

Potential for Ferry Enabled Sustainable Urban Growth in India

LAST MILE CONNECTIVITY WITH URBAN WATER TRANSPORT

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Drivers For Transit Oriented Growth of Indian Cities

Migration to Employment Centers

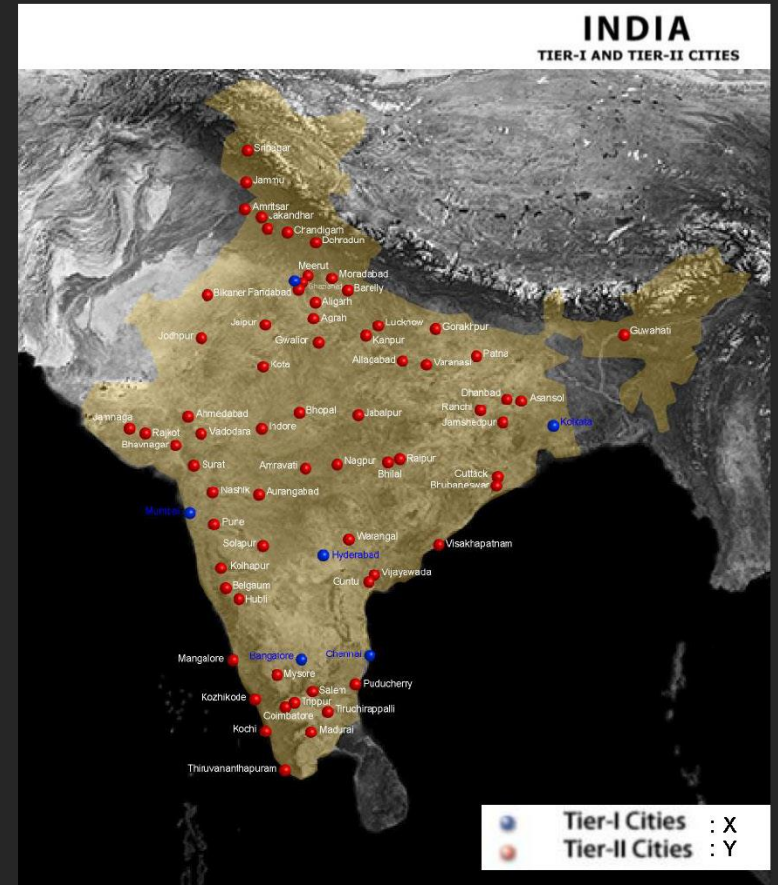
- In 2019, approximately 34% of the total population in India lived in cities.
- 4% increase of urbanization in the last decade
- Migration away from rural areas to find employment in cities.

High Utilization of Intermodal Transit in Tier 1 and Tier 2 Cities

- High Volume Low Cost Transit required
- Modal Efficiency Required: On average 7-12% of Work Day spent on Travel to work

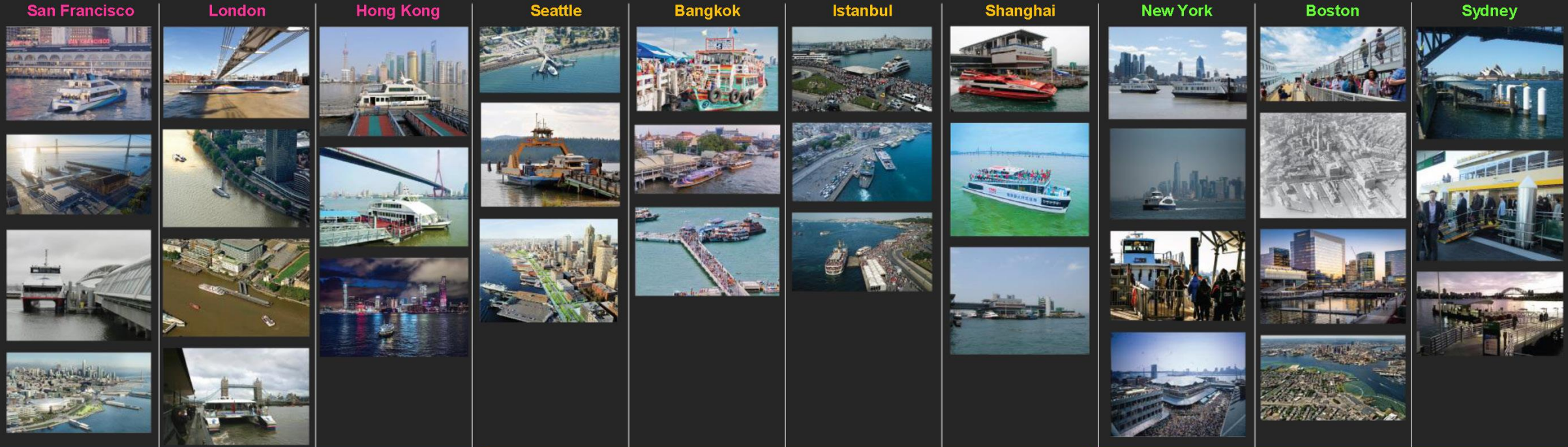
Underserved Rural and Peri-Urban (Tier 3 Towns)

- Improved Access to Markets and Government Services
- Potential future ferry locations are places currently underserved by public transport.
- New transit must support socio-economic travel patterns and needs where transit is to be supplemented.



