

# Assessment of Social Infrastructure and Transportation Networks for Sustainable Recreational and Landscape Planning: A Case Study of Alibaug City

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**Abstract** - Coastal towns like Alibaug City are witnessing increasing recreational demand due to tourism growth and urban expansion, making sustainable social infrastructure and transportation planning essential for balanced landscape development. This study assesses the existing social infrastructure and transportation networks of Alibaug City in relation to recreational and landscape planning. Key social infrastructure components such as public open spaces, recreational facilities, educational and health amenities, and community spaces are evaluated according to URDPFI Guidelines and alongside road networks, public transport, pedestrian infrastructure, and connectivity as well. GIS-based spatial analysis, field surveys, and secondary planning data are used to examine accessibility, service coverage, and integration between transport systems and recreational landscapes. The assessment identifies spatial inequities, limited walkability, traffic congestion in core areas, and weak linkage between transport corridors and recreational spaces. Based on the findings, the study proposes integrated planning strategies emphasizing improved accessibility, pedestrian-friendly environments, green mobility networks, and equitable distribution of recreational infrastructure. The research provides a sustainable planning framework for enhancing recreational and landscape development in Alibaug City and similar coastal urban contexts.

**Keywords:** *Alibaug City , recreational planning , Social infrastructure, transportation networks, URDPFI, landscape planning.*

## 1. INTRODUCTION

Rapid urban growth and increasing tourism activity in coastal cities have intensified the demand for accessible recreational spaces and well-planned urban landscapes. Social infrastructure—such as public open spaces, recreational facilities, educational, health, and cultural amenities—plays a vital role in enhancing urban livability and community well-being. At the same time, efficient transportation networks are essential for ensuring equitable access to these spaces and supporting sustainable urban development. Alibaug City, a coastal town in Maharashtra, has emerged as a major recreational and tourism destination due to its proximity to Mumbai and its natural landscape assets. However, seasonal population influx, growing vehicular traffic, and unplanned urban expansion have placed pressure on existing social infrastructure and transportation systems. These challenges have implications for the accessibility, distribution, and quality of recreational and landscape spaces. This study aims to assess the existing social infrastructure and transportation networks of Alibaug City and examine their role in sustainable recreational and landscape planning. By identifying gaps in accessibility and integration, the research proposes planning strategies to enhance urban mobility, recreational infrastructure, and landscape connectivity in a sustainable and inclusive manner.

## 2. OBJECTIVES

- 2.1 To explain the existing situation of Social infrastructure in Alibaug City and find its gap analysis according to URDPFI Guidelines.

- 2.2 To explain the existing situation of different Transportation modes in Alibaug city and understand its gaps.
- 2.3 Framing proposals and recommendation for Alibaug City based on the gaps.

### 3. LITERATURE REVIEW-

#### 3.1. Built Environment and Active Transport: A Study of Walking and Cycling in Mumbai, Ali Shkera, Vaishali Patankar.

Objective: The research aimed to examine how urban form and transportation connectivity influence walking and cycling behavior in metropolitan contexts.

Methodology: The study used built environment indicators, network connectivity analysis, and travel behavior surveys to assess non-motorized transport usage.

#### 3.2. Assessment of Urban Park Accessibility and Utility in Midnapore, West Bengal, Anirban Baitalik, Arnab Kumar Chakraborty

Objective: The study aimed to evaluate the accessibility, utility, and structural diversity of urban recreational parks in an Indian medium-sized city.

Methodology: GIS-based spatial analysis, travel-time assessment, and field surveys were used to measure accessibility and usage patterns of urban parks.

#### 3.3. Handling social considerations and the needs of different groups in public transport planning: a review of definitions, methods, and knowledge gaps, Robert Hrelja, Lena Levin.

Objective : The study was to examine how social considerations, particularly equity and accessibility for diverse and disadvantaged user groups, are incorporated into public transport planning

Methodology: The review compared different conceptualizations of accessibility, evaluated methodological approaches used to measure social inclusion in transport planning, and synthesized best practices.

### 4. Study Area:

**Location:** Alibaug, Raigad District, Maharashtra

**Geographical Coordinates:** 18°39'N to 72°52'E

**Area:** Approximately 20.4 sq. km

Alibaug is located about 95 km south of Mumbai, accessible via the Vadkhal–Alibaug Highway (NH 166A) and Mandwa ferry terminal. The city has a mix of coastal landscapes, urban neighborhoods, and tourism-driven spaces, making it ideal for studying recreational and landscape planning.

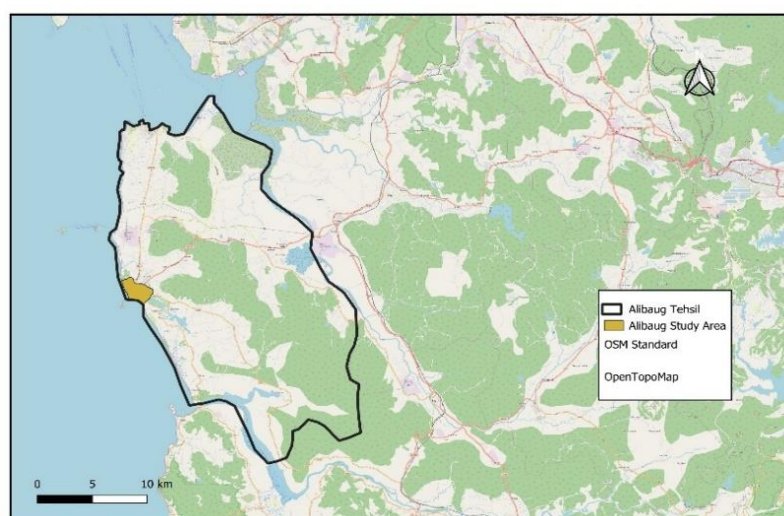


Figure No. 1 Study Area Map

**5. Methodology:** The review compared different conceptualizations of accessibility, evaluated methodological approaches used to measure social inclusion in transport planning, and synthesized best practices

- **Primary Survey:** Conducted through field visits using GPS-enabled mobile devices to mark recreational sites (parks, playgrounds, beaches, open spaces).
- **Photography:** GPS-based photographs were taken to capture current conditions, accessibility, and visual quality of the spaces
- **Social Infrastructure Assessment** -URDPFI Guidelines were compared with the existing condition of social infrastructure availability in Alibaug and Gap Analysis is done.

## 6. Data Analysis-

### 6.1 Existing Social Infrastructure of Alibaug –

#### 6.1.1 Educational Facilities-

**Education in Alibaug-**As of the 2011 Census, Alibag had a population of 20,743 of which 10,646 are males while 10,097 are females and 17,431 were educated with a literacy rate of 84 %.

**Table No 1 :Schools in Alibaug-**

| Sr. No | School                                     | Education Level               |
|--------|--------------------------------------------|-------------------------------|
| 1      | Podar Jumbo Kids Preschool                 | Pre-Primary                   |
| 2      | J.R.H Girls School                         | Primary to Secondary          |
| 3      | J.R.H Kanya School                         | Primary to Secondary          |
| 4      | K.E.S English Medium High School           | Higher Secondary              |
| 5      | Suvidya's Blooming Buds                    | Pre-Primary                   |
| 6      | Mount Carmel Pre-school                    | Pre-Primary                   |
| 7      | Kinder Dreams Pre-School                   | Pre-Primary                   |
| 8.     | Rajmata Jijau Vidyamandir School           | Primary to Secondary          |
| 9      | D.K.E Trust Chintamanrao Kelkar School     | Primary to Higher Secondary   |
| 10     | St. Marys Convent School                   | Primary to Higher Secondary   |
| 11     | K.E.S General Arunkumar Vaidya High School | Secondary to Higher Secondary |

**Table No. 2 : Colleges in Alibaug-**

| Sr. No | Colleges                                   |
|--------|--------------------------------------------|
| 1      | K.E.S Keluskar Homeopathic Medical College |
| 2      | Indira Bai G. Kulkarni Arts College        |
| 3      | J.S.M College                              |
| 4.     | J.S.M Advocate Data Patil Law College      |
| 5.     | C.H.K Homeopathic Medical College          |

