Draft Scheme on Development of Water Metro

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Ministry of Ports, Shipping and Waterways

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1. Introduction

1.1. Background

The global urban population is on the rise and is expected to constitute 68% of the world's population by 2050, adding about 2.5 billion urban dwellers, with India alone projected to add over 416 million urbanites (highest in the world)[1]. This increasing urbanization in India will put tremendous pressure on urban transport infrastructure in cities. The predominant effects of this trend over the past years can be seen in the form of rising motorization rates, wherein total registered motor vehicles in India grew at an average annual rate of approx.9.8% between 2012 and 2022, reaching 226 million vehicles by 2023 and projected to hit 494 million by 2050[2]. This surge has given rise to various negative externalities like road congestion, air pollution, and road fatalities.

Transport sector is responsible for 13.5% of the country's energy-related carbon emissions, with road transport accounting for 94% of the sector's share[3]. Under present trends, energy use and related emissions from this sector could double by 2050[4]. Therefore, addressing this growth is crucial for India to align with its 2070 netzero pledge. Prioritizing public transport is crucial for a sustainable future.

The roadbased public transport in urban areas faces systemic issues like sharing common right of way with other vehicles,higher travel times due to congestion making them vulnerable todelays in peak hours. These factors reduce operational efficiency and ridership. Metro systems, despite offering high capacity and rapid transit solutions, also present notable limitations. These include significant capital and operational expenditures, lastmile connectivity challenges, complexities related to land acquisition and construction leading to delay in project timelines.Thus, it is necessary to explore the potential of other types of public transportation systems, which are reliable and can be integrated into the current public transport ecosystem to reduce the stress on the road/metro based public transport.

[1]United Nations, Department of Economic and Social Affairs (UN DESA), World Urbanization Prospects: 2018 Revision; UN DESA updates (2023)
[2]Ministry of Road Transport and Highways (MoRTH), Road Transport Yearbook 2023; NITI Aayog, India Transport Outlook 2024
[3]Fourth Biennial Report, UNFCCC, 2024
[4]IEA/NITI Aayog, Transitioning India's Road Transport Sector (2023)

Inland Water Transportis a promising alternative to congested road and rail networks in regions with navigable waterways.India now has designated 111 National Waterways (20,187 km total, 5,155 km operational) across 23 States & 4 Union Territories. The annual passenger movement reached 7.64 crore in FY 2024-25. In addition, IWAI has initiated the deployment of advanced electric and hybrid-electric vessels to promote sustainable inland water transport. As part of this initiative, eight hybrid-electric catamarans and India's first indigenous Hydrogen Fuel Cell (HFC) vessel, bothconstructed by Cochin Shipyard Limited (CSL),introduced on National Waterway-1on Ganga River. Out of these, four electric catamarans are placed in Varanasi, Ayodhya, Patna and Kolkata. Hydrogen fuel cell vessel is operating in Varanasi.These vessels are designed to support green mobility objectives and reduce carbon emissions in passenger transport.

The development of water metro systems in cities along the NWs, waterfronts, and other waterwayswith electric and hybrid vessels could help in creatinggreen masstransit networks, which could be used for daily passenger movement, tourism activities and could serve as first and last mile connectionfor metro and bus networks resulting in multimodal integration in these cities. Water metros leverage energy efficient electric or hybrid vessels to create masstransit networks.

Recognizing this potential, the Inland Waterways Authority of India (IWAI) commissioned feasibility studies for Water Metro systems in18 citieson 25th February 2025. These cities were selected based on urban scale, navigable waterways, and existing ferry usage. The estimated approximate cost of the project ranges between Rs. 800-1300 Crore for each project[5].

In view of this, Ministry plans to develop a Water Metro Scheme to fund projects incities to promote water based public transport. These projects will connect city centerswith nearby areas and islands for daily passenger movements, tourism purposes, and will be integrated with other transport modes.

[5] IWAI analysis of the 4 TfR reports received till now.

2. Concept of Water Metro

2.1. Introduction

A Water Metro is a mechanically propelled, mass passenger transport system operatingininland, coastal, or other water bodies, designed for systematic movement of peopleand where applicable, vehicles and may include passenger vessels and Ro-Pax.

This system may operate across intracity, intercity, coastal, and interisland corridors, on rivers, canals, lakes, backwaters, estuaries, creeks and coastal waters and are not restricted to National Waterways. Water Metro services use modern, standardized vessel designs equipped with prescribed safety, accessibility, environmentalprotection features, and function as part of an organized public transport network.

Features of Water Metro

- Energy efficient Electric/Hybrid boats designed specifically for inland and coastal waterways
- Centralized control and monitoring of vessel movements.
- Metro like operations with fixed routes, timetables, and high frequency
- Seamless integration with city buses, metro, and rail networks
- Minimal travel time compared to conventional boats
- Standardized, affordable public transport fare structure
- Safe, stable vessels suitable for daily mass commuting with possibility to use for tourism purposes.
- Smart ticketing and cashless payment systems.

