“CONSERVATION ATTRIBUTES FOR THE HISTORIC CITY OF VARANASI”
IDENTIFYING PLANNING AND DESIGN ATTRIBUTES TO ENHANCE THE URBAN ENVIRONMENT

A Thesis in
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by
Nanditha Veeraraghavelu

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The thesis of Nanditha Veeraraghavelu was reviewed and approved* by the following:

Jawaid Haider
Professor of Architecture
Thesis Advisor

Madhuri Desai
Assistant Professor of Art History and Asian Studies

Ute Poerschke
Associate Professor of Architecture

Alexandra Staub
Associate Professor of Architecture
Graduate Officer

*Signatures are on file in the Graduate School
ABSTRACT

This thesis focuses on planning and design attributes for conservation and urban renewal of Varanasi in India. This city has existed for many centuries and has a rich, deep-rooted religious significance. In the midst of transformation Varanasi is facing major environmental threats due to rapid urbanization, exponential population growth, and incompetent urban planning regulations. The Varanasi Development Authority (VDA) has not been able to efficiently address issues of architectural heritage deterioration, traffic congestion, insufficient infrastructure, and natural resource depletion.

A field study conducted as part of this research revealed that the Indian National Trust For Art and Cultural Heritage (INTACH) is ill-equipped and able to preserve only a few of the existing monuments, while many have been consistently neglected leading to deterioration and demolition of historic structures. Traffic congestion on main streets due to heavy motor vehicular use on narrow streets causes immense discomfort for the people who reside within the historic site. The religious rituals performed by pilgrims along the riverfront of sacred Ganges and disposal of untreated wastes in the river have resulted in health hazards for many users who directly consume the river water. The immediate concerns that need to be addressed for the urban renewal of Varanasi are the conservation of historic fabric, transportation management, and environmental planning.

The cultural practices and religious belief system of the inhabitants play a major role in the city’s growth. In order to conserve this historic city and its urban environment, an adaptable strategy is essential not only for architectural preservation of Varanasi, but also for promoting sustainable practices so that future generations can witness the
original city and its sacred architecture for many more centuries to come. This thesis recognizes the importance of cultural, religious, political, economical and ecological aspects for the sustainable development of a historic city and proposes viable design and planning strategies to enhance the quality of the overall environment in Varanasi. To this end, relevant design attributes are identified to develop a holistic approach to solving the excruciating problems the city is facing. These attributes embody critical issues identified through research and include the following: Accessibility, Continuity, Diversity, Identity, Integration, Conservation, and Safety. The thesis proposes strategies based on the above-mentioned planning and design attributes in order to renew the heritage site and ensure that it is experientially enhanced, functionally efficient, and environmentally sustainable.
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CHAPTER 1

INTRODUCTION

Historic cities in India often undergo new additions to accommodate the increasing demands of tourists and inhabitants alike. These new additions appear unplanned and disorganized to city authorities. In order to address the demands of rapid growth, the city’s authorities propose new additions that might serve the growing needs of the inhabitants around the site. However, their future proposals to eliminate the disorganization and control the haphazard growth become inefficient due to various challenges. Presently the urban planners depend on conventional planning systems that are inappropriate in this context.

The historic city of Varanasi has existed for many centuries and has a rich, deep-rooted religious significance. Street patterns within the city are interpreted as mostly self-organized. Self-organization is a “phenomenon by which a system organizes its internal structure independent of external causes.”¹ This self-organization can be viewed as a reaction to the immediate needs of its inhabitants.

The complexity with respect to planning involves “the interaction among the constituents of the system, and the interaction between the system and its environment, such that the system as a whole cannot be fully understood simply by analyzing its components.”² The needs of the people in the urban setting change with time and create an impact on the city. According to Punekar, “Rapid urbanization and population growth have affected most historic Indian cities and consequently conservation policy is not fully

integrated with local planning and management of cultural heritage resources.³ The historic city of Varanasi also called “Kashi,” a place of ancient, sacred magnanimity due to its deep religious association with the river Ganges, is no exception to this phenomenon. Low populations might afford sufficient usage of locally available resources; but, with the rapid population increase in the last few decades and exponential increase in tourism (mainly through pilgrimages to Varanasi for its sacredness and rich history) the urban setting of the past has become insufficient to meet current demands. Present ways of practicing ancient rituals along the riverfront of sacred Ganges have resulted in unsustainable use of natural resources, thus leading to deterioration of forest and water resources. Therefore it is important for city planners to take into consideration the relationship between the society’s demands and the region’s natural resources if the city is to grow in a healthy manner.

1.1 Concept

Historic cities in India are valued highly for their contribution to their country’s identity. The cultural practices and the religious belief system of the inhabitants in these regions play a major role in such cities’ growth. Thus an adaptable strategy is essential not only for architectural preservation, but also for promoting sustainable practices so that the city will last for many more centuries to come.

Urban planners and architects need to understand the relationships between the social, cultural, political, and environmental aspects of the historical city in Varanasi while planning or proposing new guidelines for a sustainable growth. David Orr indicates the obligation to work hard towards the environmental challenges for the future in the sustainable growth goals he lists:

³ Anwar Punekar, “Value-led Heritage and Sustainable Development: The Case of Bijapur, India” from Designing Sustainable Cities in the Developing World (Ashgate Publishing Limited, 2006), 103-120.
• Learning to power civilization by sunlight;
• Reducing the amount of materials, water, and land use per capita;
• Creating resources for food sustainability;
• Reducing waste;
• Preserving biological diversity;
• Restoring ecologies ruined in the past century;
• Rethinking the political basis of modern society;
• Developing economies that can be sustained within the limits of nature;
• Distributing wealth fairly within and between generations.\(^4\)

Varanasi is considered sacred to Hindu religious society but is now deteriorating because of insufficient implementation of any of the above strategies. The only way to address the deterioration of the historic Varanasi is by understanding the relationships between the numerous problems that plague the city due to social, cultural, geographical, political or environmental factors. Hence, a planner must consider the needs and demands perpetuated by the different aspects that contribute towards the growth or deterioration of the city.

Conventional planning does not focus on natural resource preservation and restoration. Instead planners only look at different modes of utilizing natural resources for constructing buildings and cities. This way of planning cannot sustain cultural practices over a long period of time, as Kashi has undergone transformations over time based on the immediate needs of the people. With exponential increase in tourist population, Kashi is deteriorating and the Ganges River that flows along Varanasi is becoming polluted due to many ritualistic activities and also to an inefficient drainage

disposal. However the city’s historic fabric remains unchanged: the narrow streets, the ancient temples, the riverfront Ghats represent the deep historic culture and lifestyle of Varanasi’s inhabitants.

Given that Kashi is an ancient continually functioning pilgrimage site for religious multitudes, a sudden introduction to the contemporary life is creating a conflict of interests among the people. Nevertheless, after the Vedic Period, the practice of pilgrimage is so deeply embedded in the cultural consciousness that there are numerous sacred sites, which are now considered an integral part of India’s heritage. According to Punekar:

“For heritage resources such as cultural heritage sites and landscapes, which cannot be physically regenerated but only, retained, restored or modified, must ensure a continued contribution of heritage to the present. Through thoughtful management of change responsive to the historic context, the built environment and the fundamental elements of the social environment can be preserved. At present, in developing countries, most cultural heritage sites are identified solely in terms of their historical rather than contemporary importance to the communities, an approach which often alienates local communities from their own heritage.”

The importance of heritage in the life of the inhabitants can be judged through its cultural, religious, economic and environmental aspects. However, in this site, the deteriorating environment is threatening the sustainability of the sacred city and the Ganges. Although everyone worships the sacred river Ganges, all the ritualistic activities that are performed along the river continue to pollute it. The rituals of cremation, bathing, immersing of dead bodies, dumping of ashes and other organic wastes into the river as a part of these rituals has greatly polluted the Ganges. The number of pilgrims and tourists has been increasing over the years with better transportation networks to and from Varanasi. But, the historic city is not planned to accommodate the increasing demands of the people and simultaneously retain its spiritual environment.

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Consequentially, the living conditions of the people within this region have deteriorated over the years. The narrow streets witness chaos and overcrowding amidst numerous temples, small shops, and resting places for pilgrims.

These heritage sites, temples, and landscapes are of great religious significance to Hindu beliefs and practices. These mythological beliefs and practices are also of cultural significance as they emphasize the identity and continuity of traditions that have been practiced since ancient times.

To enhance the environment of this sacred setting, policy makers must propose guidelines to clean up and preserve all the historic monuments along the riverfront in Kashi. These guidelines must ensure the continuation of religious and cultural activities that not only enhance the environment, but also provide economic benefits through pilgrimage and tourism opportunities. It is imperative to create a balance between preserving the historic site and addressing the present needs of the space to accommodate the people. Therefore, the main factors responsible for enhancing the sacred setting are entangled with the local religious belief system; cultural interaction; local politics and economy; and ecology. It is important to prioritize the needs of these four factors in order to develop and protect Varanasi.
Table 1-1: Different factors targeted towards a sustainable sacred setting

The table in the previous page shows the linkage of the major principal concerns that are interrelated to each other in this historic context. For instance, in regard to the issue of overcrowding within the historic site, religiously inclined Hindus have grown up with the cultural belief that one will attain salvation if they lose their lives within the boundaries of Kashi. Due to this belief, many elderly people come and live within Kashi as they near death. Also, there are few reputed Vedic schools in this historic site for Brahmin children, who come from different parts of the country. With increasing migration of religious oriented individuals, there is greater demand on site and fewer resources available within Kashi for the future. Therefore, while making plans for the development and preservation of the site, the needs and practices of the religious and cultural activities must be reconsidered, as they create an impact on the environment.

1.2 Challenges addressing sustainability along the Historic Riverfront

Today Ganges is threatened by pollution. It is indeed ironic that the sacred river, an embodiment of purity, is becoming a dump yard for organic waste and industrial effluents. The four major contributing factors for this deterioration are:
1.2.1 The old sewage systems are unable to accommodate the current waste deposal. These accumulations of wastes on the surface of water have resulted in the formation of a breeding ground for an array of water-borne diseases.

1.2.2 Certain unsustainable ritualistic practices, such as immersion of human cadavers, pose health threats for the inhabitants who consume the same water.

1.2.3 Many inhabitants who live beside the Ganges wash clothes and vessels in the river by using detergents and soaps. The water used for this purpose is allowed to flow back into the river. Most inhabitants believe the Ganges would be purified by itself, though there are of course no real facts to prove that the Ganges is able to cleanse itself. All the pollutants get mixed in the river and are deposited at the bottom.

1.2.4 All along the course of the Ganges, pharmaceutical companies, electronics plants, textile and paper industries, tanneries, fertilizer manufacturers, and oil refineries discharge effluent waste into the river.

1.3 Local Inhabitants working for the City’s Preservation

The local inhabitants of the city have employed themselves in several sustainable practices by using locally available resources and materials. A number of small-scale industries and workshops manufacture artifacts and textile goods, which are very popular among pilgrims and tourists who visit Varanasi. For example, the Banaras silk is a highly sought after textile that can be sold for as high as $300-$400 per saree (Indian women’s traditional attire). While these practices are important for the continuity of the rich arts and culture in Benares, the weavers and artisans cannot afford to support themselves financially because all the profits are being siphoned off to dealers and middlemen. As a result the local artisans and weavers are not able to sustain their profession. Unless regulations that support local inhabitants’ livelihood are implemented,
the city cannot grow or sustain itself. It is important for the government to help the local community to be self-sustainable economically so that they do not create an impact on the environment of Varanasi. Therefore such local practices need to be recognized and supported by the planners and community members in order to develop, and improve the economic status of the city.

The participation of the local inhabitants in the planning process is essential for them to express their needs for further development and better hygienic living conditions. At the same time, the inhabitants should be able to analyze the present applications of the ancient rituals such as cremation using wood, immersion of dead cadavers in the river, and disposal of the organic materials in the flowing river. Funds must be raised for cleaning up the river and preserving the historic riverfront. Finally, planners must propose design strategies based on the needs of the local religious, cultural, and environmental situation to sustain the ancient sacred city of Kashi.

1.4 Research Overview

The complex issues of historic preservation for an urban framework within Varanasi are analyzed through case studies and field surveys. These case studies and surveys give us valuable insight on the root problems. An important criterion for the success of a designer’s solution must be its acceptability by its users. On this note, talking to inhabitants offers us different and more realistic views to address the most important planning issues within the historic site.

This chapter explains the problems addressed in Varanasi, the objective of the research, the research question, methodology, and the significance of this research.

1.4.1 Problem Statement

The historic city of Kashi, which was called the forest of bliss at one point in time, is experiencing a huge scarcity of resources for its inhabitants. The living conditions are
substandard. The same forest of Bliss is no longer blissful for its inhabitants. The spread of diseases due to unhygienic living conditions was a major concern in the city a few decades ago, and the extreme weather conditions and congestion in the city are creating huge urban development issues for the inhabitants. The city has undergone a transformation from an ancient sacred space shrouded in the mists of timeless tradition to an overcrowded twenty-first century tourism and pilgrimage hub. However, the existing city today shows examples of temples and sacred spaces that were built since the early 17th century. This research focuses mainly on change in the functional use of spaces over the years and its relevant influences on the city.

Although this historic site is deteriorating, there is a constant flow of vibrant energy as it readapts to the changes and evolves within its boundaries. Pilgrimage and tourism provide employment and economic opportunities for the local inhabitants.

According to Vrinda Dar:

“The danger now is that the riverfront palaces will be substituted with luxury hotels and fashionable shopping centers. While Banaras is one of the unique cities in the world where traditional lifestyle is best preserved, it is paradoxically also one of the cities where architectural heritage is least protected. There is no law that forbids owners to make drastic changes to their historic buildings or even completely destroy them just to achieve a clear land property.”

So, the planners must focus on the preservation of the local cultural and religious identity of the city, while concomitantly addressing the growing needs of tourists and inhabitants. Since planners give attention to the growth of the city to meet the demands of the growing population they do not have sufficient resources to preserve and protect historic sites, thus threatening the survival of such sites. Besides focusing on expanding

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the boundaries of the city, planners need to recognize that the preservation of historic sites is imperative in order for the city to retain its original identity.

1.4.2 Objective

This thesis intends to adapt planning and design attributes from Michael Fifield, et.al., “Design Principles,” Metropolitan Canals- A Regional Design Framework and Chester preservation guidelines to preserve the historic site along the riverfront. The historic boundary of Varanasi is used as a case study to analyze the existing site condition and how it can be improved ecologically, aesthetically, and economically. These attributes are better suited to fulfill the needs of the city dwellers while preserving the integrity of the historic site and its environment.

1.4.3 Research Question

How can one bring about a holistic development in the historic site between Manikarnika Ghat and Dasasvamedh Ghat in order to enhance the spiritual experience of thousands of pilgrims that visit this place every year while concomitantly maintaining a sustainable development that addresses the needs and concerns of the local community?

1.4.4 Research Method

This research allows the analysis of flexible planning within historic spaces through the six fundamental concepts of design adapted from Fifield et.al., “Design framework for Metropolitan Canals,” to enhance the performance of the historic site with respect to its function and aesthetics. The site boundary is limited to the riverfront Ghats between Manikarnika and Dasasvamedh Ghat, and the main access road to the Dasasvamedh Ghat called the Dasasvamedh Main Road.
1.4.4.1 Field Study

The case study was conducted within the historic site of the ancient pilgrimage route—the Panchkosi yatra, which lies within Manikarnika and Dasasvamedh Ghat. In this historic site, three main demonstration sites were chosen to analyze and propose conservation and urban renewal strategies. They are Manikarnika Ghat, Dasasvamedh Ghat and Dasasvamedh main road.

• In Manikarnika Ghat the ritual of cremation takes place throughout the day as people from all over the state come to cremate the dead.

• In Dasasvamedh Ghat, the main ritual of aarthi takes place every evening during sunset. Many tourists and priests gather here. It is one of the busiest sites of Varanasi.

• On Dasasvamedh market road, many shops, restaurants, temples are located with several narrow streets intersecting. This road is the main access road to the Ghat and is filled with a floating population throughout the day.

Manikarnika Ghat and Dasasvamedh Ghat are the two main Ghatas, and serve distinctly different functions. Hence they are analyzed separately in terms of the purpose of the place and their identity.

a. Sites under study were mapped through original observation and the plan was drawn from the map.

b. Sketches of architectural details of the riverfront Ghats were made.

c. Photographs were taken to establish a relation between the people, the space and the activities within this space.

d. The activities were recorded during different times of the day to understand the interaction of people with their surrounding spaces, and to help in understanding the peoples’ response to the surrounding environment.
1.4.4.2 Interview

a. Interview was held with Mr. R.P. Goswamy, (Vice President of Varanasi Development Authority) about the developmental pressures in Varanasi.

b. The priests who reside along the Ghats were interviewed to understand their relationships with the sacredness of the site and their existing problems.

c. The Doms (who perform the ritual of cremation) were interviewed to understand their needs with regards to their living standards.

d. Residents of Varanasi were interviewed in order to understand their lifestyle and their current needs.

1.4.4.3 Archival Research

a. Articles about urban preservation for historic cities in Iran and Chester were studied and adapted for this specific site.

b. A detailed study about the background of Varanasi was performed through a series of maps, books, and articles.

c. Current planning efforts for the city’s growing demands in terms of traffic were analyzed through the data collected from the Varanasi Development Authority.

The information collected from the Varanasi Development Authority included the “Land Use Plan” showing the proposed development for 2011, with extended road network along the periphery of the city. These maps help in understanding the major land use zoning in the historic site; mainly residential with many bazaar streets. The map also distinguishes between the historic site and the newly expanding city.