IWT and Urban Development: Interplay of Context and Policy

STAGES OF INTEGRATION



1 Settlement Determined

- Plan driven
- IWT leads Expected Demand
- “Build and they will Come”
- Success dependant upon Diversion Rate & Ridership Stabilization period

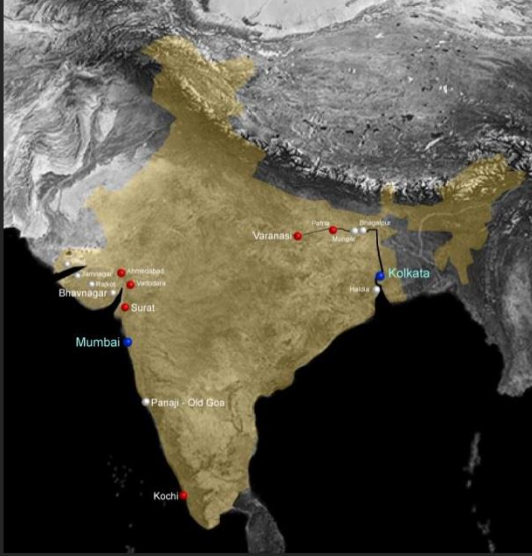
2 Modal Integration

- Connect Landside Infrastructure & IWT
- Increase Transit Capacity
- Shared Ticketing and Schedules
- Frictionless Transfer between modes
- Existing Landuse & Transit Integrated gradually

3 Induced Redevelopment

- Timed with Redevelopment Investments
- PPP Potential
- Sharing of Cost and Benefits
- Value Capture Mechanism supports Infrastructure Financing

Emerging Models from Successful Phase 1 Initiatives:



CONTEXT

INTEGRATION CHARACTERISTICS

1. Hazira/ Dahej- Gogha Ro-Ro Service (South Gujarat - Saurashtra)	City- Regional Hinterland	Settlement Led (RoRo)	Modal Integration (Ro-Pax)	
2. Panjim - Vasco	City- Regional Hinterland	Modal Integration (Ro-Pax)	Settlement Led (Tourism Led)	
3. Mumbai - Navi Mumbai	Intra- Metro	Settlement Led (Tourism Led)	Modal Integration (Ro-Pax)	Induced Urban Development
4. Kochi	Intra- City	Settlement Led (Tourism Led)	Modal Integration (Metro/ Pax/ Ro-Pax) (Ridership Enhancement)	
5. Kolkata	Intra- Metro	Settlement Led (Tourism Led)	Modal Integration (Metro/ Pax/ Ro-Pax)	
6. Varanasi	Intra City	Settlement Led (Tourism Led)	Modal Integration (Ro-Pax)	

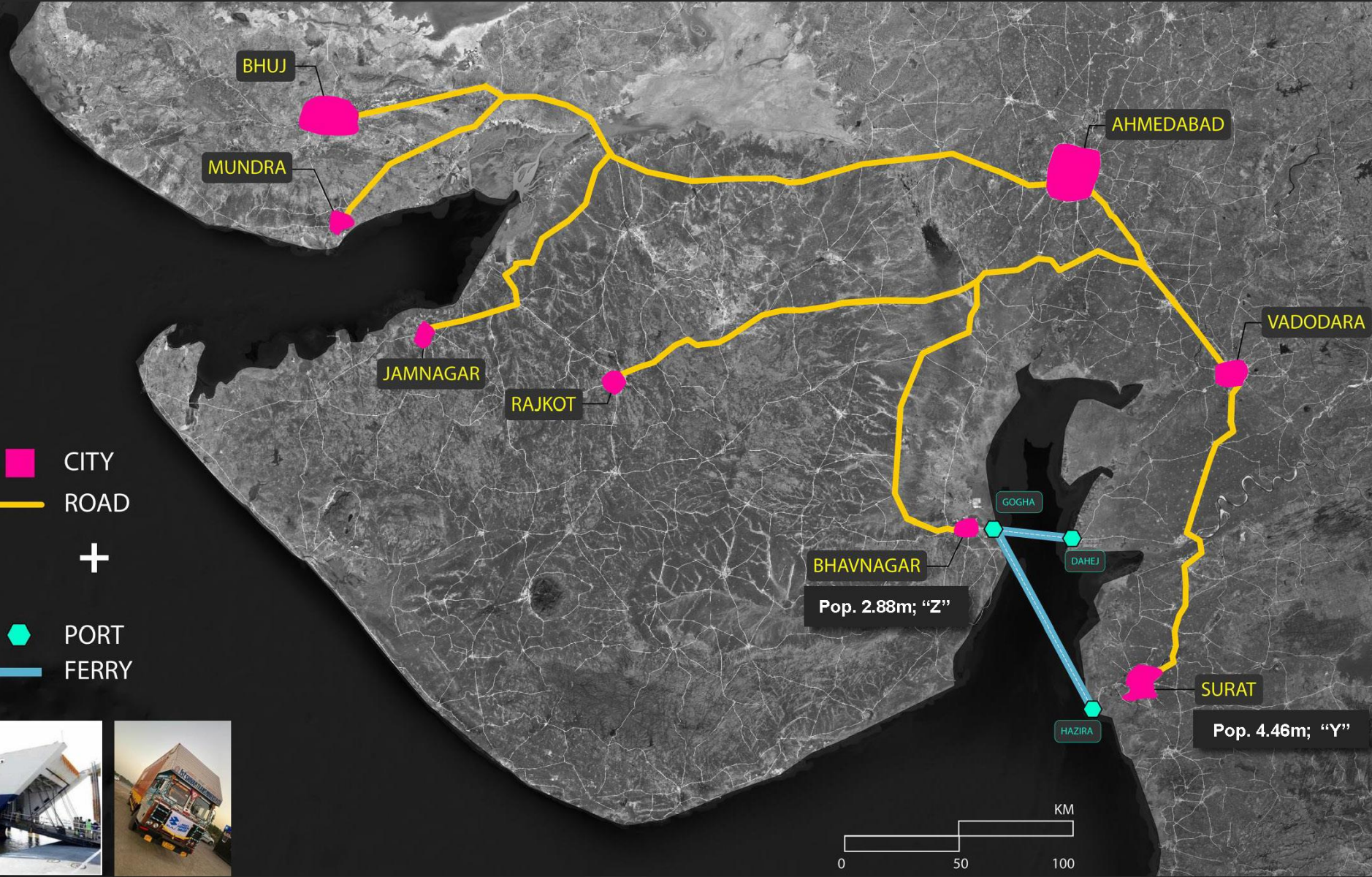
1 Gogha-Hazira Ro-Ro/ Ro-Pax

Competitive Regional & Peri-urban Growth Nodes

Hazira- GO Ferry Service inaugurated by PM in Nov 2020

- Construction of community jetties and freight terminals may be considered which would be aligned with the Ro-Ro/ Ro Pax terminals. **This was proposed with a vision to increase footfall from 145 million to 700 million by 2030 (India Maritime Vision 2030).**
- **90% Capacity utilization in first 3 months**

