A Thesis project Report Submitted in partial fulfillment of the requirements for the post graduate degree of master of architecture (urban design) on

Development of an Urban River Front : reconnecting with river

Case application : Barrackpore ,
North 24 parganas , West Bengal , India

Under the guidance of
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“ Cities have the capability of providing something for everybody , only because ,and only when , they are created by everybody. “

Jane Jacobs

Urban theorist

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1.0 INTRODUCTION

1.1.1 Thesis Title

Development of an Urban River Front : reconnecting with river

Case application Barrackpore , West bengal

Key Words:

Urban development

Urban design

Water front development

River front development

Kanpur Riverfront Development Proposal / Studio Symbiosis

1.1.2 Defining Key Words

Urban development :

Urban development refers to *urbanization* with its different dimensions and perceptions: physical (land use change such as urban sprawl and increase in artificial surfaces), geographical (population and employment concentration), economic (markets, agglomeration

Source: http://www.wikialps.eu

economies and knowledge spill overs) and societal (social and cultural change). *Urbanization* is a process that takes a territory to an urban state in these different dimensions, most notably through population and employment increase and linked land use change.

Urban Design :

Urban design is concerned with the arrangement, appearance and function of our suburbs, towns and cities. It is both a process and an outcome of creating localities in which people live, engage with each other, and engage with the physical place around them.

Urban design operates at many scales, from the macro scale of the urban structure (planning, zoning, transport and infrastructure networks) to the micro scale of street furniture and lighting. When fully integrated into policy and planning systems, urban design can be used to inform land use planning, infrastructure, built form and even the socio-demographic mix of a place.

Objectives of good urban design

Character : a place with its own identity
Continuity and enclosure : a place where public and private spaces are clearly distinguished
Quality of the public realm : a place with attractive and successful outdoor areas.
Ease of movement : a place that is easy to get to and move through
Legibility : a place that has a clear image and is easy to understand
Adaptability : a place that can change easily
Diversity : a place with variety and choice

Waterfront development :

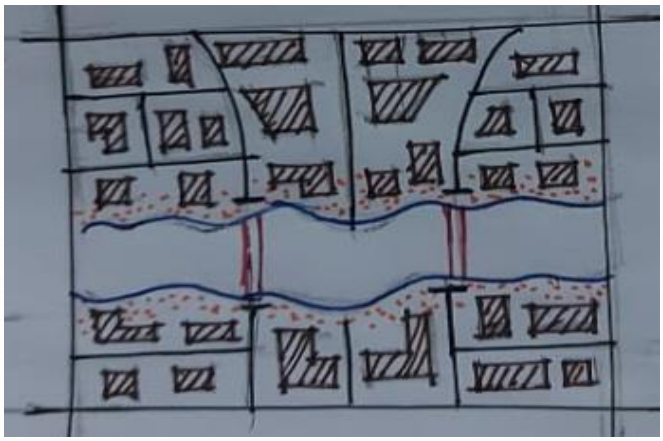
"Cities seek a waterfront that is a place of public enjoyment. They want a waterfront where there is ample visual and physical public access – all day, all year - to both the water and the land. Cities also want a waterfront that serves more than one purpose :they want it to be a place to work and to live, as well as a place to play. In other words, they want a place that contributes to the quality of life in all of its aspects – economic, social, and cultural".

Waterfront development can include any combination of different land uses, and **waterfront** projects can be new projects or re-developments of existing waterfronts into new places. Some **waterfront** projects focus on industrial uses, such as industrial ports, and others focus on more recreational and tourism-oriented uses.
reconnecting city with Riverfront leads to such development along the river that provides connectivity between city and river again after a prolong omission.

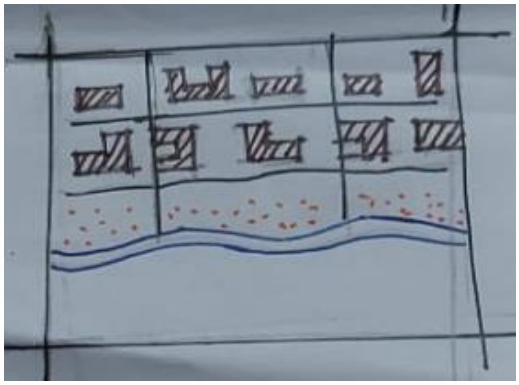
Types of waterfronts :

Lakefront development : lakefront development includes the overall development of certain areas or part of the city which create a linkage between the city and lakefront.

Seafront development : seafront or coastal development is a development which includes a series of human activities along with port , docks , marinas , tourism etc.



Riverfront development : it is a development along the riverbank , which provides a physical connection between the city and the river.



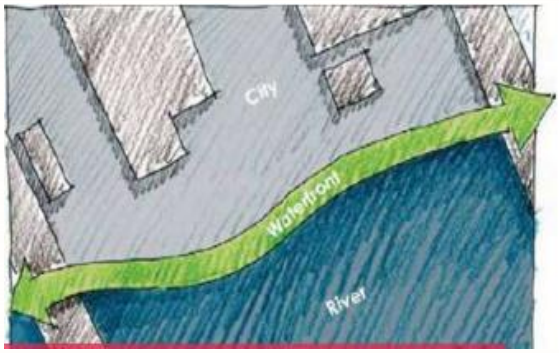
Trend of Riverfront Developments Worldwide :

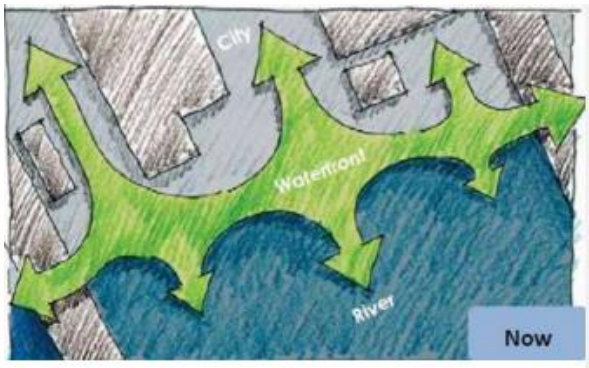
1960s : Massive waterfront development began and consequently initiated the world-wide era of waterfront revitalization.
1970s : Urban waterfront redevelopment bloomed.
1980s : Accelerated and continued in the future.

Riverfront development :

A riverfront is a region along a river. Often in larger cities that are traversed or bordered by one or more rivers, the riverfront is lined with marinas, docks, cafes, museums, parks, or minor attractions. Today many riverfronts are a staple of modernism and city beautification.

Rivers have long been the backbone of human settlements for many reasons: fertile floodplains, irrigation, and transportation. With the pressure of urbanisation, riverfronts across the world have come to represent open public space in otherwise dense cities. Today, Riverfront Development projects are viewed as a “means of economic and cultural growth, and are dominated by commerce and recreation to create a thriving and continuous public realm.”
Under the Smart Cities Mission, many cities have taken up riverfront projects, some of which are budgeted over 100 crores:





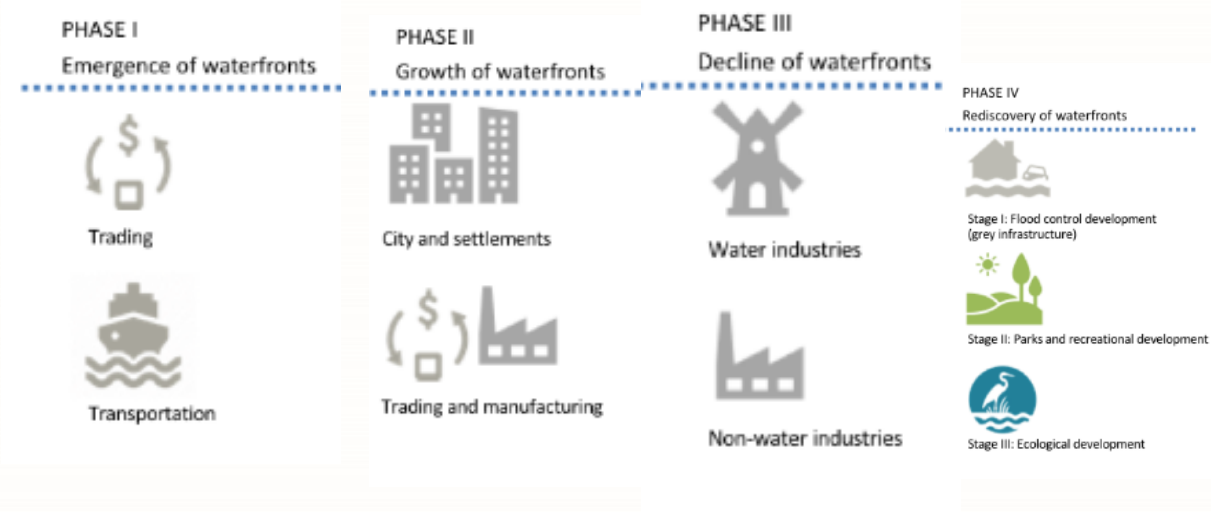
Name of the project	City	Budget (crores)
Reinvigoration of Vishwamitri Riverfront Influence Area	Vadodara	508
Riverfront Development	Shivamogga	421
Ganga Riverfront Development	Kanpur	125
Gomti Riverfront Development	Lucknow	113
Goda-Riverfront Development	Nashik	110

(Smart Cities Mission GOI, 2016)

1.1.3 Relevance of the Thesis

Need for Waterfront development :

Water is an important defining element of settlements across the world and can be traced back through a city's historical structure and morphology. The relationship between a city and its waterfront is unique and always changing, depending on the functions carried out on adjoining land.



In recent years the strategy plans that are shaping today's cities have reflected a clear growth in interest in the waterfront, that borderline between city and water – be it river or sea. The new leisure economies are turning their attention to shorelines, harbours and riverbanks, reinventing the river imaginarium within the construction of the new city.

Need for Reconnecting the City:

Reconnecting means to meet or come into contact again after long absence which can linked in between two cities or city with the other physical domain like river , lake , seafront. It is capable of healing our injured riparian ecosystem by making people aware of this issue through design strategies focused on unifying people to the river.

An ecological restoration can restore the missing link between people and a river. Creating areas of interest and activities through green space design can create opportunities for stormwater infiltration, alternative transportation uses, and

educational elements. The goal is to use the river corridor to unify urban communities and in doing so, promote a sustainable future for our ecosystem while providing economical and cultural growth.

Need for River :

From the ancient times the development started along the bank of the river which is the heart of the city. Water is an attractive factor when people choose where to live. Historically, humans have chosen to live close to rivers for domestic and agricultural water supply as well as for navigation purposes, which has led humans to follow the courses of rivers during migrations and locate in proximity to rivers when establishing settlements.

1.2 Aim & Objectives

Aim :

proposing the riverfront development for rejuvenation and embellishment of Ganga river to create a new image for revitalization of the city .

The mixed used developments along the Marina Bay in Singapore

Ravi Riverfront Urban Development Project

Objectives :

- To study the present condition of the riverfront of barrackpore
- To identify the spines and nodes that directly connected with the river
- To redesign the riverfront through axis and proper access to the river
- To encourage and explore possibility for pedestrian access to the riverfront
- To make the riverfront accessible to the public.
- To stop the flow of sewage , and keep the river clean and pollution free.

To modify the existing characteristics of the place.

Scope :

1.To create a proper connectivity with the transportation system or movement corridor within the site and the surrounding.
2.To Reutilization of surround urban spaces.
3.To Modification of built use or land use of surrounding district for commercial, recreational, public-semi , public utilities for balanced development .
4.To create public open spaces for riverfront development and new construction will enhance the quality of existing destination.
5.To create Public realm along the front , Landscaping, Creating amusement activities and tourist recreation.
6.To create an identity of the area through build form balancing between environmental with human needs with a wide variety of uses on a waterfront.

Limitation :

1.Focus is selected study area , which is a part of much broader city area.
2.The study based on various assumptions , less availability of proper data.
3.The scope of the work shall be limited to public space only.

Identifying Key Issues and Justifying The Research Area.

Literature study on Waterfront and River Front Development in Urban Planning, Urban Design and Architecture.

Identifying Opportunities and Delineation of the Study Area

Prepare documentation by survey of secondary sources (data collection) and conducting
a primary field survey and delineation of the site zones with respective studies.

Discussions and recommendations: Formulate strategies for River front Development planning in the study area

Identify and apply a framework in front sites to present options for waterfront development planning.

Design Intervention

2.1 Literature Study

2.1.1 Existing Concepts on Waterfront Development :

Any development takes place in fronts of water or water body like river, lake, ocean, bay, creek or canal is term as a waterfront development.
In the present scenario, the waterfront development is a global trend. Nowadays, thousand of schemes for water development are being carried out in all over the world. The principal function of waterfront can be classified as below:

The Natural Waterfront, comprising beaches, wetlands, wildlife habitats, sensitive ecosystems and the water itself.

The Public Waterfront, including parks, esplanades, piers, street ends, vistas and waterways that offer public open spaces and waterfront views.

The Working Waterfront, where water dependent, maritime and industrial uses cluster or where various transportation and municipal facilities are dispersed.

The Redeveloping Waterfront, where land uses have recently changed or where vacant and underutilized properties suggest potential for beneficial change.

General Principal of Waterfront Development

- Linear development of waterfront interconnected with broad public access
  - ➢ As a daily consumer path and recreational amenity, the use of riverfront greenway is encouraged.
  - ➢ Illustrating the connection between access, greenway development, and market demand.
  - ➢ Creating a logical and visually pleasing order to the water's edge.
- Protection and improvement of the riverfront environment
  - ➢ To preserve environmentally diverse the ecological state of the waterfront is documented.
  - ➢ To prevent and eliminate inappropriate use from river's edge.
  - ➢ To protect existing natural areas from development.
- Retrieve the identity of city as one of the most preferable water cities
  - ➢ Raising public expectation of what the city's waterfront offers.
  - ➢ Attracting people, investors and best aspect of urban living to the waterfront.

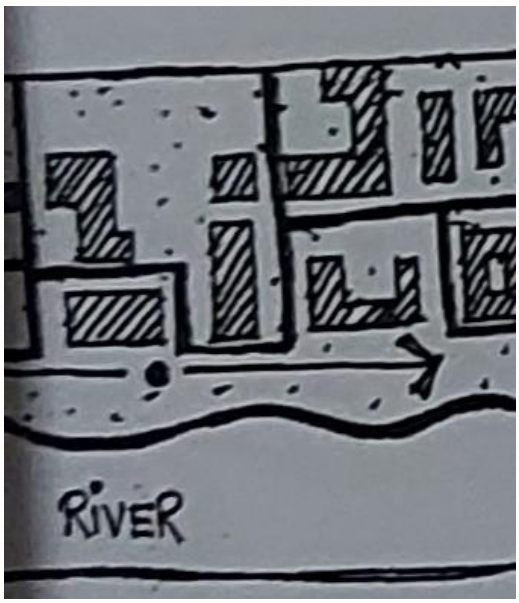
2.1 Literature Study

2.1.1 Existing Concepts on Waterfront Development :

Pattern of waterfront development

Linear waterfront development

Build form – mostly low height profile.
The linkage between the city with the river is very poor.



Parallel seafront development

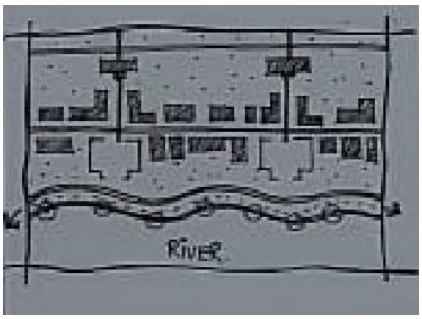
Expansion with height restriction according to the streetscape.

Parallel - perpendicular waterfront development

Parallel water front development with perpendicular stretch of roads in the important structure or build form like church , mosque , palace etc. Mostly low height profile.

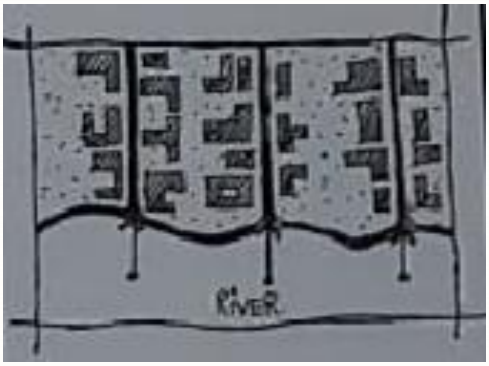
Promenade waterfront development

Proper promenade in the bank of the river with street furniture's.



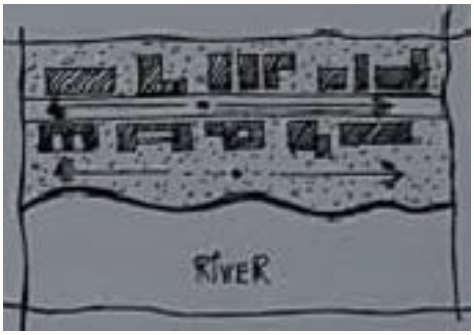
Perpendicular waterfront development

Build form – mixed height profile.
Perpendicular expansion towards the civic center.



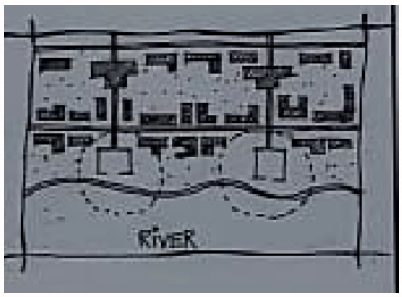
Parallel waterfront development

Parallel expansion with the river flow with no connectivity.
Mixed height profile with mostly high rise buildings on the riverfront.
There are no proposal for river corridor design.



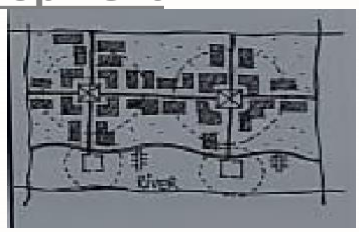
Connected waterfront development

The urban design elements like views and vistas , axis , use of plazas and squares to connect the city with the river.
Mostly low height profile.
There is no proper promenade.



Connected - Promenade waterfront development

Build forms along the squares are getting the shapes from the square to give the square a feeling of enclosure.



