MARINE DRIVE – "FORMER RAILWAY STATION" AS URBAN REGENERATION POLE IN
KOCHI - INDIA

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MARINE DRIVE – "FORMER RAILWAY STATION" AS URBAN REGENERATION POLE IN

KOCHI - INDIA

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ABSTRACT - ENGLISH

This study explores the dynamics of tourist urbanism in Kochi, aiming to understand the interplay between tourism and urban development. Using a mixed-methods approach, data was gathered through surveys, research, and spatial analysis. Key findings reveal a growing trend in tourist influx, impacting the city's infrastructure and cultural landscape. The study underscores the need for sustainable urban planning to balance the demands of tourism with residents' needs. The implications of these findings extend to policymakers, urban planners, and stakeholders involved in shaping Kochi's future. This research contributes valuable insights into managing tourist urbanism and fostering sustainable development in the context of emerging tourist destinations.

Tourism is one of the fastest-expanding businesses, making events increasingly vital. People are more interested in various events and are willing to travel long distances to participate. Events can provide economic and social benefits to places, making them an important tool for destination administrators in their tourism roles. To maximize event tourism potential, communities and destinations must take a long-term, strategic approach to planning and development. This study addresses a gap in research on the implementation of event tourism tactics in destination settings. The study found that while tourist organizations recognize the value of events, their strategic utilization varies between organizations. Some tourism organizations include events in their plan, while others treat events as a separate business area with their strategy. In certain circumstances, events are part of tourism initiatives, but their implementation is haphazard and prioritized above other business areas.

The study concludes with a model that outlines the processes involved in developing event tourism strategies in tourist organizations. According to the study, tourism organizations' progress towards strategic event tourism management is influenced by factors such as ownership structure, resource base, city involvement, and destination capacity and infrastructure.

Keywords: Tourist urbanism, Kochi, Tourism, Urban development, Sustainability. Old railway station Renovation

ABSTRACT- ITALIAN

Questo studio esplora le dinamiche dell'urbanismo turistico a Kochi, con l'obiettivo di comprendere l'interazione tra turismo e sviluppo urbano. Utilizzando un approccio a metodi misti, i dati sono stati raccolti attraverso sondaggi, ricerche e analisi spaziali. I principali risultati rivelano una tendenza crescente nell'afflusso di turisti, che influenza l'infrastruttura e il paesaggio culturale della città. Lo studio sottolinea la necessità di una pianificazione urbana sostenibile per bilanciare le esigenze del turismo con quelle dei residenti. Le implicazioni di questi risultati si estendono ai responsabili delle politiche, agli urbanisti e agli stakeholder coinvolti nella definizione del futuro di Kochi. Questa ricerca contribuisce con preziose intuizioni alla gestione dell'urbanismo turistico e alla promozione di uno sviluppo sostenibile nel contesto delle destinazioni turistiche emergenti.

Il turismo è uno dei settori in più rapida espansione, rendendo gli eventi sempre più vitali. Le persone sono più interessate a vari eventi e sono disposte a viaggiare lunghe distanze per parteciparvi. Gli eventi possono fornire benefici economici e sociali ai luoghi, rendendoli uno strumento importante per gli amministratori delle destinazioni nel loro ruolo turistico. Per massimizzare il potenziale del turismo degli eventi, le comunità e le destinazioni devono adottare un approccio strategico e a lungo termine nella pianificazione e nello sviluppo. Questo studio affronta una lacuna nella ricerca sull'implementazione delle tattiche di turismo degli eventi nei contesti delle destinazioni. Lo studio ha rilevato che, sebbene le organizzazioni turistiche riconoscano il valore degli eventi, il loro utilizzo strategico varia tra le organizzazioni. Alcune organizzazioni turistiche includono gli eventi nel loro piano, mentre altre trattano gli eventi come un'area commerciale separata con la propria strategia. In alcune circostanze, gli eventi fanno parte delle iniziative turistiche, ma la loro implementazione è disordinata e prioritizzata rispetto ad altre aree commerciali.

Lo studio conclude con un modello che delinea i processi coinvolti nello sviluppo di strategie di turismo degli eventi nelle organizzazioni turistiche. Secondo lo studio, i progressi delle organizzazioni turistiche verso la gestione strategica del turismo degli eventi sono influenzati da fattori come la struttura proprietaria, la base di risorse, il coinvolgimento della città e la capacità e l'infrastruttura della destinazione.

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Urban Study and Tourism of Kochi

Kochi, often referred to as the "Queen of the Arabian Sea," is a vibrant city on the southwest coast of India in the state of Kerala (Ernakulam, Queen Of Arabian Sea, 2024). Renowned for its strategic location, historical significance, and diverse cultural heritage, Kochi has become a major urban centre and a pivotal tourist destination. Among the various landmarks that define Kochi's urban landscape, Marine Drive stands out as a prominent waterfront promenade, offering both residents and visitors a scenic view of the backwaters and the Arabian Sea. Historically, Marine Drive has been a vital recreational space, contributing significantly to the city's socio-economic and cultural fabric.
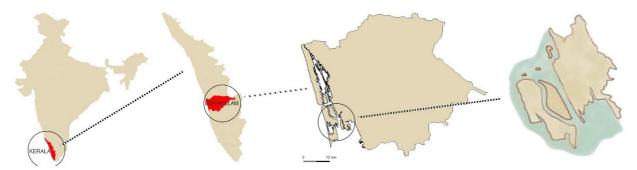
Figure 1: Location Map of Kochi Municipal Corporation a) Map of Country India, b) Map of State Kerala, c) Map of District Ernakulam, d) Map of Study Area – Kochi Municipal Corporation

Similarly, the former Ernakulam Railway Station, once a hub of activity and an essential node in Kochi's transportation network, now stands as a relic of the past. With the relocation of the primary railway operations to the new Ernakulam Junction, the old station has largely fallen into disuse. However, this site holds immense potential for adaptive reuse, serving as a bridge between the cities's storied past and its dynamic present.

This thesis explores the multifaceted relationship between urban development and the revitalization of the former railway station, examining how the city's growth, infrastructure, and cultural assets contribute to its appeal as a tourist hub.

- Research Objectives

This thesis aims to analyse the interplay between urban development and tourism in Kochi and the former railway station, Ernakulam revitalization, addressing the following key objectives:

- To examine the historical and cultural factors that shape Kochi's identity and attract tourists.

- To assess the impact of urbanization on Kochi's tourism infrastructure and visitor experience.

- To explore sustainable urban planning and tourism practices that can enhance Kochi's appeal while preserving its heritage and environment.

- To identify the challenges and opportunities presented by the growth of tourism and urbanization in Kochi.

- Investigate the historical and cultural significance of the former railway station in Kochi.

- Document the architectural and heritage value of the station.

- Propose new functions (e.g., cultural centre, museum, community space) that align with urban development and tourism goals.

- Study how the renovated station can contribute to local tourism and economic development.

- Assess the economic and social impact of the railway station renovation on the local community.

- Study how the renovated station can contribute to local tourism and economic development.

- Methodology

The research methodology encompasses a mixed-methods approach, combining qualitative and quantitative data. Primary data will be collected through surveys, interviews, and field observations involving stakeholders such as local residents, business owners, and tourists. Secondary data will include analysis of urban planning documents, tourism statistics, and academic literature. Geographic Information System (GIS) tools will be employed to map and analyse spatial patterns of urban growth and tourist activity.

- Significance of the Study

The urban study of Marine Drive and the renovation of the former Ernakulam Railway Station are crucial for multiple reasons. Firstly, they represent significant opportunities for urban renewal and heritage conservation in Kochi. The redevelopment of these areas can enhance the city's aesthetic appeal, improve public spaces, and boost local tourism. Secondly, such projects can serve as models for sustainable urban development, balancing the needs of economic growth, environmental preservation, and social equity.

Marine Drive, with its strategic location and scenic beauty, has the potential to become a vibrant urban waterfront, akin to the successful waterfront developments seen in cities around the world. However, it faces challenges such as environmental degradation, traffic congestion, and underutilized spaces that need to be addressed through thoughtful planning and design.

On the other hand, the former Ernakulam Railway Station offers a unique opportunity to preserve and repurpose a historical structure. Its renovation can provide much-needed public spaces, cultural venues, or community centres, thus revitalizing the area and fostering a sense of place and continuity within the urban fabric.

- Expected outcomes of the project

The redevelopment of the former railway station at Ernakulam, also known as Ernakulam Old Railway Station, is anticipated to bring several positive outcomes to the area. Here are some expected outcomes:

Economic Benefits:

1. Increased Business Opportunities: The redevelopment can boost local businesses, including retail, hospitality, and service industries, due to increased foot traffic and tourism.
2. Job Creation: The construction phase and subsequent operations of new facilities will create numerous job opportunities.
3. Property Value Appreciation: Improved infrastructure and amenities can increase property values in the surrounding areas.

Social and Community Benefits:

1. Enhanced Transportation Hub: Revitalizing the station can improve connectivity and make it a crucial transit point, benefiting daily commuters and travellers.
2. Cultural Preservation: The project can incorporate elements that preserve the station's historical significance, fostering a sense of community pride and historical continuity.
3. Public Spaces: Development plans often include public spaces such as parks, plazas, and community centres, providing residents with recreational areas and venues for social interaction.

Infrastructure and Urban Development:

1. Improved Infrastructure: Upgrading the station can lead to better facilities, including platforms, waiting areas, restrooms, and accessibility features.
2. Urban Renewal: The project can stimulate further development in the area, leading to urban renewal and better city planning.
3. Sustainable Development: Modern redevelopment projects typically incorporate sustainable practices, such as energy-efficient buildings and eco-friendly materials, contributing to environmental conservation.

Tourism and Cultural Impact:

1. Tourism Boost: An aesthetically appealing and historically significant railway station can attract tourists, boosting the local tourism industry.
2. Cultural Events and Activities: The redeveloped station can serve as a venue for cultural events, exhibitions, and festivals, enriching the cultural life of the community.

Overall, the redevelopment of the Ernakulam Old Railway Station is expected to have a transformative impact on the local economy, community, and environment, contributing to the overall growth and development of the region.

Part A - The City of Kochi in India: Main Overview and Potential Tourism Sources

1. Main Overview

1.1 Geography and Demographics

In the state of Kerala, Kochi, sometimes referred to as Cochin, is a significant port city on India's southwest coast. It is located in the Ernakulam district and has a population of about 600,000 people living inside the city boundaries and over 2 million people living in the surrounding metropolitan area. Kochi, also referred to as the "Queen of the Arabian Sea," is a significant commercial centre that benefits from a prime location thanks to its natural harbour (Ernakulam, Queen Of Arabian Sea, 2024).

1.2 Historical Context

Due to colonial domination by the British, Portuguese, and Dutch, Kochi has a rich historical legacy. Since the 14th century, the city has been a major hub for the commerce of spices, drawing in traders and colonial powers. Important historical occurrences consist of:

- Portuguese settlement began in 1503.
- 1663 saw Dutch rule.
- India was ruled by the British from 1795 till its independence in 1947 (Ernakulam, Queen Of Arabian Sea, 2024).

Kochi, a city in India, has a rich history dating back to ancient times. It was the center of Indian spice trade and was known to various groups, including the Yavanas, Jews, Syrians, Arabs, and Chinese. The precursor state to the Kingdom of Kochi emerged in the early 12th century after the Chera Kingdom's fall. The kingdom was hereditary, with the Perumpadappu rulers ruling over the region.

Portuguese navigator Pedro Álvares Cabral founded the first European settlement in India at Kochi in 1500. From 1503 to 1663, Fort Kochi was ruled by Portugal. The Portuguese rule was followed by the Dutch, who allied with the Zamorin of Calicut to conquer Kochi. By 1773, Mysore ruler Hyder Ali extended his conquest in the Malabar region to Kochi, forcing it to become a tributary of Mysore.

In 1925, Kochi legislative assembly was constituted due to public pressure on the state. Harbor engineer Robert Bristow transformed Kochi into one of the safest harbors in the peninsula. In 1947, Cochin became the first princely state to join the Indian Union. In 1949, Travancore-Cochin state was formed, merging with the Malabar district of the Madras State.

In 1967, the corporation of Cochin came into existence, combining the existing municipalities of Fort Kochi, Mattancherry, and Ernakulam. Kochi and Ernakulam district formed in 1958, carving areas from the Travancore-Kochi-Malabar kingdoms. The city's economic growth has been driven by service sector reforms since 2000, and its rapid commercialization has made it the commercial hub of Kerala (Ernakulam, Queen Of Arabian Sea, 2024).

1.3 Culture

- Kathakali: Kathakali is a unique and captivating dance form that combines elements of dance, drama, music, and religious rituals. Originating in the 17th century, it was initially performed exclusively by men but has since evolved to include women. Kathakali's makeup, known as "chutti," is characterized by vibrant colours and intricate designs, with green representing noble characters, red representing evil, and black representing demons. The costumes are elaborate, with male characters wearing a long skirt-like garment called "mundu" and female characters wearing a traditional sari. The dancers use hand gestures, facial expressions, and body movements to convey emotions and actions. Music, accompanied by a traditional orchestra called "chenda melam," sets the mood and creates a mesmerizing atmosphere. Kathakali is a deeply spiritual and disciplined art form that requires immense dedication and passion (Chloe, 2024).

- Mohiniyattam: Mohiniyattam, a classical dance form from Kerala, India, is known for its grace, elegance, and storytelling. Originating in the 16th century, it is traditionally performed by women in temples, resembling palm tree swaying and backwater waves. The dance form emphasizes abhinaya, or expressive storytelling, using eyes, eyebrows, and facial expressions. Mudras, hand gestures, and traditional costumes are used to convey emotions. Music is typically in the Carnatic style, with instruments like veena, mridangam, and flute. The lyrics often explore themes of love, devotion, and mythology. Mohiniyattam has evolved, incorporating elements from other dance forms and styles. It has gained international recognition and inspired contemporary artists and choreographers. Mastering Mohiniyattam requires years of practice and training, but the rewards are immense as it allows dancers to connect with their inner selves and express emotions through movement (Chloe, 2024).

- Kalaripayattu: The Vedas describe martial arts, which have been practised in India for more than 3,000 years. Particularly in the states of Tamil Nadu and Kerala, kalaripayattu is being practised today and is regarded as the original and oldest martial art still in existence on the Indian subcontinent. Kalaripayattu, an ancient martial art in India, is believed to have been transmitted by god Vishnu to sage Parasurama and his disciples. It involves hand-to-hand combat, weapons, and fighting between unarmed and armed individuals. It is closely related to traditional Indian medicine Ayurveda and herbal medicine and uses ancient massage techniques. Kalaripayattu is deeply rooted in Hinduism and teaches students compassion, discipline, and respect. It is taught as a way of life, starting at age 7 or 9, and continuing for life (Sutherland, 2020).

- Onam Festival: Onam is a culturally significant festival in Kerala, celebrated during the Malayalam month of Chingam (August-September). It marks the return of King Mahabali and the start of the Malayalam New Year. The festival is a time for unity, gratitude, and celebration of Kerala's rich cultural heritage. It is associated with the legend of King Mahabali, a virtuous and generous ruler. Lord Vishnu disguised himself as a Brahmin named Vamana, who grew to cover the universe in three steps. King Mahabali offered his head, and Lord Vishnu granted him a boon to visit his subjects annually during Onam. The festival also features the creation of Onam Pookalam, a floral carpet creation, and Onam Sadhya, a lavish vegetarian meal (cultures, 2023).

- Kochi-Muziris Biennale: The Kochi-Muziris Biennale is a well-known art festival in India that features contemporary art from all around the world. The city is transformed into a thriving creative hub by the festival, which features installations, exhibitions, and cultural events (Habib, 2024).

- Cochin Carnival: Every year, during the final week of December, Fort Kochi in Kochi, Kerala, hosts the Cochin Carnival. The final two weeks of December are when this carnival is primarily hosted, and it ends on January 1. Time frame: December (Ernakulam, Culture & Heritage, 2024).

1.4 Urban Development

The urban development of Kochi has been shaped by its role as a commercial and maritime centre. The city's port, one of the oldest in the world, has facilitated trade and cultural exchanges for centuries. In recent decades, Kochi has experienced rapid urbanization, marked by infrastructural advancements, real estate developments, and the expansion of the IT and services sectors. This urban growth poses challenges and opportunities, impacting the city's spatial organization, environmental sustainability, and quality of life for its residents.

1.5 Tourism Dynamics

Kochi, a vibrant port city in Kerala, is known for its dynamic tourism sector that blends historical charm with modern attractions. The city is known for its colonial architecture, St. Francis Church, Matancherry Palace, and Jewish Synagogue. Natural beauty includes Marine Drive, Vypeen Island, and Cherai Beach. Cultural experiences include Kathakali performances and Kalaripayattu demonstrations. Local cuisine includes specialities like Karimeen Pollichathu and Chemmeen Curry. Modern attractions include Lulu Mall and Wonderla Amusement Park. Kochi has seen significant investment in tourism infrastructure, including new hotels and improved transport facilities. It has also become a major stop for international cruise ships, boosting the local economy and attracting tourists (Invis, 2024)

1.6 Potential Tourism Places

a) Fort Kochi

Fort Kochi, located in the western portion of Kerala's Ernakulam district's Kochi city, the distance from Ernakulam Town is roughly 12 kilometres. Kerala's past has been significantly influenced by Fort Kochi. There are other attractions in Fort Kochi, such as the Santa Cruz Basilica. Numerous historical landmarks may also be found at Fort Kochi, including the China Vela, the Dutch Seminary, the St. Francis Church, and the first church built by Vasco da Gama. The Dronacharya, a ship of the Indian Navy, is situated in Fort Kochi. It's close to the Mattancherry Palace. Kerala's first European township was Fort Kochi. Every year on New Year's Eve, the Fort Kochi festival rings in the New Year. This carnival attracts thousands of visitors each year. The carnival also includes other fun activities like car rides (Ernakulam, Fort Kochi, 2024).

b) Hill Palace

Constructed in 1865, Hill Palace serves as both the administrative hub of Cochin and the greatest archaeological museum in Kerala. The 54 acres of the palace are home to 49 locally designed buildings, including the Heritage Museum, Deer Park, Prehistoric Park, Children's Park, and Hill Palace Archaeological Museum. The palace is surrounded by a large number of healing plants. Mondays are now public access days for the Museum Hill Palace. Kochi is approximately 14 miles away from the Hill Palace. Using his own money, the Maharaja of Cochin constructed Hill Palace in 1865. In 1980, the Cochin Royal Family gave the palace to the Government of Kerala. In 1986, the Archaeological Department of the Hill Palace occupied the palace. In 1991, the museum opened. There are eleven galleries as of right now. The Cochin Maharaja and his royal family's antique coins, sculptures, relics, and materials are all on display in the museum (Ernakulam, Hill Palace, 2024).

c) Marine Drive

Marine Drive is regarded as one of Kochi's most picturesque areas. The best spot for locals to hang out is the marine walk, which offers a great view of the port and backwaters (Ernakulam, Tourist Places, 2024).

d) Cherai Beach

Cherai Beach is a swimmer's dream located around twenty kilometres to the side of Vypin Island and the industrial region of Ernakulam. With the backdrop of coconut groves serving as an added incentive, it is a preferred spot for people seeking a tranquil swim. It offers a stunning view of the well-known Cheena Vala well, or Chinese fishing nets. After a satisfying swim, the fresh food from the neighbouring shacks nicely fills you up. This location is known for its distinctive seashells, and dolphin sightings are frequent. It is the perfect fusion of the sea and the backwaters. The region has had a significant influx of new resorts and hotels, contributing to the growth in tourism. With a view that almost makes it impossible to leave once you arrive, it is currently one of Kerala's most popular beaches (Ernakulam, Cherai Beach, 2024).

e) Mangalavanam Bird Sanctuary

The Mangalavanam Bird Sanctuary is located in the Ernakulam district of Kerala State, India, in the city of Ernakulam. It is 0.0274 square kilometres in size and is situated in the centre of Kochi City. This area attracts a lot of migratory birds. The primary draws here are bats and spiders. The smallest protected area within the state forest department's jurisdiction is the Mangalavanam Bird Sanctuary, which was founded in 2004. Situated in the mangrove forests of Kerala, it is the sole bird sanctuary in the state. In Portuguese, the word mangal refers to mangroves. A May 2006 survey revealed that there are 194 species of birds. There are now 72 bird species known to exist in this region. There are another 17 species of butterflies known to exist in this area. Spiders come in fifty-one different varieties (Ernakulam, Mangalavanam Bird Sanctuary, 2024).

f) Thattekkad Bird Sanctuary

Kerala's first bird sanctuary. One of the most well-known ornithologists, Salim Ali, said that this sanctuary has the richest bird habitat on the Indian peninsula (Ernakulam, Tourist Places, 2024).

2. Tourism and its local scenario

Tourism in Kochi

1. Historical Significance:

a) Fort Kochi: This historical region is known for its colonial architecture, including the famous St. Francis Church, the oldest European church in India, and the Santa Cruz Basilica.