■ CITY
— ROAD
+
◆ PORT
— FERRY



Credit: GNS News



Credit: Ahmedabad Mirror



Credit: SDCL

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Gogha-Hazira Ro-Ro/ Ro-Pax

Balancing Ridership within Existing Price Structures

- **Operational Challenges** in Gulf of Khambat:
 - High Tidal Range (10m)
 - Strong Currents (4-5 knots)
- **Pricing Challenges:**
 - Government subsidized Road (Bus) and Train services
- **Financing Parity for Capital Efficient Mode:**
 - Private Investment Rs. 130 Crores
- **Low RoR:**
 - Eight Year payback period
- **High Compliance Costs :**

ALTERNATE TRAVEL COST (For 370 KM)

For Trucks			
	Diesel	Bio-Diesel	
Avg. of vehicle (12/14 Wheeler)	3.25	3.25	Km/Lit
Fuel Cost (Diesel)	86	65	INR/lit
Fuel consumed to travel 370 Kms	115	115	Litres
Fuel Cost	9,890	7,475	INR
Toll Expenses	1,500	1,500	INR
Vehicle Maintenance	555	555	INR @ 1.5 Rs/Km
Total Cost to Vehicle by road	11,950	9,530	INR

RIDERSHIP DIVERTED / ACHIEVED

Week (Monday to Sunday)	Passengers		Cars		Bikes		Trucks/Vehicles	
	(Capacity: 500)*		(Capacity: 85)*		(Capacity: 20)*		(Capacity: 30)*	
	Numbers	Percentage (%)	Numbers	Percentage (%)	Numbers	Percentage (%)	Numbers	Percentage (%)
21.12.2020 to 27.12.2020	5676	81.09%	997	83.78%	248	44.29%	263	69.58%
28.12.2020 to 03.01.2021	5458	77.97%	1021	85.80%	223	39.82%	242	64.02%
04.01.2021 to 10.01.2021	3905	60.08%	705	63.80%	161	30.96%	219	62.39%
11.01.2021 to 17.01.2021	5824	83.20%	962	80.84%	213	38.04%	353	93.39%
18.01.2021 to 24.01.2021	5540	79.14%	992	83.36%	203	36.25%	363	96.03%
25.01.2021 to 31.01.2021	5722	81.74%	973	81.76%	179	31.96%	303	80.16%
01.02.2021 to 07.02.2021	4985	71.21%	880	73.95%	156	27.86%	360	95.24%
08.02.2021 to 14.02.2021	5307	75.81%	920	77.31%	164	58.57%	381	90.71%
15.02.2021 to 21.02.2021	6327	90.39%	1104	92.77%	231	82.50%	362	86.19%
22.02.2021 to 28.02.2021	6045	86.36%	1021	85.80%	216	77.14%	349	83.10%
WEEKLY AVERAGE	5478.9	78.70%	957.5	80.92%	199.4	46.74%	319.5	82.08%

Source: Indigo Seaways Pvt. Ltd.v

TARIFF STRUCTURE

Heavy Vehicles:
Trucks, Buses

Sr. No.	Cargo Vehicle Type	GWT	New Final Tariff
1	14-wheeler	44 MT (36 +8)	9,200
2	12-wheeler	38 MT (36 +2)	8,300
3	16-wheeler	50 MT (36+14)	10,100
4	Empty Truck/Tanker	25MT	7,500
5	Empty Trailer	18 MT	8,000
6	Eicher/	12MT	5,000
7	Tractor/ Tractor with trolley	12MT	5,000
8	Pick Up Van/Chota Hathi	3MT	2,750

