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Proposal for Godavari Riverfront Development in Nasik Region

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Abstract: Water gives birth to human life and civilization; for that reason, a unique attraction emanate from the riverfront. Many famous cities all over the world are generally located at the junctions of rivers and seas. These last two casing tone allow for suitable transport and multi-cultural integration, which imparts its unique charm to these cities. A riverfront is a region along a river, often in larger cities that border the river. The riverfront is generally lined with parks, tress & minor settlement arranged in a systematic manner. India is blessed with lot plentiful natural streams and rivers. All these rivers are unique in their own way and have historical as well as cultural background. Therefore, the river can be an attractive place for recreation and social interaction. Though Nasik is well known for its unique culture and pilgrimage places, it lacks proper infrastructure that can attract tourists in large numbers. The paper presents proposal for Godavari Riverfront development in order to develop the condition along the river bank and its surrounding areas. The aim of paper is provide better development of the region for attract the tourism The study focuses on two locations along the Godavari river bank which were identified based on availability of land. The data required is procured from Smart cities cell Nasik Municipal Corporation, Department of Irrigation.

Keywords: Godavari Riverfront, Ecological System, Tourism Place.

I. INTRODUCTION

Since the beginning of civilization, rivers have played a major and important role in shaping and influencing the development of the nation and the culture of its people. Rapid development and urbanization all over the country including riverfront areas are causing the deterioration of the natural environment such as by flooding, contamination, and drought. These troubles disturb economic growth and the activities of life and can consequence in the loss of property and lives. Many famous cities all over the world are generally located at the junctions of rivers and seas. These last two features allow for opportune transportation and multi-cultural integration, which imparts its unique charm to these cities. Waterfront is a place where urban development and water interact, and defined as a unique and inimitable resource where land, water, air, sun and destructive plants border line with each other. It is also defined as a place of integrating land with water and also having a characteristic of natural repulsion to people. Any expansion 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 here scenario, the water's edge development is a global leaning Nowadays, thousand of scheme for water expansion are being carried out in all over the humankind. The principal function of waterfront can be classified as below:

- 1) *Natural Waterfront:* Encompasses beaches, wetlands, wildlife habitats, sensitive ecosystems and water itself
- 2) *Public Waterfront:* Parks, esplanades, piers, street ends, vistas and waterways that offer public open space and waterfront view.
- 3) *Working Waterfront:* Where water dependent, maritime and industrial uses cluster or where various transportation and municipal facilities are dispersed.
- 4) *Redeveloping waterfronts:* Where land uses have recently changed or where vacant and underutilized properties suggest potential for beneficial change.

A. Waterfront Development

Over recent few decades, waterfront development and redevelopment has evolved and taken on its own identity in areas such as historic preservation and recreation. In particular, the patterns of development are changing by connecting land, water, and air and landscape aesthetics to land development planning. Development of areas near water is part of urban regeneration. The relations between rivers or other water sources and cities often show a complex interaction of various elements, including the development of tourism around the river, hereinafter referred to as riverfront tourism. This language comes from the term waterfront, which is more common and widely used. A waterfront is an area bordered by water in various forms, this can be a river, lake, ocean, bay, tributary, or canal, even man-made water .The term riverfront is used in this study to clarify that the study is carried out in the waterfront area of a river.



B. Need for Riverfront Development

Development of River front has emerged as lively Urban Core of cities - their socio-cultural, and recreation centers. Today everyone recognizes the value of waterfronts for recreation and ecological reasons. Projects for improvement of river water quality by preventing disposal of sewage directly into the river by collection of sewage and its treatment before disposal into water body are being prepared unconnectedly. Similarly project for collection of solid waste, segregation, transportation and disposal in Sanitary Land Fill/compost Plant is also under preparation which will prevent solid waste disposal in river directly. All these efforts together are likely to improve the quality of River water substantially

The intensive uses took their toll on the river. Untreated sewage flowed into the river through storm water outfalls and dumping of industrial waste posed a major health and environmental hazard. 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 of the city. Original condition of the river near Vadaj Dry riverbed with slums along the riverbanks and lacklustre development along the riverfront

C. Advantages & Benefits of Waterfront Development

The benefits and advantages of developing riverfront are manifold ranging from economic benefits, environmental benefits to social/ community benefits. These benefits are detailed below.