- St. Francis Church:

  History: St. Francis Church, also known as Kotta Palli, has a rich heritage. It became an important religious and administrative centre during the Portuguese colonial era. The Portuguese missionaries established the Portuguese Mission in 1500, and the church was built in 1505 after securing permission from the King of Cochin. It served as the cathedral of the Diocese of Kochi until 1558 when the newly built Santa Cruz Basilica took over that role (Tourism K. , n.d.).

  Architecture: St. Francis Church features a blend of Indo-European and Gothic architectural styles. Although it suffered damage over the centuries, it remains a cherished historical site in Kochi.

- Santa Cruz Cathedral Basilica:

  History: The Santa Cruz Cathedral Basilica, also known as Kottepalli, is located in Fort Kochi. Originally built by the Portuguese in 1505, it was elevated to a cathedral by Pope Paul IV in 1558. Despite destruction

by Dutch conquerors in the 17th century, it was spared. The British later demolished it in 1795, and a new structure was commissioned in 1887. Pope John Paul II proclaimed it a basilica in 1984 (Julius, 2024).

Architecture: The basilica showcases Indo-European and Gothic architectural elements. It stands as one of the finest and most impressive churches in India, attracting tourists year-round. Beyond its religious significance, it's a testament to architectural and artistic grandeur (Julius, 2024).

b) Mattancherry Palace: Also known as the Dutch Palace, it showcases beautiful murals and artifacts reflecting the history of the region. This palace is located on the palace road in Mattancherry. It was constructed by the Portuguese. Later, they presented the palace to Veera Kerala Varma (1537-65), the king of Cochin (Ernakulam, Tourist Places, 2024).

c) Jewish Synagogue: Located in Jew Town, it is one of the oldest active synagogues in the Commonwealth of Nations. Mattancherry is known as Jatappalli which is an ancient Jewish worship center in Mattancherry in Ernakulam district. The Sinagogue was built in 1567 by Malabar Jews. The synagogue is known as the oldest synagogue in the Commonwealth of Nations (Ernakulam, Tourist Places, 2024).

2. Natural Beauty:

a) Marine Drive: Marine Drive is considered to be one of the most beautiful part of Kochi city. The marine walk is the main hangout for the local populace as the view of the backwaters and the harbour from here is excellent (Ernakulam, Tourist Places, 2024).

b) Cherai Beach: Cherai Beach is flaunted as one of the excellent beach in the Kerala. It's a picturesque which looks more beautiful with green groves and paddy field (Ernakulam, Tourist Places, 2024).

3. Cultural Experiences:

a) Kathakali and Kalaripayattu Performances: Traditional dance and martial arts performances that provide a glimpse into Kerala's rich cultural heritage.

b) Biennale: The Kochi-Muziris Biennale is an international exhibition of contemporary art held in Kochi, Kerala. The Kochi-Muziris Biennale is an initiative of the Kochi-Biennale Foundation with support from the Government of Kerala (Ernakulam, Tourist Places, 2024).

4. Culinary Delights:

a) Kerala Cuisine: Visitors can enjoy local delicacies such as seafood, appam with stew, Kerala sadya, and more.

b) Cafes and Restaurants: Fort Kochi and Ernakulam areas have a variety of eateries offering both local and international cuisines.

Local Scenario

1. Economy:

- Port Activities: As a major port city, Kochi plays a significant role in maritime trade and commerce.
- IT and Business: The city is also emerging as an IT and business hub, with the Infopark in Kakkanad housing several IT companies.
- Tourism: Tourism is a crucial sector contributing significantly to the local economy.

2. Infrastructure:

- Transportation: Kochi has a well-developed transportation network, including the Cochin International Airport, metro rail services, and extensive road connectivity.
- Urban Development: The city has seen substantial urban development with new residential and commercial projects.

3. Environmental Concerns:

- Backwater Pollution: The backwaters of Kochi face pollution issues, affecting marine life and the livelihood of local communities.
- Waste Management: Waste management remains a challenge, with ongoing efforts to improve recycling and waste disposal systems.

4. Community Life:

- Education and Health: Kochi boasts several reputed educational institutions and healthcare facilities, contributing to a high quality of life for residents.
- Cultural Harmony: The city is known for its cosmopolitan culture, with communities from different religions and backgrounds living harmoniously.

Challenges and Opportunities

- Tourism Development: While Kochi has a lot to offer, there is a need for sustainable tourism practices to protect its natural and cultural heritage.
- Urban Planning: As the city grows, effective urban planning is essential to manage traffic congestion,

housing, and public amenities.

- Environmental Sustainability: Addressing pollution and waste management through innovative and sustainable solutions is crucial for the city's long-term well-being.

- Overall, Kochi is a dynamic city blending history, culture, and modernity, making it a compelling destination for tourists and a vibrant place for its residents

3. Problem and Issues of Kochi

Kochi, a major city in the Indian state of Kerala, faces a range of issues typical to urban centres, as well as some unique to its local context. Here are some main issues:

1. Traffic Congestion

Figure 2: Police vehicles parked at Marine Drive on Monday as part of security measures ahead of the roadshow of Prime Minister Narendra Modi in the city

Source: (Sanesh, 2024)

Like many growing cities, Kochi struggles with heavy traffic congestion, particularly during peak hours. The narrow roads and inadequate public transportation infrastructure exacerbate this problem (Service, Traffic congestion: Plan to widen road stretch from Edappally Junction to Oberon Mall in Kochi, 2023).

2. Infrastructure Development

While Kochi has seen significant development in recent years, there's still a need for further infrastructural improvements, such as better roads, bridges, and public transportation facilities.

1. Flyovers: The Vyttila and Kundannoor flyovers have been completed and are ready for launch. These flyovers are expected to reduce traffic congestion at busy junctions in the city. Additionally, the reconstruction of the Palarivattom flyover, which began in September 2020, is set to open for traffic in mid-2021 (Narayanan, 2021).

2. Water Metro Project: The Water Metro project, a much-awaited initiative, is progressing. Construction of water metro jetties is underway, and the first boat of the project is expected to launch in March. Phase I extension from Petta to SN Junction, including two stations (Vadakkekotta and SN Junction) and a two-lane bridge across the Panamkutty River, is targeted for completion by December 2021 (Narayanan, 2021).

3. Pre-Monsoon Cleaning Drive: Following Operation Breakthrough, which aims to address waterlogging and flooding during monsoons, the new corporation council is rolling out a detailed scientific pre-monsoon cleaning drive starting in March 2021 (Narayanan, 2021).

4. Smart City Kochi: This project focuses on energy-efficient infrastructure, smart technology integration, and the establishment of Wi-Fi hotspots for utility management and economic growth (Krishna, 2024).

5. Cochin Smart Mission: The mission has dedicated several projects to city residents, including improvements in cobblestone pavement, energy-efficient lighting, and better seating facilities (Service, Cochin Smart Mission dedicates 5 major projects to city residents, 2021).

Figure 3: Marine Drive Walkway

Source: (Acres, 2023)

3. Waste Management

Cochin City considered the industrial and commercial capital of Kerala, faces rapid waste generation due to population growth from migration. The city produces 180-250 met**ric tons of solid waste daily** (Hridya K K, 2016)**.**

Figure 4: Garbage piled up under the Rainbow Bridge at Marine Drive

Source: (Service, Waste mismanagement dogs Marine Drive walkway, 2022)

4. Flood Management

Indeed, Kochi faces significant flood risk, particularly during the monsoon season. Factors such as poor drainage systems, encroachments on water bodies, and improper constructions contribute to this vulnerability. In 2018, Kerala experienced devastating floods, impacting millions of people and causing substantial damage (Vohra, 2022). Additionally, climate change predictions indicate rising sea levels, which could further exacerbate flooding and

coastal erosion in Kochi (Sophie Mok, 2021). To mitigate these risks, experts emphasize the importance of holistic, risk-informed planning and sustainable infrastructure development (Linda Regi, 2023).

Figure 5: Flood

Source: (TNN, 2023)

5. Environmental Pollution

While other cities in Kerala showed declining trends, Kochi's pollution levels increased significantly during the winter season (Desk, 2022). After being officially opened in 2008, the waste factory at Brahmapuram has grown to be a significant issue. The city is engulfed in toxic vapours from burning plastic garbage, which is seriously polluting the air. The Indian Air Force, Indian Navy, and Kerala Fire Force are still working to put out the fire. The garbage from multiple municipalities is received by the trash plant, adding to the pollution burden (Rajagopal, 2023).

Figure 6: Loads of plastic waste littered in the backwaters near Marine Drive

Source: (Mathew, 2019)

6. Urban Planning

As more areas become urbanized, it's essential to strike a balance between development and preserving ecologically sensitive regions. (Division, 2022). Urban expansion brings economic growth, increased housing, and improved infrastructure, but it also poses significant threats to natural habitats, biodiversity, and the overall health of the environment.

7. Housing and Slums

Providing affordable housing remains a challenge in Kochi. The city has a significant population living in slums and informal settlements, lacking access to basic amenities and services. The Greater Cochin Development Authority (GCDA), for example, intends to build ninety-nine reasonably priced rental homes in various places (Bureau, 2024).

Figure 7: Slums in Kochi

Source: (Tnn, 2016)

8. Employment Opportunities

Despite being a major economic hub, Kochi faces challenges in providing employment opportunities for its growing population, especially for the youth. There's a need for diversification of the economy and the creation of more job opportunities. Kochi's economy was valued at ₹49,453.29 crores in the 2012–2013 financial year, growing at a pace of about 7.5% annually (Joseph, 2021).

9. Water Scarcity

Because of localized salt issues and rising temperatures, Kochi is experiencing a serious drinking water deficit. Groundwater is already being extracted at high rates by the city, and during the summer months when demand is highest, it is likely to become scarcer. The worst-hit regions are Edappally, Kaloor, Deshabhimani, and Vennala (Nambudiri, 2024).

10. Public Health

Health infrastructure and services need improvement to meet the growing healthcare needs of the population. Issues such as inadequate healthcare facilities, sanitation, and the spread of diseases require attention.

Part B - Marine Drive in Kochi: Case Study

1. Site Study

Marine Drive in Kochi, also known as the Marine Walkway, is a picturesque promenade that offers several attractions and reasons for its popularity. Here are some of the reasons why Marine Drive in Kochi is a well-liked destination:

1. Scenic Beauty: Marine Drive offers stunning views of the Arabian Sea and the backwaters. The walkway provides a tranquil environment for strolls, where you can enjoy the beauty of the sea, boats, and the setting sun.
2. Relaxation: It's a perfect place to relax and unwind, providing a break from the bustling city life. You can sit by the water, enjoy the sea breeze, and take in the serene atmosphere.
3. Shopping and Dining: Marine Drive is lined with various shops, street vendors, and eateries where you can indulge in local cuisine, buy souvenirs, or enjoy street food.
4. Boating: You can hire boats and go for a short ride on the backwaters, which is a popular activity for tourists and locals alike.
5. Sunset Views: The promenade is famous for its breath-taking sunset views. Many people visit Marine Drive in the evening to witness the sun setting over the Arabian Sea.
6. Recreational Activities: The area around Marine Drive has recreational facilities like parks, children's play areas, and exercise spots, making it a great place for families and fitness enthusiasts.
7. Iconic Landmarks: Marine Drive is located near some iconic landmarks in Kochi, such as the Chinese Fishing Nets, Fort Kochi, and the Subhash Park, which adds to its appeal.
8. Evening Entertainment: In the evenings, you may find street performers, artists, and cultural events that add to the entertainment and vibrancy of the area.

Marine Drive is not only a popular tourist spot but also a favourite among the locals for its serene and relaxing atmosphere. It's a great place to enjoy the natural beauty of the coastline while also experiencing the local culture and cuisine.

Figure 8: Various images of Marine Drive, Kochi

Source: (Tourism, n.d.)

1.1 Why Marine Drive?

1. **Commercial Hub** - Beyond its recreational value, Marine Drive also serves as a significant commercial and business centre in Kochi. Several offices and high-rise buildings are located in this area, making it a hub for business and commerce.

2. **Connectivity** - Marine Drive is well-connected to other parts of the city, and it's easily accessible by road. It's also close to popular tourist destinations in Kochi, such as Fort Kochi and Mattancherry.

3. **Urban Development -** Marine Drive has seen significant urban development and beautification efforts over the years. The promenade's modern amenities, cleanliness, and well-maintained infrastructure make it a welcoming destination for locals and visitors.
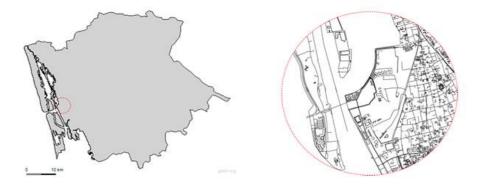
Figure 9: Location map, a) Ernakulam District b) Marine Drive

Source: Author

1.2 Major Influences

Figure 10: a) Mangalavam Bird Sanctuary, b) High Court of Kerala, c) Bolgatty Palace,

Source: (Pradeep717, 2018)

1. Mangalavanam Bird Sanctuary is a small yet ecologically significant bird sanctuary located in the heart of Kochi city, Kerala, India. It is often referred to as the "Green Lung of Kochi" due to its role in maintaining the city's green cover and providing a habitat for various avian species. The sanctuary covers an area of approximately 2.74 hectares and is surrounded by dense human habitation.

2. Inaccurate parking places at the Kerala High Court's location in the heart of Marine Drive contribute to a rise in both automotive and pedestrian traffic.

3. Bolgatty Island is a well-liked tourist destination that sees an upsurge in traffic due to its connection to Marine Drive via the Goshree Bridge.

4. Water transportation and tourism-related revenue are increased by ferry services and other local tourist transportation to Fort Kochi.

5. From all around the city, consumers are invited to the Broadway market.

6. The best place to go for recreation for people of all ages is Subhash Park, which is also close to the Marine Drive Walkway.

Figure 11: a) Chinese Net b) Boat Jetty c) Subhash Park

Source: (India, n.d.)

1.3 History of Marine Drive

1. The beginnings

-   Maharaja's College - Founded in 1985, it holds the distinction of being Kerala's most ancient and largest college.

-   Rama Varma Park - Constructed during the rule of King Rama Varma XV (1895–1914).

-   Shanmugham Road: Shanmugham Road has been interconnecting significant institutions since 1930. It ran along the backwaters before the reclamation of Marine Drive.

-   Land Reclamation: The road was reclaimed from the backwaters in the 1970s and beyond. Following the coastal zone limitations, the idea of motorable marine was shelved. The park was divided in two with the construction of the boat jetty.

Figure 12: a) Location showing Maharaja's College and Rama Varma Park b) Location showing Shanmugam Road and the part of land reclamation c) Construction of the boat jetty

Source: Author

2. Evolution

Figure 13: Evolution of Maps a) 1932 - 1992 b) 1992 - 2020 c) 2020 – Now

Source: Author

3. **Timeline**

- 1902 - Ernakulam Terminus is a decommissioned railway station in Kochi. It is Kochi's first railway station, established by Maharaja Varma.

- 1956 - On November 1, 1956, the Kerala High Court was established.

- 1962 - The sub-jail near the High Court has 16 cells.

- 1980 - The GCDA launched Marine Drive.

- 1984 - Marine Drive's First High-Rise Apartment.

- 2004 - Mangalavanam has been designated as a bird sanctuary.

- 2005 - The bridge's construction was completed on June 5th.

- 2006 - On January 8, 2006, the Ernakulam Central Police Station was built.

- 2013 - Cantilever Beams were used to enlarge the Queen's pathway.

- 2015 - The GCDA initiated a beautification effort.
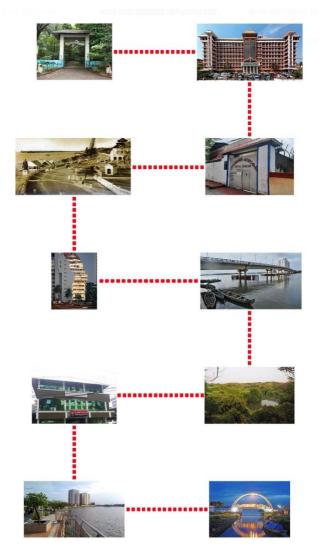
Figure 14: Timeline

Source: (Pradeep717, 2018)

4. During the 1970s

Figure 15: a) GCDA b) Chairman of GCDA -K Chandran Pillai c) Charles Correa d) Kuldip-Singh

Source: (Systems O. , 2024)

50 acres of land were acquired to create Marine Drive. The reclamation of the land was finished in 1974. A third of the reclaimed space was to be set aside for open areas for Subhash Bose Park and the helipad field. The remainder was designated for business and residential use.

5. Infrastructure

Recreational places, hospitals, institutional buildings, religious structures, and commercial structures are examples of social infrastructure. The graphic shows that recreational places account for only 8% of the context's total social infrastructure, excluding residential buildings. Recreational places were disregarded during the planting of the area in the 1980s due to the fast development and the government's demand for monetization. Furthermore, it was accorded less weight. There is a high proportion of commercial structures. This is according to the master plan devised by the government in collaboration with Kuldeep Singh. Commercial spaces were given a high priority in Kuldeep's master plan. Hospitals additionally perform an important role in this area. As a result, there are excellent healthcare services. Institutional buildings encompass the High Court, colleges, and offices, among other things. There is a lot of traffic from all over because of the High Court and important educational institutions.

Figure 16: Infrastructure map and Infrastructure statistics

Source: Author

6. Regional linkage

In terms of regional connectivity, Marine Drive is quite well-developed. People can travel throughout the city using a variety of modes of transportation. The many modes of public transportation include automobiles, buses, ferries, and metros. Although the metro is not well connected, people from remote areas can use it to change modes of transportation. Another significant feature of Marine Drive is its geographical position. It serves as a crossroads

and commercial hub for individuals travelling from east to west and vice versa. So the main advantage of Marine Drive is that, because there are numerous forms of transportation available to consumers, it creates good connectivity and services. As a result of the several other routes available to get from point A to point B, Marine Drive provides a tremendous opportunity as a commercial hub due to its transitional location. The Broadway market is a bustling shopping district. There are numerous possibilities for leisure and business venues. The Marine Drive's vulnerability is that, due to the high volume of pedestrians and traffic, there will be a high density of people and cars. There are also no transit stations or parking spots to accommodate this large number of customers and cars.

Figure 17: Linkage Map

Source: Author

Figure 18: Major Linkage Map

Source: Author

Figure 19: Road Width Map

Source: Author

The widths of the roads are depicted on this map. It can be seen that the road width varies in some spots, creating a bottleneck effect that might cause traffic congestion. Another issue is that, even though the red roads are not main roads, there is still an equal amount of traffic flow that includes the traffic for inside circulation, yet the road width is extremely narrow in comparison to the density of vehicles. The main advantage is the variety of modes of transportation and the availability of various routes for users. There are no suitable crossroads between Shanmugham Road and the Marine Drive walkway. The Marine Drive boardwalk needs extensive restoration. When compared to any other place in Ernakulam, the flow of people offers considerable economic benefits. The floating population is also an excellent user of recreational spaces. Most regions lack an adequate pedestrian walkway. Gutters that are exposed. Roads are in poor condition and are narrow.

7. Activity Analysis

Marine Drive's activities begin extremely early in the morning, at 6 a.m. when individuals from the neighbouring residential neighbourhood arrive for jogging and morning walks. Slowly, the boat service at both jetties begins at 7 a.m., and soon, people begin thronging at the jetties to come to the CBD, since a large portion of employees and students to the region are from Fort Kochi, Vypin, and so on.

Figure 20: a) Apartment Buildings b) Marine Drive Walkway c) Chinese Net

Source: (Deepak, 2011)

Recreational activities are becoming more popular. Since its debut, the Marine Drive walkway bridge has drawn visitors. An extra bridge has also been added. Pedestrians are very relaxed. The promenade provides ample shade from gorgeous shade trees as well as a good view with well-kept asphalt for walking. By 10 a.m., business activity had begun in the food joint on the eastern side of the road. There are also street hawkers. By evening, the activities had peaked, as students from colleges and workers arrived after their working hours. Families are also present. By

11 p.m., activities on the marine road have dwindled. Recreational places are now scarce in the Ernakulam district. The boardwalk along Marine Drive is a popular leisure location, and with the arrival of the metro, this has intensified as people are barred from approaching the walkway owing to traffic congestion on the access roads. Marine Drive is being developed as a result of increased commercial and leisure activities.