**Table No. 3 :Technical Institutions in Alibaug**

| Sr. No | Technical Institutions        |
|--------|-------------------------------|
| 1      | Disha Alibaug Branch          |
| 2      | Industrial Training Institute |

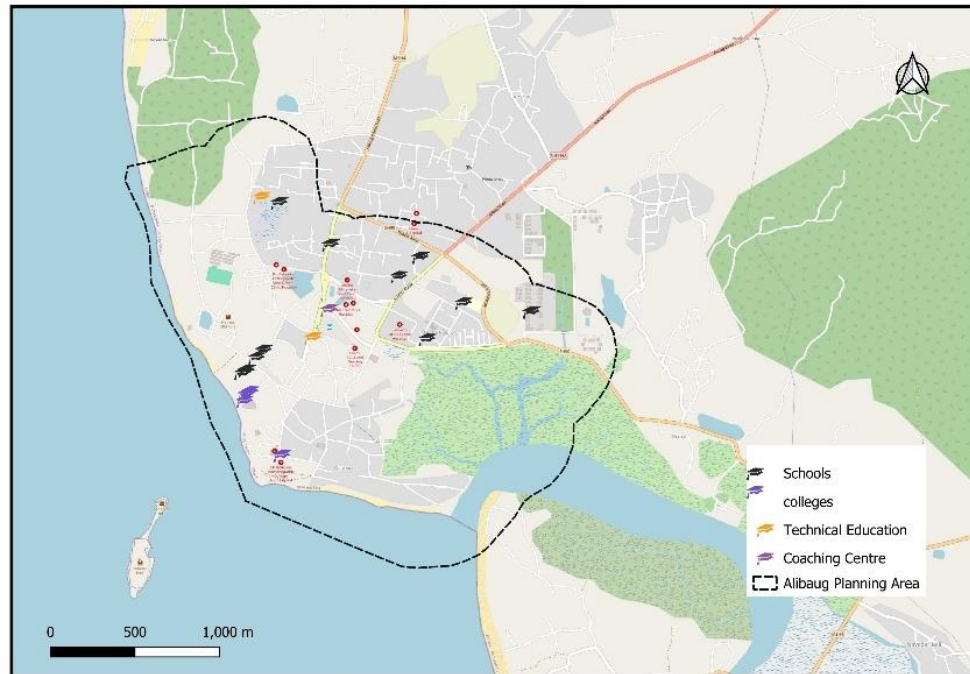


**Figure No. 2 Education Facilities Map**

### 6.1.2 Healthcare Facilities-

Few of the healthcare facilities in Alibaug are listed below

**Table No. 4 : Healthcare facilities in Alibaug**

| Sr. No | Name                                    | Category                             |
|--------|-----------------------------------------|--------------------------------------|
| 1      | Dr. Saroj Tamboli Memorial Hospital     | General Hospital                     |
| 2      | Anjali Hospital                         | General Hospital                     |
| 3      | Drishti Eye Clinic                      | Speciality Hospital                  |
| 4      | Vision Eye Clinic                       | Speciality Hospital                  |
| 5      | Old Suyash Hospital                     | Multispeciality Hospital             |
| 6      | Shree Polyclinic Dr. Karan Kumar        | Polyclinic                           |
| 7      | Dr. Phutane Hospital and Maternity Home | Nursing Home                         |
| 8      | Anandi Maternity & Children Hospital    | Child Welfare & Maternity Centre     |
| 9      | Kilbil Children Hospital                | Child Welfare & Maternity Centre     |
| 10     | Nagdongari Chendhare Alibaug            | Dispensary                           |
| 11     | Surbhi Pathology                        | Diagnostic Centre                    |
| 12     | Metropolis Labs Blood Test              | Diagnostic Centre                    |
| 13     | Tamboli Physio Clinic                   | Rehabilitation Centre                |
| 14     | Samruddhi Aquarium                      | Dispensary for Pets, Animals & Birds |
| 15     | Shivani Petshop                         | Dispensary for Pets, Animals & Birds |

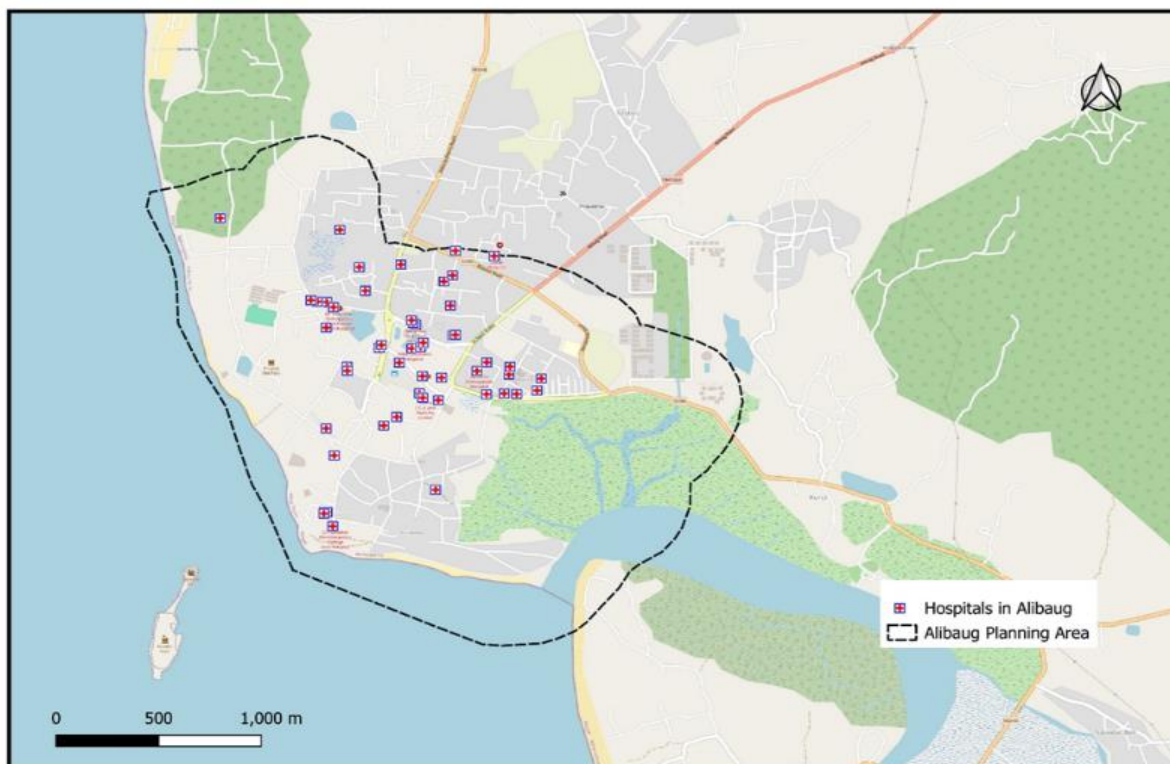


**Figure No. 3 Healthcare Facilities in Alibaug**

### 6.1.3 Religious Places-

As of the 2011 India Census ,Alibaug had 82.55 % Hindhuism , 11.06% Islam , 3.19 % Buddhism , 2.42 % Jainism ,0.44 % Christianity and 0.34 % Others. The Percentage composition for each religious place is 75.86 % for temples , 13.79 % for Masjid , 3.45 % for church , 5.17 % for Buddha Vihar and 1.73 % for Synagogue.As per URDPFI Guidelines , the provision standard for every 500 populations there should be 1 religious centre. Few of the religious places are listed below

**Table No. 5 Religious Facilities in Alibaug**

| Sr. No | A- Temples            | B -Masjid             | C -Buddha Vihar                       |
|--------|-----------------------|-----------------------|---------------------------------------|
| 1      | Vithal Mandir         | Chirag Masjid         | Vishvashanti Buddha Vihar             |
| 2      | Tejas Mhatre Mandir   | Egyptian Mandir       | Nalanda Buddha Vihar                  |
| 3.     | Swami Samarth Math    | Tabib Family God      | Siddhartha Nagar Buddha Vihar Alibaug |
| 4.     | Shri Ramji Temple     | Home Fufa             | <b>D- Synagogue</b>                   |
| 5.     | Datta Mandir          | Bilal Masjid          | Magen Aboth Synagogue                 |
| 6.     | Pothdukhi Devi Mandir | Madina Masjid Alibaug | <b>E -Church</b>                      |
| 7.     | Khandoba Mandir       | Jama Masjid           | Mary Martha Church                    |
| 8.     | Siddhivinayak Temple  | Bandarpada            | Mary of Nazareth Church               |