1.4.5 Significance

There have been several initiatives to protect the heritage space in Varanasi. Proposals to clean the riverfront and redevelop the environment in the surrounding space have not proved to be effective, as their approach lacks the integration of different
disciplines and expertise that can together come up with solutions that address and balance the religious, cultural, political, economic and environmental needs of the users. Then again, the project is very vast and will involve huge support from the government to treat the riverfront in phases.

This thesis emphasizes the renewal of three specific sites, which can be applied to other sites in Varanasi that face similar issues. These three specific sites are Manikarnika Ghat, Dasasvamedh Ghat, and Dasasvamedh main road as highlighted in Fig.1-1.

These three sites are analyzed through field study and secondary research, after which urban renewal strategies are proposed based on the planning and design attributes—namely, Accessibility, Continuity, Diversity, Identity, Integration, Preservation.
and Safety—in order to conserve the heritage site and ensure that it is experientially enhanced, functionally efficient, and environmentally sustainable.

1.4.6 Conclusion

There is a need for guidelines to assess the environmental impact of certain public and private projects, which in turn affect the cultural heritage. These guidelines are based on seven planning and design attributes, which are discussed in brief below.

1.4.6.1 Accessibility: Cleaner walkways with restricted modes of access within the historic site will help in increased mode of pedestrian access, which ensures the original purpose of the narrow streets in the historic site. Through improved accessibility, traffic noise and commotion can be eliminated.

1.4.6.2 Continuity: Along the historic riverfront, it is important to ensure continuity in architectural character by use of locally available materials and landscaping to enhance the uniqueness of this cultural setting.

1.4.6.3 Diversity: Introducing well-planned mixed land use will allow for a better organization of different services with adequate green space. Inhabitants will have better access to different facilities within the dense historic site. Therefore it is important to have a well-organized development on site that accommodates diversity in a balanced manner.

1.4.6.4 Identity: The historic character within this site can be preserved through the protection of the architectural style of the riverfront Ghats and a planning pattern that recognizes the area-specific urban fabric.

1.4.6.5 Integration: Integrating Land Use Planners, Infrastructure Planners, Transportation Planners, Tourism Development Board and Historic Preservation Department is necessary in order to make better planning and design decisions. Every
proposal will impact different disciplines; hence incorporating all these disciplines will help in making a more informed development.

1.4.6.6 Conservation and Preservation: It is important to conserve the natural resources within the historic urban fabric and preserve the architecturally heritage buildings in order to retain the original identity of Indian antiquity. This city has gone through an extraordinary past with innumerable festivals on the one side and severe bloodshed by religious fanatics on the other side. Such an intense site for its unique past and vivacious present must be preserved for the future.

There is a need to take immediate steps to protect the heritage buildings, landscapes, and other artifacts of historic significance in this site. Tourists, pilgrims, and inhabitants who are the main users will benefit from the conservation of the site’s natural resources and preservation of the architectural monuments.

1.4.6.7 Safety: The narrow streets can only allow slow traffic movement, due to the pace of pedestrians, there are very less chances for accidents. The length and width of the interior narrow streets must be preserved as they promote the safety of their inhabitants through daily interaction and recognizable faces during daytime. Street lighting for the narrow alleys must be designed in order to provide safety for pedestrians at nighttime.

For proposing urban planning guidelines in Varanasi, it is important to understand that the social-religious belief system of the inhabitants and their cultural behavior define the economical and political decision-making processes. The implementation of these decisions would create an impact on the environment. Therefore, it is essential that religious belief systems and cultural behavior of the people be given priority by encouraging community participation during the planning process, and through discussions organized by the VDA. Since the VDA views the encroachers and inhabitants of the historic city as the cause for many problems in the city, the issues
still remain. Instead a better approach would be for VDA to address the needs of the people within the historic site, and provide alternative housing facilities for the encroachers. Thus the main goal of this thesis is to conserve the historic site, architecturally preserve the existing monuments and experientially enhance the environment of the sacred setting in Varanasi.

The following chapter discusses about the different backgrounds of Varanasi and the important factors that need to be considered while proposing planning and design strategies.
CHAPTER 2

BACKGROUND OF VARANASI

Varanasi “reflects the city’s geographical setting in between where the Varana and Asi rivers flow into the Ganges. Most residents of the city refer to it as Banaras. But Kashi is the oldest name and it is the name that is used by pious Hindus who go there on pilgrimage.”⁴ Kashi has existed since the mists of time. “It is believed to be about 3000 years old.”⁵ Nature played a key role in the birth of this city; the sunrise every morning faces the Ghats that stretch along the river. These Ghats were built as high fort walls with steps leading to the river to provide access to the river and also protect the city from floods entering into the town. The fort walls along the riverfront are historic architectural monuments constructed during the late eighteenth century under the patronage of the Marathas. These Ghats generally house temples, palaces, schools or residential units. The sacred city’s background is discussed in this chapter with respect to its Historical, Geographical, Mythological, Ecological, and Urban Context (Existing Monuments and Landscape). The interrelation of these characteristics and the conservation of this historic city for future generations to retain the cultural identity of the people who live within that context are explained in the following sections.

2.1 History

The debate about when the original city of Kashi was formed remains open among archeologists and historians. The ruins of the ancient city may be found in the surroundings of the present Raj Ghat. Although Kashi’s historical background is better documented from the 18⁰ century, there have been many physical traces of the city

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⁴ Justice Christopher, “Kashi and studying Hinduism,” Dying the Good Death-The pilgrimage to die in India’s holy city (State University of New York Press, 1997) 15-36.
⁵ http://en.wikipedia.org/wiki/Varanasi
since the 5th century when, the first Vishwanath Temple was built and broken down in 1194 with the arrival of Ahmed Nailtgin in 1013.

As Coute suggests,

“From the beginning of the 11th century to the decline of Mughal Empire, the new conquerors have alternated with times of construction and times of destruction. Later in the 13th and 14th centuries there was Turkish-Afghan domination; Shah Jahan’s last destruction was in early 17th century, after which Raja Man Singh erected numerous buildings including a college and a residence. The Man Mandir Ghat located next to the Dasasvamedh Ghat was built during that period. In 1657-1707, during the Mughal period, the emperor Aurangzeb commanded mosques to be constructed in every city, converting the city of Varanasi into “Muhammadabad—a Muslim city.”

The name never caught on, but Kashi did flourish during the Mughal period. After the Mughal period in the early eighteenth century, the city’s trade grew on the national and regional level. Through extensive trade in the eighteenth-century, resources were accumulated and distributed at different levels. Frietag notes that, “The most important actors moving among the levels of power included the Maratha Empire in the west, the

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nearby Nawabi of Awadh, and the Rajas of Benares.⁷ During this period a different cultural integration took place with the merchant bankers, and mendicant soldier-traders. A lot of religious architectural structures were raised. Bayly states that, “The predominance of Maratha patronage, and the fact that between 1750 and 1790 Benares became ‘the subcontinent’s inland commercial capital’, are both largely explained by its strategic location on the main trade route which ran from Bengal down into the Maratha territories in the Deccan.”⁸

The Marathas acquired control over Mathura, Prayag (Allahabad), Varanasi, and Gaya, all of which were urban centers significant for their pilgrimage purposes. Marathas could not be the main rulers of these states as the British replaced Awadh who were ruling Benares earlier. Yet they were looked upon as culturally significant contributors. According to Frietag, “Marathas financed much of the eighteenth-century Hindu reconstruction of which, encompassed dharamshalas (rest houses) for pilgrims, temples and feasting to support Brahmin priests, palaces for themselves and their local kin and agents.”⁹

Benares revealed the expression of a “mughalizing city”¹⁰ in the early eighteenth-century. The city pattern of Mohallas (neighborhood) and Mosques still exists in the historic city. Later, in the nineteenth century, the decline of the Mughal Empire led to the redevelopment of the Hindu cultural heritage. Freitag notes that, “the local political power became intimately connected along with the cultural patronage. Nevertheless, the Mughalizing urban center in Varanasi became unique with the reinvention of Hindu

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traditions in the early nineteenth century."¹¹ This change began to accommodate the Hindus: Marathas, Bengalis, and those from eastern Uttar Pradesh state and substantial number of Muslims in the city. According to Freitag, “This unique combination of Hindu and Muslims protected the city from British intrusions particularly in the early nineteenth century and again after 1901. In 1910-11, the British created a new princely state of Varanasi and gave the Maharaja full ruling powers within his land in Ramnagar, which is located across the Ganges River.”¹² This way, a small township was developed on the other side of the Ganges. However, the growth of the town was limited due to the flood areas and the greater intensity of the flow of the river. According to Freitag, “The maharaja and the Hindu merchants patronized the artists and intellectuals. They cosponsored the Ramlila event every year in the mohallas of Varanasi. This event was a substantial investment by the maharaja in order to “restore the lost glory to the Hindus.”¹³ The religious significance of the city attracted people from all over the country. Singh states that, “Since Varanasi has always been important for religious purposes, kings, rich merchants and others who could afford it, built houses in Varanasi so that their members could come and stay here in the auspicious city. So most properties either belong to trusts, or are divided among many successors, or belong to people who presently live in other cities.”¹⁴ Artisans, religious specialists, and scholars were very famous in Varanasi. Numerous artisans in Varanasi were into manufacturing brassware or wooden toys and weaving silk products. According to Freitag, “The Muslims were the weavers of the silk and they worked independently. However, they depended on Hindus

for the Yarn supplies and for marketing their goods."\textsuperscript{15} This interdependency on each other kept them united in the nineteenth century.

Later in the twentieth century when Varanasi was viewed as an urban centre the population expanded to over a million people. (The population in 2001 was 1,371,749), many of whom tried to accommodate themselves within the Mohallas. Gradually over the years, Varanasi spread westwards. Major roads such as the Dasasvamedh main access road and Dasasvamedh road were built over earlier existing ponds close to the river. These roads are the main cultural landmarks of the city. Presently this cultural city has been a sensitive site for the last few decades. Since both Hindu and Muslim shrines are within the Mohallas and the river front Ghats, there have been many Hindu-Muslim riots. The Hindus and Muslims fight for their identity and power within the city. Even today few historic sites have tight security. However, the city is always vibrant with festivals and celebrations. The Hindu artisans and the Muslim weavers still exist, but their way of life has always been substandard. Although many tourists and pilgrims come to witness the magnificence of the cultural heritage, the poor and unplanned development of this historic site is threatening the continuity of its architectural heritage.

2.2 Geography

According to Singh, “Banaras in the early decades of the 19\textsuperscript{th} century was a typical north Indian city. Streets were not wide enough for a wheeled carriage, particularly in the densely settled residential areas. They were generally at a lower level than the entrances of the houses and shops that lined them.”\textsuperscript{16} In regard to the map below, documented by James Prinsep in 1822, Rana P. B. Singh states that, “There

were more than 1,000 temples in Benares and about 333 mosques.”

Many temples existed along the river and many smaller shrines within the narrow streets.

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The maps in the previous page (Fig. 2-2 and 2-3) of “Benares,” (an earlier name for Varanasi) indicate that railway lines were not developed until the early 19th century. It is evident that at that point the city had grown considerably along the river. Numerous narrow lanes approached the riverside and the inner zone of the city, which is marked grey in the map above. As Singh noted, “In the latter half of the 19th century, the introduction of railways, the installation of water works and the provision of improved sewerage and drainage works widely modified the urban fabric of Benares.” In addition, multiple architectural landmarks were built that established Varanasi as a modern city. With the growing population, merchants, bankers, and landowners used

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pilgrimage networks for trading, a practice that continues unabated even today. They typically traded with artifacts, traditional jewelry, silk fabrics, and offerings to the god on the street side. The streets of Kashi were too narrow for wheeled carriages, particularly in the densely settled residential areas.

Fig. 2-4: Map of Varanasi in 1933 (Source: Gutschow, 2006 p. 473)
Fig. 2-5: Map of Varanasi in 1946 (Source: Gutschow, 2006, p. 474)
In 1948, the Benares Improvement Trust was constituted with a goal of creating a master plan of Benares, and in 1951 these plans were prepared. Given the nature of the river front Ghats, along the river there has been very little change over the past few decades. Public transportation within the city is usually through cycle rickshaws and auto rickshaws. Private transportation is generally by two-wheelers and four-wheelers. Public transportation within the historic site is rather limited due to the intense population and the narrow streets. However, high population rate and lack of organized transportation and infrastructure are the main cause for traffic congestion in Varanasi.

The Varanasi Development Authority (VDA) created the master development plan of the city (1991–2011), which proposes many new roads along the city’s periphery. Due to increasing pressures of population, economic development, tourism, and pollution the city’s ability to protect its heritage is being threatened. The VDA aims to develop the city in a sustainable way, and simultaneously preserve its architecture and cultural landscape. With this objective, the authority recently began the immense task of documenting the vast architectural and intangible cultural heritage of the city and its surrounding regions and of formulating a legislative framework to protect the architectural monuments and cultural heritage.

The 2011 Plan highlights the different land uses in Varanasi; the area shaded dark brown is the heritage site of Varanasi as shown in Figure 2-6. This heritage site is marked as a dense residential land use zone. On the eastern side, the river marks the edges of development. To the north, the heritage zone is bound by the Varuna River, and to the south, the Asi River marks its boundary, which is now dried up.
The core heritage area lies within the old city heritage zone. The Kashi-Vishwanatha temple is the most important site for the pilgrims, and about 70 sacred shrines and temples lie along this sacred path known as *Panchkosi Yatra*. The pilgrims perform this yatra (Hindu pilgrimage) on festival days. The ritual involves walking along the sacred route for several days and visiting every shrine that falls along the path.

With the continuous growth in population, residents of Kashi are attempting to accommodate the ever-growing population by constructing taller buildings by breaking down the old structures or building over them. Since the old structures are of cultural importance and have narrow streets, the government has made laws to prohibit any development activities within 200 meters from the riverfront Ghats unless they are temples and are approved for any alterations or maintenance. However, today, there are
many illegal structures such as hotels, guesthouses, and illegally occupied residences built along the riverfront Ghats. The development plan made by the Varanasi Development Authority has not been implemented completely. The reasons for why the VDA was not able to fully implement this plan were put forth by the VDA official, which is noted in the appendix.

2.3 Mythology

Nature’s role in Kashi being identified as a sacred space might be because of the orientation of sacred Ganges and the historic city with respect to the sun. The rulers of this place have built innumerable temples because of the mythological belief that Lord Shiva lives there, which makes Kashi the place for religious people to seek salvation from the cycles of death and rebirth. At the time of nearing death, many devotees come to Kashi. They believe that their purpose of life is resolved when they reach the footsteps of Kashi. According to the Varanasi city website, “There is around two thousand Hindu temples in Kashi which give an identity to Kashi as the city of temples.”¹⁹ Once upon a time this sacred space was a very beautiful natural place as it was referred to as “Anand Kanana” (Forest of Bliss) in ancient texts.

Kashi is referenced in many mythological narratives called “Purana,” The Purana, which means “ancient lore,” is the name of a class of Sanskrit mythic narratives, that were composed according to formulaic rules by anonymous Brahman authors and dedicated to the cults of Lord Vishnu or Siva.²⁰ There are questions in the Puranas that ask about the significance of Kashi, and how the Hindu religious believers perceive it. The references to Kashi in the Vedas, Upanishads and some other works are brief and

¹⁹ http://www.varanasicity.com/temples/index.html
often symbolic. These symbolic descriptions have a mythological interpretation. Chandramouli describes Kashi with three forms:

• Karana (Cosmic)
• Adhyatmika (Philosophical)
• Adhibhauthika (Physical or Geographic)

The Panchkosi yatra is the sacred pilgrimage route around Kashi, considered as the medium cosmic light. The Vedas convey that the radiance of Lord Siva (in Kashi) melts away the ignorance and falsehood of the seeker of truth and that the realization of Lord Shiva for the attainment of Brahma Jnana (self realization) alone can free him from the bondages of ignorance, the fear of death and the cycles of birth. Chandramouli explains that, “Luminous Kashi is nothing but a larger scale of an enlightened soul.”

The only concise and precise explanation of Kashi is its luminosity, which can be seen in Kashi Panchakam of Adi Sankaracharya. Its translation in English by Chandramouli:

"Withdrawal of mind from sensuality is the supreme peace
That is the holiest tirtha (sacred water) of Manikarnika.
Incessant flow of knowledge is truly the pure Ganges.
That Kashi I am, in the form of Self Knowledge.

In whom this world appears like a magic spell
The moving and non-moving forms dazzle playfully.
The pure existence-consciousness-bliss is itself the Supreme Lord
That Kashi I am, in the form of Self-Knowledge.

Seated resplendently amidst the five sheaths
The intelligence is Bhavani housed in every body.
Siva the indweller in all is the witness
That Kashi I am, in the form of Self-Knowledge.

In self-knowledge shines Kashi, Kashi illuminates everything
He who understands that Kashi becomes one with it.
Body is the holy Kashi. Self-knowledge is the Ganges traversing the three worlds.
Devotion and earnestness is Gaya. Meditation in the revered feet of the Guru is Prayaga.
The Turiya state is Visvesvara, dwelling as witness inside every mind.
When everything is housed in my body itself, then what other tirtha is there?"

This above translation of Adi Sankaracharya by Chandramouli explains the sacredness of Kashi and the Panchkosi pilgrimage route for the devout Hindus. According to Chandramouli, “For most pilgrims, it is the faith, more than the philosophy, that helps them in understanding the luminosity of Kashi and Lord Siva.”23 The priests who live in Kashi even today perform daily religious rituals. There are pilgrims who pour into the city from different parts of the country for its inherent spiritual power and mythological importance. Many people come to reside in Dharmashalas within the boundaries of the Panchkosi Yatra till their death in order to attain Moksha after death.