- 1) With the development of riverfront there would be creation of jobs in developing the front, jobs as it gives way to starting up of a host of commercial activities in that region and also indirect job creation associated with the set of activities.
- 2) Source of revenue for government – government would be able to earn revenue in terms of taxes from the commercial activities in the region. The commercial activities include shops, restaurants, sport activities, transportation, boating etc which can be leased out or giving to private players to operate.
- 3) Development of tourism in the region – with the development of riverfront the tourism in the region can be increased by offering a variety of attractions like water sports, entertainment arenas, parks, shopping areas, etc.
- 4) Economic spin-off's – rise in the value of properties in and around the region, acting as a catalyst for redevelopment and renewal of nearby places.
- 5) Habitat protection and restoration
- 6) Conservation of water in the river

II. LITERATURE REVIEW

Dipali Babubhai Paneria, Vishwa D. Mehta, Bhasker Vijaykumar Bhatt - The water has a probable to make cities as a cultural and heritage hub. Every tourist that came to the city will pass the river, so by developing the river in a beautiful way that attracts the more people to visit the place and that increase the revenue. In this paper, the case study Sabarmati riverfront at Ahmadabad is discussed. The main concern is to decrease the river pollution, protection from flood and increase the tourism. The development of the river bank has the area of 202 ha that cover the area from cantonment area to vasna barrage.

Ritu Singh Rajput, Dr. Sonali Pandey, Dr. Seema Bhaduria - In this study, Dravyavati River samples were collected from three sites in various seasons (summer, rainy and winter). The objective of this study is to determine the water quality index for the Dravyavati River water of Jaipur City and its industrial area. The river water samples have been analyzed for some physicochemical parameters like pH, electrical conductivity (EC), total suspended and total dissolved solids (TSS and TDS), total solids (TS), total alkalinity (TA), total hardness (TH), chloride (Cl-) and fluoride (F-). In order to statistically determine the present water quality status and index, 19 parameters were evaluated, including pH, color, total dissolved solids. Electrical conductivity, total alkalinity and total hardness. The obtained results are compared with World Health Organization and Indian standard drinking water specification IS: 10500-2012. In general the current investigation found that most parameters were at a level indicating pollution. Key Words: Water pollution, Physicochemical parameters, Industrial area, WHO.

Azlina Binti Md. Yassin, Prof. Sandy Bond, Assc. Prof. John Mc Donag - Author has presented results of a study on the effectiveness of riverfront development guidelines in Malaysia. Water is one of the most important of all the natural resources necessary to ensure human health and civilization. Malaysia is fortunate to be able to call itself a water rich nation and possesses a number of rivers with great potential for recreation. The importance of rivers as the physical centre of a city and the site for trading from very early times remains in the history of all Malaysians. Inhabitant's growth, economic growth, urbanization and increased technology have transformed many Malaysian river systems from water industries into non water industries. Due to these changes, the function of riverfront areas has also changed and the current pattern of riverfront development in Malaysia now focuses more on mixed-use development and recreation, while incorporating Malaysian cultural and historical values.

Abdulbast Abushgra, Christian Bach - Urban planning considers one of science that gathers set of the fields in one point. Management, Art, geography, ideology, psychology, Topography and more are collected in the same side because dealing with the environment that contains human being, animals, land, weather and anything can be seen in this world is very complicated, and it requires many attempts and huge data to get a typical solution. This paper will discuss the relationship between the urban planning and others such as management, sociality, economy and environment, and planners should know all these knowledge to be able to deal with different aspects of this environment. At the end the paper is focusing on how to improve the system in the world in urban planning, and it approves the connection between some fields and the opportunity of respecting to deal with several majors in the same time.

III. URBAN RIVER MANAGEMENT PLAN

The untreated and treated sewage from almost all such towns flow either directly or indirectly into these rivers. Further in towns situated beside rivers, the riverbank is a part of the urban landscape, which is often used for dumping solid waste, open defecation and other undesirable activities. Prevention and management of the above adverse impacts on river and riverbanks in class I towns in the GRB constitute an important component of the River Basin Environment Management Plan. Riverbank management and wastewater management in the town. Once the URMP for a particular town is in place, investments can be made in various projects in a systematic and targeted manner for implementation of the URMP.

A. Salient Features of Proposed URMPs

- 1) Removal of encroachments and land acquisition for riverbank beautification and related development works.
- 2) Restriction/banning of certain activities on the riverbank or in the river, viz., open defecation, disposal of solid waste, washing of clothes, wallowing of cattle, throwing of floral offerings, disposal of corpses, routine bathing (as opposed to ritual bathing), etc.

