Jogighopa Multi Modal Logistics Park - Enhancing Logistics Efficiency in India

Draft Final Report

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Asian Development Bank

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Abbreviations

ADB	Asian Development Bank
AIDC	Assam Infrastructure Development Corporation
CAGR	compound annual growth rate
CBM	cubic meters
CFS	container freight station
CFST	Citizens Friendly Services of the Transport Department
CMV	Central Motor Vehicles
CONCOR	Container Corporation of India Limited
CPCB	Central Pollution Control Board
CWC	Central Warehousing Corporation
DGFT	Directorate General of Foreign Trade
EDI	Electronic Data Interchange
EIA	Environmental Impact Assessment
ELD	Electronic Logging Device
ETP	Effluent Treatment Plant
EXIM	export–import
FMCG	fast-moving consumer goods
FTL	full-truck load
FTWZ	Free Trade Warehousing Zones
FY	financial year
GDP	gross domestic product
GPS	Global Positioning System
GSDP	gross state domestic product
GST	Goods and Services Tax
GVW	gross vehicle weight
ICT	information and communication technology
IDD	Infrastructure Development Department
IWT	Inland Water Transport
Km	kilometer
LCL	less-than-container load
LEEP	Logistics Efficiency Enhancement Program
LPI	Logistics Performance Index
MMLP	Multi-Modal Logistics Park
MMT	million metric tonnes
MRO	Maintenance, repair and operations
MT	metric tonne
MTW	Motor Transport Workers Act
MoRTH	Ministry of Road Transport and Highways
NH	national highway
NHAI	National Highways Authority of India
ODC	Over Dimensional Cargo
PDUIF	Le Plan de Déplacements Ubains d'Île-de-France
PFT	private freight terminals
PPP	public–private partnership
RCI	Regional Cooperation & Integration
RTA	Road and Transport Authority
SASEC	South Asia Sub regional Economic Cooperation
SEZ	Special Economic Zone
SH	state highway
SPV	special purpose vehicle
STP	Sewage treatment Plant
TFS	Trade Facilitation Strategy
USD	US Dollar

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Executive Summary

A pre-feasibility study has been undertaken to assess prospects for setting up a Multi-Modal Logistics Park (MMLP) at a selected location in Jogighopa. This final report details the outcomes of the study. It has been prepared in consultation with key stakeholders, including relevant government officials, infrastructure development organizations, industry players and associations, logistics players, and transport associations.

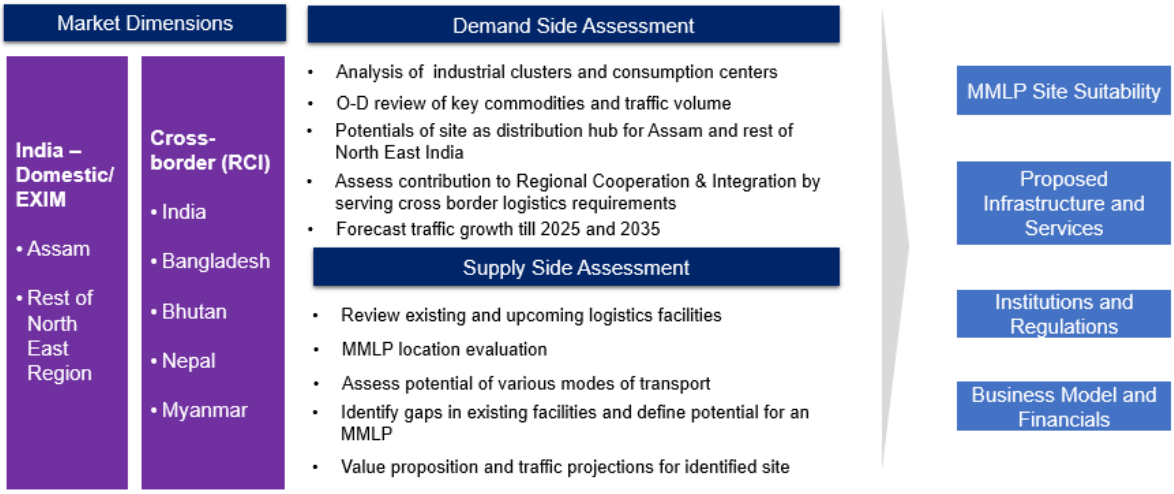
The pre-feasibility study covered the analysis of existing freight traffic patterns, logistics facilities and their capacities and the gaps in such facilities. Based on the primary interactions with stakeholders, the traffic potential for an MMLP in Jogighopa has been assessed and projected, along with the market share of container and bulk–break bulk cargo that such an MMLP facility may attract.

The proposed site has been assessed for its suitability to set up an MMLP by taking into account the available industrial base in the region, cargo potential in the catchment area, regional connectivity to the site, features of the site such as location, shape and access and ancillary infrastructure. The facilities to be provided in the MMLP have been recommended to fill the existing gaps and to align to the needs of the associated cargo profile. A draft layout plan of the MMLP has also been provided.

Based on cost estimates, the financial feasibility of the MMLP has been studied and potential business models have been recommended.

Guiding the overall MMLP study in Jogighopa is a framework that incorporates all various components of an efficient logistics park (Figure ES.1).

Figure ES.1: Study Framework for the MMLP in Jogighopa



Sources: ADB Framework for Developing MMLP, KPMG Analysis.

Demand Assessment

Assam is the most industrialized state of north east India and, with 70% of the population of the north east, is also a major consumption hub. Recent developments and policy initiatives are intended to explore the potential for industrial development, inducing freight generation and movement in Assam. These developments include North East Vision 2020, Advantage Assam, Act East Policy, investments in railway infrastructure, etc.

Guwahati serves as the distribution hub for the north east region, with cargo transported from the Indian mainland in large trucks, and transported to the rest of the north east in smaller trucks.

The total annual relevant freight market in the region is 11.96 MMT, with ~94% of the total market being domestic cargo. The domestic cargo is primarily bulk-break bulk cargo, and ~67% of the total relevant market is bulk-break bulk cargo transported by road. The detailed origin–destination (O–D) analysis of the key domestic bulk–break bulk commodities has been performed.

The region has proximity to neighbouring nations of India, including Nepal, Bhutan and Bangladesh. The region's connectivity to neighbouring nations creates the potential for regional cooperation & integration (RCI). Bilateral agreements between the nations in South Asia region illustrate the intent of the National Governments in the region to promote RCI. Land Customs Stations (LCS) are the gateways for transit of goods, services and people between India and the neighboring countries of Bhutan and Bangladesh, with major export commodities being coal and boulder stones.

The proposed MMLP site identified by Government of Assam is located close to Village Korea, near Jogighopa (formerly Ashok Paper Mills), currently owned by the Government of Assam. The land site is located ~150 km from Guwahati, and is on National Waterways 2. Apart from the industrial base and consumption centres around the region, the Jogighopa MMLP could also cater to the hinterland covering parts of Meghalaya, Arunachal Pradesh, Manipur and Nagaland.

The key container and bulk–break bulk commodities through the region have been identified and the commodity-wise traffic has been projected until FY25 and until FY35. The relevant cross-border bulk-break bulk in the region has been assessed and projected for a similar time period.

The total bulk-break bulk freight demand in terms of volume is projected to grow at a CAGR of 5.93% from 11.96 MMT in FY17 to 33.74 MMT in FY35. The total container market is projected to grow from 4,808 TEUs in FY17 to 7,925 TEUs in FY35, at a CAGR of 2.82%.

Supply Assessment

The only container handling facility in Guwahati is the CONCOR ICD in Amingaon. The other facilities that handle bulk-break bulk cargo are CWC facilities, Assam State Warehousing Corporation and the Indian Railways Goods Sheds. Of these facilities, CONCOR ICD handles container traffic by rail, and the Indian Railways Goods Sheds handle bulk-break bulk traffic by rail. The CWC facilities and the Assam State Warehousing Corporation facilities handle road-based bulk-break bulk traffic. Bulk-break bulk cargo in Guwahati is mostly transported through road and is catered to by un-organized warehousing and transportation players that are located along NH 27 in the southern portion of the city. There are limited organized facilities in the rest of north east India.

The planned expansion of organized facilities include expansion of the CWC facilities and the upcoming Tea Township and the ICD within its premises in Chaygaon.

Warehousing availability in Guwahati is limited, with high capacity utilization and limited possible expansion. There is a need for a warehousing hub outside the boundaries of Guwahati.

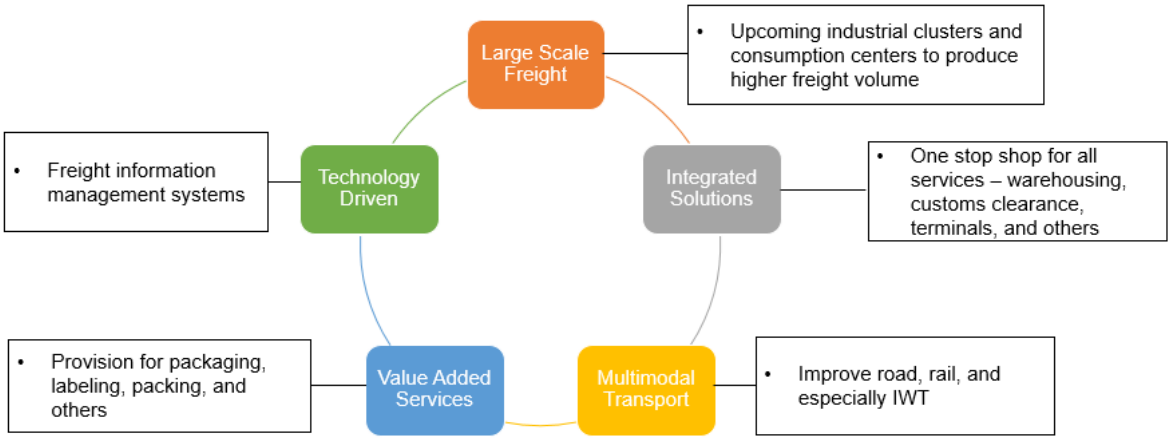
Logistics Gaps and Challenges, Opportunities, and the MMLP Solution

The current logistics facilities in the region offer limited aggregation and integration facilities. These facilities offer limited inter-modal facilities, from road to rail and rail to road. The potential of inland waterways and multi modal transport has yet to be explored. Additionally, these facilities offer limited value-added services and have limited technology-driven expertise.

Guwahati is the major distribution hub of the north east region; however the logistics facilities in the city have high capacity utilization and limited scope of expansion. The city has expanded rapidly and the existing National Highway-27 which was developed as bypass to the city has become part of the city and is currently very congested. There are significant logistics challenges in the region, including congestion of Guwahati and limited facilities and services. Hence, there is a need for an integrated, technology driven MMLP in the region.

Considering all challenges and opportunities, the defined framework for an effective MMLP is illustrated in Figure ES.2.

Figure ES.2: Framework for Effective MMLP



Source: KPMG analysis.

Proposed MMLP Site—Jogighopa

The land parcel is on both sides of the Saibari – Jogighopa Road, which provides connectivity to NH 17. The distance from the nearest railway terminal is 3.5 km to the south east of the identified land parcel, while the distance from the nearest river port is 6 km. This provides an option for multi modal connectivity.

The proposed MMLP in Jogighopa is strategically located with a potential to offer multimodal connectivity through road, rail and inland waterway modes and can develop as a distribution / aggregation centre for the North - Eastern states besides serving as a hub for the cross-border trade with Bangladesh, Bhutan, Nepal and Myanmar.

The total cargo potential for the proposed MMLP is projected to be 1.12 MMT in FY20, which is the expected year of commencement, climbing to 2.91 MMT in FY35. The total bulk–break bulk traffic potential for the Jogighopa MMLP is expected to grow from 1.10 MMT in FY20 to 2.88 MMT in FY35. The container traffic potential for the Jogighopa MMLP is expected to grow from 1,536 TEUs in FY20 to 2,249 TEUs in FY35.

As per the Sagarmala National Perspective Plan, the share of road in the overall freight modal mix is expected to decline by 10% by FY25. Commodity-wise potential for movement by inland waterways is assessed.

The expected cross-border trade of bulk-break bulk cargo through Jogighopa will increase the EXIM potential of the projected traffic for the Jogighopa MMLP. The EXIM Potential of the Jogighopa MMLP is expected to be ~35% of the estimated traffic potential of the MMLP.

MMLP Infrastructure and Services Assessment

The MMLP will also include logistics facilities, such as ICDs, warehouses, and a truck terminal. The support infrastructure includes facilities such as the central administration building, office space and amenities, a power transmission and distribution network, water treatment and storage, a sewerage treatment plant, storm water and rain water harvesting management, and a telecommunications network. The social infrastructure facilities of the MMLP have been planned to cater to the various users with a mix of residential (hotels, guest houses, and dormitories) and commercial and office complexes, together with restaurants and recreational facilities.

The connectivity infrastructure projects that are critical for the success of the proposed MMLP, based on priority are listed out in Table ES.1.

Table ES.1: Summary of infrastructure Projects

S. No.	Project Name	Current Status	Indicative Investment
	Regional Connectivity Projects (RCI related)		
1	Connectivity between Dalu-Tura-Goalpara-Gelephu	Part of JCC MoU between India and Bangladesh, October 2017	Not Estimated
2	Interchange to allow for the connection from NH 17 (including port connection) to MMLP over the railway line	Proposed	20 million USD
3	Re-development of Jogighopa River Port as an all-weather port	Feasibility to be done	Not Estimated
4	Development of NW – 2, Channelization of Waterway, River Training and other related infrastructure	Feasibility to be done	Not Estimated
	National Development Projects		
1	National Highway 17 Widening between Goalpara and Guwahati – 150 km and	Planned	200 million USD
2	Bypass around Guwahati to provide further connectivity from NH17 to NH 27	Proposed	Not Estimated
3	New Bongaigaon – Goalpara – Guwahati Railway Line (Doubling) – 176 km	Approved - May 2015	345 million USD
4	Jogighopa to Gauripur (New Line) – 150 km	Part of Approved Project	280 million USD

Source: Planning & Technical Expert – ADB.

For this project, the concept master plan is based on the proposed facility covering nearly 100 acres and catering to traffic projections for FY35. The development of the MMLP is proposed over two phases:

- Phase I will entail the development of about 61 acres and cater to the traffic projections for FY25.
- Phase II will entail the development of 39 acres based on the envisaged requirements and prevailing market dynamics.

Area and infrastructure assessments for the various facilities of the MMLP have been carried out using a set of parameters based on real-time scenarios by reviewing data from similar facilities, performing a literature review, and undertaking stakeholder consultations.

Potential Business Models

Based on the development and operating and management (O&M) responsibilities of the players (nodal agency and third parties), a framework has been developed to choose a business model. The proposed business models have been analyzed and compared based

on efficiency of operations, risk management, obtaining approvals and clearances, attracting end users, and private sector investments.

As per the evaluation of the risk profile and efficiency of possible choices, two options have been recommended:

- The first option entails development and operation of the logistics park by third-party players, with the nodal agency providing land and collecting lease rentals.
- The second option entails the nodal agency developing and operating the common infrastructure and amenities, and allowing individual third-party developers to develop and operate the facilities. The revenue in this case would be collected in the form of lease rentals and/or revenue sharing.

Based on the comparative analysis of the identified business models, a special purpose vehicle (SPV) is suggested for implementation of the MMLP.

Financial Assessment

The total capital expenditure (Capex) for the development of the Jogighopa MMLP is INR 155.46 crores in Phase I and INR 115.88 crores in Phase II. These estimates include the costs of railway sidings, container terminals, warehousing, non-cargo processing, a truck terminal, common facilities, support infrastructure, and equipment. The estimates do not include the costs of the acquisition of land.

The operating expenditure for facilities has been taken at a rate of INR 75 per ton. Escalation costs of 5% year-on-year have been assumed. The revenue drivers of the Jogighopa MMLP have been studied, with tariffs for the various facilities defined based on market research and benchmarks from peer competition.

A base case for this SPV has been established with a viability funding gap of 25%. The project returns in the base case would be an IRR of 12.40% and an NPV of INR 25.22 crore. These financial indicators have been subjected to sensitivity analysis to evaluate the response of financial ratios to variations in key drivers including Capex, operating expenses (Opex), project revenues, and viability gap funding.

Regulatory and Policy Assessment

There is a lack of comprehensive regulatory regime to manage the logistics sector in India. The existing laws and authorities are placed separately while the need is for them to work together, under a single nodal agency. Hence, there is a need for drafting a State Logistics Policy.

Policies related to labour, land, warehousing, transportation, inland waterways, railways and cross border trade facilitation should be strengthened and aligned with the overall objective of decongestion in Guwahati as well as creation of a twin city in Jogighopa, centered around the MMLP.

The policy should encourage smooth private participation and higher use of technology for data based decision making. The state government and private players should work together for skill development initiatives, which will lay down a strong foundation for the State and for the country.

1 Introduction

1.1 Background of Study

The logistics sector is an essential part of any economy as it enables the availability of goods at consumption centers, which are the engine of trade and transactions. However, the Indian logistics sector is inefficient and faces challenges such as inadequate infrastructure, high logistics costs, standalone logistics facilities, a modal mix skewed toward road transport, and limited use of technology, among others. There is a need to develop integrated logistics infrastructure to support the economic growth of the country, thereby promoting capacity expansion and modernization.

India has made significant progress over the past few years in terms of its logistics performance. The Logistics Performance Index (LPI) published by the World Bank showed India jumping 19 spots in the global rankings, from 54 to 35, between 2014 and 2016. The Make in India initiative of the Government of India has benefited the logistics sector by according it added importance. The implementation of the Goods and Services Tax (GST) is also expected to improve the efficiency of the sector. Furthermore, the Logistics Efficiency Enhancement Program (LEEP) of the Ministry of Road Transport and Highways (MoRTH) is aimed at enhancing freight movement in the country and significantly raising India's LPI score. Under LEEP, the Government of India aims to develop 35 MMLPs.

Under the LEEP program, a pre-feasibility study is being carried out by the Asian Development Bank (ADB) for the setting up of MMLPs at four identified locations in Bengaluru, Jogighopa (Assam), Hyderabad, and Surat.

1.2 Outcomes and Objectives of Study

The objective of the study is to assess the pre-feasibility of development of MMLPs at the identified locations in Bengaluru, Jogighopa (Assam), Hyderabad and Surat.

This report has been prepared in consultation with key stakeholders, taking into consideration the discussion points that emerged out of meetings with relevant government officials, infrastructure development corporations, industry players and associations, logistics players, and transport associations. The report covers demand assessment, the traffic potential of the region, existing organized and unorganized logistics facilities, gaps in existing logistics facilities, and the traffic potential for the Jogighopa MMLP in Assam. The facilities and services of the MMLP have been recommended based on the gaps in existing facilities and the cargo profile of the region.

The proposed site has been assessed for its suitability to set up an MMLP based on the available industrial base, cargo potential, connectivity, and availability of power and water, among other factors. The draft layout plan of the MMLP is provided in this report.

Based on the cost estimates, the financial feasibility of the MMLP has been studied and potential business models have been recommended.

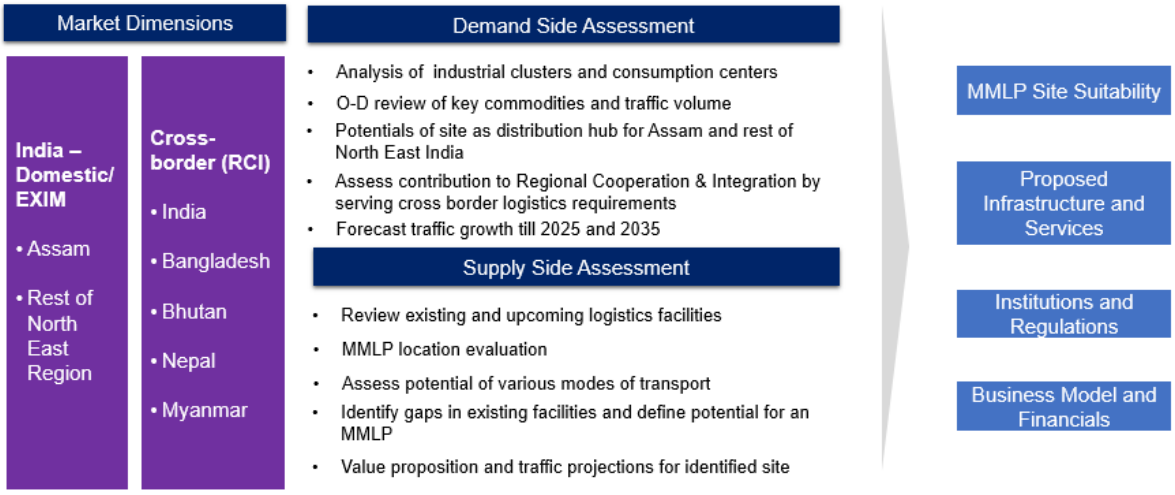
1.3 Overall Study Framework for Jogighopa MMLP

A successful MMLP will promote freight aggregation and distribution, and multi-modal freight transportation, and offer storage, warehousing, and value-added services.

This study has the objective of conducting a pre-feasibility assessment of an MMLP at a specific location, including analysis of the site's market potential, an evaluation of location suitability, a components assessment, and financial feasibility.