Passenger &
Two Wheelers

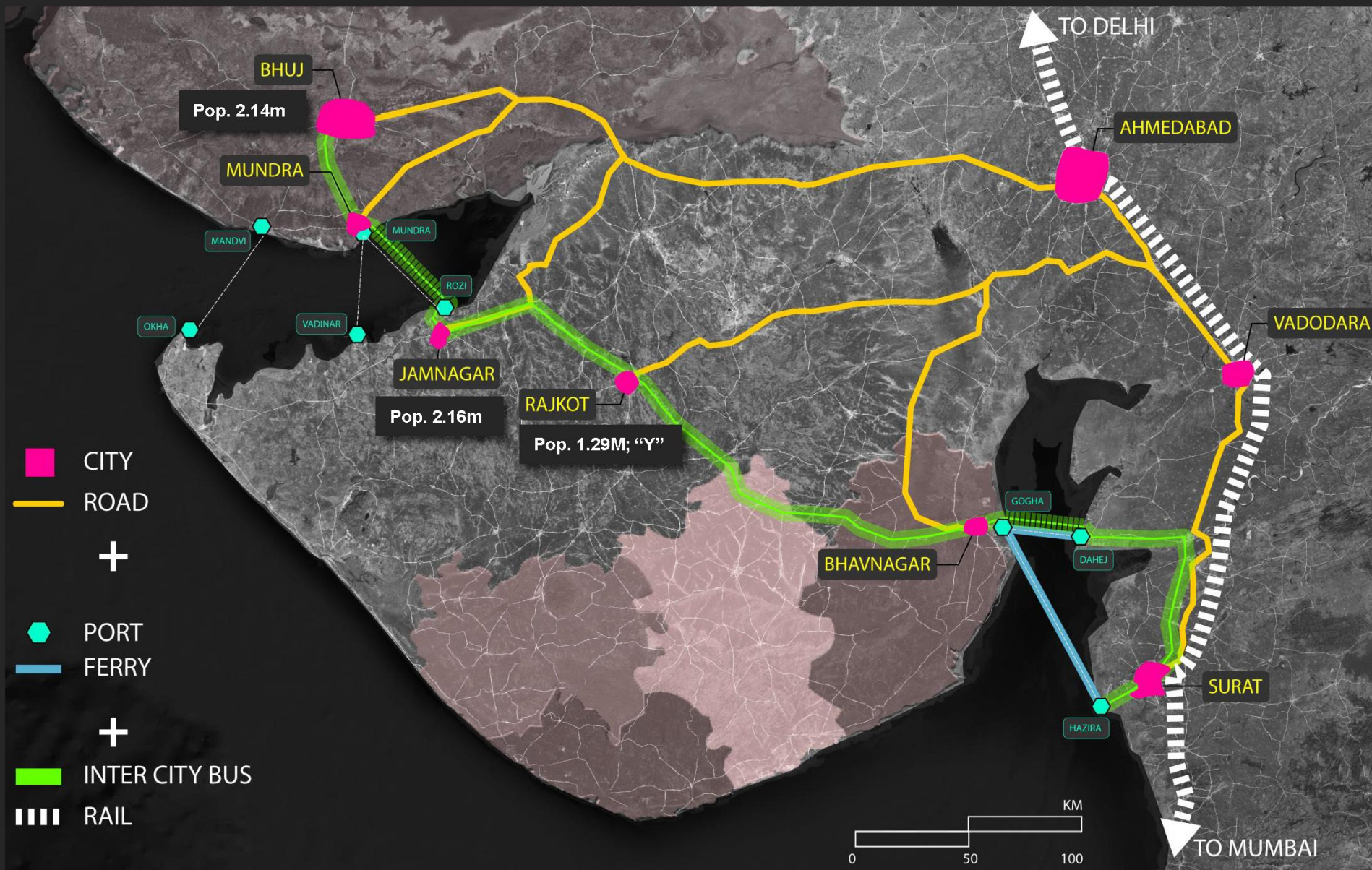
Sr. No.	Cargo Vehicle Type	New revised Tariff	
		Weekdays	Weekend
1	Passenger Executive	575	675
2	Passenger Business	775	875
3	Passenger Cambay Lounge	1500	1500
4	Cars	1300	1400
5	Bikes	300	300
6	Tempo Traveller	4500	4500

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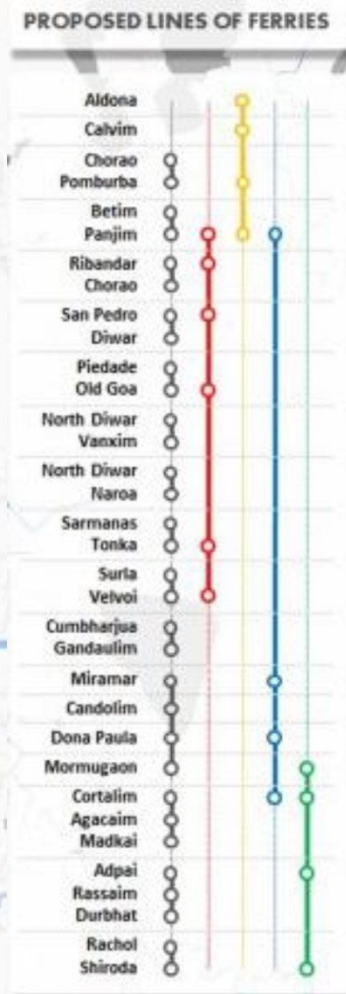
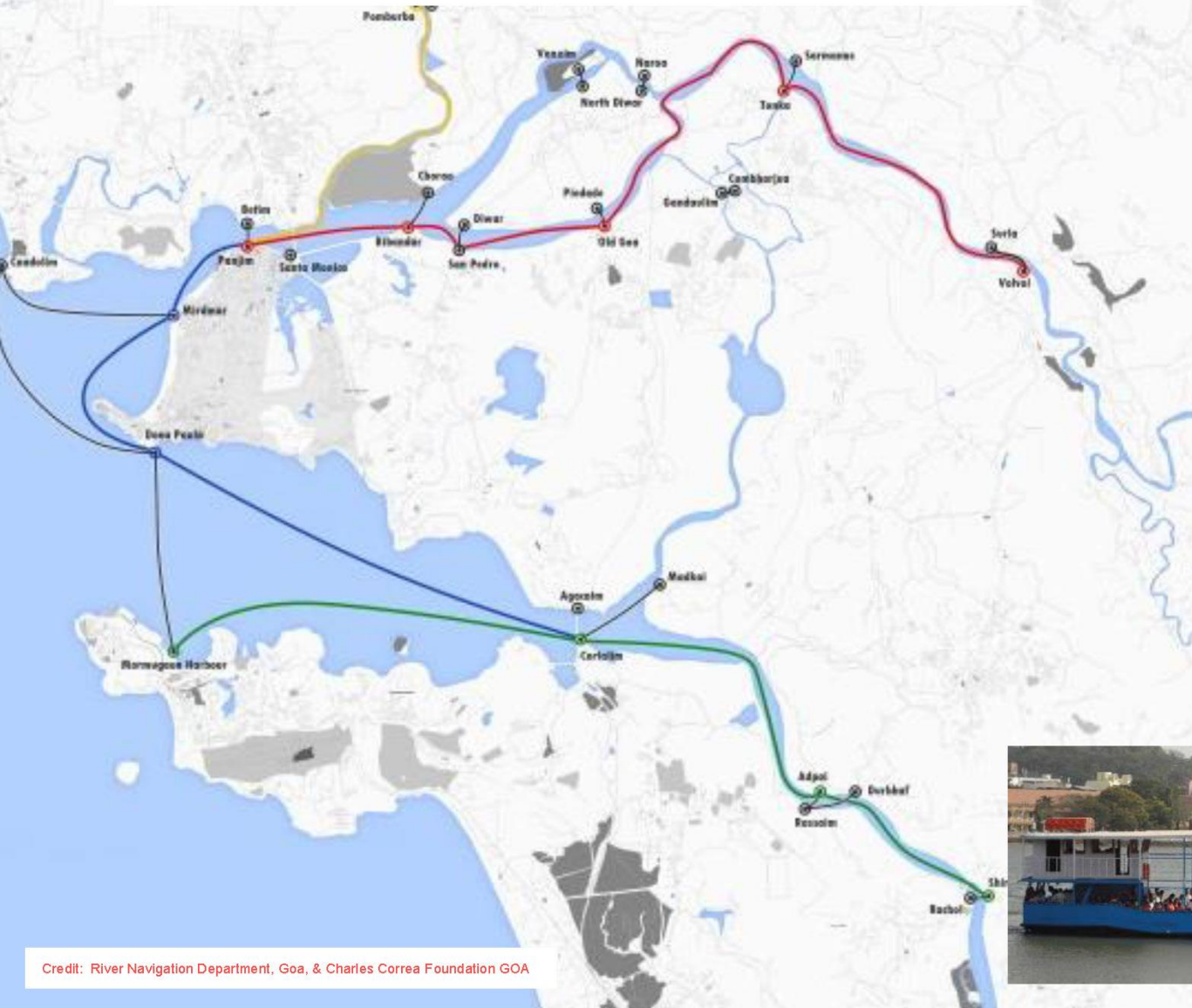
Gogha-Hazira Ro-Rof Ro-Pax Opportunity To Extend Regional Services