2.2. Suitability of Cities and Circuits for Water Metro System

Water Metro / Water Bus systems may be considered in cities, regions or specific urbanzones that demonstrate suitable geographic, demographic and mobilitycharacteristics.

1. Water Metro / Water Bus planning may be considered in urban or regionalcontexts that demonstrate inherent geographic suitability – presence ofnavigable waterways, availability of continuous or semi-continuous navigablecircuits capable of supportingscheduled servicesand hydrologicalconditions that can reasonably supportsafe and reliable operationsincludingmanageability of seasonal variations through appropriate design and operationalplanning.

2. Water Metro systems are most suitable for cities and regions with concentrated populations and directional travel patterns, in line with mass rapid transit planning principles:

a) Urban agglomerations or metropolitan regions with populations typically exceeding one million, where water-based transport can operate as a high-capacity, high-frequency public transport mode.

or

b) Cities with populations above one lakh where clearly defined demand or seasonal corridors exist, particularly in tourism-intensive areas or locations with significant existing waterway passenger traffic, indicating established or latent demand.

and

c) Supported by minimum peak ridership levels of2000 per day that justify mass-transit operations.

3. Conceptual Details of the Scheme on Water Metro

3.1. Scheme Objectives

- ***Reducing the burden on road transport:***the water metro will support in ease of congestion and provide an alternativepublic transport option.
- ***Green and Environmentally Friendly Transport Mode***: the Water Metro will promote sustainable public transport by adopting cleaner technologies and reducing reliance on fossil-fuel-based travel, thereby contributing to environmental protection.
- ***Digital Integration:***it will focus on smart ticketing, real-time tracking, and integration with other transport modes.
- ***Enhanced Passenger Experience:***It will provide modern service standards, reliable service with minimal waiting times for improving passenger experience.
- Reduction in emissions from transport sector.
- ***Comfort & Safety:*** vessels with advanced monitoring systems and safety equipment.

Wherever possible and feasible, the infrastructure developed for water metro shall be used for recreational/boating or tourism purposes.

3.2. Scheme Framework

3.2.1. Details of the Frameworks Adopted

The Ministry of Ports, Shipping and Waterways (MoPSW) proposes to implement a scheme for the development of Water Metro systems across the country's inland waterways.

i. The project may be developed via 4 models detailed in Section 3.4. Based on the model, Centre and State Government shall provide equal funds for the EPC component of capital expenditure (for each project) and/or Viability Gap Funding (VGF) for PPP component ofthe capital expenditure (for each project).
ii. A city level Special Purpose Vehicle (SPV) shall be constituted jointly by the Central and State Government for the purpose of implementing the approved projects. Based on the model in Section 3.4, respective contributions of the Central and State Governments towards capital expenditure and/or Viability Gap Funding (VGF) for capital expenditure of the project shall be considered as their equity share in the city level SPV.
iii. City level SPV shall be responsible for development of the infrastructure either through EPC/Public Private Partnership (PPP)/Hybrid model (detailed in Section 3.4) and operations of the water metro systemseitherin-house or through Operations and Maintenance Contract.
iv. The cost of the operations shall be borne by the city level SPV. In case any Viability Gap Funding (VGF) is required for operational expenditure througheither in-house or Operations and Maintenance Contract based operations of water metro, it shall be borne by the State Government.
v. In case of National Waterways, the Inland Waterways Authority of India (IWAI) will prepare the Detailed Project Report (DPR) in consultation with the respective State Government. The cost of the DPR shall be borne by IWAI.
vi. In case of Waterways other than National Waterways, two approaches may be adopted:
    a) State Government prepares the Detailed Project Report (DPR) and (if required) may request technical support from IWAI.
    OR
    b) Request IWAI to prepare Detailed Project Report (DPR).
    - In both cases, cost of the DPR should be borne by the State Government.

3.2.2. Key Components of the Scheme

The following components shall be covered under the scheme:

Civil Infrastructure	Marine Infrastructure	Navigational Infrastructure	Sustainable Development
• Major Terminals • Intermediate Terminals • Minor Terminals • Development of Access Road and Non-Motorized Transport (NMT) • Multimodal Integration • Floating pontoons, Gangway, • Fenders • Operation Control Center • Fuel Jetty • Night Parking jetty • Boat Yard • Boat Charger terminal side infra facilities	• Boat • Emergency Response cum Work Boat • Dredger	• Intelligent Transport System • Navigational aids	• Solar Farm • Weed Harvester • Water Harvesting • Disaster Management/Resilience initiatives • Electric Feeders, Bicycle Sharing and Walkways

Note: The terminals under the scheme may be used for cruise purposes by SPV.