The overall study framework for the proposed MMLP in Jogighopa is depicted in Figure 1.1.

Figure 1.1: Overall Study Framework for the MMLP in Jogighopa



Sources: ADB Framework for Developing MMLP, KPMG Analysis.

The overall study framework involves study across 2 market dimensions – India based Domestic & EXIM market, and Cross-border trade, assessing the potential for Regional Cooperation & Integration between India, Bangladesh, Bhutan, Nepal and Myanmar.

The demand-side assessment includes analysis of industrial clusters, consumption centers and economic activity in the north east Region, Assam and Guwahati region. Subsequently, key commodities have been identified, and O–D analysis performed. The suitability of the proposed site is assessed for serving as a distribution hub for Assam and the rest of north east India. The potential for RCI is assessed by understanding cross-border logistics requirements. In view of this analysis, the relevant traffic potential of the region is assessed.

The supply-side assessment includes analysis of the existing and upcoming organized logistics facilities in Guwahati, existing warehousing centers in Guwahati, gaps in logistics facilities, and the potential for an MMLP in the region. The study comprises a site assessment, an infrastructure and services assessment, an analysis of suitable business models, and a financial assessment.

2 Demand Assessment

2.1 Overview of Assam and north east India region

Assam is situated in the north east region of India, covering 0.78 lakh sq. kilometres and approximately 2.4% of India's area.[1] Further, the population of the state is 2.6% of the population of India.[2]

Assam's performance on key economic indicators against the national benchmarks are depicted in Table 2.1.

Table 2.1: Economic indicators of Assam against India

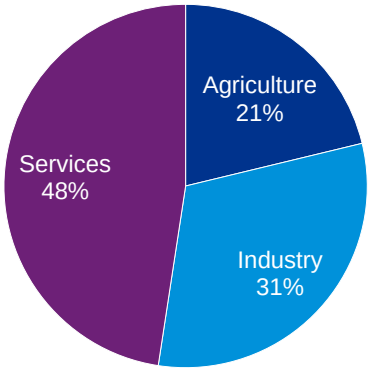
Indicator	Unit	Assam	India	Assam's rank among Indian states
Land Area	Sq. kilometers	0.78 lakh	32.87 lakh	Rank 17
Population, Census 2011	Crore	3.12	125	Rank 15
Gross Domestic Product, FY17	INR cr.	258,337	14,533,250	Rank 18
Per Capita Income at current prices, FY16	INR	60,952	93,293	-
Share of industries sector in GDP	%	31%	26%	-

Sources: Assam Economic Survey, 2016-2017; Census 2011; Indian Economic Survey 2016 – 2017; Ministry of Statistics and Programme Implementation.

Assam is the principal state of the north east region, with 68% of the population of the north east region, and a population density of 397 persons to sq.km, compared to 159 persons per sq.km[3] in India. Assam is the largest economy and the most industrialized state in north east India. Moreover, the share of manufacturing in GSDP of Assam was the highest amongst the north eastern states of India.

The major contributor to Assam's economy is the services sector contributing ~48% to the Assam economy. The sector-wise composition of the Assam economy is depicted in Figure 2.1.

Figure 2.1: Composition of Assam's economy

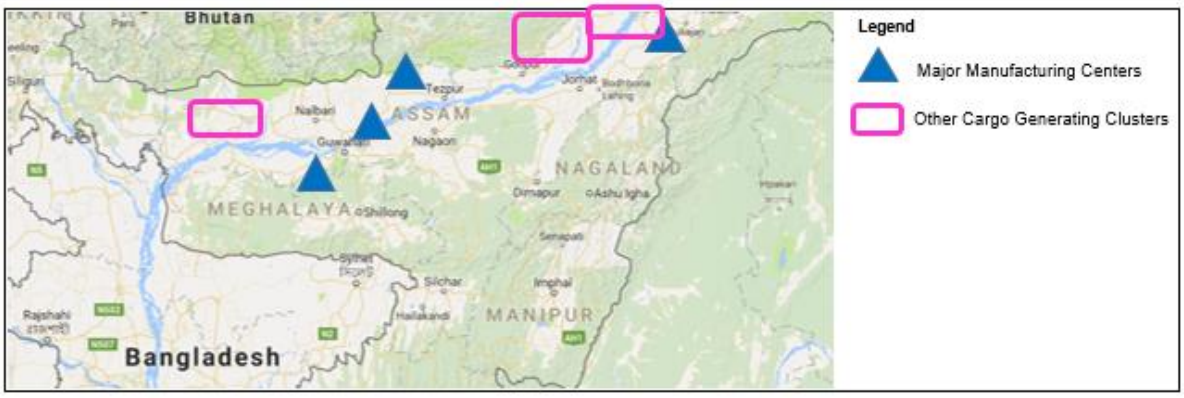


Source: Assam Economic Survey 2015-16.

[1] Economic Survey, Assam, 2016 - 17
[2] Economic Survey, Assam, 2016 - 17
[3] Census 2011

Assam's economy is largely rural, with agriculture and its allied activities providing the main source of occupation and livelihood to a large proportion of its rural population. Additionally, Assam has abundance of natural mineral resources and are a major contributing factor for industrial performance. Assam's major manufacturing centers and other cargo generating clusters, including tea and petroleum clusters, are indicated in Figure 2.2.

Figure 2.2: Major industrial centers of Assam



Source: KPMG Analysis.

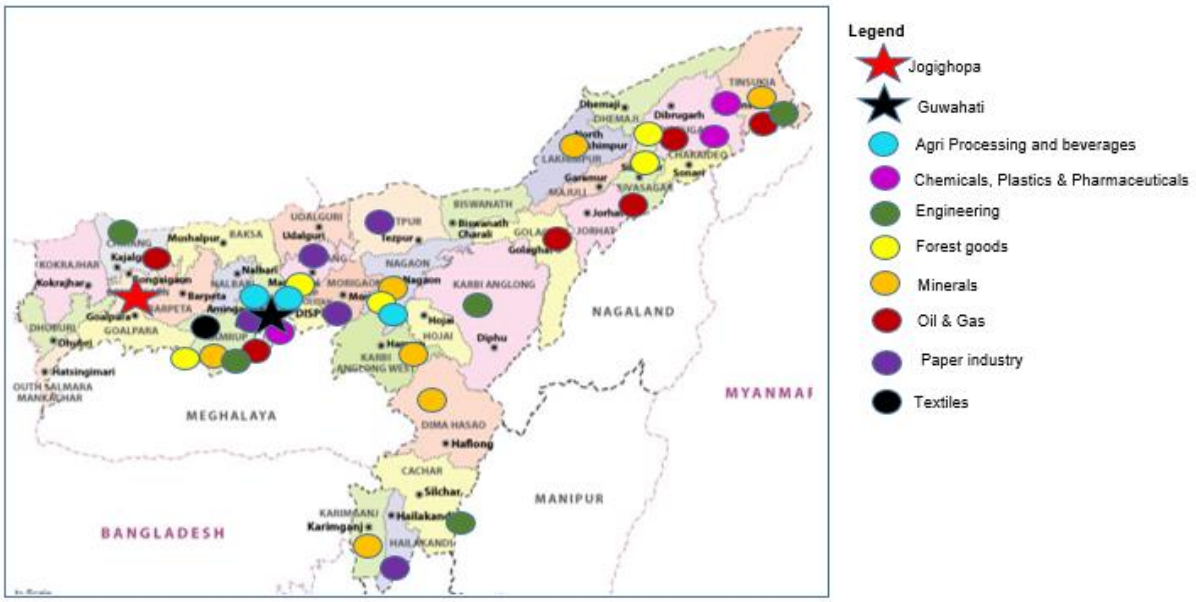
The Government of Assam has provided impetus to industrial development by creating numerous industrial facilities and upgrading existing industrial facilities. As of FY17, the industrial facilities in Assam are as follows[4]:

- 20 Industrial Estates;
- 8 Mini Industrial Estates;
- 17 Industrial Areas;
- 12 Growth Centres, with 722 industrial units;
- 1 Export Promotion Industrial Park (EPIP), with 47 industrial units;
- 11 Infrastructure Development Centres in 11 different districts;
- 3 Industrial Growth Centre;
- 2 Food Parks – in Kamrup and Nalbari districts.

The existing industrial clusters in Assam are depicted in Figure 2.3.

[4] Economic Survey, Assam, 2016 - 17

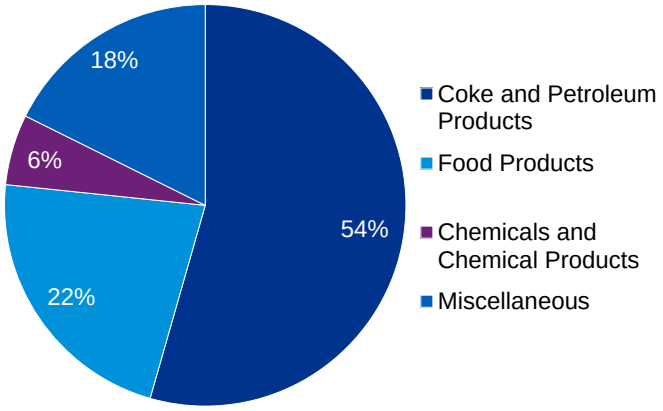
Figure 2.3: Industrial Clusters of Assam



Source: Commissionerate of Industry & Commerce, Government of Assam.

The major industries in Assam are coke and petroleum products, food products, chemicals and chemical products. The respective share total output of the state is reflected in Figure 2.4.

Figure 2.4: Share of major industries of the total output of Assam



Source: Annual Survey of Industries, 2013 - 2014

The tea industry, rubber plantations, and handloom industry are the key industries in Assam. The total area under tea cultivation in Assam accounts for more than half of India's total area under tea cultivation.[5]

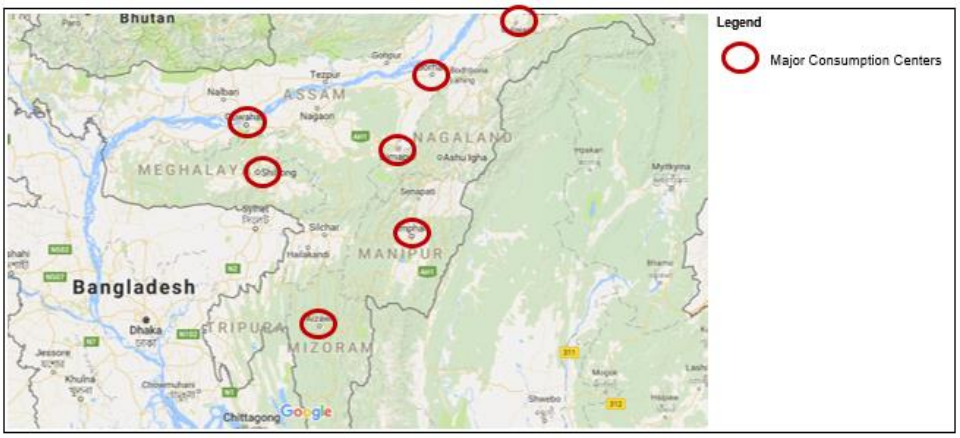
Recent developments and policy initiatives are intended to explore the potential for industrial development, inducing freight generation and movement in Assam. These developments include North East Vision 2020, Advantage Assam, Act East Policy, investments in railway infrastructure, etc.

[5] Economic Survey, Assam, 2016 - 17

Further, while Assam is the most industrialized state of the north east, there are cargo generating activities in the other regions of north east. These include manufacturing of cement in Meghalaya, mining of coal in Meghalaya, which has now been declared illegal and coal and boulder stones that are transported and used in Bangladesh.

Assam, with 70% of the population of north east India[6], is a major consumption hub of the north east region. The forecasted industrial development in Assam and north east India is expected to drive consumption in the north east region. The major consumption centres of Assam and the north east region are indicated in Figure 2.5.

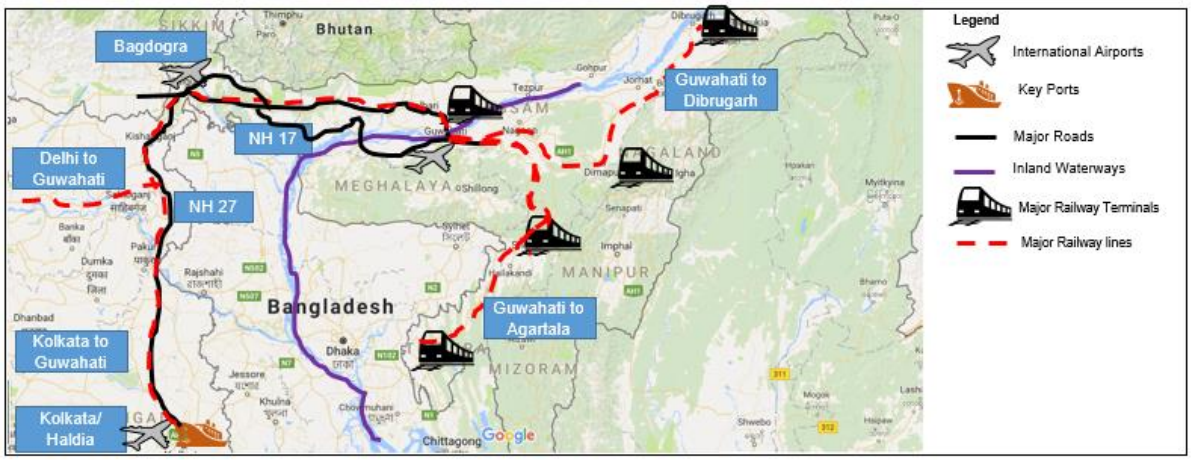
Figure 2.5: Major Consumption centers of the region



Source: KPMG Analysis.

Availability of adequate transport infrastructure is a necessary element to enable development of industrial sector and the supporting logistics sector. The major connectivity infrastructure of Assam and other states of north east India is depicted in Figure 2.6. The connectivity infrastructure includes major road network, major railway routes, international airports and nearest ports in the region.

Figure 2.6: As-Is Connectivity Infrastructure of north east Region



Sources: KPMG Analysis, National Highways Authority of India.

Guwahati, the capital city of Assam and the distribution hub of north east India, is well connected by national highways to Kolkata and other major cities of mainland India. The

[6] Census 2011

movement of cargo from Guwahati to the rest of the north east takes place via NH 27, and subsequently other respective state highways. The major railway connectivity between Guwahati and Kolkata, and Guwahati and Delhi are indicated in Figure 2.6. The major rail lines in north east India are indicated in Figure 2.6, including Guwahati to Agartala, Guwahati to Dimapur and Guwahati to Dibrugarh. The railway lines in north east India are predominantly in parallel to the road network of national highways. The international airport of north east India, situated in Guwahati, is depicted in Figure 2.6. The Bagdogra International Airport, situated in Siliguri, is located approximately 450 km to the west of Guwahati. Guwahati has existing road and rail connectivity to Kolkata that connects the north east region to Kolkata Port Trust and Haldia Port.

The road network in Assam is necessary for its swift economic development. The road network in Assam comprises of a network of 58,202 km.[7] These include National Highways, State Highways, major district Roads, urban roads, rural roads, panchayat and other non PWD roads. The length of each category of road in the state is reflected in Table 2.2.

Table 2.2: Category of Roads in Assam, FY16

S.No.	Category of roads	Length (in km)
1	National Highways	3,863
2	State Highways	2,530
3	Major district roads	4,379
4	Urban roads	1,409
5	Rural roads	36,544
6	Panchayat & Other non PWD roads	9,477

Source: Economic Survey, Assam, 2016 – 17.

As of FY16, Assam has total railway route length of 2442.57 km[8], comprising ~3.8% of the total railway route length of India. Of this route length, 2400.85 km is broad gauge, while the rest is meter gauge[9]. Over 50% of rural roads in Assam are still gravel roads, and to ensure connectivity[10]; rural roads need to be developed as all-weather roads. The Bharatmala Program, of Ministry of Road Transport & Highways, Government of India, has provided a renewed focus on road connectivity in the north east region.

Assam has a robust railway connectivity with mainland India; however the north east region has poor rail connectivity. While initiatives are underway to convert the tracks to broad gauge, the tracks are non-uniform – narrow gauge and meter gauge. Further, as of FY15, of the 60 routes in the North Frontier Railway, while 18 routes have a line capacity utilization of less than 80%, 10 routes have a line capacity utilization between 80 – 100%, 21 routes have a line capacity utilization of more than 100%, and 11 routes are One Train Only System[11]. Various developmental activities are under way to improve rail connectivity of Assam with other states.

[7] Economic Survey, Assam, 2016 - 17
[8] Economic Survey, Assam, 2016 - 17
[9] Economic Survey, Assam, 2016 - 17
[10] Economic Survey, Assam, 2016 - 17
[11] 'Indian Railways – Lifeline of the nation', February 2015

It is expected that the major state capitals of the north east region will be connected by railways in the next 3-4 years.

Assam currently has 6 operational civil airports, while small and remote airstrips are being operated under private operators such as tea gardens and Public Sector Undertakings. There are functional commercial airports in state capitals of the north east India, including Shillong, Aizawl and Agartala. Further, the entire north east region has only 1 international airport situated at Guwahati, Assam.

Inland waterways is an accepted mode of transportation, with Assam being a riverine state. National Waterway 2 (Brahmaputra River) and National Waterway 16 (Barak River) are active in Assam.

- The Inland Waterways Authority of India (IWAI), Government of India has developed terminals at Dhubri and Pandu, along NW 2, with other terminals proposed to be developed in the near future. The river ports and ferry ghats along NW 2 are used for transport of passengers and cargo.
- Along NW 16, the terminal at Karimganj is expected to be upgraded by IWAI, and terminals at Badarpur and Silchar are planned for development.

2.2 Relevant freight market

2.2.1 Overview of Guwahati

Guwahati is an important industrialized city of the north east. The key industries in Assam are tea, oil and gas, cement, limestone, agriculture and cottage industry. The major existing and upcoming industrial infrastructures in the Guwahati region are depicted in Figure. 2.7.

Figure 2.7: Industrial Infrastructure in Guwahati region

Legend:

S.No.	Name	Location	Key Commodities
		Existing Industrial Infrastructures	
1	Food Processing Park	Chaygaon	Ayurvedic medicines and pharmaceuticals, steel furniture, food processing units, etc.
2	Industrial Growth Center	Chaygaon	Automobile ancillary, Engineering goods, Plastics based products, Synthetic and Rubber based products, Agro based
3	Brass and Bell Metal Cluster	Hajo	brass utensils, utility products, decorative and religious items, etc.
4	Export Promotional Industrial Park	Amingaon	Ayurvedic medicines and pharmaceuticals, steel furniture, food processing units, etc.
5	Industrial Estate	Bamunimaidam	food products, plastic products, etc.
6	Software Park	Guwahati	Software park
		Upcoming Industrial Infrastructures	
1	Textile Park	Guwahati	Textiles
2	Handicraft Development Centre	Ambari, Guwahati	Handicrafts
3	Agro Marketing Center	Dolgaon, Darrang	Agro products
4	Agro Marketing Center	Baihata Chariali	Agro products

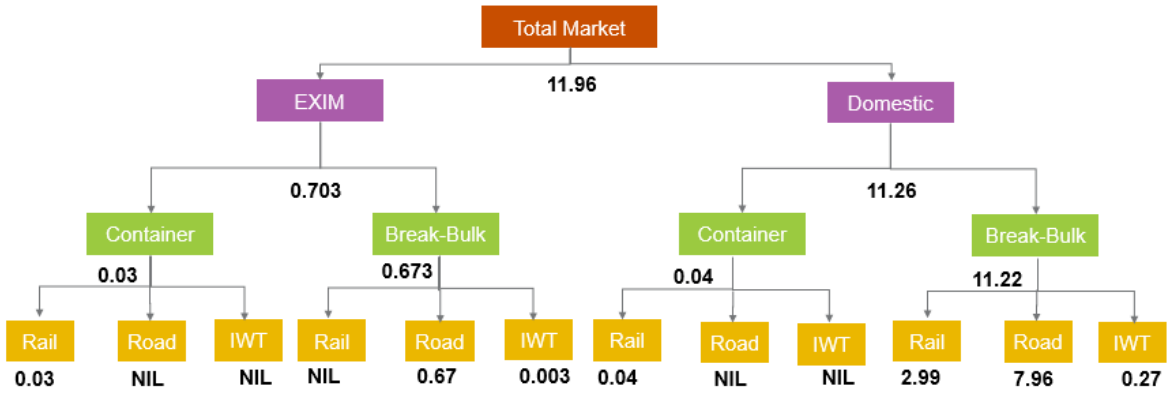
Source: Assam Industrial Development Corporation.

Guwahati serves as the distribution hub for the north east region, with cargo transported from the Indian mainland in large trucks, and transported to the rest of the north east in smaller trucks.

2.2.2 Total relevant freight market in the region

The total relevant market in the region in FY17, including both container and bulk–break bulk traffic, domestic and EXIM cargo, is ~11.96 MMT. The relevant market is indicated in Figure 2.8.