Incentivize Shared End to End Ro Pax Service (Ferry+ Bus+ Truck)

- Maximize Use of Existing Port Facilities to Scale Efficiently
- Support Weekday and weekend Travel to Optimize Capacity Utilization
- Install Joint Risk Mitigation Strategies
- Consider Performance Incentives such as :
 - Safety and Timeliness
 - Carbon Emissions Reductions
 - Reduced Congestion
 - Low Cost High Volume Operations
 - Partnerships amongst Operators of different Modes
 - Effective Frequent Traveller Programs
 - Real Time Scheduling and Ticketing



2 IWT Plan Goa: Hinterland Network Tourism & Airport



Multipurpose Fleet

State subsidized "Green" IWT

- Free 24 hour Pax Service
- Non Peak transport of Heavy Vehicles (8 ton max.)
- Ferry Hire for Special Purposes.

River Navigation Department Managed

- 20 Routes, 39 Boats (shallow draft)
- 250,000 Commuters & Tourists
- 18,000 Vehicles
- Fare Structure: Rs. 23- Rs 255 (based upon distance and tonnage)

EXTEND Riverine Transport Network

- On Navigable Rivers
- Ro-Pax (primary)
- Fast Ferry (non-core)



Credit: River Navigation Department, Goa, & Charles Correa Foundation GOA

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Mumbai – Navi Mumbai Opportunistic Growth Environment

Legacy Visitor Ferry Routes

- One Way Fare: Rs. 70- Rs. 150
- Public Landings / Private Vessel Operators

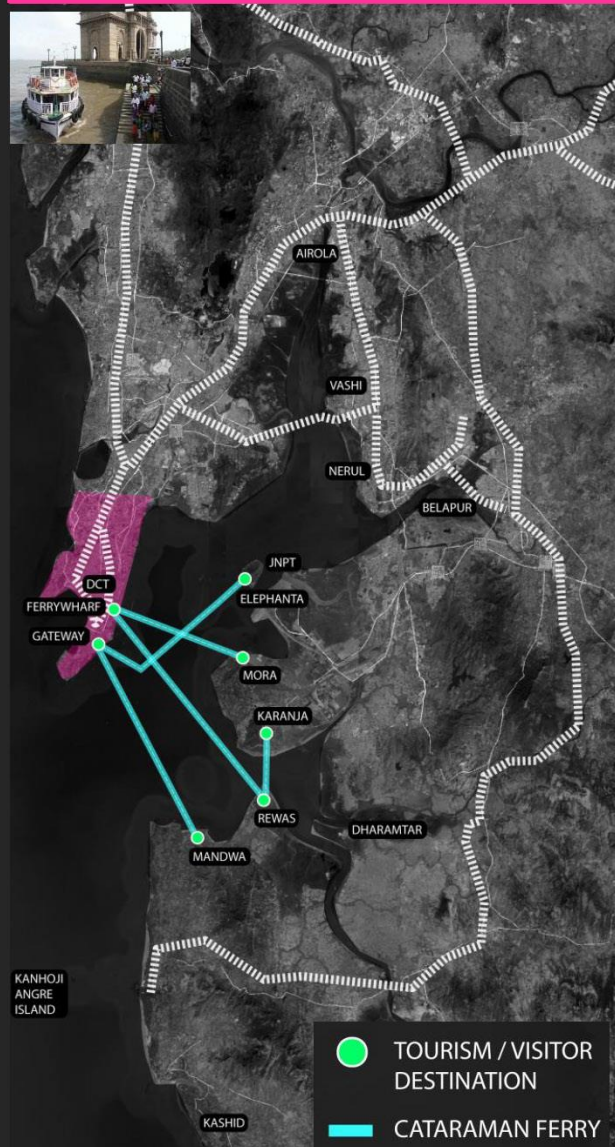
Private Ro-Pax Ferry services to Southern Shore

- Mumbai- Mandwa
- Cap. 500 Pax + 150 vehicles
- Alternate Crossing Savings: Distance 90 km ; Time: 4hr
- Base Fare (Return): Passenger:Rs. 600; Vehicle (SUV): Rs. 3200