3.2.3. Indigenization

Vessels procured for Water Metro systems shall begreen (electric, hybrid),indigenously designed and built by Indian shipyards, adhering to all applicable mandates in this regard to fulfil the objective of promoting domestic manufacturing. Aggregation of demand through standardized designs and bulk procurement is encouraged to achieve economies of scale, negotiate competitive costs, and progressively enhance localization of the components across the Water Metro ecosystem.

3.2.4. Duration of the Scheme

The duration of the scheme shall be10years from FY 2026-27 to FY2036-37.

3.2.5. Estimated Budget Outlay for Central Government's share for the capital expenditure under the Scheme

The estimated budget outlay for central government's share of the funds for the capital expenditure under the Scheme is Rs. 9,200 Crore.

Components	Total Cost (in INR Crore) [Excluding Land]	Share of the Cost (in Percentage)
1. Civil Infrastructure	4,462	49
2. Marine Infrastructure	2,884	31
3. Navigational infrastructure	712	8
4. Sustainable development	701	8
5. Project Support Team	195	2
6. Capacity Building	246	3
Total	**9,200**	**100**

(Detail Estimation of the budget is given in Annexure 3)

3.2.6. Institutional Mechanism

The implementation of water metro projects under this scheme shall require a robust institutional framework to ensure effective governance, technical appraisal, and timely execution. This framework is designed to clearly define the roles and responsibilities of all stakeholders, streamline decisionmaking, and maintain accountability at every stage of the project lifecycle. The mechanism shall operate through a three-tier structure, supported by dedicated committees and agencies, and complemented by specific responsibilities assigned to the Central Government, State Governments, IWAI, Project Appraisal Committee, andCity levelSPV.

3.2.7. ThreeTier Institutional Mechanism

1. Level 1 – Funding and Approving Authority

a) Ministry of Ports, Shipping and Waterwaysthrough Steering Cum Monitoring Committee

The Ministry of Ports, Shipping and Waterways shall act as the nodal ministry and approving authority for projects under this scheme.

A Steering-cum-Monitoring Committee (SMC) shall be constituted at MoPSW to provide overall policy direction and high-level coordination for the implementation of water metro projects under the scheme. The committee shall review various aspects of planning, approve project proposals and monitor the progress of implementation to ensure alignment with the scheme objectives. The SMC shall also facilitate interministerial coordination and resolve issues impacting project execution.The following shall be the composition of the Steering cum Monitoring Committee.

Table 1- Composition of the Steering cum Monitoring Committee

S. No.	Members	Role

S. No.	Members	Role
1	Secretary (MoPSW)	Chairperson
2	Additional Secretary & Financial Adviser (MoPSW)	Member
3	Chairman, IWAI	Member
4	Joint Secretary (MoPSW)	Member
5	Representative from Ministry of Railways (Not below the rank of Joint Secretary)	Member
6	Joint Secretary (DEA)	Member
7	Joint Secretary (MoHUA)	Member
8	Joint Secretary (DoE)	Member
9	Advisor, NITI Aayog	Member
10	Director (Special Initiatives)	Member Secretary

- The project may be developed via 4 models detailed in Section 3.4. Based on the model, Centre Government shall provide 50% of the funds for the EPC component of capital expenditure (for each project) and/or 50% of the Viability Gap Funding (VGF) for PPP component of the capital expenditure (for each project).
- Notify the scheme, the scheme guidelines and invite States to participate.
- Notify the establishment of technical committee (to be proposed by IWAI).
- Provide overall policy guidance and ensure alignment with national objectives.
- Fast track national level clearances and approvals required for projects.

b) State Government

- The project may be developed via 4 models detailed in Section 3.4. Based on the model, State Government shall provide 50% of the funds for the EPC component of capital expenditure (for each project) and/or 50% of the Viability Gap Funding (VGF) for PPP component of the capital expenditure (for each project).
- State Government shall provide Viability Gap Funding (VGF) if required to the city level SPV for the operations of the water metro.
- It shall provide land (free of cost) and shall cover all costs incurred for acquisition of any additional land for development of water metro.

- The DPR on National Waterways (NWs) and Waterways other than National Waterways shall be preparedas per the mechanism detailed in (v) & (vi) of Section 3.2.1.
- Facilitate statutory clearances for city level SPV before the tendering of the project, including environmental and local permits.
- Direct the local authorities to coordinate with the city level SPV, IWAI, wherever required for successful planning and implementation of the water metro projects.
- Ensure integration with urban transport plans, CMPs and provide operational support where required.
- Plan for the last mile connectivity to all stations through feeders, Intermediate Public Transport (IPT) etc. It should also ensure connectivity to ease ingress and egress between the multiple modes.
- State Government shall also be responsible for Dredging and maintaining fairwaysfor projects on waterways other than National Waterways.

In case of cost escalation due to any reason over the Approved Project Cost, the state and central government shall share the additional cost equally to cover this gap. This shall not be applicable in case of PPP component of a project.