B. Preparation of URMP

- 1) URMPs should be prepared immediately for all Class I towns in the River Basin, i.e., towns with population greater than 100,000 at present (2011 census).
- 2) Preparation of URMPs will be the responsibility of the individual towns. The state governments and NGRBA shall extend all possible help (including financial and technical assistance wherever necessary) to the ULBs for the preparation of URMPs.

C. Understanding Floodplain Resources

Floodplain natural capital is introduced with an explanation of floodplains, watersheds, ecosystems and natural communities. A typical river corridor has several features brought by geological and hydrological processes effective on landscapes (Figure1). The river channel wanders from side to side the landscape, carving through the terrain and depositing sediment on places where it goes. Sediment deposits and depressions on water banks might form wetlands, which are always or periodically flooded with water. Floodplains are the areas bordering rivers and streams. These parts in river valleys are regularly defined as areas where the likelihood of flooding is high in a given year.

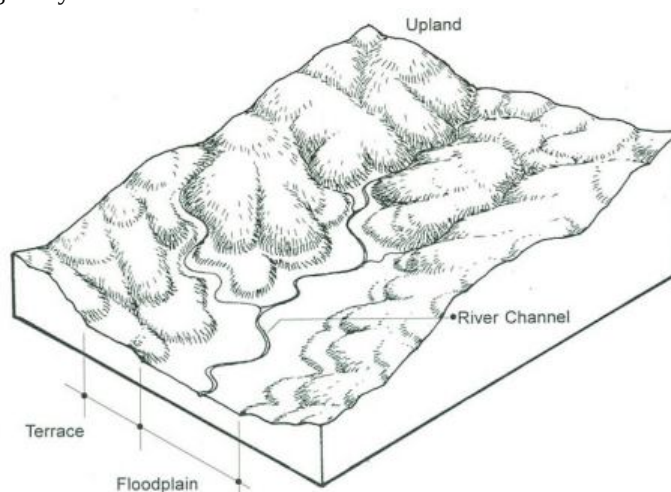


Figure 1. Major physiographic elements of a typical floodplain



D. Design Guidelines for Riverfront Development Site

- 1) **Building Placement and Orientation:** Buildings should be sited to have active spaces for area users, provide pedestrian connections, help animate the street and waterfront, and define the street edge. The placement of the building on a site should, therefore be considered within the context of its setting, as well as how the structure will support the broader design goals for the area
- 2) **Minimum Setbacks:** Building setbacks should reinforce the pedestrian character envisioned for the area and help to define the street edge. In order to enhance the pedestrian zone, the buildings should align at the street edge, with storefronts and other visually interesting features provided at ground level. Buildings along the riverfront can be varied, but will be dictated by Zoning District.
- 3) **Service Areas:** Service areas should be visually subordinate and integrated into the design of the site and building. Orient service entrances, waste disposal areas and other similar uses toward service lanes and away from the waterfront and street, when feasible.
- 4) **Pedestrian Connectivity:** Building setbacks should reinforce the pedestrian character envisioned for the area and help to define the street edge. In order to enhance the pedestrian zone, the buildings should align at the street edge, with storefronts and other visually interesting features provided at ground level. Buildings along the riverfront can be varied, but will be dictated by Zoning District
- 5) **Building Materials:** Wood frame and concrete were the primary construction methods used. These should be continued in new construction. More modern materials may also be considered when they are compatible with those used traditionally.
 - a) New materials should convey a sense of scale.
 - b) Building materials should have similar characteristics as materials used traditionally.
- 6) **Pedestrian Interest:** The waterfront area should continue to develop as a pedestrian-oriented environment. Buildings should convey a pedestrian friendly environment.
- 7) **Public Streetscape, River walk, Public Art & Plazas:** The pedestrian environment should be designed to stimulate and enhance the experience along the street and the river-walk. It should portray a unified system by creating a sense of visual continuity while also celebrating a series of experiences along the way.
- 8) **Building and Site Lighting:** The primary function of lighting is for safety and. The primary goal for lighting in Juneau is that it should not be detrimental to the adjacent surroundings or the overall environment, but should still maintain a safe environment.

IV.RESULT AND DISCUSSION

As the 100 interview was the primary data gathering instrument in the qualitative phase, a semi structured personal interview with the named respondents suggested by the company representatives was chosen.