Role of Urban Rivers

IMPROVEMENT IN AIR QUALITY is likely to be observed due to denser vegetation and the transport of fresh air along the river corridor

Water bodies can have a cooling effect on their local area and so mitigate Urban Heat Island effect, ensuring **MICRO-CLIMATE REGULATION**. Also, wetlands and ponds that might be created through river restoration along with soils and vegetation can store carbon.

River landscapes are one of the most attractive landscapes, and this **AESTHETIC QUALITY** provides many benefits by drawing people to the area.

Through their contribution to surface water drainage and regulating flows, healthy river ecosystems can help **REDUCE SEVERITY AND INSTANCES OF URBAN FLOODING.** *R*estoring rivers, i.e. re-meandering them and establishing vegetation, creating wetlands, slows the flow and increases water storage capacity.

A clean view of waterfront or greens adjacent to water can lead to significant **PROPERTY VALUE RISE.** With the continuous decrease in open spaces within cities, the value of avaialble prominent ecosystem spaces also sees a positive impact.

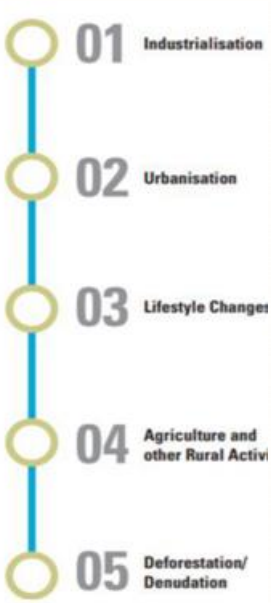
A healthy river ecosystem also serves in **HABITAT PROVISION** for the aquatic, terrestrial as well as avifauna species. It is also a suitable habitat for riparian flora. River restoration has been shown to improve the quality of water and biodiversity habitat.

Depending on the characteristics of the catchment area, **GROUNDWATER RECHARGE** is usually observed within the river catchment zones

Reconnecting people to the natural environment can be achieved by restoring natural landscapes in urban settings and making them **ACCESSIBLE FOR RECREATIONAL AND CULTURAL ACTIVITIES**. This also increases the possibility to use them as educational resources, cultural/ traditional links, adventure activity areas, increased social activities, etc.

2.1.2 Existing Concepts on riverfront Development :

Five major degradation factors and their anthropogenic causes



2.1.3 Deriving Study & Design Parameters

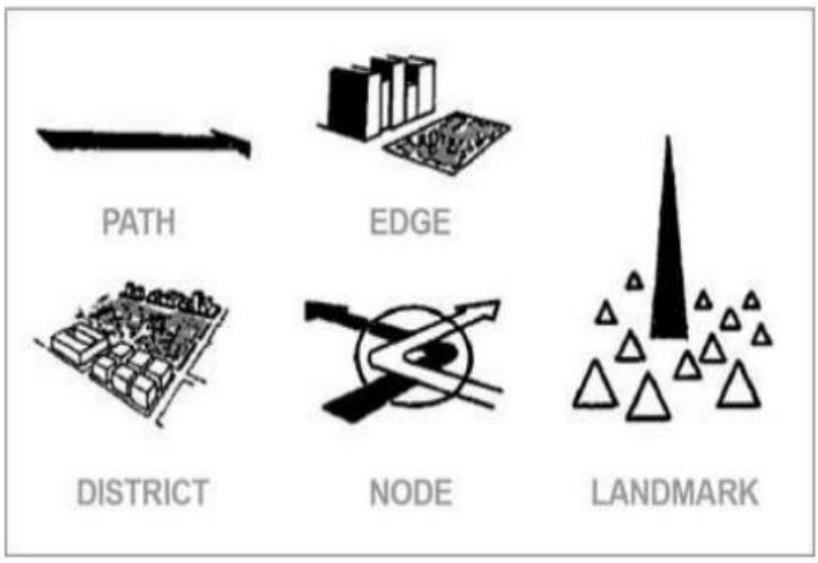
- Kevin Lynch's Image of the City, he came up with a series of elements — **path, nodes, edges, landmarks, district** etc.

—that he used to discuss what made an area legible or not.

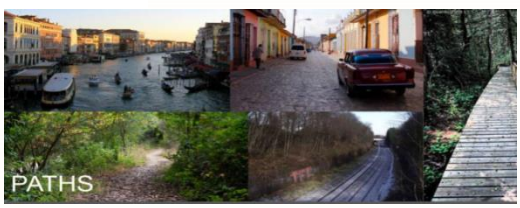
- The whole idea is to merge the concept of mental mapping of Gordon Cullen with respect to the 5 elements stated by

Kevin Lynch to understand the art of relationship which work together create an urban environment such as-a drama is

released. According to him the 3 parameters that construct a mental image of the city are-serial vision, place, context



Paths are the channels along which the observer moves. They may be streets, walkways, transit lines, canals, railroads.



Edges are the linear elements not used as paths by the observer. They are the boundaries and linear breaks in continuity: shores, railroad cuts, edges of development, walls.

Nodes are points, the strategic spots in a city into which an observer can enter, and which are the intensive foci to and from which he is travelling. They may be primarily junctions or concentrations.

Districts are the medium-to-large sections of the city which the observer mentally enters "inside of," and which are recognizable as having some common, identifying character.

Landmarks are another type of point-reference , but in this case the observer does not enter within them, they are external. They are usually a rather simply defined physical object: building, sign, store, or mountain.

2.1.3 Deriving Study & Design Parameters

Pathways and routes

- Sub Arterial road
- Major Arterial road
- Road directly connected to the river

Nodes

Edges

- Build form
- River edge

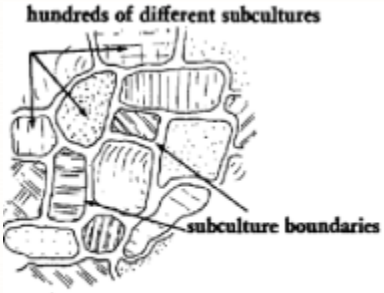
Magnets and Generators

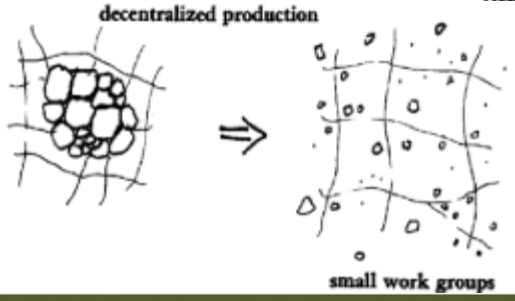
Views and Vistas

Urban Form

- Plan form
- Elevation form
- Three dimensional form

Architectural features





2.1.4 Existing Norms & Regulations

Statements for riverfront development guidelines

1. Environmental Impact Assessment (EIA) is compulsory.
2. Environment protection and awareness.
3. Maintenance and rehabilitation costs are shared between stakeholders.
4. Use environmentally friendly materials in construction.
5. Provide flood mitigation (e.g. by planting more trees).
6. Protection of natural resources (water and environment).
7. Provision of sufficient public facilities and amenities (such as pedestrian paths, landscaping, access ways, recreation areas, etc.)
8. Personal security is maintained by means of policing, surveillance cameras, etc.
9. Upgrading and maintaining established settlements along the waterfront area.
10. Continuous river rehabilitation.
11. River reserve beautification .
12. Upgrading and maintaining the sewage system.
13. Restrict type of development.
14. Integrate both modern and heritage aspects into development.
15. Encourage economic activities
16. Sharing waterfront benefits (such as views, financial rewards, etc.) among stakeholders (e.g. community, government, developer).
17. Continuously educate public about environmental concerns.
18. Provide regulations and policies that mitigate market speculation for waterfront properties.

2.1.4 Existing Norms & Regulations

Statements for riverfront development guidelines

Lower Ganga Basin | West Bengal

Land Use & Development Control Plan, Kolkata

Ganga River

Parameters reflected in Master Plan

River-sensitive Objectives

Development Policy states efforts to be made for -

- Development of river-front with pedestrian plaza and other conforming facilities along the river-bank
- Preserving wetlands, tanks, ponds, water bodies, wherever possible

Ground water augmentation

- Regulations stating no canal, pond, water body or wetland shall be filled up (unless allowed by authority taking in view drainage/ ecology & environment/ pisciculture/ fire fighting)

Development Control Regulations:

Prohibited buildings in Development Control Zone 'RF' (Riverfront):

- Existing/ new industrial building or extension
- Hazardous building
- New/ extension of existing buildings – residential, business, educational, institutional, mercantile (wholesale), mixed use, storage
- New/ extension of existing assembly buildings, excluding clubs, restaurants, eating houses, passenger stations, transport terminals, crematoria, bathing ghats
- Khatals (where cattle are kept)

Building restrictions for development Control Zone 'RF':

- Max. permissible height – 5.00m (without stilts) or 6.50m (including stilts).
- Min. height of stilt – 3.00m and stilted portion not allowed to be walled up or covered along the sides.
- Buildings alongside the river shall not be more than 20.00m long, with a clear linear gap of 50.00m between two buildings
- Max. permissible covered area – 200.00 sqm.

Highlights of the Plan

2.2 Case Example Study

2.2.1 Study Structure

Case Example

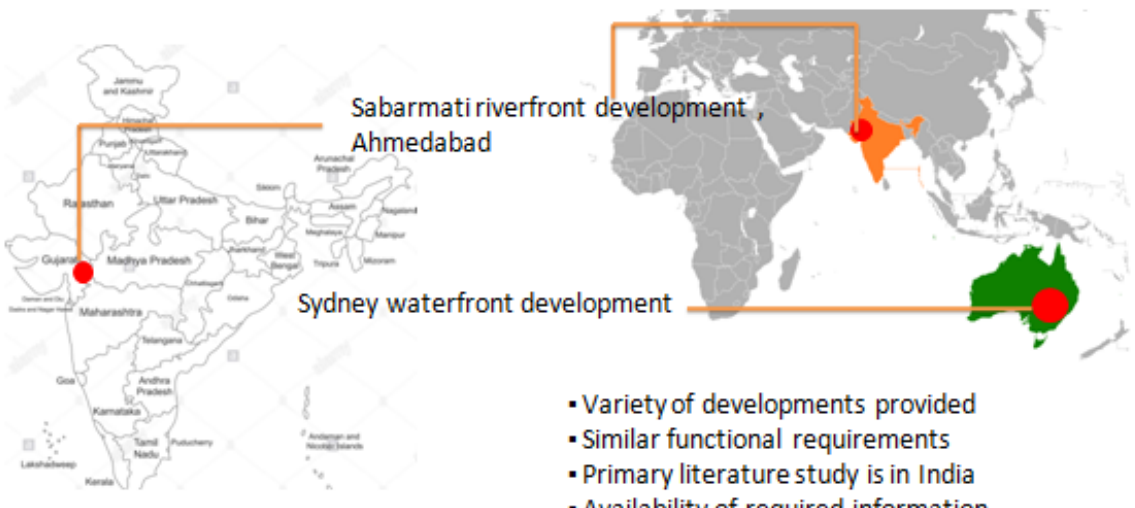
Primary study

Sabarmati riverfront development , Ahmedabad

Secondary study

Sydney waterfront development

2.2.2 Selection of Case Examples



- Variety of developments provided
- Similar functional requirements
- Primary literature study is in India
- Availability of required information

2.2.3 Case Example 1 - Sabarmati riverfront development , Ahmedabad

Primary example of similar projects

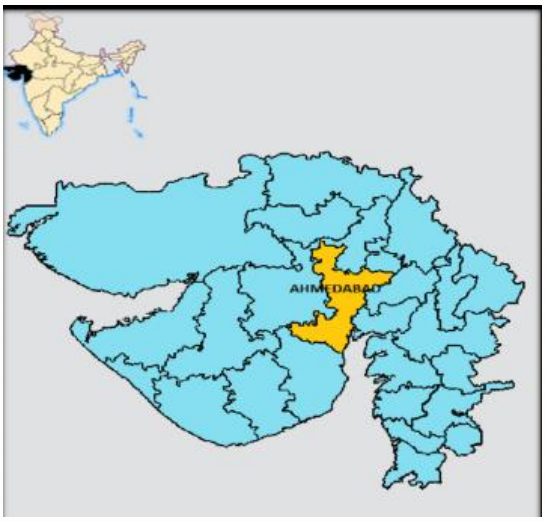
Inside India :

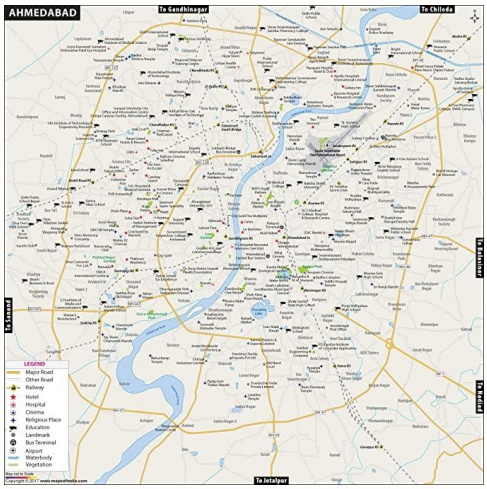
SABARMATI RIVERFRONT DEVELOPMENT

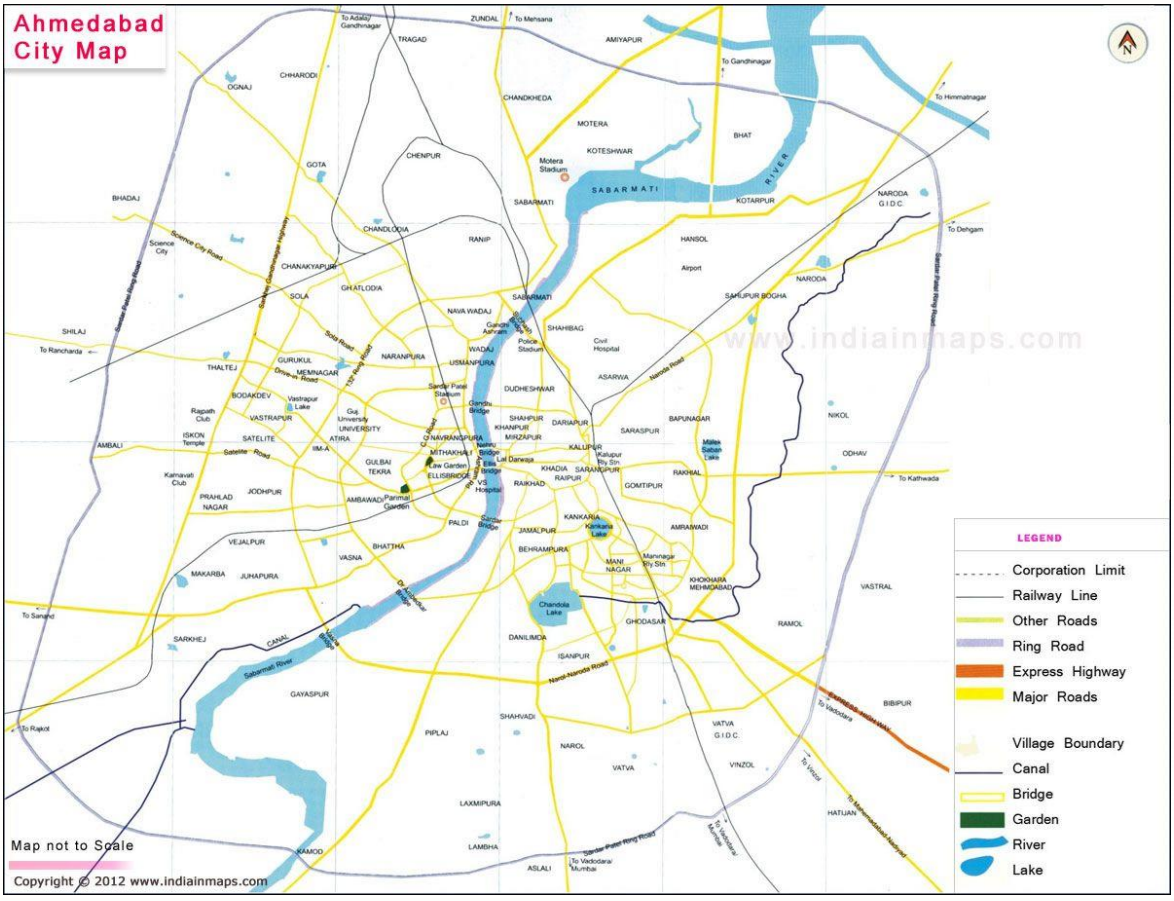
Introduction and Selection :

Sabarmati Riverfront is a waterfront being developed along the banks of Sabarmati river in Ahmedabad, India. Proposed in 1960s, the construction began in 2005. Since 2012, the waterfront is gradually opened to public as and when facilities are constructed and various facilities are actively under construction. The major objectives of project are Sabarmati river and under construction promenade environment improvement, social infrastructure and sustainable development. For the purpose of the study , two case example has been taken up , in order to accumulate data , both qualitative and quantitative , to analyze and conclude about the river front.