2. Level 2 – Nodal and Appraisal Agency

a) Nodal Agency - The Inland Waterways Authority of India (IWAI)

- IWAIshall serve as the nodal authority for water metro projects under this scheme.It shall be responsible for developing and enforcing technical standards and guidelines for water metro projects. This mandate includes formulating uniform specifications for vessels to ensure safety, reliability and operational efficiency.
- DPR on National Waterways (NWs) and Waterways other than National Waterways shall be prepared as per the mechanism detailed in (v) & (vi) of Section 3.2.1.
- It shouldensure that these project proposals adhere to the technical standards and guidelines prescribed under the scheme guidelines.
- IWAI shall also be responsible for Dredging and maintaining fairways for projects on National Waterways.
- IWAI shall empanel a set of consultants for preparing the DPRs.

- IWAI shall develop the scheme guidelines and submit it to SMC for approval. The approved guidelines shall be notified by MoPSW with approval from the hon'ble minister (MoPSW).
- IWAI shall propose the composition of technical committee, which shall be notified by MoPSW.

b) Project Appraisal Committee

A Project Appraisal Committee shall be constituted to evaluate and appraise the Detailed Project Reports (DPRs) and Proposals prepared under this scheme. The committee shall assess the technical and financial viability, compliance with scheme guidelines. The committee shall also review the alignment of the DPR/Proposal with national standards and policies. It should ensure that projects are economically viable, technically feasible, and operationally sustainable. It may also recommend modifications to improve efficiency, reduce costs, and enhance service quality.

S. No.	Members	Role
1.	IWAI Chairperson	Chairperson
2.	Member (Finance), IWAI	Member
3.	CE, IWAI	Member
4.	Director, MoHUA	Member
5.	Representative from Indian Register of Shipping	Member
6.	Subject Matter Expert 1	On invitation
7.	Subject Matter Expert 2	On invitation
8.	Subject Matter Expert 3	On invitation
9.	Member (Technical), IWAI	Member Secretary

Table 2- Composition of the Project Appraisal Committee

3. Implementation Agency

a) City levelSpecial Purpose Vehicle

- A city level Special Purpose Vehicle (SPV) shall be constituted jointly by the Central and State Government for the purpose of implementing the approved projects.
- City level SPV shall be responsible for development of the infrastructure either through EPC or Public Private Partnership (PPP) or Hybrid model (detailed in

Section 3.4) and operations of the water metro systems either in-house or through Operations and Maintenance Contract.

- The cost of the operations shall be borne by the city level SPV. In case any Viability Gap Funding (VGF) is required for either in-house or Operations and Maintenance Contract based operations of water metro, it shall be borne by the State Government.
- SPVmay allow the terminals to be used for cruise, recreational, boating and tourism purposes.
- Fare shall be determined by the SPV as per the applicable legal andregulatory framework.

A project monitoring agency may be hired to support IWAI, PAC and SMC to examine the proposals and for related administrative and documentation work.

3.3. Implementation Framework

3.3.1. Proposalto initiate the Water Metro Projects

- Proposals for Water Metro systems shouldbe supported by a comprehensive assessment of transport alternatives, comparing different modes to establish the suitability of Water Metro solutions for the identified corridor. In addition to the DPR, proposals are expected to include Techno-Economic Feasibility Report (TEFR) as part of DPR, socio-economic cost–benefit analysis, site and route assessment, land acquisition and rehabilitation requirements and plans, strategies for transit-oriented development (TOD), integration with other urban transport modes and lastmile connectivity plans and identification of potential nonfare box revenue streams to enhance long-term financial viability.
- This proposal shall also include consent and commitment from the State Government for the following:
  - Financial Commitments from respective State Governments
  - Land Acquisition & Land Availability.
  - Formation ofa Special Purpose Vehicle (SPV)
  - Environmental Clearances & Regulatory Approvals
  - Waterway Rights & Navigational Clearances.
  - Compliance with Central Government Guidelines.

3.3.2. Mechanism of Proposal Submission, Evaluation and Approval

- An MoU shall be signed between IWAI and respective State Government for each project. After signing the MoU,the DPR on National Waterways (NWs) and Waterways other than National Waterways shall be prepared as per the mechanism detailed in (v) & (vi) of Section 3.2.1.
- In both cases, State Government shall submit a proposal (including DPR) as per Section 3.3.1 of this schemeto IWAI.
- IWAI shall examine the proposal. In case proposal requires substantial modifications, IWAI may send the proposal to State Government to modify and re submit. In other cases, IWAI shall submit the proposal along with its recommendations to Project Appraisal Committee.
- Project Appraisal Committee shall examine and provide their recommendations to Steering cum Monitoring Committee.
- After the approval from Steering cum Monitoring Committee, the City level SPV shall be established by State and IWAI (Representative of Central Government).
- IWAI shall furnish the approved DPR to city level SPV for the implementation and operations of the water metro project.