As Gutschow suggests, “The original sacred place shares a sense of centrality within a given cultural realm. The centrality of Kashi/Varanasi seems to fan out and reach the corners of the subcontinent.”24 This power of Kashi brings people from different parts of the subcontinent. The celebration of life and death in this holy place is incomparable to any other Hindu religious setting. To a great extent, nature plays a role to enhance the religious belief of the people. Gutschow states that, “The small tradition of Hinduism, based on local legends and representing local ritual practices, often refers to rivers, springs, wells and ponds, but also to the non iconic representations of the divine in stone. The divine is tied with such material manifestation that creates a place.”25 Such a place is Kashi where the material manifestation of divine is evident through the ancient existence of temples and deities all over the sacred setting.

According to Singh, “Varanasi is referred to as the microcosm of India and the most sacred city of Hindu religion.”26 The ancient boundary around Kashi, which

developed in the historic period, has remained till today. Singh says that, “The pathway from the macrocosmos (heaven) to mesocosmos (earth) and finally to microcosmos (the temple or body) is spatially understood through the ancient maps and is formed by the sequence of pilgrimage routes.”

The major rituals in Kashi focus on celebrating life and death along the Ganges. Bathing in the river facing the sunrise in the morning and performing the Ganga Aarthi which involves lighting lamps facing the river in the evening, are daily rituals for many religious

Fig.2-7: Diagrams and tables showing Varanasi as a sacred route (meso cosmos) between divine universal forces (macro cosmos) and temple or body (micro cosmos)(Singh 1993, p 239-250)
inhabitants and the pilgrims who come from all over the world. Other important rituals include cremation at the Ghats. These rituals are justified as a sense of religious responsibility during the lifetime of a Hindu; yet, in recent times some rituals have been criticized because of their negative effects on the environment. For instance, bathing in the Ganges is a longstanding practice that is still prevalent today. It has been a sustainable approach in the past because it uses natural water as a resource for daily ablutions, with no energy used other than the river’s natural flow to bring the water to the users. However, the use of cleansing chemicals such as soaps and detergents has polluted the Ganges. Many residents of Kashi also wash clothes in the river and use detergents as they do so. This results in toxic levels of salts in the water making it non-potable, therefore, adversely affecting farming and health. Cremation too has become problematic in terms of the environment. Hindus believe that if their ashes are immersed in the sacred river, they will escape from the unending cycles of rebirth and death. It is to this belief that the ritual owes its origins and continued practice. But, in recent times, a modified practice has been urged—that of immersing only a handful of ashes in the river, thereby minimizing the pollution the ritual causes. It is argued that traditional practices of cremation are unethical and cannot continue to be supported environmentally. Every day, 4000 kilograms of wood is consumed for burning the bodies. When population was not an issue, the ancient Hindu belief of sacrificing a portion of what the earth has to offer into fire or water was accepted by nature. But, today with such a high demographic rate there will soon be a scarcity of wood for further consumption.

Cohen states that, “Nature was not generally considered an element requiring conservation protection. However, modern pressures within cities, including new forces (demand for parking, density, air quality, changing demographics) have made it necessary to implement conservation measures for an important urban element: the
element of nature, especially when it lies in close proximity to the city web.” Since the sacred space within Varanasi is a rich cultural and natural resource, it must be preserved and enhanced for the future growth and development of its inhabitants.

2.4 Ecology

Varanasi lies in the middle of the Gangetic Plain. Varady gives detailed information about the ecological condition of Varanasi. He observes that the terrain throughout this plain is rather flat and slightly elevated, with the northern bank situated 15 meters above the Ganges. Seasonal floods used to leave small lakes for irrigation. Varady states that,

“Soil texture varies from sandy to loamy, to clayey, but virtually all the soils of the region have been fertile and non-saline. Additionally, alluvial soils tend to be porous and are able to store groundwater. Aquifers exist, and the water table is generally high, permitting exploitation for drinking and irrigation. Nevertheless, in the 19th century ground water surveys did not exist for the region and tube-well irrigation was infrequent.”

There is some evidence to show that significant climate change has taken place over the years. Hamilton notes that, “According to the region’s gazetteer, almost all the arable land had been cropped. Tens of centuries of human occupation and agriculture had stripped most of the original vegetative cover.” According to Nevill, “By the turn of the century no forest remained, only jungles. In the remaining jungles, the wildlife population had been reduced appreciably. Benares had become one of the province’s poorest districts in regard to fauna.”

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Varanasi had comparably less non-renewable natural resources. Limestone, gravel, sand and clay were the only useful products. They were employed in road building construction, brick making and the manufacturing of lime.

Agriculture was productive and stable during Akbar’s rule in the late sixteenth century. Based on Varady’s observation, it can be understood that urbanization induced substantial changes in the agricultural areas during the 17th century. Later during British rule, agricultural practice seemed to occupy most of the arable lands. When Heber approached Benares, he noticed that the lands were poorly cultivated with no canals for irrigation and the rivers lay too far below their adjoining banks. This led to semi reliable water sources and irrigation that varied with respect to the change in annual rainfall. Thus, Varanasi began to deteriorate with respect to meeting its vegetation needs. The lack of proper irrigation methods led to the degradation of the fertile soils.

2.5 Urban Fabric

Varanasi has undergone urban transformation with different dominating powers over the years: it has been molded into a Hindu city, a Muslim city, and a colonial city under the British power.

Coute states that, “Chowk, being a traditional urban layer, is composed of Mohalla, (neighborhood) or units of houses that are surrounded by narrow gali (streets), which form a morphologically and socially coherent system. Its population is composed of Hindus and Muslims.”32 Throughout the year, the streets are filled with pilgrims and inhabitants, as there is always a festival in Varanasi. According to Coute, “Benares

accommodates communities from all over India; each mohalla (neighborhood) is a unifying harbor for pilgrims visiting the temples related to their region of origin.”

2.5.1 Existing Landscape

The historic site has very sparse green cover, due to extreme weather conditions and lack of attention to planning and scarcity of natural resources.

The urban fabric can be localized as follows:

- The busy street in Kashi called Chowk where commercial trade takes place
- The riverfront Ghats forming an urban band along the river
- The surrounding districts, which include the rural lands around the historical extensions of the city with gardens and grand residences; and the Cantonment region with middle and upper class accommodation buildings influenced by colonial architecture.

2.5.2 Existing Architecture

The traditional Indian style and the English neo-classical style display the two diverse architectural approaches prevalent in Varanasi, which need to be preserved and enhanced for future projects to enhance the identity of the city.

The elaborate traditional Indian architectural style of Varanasi is visible on the monuments along the riverfront Ghats. The Marathas and many artisans from different parts of the country built these monuments. The vernacular architectural designs adopted in this region will be explained through plans, sections and images.

2.5.2.1 Traditional Indian architecture

The plan of many monuments is rectangular with open courtyards with rooms surrounding them. Fig. 2-8 shows the plan of “Brahmapuri, the city of Brahmins, which is

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a place of residence of Brahmins, the *Pujari* (Priest in the temple) and their families.³⁴

This building’s plan shows two rows of houses with a narrow alley, two meters in width, connecting them. Its elevation is well articulated along the riverfront.

![Plan of Brahmapuri Vada - House for the Bhramin Caste](image)

**Fig. 2-8:** Plan of Brahmapuri Vada - House for the Bhramin Caste (Source: Benares, An Architectural Voyage, p.18)

The service rooms (serving different functions like washing, restrooms, storage, stairways, etc.) are organized around the central courtyard. A corridor surrounds the courtyard and is flanked with arched columns along its periphery. This organization allows for natural daylight and ventilation. Not only does the upper terrace allows room for future construction, but it also permits connections from one building to the other. The same space is also used for additional storage and sleeping during the hot season.

Fig.2-9 shows the section of Brahmapuri that is two stories tall with the height of each level being about 10 feet. The supporting columns are ornamented with sculptings.

of lotus, leaves, human figurines, elephant heads and other similar ornamentation that
represent Indian architecture. On the exterior façade there is a flight of stairs leading to
Bhahmapuri from the river. On either side of these stairs there is a raised platform on
which a temple is placed.

![Fig. 2-9: Section of Brahmapuri Vada - House for the Bhramin Caste (Source: Benares, An
Architectural Voyage, p.19)](image)

This structure represents the quintessential architectural style that most other
monuments display along the riverfront.

2.5.2.2 Neo-classical architecture

In the cantonment region, however, the architectural site is quite different from
the buildings on the banks of the Ganges. These buildings were mostly erected during
British rule and hence imported some of the Gothic revival styles. One such example is
the Nadesar palace. This palace “dates from the end of 18th century in the English neo-
classical style. It is square in plan with a central reception room. Preceding the verandah
on the façade is a large porch; the verandah at the back of the building is semicircular in
plan.”\(^{35}\) The plan of this structure is not documented; however, the elevation below
points out the different style of architecture, built during the colonial period.

\(^{35}\) Khandu Deokar, Klaus Rötzer, "Colonial Architecture and Urbanism," *Benares, An Architectural
A thorough knowledge of different perspectives on the city’s past provides an in-depth understanding of the city. Identifying the different contributors for the growth and deterioration of the city is the first step, and addressing the issues individually after identifying and integrating the different perspectives is the next step. However, the main stakeholders in the city are its users, because every intervention that takes place will affect the people. Therefore, by understanding the larger stakeholders, and the complexity of urban planning, the policy makers must integrate all the above backgrounds for a sustainable development and preservation of the historic city, which will be further discussed in the following chapter.
CHAPTER 3

RENEWAL OF THE URBAN FABRIC

With an understanding of the site’s mythological, historical, geographical, physical and ecological background from Chapter 2, the importance of protecting this site can be emphasized for its unique characteristics that define the ancient Indian culture. Thus based on the religious mental model of the inhabitants, their cultural behavior, political and economic influences, and environmental needs, a multi-level model is generated, which explains the roles of different disciplines for renewing the urban fabric. In Fig 3-1, the main focus begins from the individuals’ perception, belief, knowledge and skills, which are important as the other objective variables such as politics, economy and environmental impact. In this context, the predominating cultural activities are pilgrimage, tourism, rituals and festivals. The cultural behavior indicates the interaction of the people with the environment.

![Design framework model for urban renewal of Varanasi](image)

**Fig 3-1:** Design framework model for urban renewal of Varanasi (Adapted from Sallis. Et. Al. "An Ecological Approach to creating active living communities")
The policy and economic situation of Varanasi can influence the living conditions in many ways such as the budget allocated to provide incentives for built environment conservation, resource sustainability, and transportation regulations. These transportation and resource management regulations will in turn influence the change in air quality and water quality for the consumption of the inhabitants. Thus by understanding the needs of the local inhabitants, their cultural behavior, policies are proposed for the renewal of Varanasi.

The design framework model shown in figure 3-1 explains the different kinds of user requirements within Varanasi’s urban space and the planning and design attributes namely, “Accessibility, Continuity, Diversity, Identity, Integration, Safety, and Preservation,” are applied for the urban renewal of the Varanasi heritage site, which will be discussed in detail through an examination of the three demonstration sites within Varanasi: Dasasvamedh Ghat, Manikarnika Ghat, and Dasasvamedh main road.

3.1 Accessibility

The ability for users to be able to access the riverfront is critical for preserving the site as a valuable resource. Lynch explains that, “Cities may have first been built for symbolic reasons, but it soon appeared that one of their special advantages was the improved access they afforded.”

Not just physical accessibility but also visual accessibility is important. The goal must be to provide:

- Continuous access to both sides of river; the existing boats must be better organized and made available to link the neighborhoods separated by the river. This way, the

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neighborhoods can better integrate and increase access for safety and security. Tourists can get an alternate view of the riverfront Ghats.

- Regular maintenance and services activities provided by the municipality must be effective so that public use will not ruin the heritage site. Because of high population density, narrow streets, and mixed land use, any restoration work must be well planned in advance and completed within a fixed time frame so as to provide easy accessibility for different parts of Varanasi throughout the year.

- The use of motorized vehicles must be prohibited on the vicinity of the riverfront. Separate parking lots must be provided outside the historical site, with adequate parking space, permits and safety precautions. Rickshaws remain a primary mode of public transport in Varanasi mainly because they are affordable by the inhabitants. However, on the arterial and main roads they slow down the traffic and create havoc. Thus, providing better public transportation facilities such as buses and rickshaws from different parts of the city to the heritage site is important but vehicular access within the heritage site must not be allowed.

- Adequate parking facilities must be provided by means of construction of multistory parking lots as shown in figure 3-2. These parking lots (marked white on the image below) must be at a walk able distance from the riverfront.

- Parts of Varanasi lack access to continuous power or clean water or both. Open drainage is still found around heritage sites, which make them appear as heritage slums. It is imperative that the government provides the residents these basic facilities, as they will help improve the living conditions of the people in the riverfront locality.
3.2 Continuity

Architectural continuity is important for this heritage site as it reinforces site identity. The use of the riverfront pathway as a continuous pedestrian circulation system is paramount for uniting and linking all the major Ghats and other significant landmarks located along the riverfront. Continuity in design does not necessarily mean that the design must be identical, but that it must follow a broad design framework. The Ghats along the riverfront must follow a sense of continuity with respect to its architectural style and character in order to create a sense of oneness along the riverfront elevation.

Continuous public access along the riverfront banks should be provided and well connected to the services on both sides of the river. Along the riverfront, if continuity in the architectural style is disturbed due to certain dilapidated buildings or other reasons, then efforts should be made to restore the buildings and reinforce continuity. For continuity in access and safety of pedestrians, the following measures should be taken:

a. Demarcate crosswalks at the point of intersection
b. Introduce pedestrian crossing signals at regular intervals

c. Create safety island for pedestrian and cyclists between lanes on broad roads.
d. Specify speed zone with proper signage at regular intervals

Design elements that reinforce continuity along the riverfront Ghats, such as:

- Riverfront treatment
- Pathway system
- Green spaces
- Lighting and signage

3.2.1 Riverfront treatment: The continuity of the riverfront can be enhanced with a consistent architectural façade by the use of local sandstone materials and architectural detailing. Cleaning up the accumulated debris floating in unused corners of the river as shown in Fig. 3-3 and creating a continued width of steps along the river to connect the existing steps could enhance the view of the riverfront elevation.

*Fig 3-3: Debris floating on Ganges near the steps of Dasasvamedh Ghat proposed to be cleaned. (Source: http://www.petermalakoff.com/trashongangesblackframe.jpg)*
3.2.2 **Pathway system:** A linear walkway along the steps should ensure its continuity along the riverfront. This pathway will encourage many activities along the riverfront other than religious rituals.

3.2.3 **Green spaces:** Since the Ghats act as embankments to protect the river from entering into the city, trees do not exist in this region. However, in the Dasasvamedh main road, trees must be provided in the middle of the pedestrian roads to delineate rest areas and circulation areas as shown in Fig. 3-2.

3.2.4 **Lighting and Signage:** Installation of night lighting and consistent signage will facilitate easy circulation for pedestrians along the narrow streets. In addition, they ensure safety along the riverfront, and narrow streets. Dasasvamedh Ghat and the market road have sufficient lighting as there is heavy floating population within that area, but the other narrow streets leading to the riverfront do not have streetlights. Proposing streetlights generated from solar energy would be an energy efficient strategy to provide light for the inhabitants who live along the narrow streets as shown in Fig. 3-4.
3.3 Diversity

The riverfront property in Varanasi has not been well developed except in areas where the rituals are conducted, viz the Ghats. Land use has been left to the whims of locals, resulting in random usage of land. Haphazardness not only detracts from the continuity of the landscape, but also impedes access to spaces for public use. The existing historic city does not have a well-planned diversity, which is root cause to the vehicular and pedestrian congestion. According to Jacobs, “Flourishing city diversity, of the kind that is catalyzed by the combination of mixed primary uses, frequent streets, mixture of building age and overheads and dense concentration of users does not carry with it the disadvantages of diversity conventionally assumed by planning pseudoscience.”38 A well-developed landscape should add visual richness to the physical environment while responding to the nature of the surroundings at the same time. The historic site can be divided into three regions based on their proximity to the river: the Ghats, the market area and the residential area as shown in Fig. 3-5.

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Since the Ghats are sites in which numbers of people congregate, they must be surrounded by open, well-demarcated walkways to allow easy circulation. Also, rest areas, benches and other forms of street furniture that serve the needs of the community would add to the richness of the environment.

The site under study is a dense mixed-land use site with educational, commercial, residential and religious uses. Vedic schools, market area, houses, temples and other historical monument occupy this site. It is busy and crowded throughout the day with a high floating population. Hawkers and vendors take over the main streets, the interior lanes are flanked with residential units and riverfront Ghats house many monumental structures such as temples, havelis, ancient schools and mosques. The city is vibrant and colorful, but it lacks organization due to poorly defined regulations. In order to define regulations for the historic city that help in increasing diversity of the site, future proposal must provide adequate proportions of the following land uses:
• Open spaces within dense residential area
• Public land use (cultural spaces, libraries, domestic services) along the riverfront
• Quasi-public land use (hotels and resorts) along the riverfront
• Commercial land use in the market area
• Multi-family housing around courtyards

3.4 Identity

Varanasi is a historically famous site. It holds a unique spiritual and religious identity because of its association with Indian mythology. People from all parts of the world come here to experience the ancient culture and sacredness of the space. The architectural identity is enhanced through its ornamental style such as the Kashi-Vishwanath temple, the Dasasvamedh and Manikarnika Ghat and the river Ganges itself. Further, numerous saints, religious rituals, and pilgrims are seen along the riverfront Ghats, creating an aura of spiritualism.