Figure 21: Evolution of Marine Drive through different periods a) 1935 b) 1960 c) 1980 d) 2022

Source: (M.Suresh, 2024)
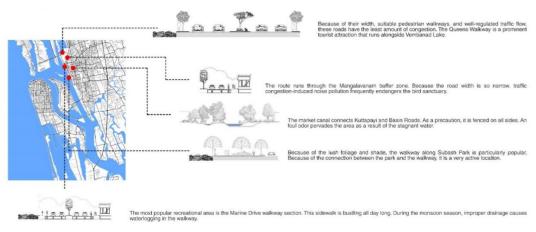
Figure 22: Major Nodes

2. Assessments

2.1 Marine Drive - Greater Cochin Development Authority Development Phase

Table 1: GCDA development plans

 Figure 23: Development Area Plan - Marine Drive	The Marine Drive is one of the most significant projects that GCDA has undertaken. The north part of the Marine Drive stretch is neglected from development and is just used as a transition route. The south part of the marine drive is considered a recreational hub. Most of the planning and development happened towards the south.
 Figure 24: Phase 1 Development	Marine Drive is very developed in terms of education, hospitality, commercial, and religious infrastructure. It is very much saturated in terms of space and thus there is only scope for improving the existing developments.

|

Figure 25: Phase I1 Development	This portion is where the second phase of the development is carried out.

Figure 26: GCDA Development Proposals | Most of the upcoming second-phase development proposals by GCDA are proposed in the area. |
|

Figure 27: Mangalavanam Bird Sanctuary (Red Portion) | It acts as an ecological hotspot due to the presence of the Mangalavanam bird sanctuary and forest, Vembanad Kayal, and other canals that run through the land. |
|

Figure 28:Goshree Island Entry | The area is the only entry point to the Goshree islands. It is also a major transition route that connects other islands to the central core city. |

Activity at major nodes

There was an inland water channel that connected the market to several other areas, allowing commodities to be carried, and the market area is bustling with activity. The canal presently serves as a stagnant drainage system and is heavily polluted. The railway station's original location was chosen because it ran next to the market. There was also a boat jetty next to the market. There was also a boat jetty nearby, which provided access to Mattancherry and Vypin.
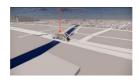
Figure 29: Rainbow Bridge

Source: Author

Analysis

The centre of the city's business activity has historically been Mahatma Gandhi Road, or MG Road as it is called locally. These days, Marine Drive and MG Road comprise the main hub of activities.

2.2 Activity analysis in major junctions
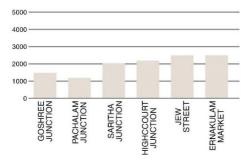
Figure 30: Graph denoting the activity analysis at major junctions

Source: Author
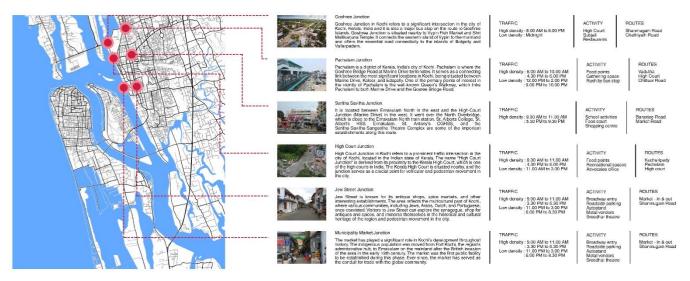
Figure 31: Major Junctions

Source: Author

Marine Drive is a linear stretch connecting commercial, recreational, Tourist, residential and ecological aspects in the area. It is the only transit point connecting the rest of Kochi with the approximately three islands (Le, Vypin, Vallarpadam, and Mulamukadu). Marine Drive's main recreation areas include the:

- Marine drive walkway
- Ketuvallam bridge
- Marine drive boat ferry
- Mangalvavanam bird's sanctuary
- Broadway market
- Broadway street
- Subhash bose park

- Indira Priyadarshini children's park
- Cochin refinery park
- Queen's walkway

User Group

User groups are collections of individuals who share common characteristics, interests, or goals, and who come together for a specific purpose within an organization or community. These groups can be formed for various reasons and can vary significantly depending on the context.

Figure 32: User Groups a) Workers b) Tourists c) Students d) Vendors

Source: (Tree, n.d.)

2.3 Vehicular Density

Marine Drive in Kochi, Kerala, is a bustling waterfront area that attracts both locals and tourists. Vehicular density in this area can vary greatly depending on the time of day, day of the week, and whether there are any special events or holidays.

Factors Influencing Vehicular Density:
1. Peak Hours:
   - Morning (8:00 AM - 10:00 AM): Many people commute to work or school during this time, increasing vehicular density.
   - Evening (5:00 PM - 8:00 PM): The return commute period also sees a rise in traffic.

2. Weekends and Holidays: Traffic often increases during weekends and holidays as more people visit Marine Drive for leisure activities.

3. Tourist Season: Tourist season, typically from December to March, can see a spike in vehicular density due to the influx of visitors.

4. Events and Festivals: Cultural events, festivals, and public gatherings at Marine Drive can significantly affect traffic patterns.
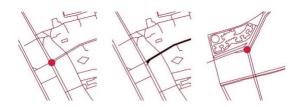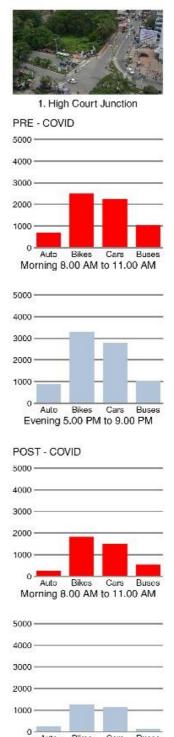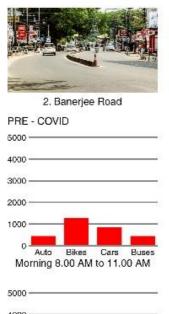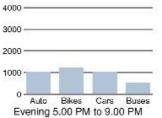
Figure 33: a) High court Junction, b) Banerjee Road, c) Goshree Junction
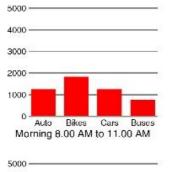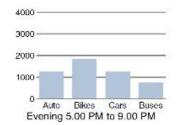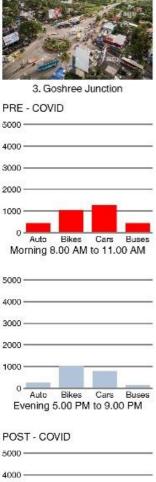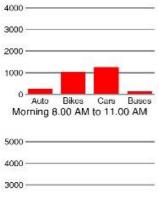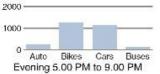
Figure 34: Vehicular Density of the 3 nodes

Source: Author

Typical Traffic Conditions:

1. Moderate to Heavy Traffic: During peak hours and weekends, the area experiences moderate to heavy traffic congestion.
2. Light Traffic: During non-peak hours on weekdays, traffic is usually lighter.
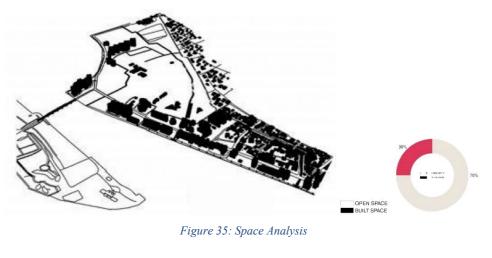
Traffic Management and Infrastructure:

1. Road Network: The road network around Marine Drive includes major roads like Shanmugham Road, which connects to other parts of the city.
2. Public Transport: Buses, taxis, and auto-rickshaws are commonly used, contributing to the overall vehicular density.
3. Parking Facilities: Limited parking space can sometimes add to congestion as drivers search for parking spots.

Suggestions for Mitigating Traffic:

1. Improving Public Transport: The increasing frequency and coverage of public transport can decrease private vehicle reliance. A well-managed system offers reliable and convenient travel options. Expanding routes to suburban and rural areas reduces waiting times and offers flexible scheduling. Integrating different modes and offering affordable pricing makes public transport more attractive to a broader population.

2. Traffic Monitoring: Advanced traffic monitoring systems, using real-time cameras, sensors, and GPS data, optimize traffic conditions, manage congestion, and provide live updates to drivers. They identify bottlenecks, enhance road safety, and inform future urban planning and infrastructure development.

3. Infrastructure Development: Expanding roads, creating parking spaces, and developing pedestrian zones can reduce congestion. Widening existing roads and constructing new ones increases traffic capacity, while multi-level parking facilities prevent vehicle blockages. Developing pedestrian zones in high-traffic areas encourages walking and reduces short car trips.

4. Promoting Non-Motorized Transport: Promoting bicycle and walking usage can reduce vehicular density, with dedicated lanes, bike-sharing programs, pedestrian-friendly infrastructure, public awareness campaigns, and incentives like tax breaks or bicycle subsidies promoting the health and environmental benefits of non-motorized transport.

2.4 Morphology

Figure 35: Space Analysis

Source: Author

On the south side of Marine Drive, there are development towers for both fine and coarse grains. The majority of the developed areas are located along the Marine Drive walkway stretch and the study area's southern edge. The north has a sparse building distribution.
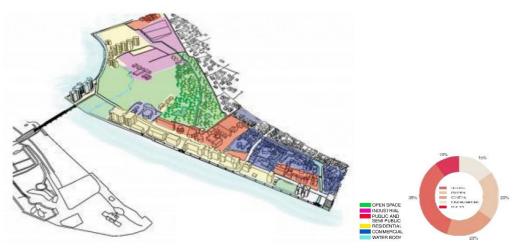
Figure 36: Building Spaces and Water Body Analysis

Source: Author

The area's land use is diverse, encompassing natural, commercial, and residential spaces. 35% of the land is dedicated to the Mangalvanam forest and sanctuary, a vital green space and habitat for various species. The commercial zone, dominated by the Broadway Market, is a hub of economic activity, attracting shoppers and businesses. The residential zone, located on the landward side, offers a serene living environment with housing developments. This balances natural preservation with urban development, promoting ecological sustainability and economic vitality. The land use pattern supports ecological sustainability and economic vitality.

2.5 Building Typologies

Marine Drive in Kochi is a prominent waterfront area known for its picturesque views and vibrant atmosphere. The building typologies in Marine Drive, Kochi, reflect a mix of residential, commercial, and recreational structures. Here are the main types:

1. Residential Buildings

- High-rise Apartments: Modern, multi-story residential complexes offering luxurious amenities like swimming pools, gyms, and landscaped gardens. Examples include DLF Bayview, Galaxy Bridge County, and Prestige Neptune's Courtyard.
- Gated Communities: These are often high-end housing societies with multiple buildings, providing a sense of community along with security and exclusive facilities.

2. Commercial Buildings

- Office Complexes: Multi-storey office buildings housing various businesses, including corporate offices, IT firms, and consultancy services.
- Shopping Malls and Retail Outlets: Large commercial spaces like Bay Pride Mall and Abad Nucleus Mall offer a variety of retail shops, eateries, and entertainment options.

3. Mixed-Use Developments

- These buildings combine residential, commercial, and recreational spaces within a single development. They are designed to create a self-sufficient living environment where people can live, work, and play without having to travel far.

4. Recreational Buildings

- Hotels and Resorts: Luxury and budget hotels catering to tourists and business travelers. Notable examples include The Gateway Hotel Marine Drive and Taj Malabar Resort & Spa.
- Restaurants and Cafes: Numerous dining establishments ranging from fine dining restaurants to casual cafes, offering local and international cuisines.

5. Public Spaces

- Parks and Open Spaces: Marine Drive itself is a popular promenade with landscaped gardens, seating areas, and pathways for walking and jogging.
- Cultural and Event Spaces: Venues that host cultural events, exhibitions, and public gatherings, enhancing the social and cultural fabric of the area.

6. Transportation Hubs

- Boat Jetties and Ferry Terminals: These are crucial for water transport, connecting different parts of the city and nearby islands.
- Bus and Taxi Stands: Providing connectivity to other parts of Kochi and beyond.

7. Healthcare Facilities

- Clinics and Hospitals: Though not as prevalent in the immediate Marine Drive area, nearby regions have healthcare facilities to cater to residents and visitors.

Architectural Styles

The architectural styles in Marine Drive, Kochi, are diverse, reflecting both contemporary and traditional influences:

- Modern Architecture: Characterized by sleek lines, glass facades, and functional design, common in high-rise apartments and commercial buildings.
- Traditional Kerala Architecture: Seen in certain buildings, blending modern amenities with traditional elements like sloping roofs, wooden structures, and open courtyards.

Overall, Marine Drive, Kochi, presents a vibrant mix of building typologies that cater to a diverse population, from residents and business professionals to tourists and shoppers, all set against the backdrop of the scenic waterfront
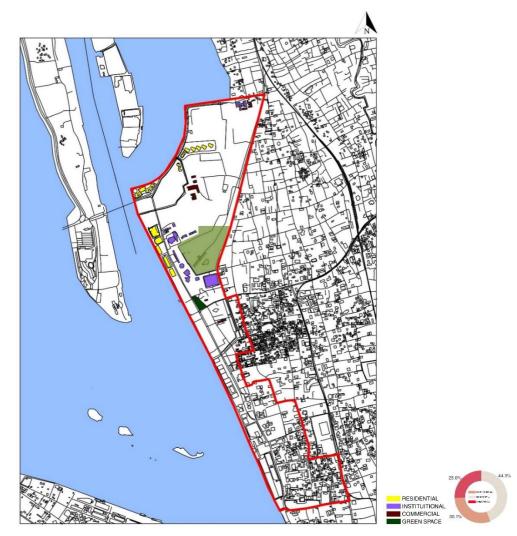
Figure 37: Building Typologies Map

Source: Author

Buildings classified as residential, institutional, and commercial have distinct zonal boundaries. The walkway's landward side is lined with residential structures, while the commercial buildings are located further south. In the south, there is a mixture of institutional and commercial architecture. The study area is divided into solitary industrial structures.

2.6 Built Heights

Marine Drive in Kochi is a prominent waterfront area in the city, featuring a mix of commercial, residential, and recreational spaces. The built heights in Marine Drive vary based on zoning regulations, land use, and specific project designs.

Typically, the buildings in Marine Drive can be categorized as follows:

1. Commercial Buildings: These include shopping complexes, office spaces, and hotels. The heights of these buildings range from 5 to 15 stories, though some may be taller depending on specific projects and permissions.

2. Residential Apartments: Many high-rise residential buildings are found along Marine Drive, often offering views of the backwaters. These buildings typically range from 10 to 25 stories.

3. Mixed-use Developments: Some buildings combine commercial and residential spaces. Their heights also vary, generally falling within the 10 to 20-story range.

4. Government and Public Buildings: There are some government offices and public utility buildings, usually not exceeding 5 to 10 stories.

The exact heights can vary significantly based on the development plans and zoning laws enforced by the local authorities. The Kerala Municipal Building Rules (KMBR) and the Coastal Regulation Zone (CRZ) rules also influence building heights and development in this area.
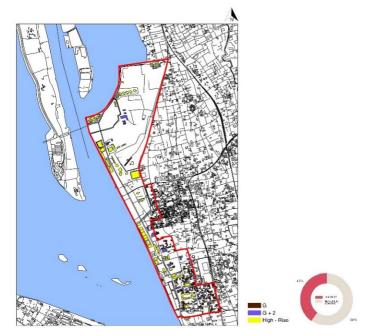
Figure 38: Built Heights Map

Source: Author

Buildings with multiple stories are the most common kind. As a result, Marine Drive has seen relatively little recreational activity, and this situation will continue to deteriorate.

2.7 Built Conditions

In Kochi, Kerala, Marine Drive is a charming boulevard lined by a variety of business, residential, and recreational structures. It is renowned for both its contemporary infrastructure and picturesque views. Several local structures have been rated as good, terrible, or mediocre below based on factors like architectural appeal, maintenance, and overall reputation.

1. Good buildings

Bay Pride Mall, Galaxy Apartments, Premium Neptune's Courtyard, and Abad Marine Plaza are well-maintained, popular buildings with excellent amenities, stunning views, and high-end residential complexes.

2. Moderate buildings

DD Samudra Darshan, Marine Plaza Apartments, Bayview Apartments, and Matthew Green County are residential complexes with decent amenities, moderate maintenance, and good views, but may require better maintenance in some areas.

3. Bad buildings

Oceanus Apartment Complex, Sunset View Apartments, and Sea Breeze Apartments face criticism for poor maintenance, inadequate facilities, and deteriorating condition, making them less desirable than other options.
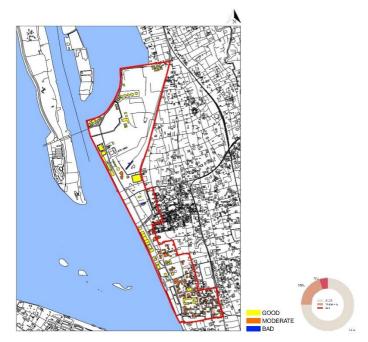
Figure 39: Built Conditions Map

Source: Author

The majority of the structures, particularly those on the site's north and west edges, are in good shape. The remaining ones, particularly those close to the former high court side, are mainly in fair shape and would benefit from the same kind of restoration.

2.8 Functional Districts

Marine Drive in Kochi, Kerala, is a picturesque promenade with stunning views and a variety of activities. It is a major commercial hub with shopping complexes, boutiques, and stores, such as Bay Pride Mall and GCDA Shopping Complex. The area also features residential complexes and apartments, making it a desirable place to live. Marine Drive is a significant recreational zone with attractions like the Marine Walkway and iconic bridges like the Rainbow Bridge and China Net Bridge. The district offers a variety of hotels, restaurants, and cafes catering to diverse tastes. It is well-connected with ferry services and buses and auto-rickshaw services. The area also features public spaces and green areas, including Subhash Park and open spaces along the promenade. Marine Drive is also a significant business district with corporate offices and banks.
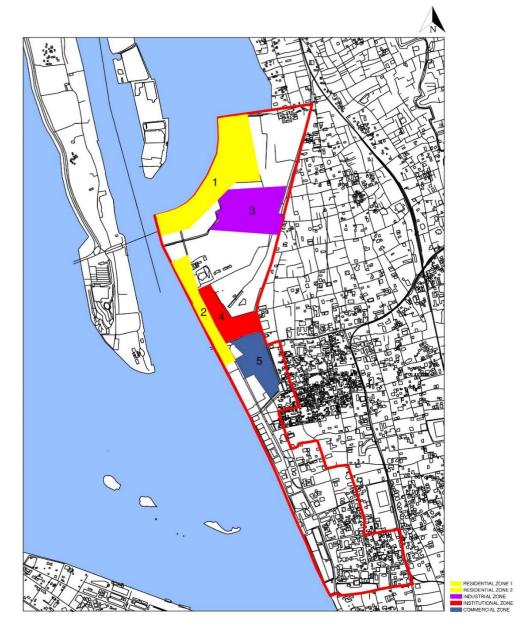
Figure 40: Functional Districts Map

Source: Author

1. Residential Zone 1

The majority of the high and low-rise structures in the residential area face the water body.

Table 2: Residential zone I functions
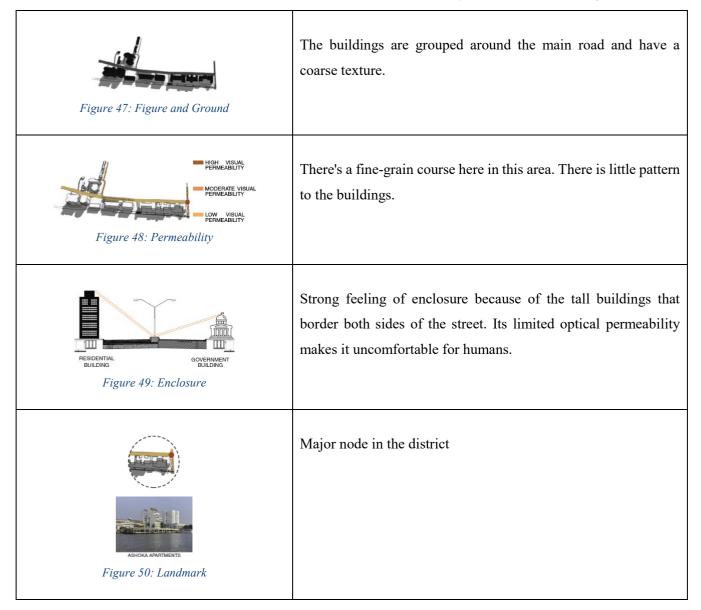
Figure 41: Typology	Most of the structures on the landward side facing the Goshree walkway are residences. The Goshree Islands Development Authority is the building in the left-hand corner.
Figure 42: Figure and Ground	There's a fine-grain course here in this area. There is little pattern to the buildings.
Figure 43: Permeability	There's a fine-grain course here in this area. There is little pattern to the buildings.
Figure 44: Enclosure	The building on the landward side blocks the high visual permeability towards the lakefront.
Figure 45: Landmarks	The Goshree intersection is the district's main hub.

2. Residential Zone

On the landward side, the residential zone is distinguished by high-rise apartment buildings.

Table 3: Residential zone II functions

Figure 46: Typology	There are many high-rise residential complexes in this densely populated area. The district's residential structures are all high-rise apartments.