3.4. Project Implementation and Operation Models

To ensure flexibility and efficiency in delivering Water Metro service, the scheme provides multiple implementation models. These models are designed to accommodate varying project complexities, operational requirements, and private sector participation levels. Each model specifies the approach for infrastructure development, operational management, and VGF/Subsidy requiredunder the scheme. The following options outline the implementation model options, enabling stakeholders to select the most suitable mechanism based on project conditions and strategic priorities. Model 1A&1B are considered EPC Model, Models2 and 3are considered PPP&Hybrid (EPC+PPP) models respectively.

- ***Model 1A – EPC based Infrastructure Development (including vessels) with In-house Operations***
  - ***Infrastructure Development:***EPC based development of infrastructure (including vessels). [Centre and State Government shall provide equal funding for the capital expenditure of the project]

- ***Operations and Maintenance:***Operations and maintenance to be undertaken by City level SPV.(operational VGF [if required] shall be borne by the State Government).

- ***Model 1B – EPC based Infrastructure Development (including vessels) with Operations and Maintenance Contract***
  - ***Infrastructure Development:*** EPC based development of infrastructure (including vessels). [Centre and State Government shall provide equal funding for the capital expenditure of the project]
  - ***Operations and Maintenance:*** Operations and maintenance to be undertaken through Operations and Maintenance Contract. (operational VGF [if required] shall be borne by the State Government).

- ***Model 2 – PPP for Infrastructure Development and Operations and Maintenance***
  - ***Infrastructure Development:***PPP-based development of infrastructure and Operations and Maintenance. Centre and state government shall provide equal funds for the Viability Gap Funding (VGF) for capital expenditureon the project. Operational VGF [if required] shall be borne by the State Government.

- ***Model 3 – SPV led Infrastructure Development with PPP for Vessels and Operations and Maintenance[6]***
  - ***Infrastructure Development:*** EPC based development of infrastructure. [Centre and State Government shall provide equal funding for the capital expenditure of the project]
  - ***Vessel Procurement&Operations and Maintenance:*** PPP contract for procurement and Operations and Maintenance. Centre and stategovernmentshall provide equal funds for the Viability Gap Funding (VGF) for Vessel Procurement. Operational VGF [if required] shall be borne by the State Government.

The State Government or IWAI may be given the authority to select the implementation model from the above 4 options.

[6] Under this hybrid model, central government will provide 50% of the cost of capital expenditure and 50% of the viability gap funding for the vessels.

3.5. Disbursement of the Central Government's share of funds for the Capital Expenditure of each project under the scheme

The disbursement shall be based on milestones. The detailed disbursement mechanism and the respective milestones shall be governed by the scheme guidelines.

4. Annexure 1 – Comparison between Traditional Metro and Water Metro Scheme

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
1.		**Passenger Carrying Capacity**	Designed capacity – 1.2 lakh per day Actual Ridership (2024) – 55,000 per day	Designed capacity – 1 lakh per day Actual Ridership – 6,000 per day
2.		**Cost Development per Km**	Rs. 204 Cr (considering Kochi Metro)[Typically Elevated - 200-400 Cr, Underground – Rs. 500-1,000 Cr]	Rs 14.10 Cr (considering Kochi Water Metro)
3.		**Cost of Development (per passenger per km)**	Rs.12.79 (considering Kochi Metro)	Rs. 1.78 (considering Kochi Water Metro)
4.		**Fare Per Passenger Per Km**	Rs. 3.00 (considering KochiMetro)	Rs. 4.44 (considering Kochi water Metro)
5.	**Financial**	**Debt: Equity Ratio**	60:40 (typical) In PPP models, it varies as per the agreement between the SPV and the Concessionaire (15% debt in case of Delhi airport metro)	No Debt, only equity by Centre and State Government
		Equity (Centre: State)	1. **Typical Model -**50:50 (across Delhi, Mumbai, Chennai) 2. ***Kolkata Metro Model*** - a) 100% funding by Centre	50:50

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
			(Ministry of Railways) for N-S Corridor. *b)* 74:26 for E-W Corridor **3. 100% funding by State Government** (Jaipur Metro) **4. PPP models –** a) Delhi airport lines – 39% by Centre + State, 46% Private (rest is debt) b) Hyderabad Metro – 40% by Centre + State, 60% by private c) VGF Model – (Centre govt : 20% of the Total Project Cost, State Government: 20 % of the project Cost)	
		Debt	60% from Multilaterals (typical)	• No Multilateral Debt for project financing. • Reason: Lower project cost

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
				(compared to metro projects) + High Revenue Risk + Lower Non-Fare Box Revenue (as the case in Kochi Metro) leads to higher chances of debt repayment default by SPV+ State creating additional liability for the Central Government.

