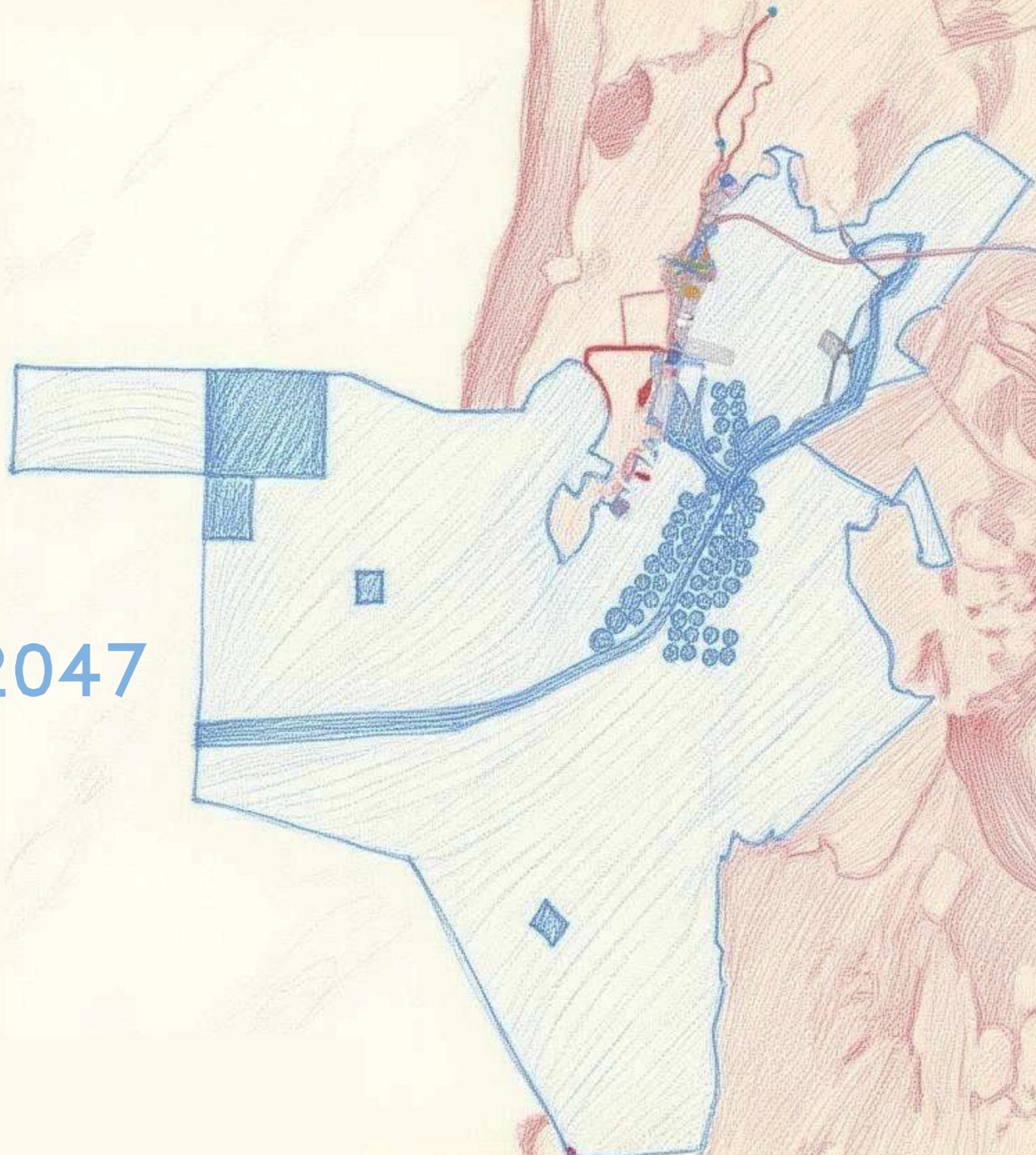


INTEGRATED MUMBAI PORT MASTERPLAN 2047

DECEMBER 2025



Message from Chairperson

Dr. M. Angamuthu, IAS



Mumbai Port is not just a key national infrastructure; it is a living institution that has shaped the economic, industrial, and urban evolution of Mumbai and the nation for over one hundred and fifty years. Generations of maritime trade, engineering achievement, and public service are embedded in its land, waters, and people.

As Chairperson of the Mumbai Port Authority, I am deeply conscious that stewarding such an institution carries both privilege and responsibility. It is in this spirit that I present the **Integrated Mumbai Port Master Plan 2047**—a roadmap that looks decisively ahead while remaining firmly anchored in the port’s enduring legacy.

Integrated Mumbai Port Masterplan 2047

The genesis of this long-term vision lies in the guidance of the Ministry of Ports, Shipping & Waterways, which called upon all Major Ports to prepare comprehensive master plans aligned with India's aspirations during the *Amrit Kaal* period. In response, Mumbai Port undertook a rigorous and structured planning process involving detailed technical studies, traffic and demand assessments, stakeholder consultations, and internal deliberations. This effort culminated in the submission of the *Comprehensive Master Plan for Port with Planning Horizon 2047* in September 2024—marking a significant milestone and establishing the first consolidated long-term blueprint for a future-ready Mumbai Port.

I place on record my sincere appreciation for the leadership of Sri Rajiv Jalota, former Chairperson of Mumbai Port Authority, under whose tenure the First Draft Master Plan was conceptualised and shaped. His vision and commitment laid the foundation for a structured and forward-looking planning exercise. While the comprehensive masterplan was broad and forward looking, it did not include many of the key assets earmarked for redevelopment or monetization. Also, following the submission of this draft, the port experienced a period of transition marked by evolving leadership, policy priorities, and changing sectoral economy. During this phase, Sri Sushil Kumar Singh served as Chairperson, providing

continuity, stability, and strategic oversight, ensuring that the planning process remained aligned with national priorities and retained its momentum.

As the maritime landscape continued to evolve—shaped by changing global trade patterns, regulatory certainty and emerging economic opportunities—it became necessary to revisit and refine the earlier plan. In addition, it was also felt that the masterplan should include each and every asset under Mumbai Port. The **Integrated Mumbai Port Master Plan 2047** reflects this renewed effort. It incorporates updated projections and contemporary policy guidance and adopts an integrated development approach that balances cargo operations, logistics, passenger and cruise movement, ship repair, fisheries infrastructure, tourism, digital systems, and environmental stewardship. The objective has been clear: to strengthen Mumbai Port's strategic position within India's maritime ecosystem while equipping it to meet the needs of future generations.

I wish to place special appreciation on the role of Adesh Titarmare, IAS, Deputy Chairperson, whose sustained involvement—from the initial draft through to the final integrated plan—has ensured continuity, depth, and operational alignment throughout this

Integrated Mumbai Port Masterplan 2047

exercise. The preparation of this document has also benefitted greatly from the contributions of consultants, domain specialists, and technical teams, as well as officers across all departments, including Traffic, Marine, Civil, Estate, Mechanical & Electrical, General Administration, Finance, and the Mumbai Port Sustainability Foundation. The Planning Division supported by Strategic Management has played a central role in coordinating and integrating these diverse inputs into a coherent and actionable master plan.

This Master Plan is conceived as a dynamic and evolving framework. As policy directions, regulatory environments, technological landscapes, and user expectations continue to change, the plan will be subject to periodic review and refinement, guided by directions from the Ministry, decisions of the Board of Mumbai Port Authority, and the long-term interests of the port.

Mumbai Port has always been more than a maritime gateway; it is a cornerstone of India's economic and urban identity. As the nation moves towards India@100, this Master Plan commits Mumbai Port not just to follow change, but to lead India's maritime transformation with confidence, capability, and global relevance.

Dr. M. Angamuthu, IAS,

Chairperson, Mumbai Port Authority

Message from Deputy Chairperson

Adesh Titarmare, IAS



Behind every operation at Mumbai Port—every vessel handled, every berth managed, every safety protocol followed—are people whose daily work sustains the port’s reliability and relevance. This Master Plan has been prepared with a clear recognition of that truth: the future of Mumbai Port

will be shaped not only by infrastructure and policy, but by the collective effort, discipline, and ownership of its people and partners.

What gives this Master Plan its strength is its grounding in operational reality. It is based on detailed assessments of existing assets, traffic flows, safety requirements, land use, environmental responsibilities, and future demand. At every

stage, the focus has been on what is practical and deliverable—what can be implemented, in what sequence, and with what level of readiness. The result is clarity not just about where Mumbai Port is headed, but about how we will move forward together.

For our employees and officers, the Master Plan provides direction and continuity. It brings departmental roles, infrastructure investments, and operational improvements into a shared framework, ensuring that individual efforts contribute to a larger institutional purpose. For stakeholders—port users, partners, regulators, and the city—it signals predictability, discipline, and a commitment to responsible, well-planned growth.

A defining feature of the Master Plan is its emphasis on phased execution. Early initiatives are designed to deliver visible improvements in efficiency, utilisation, safety, and service quality, while laying a strong foundation for larger developments in cargo, logistics, passenger and cruise infrastructure, ship repair, sustainability, and digital systems.

This approach enables steady progress, learning through implementation, and confident scaling over time.

The Master Plan is also designed to evolve. As conditions change and new opportunities emerge, the framework allows for adaptation without losing sight of long-term objectives. This balance between stability and flexibility will be essential in maintaining Mumbai Port's competitiveness and resilience in a changing maritime environment.

I would like to give my special appreciation to all officers of Mumbai Port and consultants involved in the successful compilation of this masterplan. I would also like to thank our Chairperson Dr. M. Angamuthu, IAS, the Board of Mumbai Port Authority and the Ministry of Ports, Shipping and Waterways for their valuable feedback, direction and guidance to making this plan comprehensive and useful.

Ultimately, the success of this Master Plan will depend on people—on teamwork across departments, openness to change, disciplined execution, and shared ownership of

Integrated Mumbai Port Masterplan 2047

outcomes. This is not merely a planning document; it is a shared roadmap for everyone who works with, within, and alongside Mumbai Port. With collective commitment to execution, I am confident that we will translate this plan into tangible progress on the ground and build a port worthy of its legacy as we move steadily towards 2047.

Adesh Titarmare, IAS,

Dy. Chairperson, Mumbai Port Authority

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Preface

Mumbai Port Authority stands at the cusp of a maritime revolution, and it is moving towards an inner transformation forced by the complexity of its existence. As a port with a rich legacy and an even more potent future, Mumbai Port is in a unique position to convert its challenges into opportunities for the future.

The Integrated Mumbai Port Masterplan 2047 is an attempt at bringing all aspects of the Port within one singular and related understanding, linking every asset and business competency to a global vision for the future.

This masterplan has been the result of a large number of consultations with a variety of stakeholders including trade, tenants, employees, regulators, subject matter experts, global port executives, port planners, port developers, terminal operators, industries, agents, workers, etc.

While the core DNA of Mumbai Port has been preserved in this masterplan, it has been stretched to its full potential to unlock the maximum value for the Indian Maritime Sector.

Need for a Masterplan

The Union Budget 2022 set the roadmap to achieve Hon'ble Prime Minister's vision of India, in its 100th year of independence, which has been christened, as Amrit Kaal. The Amrit Kaal is a significant era "marking Azadi Ka Amrit Mahotsav and having entered into the 25-year-long lead up to India @100," with impetus on four major focal points-

- (1) Inclusive Developments
- (2) PM Gati Shakti
- (3) Productivity Enhancement
- (4) Climate Action and Energy

With the above vision and initial level estimates, it is contemplated that the port capacity of India required in 2047 will be around four times the present port capacity. This has necessitated to undertake port planning by each port for the horizon of 2047.

The Ministry of Ports, Shipping & Waterways (MoPSW) therefore vide OM from Under Secretary, Ministry of Ports, Shipping & Waterways Shipping No.M-25021/36/2021-SM dated 25.04.2022 has guided all the Major Ports Authorities to prepare a Comprehensive Master Plan 2047 for entire port area including

- Cargo projections (considering future industrialization in the hinterland)
- Land use planning & optimization
- Connectivity gaps
- Hinterland multimodal connectivity
- Future fuels (like LNG, H₂)
- Warehousing etc.

The ultimate aim is to achieve efficient logistics for enhancing economic development. All the major ports were also asked to plan for state of art cruise terminals catering to the ferries, cruise ships, Ro-Pax ferries etc.

Principle and Approach

The Integrated Mumbai Port Masterplan 2047 has been drafted through a modern, human-centred, and future-oriented approach that balances clarity with technical depth.

The intent was not only to design a plan for the next 25 years, but to create a document that could be read and updated for the next two and a half decades by port officers, users and trade. Every choice—from language and visuals to structure—has been guided by the belief that a masterplan is both a technical blueprint and a long-term institutional legacy.

The approach began with simplicity. Ports are complex systems, but the document does not need to be. A plain English narrative style was adopted so that every reader, regardless of background, can understand the goals,

decisions, and priorities. Each chapter begins with a short summary, supported by clear visuals, diagrams, or maps. Technical content is available in modular annexures, but the main text is intentionally light, intuitive, and accessible. This protects the reader from information overload and encourages a culture of informed and speedy decision-making.

At the same time, technical credibility is never compromised. Behind every simple page lies rigorous study—cargo projections, financial evaluations, global benchmarking and stakeholder consultations. These were consciously placed in separate, replaceable modules so they can be updated without rewriting the masterplan itself. This layered structure creates a long-lasting core while

Integrated Mumbai Port Masterplan 2047

allowing the plan to evolve with technology, markets, and regulatory changes. It also ensures future officers can refine the numbers without disturbing the foundation of the vision.

A key principle was to balance permanence with flexibility. The masterplan distinguishes between durable elements—such as the port’s long-term vision, development philosophy, zoning logic, and core interventions—and variable elements like demand forecasts, costs, or policy changes. This separation makes the plan durable yet adaptable, enabling easy revisions every few years while keeping the 2047 direction unchanged.

Ease of Doing Business as well as Sustainability remain at the heart of the document. The plan emphasises digitalisation, climate readiness, green energy transition, operational efficiency, safety, and port-city harmony. Every proposed intervention considers environmental responsibility, economic value, and social equity. The port is viewed not just as a logistics node but as a long-term steward of maritime ecosystems and a generator of public value.

Finally, the masterplan is designed as a visually engaging, globally aligned document. Clean layouts, thoughtful typography, and a minimal design aesthetic were chosen so that the book feels modern, timeless, and easy to navigate. The result is a masterplan that reads like a story, performs like a technical manual, and endures like an institutional compass.

This report is divided into Five Parts:

Part 1: Who We Are

This part includes an introduction to Mumbai Port along with current performance and physical infrastructure. It also includes a brief overview of the hinterland and connectivity available. It lays out the current regulatory framework and ecosystem of stakeholders within which the port is functioning.

Part 2: Where Are We Going

A demand assessment was conducted and numerous stakeholder consultations were convened in the last three years to answer this question. There is a global perspective as well as a local view on how the hinterland will evolve over

time. This part helps us understand future demand for our services, and helped us shape the masterplan.

Part 3: Where Do We Want To Be

Here we describe our core strengths and constraints which helps us arrive at a growth strategy. This strategy in turn fuels our overall Vision for 2047.

Part 4: The Big Moves to Get There

This part describes the key projects which are essential to achieve the masterplan.

Part 5: The Road Ahead

A clear phasing and implementation plan with milestones that will help us achieve the Vision 2047.

WHO WE ARE

Introduction

Strategically located on India's west coast along a key international shipping route, Mumbai Port is a diversified maritime hub connecting global trade flows with national priorities. It supports India's energy security through its dedicated Marine oil terminal and enables the movement of specialized project cargo critical to Maharashtra's infrastructure development. The port also plays a key role in defence logistics and ship repair, facilitates seamless automotive exports through a dedicated RoRo terminal, chemicals through the Pirpau Chemical Terminal, dry bulk lightering activities at its numerous anchorages and serves as India's largest cruise gateway. With its multimodal capabilities and wide-ranging operations, Mumbai Port is an important cornerstone of the South Asian maritime network.

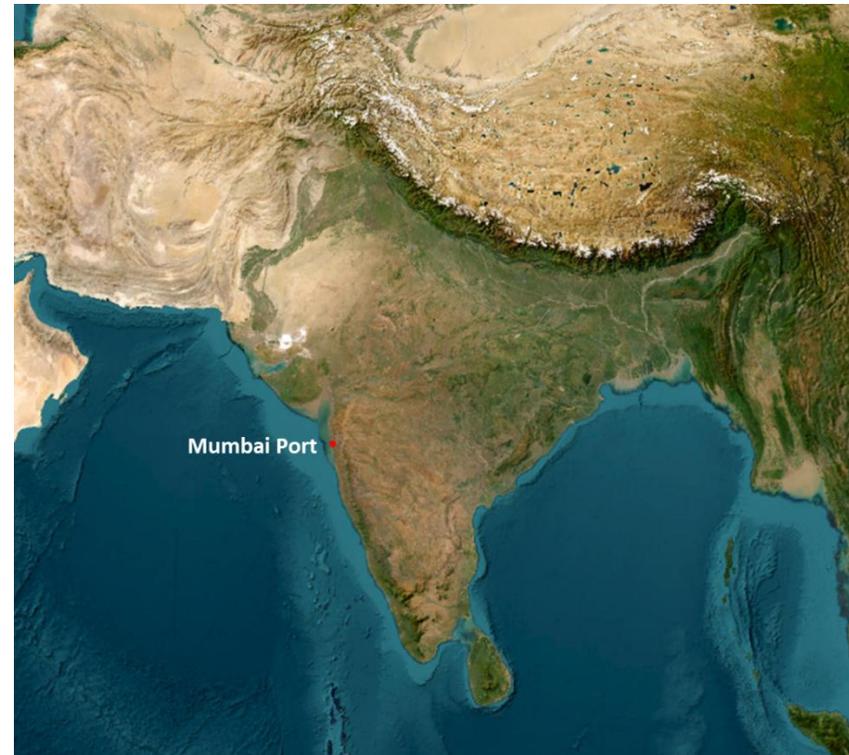


Figure 1 Location Map of Mumbai Port

History

In the mid-19th century, Bombay's harbour became central to global trade, especially during the cotton boom triggered by the American Civil War and the blockade of Confederate ports. With U.S. exports disrupted, Bombay emerged as a major supplier to British textile mills, drawing a surge in maritime traffic. This boom led to the construction of small landing facilities along the waterfront, fuelling the city's economic growth and urban expansion. The opening of the Suez Canal in 1869 further strengthened Bombay's position on international trade routes. However, uncoordinated port activity soon created the need for systematic management. The establishment of the Bombay Port Trust in 1873 was a pivotal moment — aligning port infrastructure with the city's transformation into a commercial and industrial powerhouse.

“Few natural harbours possess the advantages of Bombay; it is sheltered, deep, and capable of receiving fleets from every quarter of the globe.”

— *J. M. Campbell, Gazetteer of Bombay Presidency (1882)*

“The Harbour of Bombay is the glory of the city, a noble sheet of water upon which its prosperity has been built.”

— *James Douglas, historian and author of Bombay and Western India (1893)*

Evolution of the Port – Pre-independence

After the Bombay Port Trust was set up in 1873, the port grew around three wet docks—Prince’s Dock (1880), Victoria Dock (1888) and Alexandra Docks (1914). These docks, plus a new railway network, warehouses and workshops, turned the harbour into a major hub for cotton, grain, coal and general cargo. Ship repair was supported by facilities like Merewether Dry Dock and the Hughes Dry Dock, allowing coastal and overseas vessels to be dry-docked and serviced in the port itself. The Ballard Estate (1920) was also reclaimed as the maritime business district adjacent to the docks, using the excavated material from Alexandra Docks. At Ballard Pier and Ballard Pier Station (BPS), passenger ships berthed alongside special “boat trains”, so important travellers, troops and public figures could step straight from ship to rail and travel all the way to Calcutta (Calcutta Mail) or Peshawar (Frontier Mail).



Ballard Pier Station



Ballard Estate



Aerial View of Alexandra Dock (Indira Dock) & Hughes Dry Dock



Prince’s & Victoria Dock

Figure 2 Evolution of the Port- Pre-independence

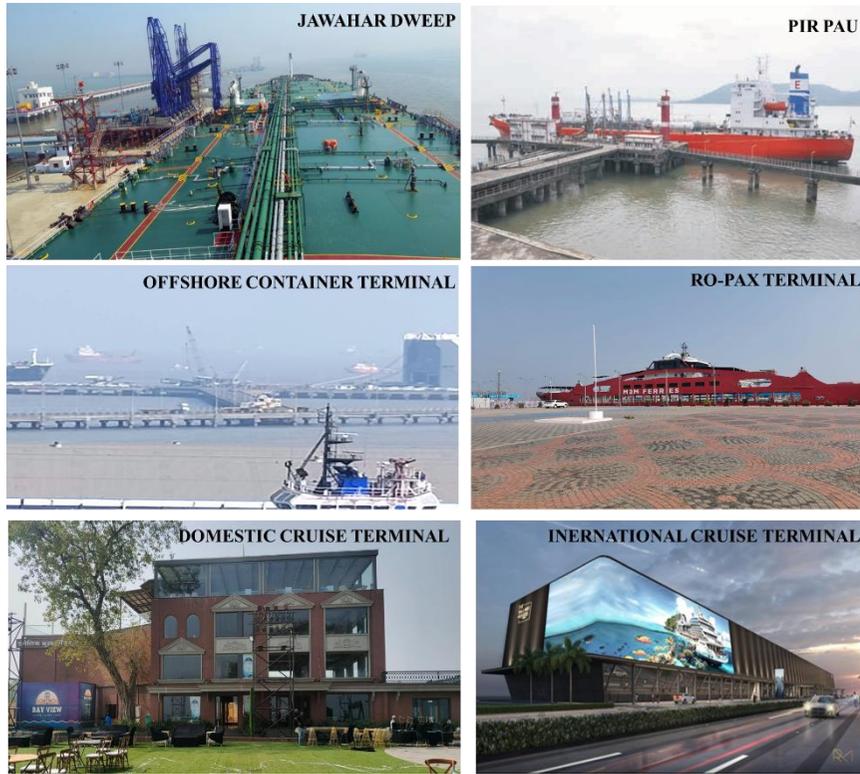


Figure 3 Evolution of the Port – Post-independence

Evolution of the Port – Post-independence

After Independence, the port's role shifted from a general break-bulk harbour to a more specialised, city-facing gateway. Crude oil and POL moved to deep-draft jetties on Jawahar Dweep, while chemicals and LPG were handled at dedicated berths at Pir Pau, freeing the old docks for other uses. With the rise of containerization in the 1970s, and the increasing size of container ships, most container traffic was shifted across the same harbour to a new satellite port—Nhava Sheva, now JNPA—reducing heavy truck and container congestion within the city. Within Mumbai Port, cargo focus moved to bulk, liquids, project cargo and then automobiles, with the Offshore Container Terminal re-used as a Ro-Ro and car-carrier berth, helping the port become an auto-export hub. On the passenger side, the traditional BPS area was developed into a modern International Cruise Terminal at Ballard Pier, bringing large cruise ships and tourists back to the historic docks and reconnecting the port with the life of the city.

Historical Timeline

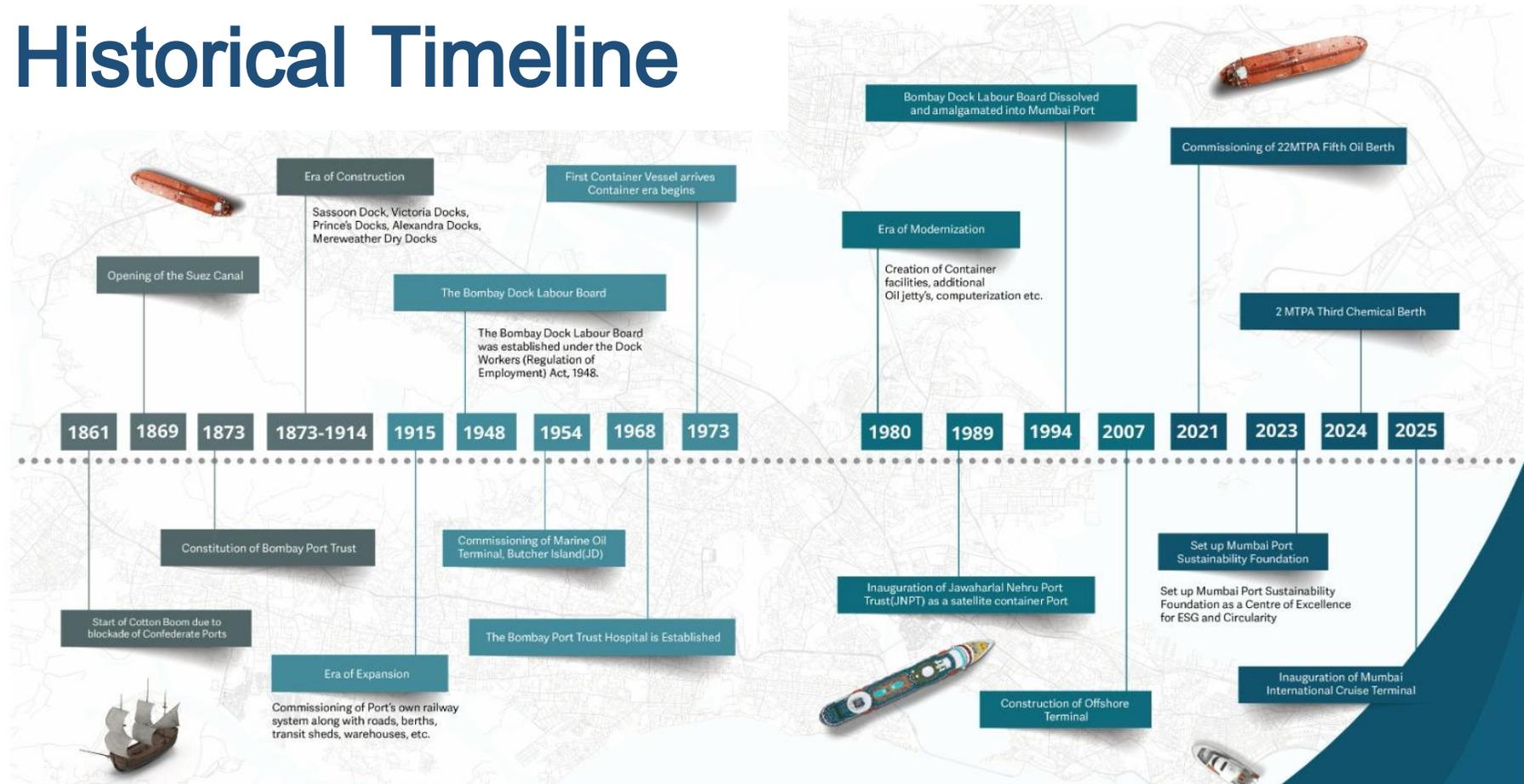


Figure 4 Historical Timeline of Mumbai Port

Location



Figure 5 Strategic Location of Mumbai Port

Mumbai Port is located on the Mumbai Harbour, on the Western Seaboard of India. It is situated at latitude 18° 54' N and longitude 72° 49' E, protected on the east by mainland and sheltered by the Mumbai Peninsula on the west.

The Port is functional in five key areas:

1. **Jawahar Dweep Island:** An offshore oil terminal handling crude and POL cargo through deep-draft jetties designed for safe tanker operations away from the city.
2. **Pirpau:** The dedicated chemical and LPG handling area with specialised berths for hazardous and liquid cargo.
3. **Indira Docks:** The historic wet-dock system with enclosed basin berths for general cargo, project cargo and mixed operations. Includes the inner berths, harbour wall berths, BPS, BPX and OCT.
4. **Bunders:** The traditional landing points at Sewri used for coastal cargo, ship repair and marine services such as bunkering.
5. **Anchorage:** 56 anchorages within the harbour as well as Port Ligherage Area (PLA) adjacent to the harbour constitute this zone for vessels awaiting berths, conducting lightering / ship-to-ship operations, undergoing inspections, or taking bunkers and supplies.

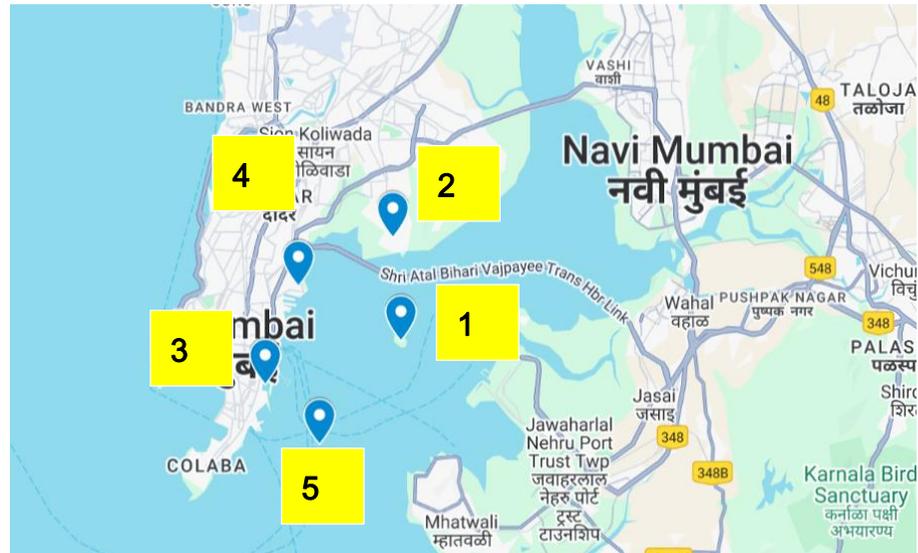


Figure 6 Location Map of Key Functional Areas of Mumbai Port

Port Limits

Land Area: 956 Ha (9.56 Sq. Km.)

Water Area: 56844.5 Ha (568 Sq. Km.)

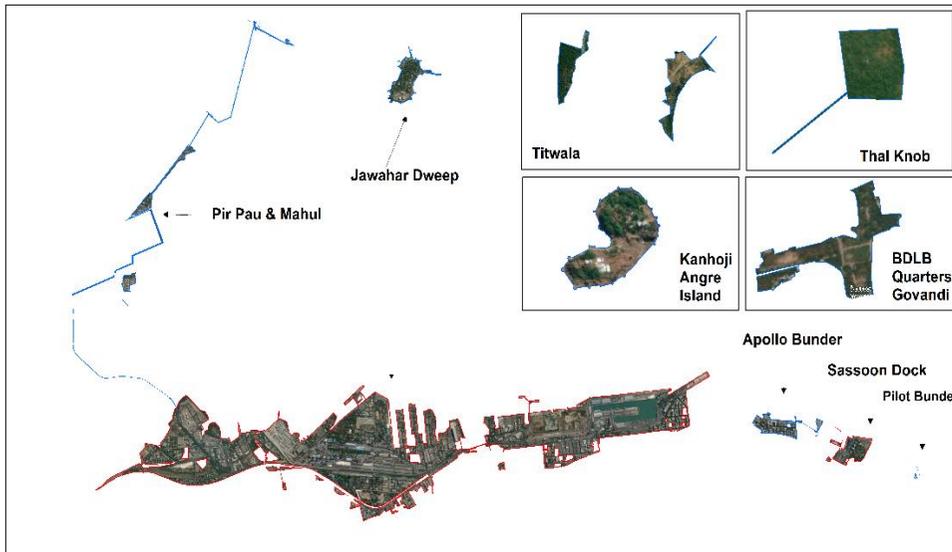


Figure 7 Land Area Owned by Mumbai Port

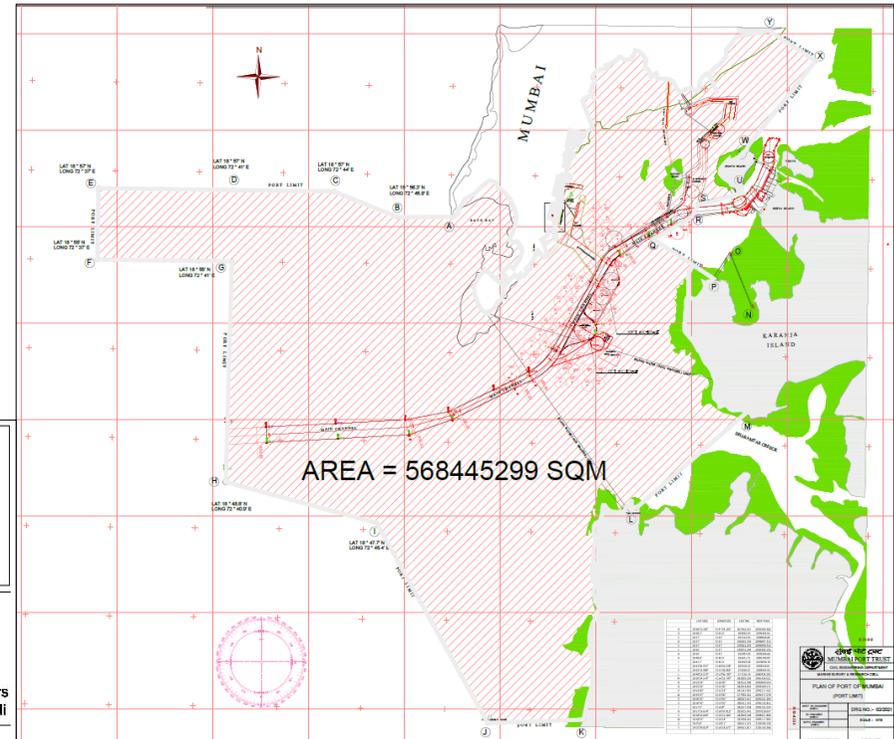


Figure 8 Port Water Limits of Mumbai Port

Competency Profile

Cargo Handling, Storage and Evacuation

Ship Building & Ship Repair

Marine Services

Cruising, Yachting and Sailing

Passenger Water Transport

Fisheries

Infrastructure

For every area of competency, Mumbai Port has created infrastructure to support the trade.

As the ship enters the port waters, it will encounter the anchorages and navigational channels which is the lifeline of the Port. The flotillas are the operational assets which are critical for ship movements within the Port waters. On the land side, the marine structures are designed to suit the particular activity – be it cargo, cruise, ship repair, fisheries or water transport.

Connectivity on the land side is the critical infrastructure for speedy evacuation.

The following section explores the existing infrastructure at Mumbai Port in deep detail.

Navigational Channel

The main navigational Harbour Channel is, for the great part, a natural deep-water fairway and the channel has been deepened to 15 meters only close to facilities. With a mean high water neap tide of 3.3 meters, the channel is adequate to meet the requirement of most of the cargo vessels, passenger ships and tankers. With good lighting arrangements navigation is allowed at the port round the clock. **This channel also acts as a common channel to Mumbai and JN port.**

The Mumbai harbour channel is presently maintained at a depth of 15 m. **The total length of the dredged channels of Mumbai Port is about 30.4 km.** A major part of the dredged channels is the main harbour channel (length 26.36 km/ 450 m wide) running between the Prong's Reef at the western end of the harbour and the oil berths at Jawahar Dweep. The entrance channel to the Indira Dock and Harbour wall berths take off from the main harbour channel at a distance of about 10 km from the Prongs reef. There is a dredged channel about 2 km long which takes off from the northern end of Jawahar Dweep to the Pir Pau Oil terminal.

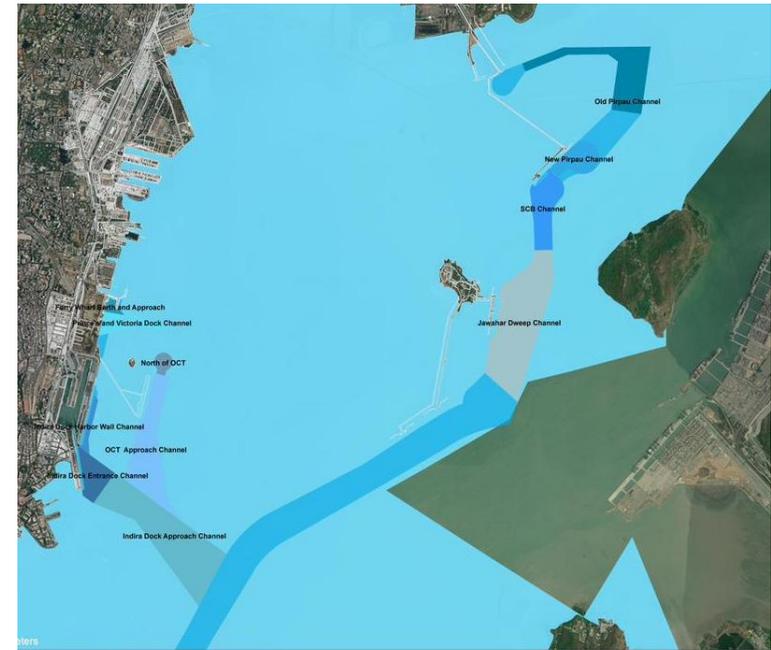


Figure 9 Map showing Navigation Channel of Mumbai Port

Table 1 Dimensions of Approach Channel

Sr. No.	Channel Segments	Length (km)	Min Width (m)	Min Depth (m)
1	Main Harbour Channel	26.36	450	15
2	To Indira Dock approach	2.30	429	8.5
3	ID Approach to ID entrance	0.8	40	8.2
4	To Jawahar Dweep (JD-1, JD-2, JD-3)	2.5	300	10.5
5	Jawahar Dweep to Second Chemical Berth	1.35	300	10.5
6	Second Chemical Berth to New Pirpau	0.75	200	9
7	New Pirpau to Old Pirpau	5.27	122	4.5

Flotillas

At Mumbai Port, flotillas are the backbone of daily marine operations. Harbor tugs, dock tugs, pilot launches, mooring boats and security craft ensure safe navigation, efficient berthing, timely pilotage and continuous vigil across the harbour. Without these vessels, port traffic, tanker movements and passenger operations could not function safely or reliably.

- Number of Harbor Tugs : 2(owned) + 4(hired)
- Number of Dock Tugs : 2(owned) + 2(hired)
- Number of Pilot Launches : 4(owned)
- Number of Mooring Launches : 2(hired)
- Number of Security Patrol Boats : 2(hired)

All port owned flotillas are operated by private operators through an O&M contract.

Definitions:

Harbour Tugs: Powerful boats used to guide large ships safely inside the harbour. They help vessels turn, stop, or hold position in tight spaces and during strong winds or tides.

Dock Tugs: Smaller, more agile tugs used inside the wet docks and basin areas. They assist ships during berthing and unberthing where manoeuvring room is limited.

Pilot Launches: Fast, sturdy boats that carry marine pilots to and from incoming ships. Pilots board vessels at sea and guide them into the harbour using their local navigational expertise.

Mooring Launches: Small craft used by mooring crews to place, adjust, or remove ropes and lines that secure ships to buoys, dolphins, or jetties within the harbour.

Security Patrol Boats: Light, quick vessels operated by port security teams to monitor harbour waters, check vessel movements, conduct patrols, and ensure safety and compliance in port limits.

Aids to Navigation

- **Sagar Drishti Augmented Vessel Traffic Management System:** Mumbai Port operates an integrated Vessel Traffic System (VTS) to monitor and control vessel movements within the harbour and outer anchorages, covering an area of about 568 sq km. The VTS Centre is located on the 3rd floor, Control Tower, South End Ballard Pier Extension (BPX), Ballard Estate (Lat 18°55.726' N, Long 72°50.648' E). The system employs three main radar stations, situated at Colaba Point, Jawahar Dweep and JNPA, with sensor data brought back to the control centre over five digital microwave links and integrated with AIS, VHF and other inputs. All vessels navigating or anchored in the VTS area are required to maintain a continuous listening watch on VHF Channel 12, through which VTS Mumbai provides information service, traffic organisation service and navigational assistance, in line with IALA/IMO guidelines.
- **Virtual Buoys:** Mumbai Port, in partnership with NTCPWC, has implemented virtual buoys to digitally mark navigational channels, enhance situational awareness, support VTS operations, and improve safe vessel movement without relying solely on physical aids. This has provided an added layer of navigational safety.
- **Harbour Inter-Agency Coordination:** Mumbai Port coordinates vessel movements with JNPA and the Indian Navy through a structured traffic-management arrangement covering the shared Mumbai Harbour approach channel. Both ports maintain continuous communication on designated marine VHF channels—**Mumbai Port on VHF Channel 12**, JNPA on **VHF Channel 13** and **Channel 16 (working frequency)**.

Anchorage

Anchorage form a critical asset for Mumbai Port wherein a large part of lighterage activity is carried out along with Marine services like Bunkering, Water Supply, minor repairs, etc.

Mumbai Port has following anchorage infrastructure

- 56 Cargo Lightering Anchorages
- Port Lighterage Area (PLA)

Currently, out of the 56 anchorages, only 6 are used for cargo lighterage activities. The remaining are used for marine services.



Figure 10 Location Map of Anchorages of Mumbai Port



Figure 11 Location Map of Port Lighterage Area (PLA)

Marine Oil Terminal - Jawahar Dweep

Jawahar Dweep is the marine oil terminal having five jetties i.e. JD 1 to JD5. Entire infrastructure is owned, operated and maintained by MbPA. Crude, Diesel, Naphtha, Kerosene and Black Oil/HFO are handled at this terminal with 5 different product pipeline networks. JD 4 and JD 5 are dedicated for crude handling. JD5 is a unique berth on the west coast with handling capacity of 22 MTPA at one berth alone. BPCL and HPCL use JD 5 to import crude through VLCC and JD 4 is used by ONGC. JD 1, JD 2 (Bunkering Terminal), and JD 3 are used for handling rest of the other commodities. Smaller vessels are handled at these jetties. Oil pumping is done at JD jetties and transferred to Pir Pau through sub-sea pipelines for further distribution to BPCL, HPCL and others.

- No. of Berths: 5
- Main Products Handled: Crude Oil & POL
- Mechanization of Berths: 100%



Figure 12 Location Map of Jawahar Dweep

Chemical Terminal at Pirpau

At Pir Pau, chemicals and petroleum products are handled. The first jetty is called Old Pir Pau (OPP) but is currently used only for barges handling lubbe oil, base oil, etc. There are 3 main berths namely

1. First Chemical Berth (FCB)
2. Second Chemical Berth (SCB)
3. Third Chemical Berth (TCB)

Chemicals, LPG and other petroleum products are handled at FCB & SCB. TCB is new berth which became operational in September 2024. It has depth of 13 m and capacity of 2 MTPA.

All the jetties are connected to Oil Refineries/storage tanks by a network of pipelines.

- No. of Berths: 3
- Main Products Handled: Crude Oil & POL
- Mechanization of Berths: 100%



Figure 13 Location Map of Pir Pau

Indira Docks

- Part 1: ID Inner Berths – 22 Berths / 9.1 m draft for Coastal Cargo, Project Cargo, Defense Cargo
- Part 2: ID Harbor Wall Berths – 4 Berths / 9.5 m draft for Break Bulk, mainly steel coils
- Part 3: Offshore Terminal – 2 Berths / 11 m draft - Specialised RoRo Terminal
- Part 4: Ballard Pier Station - 1 Berth / 10.5 m draft – Mainly Steel
- Part 5: Ship Repair: 5 Berths & Hughes Dry Dock
- Part 6: Coast Guard – 2 Berths
- Part 7: International Cruise Terminal at Ballard Pier Extension

Total Number of Berths: 39

Gates: 5 (Orange, Yellow, Yellow(PD), Blue, Grey)

Rail Connectivity: Mumbai Port Railway till Ravli Junction

Road Connectivity: Atal Setu, Eastern Freeway

Barge Handling at 14VD

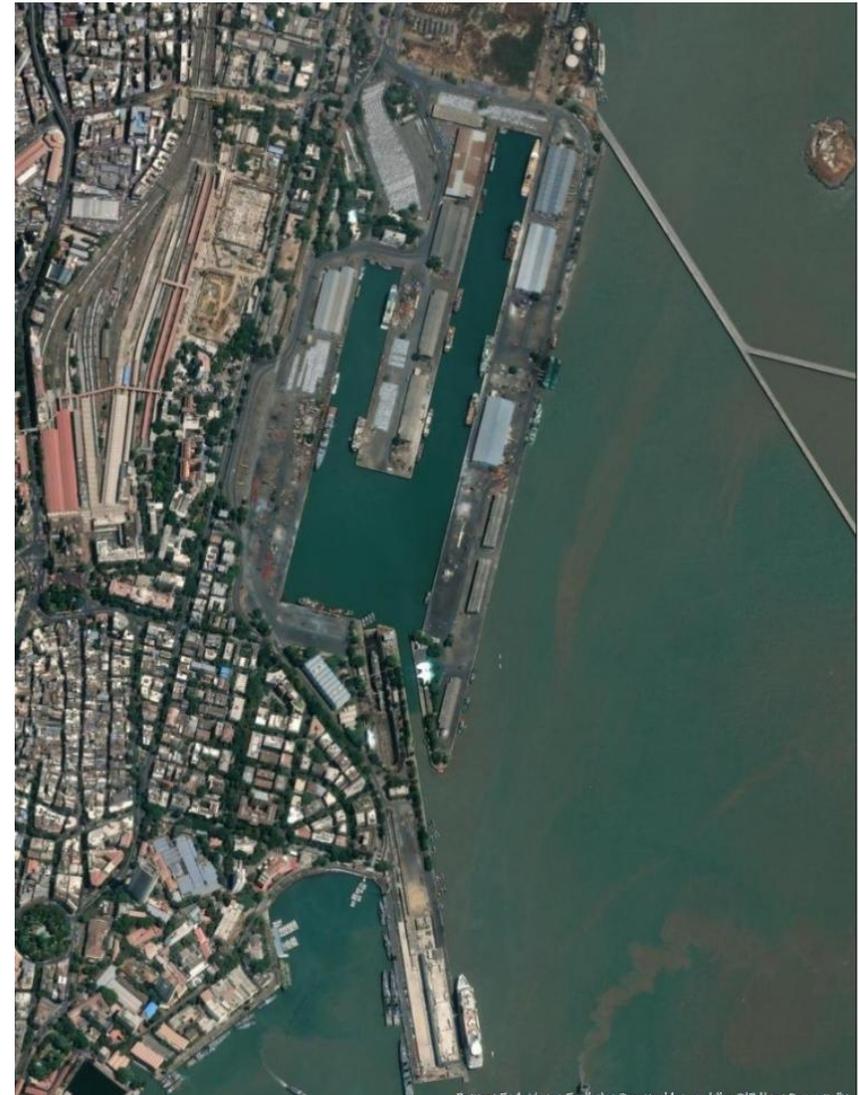


Figure 14 Location Map of Indira Docks

Storage

Table 2 Details of Existing Storage Areas

Location	Storage Area Type (sq.m)		
	Open	Covered Transit Shed	Covered Warehouse
Indira Dock	249,356	72,675	17,983
Victoria Dock	9,571	5,088	-
Prince's Dock	10,832	-	3,960
CFS	431697	15,048	119,947
Haji Bunder	38,202	3,795	-
Hay Bunder	9,000	6,564	-
OCT	4903 TEU	-	-
Mallet Bunder	-	-	11,250
Frere Basin	-	-	9,884
Total	748,658	103,170	163,024
Total (ha.)	74.9	10.3	16.3
Liquid Storage	~487,800 Tons		

Connectivity

For Mumbai Port, connectivity exists for every competency type:

Roadways:

BPT Road is the primary evacuation road for Indira Docks from the Orange Gate. This road is connected to the Atal Setu and the Eastern Freeway which goes on to for evacuation to Pune (via Mumbai Pune Expressway) and Nashik / Nagpur (via Samruddhi Expressway).