This spiritual setting is deteriorating, however, due to lack of preservation. Historical sites are falling apart under the pressure on land, leading to spiritual and environmental degradation. There are no by-laws being implemented to address this issue. Thus the identity of Varanasi as a historical-pilgrimage site is in jeopardy. A new framework needs to be created and implemented thoroughly if those with a stake in Varanasi are to save the sacred settings.

3.4.1 Regional identity: In order to revive a sense of historical pride, the government must restore the city, making it a highly desirable place for its inhabitants as well as pilgrims and tourists. Landscape and streetscape must be designed, keeping in mind the city’s spiritual and historical identity. The architectural details must be documented and used for new construction or restoration projects wherever applicable in and around the historic site.
New cultural spaces that depict the identity of the spiritual setting, such as interactive museums, commemoration parks, and statues, must be constructed, thereby encouraging interaction and creating awareness amongst the locals and foreign tourists. Actively promoting Varanasi as a world heritage site will create a sense of pride among the citizens and thus will espouse a sustainable environment where people themselves take the initiative to preserve the identity of this sacred city.

3.4.2 Local identity: A clear sense of local identity can be achieved by implementing changes in planning frameworks that emphasize the management of local resources in an efficient manner. These changes would include:

- Spreading awareness of local practices through street festivals in market areas, schools, exhibit areas in temples, museums, and other cultural centers, where tourists and pilgrims gather, in view of promoting sustainable attributes that fulfill the needs of the local people and enhance the local identity of the place. By using the skills of local artisans and craftsmen, the construction and restoration of the Ghats must take place in a sustainable manner, for which the participation and cooperation of the inhabitants is also essential.

- Sites proposed for new development along the riverfront as shown in Fig.4-6 should resemble the landscape and architectural character that is unique to the city. Designing and constructing fort walls with steps leading to the river must be ensured for any new construction along the riverfront. Adapting historical architectural style for future construction cannot be a solution for preserving the local identity of the riverfront. Nevertheless future additions or renovations must be sensitive to the context and propose architectural designs for built forms that help in retaining the local identity of the heritage site.
In order to achieve local identity, design strategies should aim at:

- Ensuring the use of local materials such as sandstone and lime will help in sculpturing architectural details on this soft material.

- Reintroducing open courtyards for design of specific building types such as residential, institutional, and religious structures will help in emphasizing the local identity of historic riverfront and also promote day lighting for efficient use of natural resources.

**Fig. 3-6:** Image of empty site along riverfront proposed for new development to ensure continuity of the visual landscape. (Source: Author)
3.5 Integration

Since the riverfront Ghats are well integrated into the social lives of the populace throughout the year, there is festive atmosphere within the historic site with high floating population. Methods to integrate this festive setting within the historic heritage in a healthy and environmentally sustainable manner site are discussed in the following paragraphs by classifying the site into natural landscape, built environment, and city level integration.

3.5.1 Natural Landscape: The main source of water for Varanasi is from the river Ganges, along which the Ghats were built 18th century to prevent flooding of the city. This river is now deteriorating because of its misuse by the local inhabitants, pilgrims and priests. To address this misuse of natural resources—mainly along the historic riverfront; local authorities must integrate five major factors responsible for creating an
ecological balance within a community as defined by Sallis et al., which are, “intrapersonal (biological/physiological health), interpersonal (cultural lifestyle), organizational, environment (natural / built) and policies (laws, rules, regulations, codes).”39 By integrating these major factors, the local authorities would be able to set more effective guidelines, for cleaning up the historic site along the riverfront and regulating the discharge of different effluent sources into the river. Also, appropriate streetscape design with suitable man-made facilities such as streetlights and shade providing structures, benches, pedestrian pathways, must be added in order to augment the riverfront landscape.

In addition to providing facilities that enhance the landscape of the riverfront, integrating the people and the landscape through awareness and participation is the key to nurturing a sustainable riverfront. The preservation proposal must also consider water conservation strategies as the river forms a vital part of the sacred setting. In order to provide a sense of completeness to the landscape, the green space, bodies of water, and built-up space must be well integrated. Protecting the natural features, providing adequate infrastructure, and preserving the historical monuments should be the main goal. To address these three main goals, the strategies recommended are below:

• Water treatment plants must be integrated along the river to remove organic and industrial effluents that flow in the river.

• The main market street under study is devoid of any trees that can provide shade for pedestrians. There is a need for plantations and trees that can grow with less maintenance. Efficient use of water through xeriscaping, which involves the use of

native trees and plants, which are locally available, could serve the purpose of being functional, aesthetic, and ecologically fit.

- In a tourist area with an absence of green cover, integrating natural landscapes along roads and pedestrian paths will provide shade and reduce the dust in the atmosphere around areas of high pedestrian and vehicular density.

- Integrating street furniture such as benches, low-water-use fountains, and trees with wide foliage can be proposed in areas where pedestrian movement is high.

- Both sides of the riverfront must be used adequately for better functional distribution. Since one side of the riverfront is considered sacred, the rituals can take place there, while tourism and other recreational activities such as meditation and yoga can take place on the other side of the riverfront.

3.5.2 Built Environment: The existing built fabric is well integrated with the river through a flight of steps. Regular maintenance and improvements should be integrated along the riverfront to enhance the aesthetics and functionality within the historic monuments.

- Integrating museums, exhibition spaces, and libraries within the existing historic monuments along the riverfront with better access must be proposed in order to educate the populace about the important aspects and ideas concerning the city’s history and development.

- Existing multifamily housing units (Havelis), which are arranged around an open courtyard, must be preserved, as they are well integrated with the surrounding environment. The narrow streets leading to large open houses are best suited in this context. Therefore, open courtyards must be integrated for future constructions along the riverfront.
• Employing an integrated team of experts and governing bodies to develop a common language will enable effective decision-making process for a sustainable urban planning intervention.

In the old city, ownership is not very well defined; local inhabitants have illegally occupied this space and resist moving. Their way of life has converted the space into a substandard living environment. This lowers the value of the sacred space and makes it visually repugnant. The only way to address this issue is for the government to take the initiative to clean up the historic site and propose strict guidelines for its maintenance while working to restore the temples, mosques, and havelis. However, government planning and execution can lack foresight; poorer inhabitants might not get sufficient compensation leading to a lot of strife between the authorities and government officials. Thus, the problem with this approach is that it would be difficult to get cooperation from the inhabitants who have been living there and have made it their home.

A more amenable approach would be for the officials and inhabitants to work together to improve the sanity of the space. The government would pump in the required funds initially to restore and build up the space. In order to make this approach sustainable, money generated from local tourism in each of these locales must be used for the preservation of heritage sites. Officials also should provide a set of guidelines to be followed by residents in exchange for an affordable rent/lease terms.

3.5.3 City Level Integration: The existing land use for the site is mixed with residential, commercial, religious, and institutional buildings located in close proximity. This mixed land use allows easy access for the users of the space. On the other hand, the overcrowding of many commercial, religious, and residential units in the site cause commotion on the streets. Furthermore, the poor infrastructure cannot support and sustain the growth of the population.
Therefore, infrastructure must be adequately provided to meet the demands in a sustainable manner by using natural resources and generating solar energy. Also, the city plan should provide well-defined pedestrian bicycle pathways for faster modes of access. Motor vehicles, cars and other heavy vehicles must have different access routes. The concept of community benefits and tax waivers must be introduced to those who incorporate green strategies for building design and choice of transportation.

- Commercial activities that take place along the main road have maximum trade potential, rather than on the interior narrow streets. Hence the interior streets could be converted completely into private residential areas. This way of distributing different land uses based on the needs of the people will allow easy access and reduce haphazard movement within the interior streets.

- Public transportation modes must be integrated within the site for better access. Bus stops, bicycle pathway facilities and other pedestrian friendly modes of transportation must be proposed and built in suitable places.

- Passive recreation spaces along the riverfront must be well defined through landscaping for safety reasons. Children who live along the riverfront are found playing in any open space. Adjacent to the riverfront, such active recreation elements should be physically buffered from the more passive riverfront uses.

- As the historical site is densely developed, the built forms therein do not abide by any restrictive setback regulations. Any new additions or constructions taking place in this site should follow the traditional architectural style of not providing setbacks around the building, but providing open courtyards within the building. However, along the riverfront, there must be a constant setback from the river to provide accessibility for other passive recreation functions.
3.6 Conservation and Preservation

The riverfront has been a strong cultural space for centuries, and it should continue to remain this way in the future as well. Tourism and pilgrimage have been large sources for the financial sustenance in this region. Gaining full potential of this aspect requires a long-term development and preservation plan.

According to Kostof Spiro, “The city is the ultimate memorial of our struggles and glories: it is where the pride of the past is set on display.” The temples in Varanasi are of historical importance. The site can be divided into three major zones as shown in the following image:

a. Waterfront Ghats (Along the river)

b. Narrow streets leading to the river (Red)

c. Main road Dasasvamedh leading to Dasasvamedh Ghat (Grey)

![Plan of site chosen for urban renewal between Manikarnika Ghat and Dasasvamedh Ghat](image)

**Fig. 3-8:** Plan of site chosen for urban renewal between Manikarnika Ghat and Dasasvamedh Ghat (Source: Prof. Desai, Art history Department, Pennsylvania State University)

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As evident in Fig 3-8, the street patterns are unique and dense. The approximate dimensions of the site above are about 1.2 square miles. The riverfront is about 0.60 miles. Within this much space an innumerable number of narrow streets are seen. These narrow streets can accommodate only pedestrian movement. The wider roads, shaded grey, are overcrowded and congested with vehicular and pedestrian traffic. The plan above displays the layout of streets and their organizational pattern.

According to the Varanasi city website, there are about two thousand temples,\textsuperscript{41} and their presence creates a significant visual impact on the city. Street networks that connect these temples are very narrow and designed solely for the purpose of pedestrians and bicycles. With no regulations for transportation within these narrow streets, motorbikes are often found using these streets, hence, causing congestion and pollution in the sacred environment. The narrow streets laid out in the historic fabric provide several virtues, such as privacy, security and human scale. For these narrow streets, “The preservation design principles are organized into three major categories: \textbf{Public Realm, Historic Artifact, and Visual Character.}\textsuperscript{42}

\textbf{3.6.1 Public Realm:} The preservation of the Ghats as a public sphere is significant for the continuity of cultural and religious practices. Discussed below are a few ways of preserving this aspect of the public realm:

- Preserving the landscape of the riverfront as a regional public area, to ensure the enhancement of the environment.
- Preserving the heritage sites along the riverfront while identifying new venues for further development.

\textsuperscript{41} http://www.varanasicity.com/temples/index.html
• Addition of green spaces and trees along the main market area, as shown in Fig. 5-24 provides shade and rest areas for the users of the historic site.

• Encouraging a variety of religious and tourist’s activities, which will attract visitors to the riverfront. In order for them to experience the sacredness of the setting, the sacred site must be kept clean after the ritual is completed for the public to be able to access the river as shown in the image below.

![Fig. 3-9: View of the Brahmapuri Wada (Brahmin House) along the riverfront Ghats. (Source: Author)](image)

**3.6.2 Historic Artifact:** Fifield, et. al. explain that, “Within a developing urban region, the preservation of historic elements creates ‘value added’ strategies.”\(^{43}\) The monuments along the riverfront such as temples, mosques, ancient schools and havelis must be preserved as an artifact. Recently painted walls on the façade of the riverfront, which is not a part of the original structure must be removed, cleaned and protected against

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corrosion related deterioration using suitable restoration guidelines. The image below shows the riverfront Ghats where the white plastered wall ruins the view of the Ghats.

Fig. 3-10: River front Ghats between Manikarnika Ghat and Dasasvamedh Ghat (Source: Author)

With no attention to the historic value of the site, the space is undergoing transformation by the inhabitants who are using easily available materials and odd colors, ruining the visual character and historic artifact of these ancient monuments. Many such walls must be cleaned, replaced and finished with sandstone.

Clearly, it is necessary to preserve these cultural landscapes and emphasize their importance. Although the local inhabitants know the value of the historic space, they do very little to preserve the space architecturally.

4.6.3 Visual Character: The public view of the river front Ghats may serve as a civic feature. The view of the Ghats remains memorable to its inhabitants and visitors. Preserving the identity of these Ghats through their architectural details can enhance the
view of the significant historic buildings’ facades. The river must be completely cleaned and preserved for visitors to enjoy the natural features.

With respect to architectural preservation, the architectural details depict the visual character of the historic setting in Kashi. Fig. 3-11 and 3-12 illustrate few architectural details documented from the elevation of Ghats.

Fig. 3-11: Elevation of the octagonal towers seen on the elevation of the riverfront (Source: Author)

Fig. 3-12: Section of columns at the entrance of historic structures (Source: Author)
It is essential to preserve the ornamentation of the existing monuments, and not allow them to decay over time. Incorporating these styles for future construction of buildings along the riverfront may not be possible as construction technology changes over time and mimicking architectural ornamentation styles of the past will deny the present architecture. However, few strategies that need to be considered are discussed in the following page.

- Maintaining existing views form the river toward significant historical built forms would allow a better visual experience for the tourists, who are the main source of economic sustenance for this specific region.

- The panoramic view must be preserved to ensure that there is consistency with respect to the historical building façade of these Ghats. Several hotels and lodges have been built along the Ghats facing the river. These hotels have been built illegally and their facades do not follow any standards of preservation consistency in terms of façade detailing.

- New building construction regulations must include a detailed report that defines height restrictions, setbacks from the river, and required minimum amount of green space, street furniture and other site planning guidelines within the historic boundary.

3.7 Safety

The high influx of pilgrims around the year creates hazardous situations. It is estimated that more than one million people visit Varanasi each year. During the Kumbhmela in April 14th 2010, about ten million people entered the Ganges for a holy dip. Improperly implemented safety features have resulted in deaths due to stampede and drowning. Thus safety should be the primary concern for design authorities.

Based on the high intensity of use, riverfront property should incorporate some of the below mentioned safety features:
• Well-marked points for entry and exit
• Paved paths that prevent slipping
• Railings along the river and walkways
• Signage
• Specified paths for emergency services
• Sufficient lighting
• Emergency accessibility
• Coordination with utility authorities
• Surface maintenance

3.7.1 Minimizing potential hazardous due to water

The entire length of the banks of the river should have safety railing designed as an ornamental railing made of local sandstone, especially in high intensity pedestrian areas. All railings must be well marked and made visible in darkness through night-lights on the walls and steps.

3.7.2 Adequate pathway dimensions

Owing to the high intensity of usage, pathways must be broad enough to accommodate large numbers of people. These pathways should be built at a sufficient distance away from the river and have railings as mentioned before. Also, in areas surrounding the Ghats, supplementary paths or two-way lanes can be provided to augment the capacity for crowds.

The pathways should also be well maintained and periodically inspected. Storm-water run-offs should be constructed to avoid slippery surfaces and prevent frequent erosion from possible floods or rains.
3.7.3 Lighting

Adequate lighting should be provided for accessing the Ghats at nighttime. Intermittent lighting in low-density areas and continuous lighting around all areas close to the Ghats is highly recommended. These lights should shine only onto the river (right-of-way) and not into commercial and private establishments. Since power outages are a problem, back-up generators should be installed to avoid any panic driven hazards.

3.7.4 Emergency accessibility

All pathways should have access to different emergency utilities. Public phones at every intersection and at periodically spaced locations would enable the easy transfer of information in case of accidents. After the recent blast in December 2010 in the Dasasvamedh Ghat, where many people get together for the evening Ganga aarthi, it is necessary to provide security cameras in crowded public areas to help authorities monitor the site and hence become better prepared in case of any hazard. Introduction of help desks and police booths would assure the public of greater measures that authorities have taken in order to ensure the safety and comfort of pilgrims and tourists.

3.7.5 Coordination with Utility Authorities

For future development proposal or addition of utility facilities, policy makers must coordinate with utility providers to abide by safety standards. Safety with respect to gas transmission lines, electricity lines and other utility uses, should be checked. Open play areas and resting spaces should not be located near transmission towers.

3.7.6 Surface Maintenance

The steps along the riverfront used by pedestrians must be inspected regularly providing sufficient maintenance to prevent any hazards caused by human activity disposals or erosion from storm water runoff.
3.8 Conclusion

Any implementation measure should acknowledge the above planning and design strategies. These strategies were adapted from framework proposed in Metropolitan Canals by Michael Fifield, Madis Pihlak, Edward Cook and Sharon Southerland and applied to Varanasi’s heritage site to conserve the environment within the historic site. Even though the above design framework was proposed for a Western site context, its fundamental design intentions such as, preserving the historically significant canals and their identity; integrating them with the social lives of the people and providing adequate accessibility, continuity, diversity and safety are common aspects of concern that hold true for the development and restoration of the historic riverfront Ghats. With an intention of conserving the environment and the structure of the historic city the above-mentioned urban planning and design strategies are discussed. These attributes will enhance the conservation and commoditization of the historic city.
FIELD STUDY AND SECONDARY RESEARCH: VARANASI

A field study was conducted to experience the on-site reality of one of the holiest cities in India. This field study was conducted in two phases. Each phase lasted for about two weeks. The first one was done in July 2009. The purpose of this visit was solely to observe and document the city as it appears from the eyes of various perceivers, such as a tourist, a pilgrim and a design researcher. The second field study was done in January 2010. The purpose of this field study was to collect more data by documenting architectural details, interviewing Mr. R.P. Goswami, the vice president of Varanasi Development Authority (VDA), the priests, and the doms (sect of people who burn corpses) in Manikarnika Ghat about the environmental aspect of Varanasi. Below is the description of the phase one and phase two components of the field study.