 Figure 47: Figure and Ground	The buildings are grouped around the main road and have a coarse texture.
 Figure 48: Permeability	There's a fine-grain course here in this area. There is little pattern to the buildings.
 Figure 49: Enclosure	Strong feeling of enclosure because of the tall buildings that border both sides of the street. Its limited optical permeability makes it uncomfortable for humans.
 Figure 50: Landmark	Major node in the district

3. Industrial Zone

The industrial zone is situated in the centre of the location and is distinguished by both high- and low-rise structures.

Table 4: Industrial zone functions

 Figure 51: Typology	There are a lot of industrial buildings in this area. There are no mixed-use buildings.
 Figure 52: Figure and Ground	Because to the buildings' sparse arrangement, a fine grain texture is seen.
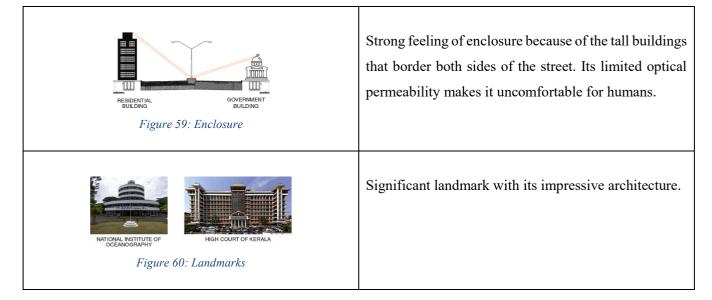
 Figure 53: Permeability	There's a fine-grain course here in this area. There is little pattern to the buildings.
 Figure 54: Enclosure	Because of the vacant area on the left, the enclosure is low.
 Figure 55: Landmark	A renowned urban bird sanctuary also referred to as the "green lung of Kochi."

4. Institutional Zone

Well-kept high-rise structures define this institutional zone.

Table 5: Institutional zone functions

 Figure 56: Typology	Well-kept high-rise structures define this institutional zone.
 Figure 57: Figure and Ground	The Kerala High Court, NIO, and other institutional buildings are primarily located in this district.
 Figure 58: Permeability	This area has a grain course.

Figure 59: Enclosure	Strong feeling of enclosure because of the tall buildings that border both sides of the street. Its limited optical permeability makes it uncomfortable for humans.
Figure 60: Landmarks	Significant landmark with its impressive architecture.

5. Commercial Zone

The market canal is lined with low-rise structures that define this commercial region.

Table 6: Commercial zone functions

Figure 61: Typology	The district is primarily made up of commercial buildings. The buildings are mostly low-rise and grouped.
Figure 62: Figure and Ground	This building, which is organized along the market canal and important roads, has a coarse grain texture.
Figure 63: Permeability	This area has a grain course.
Figure 64: Enclosure	The enclosure is high since it is surrounded by low-rise business buildings on both sides of the roadway.

Figure 65: Landmarks	The enclosure is high since it is surrounded by low-rise business buildings on both sides of the roadway.

2.9 Street Study

The street study will examine Madamakkal Road, Banerjee Road, Goshree Chathiyath Road, Kulki Street, Marine Drive, and Goshree Walkway. Madamakkal Road is a major thoroughfare in the area, focusing on traffic patterns, pedestrian safety, and commercial establishments' impact on movement. Banerjee Road is vital for commuter traffic, and the study will analyze traffic congestion, public transport efficiency, and infrastructure conditions. Goshree Chathiyath Road is crucial for connecting the mainland to the islands via the Goshree bridges. Kulki Street will focus on neighborhood dynamics, street safety, and residential activities. Marine Drive will examine pedestrian traffic, recreational activities, and commercial spaces integration. The Goshree Walkway will examine pedestrian use, pedestrian environment quality, and potential conflicts with other traffic.

Figure 66: Street Map

Source: Author

Figure 67: 3D View of Marine Drive

Source: Author

1. Abraham Madamakkal Road

Figure 68: Abraham Madamakkal Road

- Because it serves as a transit road to Bolgatty and other tiny islands, Abraham Madamakkal Road is one of the busiest highways in the Kochi region.
- The existence of a high court in the vicinity further enhances traffic.

Table 7: Abraham Madamakkal road functions

 Figure 69: Landmark	The high-rise structures on either side of the road are the road's most distinguishing feature.
 Figure 70: Legibility	Straight, legal road with sufficient signalling and signage.
 Figure 71: Edge	Because of the buildings on each side, the edges are active, but there is no defined trail to the north of the road.
 Figure 72: Enclosure	The presence of the high-rise building on both sides of the road creates a strong sensation of confinement. It is unsuitable for humans due to its limited permeability.

Figure 73: Abraham Madamakkal Road Section 1	Commercial and institutional buildings border the right side of the route. A BPCL mall and a BPCL Petrol Pump are among the commercial structures, while the NIO and Marine Fisheries building are among the institutional structures.
Figure 74: Abraham Madamakkal Road Section 2	The landward side of the promenade is densely packed with high-rise residential buildings, giving users a strong sense of enclosure. The facility is seeing an upsurge in pedestrian activity.

2. Kulki Street
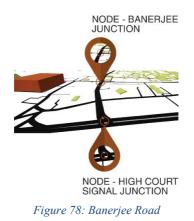
Figure 75: Kulki Street

- A major snack bar situated parallel to Shanmugam Road.
- The Marine Drive walkway and the main road are connected by a link road.
- The Kulikki Sarbath sellers, who set up makeshift shelters to offer snacks and drinks, are situated on the edge.

Table 8: Kulki Street functions

Figure 76: Legibility	Well-defined, visually connected tiled walkways to the walkway.
Figure 77: Edge	Temporary buildings that provide refreshments from street sellers outline the edges.

3. Banerjee Road

Figure 78: Banerjee Road

- One of Kochi's main routes is Banerjee Road. It is located between Ernakulam North in the east and the High Court Junction [Marine Drive] in the west.

Table 9: Banerjee Road functions

 Figure 79: Node	Banerjee Road is connected to the busiest node, High Court Signal Junction, hence there is a lot of traffic going both ways.
 Figure 80: Edge	The Banerjee Road is lined with commercial buildings; as a result, its edges are lively.
 Figure 81: Legibility	Well-defined roads with edges designated for pedestrian traffic.
 Figure 82: Banerjee Road Section	The majority of Banerjee Road's commercial structures, which can only be four stories tall, are located along its borders. Due to its link to two prominent nodes, Banerjee Junction and High Court Signal, this route is extremely congested.

4. Goshree Chathiyath Road

Figure 83: Goshree Chathiyath Road

- Goshree Chathiyath Road is well-known for Queen's Walkway, a pedestrian walkway.
- It also serves as a transition road from Fort Kochi, Bolgatty and other Goshree islands.

Table 10: Goshree Chathiyath road functions

Figure 84: Landmark	The primary landmark in this region is the Prestige apartment buildings, which are easily recognized from a distance.
Figure 85: Legibility	Well-developed roads with edges designated for pedestrians.
Figure 86: Edge	The Queens Walkway, located on the lakeside portion of the route, is a well-liked destination for tourists throughout the evening.
Figure 87: Enclosure	On the landward side, the building blocks the great visual permeability towards the lakefront. However, the landward side has very few structures.

5. Goshree Walkway
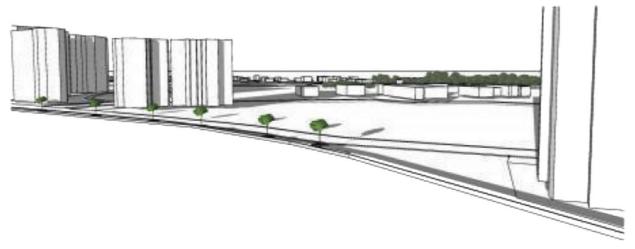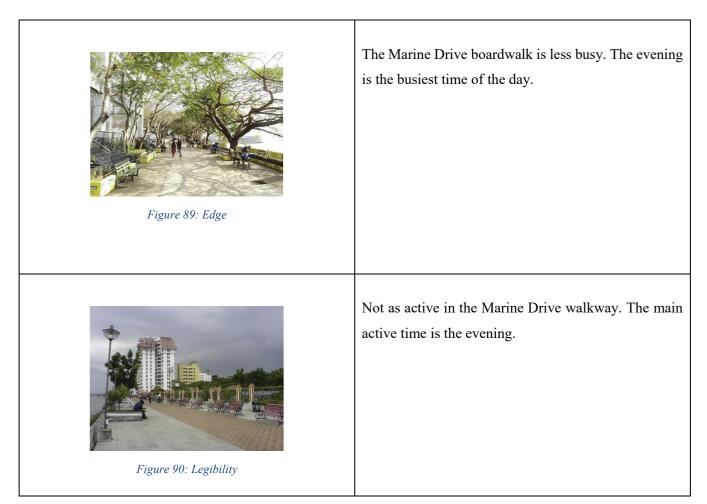
Figure 88: 3D View of Goshree Walkway

Source: Author

The Goshree walkway was constructed as an integral part of Marine Drive's second phase of development. The biggest feature is the cool breeze.

Table 11: Goshree walkway and its functions

Figure 89: Edge	The Marine Drive boardwalk is less busy. The evening is the busiest time of the day.
Figure 90: Legibility	Not as active in the Marine Drive walkway. The main active time is the evening.

6. Marine Drive Walkway

The walkway's landward side is mainly occupied by high-rise residential buildings.

Table 12: Marine drive walkway functions

Figure 91: Edge	The soft landscaping along the pathway and the retaining wall define the edges.
Figure 92: Legibility	Because the walkway is well-defined and tiled, legibility is exceptional.
Figure 93: Landmark	The bridges, including Ketuvalam Bridge and Rainbow Bridge (also known as Mazhavil Bridge), are the walkway's main landmarks.
Figure 94: Marine Drive Walkway Section | There are ledges and lounging spots all along the walkway's lakefront edge. The most significant elements that contribute to the walkway's high density and activity are the view of the lake and the sea breeze. |

2.10 Transportation Maps

Marine Drive in Kochi offers various transportation options, including auto rickshaws, taxis, public buses, ferries and boats, walking, cycling, and private vehicles. Auto rickshaws are available for short distances, taxis and ride-sharing services like Uber and Ola are comfortable for longer distances, public buses connect to nearby areas, and ferries and boats provide scenic routes. Marine Drive is pedestrian-friendly with promenades and walkways.

1. Traffic Intensity

Marine Drive itself is primarily a pedestrian walkway, but the surrounding roads, such as Shanmugham Road and Banerji Road, often see heavy traffic. The best way to avoid traffic congestion when visiting Marine Drive is to use public transport or government-run boat services, which are convenient and avoid road traffic altogether (Tourism, n.d.).
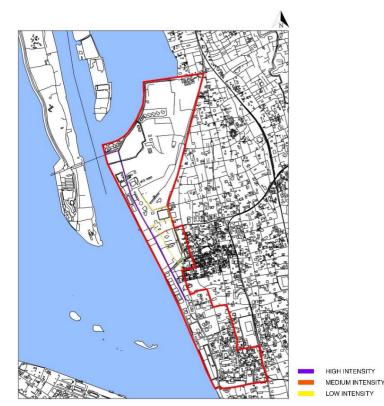
Figure 95: Traffic Intensity Map

Source: Author

2. Auto stands and Bus stands

- Auto Rickshaw Stands: Auto rickshaw stands are prevalent along Marine Drive in Kochi, providing convenient access to a variety of vehicles for city or nearby travel.
- Bus Stands: Marine Drive offers local buses to Kochi and its suburbs, providing cost-effective transportation and connecting nearby towns and neighbourhoods with marked routes and schedules.
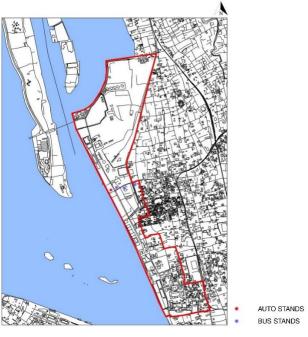
Figure 96: Auto stands and Bus stands Map

Source: Author

3. Bus Routes

Marine Drive in Kochi offers various bus routes to various parts of the city and nearby areas. These routes include Route 1, which connects Marine Drive to Fort Kochi via Mattancherry, Route 2, which connects Marine Drive to Ernakulam Junction (South Railway Station), Route 3, which travels through Vyttila to Kakkanad, Route 4, which goes to Aluva via Edappally, and Route 5, which serves the Marine Drive area.
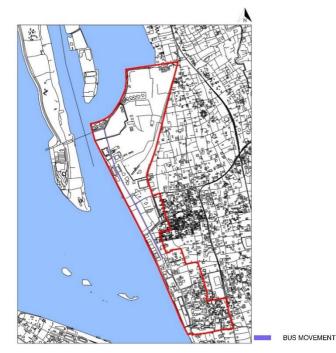
Figure 97: Bus Route Map

Source: Author

4. Road types and Networks

Marine Drive in Kochi, Kerala, is a prominent urban promenade and road that runs along the Arabian Sea's backwaters. It serves as a picturesque promenade with a walkway, ideal for leisurely walks and jogging. A well-maintained road connects various parts of Kochi, providing a vital link for local commuting and transportation.
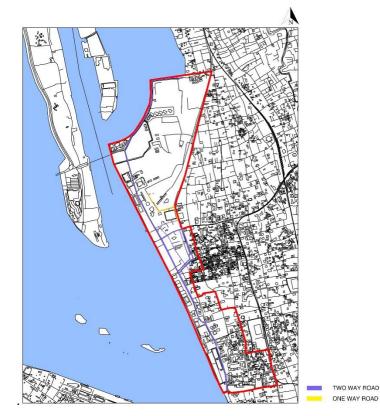
Figure 98: Road Types and Networks Map

Source: Author

Analysis

- There isn't a sufficient parking spot to fizzle down this movement.
- The entire neighbourhood is devoid of street lighting.
- Other than Queen's Walkway, there aren't many pedestrian pathways.
- Abraham Madamakkal Road is an accident-prone zone.
- Widening the roadways will aid in reducing the volume of traffic.
- Create a safe and effective pedestrian network.
- The region will be safer with more street lights.
- Create a divider on Abraham Madammakal Road akin to the one seen on Shanmugham Road.

2.11 Infrastructures

Marine Drive in Kochi, Kerala, is a picturesque promenade with stunning views of the backwaters and Kochi Harbour. It features a well-developed area with various infrastructures and amenities, catering to both locals and tourists. The main attraction is the beautifully landscaped walkway, which offers rain shelters and comfortable seating. The area also features shops, cafes, and restaurants offering a variety of cuisines and local specialties. Visitors can also enjoy traditional Chinese fishing nets and waterfront activities. Public amenities include public toilets, parking spaces, and recreational areas. The Rainbow Bridge offers excellent photo opportunities and panoramic harbor views.

1. Schools/Colleges and Hospitals

Marine Drive, Kochi is home to several schools, colleges, and hospitals. Schools include Cochin Refineries School (CRS) in Ambalamedu, Toc H Public School in Vyttila, Sacred Heart College in Thevara, and Bharata Mata College in Thrikkakara. Hospitals include Medical Trust Hospital in Pallimukku and Lakeshore Hospital and Research Centre in Nettoor. These institutions provide educational opportunities and healthcare services to Marine Drive residents.
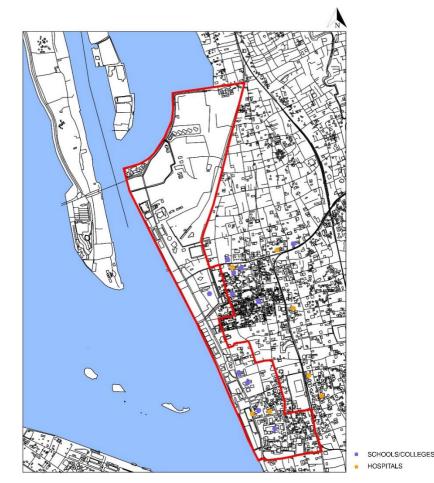
Figure 99: Schools/Colleges and Hospitals Map

Source: Author

2. Religious Buildings

Marine Drive in Kochi features several religious buildings, including St. Francis Church, Santa Cruz Cathedral Basilica, and Sree Gopalakrishna Devaswom Temple. St. Francis Church, one of India's oldest European churches, is where Vasco da Gama was buried. Santa Cruz Cathedral Basilica, a Roman Catholic cathedral, combines Indo-European and Gothic styles. These buildings not only serve as worship sites but also enrich the area's cultural heritage.
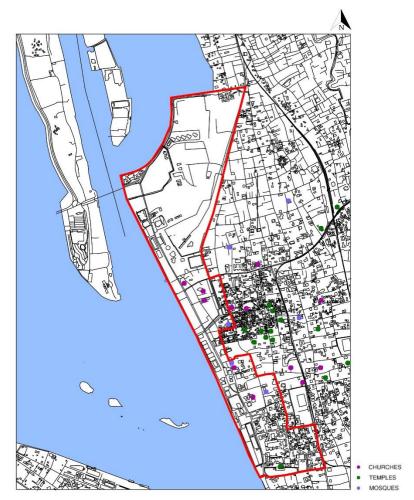
Figure 100: Religious Buildings Map

Source: Author

3. Police Stations, Courts and Bus Stands

Marine Drive in Kochi, Kerala, is a popular area with picturesque views and urban infrastructure. It is home to several police stations, courts, and bus stands. The Central Police Station ensures law and order, while the Ernakulam North Police Station maintains safety. The District and Sessions Court handles civil and criminal cases, while the High Court of Kerala is the highest judicial court in Kerala. The KSRTC Bus Station and Private Bus Stand provide services to the area.

Figure 101: Police Stations, Courts, and Bus Stands Map

Source: Author

4. Street-lights and Transformers

Marine Drive in Kochi is a popular waterfront area with a variety of street lighting and transformers.

These lights are energy-efficient, long-lasting, and can be used for both indoor and outdoor use. LED lights are commonly used, while decorative lights are used for ambiance. The lights are strategically placed on poles to ensure even illumination and are designed to withstand coastal weather conditions. Underwater lighting is also used in some sections to illuminate the backwaters. Regular maintenance by the Kochi Municipal Corporation ensures the lights are functional.

Transformers are critical components in electrical distribution systems, mounted on utility poles to efficiently step down high-voltage electricity from power lines to a lower voltage suitable for use in homes and businesses. These transformers are housed in robust protective enclosures, which serve multiple purposes. Firstly, the enclosures prevent unauthorized access, safeguarding against accidental contact with high-voltage components and protecting against vandalism and theft. Secondly, the enclosures are designed to withstand the harsh environmental conditions they are often exposed to, such as humid and saline environments typically found in coastal areas.
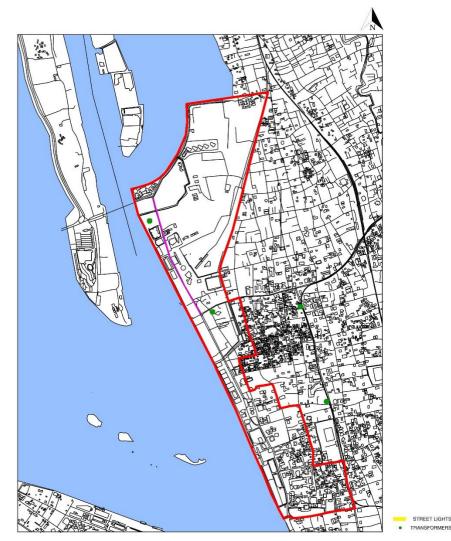
Figure 102: Street-lights and Transformers Map

Source: Author

Analysis

- Marine Drive in Kochi, Kerala, India, is undergoing an infrastructure study to assess its current state and plan for future developments.

- The study includes evaluating the existing road network, public amenities, safety measures, utility services, environmental impact, tourism and economic impact, future development plans, public and stakeholder involvement, regulatory and compliance review, cost estimates, and economic and financial analysis.

- The goal is to enhance the attractiveness and functionality of Marine Drive as a premier destination for residents and visitors.

- The study also includes a review of zoning laws, environmental regulations, building codes and standards, and potential funding sources.

- The goal is to ensure the development is sustainable and economically viable, ensuring the area remains a popular destination for both residents and visitors.

2.12 Governance – The Local Planning Policies

The walkway will be extended even further north as part of Marine Drive's second phase of development, which also includes several large-scale initiatives including Dolphin Park, the Cable Car, and the Laser Show. In order to proceed with the cable car and dolphin park projects, the GCDA has already started talking with foreign specialists.

The recreational projects that are not yet implemented, such the rehabilitation of pathways and helium balloons, are a positive development and a strength.

The city benefits from a proposal that includes the fading refuge.

Figure 103: Opportunities

Source: Author

The lack of ecological precautions taken by the proposals near to the Mangalavanam makes them a concern. The ecology has suffered because tall buildings are permitted and buffer zones are reduced.

Most of the structures and plans that are currently on the table are commercial concrete blocks as a result of the government's monetarization of this area. The government simply takes the context's economic factors into account.

Figure 104 Threats

Source: Author

Abraham Madamakkal Road widening. The 1.1-kilometer Abraham Madamakkal Road, which links Goshree Chathiyath Road and the Goshree Bridges with High Court Junction, is slated to become the first "Smart Road" in the city.

