhygienic, unsafe and crowded environment.
<b>2. Rehabilitation</b>	Improves standard buildings and localities and helps the local authority <b>to provide public areas, open green spaces</b> and for widening of existing streets or provision of new roads. It also includes the <b>rehabilitation of population and even their livelihood.</b>
<b>3. Redevelopment</b>	<b>Removes buildings</b> , which have finished their useful life or are <b>beyond conservation and rehabilitation, from blighted areas.</b> Also new facilities for public use are provided, under comprehensive plan.

*Table 1 Three corrective actions of urban renewal*

### 1.1.1.2 Temple Precinct

Temple precinct have their own unique physical features and spatial qualities. They retain their unique identity by depicting their own sense of place and provide psychological and functional meaning to people's lives. Traditional streets leading to the temple are mostly narrow, are designed for pedestrians and are perceived as humane, warm, intimate or personal and are culture specific (Tandon & Sehgal, 2017).

<b>Precinct</b>	<b>Defined by physical enclosure having unique physical features and spatial qualities</b>
<b>Temple Precinct</b>	<b>Sacred precinct around a temple.</b>

Table 2 Definitions

### Demarcation of a Temple Precinct and its Urban Development

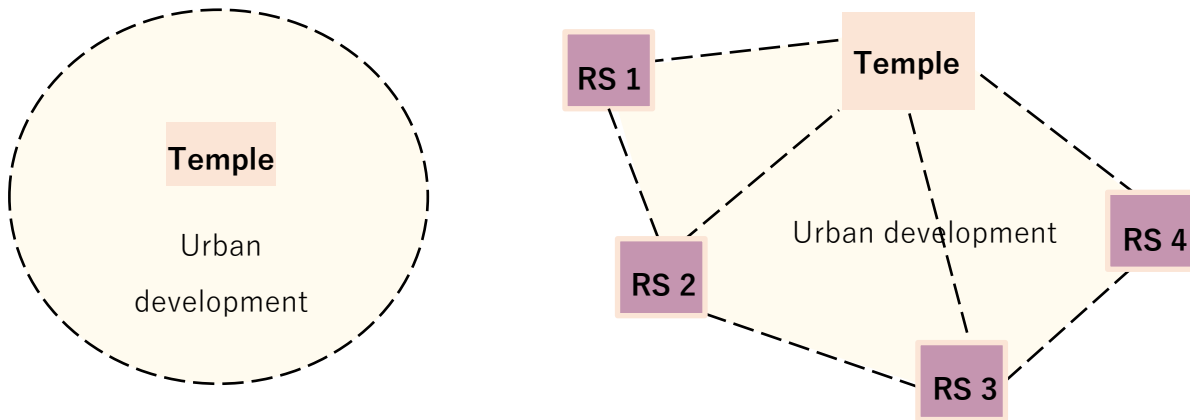


Figure 1 - Case 1 Area around main temple; Case 2 Area bound by main temple & different religious sites (RS)

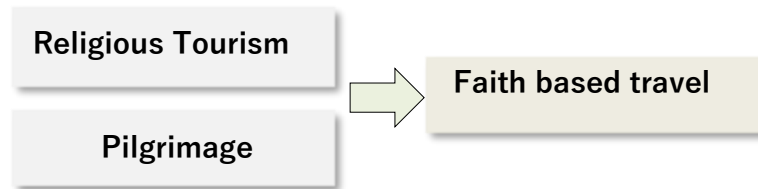


Figure 2 Character of streets leading to the main temple

### 1.1.1.3 Pilgrimage and Religious Tourism

Religious tourism is one of the fastest growing, changing sectors in the world tourism market.

We need to consider tourism growth during the urban planning and design stage in providing opportunity for the growth of the tourism industry as another source of economic income.



**Ideal model of a temple precinct** - (Soljan & Liro, 2021)

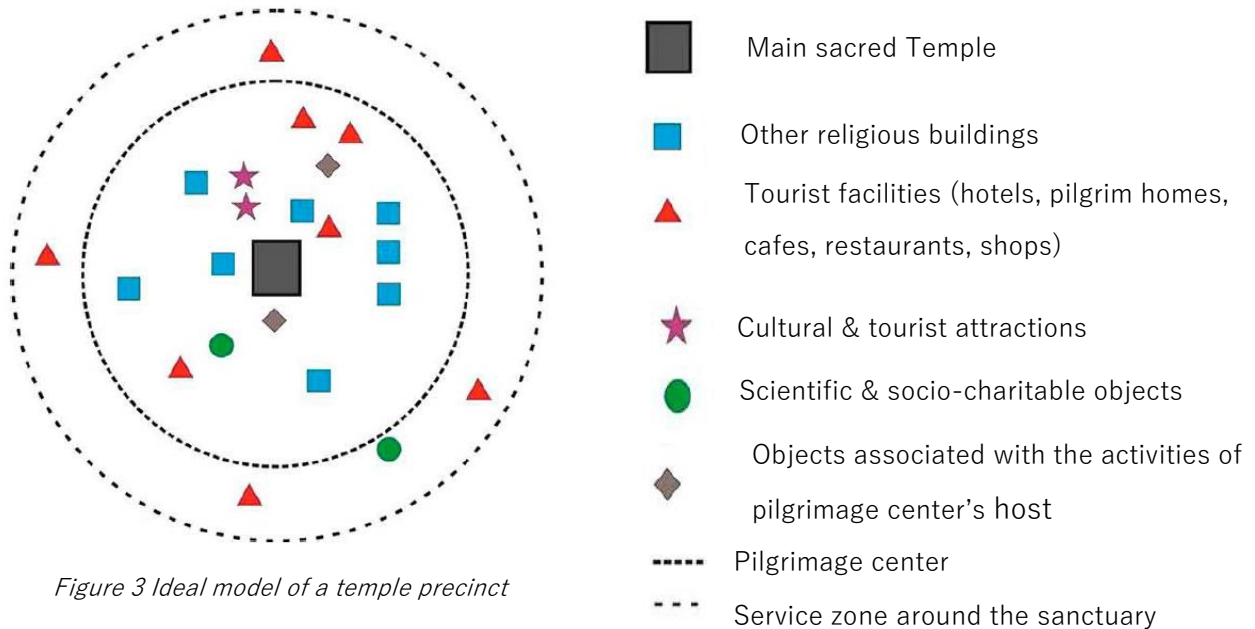


Figure 3 Ideal model of a temple precinct

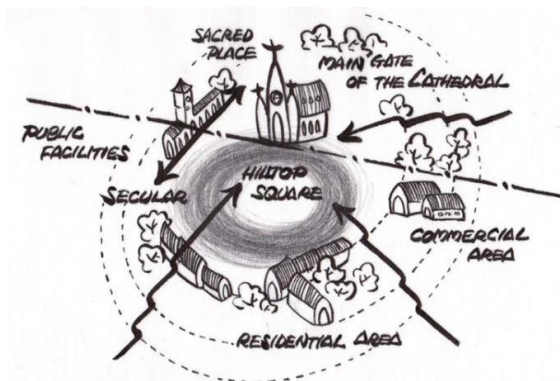


Figure 4 Myeong-Dong Cathedral, Seoul, South Korea

### 1.1.1.4 City Image and its Elements w.r.t Religious Tourism

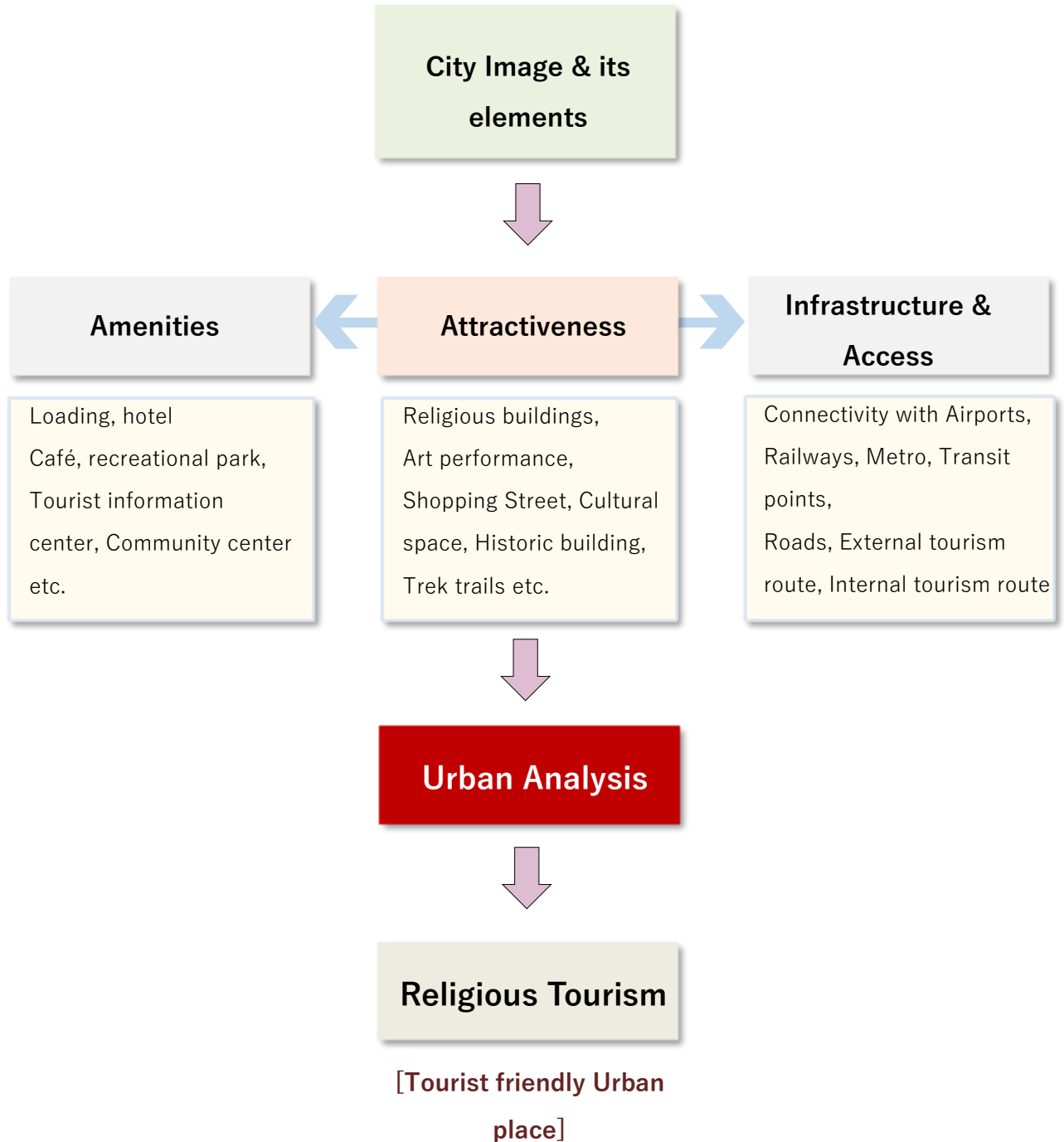


Diagram 1 City image w.r.t. religious tourism



### 1.1.1.5 Sacred Geometry of a Temple Precinct

In Indian theory, designing has been a part of ancient *Vaastu Vidya* (Architecture knowledge). It is conceived in the frame of Vaastu Shastra, that the built form should be designed in a natural setting in such a way, that there is a continuous flow of positive energies, which in turn affect the nature and health of the inhabitants. The early designing represents the archetypal manifestation of nature and its attributes in the form of Mandala with its circle, square or radial symmetries.

These sacred geometries can be cardinal, or dominated by topography, or a spiraling path towards the Centre. Therefore, the sacred geometry defined by their cardinality, centrality and circulation establishes the relationship between geographical points offering meaning and significance to the space (*Cosmic Order and Cultural Astronomy, n.d.*)

The sacred geometry of a sacred space can be manifested in a number of ways, as explained further in detail.

- ❖ **Intersection of Routes** - In the ideal city design, a centre as being the most sacred point is often the physical centre of the city, from which all routes or ritual routes are emanated
- ❖ **Periphery or Enclosure** - This periphery or enclosure is the marking off of the sacred precinct. It is the influence exerted by the Centre. For instance, there is hierarchy of activities like religious activities and indigenous activities, followed by commercial activities defining the religious precinct.

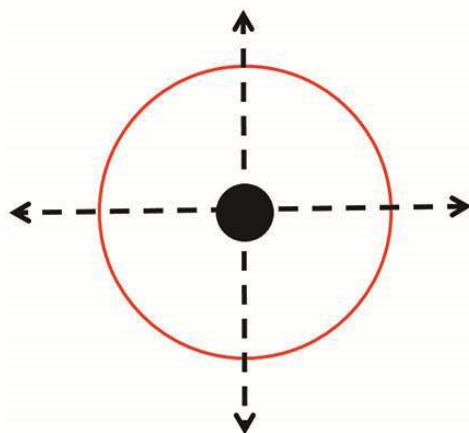


Figure 5 Major routes intersecting the Religious Centre

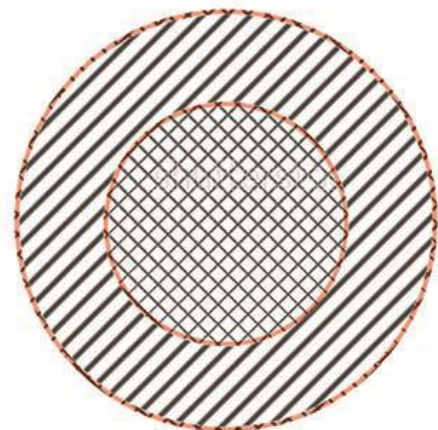


Figure 6 Specific functions defining boundaries or periphery of sacred spaces

- ❖ **Movement** - The spatial configuration of path in the sacred space plays an important role in assigning the meaning and significance to the sacred space. There exist majorly two types of movement system in a religious precinct: one is the circumbulatory movement around the Centre and one is the linear movement towards the Centre.

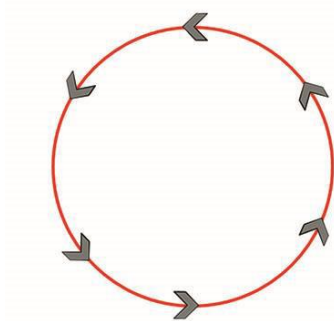


Figure 8 Circumbulation of Sacred space.

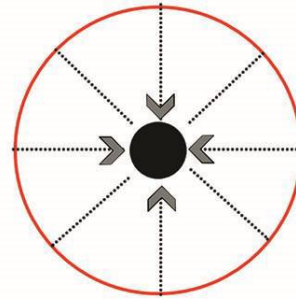


Figure 7 Linear movement towards the holy Centre

- ❖ **Spatial Configuration** - The spatial configuration of path in the sacred space plays an important role in assigning the meaning and significance to the sacred space. There exist majorly two types of movement system in a religious precinct: one is the circumbulatory movement around the Centre and one is the linear movement towards the Centre.

- ❖ **Functional Dominance** - Religious precincts are the important nodes in the city. They contain mix of activities and usually are the economic Centre for natives, encouraging local occupation of the place. They act as the coordinates in the city, as these are the locations for major pilgrimage and festivals to takes place.

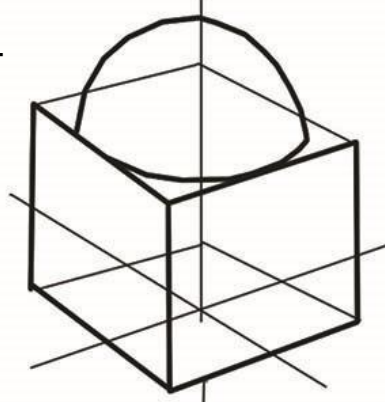


Figure 9 Centroidal form

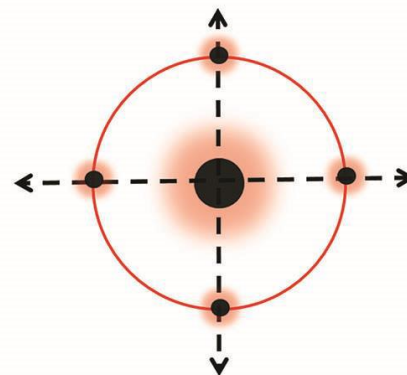


Figure 10 Important Religious nodes with functional dominance

- ❖ **Symbolism and Imageability** - Urban form in sacred space is symbolically expressed in the form of artefacts, and urban pattern is arranged in such a way that it contributes to views and vistas along the movement corridor.

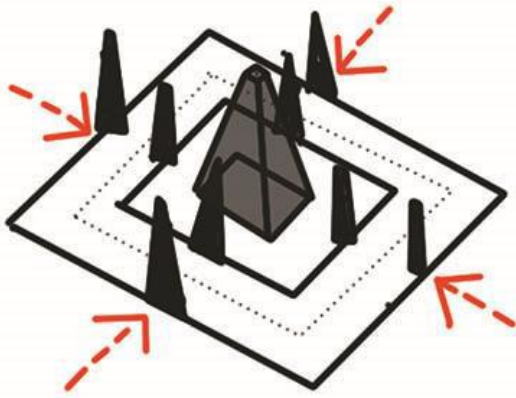


Figure 12 Religious symbols enhancing Imageability

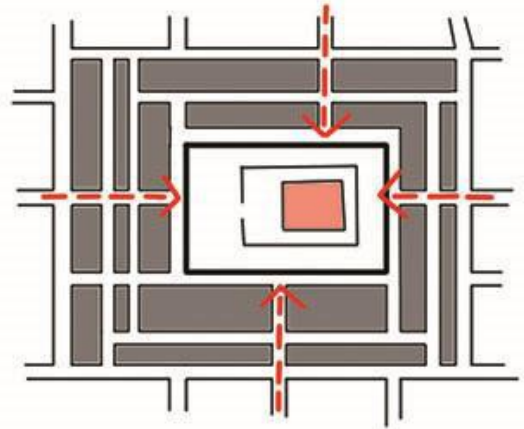


Figure 11 Urban pattern contributing in imageability

- ❖ **Location** - Sacred spaces with their sacred geometry are planned on certain strategic locations, for instance, on hill top or along the bank of water body.

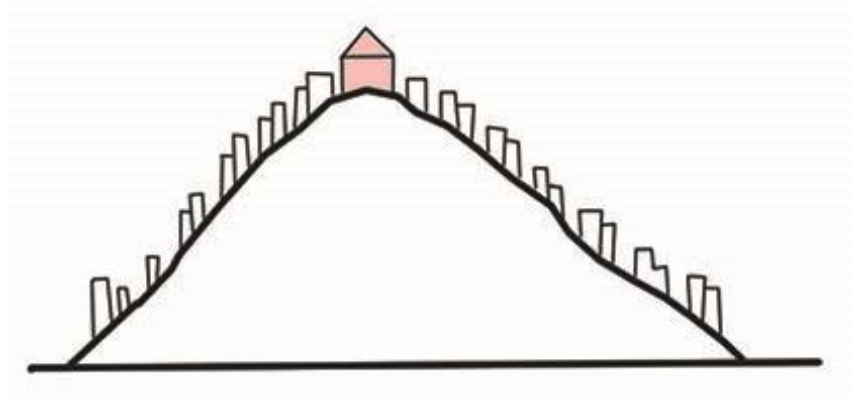


Figure 13 Strategic location of sacred spaces

## 1.1.2 RELEVANCE OF TOPIC

### 1.1.2.1 Justification

Temples have been an important part of Indian Cities. Yet, its influence has always been overlooked in our western-inspired planning systems. With the increasing pace of urbanization, there has been a rapid transformation of Urban Form, which in turn has affected the spirit of the place.

In earlier ages settlements were used to expand around the temple. Today we see issues of chaos and congestion around those areas which makes the experience less friendly.