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
		Revenue Maximization Measures	**1. Commercial and Real Estate Development** • Station Retail & Kiosks • Property Development • Transit-Oriented Development (TOD) **2. Advertising and Branding** • Station Naming Rights • Train & Infrastructure Branding • Digital Advertising **3. Asset Monetization & Infrastructure Leasing** • Leasing space for optics fiber in tunnels • Mobile Towers and ATMs **4. Service Diversification** • Consultancy services for developing other metros • Last-Mile Connectivity • Value Capture Financing (VCF)	**(From Kochi water metro Experience)** **1. Commercial Space Leasing:** • The High Court terminal currently has a seasonal book kiosk and two refreshment outlets. • KWML is actively in the process of renting out commercial spaces, with terminals at High Court, Vyttila, Kakkanad, and Vypeen having a combined nearly 39,000 sq. ft. of leasable space available. **2. Advertisement inside water metro.** The scheme does not restrict the measures to be only the ones applicable to Kochi metro.
	Institutional Mechanism		***1. Ministry of Housing & Urban Affairs (MoHUA)*** • Frames metro rail policy and	***1. Ministry of Ports, Shipping and Waterways (MoPSW)*** • Frames water metro policy, scheme

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
			guidelines. • Appraises Detailed Project Reports (DPRs) and recommends projects for approval. • Coordinates with Department of Expenditure, NITI Aayog, and Union Cabinet for funding clearance. **2. Nodal Agency** • The SPV/State agency is the nodal equivalent in the metro rail projects. • Prepares the DPR after in principle approval of the project by MoHUA SC. ***3. Technical Committee*** • Appraises the DPRs for final approval.	and subsequent scheme guidelines. • Constitute SMC, which provides approval for the DPRs. **2. Nodal Agency** • IWAI will be the nodal agency under the scheme. • *For National Waterways:* ▪ *Prepares the DPR.* • *For Waterways other than NWs:* ▪ *State government prepares the DPR or request IWAI to prepare the DPR.* • *Standardization of the vessel specifications and related activities.* ***3. Project Appraisal Committee*** • Appraises the DPRs for final approval for both NWs and waterways other than NWs. ***4. Implementing agency***

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
			4. Implementing agency • SPV is the implementing agency	• For NWs and waterways other than NWs, SPV is the implementation agency
	Implementation Mechanism		**1. In Principle Approval for Project** • MoHUA provides the in-principle approval for the project and preparation of the DPR. **2. Preparation of the DPR** • The SPV (e.g DMRC, BMRCL, KMRCL) prepares the DPR. • The DPR is submitted to Technical Committee (with consultants) at MoHUA. **3. Approval of the DPR** • Technical Committee reviews the DPR, ensuring compliance with policy, urban transport plans like CMP etc., technical standards, and financial viability. • After approval of the technical committee, MoHUA submits the	**1. In Principle Approval for Project** • SMC provides the in-principle approval for the project and preparation of the DPR. **2. Preparation of the DPR** • *For National Waterways:* ▪ *IWAI Prepares the DPR.* • *For Waterways other than NWs:* ▪ *State prepares the DPR or request IWAI to prepare the DPR.* **3. Approval of the DPR** • Project Appraisal Committee shall submit the DPR to SMC for final Approval. • After Approval, SPV shall be established for implementation and operations. • The operations model: ○ Model A – EPC based

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
			DPR to DoE and Niti Ayog (for policy compliance) for approval. • Prior to approval by DoE, Niti Ayog, the DPR is submitted to the Union Cabinet for approving project funding, including equity, grants, viability gap funding, and sovereign guarantees • Implementation by the respective SPV after approval of the DPR through various models. • Operations by the SPV.	Infrastructure Development (including vessels) with In-house Operations ○ Infrastructure Development: EPC based development of infrastructure. ○ Operations and Maintenance: Operations and maintenance to be undertaken by City level SPV. ○ Model B – EPC Based Infrastructure Development (including vessels) with Operations and Maintenance Contract based Operations ○ Infrastructure Development: EPC based development of infrastructure. ○ Operations and Maintenance: Operations and maintenance to be undertaken through Operations and Maintenance

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
				Contract. ○ Model C – Integrated PPP for Infrastructure Development (including vessels) and Operations and Maintenance Contract based Operations ○ Infrastructure Development: PPP based development of infrastructure with Viability Gap Funding under the scheme by the Central Government. ○ Operations and Maintenance: Operations and maintenance to be undertaken through Operations and Maintenance Contract. ○ Model D – SPV led Infrastructure Development with PPP for Vessels and Operations and Maintenance Contract based Operations

S. No	Parameter	Sub Parameter	Traditional Metro	Water Metro
				○ Infrastructure Development: EPC based development of infrastructure. ○ Vessel Procurement: PPP contract for procurement. ○ Operations and Maintenance: Operations and maintenance to be undertaken through Operations and Maintenance Contract.

5. Annexure 2 - Kochi Water Metro Project

A. Background

To revive and modernize Kochi's traditional water-based transport system and to connect 16 islands to the mainland, the Kochi Municipal Corporation initiated a pre-feasibility study with support from the Asian Development Bank (ADB) in 2011. The project later took a transformative turn when it was handed over to Kochi Metro Rail Ltd. (KMRL), leading to the creation of the Kochi Water Metro, an innovative, sustainable, and integrated urban water transport system.