A special shopping center for Shobha groups is being proposed. The site is close to the Goshree intersection and is roughly eighteen acres in size.

At this location, the Kerala State Housing Board (KSEB) has suggested creating an international exhibition city. The project includes hotels, offices, meeting centers, fairs, and exhibition spaces. The 17.9 acres that make up the proposed site.

This is a planned location for Lulu's headquarters. The Lulu group also owns the land.

Renovations are being made to the current Marine Drive walkway. New vegetation and a flat level grass close to the waterfront are features of the makeover. Nothing is suggested to raise the level of awareness or activity.

Adjacent to Banerjee Road, a new commissioner's office is being proposed.

The proposed aquarium complex will feature a 7-D theater dedicated to fish species, an underwater restaurant, a research center and seminar hall, and an underwater tunnel marine fish aquarium. The idea is to create "an under-sea experience" by tunneling under a massive 15 lakh liter water tank.

The idea is to bring the ERG station back to life. The idea is that it might serve as a hub for trains heading north from Ernakulam to Shornur, relieving pressure on the congested Ernakulam Town and Juncion railway stations.

The Marine Drive Walkway above the Backwater Strip runs adjacent to the ropeway/cable car system that connects Marine Drive with Bolgatty Palace. The 1.5-kilometer long ropeway's return station will be located at the northernmost point of the CMDS project area, while its driving station will be located at the Marine driving GCDA shopping complex.

Cleaning of the market canal

The canal that runs a kilometer from Banerjee Road to the Rainbow Bridge on Marine Drive has undergone renovations. Waste dumping and SRT muting measures are taken.

Helium Balloon at Rajendra Maidan.

Figure 105: GCDA Government Policies

Source: Author

Part C – Marine Drive Design Proposal Strategies

1. Why this Proposal?

The proposal for the renovation of the old railway station in Ernakulam is driven by multiple factors:

1. Historical Significance: The old railway station holds historical value and its restoration would preserve an important part of the region's heritage. Renovating it could turn it into a heritage site, attracting tourists and educating locals about the area's history.
2. Urban Development: As Ernakulam grows, there is a need to revitalize old and underused spaces to better serve the community. Renovating the railway station can integrate it into the modern urban landscape, making it functional and aesthetically pleasing.
3. Economic Boost: A renovated station could boost the local economy by attracting businesses and tourists. Heritage sites often become focal points for cultural activities and commerce, benefiting nearby businesses and creating job opportunities.
4. Improved Infrastructure: Modernizing the station can improve transportation infrastructure, easing congestion in other parts of the city. It can serve as an additional transit point, facilitating smoother and more efficient travel within and beyond the city.
5. Sustainability: Renovating existing structures is often more sustainable than building new ones. By repurposing the old station, the project can minimize environmental impact and promote sustainable urban development.
6. Community Space: The renovated station can be transformed into a community space, hosting events, markets, and public gatherings. This can foster a sense of community and provide a venue for local cultural and social activities.

Overall, the renovation of the old railway station in Ernakulam is seen as a multifaceted project that combines historical preservation, urban development, economic stimulation, improved infrastructure, sustainability, and community building. In summary, the renovation of the old railway station in Ernakulam is not just about updating a transportation hub. It is a comprehensive initiative that blends historical preservation with modern urban development, stimulates the local economy, enhances infrastructure, promotes sustainability, and strengthens community ties.

2. The aim and expected outcomes of the proposal

The proposal to renovate the old railway station in Ernakulam aims to achieve several key objectives and outcomes, which can be broadly categorized into the following areas:

Aim:

1. Preservation of Heritage: To preserve the historical and architectural significance of the old railway station, ensuring that its heritage value is maintained and celebrated.
2. Modernization and Upgradation: To modernize the infrastructure and facilities of the station, bringing them up to contemporary standards while retaining the station's historical essence.
3. Improvement of Connectivity: To enhance the connectivity of Ernakulam by providing better railway services, thus boosting the overall transportation network of the region.
4. Economic Development: To spur economic growth by attracting tourists, improving local business opportunities, and creating jobs through the renovation project.
5. Sustainability: To implement eco-friendly and sustainable practices in the renovation process, aiming for energy efficiency and minimal environmental impact.

Expected Outcomes:

1. Enhanced Passenger Experience: A significant improvement in the amenities and facilities available to passengers, including waiting areas, ticketing services, and restrooms, leading to a more comfortable and convenient travel experience.
2. Increased Tourist Attraction: By preserving and highlighting the historical aspects of the station, it is expected to become a notable tourist attraction, drawing both domestic and international visitors interested in heritage tourism.
3. Boost to Local Economy: The influx of tourists and improved connectivity are anticipated to positively impact the local economy, benefitting hotels, restaurants, shops, and other local businesses.
4. Cultural Revitalization: The station can serve as a cultural hub, hosting events, exhibitions, and other activities that promote local culture and heritage.
5. Improved Transportation Efficiency: With upgraded facilities and better service management, the station will enhance the efficiency of train operations, reducing delays and improving overall service reliability.
6. Job Creation: The renovation project is expected to create employment opportunities during and after construction, contributing to local job growth.
7. Sustainable Development: Adoption of green building practices and energy-efficient technologies will set a benchmark for sustainable development in railway infrastructure projects.

Additional Considerations:

1. Community Involvement: Engaging the local community in the planning and execution phases to ensure that their needs and suggestions are incorporated, fostering a sense of ownership and pride.

2. Funding and Partnerships: Securing adequate funding through government allocations, public-private partnerships, and potentially international grants or loans to ensure the financial viability of the project.

3. Long-Term Maintenance: Establishing a robust maintenance plan to ensure the longevity and upkeep of the renovated station, preventing future deterioration.

4. Overall, the renovation of the old railway station in Ernakulam is envisioned as a transformative project that respects the past while embracing the future, aiming to benefit the city and its residents in multiple dimensions.

3. The urban landscape value of the historical former railway station

The urban landscape value of the historical old railway station in Ernakulam can be understood through multiple dimensions, including its historical significance, architectural heritage, cultural impact, and its role in the urban fabric of the city. Here's a detailed analysis:

1. Historical Significance

- Historical Legacy: The old railway station, established during the colonial era, serves as a tangible link to the past, reflecting the historical evolution of Ernakulam and its transformation over time.
- Development Milestone: It played a crucial role in the economic and social development of Ernakulam, acting as a vital node in the transportation network that facilitated trade, movement of people, and economic activities.

2. Architectural Heritage

- Architectural Style: The station building may feature colonial-era architectural elements, which contribute to the aesthetic and historical value of the urban landscape. These elements might include specific styles of masonry, woodwork, and roofing that are characteristic of the period.
- Preservation of Design: Maintaining the original architectural features can enhance the cultural heritage of the city and provide a sense of continuity amidst modern developments.

3. Cultural Impact

- Cultural Identity: The old railway station is likely a landmark that embodies the cultural identity of Ernakulam, serving as a reminder of the city's historical and cultural journey.
- Community Space: It may have been a hub for social interactions and gatherings, thus playing a role in shaping the community's cultural dynamics.

4. Role in Urban Fabric

- Urban Connectivity: The station's historical role in connecting Ernakulam with other regions underscores its importance in the city's urban layout and development patterns.
- Tourism and Education: As a historical site, the old railway station can attract tourists and serve as an educational resource, providing insights into the city's history and heritage.

5. Modern Relevance

- Adaptive Reuse: The station can be repurposed for contemporary uses while preserving its historical essence. This adaptive reuse can blend historical preservation with modern functionality, such as converting it into a museum, cultural center, or community space.
- Urban Revitalization: Preserving and revitalizing the old railway station can contribute to urban regeneration efforts, enhancing the overall landscape and attracting investments and interest in the area.

6. Preservation Efforts

- Conservation Policies: Implementing policies for the conservation and maintenance of the station is crucial for preserving its historical and architectural value.
- Community Engagement: Involving the local community in preservation efforts can foster a sense of ownership and ensure that the station remains a cherished part of the urban landscape.

In conclusion, the historical old railway station in Ernakulam holds significant urban landscape value through its historical, architectural, cultural, and functional contributions to the city. Preserving and integrating this heritage site into the modern urban fabric can enhance the cultural richness and historical continuity of Ernakulam.

4. The main contents of the design proposal

The proposal for Ernakulam's old railway station aims to revitalize and modernize the site while preserving its architectural heritage. Key elements include restoring the station's original architecture, transforming parts into cultural spaces, creating public spaces with gardens, and integrating with local transit systems. The proposal also focuses on community engagement through hosting events and workshops. Sustainable design features energy-efficient lighting, eco-friendly materials, and renewable energy sources. The station will also develop tourism infrastructure and guided tours to boost the local economy. The proposal also includes technological integration, safety and accessibility improvements, and cultural heritage promotion through collaboration with local historians and artists. The goal is to create a vibrant hub for culture, community engagement, tourism, and sustainable urban development. A vibrant hub for culture, community engagement, tourism, and sustainable urban development

involves various elements and strategies. These include cultural institutions, events and festivals, public art, public spaces, community programs, volunteerism, tourist infrastructure, cultural tourism, marketing, sustainable urban development, green spaces, transportation, and community sustainability. Implementation strategies include collaboration with local businesses, enacting policies and regulations, and monitoring progress. By focusing on these elements, cities can enhance quality of life, attract visitors, foster economic growth, and preserve cultural heritage for future generations. By implementing these strategies, cities can create a dynamic and attractive environment that enhances quality of life, attracts visitors, and fosters economic growth. Here's an outline of what such a proposal might include:

1. Introduction

- Project Overview: Brief description of the project objectives and goals.
- Historical Context: Background of the old railway station, its historical significance, and reasons for its preservation and revitalization.

2. Site Analysis

- Location and Accessibility: Detailed analysis of the site location, including its connectivity to the city and surrounding areas.
- Existing Conditions: Current state of the site, including any existing structures, landscape, and infrastructure.
- Environmental Impact: Assessment of the environmental conditions and potential impact of the project.

3. Design Vision

- Conceptual Framework: A vision statement and guiding principles for the design.
- Design Goals: Specific objectives to be achieved through the design, such as preserving historical elements, enhancing public space, and promoting sustainable practices.

4. Architectural Design

- Preservation Plan: Strategies for preserving and restoring historical structures and elements.
- New Structures: Design of any new buildings or additions, ensuring they complement the historical architecture.
- Functional Spaces: Layout and design of various functional spaces, such as commercial areas, public plazas, cultural spaces, and transportation hubs.

5. Landscape Design

- Green Spaces: Creation of parks, gardens, and other green areas to enhance the urban environment.
- Public Spaces: Design of plazas, courtyards, and pedestrian pathways to encourage community engagement.
- Sustainability Features: Integration of sustainable landscape practices, such as rainwater harvesting, native plantings, and energy-efficient lighting.

6. Transportation and Infrastructure

- Connectivity: Plans to improve transportation links, including pedestrian pathways, cycling lanes, and public transit options.
- Parking and Traffic Management: Solutions for parking and traffic flow to minimize congestion and enhance accessibility.

7. Community and Cultural Integration

- Public Engagement: Strategies for involving the community in the design process and ensuring the project meets local needs.
- Cultural Programs: Plans for cultural activities, events, and programs that celebrate local heritage and foster community spirit.

8. Economic Impact

- Commercial Opportunities: Potential for retail, dining, and other commercial ventures that can boost the local economy.
- Job Creation: Employment opportunities generated by the project during both construction and operation phases.

9. Implementation Plan

- Phasing: Detailed timeline for the project phases, from initial planning through to completion.
- Budget: Comprehensive budget, including funding sources, estimated costs, and financial planning.
- Project Management: Governance structure, roles and responsibilities, and risk management strategies.

10. Conclusion

- Summary of Benefits: Recap of the expected benefits of the project for the community, economy, and environment.

- Call to Action: Next steps and actions required to move the project forward.
- This outline provides a comprehensive framework for a design proposal that aims to revitalize the old railway station in Ernakulam while respecting its historical value and enhancing its role in the community.

5. Existing Plans

5.1 Transportation and Connectivity
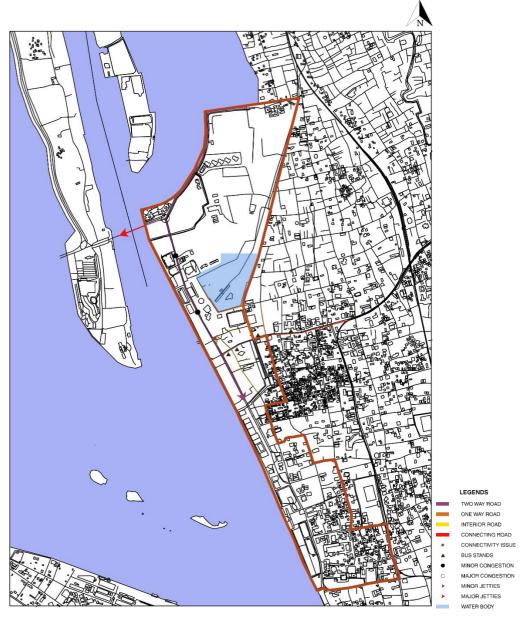
Figure 106: Map displaying the current state of transportation and connectivity

Source: Author

1. Between Abraham Madamakkal Road and High Court Road, there is a connectivity problem. Despite its proximity, the High Court Road remains unutilized, but the Banerji Road is regularly travelled.
2. Abraham Madamakkal Road is severely congested due to high traffic volumes, narrow road width, a lack of street lights, and a lack of traffic signals.

5.2 Recreation and Tourism
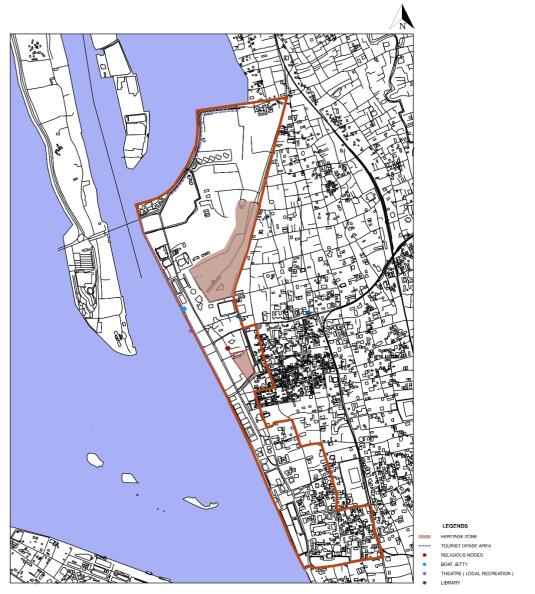
Figure 107: Map displaying the current state of recreation and tourism

Source: Author

Tourism Hub

The context's commercial and heritage value offers leisure and tourism possibilities. Because the environment includes a heritage, residential, and commercial zone, it has the potential to be a hub.

Recreational Zone

Between the heritage core and the urban core, there are possible recreation centres. There are no adequate recreation centres in the neighbourhood.

5.3 Morphology and Governance
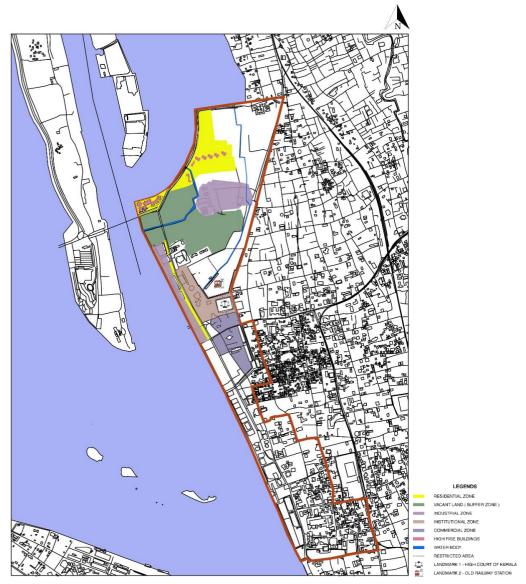
Figure 108: Map displaying the current state of morphology and governance

Source: Author

- The Kerala High Court is both a landmark and an important center of activity.

- The old railway station is a dilapidated structure. It has historic and heritage value.

- There are a lot of high-rise buildings here.

- Proposals that endanger the environment have also emerged.

Figure 109: a) High court b) Old railway station c) High-rise buildings d) Proposals

5.4 Ecology and Activity
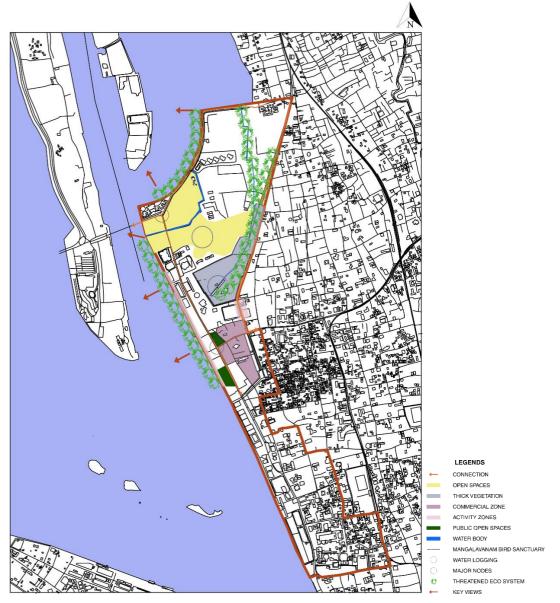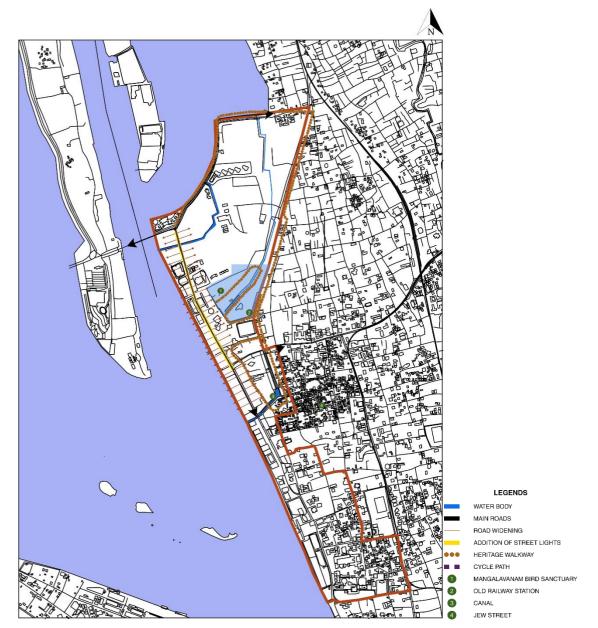
Figure 110: Map displaying the current state of ecology and activity

Source: Author

- The water body and canal are being subjected to waste disposal and siting. They are put to good use.

- Beautiful view of Vembanad Lake.

- Landfill waste poses a harm to the environment.

- Waterlogging in Managlvanam.

Figure 111: a) Market Canal b) Vembanad Lake c) Landfill Waste d) Waterlogging

6. Proposed Plans

6.1 Transportation and Connectivity

Figure 112: Map displaying the proposed state of transportation and connectivity

Source: Author

- Abraham Madamakkal Road requires enlargement because the current width is insufficient for the volume of traffic.

- There should be more street lights installed on Abraham Madamakkal Road, as there are now few.

- A history path connecting Mangalavanam, the ancient railway station, the canal, and Jew Street could be a useful method to connect all of the major historical locations.

- A network of cycling and pedestrian paths connecting significant nodes is an excellent approach to providing much-needed recreational activity for people.

6.2 Recreation and Tourism
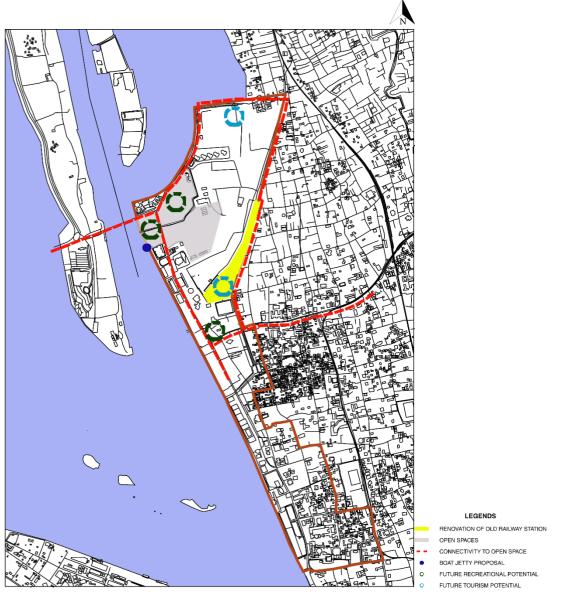
Figure 113: Map displaying the proposed state of recreation and tourism

Source: Author

HERITAGE DISTRICT RESTORATION

Reclaiming degraded historic and cultural areas can enhance their aesthetic and functional value, preserving their historical significance while making them attractive for modern use. This could involve refurbishing old buildings, enhancing public spaces, and creating educational and cultural centers. A boat jetty could provide a practical solution to excessive traffic, reducing congestion and environmental impact. This would also enhance recreational opportunities and create new business opportunities, making the area a desirable destination for both historical exploration and contemporary leisure activities.