The purpose of a semi-structured approach was to understand the respondent's point of view rather than make generalizations. This would provide sufficient suppleness and the best in sequence about the subject under discussion based on their respective interpretations.

The interview questions were carefully designed to assist in conduct the interviews and to provide adequate coverage for the purpose of the research. Major questions were developed in the form of a general statement which was then followed by a sequence of sub-questions that probed further.

A. Response Rate

A total of 25 face-to-face interviews were conducted within the 10 weeks from. The interviewees were selected from the case study areas namely: Godavari Riverfront. All interviewees represent in the sample are parties that have been actively involved in property development projects and, directly caught up in the waterfront development projects in the selected case study areas. Moreover, case study areas in this research have involved waterfront development projects planned by the State of government, therefore, a minimum number of private sectors (28%) concerned in this investigate is considerable. Table1 summarizes the in sequence from the interviewees who participated in the interviews.

Table 4.1: Response Rate of Godavari Riverfront

Sr No	Questionery	Mean	SD	Variances
1	No. of visits to riverfront/day (hh)	2	1.01	1.03
2	No. of visits to riverfront/week (hh)	2	1.32	1.75
3	Visits in the morning per day (hh)	2	1.31	1.71
4	Purpose of visit to the riverfront	3	1.46	2.12
5	Describe Godavari river in one word	2	1.42	2.02
6	According to you what are the important things around the river bank?	3	1.41	1.97
7	According to you for who reason people refuse to visit near riverfront?	2	1.38	1.90
8	What promotes you to go to the riverfront?	3	1.38	1.92
9	Are you a resident near the river or riverfront? If yes, then how close you are to the river?	3	1.32	1.75
10	What is most important in the Godavari river?	3	1.40	1.95
11	What is the main reason for flooding in nearby areas according to you?	2	1.29	1.67
12	How often would you like to go in the garden?	2	1.33	1.77
13	How far do you have to go to the garden?	3	1.45	2.10
14	You be willing to give 5-10 rupees for maintenance for riverfront development when you visit there?	3	1.38	1.89
15	Is there any parking space?	3	1.28	1.65
16	Do you attend any social events near riverfront?	2	1.36	1.86
17	Is there any existing commercial market?	3	1.27	1.61
18	Is there is need for riverfront development?	3	1.47	2.16
19	Is there is need for walkway and cycle track along river side in your area?	3	1.36	1.86
20	If you want to change the area in the following areas or if you want to change the system, what do you think should the government work first in three fields?	2.5	1.24	1.55
21	Do you think maintaining a natural environment is important for urban development?	2	1.31	1.72
22	If the government provides you accommodation in the other part of the city, ready to leave the colony?	3	1.34	1.80



Figure 2. No. Of visits to riverfront per day

In figure 2 shows that no. of visitors to visit the riverfront per day in Nasik. Interviews were sufficiently well answered to allow a response rate of 94% to be obtained. A total of 25 face-to-face interviews were conducted within the 10 weeks

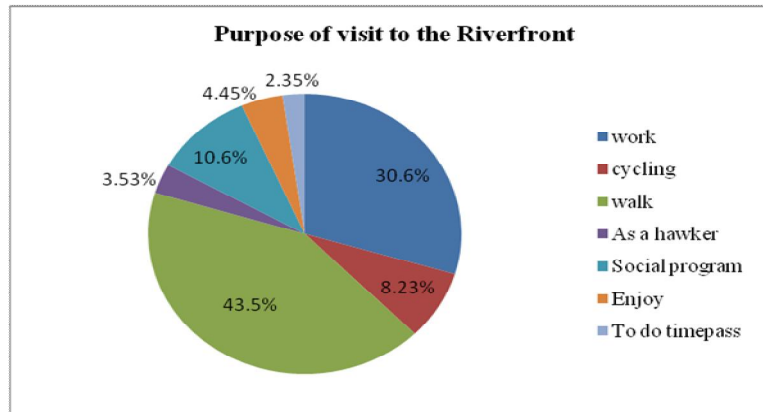


Figure 3. Purpose of visit to the riverfront

In figure 3 shows that purpose of visitors visit to the riverfront in Nasik. Interviews were sufficiently well answered to allow a response rate of 85% to be obtained. A total of 25 face-to-face interviews were conducted within the 10 weeks. In purpose of visit to the riverfront are more response percentage is 43.5% for walk and less response percentage is 2.35% for to do the time pass questionnaire.