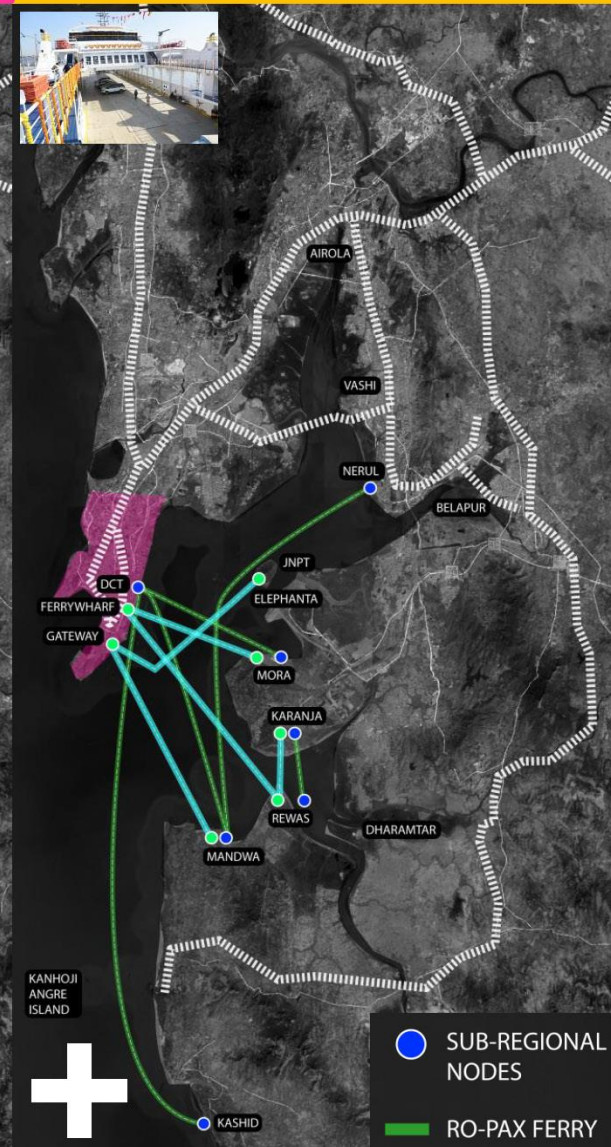
Public & Private Commuter Water Taxi services

- Scale Passenger Service requires High Frequency, Affordable, and Dependable Ferry Service
- Joint Reinvestment Revenue, possibly from Value Capture from Port Land Redevelopment
- Incentivize public and private operations with leased landing rights
- Tiered Services- High Speed, Regular, Ro-Pax, Multi Modal, Special Services (Events, Airport, etc.)
- Shared Risk Mitigation

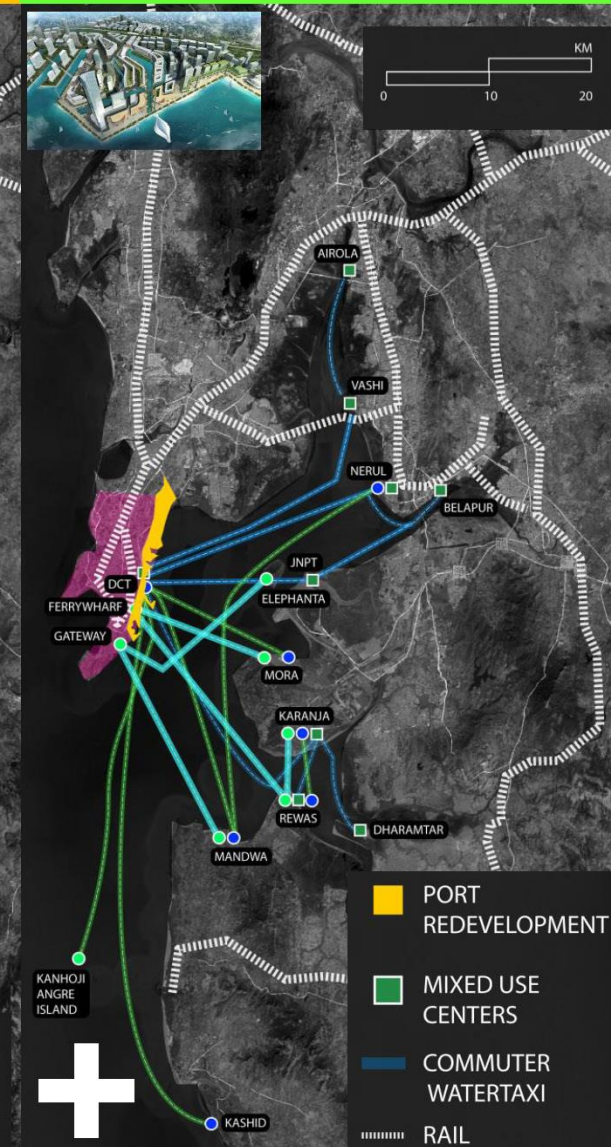
Settlement Led/ Tourism



Modal Integration (Ro-Pax)