Location :







Ahmedabad , Gujarat
LAT . & LONG – 23.03413670º N 72.5723255º E
Area of proposed site : 202.79 hectares
Proposed : since 1960 , construction began in 2005
Architect :Bimal Patel , Planning and Management

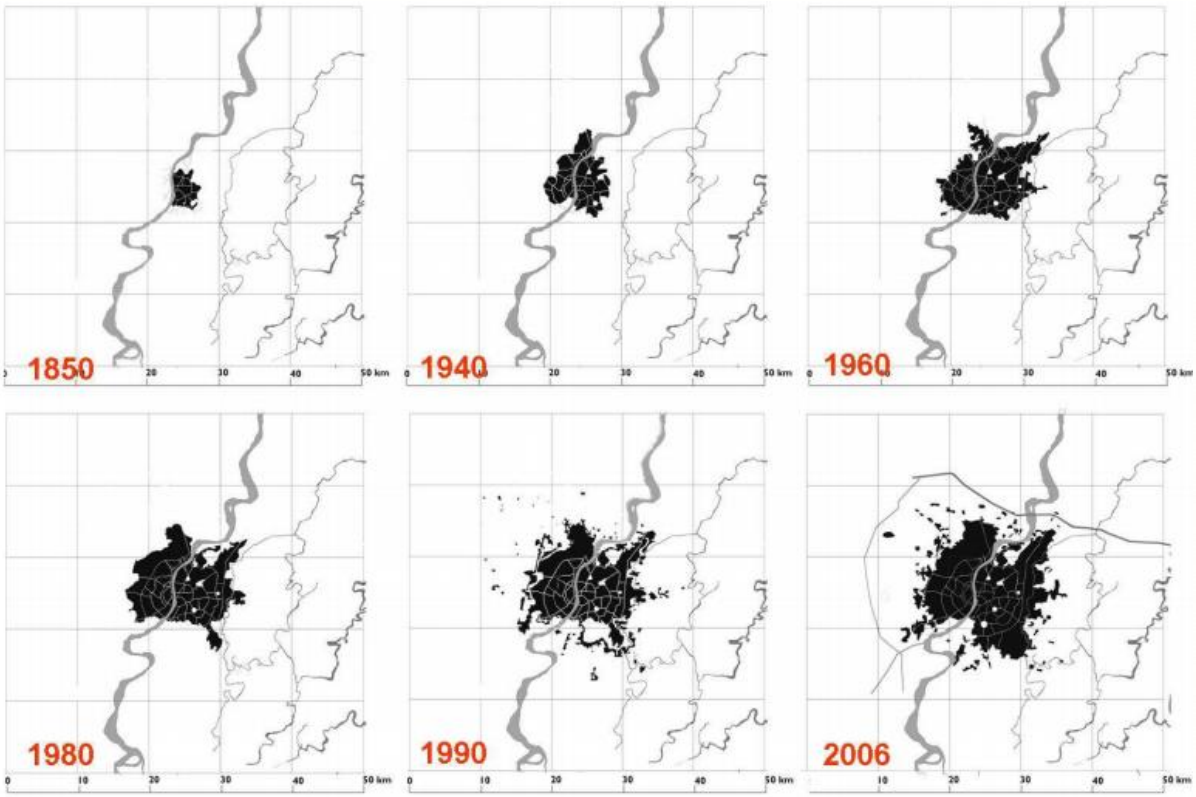
Aim :

To redefine identity of Ahmedabad and reconnect the city with the river and positively transform the neglected aspect of the river.

Objectives :

1. Environmental Improvement
2. Creating network of public open spaces
3. Providing adequate public access to the river
4. Rehabilitation of the slums
5. Rehabilitation of Gujari Bazaar
6. Rehabilitation of Dhobis (Washermen)
7. Creating vibrant urban neighbourhood
8. Recreational Activities

Sabarmati and the Growth of Ahmedabad



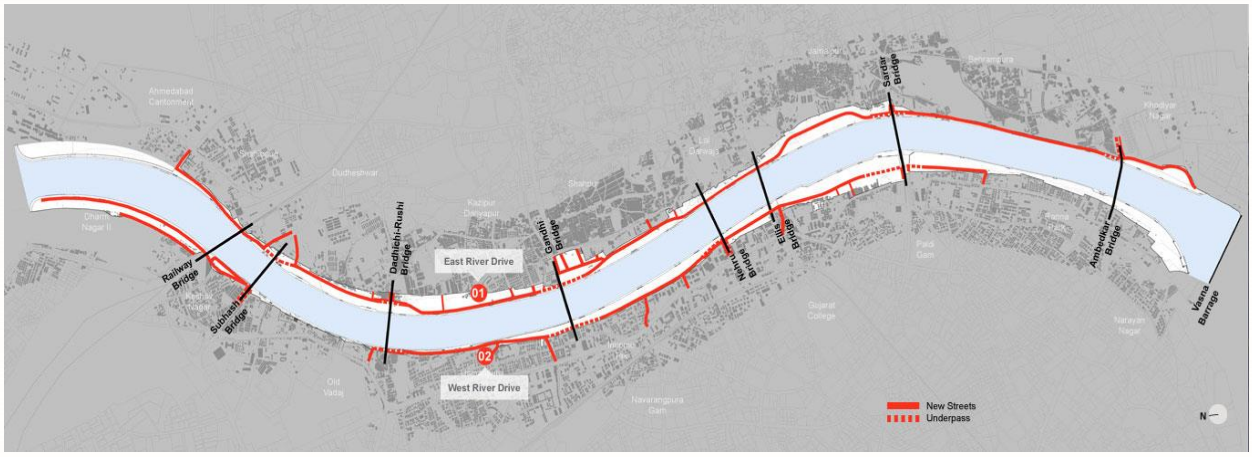
NEED FOR RIVERFRONT DEVELOPMENT

1. Untreated sewage flowed into the river through storm water outfalls and dumping of industrial waste posed a major health and environmental hazard.
2. The river bank settlements were disastrously prone to floods and lacked basic infrastructure facilities. Lacklustre development took shape along the riverfront . Such conditions made the river inaccessible and it became a virtual divide between the two parts.

Survey analysis:

Pathways and routes :

The SRFD streets have been designed carefully and deliberately to serve as effective movement conduits for various users and to be an extension of the public realm.
The SRFD streets run parallel to the river on both banks and provide continuous access to the riverfront development. Access streets at key locations connect the SRFD streets to the rest of the city.
The SRFD streets on the east banks have a 30m Row. All SRFD streets have dedicated pedestrian paths with cycle tracks, parking bays, and 6 m/20ft wide carriageways. The SRFD streets on the west bank have a 25m Row. All SRFD streets have dedicated pedestrian paths with cycle tracks, parking bays, and 6 m/20ft wide carriageways.



Analysis :

To create riverfront parks , promenades and ghats to enjoy the water maximum roads are directly connected with east and west river drives.

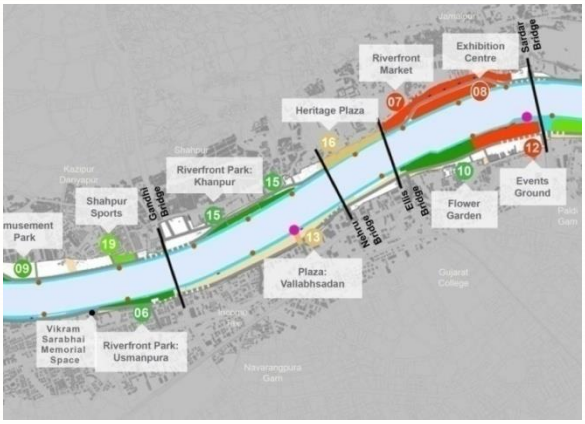
Conclusion :

Direct connectivity with the river edge is mandatory. Water routes should be used as an option to connect the city along with the bridges and the road network.

Edges :

▪The land between gandhi bridge and nehru bridge is highly attractive for the commercial development of five – floor high buildings.

▪The land between the ellis bridge to sardar bridge is flower garden and event



ground areas in the west bank and riverfront market and exhibition center on the west bank.

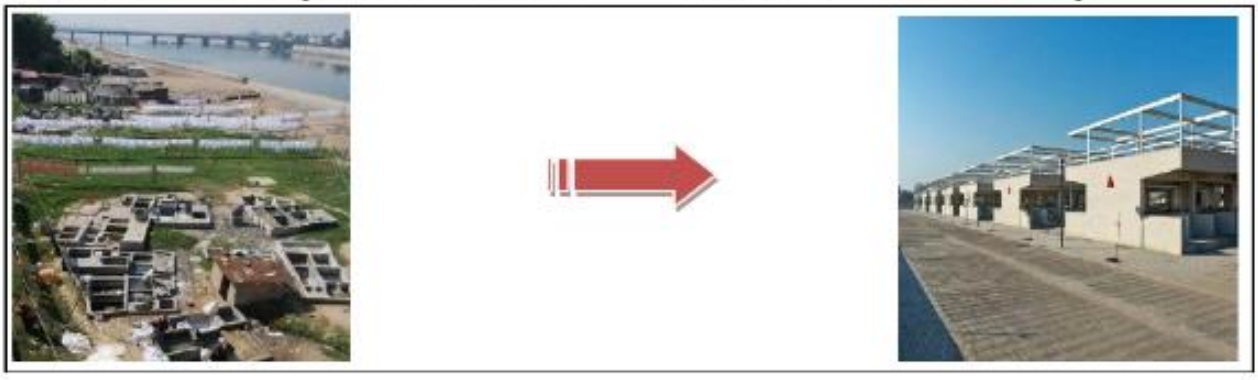
▪This land is most prominent edge on the river bank.

▪The land between nehru bridge and ellis bridge , there is heritage plaza of the east bank .

Analysis :

These two level , continuous promenade at the water's edge along each bank of the river with a long pedestrian walkway in the heart of the city.

Development of Gujari bazar



Development of dhobi ghat

Conclusion :

▪Through river edge built form should be connected to provide access to the water .

▪Built form along the river side should be designed to create the river edge more prominent from the other bank of the river.

Magnets & generators :

▪The land between the Gandhi bridge and Nehru bridge improve amenities for the city and includes provision of market and vending areas.
▪The land between the Ellis bridge to Sardar bridge provides an expensive public realm like parks , water side promenades , markets , cultural institutions , recreational facilities and commercial development.

Riverfront park: subhash bridge

Laundry campus

Event Centre

Boating stations

Conclusion :

▪People magnet should be design for encourage public interaction like commercial areas , food court , exhibition center etc.
▪These development must not create any visual barrier of the river side.

Views & vista :

Riverfront park : subhas bridge – the park is envisaged as an extension of Sabarmati ashram , across the river, providing a serene backdrop to the ashram and maximizing this vista.

Shahibaug Riverfront Park

Urban forest: paldi

Analysis :

The viewing point are mostly from the bridges and the vistas are designed from the plazas.

Conclusion :

The view s and vistas should be open up in river bank to get a clear connection to the river.

Urban form :

Urban form refers to the pattern or arrangement of development blocks, streets, buildings, open space, and landscape which make up urban areas.
SRFDCL House is situated on the prime location near nehru bridge . It is located of the heart of the proposed commercial and cultural central business district of Ahmedabad.

Analysis :

A small portion from gandhi bridge to nehru bridge are sold for commercial development , to generate sufficient enough resources to pay for developing the riverfront and managing it.

Conclusion :

The urban form should be encourage views and vistas towards river as much as possible .

2.2.3 Case Example 2 - Sydney waterfront development

Secondary example of similar projects

Outside India :
SYDNEY WATERFRONT DEVELOPMENT

Introduction and Selection :

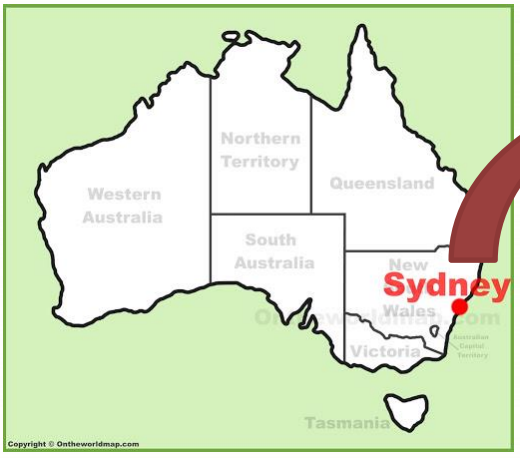
The aim is to establish urban design principles, which would:

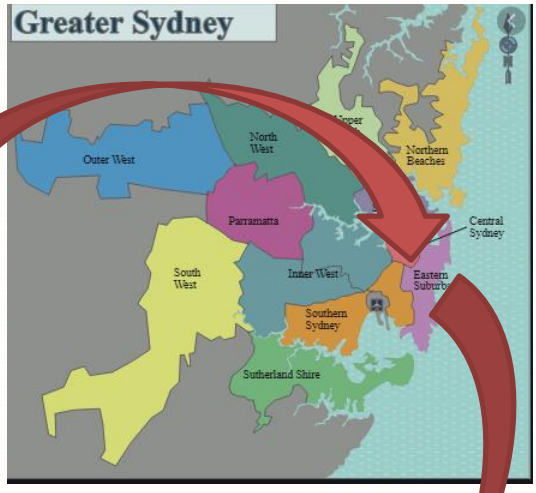
- Create a comfortable, attractive and coherent setting for those who work, live, visit and walk around the city; and
- Integrate new development into the existing city .
- Sydney south is the southern third of the site and act as an extension of Sydney's CBD , with office buildings , apartments , retail outlets , public spaces and hotels.
- Sydney central contains low rise residential and commercial buildings.

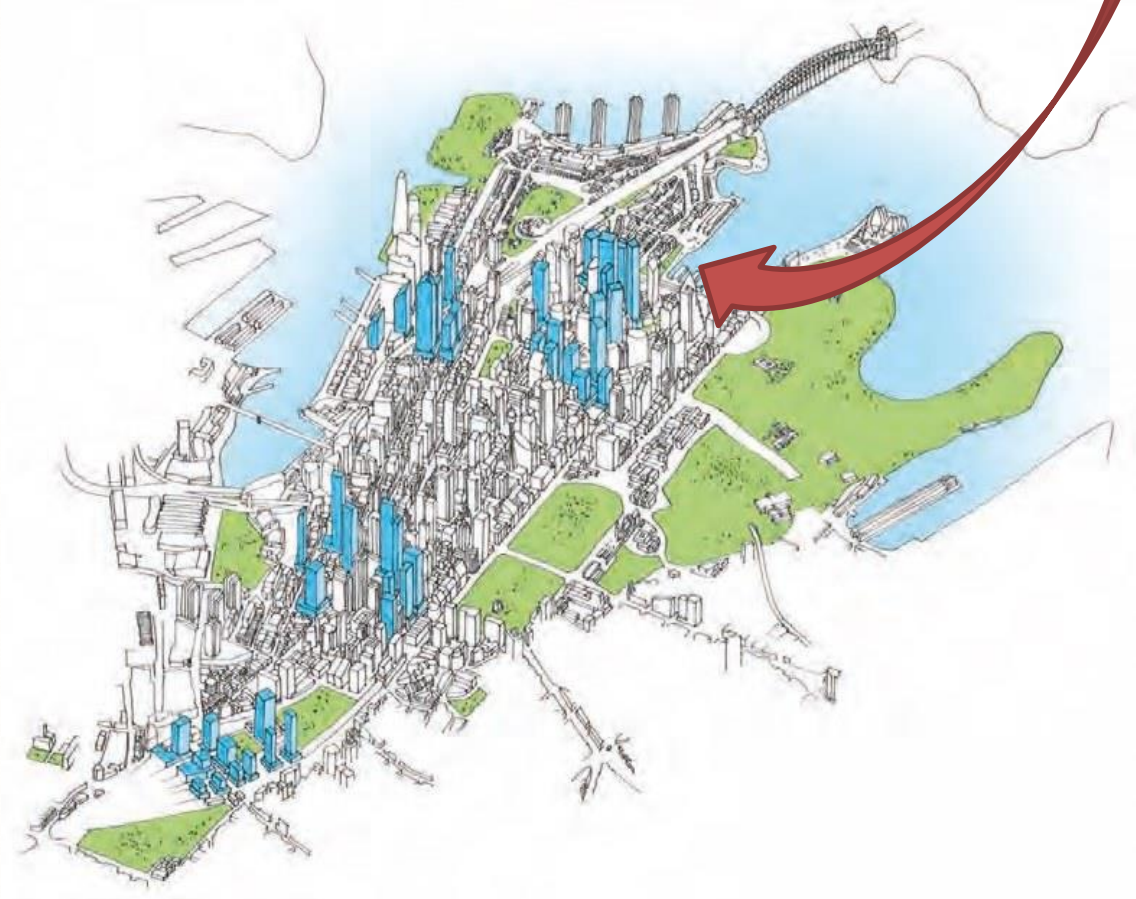
For the purpose of the study , two case example has been taken up , in order to accumulate data , both qualitative and quantitative , to analyze and conclude about the river front.

Location :

Sydney , Australia
LAT . & LONG – 33.86º S 151.20º E
Area of proposed site : 0.22 Sq km



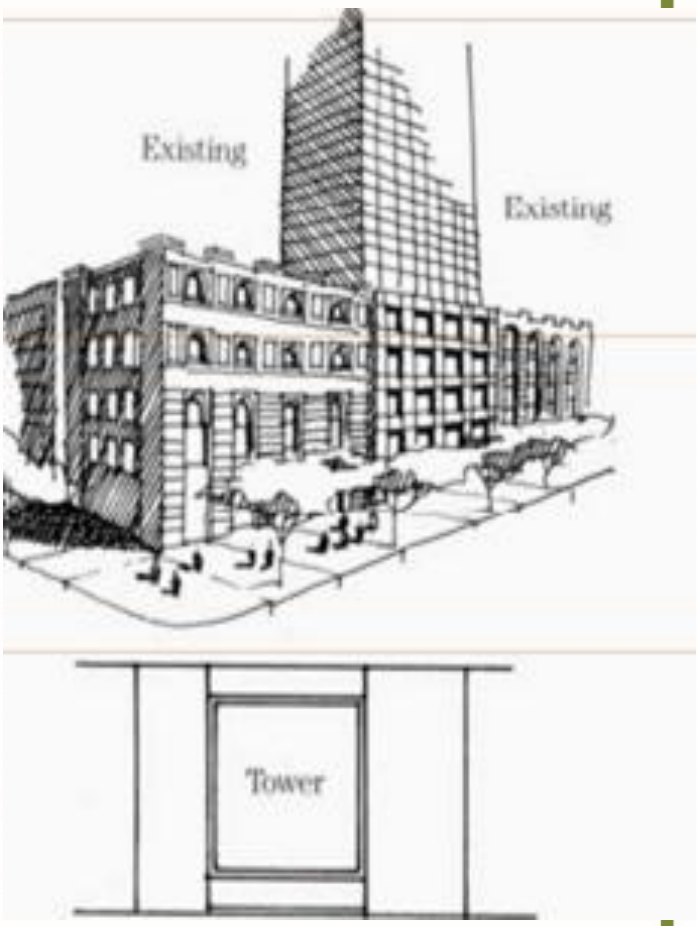


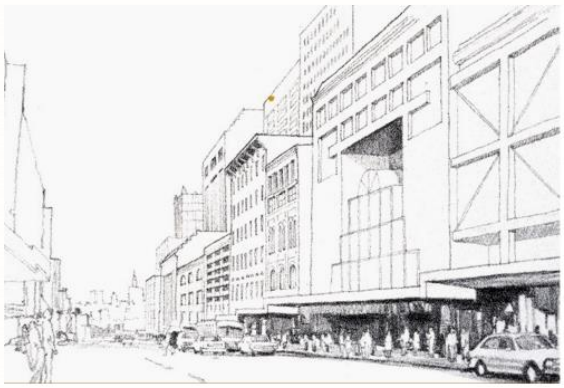


Survey analysis :

Pathways and routes :

The lower levels of new buildings should be built to street alignments to define streetscapes and to maintain the existing street pattern, unless inconsistent with guidelines applying to specific blocks or streets.
New development should take into account the details and proportions of existing development within street, especially if those buildings have heritage value. Unsympathetic contrast of proportions, scale and materials should be avoided.
Ensure that buildings are designed to create pedestrian interest at ground floor level by incorporating activities, which generate vitality, and/or design details, which create visual interest.
Shops and restaurants create vitality and visual interest to street frontage.