Railway:

The Mumbai Port railway is up to Raoli Junction at Wadala, after which, it connects with the Central Railway.

Pipeline:

There are subsea pipelines for transporting Crude Oil and POL from Jawahar Dweep to the oil refineries and storage areas. The Oil Pipelines from Old Pirpau Jetty go to Wadala-Sewri area through the OPL pipeline network.

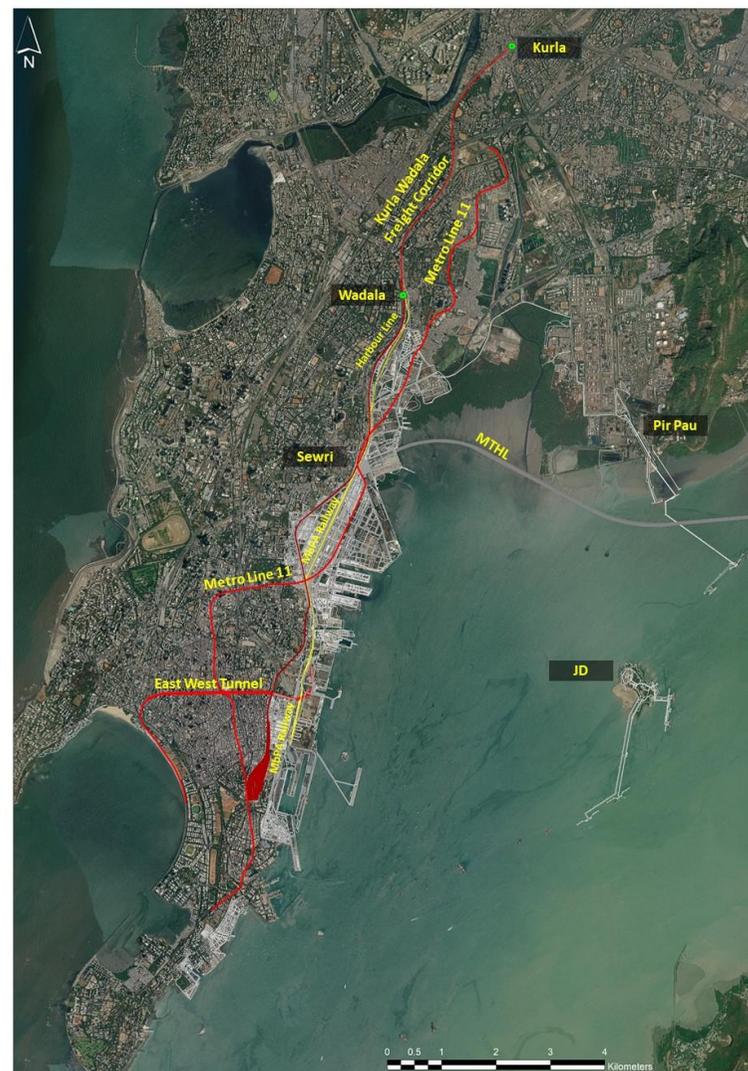


Figure 15 Map showing Connectivity of Mumbai Port

Electricity Consumption

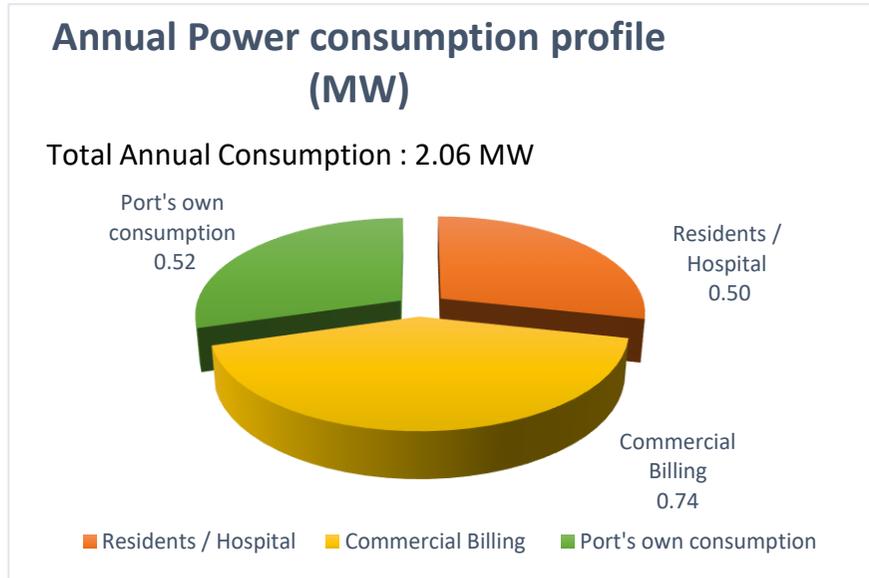


Figure 16 Annual Power Consumption Profile of Mumbai Port

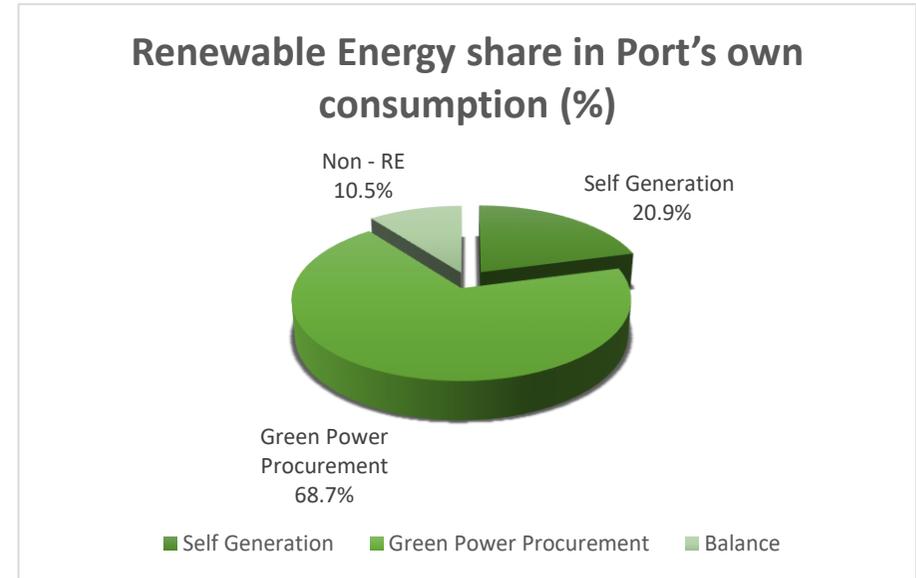


Figure 17 Renewable Energy share in Port's Own Consumption

The electricity consumption profile of Mumbai Port shows a balanced distribution across key user categories, with a total annual demand of 2.06 MW. Commercial establishments account for the largest share at 0.74 MW, reflecting the port's active business and operational ecosystem. This is followed closely by Port's own consumption at 0.52 MW, covering administrative buildings, operational facilities, and essential services. Residential areas and the hospital together consume 0.50 MW, indicating a moderate but steady demand. Notably, a significant portion of the port's internal consumption is supported by renewable energy—over 89% comes from self-generation (20.9%) and green power procurement (68.7%), reducing dependence on non-renewable sources to just 10.5% and highlighting the port's commitment to sustainable energy practices.

Regulatory Framework

Mumbai Port, as a Major Port, primarily implements the **Major Port Authorities Act, 2021**, which governs port administration, land management, port dues, conservancy, pilotage, tug and vessel traffic operations. It also enforces the **Public Premises Act, 1971** for estate matters, and applies commercial and contract-related statutes such as the **Indian Contract Act, 1872**, **Transfer of Property Act, 1882**, and **Indian Easements Act, 1882**. Cargo documentation and liabilities are governed through the **Bills of Lading Act, 1856** and the **Carriage of Goods by Sea Act, 1925**, while maritime claims and vessel arrests fall under the **Admiralty Act, 2017**.

In contrast, the **Directorate General of Shipping (DG Shipping)** administers maritime safety and vessel regulation under the **Merchant Shipping Act, 1958**, covering ship

registration, manning, training, certification, safety equipment, port state control, coastal shipping and passenger vessel safety. DG Shipping also implements rules for tugboats, harbour craft, pollution prevention (MARPOL), and navigational safety standards.

India's Major Ports (under MoPSW) follow the Major Port Authorities Act, 2021, while non-major ports and private ports (under State Maritime Boards) operate under respective Indian Ports Act, 2025. MoPSW sets national policy for ports, shipping, inland waterways and coastal infrastructure, while DG Shipping serves as the statutory maritime regulator for ships, seafarers, safety and environmental compliance across all ports—major, non-major and private.

Governance Structure

Governance Structure of Mumbai Port Authority is based on the traditional departmental structure with eight departments, which are further broken into divisions and cells.

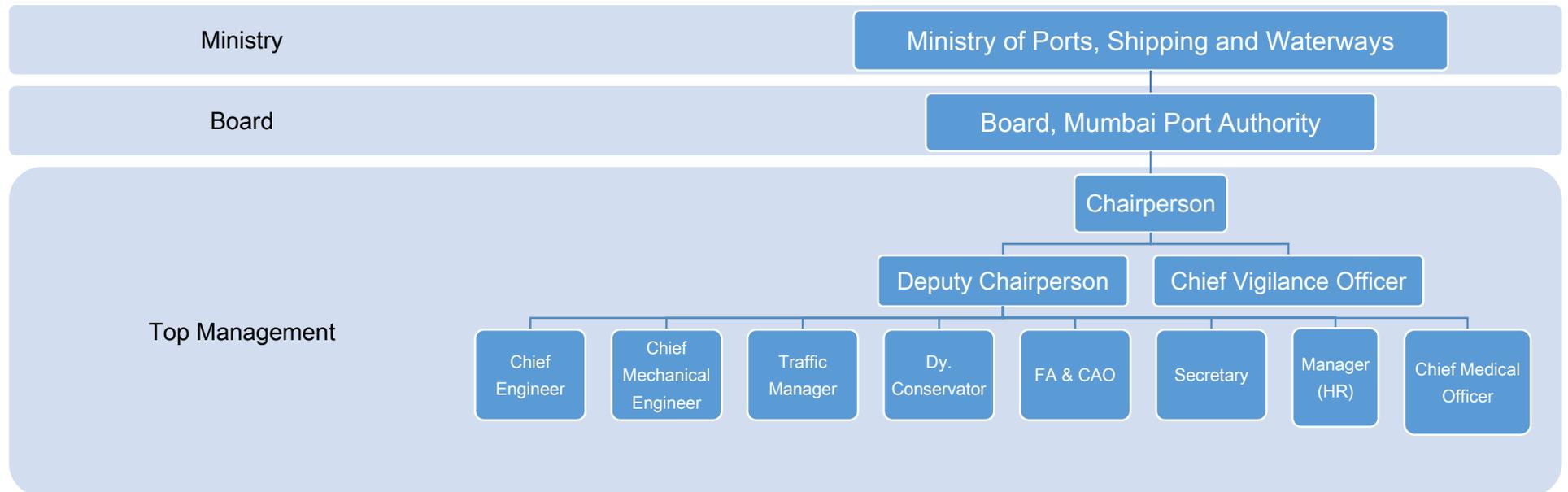


Figure 18 Governance Structure of Mumbai Port

Port Community

The Mumbai Port community is a highly diversified operational ecosystem comprising more than fifty distinct categories of stakeholders that together sustain everyday port functioning. This includes ship owners, shipping agents, stevedores, tug and barge operators, ship repairers, ship chandlers, bunker suppliers, underwater diving agencies, and offshore service providers who form the marine operations backbone. Cargo movement is enabled by transporters, container movers, palletisers, surveyors, cargo measurement agencies, customs house agents, freight forwarders, NVOCCs, importers and exporters. A wide service layer of labour

contractors, crane suppliers, scrap and sludge oil contractors, used oil handlers, chipping and painting agencies, watchmen, laundry services, canteens, vendors, and miscellaneous suppliers supports port continuity. Institutional stakeholders include trustees, government agencies, MbPA departments, contractors, employees on deputation, unions, pensioners, and ex-officials. Together, these stakeholders represent a tightly interlinked port community whose coordination, compliance, and operational discipline underpin the reliability, safety, and economic vitality of Mumbai Port.

WHERE WE ARE GOING

Global Trends

1. Larger Ships and Deeper Channels

The world's largest crude carriers exceed 320,000 DWT and require 20 m+ drafts, driving ports globally to deepen channels and modernise ship-handling infrastructure.

2. Offshore and Greenfield Terminals

Many global ports are shifting cargo handling to offshore and greenfield terminals to improve safety, increase draft availability and reduce traffic inside city harbours.

3. Containerisation and Product Diversification

About two-thirds of international seaborne trade by value is containerised, and global containerised volumes are growing at approximately 3 percent annually, reshaping port-hinterland logistics.

4. Digitalisation, VTS and Navigational Intelligence

Over 80 percent of global ports operate advanced VTS or digital-twin systems, improving tanker traffic coordination, anchorage safety and real-time vessel monitoring coupled with cargo tracking and algorithmic storage use.

5. Maritime Decarbonisation and Cleaner Fuel Handling

Global IMO regulations are pushing ports to adopt low-emission technologies, cleaner bunkering systems and improved vapour-control measures for crude and liquid-bulk operations.

National Trends

1. **India's march toward a 10-trillion-dollar economy:** Rapid GDP expansion will massively increase cargo demand, requiring ports to scale capacity, deepen drafts and modernise marine infrastructure.
2. **Government policy push:** India is driving an unprecedented maritime expansion through Maritime Amrit Kaal Vision 2047 from the current 2700 MT national port capacity to the target 10,000 MT by 2047.
3. **New laws and reforms:** The Major Port Authorities Act 2021, Indian Ports Act 2025, Merchant Shipping Act 2025, Inland Vessels Act 2021 and new tariff guidelines are reshaping governance, safety and regulatory flexibility.
4. **Tax breaks:** India is offering tax incentives through GIFT City, coastal shipping concessions, tonnage tax regimes and GST relaxations to attract global maritime investment.
5. **Push for Public Private Partnership:** Abolition of TAMP, market-linked tariff frameworks and model concession reforms are making Indian ports more bankable and private-sector friendly.
6. **Port-led Industrial Clusters:** Ports are being linked to manufacturing, energy and logistics clusters—integrating port estates with industrial corridors and high capacity logistics connectivity for large-scale port-led development.
7. **Making India an Export Powerhouse:** India's push for manufacturing-led exports demands larger, faster, higher-capacity ports with global-standard terminals, logistics zones and seamless multimodal connectivity.

India's Port Capacity Target and Roadmap

India's port capacity is currently about 2,700 million tonnes per annum. The national vision sets a target of reaching 10,000 million tonnes by 2047. This increase is expected through a combination of expansion at existing ports and development of large new deep-water ports.

- Expansion of major ports through berth addition, mechanisation and deeper drafts: about 2,500 MT additional capacity.
- Expansion of non-major ports and new greenfield ports on the west and east coasts: about 2,000 MT additional capacity.
- Development of Vadhavan Port: about 400 MT.
- Development of Galathea Bay Port: about 400 MT.
- Private sector-led port expansions and new terminals: about 1,200 MT.
- Inland Waterways, Coastal Shipping hubs and Multimodal Connectivity: about 800 MT.

Together, these interventions bring the national port system from roughly 2,700 MT today to about 10,000 MT by 2047.

India – Middle East – Europe Economic Corridor

The India–Middle East–Europe Economic Corridor (IMEC) is a proposed international trade corridor linking India with Europe through the United Arab Emirates, Saudi Arabia, Jordan, and Israel, with onward maritime connections to European ports such as Greece and Italy. For Mumbai Port, IMEC positions the port as a primary Indian gateway on the western coast, handling export–import cargo destined for the Middle East and Europe. The corridor combines a sea leg from Mumbai to the UAE, an approximately

two thousand to twenty-two hundred kilometre rail corridor across the Arabian Peninsula and the Levant, and a final sea leg from Israel to Europe, resulting in overall transit time savings of about thirty to forty percent compared to the traditional Suez Canal route.

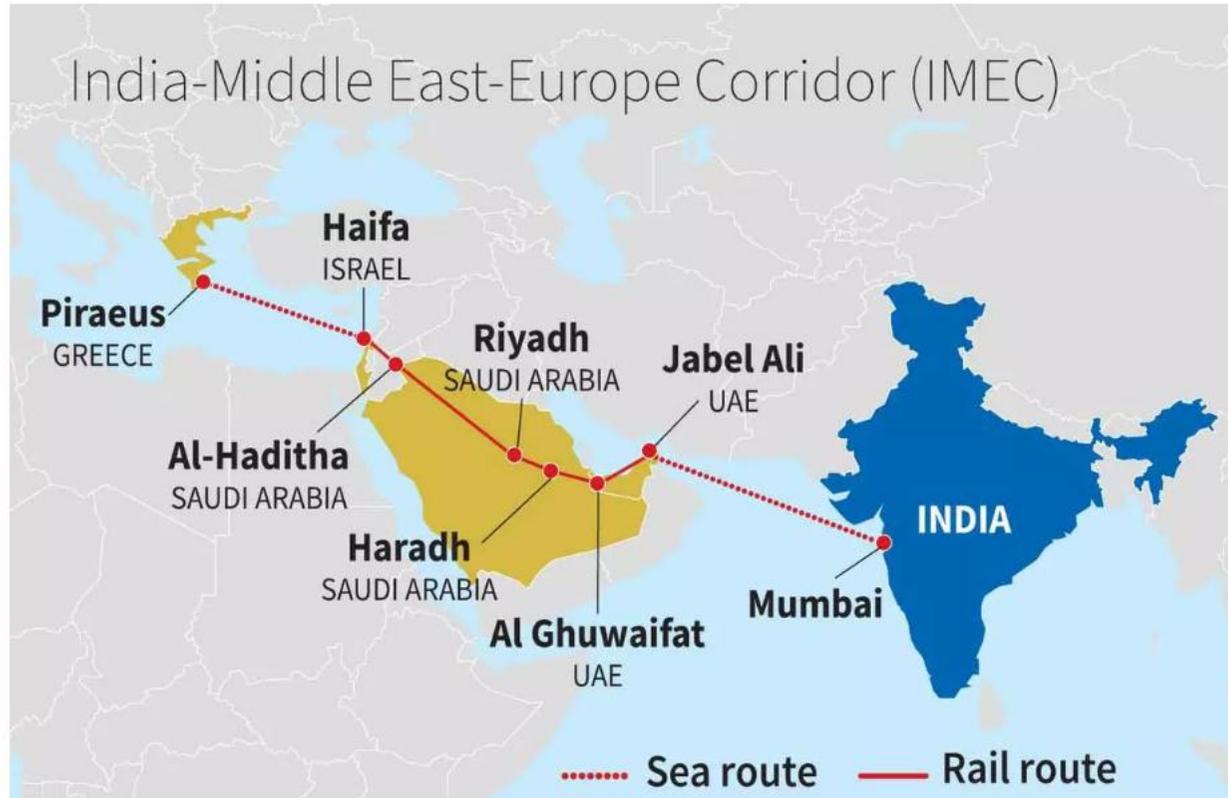


Figure 19 Route Map of India-Middle East-Europe Corridor (IMEC)

Regional Trends

1. **New Megaport Vadhwan:** Maharashtra's coastline and port system are being re-optimised through new deep-draft terminals (Vadhwan Port 20 m draft) to handle larger ships and expand capacity on the west coast.
2. **A strong policy push** by Govt. of Maharashtra supports port-led industrialisation through coastal economic zones, logistics hubs and maritime cluster development along the Konkan coast.
3. **Emerging Private Ports:** The state is witnessing rapid expansion of private and non-major ports (JSW Jaigarh, Dighi, Dharamtar) driven by flexible tariffs and industry-linked infrastructure demands.
4. **Coastal Connectivity Projects**—such as Samriddhi Mahamarg, Dedicated Freight Corridor, Virar – Alibaug Multimodal Corridor, Ro-Pax terminals, and inland waterways pilots—are strengthening multimodal freight movement across the state.
5. **Cruise and Coastal Tourism** are expanding through the International Cruise Terminals at Mumbai & Goa, positioning Maharashtra as India's leading cruise gateway.
6. **The Shipbuilding and Ship repair ecosystem** is growing around Mumbai, Nhava, Ratnagiri and Dabhol, with private yards (e.g., Bharati, Chowgule, Modest, Tebma) and Navy/Coast Guard yards forming a high-value maritime manufacturing cluster.
7. **Containerisation for Manufacturing Clusters:** As compared to Eastern Coast which is seeing a rise of bulk handling ports, the Western Coast is largely focussed on containerisation of cargo to serve the emerging manufacturing base in the hinterland.

Competitive Landscape

The primary hinterland of MbPA is in the radius of 200 km, and there are several alternative ports in this range. However, the niche commodity segment of MbPA restricts migration of cargo from MbPA to competing ports. Majority of traffic handled at MbPA is originated / destined within Mumbai Metropolitan Region extended to Maharashtra state. Crude Oil & POL have captive user base in BPCL and HPCL refineries. For Automotive Cargo, Mundhra Port is the closest competitor, which is outside the range of 200 km. For bulk and break bulk, the existing ports in the vicinity namely JNPA, Dharamtar, Dighi and Jaigad pose very limited competition. Dharamtar and Jaigad handles more than 80% of total Maharashtra's non-major ports traffic. More than 90% of traffic handled at these ports is for captive use, and rest is consumed locally. Hence, there is negligible threat to MbPA business from these ports. Hazira and Dahej handled 92.4 Mn T in FY22. Around 30% of south Gujarat traffic is handled by captive users, 5% by GMB and rest 64% by private parties.

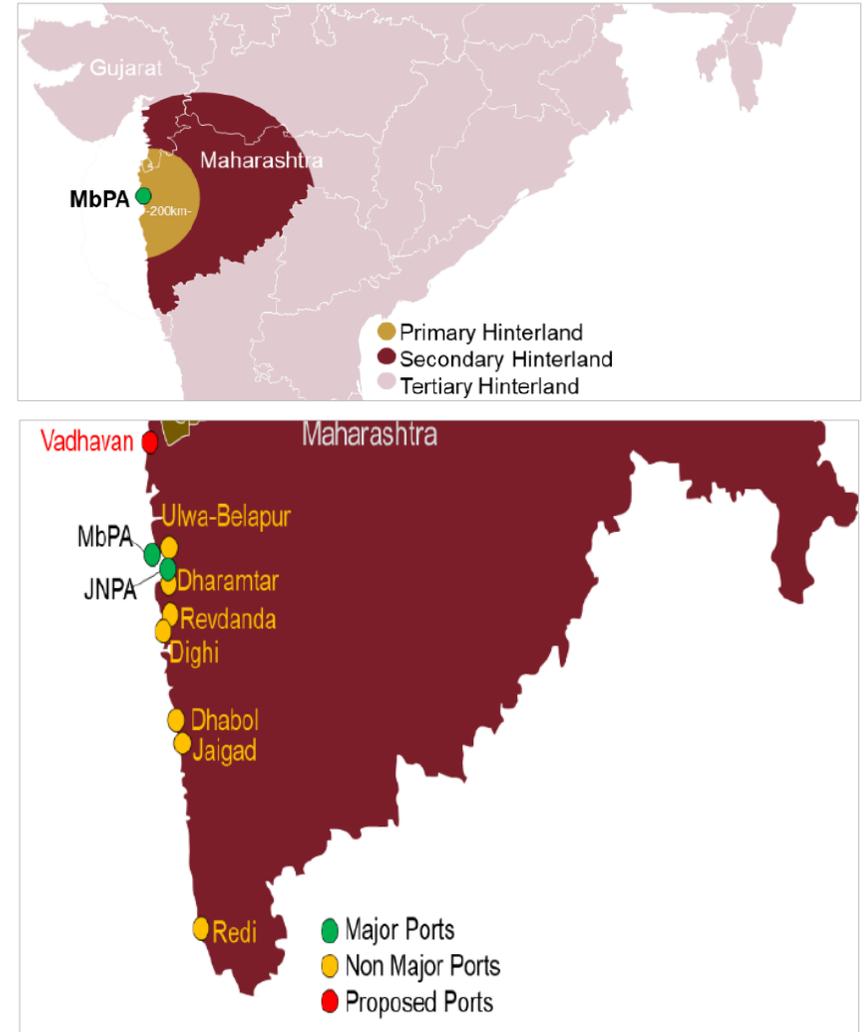


Figure 20 Hinterland Mapping of Mumbai Port

Integrated Mumbai Port Masterplan 2047

Table 3 Competition Mapping for MbPA

	JNPA	Dharamtar		Dighi	Jaigad	Dahej	Hazira
		JSW	PNP				
Draft (m)	15	4.5	4.0	9	18.5	14	14
Rail Connectivity	✓	X	✓	X	X	✓	X
Max. Vessel Size (LOA m)	370	115	78	325	350	300	350
FY22 Traffic (MT)	76	16.9	3.3	0.2	22.4	33.01	24.59
Capacity (MT)	138.9	34	5.0	30	55	36.8	35
Capacity Utilization	55%	50%	66%	0.7%	41%	90%	70%
Threats to MbPA	Moderate	X	Low	Low	Low	X	X
Reasoning	Planning provisions for non-container cargo as well	100% Captive	Low draft, non-EXIM dependent on MbPA anchorage.	Less traffic handled, No rail line, hilly road terrain	97% Captive. Can compete for Anchorage Traffic of JSW	More than 90% users located within port area	

Cargo Outlook

Mumbai Port is preparing for strong growth in:

1. Crude and POL
2. Chemicals
3. Iron & Steel
4. Iron Ore at Anchorages
5. Automotive Cargo
6. LPG
7. Agri Products

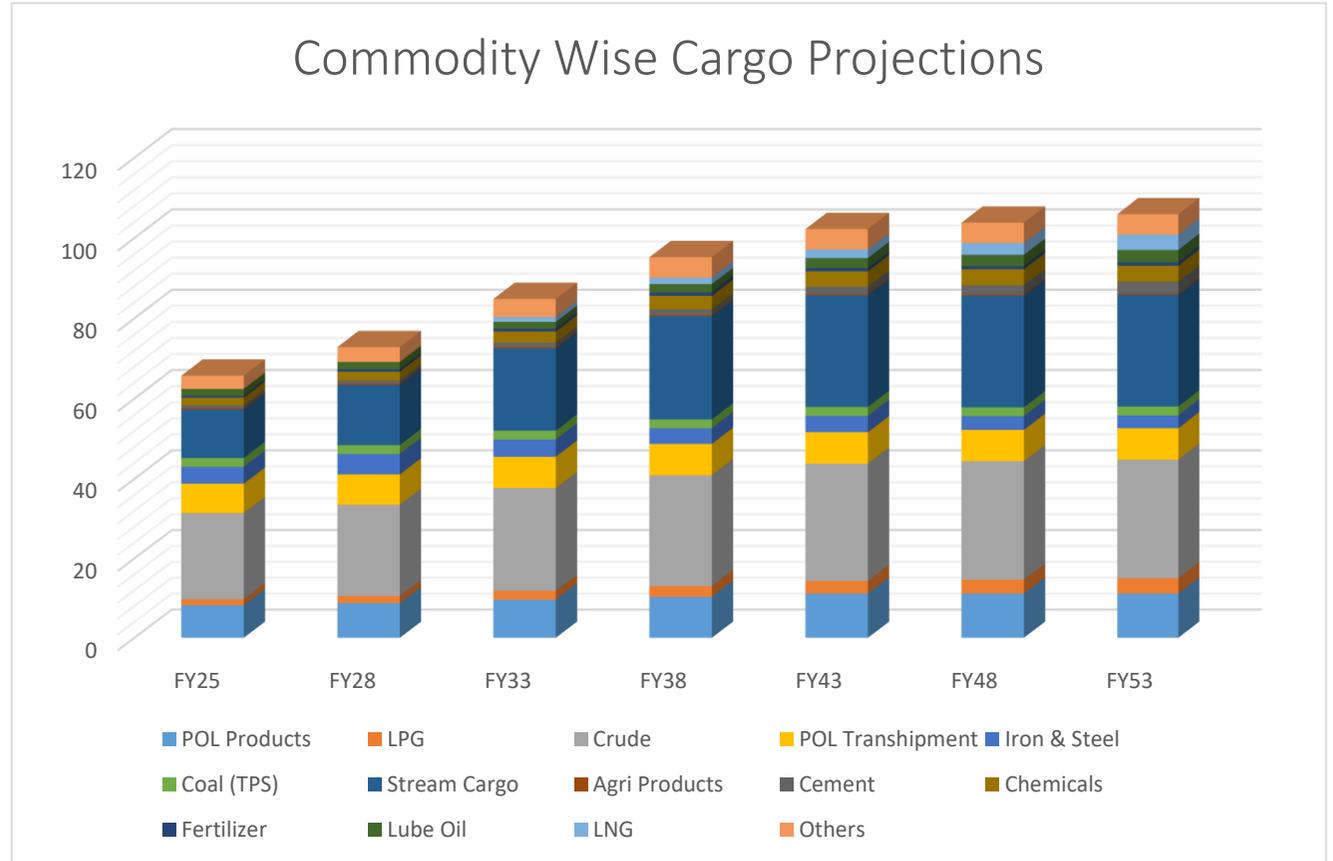


Figure 21 Commodity Wise Cargo Projections

Table 4 O-D Mapping of Commodities handled at Mumbai Port

Sr. No.	Commodities	O-D Mapping
1	Crude & POL	BPCL & HPCL unloads crude oil at Mumbai Port whereas ONGC loads crude oil at Mumbai. Both the HPCL & BPCL refineries are connected to jetty through pipeline network.
2	Stream Cargo	This dry bulk volume is handled at anchorage for transshipment to nearby ports i.e Dharamtar, PNP and Karanja. Around 35.85% of total cargo is iron ore, 35.62 % coal and rest Limestone and Dolomite
3	Coal	Entire volume is moved to Trombay Thermal Power Station jetty
4	Chemicals	Traders and manufactures located Maharashtra and South Gujarat imports Chemicals
5	Iron & Steel	JSW and POSCO are the users, more than 50% of total export is by JSW and 50% of total imports by POSCO. AMNS plant in Surat also uses MbPA for exports.
6	Lube Oil	Majorly imported by industries located in Taloja and nearby areas
7	Pulses & FG	Imported by traders / suppliers and distributed locally
8	Fertilizers	More than 95% of FRM imported by RCF. Top 10 fertilizer importers contribute to more than 95% of total imports. Majority of them are located within primary hinterland of MbPA
9	Motor Vehicles	Top 6 automobile companies contribute to more than 95% of total automobile imports. Mumbai, Pune, Nashik, Aurangabad and Nagpur are the auto hubs.
10	Others	-

Cruise Outlook

Mumbai Port is projected as the Cruise Capital of India under the Cruise Bharat Mission. The new state of the art International Cruise Terminal has given an added push along with the range of incentives rolled out by the Central govt. As per the Bermello Ajamil Report 2016, Mumbai Port has a projection to achieve **22.97 lakhs** annual cruise passengers (mid scenario) by 2041/42 as against present passengers of 2,64,643 .

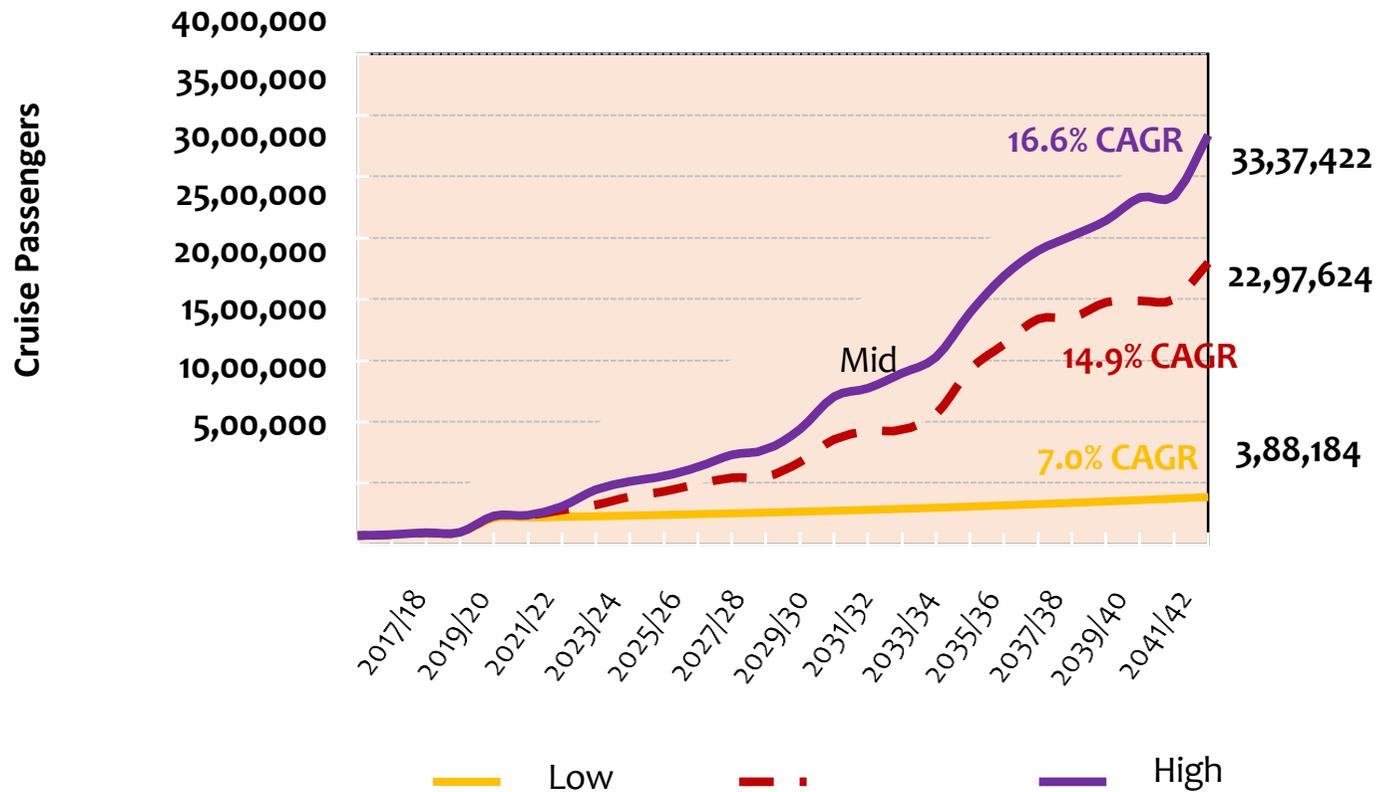


Figure 22 Cruise Passenger Projections

Bunkering Services Outlook

All the ships plying on Indian coast including ships owned and operated by Indian Navy, Indian Coast Guard, port and harbour crafts, offshore vessels and coastal vessels are dependent on bunker procurement locally. This is a saturated market that grows with growth in number ships and increase in frequency of sailing. The existing refineries of HPCL and BPCL located in Mumbai have been supplying bunkers to all the ships that are operating around Mumbai. The figure on the right shows the number of ship calling in Mumbai region.

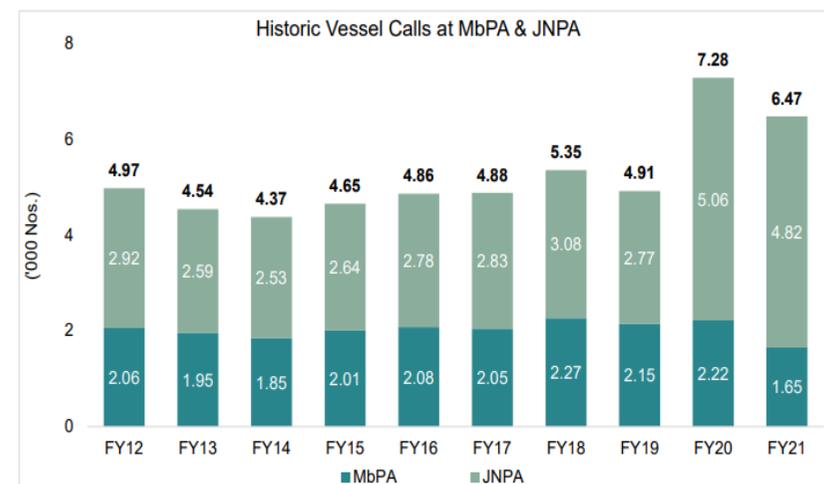
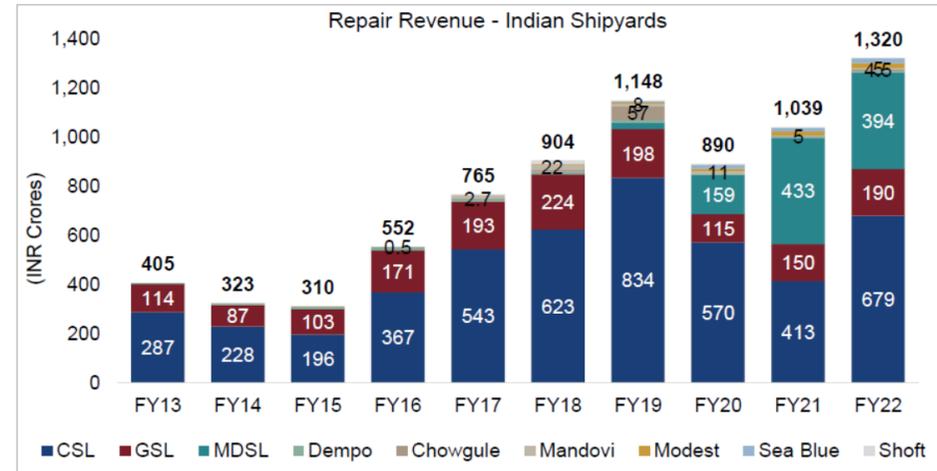


Figure 23 Total Vessel Call at MbPA & JNPA

(Source: Traffic Study Report prepared by CRISIL)

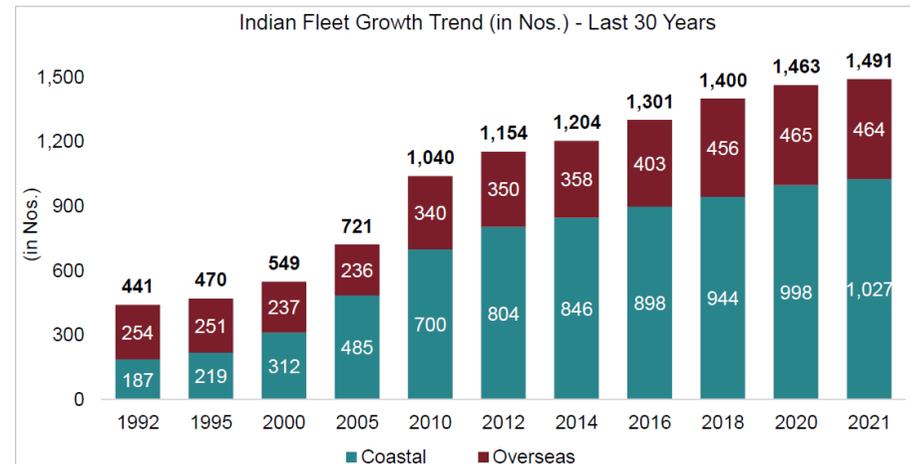
Ship Repair Outlook

1. Indian repair yards cater to <50% of domestic repair demand → Large vessels often go abroad due to facility gaps.
2. High growth in Indian fleet:
 - Coastal vessels ↑ from 187 (1992) to 1,027 (2021).
 - Overseas vessels ↑ from 254 (1992) to 464 (2021).
3. Fleet structure: <20,000 DWT in size - repair revenue potential focus for MbPA
4. Ship repair industry is growing steadily: CSL, GSL, and MDSL are major contributors.
5. Significant untapped market potential due to wide demand–supply gap.
6. Growth drivers: increase in mercantile fleet, stricter norms, changing trade patterns.



Source: Ministry of Ports, Shipping and Waterways, Annual Reports of Shipyards

Figure 24 Repair Revenue Trends of Indian Shipyards



Source: Indian Shipping Statistics

Figure 25 Indian Fleet Growth Trend

WHERE DO WE WANT TO BE

Planning Considerations

- All Major Port Authorities are required to prepare Comprehensive Master Plan 2047
- Paradigm Shift – from Port related to Port led economy
- Green fuel driving Green Ports

- Port in a Mega polis
- Globally connected and locally congested
- Stretched apart in pockets - from wadala to Sassoon Docks
- Employee liabilities
- Legal Cases
- Unauthorized Occupations



- Lock-gate & tide regulated port – changing vessel & cargo profile
- Draft limitations – frequent siltation – dredging requirement
- Urban Incursion – constricts expansion, pollution concerns, encroachments,
- Competition – overlapping hinterland with competing private ports in Maharashtra & Gujarat (Jaigarh, Dighi, Pipavav, Hazira)

- Untapped Land and waterfront resources
- Promising avenues in
 - ✓ **Maritime Logistics** (Automotive, Steel, Ship Building & Repair Hub, Commodity Distribution Hub)
 - ✓ **Maritime Leisure** – (Cruise Terminals, Marinas, Water Transport)
 - ✓ **Maritime Learning** (Research, Innovation & Skill Development Hub, Technology Enabled Smart Port)
- Booming hinterland – vibrant and happening

Growth Strategy



Vision 2047

1. **Maritime Logistics:** India's premier Multi-Cargo and Ship Repair hub

Focus: *Liquid Bulk, RoRo, Steel, Project Cargo, Lighterage, Ship Repair, Marine Services & Fisheries*

2. **Maritime Leisure:** An Inclusive Sea Tourism destination supported by MICE tourism & the Creative Economy

Focus: *Cruise Tourism, Yachting, Sailing, Water Transport, MICE (Meetings, Incentives, Conferences & Exhibitions), Concepts promoting the Creative Economy – Art Districts, Music & Film festivals, etc.*

3. **Maritime Land:** For Powering the Blue Economy

Focus: *Storage & Logistics, Ship Building & Ship Repair, Maritime Business & Skill Development, Commercial and Industrial Monetization of Vacant lands to become financially robust and power Infrastructure Development*

4. **Maritime Leadership:** Digitalisation and Sustainability for a Future Ready Port

Focus: *Integrated paperless digital systems & high capacity networks. Reduced carbon, water and waste at source*

5. **Maritime Legacy:** Preserve Maritime Heritage

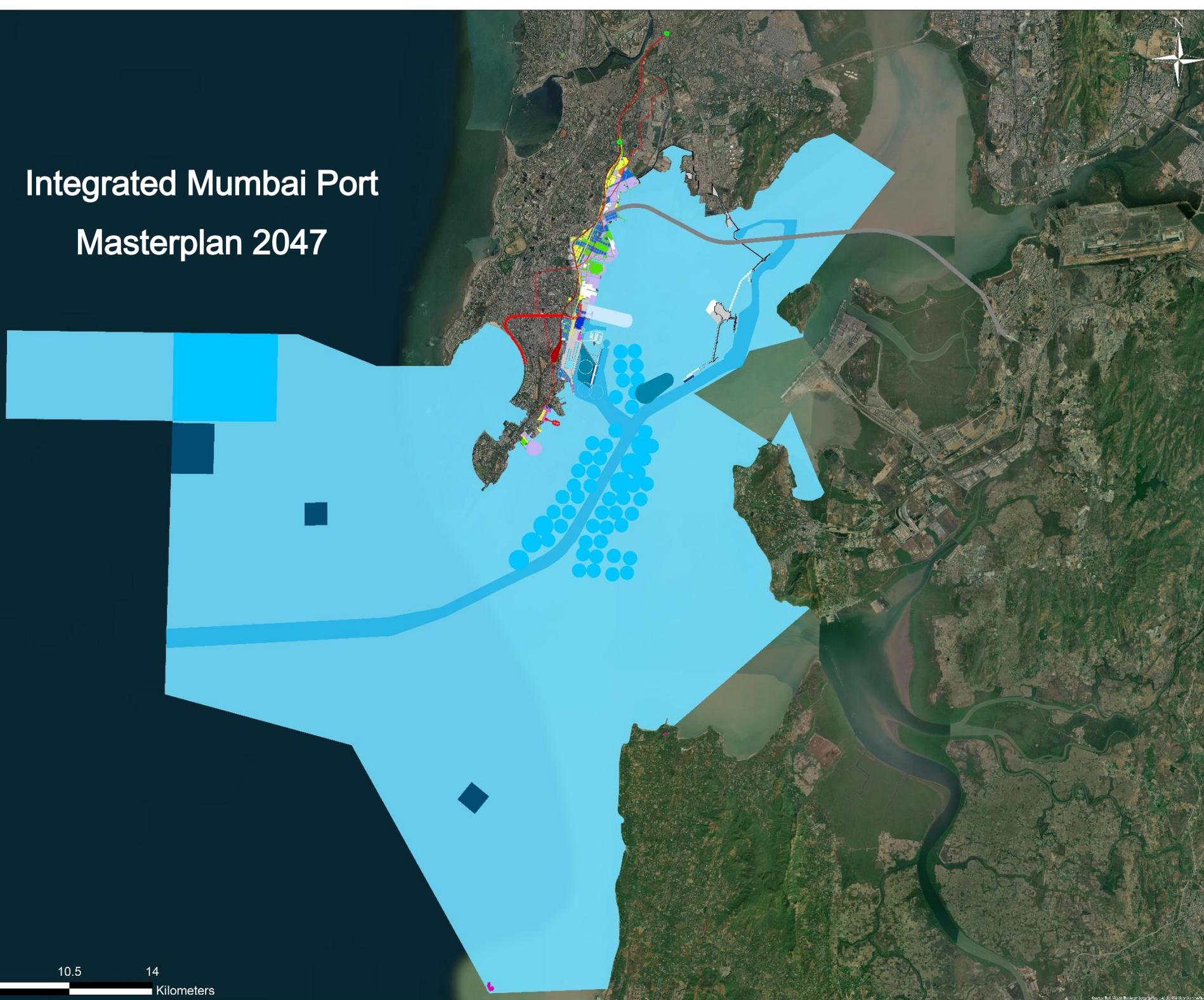
Focus: *Mumbai Port Archives, Heritage Experiences, Restoration of Heritage Structures.*

Masterplan 2047

The Integrated Mumbai Port Master Plan achieves the follow core objectives:

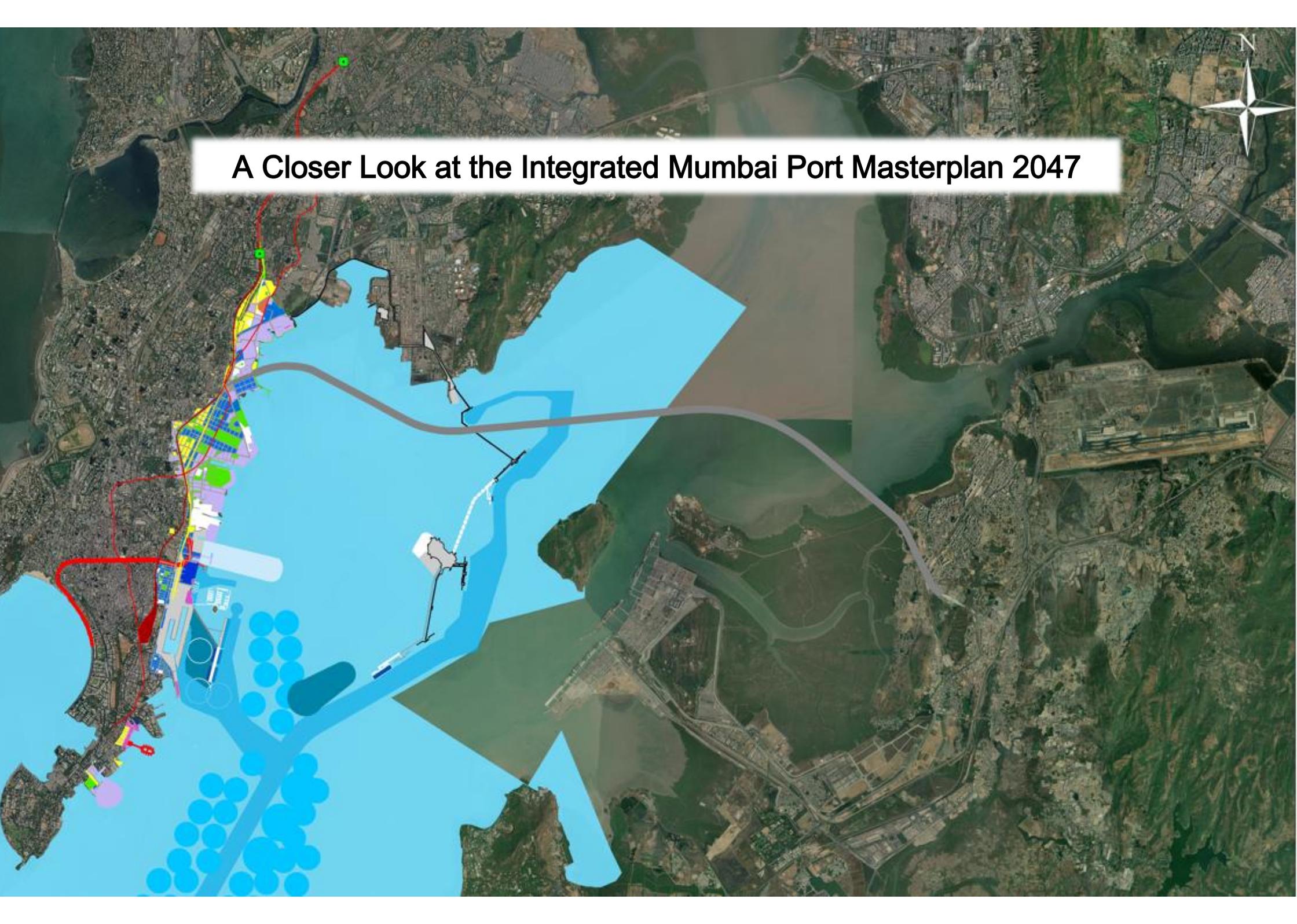
- **Enhance Traffic Flow through the Port:** Develop traffic scenarios for 2047, considering future cargo, cruise & ship repair projections and industrial growth in the hinterland. Plan new infrastructure to efficiently move the cargo traffic from ship to shore, as well as to and from the hinterland.
- **Improve Connectivity:** Connectivity is the single biggest factor for a port, and the Integrated Masterplan identifies connectivity gaps and suggests infrastructure interventions to reduce cargo dwell time.
- **Maximize Land Utilisation:** Create a master plan for land use of all land and waterfront assets of the Port, including existing and unused land parcels for high revenues as well as economic growth.
- **Create Maritime Value:** By inclusive planning for every possible aspect of Mumbai Port's Vision 2047, be cargo, cruise, ship repair, fisheries or urban water transport.