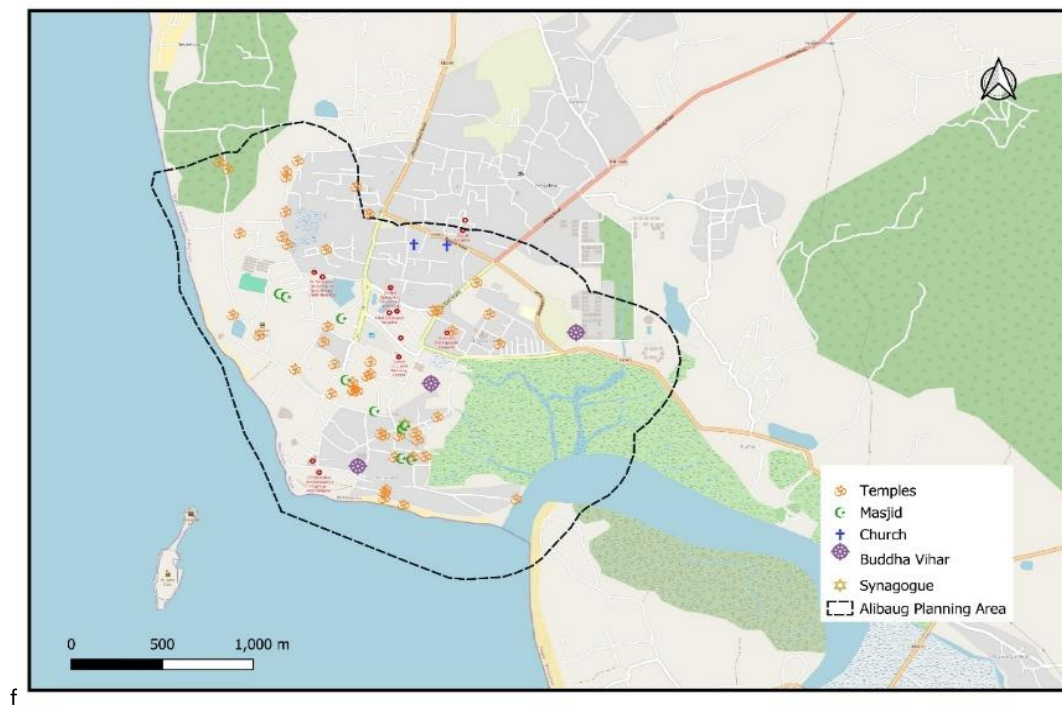


**Figure No. 4 Religious Facilities Map**

#### 6.1.4 Recreational Places in Alibaug Planning Area-

**Table No. 6 Parks and Gardens-**

| Sr. No | Parks and Gardens             |
|--------|-------------------------------|
| 1      | Kanhoji Angre Forest Garden   |
| 2      | Hirakot Lake Garden           |
| 3      | Chatrapati Shivaji Park       |
| 4      | Sarkhel Kanhoji Angre Samadhi |
| 5      | Swa. Bhau Jage Udyan          |
| 6      | Raiwadi Udyan                 |
| 7      | Virangula Udyan               |

**Table No. 7 Beaches in Alibaug-**

| Sr. No | Beaches        |
|--------|----------------|
| 1      | Alibaugh Beach |
| 2      | Varsoli Beach  |

**Table No.8 Historic Places in Alibaug-**

| Sr. No | Historic Places                       |
|--------|---------------------------------------|
| 1      | Hirakhot Fort                         |
| 2      | Hirakhot Lake Garden                  |
| 3      | Sarkhel Kanhoji Angre Samadhi         |
| 4      | Kolaba Fort                           |
| 5      | Joglekar Naka                         |
| 6      | Alibaug Stepwell                      |
| 7      | Alibaug Magnetic Observatory          |
| 8      | Kingfisher Bird Statue Alibaugh Beach |
| 9      | T-55 Tank (1965 War )                 |

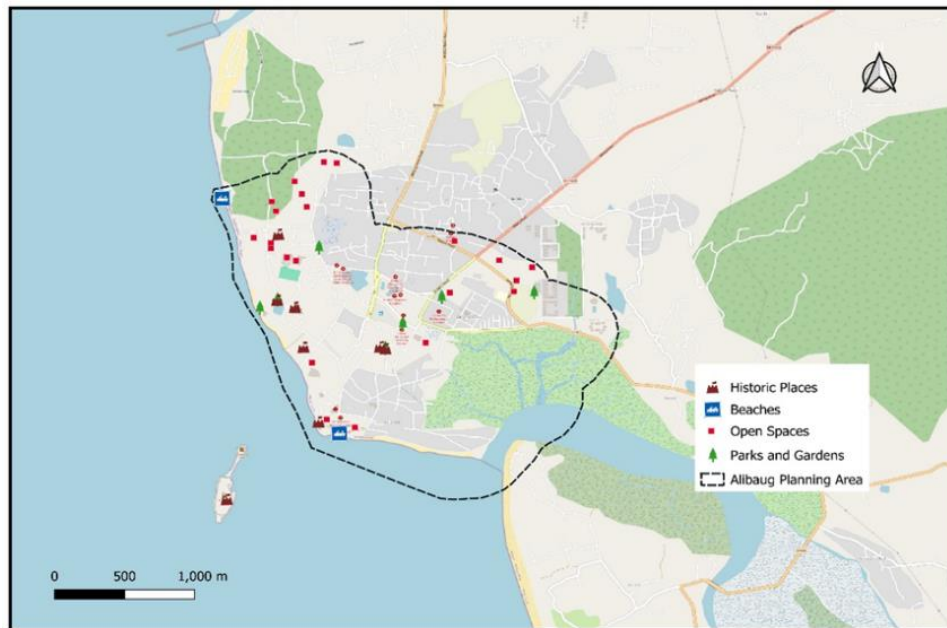


Figure No. 5 Recreational Places Map

#### 6.1.5 Socio- Cultural Places in Alibaug-

Table No 6 :Social cultural places

| Sr. No | Places                          | Category                        |
|--------|---------------------------------|---------------------------------|
| 1      | Dongre Hall                     | Public Library                  |
| 2      | Kittebhandari Hall              | Town Hall                       |
| 3      | Bhagyalaxmi Hall                | Mangalkaryalay                  |
| 4      | P.N.P Natyagruha                | Music ,Dance and Drama Centre   |
| 5      | Anganwadi, Alibaug              | Anganwadi                       |
| 6      | Shri Sadguru Krupa Baithak Hall | Community Centre                |
| 7      | Laxmi Narayan Mangal Karyalay   | Mangalkaryalay                  |
| 8      | Naman Kala Academy              | Music, Dance and Drama Centre   |
| 9      | Siddhesh Institute              | Meditation and Spiritual Centre |
| 10     | Prathamesh Boating Club         | Recreational Club               |
| 11     | Yuva Parivartan                 | Child Centre                    |
| 12     | Awara Backpacks Hostel          | Working Women -men Hostel       |
| 13     | Adio Flat                       | Night Shelter                   |