6.3 Morphology and Governance
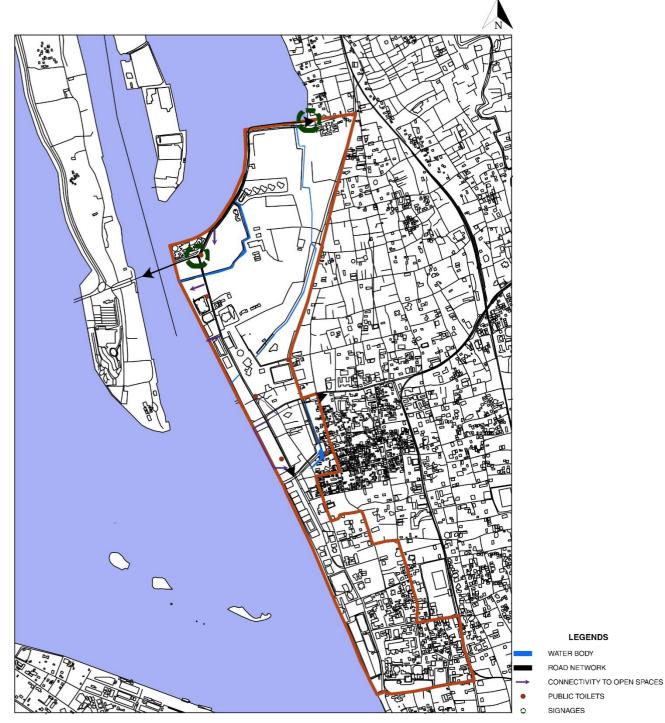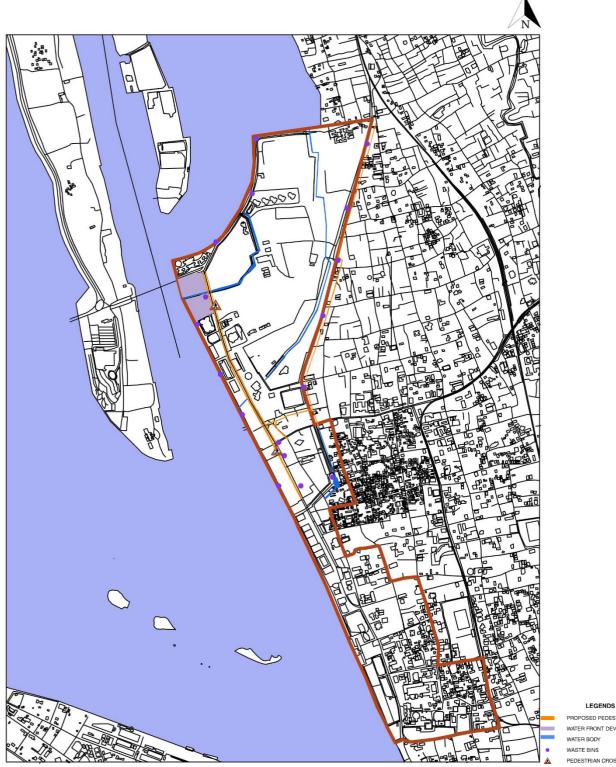
Figure 114: Map displaying the proposed state of morphology and governance

Source: Author

- Potential public areas for enhancing recreational activity are highlighted.
- The restoration of the deteriorating structure, namely the old railway station, for heritage and tourism purposes will ensure that the structure is properly maintained.
- There is appropriate signage.

6.4 Ecology and Activity

Figure 115: Map displaying the proposed state of ecology and activity

Source: Author

- Waste is being dumped in bodies of water and on vacant land. To control this pollution, waste bins are provided.
- To make the roads more user-friendly, proper pedestrian crossings and paths are created.

7. Railway Station Terminus

7.1 Ernakulam City/District Map
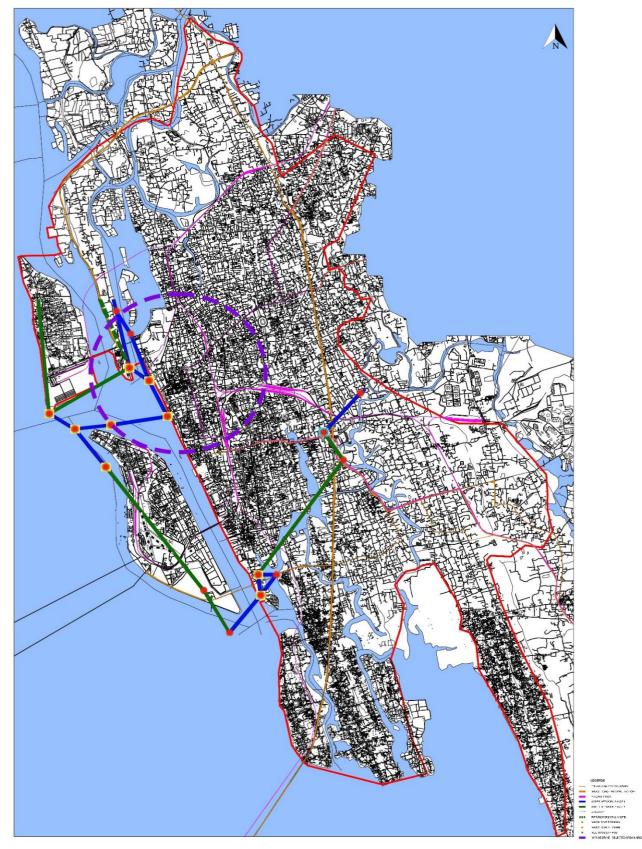
Figure 116: Ernakulam Map

Source: Author

7.2 Marine Drive – Kochi
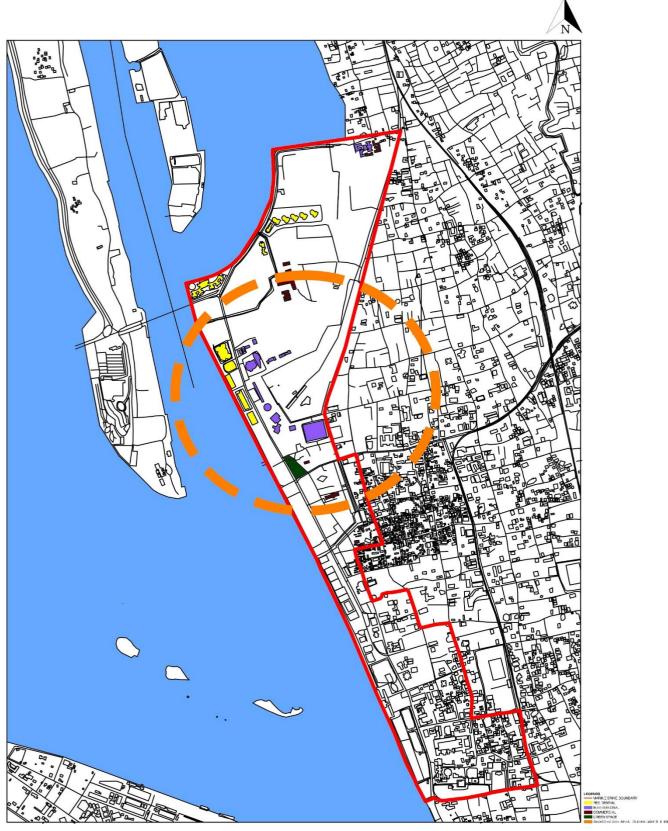
Figure 117: Kochi - Marine Drive Map

Source: Author

7.3 Site – Old Railway Station

Figure 118: Old railway station site

Source: Author

A. Station Warehouse

B. Waiting Hall

C. Single-storey dwellings on the periphery

D. Fisheries Complex Office, Ernakulam

E. High Court of Kerala

F. F. Bar Council, Advocate Generals Office

History

Following Malabar's integration into the British Southem railway network in 1861, the initial concepts for railways were formulated. The Western Ghats kept Kochi mostly isolated from Malabar, therefore a railway connection was crucial to achieving its objectives. Though none of them materialized, a private businessman proposed the concept of joining Cochin. Until the king, H. H. Maharajah Sri Sir Rama Varma XV, received support from his dewan, P. Rajagopalachari, in 1892, the Madras government was not very supportive. The comprehensive plan was given to Mr. Federic Nicholson, but in the end, the state was requested to cover all of the costs associated with installing the lines. The state didn't have enough money to cover the enormous expenditure. At all costs, he was determined to finish the ideal project.

The Raja bravely decided to sell some of the prosperity he was holding; in order to raise money for the project, he actually sold 14 gold elephant caparisons (nettipattams) that belonged to the Sree Poomathrayessa temple along with other embellishments.

Another obstacle for the project arose once the fund was approved. The railway line that connected Angamaly and Edapally went through the former state of Travancore for about eighteen kilometers. The state of Travancore was asked to provide the land needed to establish the railway line in October 1899. On behalf of the State of Cochin,

the Madras Railway Authorities started construction in 1899.

Site selection criteria

Because it was close to the Ernakulam market, the Ernakulam railway terminal was initially built there. The market was connected to other areas of the city by inland water canals as well. As a result, trade grew and it assisted in the movement of commodities.

In order to transport people and commodities to neighbouring locations, there were also ferries and boat jetties close to the station. At the time, it was a significant transportation hub. Old colonial structures from the period of its construction are also housed there.

7.4 Design Proposal – Railway Station Terminus

a) **Transformation of tracks**

In the Indian city of Kochi, Kerala, there is an abandoned train station known as Ernakulam Terminus (Station Code ERG), also referred to as Ernakulam Goods Station or Ernakulam Old Station. This historical station, built by Maharaja Rama Varma, stands as one of Kochi's oldest railway stations. The station witnessed the departure of its first passenger trains on July 16, 1902.

Ernakulam Terminus enjoyed prominence in the early 20th century, serving as a significant hub for passengers and goods. However, its importance began to wane with the opening of Ernakulam Junction Railway Station in 1932 and the Cochin Harbor Terminus in 1943. Despite the new stations, Ernakulam Terminus continued to see limited passenger train service until the 1960s. Gradually, the station fell into disuse, leading to its closure in 1990.

Throughout its operational years, Ernakulam Terminus played host to numerous prominent historical figures. Notable visitors included Mahatma Gandhi, the leader of India's independence movement; Swami Vivekananda, a key figure in the introduction of Indian philosophies to the Western world; and Rabindranath Tagore, the celebrated poet, writer, and Nobel laureate. The presence of these distinguished individuals underscores the station's historical significance.

 Today, Ernakulam Terminus stands as a relic of Kochi's rich railway heritage, echoing the city's past while marking the progress and changes that have shaped its transportation landscape. Once a bustling hub that played a crucial role in connecting Kochi to other parts of India, the terminus now serves as a historical landmark, reminding us of the pivotal role railways have played in the region's development. Its architecture and surroundings narrate stories of a bygone era, when trains were the lifeline of trade and travel.

b) **Site Images**

Figure 119: Site images - Old railway station

Source: (Vinay, 2019)

c) **Transformation of Tracks – the narrative**

Taking you to the past through an abandoned railway station located at Ernakulam, Cochin. This station holds a significant place in the history of Cochin, Kerala, as it was the very first railway station established in the region. When it was operational, it was one of the busiest stations in southern India, serving as a crucial hub for passengers and freight alike.

The station's prominence, however, began to decline with the construction of the Ernakulam Junction station. The new junction offered more modern facilities, better connectivity, and could accommodate more trains, leading to a gradual shift in passenger and freight traffic away from the original station. Over time, the old Ernakulam station fell into disuse and was eventually abandoned, leaving behind a quiet testament to its once vibrant past.

Walking through the now silent platforms and overgrown tracks of this abandoned station, one can almost hear the echoes of bustling activity from days gone by—the arrival and departure of trains, the chatter of passengers, the calls of vendors, and the hum of daily life that once filled this space. It stands as a historical monument, a reminder of the pivotal role it played in connecting Cochin to the rest of Kerala and beyond, and a symbol of the ever-changing nature of progress and development in transportation.

Getting into the Ernakulam terminus: At the railway station, we travel through the journey of time, engage through space, and get to see how it is developed through ages, which signifies the importance of time. The first building shows the period remake which evokes our memories and brings in images of the past. When we exit out of the period room, we get to see the display of the locomotive engines, which also attracts visitors. From there, they move into the gallery space, which displays the timelines, events, sculptures, artifacts, and models of the station. Eventually we also get to see the development in the building we pass

through. From the age old buildings to the contemporary containers. Then moving to the most contemporary part, which is the interactive zone and the shopping plaza, which also has some hands-on experience and workshops for the local arts of Kerala which then takes us to the bogie which has restaurants and cafes. Through this journey, they travel through time and know the importance of the past, present, and future. Moving through the spaces one can clearly see that the paradoxes can't be denied. It has a lot of binaries which include old - new, nature — man-made, Wide- narrow, still the space remains cohesive.

Why not reconstruct?

Critical reconstruction exacerbates the paradox because, while it aims to rebuild and modernize urban areas, it often erases the tangible remnants of history that future generations need to fully understand and appreciate their heritage. When these physical traces are removed, future generations are left with only intellectual knowledge, which lacks the depth and emotional connection that physical remnants provide. The presence of historical structures and artifacts is essential for accurately documenting and interpreting the history of a city. They serve as concrete links to the past, evoking memories and stories that might otherwise be forgotten. By maintaining these physical connections, we foster a sense of continuity and awareness, ensuring that future generations recognize the importance of preserving and protecting their historical heritage.

d) Master Plan

Figure 120: Master Plan

Source: Author

7.5 Buildings

1. Periodic Recreation

a) Plan
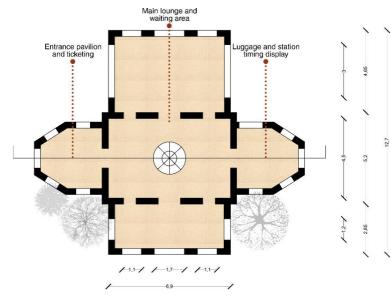
Figure 121: Periodic recreation plan

b) Section

Figure 122: Periodic recreation section

c) Elevation
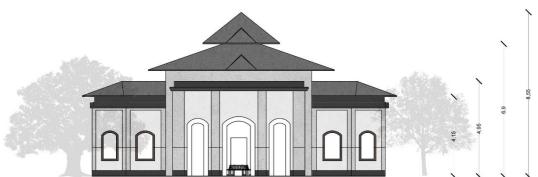
Figure 123: Periodic recreation elevation

2. Containers

a) Plan

Lower deck
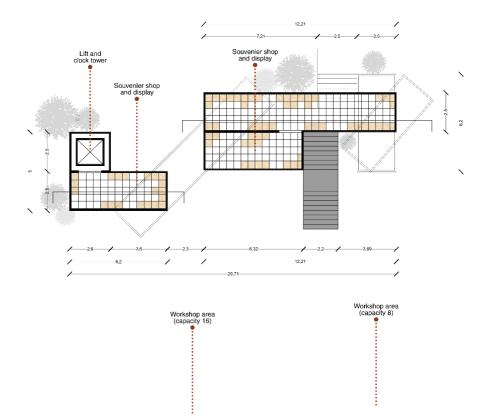
Figure 124: Containers plan - lower deck

Upper deck
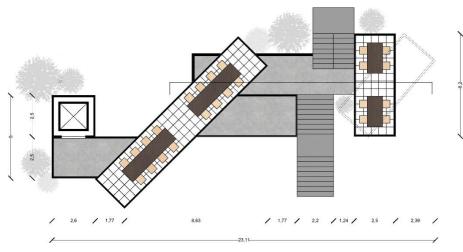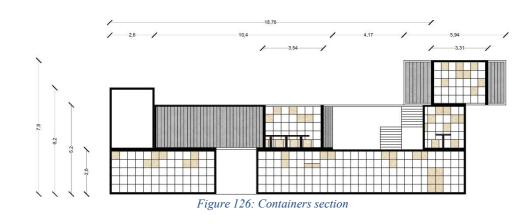
Figure 125: Containers plan - upper deck

b) Section

Figure 126: Containers section

c) Elevation
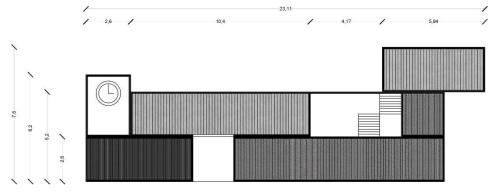
Figure 127: Containers elevation

3. Bogie Restaurant

a) Plan
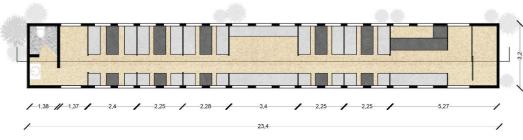
Figure 128: Bogie restaurant plan

b) Section
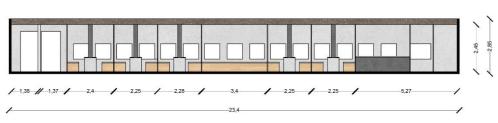
Figure 129: Bogie restaurant section

4. Museum

a) Plan
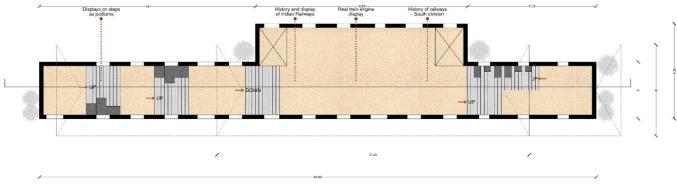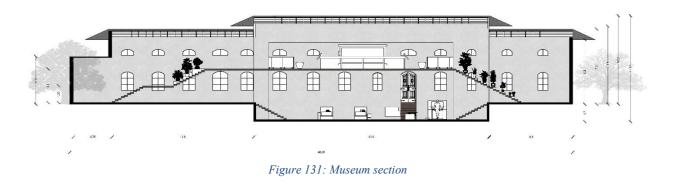
Figure 130: Museum plan

b) Section

Figure 131: Museum section

c) Elevation

Figure 132: Museum elevation

7.6 Building Contexts

1. Periodic recreation

Periodical remake of Ernakulam railway station: 1900's – 1930's

Elements:

1. Railway clock
2. Ernakulam railway station train timings
3. Ticketing area, Typewriter
4. Baggage trunk areas
5. Announcement boards
6. Statues – Gandhiji, Swami Vivekananda, Rabindranath Tagore

Materials:

a. Flooring – Red oxide flooring

Red oxide flooring is a traditional and durable flooring material used in India for decades. It is made from a mix of red oxide pigment, cement, and water, with sometimes additional ingredients like sand or marble dust. The flooring has a deep red or reddish-brown colour, giving it a warm and earthy aesthetic. Its surface is smooth and can be polished to a high gloss, and over time, it develops a natural patina. The installation process involves cleaning the floor and mixing the red oxide pigment with white cement, water, and sometimes sand or marble dust. The floor is then cured and polished to achieve the desired level of gloss. Red oxide flooring offers aesthetic appeal, durability, cost-effectiveness, and eco-friendliness. It is commonly used in residential, commercial, and educational spaces. Its cultural significance extends to South India, where it is a cultural choice reflecting traditional building practices and local aesthetics.

b. Wall – Brick wall, Concrete plastering

- Brick wall: Brick walls are durable structures made of bricks, typically fired clay or concrete. They are known for their fire resistance and aesthetic appeal. The construction process includes foundation, mortar, laying bricks, courses, and joints, which are filled with mortar and finished in various ways.

- Concrete plastering: Concrete plastering is the application of a mixture of cement, sand, and water to create a smooth finish on surfaces like walls and ceilings. It involves surface preparation, mixing, application, levelling, floating, and curing. Brick walls provide strength, insulation, aesthetics, and fire

resistance, while concrete plastering creates a uniform surface, seals it from moisture, and is versatile for both interior and exterior use.

c. Roof – Pitched tile roof

A pitched tile roof is a sloped roofing system that uses tiles as the primary material for covering and protecting the structure beneath. The roof has a noticeable angle, typically more than 15 degrees, allowing for efficient water drainage and minimizing water pooling. Common materials for roof tiles include clay, concrete, slate, and metal or composite materials. Tiles come in various shapes and sizes, providing different visual effects and functional properties.

Installation involves underlayment, fastening, overlapping rows, ridge and hip tiles, and gutters and downspouts. Benefits of a pitched tile roof include durability, aesthetic appeal, weather resistance, and energy efficiency. However, they are heavier than other roofing materials, requiring a strong roof structure. The initial installation cost may be higher than other materials, but the longevity and durability justify the investment.

Landscape:

-   Coconut tree
-   Neem tree
-   Gulmohar tree
-   Raintree

Figure 133: Reference images for the periodic recreation

2. Containers – Souvenir and Workshop area

Souvenirs

Workshop areas (capacity 8-15)

Display areas

Materials:

a. Shipping Containers – High-quality corten steel

High-quality Corten steel, also known as weathering steel, is a group of steel alloys that were developed to eliminate the need for painting and form a stable rust-like appearance after exposure to weather. This material is widely appreciated for its unique aesthetic, durability, low maintenance requirements and resistance to atmospheric corrosion.