Figure 2.8: Total Relevant Market in the region, FY17



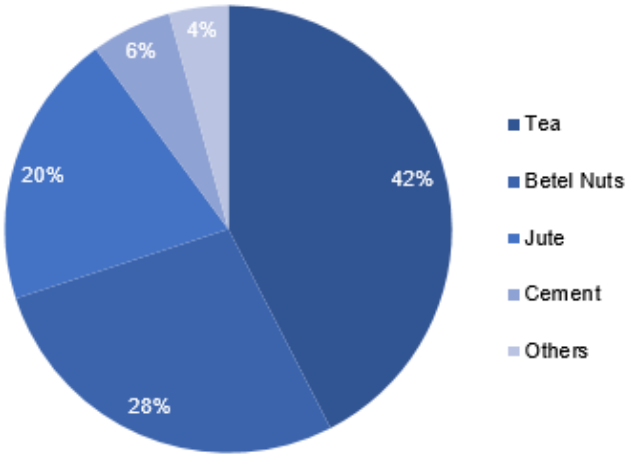
Sources: Primary Interactions with transporters, logistics players, KPMG Analysis.
Note: All figures are in million tonnes, 1 TEU = 15 Tonnes.

As indicated in Figure 2.8, ~94% of the total market is domestic cargo. The domestic cargo is mostly bulk–break bulk cargo, and ~67% of the total relevant market is bulk-break bulk cargo transported by road.

2.2.3 Container Cargo through the region

The total container volumes in FY17 for the region is ~4,808 TEUs in FY17 of which ~60% is domestic cargo. The detailed commodity-wise break-up of container traffic through the region in FY17 is shown in the Figure 2.9.

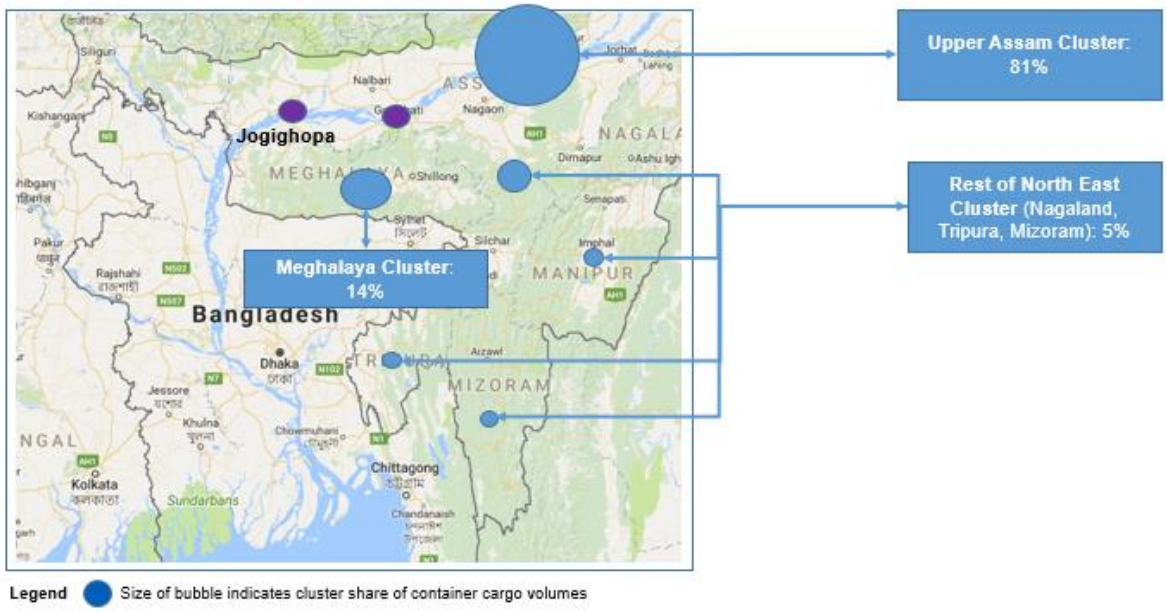
Figure 2.9: Commodity-wise container traffic in FY17 through the region



Sources: Primary Interaction with CONCOR, KPMG Analysis.

To analyze the generation of container cargo, the north east region is divided into 3 clusters – Upper Assam, Meghalaya and rest of north east. The cluster wise share of container cargo volumes is depicted in Figure 2.10.

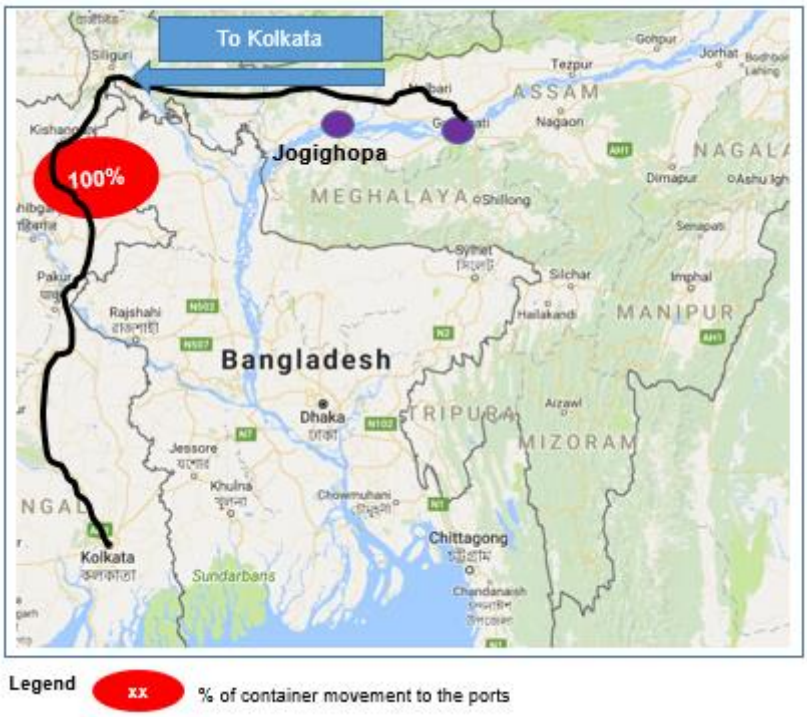
Figure 2.10: Cluster Share of Container Cargo Volumes



Sources: Primary Interactions, KPMG Analysis.

All the containerized cargo generated in the north east region is handled at Guwahati. Origin-Destination of container cargo through the Guwahati region was understood through primary interactions. The Kolkata Port handles all the EXIM container cargo that originates in the North East. The O-D Analysis of container cargo is depicted in Figure 2.11.

Figure 2.11: O-D Analysis of Container Cargo



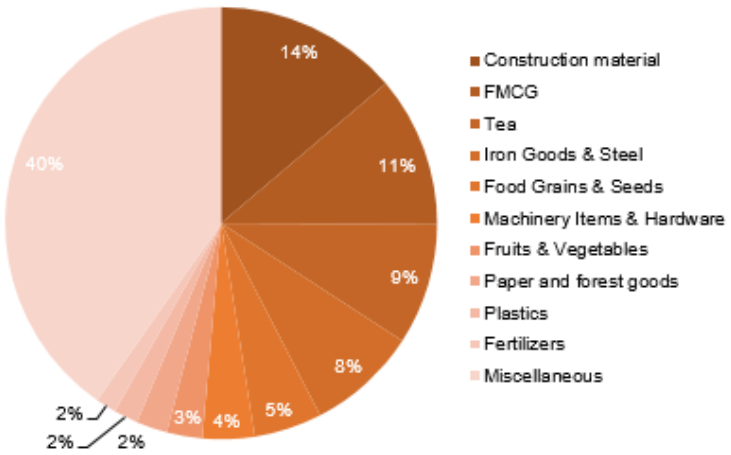
Sources: KPMG Analysis, Primary Interactions.

All the EXIM container cargo generated in the region moves towards Kolkata Port, with major containerized commodities being tea and betel nuts.

2.2.4 Domestic Bulk-Break bulk Cargo through the region

The overall domestic bulk-break bulk cargo handled in the region is 11.22 MMT in FY17. The key bulk-break bulk commodities through the region are Construction material, including cement, FMCG products, tea, iron & steel, etc. The detailed commodity-wise break-up of bulk-break bulk traffic in FY17 is shown in the Figure 2.12.

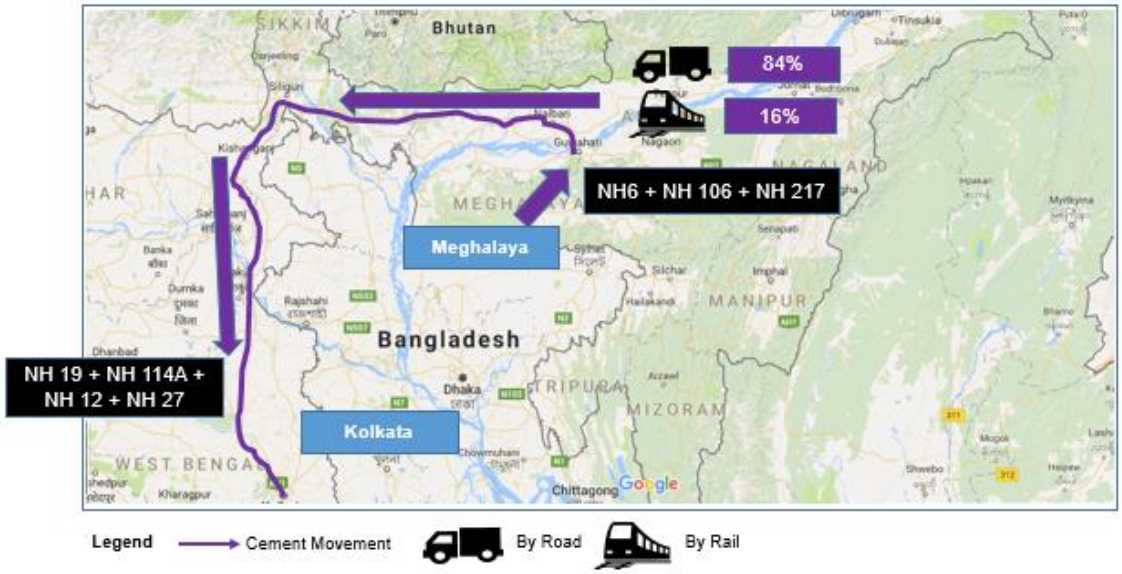
Figure 2.12: Commodity-wise bulk-break bulk traffic in FY17 through the region



Sources: Primary Interactions transporters, logistics players, KPMG Analysis.

The Origin Destination analysis of key bulk–break bulk commodities has been performed via primary interactions with transporters, key logistics players and industry players in the region. The O-D analysis of the key bulk–break bulk commodities has been depicted in Figure 2.13 – 2.16.

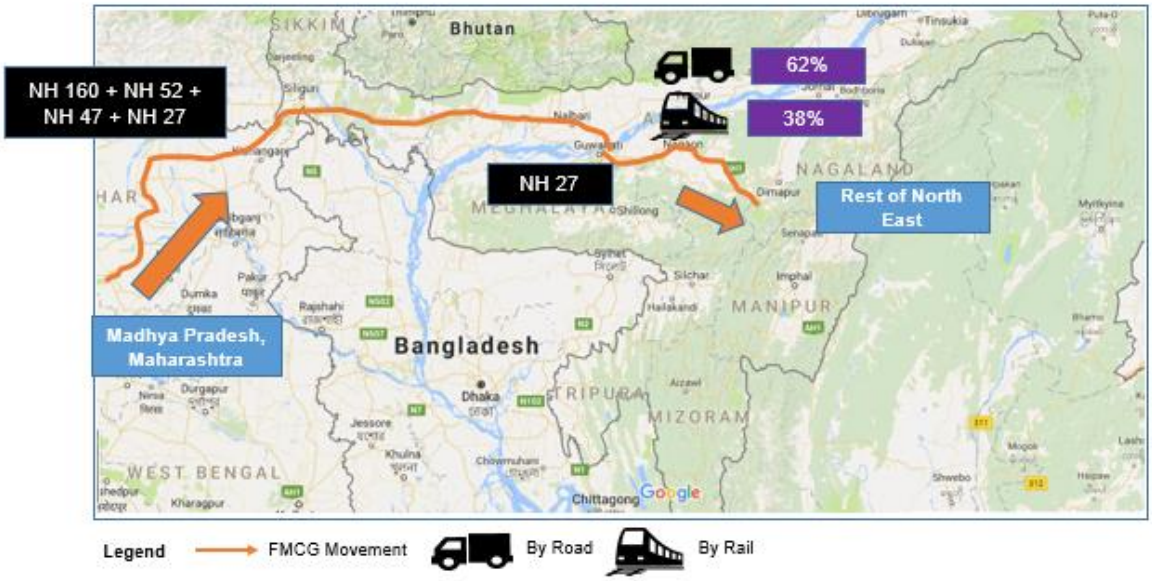
Figure 2.13: Origin – Destination Analysis of Cement



Sources: Primary Interactions with transporters, logistics and industry players, KPMG Analysis.

Cement is manufactured in Meghalaya and is transported to Guwahati, predominantly via NH 6, NH 106 and NH 217. This cement is utilized in Guwahati and is also transported to mainland India, specifically Kolkata, via the route of NH 27, NH 12, NH 114A and NH 19. Of the movement of cement, ~84% is by road, while ~16% is by rail.

Figure 2.14: Origin – Destination Analysis of FMCG Products

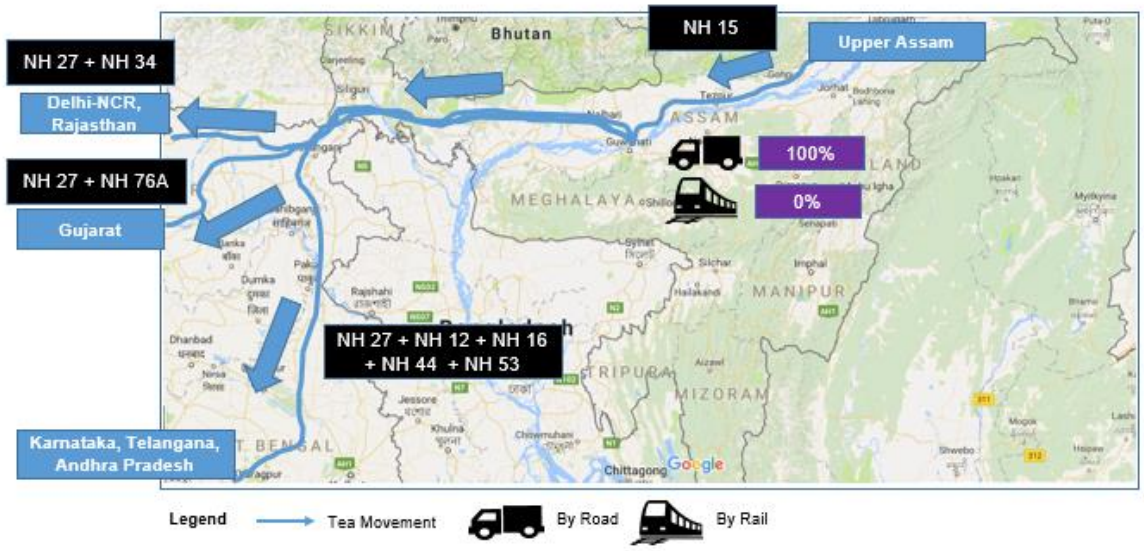


Sources: Primary Interactions with transporters, logistics and industry players, KPMG Analysis.

As depicted in the above figure, FMCG Products are transported from Madhya Pradesh and Maharashtra to Guwahati, primarily via NH 160, NH 52, NH 47 and NH 27. The FMCG

products are then transported from Guwahati to the rest of the north eastern states, via NH 27, in smaller trucks. Of this overall movement, ~62% is by road while ~38% is by rail.

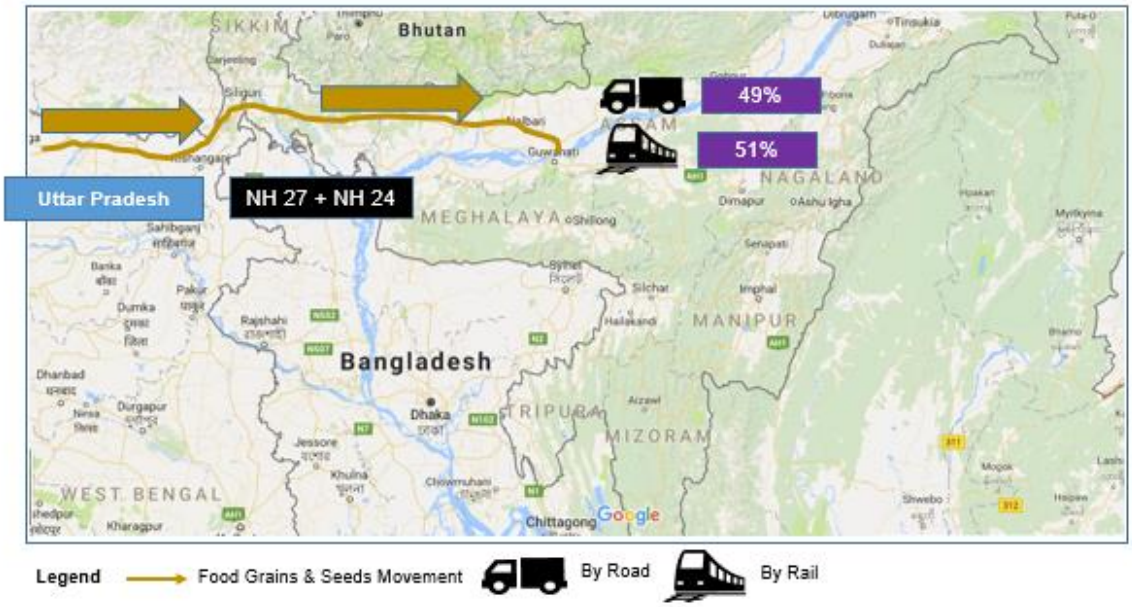
Figure 2.15: Origin – Destination Analysis of Tea



Sources: Primary Interactions with transporters, logistics and industry players, KPMG Analysis.

Tea originates from Upper Assam, is transported to Guwahati via NH 15. The tea is warehoused and aggregated at Guwahati, and is then transported to rest of India, including Gujarat, Delhi-NCR and Karnataka and other southern states. The movement of tea in bulk-break bulk for is solely via road.

Figure 2.16: Origin – Destination Analysis of Food Grains and Seeds



Sources: Primary Interactions with transporters, logistics and industry players, KPMG Analysis.

Food Grains are transported from Uttar Pradesh, via NH 24 and NH 27, to Guwahati for consumption. This movement is ~49% by road and ~51% by rail.

Of the total cargo through the region, Guwahati inbound/outbound comprises 20%, while rest of north east inbound/outbound forms 80% of the total cargo.

2.3 Assessment of Regional Cooperation and Integration in the region

2.3.1 Overview of Region

The region has proximity to neighbouring nations of India, including Bhutan and Bangladesh. The major economic indicators of the neighbouring nations are indicated in Table 2.3.

Table 2.3: Economic indicators of neighbouring nations

Indicator	Unit	Bangladesh	Bhutan
Land Area	Sq. kilometers	147,570	38,394
Population, 2016	Million	163	0.80
Gross Domestic Product, FY16	USD billion	221.4	2.237
GDP per capita, FY16	USD	1,358.78	2,804.00
Share of industries sector in GDP, FY16	%	28.6%	42.1%
Industrial production growth rate, FY16	%	8.4%	6.5%

Sources: World Bank, Index Mundi.

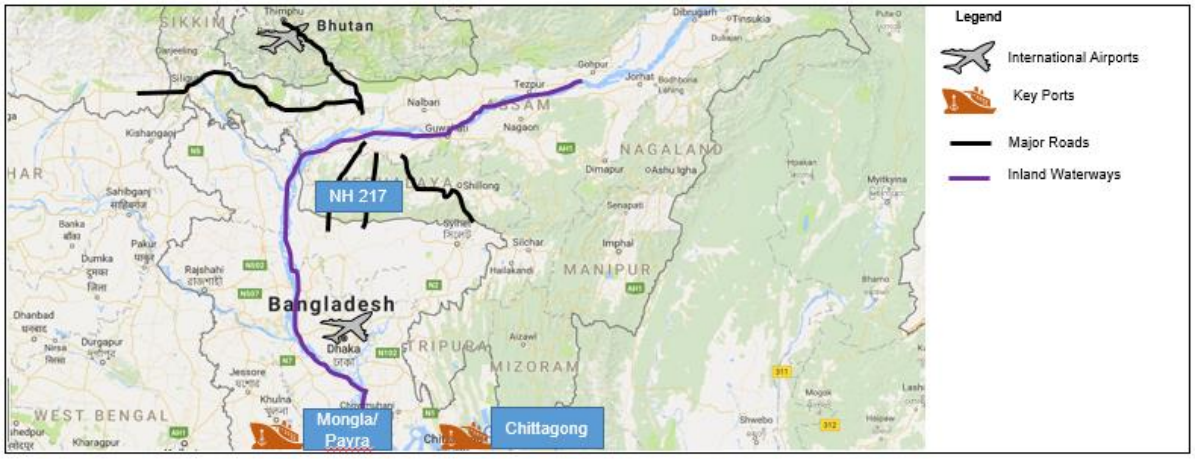
The Rangpur, Mymensingh and Sylhet districts are the northern districts of Bangladesh that border India. The major employment generators in these districts are agriculture sector, jute, natural gas, and fisheries. The major industrial and consumption centers in the neighbouring nations of Bangladesh and Bhutan are depicted in Figure 2.17.