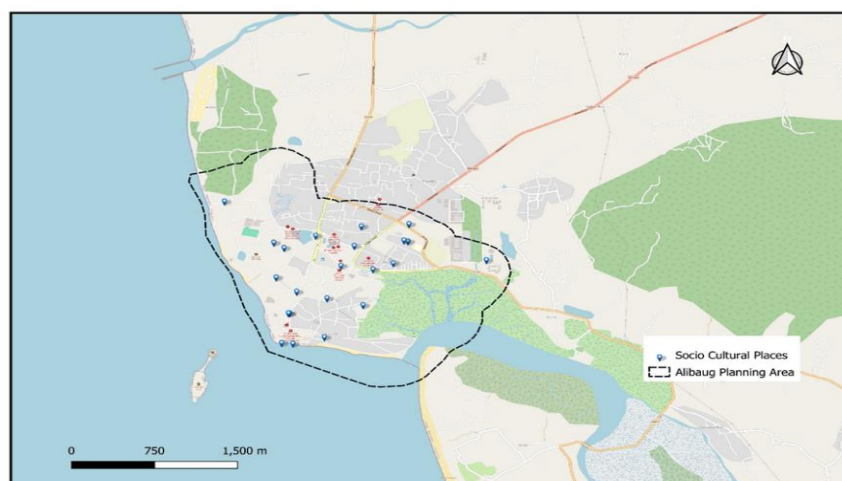


Figure No. 6 Socio Cultural Places Map

### 6.1.6 Social Infrastructure Assessment for Alibaug City as per URDPFI Guidelines-

Projected Population of Alibaug City in 2045 is 28245

**Table No. 7 Gap Analysis as per URDPFI Guidelines-**

| Sr. No | Description                    | Population Served Per Unit                                                         | Required Units | Existing Units | Gap |
|--------|--------------------------------|------------------------------------------------------------------------------------|----------------|----------------|-----|
| 1      | Pre-Primary,Nursing School     | 2500                                                                               | 11             | 4              | 6   |
| 2      | Senior Secondary School        | 1000                                                                               | 28             | 2              | 23  |
| 3      | Integrated School              | 1500                                                                               | 19             | 5              | 12  |
| 4      | Medical College                | 10 Lakh                                                                            | 1              | 2              | +1  |
| 5      | Other Proffesional College     | 10 Lakh                                                                            | 1              | 3              | +2  |
| 6      | Technical Institution          | 10 Lakh                                                                            | 1              | 2              | +1  |
| 7      | General Hospital               | 2.5 Lakh                                                                           | 1              | 5              | +4  |
| 8      | Speciality Hospital            | 100000                                                                             | 1              | 5              | +4  |
| 9      | Multispeciality Hospital       | 1 Lakh                                                                             | 1              | 1              | 0   |
| 10     | Polyclinic                     | 1 Lakh                                                                             | 1              | 1              | 0   |
| 11     | Nursing Home                   | 45000 to 1 Lakh                                                                    | 1              | 6              | +5  |
| 12     | Child Welfare & Maternity Home | 45000 to 1 Lakh                                                                    | 1              | 9              | +8  |
| 13     | Dispensary                     | 15000                                                                              | 2              | 3              | +1  |
| 14     | Diagnostic Centre              | 50,000                                                                             | 1              | 13             | +12 |
| 15     | Rehabilitation Centre          | As per requirement                                                                 | 1              | 1              | 0   |
| 16     | Public Library                 | 15000                                                                              | 2              | 2              | 0   |
| 17     | Community Hall                 | 15000                                                                              | 2              | 2              | 0   |
| 18     | Mangalkaryalay                 | 15000                                                                              | 2              | 4              | +2  |
| 19     | Music ,Dance, Drama Centre     | 1 Lakh                                                                             | 1              | 3              | +2  |
| 20     | Anganwadi                      | 5000                                                                               | 5              | 1              | 4   |
| 21     | Community Centre               | 5000                                                                               | 5              | 1              | 4   |
| 22     | Meditation & Spiritual Centre  | 1 Lakh                                                                             | 1              | 3              | 2   |
| 23     | Recreational Club              | 1 Lakh                                                                             | 1              | 4              | 3   |
| 24     | Child Care Centre              | 10 Lakh                                                                            | 1              | 1              | 0   |
| 25     | Working Women-Men Hostel       | 10 Lakh                                                                            | 1              | 1              | 0   |
| 26     | Night Shelter                  | 10 Lakh                                                                            | 1              | 1              | 0   |
| 27     | Botanical Garden               | 1 for every town                                                                   | 1              | 2              | +1  |
| 28     | City Park                      | For entire town at one or more sites, depending upon design and space availability | 1              | 2              | +1  |
| 29     | Housing Area Park              | 5000                                                                               | 6              | 2              | 3   |
| 30     | Neighbourhood Park             | 10000                                                                              | 3              | 1              | 2   |

## 6.2 Existing Transportation Network of Alibaug City

### 6.2.1 Road Network-

**National Highways**-NH-66 serves as the major north–south coastal corridor providing long-distance connectivity between Mumbai, Goa, and southern India, indirectly linking Alibaug through Pen. NH-166A acts as the primary direct highway into Alibaug, connecting the city to Vadkhal, Rewas, and Mandwa, and is crucial for tourism and ferry-based connectivity with Mumbai.

**State Highways**-State highways such as SH-4, SH-92, SH-97, and SH-104 form the regional road network connecting Alibaug to coastal towns, heritage destinations, and inland urban centers. These routes support daily commuting, tourism movement, fishing activities, and multimodal transport integration with ferry terminals.

**Major District Roads (MDRs)**- Major District Roads like MDR-166F, 166D, 166H, 166E, 166G, and MDR-266 strengthen inter-district and regional connectivity by linking highways, pilgrimage centers, historic sites, and agricultural zones. They play a key role in supporting tourism, trade, and rural–urban movement within the Raigad region.

**Other District Roads in Alibaug Taluka:**Roads such as Alibaug–Revdanda, Alibaug–Kihim, Alibaug–Nagaon, and Alibaug–Mandwa provide direct access to beaches, coastal villages, and ferry terminals. These roads are vital for local mobility, tourism development, and economic activities dependent on coastal access.

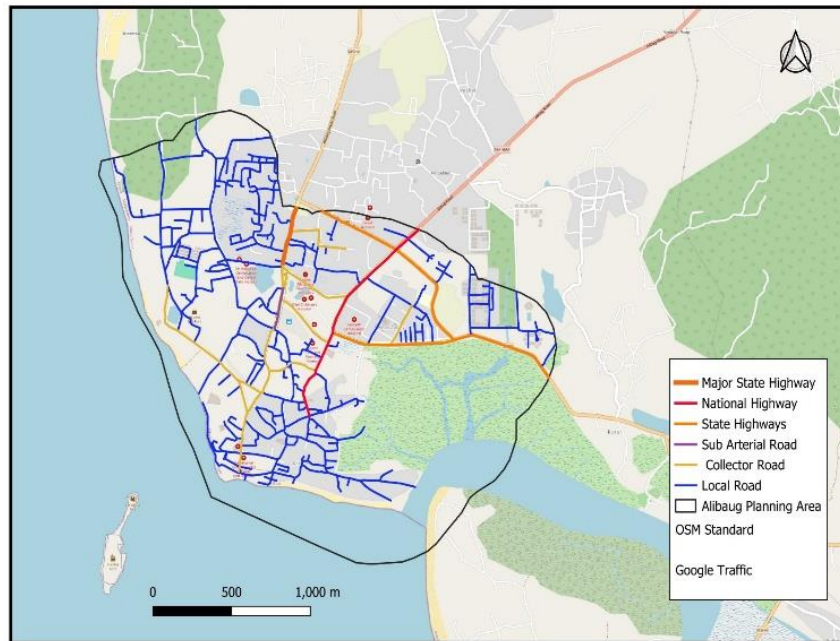


**Figure No. 7 Road Network Map**

### 6.2.2 Rail Network -

There is no rail connection to the city which is very bad for the economic growth of city .The Panvel–Roha Line is the nearest rail corridor to Alibaug, connecting Panvel, Pen, and Roha and supporting commuter and freight movement in Raigad district. Roha serves as the gateway to the Konkan Railway, providing long-distance connectivity to Goa and southern India. The Mumbai Suburban Harbour Line extends up to Panvel and further towards Pen and Roha, indirectly supporting daily commuters to nearby railheads.

Pen Railway Station is the closest station to Alibaug, offering regular services to Panvel and Roha, while Roha Railway Station functions as a major junction between Central and Konkan Railways. Panvel Junction acts as a key rail hub linking Alibaug by road to Mumbai suburban rail, Pune, and the Konkan region. CST and Dadar terminals provide indirect long-distance rail access from Mumbai to Alibaug.