The project aims to improve connectivity for island communities, promote socio-economic development, and enhance tourism. It envisions 15 routes connecting 10 islands over a 76 km network, supported by a fleet of 78 fast, electric–hybrid ferries operating across 38 jetties.

B. Current Status

- The Kochi Water Metro was planned as a comprehensive, city-wide integrated water transport network featuring 15 routes, 38 modern terminals, and a fleet of 78 electric-hybrid boats, connecting 10 islands across a 76 km corridor within the Vembanad backwaters.

- It is currently operational on multiple routes using 20 state-of-the-art electric hybrid boats, covering 28 km, and has already served 5.5 million passengers.

- When fully developed, it will form one of the world's largest organized electricboat urban transit systems, with terminals designed on the lines of metro stations, floating pontoons for universal accessibility, and seamless intermodal integration with Kochi Metro, buses, and other urban mobility services.

- This extensive infrastructure is intended to provide reliable, sustainable, and efficient connectivity across Kochi's island communities while significantly reducing congestion and supporting inclusive socio-economic development.

- Once fully operational, Kochi Water Metro will be the world's largest fleet of electric boats in an organized urban water transport system, setting new benchmarks for sustainable and efficient mobility.

- The Kochi Water Metro illustrates how sustainable, accessible, and modern water transport can transform urban mobility and inspire similar systems across India and beyond.

C. Operational and Financial Brief

Kochi Water Metro Limited (KWML) is a Special Purpose Vehicle (SPV) with 74% equity held by the Government of Kerala and 26% by Kochi Metro Rail Limited. KWML commenced commercial operations on 26 April 2023 and currently operates 20 electric passenger boats (100-passenger capacity) across 12 terminals on 6 routes.

During the initial operational year (2023–24), the system recorded a ridership of 18,44,375 passengers, which increased to 21,03,149 in 2024–25. The ridership for 2025–26, up to December 2025, is 18,12,636. Ticket revenue increased from Rs.4.13 crore in 2023–24 to Rs.8.13 crore in 2024–25. For 2025–26 (up to December), the ticketing revenue stands at Rs.7.98 crore.Non-farebox revenue stood at Rs.5.16 lakh in 2023–24, Rs.50.65 lakh in 2024–25, and Rs.38.49 lakh up to December 2025.

As per Clause 5.15 of the Memorandum of Understanding signed on 1 June 2021 between the Government of Kerala and Kochi Metro Rail Limited, the Government of Kerala shall provide Viability Gap Funding (VGF) to cover all operational losses of KWML. The Government shall also provide interest-free funding for system expansion, capital expenditure, replacements, unplanned maintenance, working capital support, and other operational requirements.

The year-wise performance, operational losses, and VGF received are summarised below:

(in Rs. Crore)

Particulars	2022-23	2023-24	2024-25	2025-26(till Dec 2025)	Total
Ridership (Nos)	0	18,44,375	21,03,149	18,12,636	57,60,160
Fare box revenue	0	4.18	8.14	7.98	20.30
Non-Fare box revenue	0.11	0.06	0 .57	0 .39	1.13
Total Revenue	0.11	4.24	8.71	8.37	21.43
Total Operational Expense	3.26	11.32	13.76	11.15	39.49
Operational Loss	3.15	7.08	5.05	2.78	18.06
Viability Gap Fund received	0.00	5.94	4.65	5.60	16.19

The current fare structure was approved by the Government of Kerala based on recommendations from IIM Kozhikode, ensuring affordability for the public while maintaining financial sustainability. Since KWML began operations on 25 April 2023, the per-kilometer fare remains the highest among public transport modes, including those operated by the State Water Transport Department.

An internal committee evaluated measures to enhance both fare and non-fare revenue. Based on its recommendations, surge pricing was introduced on 1 December 2024 for weekends, public holidays, festivals, and vacation periods, targeting tourist commuters. Surge pricing was also applied to boat hiring services, with an increase of approximately 26% during peak tourism periods.

6. Annexure 3 –Tentative Cost Break Up of a Water Metro Project

The following costs have been received in the Technical Feasibility Reports exercise undertaken by IWAI. The budget of the Central Assistance has been calculated based on these costs.Only the capital expenditure component has been covered in the table below as the centre government is funding only the capital expenditure under this scheme.

Step 1 – Calculation of the Average capital cost of projects considering 18 cities.