4.1 Phase One, July 2009

The first phase was conducted from July 11 to July 30 in Varanasi. This field study was done with the intention of understanding the ancient and ubiquitous reminders of the cultural and architectural integration over thousands of years that make up Varanasi. The aim of this field study was to observe the city through a tourists' perspective, a pilgrims' perspective and finally a researcher's perspective.

4.1.1 Tourists' Perspective

Driving through the city of Varanasi offered different views of the busy streets demonstrating rapid change that the city has gone through over the last few decades. At the heart of the city, the landscape was more of a compact urban environment with numerous medium rise buildings. Many of these buildings were built during the late eighteenth century; the Ghats along the riverfront were built in the late seventeenth and
early eighteenth centuries. Although some structures are preserved by I.N.T.A.C.H (Indian National Trust for Art and Cultural Heritage), there are many buildings that show signs of aging and deterioration. With the exception of a few main streets, all the thoroughfares are narrow, single-lane streets. The street in Fig.4-1 is about 2 meters wide, flanked with historic structures on either side.

Fig. 4-1: Narrow Streets leading to the Ghats

These streets represent the longest-standing human made features that tie together an ancient civilization. The historic fabric has a visible pattern, which was evident during this site visit. During ancient times Varanasi was perceived to be an ideal place to live for spiritual growth as well as economic development. However, uncontrolled human settlement in the city led to sporadic building development over the years, which led to deterioration.
A few measures have been taken to keep the historic city clean; for instance, workers are employed to clean the roads and collect the garbage everyday. However, this is not very effective because the streets are narrow and vehicles for collecting garbage cannot access the interior streets, and people employed for this job cannot walk through the narrow streets to collect the garbage. Therefore huge dumps of wastes are found accumulated in any open area within the historic site. Hence, there needs to be an effective way of waste disposal to keep the historic site clean.

With respect to diversity this historic site is filled compactly with residential units, temples, street side shops and small Vedic schools. As a result the mixed use of commercial, residential, and institutional buildings do not merge well for the sacred landscape that is desired by the users of this site. One interesting observation was the layout of the city, which seemed well-planned considering the extant conditions surviving from the past century. The narrow streets and ancient *havelis* (palaces) with open courtyard gave a sense of privacy on the streets and openness within the *havelis*.

Final destination of the day was the river Ganges. The city stretches along the banks of the river with the many Ghats situated all along the riverfront. There was no distinct change of land use or landscape as one moved from former to latter. This overlapping of the crowded city and the river is a quintessential reason for population pressures that plague the sacred space and the Ghats.

The path leading to the river through a linear flight of stairs stretches along the Ghats. This huge flight of stairs displaced any other form of landscape. They were originally built for millions of pilgrims to be able to access the sacred river and perform their rituals during festivals. In spite of being on the banks of a large and perennially flowing river, the banks were devoid of any green cover and appeared arid. This
condition can be partially attributed to the harsh climatic conditions. The image below shows the view of the Ghats from the river.

![View of the steps from the river](http://www.oldindianphotos.in/2010/12/ghats-of-benares-varanasi-1890s.html)

![View of Dasasvamedh Ghats from the river](http://www.travelpod.ca/ad/Dasaswamedh_Ghat-Varanasi)

### 4.1.2 Pilgrims’ Perspective

When viewing the city from a pilgrims’ perspective, one discovers its deeper religious intensity displayed through the ancient culture of Varanasi’s inhabitants. Many
religious Hindus make a pilgrimage to Kashi at least once in their lifetime to obtain salvation and bathe in the sacred Ganges, which is believed to cleanse their soul of committed sins. Various rituals are performed by priests for the pilgrims who visit Kashi; these rituals involve respecting the birth, life and death of the people. Several ashrams (resting houses) and hospices are built to accommodate the aged pilgrims. It is believed that those who die within Kashi (historic city of Varanasi) will be freed from the cycles of birth, death and rebirth.

At the time of death, most Hindus are cremated with fire from burning wood, and their ashes are dropped in the Ganges. Lepers are found begging on some of the streets and preparing for their death. As this ritual is performed throughout the day and night, the entire region around Manikarnika Ghat and Harishchandra Ghat (where the cremation takes place) is filled with smoke and heavy grey air. Loads of wood are stacked in and around these burning Ghats. Due to its high demand, wood is a valuable resource and not easily affordable. Hence some use the electric crematorium for burning a corpse, but many prefer to be burnt using wood. Some rich people use very special wood such as Sandalwood for burning.

Hindus are very sensitive about the ritual of cremation, which is central to their religious belief. As a procedure dead corpse is wrapped with a red silk cloth and placed on a pile of large wooden logs at Manikarnika Ghat. Final rites are performed before the corpse is set ablaze. Families and relatives remain to collect the ashes to complete the remaining ritual. This burning can be witnessed at any time of the day. Overall, cremation is an intimate ritual, but when performed in a very open space, it creates a riveting, intense experience for people who move in and around the space.
4.1.3 Researcher’s Perspective  

The city is undergoing a rapid transformation due to several pressures such as rapid population growth within the urban setting. According to a 1991 census, Varanasi encompassed a total area of 1550.3 sq. km. with a population of 929,270; and in 2001 the population increased to 1,100,748.⁴⁴ Above all, the issue of climate change is very evident in this region with its high air and water pollution, and with the drying up of the river Ganges and increasingly unstable local temperature. The city faced drought in 2009 as well without any rainfall. Fig.4-4 shows the drop in water level in 30 years.

Fig. 4-4: Section across Lolarkunda showing the drop in water level over 30 years (Source: Neils Gutschow, "The Sacred Landscape of Benares," Benares (Daehan Publishing Co., Ltd., 2006) 41-463.

In Varanasi, the Ganges River is the main lifeline of the historic city, so the protecting this river is crucial. Inconsistency in policies, lack of administration and religious sentiments is causing environmental negligence and resource scarcity within the city. It is very important to understand that environmental damage will have an economic impact and subsequently a cultural impact on the users of this space.

A recent news article on Varanasi discusses the government’s indifference concerning preserving the local environment:

“The electricity and irrigation departments did not plant a single tree though they had been given the target of planting 14,300 saplings on 22 hectares of land. Interestingly the state government has never shown interest in initiating action against the departments, which overlook the environmental concerns. The department claims that they had no funds or no land to plant saplings. The Deputy Manager said that non availability of land could be an acceptable reason but no department can state crisis of funds as a reason in this regard.”

There is a need to integrate different departments that are responsible for the growth and development of Varanasi and introduce environmentally efficient guidelines for the sustainable preservation of Varanasi: “Policy makers have typically viewed renewable energy as a niche resource, at best. However, when taken in historical context, and in light of progress over the past twenty years, many energy planners are now viewing it as a critical part of the integrated energy mix on which we must build our future.” Encouraging the use of passive, sustainable design strategies, such as natural lighting, wind flow, and use of local or rapidly renewable materials, must be practiced.

Varanasi Development Authority has now decided to undertake a more planned development along the historic riverfront. The master plan for 2011, which aimed at widening many roads, was not implemented effectively and the condition of the roads only worsened with the increase in traffic over the years: “The VDA could also not continue its drive against high number of illegal constructions, misuse of basements sanctioned with parking provisions and developers of illegal residential colonies on the outskirts.” So, their approach is to call for investors from the private sector to adopt historic sites and preserve them architecturally, while utilizing them for different purposes that support the cultural heritage of the users of this site.

45 http://timesofindia.indiatimes.com/city/varanasi/Plantation-targets-Some-depts-score-a-big-zero/articleshow/6836522.cms
Fig 4-5: Open drainage in front of shops (Source: Author)
Many shops are flanked on either side of the main streets, which have open drainage. Thus, the eat-out places appear very unhygienic, as this situation does not improve public sanitation.

Fig 4-6: Historic Buildings (Source: Author)
Historic buildings are occupied, but not preserved effectively, since occupants do not have the necessary resources. The Indian National Trust for Art and cultural heritage (INTACH) has preserved a few buildings, but many historic structures are left unattended.

Fig 4-7: Flat terraced housing (Source: Author)
These open terraces cause a heat island effect because of the alteration of the land surface by incredible urban growth and construction using materials that effectively retain heat. The temperature in this region is nearly unbearable in summer months.
The poor living conditions and infrastructure lead to a lack of privacy for the hawkers. Also, healthy storage of perishable goods is impossible. As a result, unhygienic perishable goods are sold.

There are no strict traffic regulations. Inefficient signage results in haphazard and slow traffic movement, with cycle rickshaws occupying most of the roads. There is no public transportation facility like buses or trains except for cycle and auto rickshaw.
The images from Fig.4-5 to Fig.4-10 show some of the urban planning and preservation challenges that need to be addressed by planners and architectural preservationists. These images were captured during the phase-one field study (July 11th to July 30th 2009).

4.2 Phase 2, December 2009

This field study focused on documenting architectural details and interviewing VDA, Doms and Priests, which are discussed below:

4.2.1 Interview with the Vice President of VDA

The Vice President of Varanasi Development Authority, Mr. R.P. Goswami was interviewed in English about the environmental planning proposals for 2011 (the detailed interview is given in the Appendix for reference). The main issues that the Vice President talked about concerning the environmental planning was their proposal to make rainwater harvesting a mandatory installation for building projects of site areas larger than 300sqm. He did not talk about other methods of proposing environmental planning or energy efficient design strategies that could be used for city development. Hence, what can be understood here is that there is inadequate attention given to energy efficient strategies that can be incorporated for projects in order to encourage sustainable growth within the city.

The Vice President also spoke about the Land Use Plan of Varanasi for 2010, which aimed at addressing issues of congestion, traffic flow, etc. However, only a partial implementation of the plan was possible due to the slow pace of construction, booming real estate prices, resistance of land acquisition programs, anti-encroachment drive, paucity of funds, religious sentiments, and fervor against shifting of places of worship. Nevertheless, their new plan aims at the following approaches:
• Create satellite townships around the city
• Create new commercial, institutional, industrial centers on the city to work as counter magnets for the city’s population.
• Promote conservation of the old city and discourage commercial and construction activity.
• Impose controls for restoration of old structures of heritage value.
• Conserve River/Water resources
• Promote tourism
• Develop waterways
• Construct ring road, radial roads and other peripheral roads
• Improve existing roads and traffic intersections
• Incorporate gardens, parks, recreation and cultural centers in the new plan
• Provide parking lots wherever possible in order to accommodate the increasing demands of vehicle users.
• Prepare zonal plans for developing areas of the city.

The Varanasi Development Authority also provided information regarding the details of ground coverage and the Floor Area Ratio permissible for different building types, which are mentioned in the appendix for future reference.

4.2.2 Interview with Priest

While interviewing a priest near Manikarnika Ghat, information about spiritual significance of Varanasi was acquired and is listed in the appendix. The priest also spoke about the environmental issues witnessed by him on a regular basis. As the temple is located near the burning Ghats, the ashes of burnt bodies that are spread in the air end up getting deposited on the walls of surrounding houses and temples.
Nonetheless, he believes that the ritual of cremation using wood is very important for every Hindu to attain Moksha after death.

According to Parry, “Though priests have a professional stake in imparting the religious certainties, it is hardly surprising that the answers they offer are not without contradiction and inconsistency. But nor are these answers an amorphous hodge-podge of individual speculation.”\(^{48}\) Therefore, it is evident that the belief of the people is spread through the influence of customs from many generations and their social preferences, which might affect many factors, such as the living condition and environment.

### 4.2.3 Interview with Doms

In Manikarnika Ghat, one of the oldest Ghats in Varanasi lives a sect of people called “Doms,” who religiously perform the ritual of cremation for hundreds of bodies every day, and were interviewed to understand their background and needs.

These doms explained about the sources of wood used for cremation and the method of cleaning the Ghats after the ritual of cremation. They said that the wood is brought from the jungles near the city and few precious wood are brought from South India. They also mentioned that people who die from snakebite, skin disease, or infant death are considered sacred and are generally not burnt. With regards to cleaning the riverfront Ghats, they explained that when the water level is high, the dirt and corpses float away and the river gets naturally cleaned. After the body is burnt, the ashes are swept away, which eventually settles into the river.

The major concern of the doms was the lifestyle: as the cost of living is increasing, but they are not given any other job opportunities because of their background. They also mentioned that if they get an alternative job opportunity, they would be willing to take it up.

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By interviewing the different sects of people, a better understanding of the needs of the main users is obtained. The doms perform their duty without any other opportunities; the priests strongly believe that cremation must be performed with wood in order to attain salvation and VDA’s land use plan of 2010 was only partially implemented due to the slow pace of construction, booming real estate prices, resistance to land acquisition programs, anti-encroachment drive, religious sentiments and fervor against shifting of places of worship, paucity of funds, etc.

From these interviews we are able to better comprehend the concerns of users and the proposals of VDA. While the VDA understands that there is a need for developing the city and at the same time preserving the historic fabric of Kashi, they are unable to address the key attributes that will help in conserving Varanasi as a successful tourist-historic setting. Thus this thesis discusses about the seven planning and design attributes namely, “Accessibility, Continuity, Diversity, Identity, Integration, Preservation and Safety,” which can be applied to renew the urban fabric and preserve the monuments along the historic riverfront Ghats and the main market street.

### 4.3 Secondary Research

Books and articles related to tourist historic cities management, urban heritage preservation, Varanasi’s background, environmental planning and architectural design strategies were studied in order to better understand the approach of addressing the complex issues that lie within the development and preservation of the heritage site.

The urban heritage is recognized by the physical fabric it displays in the present and past events, thus creating an identity and sense of belonging for its users. The inspiration and desire for preserving this heritage is to enhance the quality of life of its inhabitants. Preservation plays a major role in understanding the social morphology within urban dynamics. It is incomplete without addressing the ever-changing demands
of the community. Interpreting the urban heritage and recreating the historic religious site are not only based on its urban history, they are also based on the potential viewer’s imagination. Orbasli clearly explains—

“Although an underlying spatial morphology and a certain amount of physical fabric are of past era, the experience is of contemporary ‘heritage town’, in which layers of history in the urban fabric, use of space and contemporary human life interact, both in harmony and in tension. Conservation may be a form of interpretation, but it has to respond to the spatial pattern and morphology of the city.”

The physical aspects for urban renewal are the existing built forms, and the landscaping elements that need to be protected. The cultural aspects of urban renewal are to fulfill the continuation of traditional uses and functions of its inhabitants. The social aspects of urban renewal are to fulfill the contemporary recreational needs of inhabitants to enjoy and use the space in a healthy manner. All these values combine to form the overall environment around the urban setting. Enhancing the environment of the urban setting for the tourists and pilgrims is aesthetically critical. As the urban fabric continues to grow and change with time, conservation of these spaces will help protect their physical, cultural, and social values.

The spatial morphology of Kashi is unique, with narrow streets and tightly packed structures of mixed land uses. The narrow streets connecting these structures cannot accommodate vehicles or any huge machines that are used for the contemporary way of life, as they were not designed for that purpose. Kashi is viewed as an important religious center with hundreds of shrines and Ghats along the riverfront. Many of these shrines along the Ghats were built during the late seventeenth century (300-350 years old). The Ghats were built around the same time at a higher level to prevent water from flowing into the city. Rulers of different states built palaces and vacation homes along

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the riverfront. Today these palaces and temples within the Ghats mark the boundary of the ancient Kashi along the riverfront. With time, some of these palaces have been modified and reused as guesthouses for tourists. Some remain occupied by the following generations of the earlier caretakers. Since the caretakers of the palaces and Ghats built by rulers of different states have occupied them for many generations; they resist from moving out of these ancient monuments, as they believe it is their home.

The region between the Manikarnika Ghat and the Dasasvamedh Ghat falls within the Antagriha, which is considered the core sacred space according to mythological studies. It is clearly evident that the number of inhabitants and tourists in Kashi has increased dramatically. The urban fabric that exists today has changed very little to accommodate the increasing population. However, at the outer extensions of the city there are recent additions of several hotels, shopping malls, and other recreation facilities. In spite of this, many tourists and pilgrims come and lodge by the river in small hotels and ashrams, as their interest is to experience the sacredness of the city.

4.3.1 Conservation Challenges in Developing Countries

For developing countries with a tight financial background, urban conservation should prove its importance for economic development. Listed below are the major conservation challenges in developing countries:

- Increasing population and urban growth is extremely rapid compared to the growth in western countries.
- Limited resources for urban development cannot meet current needs.
- Government budgets can barely cover the costs of urban conservation.
- The appreciation and value of culture and heritage is quite different in the west.
- Conservation of Indian heritage does not attract funds from the foreign nations.
• The aspiration to modernize and grow is greater in developing countries. Therefore, urban conservation and preservation are not given too much importance in developing countries.

Rehabilitating historic sites by preserving and reusing traditional structures to enhance the socio-cultural values of the inhabitants is an interesting and inspiring move towards urban conservation. By giving importance to the aesthetics and craftsmanship of the traditionally built forms and educating the people about those unique characteristics, the developing countries can spark an interest in heritage values among the community. According to Cohen, “the different means of conservation are:

• Development of urban links
• Encouragement of functions
• Land arrangement and building regulations
• Conservation prototypes
• Renewal of building codes
• Enforcement of urban and national codes
• Definition of secondary divisions, land uses and intensive use
• Definition of responsibility of advancing conservation”

4.3.2 Need for Environmental Planning

Preserving the historic city of Kashi and developing the region to meet the needs of the inhabitants involves understanding the significance and limitations of this old dense city. Kashi is not only a historic site; but also a sacred site for the Hindus. Until the Ganges flows along Kashi, the site will remain significant for the Hindus. Over the years, the level of the river has dropped significantly as shown in Fig. 4-4 and the smaller tributary rivers have dried up or polluted with industrial and other organic wastes. If

environmental policies to protect Ganges from further pollution remain neglected, then the significance of Kashi as a living sacred site will fade away.