Figure 2.17: Major industrial and consumption centers in relevant neighboring nations

Source: KPMG Analysis.

The region's connectivity to neighbouring nations creates the potential for regional cooperation & integration (RCI). The As-Is connectivity, including connectivity by road, nearest sea ports and airports, is illustrated in Figure 2.18.

Figure 2.18: As-Is connectivity with relevant neighboring nations



Source: KPMG Analysis.

As depicted in Figure 2.18, India and Bangladesh are connected by road and inland waterways. India – Bhutan and India – Nepal are connected by road. An important means of connectivity through the region is inland waterways, with the Brahmaputra providing connectivity between India and Bangladesh. This also creates the potential for efficient trade between Bangladesh and Bhutan, through India, via inland waterways.

Additionally, the Indo Bangladesh Protocol on Inland Water Transit & Trade exists between India and Bangladesh. Significant progress has been made between the 2 nations for the operationalization of movement via inland waterways. The Sirajganj – Dhaikawa river stretch (~170 km) does not have sufficient depth and the Ministry of External Affairs, Government of India, has provided its in-principal approval for dredging to be undertaken along this stretch. The cost of dredging has been estimated at INR 200 crore, and the dredging will be undertaken on a cost-sharing basis of 80% – 20% between India and Bangladesh respectively. The Sirajganj – Dhaikawa river stretch is targeted to be operational by March 2019. Moreover, Standard Operating Procedures (SOPs) are in place for operationalization of movement via inland waterways between the 2 nations, and it is expected that these SOPs will be signed and notified. These SOPs define the procedures for technical assistance to be provided for navigation.

Agreements between India – Bangladesh, including the Indo Bangladesh Protocol on Inland Water Transit & Trade, and trade agreements between Bhutan – Bangladesh, illustrate the intent of the National Governments in the region to promote RCI.

Policy initiatives of neighbouring nations, for example the development of the Khulna – Dhaka – Sylhet Economic Corridor and the Banglabandha – Dhaka – Chittagong – Cox's Bazar Economic Corridor by the Government of Bangladesh, are expected to promote industrial development in the region. These initiatives are expected to drive freight movement in the region, and promote trade between India – Bangladesh and Bangladesh – Bhutan, through India.

2.3.2 RCI - Freight movement in the region

Land Customs Stations (LCS) are the gateways for transit of goods, services and people between India and the neighboring countries of Bhutan and Bangladesh. The export and import traffic, and the top 3 export and import commodities handled at the relevant LCS' in FY16 is illustrated in Table 2.4.

Table 2.4: Traffic handled at relevant land custom stations

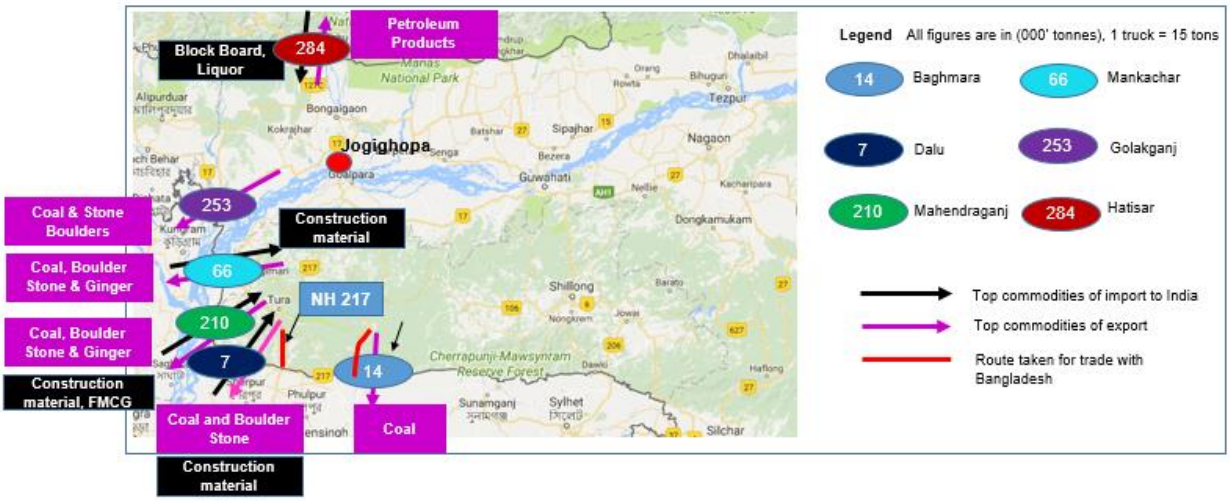
S.No.	Land Customs Station	Top 3 commodities of export	Number of trucks carrying export cargo, FY16	Top 3 commodities of import	Number of trucks carrying import cargo, FY16
1	Baghmara	Coal	919	Nil	Nil
2	Dalu	Coal & Boulder Stone	450	Cement, Bricks & Synthetic Net	2
3	Mahendraganj	Coal, Boulder Stone & Ginger	14,033	Cement, Cotton Waste & Misc. Food Products	394
4	Mankachar	Coal, Boulder Stone & Ginger	4,381	Cement, Melamine & RMGs	45
5	Golakganj	Coal & Stone Boulders only	16,890	Nil	Nil
6	Hatisar	Petroleum Products	18,907	Block Board, Liquor	567

Source: Ministry of Development of North Eastern Region.

The major export commodities from India to Bangladesh are coal and boulder stones, while the major export commodity from India to Bhutan is petroleum products. Currently, with coal mining in Meghalaya being declared illegal, there is minimal mining and export of coal from India to Bangladesh.

The freight from the relevant Land Customs Stations is illustrated in Figure 2.19.

Figure 2.19: Overview of relevant cross-border trade in the region, FY16



Sources: Ministry of Development of North Eastern Region, KPMG Analysis.

Figure 2.19 depicts the major export and import commodities across the relevant LCS in the region. The LCS in Assam at the India – Bhutan border is the Hatisar LCS, where the major commodity exported from India is petroleum products, which originates in the Bongaigaon district. The LCS' in proximity to Jogighopa at the India – Bangladesh border are the Golakganj LCS and the Mahendraganj LCS, where the major export commodities are coal and boulder stone.

The coal and boulder stones exported to Bangladesh are generated in Meghalaya. This cargo is transported in Indian trucks to within 1 km of Bangladesh, is shifted into Bangladesh trucks, and is then transported to the respective end destination in Bangladesh. The petroleum products exported to Bhutan are generated in the Bongaigaon district of Assam, and is then transported to Bhutan. The origin of the exported cargo is illustrated in Figure 2.20.

Figure 2.20: Origin of exported cargo and As-Is cross border movement

Sources: Primary interactions, KPMG Analysis.

The cross-border trade at the relevant LCS' has been estimated to grow at a rate that is equivalent to the total trade between India and the respective neighboring country. The cross border trade in vicinity of the proposed site through Land Custom Stations is aggregating about 800,000 Metric Tonnes in FY16.

2.4 Identified Site for MMLP - Jogighopa

The proposed MMLP Site identified by Government of Assam is located close to Village Korea, near Jogighopa (formerly Ashok Paper Mills). The identified land is currently owned by the Government of Assam, and is illustrated in Figure 2.21.

Figure 2.21: Jogighopa – Identified Location

Source: Planning and Technical Expert – ADB.

As depicted in Figure 2.21, the identified location is at ~150 km from Guwahati, is on NW 2, and has connectivity to 2 international airports – Bagdogra International Airport and Guwahati International Airport.

2.4.1 Primary and Secondary Hinterland

The key primary hinterland of the proposed MMLP is defined as a radius of less than 100 km from the specific location, while the secondary hinterland is outside the radius of 100 km. The primary hinterland is depicted in Figure 2.22.

Figure 2.22: Primary Hinterland

Source: KPMG Analysis.

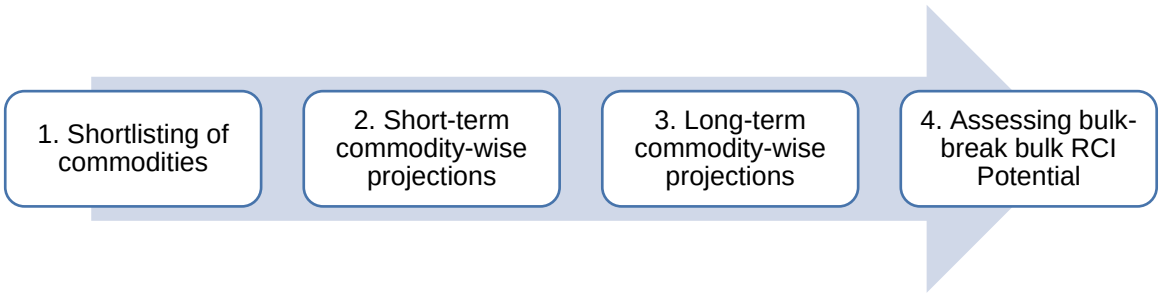
Apart from the industrial base and consumption centres around the site, the Jogighopa MMLP would also cater to the hinterland covering parts of Meghalaya, Arunachal Pradesh, Manipur and Nagaland.

2.5 Traffic Potential of the region

2.5.1 Methodology to Assess Traffic Potential of the region

This section details out the approach and methodology adopted to derive the traffic potential of the Guwahati region. The methodology adopted for traffic potential assessment of the region is shown in Figure 2.23.

Figure 2.23: Methodology to assess traffic potential of the region



Source: KMPG Analysis.

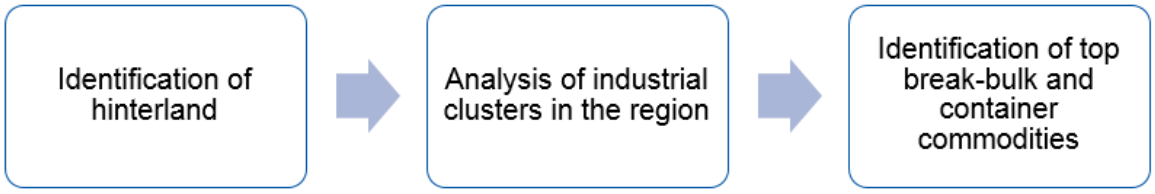
The approach broadly involves:

- shortlisting of commodities (container and bulk–break bulk) that contribute to over 60% of the total freight traffic in the region;

- assessment of commodity-wise, short-term traffic potential until FY25 based on growth forecasts published by sector reports; and
- assessment of commodity-wise, long-term traffic potential from FY25 to FY35 by tapering off the short-term growth in commodity traffic by 2% every 5 years as the effects of urbanization and congestion are expected to crowd out development away from region[12]
- assessment of bulk-break bulk RCI potential by analyzing relevant traffic handled by the Land Customs Stations in the region

Shortlisting of commodities
The framework for shortlisting of commodities is shown in the Figure 2.24.

Figure 2.24: Framework for Shortlisting of Commodities



Source: KMPG Analysis.

Primary interactions with industrial players, transporters (including freight forwarders), and logistics players were conducted to understand cargo movement in FY17, and a commodity-wise assessment was conducted of cargo moving in and out of the region through various modes of transport. Top commodities, in terms of break bulk and containerized cargo, were identified that together contribute to over 60% of the cargo potential in the region.

Traffic Projections
Traffic projections for the region involve an assessment of growth trends of key commodities in the region and a projection of demand for logistics facilities.

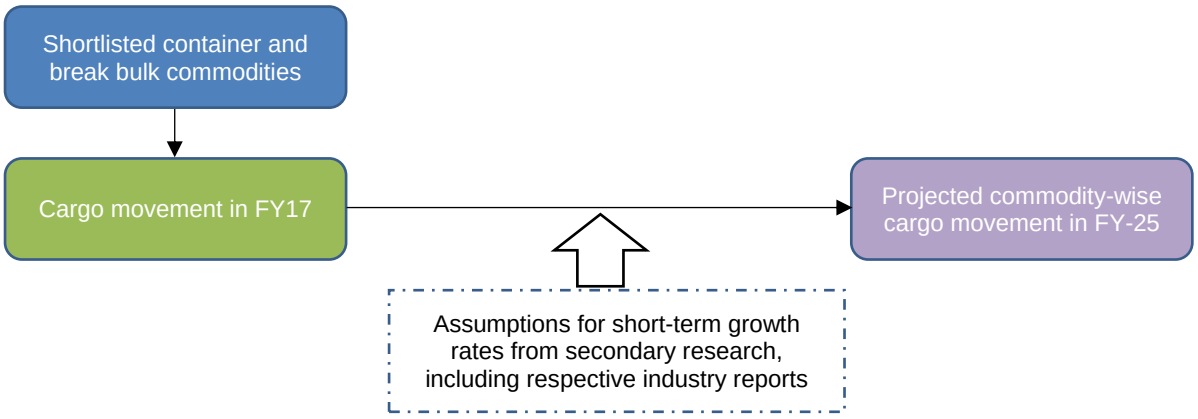
The projection of cargo potential was performed in two stages:

- short-term projections until FY25, and
- long-term projections until FY35.

Short-term commodity-wise projections (Till FY25)
The framework for short-term commodity-wise projections is shown in the Figure 2.25.

[12] Major industrial nations in Asia (e.g., Japan, Malaysia, and Singapore) and major industrial provinces in the People's Republic of China (e.g., Shanxi, Shanghai, Guangdong, and Hainan) experience an average 2.1% drop in industrial GDP CAGR every 5 years.

Figure 2.25: Framework for Short-term projections of commodities



Source: KMPG Analysis.

Long-term commodity-wise projections (Till FY35)

As an economy develops and becomes more urbanized, a shift can be observed in the industrial sector's contribution to GDP. The economy tends to shift toward the services sector as the industrial sector's share gradually declines. Empirical evidence for the same is shown in Table 2.5 by observing trends in the major industrial economies in Asia.

Table 2.5: Industrial GDP CAGR of Industrial Nations in Asia

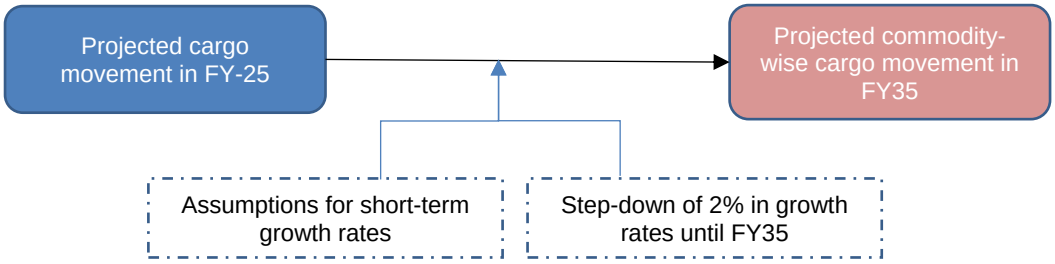
Country	1990-95 CAGR	1990-00 CAGR	1990-05 CAGR	1990-10 CAGR	1990-13 CAGR	Average reduction
Singapore	17.6%	9.4% (-8.1%)	8.9% (-0.58%)	8.3% (-0.56%)	8.0% (-0.34%)	2.4%
Malaysia	17.0%	9.3% (-7.7%)	8.7% (-0.6%)	8.6% (-0.06%)	8.5% (-0.15%)	2.1%
Japan	7.7%	1.5% (-6.26%)	0.8% (-0.67%)	1.2% 0.16	0.5% (-0.64%)	1.8%

Source: National Bureau of Statistics for China

As observed in Table 2.5, major industrial economies in Asia have experienced an average decline of about 2% in industrial GDP growth every 5 years.

In line with this trend, industrial commodities in India are expected to experience a downward trend in growth by about 2% until FY35.

Figure 2.26: Framework for Long-Term Projections of Commodities

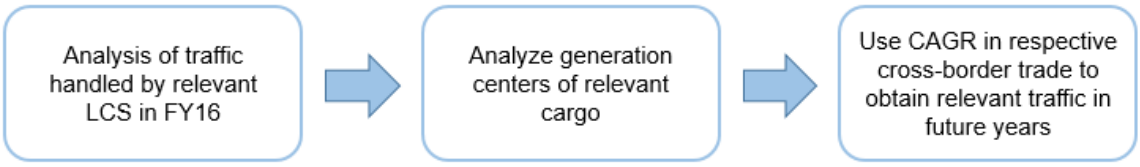


Source: KMPG Analysis.

Adding bulk-break bulk RCI Potential

The framework for RCI potential of the region is illustrated in Figure 2.27.

Figure 2.27: Framework for Assessing RCI Potential



Source: KMPG Analysis.

Data for cargo handled by relevant LCS' in FY16 in the region is obtained, and volume of key export & import commodities assessed. The cargo generation centers in India of the export commodities is considered. The CAGR for India – Bangladesh trade is utilized to obtain relevant traffic handled by LCS' along the India – Bangladesh border.

The growth in India – Bangladesh and India – Bhutan trade is illustrated in Table 2.6.

Table 2.6: Growth in trade of India with neighboring nations

S.No	Neighbouring nation	CAGR over FY01 – FY16
1	Bangladesh	12.01%
2	Bhutan	20.84%

Source: United Nations Comtrade Database.

2.5.2 Shortlisted key commodities

As per primary research, the commodities in the following table constitute over 60% of the container and bulk–break bulk market in the region and their growth potential has been assessed to derive the overall traffic projections

Table 2.7: Top Commodities in the region

S.No	Commodity Name	Traffic Volume in FY17 (in metric tonnes)	Percentage of total (%)
Container Commodities			
1	Tea	30,615	0.27%
2	Betel Nuts	19,860	0.17%
Bulk-break bulk Commodities			
1	Construction material	1,557,953	13.73%
2	FMCG	1,271,493	11.20%
3	Tea	1,022,000	9.01%
4	Iron Goods & Steel	931,545	8.21%
5	Food Grains & Seeds	574,187	5.06%
6	Machinery Items & Hardware	438,000	3.86%
7	Fruits & Vegetables	300,387	2.65%
8	Paper and forest goods	262,800	2.32%
9	Plastics	204,400	1.80%
10	Fertilizers	173,649	1.53%

Source: Primary interactions, KPMG Analysis

The market potential for the proposed MMLP in both the container and bulk–break bulk market in the short-term (until FY25) and long-term (FY25–FY35) has been assessed by adopting the projection methodology described. The traffic potential of the shortlisted commodities is projected by considering the growth rates shown in Table 2.8.

Table 2.8: Commodity-Wise Growth Rates

S.No	Commodity	Container or Bulk-break bulk?	Short Term Growth Rate (Till 2025)	Rationale	Long term Growth Rate (FY25-FY35)
1	Tea	Both	4.65%[13]	Projected growth in Indian tea exports	2% reduction from short term growth rate in every 5 years to account for saturation in industrialization

[13] '*Assessment of Indian Tea Industry 2017*', Researchmoz Global Pvt. Ltd.

S.No	Commodity	Container or Bulk-break bulk?	Short Term Growth Rate (Till 2025)	Rationale	Long term Growth Rate (FY25-FY35)
2	Betel Nuts	Container	2.17%[14]	Historical growth rate of agricultural production, 1991 – 2011	2.17%[14]
3	Food Grains & Seeds	Bulk-break bulk	0.93%[15]	Population growth rate of north eastern states of India	0.93%[15]
4	Fruits & Vegetables	Bulk-break bulk	2.17%[14]	Historical growth rate of agricultural production, 1991 – 2011	2.17%[14]
5	Fertilizers	Bulk-break bulk	2.17%[14]	Historical growth rate of agricultural production, 1991 – 2011	2.17%[14]
6	FMCG Products	Bulk-break bulk	14.7%[16]	Projected growth rate of FMCG in urban areas of India - IBEF	2% reduction from short term growth rate in every 5 years to account for saturation in industrialization
6	Machinery Items & Hardware	Bulk–break bulk	4.83%[17]	Assam's manufacturing growth rate	
7	Iron Goods & Steel	Bulk–break bulk	6.98%[17]	Based on Assam's Manufacturing Growth Rate and additional effect of urbanization	
8	Construction Material	Bulk–break bulk	6.98%[17]		
9	Paper & Forest Goods	Bulk–break bulk	7%[18]	Growth of Indian Paper Industry	
10	Plastics	Bulk–break bulk	10%[19]	Based on sector report – Care Ratings	
11	Miscellaneous	Both	4.83%[17]**Error! Bookmark not defined.**	Based on Assam's Manufacturing Growth Rate	

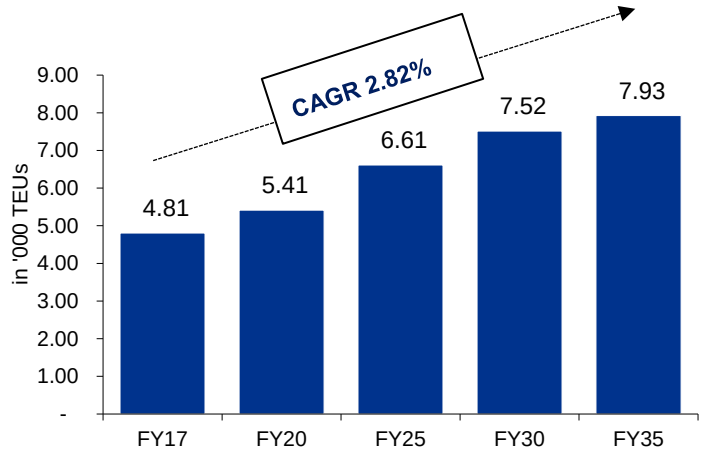
Detailed discussion on the projections for each key commodity in the region is provided in the Annexure 11.5.