**Figure No. 8 Rail Network Map**

**6.2.3 Waterways Network** -Alibaug's waterways play a vital role in passenger movement and tourism, with Mandwa Jetty serving as the primary ferry terminal connecting Mumbai and Alibaug, followed by Rewas Jetty supporting passenger and fishing activities. Smaller jetties at Kihim, Awas, Sasawane, Revdanda, and Murud cater to local fishing, water sports, and limited goods movement. Although Alibaug lacks a major commercial port,

nearby facilities such as Rewas Port, Mandwa tourism port, Dighi Port, and JNPT significantly influence regional trade, logistics, and maritime connectivity along the Konkan coast.

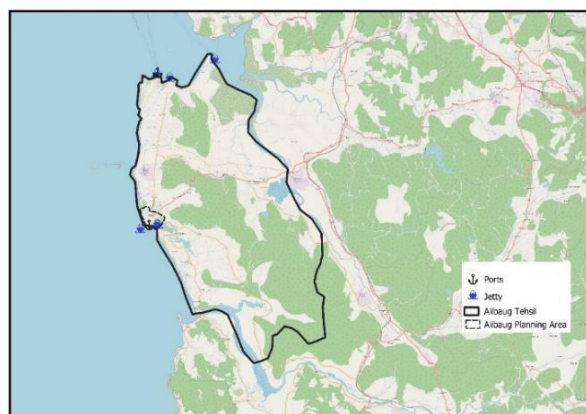


**Figure No. 9 Waterway Network Map**

**6.2.4 Air Network** –Alibaug city does not have its own airport and currently depends on nearby airports for air connectivity. Chhatrapati Shivaji Maharaj International Airport, Mumbai, located about 100 km away, serves as the primary airport, with access through road or ferry routes. Pune International Airport, around 140 km away, acts as a secondary option. The upcoming Navi Mumbai International Airport at Ulwe, approximately 65 km from Alibaug, is expected to significantly improve regional accessibility. Limited private airstrips exist in Raigad district but are not used for commercial operations.

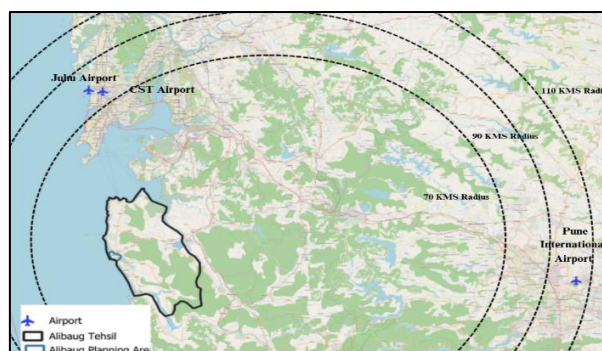


**Figure No. 10 Air Network Map**

## 6.3 Proposals for Social Infrastructure-

### 6.3.1 Educational Facilities

**a. Pre-Primary School**-Proposed to improve early childhood education access at the neighbourhood level. As per URDPFI norms, one pre-primary school is required per 2,500 population; current provision is inadequate. To be located within residential and mixed-use areas, integrated with neighbourhood parks. Safe pedestrian access within a 400–800 m walking radius is recommended. Design to include child-friendly spaces, open play areas, shaded courtyards, and universal accessibility features.

**b. Senior Secondary School**-Identified shortage of senior secondary institutions leading to out-migration of students. Proposed along major growth corridors such as the Alibaug–Rewas corridor and northern expansion area. Encourages Public–Private Partnership (CBSE, ICSE, and State Board models). Provision of digital classrooms and future skills laboratories is recommended.

**c. Specially-Abled School**-Proposed to promote inclusive and equitable education for children with disabilities. To function as a district-level support center offering therapy and rehabilitation services. Includes adaptive classrooms, sensory learning spaces, medical support facilities, and barrier-free design compliant with NBC norms.



**Figure No. 11 Specially Abled School**

- d. **Marine Research Institute-** Alibaug leverages the city's coastal ecology and proximity to Mumbai to support marine science, climate adaptation, fisheries technology, and blue economy initiatives . The institute would include research laboratories, field training facilities in collaboration with academic and coastal authorities, and public awareness components such as marine exhibits to promote eco-tourism and local skill development.



**Figure No. 12 Maritime Research Institute**

- e. **Immersive Training Learning Centre-** The proposed Immersive Learning Centre integrates Virtual Reality (VR) into education and training to support experiential learning. It is particularly beneficial for learners with neurodiverse conditions, including Autism Spectrum Disorder, by providing safe, simulated environments for practising social, behavioural, communication, and life skills, as well as professional and school-based training.



**Figure No. 13 Immersive Training Learning Centre**

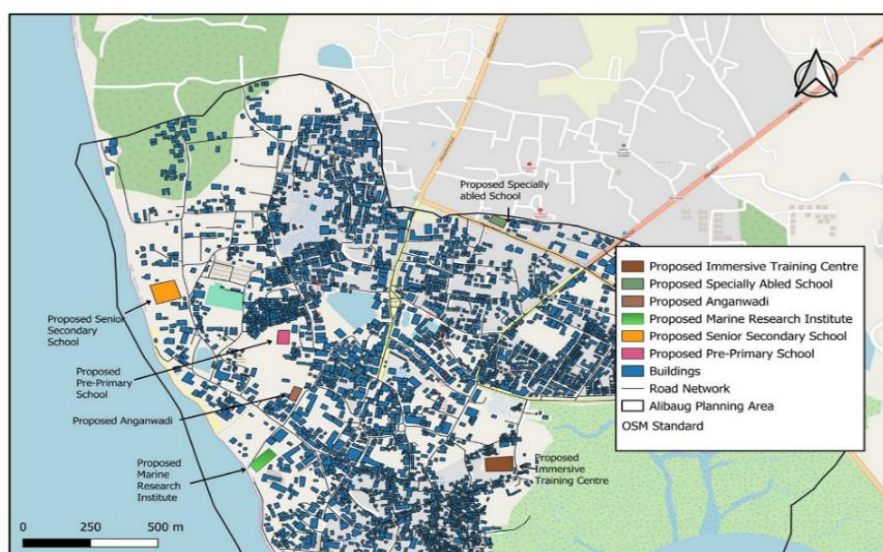


**Figure No. 14 Proposed Educational Facilities Map**

### 6.3.2 Healthcare Facilities-

a. **Infrastructural Upgradation of Hospitals:** Government healthcare facilities in Alibaug serve a large population but require infrastructure upgradation and improved maintenance. Strengthening public hospitals will enhance service quality, reduce dependence on private healthcare, and support an equitable and efficient public health system.

b. **E-Health Services:** E-health services use digital technologies to improve healthcare accessibility, efficiency, and transparency. Systems such as digital health records, telemedicine, and Health ATMs enable basic diagnostics and primary care in underserved areas, reducing paperwork, service delays, and overall healthcare costs.



**Figure No. 15 Health ATM**

**c. District Level Medical Emergency Coordination Centre-** A district-level medical emergency coordination centre is proposed to strengthen emergency response, especially during cyclones, floods, and seasonal population surges in Alibaug. The centre would integrate ambulance dispatch, telemedicine support for peripheral areas, and emergency medical storage in coordination with health and disaster management authorities.

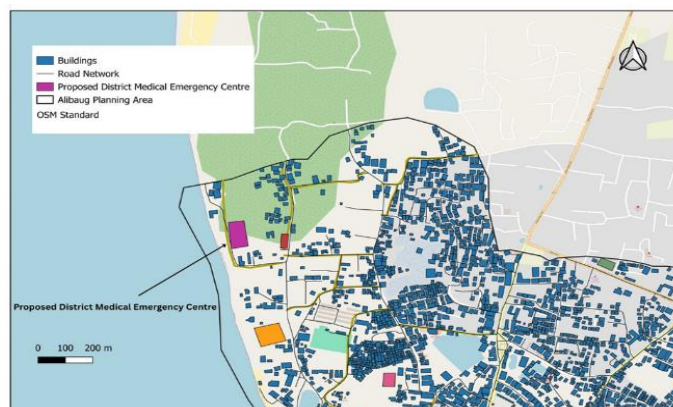


**Figure No. 16 District Level Medical Emergency Coordination Centre**

### 6.3.3 Recreational Facilities-

#### a. Coastal Ecological Park:

The Coastal Ecological Park is proposed as a nature-based recreational space that conserves Alibaug's coastal ecosystems while providing public access. It will include restored mangroves, dune vegetation, nature trails, and bird-watching decks, offering low-impact recreation and serving as an ecological buffer to enhance shoreline resilience.