### 1.1.2.2 Why Temple Precinct?

Challenges faced by Religious Precinct in India – *(Sharma et al., n.d.)*

- **Poor infrastructure**
- **Safety and security**
- **Carrying capacity issues**
- Deficiency of proper sub-structure
- **Access and connectivity**
- Information and communications
- Convenience
- **Cultural degradation**
- **Visual pollution**
- **Waste management**
- Human resources
- Lack of publicity
- Monetizing religion
- **Limited community participation**

### 1.1.2.3 Why Tourism?

- Tourism sector contributes 10% of India's GDP and supports 8.75 crore jobs which is 12.75% of India's total employment.
- India ranked 8<sup>th</sup> position on Cultural resources and Business travel list in 2019.
- International tourists' arrival on religious sites in 2019 was 1.8 crore.
- Tourism industry produces 30% of total waste which is estimated to be around 62 million tonnes annually.
- India has the 4<sup>th</sup> largest carbon-footprint from the travel industry around the world. *(India Tourism Statistics at a Glance-2021, n.d.)*

- There are a number of **government schemes and policies working towards enhancing the experience of pilgrimage**, thereby increasing religious tourism across the country. Current working schemes and policies are HRIDAY Scheme, **PRASAD Scheme**, Swadesh scheme, Pro poor religious tourism scheme and Braj Tirth Vikas Parishad.

### **“PRASAD Scheme by GOI” - National Mission on Pilgrimage Rejuvenation & Spiritual Augmentation Drive**

- It aims at integrated development of pilgrimage destinations in a prioritized, planned, and sustainable manner in order to provide a complete religious tourism experience.
- The focus is on the development and beautification of the identified pilgrimage destinations under HRIDAY Scheme (*Pasad, S. Kashyap, Rs. Purohit, 2007*).

#### **1.1.2.4 Why Mathura**

For about 3000 years, Mathura was the hub of culture and civilization and economic activities, as it was located at the junction of important trade routes.

Now the city is facing major problems in entertaining the religious tourism sector. Lack of infrastructure and tourist amenities makes the tourist journey difficult and challenging. The major religious precincts in the city need to be renewed as per the requirements of tourist as well as locals.

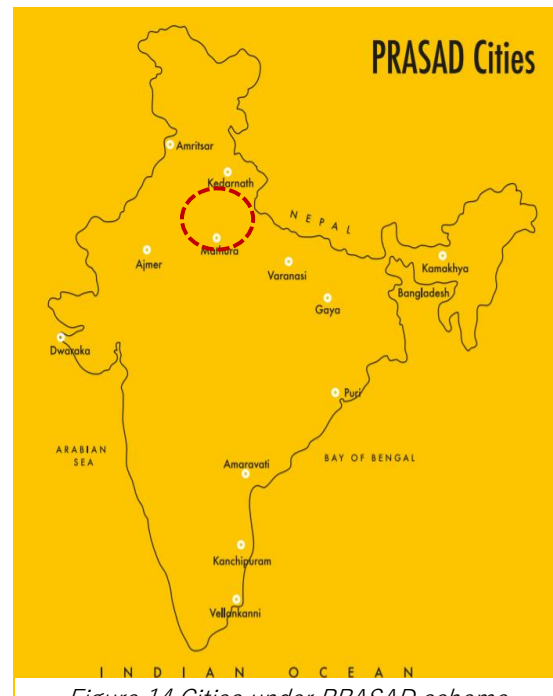


Figure 14 Cities under PRASAD scheme

### 1.1.3 PARAMETERS OF THE STUDY

1. Landuse and Built form
2. Open Spaces
3. Nodes
4. Landmarks
5. Permeability
6. Variety
7. Sense of Place

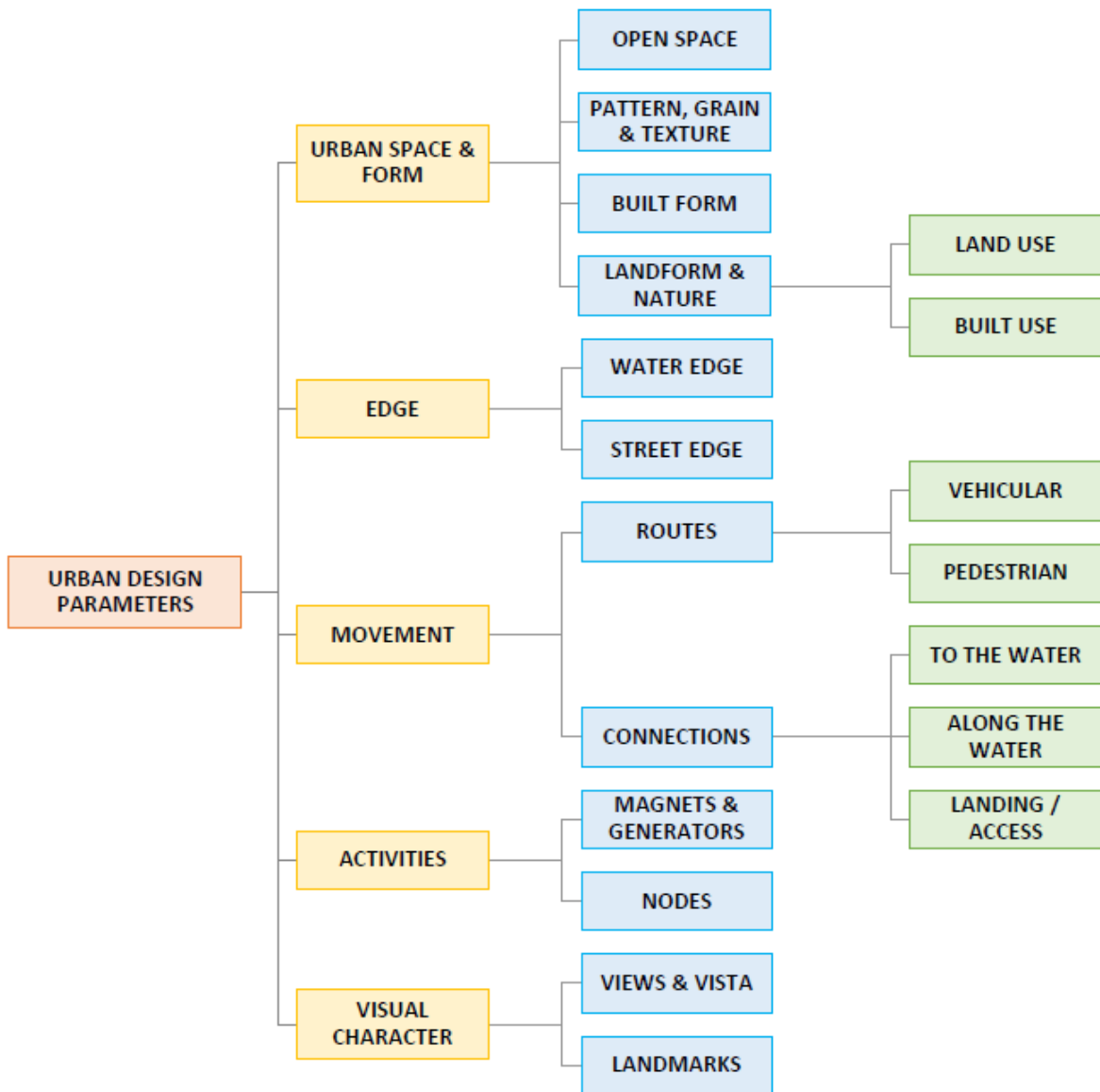


Diagram 2 Parameters source: Author

## 1.2 AIM

The aim of the study is to redirect the course of transformation of temple precinct due to urbanization and enhance tourism attractiveness to integrate the development of pilgrimage destinations in sustainable manner in order to improve the religious tourism experience, along with incorporating the needs of all people.

## 1.3 OBJECTIVES

1. To study the existing social, environmental and physical infrastructure conditions of the study area.
2. To understand various issues related to religious activities faced by tourists as well as locals.
3. To introduce better infrastructure and tourist amenities to re-create viable attractive places and ease of movement for tourists for their memorable trip.
4. To conserve the heritage value of the precinct for better promotion of tourism.
5. To enhance local distinctiveness and sustain a sense of place that people can be proud of and tourism sector can flourish.

## 1.4 SCOPE OF WORK

1. Understanding the study area by conducting tourist surveys and local participation for data collection.
2. Developing different Urban Renewal Strategies to introduce better infrastructure and reconstruct the dilapidated structures for different tourist amenities in the study area.
3. Better connectivity with nearby tourist spots for the ease of movement.
4. Improvement in streetscapes and congestion problems around the temple.
5. Encroachments on street and organizing informal activities.
6. Resolving the issues of visual pollution and animals on street, hampering the street activities.
7. Beautification of pedestrian street leading to main temple area.



*Figure 15 Religious assets in dilapidated conditions*



*Figure 16 Street character*

## 1.5 LIMITATIONS

Within whole of the Mathura city, a particular temple precinct has been chosen for detailed intervention based on its historical & cultural significance and the impact of urbanization on the place.



## 1.6 METHODOLOGY

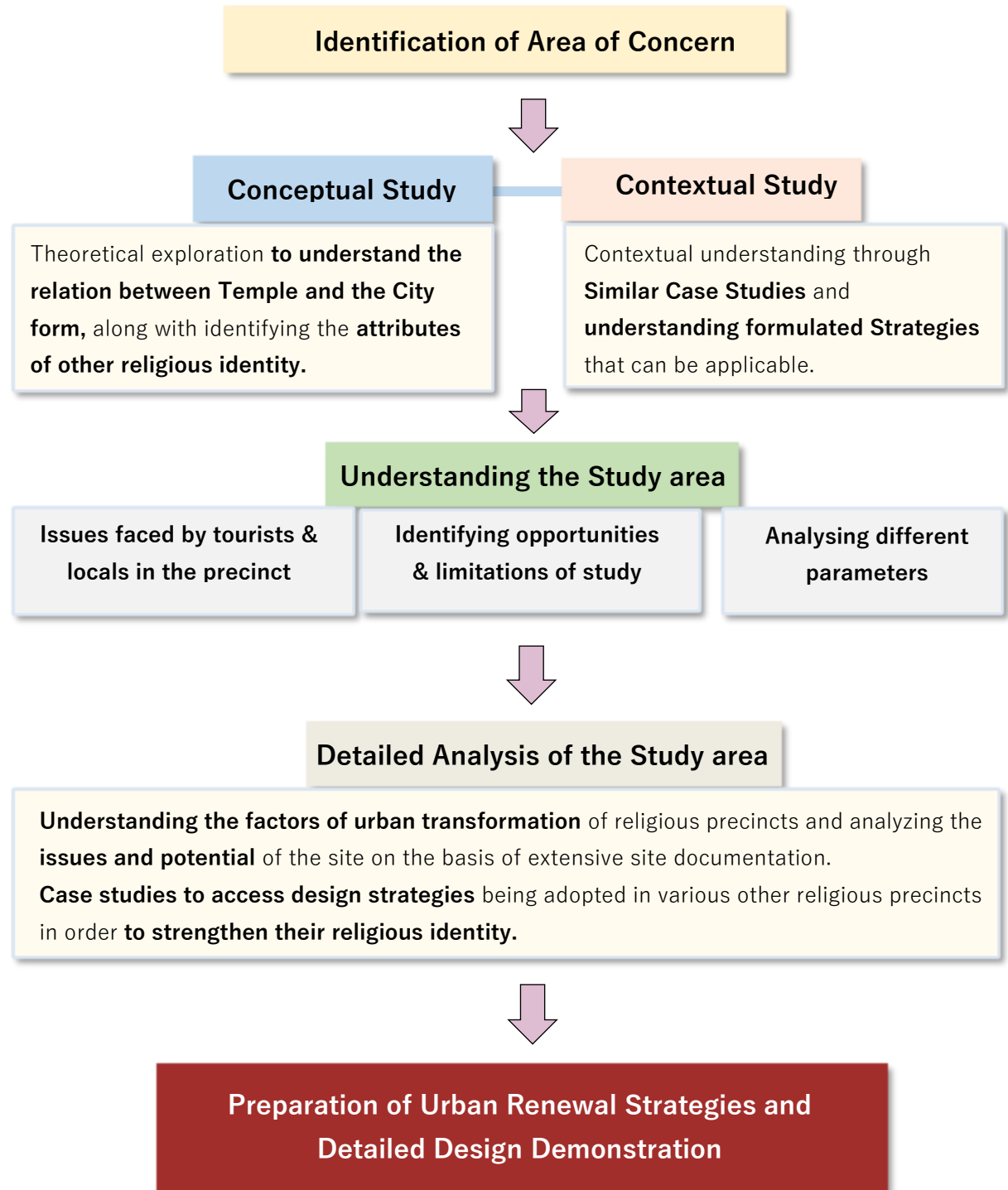


Diagram 3 Methodology source: Author

## 2.0 CASE EXAMPLES

Case studies are selected on the basis of the similarities to the case application.

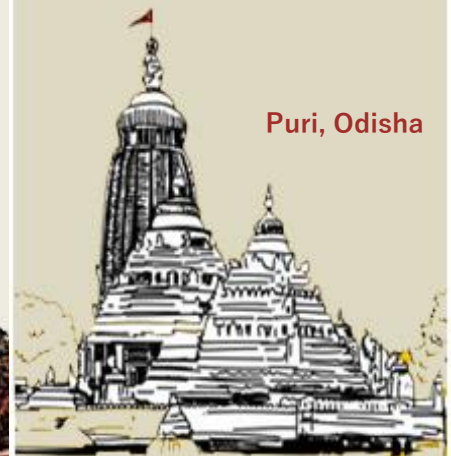
Under the PRASAD scheme and lots of work and initiatives are taken in the city of Varanasi and Puri, to improve the pilgrimage and religious tourism experience.

1. **Kashi Vishwanath Mandir Precinct, Varanasi, Uttar Pradesh**
2. **Shree Jagannatha Heritage Corridor, Puri, Odisha**

Varanasi, Uttar Pradesh



Puri, Odisha



## 2.1 KASHI-VISHWANATH MANDIR PRECINCT, VARANASI

### 2.1.1 DESCRIPTION

The city of Varanasi is one of the world's oldest living cities and have been destroyed and rebuilt several times over the period of time.

Varanasi is located in the Gangetic plain of Uttar Pradesh and the most important pilgrimage center of the Hindus. This holy city is also known as Kashi and the city of light. The city with all its religious and cultural attributes, attracts millions of in-lands as well as overseas tourists and pilgrims.

**Justification** - With the increasing levels of urbanization, there has been a continuous urban transformation of sacred space. The city of Varanasi is particularly has been selected because of the shared similarities of the urban place with the city of Mathura. Both the cities are highly dense river valley settlement and shares very similar urban character.



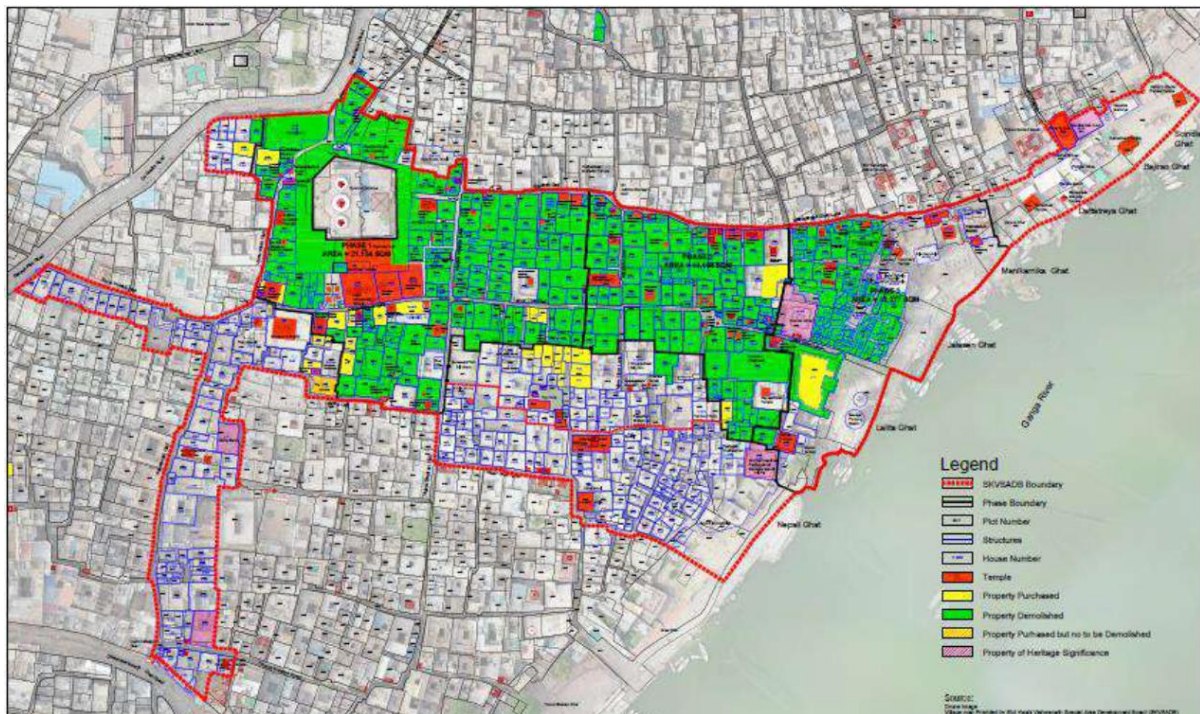
Figure 17 Location map of Varanasi



Figure 18 Ariel view of Varanasi

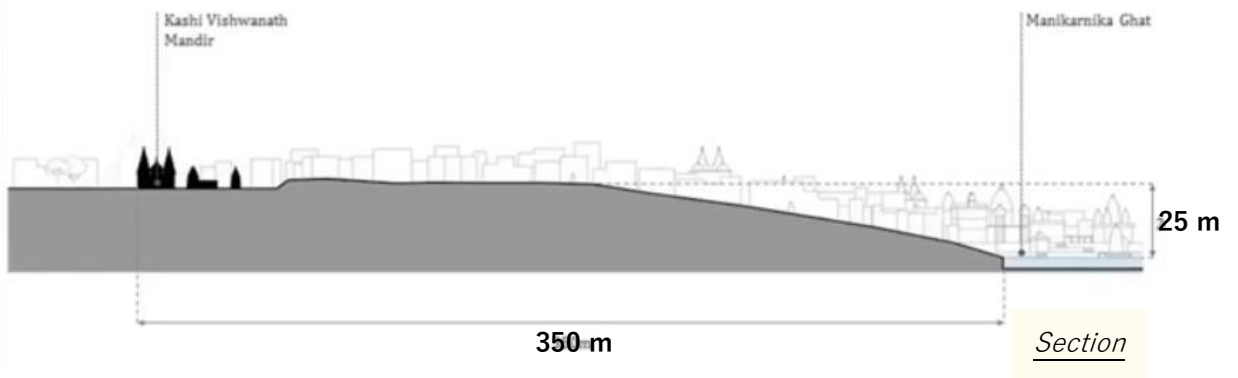
## 2.1.2 DELINEATION

- Kashi – Vishwanath Corridor is the recently inaugurated project of India, under which pilgrims get the direct access to Kashi Vishwanath Temple from Manikarnika, Jasleen and Lalita Ghats.
- 166 buildings were identified to be removed for creating the corridor and 118 buildings were purchased.
- 46 ancient temples, library and buildings of architectural importance to be preserved in corridor area.
- 1400 Rehabilitation of tenants, including shopkeepers of the buildings being purchased for the corridor.



Map 1 Property map





Map 2 Plan and section of mandir precinct

## 2.1.3 SURVEY AND ANALYSIS

### 2.1.3.1 Initial Character of Mandir Precinct

- i. Area around the temple is highly dense low-income neighborhood.
- ii. Lanes were narrow and mostly crowded with long lines of pilgrims.
- iii. Lanes near the ghats were filled with the piles of wood for cremations.
- iv. Many temples were encroached by the houses.
- v. Ad hoc encroachments near the ghats.
- vi. Lanes were filled with filth and open gutters.
- vii. Animals hampering the daily activity.