Varanasi might develop with better infrastructure beyond the historic site, but it might lose its identity as a living sacred site with hundreds of temples and Ghats along the Ganges. Therefore it is necessary to propose environmental regulations to prevent Ganges from being further polluted. Daniels points out that,

"A common problem in traditional comprehensive planning process, which usually emphasizes growth and development and does not place a high priority on environmental planning. Specifically, it is not uncommon to find comprehensive plans that have little to say about the capabilities and constraints of natural environment."\(^\text{51}\)

For a sustainable development of a dense historic city, we first need to understand how sustainable development has been defined. According to the 1987 Bruntland report for the United Nations, sustainable development is defined as “Development that meets the needs of the present, without compromising the ability for the future generations to meet their needs."\(^\text{52}\) Since this definition is obtained from the Bruntland report for the United Nations, it can be applied for the sustainable growth of ancient cities in India. However, the uniqueness of the city and the needs of its inhabitants are the exclusive criteria, which need to be addressed.

In a recent news article, the Varanasi Development Authority (VDA) announced on Oct 28, 2010 that, “Varanasi will be the first city in the country to have an exclusive cultural mini city having religious, cultural and spiritual centre. The VDA will develop about 600 acres of land on the banks of the river Ganges and give it to private organizations and institutions to promote cultural, religious and educational activities on


This project is earmarked at 3.5 billion rupees ($~78 Million USD) and will be a joint venture between the VDA and the Indian government. The VDA is proposing the introduction of museums, auditoriums, meditation centers, cultural centers, hotels and guesthouses on this land. The governing body is also emphasizing the conservation of the cultural heritage as the monuments hold great national value. Developers must be sensitive to the existing historic monuments to prevent alteration of the Ghats’ façade.

4.4 Renewal of the sacred urban fabric

The uniqueness of this urban fabric is due to the belief of the people about the sacredness of the site: “Many of the world’s religions hold the same four elements sacred: earth, air, fire and water. Hinduism religion, the religion of India, adds a fifth: Spirit.”54 This spirit of Varanasi’s sacredness is seen and witnessed by the users of this space, through the numerous festivals and rituals that are performed almost every day in Kashi. Thus, to enhance this unique “Spirit” of the sacred site, it is crucial to involve the users of this space in order to comprehend their needs. By interviewing the priests, the doms and the VDA Vice President, a better understanding of the site’s context was obtained. Based on an analysis of this comprehensive data, planning and design strategies are proposed for three important site fragments within the historic boundary: Manikarnika Ghat, Dasasvamedh Ghat and Dasasvamedh main access road. These three fragments are analyzed with respect to the traffic density regulation and the architectural style enhancement wherever applicable. Through analysis, planning and design strategies are proposed with the goal of enhancing the site with respect to its Identity, Integration, Accessibility, Continuity, Diversity, Preservation and Safety, which are discussed in the following chapters.

4.4.1 Planning Strategies for a Sustainable Built Environment

In order to make sure that urban development does not conflict with conservation, a set of guidelines must be developed. These guidelines must complement the urban development initiative proposed by the VDA. The guidelines proposed in the following chapters for enhancing the space around Manikarnika and Dasasvamedh Ghat along the riverfront includes not only planning suggestions, but also preservation management proposals. In Dasasvamedh main road, planning guidelines are proposed to address the issues of pedestrian and vehicular traffic management. A community’s identity will depend on how the built environment interacts with the natural environment, just as it also creates an impact on public health.

4.4.2 Design Strategies for a Sustainable Built Environment

In order to create a sustainable built environment in a historic site, the cultural life of the inhabitants must be defined by enhancing the identity of the space, its enduring monuments and landscape. Although use of renewable energy cannot be easily incorporated as the government funding will prioritize on providing adequate infrastructure for inhabitants such as health care facilities, electricity, road network for better accessibility and housing for slum dwellers; it is important to sustain the active lifestyle of local inhabitants by promoting the use of local materials for construction, encouraging local arts and crafts that are inherently developed by the inhabitants of this historic site. According to Daniels, “Attractive buildings, a mix of different land uses, walk ability, and access to green spaces can contribute to a community’s quality of life. A healthy environment minimizes pollution and waste. Enduring buildings have cultural
aesthetic, historical, and economic values. They make community recognizable and give it uniqueness and style.”

This research develops architectural preservation guidelines for the historic monuments and proposes strategies to integrate sustainable design that is inherited from the vernacular architecture of Varanasi. Initially, it is necessary that all built forms in the historic site be surveyed in order to rate the condition of each built form, its area, its age, and its value. Then a feasibility study of its future use must be prepared based on the survey and observations made. A team of interdisciplinary individuals of art historians, designers, builders, planners, policymakers and technically skilled professionals are required from the initial stage of analysis. Then a discussion of feasibility reports can be made in order to make design decisions that create a balance between the aesthetic, economic, and ecological sustenance of the historic monuments. With this objective, the following chapters discuss planning and design strategies for the urban renewal of the historic site and the architectural preservation of its monuments.

CHAPTER 5
CONSERVATION OF MANIKARNIKA AND DASASVAMEDH GHATS

For architectural enhancement of a historic site, an integrated team of architectural historians, conservators, historical preservationists, and engineers is needed for a well-reasoned decision-making process and its implementation. With an architectural background one finds a few design improvements to suggest for the enhancement of the following spaces within the city:

- City streets and market areas
- Historic riverfront Ghats

These sites are significant for their historical, mythological, geographical, architectural, physical, and ecological virtues as discussed in Chapter 2. Therefore, the setting around this ancient site must be improved with respect to its identity, integration, continuity, preservation, and safety. These attributes are to be applied to three specific sites within the Panchkosi yatra boundary:

1. Manikarnika Ghat (Historic Preservation)
2. Dasasvamedh Ghat (Tourism management)
3. Dasasvamedh main road (Traffic flow)

Through visual observation of the site, and interviews conducted with the inhabitants, several analyses in urban planning were made in regard to the traffic flow, preservation of historic structures, and tourism management. The three main sites mentioned above were chosen for their deep historical and mythological significance. Also, because they are being proposed for UNESCO world heritage site recognition these sites are critical to exhibit Varanasi’s rich culture and heritage.
In the map above, the site under study is shown. The highlighted green zones are the specific riverfront Ghats chosen for study and the highlighted grey road show main access roads in the plan below.

The Manikarnika Ghat is the site of cremation while the Dasasvamedh Ghat is where religious rituals like the Ganga aarthi are performed at the time of sunset. Many tourists come to watch this splendid ritual performance. The Dasasvamedh main road is the main access to both these Ghats. Since all tourists must pass this route it is very busy. The market street is flanked with shops, vendors’ carts, and hawkers.

It is important to preserve this urban fabric because of its unique street pattern and historical significance. Hence, design strategies, which help in preserving the identity of this site, are suggested in order to improve the ambience and comfort level for the users of the space. The needs of the users are analyzed and possible modifications are proposed for improving the environment within the site. These improvements are not
exhaustive, and are limited to the background information gained through architectural and urban planning studies.

The following issues are addressed in the following three sites:

**Manikarnika Ghat**

- Cremation rituals polluting the waterfront
- Storage of large quantity of wood on the riverfront denying continuity of access along the riverfront.
- Preservation of architectural Monuments

**Dasasvamedh Ghat**

- High density of tourist population
- Inefficient Infrastructure—Sewage, Water Supply, Electricity, etc.
- Insufficiency of parks and open spaces

**Dasasvamedh Main road junction**

- Shortage of parking facilities
- Chaotic situations on road intersections
- Slow and unorganized movement of traffic causing traffic jams and commotion

### 5.1 Manikarnika Ghat

According to the Varanasi pilgrimage website, “Manikarnika Ghat is the main cremation Ghat of Varanasi. It is one of the oldest and most sacred Ghats in Varanasi. According to the Hindu mythology, being burnt here provides an instant gateway to liberation from the cycle of births and rebirths.” This sacred space is very important and is one of the busiest places within the city. Many ancient temples exist in the Manikarnika Ghat due to the mythological belief the Panchkosi yatra begins from this site. Thus, this site was selected for its outstanding historical features. The image below

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[56](http://www.varanasicity.com/manikarnika-Ghat.html)
is the plan of Manikarnika Ghat along the riverfront. The red highlighted structures are temples located in Manikarnika Ghat. The dark grey areas are built-up structures, mostly residential in the interiors and small shops along the narrow streets accessing the riverfront. Light grey shaded areas are pedestrian walkways. The yellow shaded areas are open with steps leading to the river. Huge piles of wood are stocked on the left for burning. These structures should be documented and proposed for the architectural enhancement of the historic site by incorporating suitable planning and design attributes as discussed in Chapter 3.

In Manikarnika Ghat, the following factors are applicable: Accessibility, Preservation, Identity and Safety. Based on these factors, the following issues were identified within this Ghat:

- Preservation: Architectural monuments façade treatment
• Accessibility: Pedestrian Circulation and Parking
• Safety: Storage of wood and waste disposal regulations

5.1.1 Preservation: Architectural monuments façade treatment

The architectural monuments in this site are temples, havelis (palace), ashrams (resting house), and the kund (stepped well). These structures show deterioration on their outer façade by deposition of dust, smoke, and erosion due to the water and extreme weather conditions. Preservation of these structures is discussed below.

5.1.1.1 Temples: Many temples in this site have intricately sculptured columns, arches and overhang chajjas (shading overhang above the window). Few of these structures have been preserved by INTACH few years back. Yet these temples need to have their condition mapped at regular intervals to check for any form of deterioration on the natural sandstone and have this repaired by local artisans and traditional builders. Moreover, an attempt must be made to promote knowledge acquisition of traditional construction methods from old builders by young artisans.

Fig. 5-3: Image of Amiti temple, Manikarnika Ghat (Source: Author)

The highlighted area in the image, shows that water and smoke deposition over the years cause discoloration of the natural stone. As a result, there is a need for cleansing the outer structure and protecting the temple.
Newly added temples must have well-articulated *shikaras* (temple top pyramidal structure) and *mandapas* (colonnaded hallway leading to the main shrine for prayer) as shown in Fig 5-5 in order to preserve the classical style and identity of this space. Fig.5-5 gives an idea of a typical modular plan and elevation of many temples that exist along the banks of the Manikarnika Ghat. It serves as an example of a temple module that must be preserved for the future generations.

![Fig. 5-4: Architectural detailing for temples in Manikarnika Ghat (Source: (http://guruvesaranam.com/Trailangai.html))](http://guruvesaranam.com/Trailangai.html)
The area highlighted in red in this image shows a structure, which does not follow the classical architectural ornamentation. Such structures add to the variety of architectural expressions. However, when built in a substandard manner, they might demean the ancient architectural identity, which must be considered carefully before construction. The temple highlighted in green is the ancient Amiti temple with elaborate ornamentation, which goes unnoticed due to many recent additions on the Ghats.
Fig. 5-5: Plan and elevation of different temple types along the riverfront (scale: unknown) 
(Source: Benares illustrated in a Series of Drawings, James Prinsep, p 64)

5.1.1.2 Havelis and ashrams: These monuments located along the riverfront, are either rulers’ palaces or the homes of priests and workers from historic times. These structures are generally planned around open courtyards to allow natural daylight and cross-ventilation for all rooms within the building. Similar planning, materials, and architectural details must be adapted for any new construction or renovation project along the Ghats to preserve the identity of its cultural heritage.
Fig. 5-6: Image of Annapurna Chatra, planned around a central courtyard. (Source: Author)

This space is used as a five star tourist guesthouse. Similarly, other Havelis and ashrams, which are not functioning effectively, must be preserved and given accessibility to tourists in order to help in generating revenue for the regular maintenance and restoration of such monuments.

Fig. 5-6 is an example of the preservation project, being implemented in few places along the Ghats. This place is presently used for events and performances for international visitors and is taken care of by the Clarks hotel in Varanasi (although historically, it belonged to a rich family from Pune). Many such historic sites along the riverfront can be preserved and reused for promoting the heritage of Varanasi. The interior alterations are temporary with flowers and other decorating materials. However the structure remains unaltered to retain the original appearance of the monument.

The images from fig 5-7 to 5-9 illustrate a few architectural details from different Ghats that were documented on site. Such unique architectural styles must be preserved within the monuments for enhancing the heritage of Varanasi.
Fig. 5-7: Interior Elevation of Chet Singh Haveli
Such articulate designs on the walls of havelis must be made visible to the tourists. These structures need to be cleaned and strengthened by repairing the open joints and using same materials that were used at the time of construction.

Fig. 5-8: Elevation of a doorway in Chet Singh Ghat
This fragment of architectural detail is unique to this site. Thus, the details of every structure along the riverfront must be documented and preserved for tourists and visitors alike to learn more about them.

Fig. 5-9: Elevation of pavilion in Ganesh Ghat
These pavilions are rooftop garden features prominently visible on the Ghats’ terrace. Tourists must be allowed access to these pavilions so that they can witness the pleasures of the past. These design elements must also be adopted in the future construction of public buildings along the Ghats.
5.1.1.3 Kund: The stepped well in Manikarnika Ghat is considered sacred: “the world’s first tirtha, said to have dug out by Vishnu, whose sweat filled in it as he created the world as ordered by Shiva,”\textsuperscript{57} This pond is rectangular in plan with stone steps decorated with statues of a deity on one side. The water level is generally very low and might contain flowers and other organic remains that are used during the ritual. However, it is not difficult to clean up the kund by pumping the water out, cleaning the debris, and pumping in fresh water again. This stepped well must be preserved and reintroduced in areas where organic matter needs to be immersed in the Ganges for ritual reasons.

![Painting on the stepped wells and heritage structures must be prohibited unless approved by INTACH Varanasi.](http://indiaadvices.com/Images/V/varanasi/Manikarnika-Kund.jpg)

\textbf{Fig. 5-10:} Manikarnika Kund (with a low water level) enclosed by a metal railing. (Source: http://indiaadvices.com/Images/V/varanasi/Manikarnika-Kund.jpg)

The following strategies must be employed for renewal of Manikarnika Ghat:

- \textit{Cleaning up:} the façade from newly applied paints and materials on the monuments.

\textsuperscript{57} Pippa de Bruyn, Keith Bain, David Allardice, “Varanasi (Benares),” \textit{Frommer’s India} (Wiley Publishing Inc., 2010) 465-471.
• **Strengthening:** temples, fort walls, and steps through continued maintenance programs. Any sign of loose joints must be covered and strengthened. Many walls that have broken down along the riverfront must be rebuilt. The existing walls must be checked for any signs of deterioration and repaired to avoid any form of collapse.

• **Local material reuse:** for future construction or renovation projects along the Ghats like sand stone, granite, marble with lime mortar in order to be self-sustainable and to give a sense of continuity and identity for the heritage site.

• **Reintroduce vernacular architecture:** through temples, havelis, ashrams, and gurukuls with arches, columns, open courtyards, flat terraces and stepped wells.

### 5.1.2 Accessibility: Pedestrian Circulation and Vehicular Parking

Vehicular access within the narrow streets has caused the need for vehicular parking slots on the Ghats, which is disturbing the pedestrian accessibility within heritage site. Hence, vehicular access must be prohibited within the narrow streets, and multilevel parking lots must be built at the Dasasvamedh main road and Godaulia junction.

![Fig. 5-11: Parking of two wheelers near Tarakeshwar temple in Manikarnika Ghat.](Source: Author) Motor vehicles and cycles parked on the Ghat are blocking pedestrian accessibility and also ruining the view of the riverfront ghats. In order to preserve the identity of the historic site, vehicular access to the Ghats must be prohibited and well-defined pedestrian pathways with seating benches at regular intervals must be provided.
Motor vehicles can be used until the beginning of Dasasvamedh main road as shown in Fig 5-24. Proposed parking lots on Dasasvamedh main road can hold some vehicles. However, since the site is dense parking may not be sufficient. Vehicular travel must be strongly discouraged and the use of bicycles must be promoted for shorter distance traveling.

5.1.2.1 Shade for pedestrians: The Ghats are devoid of trees, as they were built to block the water from entering into the city in case of floods. These Ghats become hot during summer months because their orientation faces direct sunrays from the East. However, since plantings cannot grow along the Ghats, traditionally-made parasols must be reintroduced along the Ghats to provide a shade for the users of this space.

Fig. 5-12: Traditional parasols along the Ghats to provide shade for the users of the Ghats. (Source: http://schwaby-chicart.com/page5.htm)

Varanasi’s unique parasols are disappearing now because of their falling demand. Nevertheless, these structures mark the identity of the Ghats and their potential role in landscape enhancement must be acknowledged.

5.1.2.2 Paving: The riverfront is almost entirely paved using natural stones to retain the character of the ancient Ghats. It is interesting to note that the narrow streets from the main road to the Ghats are paved using brick blocks. These blocks are in fact laid out to direct the people into the Ghats, as there are numerous misleading cross lanes.
Therefore the brick pavers on the street must be used consistently to direct the people from the main road to the Ghats.

5.1.2.3 Repair and continuity of steps: The wide steps are usually constructed in front of every Ghat where people gather for rituals. These steps connect the Ghats to the river. They also serve as seating areas for tourists and pilgrims, especially during sunrise and sunset. These steps are integral for the people and need to be maintained and preserved. In some regions where steps do not exist and are barren, suitable landscaping must be designed to utilize those open spaces for recreational purposes.