[14] '*Growth performance of Agriculture and Allied Sectors in the North East India'*, A. Roy, D.S. Dkhar, A.K. Tripathi, et al, 2014
[15] Population Projection for India and States 2001 – 2026, Census 2001
[16] Indian Consumer Durables and FMCG Industry Analysis, IBEF;2017
[17] Economic Survey, 2016 - 2017
[18] Credit Perspective: Paper Industry, CARE Ratings
[19] Federation of Indian Chambers of Commerce and Industry (FICCI)

2.5.3 Projected container traffic in the region

The total container volume in the region is projected to grow from 4,808 TEUs in FY17 to 7,925 TEUs in FY35 at a CAGR of 2.82% over this period (Figure 2.28).

Figure 2.28: Projected Container Volume through the region, FY35



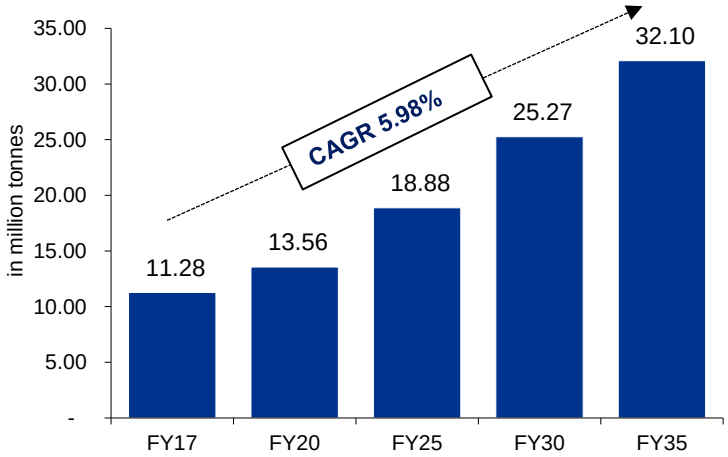
Source: Primary interactions, Secondary Research, KPMG Analysis

The container traffic is expected to grow at a CAGR of 4.06% from FY17 to FY25 compared with a slower CAGR of 1.83% from FY25 to FY35.

2.5.4 Projected domestic bulk–break bulk traffic in the region

The volume of break bulk commodities is projected till FY35, with the projected volumes displayed in the Figure 2.29.

Figure 2.29: Projected Bulk-break bulk Volume through the region, FY35



Source: Primary interactions, Secondary Research, KPMG Analysis

The total bulk-break bulk volume is projected to grow from 11.28 MMT in FY17 to 32.10 MMT in FY35 at a CAGR of 5.98% over this period. The bulk-break bulk traffic is expected to grow at a CAGR of 6.65% from FY17 to FY25 and a slower CAGR of 5.45% from FY25 to FY35.

2.6 Summary of Demand Assessment

Assam is the most industrialized state of north east India and, with 70% of the population of the north east, is a major consumption hub.

The total relevant market in the region in FY17, including both container and bulk–break bulk traffic, both domestic and EXIM cargo, is ~11.96 MMT. ~94% of the total relevant market is domestic cargo. The domestic cargo is mostly bulk–break bulk cargo, and ~67% of the domestic bulk–break bulk cargo is transported by road.

The total container volumes in FY17 through the region is ~4,808 TEUs in FY17. The key container commodities include tea, betel nuts, etc. The north east region is divided into 3 clusters – Upper Assam, Meghalaya and rest of north east, to analyze the generation of the container cargo. The Upper Assam cluster generates ~81% of the total container cargo of the region, the Meghalaya cluster generates ~14% of the total container cargo and the rest of the north east (comprising Nagaland, Tripura and Mizoram) generates ~5% of the total container cargo. In FY17, all the EXIM container cargo through the region is transported to Kolkata Port.

The domestic bulk-break bulk cargo handled in the region is 11.26 MMT in FY17. The major domestic bulk-break bulk commodities through the region are Construction material, including cement, FMCG products, tea, iron & steel, etc.

The Origin Destination analysis of key bulk-break bulk commodities has been performed. As per primary interactions, FMCG products originate from Madhya Pradesh and Maharashtra, and move into the region. Additionally, tea originates from Assam and is transported to rest of India, including Gujarat, Delhi-NCR, Karnataka, etc.

The region borders 2 nations – Bangladesh and Bhutan, and offers potential for foreign trade through its borders with neighbouring nations and South East Asian nations. The region's connectivity to neighbouring nations creates the potential for regional cooperation & integration (RCI). The relevant cross-border bulk-break bulk cargo handled in the region is 0.703 MMT in FY17. The major commodities include construction material, coal and boulder stone.

The Government of Assam has identified land for the development of the proposed MMLP close to Village Korea, near Jogighopa (formerly Ashok Paper Mills). Apart from the industrial base and consumption centres around the region, the Jogighopa MMLP would also cater to the hinterland covering Meghalaya, Arunachal Pradesh, Manipur, Nagaland, Mizoram and Tripura.

The traffic potential of the region has been assessed. The total bulk-break bulk volume is projected to grow from 11.89 MMT in FY17 to 33.62 MMT in FY35 at a CAGR of 5.95%. The container market is projected to grow from 4,808 TEUs in FY17 to 7,925 TEUs in FY35 at a CAGR of 2.82% over this period.

3 Supply Assessment

3.1 Organized logistics facilities

Guwahati, the distribution and aggregation hub of north east India, has logistics facilities in and around its industrial clusters to cater to the cargo demand in the city. Among the existing logistics facilities, the only container handling facility is ICD Amingaon, operated by CONCOR. There are limited organized facilities in the rest of north east India.

A large share of bulk–break bulk movement in and out of Guwahati is through road, and is catered to by unorganized warehousing and transportation players. Rail movement of bulk-break bulk cargo is through Indian Railways' good sheds – New Guwahati (B.G. Godown), and Changsari. Other major players that operate warehousing facilities in the region include Central Warehousing Corporation and Assam State Warehousing Corporation.

The existing organized logistics facilities in the Guwahati region are plotted in Figure 3.1.

Figure 3.1: Existing Organized Logistics Facilities in Guwahati

Legend

Existing Facilities

Sources: Primary Interactions, ICD Amingaon, CWC, Assam State Warehousing Corporation, Indian Railways.

The snapshot of the organized logistics facilities in the Guwahati region has been provided in Table 3.1.

Table 3.1: Existing Organized Logistics Facilities in Guwahati

Name of Facility	Traffic Volume in FY17	EXIM/Domestic		Road/Rail	
		EXIM	Domestic	Road	Rail
Containers (in '000 TEUs)					
ICD, Container Corporation of India	4.81	39%	61%	-	100%

Name of Facility	Traffic Volume in FY17	EXIM/Domestic		Road/Rail	
		EXIM	Domestic	Road	Rail
Bulk-break bulk (in MMT)					
Central Warehousing Corporation, Guwahati	0.03	-	100%	100%	-
Assam State Warehousing Corporation	0.06	-	100%	35%	65%
Indian Railway Goods Shed, B. G. Godown	2.76	-	100%	-	100%
Indian Railway Goods Shed, Changsari	0.23	-	100%	-	100%

Sources: Primary Interactions, ICD Amingaon, CWC, Assam State Warehousing Corporation, Indian Railways.

Of these facilities, ICD Amingaon, and the Indian Railway Goods Sheds in Changsari and New Guwahati (B.G.Godown) handle rail-based cargo, while ICD Amingaon is the only facility that handled EXIM cargo. Detailed analysis of existing organized facilities in Guwahati is illustrated in the subsequent sub-section.

3.1.1 Existing Organized Logistics Facilities

3.1.1.1 ICD Amingaon, Container Corporation of India Ltd.

CONCOR has an ICD in Amingaon, in close proximity to the industrial clusters in Amingaon, including Export Promotion Industrial Park, Amingaon.

This facility caters to the industrial area covering Assam, Tripura and Meghalaya. It has good road connectivity, with its connectivity with NH 27, and Hajo Road / North Guwahati Road. The connecting railway station is Agthuri (AGT) and the facility has two full length railway sidings, of approximate length of 686 m.

The facility handled 4,808 TEUs in FY17, while the major commodities handled by the facility include tea and betel nuts, comprising 70% of the total containerized commodities handled. The other commodities handled include jute, cement, etc.

The facility has ~7500 sq.mt of export warehousing space, and 2454 sq.mt of bonded warehousing space. Further, it has 1076 sq.mt of transit warehousing space. However, it doesn't have import and domestic warehousing space. The facility lacks in-house, third-party logistics and freight-forwarding activities.

The container cargo generated in the region and handled by the facility is minimal; moreover the facility has minimal possibility for future expansion. Further, industrialization will increase containerization of cargo in the Assam and north east region, and there may be a need for another container handling facility in the north east region.

3.1.1.2 Central Warehousing Corporation, Guwahati

The Central Warehousing Corporation has 2 major warehouses in Guwahati – in Amingaon, within the premises of EPIP Amingaon, and in Maligaon. The Amingaon facility has a capacity of 20,000 metric tonnes and the Maligaon facility has a capacity of 8,500 metric tonnes. CWC has plans to expand its warehousing space in Guwahati by 6,000 metric tonnes by FY19.

The major commodities handled by these facilities include food grains & pulses, FMCG products, including paper, beverages, mosquito coils, etc. The capacity utilization of these facilities is 80%.

3.1.1.3 Assam State Warehousing Corporation, Guwahati

Assam State Warehousing Corporation has numerous warehousing facilities in the Guwahati region and across Assam. As of FY17, the cumulative capacity of warehousing facilities across Assam is 245,985 metric tonnes.

The facilities in Guwahati are situated in Satgaon, Maidamgaon, and Amingaon. As of FY17, the facilities in the Guwahati region have a cumulative capacity of ~57,000 metric tonnes, and an average capacity utilization of 70%.

The key commodities handled by the facilities include food grains, pulses, fertilizers, cement, salt, tea, poultry feed, etc. Of the cargo handled by the facilities in the Guwahati region, 65% is transported by rail, in bulk-break bulk form, and 35% transported by road.

3.1.1.4 Indian Railway Goods Shed, Guwahati

The Indian Railway has 2 Goods Sheds in the Guwahati region – with bulk–break bulk commodities transported by rail to the New Guwahati Railway Station in the B.G.Godown Area and in Changsari.

The facility in New Guwahati is a major bulk–break bulk facility in the region, with cargo transported by rakes from all across India. The inbound traffic handled by the facility was 2.76 MMT in FY17, with the key inbound commodities include cement, fertilizers, edible oil, iron goods, sugar, etc. The outbound traffic is negligible, with the major commodity being petroleum coke and cement.

The facility in Changsari handles food grains – rice and wheat, for the Food Corporation of India (FCI). The facility handled 0.23 MMT of cargo in FY17, with rice comprising 90% of this freight.

3.1.2 Proposed Facilities for Development

Apart from the existing facilities, the following facilities have been commissioned for development in the region.

Table 3.2: Proposed Logistics Facilities in the region

S.No	Facility Name	Location	Extent of Land (Acres)	Proposed Facilities
1	Central Warehousing Corporation	Guwahati	Expansion	It is proposed to expand capacity of existing facilities in Guwahati by 6,000 metric tonnes by FY19.
2	ICD, Tea Township	Chaygaon	80 acres	AIDC is developing a Tea Park in Chaygaon, with ICD to be operated by CONCOR for rail movement of tea. The proposed facility is ~35 km from Guwahati International Airport. Proposed facilities to be available include warehousing spacing, truck

S.No	Facility Name	Location	Extent of Land (Acres)	Proposed Facilities
				yard, service centres, driver facilities & other transport related infrastructure, commercial space to house tea brokers/buyers and others tea related personal, tea auction centre space, convention centre, meeting rooms, exhibition halls, hotel, tea tasting facility, tea R&D facilities, packaging related space, tea blending related space, recreation facilities etc.

Sources: Primary Interactions, Assam Industrial Development Corporation, Central Warehousing Corporation.

3.1.3 Tariff Structure of Existing Organized Facilities

The tariff structure of the major warehousing facilities in the region has been summarized in Table 3.3.

Table 3.3: Tariff Structure for warehousing facilities in Guwahati

S.No.	Name of Facility	Gross Area Rate	Storage Rate
1	CWC Amingaon	INR 164 per sq.mt per month	INR 74 per MT per month
2	CWC Maligaon	INR 164 per sq.mt. per month	INR 74 per MT per month

Sources: Secondary Research, Central Warehousing Corporation.

The tariff structure of the container facility in the region is provided in Table 3.4.

Table 3.4: Tariff Structure for container facilities in Guwahati

Name of Facility	Warehouse Stuffing of EXIM Cargo	Warehouse Stuffing of Domestic Cargo	Out of cycle single Handling Loaded Container
ICD Amingaon, CONCOR	INR 5,300/TEU	INR 1,750/TEU	INR 2,100/TEU

Source: Secondary Research

The tariffs of warehousing facilities in Guwahati are on the higher end; the tariffs of existing warehousing facilities in other parts of Assam, including Jorhat, Sorbhog, and Dhubri, are ~20% less than that of tariffs of warehousing facilities in Guwahati. It is expected that the proposed MMLP may offer a price advantage compared to facilities in Guwahati but not as much as facilities in the other parts of Assam, being the only major facility in the region.

3.2 Warehousing facilities

The existing warehousing facilities for key bulk–break bulk commodities are depicted in Figure 3.2.

Figure 3.2: Existing Warehousing Facilities for key bulk–break bulk commodities

Sources: Primary Interactions with transporters and logistics players, KPMG Analysis.

Warehousing facilities in Guwahati are concentrated along NH 27. Further, the four lane highway that was earlier constructed as a by-pass to the city has become part of the city, increasing congestion. Warehousing availability in Guwahati is limited, with high capacity utilization and limited possible expansion. There is a need for a warehousing hub outside the city limits of Guwahati.

3.3 Summary of Supply Assessment

Currently, the only container handling facility in the Northe East of India is the CONCOR ICD in Amingaon. The other facilities that handle bulk–break bulk cargo are CWC facilities, Assam State Warehousing Corporation and the Indian Railways Goods Sheds. Of these facilities, CONCOR ICD handles container traffic by rail, and the Indian Railways Goods Sheds handle bulk–break bulk traffic by rail. The CWC facilities and the Assam State Warehousing Corporation facilities handle road-based bulk–break bulk traffic. Bulk-break bulk cargo in Guwahati is mostly transported through road and is catered to by un-organized warehousing and transportation players. Further, there are limited organized facilities in the rest of north east India.

Of the organized facilities, the container handling facility, ICD Amingaon, handled 4,808 TEUs of container traffic in FY17, with the facility catering to the industrial area covering Assam, Tripura and Meghalaya. The planned expansion of organized facilities include expansion of the CWC facilities and the upcoming Tea Township and the ICD within its premises in Chaygaon.

The tariffs of warehousing facilities in Guwahati are on the higher end compared to existing warehousing facilities in other parts of Assam, including Jorhat, Sorbhog, and Dhubri. It is expected that the proposed MMLP may offer a price advantage compared to facilities in Guwahati but not as much as facilities in the other parts of Assam.

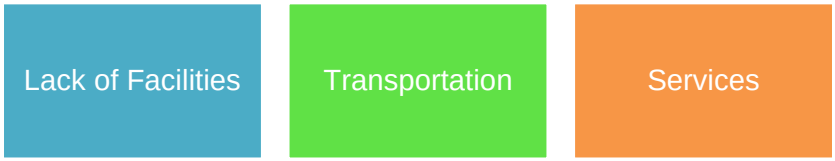
Warehousing facilities in Guwahati are concentrated along NH 27. Further, the four lane highway which was earlier constructed as a by-pass to the city has become part of the city, increasing congestion. Warehousing availability in Guwahati is limited, with high capacity utilization and limited possible expansion. There is a need for a warehousing hub outside the city limits of Guwahati.

4 Logistics Challenges, Opportunities and the MMLP Solution

4.1 Key logistics challenges in the region

Primary interactions with industry players, logistics players, transporters, and government officials have helped to highlight the key logistics challenges in the region (Figure 4.1).

Figure 4.1: Defining Key Logistics Challenges



The key challenges faced by the stakeholders in the Assam region is as follows:

Facilities

- Concentration of warehousing facilities along NH 27, in the Lokhra Chariali and Beltola region
- Lack of adequate cold storage facilities for fruits, vegetables and pharmaceutical products in and around Guwahati region
- Absence of truck terminals in the Guwahati region, resulting in parking along national highway, leading to city congestion

Transportation

- Expansion of transportation infrastructure in Siliguri Corridor or Chicken's Neck is a challenge, and hence development and operationalization of inland water transport is critical
- Unorganized warehousing facilities are concentrated along NH-27. This results in congestion along NH 27
- Unsatisfactory road condition in the north east Region, with narrow roads, connectivity being affected by rainfall and landslides, and inadequate repair and maintenance
- Rail connectivity in the north east region has high line capacity utilization, and the following issues:
    - Largely single track network
    - Non-uniform (broad gauge/meter gauge) gauge
    - Congestion in network

Services

- The region has fragmented ecosystem with multiple service providers for different services, leading to cost and time in-efficiencies
- Existing facilities lack value added services and have limited technology-driven expertise. There is a lack provision for cargo consolidation

The problem of congestion of the city can be addressed by understanding global best practices (Figure 4.2).

Figure 4.2: Solutions for Congestion - Paris Freight Distribution Model

Effective freight distribution methods are needed to make cities livable by minimizing negative impacts on the commercial/industrial establishments. The issues that need to be addressed include efficiency of goods distribution, problems of road congestion, air quality, greenhouse gas emissions and noise pollution.

Paris has one of the more efficient urban freight management models in Europe. The key features of this model include the *Urban Mobility Plan*, *Driving Restrictions*, *Delivery Areas*, *Promoting Consolidation*, *Multi modal freight distribution*, and *Last mile delivery*.

Paris has had complex truck regulations that link the trucks' characteristics, including surface, to specific time-windows of authorized delivery in the cities. The city promotes night deliveries for large vehicles, and it incentivizes smaller and environmental-friendly delivery vehicles.

Street space in Paris has been redesigned to accommodate on-street delivery areas, with new rules and regulations to be adhered to for usage of these areas. Also, specific time durations have been identified for limiting the use of these delivery areas.

Consolidation is encouraged to reduce traffic by finding ways to combine pickups and deliveries of transporters.

Source: Secondary Research

4.2 The Challenges with the Siliguri Corridor

The Siliguri Corridor, or the Chicken's Neck, is a narrow stretch of land in West Bengal that connects north east India to Indian mainland. The Siliguri Corridor serves as the bridge for people, cargo and utilities between mainland India and the north east region. It is critical from a commercial and strategic perspective. The corridor, which at one point is less than 27 km wide, is depicted in Figure 4.3.

Figure 4.3: Siliguri Corridor, West Bengal, India

Source: Secondary Research.

The freight intended for the North Bengal, Sikkim, Guwahati region and the rest of north east region is transported from the Indian mainland via road and rail, through the Siliguri Corridor. The major national highway through the corridor is NH 27, which connects the Indian mainland to Guwahati. Additionally, the Northeast Frontier Railway links the corridor with Kolkata and Bihar with north east region. The corridor has a major broad gauge railway line, with electrification of the double-track corridor in progress. As of FY15, the railway network in the corridor has a line capacity and utilization of more than 100%[20].

With the Act East Policy of the Government of India and multilateral initiatives, like South Asia Subregional Economic Cooperation (SASEC) and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), north east India is expected to serve as a gateway for foreign trade with other South Asian and South East Asian nations.

Forecasted industrialization in Assam and north east, expected increase in purchasing power and consumption, and regional trade and cooperation are expected to drive freight movement between mainland India and the north east region.

With the international borders with Nepal and Bangladesh, there is limited scope for expansion of connectivity infrastructure in the corridor; and the infrastructure in the corridor may not address the rising freight movement.

There is a need to explore alternatives to the Siliguri Corridor, for transport between mainland India and the north east region. One alternative is exploring the potential of inland waterways, with cargo being transported via inland waterways till a river port in Assam, like proposed in Jogighopa, and then onward transport to end destination via road or rail.

4.3 Need for Logistics facilities in the region

Guwahati is a distribution hub for the north east, with large trucks bringing in cargo from mainland India; the cargo is then transported from Guwahati to the rest of the north east in smaller trucks. The use of smaller trucks is driven by relatively low demand at these consumption centers in the rest of the north east and low outbound cargo from these centers, resulting in transporters having to bear the cost of empty trucks travelling from rest of north east to Guwahati.

Guwahati, serving as a transhipment hub, is currently facing severe congestion. Moreover, warehousing availability in Guwahati is limited, with high capacity utilization and limited possible expansion. There is a need for a warehousing hub outside the city limits of Guwahati. Further, there are a large number of trucks, including empty trucks, being parked along NH 27 due to lack of adequate truck terminals in the region.