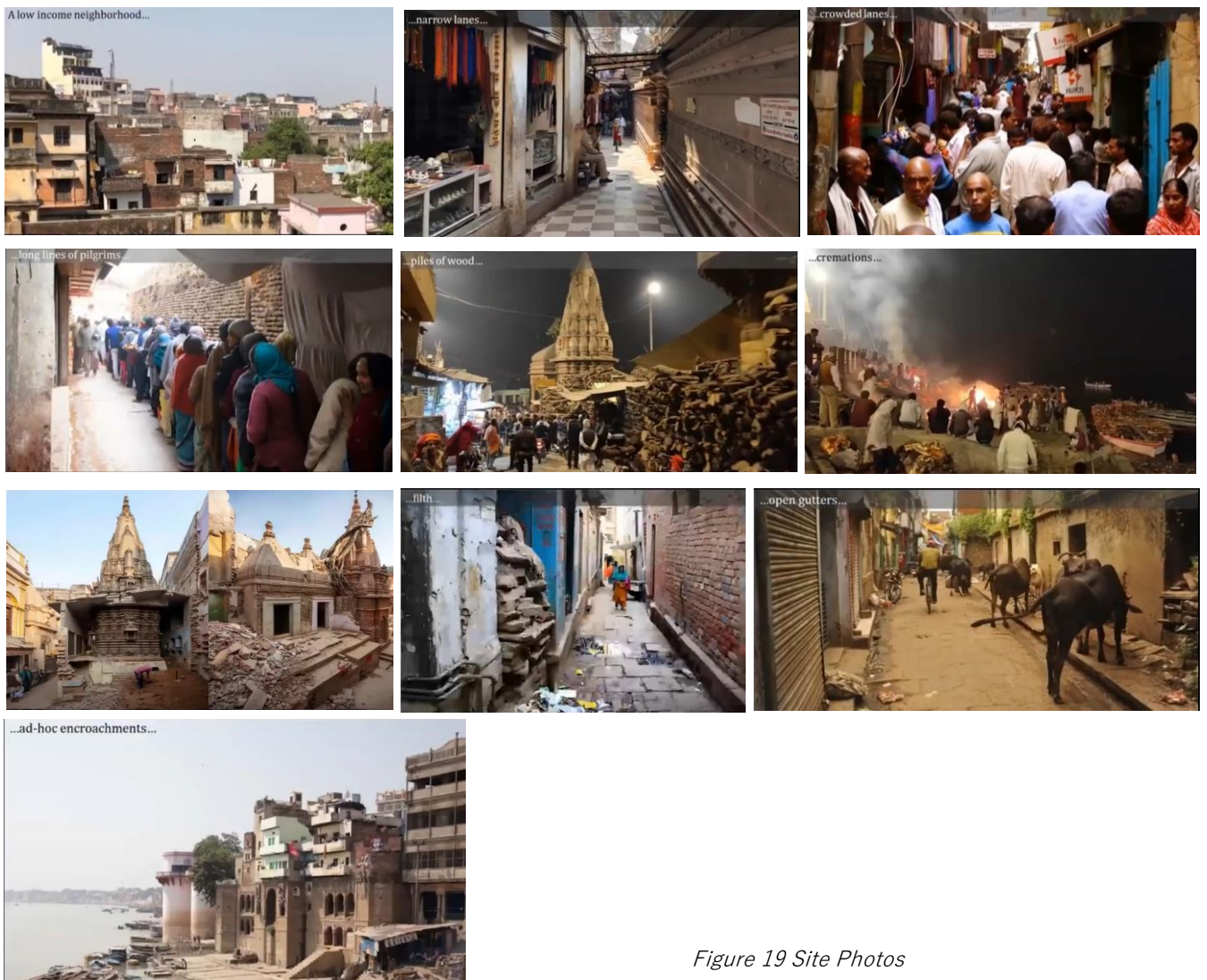


Figure 19 Site Photos

### 2.1.3.2 Design of a Mandir Precinct

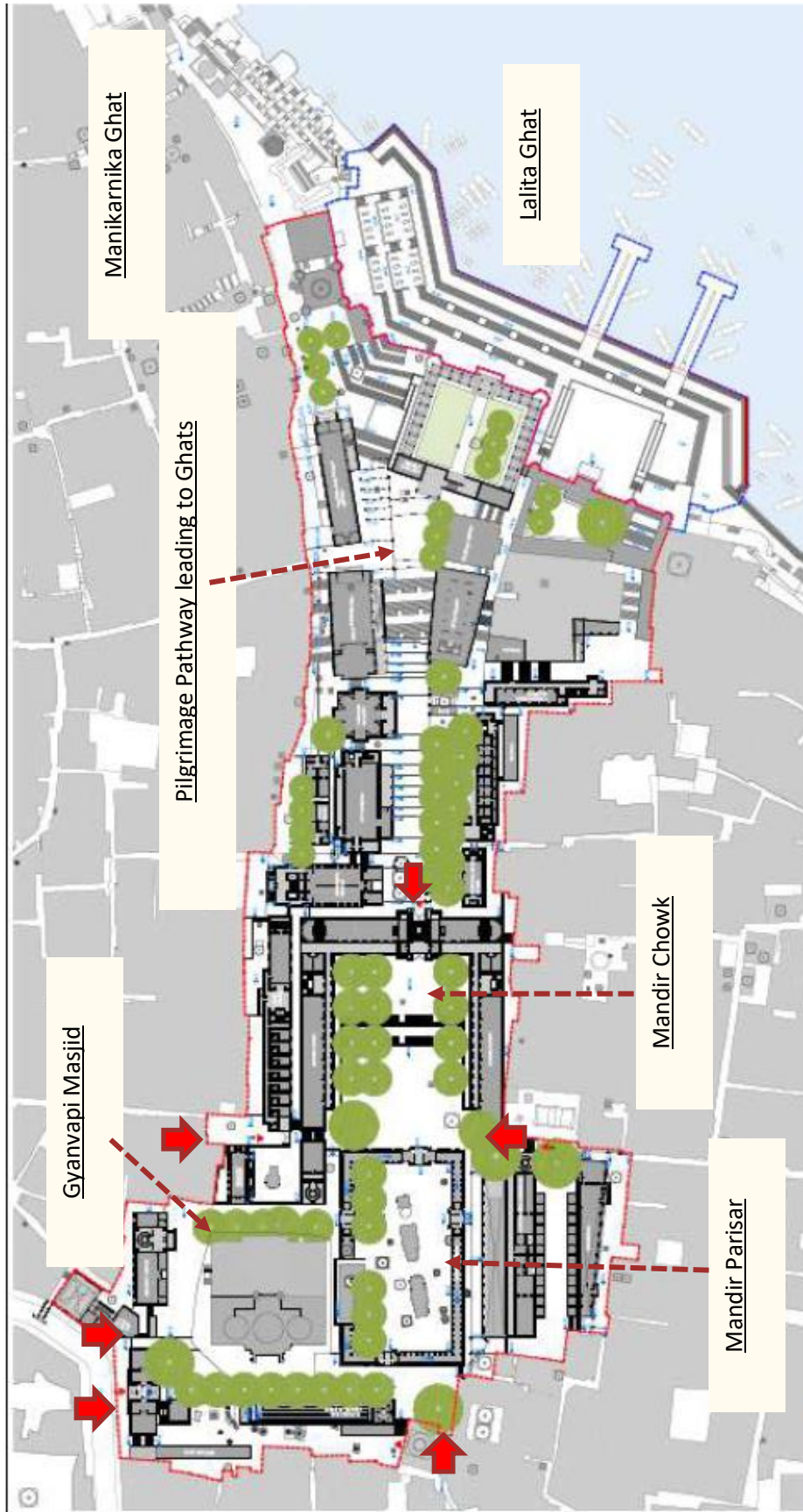
- i. Original approaches to the precinct are maintained and widened.
- ii. To resolve the congestion problems in and around the main temple, the boundary walls of Mandir Parisar is shifted outwards (new dimensions 72m x 42m) and proper parikrama corridors are designed for pilgrimage lines.
- iii. Node – Mandir Chowk connects Pilgrimage Pathway to the main temple and has all the facilities like guest house, yatri suvidha kendra, lockers, shoe racks, toilets and changing rooms.
- iv. Pilgrimage Pathway facilitates all the cultural civic institutions & tourist facilities includes –
  - City Museum informing the history of Varanasi.
  - Spiritual Gallery
  - Multipurpose Hall
  - Food court
  - Spiritual Bookshop
  - Vedic Kendra
  - Yatri Suvidha Kendra
  - Tourist Facilitation Centre
  - Hospice (type of healthcare focuses on emotional & spiritual needs of patient)
  - Goenka Library and Goenka Chatralaya (preserved)
  - Rajeshwari Mandir (preserved)



Figure 20 Before interventions



Figure 21 After interventions



Map 3 Design of mandir precinct



### 2.1.3.3 Parameters Analysis

1. **Orientation & climate** - Majorly buildings are oriented parallel or perpendicular to the street grid which helps to create a uniform elevation corridor through the streets. Moderate climate appreciates & enhance
2. **Shape and pattern** - Coarse grain textures create dynamic pattern through the city core more outdoor activities.
3. **Routes and pathways** - Dedicated pedestrian ways connecting all along the major public areas. Mandir chowk is quite spacious which enables safety as well as enhances grandeur to the precinct. Corner buildings are properly treated to respect the nodes.
4. **Open spaces** - Open spaces around this area are designated for public activities. Interconnections between the open spaces through pedestrian walkways makes it a vibrant public realm.
5. **Architectural features** - Hindu architecture is prominent throughout the precinct. Various design guideline has been formulated to control the haphazard developments of the private buildings around the mandir precinct.
6. **Street furniture** - Measurements have been taken to design some integrated street furniture to enhance the beauty of the public realm.

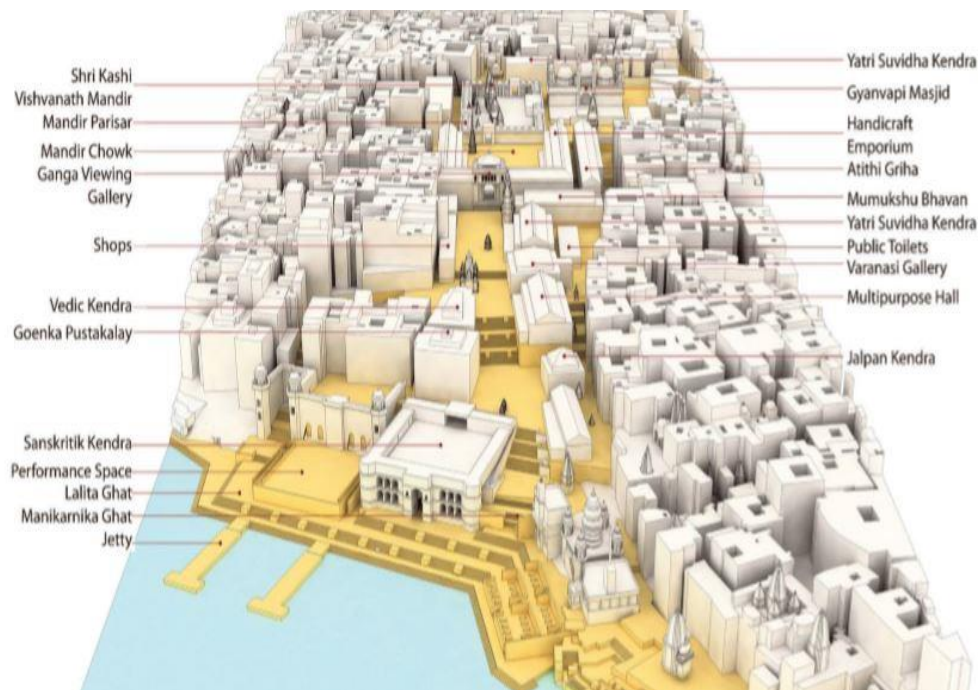


Figure 22 Built form of mandir precinct

Kashi Vishwanath Corridor Project will help increase religious tourism and give a boost to the local economy here. **During the construction phase** of the project, number of **tourists** to Kashi Vishwanath **increased by 2.5 times**. **Phase-1 of the project is completed and recently inaugurated**. Phase-2 of the project is expected to get complete by year 2024.

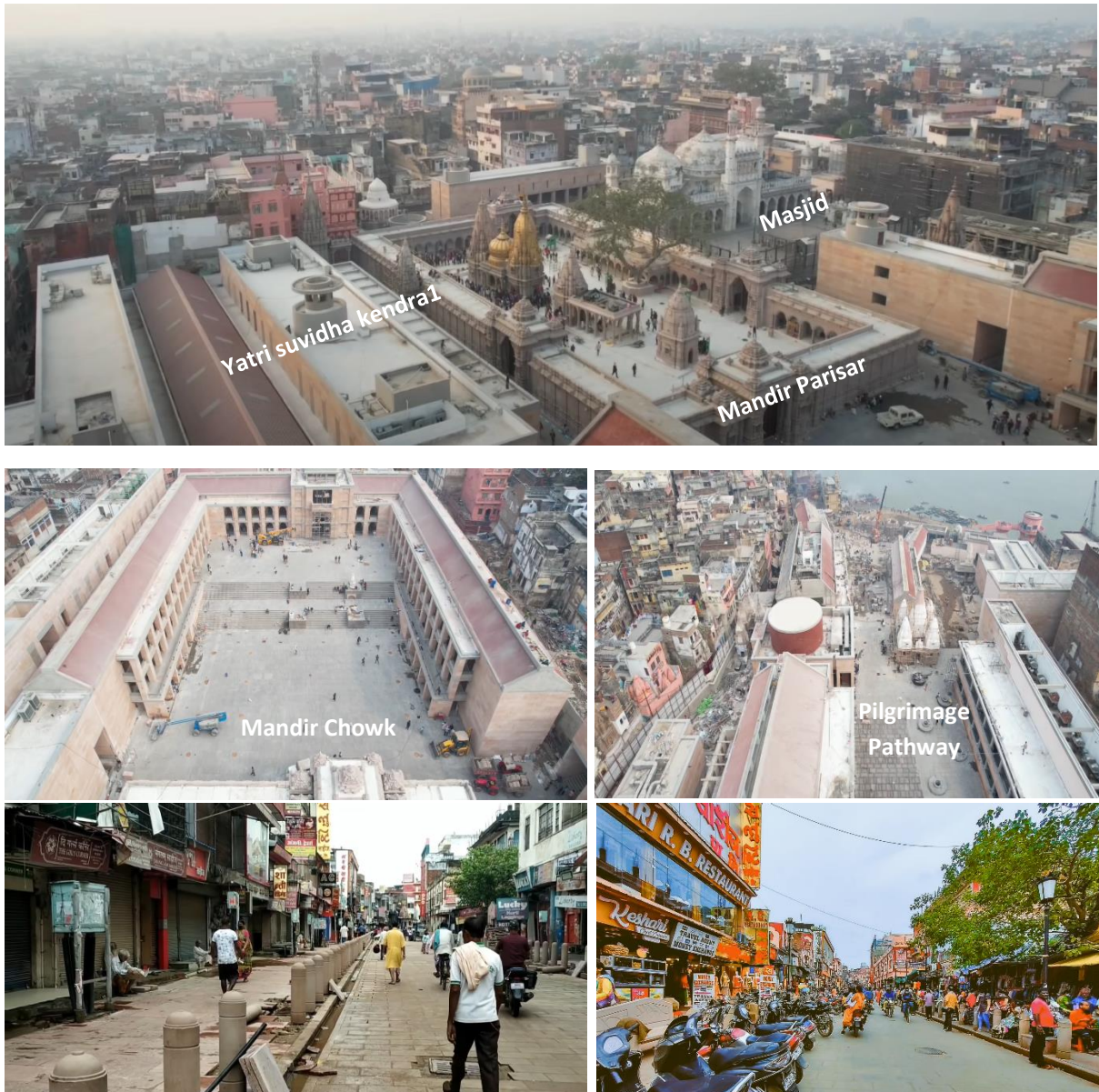


Figure 23 Site photos

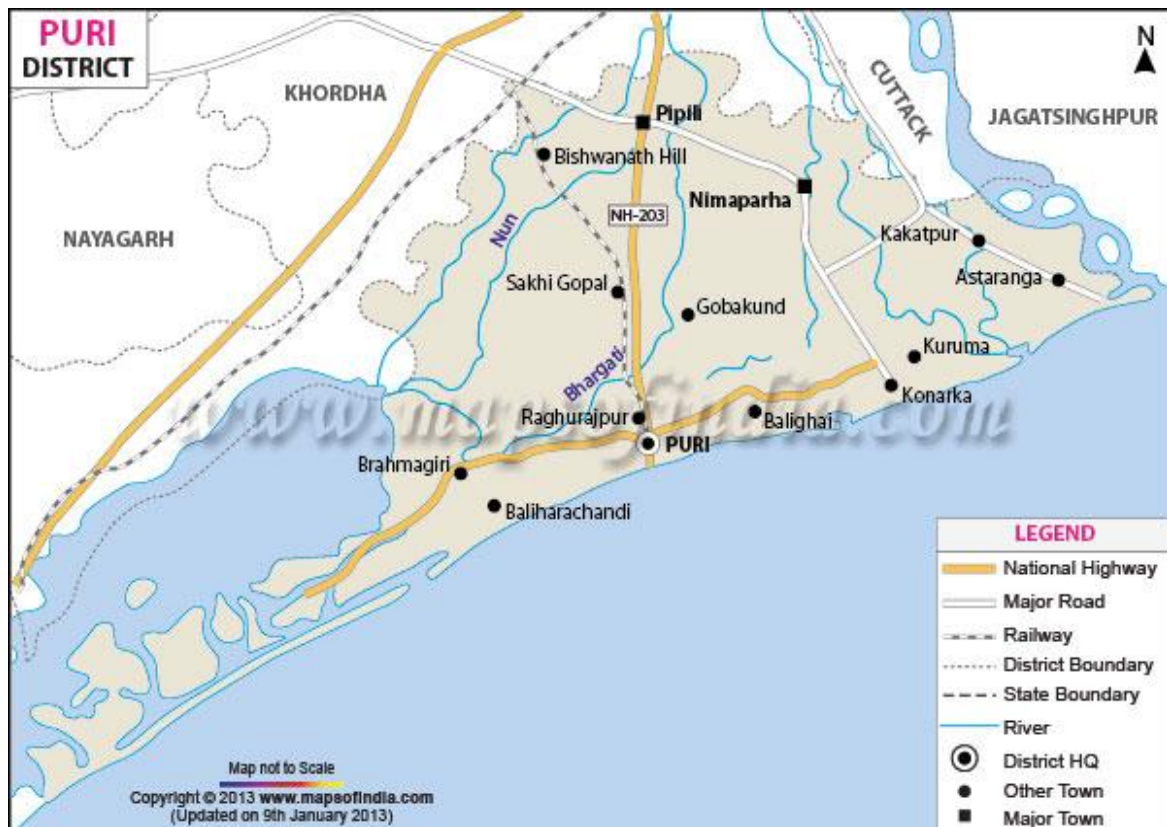
## 2.2 SHRI JAGANNATHA HERITAGE CORRIDOR, PURI, ODISHA

### 1.2.1 DESCRIPTION

The Jagannath Temple, Puri is an important Hindu site dedicated to Lord Jagannatha ji (form of Sri Krishna), Balabhadra ji and goddess Shudhdra ji in the state of Odisha on the eastern coast of India. The site is also one of the Char Dham pilgrimage.

The Puri temple is famous for its annual Ratha Yatra, or chariot festival, in which the three principal deities are pulled on huge and elaborately decorated chariots. The temple also has one of the world's largest fire-based kitchen in the complex which serves around 50,000 people per day.

The city is coming closer to the temple compound over the period of time. At peak time, city attracts 20 lack people in about 4 to 5 days. So, dealing with extremely large volumes, safety & security measures and issues of heat exhaustions.