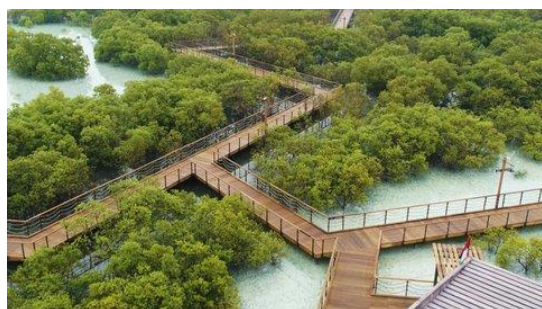


**Figure No. 17 Coastal Ecological Park**

#### b. Beach front Promenade-

The Beachfront Promenade is envisioned as an active public corridor along the coastline, promoting walkability, tourism, and social interaction. With pedestrian paths, cycling lanes, shaded seating,

cultural spaces, and climate-resilient design features, it will transform the waterfront into an inclusive social and economic hub.



**Figure No. 18 Beach front Promenade**

#### c. Community Centre:

The Community Centre will function as a multipurpose civic space supporting education, recreation, and cultural activities for all age groups. Flexible indoor-outdoor facilities will host workshops, events, skill development programs, and community gatherings, strengthening social cohesion and local identity.



Figure No. 19 Community Centre

**d. Meditation and Spiritual Centre:**

The Meditation and Spiritual Centre is proposed as a tranquil wellness space focused on mental well-being and mindfulness. Designed with natural materials, landscaped gardens, and quiet zones, it will provide areas for meditation, yoga, and

community wellness activities in a calm, restorative environment.



Figure No. 20 Meditation and Spiritual Centre

**e. Heritage Walk** – A heritage walk to be proposed connecting all the important heritage areas of city connecting Alibaug Stepwell , Hirakhot Lake Garden , Hirakhot Fort , Alibaug Magnetic Observatory and later a via boat ferry connection to Alibaug Fort which continues its way back to T-55 Tank and end at Sarkhel Kanhoji Angre Samadhi.

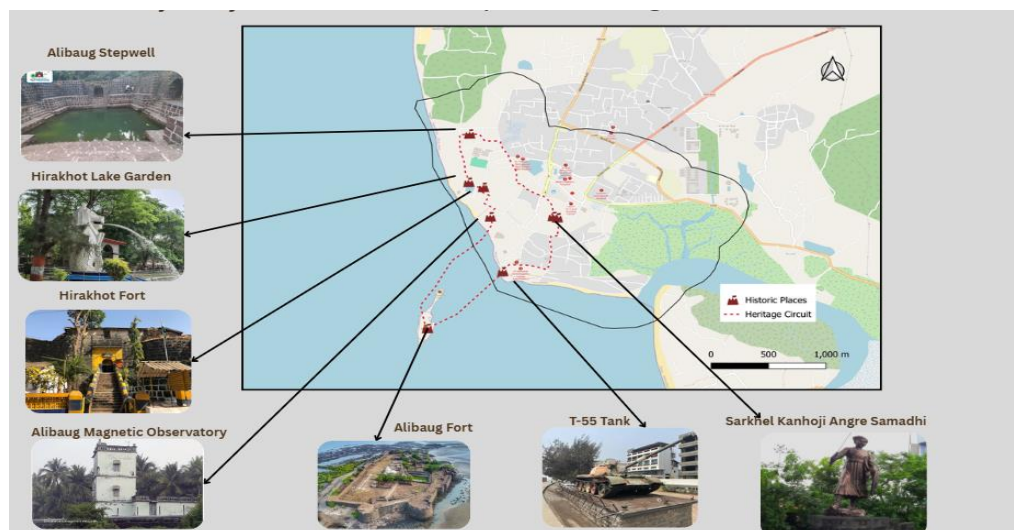


Figure No. 21 Heritage Walk Map

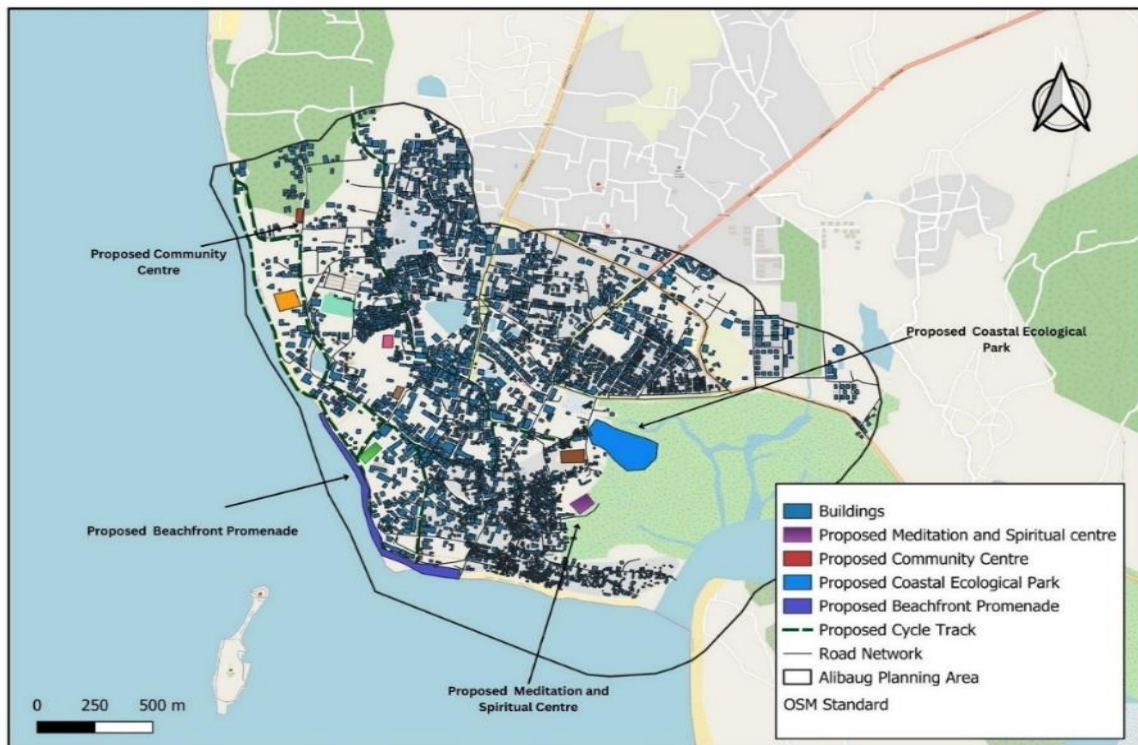


Figure No. 22 Proposed Recreational Facilities Map

#### 6.4 Proposals for Transportation Networks-

**6.4.1 Proposed Non Motorised Route-** A continuous Cycle track is proposed near Alibaug Beach and Varsoli Beach connecting the Heritage Structures and Proposed Beachfront Promenade. For the safety of children travelling with bicycles and also for the well being of other age groups.