The existing organized facilities have been analyzed, and the gaps in the existing facilities studied based on the defined framework. The existing facilities offer limited inter-modal transport and handling of commodities, with most of the cargo transported through road, and there is a need to develop a facility that promotes multi modal movement of cargo, including exploring the potential of inland waterways. Moreover, the existing facilities offer limited value added services and have limited technology driven expertise. The logistics ecosystem is fragmented, with multiple service providers for different services, leading to cost and time-efficiencies.

Though the existing facilities have expansion plans, their proximity to the Guwahati and their concentration along NH 27 limits the scope for expansion. Also, the rate of expansion of

[20] 'Indian Railways – Lifeline of the nation', February 2015

existing facilities may not be able to cater to the rising demand for logistics services, influenced by projected industrial development.

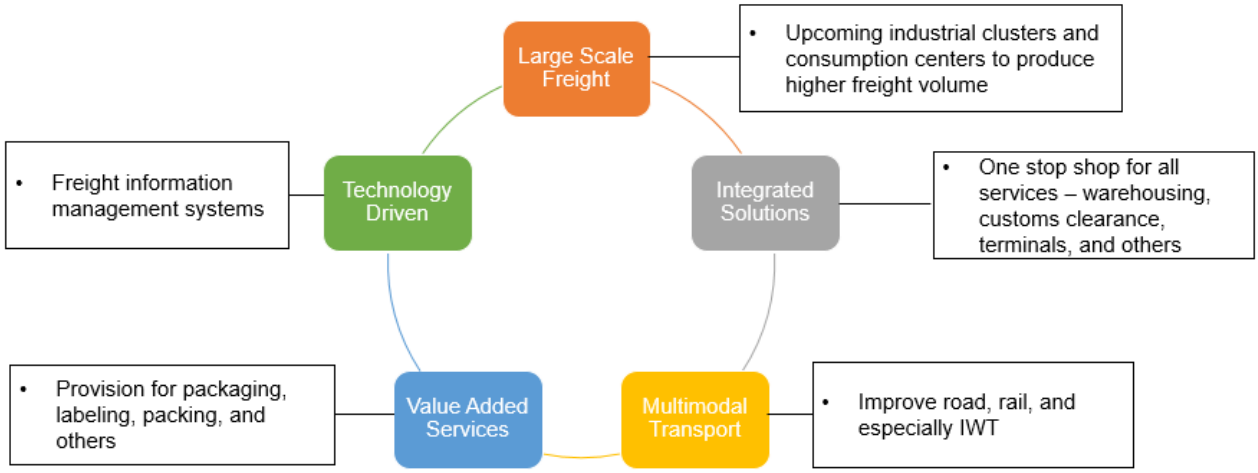
Hence there is a need for an integrated, technology-driven multi modal logistics park in Assam that can cater to Assam and the rest of north east India, reducing the burden on Guwahati as a transshipment / consolidation hub.

4.4 Framework for effective MMLP

A five-point framework has been developed for an effective MMLP. The essential characteristics of an effective integrated logistics park is demonstrated through the following framework which calls for an integrated, large-scale facility providing value-added services through streamlined processes, driven by technology and with access to multi-modal transport.

The defined framework for an effective MMLP is illustrated in Figure 4.4.

Figure 4.4: Framework for effective MMLP



Source: KPMG Analysis

Large-Scale Freight

In order to be able to consolidate large volumes of cargo and achieve economies of scale, it is strategically advantageous to locate the logistics parks in close proximity to gateways like ports, airports, industrial clusters and consumption centres. The facilities in Guwahati are well connected to consumption centres, ports and airports, as depicted in Figure 4.5.

Figure 4.5: Key Gateway connectivity to Existing Facilities in Guwahati

Source: KPMG Analysis, Primary Interactions

The current organized facilities such as ICD Amingaon, CWC, and Indian Railways Good Sheds, having good proximity to Kolkata ports and also to the Guwahati International airport, though currently there is negligible movement of freight through the air terminal.

Industrial clusters are located in close proximity to the organized facilities, generating consistent volumes for these facilities. However, the region's current freight volume is relatively small. Upcoming industrial clusters and other developments are expected to produce consistently higher freight volume. In spite of the proximity to industrial clusters, the planned expansion of the existing logistics facilities may not be able to cater to the expected rising freight volumes.

Integrated Facilities

An integrated logistics park can act as a hub which aggregates all types of commodities and provides multitude of services ranging from warehousing, freight forwarding, railway and road transportation, Custom Hosting Solutions (CHS'), CFS' etc.

The current logistics facilities in the Guwahati region offer limited aggregation and integration facilities and have to depend on other logistics players to provide the services which causes in-efficiencies as cost and time involved in transitioning from one facility to another increases. Table 4.1 represents the services offered by existing organized logistics facilities in Guwahati.

Table 4.1: Services offered by current organized logistics facilities in Guwahati

Existing Facilities	Customs handling agents	CFS/ICD/Rail Terminal	Clearing and Forwarding Agents	Warehousing	Third Party Logistics	Cargo Consolidation
ICD Amingaon	✓	✓	✗	✓	✗	✓
CWC, Guwahati	✗	✗	✗	✓	✗	✗
Assam State Warehousing Corporation	✗	✗	✗	✓	✗	✗
Indian Railways Goods Shed	✗	✓	✗	✓	✗	✗

Sources: KPMG Analysis, Secondary Research, Primary Interactions.

The organized facilities in the region a range of facilities, however, lacks in house third party logistics and freight forwarding activities.

In all, an integrated facility is required to offer cost effective solution and provide one-stop solution to the customers.

Access to Multi-Modal Transport
The existing facilities in Guwahati offer inter modal facilities, from road to rail and rail to road and there exists a scope for offering multi – modal solutions, across road, rail and inland waterways, to the customer, enabling logistics cost reduction in addition to decongesting the road networks.

Table 4.2: Mode of Transport for existing organized existing facilities in Guwahati

Existing Facilities	Rail	Road	Airport	Inland Waterways
ICD Amingaon	✓	✗	✗	✗
CWC, Guwahati	✗	✓	✗	✗
Assam State Warehousing Corporation	✗	✓	✗	✗
Indian Railways Goods Shed	✓	✗	✗	✗

Source: Primary Interactions, KPMG Analysis

An efficient logistics park in the region would have access to multi modal transport including roads, inland waterways, air strips and coastal shipping.

Value added services and Technology
Value-added services such as co-packing, handling return goods, and labeling enable the facility provider to be highly effective in addressing customer demands.

Technology plays a predominant role in the effective functioning of a logistics facility. Live-tracking of products as they move in and out of the facility enables better customer service. Enterprise Resource Planning technologies and predictive analysis allows for real-time demand forecasting, which is crucial for the efficient management and planning of inventory. The internet of things can also drive value by facilitating remote billing and temperature control, among others.

Current facilities in Guwahati offer limited value added services and have limited technology driven expertise; there exists a huge potential for these services in the region.

The Indian logistics sector is witnessing a transformation and the needs of the hour include improvement of road and rail infrastructure, creation of modern warehouse facilities and adoption of newer facilities like MMLPs, provision of value-added services, targeting e-commerce customers, and levering the locational advantage of India to the fullest.

Figure 4.6: Case Study – Bhiwandi Warehousing Hub

A consumption-driven warehouse cluster, the Bhiwandi Warehousing Hub is strategically located in the Mumbai Metropolitan Region (MMR) in close proximity to the densely populated consumption markets of Mumbai, Thane, and Navi Mumbai. This geographic advantage makes Bhiwandi a preferred choice of the consumer-based industries of the MMR. In addition, the need for reducing delivery time to consumers makes it a preferred warehouse location in the MMR.

MMR is a densely populated urban agglomeration and the presence of residential catchments for all income groups in and around Bhiwandi ensures an abundant supply of skilled, semi-skilled, and unskilled workers.

Bhiwandi is a good example of a cluster catering to varied industries and leveraging its location to its advantage, along with other factors like rental costs and cheap labor.

Source: India Warehousing & Logistics Report, 2014, Knight Frank

4.5 Economic benefits of MMLP

Inherent to the concept of an MMLP is the provision of multi-modal transportation facilities for the end user. The key transport infrastructure prevalent in India are roads, rail, shipping ports, inland waterways, and airports. An MMLP serves as an inter-linking point for all modes of transport at one location.

The concept of an MMLP is relatively new to India and it has several benefits over a logistics park with a single mode of transport.

Reduced cost of transportation
With the use of the right modal choice for the movement of goods, MMLPs can help through reduced transportation cost savings. This is an important factor to consider when keeping in mind high logistics costs in the Indian context.

Reduced transit time
Along with promoting a cost-friendly system, a multi-modal system would also promote efficiency in operations by reducing transit time of the goods. This reduces the inventory costs of the logistics operators and the ultimate user of the transport mode.

Higher utilization of assets
As transit time is reduced, the vehicles transporting goods and other hardware facilities are available for use for other purposes. Hence, an MMLP promotes the increased utilization of assets.

Balanced growth of all modes of transport
The current freight movement in India is heavily skewed toward movement by road and this has only increased over the years. The share of road transport rose to approximately 58% in 2012, up from 31% in 1990. An MMLP helps in the balanced growth of all modes of transport and enables the effective utilization of assets.

Environment friendly
Transportation represents one of the major sources of environmental pollution and significantly contributes to global warming. MMLPs encourage greater use of environmentally friendly transport modes and reduces the carbon footprint, hence promoting the concept of green logistics.

Customization of transportation
Multi-Modal transport can accommodate special shipping needs, including accessibility to remote locations and large or oversized shipments.

Employment
Multi-Modal logistics parks provide a range of employment opportunities in areas of warehousing, trucking, railways, IT, and logistics services. For example, the 9,600-acre Alliance Global MMLP in Texas created about 31,000 direct jobs and 36,000 indirect jobs.[21]

GDP and Income
There is a positive association between logistics services and growth in GDP. This has been observed in the case of the Alliance Global MMLP in Texas, which contributes $6.4 billion to GDP and accounts for $3.6 billion in personal income.

[21] Alliance Texas Impact to the Texas Economy. 2015. *Port of Entry: Fort Worth*.

5 Proposed MMLP Site – Jogighopa

The site identified by the Government of Assam for the developed of the MMLP is near Jogighopa. The land parcel is on both sides of the Saibari – Jogighopa Road, which provides connectivity to NH 17. The distance from the nearest railway terminal is 3.5 km, to the South East of the identified land parcel, while the distance from the nearest river port is 6 km.

The proposed MMLP in Jogighopa is strategically located with a potential to offer multimodal connectivity through road, rail and inland waterway modes, can develop as a distribution / aggregation centre for the North - Eastern states besides serving as a hub for the cross-border trade with Bangladesh, Bhutan, Nepal and Myanmar.

Recent developments like the announcement of the North East Economic Corridor under the Bharatmala Program of the MoRTH and signing of the MoU between India and Bangladesh for developing the Dalu-Tura-Goalpara-Gelephu multimodal trade route further strengthen Jogighopa's case for a Multimodal Logistics facility.

5.1 Jogighopa —Site Attributes

5.1.1 Location and Land Area

Assam Government has identified an area close to Village Korea, near Jogighopa for the development of the MMLP. About 300 acres out of a land parcel of more than 700 Acres spread on two sides of the Saibari – Jogighopa (formerly Ashok Paper Mills) is readily available. The location is approximately 110 km (aerial distance) west of Guwahati and approximately 10 km (aerial distance) North West of the nearest town, Goalpara. The Project Site is located at the intersection of Latitude of 26° 14' 56" N and Longitude of 90° 33' 19" E.

The Site is located on the northern banks of the Brahmaputra River very close to the Naranarayan Bridge, one of the 5 bridges across the Brahmaputra in Assam.

5.1.2 Current Ownership and Usage

The foundation stone for a 30,000 TPA Pulp and Paper Mill promoted by Ashok Paper Mill (APM) was laid at the location in 1970 starting Commercial Operations in 1976. The operations of the mill were interrupted due to various reasons 1979 onwards, bringing it to a grinding halt in March 1983. The Government of Assam took over the APM's Jogighopa Unit on 7th January 1991 under the provisions of Assam Act No. XV of 1990 (Acquisition and Transfer of Undertaking) in the name of Ashok Paper Mill. In spite of various subsequent measures taken by the Government to put the Mill back in profitable operation, the operations could not be sustained due to various reasons and the Mill has been non – operational ever since.

The current broad land usage for the land parcel is indicated in Table 5.1.

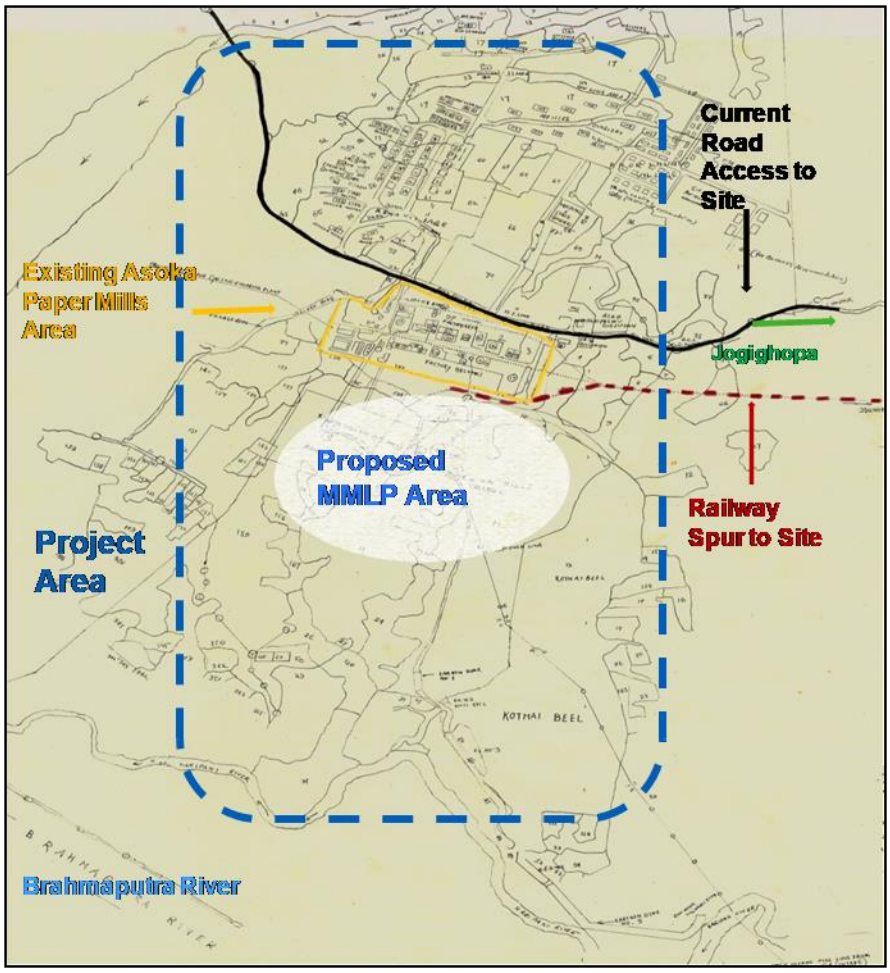
Table 5.1: Current Land Usage – Jogighopa land parcel

Land Use	Area
Existing Mill Complex (with industrial structures)	60 acres
Colony Area (with some residential structures)	185 acres
Low Lying Areas and Water Bodies	185 acres
Vacant land	320 acres

Sources: AIDC, Planning & Technical Expert – ADB.

The vacant land available at the location is adequate and is therefore proposed to be utilized for the MMLP and future expansions if required. The overview of the proposed site is illustrated in Figure 5.1.

Figure 5.1: Overview of MMLP Site



Sources: AIDC, Planning & Technical Expert – ADB.

5.1.3 Developments in the Vicinity of Site Location

The proposed site is located in Bongaigaon District, very close to Korea Village which borders the MMLP site on the west side. Jogighopa town is approximately 3 km from the site, connected with the Saibari – Jogighopa Road providing the current access to the site. Goalpara, a major town is located approximately 20 km on the southern side of the Brahmaputra River and is connected through NH – 17. Bongaigaon, the District Headquarter is approximately 45 km to the North of the site, again connected via NH – 17.

Bongaigaon Refinery and Petrochemicals of Indian Oil Corporation Limited, located about 50 km from the site, has a crude refining capacity of 2.35 MMTPA and also produces value added petrochemicals and polyester staple fiber (PSF) products. The 750 MW, Coal Fired Bongaigaon Thermal Power Station located at Salakati near Bongaigaon in the adjacent Kokrajhar district is at a distance of 45 km from the site.

The Assam Industrial Infrastructure Development Corporation (AIIDC) proposes to set up a Multi – Sector Industrial Park over 726 acres with an investment of INR 600 Crores (approx) in Bongaigaon District. The Matia Industrial Growth Center in Goalpara District located around 55 km from the MMLP site is being developed by the Assam Industrial Development

Corporation (AIDC) over a land parcel of 450 acres (approx) to cater to Manufacturing Units producing Pulps and Papers, Packaged Drinking Water, G.I. Black wire, Forklift, Battery, Cosmetic product etc.

The Government of Assam may also explore the possibility of utilising the balance land available from Ashok Paper Mills for Industrial Development in the future.

5.1.4 Land Features

The overall land parcel has an irregular shape with low lying areas and water bodies at the periphery of the Site to the North and East. However for the purposes of the MMLP the available vacant land of 320 Acres is sufficiently adequate. This part of the site is flat with minimal undulations and hence suitable for development of the MMLP without major investments in land development.

Any costs to be incurred for the development of 185 acres of peripheral low lying areas will have to be done for extensions or other usages in the future.

The proposed area for the development is approximately 8 – 10 meters higher than the Brahmaputra River which runs 1.5 km to the South of the Project location and hence risk of flooding of the area is not foreseen. The site is additionally protected by a dyke / check dam which runs along the southern and eastern periphery of the site.

5.1.5 Road Connectivity

The proposed MMLP location is connected with National Highway No. 17 at Jogighopa approximately 3 km to the East by a narrow access road (Saibari – Jogighopa road). NH – 17 is currently a 2 – lane Highway which provides connectivity to Bongaigaon / NH – 27 in the north and to Goalpara in the South and further on to Guwahati along the Southern Bank of the Brahmaputra. The Naranarayan Bridge located approximately 6 km from the site is one of the 5 all weather bridges across the Brahmaputra along its 850 km journey in Assam. It is a 12 m wide, 2.3 km long double-deck bridge with a railway track on the lower deck and a road on the upper deck, connecting Jogighopa with Goalpara.

5.1.6 Rail Connectivity

Jogighopa Railway Station on the New Bongaigaon – Goalpara Section of North Frontier Railway is located at a distance of 3.5 km from the Site towards the East. The single track railway line runs parallel to the NH -17 in this section and utilises the Naranarayan Bridge across the Brahmaputra.

5.1.7 Waterways Connectivity

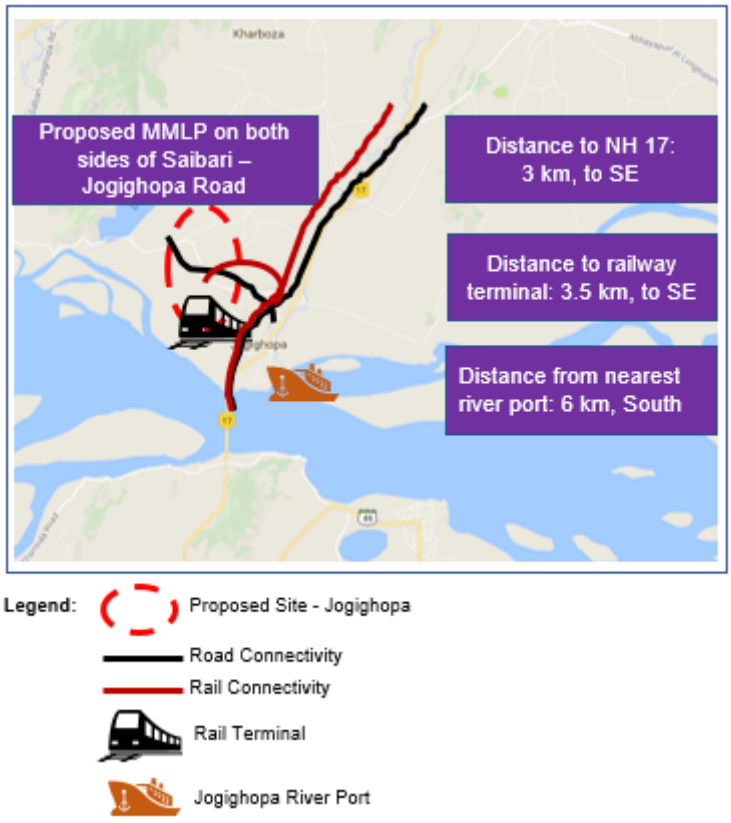
The river Brahmaputra having a length of 891 Km between Dhubri (Bangladesh Border) and Sadiya (Upper Assam) is designated as National Waterway 2 (NW 2). The Inland Waterways Authority of India (IWAI) is maintaining a navigable depth of 2.5m between Dhubri and Neamati (629 Km), 2.0 m in Neamati – Dibrugarh (139 Km) and 1.5m in Dibrugarh – Sadiya stretches for navigational purposes. As per IWAI, 120 m Horizontal and 12 m Vertical Clearances above the HFL (High Flood Level) are available throughout this stretch of the Brahmaputra. Jogighopa is one of the 8 river ports on NW 2 and currently has facilities to operate as a floating terminal with a steel crane pontoon.