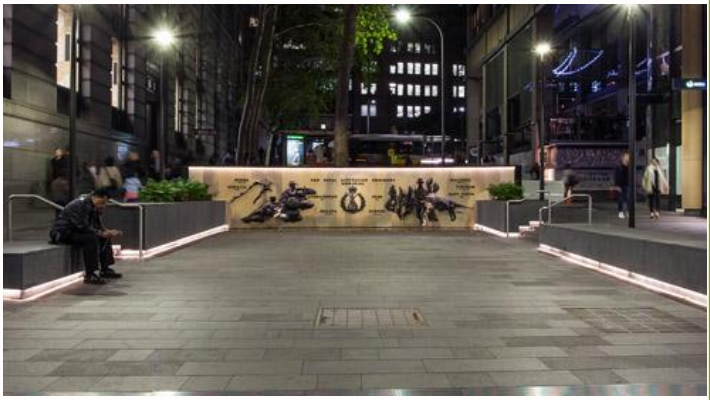


Conclusion :

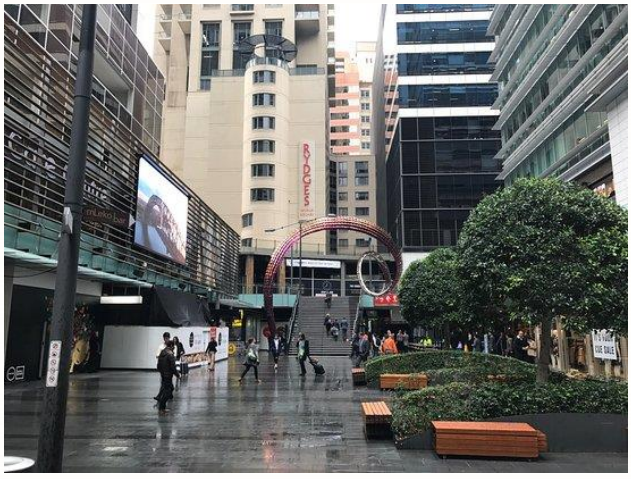
- Direct connectivity with the river edge is mandatory.
- Water front promenade should be accessible and available for the public .

Nodes :

▪Historic waterfronts , monuments , waterfront sports activity , public squares create urban nodes in Sydney.
▪Regimental square , Sydney square , Australia square etc. are the main active nodes.



Regimental square



Sydney square

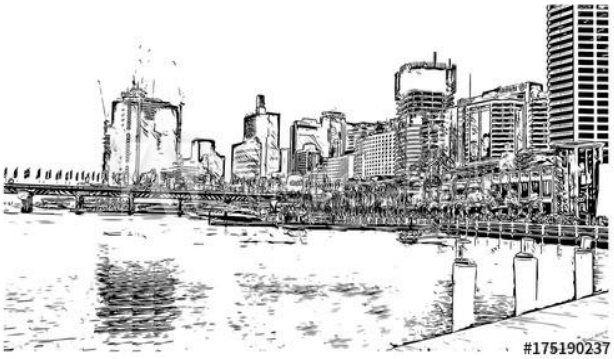
Australia square

Conclusion :

▪These active nodes should be interconnected to reach the desired destination in minimum time.
▪Active promenade crossing should be designed to attract the mass of people towards the river.

Edges :

The sea front edge is well defined with promenade along with the build form which have direct connectivity to the sea .



Conclusion :

Through edge built form should be connected to provide access to the water . Built form along the sea side should be designed to create the sea front edge more prominent.

Magnets & generators :

1. Sydney opera house
2. Royal botanic garden
3. Sydney harbor bridge
4. Circular quay
5. Museum of sydney
6. The domain
7. Cadman's cottage
8. Queen victoria building
9. Darling harbor
10. Sydney observatory

Conclusion :

People magnet should be design for encourage public interaction like commercial areas , food court , squares etc.

Views and vistas :

▪Maintain vistas along streets to buildings and places of architectural, landscape or cultural significance, and to the harbour. Avoid blocking of vistas by pedestrian overpasses.

▪Encourage the sitting of towers to maximise view corridors to and from Port Jackson and Botany Bay especially views enjoyed by existing development.

Conclusion :

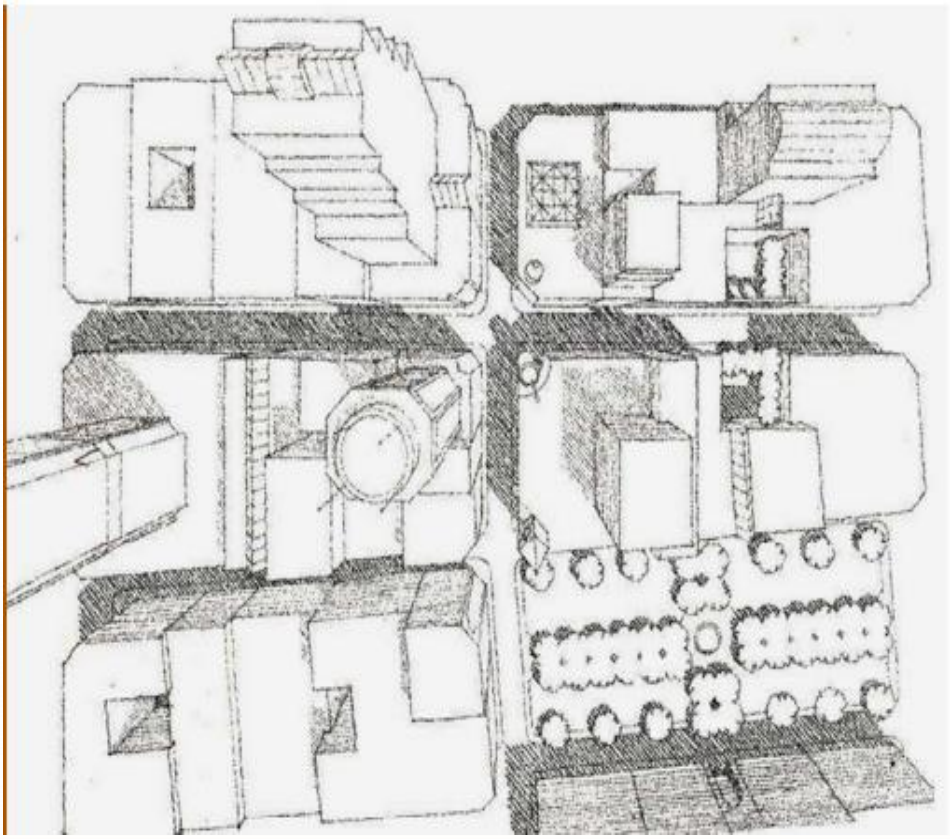
The view s and vistas should be open up in river bank to get a clear connection to the sea.

Urban form :

Building bulk created by large unbroken expanses of wall should be reduce by varying height and setback.
Ensure that buildings are designed to create a visually interesting skyline.

Conclusion :

The urban form should be encourage views and vistas towards sea as much as possible .



2.3 Study Conclusion

- Design of promenade with balanced landscape and choice of activities is important.
- Improved access to the water edge.
- The front should have distinct built and street edge with similarity in visual character and built form

• Even distribution of commercial & recreational activities at Nodes or along the stretch is important for tourist distribution and full utilization of commercial possibilities.

Brahamaputra River Front Development

- Special care should be given to the design and specification of street furniture and street elements.
- Minimization of hardscape and maintain the open space and built space ratio for good environmental quality.
- Positioning of landmarks for better understanding of the orientation of the place also for creating a mental map. The landmark also should contribute to the skyline of the area.

3.0 Case Application

3.1 Introduction to the Case Application

3.1.1 Selection of Case Application

The area has very strong historical roots. Barrackpore, at present, has inadequate public open spaces at the neighbourhood level where people of different socio-cultural, economic, and religious backgrounds can come together and engage in leisure time activities. There are no opportunities either, where people can learn about and explore the rich history of the settlement. These issues form the backdrop for the idea of this proposed project, which has been conceptualized as a place that will bring the people back to the river for increased community interactions and will also celebrate and commemorate the historical importance of the river and its edges.

Staring from Rani Rasmoni Ghat to Mangal pandey park , this stretch is having maximum historical assets.

Selection of the area has been done depending upon the historical assets in and around the site as the selected region can be reconnected with the river.

Dense residential settlements and dilapidated structures are most important and challenging factor to the intervention zone.

PMC ready with Rs 2,618-cr river beautification plan

Plan includes continuous access with pathways for walking, cycling; 16 new boating facilities, 20 new ghats and more eateries

AJAY KHAPE
PUNE, JULY 4

RIVERS FLOWING through Pune city are all set for a makeover, with the Pune Municipal Corporation (PMC) ready with a Rs 2,618-crore plan that promises to beautify the 44-km of river stretch passing through the civic limits. The plan includes continuous access with pathways for walking and cycling, 16 new boating facilities, doubling the ghats to 40 and increased number of eateries.

Ahmedabad-based HPC Design, Planning and Management Pvt Ltd and city-based Center for Development Studies and Activities presented a tentative draft plan of the ambitious river development and beautification project to the civic standing committee on Tuesday.

The project covers both side of 44-km of river stretch passing through the city – including 22.2-km stretch of Mula, 10.4-km stretch of Mutha and 11.8-km stretch of Mula-Mutha river. The agency carried out the study of the entire catchment upstream

NOW: The area around Omkareshwar Temple

PROPOSED: River development project promises to beautify the area around Omkareshwar Temple. *Express*

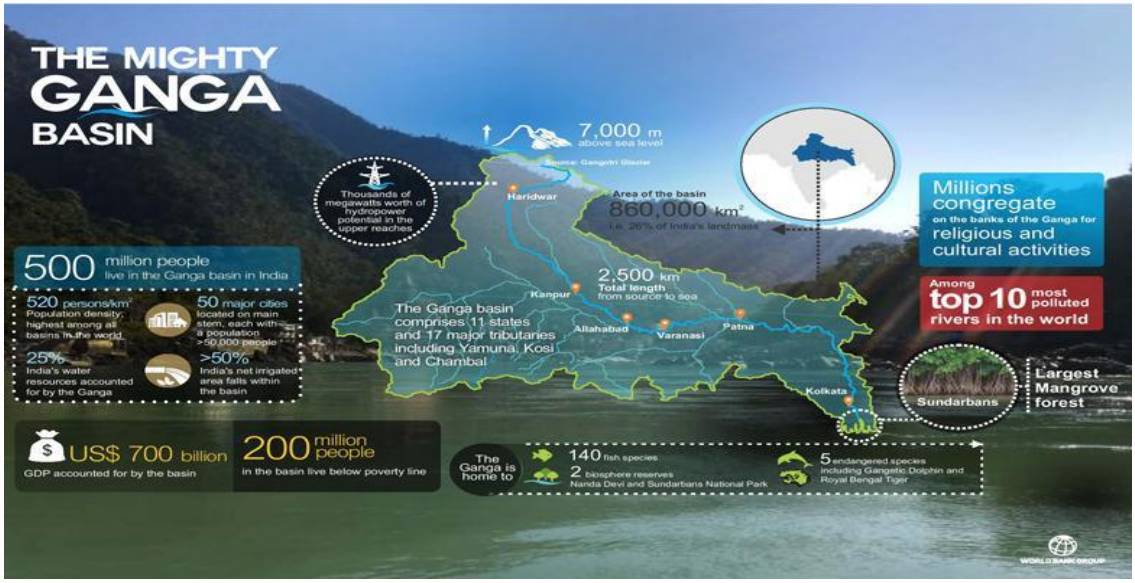
World Bank Assistance : The World Bank is supporting the Government of India in its effort to rejuvenate the Ganga River. The $1 billion *National Ganga River Basin Project* is helping the National Ganga River Basin Authority (NGRBA) build institutional capacity for rejuvenating the river. It is also financing key infrastructure investments in the five mainstem states - Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

The project has two key components: Component 1 ($200 million) supports institutional development that includes the operationalization of institutions at the central and state level; a communications and stakeholder engagement program; water quality monitoring; and technical assistance for city service providers and environmental regulators. Component 2 comprises a $800 million financing window for infrastructure investments in four sectors: wastewater collection and treatment, control of industrial pollution, solid waste management, and riverfront development.


NEWS

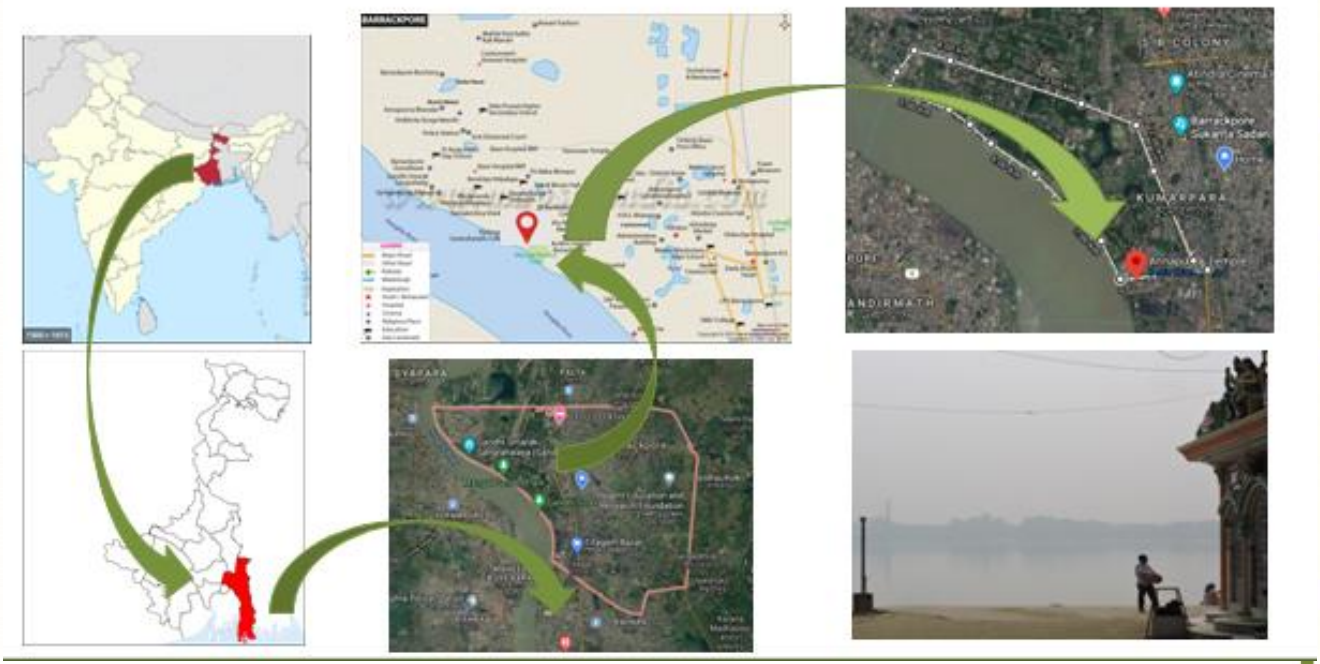
Bamboo trail on Yamuna riverfront

BRIDGES, MACHANS AND SHELTERS TO BE MADE OF BAMBOO; PROJECT TO BE READY BY NEXT YEAR; WILL HAVE RECREATION, EXHIBITION AREAS



3.1.2 Location

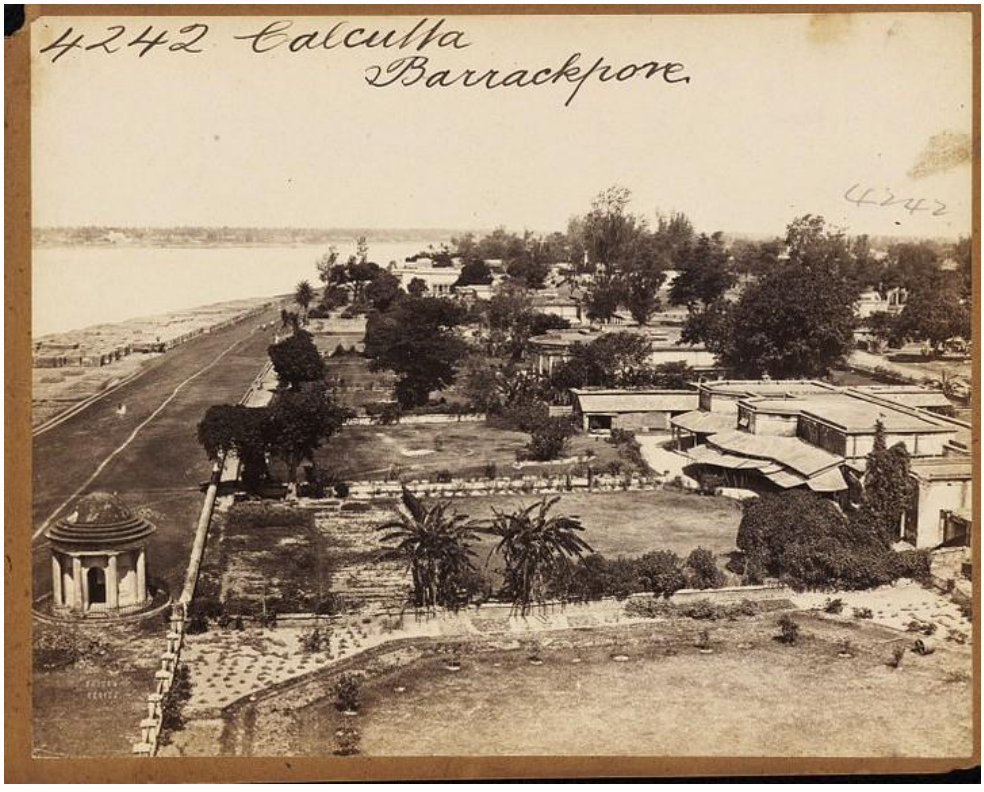
- Barrackpore is a city in the West Bengal state of India. It lies just east of the Hugli (Hooghly) River and is part of the Kolkata (Calcutta) urban agglomeration, lying 15 miles (24 km) north of Kolkata . It is located 22.7674° N, 88.3883° E . It has an average elevation of 15m.
- Area – 2.08 sq km