Induced Urban Development



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Kochi Integrated Transport

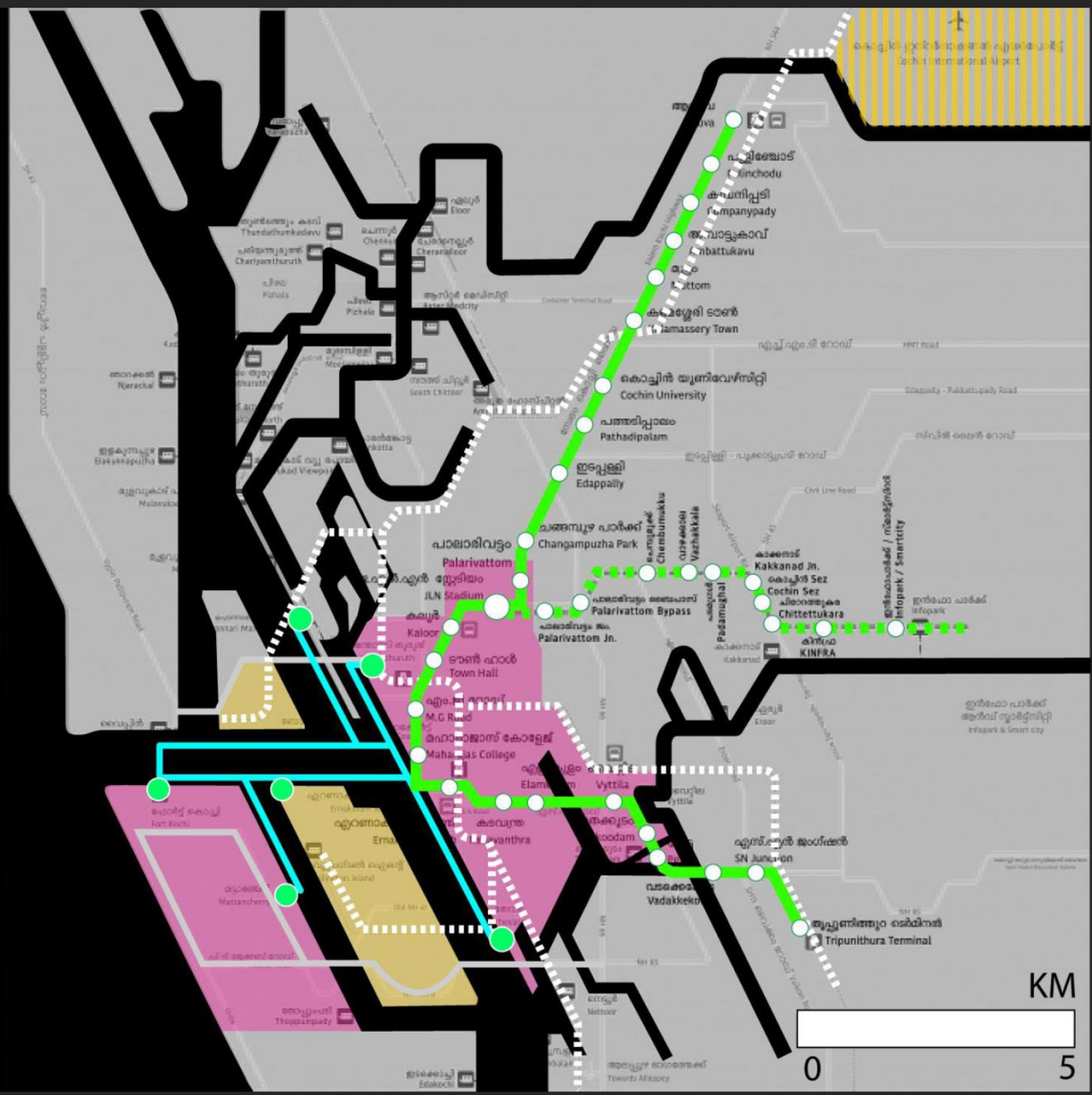
Tier 2 City
Pop. 6.4 m.