S. No.	Component	Unit	Patna (INR Cr)	Units	Srinagar (INR Cr)	Units	Guwahati (INR Cr)	Units	Varanasi (INR Cr)	Units	Average Project Cost (INR Cr)	Total Project Cost (INR Cro) for 18 cities
1.	Terminals	Per Terminal	127	10	75	17	76	10	126	8	101	1,814
2.	Development of Access Road and NMT		-		-		45	12	-		11	203
3.	Floating pontoons, Gangway, Fenders	No	155	10	62	34	390	26	210	14	204	3,674
4.	Operation Control Center	No	7	1	55	2	7	1	20	1	22	404
5.	Fuel Jetty	No	2	1	4	2	2	1	2	1	3	50
6.	Night Parking jetty	No	2	1	2	2	4	1	4	1	3	54
7.	Boat Yard	No	25	1	70	2	26	1	26	1	37	659
8.	Boat Charger terminal side infra facilities	LS	7	1	7	2	37	14	21	8	18	324
9.	Dredging	Cum	30	6,75,000	51	11,27,541	2	54,000	37	8,15,500	30	542
10.	Studies investigations	LS	3	1	5	2	3	1	3	1	4	59
11.	Model Study	LS	1	1	1	2	1	1	1	1	1	14

A	**Total Civil Infrastructure Cost**		**359**		**332**		**593**		**450**		**434**	**7,797**
	20 pax	No	-		74	21			-		19	331
	50 pax	No	-		54	9	-		-		14	243
	100 pax	No	294	21	24	3	380	19	150	6	212	3,816
	Emergency Response cum Work Boat	No	7	1	14	7	7	1	7	**1**	9	158
	Dredger	No	7	1	-		7	1	7	**1**	5	95
B	**Total Marine Infrastructure Cost**		**308**		**166**		**394**		**164**		**258**	**4,642**
	Intelligent Transport System	LS	10	1	30		10		10		15	270
	Navigational aids	LS	1	1	3		1		1		2	27
C	**Total Navigational Infrastructure Cost**		**11**		**33**		**11**		**11**		**17**	**297**
	Essential Equipment and Furnitures	LS	-		-		1		-		1	12
	Signage's	LS			-		4		-		2	32
	Security and surveillance	Per Terminal	-		-		-		-		-	6

	Development of Electric Feeders, Bicycle sharing and Walkways	LS	10	1	20		10		10		13	225
D	**Total Sustainable Initiatives Cost**		**10**		**20**		**15**		**10**		**16**	**276**
	Grand Total (A+B+C+D)		**688**		**551**		**1,013**		**635**		**723**	**13,011**
	Contigency 3%		21		17		30		19		22	403
	General Charges 5%		34		28		51		32		37	672
	Total Capital Cost		**743**		**595**		**1,094**		**686**		**783**	**14,085**
	State and Central Taxes		88		127		128		81		106	1,908
	Completion cost & IDC		77		77		113		71		85	1,526
	Total Completion Cost (INR Crore)		**908**		**799**		**1,335**		**838**		**973**	**17,519**
	Ridership (Nos)		**8,818**		**11,689**		**8,336**		**14,700**			
	Route Length (km)		**45**		**61**		**64**		**12**			

Step 2 - The Cost of contingencies, tax and IDC have been divided equally in 4 components under the scheme i.e. [A,B,C,D]

Component		Total Cost (INR Crore) [1]		General + Contingency+ State& Central Tax + Completion cost &IDC (this cost has been divided equally in all components head of the Project) (INR Crore) [2]		Total Cost (INR Crore) [1] + [2] = [3]		Share of the Cost
Civil Infrastructure		7,797		1,127		8,924		51
Marine Infrastructure		4,642		1,127		5,769		33
Navigational Infrastructure		297		1,127		1,424		8
Sustainable Development		276		1,127		1,402		8
Total (In INR Cr)		**13,011**		**4,508**		**17,519**		**100**

Step 3 – 2 components i.e.Project Support Team (@3% of total cost) and Capacity Building (@5% of total cost) have been added under the scheme.

Component		Total Cost (INR Crore) [1]		General + Contingency+ State& Central Tax + Completion cost &IDC (this cost has been divided equally in all components head of the Project) (INR Crore) [2]		Total Cost (INR Crore) [1] + [2] = [3]		Share of the Cost
Civil Infrastructure		7,797		1,127		8,924		48
Marine Infrastructure		4,642		1,127		5,769		31
Navigational Infrastructure		297		1,127		1,424		8
Sustainable Development		276		1,127		1,402		8
Project Support Team		390				403		2
Capacity Building		651				672		4
Total		**14,052**		**4,508**		**18,594**		**100**

Step 4 – The share of the Central Government shall be only 50% of the total capital expenditure.

Component		Total Cost (INR Crore) [1]		General + Contingency+ State& Central Tax + Completion cost &IDC (this cost has been divided equally in all components head of the Project) (INR Crore) [2]		Total Cost (INR Crore) [1] + [2] = [3]		Share of the Cost
Civil Infrastructure		3,898		563		4,462		48
Marine Infrastructure		2,321		563		2,884		31
Navigational Infrastructure		149		563		712		8
Sustainable Development		138		563		701		8
Project Support Team		195				195		2
Capacity Building		325				325		4
Total		**7,026**		**2,254**		**9,280**		**100**