1.5.3 History & Chronological Development

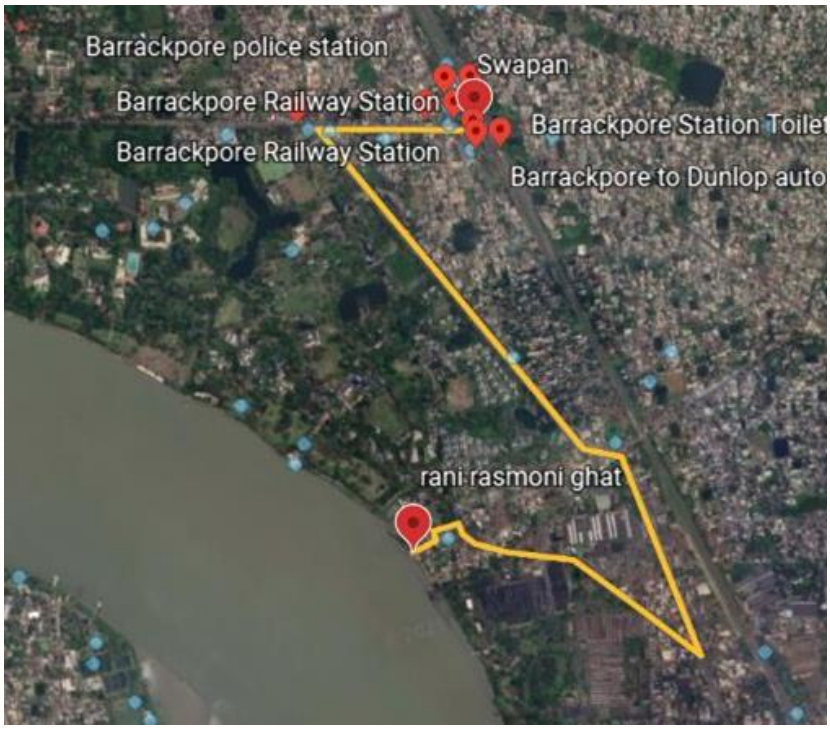
The name Barrackpore is believed to have originated from the English word barracks, as it was the site of the first cantonment of the British East India Company. The first British barracks or cantonment in India was built in the town in 1772. After the British crown assumed direct control of India, the sprawling Government House and the Government Estate

were built in Barrackpore to provide the viceroy with a suburban residence 15 miles (24 km) outside of Calcutta. Two rebellions against British authority took place in Barrackpore in the 19th century. In 1857, Barrackpore was the scene of an incident that had some connection with starting the Indian rebellion, or the First War of Independence. Mangal Pandey, an Indian soldier, attacked his British commander, and was subsequently court-martialed. In order to commemorate his sacrifice, a park named 'Sahid Mangal Pandey Udyan' was opened on the river bank. The Arnapurna temple similar to Dakshineswar Temple at Titagrah on the river bank, was opened to devotes on the 12th of April, 1875 (30th Chaitra 1281) by Sri Sri Ramkrishna Paramahansa. The Temple was built by Rani Rashmonis Youngest daughter Jagadamba Devi. The majestic Temple stands on the Rani Rashmoni ghat near Barrakpore.



3.1.4 Connectivity

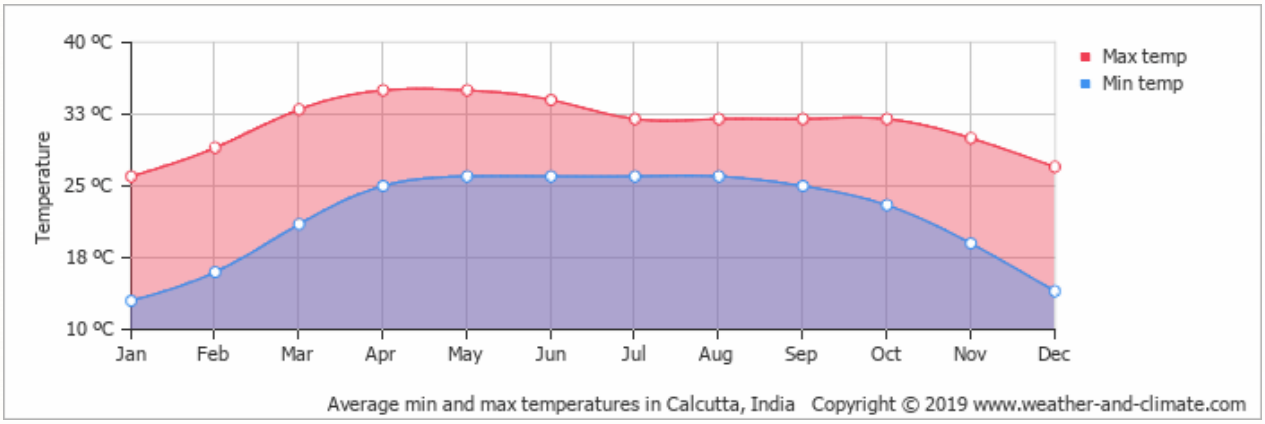
The site is well connected with Barrack pore railway station by road , its around 12 to 15 min from Barrack pore station.

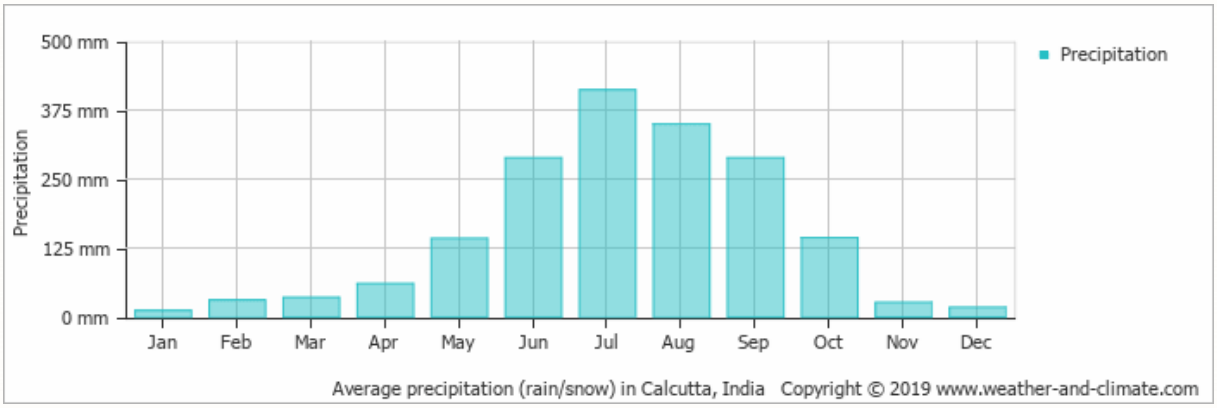


B T road

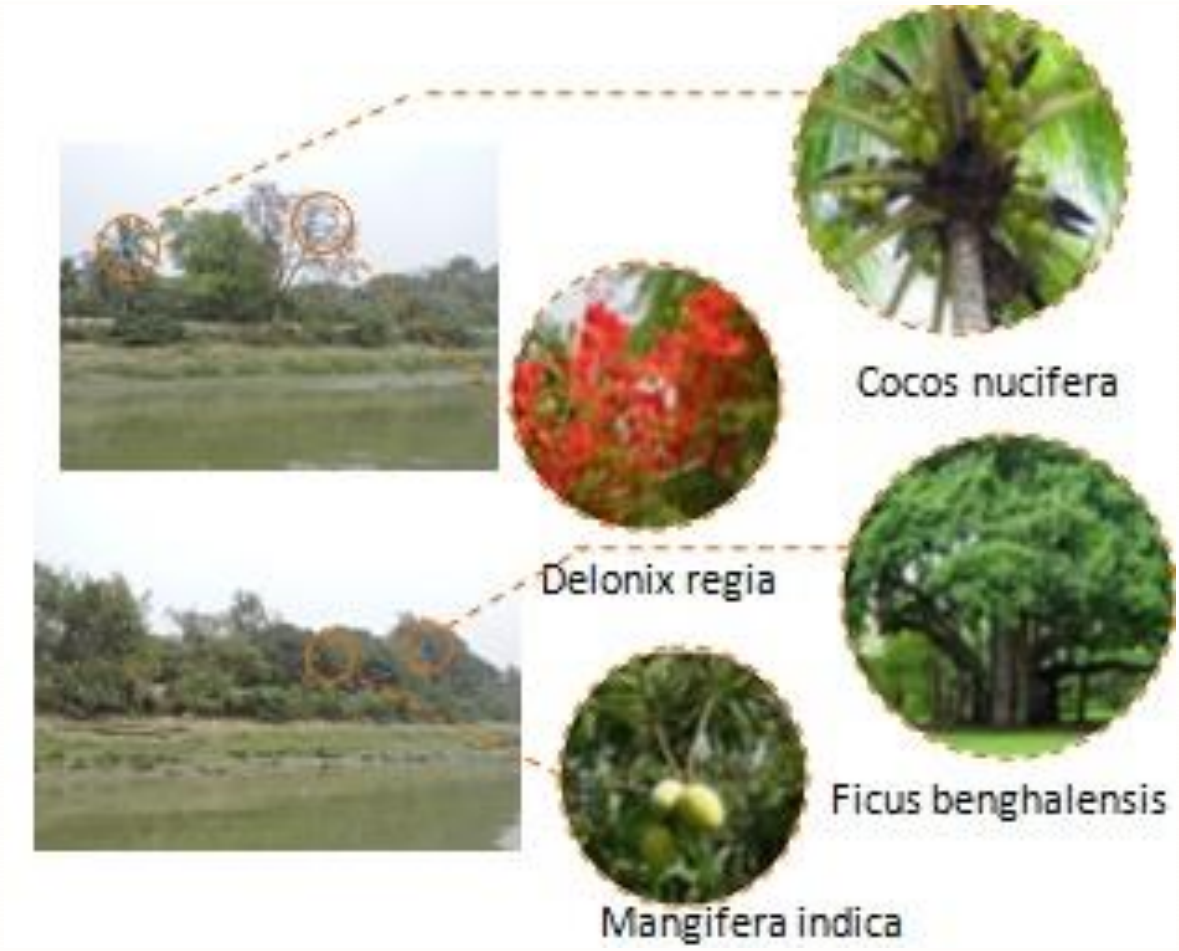
Barrackpore station

3.1.5 Climatic Condition & Orientation



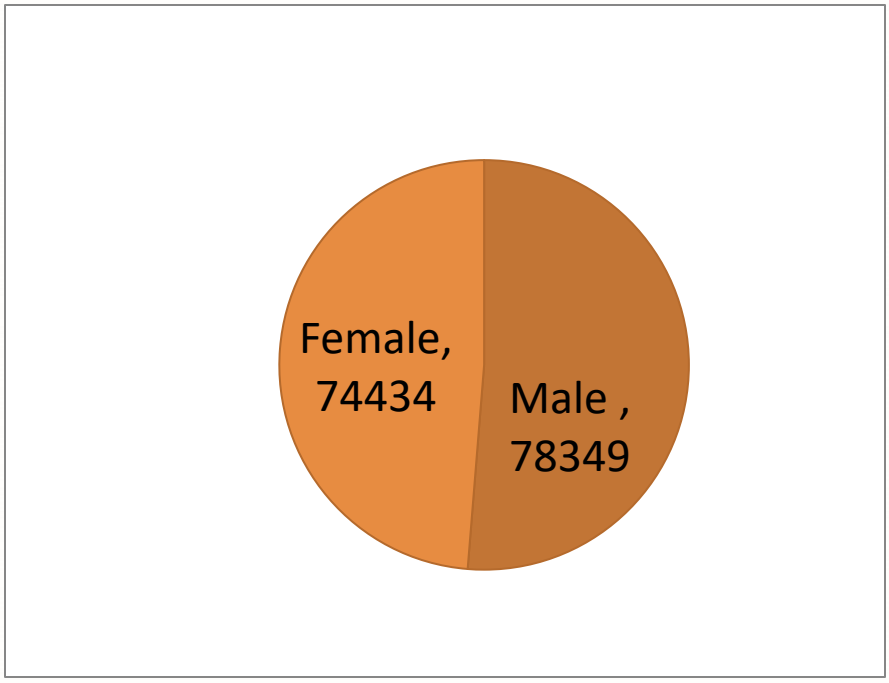


In the summer days (March to June) max During the summer months, temperature is 28C to 34C normally and in winter (November to February) , Temperature - 12C to 27C.
Avg. Rainfall – 160 cm.

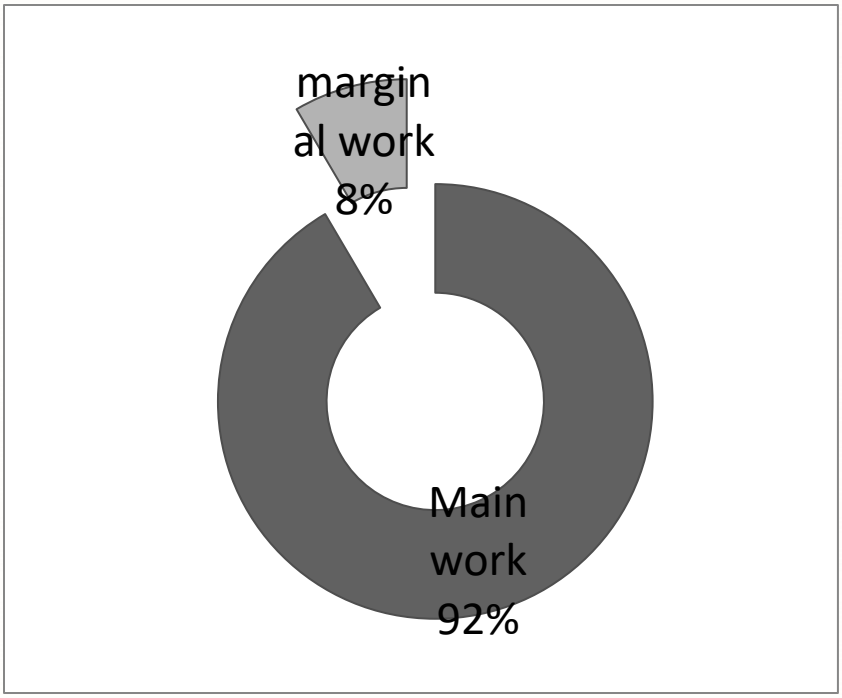


3.1.7 Demographic Profile

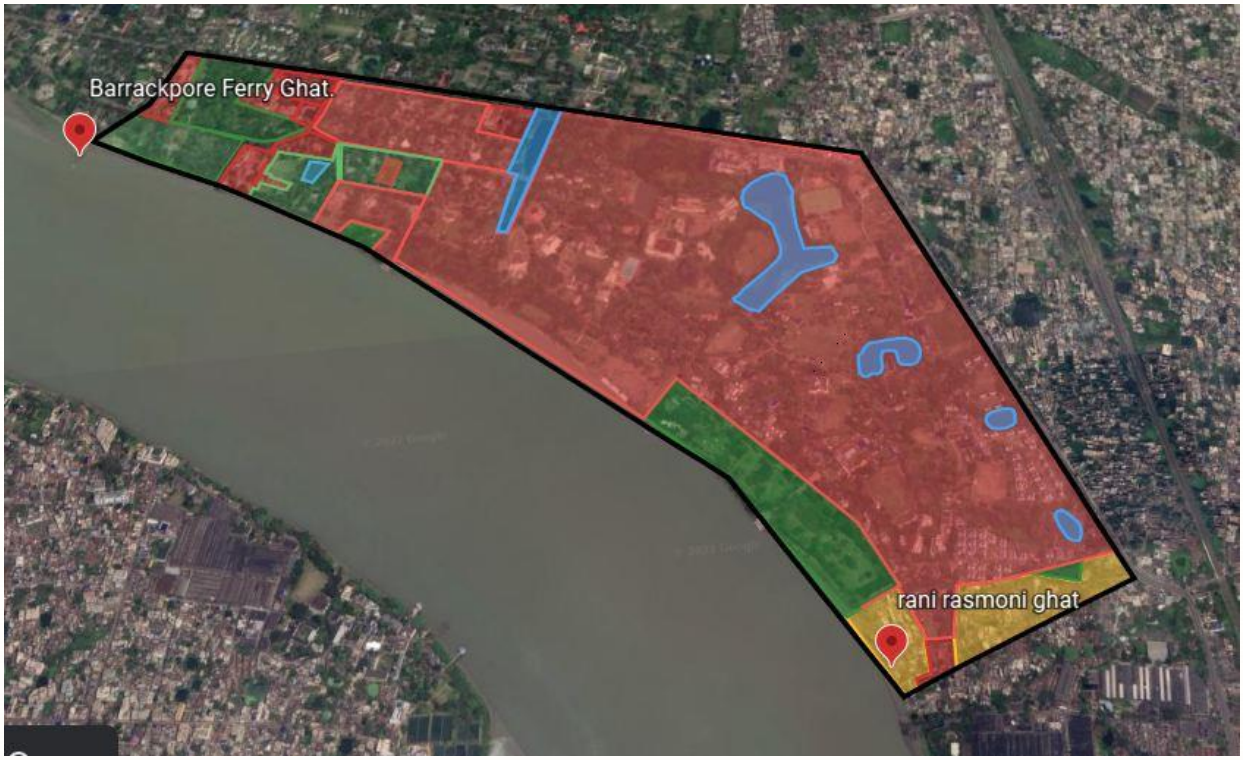
As per provisional reports of Census India, **populatio n** of **Barrackpu r** in 2011 is 152,783; of which male and female are 78,349 and 74,434 respectively.