Map 4 Location map of Puri



Figure 24 Ratha yatra



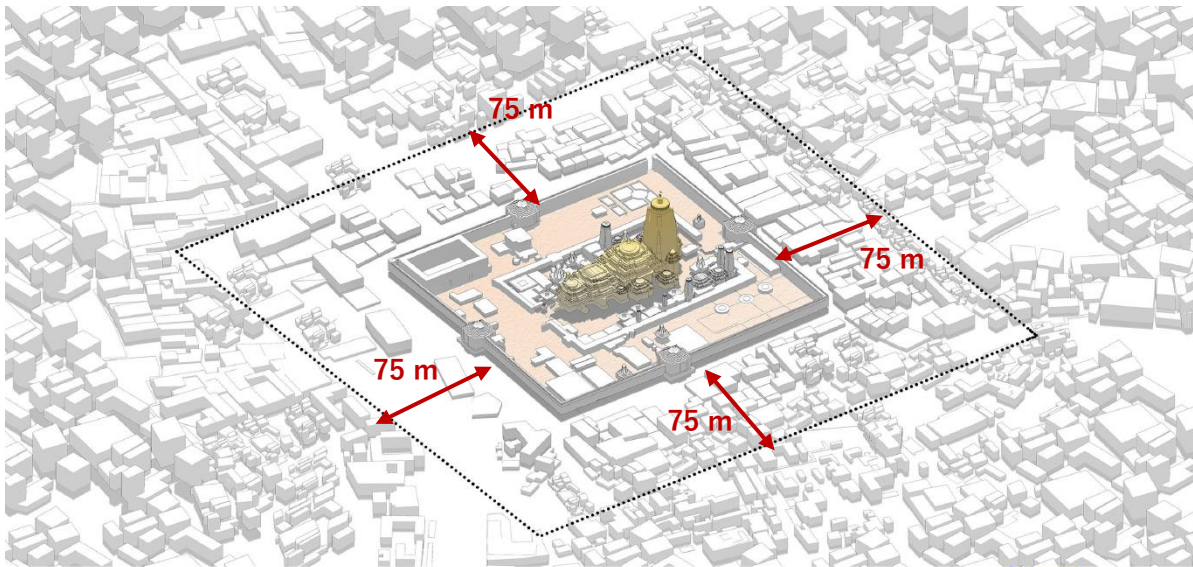
Figure 25 Encroachment towards main temple

### Issues –

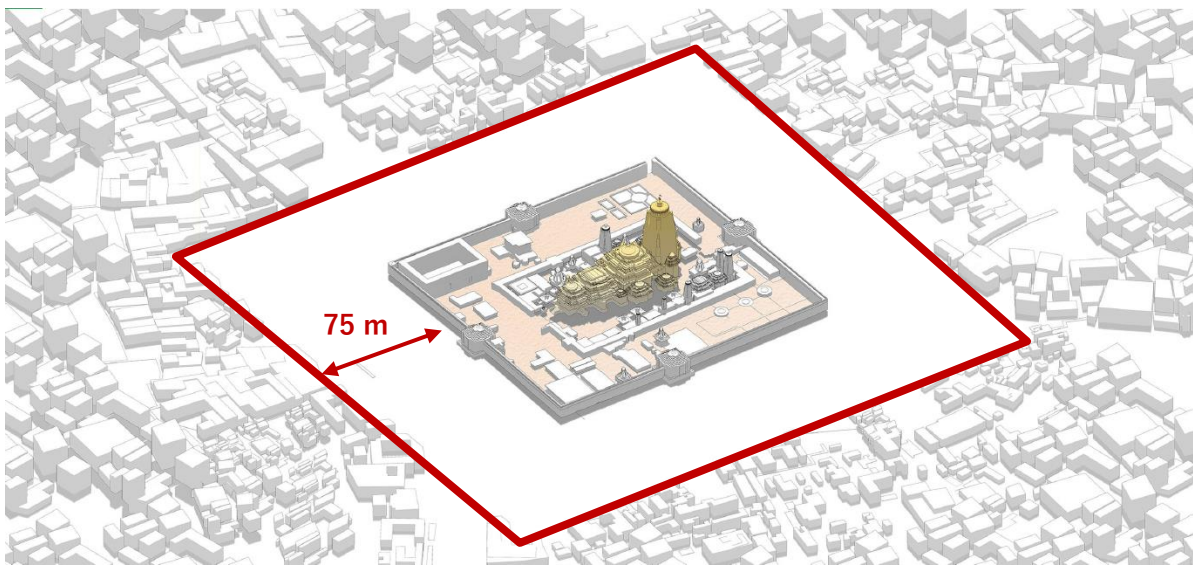
- Encroachments towards the temple complex.
- No lane discipline, no traffic signals, no designated.
- Makeshift cloak rooms all around the area due to which no organized que system
- Queuing is done on the main road where the traffic moves.
- All the services are tacked on, temporary signages, electrical meter, paneling and so on.
- Wood piles on the side of the road, trash chute on the other side of the compound wall.
- No proper space for the vendors, all sitting at the side of the road.

## 1.2.2 DELINEATION

- Under this project, the temple compound around the main temple is to be developed and providing it with all the major utilities and tourist facilities.
- For the temple compound, verdict was given by the Odisha High Court that 75m on all sides of the temple could be acquired and was effective in 2019.
- Land acquisition part is almost over and the Phase 1 of the project is already started on ground level.



Map 5 Periphery around the main temple



Map 6 Delineation of area for intervention

## 2.2.3 SURVEY AND ANALYSIS

### 2.2.3.1 Character of Heritage Corridor



Figure 26 Streets with no lane discipline

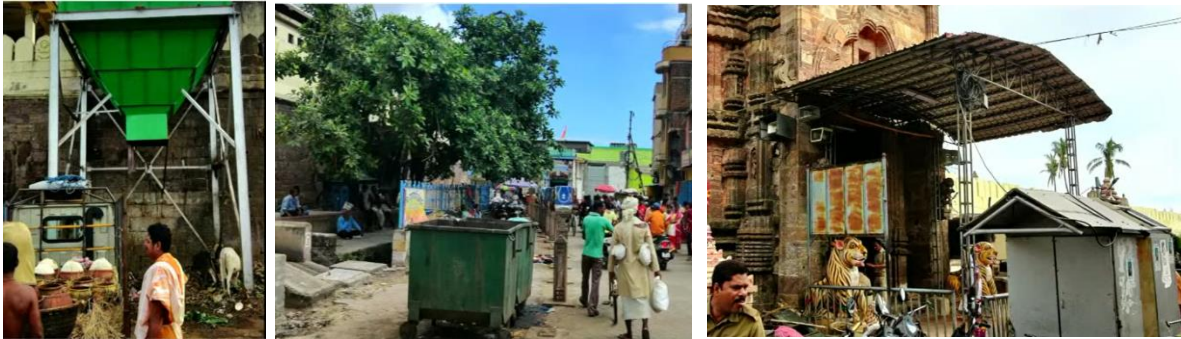


Figure 28 Trash chutes near the main temple

Figure 27 Services are intact on one another



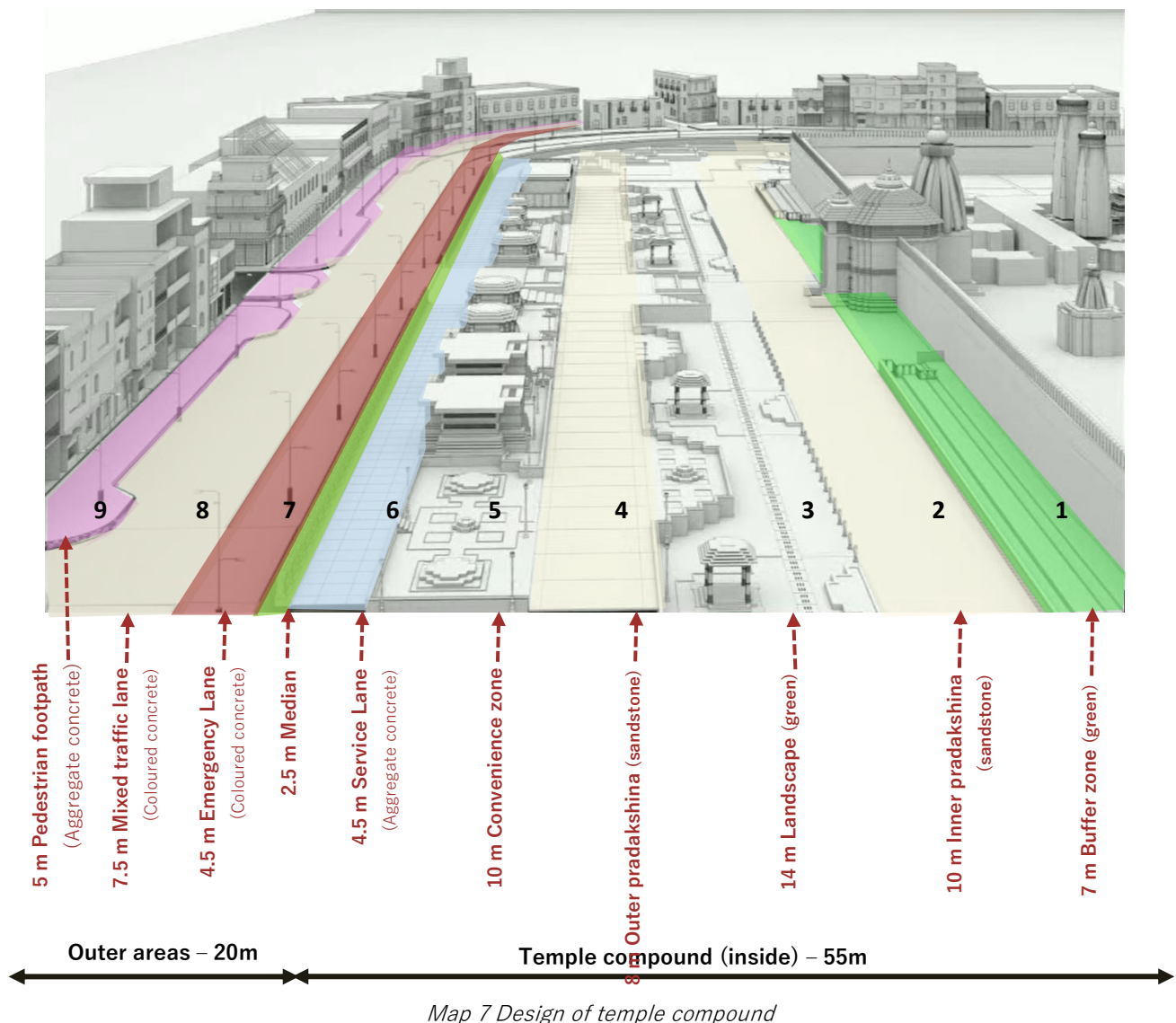
Figure 29 Makeshift cloak rooms



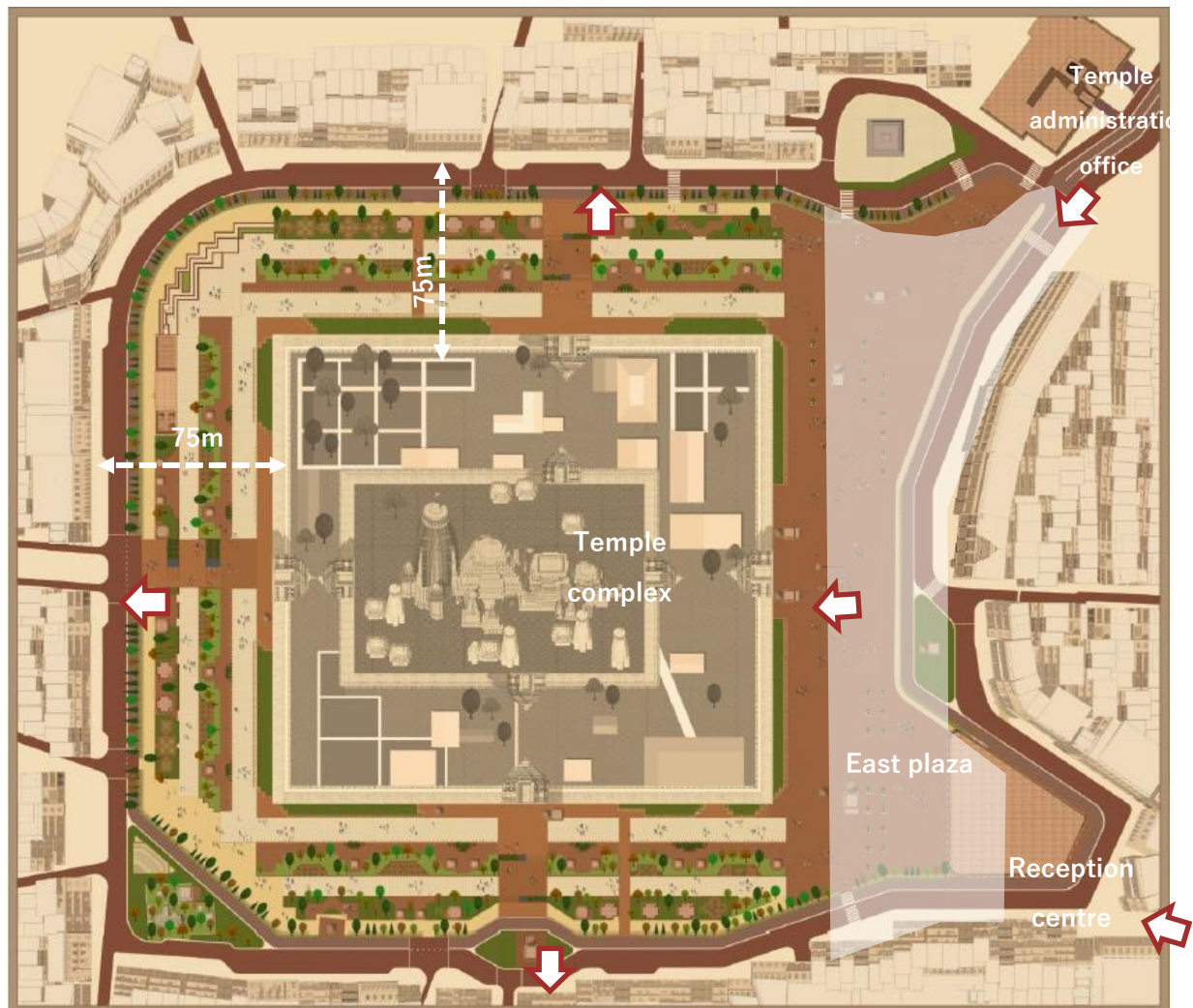
Figure 30 Roadside wood storage

### 2.2.3.2 Design of Temple Compound

- The 75m stretch is divided into 9-layer filter around the 3 sides of temple which has all the tourist facilities. and none is overpowering the main shrine.
- None of the layer is overpowering the main shrine and has the clear site line of the temple in terms of scale.
- There are 25 existing Mathas/ shrines for the service of lord Jagannatha, which are preserved and refurbished.
- Landscape zone will be installed by rainwater collection drains.
- Convenience zone is furthest away from the temple and holds all the activities like toilets, information counters, cloak rooms and all the tourist facilities.



- All pilgrims enter through the east and exits from all the 3 sides
- 2 new buildings have been proposed on the east side of the complex
  - 1) Temple administration office on north-east side of complex.
  - 2) Reception centre on the south-east side. It is the main entry point to the compound which has all the facilities like baggage cloak room and also the city museum.
- East plaza has no built structure because it will be used for chariots assembly for the Ratha Yatra.
- For the pedestrian movement patterns, moveable planters and bollards are installed which acts as barriers for the pedestrians.
- At the entire site, Totem pole are used which is the integrated system of CCTV camera, lighting, signage and speakers all put together in one system.



Map 8 Site plan of temple compound



### 2.2.3.3 Elevation Design

Elevations of different structures in the convenience zone is inspired by earlier temple like Parashurameshvara temple, Rajarani temple, Mukteshwar temple and Siddheshwar temple.



Figure 31 Parashurameshvara Temple, 7th Century AD

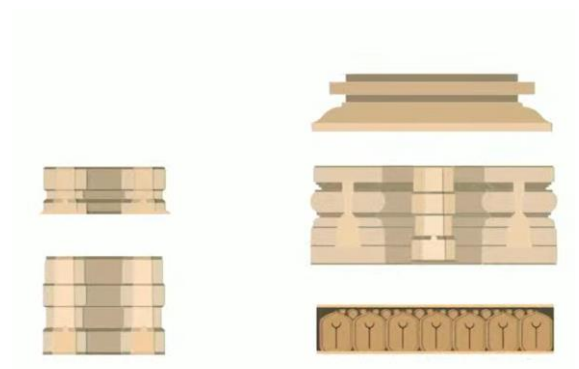


Figure 32 Motifs for plinths



Figure 33 Motifs for roof

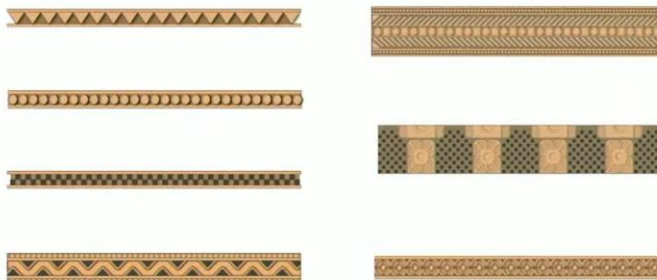


Figure 34 Motifs for ornamentation

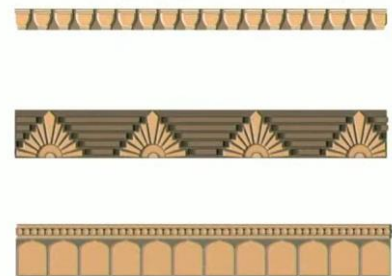


Figure 35 Motifs for lintel

### 2.2.3.4 Parameters Analysis

1. **Landuse** - Dedicated open area & public space are secured for the future.
2. **Routes and pathways** - Node junctions are chamfered to connect from all directions. Proper segregations of mixed traffic lanes, service lanes and pedestrian pathways.
3. **Activities** - Public square or the east plaza is the main attraction for gathering of citizens and tourist with proper landmark and view axis.
4. **Open spaces** - Public open greens are created in close proximity.
5. Continuous Green corridors in between the Public open
6. spaces. Other than open spaces a series of playing places are also there to make the corridor livelier. Inner and outer pradakshina plays an integral part of the city landscape.
7. **Street furniture** - All the bollards, benches, planters etc. are moveable, so that they do not act as any obstruction during rath yatra.



Figure 36 Street furniture

### 3.0 CASE APPLICATION: MATHURA, UTTAR PRADESH

## 3.1 MATHURA DISTRICT

### 3.1.1 DESCRIPTION

Mathura is one of the 7 sacred cities and believed to be the third oldest living city of the world after Kashi (Varanasi) and Rome. It is located in the state of Uttar Pradesh in the Ganga-Yamuna doab region.

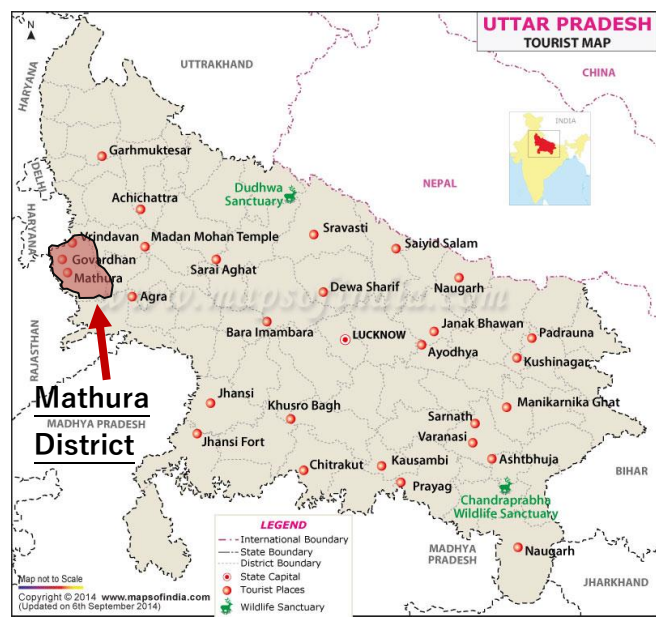
Mathura district covers the boundaries of major sites of Lord Krishna's paramount of Lilas which are the major tourist towns of India –

1. Mathura
2. Vrindavan
3. Barsana
4. Govardhan
5. Nandgaon
6. Gokul.

The nearest international airport to Mathura is located in Delhi, at a distance of 147 km while the closest domestic airport is kheria airport, Agra, located at a distance of 57 km. Taxis are available to the holy city from both these airports.