Integrated Mumbai Port Masterplan 2047



0 1.75 3.5 7 10.5 14 Kilometers

A Closer Look at the Integrated Mumbai Port Masterplan 2047

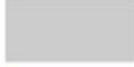


Legends

Water Use

	Port Waters
	Channel
	Existing Anchorages
	Proposed Anchorages
	Berthing Pockets
	Dumping Grounds
	Port Allied Activities

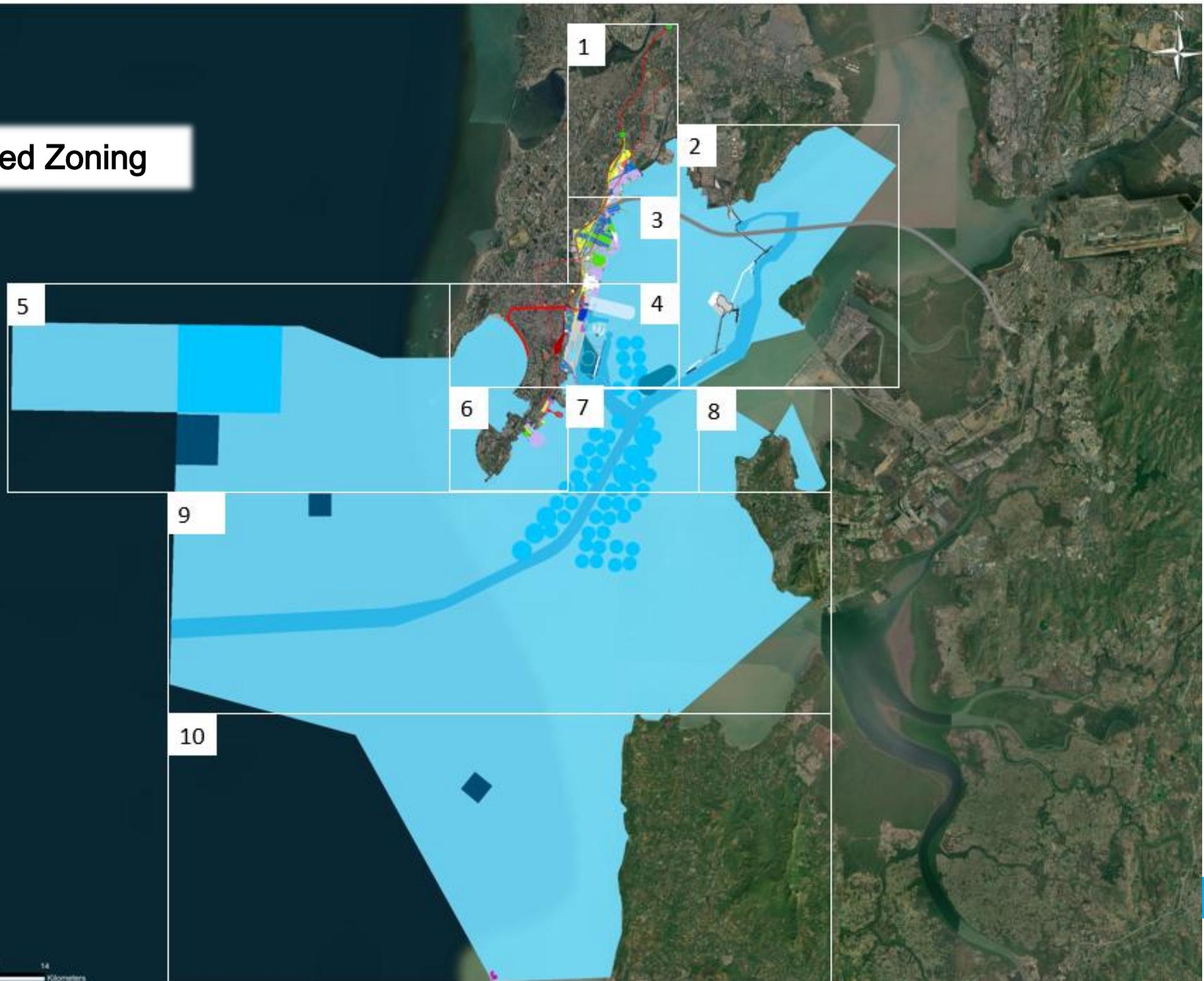
Land Use

	Port Operational Area
	Commercial
	Residential
	Port linked Eco-Tourism
	Healthcare
	Non Port Owned
	Open Space
	Road
	Water Transport
	Metro
	Railway
	Port Railway

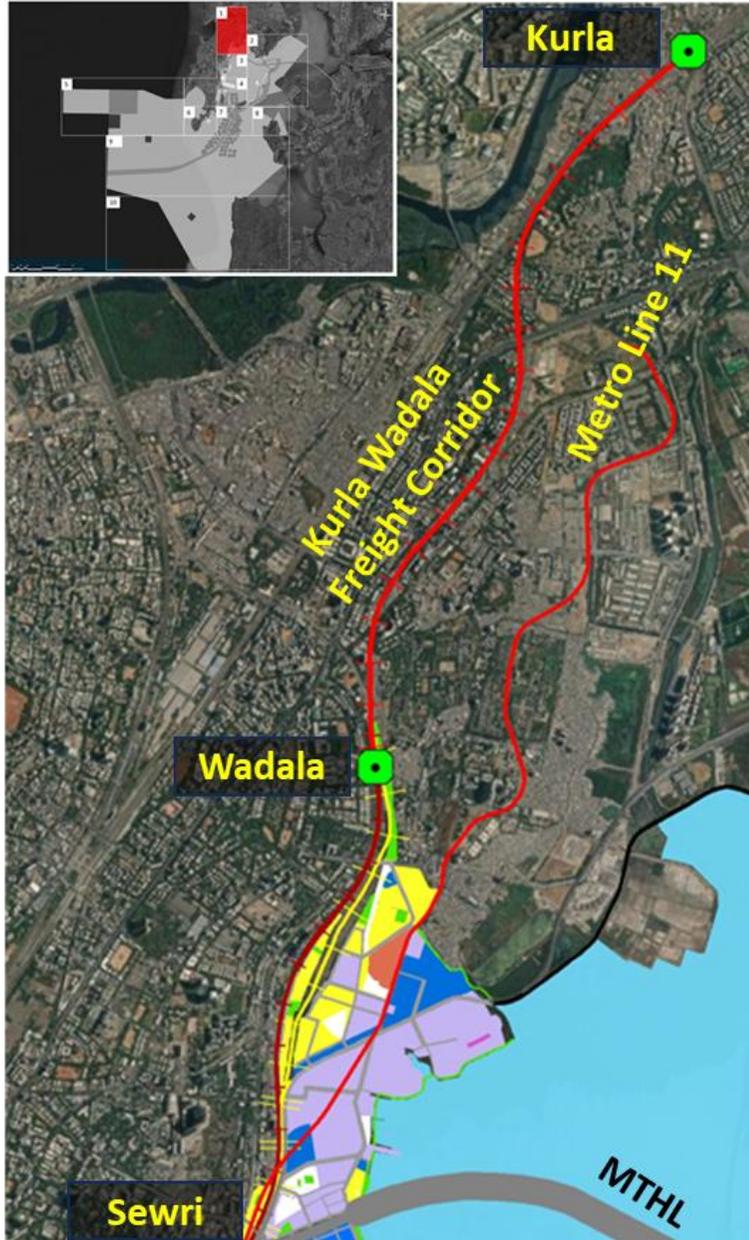
Grid Based Zoning

Grid-based zoning is a planning approach in which the area is divided into grids that act as discrete analytical units for assessing land potential, constraints and development priorities. In this context, the grids are not of uniform size, as their dimensions vary based on the nature and intensity of existing or proposed development. Rather than assigning fixed land-use designations to each grid, the framework uses these variable-sized cells to evaluate suitability, environmental sensitivities, infrastructure needs and regulatory requirements. This flexible method helps simplify complex planning areas and supports more nuanced, data-driven decision-making.

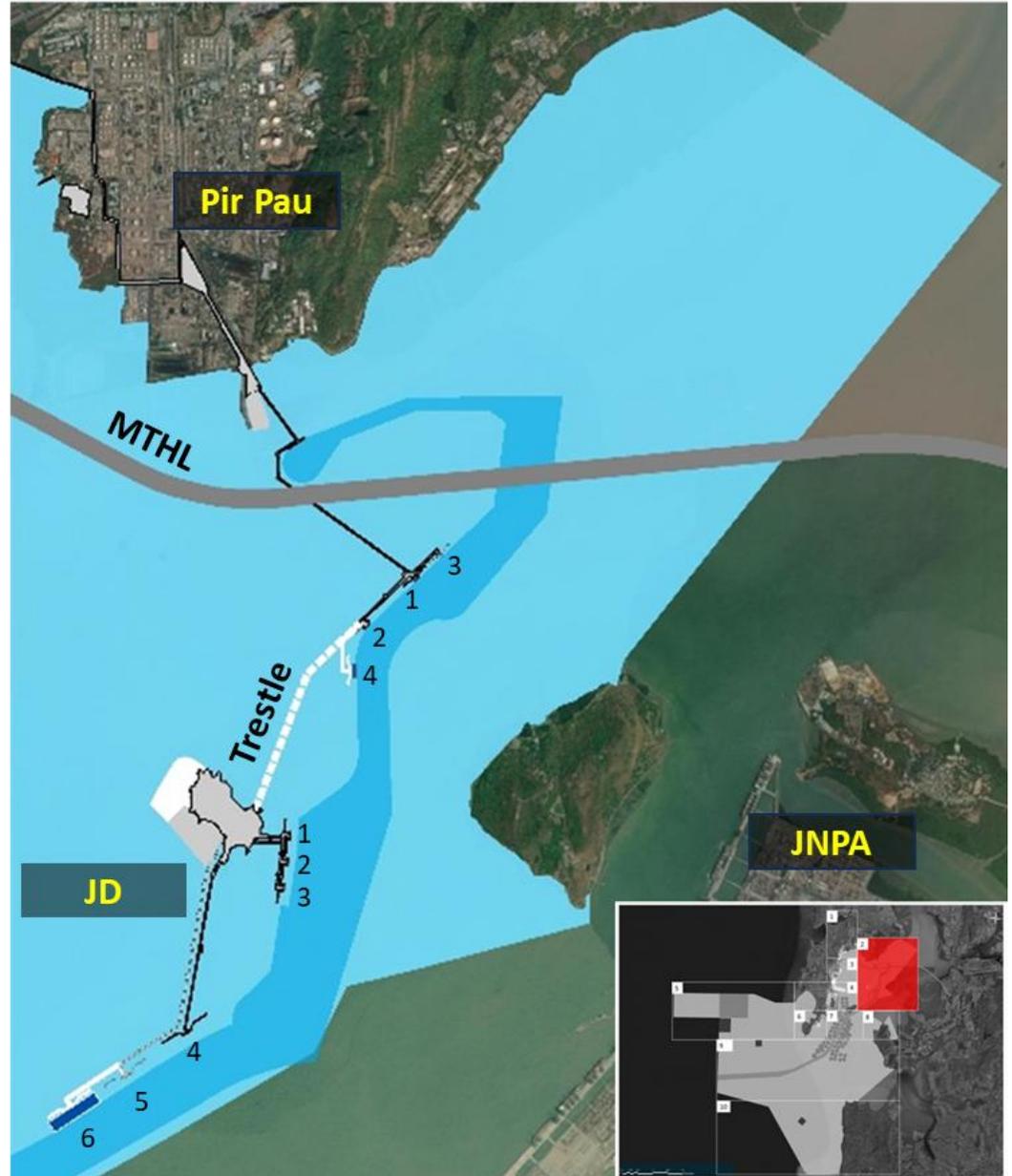
Grid-Based Zoning



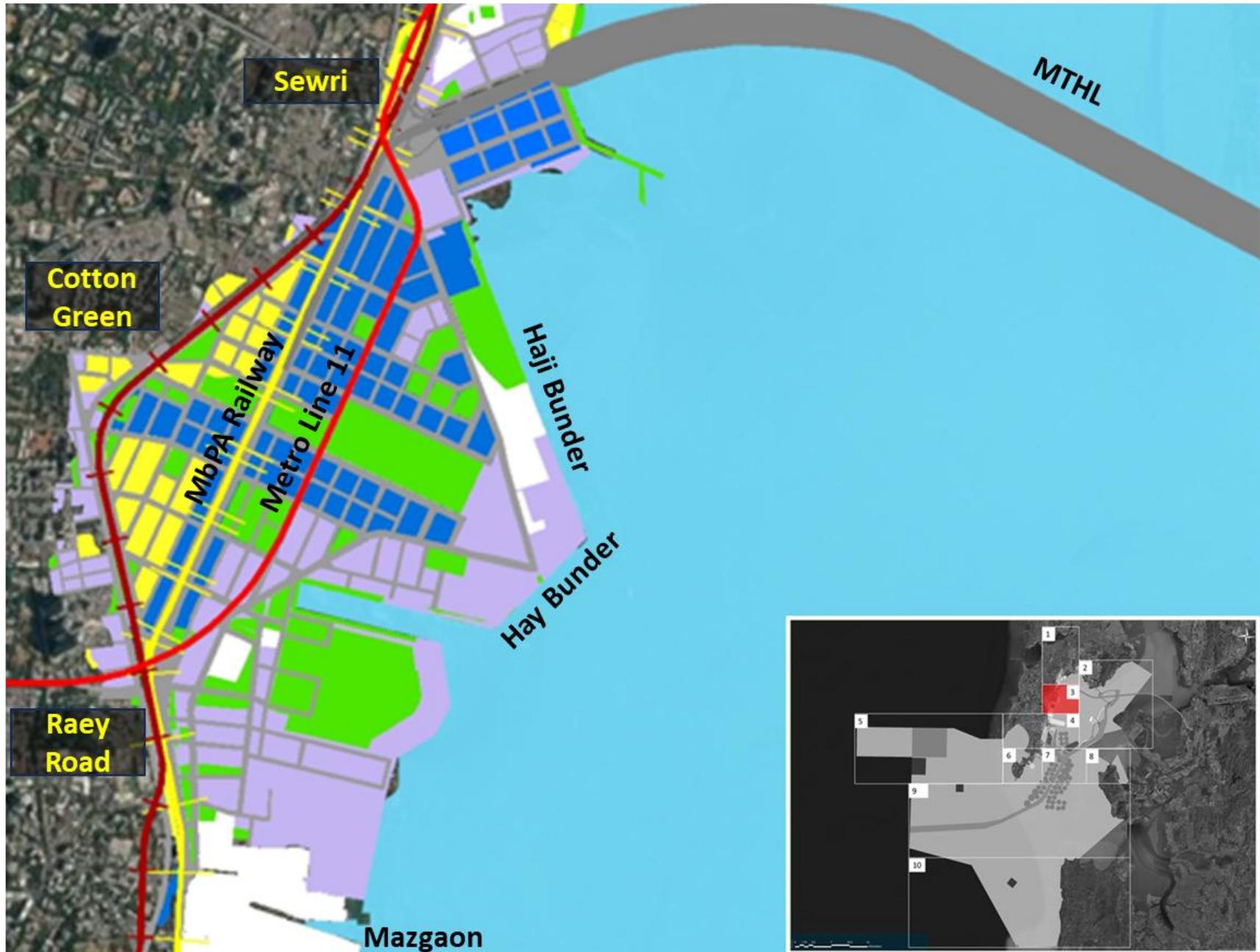
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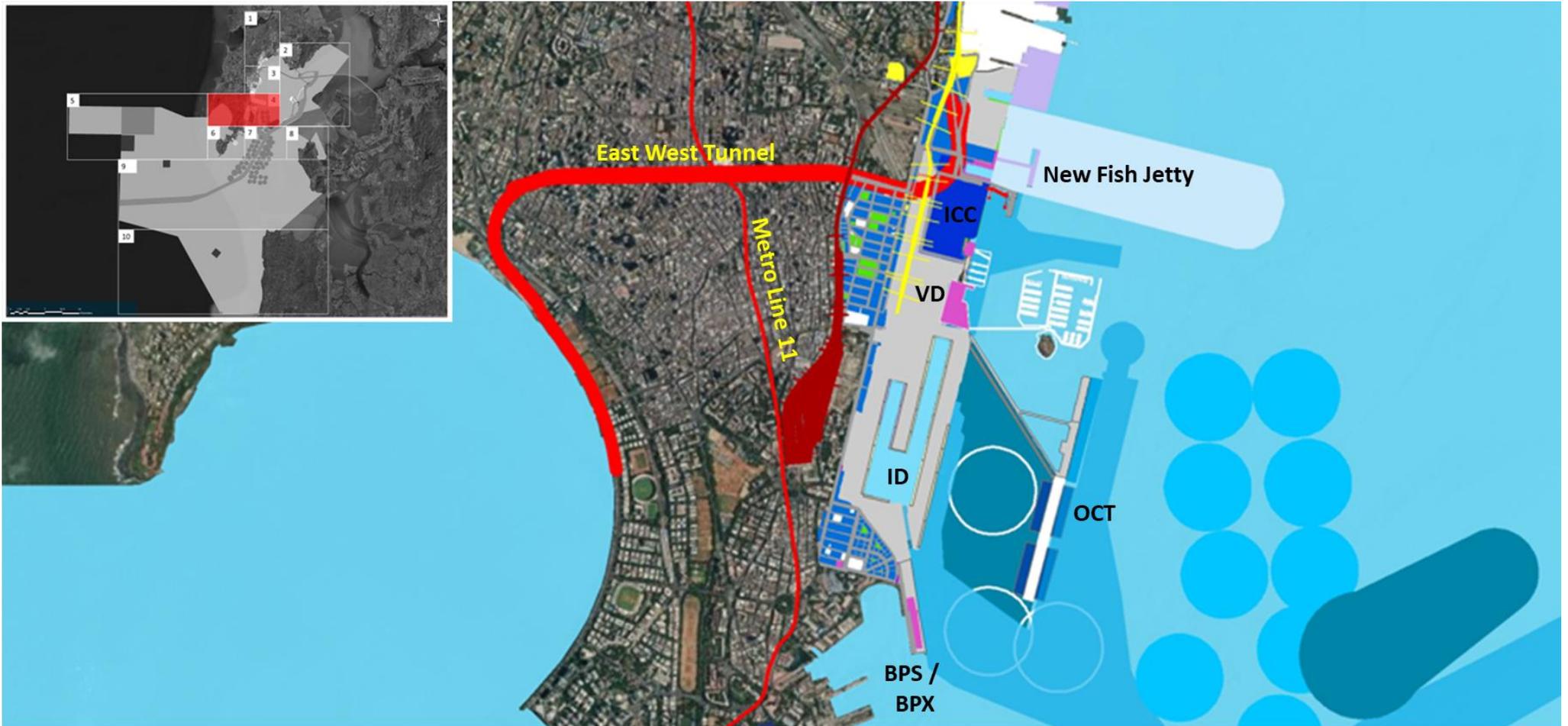
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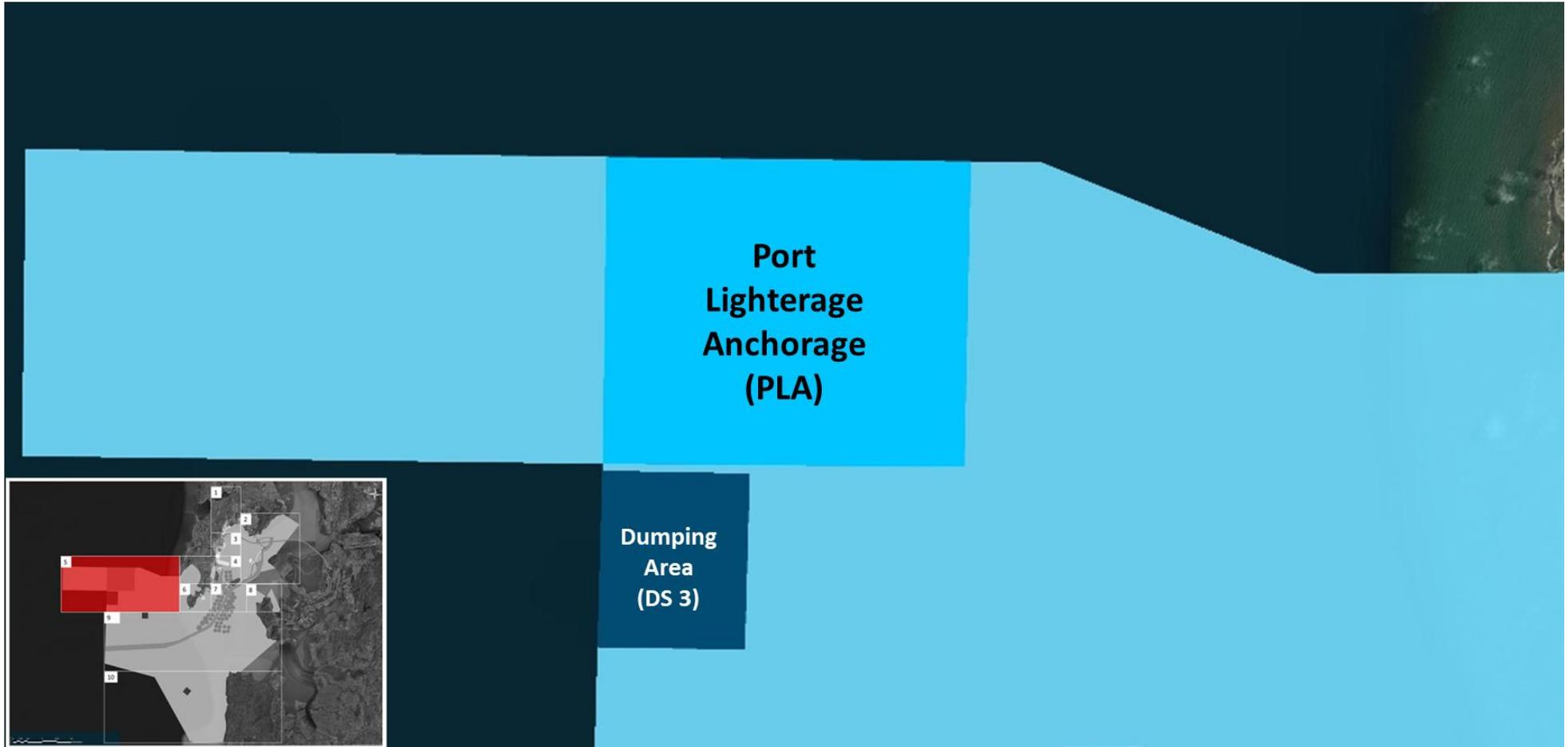
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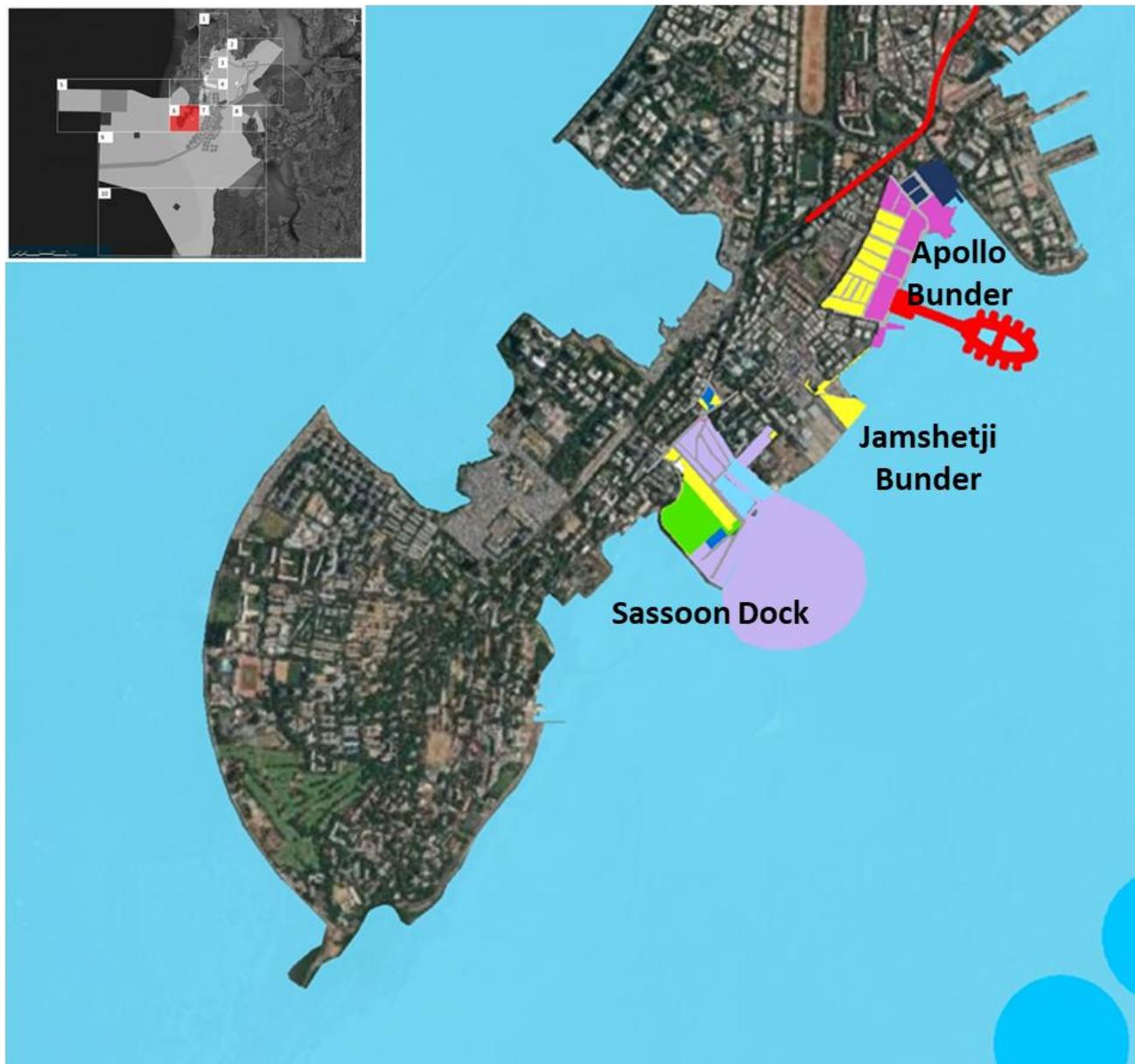
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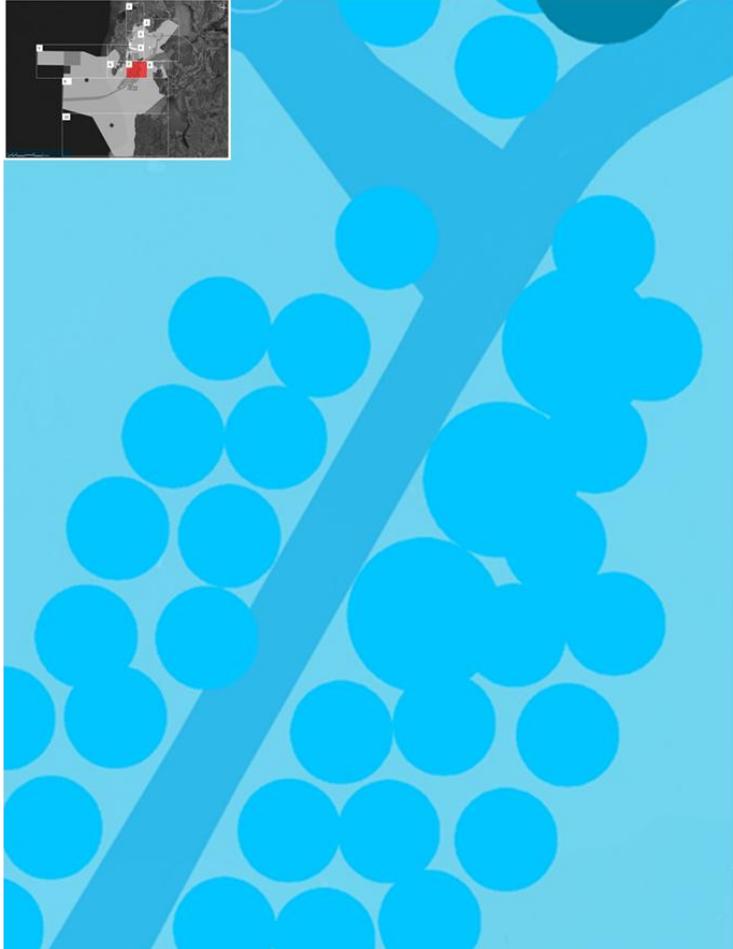
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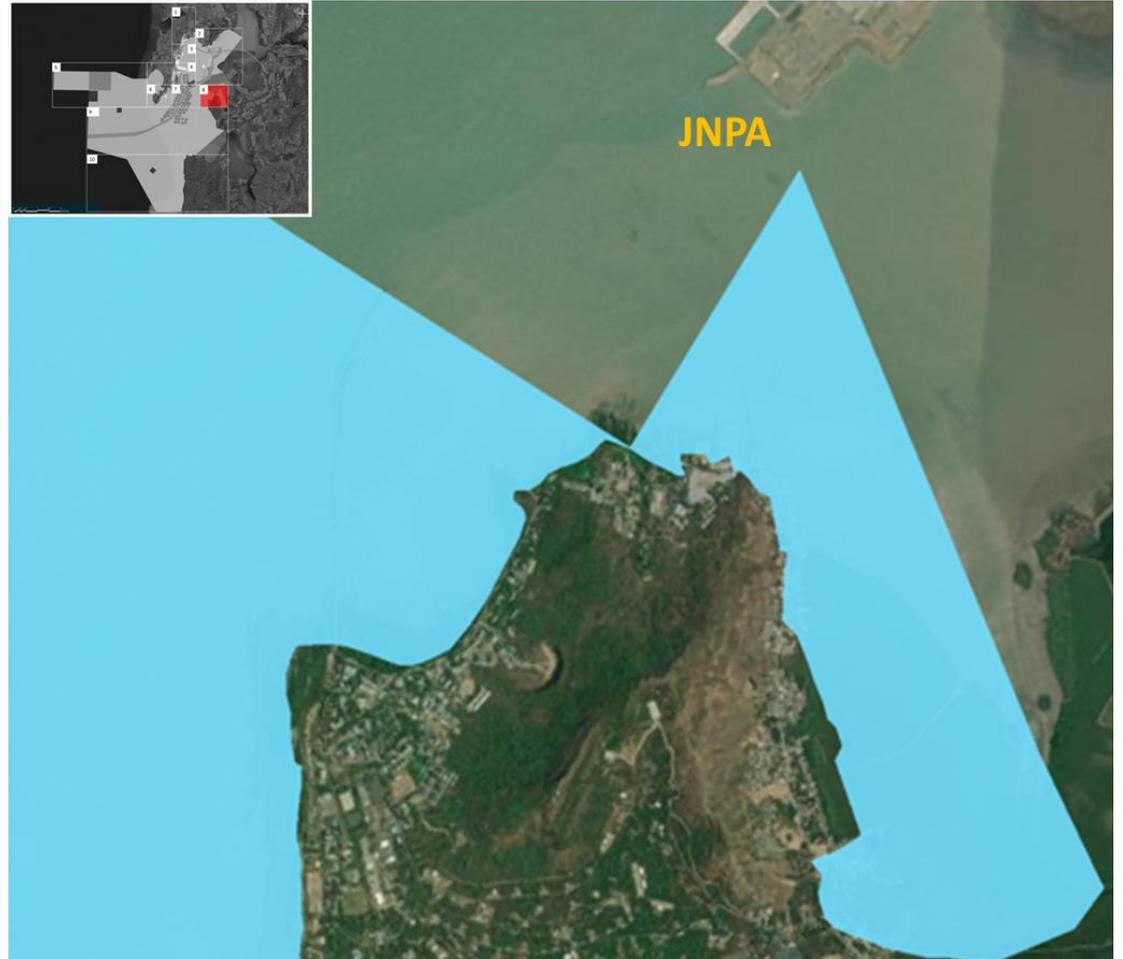
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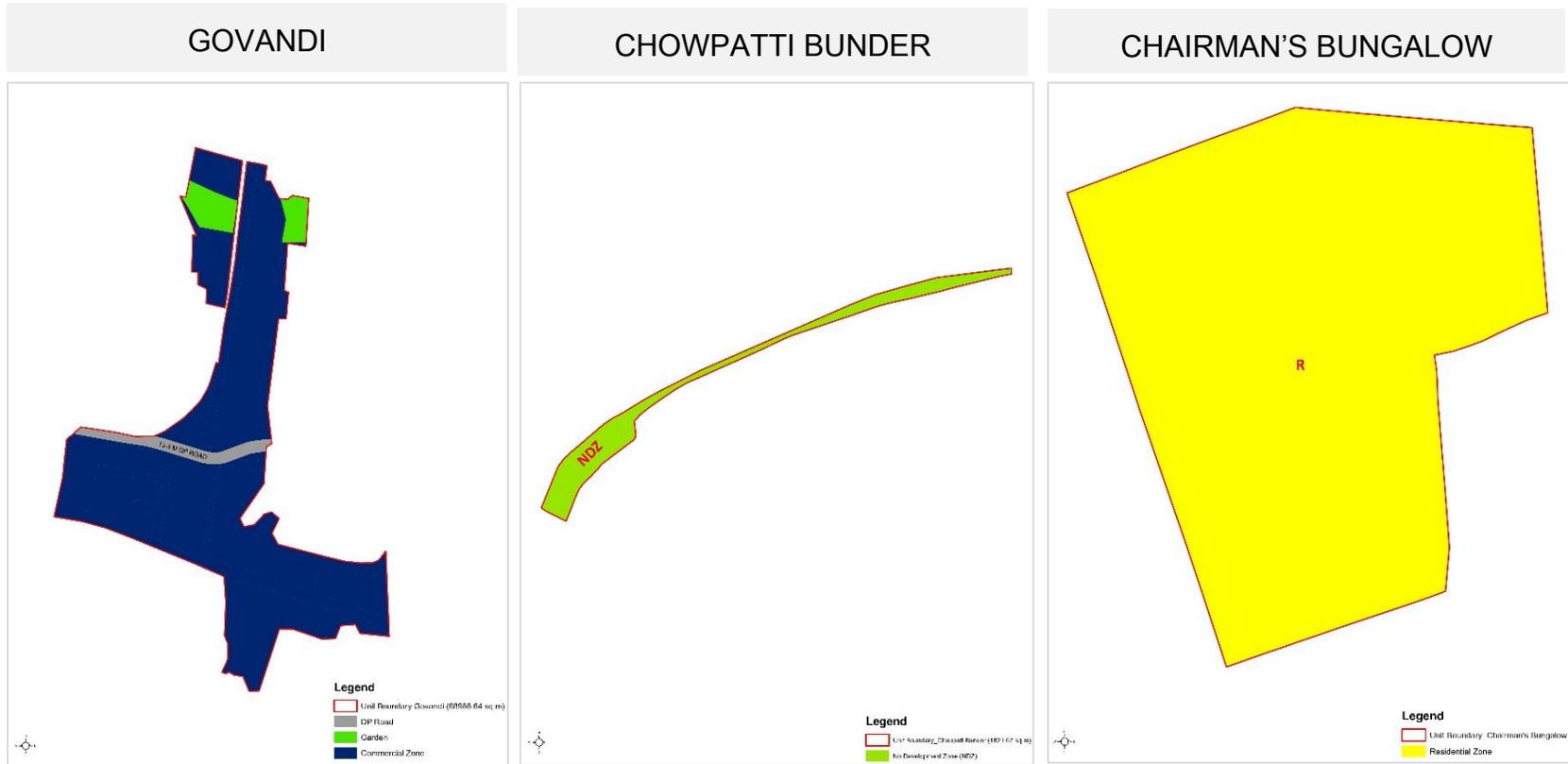
GRID 9



GRID 10

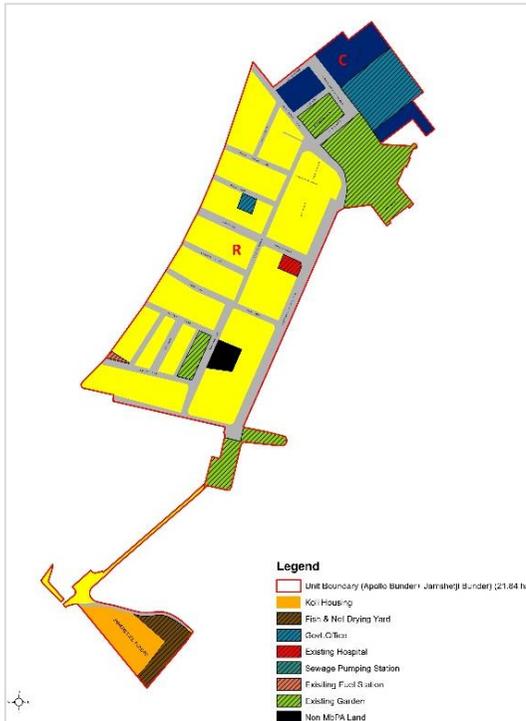


Land Use of Isolated Parcels

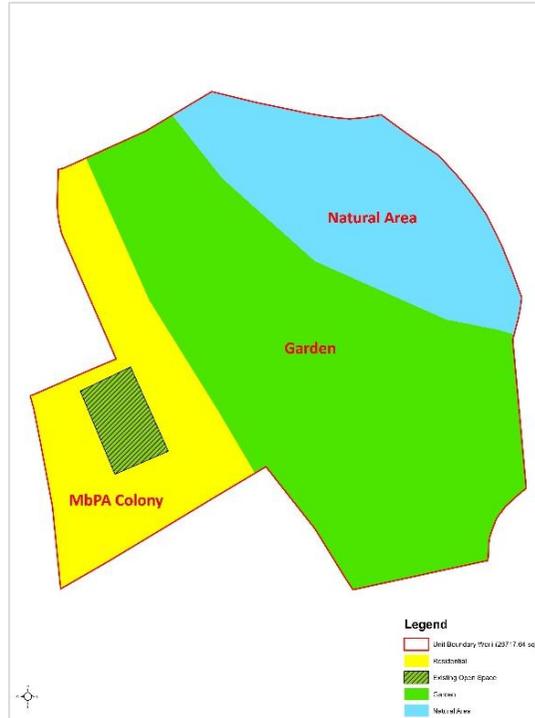


Integrated Mumbai Port Masterplan 2047

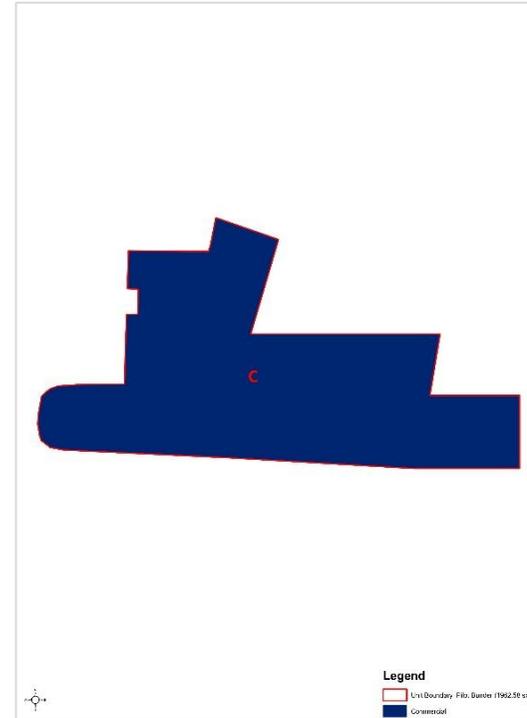
APOLLO BUNDER & JAMSHETJI BUNDER

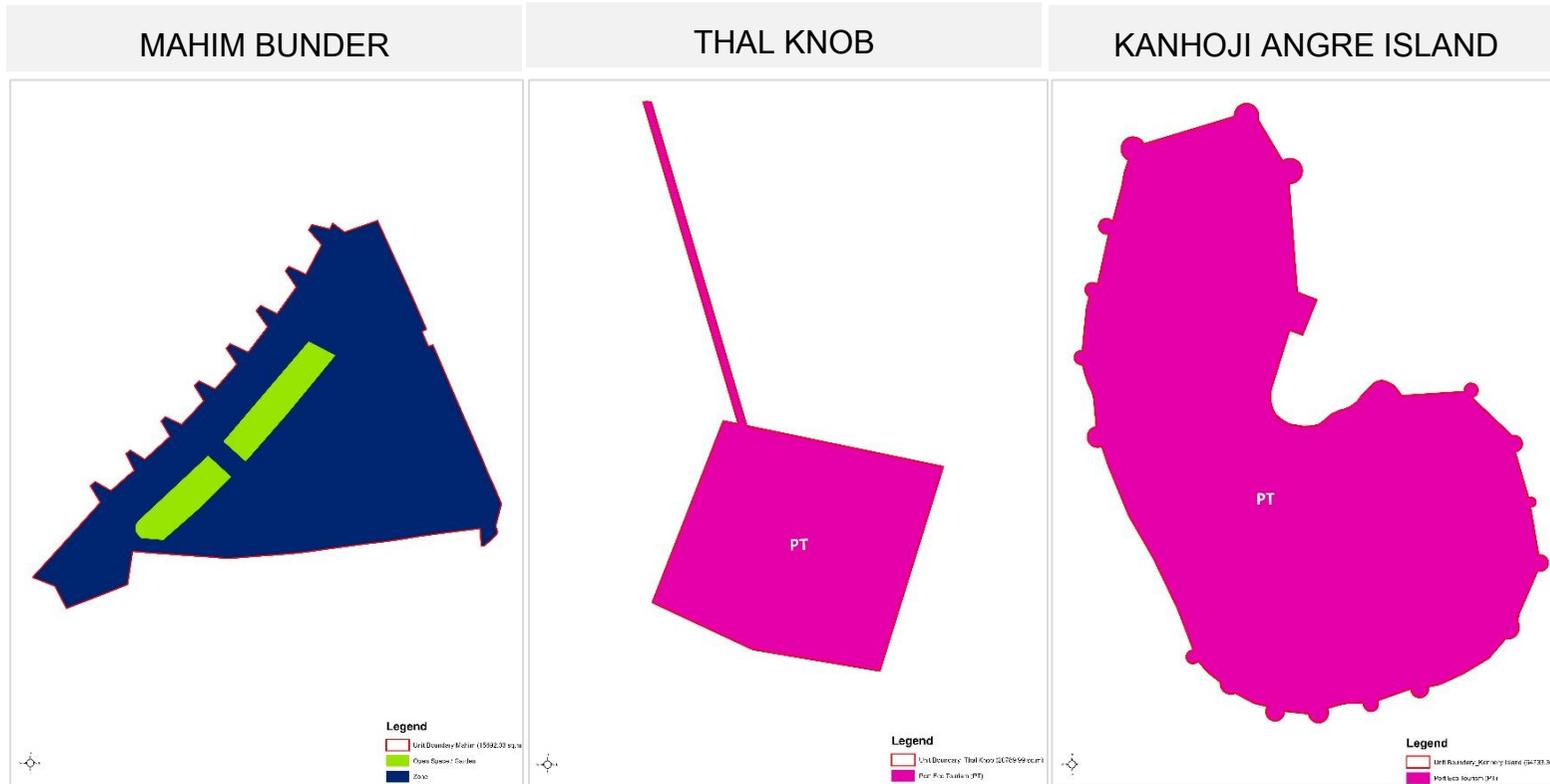


WORLI BUNDER

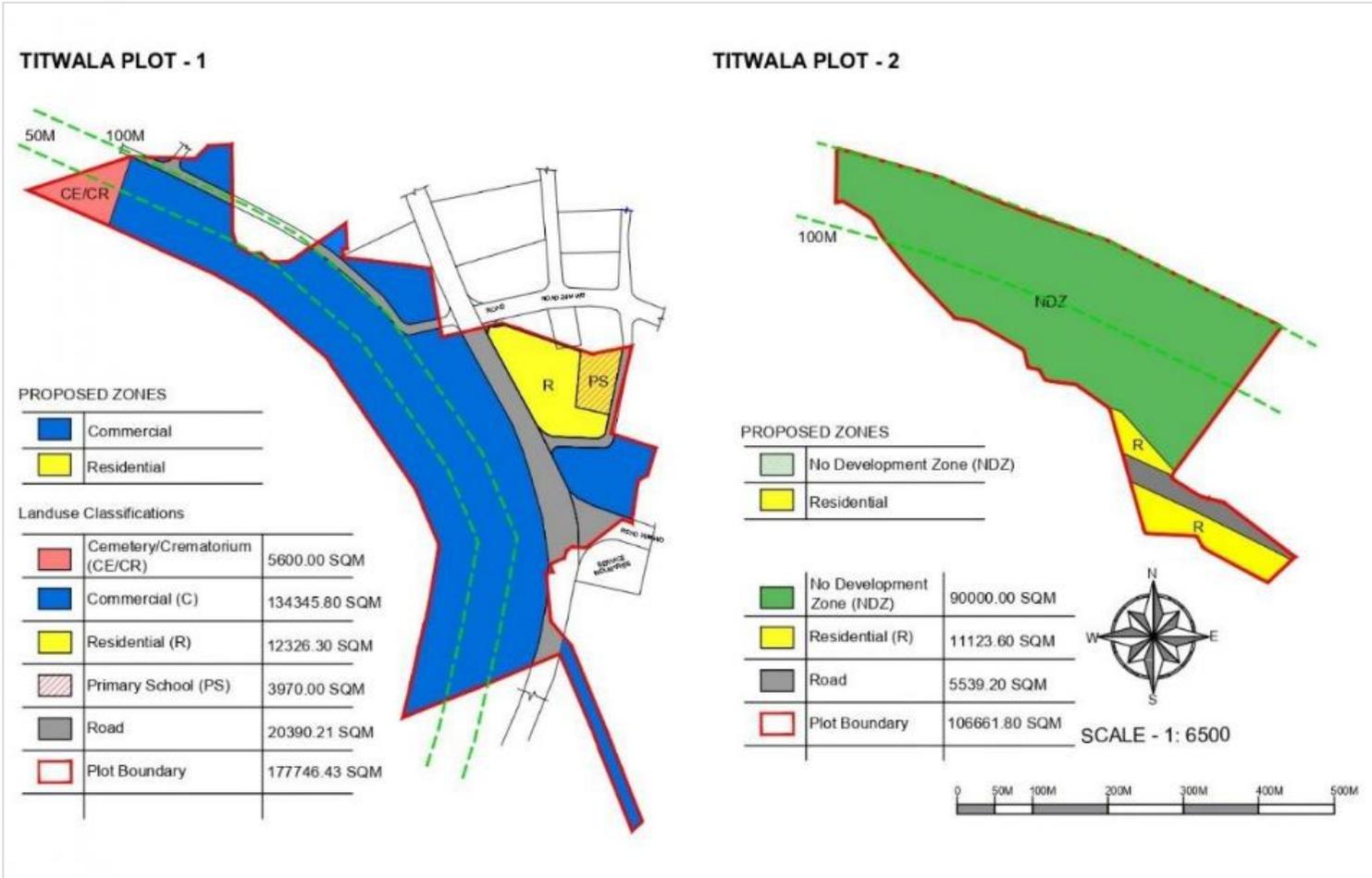


PILOT BUNDER





TITWALA



Outcomes of the Masterplan

Table 5 Land Use Statement

Sr. No.	Particulars	Details	Units
1	Port Operational Area	235.58	Ha
2	Port Led Activities	286.5	Ha
3	Port Eco Tourism	15.15	Ha
4	Residential	110.75	Ha
5	Health care	4.75	Ha
6	Commercial	278.28	Ha
7	Transport	15.68	Ha
8	No Development Zone	9.18	Ha
9	Natural Areas	0.60	Ha
	Total Land Area	956.47	Ha