IWAI has developed terminals at Dhubri and Pandu. However, Pandu River Port is within Guwahati, which makes its operations difficult, and may lead increase in time taken for trucks to reach the port, and may also lead to congestion within the city. This increases the

importance of other possible river ports along NW 2, including that of a possible river port at Jogighopa.

The connectivity of the site is illustrated in Figure 5.2.

Figure 5.2: Jogighopa – Site Connectivity



Source: Planning & Technical Expert – ADB.

5.1.8 Proximity to the Airport

The Guwahati International Airport (Lokpriya Gopinath Bordoloi Airport) which is located 110 km towards the east is accessible directly from the MMLP Site by National Highway 17 which is currently a 2 Lane Highway. The next closest airport to the MMLP site is Bagdogra which is 340 km away towards the west and connected through National Highway 17 upto Bongaigaon and then National Highway 27 which is a 4 lane highway.

5.1.9 Obstructions within the Site Boundaries

Based on the observations during the Site Visit and as confirmed by Assam Industrial Development Corporation (AIDC) Officials, there are no major obstructions within the site boundaries. The overall site area is split into two parts with the Saibari – Joghighopa road separating the Colony area on the north from the larger part towards the south. For the purposes of the MMLP only southern part is intended to be used. Further the structures of the old mill complex are restricted to a 60 acre parcel at the north end of the remaining land. As such leaving out these land parcels as well as the low lying areas, a clear area of about 320 acres is available for development. This area is free of Public Roads / Village Paths / Drainage Channels / High Tension Power Lines / Underground Gas lines / Other Major Over ground or Underground Utilities.

5.1.10 Future Expansion

The current location of the Site provides possibilities of future expansion over an equivalent area (100 – 150 acres) towards the south without even considering the development of low lying areas.

5.2 Industrial Clusters around the Site

While Guwahati is the major industrialized city of north east region, the Government of Assam is driving industrial development in close proximity to the proposed site – Jogighopa. Industrial development is to be promoted by the Government of Assam in industrial area of ~1700 acres of land, within 70 km of the proposed MMLP. This planned industrial development will drive freight movement through the region and is expected to drive demand for logistics services.

Figure 5.3: Industrial Clusters around site - Jogighopa

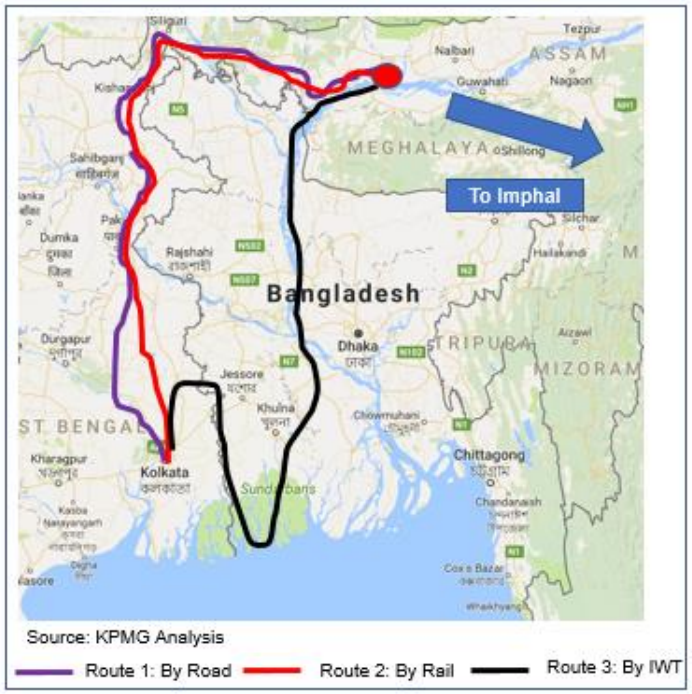
Sources: AIDC, KPMG Analysis.

5.3 Economics of Jogighopa MMLP

In the current scenario, Guwahati serves as a distribution hub for the north east region, with large trucks bringing in cargo from the Indian mainland, and then transported from Guwahati to the rest of the north east region in smaller trucks. The proposed MMLP at Jogighopa may provide the option of Jogighopa serving as a distribution hub, with smaller trucks transporting cargo to the rest of north east from Jogighopa.

Assessing the economics of the Jogighopa MMLP has been done by taking an indicative illustration in the form of cargo being transported from Kolkata to Imphal. The As-Is scenario is movement from Kolkata – Guwahati by road in large trucks, and Guwahati – Imphal by road in smaller trucks. Taking into view the proposed Jogighopa MMLP, the potential routes for transport of cargo to Imphal are illustrated in Figure 5.4.

Figure 5.4: Cargo moving from Kolkata – Jogighopa -- Imphal



Source: KPMG Analysis.

There exist 3 options for the Segment 1 (Kolkata – Jogighopa) of the journey for cargo movement - by road, by rail and by inland water transport. Segment 2 (Jogighopa – Imphal) of the journey – may be done by road or by rail. The various options that arise are depicted in Table 5.2, with respective savings in transportation costs illustrated.

Table 5.2: Economic Benefits of Jogighopa MMLP

Cargo moving from Kolkata – Jogighopa – Imphal		Jogighopa – Imphal (last mile)	
		Road	**Rail**
Kolkata to Jogighopa	**Road**	Additional Costs	N.A.
	Rail	+	+
	IWT	++	N.A.

Sources: Primary interactions, KPMG Analysis, Integrated National Waterways Transportation Grid (INWTG), RITES (2014).
Notes:
1. N.A: Not Applicable,
2. +: Transportation Cost savings, compared to As-Is.

The road – road transport over the 2 defined segments may be unattractive, with the most attractive option being transport over Segment 1 by inland waterways and Segment 2 by road.

While inland waterways appears to be the most attractive mode of transport for cargo movement, certain key considerations – including policy, operational and bilateral considerations, need to be addressed.

Hence, on operationalization of inland waterways for cargo movement, Jogighopa is suitably located to exploit the economic benefits of inland waterways.

5.4 Site Assessment

The upcoming industrial clusters around Jogighopa and the proposed economic corridor in the region is expected to drive freight flows to and from the proposed Jogighopa MMLP. Its proximity to India's international borders with Bangladesh and Bhutan is expected to promote cross-border trade with Bangladesh and Bhutan, via this proposed facility, and transit trade between Bhutan – Bangladesh.

Recent developments like the announcement of the north east Economic Corridor under the Bharatmala Program of the MoRTH and signing of the MoU between India and Bangladesh for developing the Dalu-Tura-Goalpara-Gelephu multimodal trade route further strengthen Jogighopa's case for a Multimodal Logistics facility.

Additionally, increased investments in connectivity infrastructure and industrial development is expected to increase the consumption base in the region, and contribute to the traffic potential of the region.

The existing organized facilities in Guwahati are concentrated along NH 27. Warehousing availability in Guwahati is limited, with high capacity utilization and limited possible expansion. There is a need for a warehousing hub outside the city limits of Guwahati. An MMLP in Jogighopa may provide value added services, at competitive prices, that may help in reducing congestion in Guwahati.

The site had good connectivity to road, rail and inland waterway networks. It is on both sides of the Saibari – Jogighopa Road, which provides connectivity to NH 17. The distance from the nearest railway terminal is 3.5 km, to the South East of the identified land parcel, while the distance from the nearest river port is 6 km. Hence, Jogighopa is a suitable location for development of the proposed MMLP.

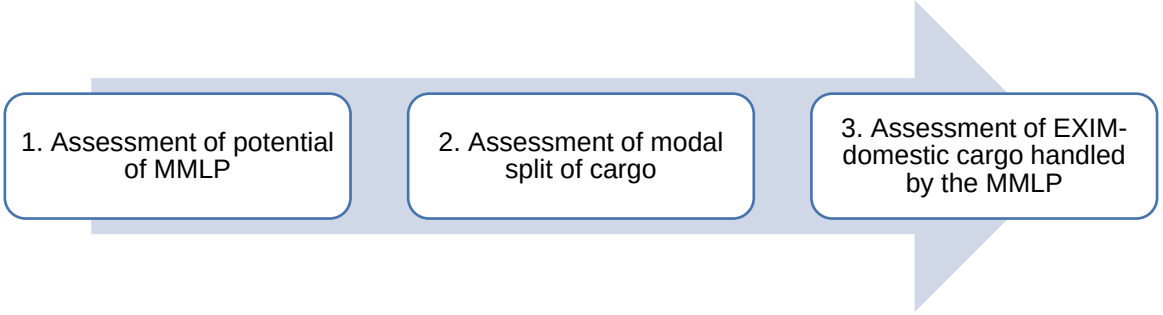
5.5 Assessment of traffic potential of Jogighopa MMLP

5.5.1 Methodology to assess traffic potential of Jogighopa MMLP

This section details the approach and methodology adopted to derive the traffic potential of the logistics park until FY35. The objective of the traffic assessment is to project the container and bulk–break bulk cargo potential of the MMLP and modes of transportation.

The methodology adopted for traffic potential assessment of the MMLP is shown in Figure 5.5.

Figure 5.5: Methodology to Assess the Traffic Potential of the MMLP



Source: KPMG analysis.

The approach broadly involves an

- assessment of share of regional traffic that could be attracted to the proposed MMLP, and
- evaluation of the share of road and rail and EXIM and domestic cargo in the total traffic potential of the MMLP.

5.5.1.1 Projected traffic of Jogighopa MMLP

The traffic potential for container and bulk–break bulk commodities in the region has been estimated.

The methodology adopted for assessment of traffic potential of the MMLP is explained below.

Domestic bulk–break bulk potential assessment

1. The warehousing requirements of key bulk-break bulk commodities in the Jogighopa region were assessed, based on understanding of the region and primary interactions.

2. Jogighopa inbound/outbound movement and Guwahati inbound/outbound movement of key commodities has been assessed based on O–D analysis and primary interactions.

3. The amount of traffic that the Jogighopa region would attract has been calculated to arrive at the domestic bulk-break bulk traffic potential for this region.

Cross-border bulk–break bulk potential assessment

1. The potential for inland water transport as a mode of transport for cross border trade has been assessed.

2. The potential traffic that can be aggregated at Jogighopa MMLP for subsequent cross-border trade has been assessed

Container potential assessment

1. The current share of container traffic in three clusters – Upper Assam, Meghalaya, and Rest of north east (comprising Mizoram, Nagaland, and Tripura), has been assessed and it has been assumed that the cluster share remains the same till FY35.

2. The amount of traffic that the Jogighopa region will attract from all clusters has been calculated to arrive at the container traffic potential for this region.

5.5.1.2 Assessment of Modal Split of Cargo

The modal split of the total cargo potential of the MMLP has been assessed to identify road, rail and inland water volumes, based on existing modal shifts and primary interactions. The expected shift in the modal split over the next 2 decades has been factored in.

5.5.1.3 Assessment of EXIM and Domestic Cargo

The EXIM versus domestic split of total cargo potential of the park has been assessed based on primary interactions. Further, the future expected share of EXIM and domestic cargo has been factored in.

5.5.2 Projected traffic of Jogighopa MMLP

5.5.2.1 Domestic bulk–break bulk potential in Proposed MMLP

Bulk–break bulk commodities are predominantly inbound due to the large consumption base and low industrial base of the north east region. The key commodity-wise through the region, including freight that is Jogighopa inbound/outbound and Guwahati inbound/outbound, has been assessed based on O–D analysis for the commodities. This share of traffic has been estimated based on primary interactions and is shown in Table 5.3.

Table 5.3: Commodity-Wise Traffic Share that is region-wise inbound/outbound

S.No.	Bulk–break bulk Commodity	Jogighopa inbound/outbound	Guwahati inbound/outbound
1	Construction material	30.0%	70.0%
2	FMCG	20.0%	80.0%
3	Tea	30.0%	70.0%
4	Iron Goods & Steel	25.0%	75.0%
5	Food Grains & Seeds	30.0%	70.0%
6	Machinery Items & Hardware	20.0%	80.0%
7	Fruits & Vegetables	80.0%	20.0%
8	Other Commodities	20.0%	80.0%

Sources: Primary interactions, KPMG analysis.

It is estimated that the MMLP can target a market share of about 40% of all the traffic that is Jogighopa inbound/outbound, and may not be able to effectively target any traffic that is Guwahati inbound/outbound. The warehousing requirements of commodities have also been assessed to arrive at the actual demand for MMLP. The domestic bulk–break bulk traffic projections for the Jogighopa MMLP is shown in Table 5.4.

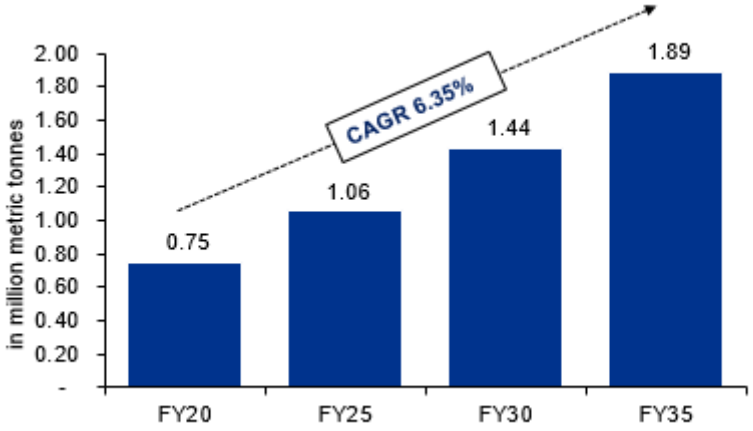
Table 5.4: Domestic bulk–break bulk traffic potential in Jogighopa MMLP

S.No	Year	Domestic Bulk–Break Bulk Traffic in Region (MMT)	Domestic Bulk–Break Bulk Traffic in Proposed MMLP (MMT)
1	FY20	13.56	0.75
2	FY25	18.88	1.06
3	FY30	24.89	1.44
4	FY35	31.15	1.89

Source: KPMG analysis.

The projected domestic bulk–break bulk traffic potential for the Jogighopa MMLP is depicted in Figure 5.6.

Figure 5.6: Domestic bulk–break bulk traffic projections for the Jogighopa MMLP



Sources: Primary interactions, KPMG analysis.

The domestic bulk–break bulk traffic is expected to grow at a CAGR of 6.35% from FY20 to FY35.

5.5.2.2 Cross-border bulk–break bulk potential in Proposed MMLP

Of the LCS' along the India – Bangladesh border, the relevant key export commodities are coal and boulder stone, which are exported from the Golakganj LCS, Mankachar LCS, and the Mahendraganj LCS. The key import commodities from Bhutan are construction material and FMCG products, including liquor. These key commodities and the current cargo movement are considered as representative commodities of the cross-border trade in the region. The current cross-border trade in the region is illustrated in Figure 5.7.

Figure 5.7: As-Is cross-border trade between India - Bangladesh

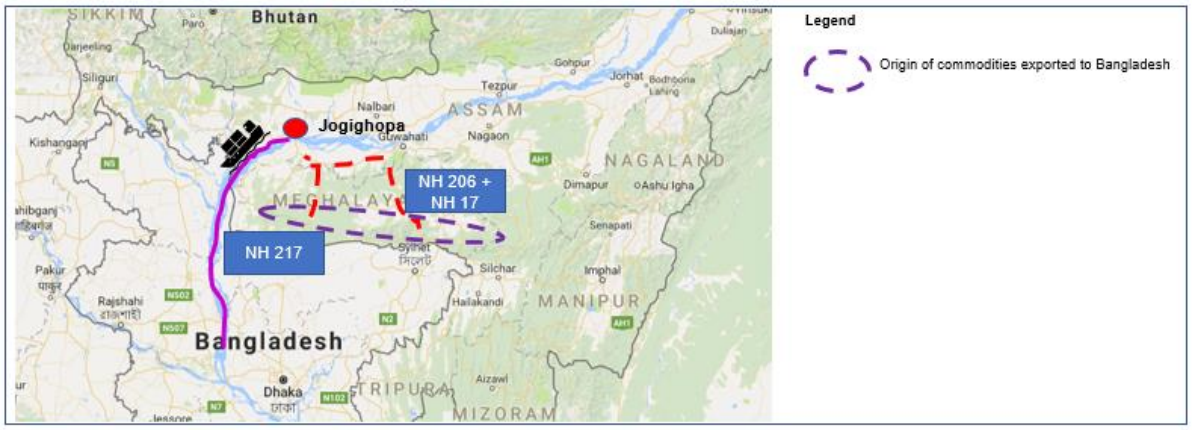
Sources: Primary interactions, KPMG analysis.

As depicted in the region, the major export commodities to Bangladesh – coal and boulder stone, are generated mostly in southern regions of Meghalaya, transported by Indian trucks to within 1 km of Bangladesh, transshipped to a Bangladesh truck and then transported to

major demand centers of Bangladesh. Multiple handling costs increases the cost of cross-border trade.

Jogighopa has the potential to serve as an aggregation hub, by exploring the potential for inland water transport. This commodities will be transported by road to Jogighopa, mainly along NH 217 and NH 206 & NH 17. It is estimated that 40% of the commodities currently traded between India and Bangladesh – boulder stones, and limestone, may be aggregated at Jogighopa. These commodities will then be transported via inland waterways to Bangladesh. The proposed means of cross-border trade between India – Bangladesh is depicted in Figure 5.8.

Figure 5.8: Proposed means of cross-border trade between India - Bangladesh



Sources: Primary interactions, KPMG analysis.

The cross-border bulk–break bulk traffic projections for the Jogighopa MMLP is shown in Table 5.5.

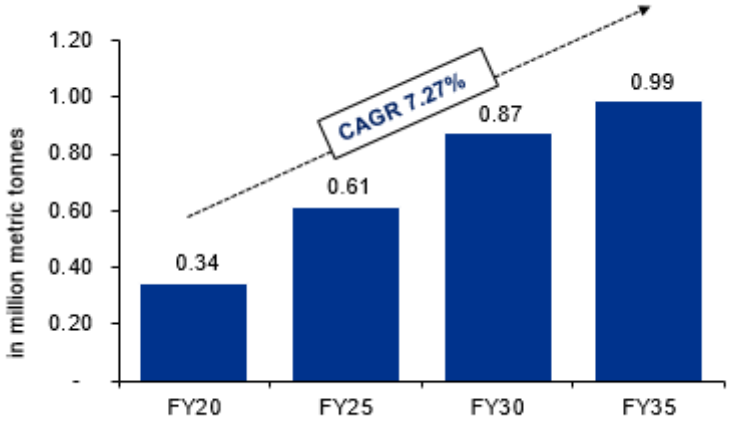
Table 5.5: Cross-border bulk–break bulk traffic potential in Jogighopa MMLP

S.No	Year	Cross-border bulk–break bulk traffic in the Region (MMT)	Cross-border bulk–break bulk traffic in Proposed MMLP (MMT)
1	FY20	0.86	0.34
2	FY25	1.53	0.61
3	FY30	2.18	0.87
4	FY35	2.47	0.99

Source: KPMG analysis.

The projected cross-border bulk–break bulk traffic potential for the Jogighopa MMLP is depicted in Figure 5.9.

Figure 5.9: Cross-border bulk–break bulk traffic projections for the Jogighopa MMLP



Source: Primary interactions, KPMG Analysis

The cross-border bulk–break bulk traffic is expected to grow at a CAGR of 7.27% from FY20 to FY35.

Further, Jogighopa MMLP may serve as a transshipment hub for trade between Bhutan and Bangladesh, as depicted in Figure 5.10. This can by exploring the inland waterways and via the proposed Dalu – Tura – Jogighopa – Gelephu route.

Figure 5.10: Potential for Jogighopa as transshipment hub for transit trade

Sources: Primary interactions, KPMG analysis.

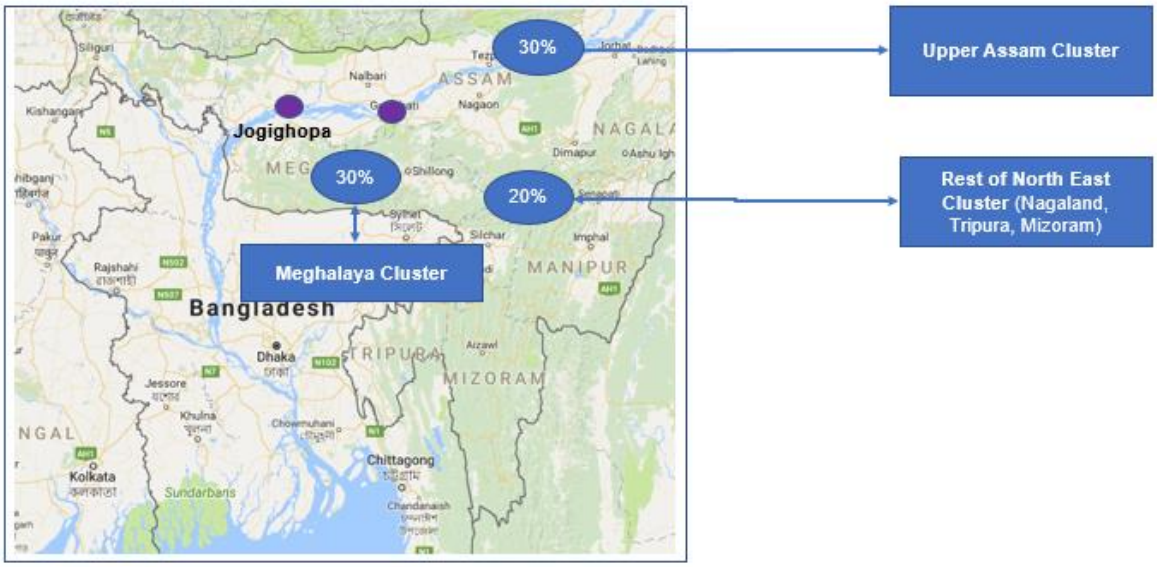
With the development of Inland Waterways and the Jogighopa River Port, Jogighopa is suitably located to serve as a hub for trade between India and Bhutan, between India and Bangladesh and transit trade between Bhutan and Bangladesh, through India.