Map 9 Mathura location on map of India



Map 10 Mathura location on UP state map

**Geographical Features –**

- Latitudes – 27° 14' and 27° 58'N
- Longitudes – 77° 17' and 78° 12'E
- Slope – North to South and South-East
- Area – 3625 square km
- Population – Over 2 million
- Distance from –
  - i. Agra – 57 km;
  - ii. Delhi – 147 km;
  - iii. Jaipur – 221 km
  - iv. Lucknow – 395 km

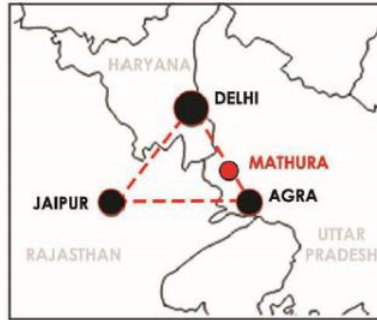


Figure 37 Golden Triangle Delhi-Jaipur-Agra

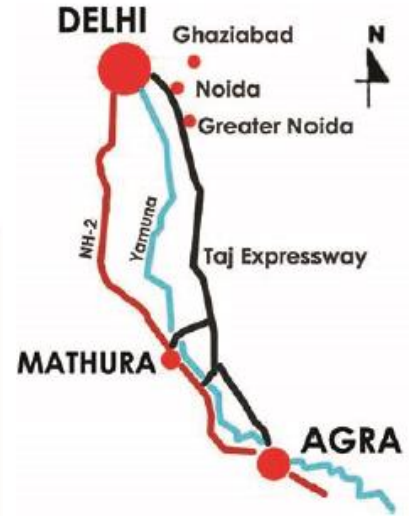


Figure 38 Expressway connectivity



Map 11 Mathura district

### 3.1.2 HISTORY AND EVOLUTION

Mathura was earlier known as **Madhuvan** (as it was thickly wooded) and then name changed to **Madhupura** and now **Mathura**.

Table 3 Evolution of Mathura (Source: Author)

<p><b>Treta Yuga</b></p>	<ul style="list-style-type: none"> <li>➤ Mathura city was <b>established in the forest area of Madhuvan</b> by Satrughna, after killing the demon Lavanasura.</li> <li>➤ It is described as the <b>fortification wall, the moat, the crescent shape, gardens, high rise buildings, prosperity</b> (in terms of crop production, availability of precious jewels) <b>and the commerce of the city.</b></li> </ul>
<p><b>Dvapara Yuga</b></p>	<p><b>Birth of Lord Vishnu</b> in the form of Krishna and is worshipped by many devotees as Sanatana Puri. The <b>city was well developed with proper trade and commerce.</b></p>
<p><b>Indus Valley Civilization</b></p>	<p>Archaeologists have discovered a fragment of <b>Mathura red sandstone from Rakhigiri, site of Indus Valley Civilization in 3<sup>rd</sup> millennium BCE, which was used as a grindstone in sculptures</b></p>
<p><b>Vedic Period</b></p>	<p>Archaeological excavations at Mathura show <b>the gradual growth of a village into an important city during the Vedic age.</b></p>
<p><b>6<sup>th</sup> - 3<sup>rd</sup> Century BCE</b></p>	<ul style="list-style-type: none"> <li>➤ By the 6<sup>th</sup> century BCE Mathura became the capital of the Surasena kingdom.</li> <li>➤ The city was later ruled by the Maurya empire (4<sup>th</sup> to 2<sup>nd</sup> centuries BCE).</li> <li>➤ <b>By 3<sup>rd</sup> century BCE, Mathura became a great city under the name of Méthora</b></li> </ul>
<p><b>2<sup>nd</sup>-1<sup>st</sup> Century BCE</b></p>	<ul style="list-style-type: none"> <li>➤ <b>Indo-Greeks had control over Mathura</b> and thus <b>Silk Route was established to connect East to West</b> joining China, India, Persia, Arabia, Greece and Italy. <b>Silk route facilitated the trade of silk and other fabrics, spices, grains, fruits and vegetables, animal hides, wood and metal work, precious stones, and other items of value</b></li> </ul>

<p><b>4<sup>th</sup>-5<sup>th</sup> Century CE</b></p>	<p>In the reign of Chandragupta Vikramaditya, <b>a magnificent temple of Vishnu was built</b> at the site of Katra Keshavadeva. <b>Settlement grew around the temple.</b></p>
<p><b>Around 400 CE</b></p>	<p>The city became as a centre of Buddhism. The city contained twenty Buddhist monasteries and five Brahmanical temples</p>
<p><b>Around 1018 CE</b></p>	<p><b>Due to the silk trade route</b>, stories were exchanged among traders about “golden bird India” which leads to the <b>looting and destroying of our temples by Mahmud of Ghazni.</b></p> <p>The <b>wall of the city was constructed of hard stone</b>, and <b>two gates opened upon the river flowing</b> under the city, which were erected upon <b>strong and lofty foundations, to protect them against the floods of the river and rains.</b></p> <p>On both sides of the city there were <b>a thousand houses</b>, to which idol temples were attached, all <b>strengthened from top to bottom by rivets of iron, and all made of masonry work;</b> and <b>opposite to them were other buildings, supported on broad wooden pillars</b>, to give them strength.</p> <p>In the <b>middle of the city, Vishnu temple</b> stand larger and firmer than the rest, which can neither be described nor painted.</p>
<p><b>1489 – 1517 CE</b></p>	<p><b>The city was sacked again by Sikandar Lodi</b>, who ruled the Sultanate of Delhi.</p> <p>In the city of Mathura, <b>he caused masjids and bazaars to be built opposite the bathing-stairs leading to the river</b>, and ordered that no Hindus should be allowed to bathe there. He forbade the barbers to shave the beards and heads of the inhabitants, in order to prevent the Hindus following their usual practices at such pilgrimages</p>
<p><b>1804 CE</b></p>	<p><b>Then in 1804 the British established their rule over Mathura and established their cantonment. This was the end of an era whereby the Mathura kings ended their rule and took on the tutelage of the British till Independence in 1947.</b></p>

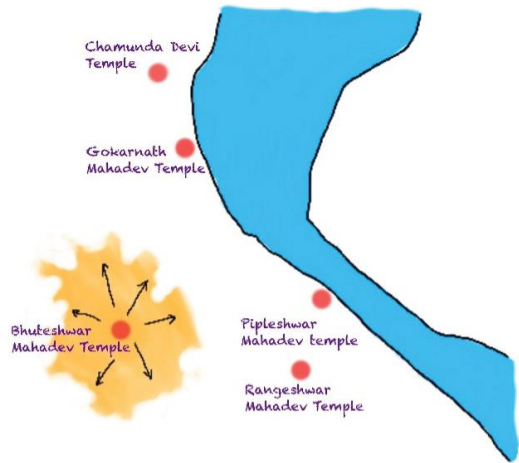


Diagram 4 Mathura in Treta yuga

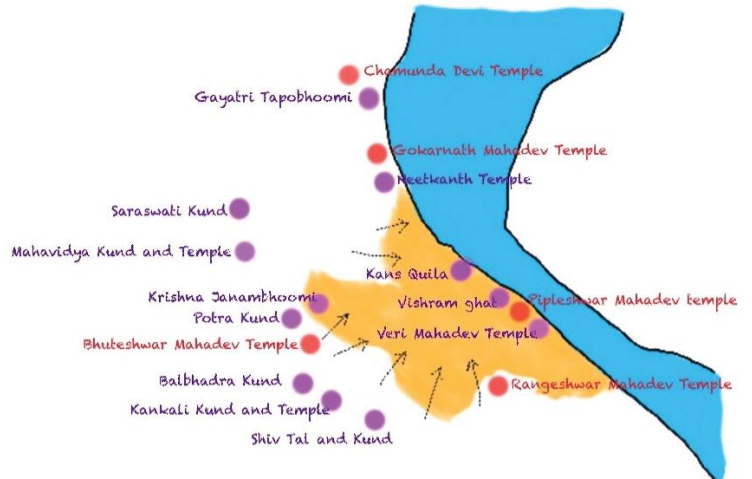


Diagram 5 Dvapara Yuga (5411 - 4310 BC)

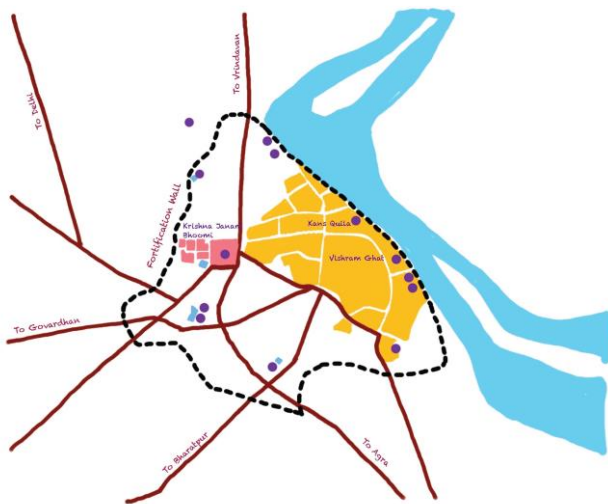


Diagram 6 6th Century BCE



Diagram 7 Mughal period

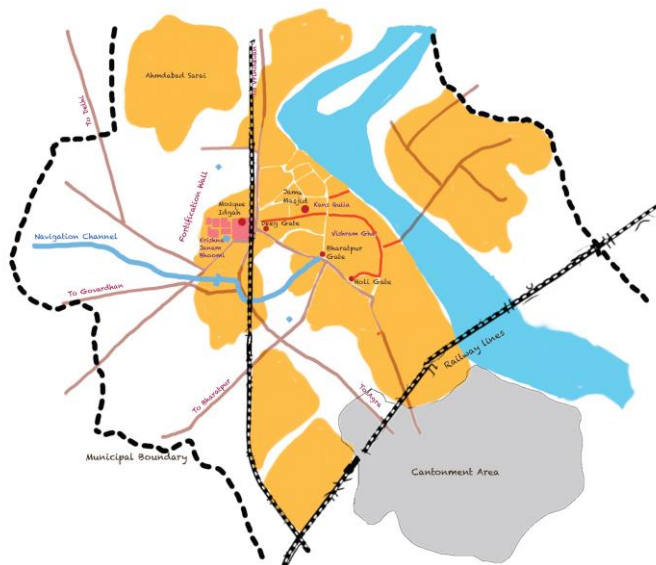


Diagram 8 Mathura under British Raj



### 3.1.3 URBANIZATION PATTERN POST-INDEPENDENCE (1947 - 2022)

- Urban areas in the Mathura district have been expanded a lot over the span of time, especially around Mathura-Vrindavan municipal area.
- The Yamuna River has been narrowed and buildups have been expanding on both sides of the river.
- The direction of spatial geometry of this evolution is towards the Yamuna River because the core city was established at the river's bank.
- Mathura-Vrindavan municipal area has been expanding exponentially over last decade with built-up area growth rate of 55.7% because of Yamuna Expressway NH-2 (Inaugurated in 2012) and NH-44 (Srinagar to Kanyakumari), leads to smooth connectivity from capital Delhi and Agra resulting in the increase of overall tourism in the district.

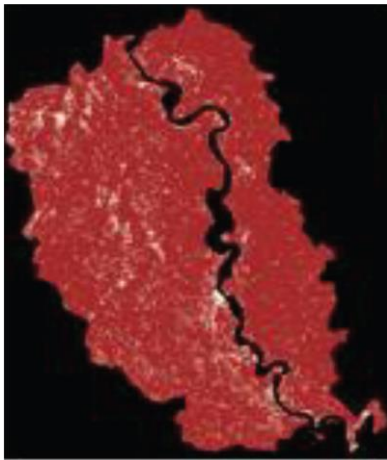


Figure 41\_02-03-1973 (Landsat-1)

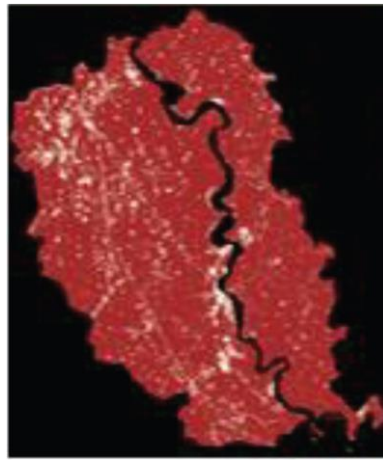


Figure 40\_20-02-1989 (Landsat-5)

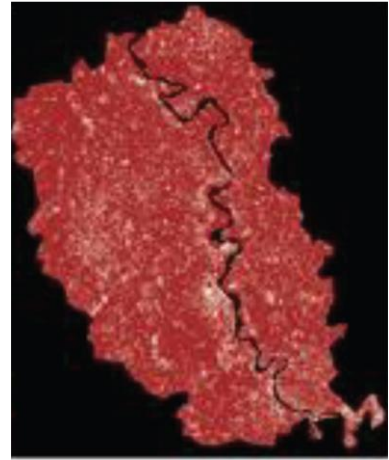


Figure 39\_01-03-1998 (Landsat-5)

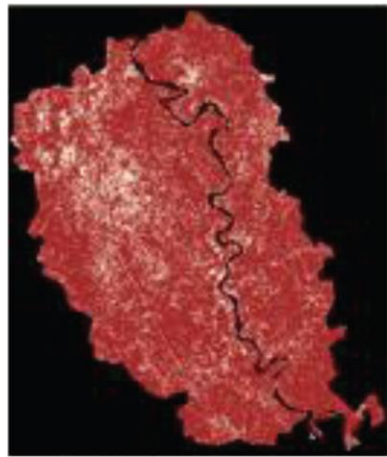


Figure 44\_05-02-2001 (Landsat-5)

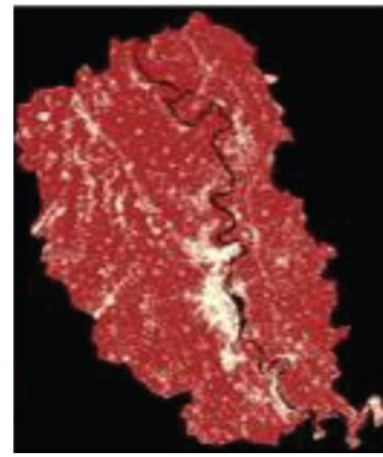


Figure 43\_14-02-2010 (Landsat-5)

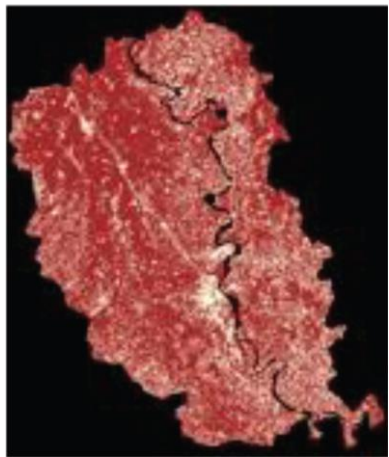




Figure 42\_24-03-2018 (Landsat-8)

- Analyzing each classified image, it can be easily seen that pixels representing the **urban buildups are increasing in every image**. Impervious surfaces are escalating because of **physical infrastructure like buildings and roads**.
- **Buildups are growing towards the both sides of the river** and also the pattern of the Yamuna River has been changed in these 45 years. **In overall duration of these 45 years, the river has been narrowed and buildups have been expanding.**
- The percentage of buildups was **gradually increased from year 1973 to 1980** then **little faster from year 1980 to 1989 and to 1998**. But after year 1998, buildups have expeditiously evolved in year 2001 and a **gradual growth from year 2001 to 2010** then again, **a rapid expansion from year 2010 to 2018**.

Table 4 Built-up percentage

Year	1973	1980	1989	1998	2001	2010	2021
 Built-up%	7.12	7.73	9.10	11.78	14.62	15.35	23.90
 Non-built-up%	92.87	92.27	90.90	88.22	85.38	84.65	76.11

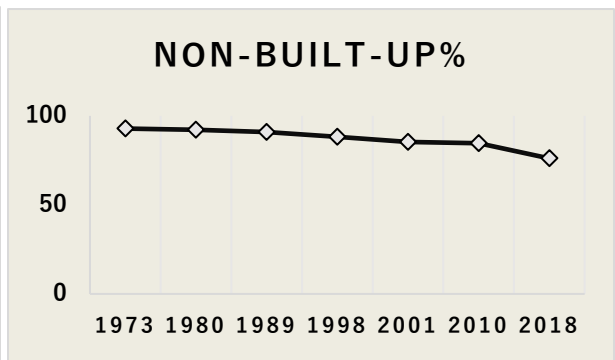
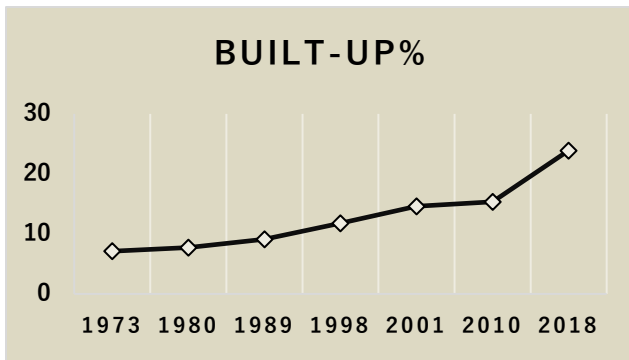
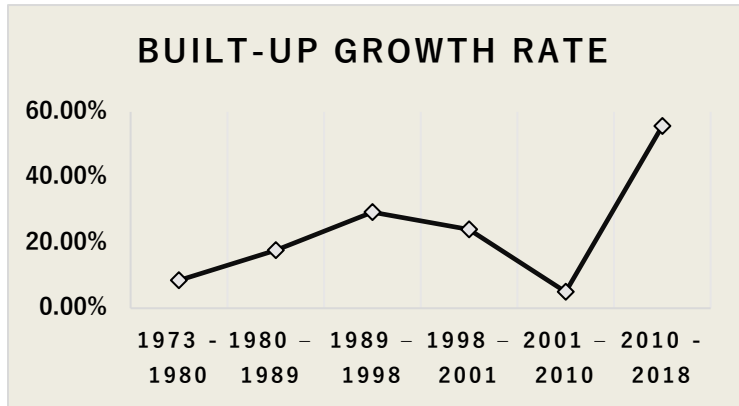


Table 5 Built-up growth rate

Year	Built-up Growth rate
1973 - 1980	8.5%
1980 - 1989	17.7%
1989 - 1998	29.4%
1998 - 2001	24.1%
2001 - 2010	5%
2010 - 2018	55.7%



- As its clear that **from last decade the population has shoot up drastically** and its been predicted that the state will have the population of 8,29,009 in the year of 2035.
- **Population growth rate from 2010 to 2021 is 34.54%** and is predicted to have growth rate of **37.41% from 2021 to 2035**.
- Year wise growth rate of Mathura –
  - 1) Year **2021 - 603,301, 2.55% increase from 2020**.
  - 2) Year 2020 - 588,000, **2.44% increase** from 2019.
  - 3) Year 2019 - 574,000, **2.68% increase** from 2018.
  - 4) Year 2018 - 559,000, **2.76% increase** from 2017.