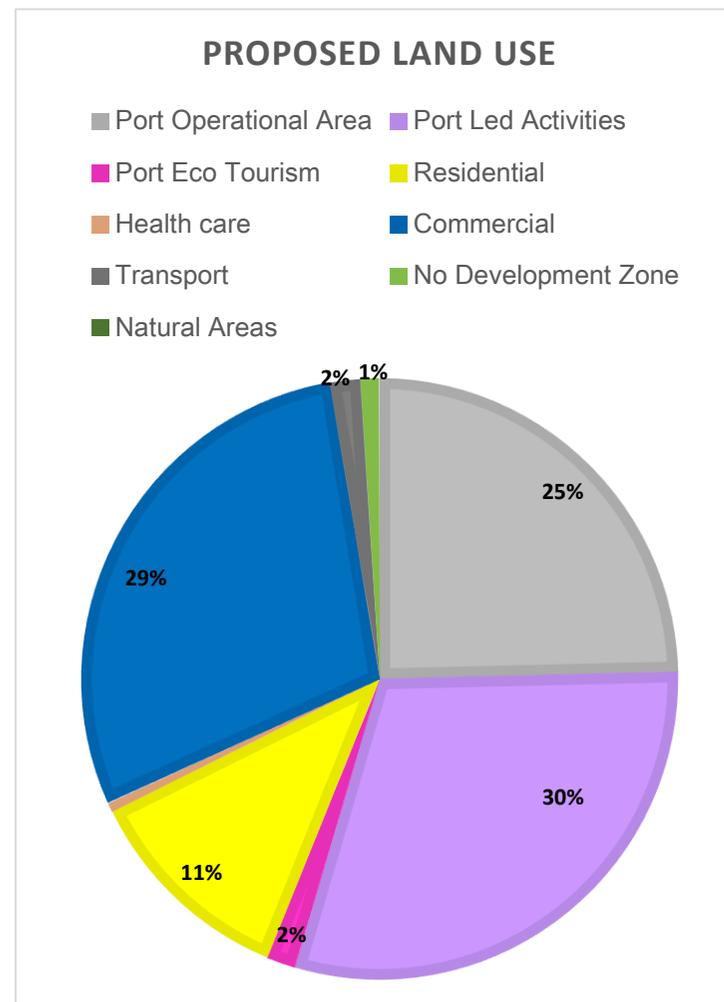


Figure 26 Land Use Distribution

THE BIG MOVES TO GET THERE

Maritime Logistics

Capacity Expansion:

1. Shore Protection and Land Reclamation at JD (15 ha)
2. Additional Reclamation at Jawahar Dweep (18 Ha)
3. 22 MTPA Sixth Oil Berth at Jawahar Dweep
4. 2 MTPA Fourth Chemical Berth at Pirpau
5. Reclamation at Pirpau
6. Deepening & Expansion of J3 Anchorage
7. Multipurpose Offshore Terminal
8. Multi-level Car Park at Gamadia Complex

Connectivity:

1. Kurla Wadala Dedicated Freight Line
2. Trestle from Jawahar Dweep to Pirpau

Efficiency Improvement / Mechanization:

1. O&M of Indira Docks
2. Base Oil /Mechanized Dry Bulk Handling at Hay Bunder
3. OCT Restructuring
4. Shifting of Orange Gate – Princes' Dock

Fishery Development:

1. New Fish Jetty at Mallet Bunder

Shore Protection and Land Reclamation at Jawahar Dweep

Mumbai Port Authority signed an MoU with HPCL and BPCL during GMIS 2023 for the development of crude oil and product tankages at the Marine Oil Terminal, Jawahar Dweep. MbPA is undertaking reclamation of 13 hectares adjacent to the island, to be handed over to the oil PSUs upon completion. HPCL and BPCL will establish crude oil storage tanks with a total capacity of 4.2 lakh tonnes, enhancing throughput efficiency and reducing tanker turnaround time, thereby saving foreign exchange.

The PSUs have appointed EIL to prepare the DPR for the project.

- Project Cost: Rs 2700 Cr.

- **Status:**

Land Reclamation :95% Complete

Shore Protection:25% Complete

Expected completion: June, 2026

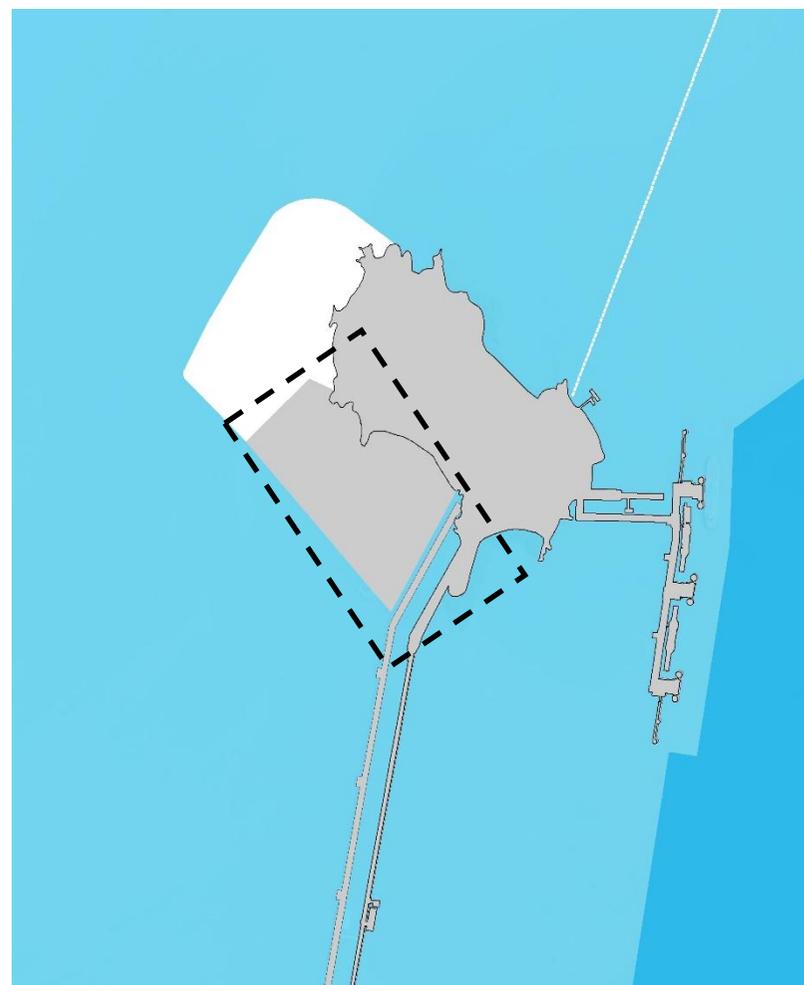


Figure 27 Shore Protection & Land Reclamation at Jawahar Dweep

Additional Land Reclamation at JD

Reclamation for Crude Oil Tankages for BPCL: MbPA plans to allocate 4 hectares of reclaimed land to Bharat Petroleum Corporation Limited (BPCL) for the development of a crude oil terminal. This terminal will have a capacity of 1.20 Lakh Tonnes.

Reclamation for LNG Terminal for BPCL: MbPA has also proposed the reclamation of 14 hectares of land for the development of an LNG terminal to be awarded to BPCL. The terminal will have a total capacity of 5 MTPA and will feature a captive intake jetty located between JD-3 and JD-4. The project will be executed in two phases:

- **Phase 1:** 3.5 MTPA
- **Phase 2:** 1.5 MTPA

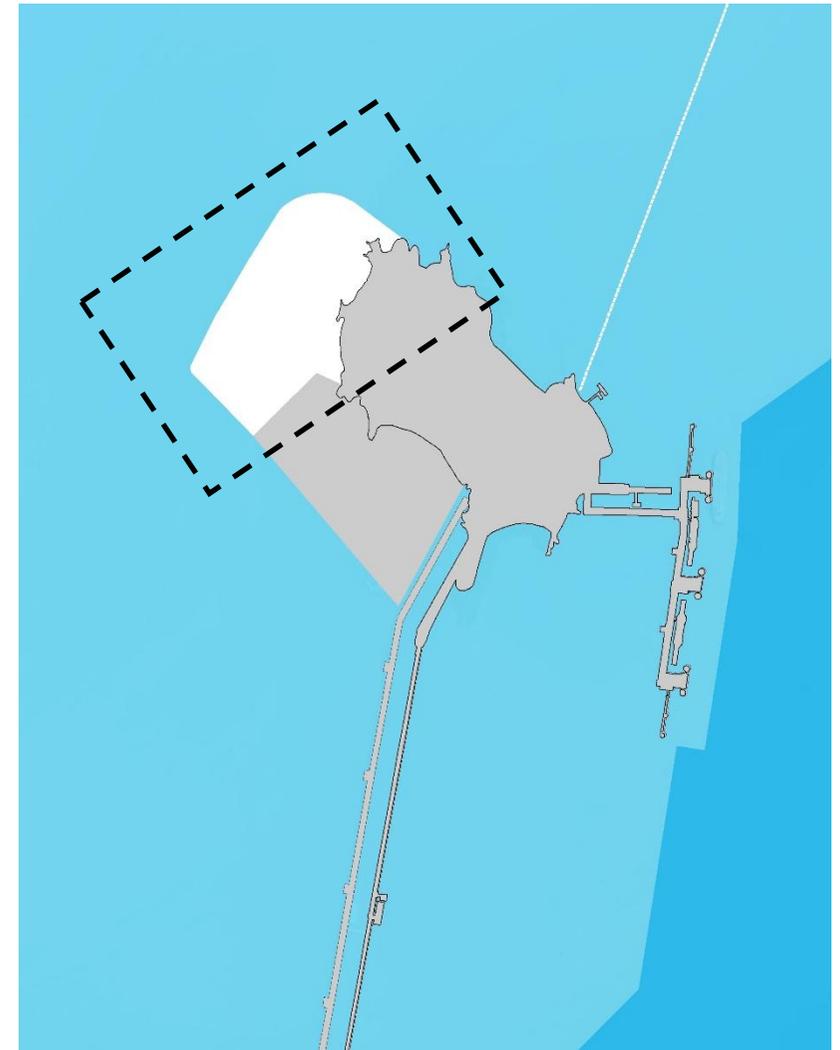


Figure 28 Additional Land Reclamation at JD

Sixth Oil Berth at JD

The Sixth Oil Berth (JD-6) at Jawahar Dweep is a ₹400 crore expansion project, 300 m south of JD-5, designed for 2.81 lakh DWT Suezmax vessels, 16.8 m draft, enabling 5–6 MMTPA crude import growth.

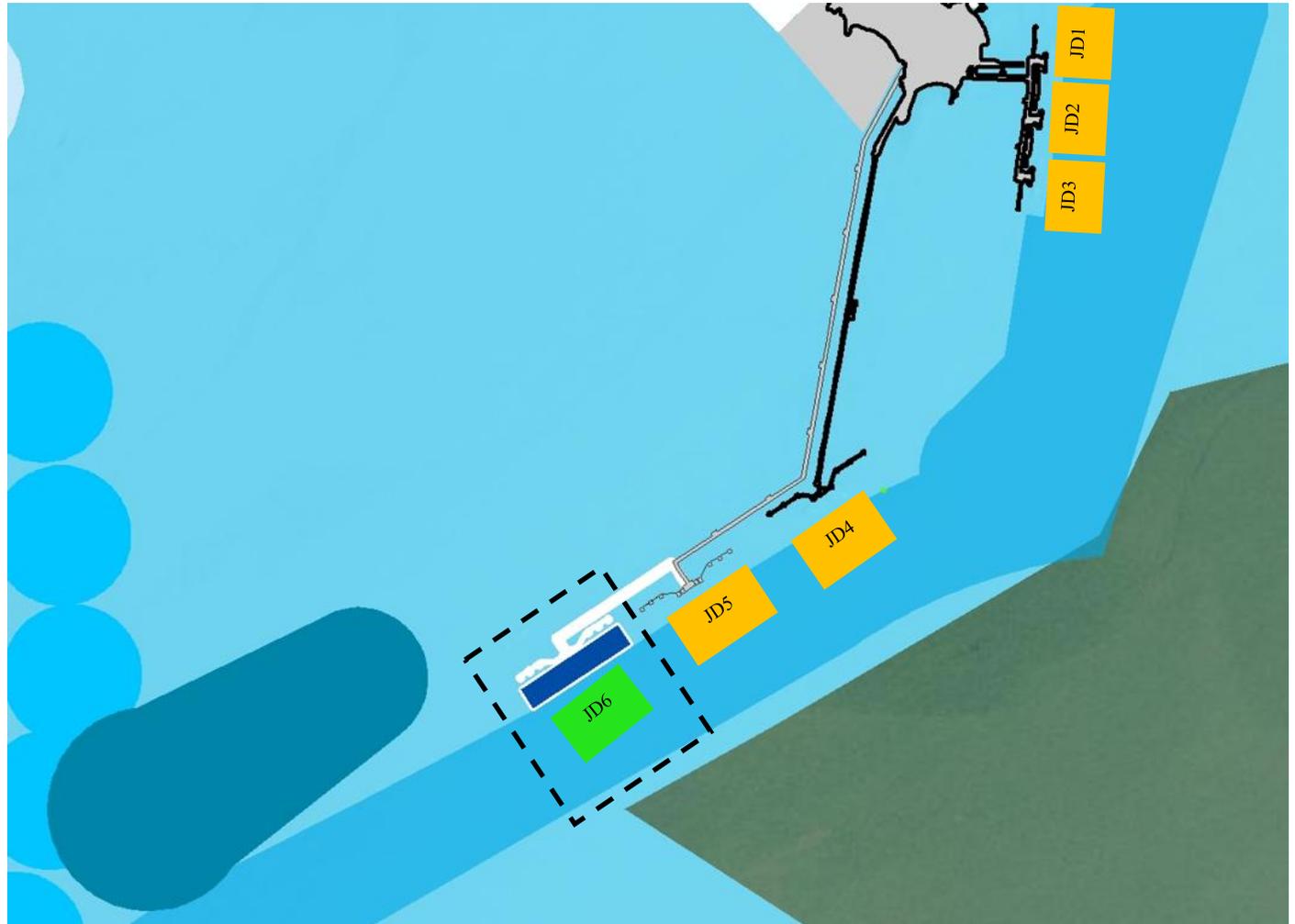


Figure 29 Berths at Jawahar Dweep

Connectivity Trestle from JD to Pirpau

Develop an offshore trestle bridge (approx. 5 km) connecting the Second Chemical Berth to Jawahar Dweep.

Scope: 4-lane road with service ducts, pipeline corridor, and emergency berthing.

Benefits: Reduces cargo congestion on existing island routes.

Enables heavy-cargo transport directly from sea to shore.

Improves resilience against weather-related port disruptions.

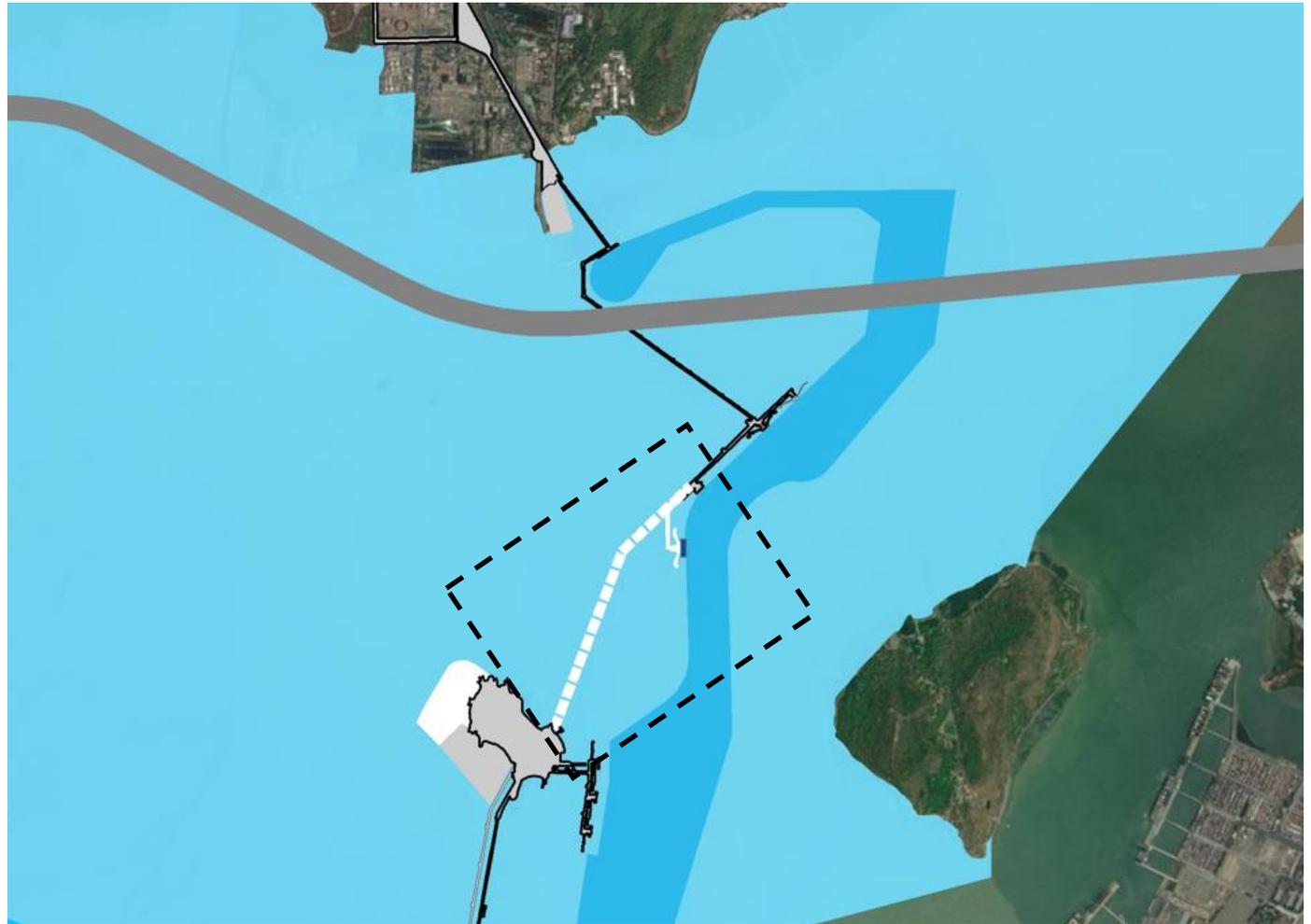


Figure 30 Connectivity Trestle from JD to Pirpau

Fourth Chemical Berth at Pirpau

The proposed Fourth Chemical Berth, located beside the Third Chemical Berth, will add about 2–3 million tonnes annual capacity, reduce tanker waiting, and meet advanced safety and environmental standards.

The new terminal is planned adjacent to the Second Chemical Berth and set back from the channel to avoid congestion on the channel.



Figure 31 Berths at Pirpau

Reclamation at Pirpau

Reclamation of 6 Ha for
storage of chemical

Storage Capacity: 3
Lakh Kilo Litre

Approximately 2.5
MMTPA of liquid bulk
growth

Cost: 120 Crores

Target Completion: 2029



Figure 32 Reclamation at Pirpau

Deepening & Expansion of J3 Anchorages

Current Stream Cargo Handling

Stream (Anchorage) Cargo: 16.79 MnT (24.47%)

Major Commodities: Crude Oil, POL, Stream Cargo like coal, cement clinkers, minerals and Base Oils

Growth Trends (Last 5 Years) Increased by 28.36%.

MbPA maintains 56 inner anchorages, including:

- 6 deep draft anchorages (up to 11.8 meters), used primarily for break-bulk cargo operations.
- Alpha-3 anchorage, with a 15-meter draft, designated as an emergency anchorage.
- F-2 and TA-1 anchorages, dedicated to handling base oil tankers.

Expansion Drivers

JSW Steel Plant (Dolvi) expansion planned

MbPA Proposes to Develop 2 new 13 m draft inner anchorages (near J-3)

Target completion: by 2030

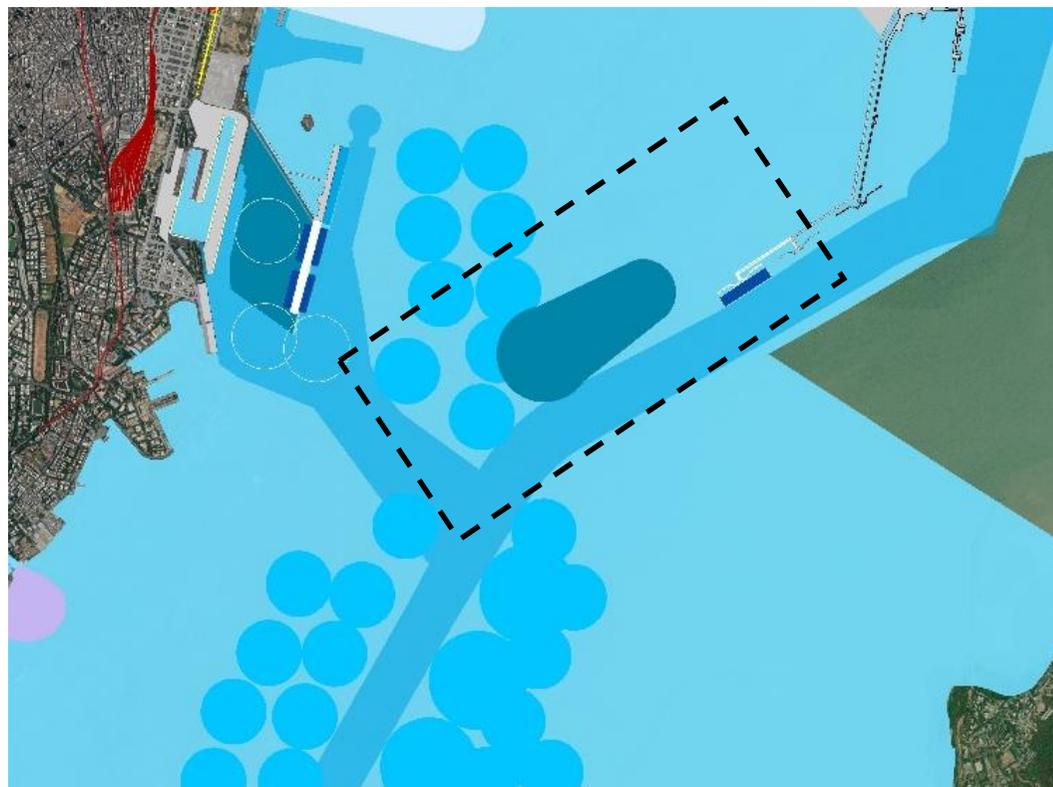


Figure 33 Deepening & Expansion of J3 Anchorages

Multipurpose Offshore Terminal

Future Capacity Expansion for Bulk and Break Bulk including RoRo is foreseen at the site south of Offshore Container Terminal.

The Multipurpose Terminal is envisaged as a double banking berth with turning circles and pockets at both sides.

This infrastructure will add approx. 4 MMTPA capacity for Indira Docks.

While commercial concerns with regard to dredging and contractual considerations with respect to OCT will govern the actual development, the depiction is to show the maximum possibility for the next 25 years.

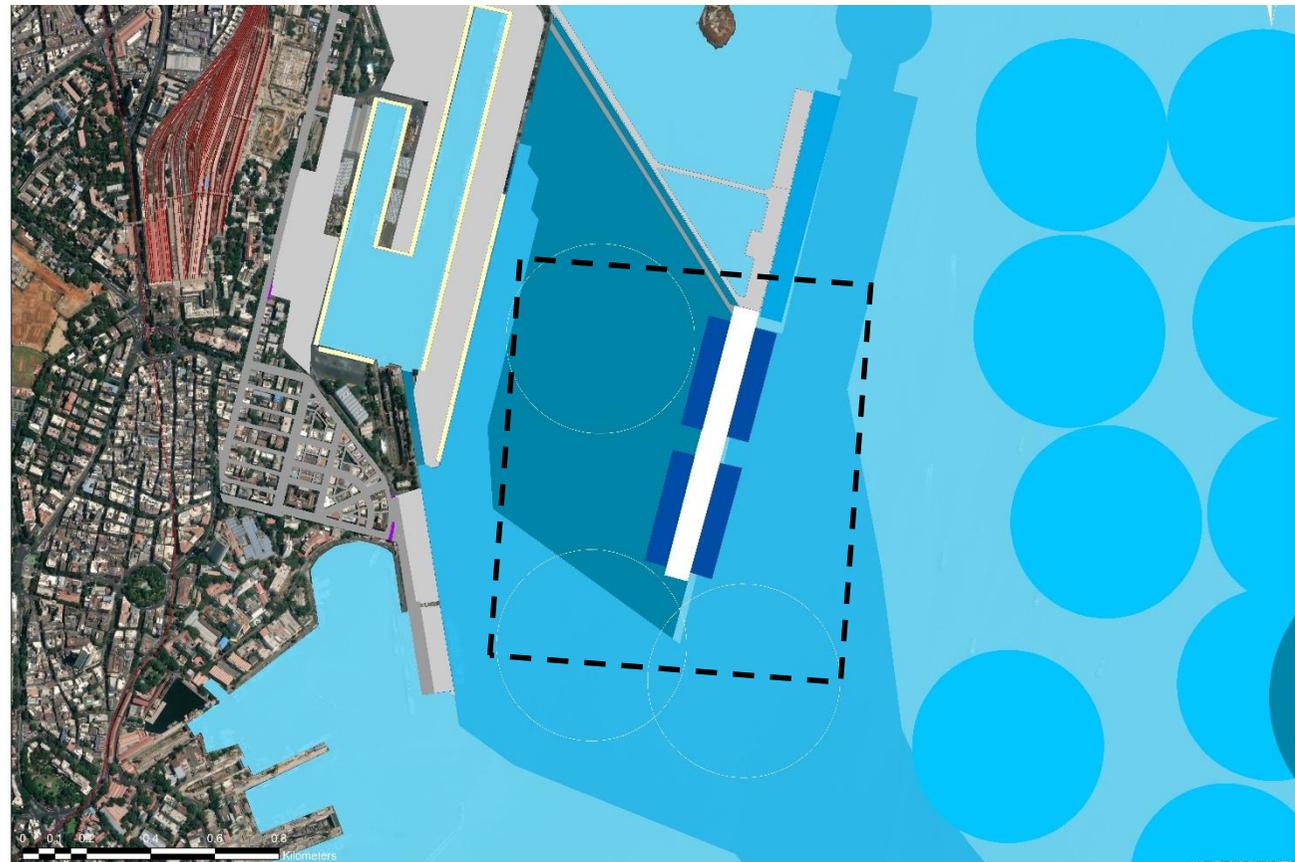


Figure 34 Multipurpose Offshore Terminal

Multi-level Car Park at Gamadia Complex

The Gamadia Car Park currently has a capacity of holding 5000 cars.

To increase the capacity of the car park is in the interest of Mumbai Port and Trade.

Since this storage is closest to the RoRo terminal, it is the best location for storage of vehicles to reduce lead time in loading the ships with accumulated cars.

Accordingly, it is proposed to create a multi-level car park to increase the capacity of this location.

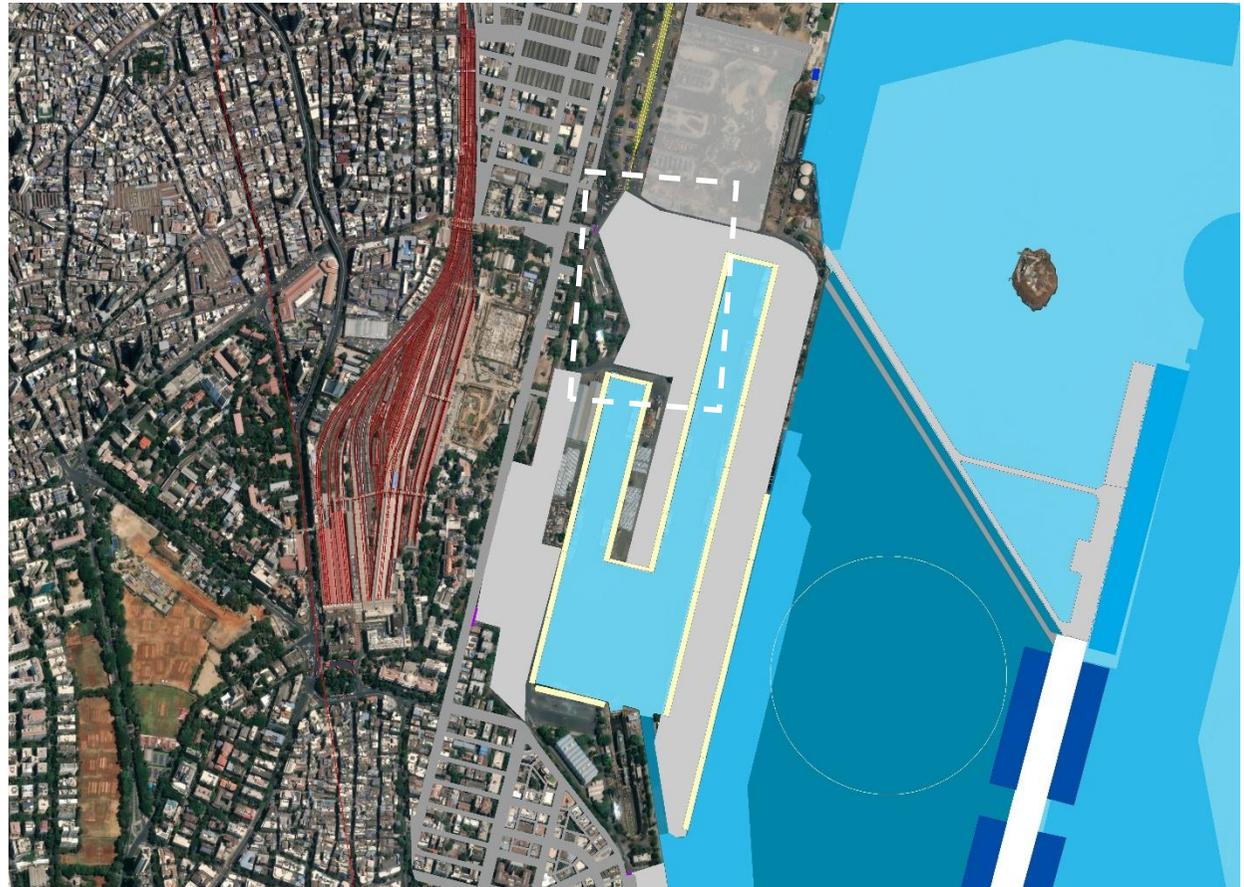


Figure 35 Multi-level Car Park at Gamadia Complex

Shifting of Orange Gate – Princes' Dock

The Orange Gate – Princes Dock is the gate of entry for trucks from the P'Dmello Road.

To avoid queuing of trucks on the road and congestion for the city at the time of entry, and to create a holding area for trucks, it is proposed to shift the gate by 150 m.

Note: The location of the gate is likely to change based on detailed study.



Figure 36 Existing & Proposed Location of Orange Gate - Prince's Dock

Kurla Wadala Dedicated Freight Line

The Kurla Wadala Dedicated Freight Line project was initiated to create a congestion free freight corridor within the city for 24-hour access to docks.

This project was taken up in lock step with the development of the Offshore Container Terminal, however, with containers moving to Nhava Sheva, the project viability was in question.

This project is to be revitalised by Central Railway and has been included in PM Gati Shakti.

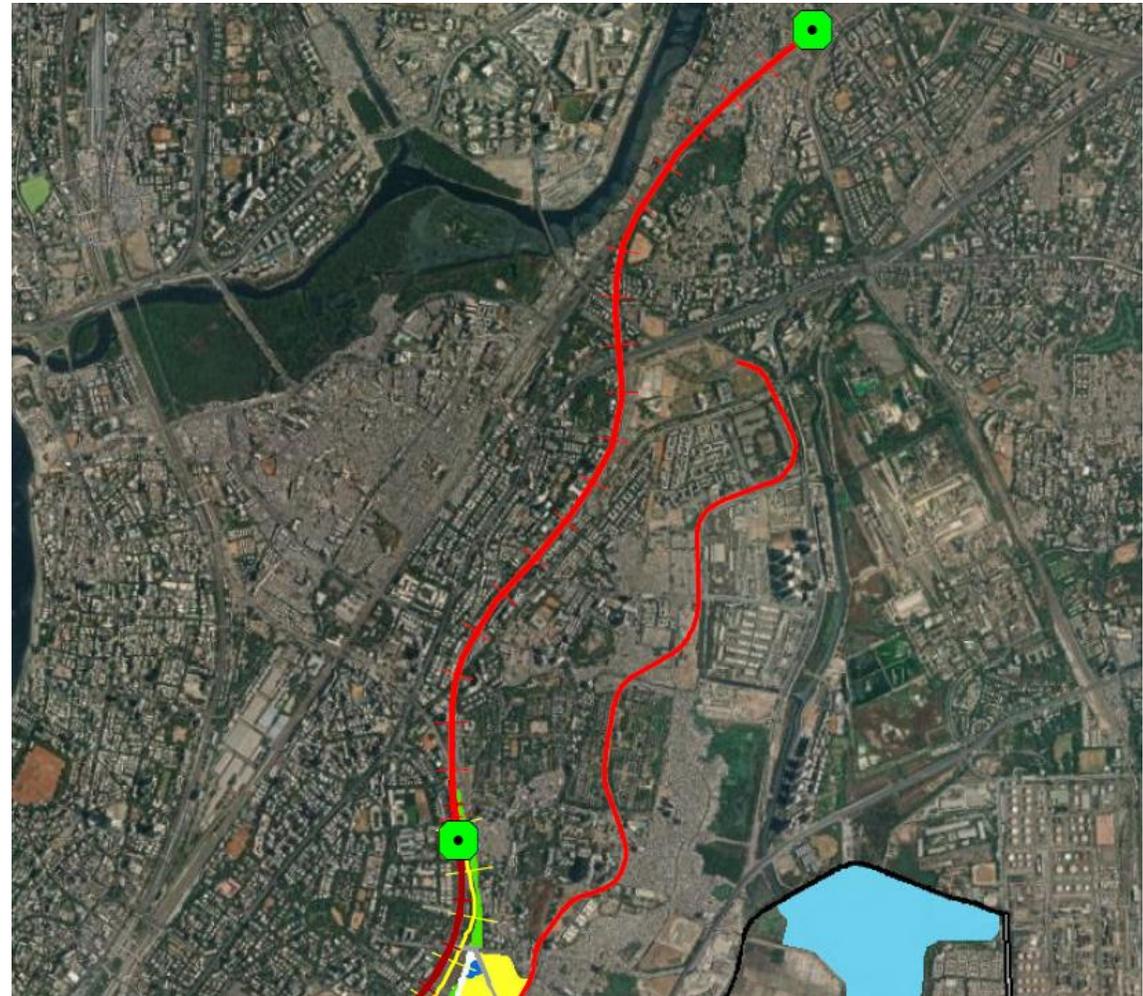


Figure 37 Route Map of Kurla Wadala Dedicated Freight Line

Operation & Maintenance of Indira Dock Berths

MbPA has issued an EOI for **Operation & Maintenance (O&M)** of 22 berths at Indira Dock — covering quay length of ~ 3.733 km — under a single contract.

This initiative will consolidate handling of “clean cargo” operations — including marketing, administration /management, cargo handling (excluding hazardous cargo), use of storage sheds & open yards, logistics and delivery, stevedoring — essentially full-spectrum cargo services at those berths.

The contract is proposed for an **initial 5-year term, extendable by another 5 years.**

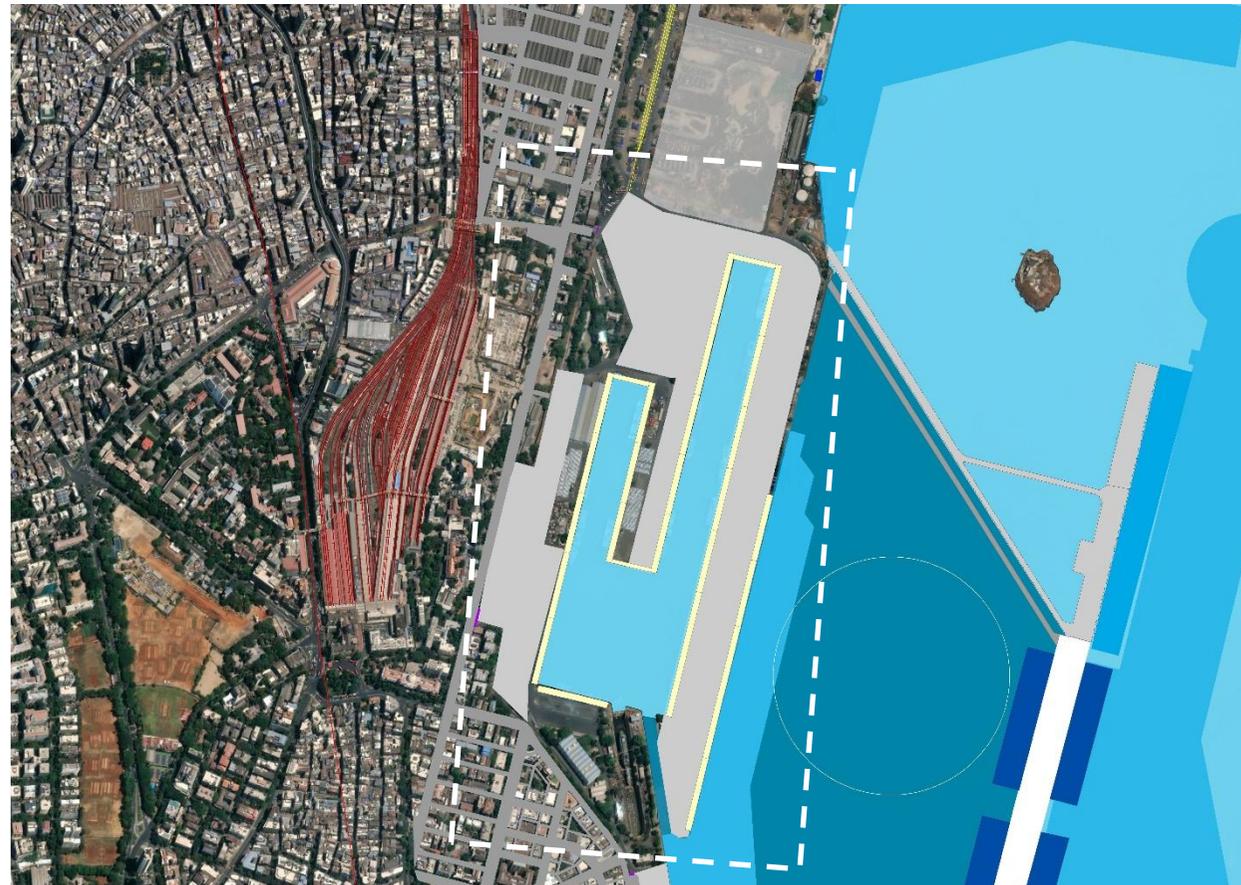


Figure 38 Location Map of Indira Docks

Base Oil / Mechanised Dry Bulk Handling at Hay Bunder

Hay Bunder has been traditionally used to handle dry bulk in a non-mechanised manner.

MbPA intends to convert this space into a Semi Mechanised Dry Bulk Handling as well as a location to handle Base Oil coming through barges.

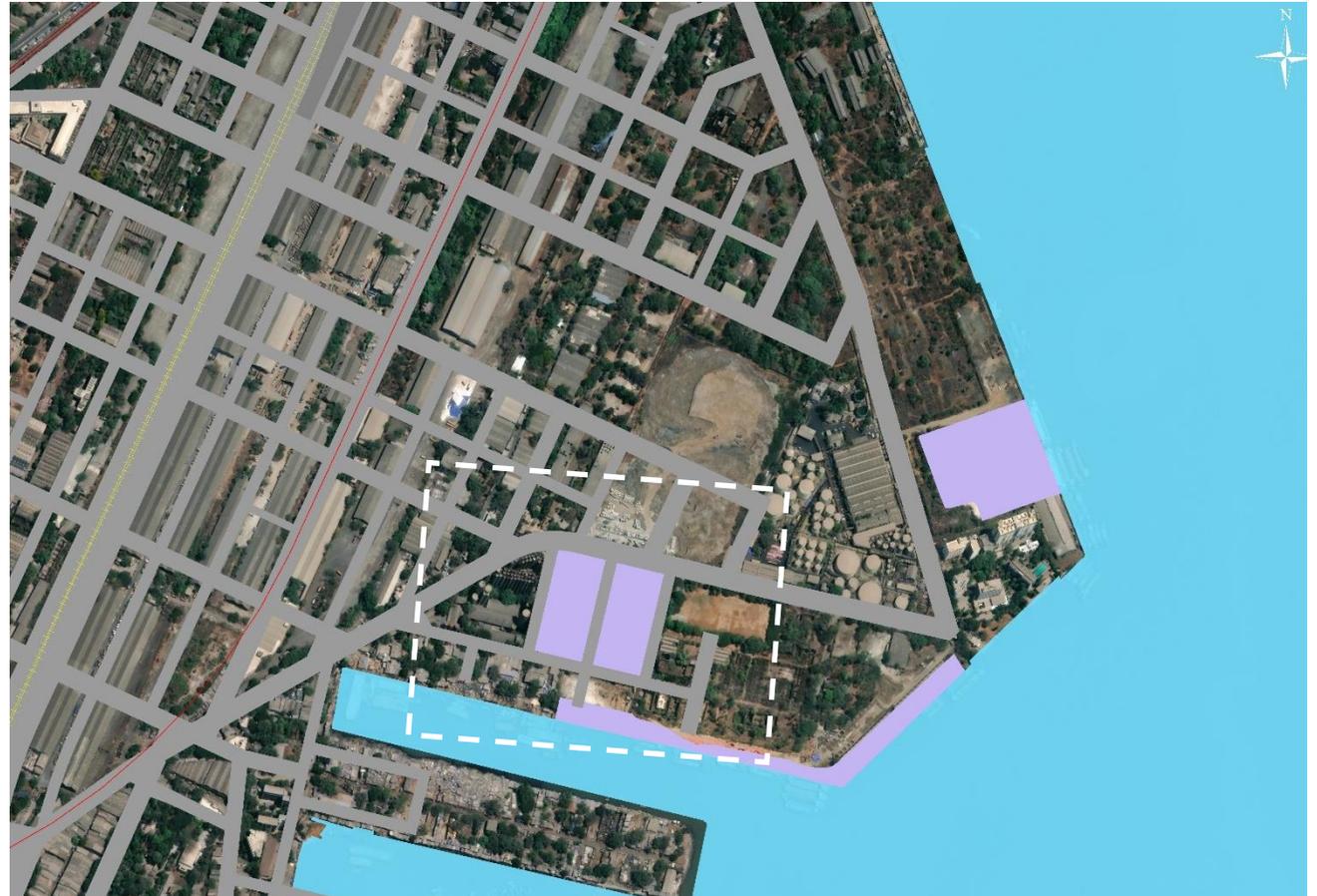


Figure 39 Location identified for Base Oil & Mechanised Dry Bulk Handling

Integrated Ship Building Centre

This location has been earmarked for building an integrated Ship Building Centre.