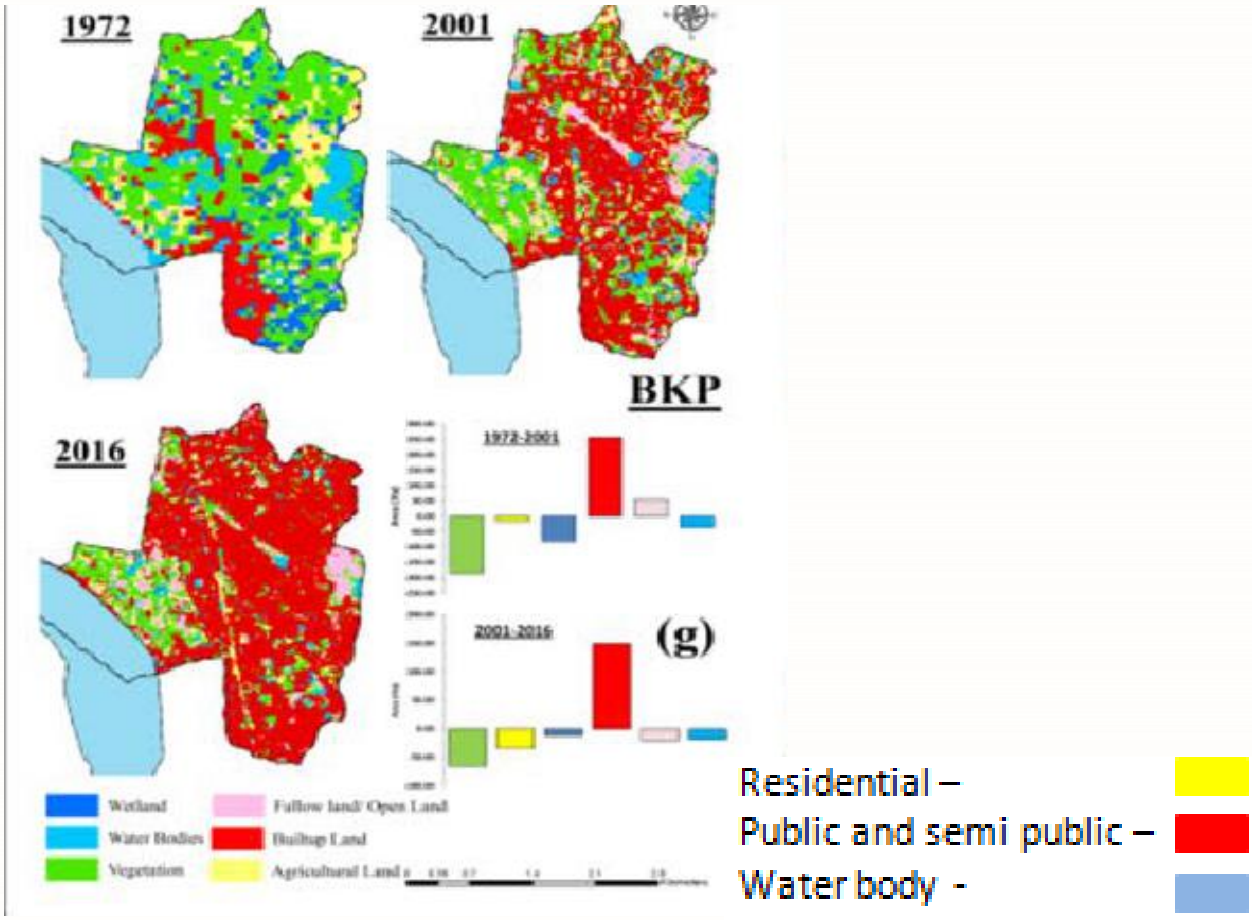


working population - 52874, 91.54 % were engaged in Main **Work** while 8.46 % of total **workers** were engaged in Marginal **Work**.



3.1.8 Land use





Residential –
Public and semi public –
Water body -
Vegetation -

LAND USED MAP OF BARRACKPORE

3.1.9 Tourism Scenario

Water has a powerful attraction for people. When people decide to plan vacations and travel for recreation, instruction, and pleasure, many have a strong tendency to head to the water.

Because of the popularity of tourism worldwide, coastal, lake, and riverfront development has dramatically increased in recent decades. For instance, riverfront developments often include convention centers, hotels, retail and entertainment facilities, housing, and sometimes an aquarium or discovery center. With the emergence of riverfront parks, land near rivers is becoming highly desirable.

RIVER SIDE KOLKATA

Kolkata is adorned by the beauty of River Hooghly. The lush greenery and serene atmosphere surrounding the river are surely captivating. In fact, lots of tourism spots have been developed around the river, of which one is the Millennium Park. A relatively new park in the city, it was inaugurated on December 26, 1999 and opened to the general public on January 1, 2000. This park was built by Kolkata Metropolitan Development Authority (KMDA/CMDA), adorning the surrounds of the river.

NIMTALA GHAT

PRINCEP GHAT

MILLENNIUM PARK

BABUGHAT

ARMENIAN GHAT

OUTTRAM GHAT

JAGANNATH GHAT

3.1.10 General Issues of riverfront in terms of Tourism

1.Stabilisation of the River bank to prevent erosion.
2. Rapid development along the fronts causing threat to natural vegetation.
3. Uneven distribution of commercial, recreational, amusement activities.
4.Uge water pollution during festival period.
5. River pollution from tourism activities causing decreasing biodiversity, destruction of flora and fauna.
6. Low Safety and security of the riverfront and surround roads at night.

Parameter check from issues for study and design

- Activity
- Land use & Built use
- Streets & Pedestrian Environment
- Landscape
- Safety & Security

3.1.11 SWOT Analysis of the Area

Strength

- Barrack pore Mangal Pandey park and Arnapurna temple have a historical value.
- A 2.69km long stretch of riverfront, which attract people from outside of Barrack pore.
- Excellent a full day outing spot.

Opportunity

- Development and beautification can be controlled in a planned manner.
- Water pollution also can control through proper design.
- It's a greater opportunities to create a beautiful riverfront area.

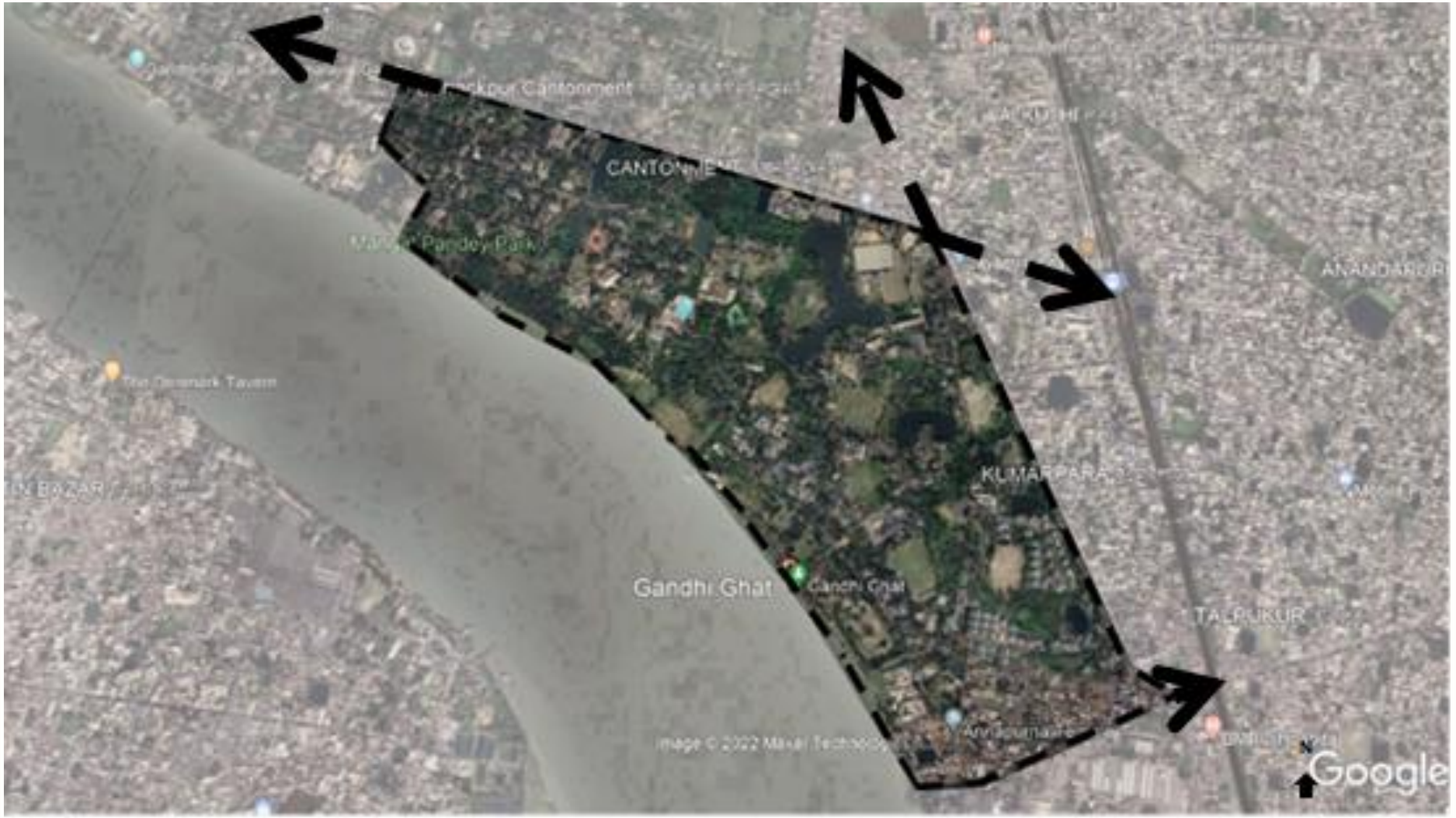
Threats

- Continuous erosion.
- Maintaining clear river bank and water pollution's is a major threat.

Weakness

- Sewerage system is too poor.
- Unwanted activity after sunset , which hampers safety and security of tourist and local people.

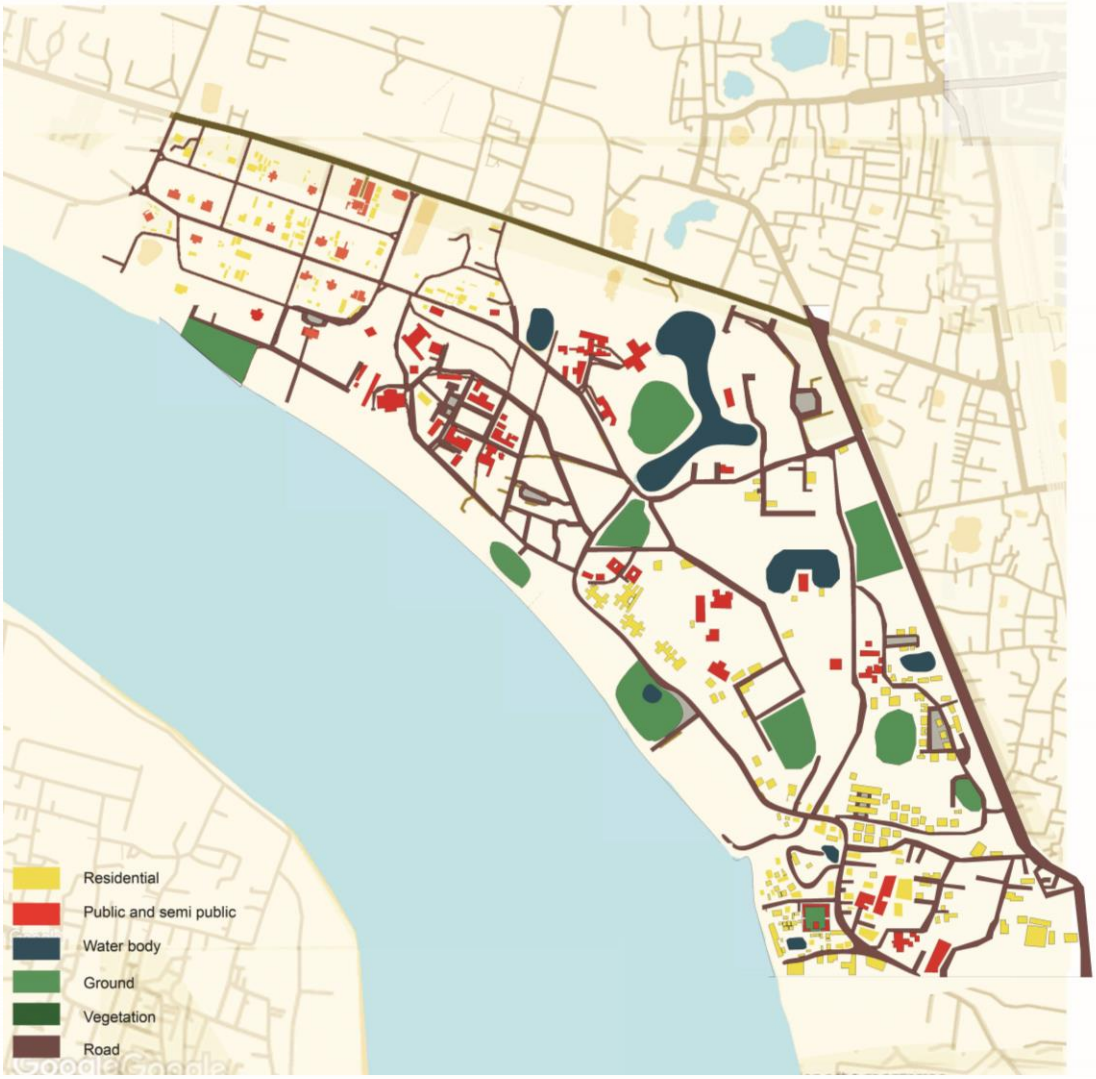
Area level study


CANTONMENT
Gandhi Ghat
KUMARPARA
TALPUKUR
Google

3.2 Area level study

3.2.1 Delineation

- The delineation has been done through the road network in the eastern edge.
- Barrackpore trunck road on the east side and hoogly river creats a boundary line on the west side .
- Local road called park road on south east side and mongal pandey park road on north west side
- The whole area is surrounded by residential and mixed land uses .
- Based on the historical assets this area is identified for intervention area.
- Major activities and movement are done by in three parts of the selected area.



3.2.2 Survey

Pathways and routes :

Observation

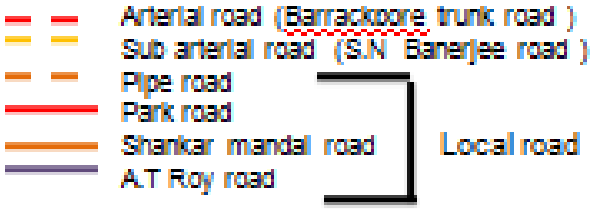
- There is no bridges or setu over the Ganges.
- There is only ferry service available.

Analysis

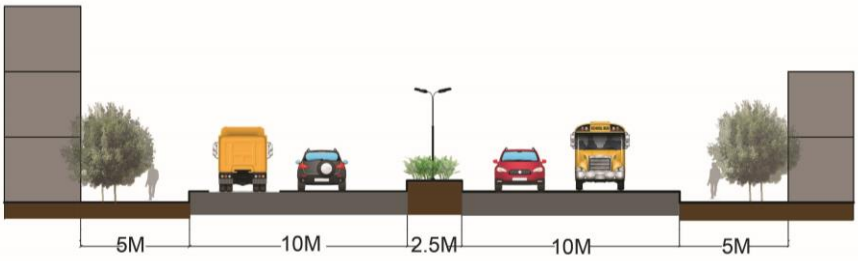
- Ghandhi ghat and Mangal pandey ghat are well connected by local roads to B.T. road .
- The ferry service is connects Serampur and Seoraphuli.

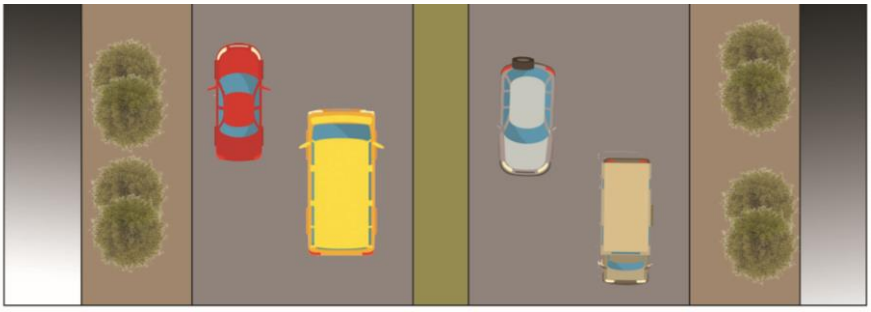
Conclusion

- There is no direct connection between Ghandhi ghat and Mangal pandey ghat.
- B.T road is main major road.

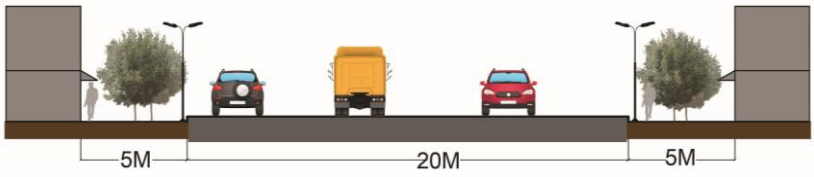


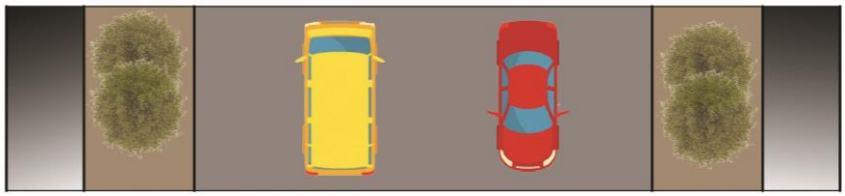
Pathways and routes :



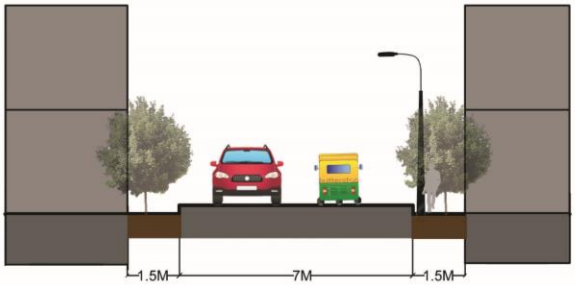


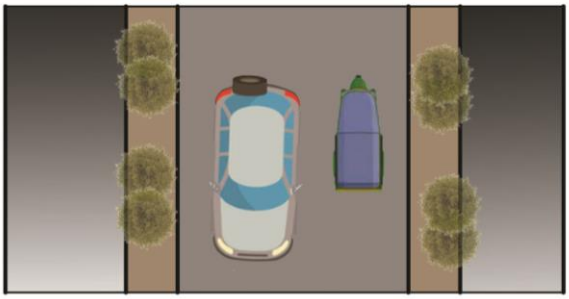
Arterial road
(Barrackpore trunk road)





Sub Arterial road





Local road

Edges:

Observation

- Most of the Gov. area.
- Mixed use type settlements
- Roads and hoogly river as edge.