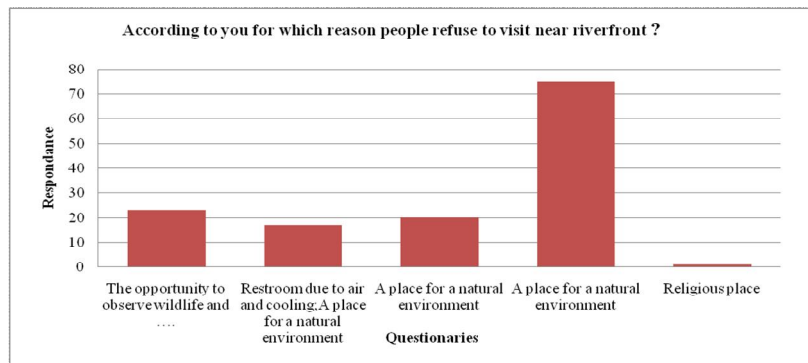


Figure 4. According to you what are the important things around the river bank?

In figure 4 shows that Important things around the river bank in Nasik. Interviews were sufficiently well answered to allow a response rate of 93% to be obtained. A total of 25 face-to-face interviews were conducted within the 10 weeks. In Important things around the river bank in riverfront are more response percentage is 80.65% for A place for natural environment and less response percentage is 1% for religious place questionnaire.

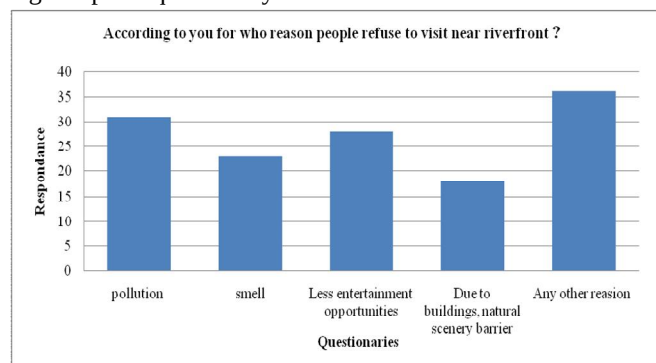


Figure 5. According to you for who reason people refuse to visit near riverfront?

In figure 5 shows that according to you for who reason people refuse to visit near riverfront in Nasik. Interviews were sufficiently well answered to allow a response rate of 94% to be obtained. A total of 25 face-to-face interviews were conducted within the 10 weeks. In according to you for who reason people refuse to visit near riverfront are more response percentage is 38.69% for any other reason and less response percentage is 19.14% for due to buildings, natural scenery barrier questionnaire.

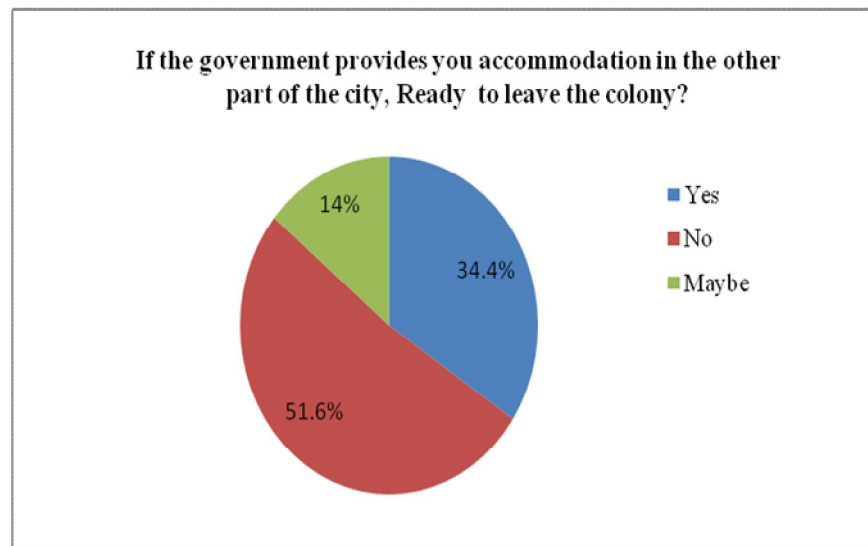


Figure 6. If the government provides you accommodation in the other part of the city, Ready to leave the colony?