5.1.3 Safety: Storage of wood and waste disposal

The wood stacked in Manikarnika Ghat block pedestrian access along the Ghats. These huge stacks of wood also ruin the view of Ghats from the river. Although cremation in Varanasi is very sacred for Hindus, this wood must be stored in the terrace spaces rather than on the Ghats. Cutting so much wood and using them for burning corpses is causing immense deforestation in the jungles nearby Varanasi. Also, transportation of wood is expensive and a cumbersome process. From the field trip, it was learnt that the doms, who work in this occupation were vocal in their willingness to take up a different job and make a new living other than burning dead bodies. By providing alternative jobs, deforestation can be minimized and more people will choose to use the electric crematorium.

Nevertheless, the demand for cremation using natural wood will prevail until the government passes strict regulations to forbid this practice. However, this law might not prove effective as the belief system of the people is very sensitive among the religious inhabitants and can lead to religious riots that might cause more destruction for the local community.
Fig. 5-13 portrays the huge pile of wood stocked for cremation in Manikarnika Ghat. There is a wide flight of stairs leading down to the main pyre where the bodies are burnt throughout the day resulting in excessive smoke and ashes. The stairs are now blackened due to lack of maintenance. Another smaller flight of stairs leads to the water where the ashes are immersed. The water’s surface also has lot of floating detritus of flowers and other materials used for cremation, thus polluting the Ganges River. In order to ensure the safety of the historic site and proper storage of wood and waste disposal are carried out, the following objectives must be met:

- Polluting the river with organic wastes and ashes must be prohibited. For ritualistic reasons, a step well must be constructed for the disposal of ashes and other wastes that can be decomposed near the cremation area as shown in Fig. 5-2.
- Government must pass strict laws to prevent deforestation and replant trees. The stocked wood must be relocated to the terraces of buildings or interior storages spaces.
- Proper utilities and services such as trash cans, streetlights, and public toilets must be provided in the Ghat with regular maintenance and operations.
Fig 5-14: Plan of Manikarnika Ghat highlighting existing monuments and cremation area. (Map Source: Google)

Table 5-1 briefly describes the urban preservation challenges faced in Manikarnika Ghat, and outlines objectives for addressing these urban preservation issues.

Manikarnika Ghat

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Table 5-1: Urban environmental issues and objectives for renewal of Manikarnika Ghat
5.2 Dasasvamedh Ghat

Dasasvamedh is one of the most important Ghats in Varanasi. Every pilgrim visits this Ghat and many rituals are performed here. Many tourists visit this Ghat for a boat ride on the Ganges. Every evening, the Ganga aarti is performed here: priests offer prayers to god on behalf of the pilgrims by lighting lamps under divine auspicious. At the end of prayers, hundreds of lamps are set afloat on the river. This ritualistic spectacle is visited by thousands of pilgrims as it holds religious significance. For tourists, the view of the aarti offers a splendid vista. The two main access points to this Ghat are roads that lead out from Dasasvamedh Street, which is the commercial center of the city. Hence, the streets are always busy with a large floating population consisting of tourists, pilgrims, and local inhabitants, people from neighboring towns, and villages. Hawkers are also seen here daily selling goods on the roads.

The busy roads leading to Dasasvamedh Ghat are filled with vehicular traffic and noise resulting in disturbances of the sacred setting. During the Ganga aarti, hundreds of boats surround the Ghats. The waterways close to this Ghat are always clogged with boats. Throughout the day, these boats are either anchored a little distance away from the bank or tied to some crude pole on the bank. There are no piers or hangers for boats to dock, thus blocking the view of the Ganges and ruining the visual appeal from the steps. During festivals, thousands of earthen lamps that are set afloat seldom find their way through the maze of catamarans. Also, thousands of people gather on these auspicious days to take a holy dip in the river. However, due to the overcrowding of people within the Ghats and the narrow streets despoils the spirituality of the events that have been occurring on the banks of the Ganges for many centuries. Also, the Dasasvamedh Ghat has not been landscaped appropriately to accommodate the crowds
of tourists and pilgrims and provide them with a good view of the *Ganga aarthi*, causing congestion and stampede during festival days. In order to preserve the sanctity of this sacred site, planners must address these specific issues and propose solutions appropriately.

The main planning and design concepts addressed in Dasasvamedh Ghat are—

5.2.1 **Diversity: Mixed land-use for historic site**

Encouraging diversity of this site by creating different design programs within the site for different times of the day such as street-side shops, and temples along the Ghat. For example, designing facilities for the pilgrims to perform the rituals of bathing and prayer in the morning, aarthi rituals in the evening, and boating facilities throughout the day.

5.2.2 **Integration: Multi-functional space design**

Designing multipurpose spaces within the given boundary and providing utilities for different activities, such as benches, parasols, and wooden platforms for performing specific rituals.

5.2.3 **Safety: Security for users of the historic site**

Providing railing and ramps for elderly people within the site and controlling the entry of the people within Dasasvamedh Ghat on festival days by blocking the entry zones. Also, installing security cameras for the crowded areas will help control mishaps.
In the plan of Dasasvamedh Ghat (Fig. 5-15), the dark grey area represents the different types of buildings in and around this Ghat. The light grey area shows the two main pedestrian access pathways that people use to come to commute in and out of the riverfront. The red shaded areas are the temples. The yellow area is a multilevel open space where the aarthi is conducted. The waterway in front of the area marked “Ganga aarthi” is where all the boats accumulate. Since many boats are found lining up along Dasasvamedh Ghat, a row of boat docks is proposed to organize the parking of boats.

The boat dock must be adjacent to the space delineated for Ganga aarthi so that they can help in reducing traffic on the waterway. Preferably they must be upstream, as the main rituals (Ganga aarthi, Bathing and Lighting of the lamps that are set afloat) occur downstream. Since Dasasvamedh Ghat is very popular amongst pilgrims and tourists, the steps can be converted into an amphitheatre so that people can sit and view the entire ceremony. More seating area should be provided at the best viewpoints so
that the tourists can view the Ganga aarthi in the evening. Well-defined paths to provide interconnectivity between the different Ghats will allow for better movement of foot traffic. In order to improve accessibility, the pathways leading to the Ghats need to be re-laid with pedestrian paving materials like burnt brick blocks. The numerous small shops must be integrated with each other to form a unified shop front. This will make the street more organized and appealing for tourists. Providing a common pedestrian shelter will add to the convenience of the pilgrims. Tourist facilities such as cafés, restaurants, museums, and other recreational facilities could be a suitable addition to this site. An excellent position would be in one of the havelis or any such historic monuments along the Ghats overlooking the river.

Fig. 5-16: Plan of Dasasvamedh Ghat highlighting the main congregational area and important monuments. (Map Source: Google)
Table 5-2 briefly describes the urban preservation challenges faced in Dasasvamedh Ghat, followed by objectives and strategies for addressing these urban preservation issues.

### Dasasvamedh Ghat

<table>
<thead>
<tr>
<th>URBAN ENVIRONMENT ISSUES</th>
<th>OBJECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Density of Pilgrim and Tourist Population</td>
<td>Safety: Prevent Illegal Encroachment within the Historic Site and Provide Security</td>
</tr>
<tr>
<td>Inefficient Infrastructure — Sewage, Water Supply, Electricity Etc.</td>
<td>Integration: Introduce Alternative Sources of Electricity, Use Water Recycling and Ensure Proper Underground Sewage Disposal</td>
</tr>
<tr>
<td>Lack of Well Defined Spaces for Different Functional Programs</td>
<td>Diversity: Enhance the Site through Well Organized Spaces that Serve Different Functions During Different Times of the Day</td>
</tr>
</tbody>
</table>

**Table 5-2:** Design issues and proposed solutions for enhancing the environment of Dasasvamedh Ghat
5.3 Dasasvamedh main road

The main component of any urban setting is the road. The Dasasvamedh main road provides the main access route from the extended city to the historic Ghats. Throughout the day there is floating population of tourists and local inhabitants. Hence, this main road is devoted for pedestrian use. The pedestrian traffic consists of hawkers, pilgrims, and tourists, as well as street side vendors and priests. Non-motorized vehicular traffic such as cycle rickshaws and bicycles also use this street. This street is very congested during peak hours of transportation, especially at the time of sunset, when many people gather for the Ganga Aarathi. Hence this site has been chosen to study the direct influence it bears on the preservation of the Ghats. Based on the analysis, appropriate solutions have been suggested.

Fig. 5-17: Road pattern in Dasasvamedh main road (Map Source: Dr. Madhuri Desai, Art History Department, Pennsylvania State University)

The image above describes the vehicular traffic flow along Dasasvamedh main road. This road is about ten to fifteen meters wide in many places. Along this main road, there are many narrow lanes intersecting at various points. These intersections slow down the traffic due to a constant inflow of pedestrians at every intersection. Near the Ghats, Dasasvamedh main road splits into two roads leading to two different access points of the Dasasvamedh Ghat as shown in fig. 5-13.
The image below shows the different traffic flow patterns at the Dasasvamedh main road intersection. The main traffic danger spots are highlighted in maroon and the pedestrian walkways are highlighted in blue.

Fig. 5-18: Traffic pattern analysis of Dasasvamedh main road (Map Source: Dr. Madhuri Desai, Art History Department, Pennsylvania State University)

The pictures below show the traffic scenario on Dasasvamedh main road. The image on the left is a bird’s eye view of the main road; the majority of users are cycle rickshaws and pedestrians. An incomplete road divider is causing haphazard traffic movement around the traffic island because there is no area demarkated for pedestrians to cross the roads.

Fig. 5-19: Bird’s eye view of the traffic movement in Dasasvamedh main road (Left)
Fig. 5-20: Image showing irregular traffic movement at the Dasasvamedh Junction (Right)
While addressing traffic issues in historic areas it is necessary to understand that roadways connecting historic buildings are difficult to be widened to increase vehicular access in to these sites. For instance, the historic temples and ancient sites cannot be broken down to widen the roads. In such a case, it is important to

• Decide which buildings and structures are of historical significance and need to be preserved.

• Provide pedestrian pavement and discourage motor vehicular and public transportation access, within the main streets of heritage site.

The width of the street is decided through the placement of the historic site—where it cannot be widened further—and this width is kept constant throughout the length of the street. The remaining space can be used for the placement of street furniture and other service bays. When it is not possible to reduce shopping units, an arrangement must be provided for their circulation and regular maintenance so as to prevent any sort of discomfort for the users of this space, as depicted in Fig. 5-21.

![Fig.5-21: The main streets of Varanasi offer no space for vehicular movement](Source: Author)

Pedestrian movements dominating the streets cause slow vehicular movement and traffic jam. Hence vehicular movement must be prohibited on these main roads.

The most commonly found means of public transportation within Varanasi is through cycle rickshaws as it is quite affordable and easily available. They are found
mostly along the main streets of Varanasi. However, these cycle rickshaws are a conventional mode of transportation and very labor intensive, which causes a lot of congestion and disturbance within the historic site.

There are other modes of public transportations outside the historic city, such as shared autos and individual autos in addition to rickshaws, two-wheelers and four wheelers. However, their speed of transportation varies, and they share the same route resulting in a lot of traffic commotion.

Adding other larger modes of public transportation such as buses, trains, or coaches cannot be the solution to ease the traffic flow. The city is comparatively smaller than other metropolitan cities to have an inner railway network proposal at this point. The main issue to be addressed here is the traffic guidelines that regulate the movement of pedestrian and vehicular traffic.

Fig. 5-22: Cycle rickshaws used as the main mode of public transportation (Left) (Source: Author)
Fig. 5-23: View of a typical street in the historic city (Right) (Source: Author)

Fig.5-22 and 5-23 describes the view of the city with two different widths. The main roads are about 8-10m wide and the interior pedestrian roads are about 2-3m wide. However, traffic along these streets disturbs the pedestrian users leading to the need of
traffic regulations. Since the entire city of Varanasi experiences traffic congestion issues due to irregular movement of traffic, a forceful attempt must be made to regulate the traffic in Varanasi. City planners need to provide:

- **Accessibility**: Assess the traffic and generated demand
- **Safety**: Create pedestrian crossing locations and appropriate environmental standards

### 5.3.1 Accessibility: Traffic Regulatory Guidelines

To control the movement of traffic on the streets and enhance its functionality, road signs, street shops, streetlights, and furniture all play a role. According to Donald W Insall and Associates, “Chester- A study in conservation,” the street should have:

**For pedestrians:**

- Pedestrian walkway with paving on the sides of the streets with railing to protect pedestrians from vehicles
- Proper pedestrian crossings at every major intersection
- Shelter for pedestrians along the street shops

**For vehicles:**

- Well-defined routes for through-traffic
- Facilities for essential service vehicles
- Easily accessible parking for rickshaws

### 5.3.2 Safety: Pedestrian Crossing Locations and Environmental Guidelines

In urban tourist areas where pedestrian use dominates vehicular use, multiple pedestrian crossing signals must be provided, although as a consequence rickshaw movement might slow down. Two-wheeler and four-wheeler vehicles must not be allowed entry on Dasasvamedh main road in order to prevent pedestrian and vehicular traffic congestion.
The main environmental issues within Dasasvamedh main road are noise pollution and air pollution. The major contributors of noise pollution are:

- Places and Vehicles (Vehicle horn, Street music, Restaurants, and Shops)
- People (Pedestrians, Processions, Hawkers, and Beggars)

Noise pollution causes a lot of discomfort for tourists, pilgrims and local inhabitants. People exposed to this noise over an extended period suffer from hearing impairment. Hence it is imperative to take up measures that conserve the serenity of Varanasi.

Street music is played from restaurants and shops throughout the day, especially during mornings and evenings when the pedestrian traffic reaches its peak. Regulations that limit the decibel levels of the music must be passed and strictly implemented. Vehicular noise from horns and engines should be limited by means of regulations.

Materials used for construction of such busy roads should be able to absorb some of the noise. The façade of the buildings along Dasasvamedh Street can be built of such noise-insulating material. Reducing traffic commotion in general, by following the traffic guidelines in the previous sections, will reduce pedestrian and rickshaw noise levels on the street.
The major contributors of air pollution are:

- Dust on the streets
- Vehicle-emitted carbon monoxide

When constant movement kicks up dust, vehicles emit smoke or insufficient street cleaning cause air pollution. Proper paving and regular cleaning is recommended. Regulatory laws for vehicles can keep smoke levels in the atmosphere under control. Trees that absorb dust and provide shade must be planted on the main road as shown in Fig.5-24.

Table 5-3 shows a brief overview of the urban preservation challenges, possible solutions, and some strategies that can be followed by the planning committee.

**Dasasvamedh Main Road**

<table>
<thead>
<tr>
<th>URBAN PRESERVATION CHALLENGES</th>
<th>OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORTAGE OF PARKING SPACES</td>
<td>SAFETY: CONTROL THE TRAFFIC FLOW WITH STRICT REGULATIONS AND PROVIDE PEDESTRIAN SAFETY</td>
</tr>
<tr>
<td>CHAOTIC SITUATION ON ROAD INTERSECTIONS</td>
<td>CONTINUITY: REGULARISE TRAFFIC SPEED AND PROHIBIT LOUD HORNS WITHIN THE HISTORIC SITE</td>
</tr>
<tr>
<td>SLOW MOVEMENT OF TRAFFIC CAUSING TRAFFIC COMMOTION</td>
<td>DIVERSITY: ENHANCE THE ROAD WITH GREEN SPACES USE SMALLER PLANTATIONS FOR NARROW STREETS</td>
</tr>
<tr>
<td>INSUFFICIENCY OF PARKS AND OPEN SPACES</td>
<td>ACCESSIBILITY: DISCOURAGE PARKING OF VEHICLES WITHIN THE HISTORIC SITE</td>
</tr>
</tbody>
</table>

*Table 5-3: Design issues and proposed solutions for enhancing the environment of Dasasvamedh main road*
CHAPTER 6

CONCLUSION

The historic city of Varanasi has a rich cultural heritage through the traditional lifestyle of its inhabitants; however, ironically, its architectural heritage has deteriorated to a great extent. The reason could be that the inhabitants value the cultural heritage defined through their traditional rituals and customs much more than the built architectural heritage. The temples and palaces are perceived as leftovers or remnants of the ancient Vedic rituals. With an attempt to conserve the historic city of Varanasi as a diverse and culturally rich heritage center, this thesis focuses on planning and design attributes that can create a balance between urban development and heritage conservation. By viewing the city as a resource, as a living entity and as a built environment an urban renewal framework is proposed in Chapter 3, which can be more effective if VDA considers the preservation of many of the deteriorating historic structures while simultaneously aiming to meet the demands of the future growth. By enhancing the environment of the historic site, local economic growth and the renewal of cultural heritage can also be achieved. Pilgrimage and tourism could be a major source of revenue for the local inhabitants. Conservation of the historic city will help increase the vitality of the historic site. Hence this thesis throws light on architectural heritage conservation within the historic city of Vatanasi. This site is symbolic of Hindu belief system and its identity is important for the religious society. By incorporating planning and design attributes comfort for the users with better accessibility and safety can be provided. There is a need for integration of planners, designers, policy makers and inhabitants in order to provide diversity in land use and infrastructure. Conservation schedule of existing monument must be prioritized based on the urgency of repair and
existing condition of the structures. The planning and design attributes discussed in this thesis will improve the living conditions of the inhabitants and will help in the restoration process of existing monuments, which are of main value for visitors and tourists. This thesis also discusses possible strategies for protecting natural resources and not polluting the river through religious practices and rituals. Through continued education of sustainability to inhabitants and visitors strict guidelines must be followed within the heritage site in order to reduce and recycle wastes. This thesis answers ways of providing sustainable modes of transportation, reintroducing landscape areas on pedestrian market streets, providing street lighting for interior narrow streets, ensuring pedestrian accessibility to public areas and preventing the use of motored vehicles in historic sites. The strategies proposed in this thesis aims at creating a balance between the needs of the people and the available resources. Research summary discussed below highlights the main objective behind this proposal.