Composition - High-quality Corten steel typically contains:

- Carbon (C): 0.12% max
- Silicon (Si): 0.25-0.75%
- Manganese (Mn): 0.20-0.50%
- Phosphorus (P): 0.07-0.15%
- Sulfur (S): 0.030% max
- Copper (Cu): 0.25-0.55%
- Chromium (Cr): 0.30-1.25%
- Nickel (Ni): 0.65% max

Its corrosion resistance and rust-like appearance make it a popular choice for architectural projects and outdoor sculptures. Corten steel is suitable for harsh weather conditions and has minimal maintenance requirements. It is used in various applications such as bridges, facades, roofs, and landscape elements. Its low maintenance requires only occasional inspection, especially in pollution or salt-contaminated environments. Corten steel is also eco-friendly, contributing to sustainable building practices and reducing resource consumption.

b. Vertical Planes – Reflective mirror planes

Reflective mirror planes are crucial in the study of symmetry in various scientific fields, including crystallography, physics, and chemistry. They are hypothetical planes that divide an object or system into two halves that are mirror images of each other. When an object or molecule is placed in front of a mirror, the plane represents the reflective mirror plane. Reflection across this plane is a symmetry operation, meaning the object

appears unchanged when reflected. Types of reflective mirror planes include vertical, horizontal, and diagonal. Mirror planes can influence molecule properties, such as polarity and chirality, and can simplify pattern recognition in computational fields and image processing.

c. Interiors: Steel grid structure, Steel lightweight furniture, Steel panels for souvenir display

- Steel grid structure: Steel grid structures are robust, flexible, and versatile structures made of interlocking steel bars or beams. They are used in architectural frameworks, bridges, and industrial buildings for supporting heavy loads and machinery. Key characteristics include high strength-to-weight ratio, durability, versatility, and ease of installation due to prefabricated components.

- Steel lightweight furniture: Steel lightweight furniture, including chairs, tables, shelves, and storage units, is a blend of strength and modern design, offering functionality, durability, and aesthetic appeal. Its minimalist design, easy mobility, resistance to wear and tear, and easy maintenance make it suitable for both indoor and outdoor use.

- Steel panels for souvenir display: Steel panels are versatile and sturdy backdrops for displaying souvenirs in retail settings, museums, or exhibitions. They offer a modular design, customizable sizes, finishes, and colours, and are durable and easy to install. They are suitable for retail displays, museums, exhibitions, and trade shows, providing organized and professional presentations.

Landscape

- Coconut tree
- Neem tree
- Gulmohar tree
- Raintree

Figure 134: Reference images for the containers
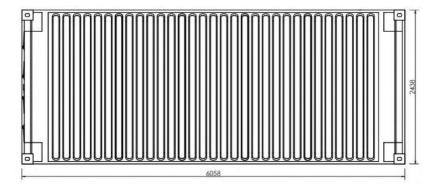
Figure 135: 20ft Shipping container - roof plan
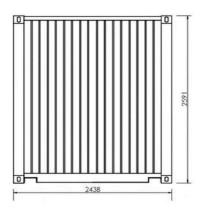
Figure 136: 20ft Shipping container - front elevation

3. Bogie restaurant

Materials

a. Bogie – external existing structure

A bogie is a wheeled chassis or frame designed to support and carry heavy loads, often used in vehicles like trains, trucks, and military equipment. They are typically made from robust materials like steel or aluminium alloys, and their size and shape vary depending on their intended use. Bogies have multiple wheels, bearings, suspension systems, couplings, mounting points, protective coverings, and access panels. Brake discs or drums provide stopping power, while control linkages connect the braking system to the vehicle's main control mechanisms. Bogies have identification plates and paint and finish coatings that resist corrosion and weathering. They are often aerodynamically optimized to reduce drag and improve fuel efficiency. Safety features include reflective markings and emergency braking or derailment prevention systems. Overall, bogies are meticulously engineered structures that ensure stability, safety, and operational efficiency for the vehicles they support.

b. Vertical fluted wall panels

Vertical fluted wall panels are architectural elements with narrow, vertical grooves or channels running the height of the panel. They are made from wood, metal, plastic, or composite materials, with the groove design influencing the panel's texture and visual impact. These panels are commonly used in interior design and architecture to add texture and visual interest to walls. They can be installed vertically or horizontally, and can be customized in terms of groove spacing, dimensions, and finish options. The vertical grooves create dynamic patterns of light and shadow, enhancing the visual depth of a space.

c. Foldable/adjustable table tops

Foldable and adjustable table tops are versatile pieces of furniture that offer flexibility and convenience. They can be folded into smaller sizes for easy storage and transport, and some models also offer adjustable height settings. These tables are made from lightweight yet durable materials like HDPE, plywood, or metal, and have a surface finish ranging from smooth plastic to textured finishes. They are designed for durability, with reinforced legs and support structures for stability. Foldable tables are ideal for events, picnics, camping, and other temporary or portable situations. They can serve as dining tables, work surfaces, craft tables, or buffet stations. Setup is straightforward, and they come in various shapes and sizes. Modern designs often incorporate safety features like locking mechanisms to prevent accidental collapse or slipping.

d. Pantry doors – mirror panel

Pantry doors with mirror panels are a unique combination of functionality and aesthetics. They consist of a sturdy frame surrounded by a large central mirror panel, which can be made of sleek metals or classic wood finishes. These doors serve a dual purpose, providing a full-length mirror for quick outfit checks and concealing pantry contents for easy access. They also offer aesthetic benefits such as space enhancement, light reflection, and style versatility. However, regular cleaning is required to maintain clarity and safety. These doors are popular among homeowners seeking to optimize space and aesthetics in their kitchens.

Landscape

- Coconut tree
- Neem tree
- Gulmohar tree
- Raintree

Figure 137: Reference images for the bogie
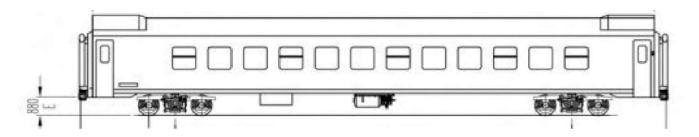
Figure 138: Bogie elevation

Figure 139: Bogie interior area

4. Museum Gallery

Gallery displays:

- Top gallery
- History of Indian railways and artifacts
  - Photographs, models, important events in the history of railways dated
  - Display means – through light box pedestal

- Basement gallery: History of south Indian railways

Materials

a.   Flooring – Red oxide flooring

Red oxide flooring is a traditional, durable, and eco-friendly flooring material in India, made from a mix of red oxide pigment, cement, water, and sometimes sand or marble dust. Its deep reddish-brown colour and smooth surface make it suitable for residential, commercial, and educational spaces. Its cultural significance extends to South India, reflecting traditional building practices and local aesthetics.

b.   Wall – Brick wall, Concrete plastering

•   Brick wall: Brick walls, fire-resistant and visually appealing, are constructed using fired clay or concrete bricks, foundation, mortar, brick laying, courses, joints, mortar filling, and finishing.

•   Concrete plastering: Concrete plastering is a process of applying a cement, sand, and water mixture to walls and ceilings, providing strength, insulation, aesthetics, fire resistance, and versatility.

c.   Roof – Pitched tile roof

A pitched tile roof is a sloped system using tiles for protection and water drainage. Common materials include clay, concrete, slate, and metal. Installation involves underlayment, fastening, and overlapping rows. Benefits include durability, aesthetic appeal, weather resistance, and energy efficiency. Although heavier, the initial cost may be higher.

Figure 140: Reference images for the museum

7.7 3D Views of the project

Figure 141: Overall view of the site

The image shows the top view of the entire site of the renovated railway station, Ernakulam. The site is about 42 acres and it is located on the Marine Drive, Kochi. The site comprises 4 dimensions a periodic recreation building, container massing, a bogie restaurant, and the museum gallery. There is also a café space with co-working space provided. There is a 3-storey twin tower building automated multilevel parking area and public space is provided between the two towers. There is also the presence of water bodies on the site.

The features of the system's sequential organization from the point of entry to the exit across the site, ensuring that every zone is covered without repetition, are referred to as the 4 dimensions. The track shows the linearity and directionality throughout the site. The orientation of the buildings is also aligned to the track which guides movement. There is a common entry and exit point for the visitors which aids in the tick-in process a guided circulation. By regulating the flow and direction of movement, circulation—such as walkways and pathways—can serve as a wayfinding aid, directing users across space and influencing their experience. Continuous route that travels from one unit to the next and emerges at the same location. Three main places of interaction include the cafe area with co-working spaces, the amphitheatre between the two apartments, and Zone 1 near the clock tower. These sections of the museum also draw more visitors and add to its overall usage. Landscaping elements such as trees, shrubs, and hedges, can act as natural partitions, defining different zones within a space and creating a sense of separation and enclosure. Also, the native trees and shrubs create a connection and memory with the place. Water bodies can act as a reflective surface, mirroring the surroundings, which can visually expand the perception of space.

Figure 142: Main Entrance

This area serves as the entrance to the railway station terminus, a bustling hub of transportation and connectivity. Dominating the scene is a prominent name board affixed to the station building, clearly identifying the location for travellers and visitors alike. Adjacent to the name board, a towering clock stands as a striking focal point, not only marking time but also adding a touch of historic charm to the surroundings.

In the backdrop, two substantial buildings rise, integral to the expansive railway project. The first building on the right acts as a periodic recreation and serves various functions crucial to the station's operations, from administrative offices to service facilities, the second building on the left, partially visible in the scene, adds a cultural dimension to the railway terminus with its museum galleries. These galleries provide a historical and educational perspective, showcasing the rich heritage of the railway system, its evolution over the years, and its impact on the region. The museum not only serves as a tourist attraction but also enriches the travel experience for passengers, offering them an insightful glimpse into the past and present of railway transportation.

Positioned strategically, the entrance enjoys proximity to a bustling main road, which enhances both accessibility and visibility. This strategic placement not only facilitates easy access for commuters arriving by various means but also ensures that the terminus is a prominent landmark visible to all passing by.

Overall, this entrance area is not just a gateway to the railway station but a vibrant intersection where functionality meets architectural prominence, seamlessly integrating into the urban landscape while serving as a beacon of connectivity and transport efficiency.

Figure 143: Periodic recreation building

The Periodic Recreation Building, an iconic yet neglected structure at the Ernakulam railway station, has undergone extensive renovations to restore its former glory and repurpose it for contemporary use. The building, the sole remaining structure from the original railway station complex, has been meticulously restored to preserve its architectural integrity and transform it into a dynamic space celebrating the rich history of the Indian Railways. The restoration includes a clock tower, a serene water body, and interactive displays that detail the development of the railway system, milestones, and notable figures in railway history.

The renovated building is designed to be an immersive museum that narrates the history and evolution of the railways, incorporating modern technologies to provide an engaging experience for visitors. Interactive displays feature touchscreens and multimedia presentations, while audio guides offer narrated tours of the exhibits in multiple languages. Virtual Reality (VR) experiences allow visitors to experience historical railway journeys and witness the construction of early rail lines.

The building serves as an educational hub, chronicling the rich heritage of the Indian Railways through well-curated exhibits. It aims to preserve history by securing and displaying artifacts related to the railways, educate visitors through educational programs and workshops, and engage the local community through events, lectures, and interactive sessions. The renovation has breathed new life into the structure, making it a testament to the enduring legacy of the Indian Railways and a beacon of historical education and cultural preservation.

Figure 144: Container massing

Figure 140 illustrates the strategic placement and arrangement of shipping containers repurposed for specific functions within a project. The containers are positioned to optimize functionality and aesthetics, aligning with the project's objectives of creating interactive spaces for souvenir displays and workshops. The containers are designed for souvenir displays, showcasing local crafts, memorabilia, and unique items. They are placed in high-traffic areas to maximize visibility and footfall, with interior layouts designed for easy browsing and aesthetics.

Workshop areas are designed to host interactive sessions, classes, and small group activities, accommodating 8-16 people. The containers are designed with efficient use of space, amenities, and proper ventilation and lighting. The project chose an abandoned container to emphasize sustainability and creative reuse of materials. The re-establishment process includes structural integrity assessment, customization, insulation, and comfort features.

The containers are arranged in a coherent flow between different functional areas, such as linear, lighted, or vertical stacking arrangements. Environmental and aesthetic considerations include integrating with the surrounding environment, incorporating sustainable practices, and creating a visual impact. Functional and operational aspects include safety and accessibility, long-term maintenance, and utility connections.

In summary, Figure 140's container massing demonstrates a thoughtful approach to repurposing abandoned containers for dual purposes, focusing on functionality, sustainability, and aesthetic appeal.

Figure 145: Bogie Restaurant

The Bogie Restaurant is a unique concept that repurposes old train bogies into functional and aesthetically pleasing dining spaces. The process begins with identifying and acquiring an abandoned or decommissioned train bogie, which is then thoroughly inspected for structural integrity and suitability for conversion. The design and planning process involves conceptual design, regulatory compliance, structural modifications, panel installation, folding table tops, seating arrangement, lighting, and climate control.

The interior of the bogie is stripped down to its bare structure, with old seats, fittings, and unnecessary components removed. If necessary, the bogie is reinforced to support additional weight and usage as a restaurant. Vertical wall panels are chosen based on durability, aesthetics, and ease of maintenance, and panels can be designed to incorporate decorative elements or themes. Folding table tops are installed along the interior walls, providing insulation and soundproofing.

Additional features include comfortable seating arrangements, proper lighting and ambient lighting, and climate control systems. Interior decor is tailored to the restaurant's theme, ranging from vintage railway memorabilia to modern chic designs. A small kitchen or service area is set up either within the bogie or in an adjacent structure to facilitate food preparation and service.

Operational aspects include staff training to operate within the unique space of a bogie restaurant, managing foldable tables, and serving within a confined area. The concept is marketed to attract customers seeking a novel dining experience.

Figure 146: Inside the bogie restaurant

The Bogie restaurant interior features a warm, rustic charm that blends modern elegance with classic comfort. The use of wood in the design adds a touch of natural beauty and sophistication. The divided panels are made of high-quality, polished wood, adding warmth and organic texture to the space. The seating arrangement is designed to facilitate conversation and interaction among diners.

The 4-seater table on the left is likely made from sturdy wood that matches or complements the wood used in the panels, providing a comfortable dining experience. The chairs around the table are likely cushioned for added comfort and upholstered in a fabric that matches the restaurant's colour scheme. The 2-seater table on the right is smaller but equally elegant, ideal for intimate dining experiences. The seating arrangement is similar to those of the 4-seater, ensuring a consistent look throughout the restaurant.

Lighting in the Bogie restaurant is soft and ambient, likely achieved through overhead fixtures and possibly table lamps or wall sconces. The decor is tastefully chosen to complement the wooden elements, such as framed artwork, potted plants, or decorative items. Table settings are elegant, with quality tableware, napkins, and possibly fresh flowers or candles to enhance the dining experience.

Flooring is likely made of wood or another material that harmonizes with the wooden panels and tables, maintaining a cohesive and inviting look throughout the restaurant. In summary, the Bogie restaurant interior showcases a well-thought-out design that emphasizes comfort, elegance, and a cohesive aesthetic.

Figure 147: Museum

Figure 143 is a modern museum gallery that showcases the historical significance of the Indian railway system, particularly the Southern Railway. The museum is housed in a modern architectural structure that blends seamlessly with the historic elements of the railway terminus. The interior layout is thoughtfully designed to guide visitors through the rich history of the Indian railway, with open spaces and high ceilings creating a welcoming atmosphere. There is also a seating area provide on the front of the building between columns.

Exhibits focus on the development and impact of the Indian railway system, emphasizing its role in the socio-economic transformation of the region. Detailed timelines and interactive displays illustrate the evolution of the railway from its inception to the present day. Special sections are dedicated to the Southern Railway, highlighting its unique challenges, achievements, and contributions.

Technological advancements in railway engineering and infrastructure are showcased through displays of trains and engines, both historical and contemporary. Interactive features such as touchscreen kiosks and VR experiences allow visitors to engage with the history of the railway in an immersive manner.

The museum offers educational programs and workshops aimed at students and researchers, guided tours led by knowledgeable staff, and art installations and multimedia presentations celebrating the railway as a cultural icon. A conservation lab is included to demonstrate efforts to preserve and restore railway artifacts, while sustainability is prioritized with energy-efficient systems and materials.

Multilingual signage and audio guides ensure information is available to a diverse audience. Amenities include a museum shop offering memorabilia, books, and souvenirs related to the Indian railway.

Figure 148: Inside the museum

The image depicts a museum's interior design, featuring a multi-level circulation system, efficient ventilation, and strategically placed skylight. This layout allows for easy movement and access to different exhibits, ensuring a curated experience for visitors. Each level may host different types of exhibits, grouped by theme, time period, or artifact type.

The museum's robust ventilation system ensures a comfortable environment for visitors and protects the artifacts by controlling temperature and humidity levels. The air circulation system distributes fresh air evenly throughout the museum, reducing the risk of stagnant air pockets and maintaining indoor air quality.

A skylight on the roof is a significant architectural feature, allowing natural light to flood into the interior spaces, creating a bright and inviting atmosphere. It may be designed with UV-filtering glass to protect the exhibits from direct sunlight damage and strategically placed to highlight specific areas or exhibits.

The interior design is likely characterized by modern or contemporary architectural elements, with open spaces, clean lines, and minimalist decor. Materials like glass, steel, and polished concrete contribute to a sleek and sophisticated ambiance.

The combination of levels, proper ventilation, and natural lighting through skylights enhances the overall visitor experience, making the environment more enjoyable and reducing fatigue. The design ensures a clear path for visitors, reducing congestion and allowing for a more relaxed exploration of the museum's offerings.

Figure 149: Rail car

The existing railway line, which was once abandoned, has undergone a revitalization effort focused on implementing a rail car linking to an urban area. This initiative has transformed the railway line into a vital transportation link connecting directly to Ernakulam town. The revitalization project aimed to restore functionality to the previously neglected railway infrastructure, recognizing its potential to efficiently transport passengers to and from Ernakulam terminus.

The revitalized railway line now serves as a crucial conduit for commuters and travellers alike, offering swift and convenient access to Ernakulam town. This development has significantly enhanced connectivity in the region, facilitating smoother and more efficient transportation for residents and visitors. By reintegrating the railway line into the local transport network, the project has contributed to reducing congestion on roads and providing a sustainable transportation option.

Furthermore, the concept of a rail car linking to an urban area underscores a strategic approach to urban development and transportation planning. By leveraging existing railway infrastructure and optimizing its usage, the project not only promotes accessibility but also supports economic growth by facilitating easier movement of goods and people.

In summary, the revitalization of the abandoned railway line into a rail car linking directly to Ernakulam town represents a successful integration of sustainable transportation solutions with urban development objectives. It serves as a model for leveraging existing infrastructure to meet modern transport needs efficiently and effectively.

Figure 150: Multilevel parking and coconut farm

The image depicts twin multilevel parking buildings that dominate the immediate area. These structures, designed to accommodate a significant number of vehicles, are positioned adjacent to each other, likely to maximize the use of vertical space in a densely populated or urbanized area. The buildings are functional and modern, reflecting an architectural style that prioritizes utility and efficiency.

Between the two parking buildings, there are public spaces. These spaces are thoughtfully designed to provide a breath of fresh air in an otherwise utilitarian environment. Such public areas often include benches, small green patches, pathways, and possibly water features, serving as a social hub for people to gather, relax, or pass through. These spaces help break the monotony of the concrete structures and add a human touch to the infrastructure.

To the left side of the parking buildings, the scene transitions into a more natural setting with a coconut farm. This farm is not just a random element but an integral part of the landscape, providing a sharp contrast to the urbanized structures. Coconut farms are ubiquitous in Kerala, a state in India renowned for its lush greenery and agricultural heritage. Kerala is often referred to as "the land of coconuts" (the name Kerala itself is derived from "Kera," which means coconut in Malayalam), underscoring the cultural and economic significance of coconuts to the region.

The coconut farm in the image likely features tall, swaying coconut palms, with their distinctive slender trunks and large, green fronds creating a serene and tropical ambiance. This farm may be used for various purposes, including the cultivation of coconuts for commercial sale, production of coconut oil, and other by-products that are staple to the local economy and cuisine.

Figure 151: Public spaces between the multilevel parking areas

The image depicts a well-designed public space located between two twin-tower multilevel parking buildings, serving as a communal oasis for residents and visitors to unwind, socialize, and engage in various activities. The space is equipped with various seating arrangements, such as benches, tables with chairs, lounge chairs, and greenery. Trees provide shade, shrubs and flower beds add colour and texture, and potted plants can be moved or rearranged to adapt to changing needs and seasonal decorations.