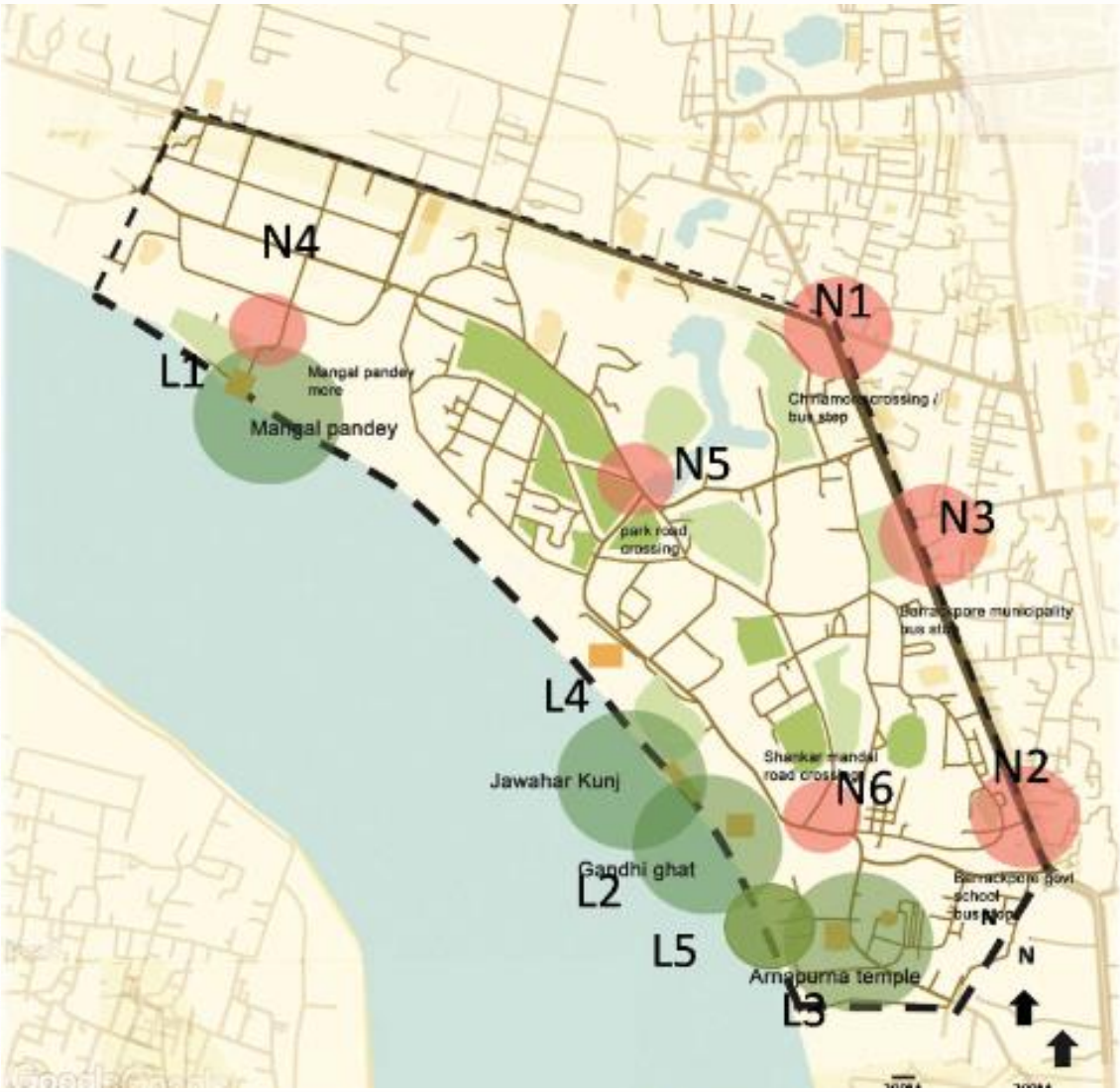
Analysis

- The site is having the longest river edge.
- And mainly two types of street edge which are B.T.road and S.N .Banerjee road.

Conclusion

- The river edge acts as a seam or permeable element.

Nodes and Landmarks:



Observation

- Under major nodes , there are many road crossing .
- Minor nodes are mainly mixed activity center.

Chiriamore crossing /bus stop

park road crossing

Barrackpore municipa
bus stop

bus stop

Mangal pandey more

Barrackpore govt school /bus stop

Ghandhi Ghat

Annapurna Temple

Conclusion

- The nodes mainly generates from the main road and ghats.

Views and vistas:

Observation

•View of mangal pandey , Gandhi Ghat and Arnapurna temple is obstructed by long trees and few buildings.
•There is small length vista create by local road.

Analysis

The arcaded entrance gate should be large in scale to encourage the people to come from a great distance

Conclusion

•All the vista should be open up in the river bank to connect the people.
•All the plazas must blend with the pedestrian promenade to encourage the peoples activity.

Architectural features:

Observation

•The temple and ghat style is Bengal architecture and navaratna style.

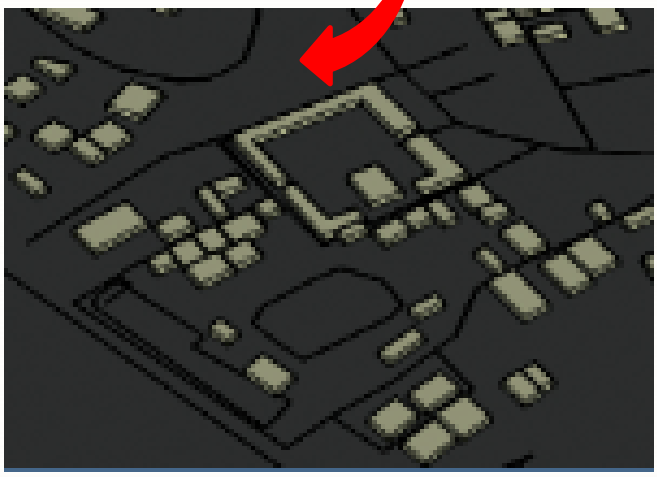
Analysis

•There is no promenade to enter the Mangal pandey ghat with seating areas.
•The night life of these ghats are not appropriate and there are no signage or adequate light.
•all ghat entrance are not remarkable in terms of architecture which will be visible from a great distance.

Conclusion

•Urban proposal should include all the required architectural features along the river

Urban form:



Observation

•From the edge of the river the Urban forms on both the bank of the river are not visible from the other side because of the huge span of river Ganges.

•From the streets opening up to the river edge defines somewhere a very congested settlement with low rise urban form which discourage any involvement with the river.

•From the street level the urban form is linear in pattern having fine grain and uniform texture.

Analysis

•Most of the buildings are one or two storied with no setback in a very congested manner.

• most of the buildings in dilapidated condition .

Conclusion

•The urban form should encourage the views and vistas towards the river as much as possible.

Zonal level study

Zone selection

3.3 Zonal level study

3.3.1 Zone 1

3.3.1.1 Delineation

•The delineation has been done through the Road network in eastern and northern edges.
•Most of the part of this area is govt restricted area. and some of the mixed land use zone.
•central zone is mostly Govt. restricted and mixed used activity throughout the periphery.
•Based on the historical assets this area is identified for intervention area.

Mangal pandey park

In between Mangal pandey ghat and Gandhi ghat

Mangal pandey ghat

3.3.1.2 Survey

Pathways and routes :

Observation

- Major roads are in periphery , have mixed vehicular movement, no grade separation.
- Internal roads are by small retail shop , unauthorised sattlements, immediate intervention required

Analysis

- All local roads are opening up in the B.T.road or S.N.Banerjee road.
- B.T.Road and S.N.Banerjee roads are meet at the chiriamore crossing.

Legend

Arterial road (35M)

Sub - Arterial road (30M)

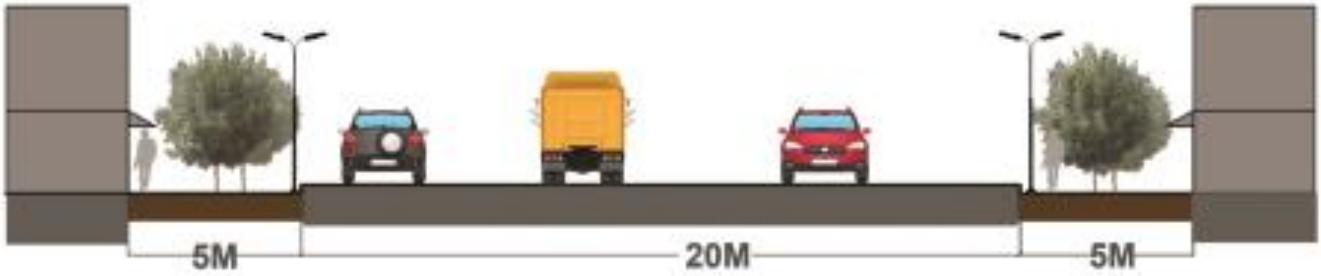
Local road (7 -12 M)

(Park road)

(Middle road)

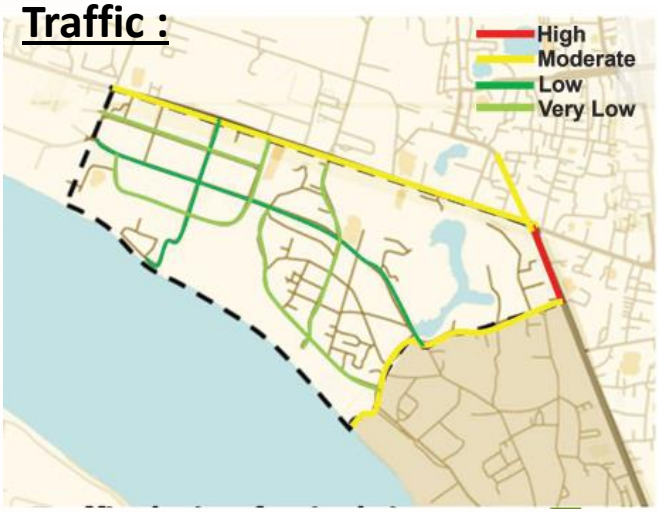
(Shankar mandal road)

(Mangal pandey road) 9M



Sub - Arterial road (30M) S.N.Banerjee road

Traffic :



During normal time

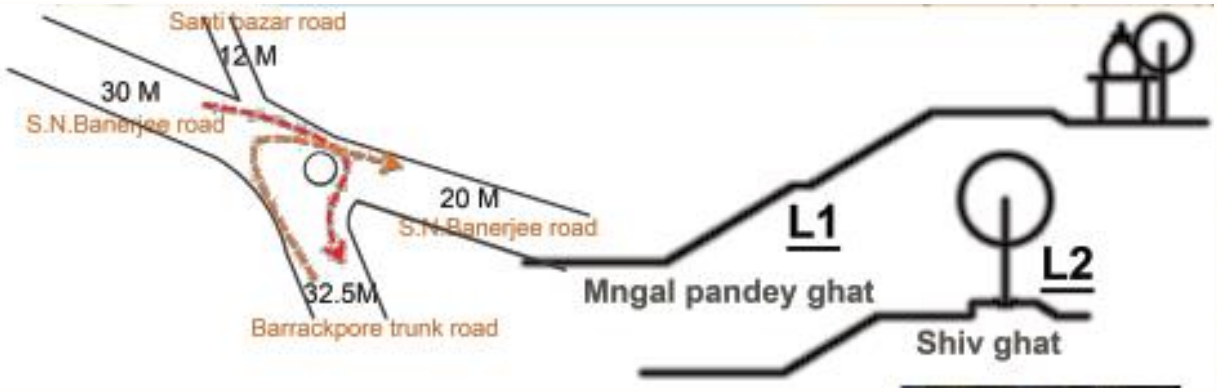
S.N.Banerjee road

During festival time

Conclusion

- Grade separation should be required for the road.
- Adequate spaces for the pedestrian and light vehicle are important.
- Adequate bus stop ,parking areas should be intervened whether required.

Nodes and Landmarks :



Observation

- Many parks , picnic spot are scatted all over this zone.
- There is a major nodes like chiriamore crossing , which attracts the crowd of people.
- Minor nodes are mainly mixed activity center which makes this node vibrant than any other nodes.
- There are main two land marks .

L1 - Mangal pandey ghat

N1 - Chiriamore crossing

L2 - Shiv ghat

N7 - park road crossing

N3 - Mangal pandey more

Analysis

- The density of urban nodes are higher in the region of N1 , N2 and N3.
- Landmark L1 is Mangal pandey ghat , which is more prominent land mark in this area.

Conclusion

- The Nodes generating from the major and minor road crossing and from the ghat.
- In the mangal pandey ghat ,there is not ferry services so the ghat node is not a main transportation nodes its a mixed use node.

Magnets and Generators :

Observation

- Major magnets are on light vehicular road and connectivity with the river edges required.
- Spill over the crowds on these magnets are directly over the road, irregular movements generated ,intervention required.
- Seasonal activities are very congested due to Durga puja , affecting roads.

M1 - Mangal pandey park
M2 - Barrackpore Rastraguru Surendranath College
M3 - PTC Hospital
M4 - Children's Park
M5 - Nivedita Vidyapith
M6 - Modern School Barrackpore
M7 - Modern English Academy
M8 - Assembly of Angels Secondary School
M9 - Central Calcutta Science & Cultural Organization for Youth
M10 - Cenotaph - The Temple of Fame
M11 - Lord Canning's Statue

M1 - Mangal pandey park

M2 - Barrackpore Rastraguru Surendranath College

M3 - PTC Hospital

M10 - Cenotaph - The Temple of Fame

M11 - Lord Canning's Statue

M4 - Children's Park

Analysis

- This zone having mixed activity pattern but mainly the magnets are generated for school and college areas.
- Proper connectivity is missing in the areas of all magnets.

Conclusion

- Accessibility to the magnets and connectivity has to be enhanced .
- heritage assets , Mangalpandey ghat should be well connected to the road by enhancing the walk ability

3.3.1.3 Proposal

Modify road network system through grade separation for better accessibility , safety and comfort.

Introducing dedicated pedestrian walk ways and light motor vehicular ways for better accessibility.

Creating public open spaces for the image making of the river front area as well as enhancement of this historical area.

Interconnecting the new and the existing nodes , historical assets to reconnect the river with the city.

Creating of plazas , squares , parking and active public nodes to connect the major roads with the ghats.

3.3.1.4 Identification of the intervention zone

Based on the study done it is established that the selected sites have the most potential to intervene.

SITE A

Site area starting from Mongal pandey more to Mangal pandey ghat.

SITE B

Site area starting from Mongal pandey Ghat to Gandhi ghat.

3.3 Zonal level study

3.3.2 Zone 2

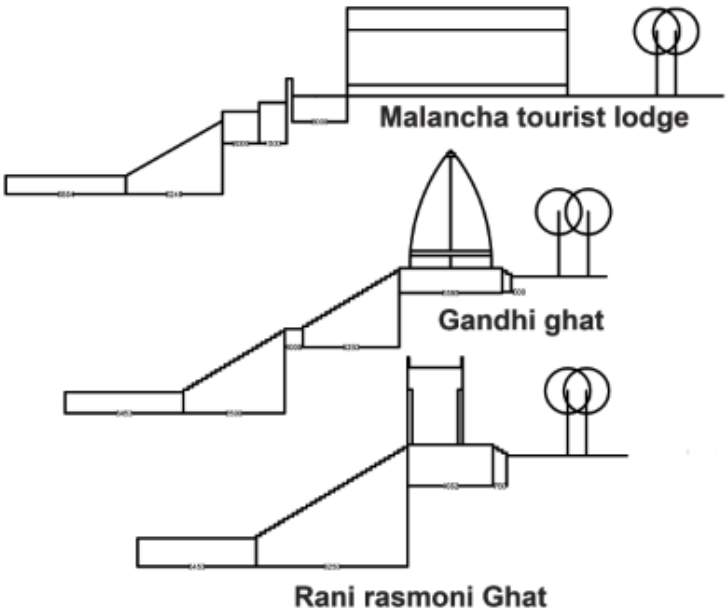
3.3.2.1 Delineation

Malancha tourist lodge

Rani rasmoni Ghat

The delineation has been done through the Road network in eastern and northern edges.
Most of the part of this area is residential and mixed land use area.
central zone is mostly Govt. restricted and mixed used activity throughout the periphery.
based on the historical assets this area is identified for intervention area.