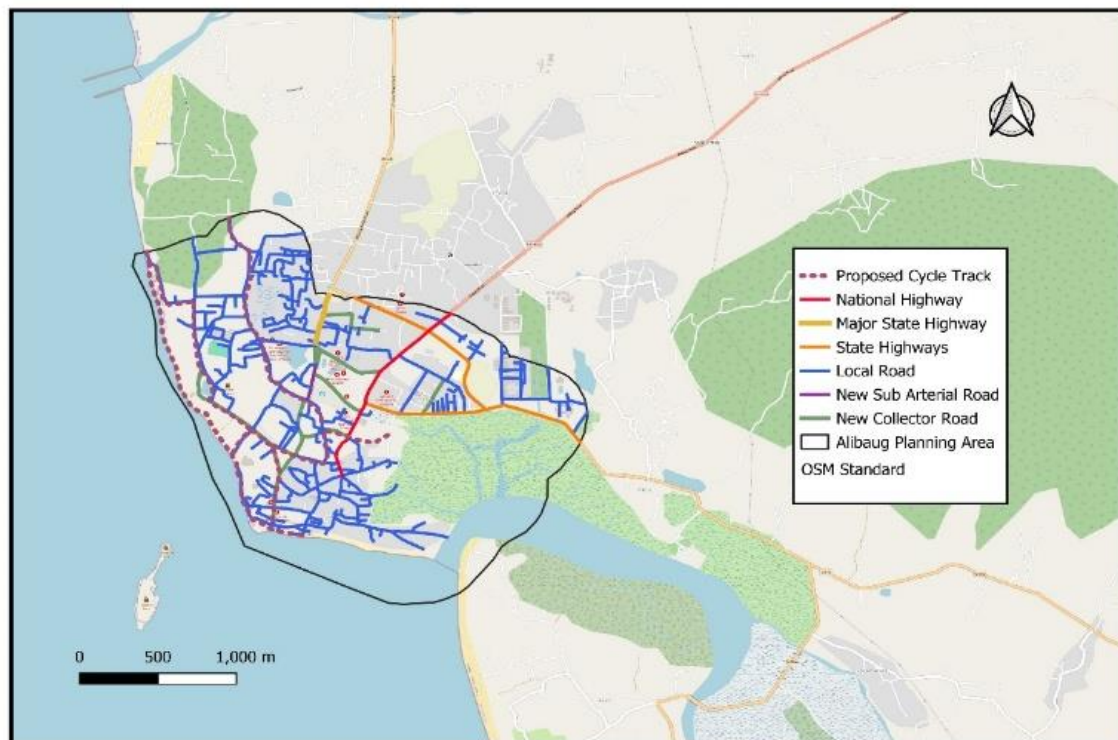


Figure No. 23 Proposed Cycle Track Map

**6.4.2 Proposed Multilevel Parking-**A multilevel parking is being proposed in proximity to Beachfront Promenade and Alibaug market area so as to reduced the areas traffic congestion.

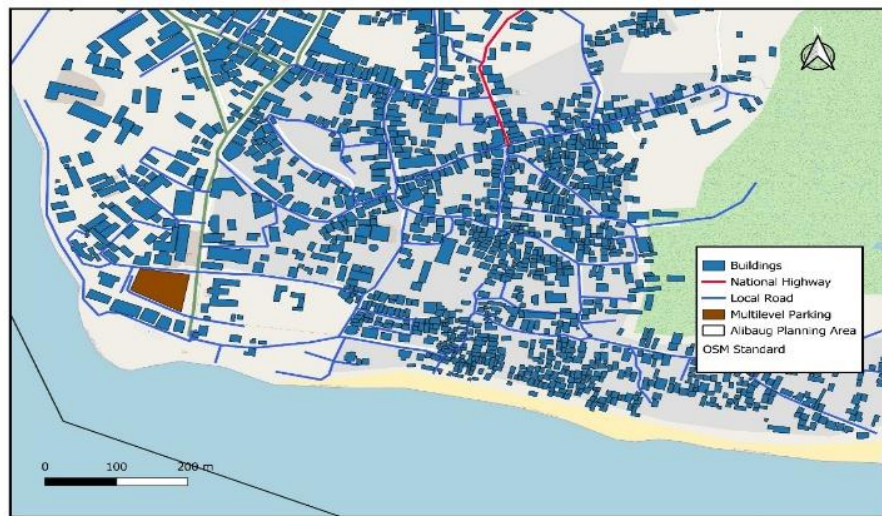


**Figure No. 24 Multilevel Parking**

**6.4.3. Proposed Railway Network** -A extended rail line can be proposed from the incomplete railway line at Thal . Also a railway station can be proposed at Thal and a railway station on the outskirts of Alibaug city.

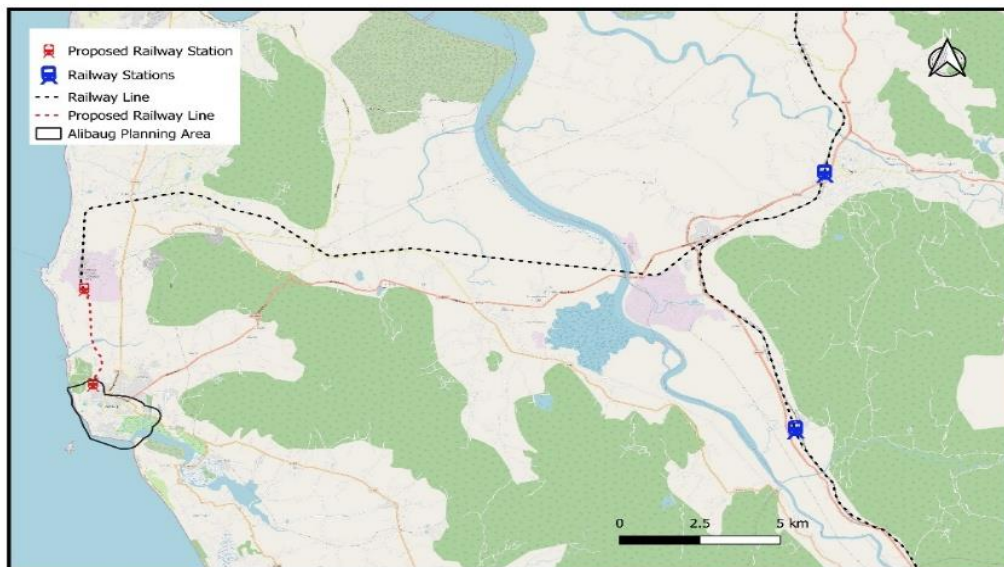


**Figure No. 25 Proposed Railway Network**

**6.4.4. Proposed Jetty-**A jetty is being proposed near the Varsoli beach for the circular movement of the boats and ferries from the Sakhar Koliwada Jetty to Kulaba Fort and then to Varsoli .