Table 6 Population growth of Mathura

Year	POPULATION	GROWTH RATE %
1973	144,322	-
1980	158,122	0.96
1989	221,029	39.78
1998	312,946	41.58
2001	349,997	11.83
<b>2010</b>	<b>448,411</b>	<b>28.11</b>
<b>2021</b>	<b>603,301</b>	<b>34.54</b>
<b>2035</b>	<b>829,009</b>	<b>37.41</b>

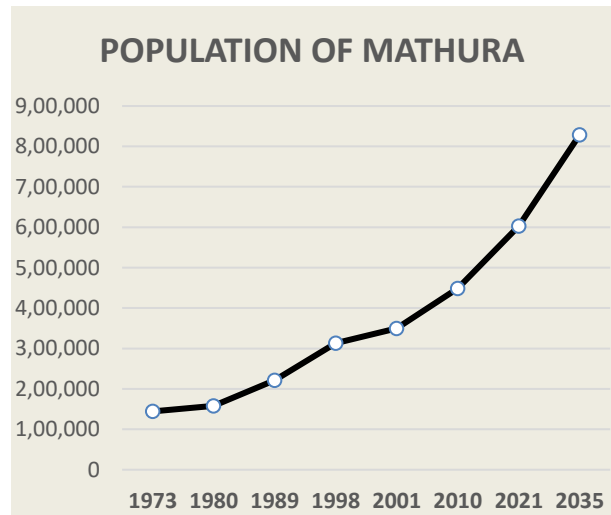
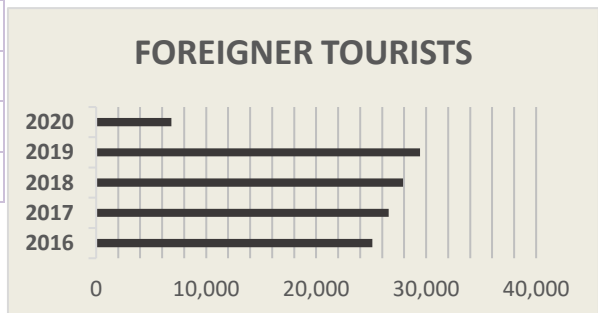


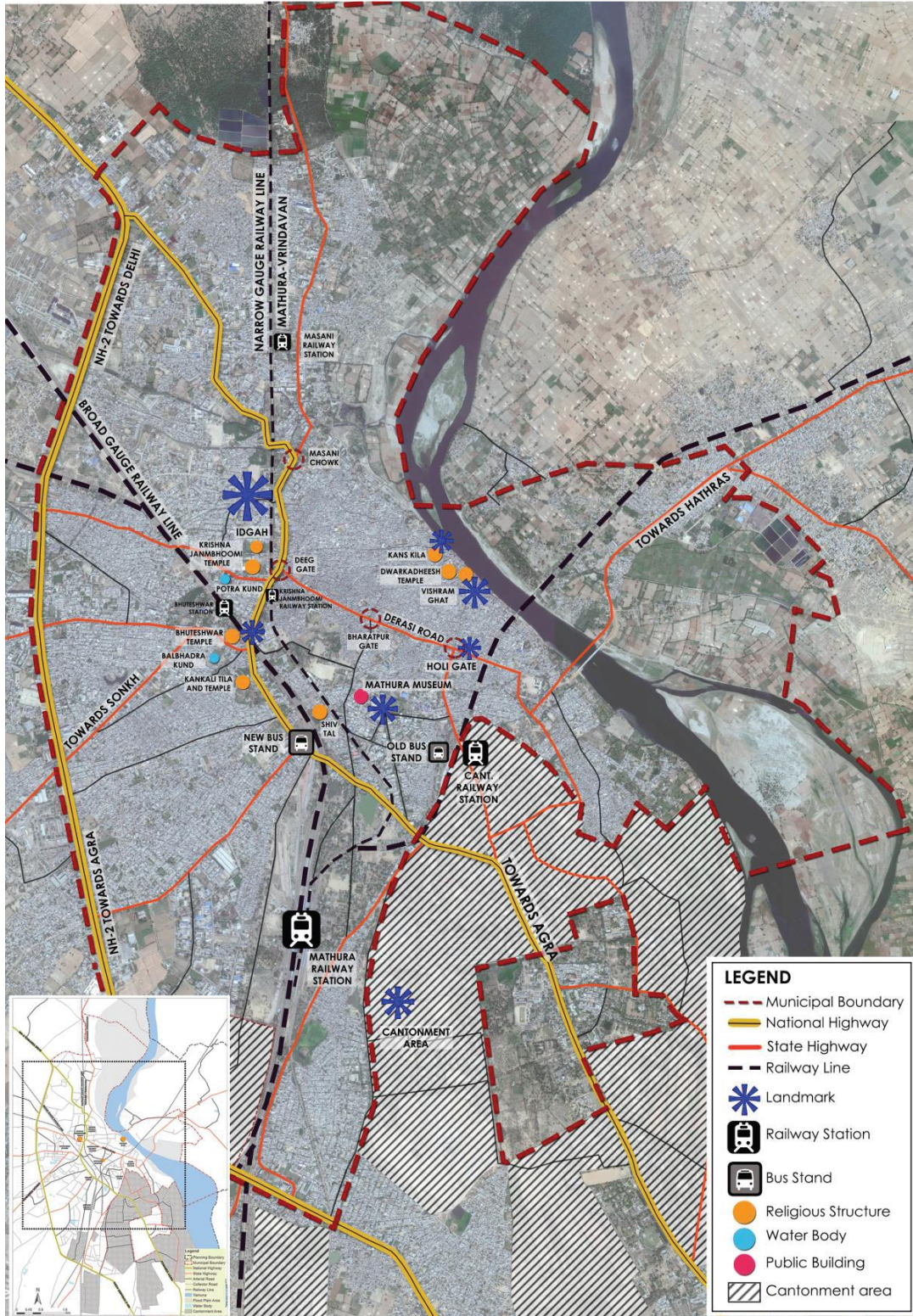
Table 7 Tourist footfall

Year	Indians	Foreigners	Total
<b>2016</b>	66,30,000	25,100	66,55,100
<b>2017</b>	72,26,700	26,605	72,53,305
<b>2018</b>	76,60,300	27,910	76,88,210
<b>2019</b>	<b>82,40,400</b>	<b>29,435</b>	<b>82,69,835</b>
<b>2020</b>	<b>13,64,135</b>	<b>6,837</b>	<b>13,70,972</b>



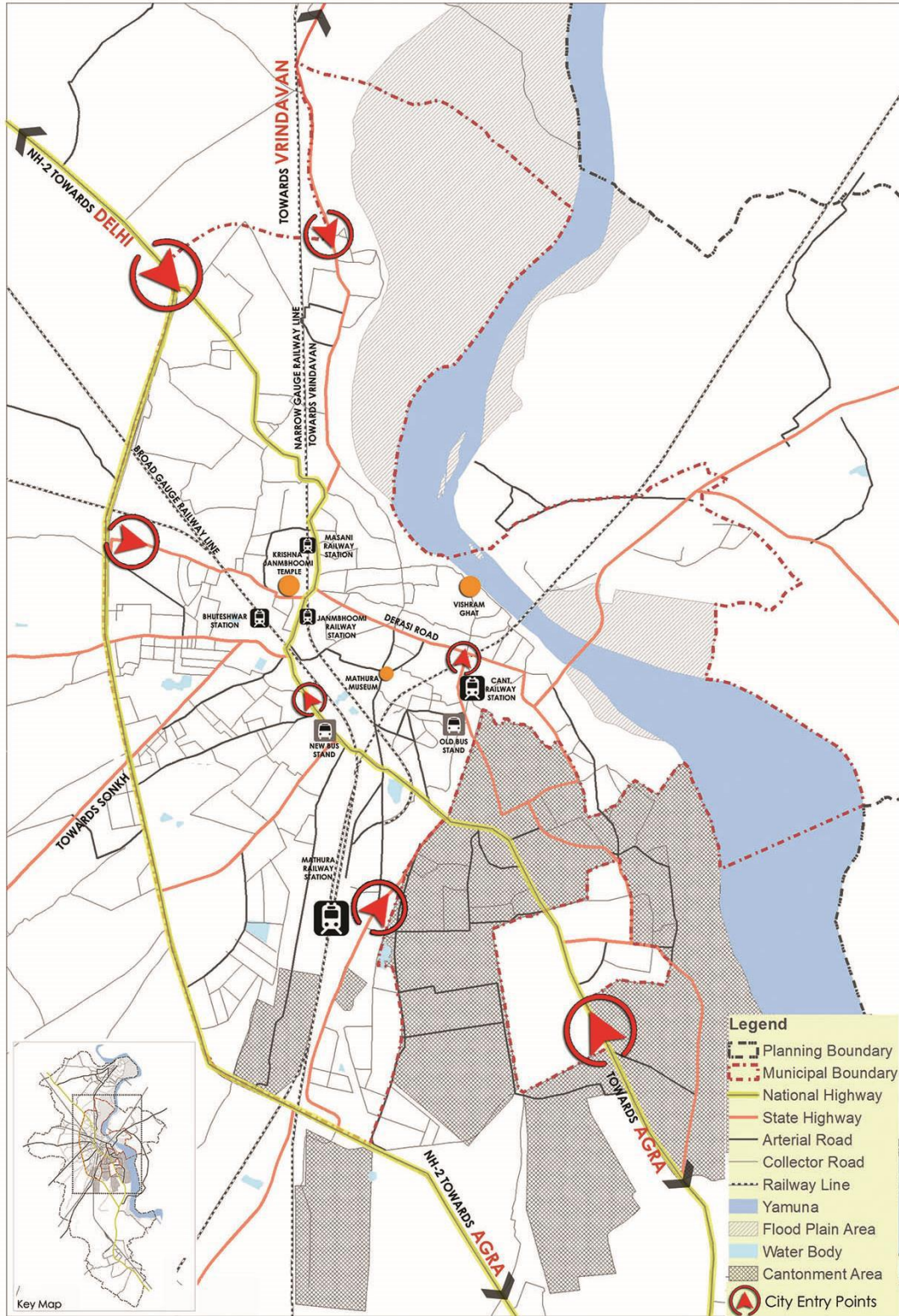
## 3.2 MATHURA- VRINDAVAN MUNICIPAL AREA

### 3.2.1 CITY OVERVIEW WITH LANDMARKS



Map 12 Mathura-Vrindavan municipal area

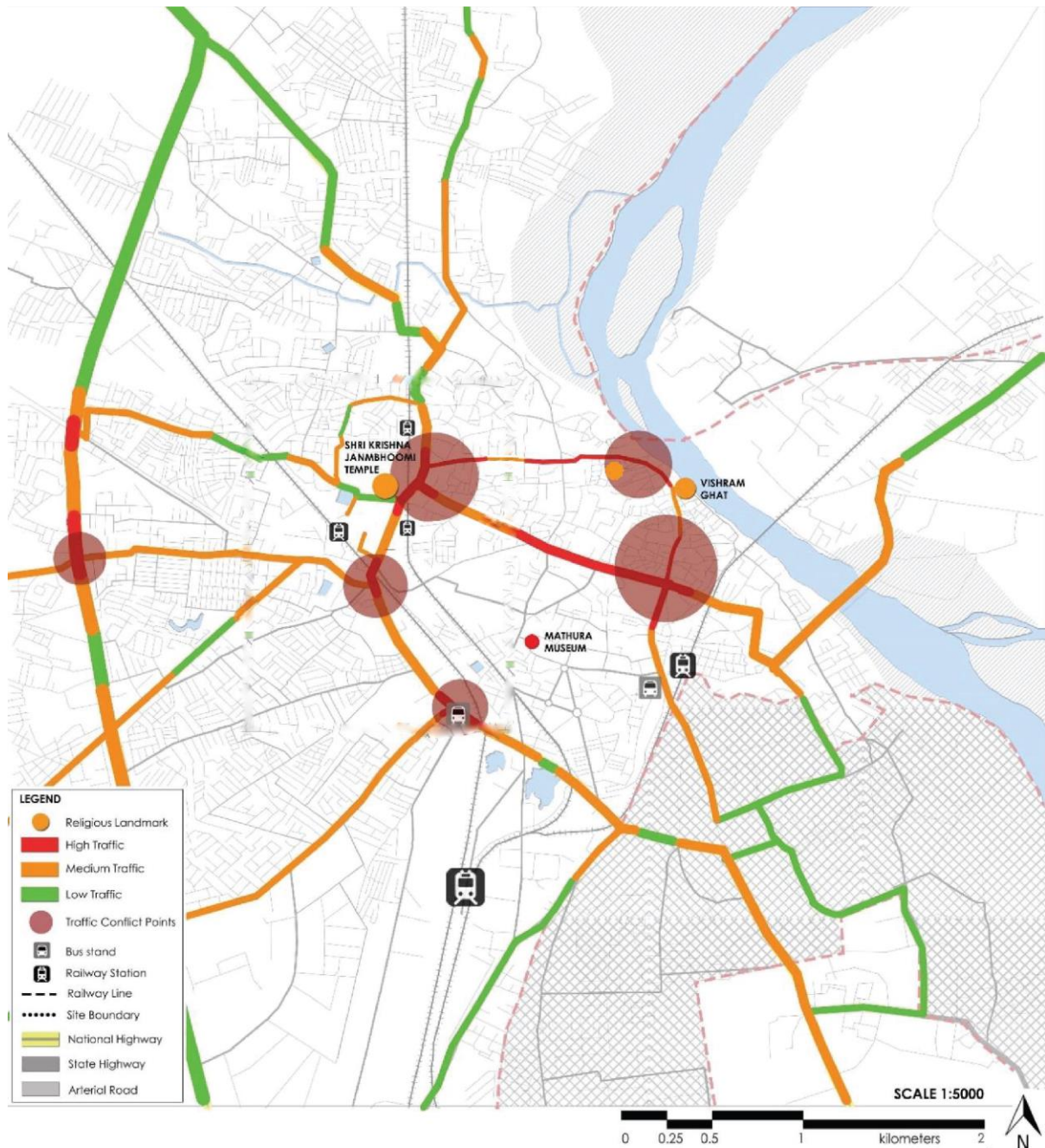
### 3.2.2 CITY NETWORKS AND ENTRY POINTS



Map 13 Mathura city networks and entry points

### 3.2.3 MAJOR CONFLICT ZONES

Traffic analysis of major roads of Mathura city has been done in order to identify the areas within the city which faces the problem of traffic congestion. Being a Pilgrim oriented city, the problem of traffic is likely to create a barrier in the experience of the city.



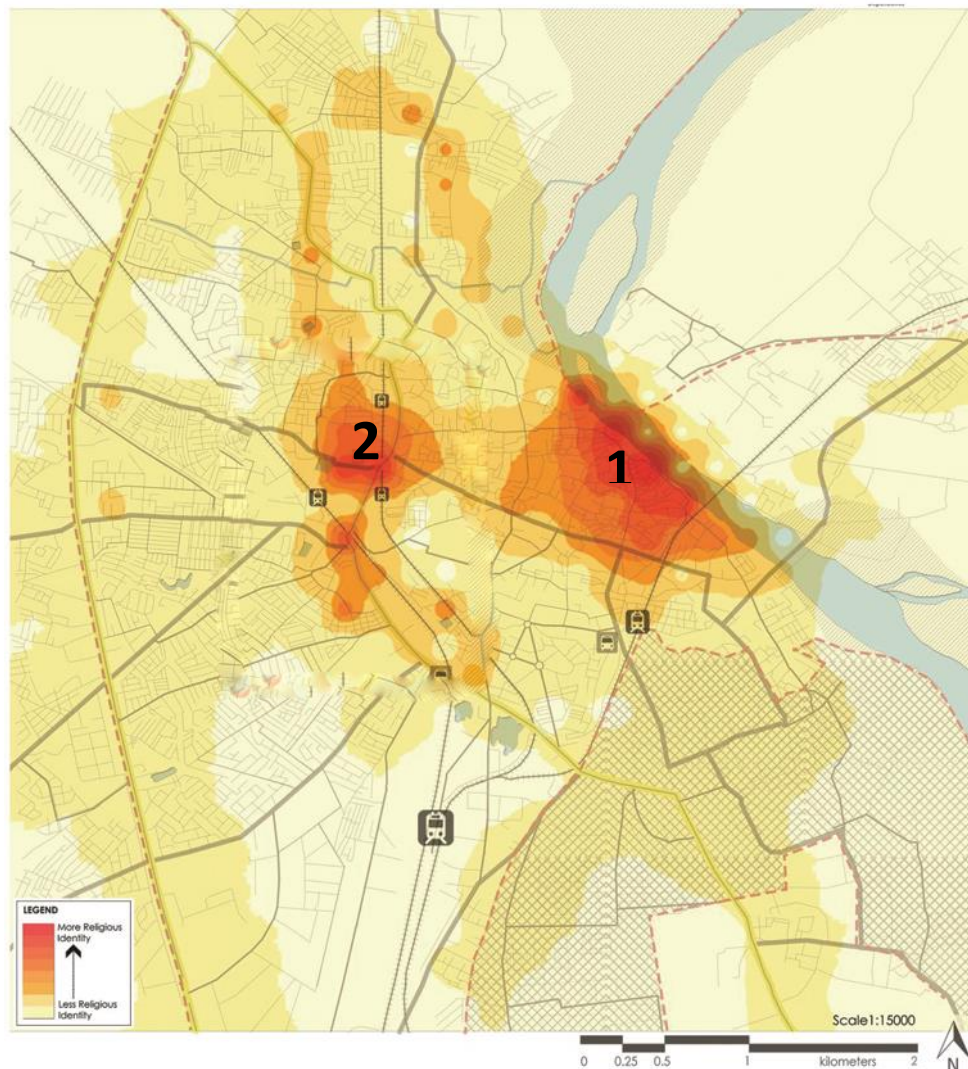
Map 14 Major conflict zones

### 3.2.4 RELIGIOUS MAPPING

Religious mapping is done to figure out the precinct where interventions can be done. The intensity of religious activity including temples, ghats, pilgrimage walkways etc. is shown in the below map where dark orange represents the maximum level of intensity.

Area 1 includes the major Dwarkadhish temple, 10 pilgrimage ghats, pilgrimage walkways and historic bazaars from Mughal times.

The area 2 includes Shri Krishna Janmabhoomi and masjid which comes under the political and religious conflicts in the society. As the case is on-going in the Supreme Court and the faith of the place depends on the future hearings, so I'll be choosing area 1 for the urban renewal interventions.



Map 15 Religious mapping

### 3.3 AREA LEVEL STUDY

#### 3.3.1 DELINEATION

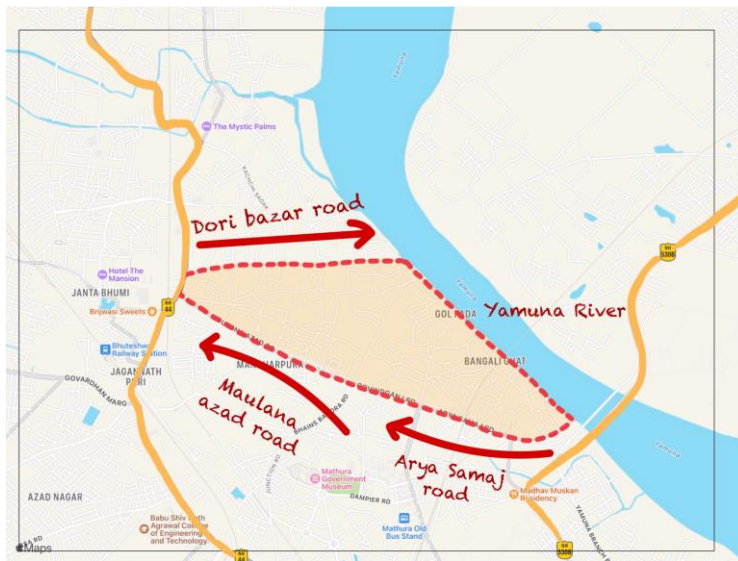
Study area is selected after deeply analyzing all the potential religious sites where interventions can be done. Different conflict zones are marked at the city level to study the major nodes to intervene, to have a bigger impact at a city level. The study area is bounded by the 3 roads which are basically a tourist road circuit.

Dori bazar road, Maulana Azad Road, and Arya samaj road are the major Arterial roads.