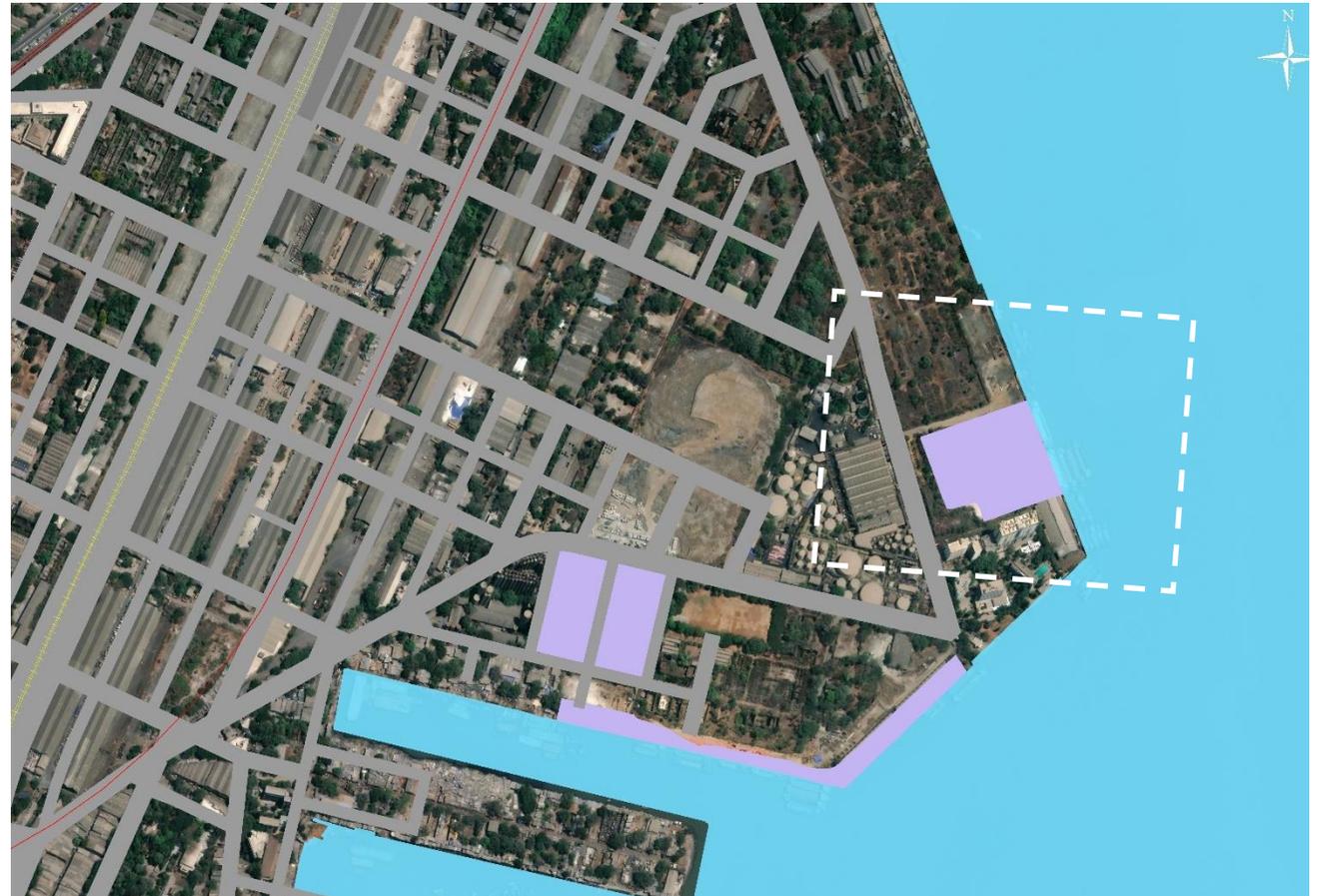


Figure 40 Proposed Location for Development of Integrated Ship Building Centre

Cement Handling at Wadala

Dedicated cement terminal with four cement silos of 17000 T capacity

To enhance the capacity to 2 MTPA at Wadala Railway Yard (Golden Yard)

Area: 48839.40 Sq.m

Expected annual income Rs. 20 Crores.

The concession period is 30 years.



Figure 41 Location identified for Cement Handling

New Fish Jetty at Mallet Bunder

Dedicated cement terminal with four cement silos of 17000 T capacity

To enhance the capacity to 2 MTPA at Wadala Railway Yard (Golden Yard)

Area: 48839.40 Sq.m

Expected annual income Rs. 20 Crores.

The concession period is 30 years.



Figure 42 New Fish Jetty at Mallet Bunder

Maritime Leisure

Cruise Development:

1. Mumbai International Cruise Terminal – O&M

Promoting Yachting & Sailing:

1. Development of Mumbai Marina
2. International Sailing Centre
3. Yacht Bay at Domestic Cruise Terminal

Water Transport:

1. Second RoPax
2. Radio Club Jetty

Tourism and MICE Destination:

1. Art House & Clock Tower
2. Themed Streets at Mallet Bunder
3. Wadala Art District
4. Event Bay at STP

Mumbai International Cruise Terminal

The **Mumbai International Cruise Terminal** is located at Ballard Pier within the estate of the Mumbai Port Authority. It is developed to handle large international cruise vessels with a design capacity of **one million passengers per annum**, with peak handling of about **ten thousand passengers per day**. The terminal includes dedicated immigration, customs, security, baggage handling, and passenger processing facilities in compliance with international cruise standards. The project has been implemented under an EPC–PPP framework and is connected to the city through major road corridors and the Eastern Freeway. Trial operations commenced in 2024–25 with commercial operations being progressively scaled up. The terminal positions Mumbai as India’s principal international cruise gateway on the western coast.

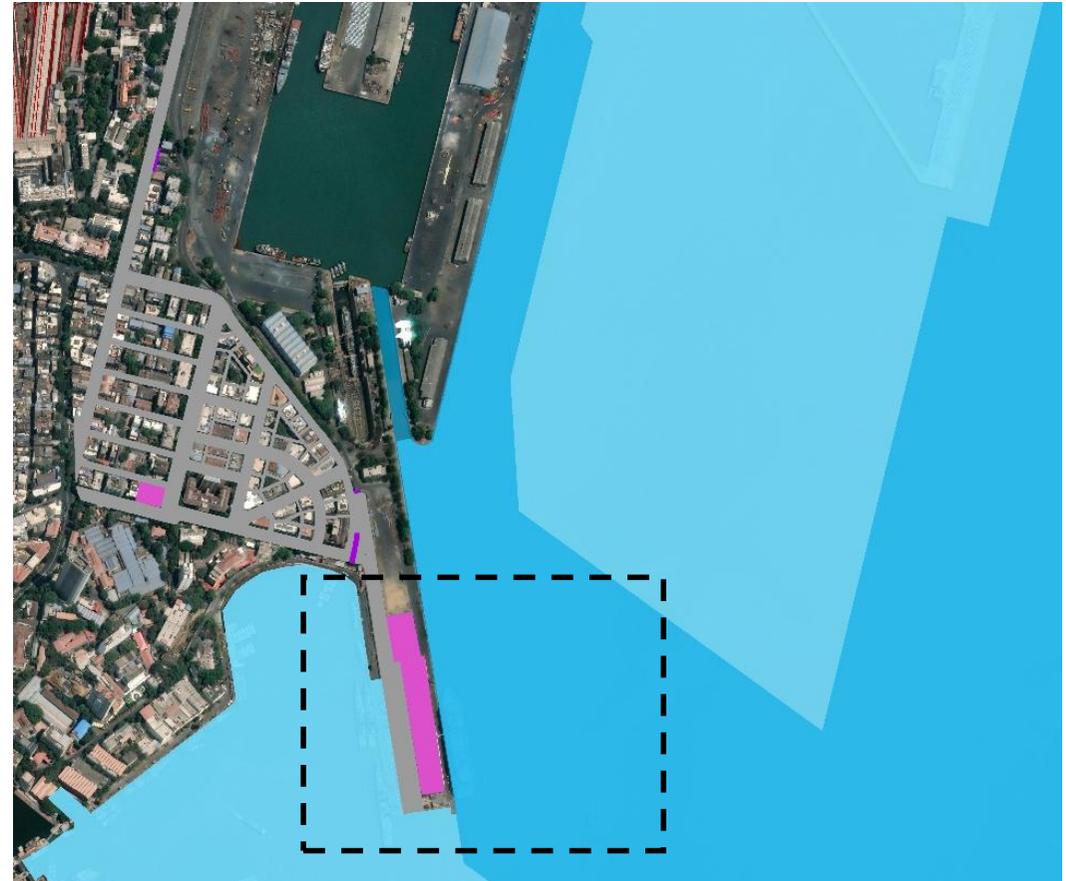


Figure 43 Mumbai International Cruise Terminal

Viksit Bharat Mumbai Marina

The Viksit Bharat Mumbai Marina Project is envisioned as India's first world-class marina facility which will give equitable access to the water. The project, spread over 12 hectares of water area, will feature a berthing capacity for 424 yachts and supporting infrastructure such as a five-star hotel, yacht club, and repair facilities. Developed through a hybrid model, the construction phase (₹470 crore) will be undertaken on an EPC basis, while the Operation & Management phase (₹417 crore) will follow a DBFOT model, inviting private investment and expertise. Strategically located with seamless connectivity via Atal Setu, Eastern Freeway, and the upcoming Orange Gate Marine Drive Tunnel Project, the Marina will offer commercial opportunities including hotel operations, yacht berthing, repair services, and F&B ventures.

- **Project Cost:** Total investment envisaged is Rs 887 Cr.
- **Status:** Global tender floated.

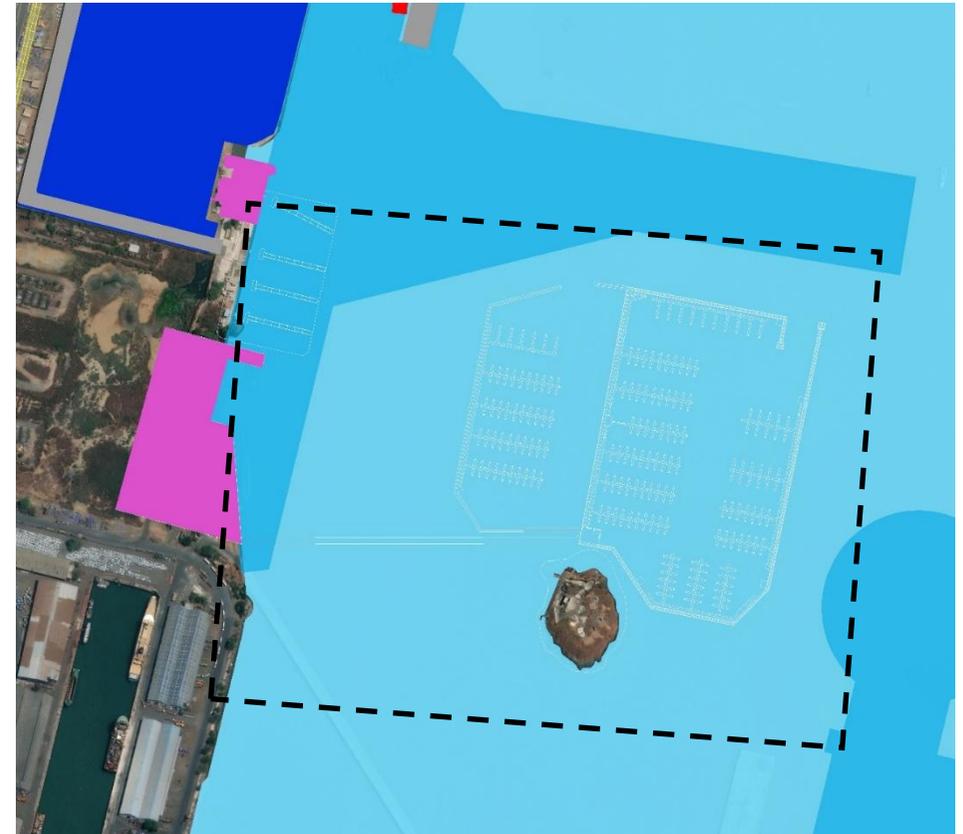


Figure 44 Viksit Bharat Mumbai Marina

Namo Bharat International Sailing School

The Namu Bharat International Sailing School has been conceived as an answer to the demand for equitable sailing facilities for promoting sailing as a sport within Mumbai Harbour. Co-located with the Viksit Bharat Mumbai Marina, this project will further augment the Marina facilities and add value to the yachting and sailing ecosystem of Mumbai.



Figure 45 Namu Bharat International Sailing School

Second RoPax Terminal

The Second RoPax terminal is designed to augment the first RoPax terminal which is providing services to Mumbai – Mandwa route. With the rising demand of tourism at Alibaug, coupled with additional RoPax Terminals in Navi Mumbai, this facility will be developed to further augment water transport facilities in Mumbai.

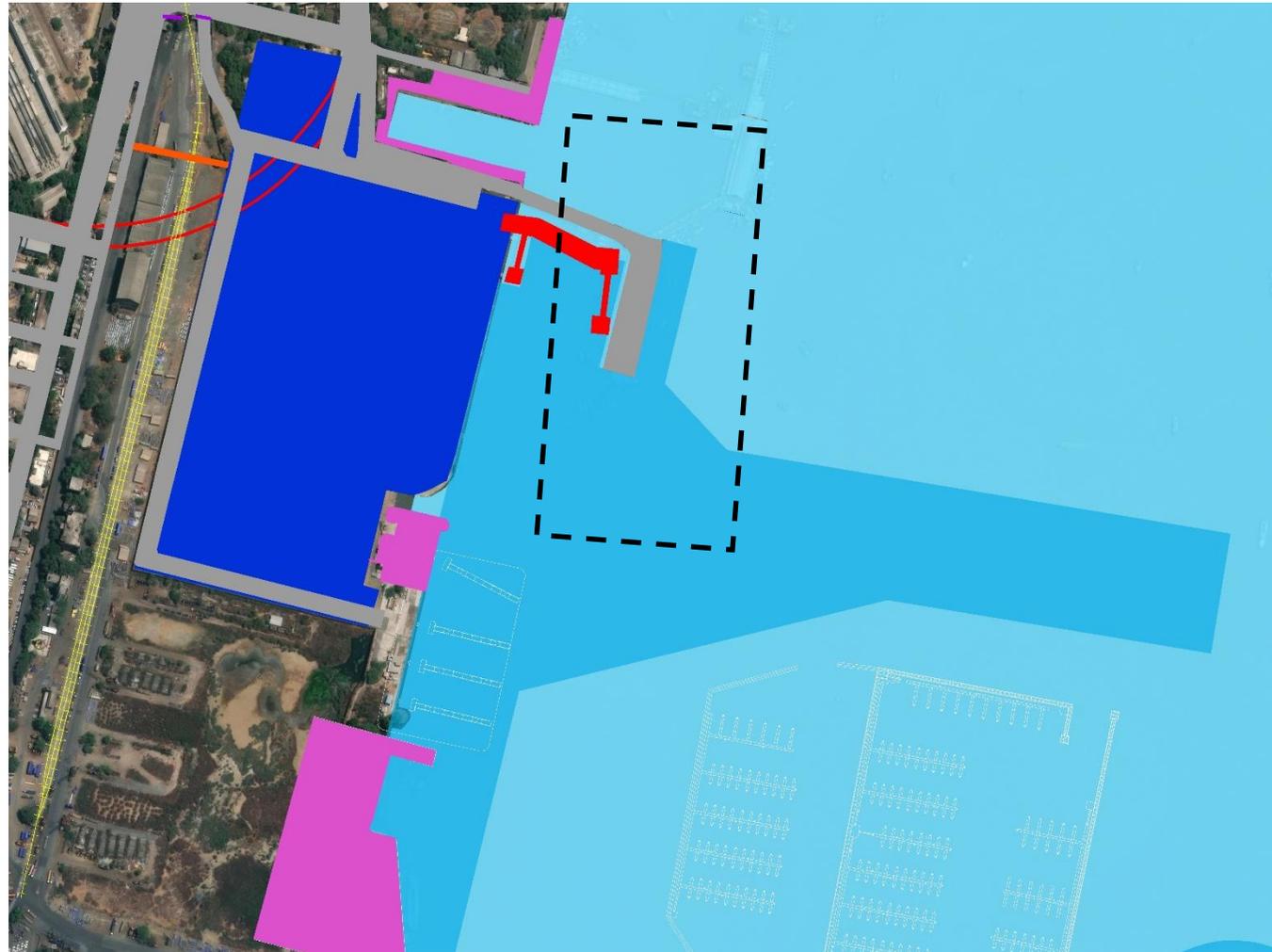


Figure 46 Second RoPax Terminal

Radio Club Jetty

The **Radio Club Jetty Project** is a ₹229-crore passenger water-transport terminal planned by the Maharashtra Maritime Board near the Radio Club, about 280–300 metres off the Gateway of India waterfront. The project occupies nearly 1.5 acres of sea space and includes a racquet-shaped jetty with 10 boarding platforms, a passenger terminal with ticketing halls, waiting areas, VIP lounge, security zones, and parking for around 150 cars. It is designed to support high-speed ferries and water taxis for routes such as Alibaug, Mandwa, and Elephanta. The jetty is intended to decongest existing Gateway jetties that currently handle about 3–3.5 million passengers annually and to strengthen Mumbai's coastal passenger mobility network.

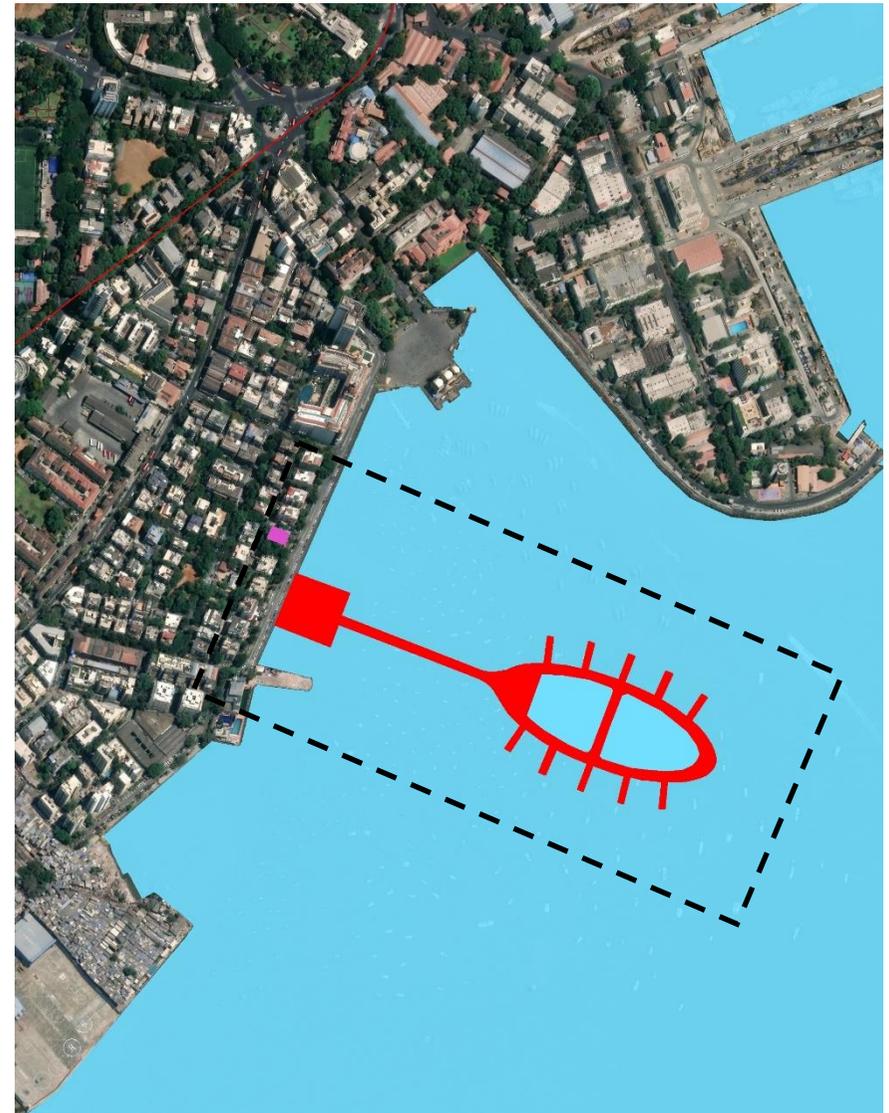


Figure 47 Radio Club Jetty

Art House & Clock Tower

The **Sassoon Dock Art House and Clock Tower** form a prominent cultural landmark on Mumbai's eastern waterfront created through the adaptive reuse of a heritage port structure. The Clock Tower, a historic navigational and visual marker within Sassoon Dock, was restored and integrated with a newly developed Art House as part of the city's waterfront and cultural activation efforts. The site was a key venue of the **Mumbai Urban Art Festival**, during which the dock precinct was transformed through large-scale public art installations, murals, performance spaces, and curated exhibitions by Indian and international artists. The Art House serves as a flexible exhibition and community space, while the Clock Tower acts as a heritage anchor and visual icon. Together, they demonstrate the integration of maritime heritage with contemporary public art and urban placemaking on Mumbai's port waterfront.



Figure 48 Art House & Clock Tower

Themed Streets at Mallet Bunder

Themed Streets at Mallet Bunder will be an attempt to promote Mallet Bunder as a fish tourism destination, and create a unique destination for Cruise Tourism.

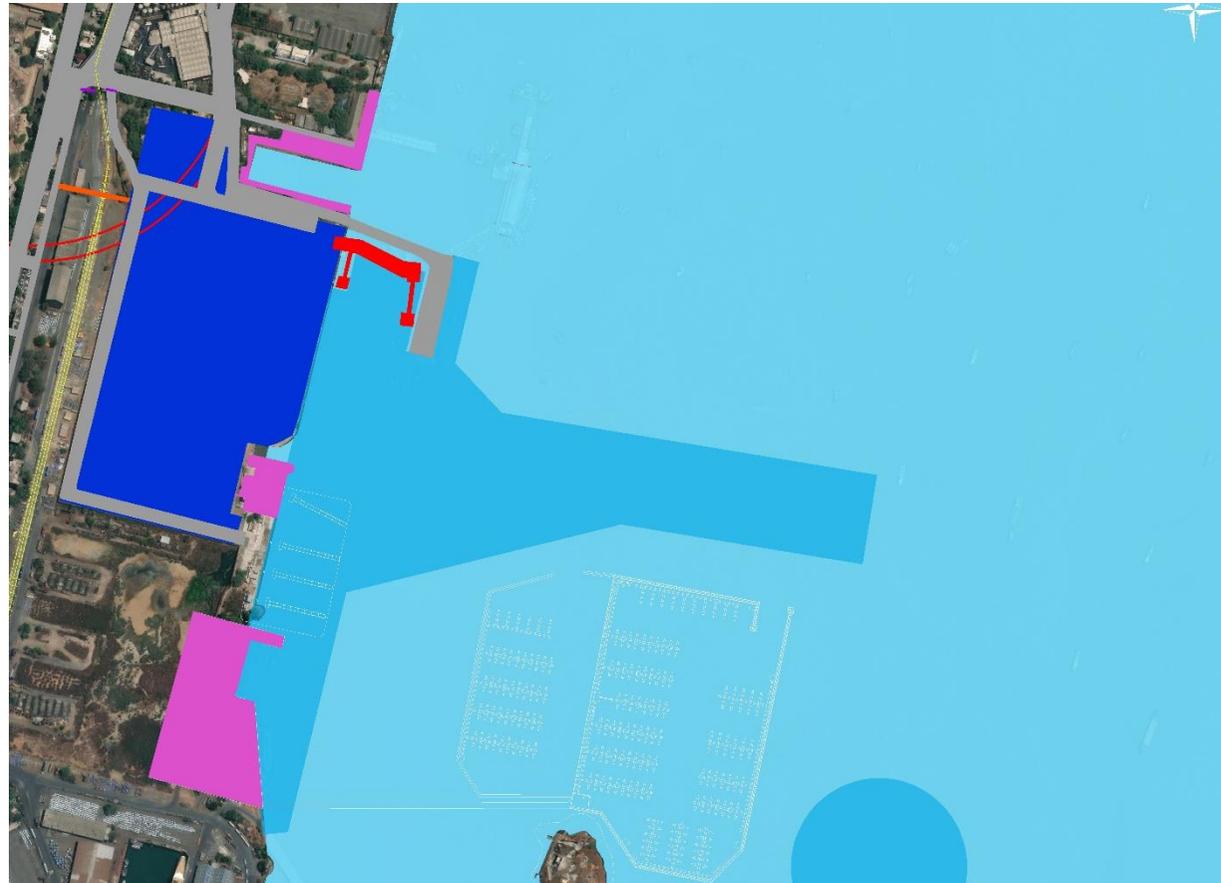


Figure 49 Themed Streets at Mallet Bunder

Wadala Art District

The Wadala Art District shall be a destination for Cruise tourism as well as become a supporter for the Creative Economy. The attempt is to revitalize old port warehouses into commercial centers for promoting maritime history, sustainability and coastal community life through Art..



Figure 50 Wadala Art District

Event Bay at STP Plot

The Event Bay at STP is a unique location and a large space adjacent the newly commissioned Atal Setu. This space is proposed as an event space for handling large events which require speedy evacuation and do not create congestion for the city. With further development, this space could be the venue for events like the India Maritime Week.



Figure 51 Event Bay at STP Plot

Maritime Land

Projects:

1. International Convention Centre at Princes' Dock
2. Central Government Office Complex
3. District Blue – Maritime and Blue Economy Business District
4. Iconic Mumbai Port Administrative Office Complex
5. JNPA Office Complex
6. Reclamation for Ship Repair at Darukhana

Connectivity:

1. Orange Gate Marine Drive Tunnel Project
2. Metro Line 11

Monetization of Isolated Parcels

Reclamation for Modern Ship Repair Facility at Darukhana

Considering the strong demand for Ship Repair and a captive informal ship repair community in Darukhana, it is proposed to transform the ecosystem to a Modern Ship Repair Facility by reclaiming Darukhana.

This initiative will provide a strong ship repair infrastructure and additional employment opportunities.

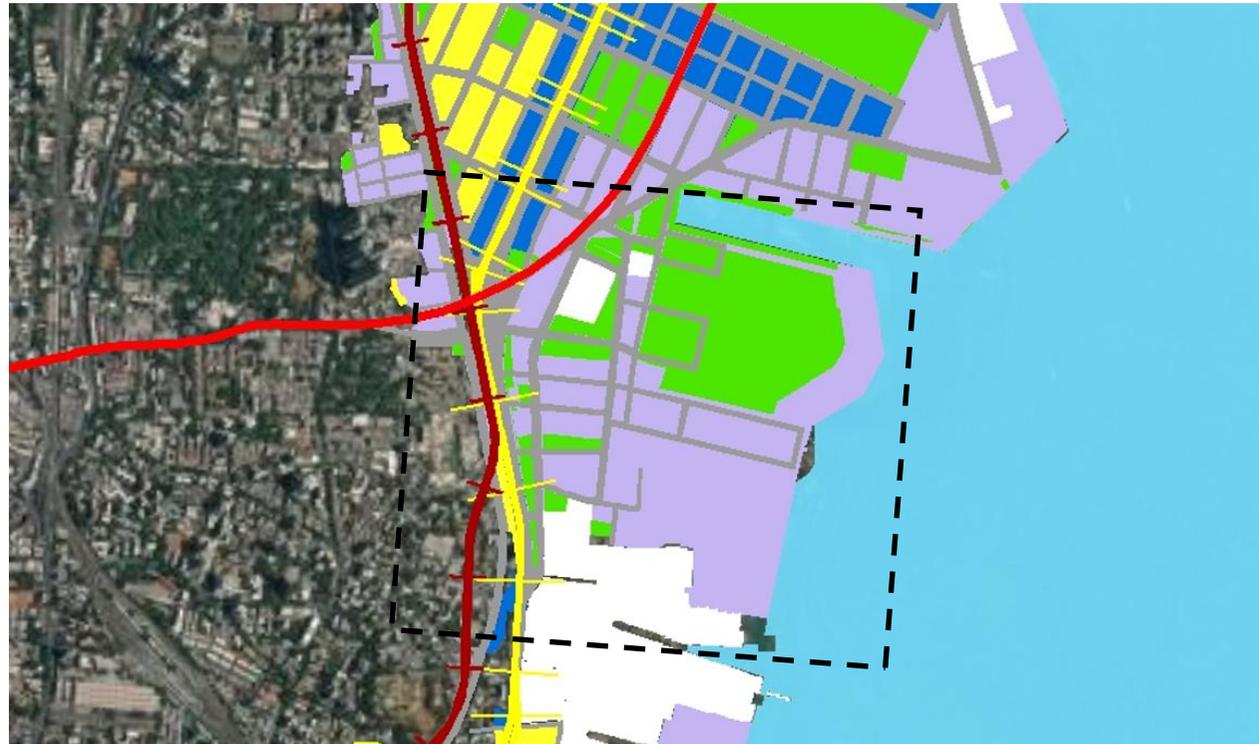


Figure 52 Reclamation for Modern Ship Repair Facility at Darukhana

International Convention Centre

An iconic International Convention Centre is proposed at Mazgaon over 14.6 hectares with a built-up area of 25.94 hectares. The complex will integrate a convention arena, business offices, and a five-star hotel, positioned as a global events and trade venue. Techno-economic feasibility studies are underway. The project is to be implemented through PPP mode with a lease period of 30–50 years. Revenue Potential from Lease premium, rentals from hotels, offices, and convention facilities.

Project Cost: Estimated Investment of Rs. 10,000 crore (including lease premium)

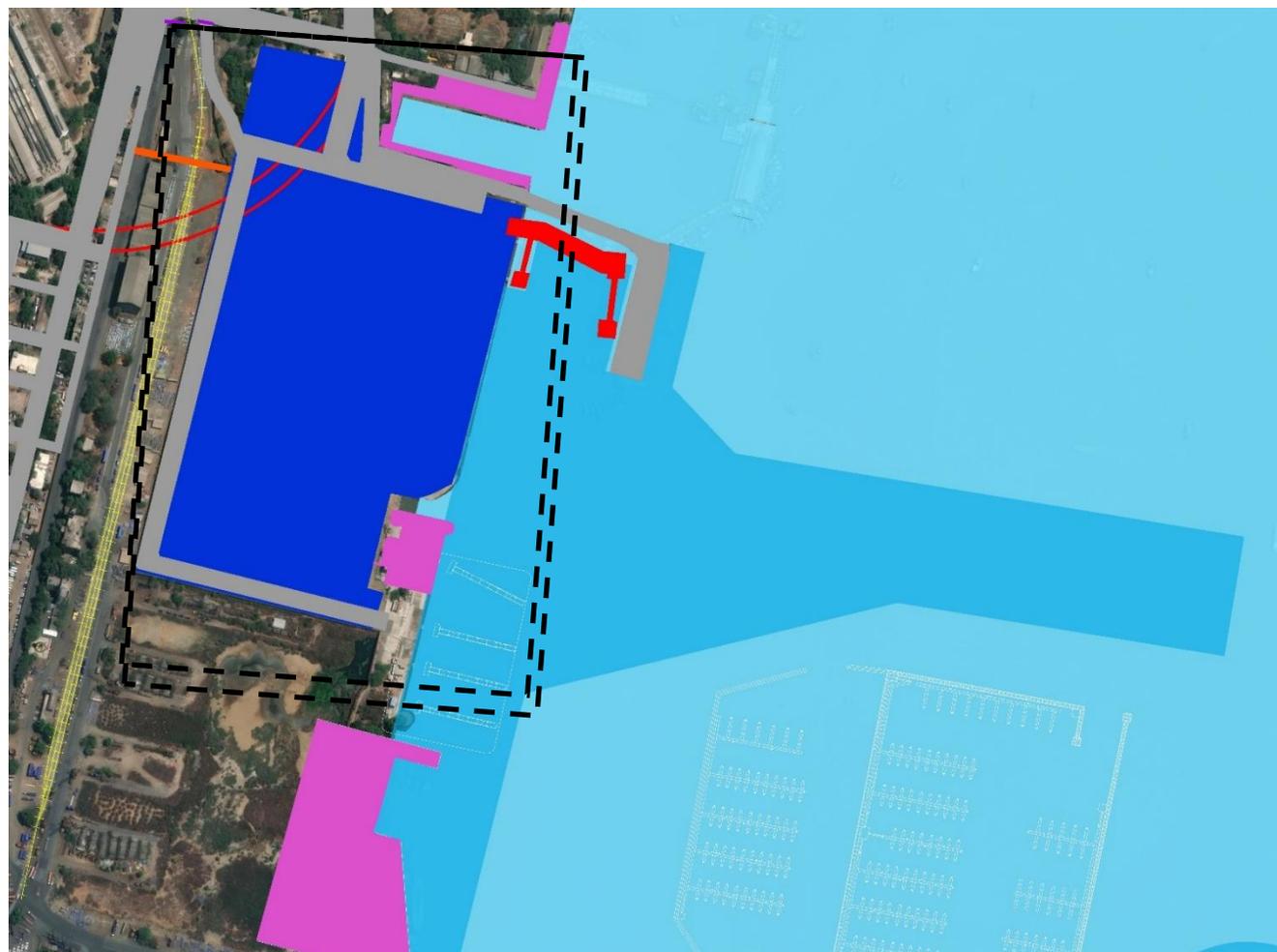


Figure 53 International Convention Centre

Central Government Office Complex

A proposal for the development of the Central Government Offices (CGO) Complex at Cotton Depot, Mumbai—covering an area of 98,485.43 sq.m. (BUA: 3,33,146.44 sq.m.)—has been submitted to the Ministry of Ports, Shipping and Waterways (MoPSW). The project aims to provide modern, well-planned office spaces for Central and State Government organizations, along with supporting infrastructure such as utilities, public amenities, and integrated urban access.

Project Cost: Total investment envisaged is Rs 3000 Cr

Status: The process for infrastructure design and quotation has been initiated by MbPA. MbPA is in process of allotting to the Bureau of Immigration

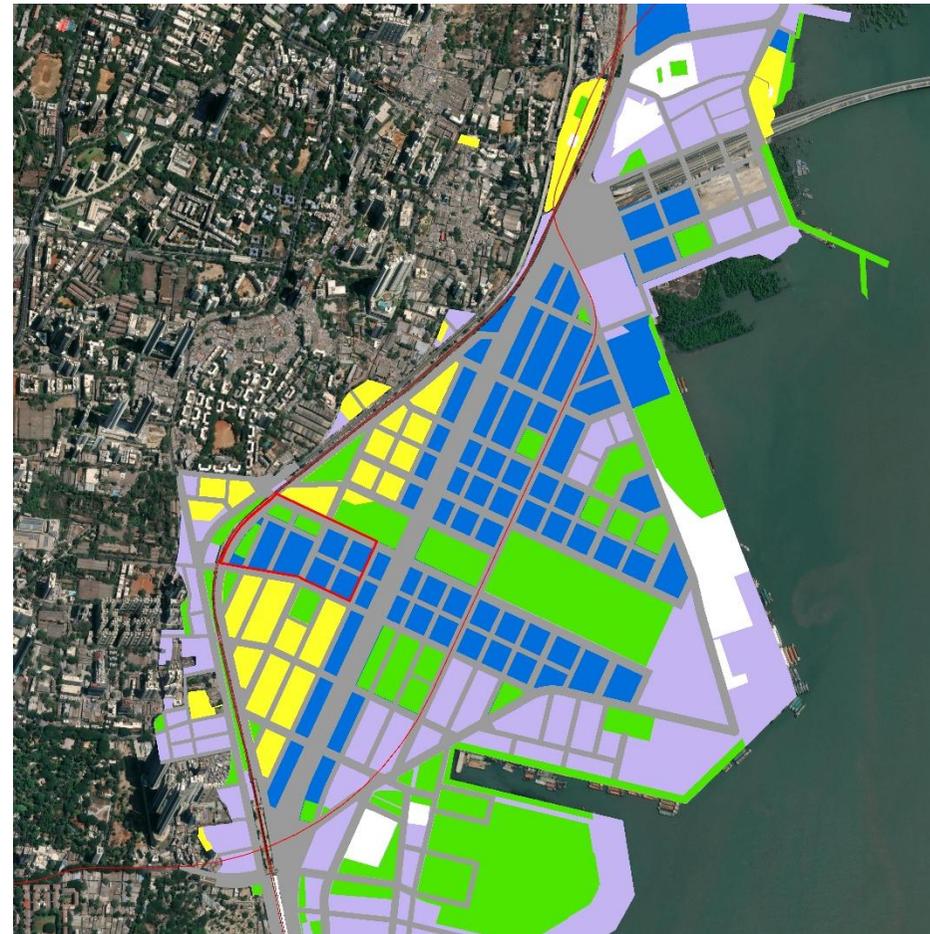


Figure 54 Central Government Office Complex

District Blue – A Global Blue Economy Business District

District Blue is designed to create a Maritime and Blue Economy linked business district to cater to the Global Blue Economy companies.

Precinct Based Masterplan with six anchor precincts

1. Global Maritime Precinct
2. Marine Mobility and Future Transport Precinct
3. Fishery & Marine Biotech Precinct
4. Offshore Energy and Future Fuels Precinct
5. Ocean Environment & Climate Change Precinct
6. Blue Finance and Innovation Precinct

Location: Cotton Green

Area: 10 Ha (Phase 1); 50 Ha (Phase 2)

Development Mode: Long Term Lease

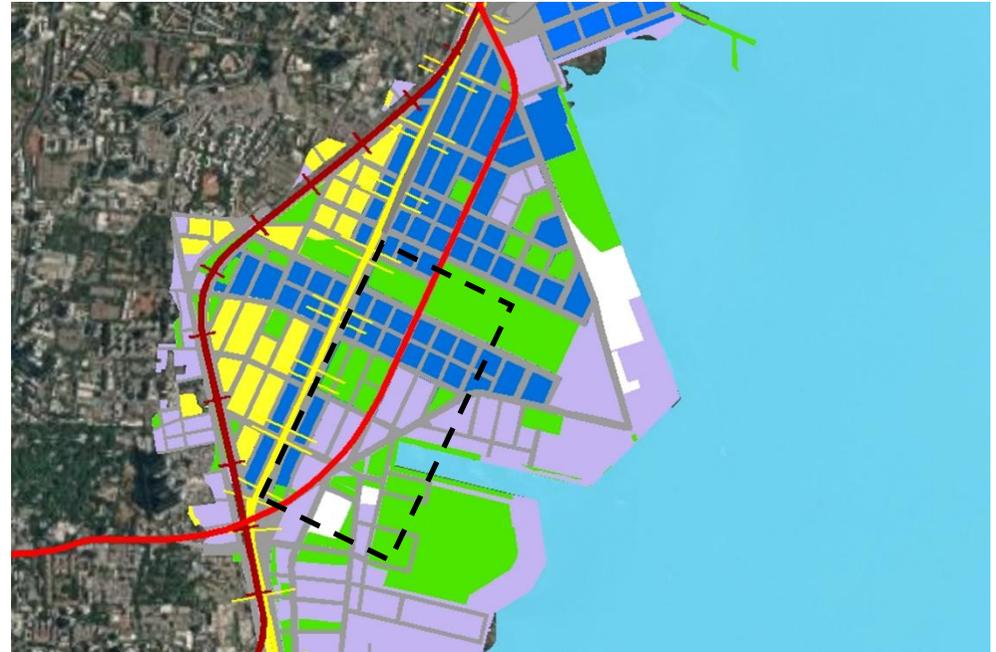


Figure 55 District Blue – A Global Blue Economy Business District

Orange Gate – Marine Drive Tunnel Project

The **Orange Gate–Marine Drive Tunnel Project** is a twin-tube underground road tunnel planned to connect Orange Gate on the eastern waterfront with Marine Drive on the western coast of Mumbai, integrating with the Eastern Freeway. The project is approximately 9 km long, with an underwater section beneath Mumbai Bay, and is designed for four to six lanes of traffic. It will provide a direct east–west road link between South Mumbai, the Eastern Freeway, and the Western Coastal Road corridor. The tunnel is being implemented by the city civic authorities in coordination with the Mumbai Port Authority and state agencies. The project is intended to divert port-bound and city traffic away from surface roads, reduce congestion on P D'Mello Road and South Mumbai arterials, and cut east–west travel time from over 60 minutes to under 10–15 minutes. It is a critical connectivity project for eastern waterfront redevelopment and port logistics efficiency.



Figure 56 Orange Gate – Marine Drive Tunnel Project

Metro Line 11

Metro Line 11 is a proposed fully underground east–west metro corridor planned to connect Wadala in Central Mumbai to South Mumbai, with alignment passing through key eastern waterfront and central city impact zones. The line is planned as part of the larger Mumbai Metro master network to serve high-density port, warehousing, rail yard, and redeveloping brownfield areas. Metro Line 11 is designed to provide high-capacity, high-frequency rapid transit and direct interchange with existing Mumbai Suburban Railway lines and other metro corridors. The project is being planned by Mumbai Metropolitan Region Development Authority with state government support. Line 11 will significantly reduce road dependency in the island city, decongest arterial corridors, and improve first- and last-mile connectivity for port areas, commercial districts, and residential catchments. It is a critical enabling infrastructure for eastern waterfront redevelopment, Transit-Oriented Development, and long-term urban mobility capacity in South and Central Mumbai.

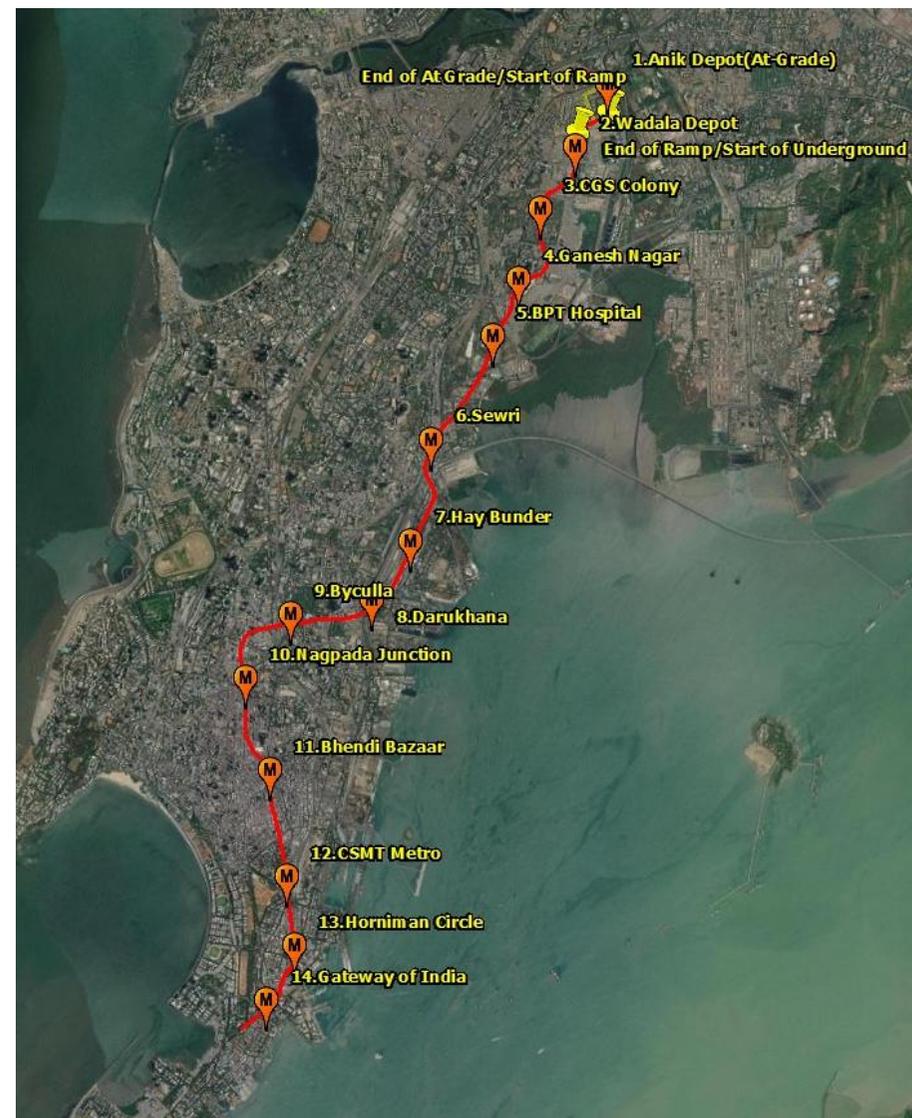


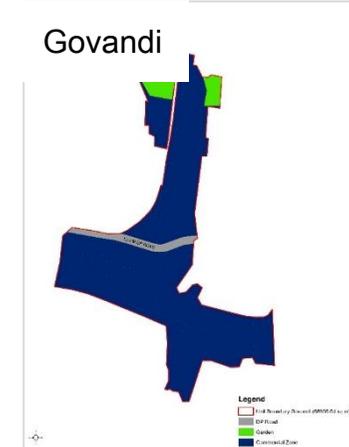
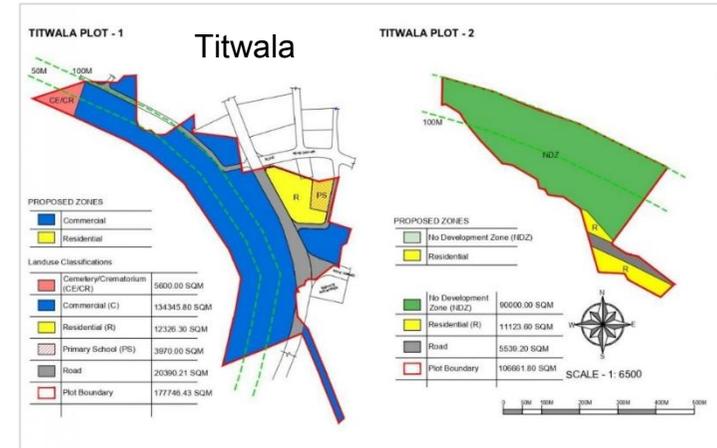
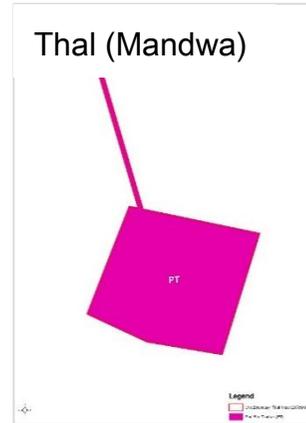
Figure 57 Proposed Alignment of Metro Line 11

Monetization of Isolated Parcels

Monetization of Isolated parcels of land will not just streamline asset management but also allow for additional financial corpus to power port business development as well as infrastructure development.