Gandhi ghat



Jawahar Kunj

3.3.2.2 Survey

Pathways and routes :

Legend

Arterial road (35M)

Local road (10M)
(B.T. Road)
(SAP 6th Bn. office road - 5m) local road

Local road (10 M)
(Park road)
(A.T.Roy road - 7m) local road

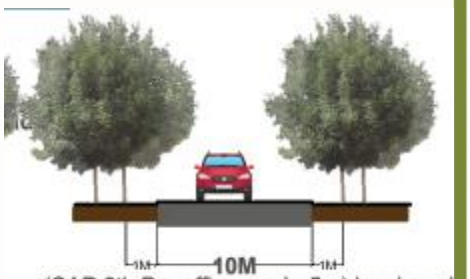
Local road (10 M)
(Shankar mandal road)
(SAP 2nd Bn. groung road - 5m) local road

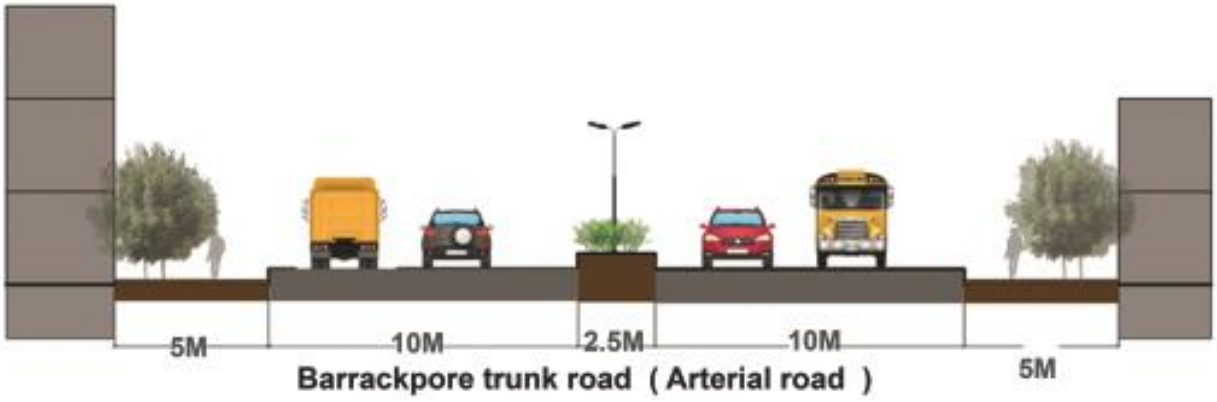
Observation

- Major roads are in periphery .
- Internal roads are by small retail shop , unauthorized settlements, immediate intervention required.
- Traffic rush is highly increased in the festival time.

Analysis

- All local roads are opening up in the BarrackporeTrunk road.
- Shankar mandal road is one of the important and busy local road at this site.





Traffic :

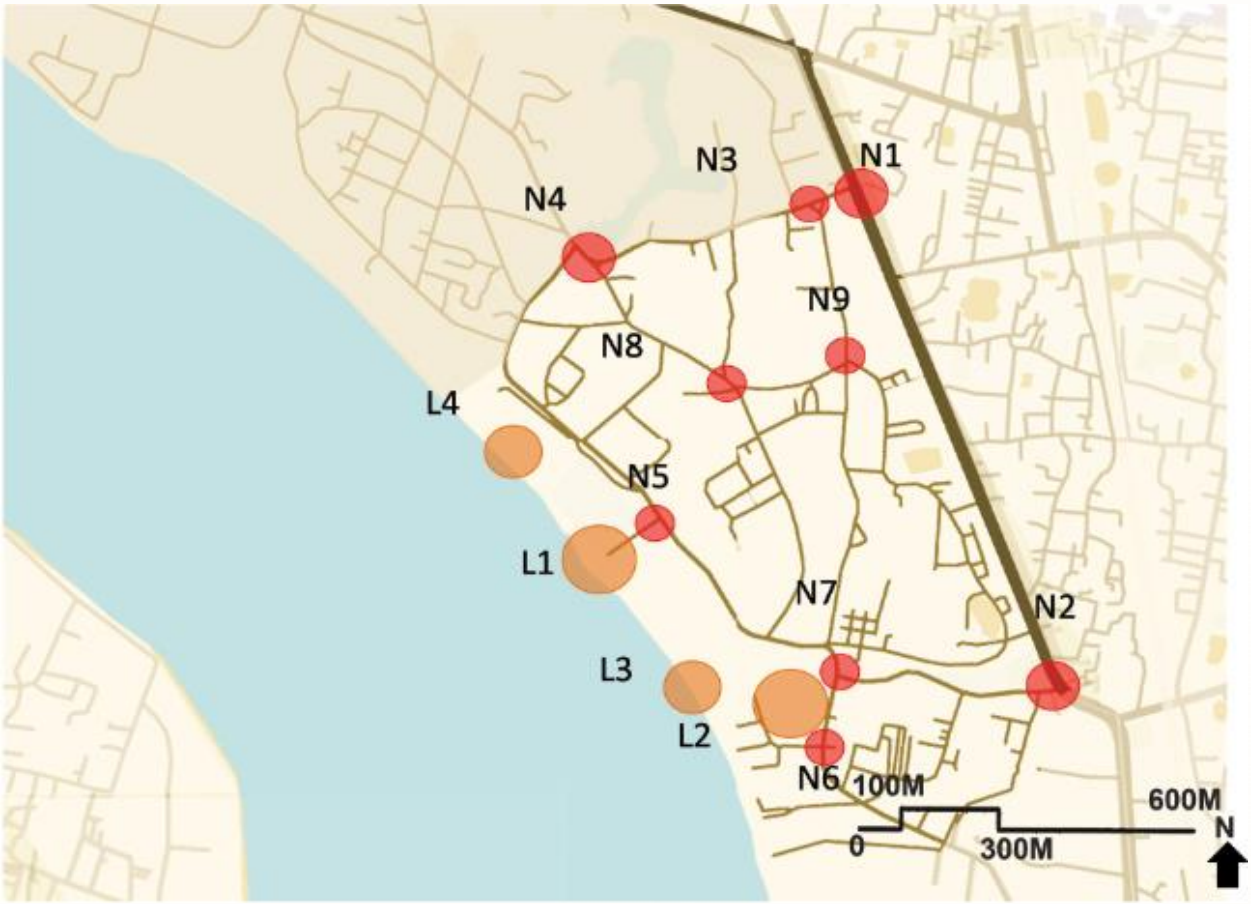
During normal time

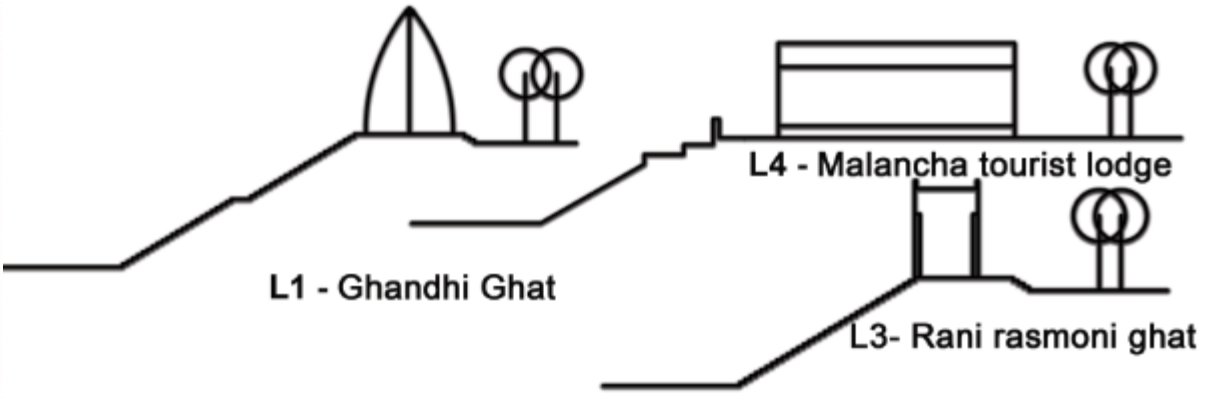
During festival time

Conclusion

- Grade separation should be required for the road.
- Adequate spaces for the pedestrian and light vehicle are important.
- Adequate bus stop ,parking areas should be intervened whether required.

Nodes and Landmarks :





Observation

- Many schools , temples are scatted all over this zone.
- There is a major nodes like barrackpore govt school more and shankar more, which attracts the crowd of people.
- Minor nodes are mainly mixed activity center which makes this node vibrant than any other nodes.
- There are main four land marks .

L1 - Ghandhi Ghat

L3- Rani rasmoni ghat

N2 - Barrackpore govt school / bus stop more

N7 - Arnnapurna Temple more

N5 - Gandhi ghat more

Analysis

- The density of urban nodes are higher in the region of N1 , N2 , N4 and N7.
- Landmark L1 is Gandhi ghat and L3 is rani rasmoni ghat, which are more prominent land mark in this area.

Conclusion

- The Nodes generating from the major and minor road crossing ,from the ghat and from the temples.
- Rani rasmoni ghat is also used as a burning ghat so its not only a landmark is also acts public gathering area.

Magnets and Generators :

Legend

M1 - Jawahar kunj Park
M2 - Latbagan High school
M3 - Barrackpore Government High School
M4 - Kusum Kumari Deshbandhu F. P. School
M5 - Lalkuthi Fire Station (Old Building)
M6 - Hanuman Mandir
M7 - Durga Mandir
M8 - Jagannat Mandir Talpuur
M9 - Jagaddhatri Temple
M10 - Over head water tank 2

- Major magnets are on light vehicular road and connectivity with the river edgeis required.
- The crowds generated from schools and temples on these magnets are directly over the road, irregular movements generated ,intervention required.
- Seasonal activities are very congested due to Durga puja , affecting roads.

M2 - Latbagan High school

M8 - Jagannat Mandir Talpukur

M5 - Lalkuthi Fire Station (Old Building)

M1 - Jawahar kunj Park

M9 - Jagaddhatri Temple

M3 - Barrackpore Government High School

Analysis

- This zone having mixed activity pattern but mainly the magnets are generated for school and temples areas.
- Proper connectivity is missing in the areas of all magnets.

Conclusion

- Accessibility to the magnets and connectivity has to be enhanced .
- Heritage assets , Arnapurna temple should be well connected to the road and also the river by enhancing the walkability

3.3.2.3 Proposal

Rearranging the haphazard distribution of the area preserving the historical assets.

Reshaping the existing roads and the development and the surrounding with public facilities.

Existing green space has been proposed to give in a proper form and developed into landscape plazas.

Recreate ghat areas and unique architectural elements used in the new developments.

The dilapidated structures has been proposed to people gathering spaces , having open plazas with the vibrant pedestrian oriented community.

3.3.2.4 Identification of the intervention zone

Based on the study done it is established that the selected sites have the most potential to intervene.

SITE B

Site area starting from Mongal pandey Ghat to Gandhi ghat.

SITE C

Site area starting from Arnapurna ghat to Arnapurna temple complex

3.4 Site level study

3.4.1.1 Delineation

- Site level delineation has been done through along the river .
- The whole area is surrounded by long tresses and mixed residential.
- Based on historical assets this area is identified for intervention area.

3.4.1.2 Proposal & schemes

SITE A

Recreate ghat areas and unique architectural elements used in the new developments.

The dilapidated structures has been proposed to people gathering spaces , having open plazas with the vibrant pedestrian oriented community.

Existing green space has been proposed to give in a proper form and developed into landscape plazas.

3.4.1.2 Proposal & schemes

SITE B

Existing green space has been proposed to give in a proper form and developed into landscape plazas.

Introducing more public activities along with river through pedestrian promenade .

Introducing more public activities along with river through pedestrian promenade .

3.4.1.2 Proposal & schemes

SITE C

Rearranging the haphazard distribution of the area preserving the historical assets.

The dilapidated structures has been proposed to people gathering spaces , having open plazas with the vibrant pedestrian oriented community.

Reshaping the existing roads and the development and the surrounding with public facilities.

Creating urban nodes in front of heritage assts.

Reviving the existing urban nodes to reconnect the river with the heritage assts.

3.3.2.1 Design Guideline

Pathways and routes

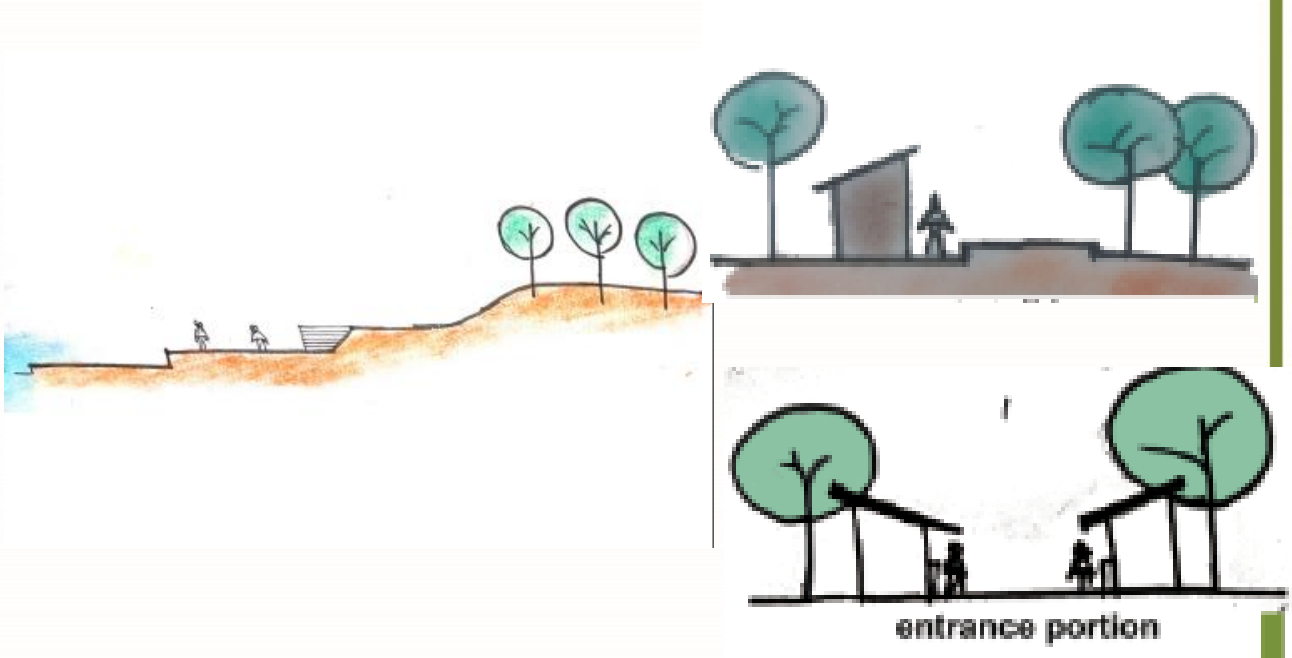
To create extended public promenade providing proper axis from the roads and important junctions.

To incorporate adequate road facilities and street furniture to enhance the comfort of the outdoor activities.

To provide public amenities to the pedestrian users. To design street furniture such that the act as functionally and visually unifying element in the public realm.

To restrict the heavy vehicular movements on the pedestrian zone.

To enhance the pedestrian movements .



Nodes

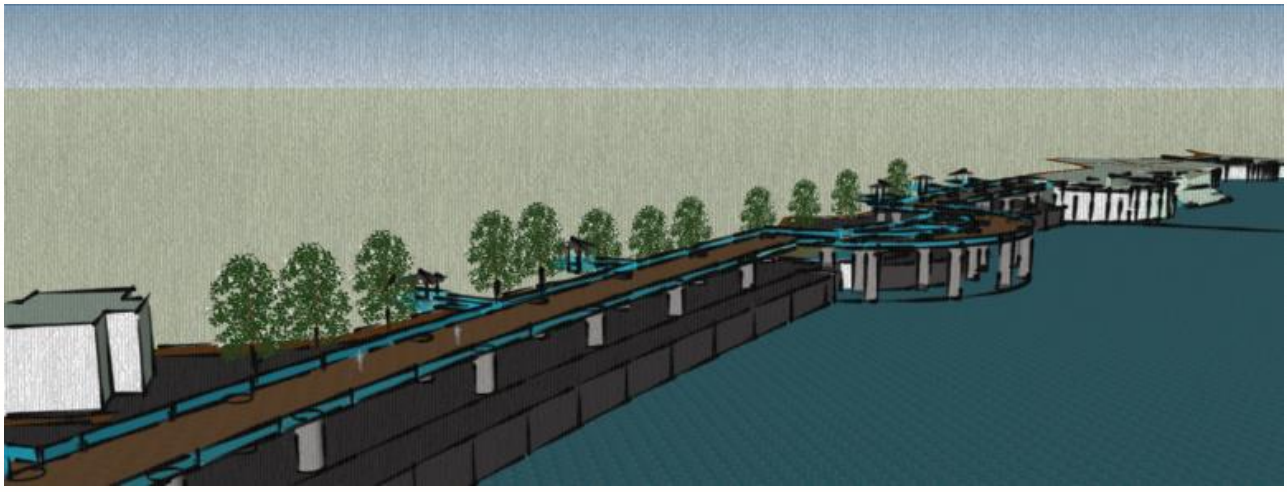
To reconnect heritage assets with the river creating urban nodes with proper visual and physical axis.

To rearrange the haphazard activities in the nodes specially to restrict random activities in the nodes.

To develop the nodes with adequate space and make it comfortable for all group of users.

Edges

To reconnect the river edge with the residential cum commercial area through public plaza and squares.



Orientation & climate

To introduce more landscape and shaded area and river promenade.

Magnets & generators

To establish the connection between the magnets and generators.

To enhance the connectivity of the magnets with nodes.

Building use

To incorporate more public activities at the riverfront zone, will act as a catalyst to regenerate the connectivity.

Open spaces

To rearrange open spaces with well connectivity and provide street furniture.

Views & vistas

To enhance the existing views and vistas and to create new views and vistas wherever possible.

Urban form

To rearrange the existing urban form and introduce new activities whether applicable.

Architectural features

To create new build form maintain the front facade to retain the character of this place and create an image of this area

4.0 Design implementation

5.0 Conclusion

5.0 Conclusion

1 . Developing strategies to generate a better quality of life for people who live and work close to the tourist area.
2. In the same time , this would be promoting valued experiences which will support local economics.
3.Developing strategical framework to improve the quality of tourist spots supported by the connecting routes , major nodes , landmarks , shops , food stalls , vehicular parking and basic amenities.
4. Finding out the unorganized open spaces around the tourist spots.

6.0 Reference

1. http://www.wikialps.eu
2. https://urbandesign.org.au/what-is-urban-design/
3. https://charlescorreafoundation.org/
4. https://indiawris.gov.in/
5. https://bkpmuty.in/
6. https://wri-india.org/
7. https://sabarmatiriverfront.com/
8. https://en.wikipedia.org/wiki/Sabarmati_Riverfront
9. https://sydneywaterfront.com.au/
10. http://wbpwd.gov.in/
11. https://en.wikipedia.org/wiki/Barrackpore
12. https://planningtank.com/urbanisation/riverfront

Thank you