In figure 6 shown that if government provides you accommodation in the part of the city, ready to leave the colony. Interviews were sufficiently well answered to allow a response rate of 93% to be obtained. A total of 25 face-to-face interviews were conducted within the 10 weeks. In this questionnaire are more response percentage is 51.6% for No and less response percentage is 14%

V. CONCLUSIONS

The proposal and recommendation for Godavari Riverfront development are providing in three parts. The first part is consisting of community spaces along the river. The subsequent part consists of strategy of road network along the waterway and the third parts consist of recreational amenities.

A. Proposal for the Public Places

- 1) **Environmental Issues:** Socio Interactive areas demands huge amount of construction and willing to help greater number of people on the location led to ecological issue Interaction with the river has become imperative for planning of sustainable development. This can be tackled by selecting the heights, materials used for construction, native plants for landscaping, reusing disturbed areas and building within the framework.
- 2) **Community Convenience:** People are drawn to water. Human communication with water is foremost feature that calls for riverfront expansion. People encompass a strong longing to feel it, reach it; and thus it becomes very important that accessibility to water should be given. To achieve these objective walkways, cycle track, parking space, trails and benches are provided as they give people an opportunity to be either in the river or near it. An effective or productive riverfront having active use can be achieved if multiple entry points to the river are available. Walkways are important as they define the movement pattern on the site. They are also physical pedestrian linkages between different parts of the site.
- 3) **Visual Connectivity:** The building layouts and structures should be designed in a way so as to not block views of the river. The attendance and view of the river beginning various locations on the site not only help in achieve a winning project but also help in developing the surroundings
- 4) **Riverfront Use:** They are encouraged to be inhabited spaces, providing amenities to both users and business owners.
 - a) Orient ground-floor uses to the connection and seek to engage the public.
 - b) Locate public entrances to ground floor uses along the at right angles connection.
 - c) Provide curb-cuts at these crossings to accommodate people of all levels of mobility, but install detachable bollards in the direction of control vehicular access.
 - d) Design the prototype of street illumination and trees along the thoroughfare that is intersect by a perpendicular association to relate to the connection.

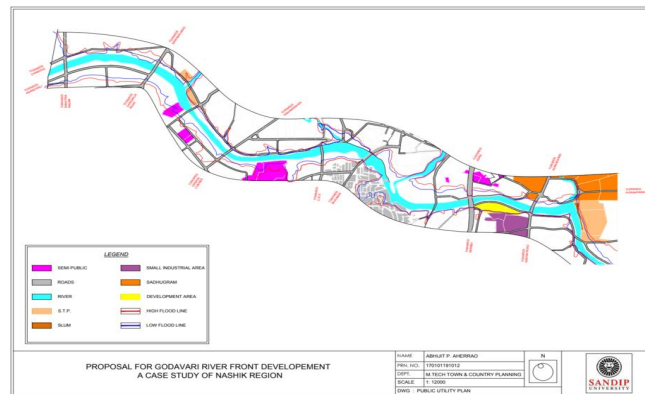


Figure 7. Proposal for public spaces

B. Proposal for Road Network

Streets along a riverfront have the potential to be an exciting and different way to experience riverfront parks, and to create new opportunities for development adjacent to them. Riverfront streets should be professed as an additional room of the riverfront park.

- 1) Encourage residential uses along riverfront streets. Locate primary addresses and entrances to buildings on the riverfront street.
- 2) Limit riverfront street width to no more than two lanes of traffic and one lane of on-street parking. The minimum width for riverfront streets should be 34 feet, including two lanes of traffic and one lane of on-street parking on the land side of the street. The preferred width is 30 feet.
- 3) For new streets along the riverfront, make available an appropriate slow down that allows a natural slope and enough space for different desired activities along the river. Provide a 7- to 8-foot sidewalk and 4- to 5-foot tree range. Where space is limited, the trail may substitute for the riverside sidewalk.
- 4) Orient riverfront streets to pedestrians and light traffic. Truck and delivery traffic are not suitable on riverfront streets. Post highest speeds of 30 miles per hour on riverfront streets, with traffic calming measures incorporated in pedestrian districts at intervals of no more than 400 to 600 feet.
- 5) Provide perambulator crossings not less than 600 feet apart. Provide a change of street paving that incorporate variation in touch and color at hiker crossings.
- 6) Streets should be designed with all transportation modes fully accommodated instead of being designed first in addition to foremost for automobiles.