The isolated parcels identified for monetization are :

1. Titwala
2. Worli
3. Mahim
4. Thal (Mandwa)
5. Govandi



Maritime Leadership

Digitalization

1. Integrated Access Control and Surveillance System
2. Captive 5G
3. Digital Twin

Green Ports

1. Green Tugs
2. Shore Power

Safety

1. Safety Experience Centre
2. Disaster Management

Integrated Access Control and Surveillance System

- Integrated Access Control and Surveillance System (IACASS) is designed for real-time, 360-degree situational awareness.
- It leverages **AI-driven video analytics** and **5G-capable CCTV infrastructure** to enable precise tracking and tracing of all personnel and vehicles within the port.
- The solution features advanced authentication methods, including **Face Recognition, FASTag, and ANPR**, and will seamlessly integrate with national databases (UIDAI, VAHAN) and internal Port systems such as ERP, Port Operating System, weighbridge(s) for automated, secure access and exchange of data.
- A fully digitized **Visitor Management System** streamlines permit issuance while ensuring data integrity.
- Compliant with strict cyber-security standards (CERT-IN, ISO 27001), this initiative transforms the port into a data-driven, intelligent maritime hub.
- Based on **Revenue Sharing Model** for a tenure of 10 Years.

Captive 5G

- This project aims to create a unified digital backbone across the Port's geographically fragmented pockets by deploying a **Captive Private 5G Network**, bridging physical distances with ultra-low latency wireless connectivity.
- Unlike public networks, this Captive architecture grants the Port exclusive control over a slice of the spectrum and infrastructure, ensuring that sensitive operational data remains isolated from public traffic, guaranteeing enterprise-grade security and no network congestion.
- The initiative modernizes the communication landscape by replacing legacy telephone exchanges with a robust **Unified Communication system**, enabling high-definition voice and collaboration across the city-wide expanse.
- Serving as a complementary force to existing fibre, the 5G network solves complex "last-mile" connectivity challenges, allowing for secure mobility and remote operations in areas where laying physical fibre is difficult and maintenance-heavy.
- This sovereign network infrastructure lays the foundation for Port 4.0, providing the reliability and bandwidth needed for future automation while maintaining total data sovereignty within the Port's premises.

Digital Twin

- A **Digital Twin** virtual representation of a port (including its infrastructure, equipment, processes, operations, and associated maritime environment) that is updated through the exchange of information between the physical port system and the virtual model.
- Acting as the **Single Source of Truth**, it fuses static geospatial data with real-time operational streams from IoT sensors and other data sources, transforming the port into a immersive digital environment.
- It breaks down traditional silos by seamlessly consolidating **business data** with **real-time operational telemetry**, providing a unified, panoramic view of the Port.
- This convergence empowers leadership to correlate financial outcomes with physical operations instantly, facilitating data-backed strategic decisions, optimized resource allocation, and streamlined cross-departmental collaboration.
- Moving beyond simple monitoring, the platform **powers predictive analytics** and '**what-if**' simulations, allowing the Port to anticipate traffic bottlenecks, optimize berth planning, and test strategies in a risk-free virtual environment.

Green Tugs

The following is the roadmap for green transition of tugs:

Table 6 Road Map for Green Transition of Tugs

Year	2030	2035	2040	2047
% of Tugs Converted to Green Tugs	25	50	75	100

Safety Experience Centre

The Safety Experience Centre at Mumbai Port is envisioned as a dedicated, purpose-built facility to strengthen safety awareness and emergency preparedness across port and industrial operations.

The centre will use immersive, hands-on learning methods such as simulations, mock-ups, and scenario-based demonstrations to replicate real-life situations including fire incidents, hazardous cargo handling, confined-space operations, oil spill response, and evacuation procedures.

Designed to serve port employees, contractual labour, emergency responders, maritime professionals, and trainees, the facility will function as a regional hub for safety training and behavioural reinforcement. Integrated into the port's long-term masterplan, the Safety Experience Centre supports safer operations, reduces incident risks, and reinforces Mumbai Port's transition towards modern, resilient, and internationally benchmarked port infrastructure.

Disaster Management

- Mumbai Port has a comprehensive Disaster Management Plan in place to ensure preparedness, coordinated response, and swift recovery during any emergency.
- The Disaster Management Plan 2019 (Revised 2024) of the Mumbai Port Authority serves as a detailed blueprint for ensuring preparedness, risk mitigation, effective response, and swift recovery from potential disasters at Mumbai Port.
- Aligned with the Disaster Management Act 2005 and the National Policy on Disaster Management 2009, the plan outlines the port's profile, key objectives, major hazards, mitigation strategies, preparedness and response mechanisms, institutional responsibilities, and recovery measures.
- It emphasizes comprehensive risk assessment, formation of Crisis Management and Incident Response Teams, clear communication protocols, hazard-specific actions, and continuous capacity development.
- Regular review and monitoring ensure that the plan remains dynamic and responsive to emerging needs, enabling Mumbai Port to safeguard lives, property, and the environment effectively.

Maritime Legacy

1. Experience Centre at Port House
2. Maritime Museum at Ghadiyal Godi
3. Heritage Precinct at Ballard Estate
4. Mumbai Port Archives

Experience Centre at Port House

“The Glorious Past and Prosperous Future” theme of an Experience Centre is planned on one side of the historic Port Bhavan, encompassing the ground, first, second, and third floors, as well as the terrace. This multi-level centre is envisioned to showcase Mumbai's rich maritime legacy while highlighting the city's promising future.

Through thoughtfully curated exhibits, interactive installations, and multimedia displays, the Experience Centre will provide visitors with an engaging journey that bridges the city's historical significance and its forward-looking aspirations.

The setting within the heritage Port Bhavan amplifies the authenticity of the narrative, creating a seamless connection between Mumbai's past and its ongoing progress. The centre will serve as both an educational resource and a cultural attraction, celebrating the city's vibrant story across its various levels and the panoramic terrace view.



Figure 58 Thematic Representation of Experience Centre at Port House

Maritime Museum at Ghadiyal Godi

The proposed Maritime Museum at Ghadiyal Ghodi aims to repurpose the historic 1890 heritage structure into a comprehensive facility that documents and interprets Mumbai's maritime legacy.

The concept envisions a curated sequence of thematic galleries covering marine archaeology, the geographic and historical evolution of Bombay, shipbuilding traditions, maritime communities, naval development, coastal ecology, and operational aspects of life at sea. The proposal also includes the creation of immersive 4D experiences depicting significant maritime events and on-board environments to enhance visitor engagement.

Situated within a restored heritage building, the museum is intended to function as a prominent public institution that presents Mumbai's maritime heritage in a structured, informative and accessible manner.



Figure 59 Ghadiyal Godi

Heritage Precinct at Ballard Estate

The development of the Ballard Estate precinct focuses on revitalizing the historic commercial district while preserving its architectural integrity and urban character.

The proposed interventions include restoring heritage buildings, improving streetscapes, upgrading pavements, and introducing cohesive street furniture to enhance the pedestrian environment. Inner courtyards (currently underused) are envisioned as active urban plazas featuring food courts, art courts, amphitheatres, and service kiosks, thereby bringing vitality to the precinct beyond office hours.

Landscape enhancements, improved lighting, better traffic and parking management, and curated heritage trails further aim to create a more engaging, accessible, and culturally vibrant environment. Collectively, these measures seek to reinforce Ballard Estate's identity as a well-preserved, humane, and dynamic heritage business district.



Figure 60 Revitalisation of Ballard Estate Heritage Precinct

Mumbai Port Archives

The Mumbai Port Archives are proposed as a dedicated facility to systematically conserve, organise, and present over one hundred and fifty years of the port's historical records, including maps, engineering drawings, photographs, ship registers, and administrative documents. The project is intended to document the evolution of Mumbai Port and its influence on the city's growth, covering themes such as dock development, land reclamation, rail connectivity, oil infrastructure, and maritime trade. Envisaged as both a research resource and a curated public space within the port masterplan, the proposed Mumbai Port Archives will support academic study, informed planning, and public engagement by making the port's historical legacy accessible in a structured and secure manner.



Figure 61 Thematic Representation of Mumbai Port Archives

THE ROAD AHEAD

Phasing of Major Projects

Table 7 Phasing of Major Projects

Sr. No.	Project	Completion by
1.	Mumbai International Cruise Terminal (EPC+PPP)	Jun 2026
2.	New Fish Jetty and Approach Trestle	Jun 2026
3.	Award of Viksit Bharat Mumbai Marina (EPC)	Jun 2026
4.	Reclamation & Shore Protection at Jawahar Dweep	Jun 2026
5.	O&M of Berths at ID - Award	Dec 2026
6.	O&M of Viksit Bharat Mumbai Marina (PPP) - Award	Dec 2026
7.	Additional Land Reclamation at JD – CRZ Clearance	Dec 2026
8.	22 MTPA Sixth Oil Berth at JD – EPC Award	Dec 2026
9.	Kurla Wadala Dedicated Freight Line	Dec 2026
10.	Integrated Ship Building Facility at Hay Bunder– License Award	Dec 2026
11.	Mechanised Dry Bulk Handling at Haji Bunder– License Award	Dec 2026
12.	Reclamation at Pir Pau	Dec 2026
13.	Integrated Access Control and Surveillance System	Dec 2026
14.	Metro Line 11 – MoU Finalisation	Dec 2026

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Sr. No.	Project	Completion by
15.	RoPax Terminal at M-Shed	Dec 2026
16.	Passenger Terminal at Bhaucha Dhakka	Dec 2026
17.	Namo Bharat International Sailing School	Dec 2026
18.	Revamp of Jawahar Dweep	Jun 2027
19.	Captive 5G Implementation	Jun 2027
20.	Green Tug Procurement	Jun 2027
21.	Modern Ship Repair Facility at Darukhana	Dec 2027
22.	Viksit Bharat Mumbai Marina – EPC Completion	Jun 2028
23.	Viksit Bharat Mumbai Marina – PPP Completion	Dec 2028
24.	22 MTPA – Sixth Oil Berth – Completion of EPC Works	Dec 2028
25.	Trestle Connectivity at Jawahar Dweep – Award	Dec 2028
26.	Completion of Digital Twin	Dec 2028

Action Plan for Improving KPIs

Table 8 Future Plan for improving KPIs for 2026-27, 2027-28, 2029-30

KPI	2026-27	2027-28	2029-30
TRT	<ul style="list-style-type: none"> Two mooring boats. Two Pilot Launches. Out sourcing cargo operations at Indira Dock through O&M Effective utilization of OCT Berth - Supplementary MoU 	<ul style="list-style-type: none"> Addition of One Tug of 50 BP – One Green Tug of 60 BP. Replacement of Four (4) Dock Tugs Coffer Dam opposite to Harbour Wall shall be removed to avoid multiple shifting of Vessels. 	<ul style="list-style-type: none"> Replacement of Two Harbour Tugs of 60 BP.
OSBD	<ul style="list-style-type: none"> Out sourcing cargo operations at Indira Dock through O&M Effective utilization of OCT Berth - Supplementary MoU 	<ul style="list-style-type: none"> Deepening of channel in front of 1st Chemical Berth and turning circle-facilitates berthing of VLGC at 3rd Chemical Berth Allotment of land at Jawahar Dweep for tankages 	<ul style="list-style-type: none"> Dredging channel leading to OCT up to 11.0 mtrs to accommodate bigger vessels at OCT Deepening of channel in front of 1st Chemical Berth and turning circle-facilitates berthing of VLGC at 3rd Chemical Berth Construction of additional tankages at Pirpau

KPI	2026-27	2027-28	2029-30
<p>Cargo Volume</p>	<ul style="list-style-type: none"> • Effective utilization of disputed OCT Berth - Supplementary MoU • Out sourcing cargo operations at Indira Dock through O&M • Regular customer meets - Volume based discounts - MoUs with customers. • Deepening of Anhorages J3 & D3 from 11.8 m to 13.5 m 	<ul style="list-style-type: none"> • New Jetties at Pir Pau (4th Jetty) & Jawahar Dweep (6th Jetty) - Reclamation at JD for storage tanks - capacity addition of 22 MMT. • Deepening of channel in front of 1st Chemical Berth and Turning Circle - facilitates berthing of VLGC at 3rd Chemical Berth. • Regular customer meets - Volume based discounts - MoUs with customers 	<ul style="list-style-type: none"> • Dredging channel leading to OCT up to 11.0 mtrs to accommodate bigger vessels • New Jetties at Pir Pau (4th Jetty) & Jawahar Dweep (6th Jetty) - Reclamation at JD for storage tanks - capacity addition of 22 MMT. • Regular customer meets -Volume based discounts - MoUs with customers. • Creation of Tank Farms at Hay Bunder

Governance and Implementation Mechanism

Public Private Partnerships

- EPC + PPP Hybrid Model for projects where long-term revenue streams exist
- Partner with Central Government Agencies like NBCC, HUDCO, EIL, NISG, etc.
- Lease to Master Developer for land development projects

Institutional Reforms

- Digital Paperless Systems for Port Management
- Creation of Technology and Business Development Verticals
- Creation of sector specific SPVs if necessary

Financial Strategy

- Funding sources: 80 % Private Sector (PPP) & 20 % MbPA internal resources and land monetization
- War Chest Target: INR 2000 Cr
- 25% of Monetization to be directed towards Infrastructure Development / War Chest
- Closing the INR 13630 Cr Superannuation Liability through 75% of the Monetization funds.

Capacity Expansion Roadmap

Table 9 Capacity Expansion Roadmap

Year	Capacity (Liquid Bulk) MTPA	Capacity (Dry Bulk) MTPA	Capacity (Anchorage+ OPP) MTPA	Total Capacity MTPA	Project
2025	25.55	44	15+ 1.3	85.85	
2030	+24	-	-	109.85	Sixth Oil Berth at JD (22 MTPA) Fourth Chemical Berth (2 MTPA)
		+5	-	114.85	Multipurpose Offshore Terminal (2 MTPA) Cement Silo (2 MTPA) O&M of Indira Docks (1 MTPA)
2035	-	-	+2	116.85	Deepening of Anchorages
2040	3.5	-	-	120.35	LNG Terminal (Ph 1)
2047	1.5	-	-	121.85	LNG Terminal (Ph 2)

Manpower Planning

The following is the proposed manpower plan for optimum operations at Mumbai Port:

Class	Core (Regular)	Core (Contract)	Non-Core (Regular)	Non-Core (Contract)	Total (Regular)	Total (Contract)
I	401	69	0	5	401	74
II	28	10	0	0	28	10
III	1003	406	22	180	1025	586
IV	0	0	0	0	0	0
Total	1432	485	22	185	1454	670

Financial Roadmap

Table 10 Financial Roadmap

	As per budget		Forecasted	(INR n crores)	
	2025-26	2026-27	2027-28	2028-29	2029-30
TRAFFIC (in MMT)	72.60	74.05	76.27	78.56	80.92
Operating Income					
Cargo Handling (incl. Stevedoring)	889.99	908.43	935.68	963.75	992.67
Port & Dock Charges	1,300.60	1,326.27	1,366.06	1,407.04	1,449.25
Estate Rental (considering 5% annual Increment)	375.44	382.48	401.60	421.68	442.77
Railway earning	5.42	5.51	5.50	5.50	5.50
Total Operating Income	2,571.45	2,622.69	2,708.85	2,797.98	2,890.19
Salary & Wages	480.97	388.79	461.88	508.07	558.88
Outsourcing Exp (20% of salary)			92.38	101.61	111.78
Total Salary & Wages	480.97	388.79	554.26	609.68	670.65
Stores	56.19	56.90	58.04	59.20	60.38
Office & Administrative Expenses	59.81	59.41	60.00	60.60	61.21
Operation & Maintenance Expenses	398.08	437.53	481.28	529.41	582.35
Security Expenses:	76.09	86.95	96.51	107.13	118.92
Medical Expenses	102.86	98.90	103.85	109.04	114.49
Depreciation	80.00	80.00	85.00	85.00	85.00
Total operating expenditure	1,254.00	1,208.48	1,438.94	1,560.07	1,693.00
Operating Profit	1,317.45	1,414.21	1,269.90	1,237.91	1,197.18
Add: Finance & Misc. Income	406.12	129.16	150.00	150.00	150.00
Less: Finance & Misc. Expenditure	1,771.75	2,023.75	1,000.00	1,000.00	1,000.00
Profit before Tax	-48.18	-480.38	419.90	387.91	347.18
Operating Ratio	48.77	46.08	53.12	55.76	58.58

APPENDIX

Appendix 1: Geographic Assessment

Meteorology

The climate of Mumbai generally shows a regular seasonal variation and the general character of the weather is more nearly related to the season. Mumbai is subject to the influence of both the SW and NE monsoon winds prevalent over the sub-continent. However, the former is more strongly marked along the west coast than the latter. The fair weather period is from October to June when it is generally sunny and dry. In the latter half of May, the weather becomes hot, sultry and humid as the conditions build up for the onset of SW monsoon. The “break” of the monsoon is accompanied by heavy rains, often lasting for several days. For the next two or three months there are periods of heavy rains interspersed with periods of less intensity. Towards the end of August, the monsoon begins to slacken and eventually recedes from Mumbai by the end of September.

Winds

During the fair weather period from October to June, the general wind direction is from the NW-NE quarter. From June, for two or three months, the wind has an almost constant SW direction. The south-west monsoon winds are relatively stronger than the north-east winds. The maximum wind speed recorded is 150 km/h during the cyclonic storm of 1948.

Rainfall

The SW monsoon period starting about mid-May is the season for heavy rains. Nearly all the rainfall in Mumbai occurs during this

period. The average yearly rainfall is about 2098 mm, of which 1965 mm (93.66%) occur during June to September. Usually maximum monthly rainfall occurs in July. The average monthly rainfall in July is 709 mm. There is practically no rainfall from December to April.

Temperature

The mean of the highest air temperature recorded in Mumbai is 35° C in the months of March, April and May while the mean lowest is 16° C recorded in the month of January. Mean daily maximum and minimum temperatures are 31° C and 24° C respectively.

Visibility

At Mumbai from November to March smog hangs over the land, obscuring everything in view. This happens only for short periods most often shortly after sunrise but also occasionally in the evenings. Visibility is generally good for most part of the year.

Relative Humidity

Mean yearly relative humidity at 0830 hours is 77% while the same at 1730 hours is 71%. The monthly average is lowest in February (62%) and highest in July to September (85%).

Cyclone

In general, the west coast of India is less prone to cyclonic storms compared to the east coast. From the information reported by India Meteorological Department (IMD) a total of 1034 disturbances occurred in the Bay of Bengal during the period 1891 to 1970 of which 363 intensified to cyclonic storms, the rest being 'depressions'. On an average the number of cyclonic disturbances per

year during this period was about 13. However, if the data is updated to 1990, the number of cyclonic events per annum works out to be 16, varying from a minimum of 8 to a maximum of 18. It is observed from the tracks of the cyclones in the Arabian Sea from 1877 to 1992 that only 10 storms endangering the Mumbai coast have occurred in the above said period i.e. at a frequency of once in 12 years.

Cyclone Nisarga

Cyclone Nisarga had notable impacts on the port operations in Mumbai as it approached the western coast of India in June 2020. In anticipation of the cyclone's landfall, maritime activities at the Mumbai port were suspended as a precautionary measure. This included halting vessel movements, loading and unloading operations, and other port activities to ensure the safety of ships, cargo, and personnel. The cyclone's strong winds and rough seas disrupted shipping operations in and around Mumbai port. Vessels were advised to seek shelter or move to safer locations to avoid the brunt of the cyclone.

Cyclone Taukte

It was a cyclonic storm occurred in 17th and 18th March 2021, that emerged from Arabic sea and touch the Mumbai Port waterfront. Minor damages to the waterfront were observed. In short, the harbour water of Mumbai Port is calm and less affected by any cyclonic activity.

Oceanography

Tides

The tides in the Mumbai region are of the semi-diurnal type i.e. characterized by occurrence of two high and two low waters every day. There is a marked inequality in the levels of the two low waters in a day. The various tide levels with respect to Chart Datum reported at Mumbai are shown below:

Table 11 Tide Levels w.r.t.Chart Datum

Sr.No.	Particulars	Details
1	Highest High Water (HHW)	+5.39 m
2	Mean High Water Springs (MHWS):	+4.42 m
3	Mean High Water Neap (MHWN)	+3.30 m
4	Mean Sea Level (MSL)	+2.51 m
5	Mean Low Water Neap (MLWN)	+1.85 m
6	Mean Low Water Springs (MLWS)	+0.76 m
7	Lowest Low Water	- 0.44 m

(Source: Final Report on Master Plan for Mumbai Port prepared by AECOM)

The distance from the Mumbai floating light to the Elephanta island is 26 km, and it will take 1½ to 2 hours to navigate this distance. Probability curves for HHW and tide levels 1 and 2 hours before HHW indicate that virtually on all occasions the tide level will

exceed + 2.7 m two hours before high water and + 3.0 m one hour before high water. Hence larger vessels taking advantage of this tide, should therefore, enter the channel between two and one hour before high water and berth within one hour after high water.

Currents

The currents in the Mumbai region in the near shore zone are tide induced with reversal at high and low waters. The currents in the creeks are also affected by the freshets which result in not only increasing the strength of the ebb current but also limiting the propagation of the tide upstream. The normal maximum currents inside the harbour are about 2 to 3 knots although 4 knots occur on ebb flow during the monsoons.

Waves

The significant waves entering the harbour are the long period swell waves generated by deep sea storms. These mainly arise just before and during the monsoon and their direction of approach is normally from South – West. Whatever the wave-front orientation outside the harbour, the waves running up the harbour tend to be refracted in to a constant pattern. Waves are also substantially attenuated by the time they reach the berthing facilities in the harbour. As the Mumbai harbour is sheltered, no significant wave climate exists within the harbour area. The wave height reaches a maximum of 1.5 m under normal conditions with wave period ranging from 6 to 10 s. The offshore and nearshore wave rose diagram is as shown in Figure 2.2.

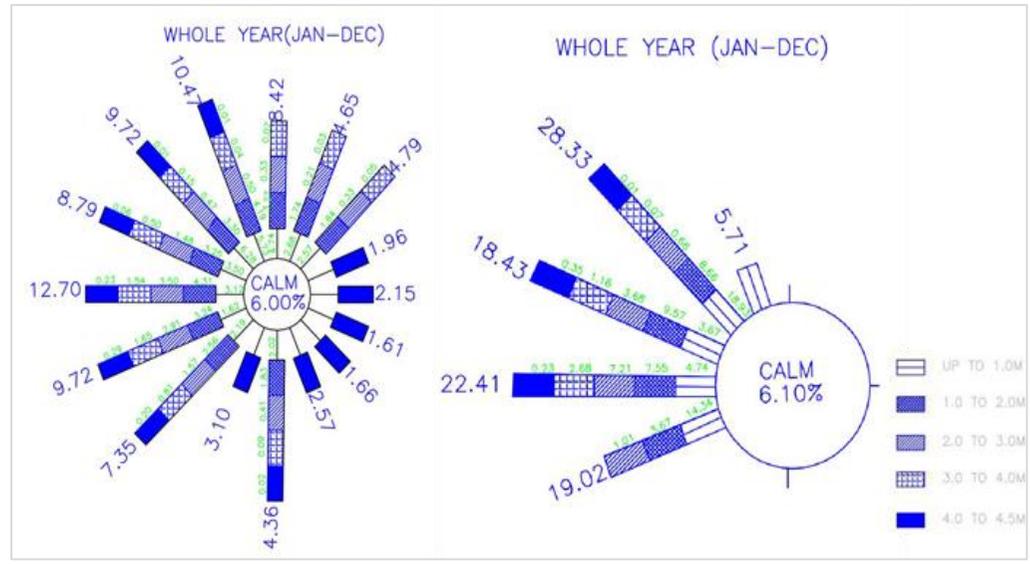


Figure 62 Offshore and Near Shore Waverose Diagram

(Source: Final Report on Master Plan for Mumbai Port prepared by AECOM)

Geology of the Area

The geological origin of rocks in the Mumbai region is that of the Deccan traps- a series of vast lava flows accompanied by volcanic eruptions at the close of Cretaceous period. Over the Deccan Plateau, the flow strata have remained nearly horizontal, but in the Mumbai area, they are inclined as much as 150 towards west. The type of rock is amygdaloidal basalt showing different grades of weathering from slightly to completely weathered.

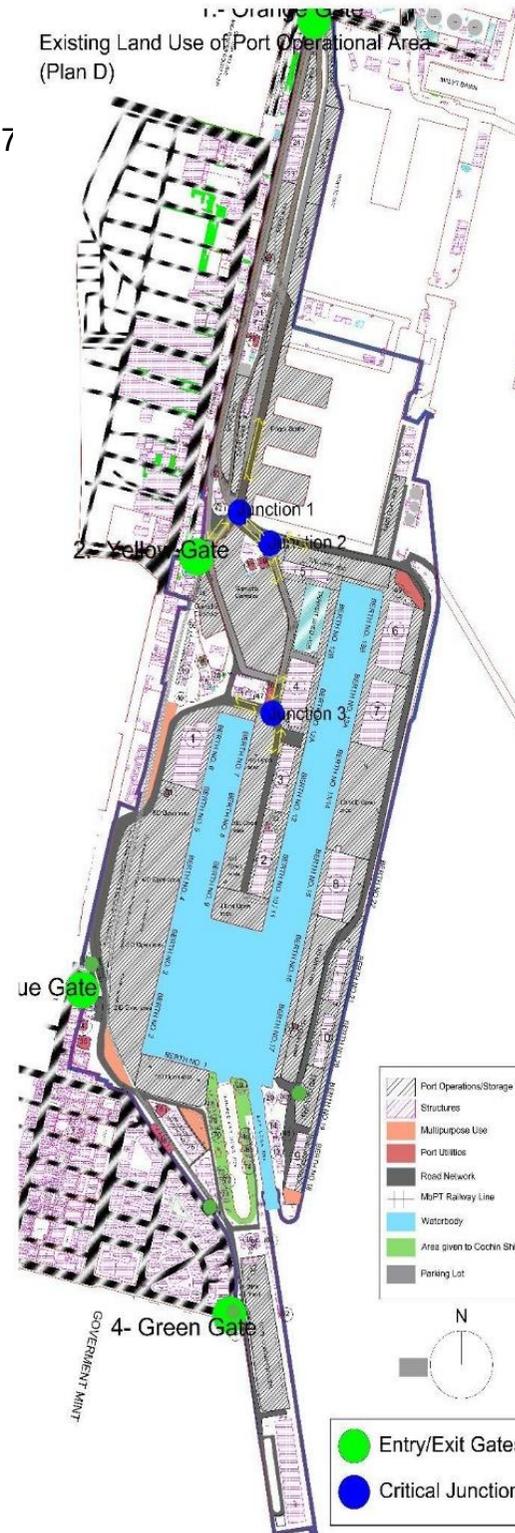
This basalt layer is overlain by residual soil which in turn is overlain by marine clay. In general, the colour of marine clay is grey to

dark black and its nature is soft to very soft. These are silty marine clays. At some places, these are mixed with fine to medium sized sand and gravels and at some places with gravels of weathered rock. The thickness of this layer is variable. The residual soil is the weathering product of underlying basalt. These are reddish brown in colour. These are hard to very hard in strength.

The Deccan trap basalt are of two types viz., amygdaloidal basalt and compact basalt. The difference between these two is that amygdaloidal basalt contains gas cavities whereas compact basalt does not. The basalt in the area of Pir Pau and Jawahar Dweep are of amygdaloidal type. These basalts are fine grained and show thin to thick bands of weathering. At some places, these rocks are highly jointed and show weathering and staining along these joints. Otherwise these are fresh and are strong to very strong in strength.

Appendix 2: Existing Land Use of Indira Docks

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Sr. No.	Name of Plot/Structure	No. of floors of Structure	Built up area in M2	Use of plot/Building	Materials/ Goods stored (in case of use is storage)	Structural Quality/dilapidated	
SHEDS							
1	8 D	G	8500	Storage of Export/Import cargo.	Storage of Export/Import cargo.	Sound	
2	10/11 D	G	4500				
3	12 D	G	4500				
4	12A D	G	8600				
5	13B D	G	2975				
6	13B D	G	9144				
7	13A D	G	9144				
8	15 D	G	3050				
9	15 D	G	3146				
10	20 D	G	3050				
11	21 D	G	3050				
12	14 VD	G	2600				
13	CSO	G	835.9				Store
14	Sr. Dock Master office	G+3	1713	Office	Port Dept Offices		
15	Ambedkar Bhavan	G+8	6740	Office	Traffic/COMED/Cash Office+Carriage		
16	CMC Building	G+3	2536.8	Office	S-S Port Dept/Custom Offices		
17	Hemalaga Building	G+5	4743	Office	Traffic Dept Offices + Canteen		
18	Yerra Bhavan	G+5	5477.4	Office + workshop			
19	Mobile Crane Section Building	G+1	450	Office	Mobile Crane Section		
20	Shed + Store + Chargeman office	G	935	Workshop			
21	Combined Building	G+2	567.19	Office	Office		
22	Traffic Baking	G+2	3415	Office	Traffic Dept/Custom Offices+Canteen	Needs Repairs	
23	Hydraulic Building	G+4	2623	Office+ Fire Station	Fire Station+Custom+Traffic office	Sound	
24	5 ware house PD	G+3	7400	Storage of Export/Import cargo.	Warehousing of codified, uncleaned goods.	Needs Repairs	
25	6 ware house PD	G	1820		Warehousing of uncleaned goods.	Hemalaga workshop and Ship General Record Office.	Needs Repairs
26	7 Ware house	G	1820		Storage of Export/Import cargo.		Needs Repairs
27	8 Ware house	G+3	8920		Warehousing of uncleaned goods.		Sound
28	Shramic Bhavan	G+3	1485	Office	Offices	Sound	
29	8 D Canteen	G	342.1			Sound	
30	Central Kitchen V docks	G+1	785	Cotton+Miss	Kitchen+Miss	Sound	
31	Harbour view canteen & mess	G+1	647.5			Sound	
32	Substation 5/6 ID	G	143.2	Hub station	Sub station	Sound	
33	Substation 10/11 ID	G+1	306				
34	Substation 16/17 ID	G+1	240				
35	Substation PG2	G+1	515				
36	Substation STARS	G+1	1741.8				
37	Substation near RG V docks	G	178				
38	Substation/ store Red gate ID	G	92.5				
39	UIC Pump room	G	37.4				
40	PS2 pump room	G	54				
41	8 D pump room	G	38.6				
42	Ambedkar Bhavan Pump room	G	62.95				
43	9 VD pump room	G	79.05				
44	Traffic Building pump room	G	4.45				
45	Central kitchen pump room	G	10.4				
46	Sr. Dock Master office pump room	G	5.8				
47	Shramic Bhavan pump room	G	38				
48	Hemalaga Building pump room	G	20				
49	Yerra Bhavan pump room	G	15.4				
50	Weigh Bridge 13B ID	G	16.17				
51	Weigh Bridge 7 ID	G	16.17				
52	Weigh Bridge 9 VD	G	10				
53	Yellow gate baggage hall	G	48	Baggage Hall	Passenger Baggage Scanning	Sound	
54	Green gate baggage hall	G	48				
55	Green gate house	G	87.4	Gate House	Traffic and CSF office for verification of dock entry users	Sound	
56	Blue gate house	G	47.2				
57	Brown gate house	G	53.71				
58	New yellow gate ID house	G	47				
59	Orange Gate Ports Cabins	G		Gate House	Traffic Dept Gate staff CSF on duty/Customs - Movement of EXIM cargo.	Temp Structure	
60	Yellow Gate PD Porta Cabin	G					
61	Rest gate PD	G	57.5	Toilets	Traffic Dept Gate staff CSF on duty/ Customs - Movement of Exim cargo/ Defence personnel	Sound	
62	Grey gate toilet	G	62				
63	Blue gate toilet	G	62	Toilets	Toilets	Sound	
64	16 ID toilet	G	44.2				
65	East mole Rest Room	G	35.5	Rest Room	Rest Room	Sound	
66	Sarang room ID	G	61.44				
67	Blue gate scanner room	G	40.6	Baggage Scanners	Baggage Scanning of dock users	Sound	
68	Green gate scanner room	G	40.6				
69	Green gate ID house	G	53.71	Office	Office	Sound	
70	Green gate toilet	G	20.25				
71	HDD substation on East side of Dry dock	G	230.4	COCHIN SHIPYARD LIMITED	COCHIN SHIPYARD LIMITED	Sound	
72	HDD pumping station and engine room	G	219.35				
73	HDD work shop on w side	G	47.61				
74	HDD toilet	G	53.55				
75	HDD work room	G	19.58				
76	HDD oil office	G+2	1532				
77	HDD rest room on west side of Dry dock	G	78.28				
78	HDD oil office	G	59.4				
79	HDD substation on w side	G	266.77				
80	HDD work shop on w side	G	47.61				
Area Statement							
81	Substation	Substation				Sound	

Table 12 Details of Existing Berths

Sr.No.	Name of Berth	Quay Length (m)	Permissible LOA (in m)	Permissible Draft (in m)
1.	Indira Dock Basin - 1	180	160	7
2.	Indira Dock Basin - 2	158	140	6.7
3.	Indira Dock Basin - 3	158	140	6.7
4.	Indira Dock Basin - 4	158	140	6.9
5.	Indira Dock Basin - 5	158	140	6.8
6.	Indira Dock Basin - 6	158	140	6.7
7.	Indira Dock Basin - 7	152	135	4.7
8.	Indira Dock Basin - 8	152	135	4.7
9.	Indira Dock Basin - 9	152	135	4.6
10.	Indira Dock Basin - J/E	130	130	6.7
11.	Indira Dock Basin - 10	152	135	6.8
12.	Indira Dock Basin - 11	152	135	6.9
13.	Indira Dock Basin - 12	152	135	6.7
14.	Indira Dock Basin - 12 A	180	160	6.7
15.	Indira Dock Basin - 12 B	180	160	6.2
16.	Indira Dock Basin - 13	158	140	6.7
17.	Indira Dock Basin - 13 A	180	160	6.6
18.	Indira Dock Basin - 13 B	180	160	6.1
19.	Indira Dock Basin - 14	158	140	6.9

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Sr.No.	Name of Berth	Quay Length (m)	Permissible LOA (in m)	Permissible Draft (in m)
20.	Indira Dock Basin -15	158	140	7
21.	Indira Dock Basin - 16	158	140	6.8
22.	Indira Dock Basin -17	158	140	5.7
23.	Harbour Wall -18	183	160	8.3
24.	Harbour Wall – 19	168	167	8.3
25.	Harbour Wall - 20	168	167	8.3
26.	Harbour Wall – 21	168	167	8.2
27.	Harbour Wall – 22	431	167	7.7
28.	Harbour Wall - 23	431	152	2.7
29.	Ballard Pier Station	244	182.88	9.7
30.	Ballard Pier Extension	242.42	221	9.7
31.	OCT 1	350		10.4
32.	OCT 2	350		10.9
33.	Jawahar Dweep-1	276.14	230	11
34.	Jawahar Dweep-2	238	183	10.8
35.	Jawahar Dweep-3	276.44	230	11.3
36.	Jawahar Dweep-4	450	279	12.5
37.	Jawahar Dweep-5	500	359	15.8
38.	First Chemical Berth (FCB)	300	197	10.6
39.	Second Chemical Berth (SCB)	300	230	13
40.	Third Chemical Berth (TCB)	30	230	10

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Sr.No.	Name of Berth	Quay Length (m)	Permissible LOA (in m)	Permissible Draft (in m)
41.	Main Approach Channel	5.5 km	Wide 350-450 m	15.6 m depth
42.	Total Anchorages	53 No.s		
43.	Deep Water Anchorage	5 No.s	400 m radius	18.8
44.	Other Anchorages	48 No.s		7 m to 9.5 m

Details of Submarine Pipelines

Table 13 Details of Submarine Pipelines

Sr. No.	Nomenclature	Product	Diameter (inches)
1.	C1 & C2	Crude	42
2.	B1	Black oil	36
3.	W1	Naphtha	30
4.	W2	HSD	30
5.	W3	MS	30
6.	FW	Fresh water	8

Appendix 3: Stakeholder Consultation by MbPA

The summary of the stakeholder consultations organised by MbPA from 2021 to 2025 is summarised below:

Date	Meeting / Sector	Key Issues Raised by Stakeholders	MbPA Responses / Assurances
18 Nov 2021	Steel Trade Meeting	<ul style="list-style-type: none"> • Shortage of covered storage for CR/HR coils • Need for temporary roofs at 11ID, 13AID, 5–6ID • Limited gates at 20–21ID; need 6 OGPD gates • Interest charged despite advance PD payment • Dilapidated sheds • Slow online DEP processing • Need Customs examination on weekends 	<ul style="list-style-type: none"> • Shed repairs undertaken (6ID, 13BID etc.) • Temporary shed policy introduced; CE to examine new covered areas • Additional door allowed at 20–21ID; proposal for 6 OGPD gates • Interest issue to go to Steering Committee • Offline/manual DEPs permitted • Customs issues to be raised at CCFC
19 Jan 2022	Agri Products Stakeholder Meet	<ul style="list-style-type: none"> • Surge in wheat/sugar exports; need space & rake support • BPX road in bad condition • Requirement of 80T weighbridge at P&V Docks • Need for temporary sheds at Indira Dock • Canteen facility inadequate 	<ul style="list-style-type: none"> • SE instructed to asphalt BPX road • Permission issued for weighbridge at 14VD • Storage areas earmarked; temporary sheds permitted • Formal request for canteen facility sought • Briefing on priority berthing for wheat export vessels
04 Mar 2022	MLCP Discussion –	<ul style="list-style-type: none"> • Congestion in auto yards; need MLCP • High project cost; need stakeholder equity • Ground 	<ul style="list-style-type: none"> • MLCP planned on PPP (₹371 crore; 10,000 cars) • MbPA to provide land; 30% equity–70% bank

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Date	Meeting / Sector	Key Issues Raised by Stakeholders	MbPA Responses / Assurances
	Automobile & Steel	floor of MLCP may store steel • Dwell time concerns • Storage constraints increasing	finance model • NITIE engaged for optimisation • Stakeholders asked to submit written participation commitment
12 Jul 2023	Operational, Logistics & Commodity Meeting	Operational: Lack of storage, free days clarification for pulses, space for CHA labour, shed utilisation, need for tally clerks & auditors Logistics: High stevedoring charges Commodity: Feasibility of raw/bulk sugar; broken rice handling Billing: Issues with online payment & EBS Cleanliness: Wharf/yard cleaning responsibility, packing waste removal, SOP requirement	<ul style="list-style-type: none"> • Explore additional storage space • Clarification on pulses free days to be issued • Dedicated spaces for labour to be assigned • Committee to be formed for billing issues • Cleanliness SOP to be jointly prepared; tarpaulins on chargeable basis
31 Jul 2023	Cleanliness SOP Meeting	<ul style="list-style-type: none"> • In free-out cases, handling agents should clean wharf • Proposal for refundable cleanliness deposit • Staining from sugar/PTA cargo • Opposition to new Cleanliness Cess • Cargo spillage during movement • Need stevedoring charge reduction 	<ul style="list-style-type: none"> • Cleanliness SOP to include deposits & penalties • Cess proposal dropped; existing penalty circular to continue • Measures to minimise spillage agreed • Tarpaulin size & GSM shared • Trade asked to justify stevedoring reduction
23 Feb 2023	Automobile Review Meeting	Volkswagen: Volume decline due to semiconductor shortage; EV plans Maruti: Storage constraints; market volatility; dry grass hazard Tata Motors: Containerised export cheaper; fencing required at RCD General: Vehicle delays increase congestion	<ul style="list-style-type: none"> • Additional storage possible with volume commitment • Dry grass removal & fire audit initiated • Fencing work at RCD directed • Team formed to negotiate increased volumes with OEMs

Date	Meeting / Sector	Key Issues Raised by Stakeholders	MbPA Responses / Assurances
03 May 2023	Steel Review Meet	<ul style="list-style-type: none"> • Need for dedicated covered storage during monsoon • Coil contamination from bulk cargo remains • Request to stack CR coils G+2 • Excess shipping bills cause delays • Over-stacking booms risky • Staff shortage at sheds • Limited road movement window; need more free days • SOR increase high • Request for railway siding access • Shortage of tugs/pilots 	<ul style="list-style-type: none"> • Temporary shed policy encouraged • CR stacking allowed only G+1 • Two separate sheds allotted for JSW & CHAs • Staffing review initiated • Free period extension linked to 25% increased volumes • Two tugs + six pilots to be inducted • Feasibility of using Victoria Dock siding to be examined
2022–23 (General)	Automobile Trade – Operational Issues	<ul style="list-style-type: none"> • Space crunch at FRB • Poor illumination at FRB, RCD, 12BID • Night berthing restrictions • Need for 8.5m depth • End-month congestion; trespassing • CISF shortage affects unloading • Trailer permits not valid for 24 hrs • Customs not working 24x7 • Need CCTV • MLCP required 	<ul style="list-style-type: none"> • Strengthened lighting; vegetation clearing • Night berthing allowed if weather permits • CE to examine dredging needs • Forecasting mechanism requested from OEMs • Temporary barricading to be provided • 24-hr trailer permits approved • Customs & CISF meetings to be arranged • CCTV installation in non-dedicated yards • MLCP Steering Committee formed
25 Sep 2024	Steel Business Development Meet (PDF)	<ul style="list-style-type: none"> • Severe shortage of covered storage; need use of PD/VD areas • Need to extend storage for coils awaiting BIS clearance • IPORTMAN billing delays; incorrect berth queue display • Berth shortages; vessel shifting charges disputed • Priority for car 	<ul style="list-style-type: none"> • Temporary shed policy to be used for creating covered space • CTO to resolve IPORTMAN issues • Berthing/shifting review to consider OCT arbitration • CISF to regulate parking inside docks • SOP to be created for shifting supply vessels; penal

Date	Meeting / Sector	Key Issues Raised by Stakeholders	MbPA Responses / Assurances
		<p>carriers needs formal circular • Congestion at night in docks • Supply vessels occupying ID berths • Poor lighting at BPS/BPX/12ID • Removal of shore cranes at 2 & 3 ID • Slow Customs conversion of foreign vessels • Need more cranes/forklifts & increased free days • Shortage of tugs/pilots • Waiver of charges when vessels idle due to cruise priority</p>	<p>hire considered • M&EE to improve illumination & remove shore cranes • Customs Commissioner to expedite vessel conversion timelines • Equipment requirement to be met through vendors • Marine Dept. to strengthen tug/pilot capacity</p>
<p>10 Jan 2025</p>	<p>Liquid Bulk Business Development Meet (PDF)</p>	<ul style="list-style-type: none"> • Idle time high at JD4 (24%) & JD5 (26%)• Need improved gangways & mooring launches• Dredging needed at JD4 & Chemical Berth 3• Congestion at JD5 due to expansion requirements• Need for LNG/Green Hydrogen storage expansion (22 ha reclamation)• Base oil demand rising; need long-term land parcels• Wayleave charges high at 3rd Chemical Berth• Need more weighbridges • Lack of draft for large base oil vessels• Pilot shortage & long waiting time• SOPs for liquid cargo overdue • Need dedicated base oil berth & pipeline capacity expansion 	<ul style="list-style-type: none"> • Slop tanks to be commissioned in 4–5 months • JD interconnection approvals by Jan 2025; completion by end-2026 • New 60 tBP tug to be deployed; 5 new pilots appointed • Two new mooring launches being procured • Telescopic gangways to be installed • Capital dredging to be completed by Dec 2025 • SOPs for liquid cargo to be released by 1 Apr 2025 • Land parcels for base oil to be re-evaluated; long-term leasing considered • Consultant’s shore power study to be revisited when vessel-readiness ensured • Support for BPCL & HPCL expansion projects assured • Pipeline capacity issues to be

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Date	Meeting / Sector	Key Issues Raised by Stakeholders	MbPA Responses / Assurances
			taken up • Coordination mechanism with Customs to be strengthened
10 Mar 2025	Automobile Business Development Meet <i>(PDF)</i>	<ul style="list-style-type: none"> • Hyundai Talegaon & Tata EV exports expected to increase volumes • Need single consolidated auto yard, not scattered plots • Delays in environmental compliance • Need for loyalty benefits & tariff rationalisation • EV charging infra required; PDI upgrades • Yard requires paving, fencing, shading & CCTV • Request for shore power, LNG/ammonia bunkering • Need uniform rules, standardised processes • MLCP strongly recommended • Need synchronisation of CISF–MbPA operations • Railways ready with double-decker auto wagons 	<ul style="list-style-type: none"> • Additional parking being created at VD/PD using tunnel debris • Asphaltting & fencing at 4/5 ID to add 20,000 sq.m parking • Site visits planned to OEM plants for infra alignment • Exclusive, paved, fenced auto yards approved in principle • CISF synchronisation to be resolved immediately • MLCP under active reconsideration; investments linked to volume commitments • Shore power & bunkering to be evaluated • Commitment to upgrade IT systems & yard management

Appendix 4: Chronology of Events

October 2015	A report titled 'Unlocking National Ports Potential: Deep Dive – MbPT' was prepared under Project Unnati by the Boston Consulting Group, setting the stage for transformative developments.
June 2016	A detailed Traffic Study was conducted by SLS Transport Training Institute and Consultancy to devise strategic traffic management solutions for the Mumbai Port area.
August 2016	A comprehensive Master Plan for Mumbai Port was developed by AECOM under the Sagarmala Program, aiming to drive modernization and expansion.
April 2022	Release of Office Memorandum from MoPSW regarding "Preparation of Comprehensive Master Plan for Ports with planning horizon of 2047".
2023	<p>CRISIL carried out an updated Traffic Study for the Mumbai Port Authority, offering insights into evolving transport dynamics.</p> <p>A Demand Assessment for ship repair, water transport, and fisheries for MbPA was undertaken by CRISIL to gauge future needs and opportunities.</p> <p>Traffic Study Report prepared by CRISIL was accepted by Board under Resolution No.145 dated 27.10.2023</p>
2022-23	MbPA conducted numerous stakeholder meetings with trade such as Pulses/Sugar/Calcite Chips/Other Agri Products, automobile trade, steel trade etc.