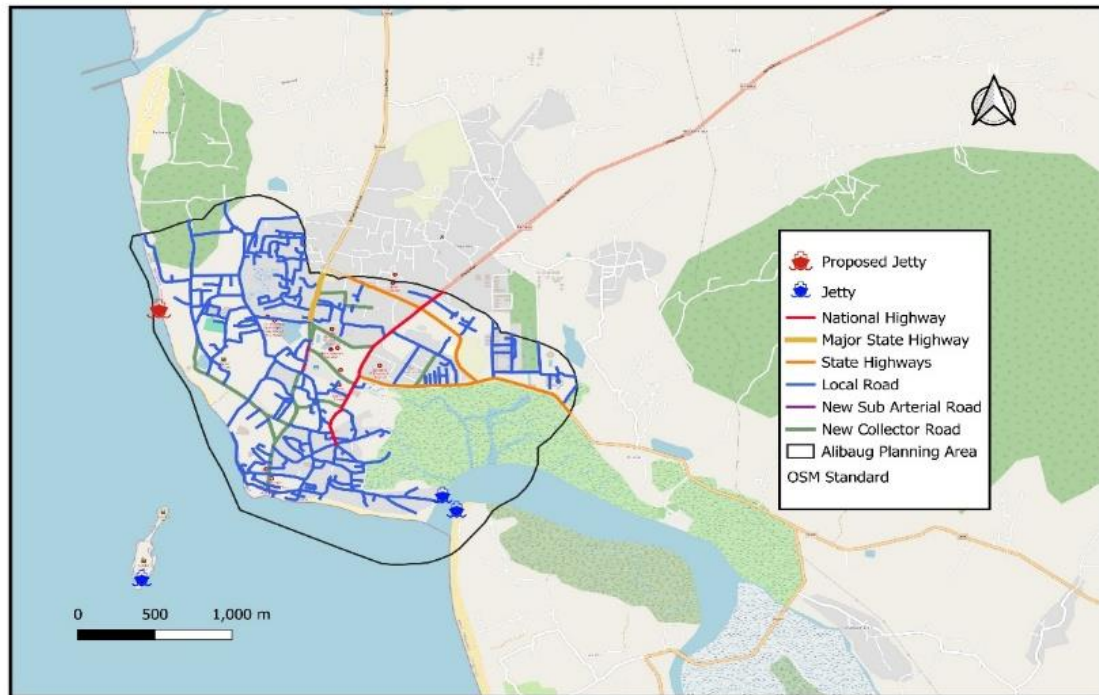


Figure No. 26 Proposed Railway Network

#### 6.4.5. Proposed Transportation Map-

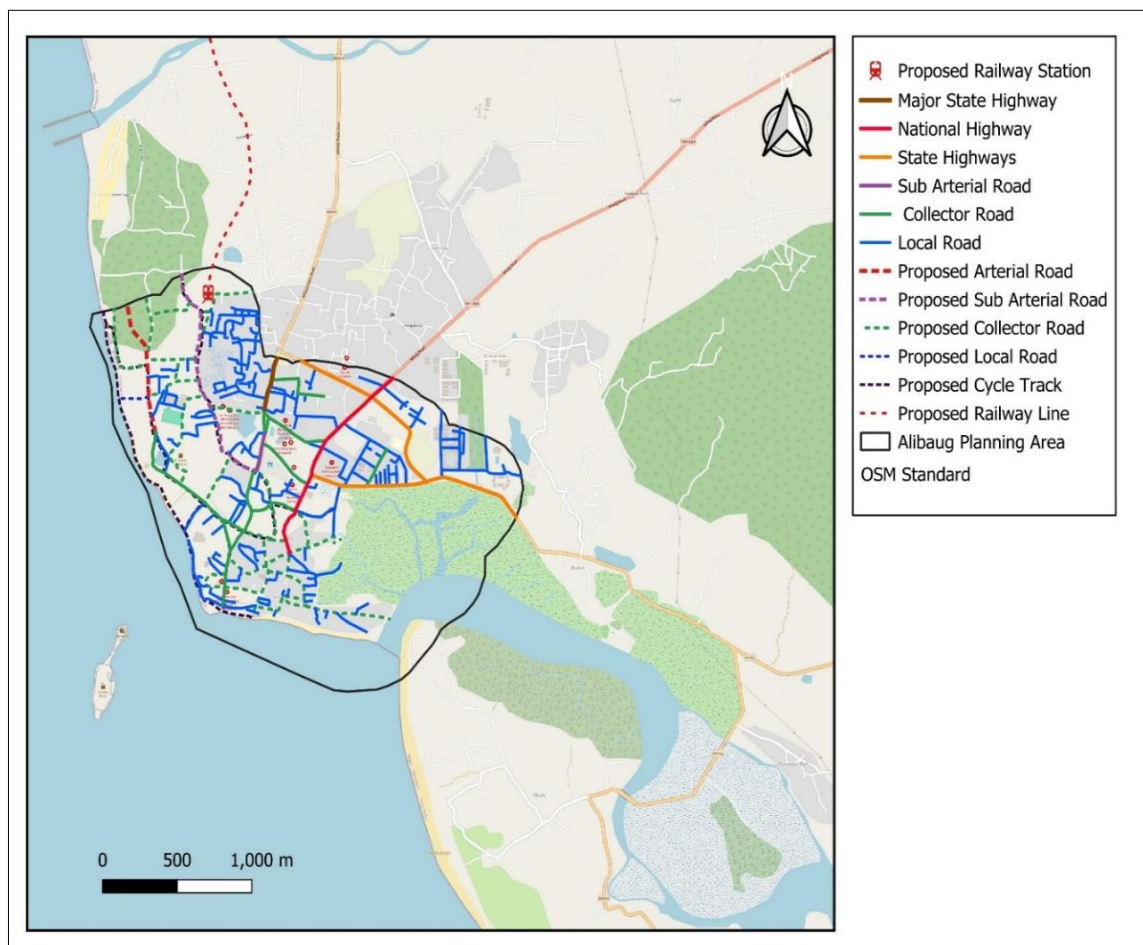


Figure No. 27 Proposed Transportation Network Map

## 7 RECOMMENDED POLICY-

### 7.1. Integrated Social Infrastructure Planning Policy

A city-level policy should mandate the integrated planning of education, healthcare, recreation, and community facilities within walking or cycling distance of residential areas. Social infrastructure provision standards must be aligned with population projections and seasonal tourist inflow to ensure equitable access for permanent and floating populations.

### 7.2. Multimodal and Inclusive Transport Policy

Alibaug should adopt a multimodal transport policy that integrates road, ferry, bus, cycling, and pedestrian networks. Priority must be given to last-mile connectivity, universal accessibility for the elderly and differently-abled, and safe non-motorized transport corridors connecting recreational, coastal, and social infrastructure nodes.

### 7.3. Transit-Oriented Recreational Development Policy

Recreational and public open spaces such as promenades, community centres, and ecological parks should be planned along major transport corridors and transit hubs. This policy will reduce private vehicle dependency while improving public access to leisure and cultural facilities.

### 7.4. Coastal Ecology and Blue-Green Infrastructure Policy

A dedicated policy is required to protect coastal ecosystems by integrating mangroves, dunes, wetlands, bioswales, and permeable surfaces into recreational landscapes. Development within coastal zones should follow low-impact design principles and strengthen natural flood buffers and climate resilience.

### 7.5. Public Health and Digital Healthcare Policy

Urban health policy should focus on upgrading government hospitals, implementing E-health services, Health ATMs, and district-level emergency coordination centres. Digital healthcare infrastructure must be linked with disaster response systems to ensure service continuity during floods, cyclones, and peak tourist seasons.

### 7.6. Inclusive and Universal Design Policy

All social, recreational, and transport infrastructure should comply with universal design and accessibility norms, ensuring usability for children, elderly populations, women, and persons with disabilities. Recreational planning must include community spaces that support mental well-being, social interaction, and cultural activities.

### 7.7. Education, Skill Development, and Knowledge Hub Policy

The city should promote specialized educational and research institutions, such as Marine Research Institutes and Immersive Learning Centres, aligned with local ecology and economy. This policy will support workforce development in tourism, fisheries, maritime services, and climate adaptation sectors.

### 7.8. Climate-Resilient Urban Planning Policy

Urban development regulations must integrate climate risk assessments into land-use planning, transport design, and social infrastructure placement. Recreational spaces should double as flood retention areas, evacuation zones, and thermal comfort spaces during extreme weather events.

### 7.9. Public-Private-Community Partnership (PPCP) Policy

A participatory governance policy should encourage public-private-community partnerships for planning, financing, and maintaining recreational and social infrastructure. Local stakeholders, NGOs, and citizen groups should be actively involved in decision-making and stewardship of public spaces.

### 7.10. Monitoring, Data, and Smart Governance Policy

A city-level GIS-based monitoring system should be established to assess accessibility, infrastructure performance, and recreational usage patterns. Periodic audits and digital dashboards can support evidence-based planning, policy updates, and transparent governance.

## 7. CONCLUSION

This study assessed the social infrastructure and transportation networks of Alibaug city, highlighting their role in promoting sustainable recreational and landscape planning. The analysis revealed gaps in healthcare, educational, and recreational facilities, as well as limited integration between road, rail, and water transport modes. Proposed interventions—including pre-primary and senior secondary schools, specially-abled education centres, a Marine Research Institute, immersive learning facilities, upgraded hospitals, E-health services, emergency coordination, coastal ecological parks, promenades, community centres, and meditation hubs—aim to enhance accessibility, inclusivity, and resilience. Improving multimodal transport connectivity and integrating recreational planning with ecological conservation can strengthen Alibaug's urban fabric, support tourism, and ensure equitable access to public amenities. Overall, this research underscores the importance of coordinated planning of social infrastructure and transport systems as key enablers of sustainable and inclusive urban development.

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