The public space offers recreational activities such as chess and billiards, which foster a sense of community and provide entertainment. Large outdoor chess sets or designated tables with built-in boards attract casual players and serious enthusiasts, promoting social interaction. Outdoor billiard tables provide a unique and engaging activity suitable for individuals of various ages, with weather-resistant equipment ensuring durability and usability throughout different seasons.

Accessibility and connectivity are ensured through well-paved and clearly marked pathways that guide residents and visitors through the space. Adequate lighting ensures the space is safe and usable during the evening hours, while strategically placed lights highlight key features of the landscape and architecture.

The design and layout of the public space aim to create a welcoming and inclusive environment where people can relax and enjoy their surroundings. The careful selection of seating, greenery, and recreational activities promotes a sense of community and well-being. This space serves as a functional area between the parking buildings and a vibrant social hub that enhances the quality of life for residents and visitors alike.

Figure 152: Café

Expanding on Figure 147: Café, the image portrays a vibrant and inviting café setting situated adjacent to a parking area, designed to offer a comfortable and enjoyable dining experience. Here's a detailed description:

The café itself is open-air, providing a pleasant al fresco dining environment. This layout allows patrons to enjoy the ambiance of their surroundings while indulging in their meals or beverages. The open design also promotes natural ventilation and a sense of spaciousness, contributing to a relaxed atmosphere.

Seating arrangements are carefully planned to maximize comfort and accommodate a significant number of guests. The furniture is likely to include a mix of sturdy tables and chairs, possibly complemented by cozy booths or lounge seating for more intimate gatherings or solo diners. The seating is arranged thoughtfully to optimize the available space without overcrowding, ensuring that each customer can enjoy privacy while still feeling part of the café's lively atmosphere.

The café's location adjacent to the parking area makes it easily accessible for customers, whether they arrive on foot or by car. This convenience encourages both regular visitors and passers-by to stop and enjoy a meal, snack, or beverage, enhancing the café's popularity as a local hangout spot or a destination for casual dining.

The overall ambiance of the café is likely enhanced by tasteful decor and possibly some greenery or potted plants, adding a touch of freshness and visual appeal to the outdoor setting. The design and layout of the space reflect a balance between functionality and aesthetic charm, creating an inviting environment that appeals to a diverse clientele.

Figure 153: Locomotive engine display and clock tower

The image captures a scene that encapsulates the essence of locomotive engines alongside an amphitheatre where people can enjoy and relax.

The locomotive engines, likely situated prominently within the site, represent a historical or industrial theme. These engines often symbolize innovation, power, and the development of transportation technology. Their presence suggests a connection to the past, possibly indicating the site's historical significance or its role in the industrial revolution.

Contrasting with the engines is the amphitheatre, a space designed for leisure and communal activities. Its architecture likely blends harmoniously with the surroundings, providing a venue where people can gather, socialize, and enjoy various forms of entertainment. The amphitheatre serves as a focal point for cultural events, performances, or simply a place to unwind and appreciate the atmosphere.

In this scene, the juxtaposition of the locomotive engines and the amphitheatre creates a unique ambiance where visitors can engage with both the historical significance of the locomotives and the modern-day recreational opportunities offered by the amphitheatre. It invites people to explore and appreciate the site's dual identity: a place where the past meets the present, and where historical artifacts coexist with contemporary community spaces. The image thus portrays a blend of heritage, relaxation, and community engagement, making it a multifaceted and inviting environment for all who visit.

Conclusions and Future Recommendations

1. The outcome of this study

The study emphasizes the importance of preserving this historical site to maintain the city's cultural heritage. It suggests transforming the station into a multifunctional space that can serve both as a historical museum and a community hub. This adaptive reuse plan includes creating exhibition spaces to showcase the station's history and the broader narrative of railway development in the region. Additionally, the project proposes incorporating modern amenities like cafes, galleries, and interactive zones to attract visitors and provide a hands-on experience with local arts and crafts.

2. The project outcomes

The Marine Drive Kochi urban study project led to significant developments aimed at revitalizing and enhancing the popular waterfront area.

Key outcomes of the project include:

- Renovated Walkway: The 2.4 km Marine Drive walkway underwent substantial upgrades, including the relaying of tiles, installation of new street lights, and improved landscaping. The walkway now features tactile tiles for better accessibility, new seating arrangements, and open gym areas.

- Public Amenities and Recreational Spaces: The redevelopment added facilities such as children's play areas, a yoga space, platforms for sculptures, and an event space for cultural activities. These additions aim to make Marine Drive a more family-friendly and versatile public space.

- Sanitation and Maintenance: The project also addressed sanitation issues by installing new drainage systems and placing dustbins at regular intervals. Additionally, container toilets, including disabled-friendly options, were introduced under the "Klean Toilet" scheme.

- Commercial and Social Spaces: The Greater Cochin Development Authority (GCDA) has plans to construct a modern high-rise commercial complex to replace the old bunk shops, aimed at supporting economically and socially backward sections of society. This complex will include facilities like a mini-conference hall and a restaurant.

- Environmental and Community Impact: The project also focused on sustainable practices, such as setting up sewage treatment plants in nearby apartments, which was achieved through legal interventions and community efforts.

3. The project's main pillars

The urban study of the Marine Drive, Kochi and the renovation of the old railway station in Ernakulam is likely to involve several main pillars to ensure the project is successful, considering historical preservation, modern amenities, and community engagement. Although specific details can vary based on the final project plan, here are common key pillars that such a renovation project would typically focus on:

Historical Preservation:

- Restoration of Architectural Features: Ensuring that the unique architectural elements of the old railway station are preserved or restored to their original state.
- Heritage Conservation: Maintaining the site's historical significance, possibly through collaboration with heritage conservation experts.

Modernization and Infrastructure:

- Upgrading Facilities: Improving basic amenities such as restrooms, waiting areas, and ticket counters to meet contemporary standards.
- Accessibility Improvements: Ensuring the station is accessible to all, including the elderly and people with disabilities, by adding ramps, elevators, and other necessary features.
- Safety Enhancements: Updating safety features, including fire safety systems, security measures, and structural reinforcements.

Sustainability:

- Eco-friendly Practices: Implementing sustainable building practices, such as using energy-efficient lighting and renewable energy sources.
- Waste Management: Setting up efficient waste management systems to minimize the environmental impact of the station's operations.

Community and Cultural Engagement:

- Cultural Spaces: Creating areas within the station for cultural activities, exhibitions, and events that reflect the local heritage and community spirit.
- Public Participation: Involving the local community in the planning and execution phases to ensure the project meets their needs and preserves the local identity.

Economic Viability:

- Commercial Opportunities: Incorporating commercial spaces like cafes, shops, and kiosks to generate revenue and make the station a vibrant hub.
- Tourism Promotion: Leveraging the station's historical significance to attract tourists, potentially creating guided tours or informational displays.

Connectivity and Integration:

- Improved Transport Links: Enhancing connectivity with other modes of transport, such as buses, taxis, and future metro services.
- Intermodal Facilities: Creating seamless integration for travellers transferring between different transportation modes.

4. Benefits for local communities and the landscape and historical value of the former railway station in Ernakulam

Benefits for Local Communities

a. Cultural Hub:

- Community Events: The station can be repurposed as a venue for local events, art exhibitions, cultural performances, and community gatherings, fostering a sense of community and local culture.
- Educational Opportunities: Schools and educational institutions can use the space for historical tours, workshops, and learning sessions about the region's railway history and broader historical context.

b. Economic Boost:

- Tourism: Revamping the station can attract tourists, boosting local businesses such as hotels, restaurants, and shops.
- Small Businesses: The station can house local markets, craft stalls, and food vendors, providing opportunities for small businesses and artisans.

c. Transportation:

- Heritage Railway Services: Introducing heritage train rides can improve local transportation options while

also serving as a tourist attraction.

Benefits for the Landscape

a. Green Spaces:

- Parks and Gardens: The area around the station can be developed into public parks and gardens, enhancing urban greenery and providing recreational spaces for residents.
- Sustainability Projects: Initiatives like community gardens or green rooftops can promote sustainable urban living.

b. Urban Aesthetics:

- Architectural Preservation: Preserving the architectural integrity of the station can contribute to the city's aesthetic value and maintain its historical charm.
- Public Art: Integrating public art installations around the station can enrich the urban landscape and reflect local culture and history.

Historical Value

a. Heritage Conservation:

- Preservation of History: Maintaining the station helps preserve a physical link to the past, offering insights into the region's transportation history and architectural styles of the era.
- Educational Resource: The station can serve as a living museum, providing educational materials and exhibits on the history of railways in Kerala and India.

b. Cultural Identity:

- Local Pride: The station's preservation fosters a sense of pride among local residents by highlighting and valuing their shared heritage.
- Historical Narrative: It helps narrate the story of the region's development, migration patterns, and economic history tied to the railway network.

Integrated Benefits

a. Community Engagement:

- Volunteer Programs: Involving local communities in the restoration and maintenance efforts can increase

civic engagement and responsibility.

- Local Partnerships: Collaborations with historical societies, educational institutions, and government bodies can ensure sustainable use and upkeep of the site.

b. Sustainable Development:

- Adaptive Reuse: Repurposing the station for modern uses such as community centres, museums, or commercial spaces can prevent urban sprawl and promote sustainable development practices.

In summary, the former railway station in Ernakulam can provide multifaceted benefits, including fostering community spirit, enhancing local economies, improving urban landscapes, and preserving historical heritage. Its thoughtful redevelopment can create a vibrant, culturally rich, and sustainable urban space.

5. **Future Recommendations/Policies**

   a. Long Term

   - To enhance the built environment in environmentally sensitive places.
   - Improvements to the infrastructure.
   - Enhancement of mobility.

   b. Short Term

   - A proposal to improve the buffer area for Mangalavanam by rerouting cars and boosting the number of walkers.
   - Buildings that have minimal energy use near environmentally sensitive areas.
   - Trash traps placed alongside waterways to collect and filter waste.
   - At nodes, provide bus stands.
   - Establish recreation spaces
   - Establish walkways with shade and link green spaces.
   - Establish a suitable buffer zone to separate residential and recreational areas.
   - Offering water transportation as a substitute mode of transportation.
   - Abraham Madamakkal Road is getting wider.
   - High Court Road will be rerouted to lighten traffic.
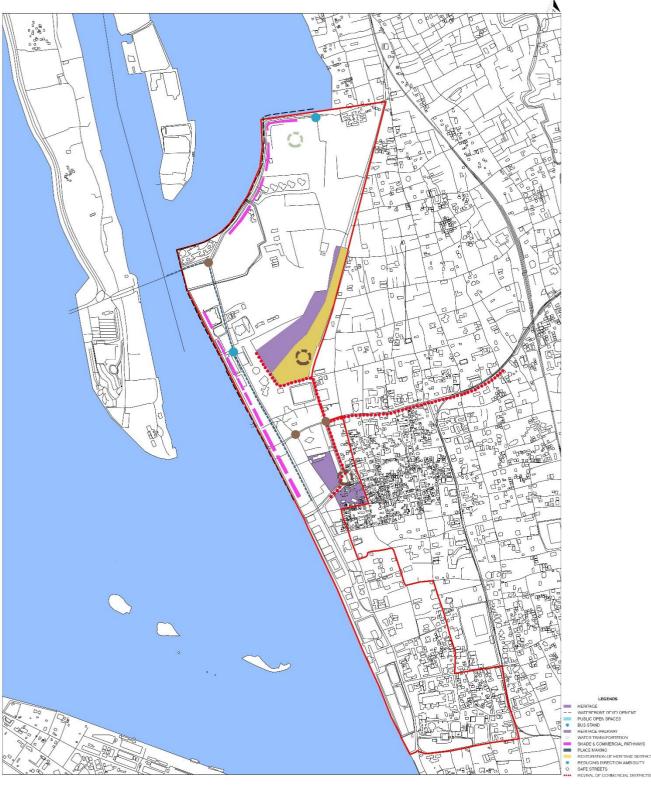   - Cycle and pedestrian routes have been added in Mangalavanam

Figure 154: Map showing the future potential of marine drive

History

Heritage

The preservation and revitalization of existing heritage zones will enhance tourism potential.

Ecology

━ ━   Waterfront development

Recreational activities in the open spaces of the Marine Walkway will have the potential to promote tourism.

▬   Public open spaces

Open spaces will be included for various public and semi-public vacant lands that can be efficiently used for recreational activities.

Transportation and Infrastructure

● Bus stand

The presence of a bus stop will minimize traffic congestion for private automobiles and will make mobility easier for business-related street users. This will apply to both commercial and KSRTC transportation, triggering regional and local services.

▬   Heritage walkway

The old railway station, Jewish synagogue, and Mangalvanam will all be linked to the commercial section of Marine Drive, increasing the possibilities of future cultural and heritage plans and connecting the heritage core to the urban core.

↻ Water Transportation

The most active generators will be commercial recreational arms. The presence of water transportation networks will raise user intensity.

▬   Shade and commercial pathways

Proper shade in the Marine and Queen's walkways will increase user intensity, making the activities and the space livelier.

Morphology

███ Place making

Creating green networks and pedestrian-friendly streets in each functional district, as well as better defining street borders.

███ Restoration of heritage district

Degraded historic and cultural areas could be reclaimed, allowing for future development of the area.

● Reducing direction ambiguity

Adding correct signage to nodes will decrease traffic confusion and mayhem in the future.

Activity

⟳ Safe streets

A stray dog-free street will be conceivable if inappropriate waste management is eliminated. The potential for developing safe streets for women and children should be accessible to the disabled in the future.

●●●● Revival of commercial districts

With suitable parking and pedestrian walkways, there will be the potential to make the economic district more user-friendly. The transit centre under construction will attract more users in the future.

DESIGN SOLUTIONS

- A cohesive streetscape layout that is adaptable to adjacent land uses.
- Landscape and pavement to highlight the natural environment's richness and the view of the waterfront.
- CCTV surveillance cameras.
- Family play area and gym.
- Dustbins and routine garbage collection.
- Uniform advertisement boards.
- Improved green cover. Plantings of native trees and flowering plants were made.
- Plant watering with secondary processed sewage water.
- Future collaborations with resident welfare associations for pathway upkeep.
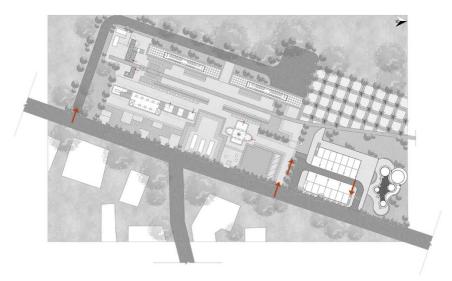
Annex

1. Point of access and track

Figure 155: Map showing the point of access and track to the site

The track not only exemplifies the directionality and linearity of the entire website but also serves as a guiding framework for the physical layout of the site. The buildings are strategically aligned with the track, creating a cohesive and intuitive pathway that directs the flow of traffic. This alignment ensures that visitors naturally follow the designed route, enhancing their overall experience and simplifying navigation.

By sharing a common point of entry and departure, the site streamlines the movement of visitors, making it easier to manage and monitor traffic. This design choice also facilitates efficient ticketing operations, as the directed movement reduces congestion and bottlenecks. Consequently, visitors can enjoy a more organized and pleasant visit, while staff can maintain better control over the site's operational dynamics.
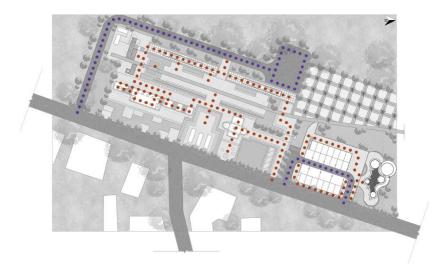
2. Circulation

Figure 156: Map showing the circulation through the site

Circulation systems, such as walkways and pathways, are crucial for efficient wayfinding and shaping the experience of people. They provide guidance, control movement, and enhance the spatial experience. Well-designed paths can facilitate smooth traffic flow, prevent congestion, and enhance accessibility. Pathways can be curved or straight, with natural elements enhancing aesthetic appeal. Safety and accessibility are ensured by clear, well-maintained paths, with ample lighting and visible signage. Circulation systems also optimize space utilization, particularly in high-traffic environments. Design considerations include continuity, flexibility, integration with the environment, and user experience. Pathways should be continuous, visually appealing, and adaptable to accommodate varying traffic volumes and users. They should blend seamlessly with the surrounding architecture and landscape, and prioritize user comfort and convenience. Continuous feedback from users can refine the circulation system.
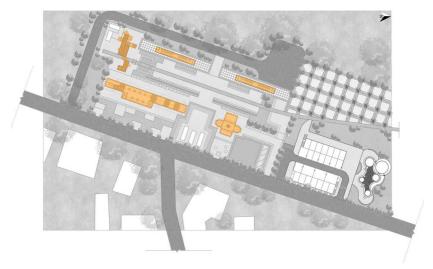
3. The 4 dimensions of the site

Figure 157: Map showing the 4 dimensions of the site

The four dimensions of a system organization throughout a site are spatial, temporal, interactive, and informational. Spatial dimensions address the physical layout and arrangement of the site, guiding users through different zones in a logical and intuitive manner. The temporal dimension focuses on the timing and flow of user interactions, ensuring efficient use of each zone without delays. Interactive dimensions involve touchpoints and interactions users have with the system, including friendly staff or automated kiosks, digital screens or brochures, interactive elements, engagement points, and exit points. Informational dimensions cover the dissemination and accessibility of information throughout the user journey, including initial information, orientation materials, on-demand information, instructional signage, summary information, and future information. A sequential path is followed to avoid repetition and ensure all zones are covered systematically, ensuring a well-organized, efficient, and user-friendly experience throughout the site.
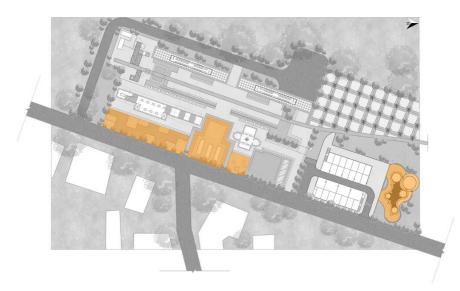
4. Interactive zones

Figure 158: Map showing the interactive zones of the site

The plan for Zone 1 near a museum's clock tower, amphitheatre, and cafe area aims to increase user engagement and foot traffic. It includes installing digital kiosks and AR displays, enhancing outdoor seating and landscaping, showcasing art installations and performances, scheduling diverse events, designing flexible seating and stage design, introducing interactive installations, offering modern co-working spaces, offering a diverse menu, hosting networking events, and promoting sustainability initiatives. The plan also includes improvements in Wi-Fi and charging stations, signage and wayfinding, implementing green initiatives, and ensuring accessibility features for people with disabilities. By implementing these improvements, Zone 1 can be transformed into a vibrant, multi-functional space that attracts a diverse range of visitors, thereby increasing the museum's overall usage and appeal.
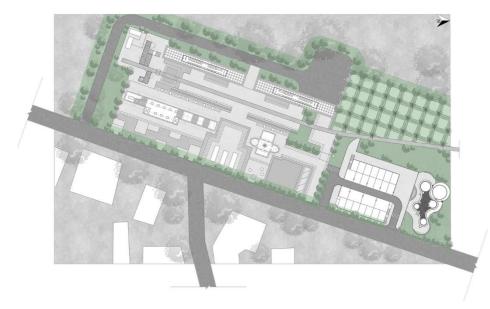
5. Vegetation and the spatial quality

Figure 159: Map showing the vegetation and the spatial quality of the site

Landscaping elements like trees, shrubs, and hedges can create natural partitions, enhancing privacy and structure in outdoor spaces. They can be trimmed and shaped to suit various design needs, and their variation contributes to the visual interest and diversity of the landscape. Incorporating native trees and shrubs into landscape design fosters a deep connection to the local environment and culture. These plants are well-adapted to local climate and soil conditions, require less maintenance, and support local wildlife. Their presence can evoke memories and memories of past events, making the landscape more meaningful and cherished.

The diversity and visual interest provided by these plants are significant. Different species and varieties offer a range of textures, colours, and forms that can be used to create dynamic and engaging landscapes. This variation not only enhances the beauty of the space but also adds to its ecological value by supporting a broader range of wildlife and promoting biodiversity

6. Water bodies

Figure 160: Map showing the water bodies of the site

Water bodies can act as reflective surfaces, creating an illusion of continuity and openness in landscapes. Strategic placement of water bodies at key junctures can enhance the aesthetic appeal and depth of the environment. Clear water, such as calm lakes and infinity pools, provides the best reflections. These water bodies can be integrated into various landscapes, such as parks, gardens, and urban plazas, to enhance the spatial experience. Strategic positioning near entryways, pathways, or central locations ensures that water bodies' reflective properties are fully appreciated by viewers.

Integrating water bodies into various landscapes, such as parks, gardens, and urban plazas, can greatly enhance the spatial experience for visitors. In parks and gardens, water features like ponds, streams, and fountains can create serene spots for relaxation and contemplation. The sound of flowing water also adds a soothing auditory dimension to these spaces, contributing to a multisensory experience.

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