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July 2024	MbPA organised a One Day Port Master Plan 2047 Workshop to formally conclude all the discussions on Port Master Plan 2047
September 2024	The Draft Comprehensive Master Plan for Mumbai Port Authority, with a planning horizon extending to 2047, reached completion and the Board of Mumbai Port Authority approved on the same on Board Meeting held on 20 th September 2024.
31 st Jan 2025	Workshop by MoPSW in Delhi – gap identification, KPIs and suggested revision in the Draft Comprehensive Port Master Plan 2047.
	The Integrated Mumbai Port Masterplan 2047 was approved by the Board of Mumbai Port Authority

Appendix 5: Studies and Inferences

New Studies Conducted & Projections for 2047

As part of preparation of Comprehensive Master Plan of Mumbai Port Authority for Planning Horizon 2047, MbPA has appointed CRISIL Limited to undertake detailed study to understand the current port performance, future market, infrastructure requirements and demand assessment in the following sectors:

- 1) Traffic
- 2) Ship Repair
- 3) Fisheries
- 4) Urban Water Transport

Traffic Study by CRISIL

CRISIL Limited had conducted a detailed comprehensive study covering the following domains:

- Hinterland, Completion & Connectivity Analysis
- Commodity Analysis
- Traffic Projections & Ship Calls
- Berthing & Storage Planning
- Action Plan

Hinterland, Competition and Connectivity Analysis

MbPA has niche cargo focus. Majority of the customers of MbPA have long term loyalty and cargo commitment with MbPA. Hence, the presence of competition ports in the hinterland have limited influence on MbPA business prospects. The primary hinterland of MbPA includes the immediate geographical area falling in the radius of 200 km. There are several alternative ports in the 200 km radius of MbPA. However, the niche commodity segment of MbPA restricts migration of cargo from MbPA to competing ports. Majority of traffic handled at MbPA is originated / destined within Mumbai Metropolitan Region extended to Maharashtra state. The existing ports in the vicinity namely JNPA, Dharamtar, Dighi and Jaigad would pose very limited competition. Dharamtar and Jaigad handles more than 80% of total Maharashtra's non-major ports traffic. More than 90% of traffic handled at these ports is for captive used, and rest is consumed locally. Hence, there is negligible threat to MbPA business from these ports. Hazira and Dahej handled 92.4 Mn T in FY22. Around 30% of south Gujarat traffic is handled by captive users, 5% by GMB and rest 64% by private parties.

Table 14 Competitive Mapping of MbPA

Features	JNPA	Dharamtar		Dighi	Jaigad	Dahej	Hazira
		JSW	PNP				
Draft (m)	15	4.5	4.0	9	18.5	14	14
Rail Connectivity	✓	X	✓	X	X	✓	X
Max. Vessel Size (LOA m)	370	115	78	325	350	300	350
FY22 Traffic (mn T)	76	16.9	3.3	0.2	22.4	33.01	24.59
Capacity (mn T)	138.9	34	5.0	30	55	36.8	35
Capacity Utilization	55%	50%	66%	0.7%	41%	90%	70%
Threats to MbPA	Moderate	X	Low	Low	Low	X	X

Features	JNPA	Dharamtar		Dighi	Jaigad	Dahej	Hazira
		JSW	PNP				
Reasoning	Planning provisions for non-container cargo as well	100% Captive	Low draft, dependent on MbPA anchorage. Not suitable for EXIM	Less traffic handled, No rail line, hilly road terrain	97% Captive, rest consumed locally. Alternate option for JSW's share in MbPA's anchorage traffic	More than 90% users located within port area	

(Source: Traffic Study Report prepared by CRISIL)

It is also expected that development of Vadhvan port (COD expected in FY32) may divert some of the main line container traffic from JNPA and JNPA will have some vacant capacity. The terminals at JNPA is constrained by concession agreement to handle cargo other than container. Recently in the new concession that is awarded to J M Baxi group, has been allowed to handle Ro-Ro traffic. Similarly, it can also be expected that going ahead, JNPA will also allow handling of cargo such as Ro-Ro and steel at its other terminals in their renewed concessions. In this regards Mumbai port may face some competition from JNPA in future with respect to clean break bulk cargo such as car export, steel etc.

Cargo evacuation by road and rail from MbPA to hinterland has serious interference with passenger traffic. Passenger traffic has preference over cargo on all roads passing through Mumbai Metropolitan Region. Mumbai Metropolitan Region Development Authority (MMRDA) is implementing large-scale infrastructure upgradation plans for passenger mobility. These infrastructures proposed to be constructed in coming years are likely to ease passenger traffic on existing roads of Mumbai. A large number of personnel vehicles bound passengers are anticipated to shift to Metro. This would reduce load on common roads used by both cargo and passengers. It is believed that the present restriction on use of roads for cargo transportation would be eased. There is unlikely to be any difference in situation for rail cargo. The passenger traffic as well as schedule of suburban trains are likely to either remain same or further increase. Hence, there is unlikely to be any positive impact for cargo transportation from MbPA using Railways. The upcoming W-DFC connecting Delhi NCR to JNPA would not be able to connect to MbPA due to city congestion. Hence, the upcoming infrastructure developments of MMRDA is likely to immensely improve road evacuation of cargo from MbPA and is unlike to impact rail evacuation of cargo from MbPA using railways.

Traffic Analysis

Potential commodities for MbPA are selected based on the trade rationale and present traffic at the nearby port. MbPA would be able to divert cargo due to ports logistics positioning. Captive cargo is discarded from further study. Also, dirty dry cargo has been excluded. Coal volume handled by MbPA is either for Trombay Thermal Power Station or transhipped to Dharamtar/PNP. Commodities identified for higher business prospects at MbPA are analysed to understand the present Indian scenario, Maharashtra's overview and additional share that MbPA could attract.

O-D Mapping of Key Commodities handled at MbPA (mn T)

Sr. No.	Commodities	FY 23-24	Movement
1	Crude & POL	39.81	BPCL & HPCL unloads crude oil at Mumbai Port whereas ONGC loads crude oil at Mumbai. Both the HPCL & BPCL refineries are connected to jetty through pipeline network.
2	Stream Cargo	15.29	This dry bulk volume is handled at anchorage for transhipment to nearby ports i.e Dharamtar, PNP and Karanja. Around 35.85% of total cargo is iron ore, 35.62 % coal and rest Limestone and Dolomite
3	Coal	2.66	Entire volume is moved to Trombay Thermal Power Station jetty
4	Chemicals	1.79	Traders and manufactures located Maharashtra and South Gujarat imports Chemicals

Sr. No.	Commodities	FY 23-24	Movement
5	Iron & Steel	5.38	JSW and POSCO are the users, more than 50% of total export is by JSW and 50% of total imports by POSCO. AMNS plant in Surat also uses MbPA for exports.
6	Lube Oil	1.03	Majorly imported by industries located in Taloja and nearby areas
7	Pulses & FG	0.116	Imported by traders / suppliers and distributed locally
8	Fertilizers	0.55	More than 95% of FRM imported by RCF. Top 10 fertilizer importers contribute to more than 95% of total imports. Majority of them are located within primary hinterland of MbPA
9	Motor Vehicles	0.2	Top 6 automobile companies contribute to more than 95% of total automobile imports. Mumbai, Pune, Nashik, Aurangabad and Nagpur are the auto hubs.
10	Others	0.434	-
Total		67.26	

(Source: Annual Report on Traffic & Performance 2023-24)

Traffic Projections & Ship Calls

Before arriving at traffic projections for MbPA, certain assessments were carried out. The size of the total relevant market for each commodity is studied. Per commodity, the key drivers for future volume developments is identified. Competition, expansion plans of companies operating in the state or elsewhere and using MbPA and other competing ports are considered. Hinterland connectivity and alternate infrastructure availability level analyses are considered as well. These assessments are incorporated while projecting the market volume that MbPA will be able to attract till FY53.

Table 15 Commodities wise Traffic Projections for MbPA 30 Years (mn T) - Realistic Scenario

Commodities	FY25	FY28	FY33	FY38	FY43	FY48	FY53
POL Products	8.2	8.7	9.6	10.3	11.1	11.1	11.1
LPG	1.5	1.8	2.2	2.7	3.2	3.5	3.9
Crude	21.7	23.0	25.9	27.9	29.5	29.8	29.8
POL Transshipment	7.4	7.6	7.8	7.8	7.8	7.8	7.8
Iron & Steel	4.2	5.1	4.3	3.9	4.1	3.4	3.2
Coal (TPS)	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Stream Cargo	12.1	15.0	20.5	25.7	27.8	27.8	27.8
Agri Products	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Cement	0.7	0.8	1.1	1.4	1.8	2.3	3.0
Chemicals	1.9	2.2	2.8	3.4	3.9	4.0	4.0
Automobile	Refer table below						

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Commodities	FY25	FY28	FY33	FY38	FY43	FY48	FY53
Fertilizer	0.5	0.6	0.7	0.8	0.8	0.8	0.8
Lube Oil	1.7	1.8	1.7	2.1	2.5	2.8	3.1
LNG	0.0	0.0	1.2	1.6	2.1	2.9	3.8
Others	3.3	3.7	4.5	5.1	5.1	5.1	5.1
Total	66.1	73.1	84.9	95.4	102.3	104.1	106.2

(Source: Traffic Study Report prepared by CRISIL)

Table 16 Automobile Traffic Projections for MbPA 30 Years - Realistic Scenario

Vehicles	FY22	FY23	FY28	FY33	FY38	FY43	FY48	FY48
Automobile ('000 units)	122	102	177	175	189	207	238	259

(Source: Traffic Study Report prepared by CRISIL)

Note: Actual data for FY23 not available

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Table 17 Commodity wise Annual Ship Calls at MbPA

Annual Ship Calls	FY25	FY28	FY33	FY38	FY43	FY48	FY53
POL Products	408	433	476	513	550	550	550
LPG	77	90	109	133	158	175	193
Crude (ONGC)	72	72	72	72	72	72	72
Crude (BPCL)	51	54	61	65	65	65	65
Crude (HPCL)	19	21	26	31	38	39	39
POL Transshipment	164	168	173	173	173	173	173
Iron & Steel	202	236	183	152	149	105	88
Iron & Steel Coastal	21	29	42	55	67	74	79
Coal (TPS)	51	51	51	51	51	51	51
Stream Cargo	273	339	463	580	627	627	627

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Annual Ship Calls	FY25	FY28	FY33	FY38	FY43	FY48	FY53
(Coal +Iron Ore)							
Agri Products	18	18	18	18	18	18	18
Cement	14	20	33	50	70	95	133
Chemicals	131	151	191	230	264	275	275
Automobile	40	56	55	59	65	75	81
Fertilizer	24	27	31	35	35	35	35
Lube Oil	86	88	83	101	120	138	150
LNG	0	0	13	17	23	31	41
Others	143	164	197	222	222	222	222
Total	1794	2017	2277	2557	2767	2820	2892

(Source: Traffic Study Report prepared by CRISIL)

Table 18 Traffic Distribution under each mode of Transportation (mn T)

Commodities	Mode	% Share	FY25	FY33	FY43	FY53
POL Products, LPG & Crude	Pipeline	100%	39.0	45.5	51.6	52.7

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Commodities	Mode	% Share	FY25	FY33	FY43	FY53
Iron & Steel	Road	95%	3.7	3.3	2.7	1.6
	Rail	5%	0.2	0.2	0.1	0.1
Iron & Steel Coastal	Water	100%	0.4	0.8	1.3	1.5
Coal (TPS)	Water	100%	2.2	2.2	2.2	2.2
Stream Cargo (Coal + Iron Ore)	Water	100%	12.1	20.5	27.8	27.8
Agri Products	Road	95%	0.3	0.3	0.3	0.3
	Rail	5%	0.02	0.02	0.02	0.02
Cement	Road	100%	0.7	1.1	1.8	3.0
Chemicals	Road	50%	1.0	1.4	1.9	2.0
	Rail	50%	1.0	1.4	1.9	2.0
Automobile	Road	100%	0.1	0.2	0.2	0.3
Fertilizer	Road	100%	0.5	0.7	0.8	0.8
Lube Oil	Road	100%	1.7	1.7	2.5	3.1
LNG	Pipeline	100%	-	1.2	2.1	3.8
Others	Coastal	78%	2.5	3.5	4.0	4.0
	Road	11%	0.4	0.5	0.6	0.6

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Commodities	Mode	% Share	FY25	FY33	FY43	FY53
	Rail	11%	0.4	0.5	0.6	0.6
Total	Pipeline	-	39.0	46.7	53.7	56.5
	Road	-	8.3	9.1	10.7	11.6
	Rail	-	1.5	2.1	2.6	2.7
	Water	-	17.3	27.1	35.3	35.5
	Total	-	66.1	84.9	102.3	106.2

(Source: Traffic Study Report prepared by CRISIL)

Berthing and Storage Planning

Requirement of infrastructure enhancement for cargo handling is studied based on the berth capacity and storage area availability. After the detail analysis of utilisation of present infrastructure, it is understood that additional infrastructure may be required to handle projected traffic till FY53.

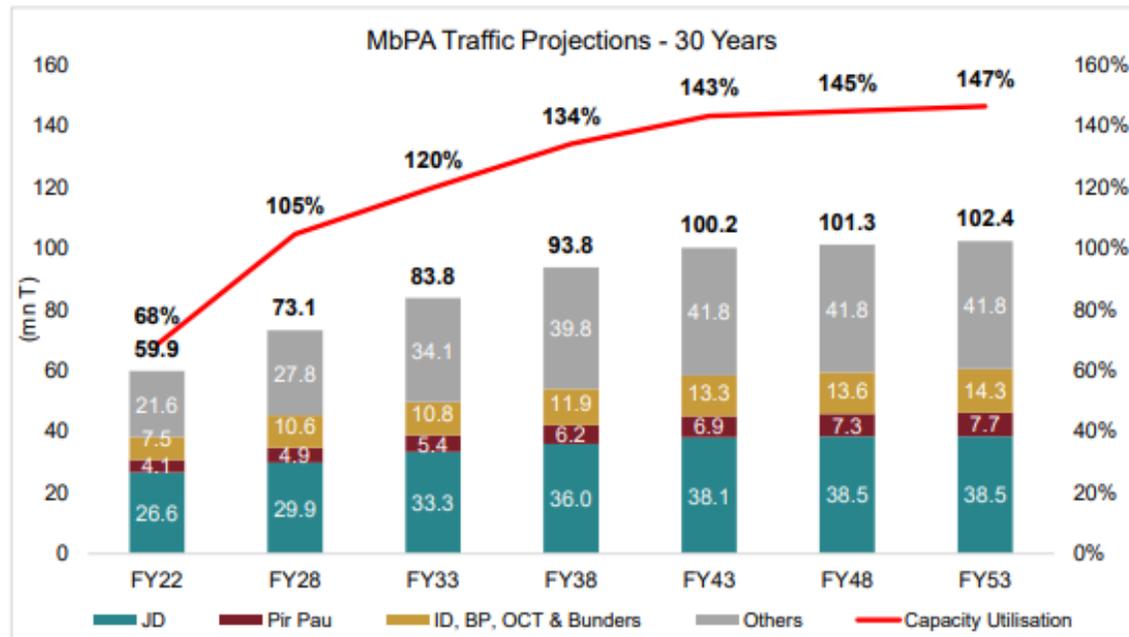


Figure 63 MbPA Traffic Projections and Utilization of Existing Capacity in next 30 years

(Source: Traffic Study Report prepared by CRISIL)

As depicted in chart above, capacity over 100% utilisation demands for additional infrastructure. In order to accommodate projected traffic, new berths need to be developed.

Jawahar Dweep (JD)

JD berths presently have catered to petroleum products requirement of both the Refineries. Expansion of refineries would lead to higher volume. There exists possibility of refineries pro crude in larger ships and berthing them in lightered condition. The parcel size of shipments, should ideally, increase with the increase in throughput of crude. Larger parcel size would lead to increase in ship dimensions. Alternatively, the number of ship calls would increase, if Refineries choose to import crude in same ship sizes presently importing. There would be requirement of one additional berth for petroleum products. *The existing capacity at Pir Pau would fall short of projected traffic. Hence, there would be requirement of additional infrastructure.*

Pir Pau

The berth is already constructing a liquid terminal (NPP 3) with additional capacity of 2 MTPA. The estimated capacity at Pir Pau after commissioning of NPP3 would be 7 million tonnes. The additional demand would be due to rise in traffic of Petroleum products. *The additional berth at JD would be able to accommodate incremental traffic of Crude and Petroleum products both at JD and Pir Pau.*

Indira Docks, Ballard Pier Berths, OCT & Bunders

The berths are allocated for handling multiple products in smaller shipments. It also handles lightered liquid cargo in inner-harbour of Indira Docks. The existing BPS and BPX berths are available for cargo handling during monsoon only, when cruise handling is not in operation. Hence, the 4-month cargo handling capacity of berth the berths have been assumed to be 2 million tonnes. The OCT is presently handling automobiles only. Automobile traffic is presently handled at OCT berth with less than 20% berth

occupancy. The projected automobile traffic may not require additional infrastructure as existing would suffice the purpose. Going forward, it is assumed that OCT could handle some of other breakbulk cargo namely Iron and Steel whenever the berth is not handling automobiles. The Iron and Steel could be unloaded or loaded on to trailers using Mobile Harbour Cranes or ships gear. The total achievable capacity of Indira, BP, OCT & Bunders have been assumed to be 12.2 MTPA. *There would be requirement of creating an additional berth with a capacity of 2.1 MTPA.*

Anchorage

Anchorage utilisation at MbPA is high. JSW is the largest customer of MbPA using substantial share of Anchorage for its Dolvi Plant. There would be a requirement for augmenting capacity of Anchorage. However, any capacity augmentation has financial risks for MbPA. JSW is also using a combination of Anchorage and cargo handling at JSW Jaigad followed by moving cargo using coastal mini bulk carrier. It is not clear, what will be share of cargo handling by JSW at anchorage and using coastal mini bulk carrier. This uncertainty leads to following 2 options of anchorage upgradation for MbPA

1. MbPA could offer JSW an option to invest on creating dedicated anchorage points to be used for JSW cargo on priority. The anchorage tariffs of MbPA could be adjusted suitably to help JSW recover investment
2. MbPA could increase deep draft anchorage. This will lead to faster turnaround of ships at the outer harbour anchorage. Ships 1st call to outer harbour anchorage. They take around 3 days to part unload ship's cargo onto barges. The lightered ship is called to shallow draft anchorage for further discharge. Increasing depth of shallow draft anchorage from 8m to draft to 9m draft would lead to shifting of ships from deep draft anchorage to shallow draft anchorage after single day discharge. This is likely to increase turnaround of ships at outer harbour anchorage and inner harbour anchorage.

MbPA would be required to develop infrastructure for handling LNG cargo using PPP. The existing contract for installation of FSRU is delayed. There is uncertainty over commissioning of FSRU unit. However, looking at the demand for cleaner energy, there would be an opportunity for FSRU unit at MbPA. Hence, a provision for installation of FSRU unit has been considered in the 2047 plan.

Storage area and slots available at MbPA are sufficient enough to handle projected traffic.

- POL is considered as captive cargo. The storage infrastructure required is already in place. There exist dedicated pipelines from Jawahar Deep to storage area. Hence, it is assumed that future expansion would mostly be created by Oil Refineries at their plant.
- The traffic for coal by Tata Power Station at Trombay would remain constant. Hence does not require any additional infrastructure.
- All the cargo that are handled in stream are transported to river jetties using barges. These cargoes are not stored or handled at MbPA infrastructure.
- The requirement of storage infrastructure is limited to few commodities i.e iron & steel, agri products, cement, automobile, fertiliser, and other break bulk commodities. MbPA historically has handled more than around 6 mn T of iron & steel traffic. There exists sufficient backup area for storage of steel coils.

Ship Repair Assessment in MbPA

Need for Ship Repair

A ship is a floating structure, which requires regular repair and maintenance to retain its seaworthiness. Thus, repair and maintenance of ships is a regulatory requirement. The repair, maintenance, and seaworthiness of a ship are monitored by third party based on certain guidelines issued by international bodies, which is endorsed and implemented by respective governments. This independent body, called classification society and government appointed regulatory authority, undertakes periodic survey and inspection of ship and issues necessary for permission and certificate. A ship without these certificates is not allowed to trade. Hence, undertaking periodic repair and maintenance is one of the essential tasks of a ship owner. The major reasons for MbPA to switch towards ship repair domain are as follows:

- Dry-docking repair is a statutory requirement for ships to carry out regular business.
- Stringent statutory requirements have mandated compulsory repairs and maintenance.
- Ship repair is a stable business.
- The availability of ship repair infrastructure is much less compared to the demand

Recommendations- (MIV 2030)

MIV 2030 recommended to declare 2 ship repair clusters to enhance the ship repair capability in India. It emphasizes on infrastructure required, cluster management, fiscal and regulatory recommendations, establishing of small repair facilities for inland and fishing vessels.

Establish Small Repair Facilities for Fishing & Inland Vessels

- Setting up 2 facilities in each state near the fishing harbour. One facility to be setup in each National Waterway (1 to 5) near Industry clusters.
- Warehousing facilities to meet needs of these repair facilities. Creation of a common portal for locating repair yards and major clusters
- Shared funding model amongst GOI, state govt, and ship owners based on ownership model of repair hubs
- Workforce to follow best practices and meet necessary standards. Based on demand, training of workforce for advanced repairs of vessels can be done at CoETC.

Key Guidelines to Initiate Ship Repair Cluster

- Select one of the 3 locations (Maharashtra, Goa and Cochin regions) based on the parameters - whether shipyard has capability to repair medium to large vessels, minimum concentration of suppliers nearby and empty land space available to build a cluster.
- Shortlist the types of repairs based on docking infrastructure and repair facilities available
- Define fiscal incentives to engage OEMs to setup service centers and warehouses to stock spares
- Identify investments required in the logistics infrastructure to further ease the movement of goods and people

Infrastructure Recommendations

- Ship repair yards should maintain minimum draft near the docks as per the requirements of vessels coming for repair
- Ancillary industries should be established in the hinterland of the ship repair clusters.

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- OEMs should be incentivized to service centers to support equipment repair for vessels and logistical requirements for moving parts & people in and around the cluster area
- Good housing facilities to ensure workers don't have to travel long distances every day thereby ensuring higher availability in the yard
- Authorize global ship repair agencies to build floating dry docks to supply repair services during peak times of the year at lower cost of operations.
- Build warehouses with storage capabilities to stock inventory for at least 3 months, live tracking of parts & equipment and semi-automated / automated part handling capabilities
- Setup road, rail and water logistics to enable faster and low-cost transportation of goods and people.

Indian Ship Repair Market

India, located on the major trading route, has a well-established market potential for ship repair units. Increase in overseas trade and the impact of increase in foreign ships plying on Indian markets have created the need for more number of repair and maintenance infrastructures. IMO regulations and classification societies have introduced stringent regulations, which need corresponding repair works to be done at regular intervals so as to meet their standards.

The need for technology upgradation has also increased. Owners and managers of ship repair yards have realised importance of technology upgradation, as only comfort of low labor cost is not likely to make Indian yards competitive in the global market.

The Indian Ship repair industry has an exciting future ahead, which can be supported by the following points:

- There is a substantial untapped market potential available for existing and new upcoming ship repair units in India, because of the wide demand-supply gap. At present, the Indian repair yards cater to less than 50 % of the repair requirements of the

domestic Indian flagged vessels. Moreover, most of India's large-sized vessels and specialised offshore vessels have to go abroad for their repair requirements, due to lack of facilities available within the country.

- The demand is likely to grow even further in the years to come, due to addition in the Indian mercantile fleet, as well as the increasing traffic at the Indian ports. Moreover, Indian ship repair industry can also have access to repair market of foreign flag ships, provided it can provide competitive and quality-oriented repair services.
- Changes in trading patterns, international regulations requiring more conversions & retrofitting of new equipment as well as stricter norms enforced by the classification societies etc., are likely to give rise to higher demand for ship repair / retrofitting units in India. In terms of management, manpower, and skills, basic framework is available with Indian shipyards. They have been repairing ships in India for several years. A majority of the workers and management personnel working in international Asian yards are Indians. They have been trained in Indian shipyards and repair yards in the initial years of their careers. Hence, talent is available locally for ship repair yards.

With a large reservoir of skilled / experienced manpower at economical rates, the prospects for Indian repair units are brighter. However, ship repair yards in India need to focus on training needs of its workers at shop floor. They also need to work towards increasing retention of employees at their shipyards, who migrate to international ship repair yards for better remuneration.

In the present scenario of ship repair industry in India, it has been found that there is a large demand supply gap of infrastructure in the country. Due to unavailability of infrastructure, ships operating in India have to go to foreign yards to meet their repair and maintenance requirement. In some of the cases, migration of ships to other countries for repair and maintenance is due to commercial reasons also. Foreign repair yards, due to assistance of government and availability of cheap material, spares, and productive manpower are found to be more competitive compared to Indian ship repair yards. This has led to a large number of Indian ships going to foreign yards for undertaking their routine repair and maintenance. There still exist a large fleet, which has

natural commercial advantages of getting repaired locally in India. However, unavailability of local infrastructure is driving them to foreign ship repair yards. Following chart depicts number of ship repairs undertaken by Shipping Corporation of India (SCI) for major categories of their fleet in the last 10 years.

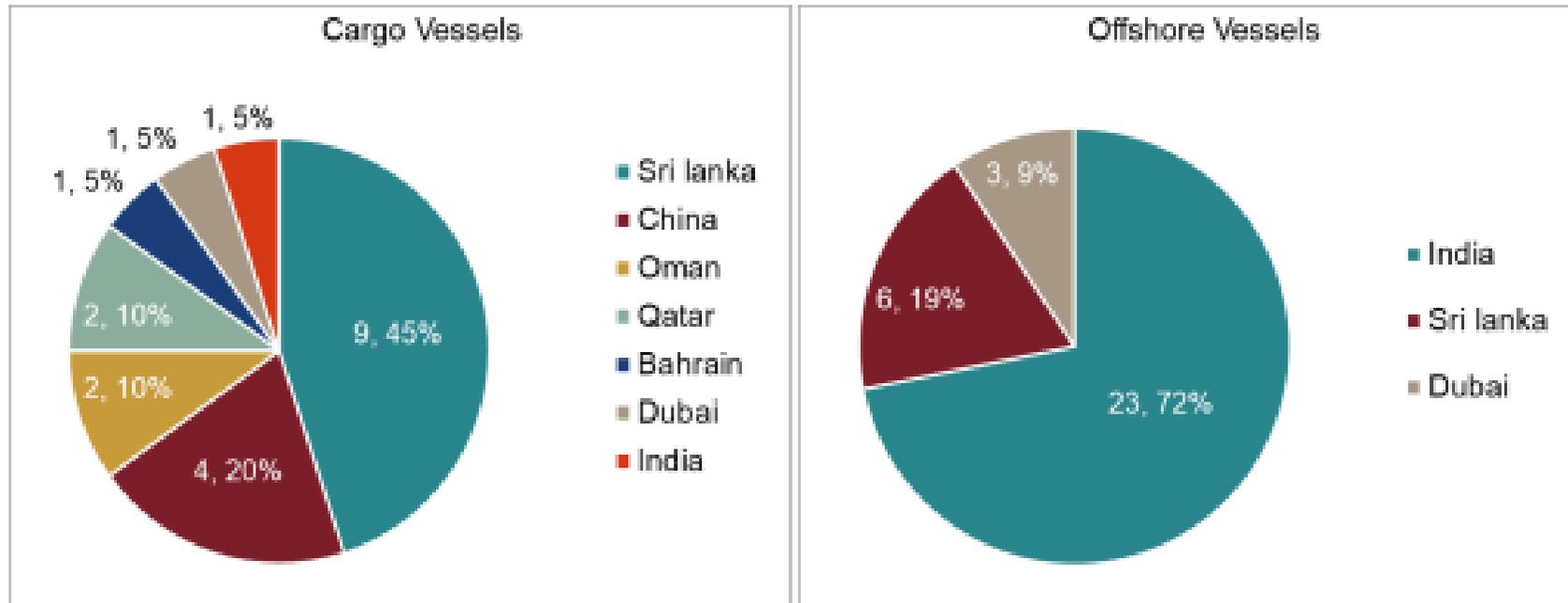


Figure 64 No. of SCI Vessels Repaired between 2012-2021 – Cargo & Offshore

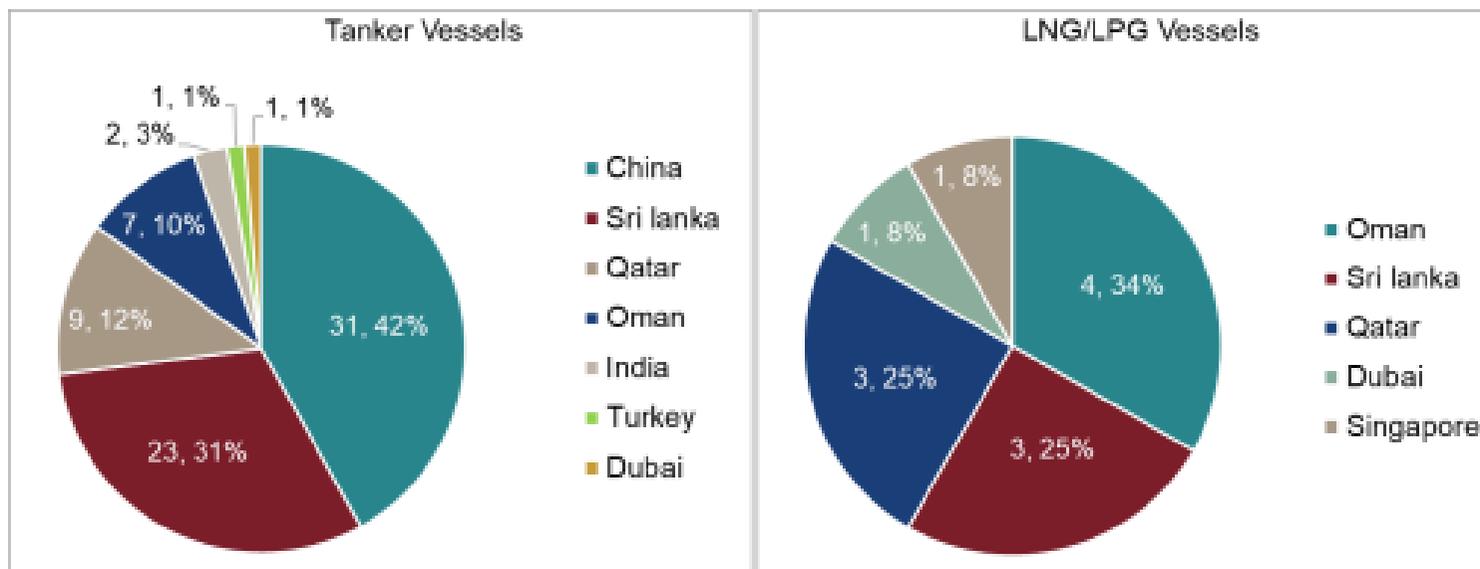


Figure 65 No. of SCI Vessels Repaired between 2012-2021 – Tanker & LNG/LPG

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

As can be seen in Figure 5.5 & Figure 5.6, SCI takes 45% of its cargo vessels to Sri Lanka (Colombo) for repair, followed by 20% to China, 10% to Oman (Duqm), 10% to Qatar & 5% each in India, Bahrain & Dubai in last 10 years (2012-2021). Around 72% of offshore vessels i.e. 23 Nos. are repaired in India in last 10 years (2012-2021) and remaining 19% in Sri Lanka and 9% in Dubai.

Repair Revenue of Shipyards

Over the last 10 years, the ship repair revenue of Indian shipyards has seen significant growth. CSL, GSL and MDSL contribute maximum to the ship repair revenue. The expansion of infrastructure by CSL along with acquisition of several new infrastructures for repair activities could be attributed to the growth. Some of the defence shipyards including GSL and MDSL have diversified into repair of Naval and Coast Guard ships.

Cochin Shipyard Limited (CSL) have invested in expanding and upgrading their repair infrastructure to accommodate a wider range of vessels and more complex repair projects. The company has begun to operate repair facilities at multiple locations, including HDD of MbPA, CSL Kolkata Ship Repair Unit, CSL Andaman & Nicobar Ship Repair Unit (Port Blair). CSL has been able to increase its capacity to simultaneously handle more ships leading to increased repair revenue.

Shipyards that have historically focused on naval shipbuilding, such as Mazagon Dock Shipbuilders Limited (MDSL) and Garden Reach Shipbuilders & Engineers (GRSE), have started undertaking repair and maintenance projects for the Indian Navy. These strategic partnerships have not only increased the ship repair revenue for these shipyards but also enhanced their technical expertise and capabilities. Similarly, Goa shipyard building ships for Indian Coast Guard have begun undertaking repair activities. The repair activities with other shipyards are limited to smaller vessels including barges, port crafts and inland vessels. The ship repair infrastructure is relatively limited with other smaller shipyards. The shipyards in India lack the necessary facilities, equipment, and dry docks to accommodate larger vessels or those with specific requirements.

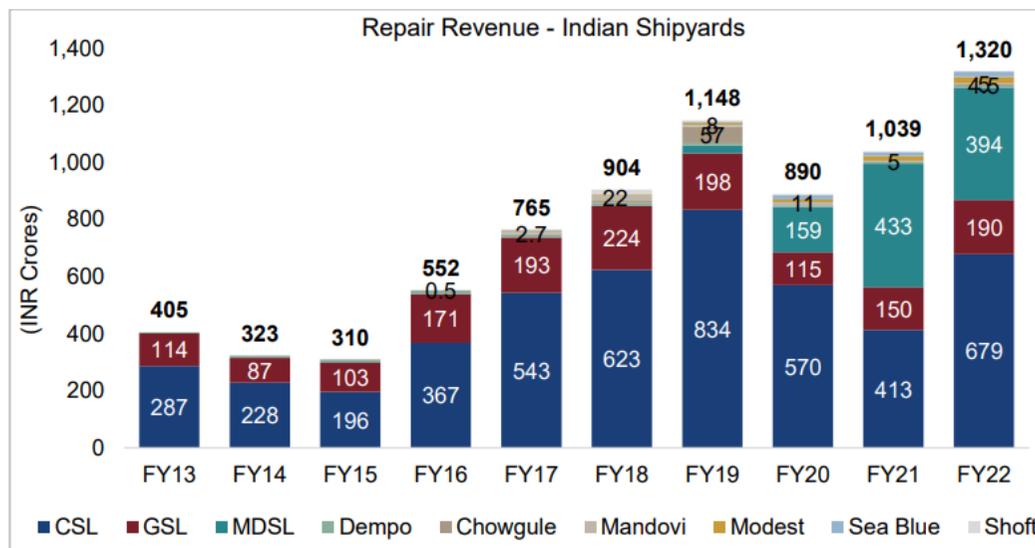


Figure 66 Repair Revenue of Indian Shipyards in last 10 years

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Competitive Analysis

This section compares competitiveness of MbPA’s ship repair facilities with other ship repair yards in the west coast of India. Depending on competitive advantage a shipyard has compared to MbPA’s ship repair, they have been categorised as high potential competition, moderate competition, or no competition. Ship repair yards located on the west coast of India, Middle East, Oman, and Sri Lanka would provide competition to MbPA’s shiprepair yard. The ship repair yard located on the east coast of India does not offer any type of competition to the proposed ship repair at MbPA. It is unlikely that any ship located on the west coast of

India would migrate to east coast for repair. There have been exceptions for large ships requiring highly value of repairs. Large-scale and value of repairs justify high mobilisation cost of ship from west coast to east coast. Following section outlines competitive advantage of MbPA’s ship repair yard with other ship repair yards located on the west coast of India.

Table below speculates competition scope and scale for ship repair at Mumbai Port with other repair yards on India’s west coast:

Table 19 Competition Analysis of Shipyards on West Coast of India

Sr. No.	Shipyard	Promoter	Location	Market Focus	Status
High Potential Competition					
1	Hughes Drydock	MbPA	Mumbai, MH		Functional
2	Lavgan	Chowgule Global	Jaigad, MH	Coastal ,Offshore	
Moderate Competition					
3	Goa	Goa Shipyard	Goa	Coastal ,Offshore	Functional
4	Modest Infrastructure	Dempo Group	Bhavnagar, Gujarat	Offshore, Tankers	
5	Dempo Shipbuilding & Engineering	Dempo Group	Bandora, Goa Bainguinim, Goa	Barges, Tankers	

Sr. No.	Shipyard	Promoter	Location	Market Focus	Status			
6	Mandovi Dry docks	Mandovi Drydocks	Pilgao, Goa	Mini Bulk Carriers, Barges				
			Rassaim, Goa					
7	Cochin	Cochin Shipyard	Kochi, Kerala	Offshore, Rigs, Coastal, Navy				
8	Sea Blue Shipyard	Sea Blue Shipyard	Kochi, Kerala	Barges, Tugs, Patrol, Cargo				
9	Shoft Shipyard	Shoft Shipyard	Dahej, Gujarat	Cargo, Barges				
10	Kurul	Konkan Barge Builder	Alibag, MH	Barges				
Good Infrastructure - No Competition								
11	Naval Dockyards	MOD	Mumbai, MH	Indian Navy			Functional	
12	Mazagon Docks	MDSL/MOD	Mumbai, MH	Indian Navy				
Competition at Planning Stage								
13	Shipyard at Plot - 2 under shipyard cluster in Belapur creek	Maharashtra Maritime Board	Navi Mumbai, MH	Tugs, barges, speed boats, yachts, cruise	RFP floated for selection of			

Sr. No.	Shipyard	Promoter	Location	Market Focus	Status	
14	Shipyard at Plot - 4 under shipyard cluster in Belapur creek			liners ships / boats / hovercrafts / seaplanes or other cargo or passenger ships	developer on DBFOT basis	
15	Shipyard at Plot - 5 under shipyard cluster in Belapur creek					
16	Shipyard at Plot - 6 under shipyard cluster in Belapur creek					
17	Shipyard at Plot - 7 under shipyard cluster in Belapur creek					

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

a. High Potential Competition

There are 2 high potential competitors of proposed ship repair yard in Mumbai based on their location advantages, suitable infrastructure to undertake ship repair activity, technical knowhow, etc. The first one is Hughes Dry dock owned by MbPA only

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(leased to CSL for operation for 30 years) and second one is Lavgan shipyard owned by Chowgule Global Pvt. Ltd. at Jaigad, Maharashtra.

Table 20 Competitiveness comparison among high potential competitors

Shipyard	Advantages				Market Focus					Competition
	Market	Location	Connectivity	Ancillary	Naval	Rigs	Offshore	Commercial	Coastal	MbPA
Hughes Drydock	*****	*****	*****	***	✓ CG	X	✓	X	X	*****
Lavgan	*****	***	***	***	✓ CG	✓		X	✓	*****

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Note:

1. No. of star indicates share by importance. All comparisons with respect to MbPA and is relative in nature
2. CG indicates Coast Guard Vessels

b. Moderate Potential Competition

Companies that qualify to compete with MbPA based on their location advantages, suitable infrastructure to undertake ship repair activity, technical knowhow, etc., but lack competitive advantages, have been categorised under “Moderate Competition”. The competition posed by them to the ship repair at MbPA would be moderate.

Table 21 Competitiveness Comparison with companies having moderate competition

Shipyard	Advantages				Market Focus					Competition
	Market	Location	Connectivity	Ancillary	Naval	Rigs	Offshore	Commercial	Coastal	MbPA
Goa	****	****	****	****	✓	X	✓	X	✓	****
Modest	***	****	****	**	X	X	X	✓	✓	***
Dempo	***	***	***	**	X	X	✓	✓	✓	***
Madovi	***	***	***	**	X	X	✓	✓	✓	***
Cochin	***	****	****	****	✓	✓	✓	✓	✓	***
Sea Blue	***	****	**	**	X	X	X	✓	✓	***
Shoft	***	****	***	***	✓CG	X	X	✓	✓	***
Kurul	**	***	**	**	X	X	X	X	✓	***

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Note:

1. No. of star indicates share by importance. All comparisons with respect to MbPA and is relative in nature.
2. CG indicates Coast Guard Vessels.

The infrastructure required for ship building and repair may look similar, but they are far different in practical terms. A shipbuilding yard can, technically, undertake both new-building and repair activity. However, commercially, it is unviable to undertake ship repair activity at a shipyard designed for ship building. Most of the shipbuilding yards in India have undertaken ship repair activity out of compulsion arising out of slowdown, and not out of choice.

In the event of shipbuilding gaining pace, all the shipyard that had focused on new-building and had started undertaking repair to increase utilisation of their yard, are likely to again start new-building activity and forsake repair of ships.

A ship repair yard designed for repair activity cannot undertake new building activity due to infrastructure constraints. Conditions required for new-building and repair is different. In case of new-building, the shipyard needs to plan in advance and procure equipment and machinery with enough inventories for spares. In addition, shipbuilding projects run for a longer duration of time. A typical new-building project could take anywhere between 12 months and 18 months for completion. Hence, the shipyard with the new-building focus has enough time for planning, scheduling, and inventory management of all the material and equipment. However, in case of ship repair, it is not possible to follow the same procedure. All of the commercial ships require less than 18 to 20 days for completion of repair. Every ship that comes for repair is a different ship. The makers of equipment and machinery are different. There are hundreds of different kinds of critical spare required during repair of ships. It is not possible for the ship repair yard to maintain inventory of all such spares. They have to always depend on equipment suppliers for the procurement of these spares at the time of repair. Even original equipment suppliers do not keep all types of spares at every location. Moreover, India

having smaller volume of repairs, it is not viable for the equipment suppliers to maintain complete inventory locally. At times of need, they are procured from global warehouses and supplied to the ship repair yard. This reduces competitiveness of yards located in location with poor logistics and connectivity.

c. Good Infrastructure-No Competition

Several repair infrastructures have been developed along the west coast of India. However, these infrastructures have different product focus. The following table depicts the shipyards located on the west coast, which has good infrastructure, but due to differential product focus, do not compete with MbPA for ship repair activity.

Table 22 Competitiveness Comparison with Companies with Good infrastructure

Shipyards	Advantages				Market Focus					Competition
	Market	Location	Connectivity	Ancillary	Naval	Rigs	Offshore	Commercial	Coastal	MbPA
Naval Dockyards	X	*****	*****	****	✓	X	X	X	X	X
MDSL	X	****	****	****	✓	X	X	X	X	X

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Note:

1. No. of star indicates share by importance. All comparisons with respect to MbPA and is relative in nature.

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d. MMB Planned Shipyards (Competition)

Maharashtra Maritime Board has proposed shipyard cluster in Belapur region of Navi Mumbai. The proposed development is in RFP stage. It will take few years to start the repair operations at these shipyards. The proposed shipyards will cater to repair needs of smaller vessels in the region, focusing mainly on barges, fishing vessels, passenger vessels, etc. Below table lists these planned repair yards in the region.

Table 23 Competitiveness Comparison with yards in Planning Stage

Shipyard	Advantages				Market Focus					Competition
	Market	Location	Connectivity	Ancillary	Naval	Rigs	Offshore	Commercial	Coastal	MbPA
Shipyard Cluster, Belapur	****	*****	*****	**	✓ CG	X	X	✓	✓	*****

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Note:

1. No. of star indicates share by importance. All comparisons with respect to MbPA and is relative in nature.
2. CG indicates Coast Guard Vessels.



Figure 67 Ship Repair Locations nearby- Belapur

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Demand – Supply Gap Assessment

India is strategically located on the busiest maritime route in the world. The Indian Ocean is a major oceanic corridor for international maritime trade, and India's location on the eastern shore of the Indian Ocean makes it a key player in the region's maritime trade and commerce.

The Indian Ocean is a vital sea lane for maritime trade, connecting the major ports of India, the Middle East, and Africa. The maritime route passing through the Indian Ocean is also known as the Indo-Africa Maritime Route, which connects the Arabian Sea and the Red Sea with the African ports on the east coast.

India is strategically located on this route, with its west coast facing the Arabian Sea and its east coast facing the Bay of Bengal, which is connected to the Indian Ocean. India's western coast is home to some of the prominent ports of India which are important transshipment hubs for cargo moving between Asia and Africa. The eastern coast of India also has several ports, which serve as important gateways for India's trade with Southeast Asia and the Far East.

The maritime trade route between India and Europe, connects the ports of India on the west coast with the ports of Europe, passing through the Arabian Sea, the Red Sea, and the Mediterranean Sea. The Arabian Gulf, also known as the Persian Gulf, is an important sea lane that connects the ports of the Middle East and South Asia. The Gulf is home to some of the world's largest oil and gas reserves and is a major source of revenue for the countries in the region.

There is huge volume of trade carried out in the region which gives prominence to ports located on the west coast of India. Due to lack of advanced ship repair infrastructure in the region, vessels calling on the west coast ports of India have to go to other locations i.e. Colombo, Middle East, China for carrying out their repairs and scheduled dry docking.

Proposed ship repair at MbPA could target these vessels subject to increase in adequate depth availability in the Mumbai Harbour region to handle these big vessels / carriers. Proposed ship repair at MbPA could also target smaller vessels calling at non-major ports of the west coast, barges, fishing vessels, etc. These vessels require less depth as compared to big vessels. Following chart depicts prominent maritime routes in the region and major ports of India.

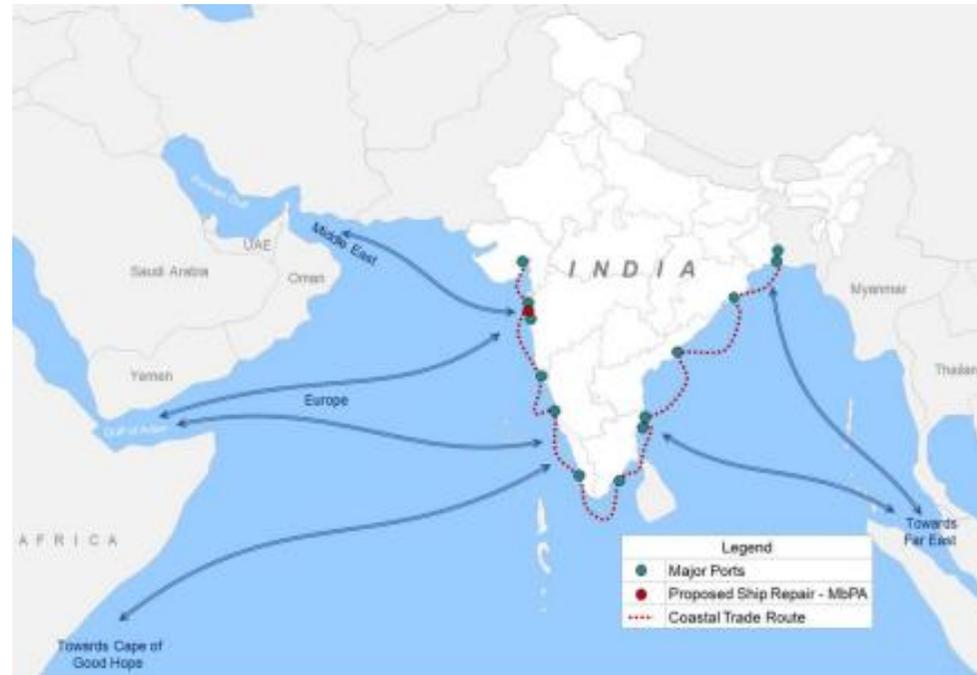


Figure 68 Prominent Maritime Trade Route w.r.t MbPA

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Number of Ships

Ports on the west coast of India handled 866 million tonnes of traffic in FY21. Gujarat and Maharashtra ports contributed 78% to the total traffic handled on the west coast. In FY21 12,704 number of vessels called at major ports on west coast. JNPA and MbPA handled 14% and 5% of the total vessel calls respectively, followed by ports of Deendayal, MbPA, Cochin, New Mangalore and Mormugao. Non-major ports of Gujarat and Maharashtra contributed 51% share to the total traffic handled in FY21.