**Area - 803940 sq.m (approx. 198 acre)**

**80.394 Ha**

**Perimeter - 4.5 km**



Map 16 Rad bound study area



Map 17 Boundary perimeter



### 3.3.2 Major Landmarks



ks

### 3.3.3 Major Nodes



Map 19 Major nodes

### 3.3.4 LANDUSE ANALYSIS

- Predominant landuse is residential.
- On the major Arterial and Sub-arterial roads, most of the buildings are used for retail, commercial and wholesale purposes









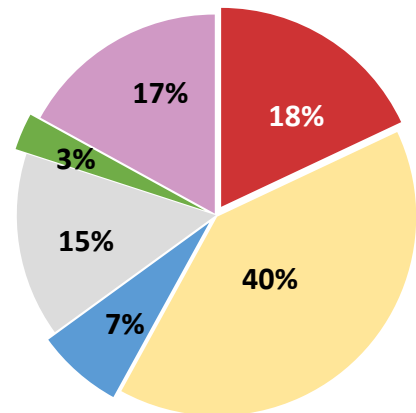
**Total Study Area – 803940 sq.m (198.6 acres)**

**80.394 Ha**

**Perimeter – 4.5 km**

*Table 8 Landuse percentage of study area*

	S No.	Landuse Category	%	Area (Sq.m)
	1	Residential (including Dilapidated structures)	40	3,21,676
	2	Public-Semi Public	7	56,276
	3	Commercial	18	1,44,709
	4	Religious building & Heritage	17	1,36,670
	5	Transportation & Communication	15	1,20,591
	6	Recreational	3	24,118

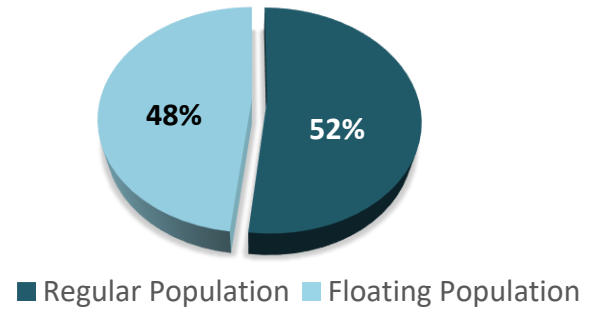


### 3.3.5 FOOTFALL IN STUDY AREA

Mathura comes under Class 1 – Below Million+ City (Census 2011)

Table 9 Footfall in study area

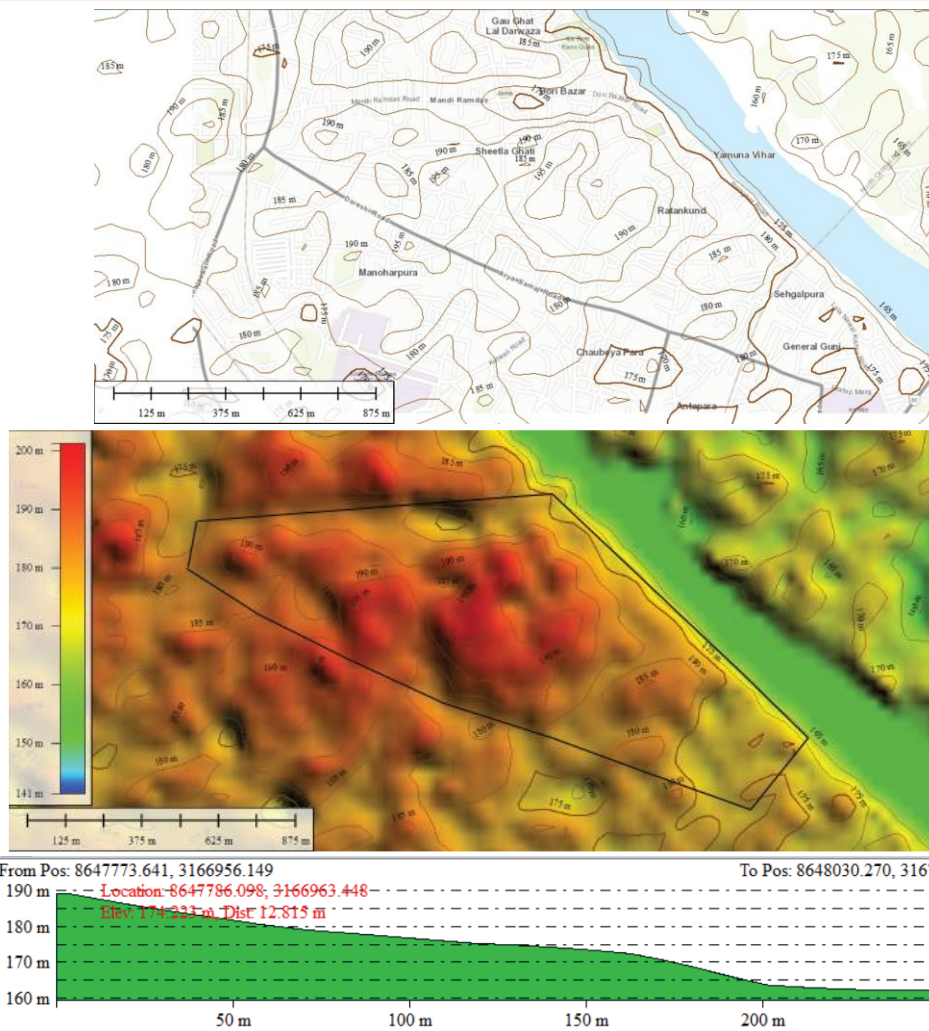
Type	Population
Regular Population	6.5 Lac (whole city) 33% of 6.5 lac = <b>2.15 lac</b>
Floating Population	82 lac (before pandemic) 6.8 lac/ month <b>2 lac/ day</b>



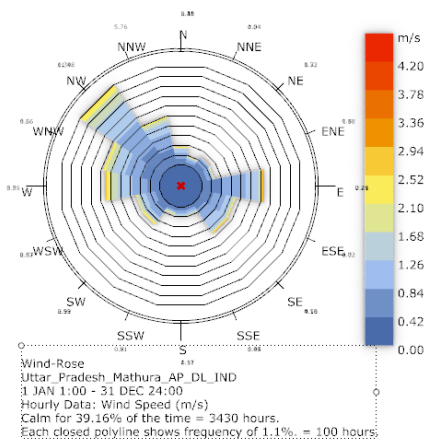
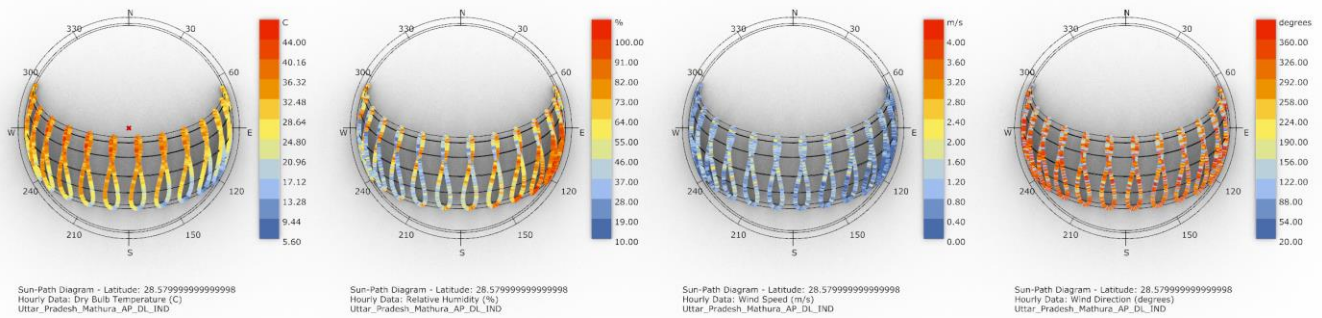
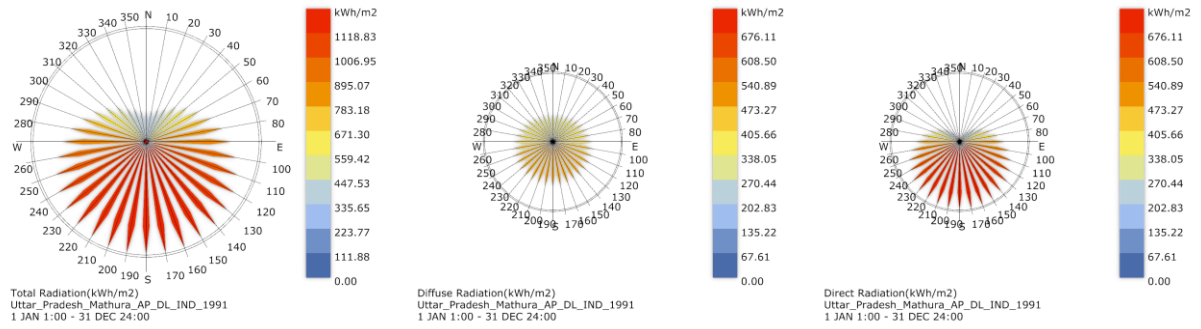
**Total footfall – 4.15 lac / day**

**Density of Study area – 5162 pph**

### 3.3.6 LANDFORM OF STUDY AREA



### 3.3.7 CLIMATE ANALYSIS OF STUDY AREA



### 3.3.8 FIGURE-GROUND RELATIONSHIP

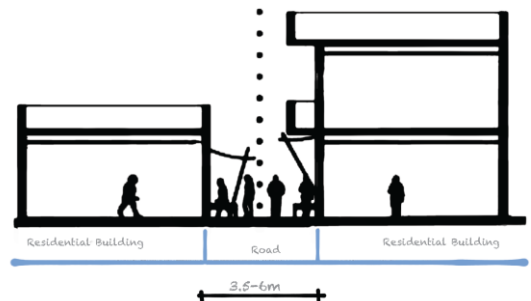
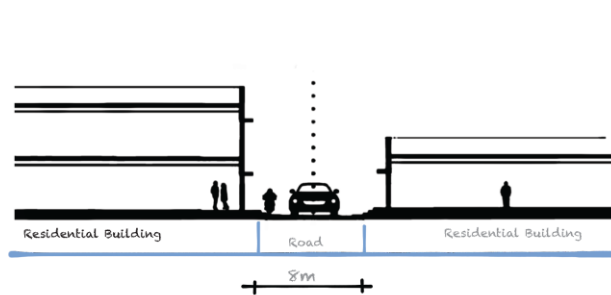
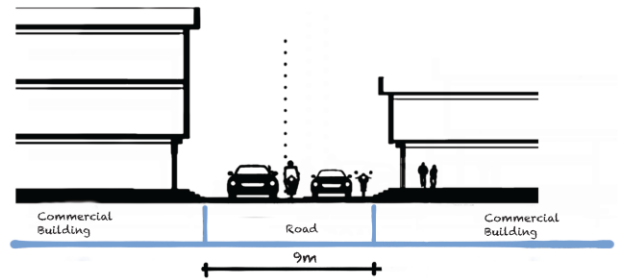
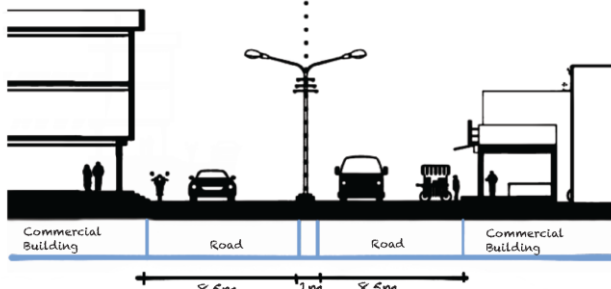
- Figure ground relationship plan of the study area depicts that there is less open space as compared to the built form and density.
- **Urban Pattern:** The major streets show an irregular geometric pattern whereas the local streets show an organic pattern of growth.
- **Urban Grain & Texture:** Highly densed population with fine urban grain & dense texture. The below map shows that there are encroachments at various parts and no proper regulations had been followed at the site developments.



### 3.3.8 HIERARCHY OF STREETS



— National Highway    — Sub arterial road    — Local road  
— Arterial road    — Collector road



Map 27 Access Road section

Table 10 Hierarchy of roads

S No.	Types of Roads	ROW	Road Width
1	National Highways	30 m	21 m (6 lanes of 3.5 m each)
2	Arterial Roads	18 m	12-15 m
3	Local Roads	12 m	8 m
4	Access Streets	8 m	8-6 m

### 3.3.9 SPACE SYNTAX OF STUDY AREA

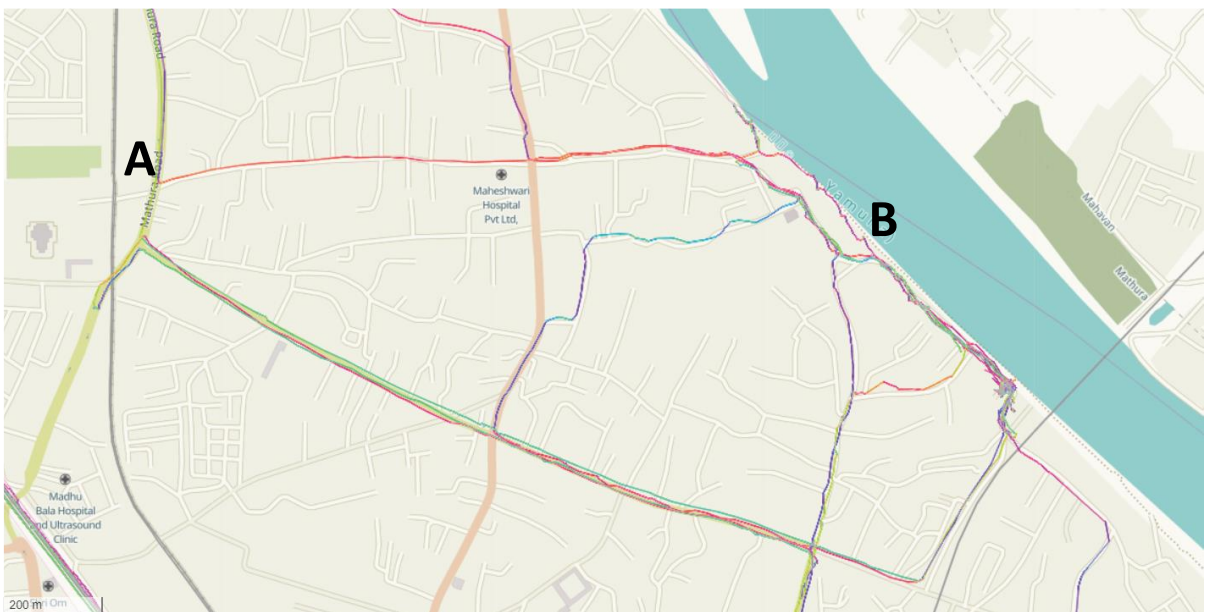


Map 28 Space syntax map



Less traffic

High traffic



Preferred Route Choice from reaching Point “A” to “B”

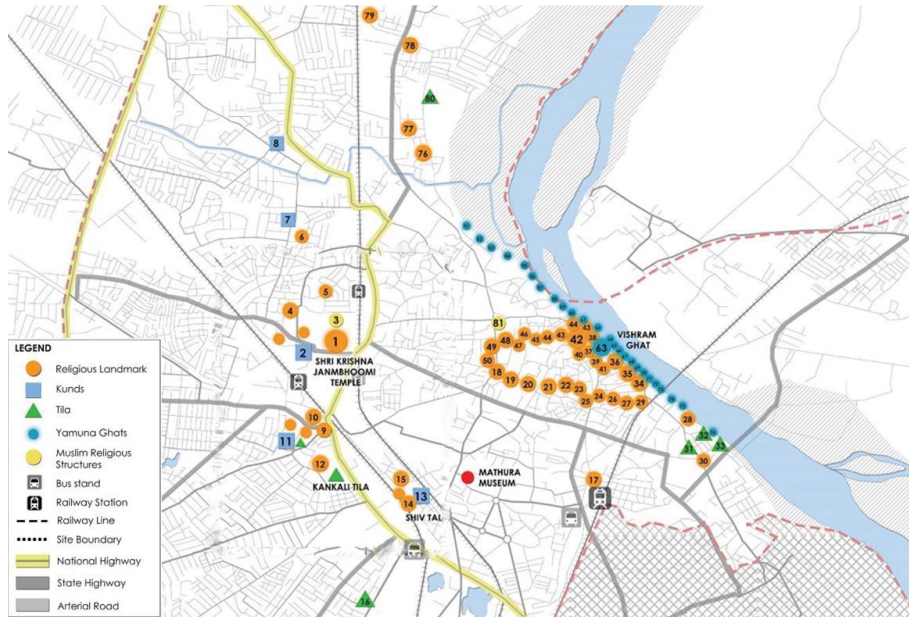
### 3.3.10 MAPPING OF RELIGIOUS ASSETS IN STUDY AREA

Table 11 Religious assets data

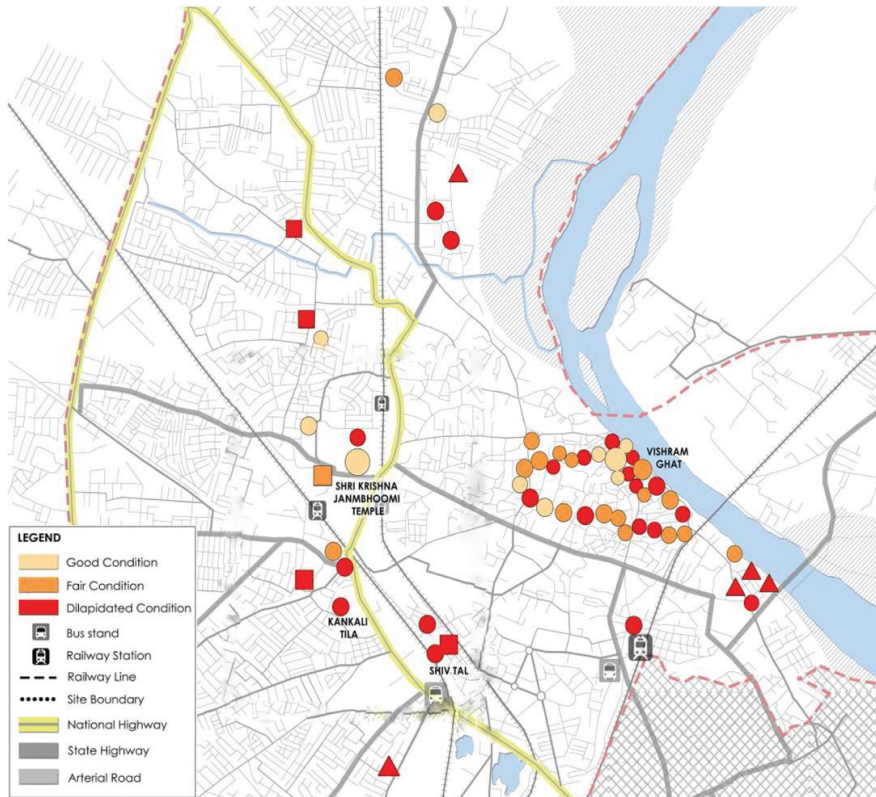
		Imp		Value Assessment		Tempor	State of Preservation			
		Local	National	Historical Narrative	Sacred Geography	Festivals	Good	Fair	State of Decay	Danger of Disappearance
1	Krishna Janmbhoomi Temple									
2	Potra Kund									
3	Idgah Mosque									
4	Keshav Dev Ji Temple									
5	Galteshwar Mahadev									
6	Mahavidya Temple									
7	Mahavidya Kund									
8	Saraswati Kund									
9	Kos Minar									
10	Bhuteswar Temple									
11	Balbhadra Kund									
12	Kankali Temple and Tila									
13	Shiv Tal									
14	Radha Krishna Temple									
15	Shiv Temple									
16	Gopal Khera									
17	Rangeshwar Temple									
18	Dheergh Vishnu Temple									
19	Mathura Devi Temple									
20	Gopal Sundari Temple									
21	Padmnath Temple									
22	Narsingh Temple									
23	Shatraghn Temple									
24	Veer Bhadra Temple									
25	Gopal Nath Temple									
26	Shri Nath ji Temple									
27	Ram Temple									
28	Dau ji Temple									
29	Shyama Shyam Temple									
30	Surya Temple									
31	Naag Tila									
32	Dhruv Tila									
33	Saptrishi Tila									
34	Veer Madhav Temple									
35	Pipleshwar Mahadev									
36	Sati Burj									
37	Laxmi Narayan Temple									
38	Yamuna Temple									
39	Raj Rajeshwar Mahadeva									
40	Raja Damodar Temple									
41	Mahaprabhu Baithak									
42	Dwarkadheesh Temple									
43	Bada Hanuman Temple									
44	Kans Kila									
45	Shwet Varaha Temple									
46	Adi Varaha Temple									
47	Kalia Mardan Temple									
48	Shrinath ji Temple									
49	Ganga Temple									
50	Keshav Dev Temple									
51	Manikarna Ghat									
52	Assi Ghat									
53	Sant Ghat									
54	Swami Ghat									
55	Rani Ghat									
56	Dola mala Ghat									
57	Gau Ghat									
58	Dauji Ghat									
59	Rameshwar Ghat									
60	Lakhpatiya Ghat									
61	Krishnaganga Ghat									
62	Chkkratirth Ghat									
63	Vishram Ghat									
64	Sati Ghat									
65	Raja Chat									
66	Shringar Ghat									
67	Prayag Ghat									
68	Shyam Ghat									
69	Ram Ghat									
70	Dauji Ghat									
71	Rishi Ghat									
72	Dandi Ghat									



73	Bengali Ghat								
74	Triloi Ghat								
75	Surya Ghat								
76	Gopal Ghat								
77	Neelkantheshwar Temple								
78	Gokarnath Temple								
79	Gayatri Tapobhoomi								
80	Chamunda Devi								
81	Ambrish Tila								
82	Jama Masjid								