6.1 Research Summary: Conservation that promotes Sustainability

This architectural thesis is an attempt to create a sustainable living environment for the people in Varanasi. By adapting the planning and design attributes such as Identity, Integration, Diversity, Continuity, Accessibility, Preservation, and Safety strategies are proposed in order to sustain the existing site in an aesthetic, ecological, and economic manner. This thesis is a proposal for policy makers to view the city as a resource, as a living entity and as a built environment and balance these three elements for the city’s sustainable growth.

With this objective, strategies are proposed along with its application, significance, and future research on urban restoration and conservation of historic sites. However, there are few limitations in this research, which are discussed in the following section.
6.2 Research Limitation

Several limitations of this research are listed below:

6.2.1 Seven Fundamental Design Attributes: The above-mentioned seven fundamental design concepts are adapted from the Design Framework of Metropolitan Canals. There may be more design concepts that can be applied for the enhancement of this historic setting through visual analysis and further research. However, within the given time and resources, this thesis aimed at identifying the issues that need to be addressed and while providing appropriate design strategies that can be applied in the future.

6.2.2 Limited Case Study: As the case study focused only on Varanasi, the strategies proposed might hold good only for this specific site. However, they can be adapted and modified to other cities to suit the different features of other historic sites.

6.2.3 Urban Renewal and After: The research goals for the urban renewal of Varanasi are not well defined and ambiguous with respect to the results that could be achieved after implementation. Only through further research and through more precise data that might be available in the future from Geographic Information Systems (GIS) integration for Varanasi, India, can one be able to expect results for architectural heritage conservation and urban development.

6.3 Future Research

The highlights provided in this research are not meant to be final design guidelines. They only serve as a basis for additional investigation into the issue of preserving and developing tourist historic urban fabric. This study might lead to several other directions that stem from the seven planning and design attributes discussed in the previous chapters. This thesis is based on the visual observation of the urban fabric as well as secondary research in books and articles related to urban planning of tourist historic
cities. In the future, a study that investigates different data of the city through GIS integration might help produce more specific guidelines. As the urban fabric continues to grow over the years, the limited natural resources and funds will play an important role in the decision-making and implementation of civic amenities and urban infrastructure. Future organizations can aid in recognizing local employment opportunities for Benares silk weavers, artists, and architectural craftsmen of Benares to self-sustain themselves within the historic fabric.

This thesis is an attempt towards creating awareness of the present condition of the historic sites in India. The conflicts of ownership within these historic monuments make it more challenging for preserving and developing the urban fabric along the historic riverfront. Finally, the conclusion of this thesis is to understand users’ needs within an urban fabric renewal that seeks to optimize and maximize the use of space. It is only through the understanding of users’ behaviors and the unique local features that one may propose appropriate guidelines for the enhancement of the environment of the historic riverfront. Only in this way will the users value and respect the heritage of Varanasi.
GLOSSARY

**Aarthi**: Hindu ritual of respecting the god with a flame at the end of the prayer.

**Ahmed Nailtgin**: Mughal Ruler of Benares in early 10th century.

**Brahmin**: A caste in the Hindu religion that learns the vedas and performs services to the Hindu gods.

**Chajja**: An overhang above the window to prevent glare from sun’s radiation.

**Chowk**: A busy street within Kashi, the historic site of Varanasi.

**Dharmashala**: Resting houses for pilgrims around a courtyard usually located near temples.

**Gurukul**: A Vedic School for Brahmin children to learn the four main vedas and practice them while performing sacred Hindu rituals.

**Kund**: Stepped well for bathing or other religious rituals

**Mandapa**: A pillared outdoor hall leading to the shrine where the main deity is kept.

**Moksha**: Attainment of salvation from the cycles of death and rebirth.

**Lord Shiva**: One of the prime Hindu gods.

**Kashi**: A sacred setting within Varanasi where pilgrims come from all over the country.

**Maharaja**: A king of any Indian empire.

**Mohallas**: Part of the larger community defined by the spatial formation by urbanization process.

**Shiva**: Name of the Hindu lord who is responsible for destroying the bad and who is believed to be residing in Kashi. (Other names of the same lord in different forms are: Vishwanath, Lingeshwar, etc).

**Shikara**: Superstructure of the temple sanctum seen in North Indian temples.

**Vedas**: Entire body of Hindu sacred writings, chief among which are four books: Rig Veda, Atharva Veda, Sama Veda, Yajur Veda.

**Vishnu**: Name of the Hindu lord who is responsible for creating the universe. (Other names of the same lord in different forms are: Govind, Srinivas, Venkateshwar, Narayan etc).
APPENDIX

The table below gives information of ground coverage and FAR as permissible in Varanasi Development Area. This information can be used for further research and proposal of guidelines for the development of Varanasi:

<table>
<thead>
<tr>
<th>Type</th>
<th>Plotted Development area</th>
<th>Ground Coverage (%)</th>
<th>F.A.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Residential (Built up/ Developed area)</td>
<td>Up to 100 sqm</td>
<td>75</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>101 – 300 sqm</td>
<td>65</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>301 – 500 sqm</td>
<td>55</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>501- 2000 sqm</td>
<td>45</td>
<td>1.25</td>
</tr>
<tr>
<td>1b. Residential (New/ Undeveloped area)</td>
<td>Up to 100 sqm</td>
<td>65</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>101 – 300 sqm</td>
<td>60</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>301 – 500 sqm</td>
<td>55</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>501- 2000 sqm</td>
<td>45</td>
<td>1.25</td>
</tr>
<tr>
<td>2a. Commercial (Built up/ Developed area)</td>
<td>Convenient shops</td>
<td>60</td>
<td>1.20</td>
</tr>
<tr>
<td></td>
<td>Neighborhood/ sector shopping center</td>
<td>40</td>
<td>1.20</td>
</tr>
<tr>
<td></td>
<td>Bazaar Street</td>
<td>40</td>
<td>1.20</td>
</tr>
<tr>
<td></td>
<td>Sub city center/ Sub central Business District/ District shopping center</td>
<td>40</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>City center (Central Business District)</td>
<td>50</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>2.00</td>
</tr>
<tr>
<td>2b. Commercial (New/ Undeveloped area)</td>
<td>Convenient shops</td>
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<td>1.50</td>
</tr>
<tr>
<td></td>
<td>Neighborhood/ sector shopping center</td>
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<tr>
<td></td>
<td>City center (Central Business District)</td>
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<td>3.00</td>
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<td>3a. Office</td>
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<td>1.50</td>
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<tr>
<td>3b. Office</td>
<td>Developed area</td>
<td>30</td>
<td>2.00</td>
</tr>
<tr>
<td>3c. Office (New/ Undeveloped area)</td>
<td>Government and Semi Government Professional/ Commercial Office</td>
<td>35</td>
<td>2.00</td>
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<td>30</td>
<td>2.50</td>
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<tr>
<td>4a. Educational (Built up/ Developed area)</td>
<td>Primary and Nursery School</td>
<td>35</td>
<td>2.00</td>
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<tr>
<td></td>
<td>High school/ Intermediate higher Institute</td>
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<td>2.50</td>
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<tr>
<td>4b. Educational (New/ Undeveloped area)</td>
<td>Primary School</td>
<td>40</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>Nursery School</td>
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<td>1.00</td>
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<tr>
<td></td>
<td>High school</td>
<td>35</td>
<td>1.20</td>
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<td></td>
<td>Degree College</td>
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<td>1.50</td>
</tr>
<tr>
<td></td>
<td>Technical/ Management Institute</td>
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<td>2.00</td>
</tr>
<tr>
<td>Type</td>
<td>Plotted Development area</td>
<td>Ground Coverage (%)</td>
<td>F.A.R.</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------</td>
<td>---------------------</td>
<td>-------</td>
</tr>
<tr>
<td>5a. Community and Organizational Facility</td>
<td>Built up/ Developed area</td>
<td>35</td>
<td>1.50</td>
</tr>
<tr>
<td>5b. Community and Organizational Facility (New/ Undeveloped area)</td>
<td>Community Center, Baraatghar and Religious Building Other Organization</td>
<td>40</td>
<td>1.50</td>
</tr>
<tr>
<td>5a. Community and Organizational Facility</td>
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<td>2.00</td>
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<tr>
<td>6a. Storage</td>
<td>Built up/ Developed area</td>
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<td>0.80</td>
</tr>
<tr>
<td>6b. Storage New/ Undeveloped area</td>
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<td>1.20</td>
</tr>
<tr>
<td>7a. Industrial (Built up/ Developed area)</td>
<td>Upto 100 sqm</td>
<td>60</td>
<td>1.20</td>
</tr>
<tr>
<td>7a. Industrial (New/Undeveloped area)</td>
<td>101 to 450 sqm</td>
<td>60</td>
<td>1.00</td>
</tr>
<tr>
<td>7a. Industrial (Built up/ Developed area)</td>
<td>451 to 2000 sqm</td>
<td>55</td>
<td>0.80</td>
</tr>
<tr>
<td>7a. Industrial (New/Undeveloped area)</td>
<td>2001 to 12000 sqm</td>
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<td>0.70</td>
</tr>
<tr>
<td>7a. Industrial (Built up/ Developed area)</td>
<td>2001 to 20,000 sqm</td>
<td>50</td>
<td>0.65</td>
</tr>
<tr>
<td>7a. Industrial (New/Undeveloped area)</td>
<td>Above 20,000 sqm</td>
<td>50</td>
<td>0.60</td>
</tr>
<tr>
<td>7b. Industrial (New/Undeveloped area)</td>
<td>Flatted Factories Small and Medium Industries Heavy Industries</td>
<td>50</td>
<td>1.20</td>
</tr>
<tr>
<td>7b. Industrial (New/Undeveloped area)</td>
<td>60</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>7b. Industrial (New/Undeveloped area)</td>
<td>40</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>8a. Hotel (Built up/developed area)</td>
<td>Up to 3 star</td>
<td>40</td>
<td>1.20</td>
</tr>
<tr>
<td>8a. Hotel (Built up/developed area)</td>
<td>5 star and above</td>
<td>30</td>
<td>2.00</td>
</tr>
<tr>
<td>8b. Hotel (New/Undeveloped)</td>
<td>Up to 3 star</td>
<td>40</td>
<td>1.50</td>
</tr>
<tr>
<td>8b. Hotel (New/Undeveloped)</td>
<td>5 star and above</td>
<td>30</td>
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</tr>
<tr>
<td>9a. Large Commercial (Built up/ Developed)</td>
<td>Fruit and Vegetable market Other Large commercial</td>
<td>40</td>
<td>0.80</td>
</tr>
<tr>
<td>9a. Large Commercial (Built up/ Developed)</td>
<td>60</td>
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<tr>
<td>9b. Large Commercial (New/Undeveloped)</td>
<td>Grain market Fruit and Vegetable market Other Large commercial</td>
<td>35</td>
<td>1.00</td>
</tr>
<tr>
<td>9b. Large Commercial (New/Undeveloped)</td>
<td>40</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>9b. Large Commercial (New/Undeveloped)</td>
<td>50</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>10a. Medical (Built up/ Developed area)</td>
<td>Clinic/ Dispensary Nursery Home up to 50 bed Hospital 50 to 100 bed Hospital above 100 bed</td>
<td>35</td>
<td>1.50</td>
</tr>
<tr>
<td>10a. Medical (Built up/ Developed area)</td>
<td>35</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>10a. Medical (Built up/ Developed area)</td>
<td>35</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>10a. Medical (Built up/ Developed area)</td>
<td>35</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>10b. Medical (New/ Undeveloped area)</td>
<td>Clinic/ Dispensary Nursery Home up to 50 bed Hospital 50 to 100 bed Hospital above 100 bed</td>
<td>40</td>
<td>1.50</td>
</tr>
<tr>
<td>10b. Medical (New/ Undeveloped area)</td>
<td>35</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>10b. Medical (New/ Undeveloped area)</td>
<td>35</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>10b. Medical (New/ Undeveloped area)</td>
<td>35</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>11a. Service Industries (Built up/ Developed area)</td>
<td>Filling station Filling station/ Service station</td>
<td>10</td>
<td>0.10</td>
</tr>
<tr>
<td>11a. Service Industries (Built up/ Developed area)</td>
<td>20</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>11b. Service Industries (New/ Undeveloped area)</td>
<td>Petrol Pump/ Service garage/ repair Shops etc.</td>
<td>10</td>
<td>0.15</td>
</tr>
<tr>
<td>Type</td>
<td>Plotted Development area</td>
<td>Ground Coverage (%)</td>
<td>F.A.R.</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------</td>
<td>---------------------</td>
<td>--------</td>
</tr>
<tr>
<td>12a. Usage and services</td>
<td>Built up/ Developed area</td>
<td>10</td>
<td>0.10</td>
</tr>
<tr>
<td>12b. Usage and services</td>
<td>New/ Undeveloped area</td>
<td>10</td>
<td>0.10</td>
</tr>
<tr>
<td>13a. Open Spaces (other than park and playground)</td>
<td>Built up/ Developed area</td>
<td>2.5</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>New/ Undeveloped area</td>
<td>2.5</td>
<td>0.025</td>
</tr>
</tbody>
</table>

Interview with the Vice President of VDA

On interviewing the Vice President of Varanasi development authority (VDA) of Manikarnika Ghats about the environmental planning proposals for 2011, the following information was collected.

NV: What are the important environmental guidelines for the city of Kashi?

Vice President: The environmental guidelines for Varanasi are built into the building by-laws. The by-laws stipulate the minimum number of trees on a site and rain water harvesting is mandatory for obtaining building permit on every plot larger than 300 sqm."

NV: Who is responsible for documentation and updating the information for the historic city of Varanasi—Kashi?

Vice President: The old city of Kashi is very well documented as detailed maps, which were prepared well before Independence. Copies of these are archived in the Nagar Nigam (Municipal Corporation) office of Varanasi.

NV: How are the land-use guidelines for Varanasi stipulated? What are the objectives of these guidelines?

Vice President: The land-use plan of Varanasi for 2010 is available in V.D.A., the plan aimed at addressing issues of congestion, traffic flow, etc. and defined land uses. It has been possible to only partially implement the provisions of the plan. The phenomenal
pace of construction, booming real estate prices, resistance to land acquisition programs and anti-encroachment drives, religious sentiments and fervor against shifting of places of worship, paucity of funds, etc. have come into the way of the Development Authority’s working.

The issues that confront the city today are:

- The high density of inhabitants in the city
- Congestion in traffic flow
- High load on services such as sewage, water supply, electricity, etc
- Insufficiency of parks and open spaces in the city
- Shortage of parking spaces
- Chaotic situation on road intersections

The new city plan should clearly aim at the following approaches:

- Creation of satellite townships around the city
- Creation of new commercial, institutional, industrial centers on the city to work as counter magnets for the city’s population.
- Promote conservation of the old city and discourage commercial and construction activity.
- Imposing controls for restoration of old structures of heritage value.
- Conserving River/Water resources
- Promoting tourism
- Development of waterways
- Construction of ring road, radial roads and other peripheral roads
- Improvement of existing roads and traffic intersections
- Incorporation of gardens, parks, recreation and cultural centers in the new plan
- Provision of parking lots wherever possible
• Preparation of zonal plans for developing areas of the city.

Interview with the Priest

A priest who takes care of a temple near Manikarnika Ghat was interviewed and below is the information given by him.

NV: Could you give me a brief note of the relationship you share with this city Kashi?

Priest: I was born here and educated in Kashi. My parents and ancestors are also from Kashi. I have traveled to different places, but Kashi is the place I want to spend the rest of my life.

NV: What is important about Kashi?

Priest: Kashi lord’s mukti (meaning salvation) is received here. This city is very closely related to the cosmos. If you put all the 7 puris (Holy city of the Hindus: Dwarakapuri, Ayodhya, Mathura, Brindhavan, Mayapuri, Avantika, Kantipuri) together you get Kashi.

NV: What are the difficulties faced for those living this region?

Priest: We see a lot of dead bodies and witness the smoke. Everyday the ashes of dead bodies get spread and fall into the house. It is very difficult to remain clean and live in this condition.

NV: Is the ritual of cremation very important despite the problems it causes for the living conditions of the people?

Priest: The ritual of cremation in Kashi is very important for every Hindu to get moksha (freedom from the cycles of death and rebirth as believed by Hindus). So, we believe that few sacred materials like the woods, silk and flower garland are necessary to burn the bodies. Ex minister Rajiv Gandhi came and witnessed this issue. He installed a crematorium for the poor to encourage a more cost efficient way of burning the corpses. But, even today the ancient way of cremation is preferred because of its spiritual reasons.
Interview with the Doms

NV: From where are the woods brought?

Doms: From the Jungles nearby and few precious woods are brought from the south India.

NV: How often is the dirt accumulated in the riverfront cleaned, where are the remaining ashes deposited?

Doms: We clean the dirt in the river when the water level is low. When the water level is high, the dirt and the corpses float away and the river gets naturally cleaned. After the body is burnt, the ashes are swept away, which eventually settles into the river.

NV: Why are few types of bodies not burnt and just immersed into the river?

Doms: People who die from snakebite, skin disease, or infant death are considered sacred and they are generally not burnt. These corpses are taken far away and immersed in to the river, with a stone tied to their body, so that they do not float.

NV: Why do you choose to do this work?

Doms: We have to make a living and it is an ancestral custom. The cost of living is increasing, but we are not given any other opportunity because of our background.

NV: Would you be willing to take up another job, if it pays better and serves better to the community?

Doms: Yes we would, if we get an opportunity.
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