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The proposed ship repair yard at MbPA would be primarily targeting the vessels calling on the major and non-major ports of west coast. Annual vessel calls at MbPA has decreased in last 10 years from 2,156 in FY11 to 1,652 in FY21 at a CAGR of -3%. Whereas vessel calls at JNPA has increased from 3,100 in FY11 to 4,819 in FY21 at a CAGR of 5%. Share of MbPA in the total vessel calls at ports of west coast has decreased from 9% in FY11 to 5% in FY21. Following chart depicts historic vessel calls at major ports of west coast based on ship size (DWT).

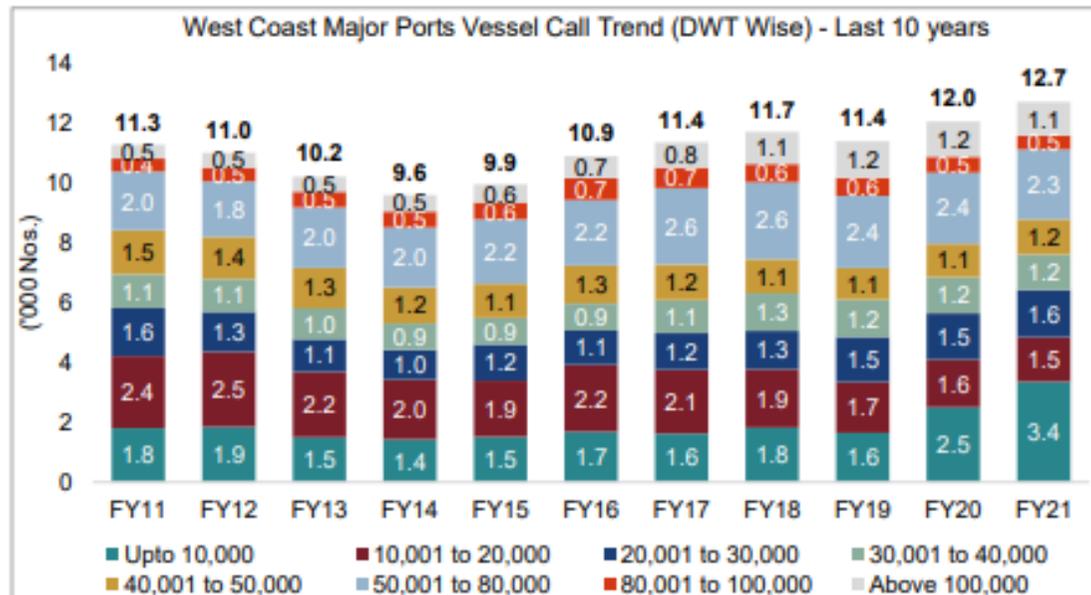


Figure 69 Vessel Call Trend at Major Ports of West Coast of India – DWT Wise

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Demand Assessment for Fisheries

Ferry Wharf Fishing Infrastructure Upgradation

The existing fish jetty at Ferry Wharf has been designed to cater to 300 boats. The jetty is now being used by more than 1,500 boats which creates congestion. Therefore, MbPA has proposed the expansion of the existing jetty. The details of the project are given in section 4.8.

The details of the existing fishing vessel using the ferry wharf such as overall length of boats, average landing per trip, duration of each fishing trip etc. are described in below table.

Table 24 Details of Fishing Vessel at Ferry Wharf

Overall Length of Boats (Average)	No.of Boats	Average Landing per Boat (Ton per trip)	No.of days in fishing season	Duration of each trip (days)
14 m Trawlers	36	4	270	4
16 m Trawlers	194	5	270	4
18 m Trawlers	740	5	270	8
18 m Trawlers Migratory	202	5	270	8
20 m Trawlers	114	6	270	10

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Demand Assessment for Urban Water Transport

Ro-Pax Service

At present MMB manages short haul passenger ferry services for river crossing. Recently, MMB has given some new permissions to several operators for short haul and long-haul service as well. The table below shows the list of newly permitted routes that are likely to be connected to MbPA (Ferry Wharf or Gateway). Most of the operators are presently operating ferry and ro-pax service for across the river movement.

Table 25 Newly Permitted Long-Haul Routes by MMB

Sr. No.	Long Haul Routes	Operators with Permission (No.s)
1	Gateway/Ferry Wharf – Dharamtar	5
2	Ferry Wharf – Dighi / Agardanda	1
3	Ferry Wharf – Jaigad (via Dighi & Dhabol)	1
4	Mumbai – Goa (via Jaigad & Vengurla)	1
5	Ferry Wharf – Maharashtra & Goa	1

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

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During the in-person interaction with MMB, it was understood that MMB is planning to operational below listed routes for passenger and ro-pax movement at earliest. The construction works of terminal at many places have already started and likely to be completed in a year.

Table 26 Upcoming Routes for Passenger Water Transport (Ro-Ro)

Sr. No.	Route	Terminal	Current Status of Terminal	Established Date of Commencement
1	From MbPA to -	Mora	WIP	Sep. 2024
2		Kashid	WIP	Oct. 2023
3		Dighi	Approval Awaited	Oct. 2024
4	Narangi - Kharwadeshwari	Narangi	Jetty Completed, Road WIP	Feb. 2024
		Kharwadeshwari	Road Completed, Jetty WIP	Feb. 2024
5	Vasai - Bhayander	Vasai	WIP	May. 2023
		Bhayander	Completed	May. 2023
6	Gorai - Borivali	Gorai	Forest Clearance Awaited	Sep. 2024
		Borivali	Forest Clearance Awaited	Sep. 2024
7	Manori - Marve	Manori	WIP	Sep. 2023
		Marve	Completed	Sep. 2023
8	Karanja - Rewas	Karanja	Completed	Sep. 2023
		Rewas	WIP	Dec. 2023

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Sr. No.	Route	Terminal	Current Status of Terminal	Established Date of Commencement
9	Ambadave - Toradi	Ambadave	WIP	July. 2023
		Toradi	Completed	Mar. 2023
10	Dabhol - Veldur	Dabhol	Jetty Already Existing	-
		Veldur	WIP	Jun. 2023

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Table 27 Upcoming Routes for Passenger Water Transport (Passengers)

Sr. No.	Route	Terminal	Current Status of Terminal	Established Date of Commencement
1	Arnala - Arnala Fort	Arnala	Work Completed	Sep. 2023
		Arnala Fort	WIP	Sep. 2023
2	Malvan - Sindhudurg	Malvan	Work Completed	Oct. 2022
		Sindhudurg	Jetty Already Existing	N.A.
3	Radio Club / Gateway - Belapur, Elephanta, Mandwa	Radio Club	In Tendering Process	Dec. 2024
		Belapur	Jetty Already Existing	N.A.
		Elephanta	Clearance Awaited	Dec. 2024
		Mandwa	-	-

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Above highlighted routes would be connected to MbPA for ro-pax service. Operator would require to deploy vessel similar like M2M ferry in these routes. Existing ferry terminals at other side of these routes are capable of handling small ro-pax vessels. MMB is developing ro-pax infrastructure (like Ro-pax in Mandwa) at other side of the newly permitted routes to accommodate Ro-Pax vessel. The table below shows the infrastructure and facilities available at Ro-Pax Terminal of MbPA. Benchmarking to this terminal, MMB should develop similar terminal infrastructure at Dighi, Kashid and Mora to operationalise the newly permitted routes.

Table 28 Ro-Pax Terminal – Infrastructure and Facilities

Sr. No	Parameters	Units	Value
1	Area	sq.m	5,371.9 (~1.5 Acres)
2	Ro-Ro Ramp	m	85
3	Vessel Size (LXW)	m	94.6 x 17.6
4	Vessel Draught	m	2.4

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

MMB is planning to complete construction of Ro-Pax terminal at Dighi, Kashid and Mora by end of 2024. Operators have already got permission, procurement of Ro-Pax vessel would take few months. MbPA does not require to take any actions till the time Ro-Pax terminal gets developed on other side of the routes. Once Ro-Pax terminal gets developed and operators are ready with vessels, MbPA need to give permission to berth their vessels at Ro-Pax terminal.

MbPA’s Ro-Pax terminal is currently under-utilised. The terminal is only used by passengers moving to/from Mandwa. At present only 1 vessel is deployed on this route. Looking at the demand, operator have scheduled 2-3 trips a day in weekdays and 4-5 trips a day during weekends. Sailing time between Mandwa and Mumbai is around 1 hours. Vessel spends around 30 – 40 mins on berth for passengers alighting and boarding for next trip. Considering the present ferry service operation, the capacity of Ro-Pax terminal is calculated below.

Table 29 M2M Ferry Terminal – Capacity Utilization Assessment

Parameters	Units	Weekdays	Weekends
Operational Hours	Hrs. / Day	8	15
Berth utilized in single trip			
• Vessel Mooring Time (alight and board)	Mins / Trip	40	30
• Vessel Turnaround, Misc.	Mins / Trip	20	20
Time taken on berth	Mins / Trip	60	50
Daily Trips Calculation			
Ideal Trips (Capacity)	No. / Day	8	18
Ideal Trips (Optimum Capacity at 75%)	No. / Day	6	13
Trips as per existing schedule	No. / Day	2	4
Spare Capacity for additional trips	No. / Day	4	9

Parameters	Units	Weekdays	Weekends
Weekly Trips Calculation	No. / Day		
Weekly Trips Calculation			
Ideal Trips (Capacity)	No. / Week		86
Ideal Trips (Optimum Capacity at 75%)	No. / Week		63
Trips as per existing schedule	No. / Week		20
Existing Capacity Utilization	Of total Capacity		32%
Spare Capacity for additional trips	No. / Week		43(68%)

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

As shown in table above, existing Ro-Pax terminal is under-utilized at 32%. This terminal has capacity to handle 63 ship calls a week, however only 20 ship calls a week are handled currently. The terminal still has capacity to handle an additional 43 ship calls a week. This spare capacity could be utilized by the newly permitted long-haul routes. At present, MbPA does not need to develop any additional infrastructure for passenger / tourist handling. The existing infrastructure is adequate to handle passenger traffic for new routes / developments.



Figure 70 Proposed Location for Additional Ferry Terminal

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

The required additional Ro-Pax terminal in future should replicate the existing Ro-Pax terminal at MbPA. The figure above maps the location of two options where additional terminal should be constructed.

✓ Option I – Existing Ro-Pax terminal to be expanded by installing additional ramp.

✓ Option II – On southern side of Ro-Pax terminal, there exists m-shed which is in not usable condition. MbPA could demolish that and built a Ro-Pax terminal in future.

1. *Passenger Ferry Services*

At present, Ferry Wharf at Mumbai port provides ferry service to Mora, Rewas and Elephanta (occasionally). Most of the commuters are fishermen / fish sellers. Residents of Mora and Rewas alight at ferry wharf to reach Bhaucha Dhakka fishing jetty. Other than fishermen, daily commuters also include office going people and workers employed nearby port area. Ferry service is the only option for residents of Rewas, rail connectivity is not available on this route and by road connectivity is way too time consuming. Residents of Uran (Mora Jetty) used to highly prefer ferry service over any other mode till few years back. However, in last few years’ foot falls on the jetty have reduced drastically. During the site visit it was understood that better road and rail connectivity have taken over the ferry business. The table below shows the time – Distance – Fare comparison between ferry service and other available mode.

Table 30 Time-Distance-Cost Comparison between Mora – Ferry Wharf and its Alternate Options

Sr. No.	Route	Mode	Time (Min)	Distance (km)	Fare (Rs.)
Option I - Ferry Route					
1	Uran - Mora Ticket Counter	Auto	20	4.5	30
2	Mora Ticket Counter - Mora Jetty	Walking	10	0.5	-

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Sr. No.	Route	Mode	Time (Min)	Distance (km)	Fare (Rs.)
3	Mora jetty - New Ferry Wharf	Ferry	55	9.5	80
4	Mora jetty - New Ferry Wharf	Taxi	20	6	50
Total			105(1hr.45mins)		
Option II - Road & Rail					
1	Uran - Juinagar	Bus	60	30	45
2	Juinagar- CSMT	Train	50	31	20
3	CSMT - Market	Walking	10	1	0/28
Total			120 (2 hrs.)	62	70
Option III - Direct Rail (Upcoming Connectivity)					
1	Uran – Belapur	Train	30	30	15
2	Belapur - CSMT	Train	60	38	20
3	CSMT - Market	Walking	10	1	0/28
Total			100 (1 hr.40 mins)	69	60

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

As shown in table above, ferry service to Mumbai is costlier than any other alternate mode available. Though distance is less, but difference in transit time is not so noticeable. Ferry route saves around 40km distance and 15 mins, but costs around INR 100

higher. Daily workers have shifted to Option II in last few years. Increasing ticket fee, poor connectivity and infrastructure at Mora jetty have also moved people to opt for alternate mode. Rail connectivity to Uran is under construction and likely to get operational soon, this upcoming direct rail option would provide faster and cheapest alternate mode to reach south Mumbai. Daily workers traveling to South Mumbai is more likely to shift on Option III in future. However, fishermen / fish sellers and people for retail shopping are likely to continue using ferry service. For such people, ferry service is more convenient to travel with their bulk luggage.

2. *Traffic Projections*

Table 31 Traffic Projections at Ferry Wharf of MbPA (Annual Traffic in Lakhs)

Scenarios	FY25	FY27	FY32	FY37	FY42	FY47
Ferry Wharf - Mora						
Optimistic	5.7	6.1	7.1	8.4	10.0	12.1
Realistic	5.7	6.1	7.1	8.2	9.5	10.9
Pessimistic	5.7	6.1	7.0	8.0	9.1	10.3
Ferry Wharf - Rewas						
Optimistic	1.0	1.1	1.3	1.7	2.3	3.1
Realistic	1.0	1.1	1.3	1.6	2.0	2.4
Pessimistic	1.0	1.1	1.3	1.5	1.6	1.9
Total Ferry Wharf						
Optimistic	6.8	7.2	8.4	10.2	12.3	15.2
Realistic	6.8	7.2	8.4	9.8	11.4	13.3

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Scenarios	FY25	FY27	FY32	FY37	FY42	FY47
Pessimistic	6.8	7.2	8.3	9.4	10.7	12.1

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Table 32 Passenger Traffic Projections at Ro-Pax Terminal of MbPA (Annual Traffic in Lakhs)

Scenarios	FY25	FY27	FY32	FY37	FY42	FY47
Ro-Pax - Mandwa						
Optimistic	7.4	8.7	10.6	13.5	17.1	21.8
Realistic	7.4	8.7	10.6	13.1	15.3	18.9
Pessimistic	7.4	8.7	10.6	12.4	14.2	16.0
Ro-Pax - Dighi via Kashid						
Optimistic	0.0	1.9	2.7	3.7	4.9	6.5
Realistic	0.0	1.9	2.7	3.6	4.6	5.9
Pessimistic	0.0	1.9	2.6	3.3	4.0	4.9
Ro-Pax - Mora						
Optimistic	0.0	2.7	4.0	5.3	6.9	9.3
Realistic	0.0	2.7	4.0	5.1	6.6	8.4
Pessimistic	0.0	2.7	3.6	4.7	5.8	6.9
Total Ro-Pax Terminal						
Optimistic	7.4	13.4	17.3	22.4	28.9	37.7
Realistic	7.4	13.4	17.3	21.8	26.5	33.2
Pessimistic	7.4	13.4	16.8	20.4	24.1	27.8

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Table 33 Vehicle Traffic Projections at Ro-Pax Terminal of MbPA (Annual Traffic in Lakhs)

Scenarios	FY25	FY27	FY32	FY37	FY42	FY47
Ro-Pax - Mandwa						
Optimistic	1.9	2.2	2.6	3.4	4.3	5.5
Realistic	1.9	2.2	2.6	3.3	3.8	4.7
Pessimistic	1.9	2.2	2.6	3.1	3.5	4.0
Ro-Pax - Dighi via Kashid						
Optimistic	0.0	0.5	0.7	0.9	1.2	1.6
Realistic	0.0	0.5	0.7	0.9	1.2	1.5
Pessimistic	0.0	0.5	0.6	0.8	1.0	1.2
Ro-Pax - Mora						
Optimistic	0.0	1.9	2.7	3.7	4.9	6.5
Realistic	0.0	1.9	2.7	3.6	4.6	5.9
Pessimistic	0.0	1.9	2.6	3.3	4.0	4.9
Total Ro-Pax Terminal						
Optimistic	1.9	4.6	6.1	7.9	10.4	13.6
Realistic	1.9	4.6	6.1	7.8	9.6	12.1
Pessimistic	1.9	4.6	5.9	7.2	8.6	10.1

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

Note: Mora and Dighi route are assumed to get operationalise by FY26.

Consultation by CRISIL

CRISIL Consultation – Ship Repair

As part of demand assessment study on ship repair, CRISIL had consulted the following stake holders:

Table 34 List of Stakeholders consulted for Ship Repair

Sr. No.	Organisation	Name of the attendee	Designation of the attendee
1	Indian National Ship owners Association (INSA)	Mr. Anil Devli	Managing Director
2	ProComm Professional Communication	Mr. Farrokhi Bengal	Managing Director
3	The Orient Engineering & Ship Repair Works	Mr. Shetye	Technical Manager
4	Marine Engineering Consultancy & Services	Mr. Aditya Rai	Managing Director
5	United India Marine Services	Mr. Kamlesh Kumar	Chief Executive Officer
6	Excel Marine Services Pvt. Ltd. & Quality Marine Services Pvt. Ltd.	Mr. Yashpal Mahajan	Director in both companies
7	Ashapura Marine Tech International	Mr. Aniket Gaikwad	Assistant manager, Radio Surveyor
8	Shree Laxmi Enterprises	Mr. M Mishra	Chief Executive Officer
9	PRO Marine Solutions Pvt. Ltd.	Mr. Sudeesh Nair	Service Manager
10	Jai Durga Contractor	Mr. Rajesh Dongre	Proprietor
11	I.V.& Sons Engineering Works	Waseem Vanu	Proprietor

Sr. No.	Organisation	Name of the attendee	Designation of the attendee
12	Homa Engineering Works	Mr. More	Assistant General Manager
13	Maaniyar Enterprises	Mr. Shibin Ra	Project Manage
14	D.S. Marine Repair	Mr. Chandrakant Dalvi	Partner
15	Mars Ship Repairs Pvt. Ltd	Ashok Kumar Pandey	Director
16	Shri Renuka Marine Service	Prabhu Jagde	Proprietor
17	Prabhat Marine Services	Sunil Tripathi	Director
18	Marks Marine Radio Pvt. Ltd.	Mr. A. Chaugule	Director

(Source: Report on Demand Assessment for Ship Repair, Water Transport & Fisheries for MbPA prepared by CRISIL)

The main inference from the stake holder consultation regarding ship repair are as follows:

- Ship repair industry in India lacks basic competence. Indian ship owners are forced to get their ships built and repaired at international ship repair yards. There have been unprecedented delays in delivery of new building orders.
- The infrastructure along with ancillary has to be created around ship repair facility. The availability of spares and ancillary is required.
- Work productivity and timely delivery of ships is essential.
- Ships in coastal waters have no other options to look for repair even if the ship yards are inefficient. There is huge mobilisation cost associated with taking a coastal ship to an international ship repair yard for repair.
- Competence of ship repair yard at MbPA has to be at par with international ship repair companies operating in the region.

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- Presently other than HDD no dry docks are available in MbPA. If a slipway is developed, it would mainly be utilized by small boats, tugs, and launches with lengths ranging from 20-25 meters and weighing between 200-250 tons.
- Vessels have fixed schedules and limited time when they visit ports. During this time, they must undergo repairs, maintenance, and servicing to avoid disrupting their operations. So, time is a crucial factor in shipping industry. Vessels calling at MbPA could be targeted for repair subject to availability of dry dock, slipways.

CRISIL Consultation – Fisheries

The following comments were received post stakeholder consultation regarding fisheries

Ferry Wharf (Bhaucha Dhakka)

- No ice factory is present near Fishing jetty. Ice is procured all the way from Ambernath, Vashi, Taloja etc.
- Current capacity of the jetty is for 300 boats, but 1,200 boats are accommodated at present. Daily 100 Vessels come on Jetty for fish selling. Space issue was observed during site visit.
- Existing metal shed is corroded and requires replacement before monsoon of 2023.
- Bridge that connects Bhaucha Dhakka to Ferry wharf road is in poor state. Also heavy traffic is observed on this road in rush hours.
- During low tide, silt can be observed in space between Bhaucha Dhakka and Mallet bunder. Dredging will be required here for smooth operation of supply vessels.
- The first floor of Bhaucha Dhakka is currently lying vacant. This space can be used by operators to keep their goods.
- Underwater pillars of the jetty possess the biggest threat to the fishing boats. Some of the pillars are damaged and broken. So when a fishing vessel approaches to jetty, because of these broken submerged pillars the vessels hit them and get damaged. Immediate action is required here.
- washrooms are available on Jetty and one of them is not in use. It also occupies space and is very unhygienic for the fishes kept nearby. Construction quality is weak so it should be either repaired or removed so that space can be utilized.

Sassoon Dock

- An ice plant and ice crusher unit is present nearby the dock which has a daily capacity of 50 Tons. This ice is mainly utilized in Sassoon dock itself. Daily 25-50 tons of ice is sold.
- On an average 500 Tons per day of ice is required at Sassoon dock. So this requirement is fulfilled from Taloja, Vashi, Ambernath etc. This ice is ordered by Operators.
- Earlier there were fish processing units like Firoz, Sonia etc. Now no unit exists here as they are shifted to Taloja. Fish catch is collected at Sassoon dock and transported to Taloja for processing.
- Old jetty has traffic issues in peak hours due to narrow approach roads.
- New Public toilets were present but not operational.
- Between two auction halls (sheds) there was an empty plot which was earlier used for parking Ice trucks. Then construction of ice plant was started on this plot and stopped at initial stage itself. Operators demand either completion of this project or using this land for parking. MFDC has floated tender to complete the remaining works of this plant.
- At old Sassoon dock, dredging is required for fishing vessels due to unavailability of required draft during low tide.

CRISIL Consultation – Urban Water Transport

The following comments were received post stakeholder consultation regarding urban water transport demand assessment of MbPA:

- Currently, approx. 50 tickets are sold daily from Ferry Wharf to Rewas. For Mora, around 350 tickets are sold. Before COVID, these numbers were nearly double.
- The regular travellers include students, fishermen, shopkeepers, and people with jobs in South Mumbai. During the morning peak time, which is from 8 AM to 11 AM, the majority of passenger traffic is incoming at Ferry Wharf. In the evening, the peak time is from 5 PM to 7 PM. Currently, there is a Ferry service available from Gateway of India to Elephanta. However, a Ferry service can also be arranged from Ferry Wharf upon demand, requiring a minimum of 40 passengers. The cost for this service is Rs 8,000 for 40 passengers, and the travel time is approximately 1 hour.
- Presently, the fare for a one-way journey from Ferry Wharf to Mora is Rs. 80, while the estimated fare for the Uran to CSMT local is around Rs. 20. This difference in fare is expected to be beneficial for daily commuters, as they will be able to save money in their monthly travel budgets.
- Operators feel the biggest threat to their business will be MTHL and Uran local. They have a fear that once these projects are operational, ferry passengers will get shifted to these modes.
- Ferry services experience a boom only during the holiday season, such as April and May. During the non-season period, it becomes challenging for ferry operators to cover their expenses. Even providing salaries to the 4-5 employees working on each ferry becomes difficult due to the reduced passenger flow.

- People working on the vessels do not have accommodation arrangements. They often sleep on the ferries and have to use paid public bathrooms for their needs.
- Around 80-100 passengers were needed to cover the trip expenses. However, now, sometimes there are hardly 20-40 passengers available for a trip. The introduction of Ro-Ro services has had a significant impact on the ferry services. It has successfully shifted the passenger crowd, especially tourists and business people, from ferries to Ro-Ro.
- Cleanliness is not maintained due to unavailability of ample dustbins at Ferry Wharf.
- Seating arrangements at jetty are inadequate and in bad condition.
- Unpleasant smell of fish from neighboring Bhaucha Dhaka, makes some passengers uncomfortable.
- Some passengers bring their 2 wheelers on ferry but loading and unloading at ferry wharf is difficult. A wooden plank is used to connect ferry and jetty for transferring 2 wheelers. Also there is no separate way for 2 wheelers to enter Ferry Wharf jetty. 2wheelers are navigated from passenger crowd in waiting area.
- Travelling by ferry during monsoons is risky and the ferries are often delayed due to weather conditions.
- Upon reaching Mora jetty, passengers have to walk for almost 500 meters from ferry to auto stand. It is very inconvenient.
- There are connectivity issues with bus services from Ferry Wharf to CSMT and nearby places.

Key Inferences of Study by CRISIL on Port Traffic, Ship Repair, Fisheries & Urban Water Transport

After analysing the studies conducted in the past and by CRISIL Ltd, the following key inferences were drawn in conjunction with the preparation of comprehensive master plan for MbPA:

- The inside berths of Indira Dock are underutilized due to draft and beam size limitation. The lock gate mechanism at Indira Dock also restricts the vessels with beam size more than 28 m. On the contrary, the outside berths at Indira Dock have extremely high occupancy.
- Low capacity cranes also necessitate reliance on ship cranes as the berth infrastructure is so old that it cannot withstand modern equipment and heavy cranes, rendering mechanization difficult to sustain.
- Since MbPA is not able to cater to container cargo as expected at the construction of Offshore Container Terminal (OCT), the possibilities of handling alternate commodities at OCT should be explored.
- The port being located at the southernmost side of the island city; the city traffic can have adverse impacts on cargo evacuation in terms of speed and efficiency. Vehicular movement restrictions, non-availability of dedicated corridor for road/railway, permission for existing port related railway goods traffic to ply on Indian railways during non-peak hours of local trains as per the time slot available. and restriction on cargo handling due to city proximity makes cargo evacuation very slow and inefficient. The upcoming infrastructure developments of MMRDA is likely to immensely improve road evacuation of cargo from MbPA and is unlike to impact rail evacuation of cargo from MbPA using railways.
- Considering the percentage share of export cars being damaged due to poor road condition, it is necessary to augment the condition of existing roads. The car cleaning and inspection facilities may be expanded.

- Multi-level car parking facility can be planned to ensure optimum utilization of land and to provide covered parking spaces for export vehicles.
- MbPA has niche cargo focus. Majority of the customers of MbPA have long term loyalty and cargo commitment with MbPA. Hence, the presence of competition ports in the hinterland have limited influence on MbPA business prospects.
- Majority of traffic handled at MbPA is originated / destined within Mumbai Metropolitan Region extended to Maharashtra state. JNPA will also allow handling of cargo such as Ro-Ro and steel at its other terminals in their renewed concessions. In this regards Mumbai port may face some competition from JNPA in future with respect to clean break bulk cargo such as car export, steel etc.
- The commodity wise traffic projections of MbPA for 30 years as depicted in Table 3.4 indicates a tremendous rise in the volume of commodities such as cement, lube oil, LNG and automobiles in the upcoming years. However, the volume of steel cargo is expected to decline gradually in the upcoming years.
- Considering the future demands, there is need for additional infrastructure and in order to accommodate projected traffic, new berths need to be developed. Storage area and slots available at MbPA are sufficient enough to handle projected traffic.
- There would be requirement of one additional berth for petroleum products. The existing capacity at Pir Pau would fall short of projected traffic. Hence, there would be requirement of additional infrastructure.
- Anchorage utilisation at MbPA is high. JSW is the largest customer of MbPA using substantial share of Anchorage for its Dolvi Plant. There would be a requirement for augmenting capacity of Anchorage.
- India, with its vast coastline and maritime history had a thriving shipping industry. As a result, ship repair is a crucial aspect of this industry, and the government has implemented various policies and initiatives to promote the growth of the ship

repair industry. Maritime India Vision 2030 is formulated by Ministry of Ports, Shipping and Waterways to build and upgrade port and maritime infrastructure in the country.

- There is huge volume of trade carried out in the region which gives prominence to ports located on the west coast of India. Due to lack of advanced ship repair infrastructure in the region, vessels calling on the west coast ports of India have to go to other locations i.e. Colombo, Middle East, China for carrying out their repairs and scheduled dry docking.
- Proposed ship repair at MbPA could target these vessels subject to increase in adequate depth availability in the Mumbai Harbour region to handle these big vessels / carriers. Proposed ship repair at MbPA could also target smaller vessels calling at non-major ports of the west coast, barges, fishing vessels, etc. These vessels require less depth as compared to big vessels.
- The existing fish jetty at Ferry Wharf has been designed to cater to 300 boats. The jetty is now being used by more than 1,500 boats which creates congestion. Therefore, MbPA has proposed the expansion of the existing jetty. The proposal includes construction of fish jetty to Mallet Bunder.
- Existing Ro-Pax terminal is under-utilized at 32%. This terminal has capacity to handle 63 ship calls a week, however only 20 ship calls a week are handled currently. The terminal still has capacity to handle an additional 43 ship calls a week. This spare capacity could be utilized by the newly permitted long-haul routes.
- At present, MbPA does not need to develop any additional infrastructure for passenger / tourist handling. The existing infrastructure is adequate to handle passenger traffic for new routes / developments.

Appendix 6: Applicable Policies & Guidelines for Maritime Sector in India

Ports and shipping policies in India aim to support the port sector through various measures. The government has allowed up to 100% FDI through the automatic route for projects related to building and maintaining ports and harbours. Private ports have more freedom with their prices because the government lets non-major ports set their own tariffs in consultation with the State Maritime Boards. The Model Concession Agreement (MCA) was introduced to bring transparency and uniformity to contractual agreements for major ports and was revised in recently to make major ports in the country more investor-friendly. The Major Port Authorities Bill-2021, was passed to decentralize decision making and reinforce excellence in major port governance. To set up modern floating infrastructure along the coast, guidelines for floating structures were also made. Following are some the prominent initiatives taken by government in ports and shipping sector of India.

Maritime India Vision 2030 (MIV)

Maritime India Vision 2030 is formulated by Ministry of Ports, Shipping and Waterways to build and upgrade port and maritime infrastructure in the country. Maritime India Vision 2030 has identified 150+ initiatives across ports, shipping & waterways sub-sectors which will propel Indian maritime sector to its next level of growth in the new decade. The following key guiding principles were incorporated to define the MIV 2030:

- (1) Analyze current and future challenges to define initiatives
- (2) Drive innovation by utilizing latest technology
- (3) Create time-bound action plan
- (4) Benchmark to understand current standing and adopt best-in-class practices
- (5) Address capability building and human resources
- (6) Explore ideas to achieve “Waste to Wealth”

MIV 2030 outlines 10 key themes which are essential for India to secure its place at the forefront of the Global Maritime Sector:

- (1) Develop best-in-class Port infra structure
- (2) Drive E2E Logistics Efficiency and Cost Competitiveness
- (3) Enhance Logistics Efficiency through Technology and Innovation
- (4) Strengthen Policy and Institutional Framework to Support all Stakeholders
- (5) Enhance Global Share in Ship Building, Repair and Recycling
- (6) Enhance Cargo and Passenger Movement through Inland Waterways
- (7) Promote Ocean, Coastal and River Cruise Sector
- (8) Enhance India’s Global stature and Maritime Co-operation

(9) Lead the World in Safe, Sustainable & Green Maritime Sector

(10) Become Top Seafaring Nation with World Class Education, Research & Training

Maritime Amrit Kaal Vision 2047 (MAKV 2047)

The Maritime Amrit Kaal Vision 2047 (MAKV 2047) is the Government of India's long-term strategic framework aimed at transforming the nation into a globally competitive, environmentally sustainable and technologically advanced maritime power. Anchored in the principles of Atmanirbhar Bharat, Ease of Doing Business, Gati Shakti, and the Blue Economy guidelines, MAKV 2047 lays down sector-specific pathways for port modernisation, multimodal connectivity, coastal shipping, shipbuilding, logistics efficiency, maritime safety, and green port initiatives. The vision emphasises large-scale infrastructure development through PPP, digitalisation under PM Gati Shakti National Master Plan, decarbonisation through shore power and renewable adoption, and regulatory reforms in line with national maritime policies and IMO conventions. For major ports, including MbPA, MAKV 2047 provides a roadmap to enhance cargo capacity, reduce logistics cost, integrate with industrial corridors, adopt advanced technologies such as PCS, AIS, and smart terminals, and achieve global service standards by 2047.

Key Performance Indicator		Current (2020)	Target (2030)
1	 Major Ports with >300 MTPA cargo handling capacity	-	3
2	 % of Indian cargo transshipment handled by Indian ports	25%	>75%
3	 % of cargo handled at Major Ports by PPP/ other operators	51%	>85%
4	 Average vessel turnaround time (containers)	25 hours	<20 hours
5	 Average container dwell time	55 hours	<40 hours
6	 Average ship daily output (gross tonnage)	16,500	>30,000
7	 Global ranking in ship building and ship repair	20+	Top 10
8	 Global ranking in ship recycling	2	1
9	 Annual cruise passengers	4,68,000	>15,00,000
10	 % share of Indian seafarers across globe	12%	>20%
11	 % share of renewable energy at Major Ports	<10%	>60%

Figure 71 Key Targets of MIV-2030

(Source: Report on MIV 2030)

PM Gati Shakti

Prime Minister Gati Shakti, also called the National Master Plan for Multi-modal Connectivity, is a \$1.2 trillion mega project that was announced on August 15, 2021. The goal of this project is to make manufacturing in India more competitive and help the Indian economy grow. The goal of the plan is to connect all of India's economic zones with multimodal infrastructure and bring

together all of the relevant government departments to make a digital platform for more complete and integrated project planning. It will link the Indian Roadways, Indian Railways, Indian Airways, and Indian Waterways so that goods can move more easily. It will also make it easier to keep track of current projects and give the community information about upcoming connectivity projects. The main goals of the plan are to keep the economy at \$5 trillion and then grow it to \$20 trillion by 2040.

Sagarmala Project

The Sagarmala programme is the flagship programme of the Ministry of Ports, Shipping, and Waterways in India, aimed at promoting port-led development by exploiting India's 7517 km of coastline, 14500 km of potentially navigable waterways and its strategic location on key international maritime trade routes. The Sagarmala Program was initiated by the Government of India after cabinet approved it in 2015. The programme aims to modernize India's ports and integrate the development of ports, industrial clusters, the hinterland, and efficient evacuation systems through road, rail, inland, and coastal waterways, making ports the drivers of economic activity in coastal areas. Sagarmala Seaplane Services (SSPS) is an ambitious project announced in January 2021 and being implemented by the Sagarmala Development Company Limited to facilitate faster and hassle-free travel across the country through seaplane services under a hub-and-spoke model. The Sagarmala Development Company Limited (SDCL) oversees developing and making plans for projects in the Sagarmala project's national perspective plan.

Major Port Authorities Act-2021

The Major Port Authorities Act-2021, is an act passed in India to regulate, operate, and plan for the 12 major ports in the country and to vest the administration, control, and management of these ports upon the Boards of Major Port Authorities. The act covers the following major ports:

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- (1) Deendayal (formerly Kandla)
- (2) Mumbai
- (3) JNPA
- (4) Mormugao
- (5) New Mangalore
- (6) Cochin
- (7) Chennai
- (8) Kamarajar (formerly Ennore)
- (9) V. O. Chidambarnar
- (10) Visakhapatnam
- (11) Paradip
- (12) Kolkata (including Haldia)

The act aims to promote port infrastructure expansion and facilitate trade and commerce, decentralize decision-making and instil professionalism in major port governance and reorient the governance model in central ports to a landlord port model in accordance with global practice. The board of the Major Port Authority will have 11 to 13 members, and it has been suggested that an adjudicatory board be set up to do the work of the old TAMP for major ports.

Foreign Trade Policy 2023

New Foreign Trade Policy (FTP) 2023 was launched on 31st March 2023. This newly launched policy is not limited to the coming 5 years and will instead focus on long-term plans and will be revised as and when required on a regular basis. The vision is to take

India's export goods and services to US\$ 2 trillion by 2030. Exports of FY23 are estimated to be US\$ 760 billion against US\$ 676 billion in the previous year. Key approaches of the policy are based on 4 pillars i.e.

- (1) Move from Incentive to Remission
- (2) Export Promotion through Collaboration
- (3) Ease of doing business, reduction in transaction costs and e-incentives
- (4) Emerging Areas, e-commerce developing districts and streamlining SCOMET policy.

Aims and objective of FTP 2023 are summarized below.

- Government restated sector specific 2030 targets – US\$ 1 trillion Merchandise Exports and US\$ 1 trillion Service oriented exports.
- Additional 4 new towns (Faridabad, Mirzapur, Moradabad and Varanasi) have been designated as Towns of Export Excellence in the existing list of 39 towns, for apparels, handicraft, carpet and handloom.
- Provision for merchanting trade, introduction of trade settlement in rupees for export benefits • Introduction of amnesty scheme for one-time settlement of default in export obligation
- Exemption of dairy sector from maintaining average export obligation • Special advance authorization scheme for apparel and clothing sector
- Value limit extended for exports through courier from INR 5 lakhs to INR 10 lakhs per consignment
- Recognition of exporters based on export performance rating, leading to better branding opportunities in export markets, exporters to achieve higher recognition and reduce transaction cost
- Encourage e-commerce exports • Creation of e-commerce warehousing facilities at designated zones

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- Streamline SCOMET Policy – Simplifying licensing process and reducing bureaucratic hurdles to make industry easy to comply with export regulations.

Sectors that will be benefited from the FTP 2023

- Textile & Apparels
- Dairy Sector
- Green technology products
 - Eligible for reduced export obligation condition under EPCG Scheme
 - New additions in sector - Battery Electric Vehicles, Farming Equipment, water treatment, rainwater harvesting & filters and green hydrogen.

Around 98% of the traffic handled by MbPA is industrial cargo like POL, Chemicals, Iron & Steel, etc. The port handled 59.9 mn tons in FY22, out of which outbound traffic contributed 32% and rest 68% inbound traffic. Total outbound traffic includes transshipment and exports. Exports of MbPA are hardly 20% of total traffic, which consists of POL, Iron & Steel, Sugar & others. New FTP 2023 focuses more on Textile, Dairy and Green technology-oriented exports. Target is to encourage e-commerce trade and facilitate the warehousing facilities for the same. No developments or initiatives are mentioned in FTP 2023 for the type of cargo exported from MbPA. Hence, due to differences in target industries, new FTP 2023 does not create any impact on MbPA traffic.

Pradhan Mantri Matsya Sampada Yojana (PMMSY)

The Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India is implementing Pradhan Mantri Matsya Sampada Yojana – A scheme to bring about ecologically healthy, economically viable, and socially inclusive development of the Fisheries sector of India. The key objectives of PMMSY are as follows:

- Harness the potential of the fisheries sector in a sustainable, responsible, inclusive and equitable manner
- Enhance fish production and productivity through expansion, intensification, diversification and productive utilization of land and water
- Modernize and strengthen the value chain including post-harvest management and quality improvement
- Double fishers and fish farmers' incomes and generate meaningful employment
- Enhance the contribution of the fisheries sector to Agricultural GVA and exports
- Ensure social, physical and economic security for fishers and fish farmers
- Build a robust fisheries management and regulatory framework

Appendix 7: Codes of Port Stakeholders

Codes for Various Agencies

Id	Description
1	Barber
2	Bidder
3	Bunker Supplier
4	Chipping & Painting
5	Condemned Ship Stores/Scrap Clearance
6	Container Transporter
7	Crane Supplier/Repairer
8	Custom House Agent
9	Dock Merchants
10	Freight Broker/Forwarder
11	Gear Supplier
12	Government Agency
13	Gunny Bag Supplier

14	Importer/Exporter (Gen.)
15	Importer/Exporter (Self)
16	Labour Contractor
17	Launch Operator
18	Laundry Contractor
19	Marine Consultants
20	MBPT Contractors
21	MbPT Co-Op. Societies/Canteens/Club
22	Measurement of Cargo
23	Misc. services & suppliers
24	Mutilation Contractor
25	NVOCC/MTO
26	Offshore Engineer/Services
27	Others
28	Palletisers
29	Private Canteen
30	Pulses Broker

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31	Ship Breaker
32	Ship Chandler
33	Ship Management
34	Ship Owner
35	Ship Repairer
36	Ship Stores Supplier
37	Shipping Agent
38	Sludge Oil Contractor
39	Stevedore
40	Surveyor
41	Trade Union/Sangh/Association
42	Transporter
43	Trustees

44	Tug/Barge Owner
45	Under Water Diving
46	Watchman Contractor
47	Used Oil Clearance Contractor
48	Ex-Trustee
49	Scrap Removal Contractor
50	Telephone Booth Operator
51	EX_HOD
52	Vendor
53	PENSIONER
54	Employee on Deputation
55	MbPT Department

Table 35 Official Codes of Port Stakeholders for issuing Port Entry Permits

Appendix 8: Project Summary

Key Projects Under Implementation

Projects	Focus	Cost (INR Cr)	Status
Logistics			
1. Shore Protection & Land Reclamation at JD	Liquid Cargo	2700	95% Reclamation; 25% Shore Protection
2. New Fish Jetty at Mallet Bunder	Fisheries	136.75	70% Complete
3. Kurla Wadala Dedicated Freight Line	Port Rail Connectivity	176.81	To be restarted by Central Railway
4. Shifting of Orange Gate Princes' Dock	Efficiency	50	
5. Filling & Strengthening of Victoria Docks	Storage	10	
6. Concretisation of Roads at Indira Docks	Efficiency	95	

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Projects	Focus	Cost (INR Cr)	Status
7. Strengthening of Road Network below Eastern Freeway	Upgradation	100	
8. Development of Anchorages	Lighterage	20	
9. Capital Dredging – Third Chemical Berth	Capacity Expansion	67	Tender to be floated
Leisure			
10. Viksit Bharat Mumbai Marina	Marine Tourism	470	
11. Mumbai International Cruise Terminal (EPC)	Cruise Tourism	363	Operationalised
12. Mumbai International Cruise Terminal (PPP)	Cruise Tourism	192	60%
13. Passenger Terminal at Bhaucha Dhakka	Water Transport	1.5	
14. RoPax Terminal at M-Shed	Waterfront Dev	15	

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Projects	Focus	Cost (INR Cr)	Status
15. Viksit Bharat Yacht Bay	Yachting	-	Complete
16. Namo Bharat International Sailing Centre	Sailing	-	
17. Radio Club Jetty at Colaba	Water Transport	230	
18. Event Bay at STP	MICE Destination	-	
Land			
19. Integrated Ship Building Centre at Haji Bunder	Land for Ship Building	-	
20. Integrated Maritime Office Tower at Mallet Bunder	Land for Maritime Office	1000	
21. CGO Complex	Land for Govt. Office	3000	

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Projects	Focus	Cost (INR Cr)	Status
22. Orange Gate Marine Drive Tunnel Project	City Connectivity	9158	
Leadership			
23. Integrated Access Control & Surveillance System	Smart Port	25	Under Award
24. AI/ML based Land Use Intelligence System	Digital Land Monitoring	5	WO Issued
25. Procurement of Green Tugs	Green Port	693.24	EoI Published
Legacy			
26. Development of Kanhoji Angre Island – World Heritage Site	Heritage Island Development	52	Awarded
27. Iconic Lighting of Port House & Evelyn Guest House	Heritage	-	Complete

Key Projects Under Planning

Projects	Focus	Cost (INR Cr)	Status
Logistics			
1. Additional Land Reclamation at JD	Capacity Expansion	7207	CRZ clearance
2. 22 MTPA Sixth Oil Berth at JD	Capacity Expansion	500	Concept Stage
3. Trestle Connectivity at Jawahar Dweep	Efficiency	500	Concept Stage
4. Revamping of Jawahar Dweep	Efficiency	95	In-house DPR
5. Modernisation of JD Berths & Substations	Efficiency	300	DPR prep
6. Reclamation at Pir Pau	Capacity Expansion	-	Concept stage
7. O&M of all Berths at Indira Docks	Efficiency	150	Eol published
8. Multi-level Car Park at Gamadia Complex	Capacity Expansion	30	Concept stage
9. Upgradation of Railway up to Ravli Junction	Upgradation	50	Concept Stage
10. Multipurpose Offshore Terminal	Capacity Expansion	300	Concept Stage
11. Mechanised Dry Bulk Handling at Hay Bunder	Capacity Expansion	-	Concept Stage
Leisure			
12. O&M of Viksit Bharat Mumbai Marina (PPP)	Marine Tourism	417	DPR

Projects	Focus	Cost (INR Cr)	Status
13. Second RoPax Terminal	Water Transport	60	Concept Stage
Land			
14. Ship Repair Hub at Darukhana	Ship Repair	-	Concept Stage
15. Dedicated Cement Terminal at Golden Yard	Capacity Expansion	-	Concept Stage
16. Consolidation of MbPA Colonies	Asset Utilisation	200	Concept Stage
17. International Convention Centre	Waterfront / MICE	10,000	Concept Stage
18. Iconic Maritime Tower	Maritime Hub	1000	MoU with HUDCO
19. Metro Line 11	City Connect	23,487	
Leadership			
20. Hospital Information Management System	Digital	25	Concept Stage
21. Centralised Grievance Management System	Digital	-	Concept Stage
22. Captive 5G Implementation	Digital	19	Concept Stage
23. Digital Twin	Digital	25	Concept Stage
24. Green Fuel Bunkering and Storage at JD	Green Port	TBD	Concept Stage
25. Safety Experience Centre	Safety	-	RfP Floated

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Projects	Focus	Cost (INR Cr)	Status
Legacy			
26. Development of Mumbai Port Archives	Heritage	30	Concept Stage
27. Experience Centre at Port House	Heritage	-	Concept stage

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