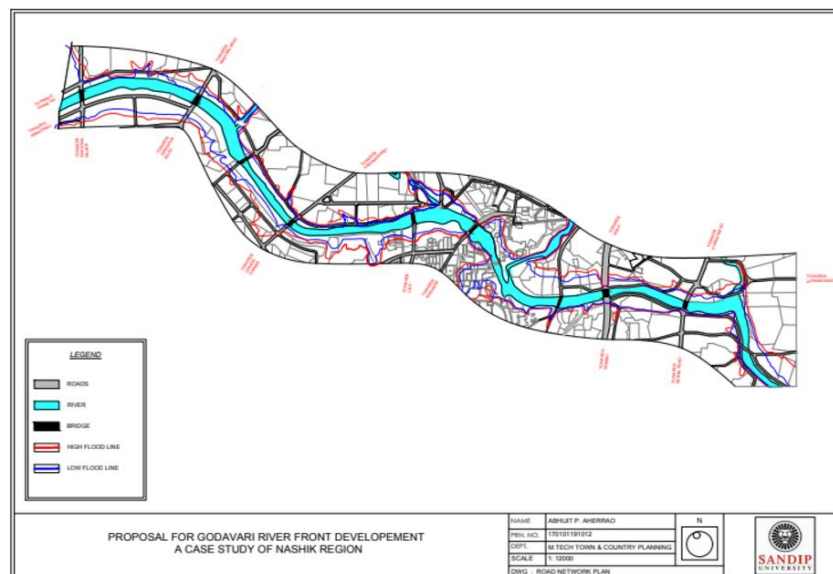


Figure 8. Proposal for road network

C. Leisure, Recreational activity

- 1) **Parks and open spaces:** To enhance the city environment and make it habitable, it is essential to build some parks. This emerald park should be kept open for public visit and spare time. There will be a park beside the river side areas which determination is the recreational place for people.
- 2) **Shops:** There should be some small shops. For example-clamps necklace, shops of fuchka, Chotpoti, commercial shops, various types of flowers shops should be available the length of the river side. But in attendance should not be some large shops or departmental shops in the river side.
- 3) **Parking:** Parking is the safety place for the keeping cars. Parking is the act of stopping and leave-taking it unoccupied. Parking on one or both sides of a road is often permitted, though sometimes with restrictions. Parking facilities are constructed in grouping with some buildings, to facilitate the coming and going of the buildings' users. Two parking lots are provided. One is located only little distance from the proposed bus incurable and another is beside the Nashik residential area which will serve the vehicles of the commercial area and the people who determination visit this area. Both parking will serve minimum 80-100 vehicles.