Map 29 Location of religious assets



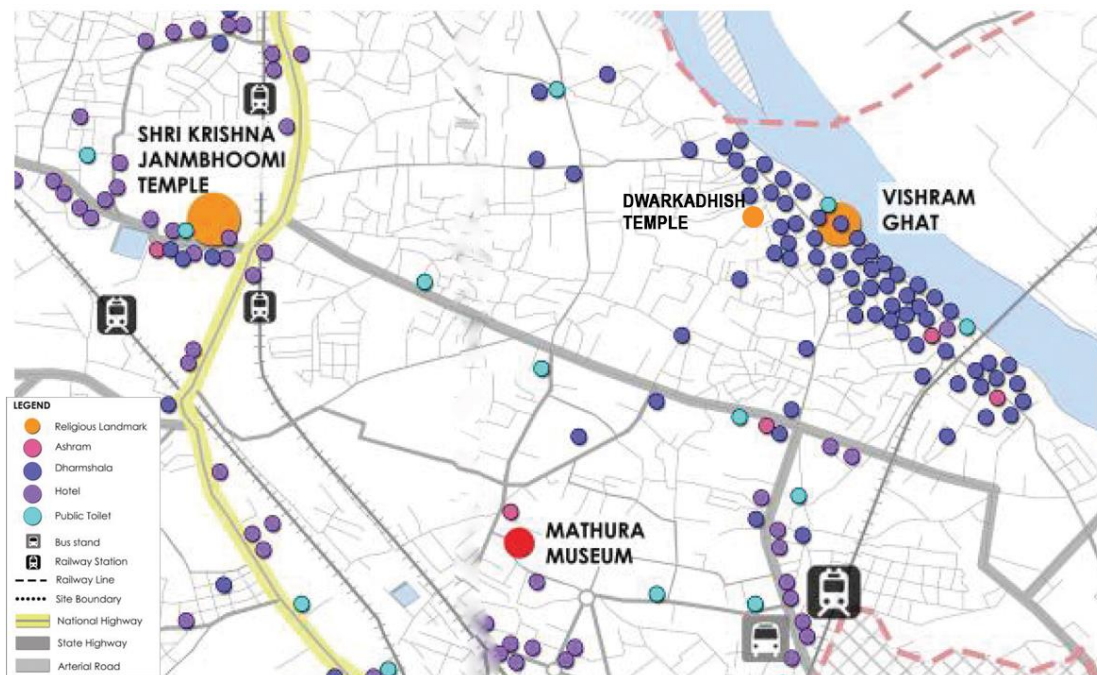
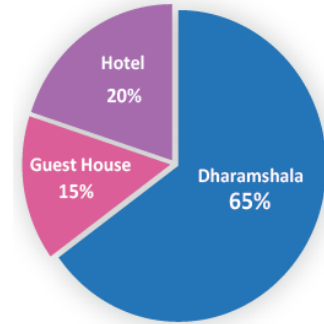
Map 30 Physical condition of religious assets in study area

### 3.3.11 TOURIST INFRASTRUCTURE GAPS

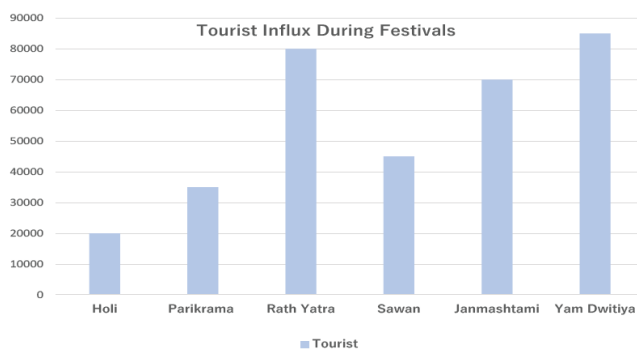
The city consists more of dharmshala than Hotels or /guest house. Also, according to the primary survey 65% of pilgrims preferred staying in dharmshala than in hotels. Present availability of Accommodation facility as per the JNNURM report in the city is –

- 250 Dharmshala
- 3 Guest Houses with 15 rooms each, and
- 28 Hotel with 20 rooms each.

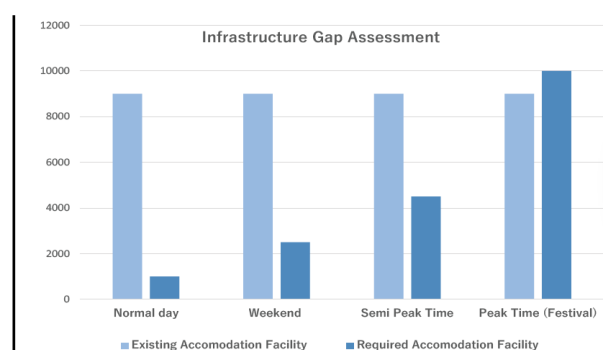
It can be inferred that the present accommodation facility is sufficient to cater to the floating population on normal days, Weekends and during semi-peak time, but during the peak time that is during festivals, accommodation availability becomes an issue.



Map 31 Existing tourist infrastructure



Graph 1 Tourist influx during festivals



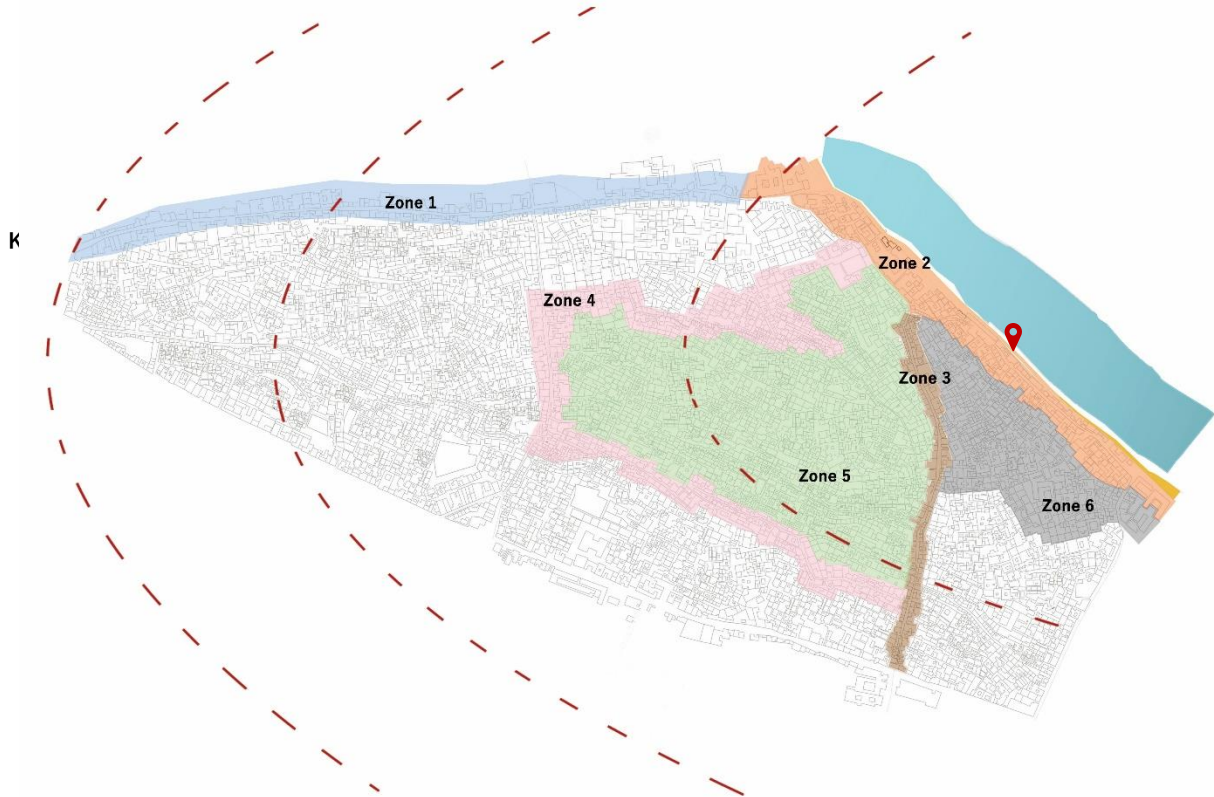
Graph 2 Infrastructure gap assessment







### **3.3.12 STREET ANALYSIS OF TEMPLE PRECINCT**

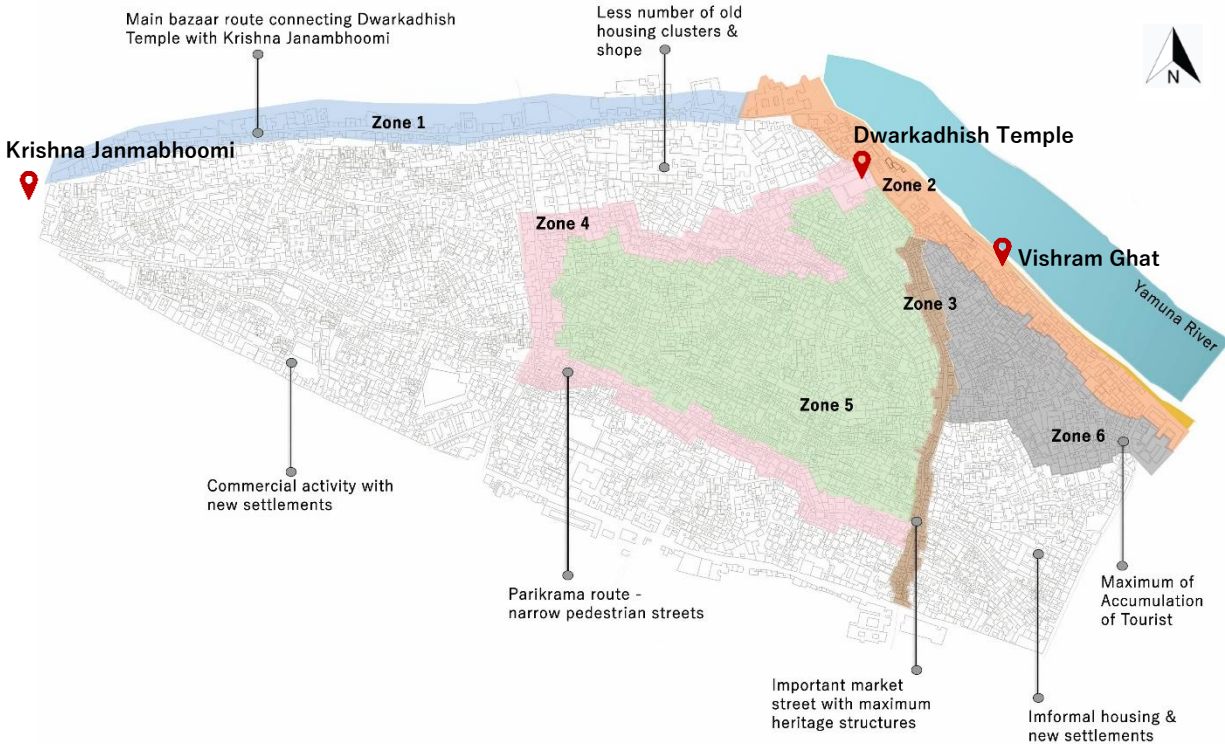
### **3.3.13 ACTIVITY MAPPING - GHATS AND STREET RITUALS**

### 3.4 ZONAL LEVEL STUDY

Study area is divided into various zones based on character, form, tourist movement and activities of the urban places.



	Zone 1	<b>Main Route connecting Ghats and Temples with Krishna Janmabhoomi</b>
	Zone 2	<b>Pilgrimage Importance</b> Dwarkadhish Temple & Vishram Ghat
	Zone 3	<b>Chatta Bazaar</b> High Portion of Heritage Buildings and Market
	Zone 4	<b>Parikrama route during festivals</b> Old housing clusters
	Zone 5	<b>High portion of mix urban fabric</b> (new and old)
	Zone 6	<b>Maximum Dharamshala and Tourist Amenities</b>



Map 33 Zonal Distribution of study area 2

- **Zone 1** – This zone has the maximum traffic which joins Shri Krishna Janmabhoomi with Dwarkadhish temple and Ghats. Along this route there is Jama Masjid which also attracts a lot of tourists. The zone bounds between 2 major conflict zones of the city. This makes it one of the most important routes.
- **Zone 2** – This zone includes most of the major pilgrimage activities near Dwarkadhish temple and 10 ghats. From this zone the Mathura city started developing outwards and is one of the oldest & dilapidated infrastructure which needs to be taken care of.
- **Zone 3** – Chatta bazaar is one of the oldest markets introduced back in the Mughal times. This zone is of utmost importance as the bazaar represents the diminishing culture unique to Mathura city.
- **Zone 4** – This zone is the pilgrimage pathway which is most active during the festival seasons. The pathway makes a parikrama route which meets to zone 2 at the end.
- **Zone 5** – This zone has the maximum number of tourist infrastructure and mixed and high portion of mix urban fabric.
- **Zone 6** – This zone has maximum number of dharamshalas in the study area, so the tourist influx here during festivals is the maximum.

**3.4.1 ZONE 1**

**3.4.2 ZONE 2**

**3.4.3 ZONE 3**

## 3.5 SITE LEVEL STUDY

## 4.0 DESIGN PROPOSALS





## 4.1 DESIGN GUIDELINES

## 4.2 URDPFI GUIDELINES OF RELIGIOUS PRECINCT

### 4.2.1 PROPOSED ROAD STRUCTURE

Table 12 Proposed Road structure

S No.	Types of Roads	Space Standards (m)	Lane width (for cars)	Lane width (for bus)
1	National Highways	50 – 60	3.0 – 3.5 m/lane	3.5 m (segregated)
2	Arterial Roads	50 – 80	3.0 – 3.5 m/lane	3.5 m (segregated)
3	Local Roads	12 – 20	2.75 – 3.0 m/lane	Not required
4	Access Streets	6 - 15	2.75 – 3.0 m/lane	Not required

S No.	Description of Footpath as per adjacent landuse	Required Width
1	Minimum free walkway width and residential/ mixed use areas.	1.8 m
2	Commercial / Mixed use areas	2.5 m
3	Shopping Frontages	3.5 m to 4.5 m
4	Bus Stops	3.0 m
5	High Intensity Commercial Areas	4.0 m

### 4.2.2 GUIDELINES FOR CYCLES TRACKS

Table 13 guidelines for cycle tracks

S No.	Description	Arterial Roads	Local Roads	Access Roads
1	Non-Motorised Vehicle	Segregated Cycle Track	Cycle Lane	Mixed / Traffic
2	Location	Between Carriageways or street parking and footpath on either edge of the carriageway	On the edge of the carriageway, adjacent to the footpath or parking	Not Applicable
3	Gradient	1:12 to 1: 20	1:12 to 1: 20	1:12 to 1: 20
4	Lane width	2.2 m to 5.0 m	1.5 m to 2.5 m	Mixed with Motorized Vehicular Traffic
5	Minimum Width	2.5 m for a two lane cycle track and 1.9m for a common cycle track and footpath	1.5 m	1m (painted)

Source: URDPFI Guidelines (guidelines for historic/religious/tourism city)

## 4.2.3 GUIDELINES FOR PARKING

Table 14 Parking standards

S No.	Landuse	Parking Standards
1	Residential Plot – Plotted Housing	2 ECS in plot size 200 – 300 sq.m. and 1 ECS for every exceeding 100 sq.m. built up area.
2	Guest House/ Lodging & Boarding House/ Dharamshala	2 ECS / 100 sq.m. of built up area
3	Hotel	3 ECS / 100 sq.m. of floor area
4	Local shopping centre	2 ECS / 100 sq.m. of floor area
5	Community Centre	3 ECS / 100 sq.m. of floor area
6	Recreational Club	2 ECS / 100 sq.m. of floor area
7	Auditorium / Meditation or Spiritual Centre	2 ECS / 100 sq.m. of floor area
8	Convention Centre	2 ECS of floor area
9	Old age home/ Working women and men hostel/ orphanage/ Children's Centre/ Night Shelter	1.8 ECS of floor area
10	Hospital	2 ECS / 100 sq.m. of floor area
11	Mixed Land use	2 ECS / 100 sq.m. of floor area

Source: URDPFI Guidelines (guidelines for historic/religious/tourism city)

S No.	Vehicle Type	ECS	S No.	Type of Parking	Ares in sq.m. per ECS
1	Car/ Taxi	1.00	1	Open	23
2	Two-Wheeler	0.25	2	Ground Floor Covered	28
3	Auto Rickshaw	0.50	3	Basement	32
4	Bicycle	0.10	4	Multi-Level with Ramps	30
5	Trucks/ Buses	2.50	5	Automated Multilevel with Lifts	16
6	Emergency Vehicles	2.50			
7	Rickshaws	0.8			

## 4.2.4 NORMS FOR PUBLIC TOILETS

S No.	Type	Norms of Toilets (Acc. To URDPFI)
1	Public Toilet	On roads and for open areas - @ every 1 km, including parks, plaza, open air theatre, swimming area, car parks and fuel stations. Toilets shall be disabled-friendly and in 50-50 ration of males and females. Provision may be made for Public Rooms.
2	Signage	Signboards on main streets shall give directions and mention the distance to reach the nearest public convenience of visitors. Helpline number shall be pasted on all toilets for complaints / queries.
3	Modes	Pay and use or Free In pay and use, toilets entry is allowed on payment to the attendant or by inserting coin and user gets 15 to 20 minutes.
4	Maintenance / Cleaning	The toilet should have both men and women attendants. Alternatively automatic cleaning cycle covering flush, toilet bowl seat, handwash basin, disinfecting of floor and complete drying after each use can be adopted which takes 40 seconds. Public Toilets shall be open 24 hours.

Source: URDPFI Guidelines (guidelines for historic/religious/tourism city)

Toilet Seats	Bath Units	Urinal Units	Cloths Washing Area	Description	Optimum (mm)	Minimum (mm)
1 seat for 35 Men	1 unit for 50	1 unit for 200 – 300	4 to 5 sq.m. per 10 toilet seats	Toilet Cubical	900 X 1200	750 X 900
1 seat for 25 Women	Users	Users		Bathrooms	1050 X 1200	900 X 1050
<b>Wash Basin – 1 per WC and urinal provided</b>				Urinals	575 X 675	500 X 600
				Washing Area	1750 X 1500	1200 X 1500

Source: Guidelines on Swachh Bharat Mission – Urban, GOI 2014)

## 4.2.5 NORMS FOR SOCIO-CULTURAL ACTIVITIES AND GREEN AREAS

S No.	Category	Population Served per Unit	Land Area Requirement (sq.m.)
1	Community Room	5000	750
2	Community Hall / Library	15000	2000
3	Meditation and Spiritual Centre	1 Lakh	5000
4	Recreational Club	1 Lakh	10,000
5	Old age home	5 Lakh	Maximum 1000 sq.m subject to availability of land
6	Working Women – Men Hostel	10 Lakh	Maximum 1000 sq.m. subject to availability of land
7	Night Shelter	10 Lakh	Maximum 1000 sq.m subject to availability of land
8	Socio-Cultural Centre/ Exhibition cum fair ground	10 Lakh	15 Ha (NBC)
9	International Convention Centre	City Level	As per Requirement

Source: URDPFI Guidelines (guidelines for historic/religious/tourism city)

**Hierarchy of Organized Green Areas** (Acc. To URDPFI Guidelines)

<b>S No.</b>	<b>Planning Unit</b>	<b>Number of Organized Green Spaces</b>
1	Housing Cluster	3 – 4 local parks and playgrounds
2	Neighbourhood	3 – 4 local parks and playgrounds
3	Community	2 -3 community level park and open spaces
4	Direct/ Zone	1 district level park and sports centre, maidan
5	Sub City Centre	1 city level park, sports complex, botanical/ zoological garden, maidan

<b>S No.</b>	<b>Category</b>	<b>Population served per unit</b>	<b>Area requirement (Ha)</b>
1	Housing Cluster	5000	0.50
2	Neighbourhood	15000	1
3	Community Park	1 Lakh	5
4	Direct/ Zone	5 Lakh	25
5	Sub City Centre	10 Lakh	100

## 4.2.6 NORMS FOR DIFFERENT ACTIVITIES TO BE INTRODUCED IN THE STUDY AREA

### Distribution of Activities

1. Tourist Facilitation Centre
2. Food Court
3. Guest House
4. Hotel
5. Bank / ATM
6. Museum
7. Meditation & Spiritual Centre
8. Spiritual Gallery
9. Multi purpose hall
10. Socio-Cultural Centre
11. Library
12. Reading Room
13. Old age home
14. Working Women – Men Hostel
15. Night Shelters
16. Fire Station
17. Para Transit Points
18. Bus Stops / Mass
19. Transit Points
20. Parking

### Rehabilitation

1. Relocation of Affected Shops = 37
2. Relocation of Affected houses = 7
3. Relocation of Affected Livelihood = 80 Hawkers

## 4.3 DESIGN SOLUTIONS

## 5.0 REFERENCES

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