Kochi Metro: \$730m
(2004-2017);
22 Stations; 25 KM

8 Year Payback ;
Dependent upon Meeting
Ridership Projections

User Fee + Advertising
Revenue

-  HISTORIC CORE
-  TOURIST TERMINAL
-  VISITOR FERRY
-  PORT
- 
-  AIRPORT
-  METRO STATION
-  METRO RAIL
-  RAIL



5 Kolkata Ferry Gateways to Multimodal Hubs

Central Kolkata Reach

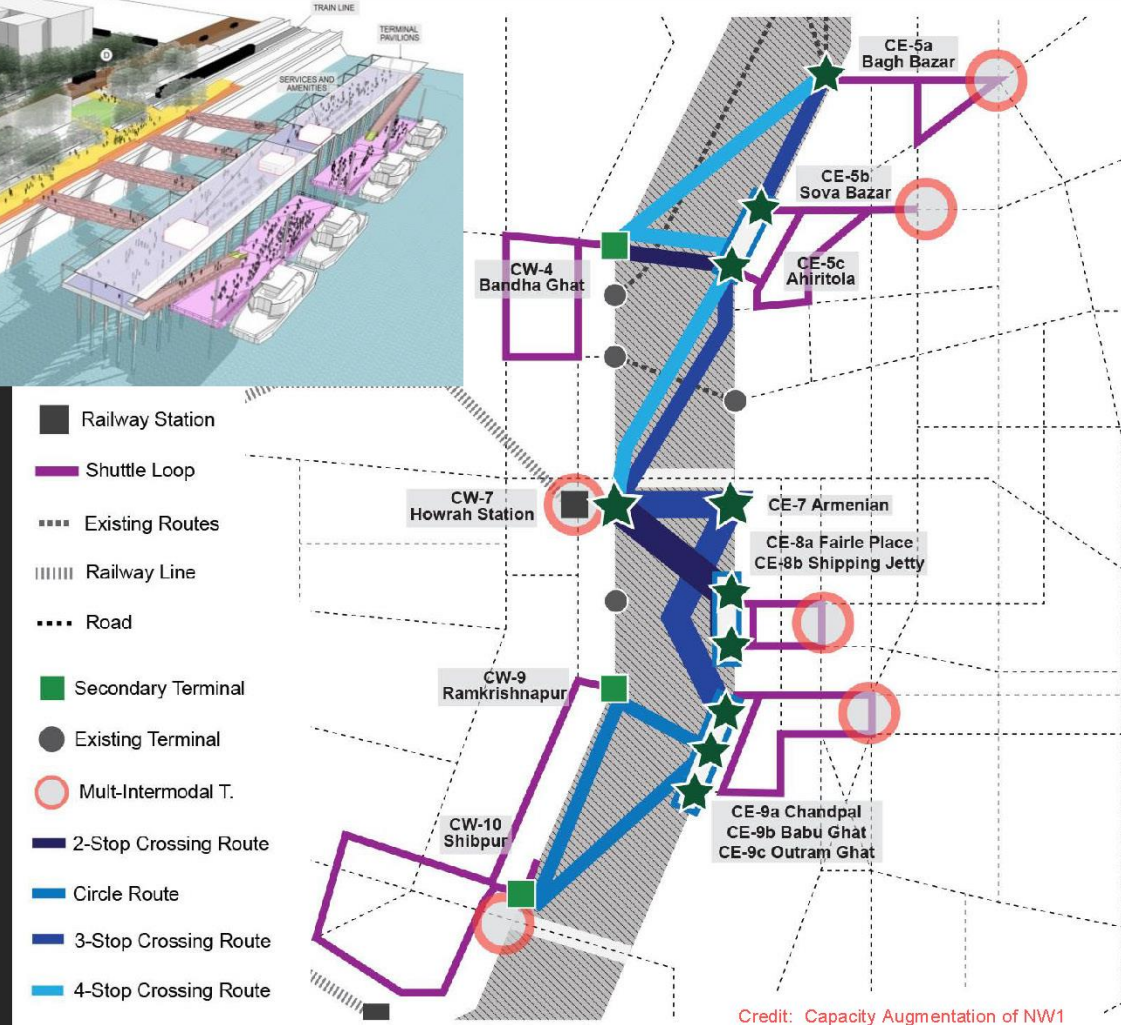
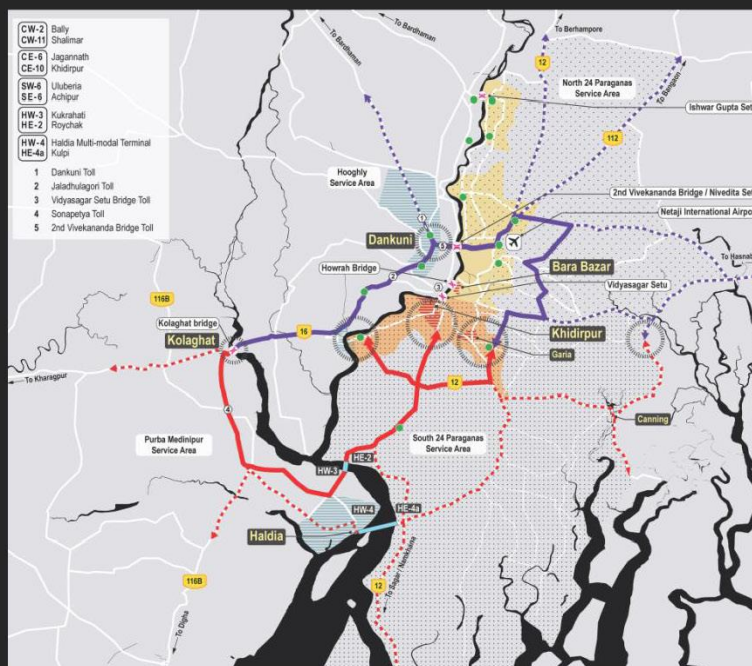
- \$110 m World Bank Financed Improvements
- Build Flexible Terminals after Ridership has stabilized



Primary Commuter Routes in Central Kolkata in Peak Hours

Improve Modal Efficiency by Replacing Road based transit with IWT

- WBTC- Common Management of Tram, Bus, Ferry, Shuttles
- Frictionless Transfer between Modes
- PathDisha: Real Time Scheduling and Zone Based PASS
- Organized Schedule through Manning Contracts for all 15 Routes
- Projected Monthly Ridership: 55 Lakhs Base Fare Rs. 6



Credit: Capacity Augmentation of NW1

Reserve Locations for Phased investments in Ro-Ro/Ro-Pax

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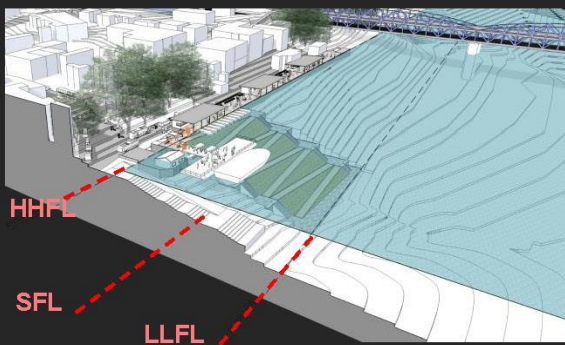
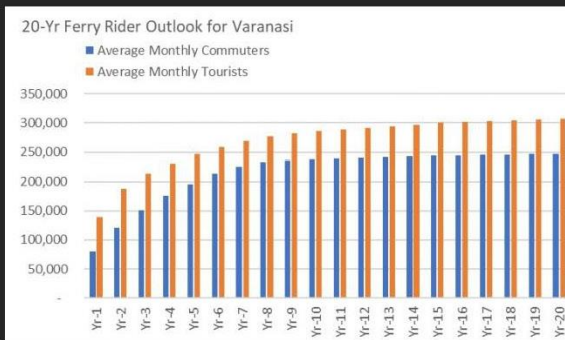
Varanasi Combined Tourist & Commuter Service

Recently Delivered Double-Decked Vessels built under PRASAD Program

- Commuter Fare subsidized by high value Tourist Tariff
- Projected Monthly Stabilized Ridership
 - Avg. Tourists 300,000
 - Avg. Commuter: 250,000

GHAT – HAAT –UPVAN Strategy

- For Resilient and Public Bank Edge
- Facilitate Year Around Use of Landings for Transit and Disaster Relief
- High flow and low water levels are expected to exacerbate due to Climate Change.





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