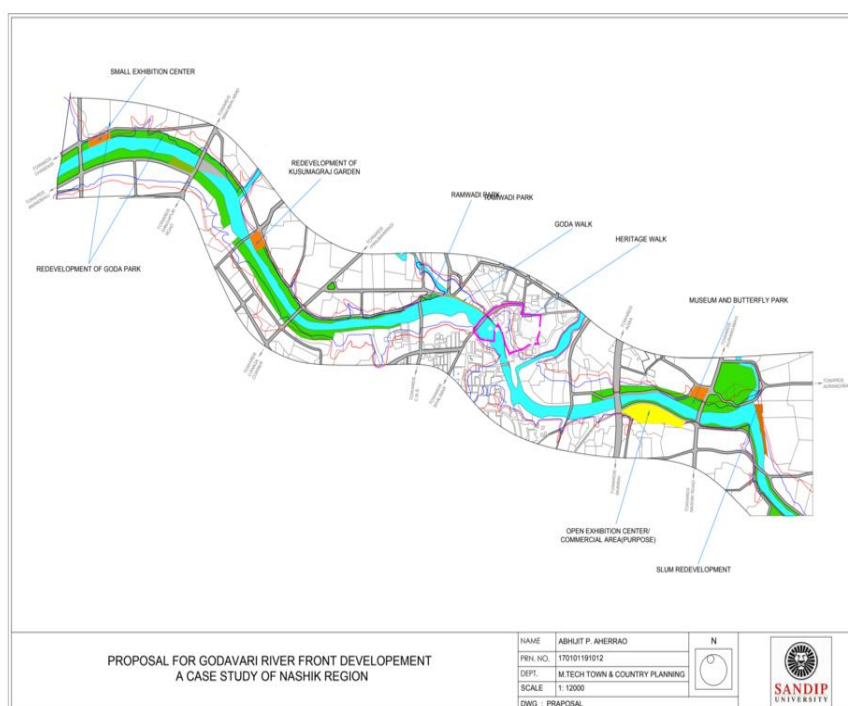


Figure 9. Layout for Godavari riverfront

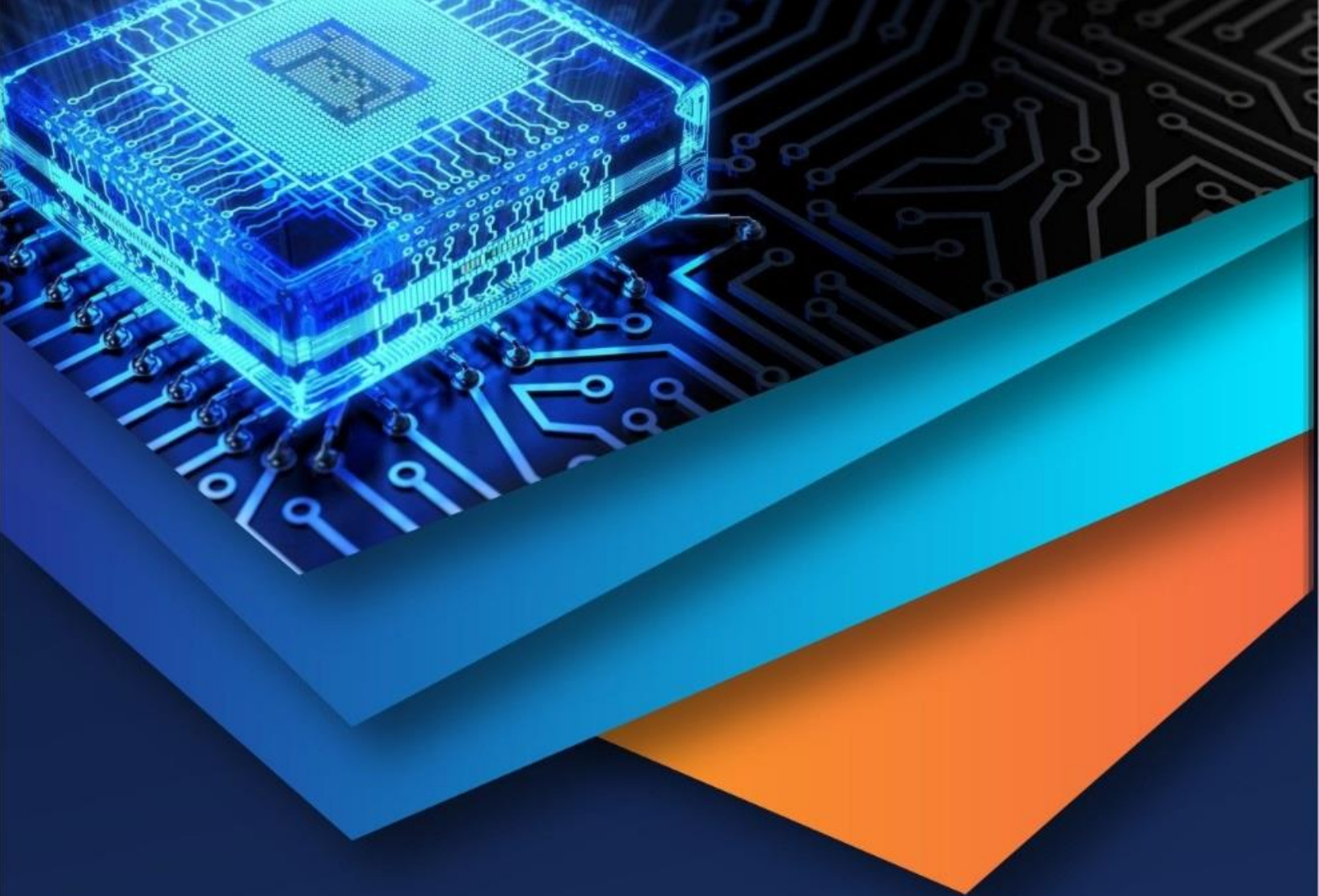
After the inspection of the current Godavari Riverfront, it is observed that there is the requirement of embellishment of the river and river banks. Some open space is necessary for the people to take breaths fresh and feel peace. Some illumination work is mandatory because even despite the fact that all that glitters is not gold, but all that glitters is attractive. This development will also create the permanent employ for poor people which will be a win-win de for them. And the most important objective of this project that is between the citizens to the waterway will be done.

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