5.5.2.3 Container Traffic Potential in Proposed MMLP

The amount of traffic that the Jogighopa region would attract from all defined clusters in the north east has been calculated to arrive at the container traffic potential for the Jogighopa MMLP. It has been assumed the MMLP would attract 30% of the traffic from the Upper Assam

region, 30% from the Meghalaya region, and 20% from the Rest of north east region. This has been depicted in Figure 5.11.

Figure 5.11: Assessment of Container Traffic Potential for the Jogighopa MMLP



Source: KPMG analysis.

The current container traffic share has been assumed to remain the same till FY35. The container traffic share from each cluster share to the Jogighopa MMLP is depicted in Table 5.6.

Table 5.6: Container Traffic Share from Each Cluster to the Jogighopa MMLP

S.No	Cluster	Share of total container traffic	Share of traffic from each cluster to the MMLP
1	Upper Assam	80.53%	30%
2	Meghalaya	14.07%	30%
3	Rest of north east	5.40%	20%

Sources: Primary interactions, secondary research, KPMG analysis.

As per these estimates, the container traffic potential of the Jogighopa region and the proposed MMLP is shown in Table 5.7.

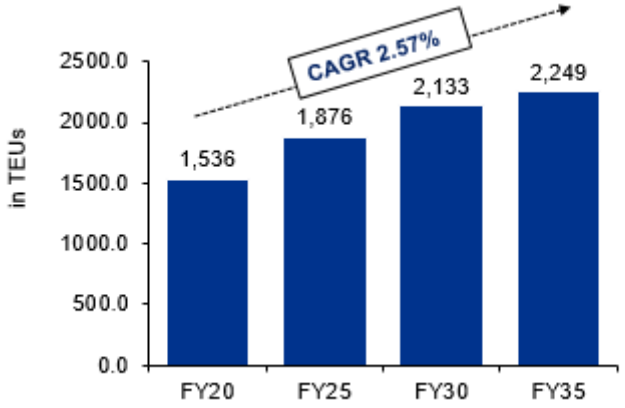
Table 5.7: Container Traffic Potential in Jogighopa Region and the MMLP

S.No	Year	Container Traffic in Region (TEUs)	Container Traffic in Proposed MMLP (TEUs)
1	FY20	5,413	1,536
2	FY25	6,612	1,876
3	FY30	7,515	2,133
4	FY35	7,925	2,249

Source: KPMG analysis.

The projected container traffic potential for the Jogighopa MMLP is depicted in Figure 5.12.

Figure 5.12: Container Traffic Projections for the Jogighopa MMLP



Sources: Primary interactions, KPMG analysis.

The container potential of the Jogighopa MMLP is expected to be negligible and grow at a CAGR of 2.57% from FY20 to FY35.

5.5.3 Modal Mix of Projected Traffic in the Jogighopa MMLP

As the Jogighopa MMLP is envisaged to cater to road, rail and inland water traffic, the long-term shift from road to rail and inland waterways is expected to change the respective capacities in the MMLP. As per the Sagarmala National Perspective Plan, the share of road in the overall freight modal mix is expected to decline by 10% by FY25.[22]

The medium-term efforts of the Ministry of Railways in the north east Region to convert meter gauge/narrow gauge to broad gauge, to develop railway stations, and laying of double tracks, are expected to contribute to the shift towards railways in the long term. In addition, the following actions are expected to contribute to increased freight movement through railways:

- withdrawal of the port congestion charge (10% of base freight), which was charged on importers as a compensation for the huge costs arising from the pressure on intermodal rail connection as a result of the surge in import volumes;
- withdrawal of a dual freight policy for iron as per which freight tariffs on iron ore exports used to be three times of the domestic freight tariff;
- opening up of stations and goods sheds notified in Group I and II for container operations including lift-on lift-off and/or chassis stuffing and de-stuffing; and
- proliferation of a roll-on roll-off scheme at Indian Railways undertaken by the Ministry of Railways to increase freight traffic.

Further, the efforts of the Inland Water Authority of India (IWAI), Government of India to promote the development of the inland waterways and operationalization of National Waterways – 2 will stimulate the shift towards inland waterways.

As per the current freight traffic handled in the region, the share of road, rail and inland waterways volumes are 71%, 26% and 2% respectively. As per the estimates of the Sagarmala National Perspective Plan, domestic bulk-break bulk road traffic's share would decline by 10%, to 61% in FY25.

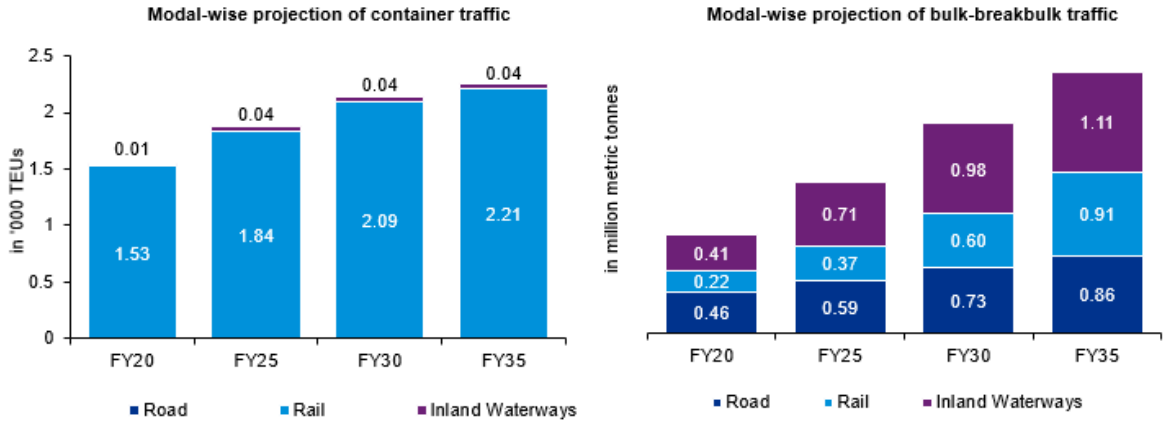
[22] Sagarmala National Perspective Plan, 2016.

The current domestic road-rail mix is assumed to continue until FY20 and a shift of 1.25% from road to rail is assumed every year until FY25 to achieve the projected mix. The same modal mix for domestic movement is expected to continue until FY35 and projections have been made accordingly.

Domestic inland waterways movement is estimated at a commodity-level, with understanding gained from primary interactions on which commodities transported from/to Kolkata can be transported via inland waterways. For the domestic commodities with IWT potential, it is estimated that the modal share for inland waterways for the respective domestic commodities will rise by 1.95% by FY25[23], and remain constant till FY35.

The cross-border movement via Jogighopa is expected to be transported by inland waterways, with the proposed Jogighopa MMLP serving as an aggregation hub for subsequent movement to Bangladesh via inland waterways.

Figure 5.13: Modal Mix of Projected Traffic in the Jogighopa MMLP



Source: KPMG analysis, Primary interactions, National Perspective Plan Sagarmala

As per projections, the bulk-break bulk cargo transported by road is expected to grow at a CAGR of 4.22% over FY20 – FY35, from 0.41 MMT to 1.11 MMT, and the total bulk-break bulk cargo transported by inland waterways is expected to grow from 0.46 MMT in FY20 to 0.86 MMT in FY35, at a CAGR of 6.87% over this period.

5.5.4 EXIM Potential of Projected Traffic in the Jogighopa MMLP

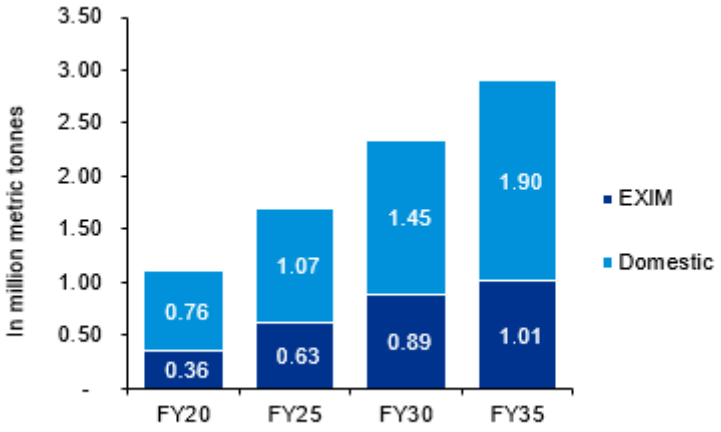
Facilities required for EXIM and domestic commodities in the logistics park would be different. For example, free trade zones, custom clearances, and most value-added services, such as branding and customizations, may not be required for handling domestic cargo. Hence, it is recommended to demarcate domestic and EXIM zones in the proposed logistics parks.

The share of domestic and EXIM cargo in the MMLP would enable determination of the area for domestic and EXIM commodity handling as the facilities and services required are different. As per the current scenario, ~39% of container freight is for EXIM movement and ~99% of bulk–break bulk commodities cater to the domestic market. The expected cross-border trade of bulk-break bulk cargo through Jogighopa will increase the EXIM potential of the projected traffic for the Jogighopa MMLP.

[23] Sagarmala National Perspective Plan, 2016.

As per the assumptions, the projections for EXIM and domestic cargo are shown in Figure 5.14.

Figure 5.14: EXIM and Domestic Cargo in the Jogighopa MMLP



Sources: KPMG analysis, National Perspective Plan Sagarmala.

The EXIM Potential of the Jogighopa MMLP is expected to be ~35% of the estimated traffic potential of the MMLP.

6 MMLP Infrastructure and Services

6.1 Infrastructure in the vicinity of the MMLP Site

6.1.1 Power Infrastructure

Assam Electricity Grid Corporation Ltd. (AEGCL) has an existing 132/11 KV Grid Substation adjacent to the site on the Saibari – Jogighopa Road. The Substation was set up to cater to the power requirements of the Ashok Paper Mills initially, but has thereafter been utilised for power supply to other consumers in the area after the mill becoming non-operational. As per discussions with the relevant authorities, augmentation of this Substation to meet the requirements of the MMLP is possible.

The power requirement of the fully developed MMLP over 100 acres has been estimated at about 12 MW Demand Load. It is expected that in the initial stages the requirements of the MMLP can be met from the 132 / 11 Kv Substation of AEGCL located adjacent to the site. Based on the increase in the requirements, the AEGCL Sub-station can be augmented for which the provision for land has been made. The back-up power up to 25% of the Demand Load has been considered and the area provisioning for the same is included.

The distribution of power to the various facilities within the MMLP has been proposed through an underground cable network.

The development of the power infrastructure has been spread to cater to the phase wise development of the MMLP. However provisioning of Ducts / Conduits is planned for overall requirement to avoid minimum disruptions to operations of existing facilities due to future phases.

6.1.2 Water Infrastructure

An existing Intake Structure at the Brahmaputra River with a conveyance pipeline had been erected for the Ashok Paper Mills. The water requirements of the proposed MMLP will be substantially lower than the erstwhile Paper Mill. Alternatively it should be possible to use ground water for the operations of the MMLP.

The fresh water requirement of the fully developed MMLP of 100 Acres has been estimated at around 2.25 MLD. The condition of the existing water infrastructure including the water intake at Brahmaputra and the conveyance system should be assessed to check the possibility of usage for the MMLP with overhauling / replacement.

To supplement the water from this source, ground water may have to be extracted to suffice the needs of the MMLP. Provisioning of bore wells, treatment, and storage and pumping facilities has been considered in the estimates.

Maximizing of treated water for non-potable uses is essential for the water balance of the site and the same has been accounted for in the estimate.

The development of the water infrastructure has been split into stages to cater to the phase wise development of the MMLP.

6.1.3 Sewerage Infrastructure

As such there is no Centralized sewerage network in the area. A dedicated Sewage Treatment Facility for the MMLP would be the optimal solution. The treated waste water could be used for irrigation of the cultivated lands of the adjoining Korea village in

consultation with the Local Urban Body / Village Panchayat.

The MMLP will be provided with its own Sewage Treatment Plant capable of treating to limits that will allow treated water to be used for non-potable purposes.

A Recycled Water system consisting of storages, pumping and distribution networks has been considered so that recycled water can be used for permitted uses like horticulture, cooling systems, repair and servicing facilities, flushing etc.

While a large component of the trunk infrastructure has been considered in Phase I, the development of the Sewage Treatment Plant has been considered in stages as per the requirements of the phasing of the MMLP.

The development of the sewerage infrastructure has been split into stages to cater to the phase wise development of the MMLP.

6.1.4 Storm Drainage Infrastructure

As such there is no Centralized Drainage Network in the area. Considering that the MMLP Site area is at a higher level as compared to the surrounding areas and there are water bodies at the periphery of the site, the Storm Drainage Network will have to be planned independently to regulate it to the existing drainage streams with minimal disturbance to the existing flow patterns. Considerations will also have to be given to the village abutting the MMLP area on the west side.

The Storm Water Management for the MMLP takes into account the level of the site with respect to the surrounding low lying areas / water bodies. This aspect has been given due consideration during the Planning of the MMLP and the estimation of the Site Development Works. The Drainage for the Site will have to be planned considering the Existing Topography and the presence of existing habitations / villages towards the West of the Site, with minimal disturbance to the existing drainage patterns.

Considering that a large percentage of the area will be paved, the storm water system has to be planned to capture the run-off from the paved areas to water storage bodies and a network of rain water harvesting systems for ground water recharging to compensate for the extracted water.

The development of the water infrastructure has been split into stages to cater to the phase wise development of the MMLP.

6.1.5 Effluent Handling Infrastructure

As such no effluents are expected to be generated from the MMLP operations and the requirement of an ETP has therefore not been considered.

6.1.6 Solid Waste Management Infrastructure

As such no Solid Waste Management and Incineration facility is available in the immediate vicinity of the site. The operations at the MMLP will not be generating large quantities of Solid Waste.

The MMLP will have a system of collection of solid waste and a designated area for segregation.

It is suggested that the Solid Waste and Incineration Facility that may become available in

the future as a consequence of the development of the Economic Corridor be utilised for the treatment of the Solid Waste generated and segregated at the MMLP.

The development of the solid waste infrastructure has been planned on the above basis split into stages to cater to the phase wise development of the MMLP.

6.1.7 Other Support Infrastructure

The whole 100 acres of the development will be secured with a boundary wall in the Phase I itself with entry regulated at the Gate House.

The MMLP will have adequate general area lighting including street lighting and a Security and IT / Telecom Network and the same has been considered in the current estimates.

6.2 Project Components of the MMLP

While each of the components described here below are present on stand-alone basis in many locations, the MMLP will provide such facilities in an integrated manner. Companies located within the facility will get benefits in terms of economies of scale from the cross bundling of the facilities across the Logistics value chain and ability to provide integrated services with complementary service providers being present in the vicinity. Hence, for the proposed MMLP an integrated facility is planned. The nature and the extent for each facility are suggested based on market assessment of the Commodities.

Key Facilities proposed in the Logistics Park comprise the following:

6.2.1 Transportation

Transportation plays an important role in the logistics value chain and is a vital component to decide upon the facilities to be created in a logistics park. Goods are exported / imported and / or transported within the country by the different modes of transportation available such as road, rail, water and air. The road and rail bound goods are directly transported till the logistics facility, whereas water borne and air borne goods are further transported either by road or rail.

The Jogighopa location for the MMLP provides an opportunity of utilising 3 modes of transportation - Roads, Railways and Inland Waterways, all modes available in the immediate vicinity of the site. Jogighopa has the potential to be well connected with Bhutan, Bangladesh, Nepal and Myanmar, increasing potential as a hub for regional cooperation & integration.

Road

The National Highway 17 running approximately 3 km from the MMLP will provide the main road connectivity for the facility. This highway further connects to NH 27 near Bongaigaon in the north which is the main link westwards towards the mainland through the Siliguri Corridor, besides providing connectivity with Bhutan - further north to Gelephu. Towards the south, NH 17 traverses across the Brahmaputra and then eastwards along the southern bank of the Brahmaputra and then finally joins the NH 27 once again at Guwahati providing connectivity to the upper reaches of Assam and the other north eastern States.

The Bharatmala Program of the Ministry of Road Transport and Highways (MoRTH), Government of India, launched in October 2017 proposes the North East Economic Corridor for the development of the north eastern states. This Economic Corridor is also proposed along NH 17 in the Bongaigaon – Guwahati stretch before it aligns with the NH 27 in the upper reaches. The proposed projects of the Bharatmala Program to improve connectivity of the north east region are depicted in Figure 6.1.

Figure 6.1: Planned development of north east India - Bharatmala Program

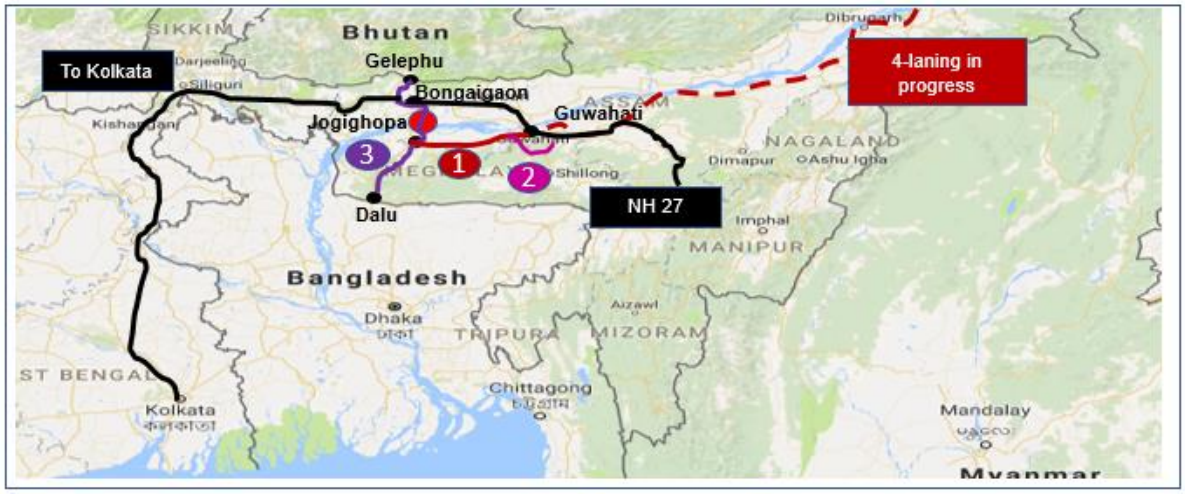
Source: Ministry of Road Transport & Highways, Government of India

As part of the Memorandum of Understanding (MoU) between India and Bangladesh at the Joint Coordination Committee (JCC) meeting in October 2017, Dalu – Tura – Goalpara - Gelephu multimodal connectivity has been proposed for trade promotion between India, Bangladesh and Bhutan. The stretch of NH 17 between Bongaigaon and Goalpara will be a part of this proposed connectivity with Jogighopa being strategically positioned close to this link.

With due considerations to the above proposals it is evident that the regional road connectivity will have to augmented to cater to the increased traffic in the future. Some of the projects proposed towards achieving this objective are depicted in Figure 6.2. The As-Is road connectivity in the region is depicted in Figure 6.2, with connectivity between Jogighopa - Kolkata and NH 27 that passes through Bongaigaon, along the Northern Bank of the Brahmaputra, passes through Guwahati and then moves towards the rest of the north east.

Road connectivity projects are proposed to encourage traffic through NH 17, on the Southern Bank of the Brahmaputra, to reduce congestion with Guwahati, and to promote cross-border trade between Bangladesh and Bhutan, through Jogighopa.

Figure 6.2: Proposed Road Connectivity Projects



List of Key Projects:

1. National Highway 17 Widening between Goalpara and Guwahati – part of NE Economic Corridor (Bharatmala)
2. By-pass, allowing traffic from NH 17 to by-pass Guwahati
3. Connectivity between Dalu - Tura - Goalpara - Gelephu

Source: Planning & Technical Expert – ADB.

The proposed road projects are summarized in Table 6.1, along with the rationale for each proposed project.

Table 6.1: Rationale for proposed road projects

S.No.	Proposed Project	Rationale
1	Widening of the NH 17 stretch Bongaigaon – Jogighopa – Goalpara – Guwahati to 4 lanes, from the present 2 lanes.	This project is expected to improve road connectivity and reduce distance between Guwahati and Jogighopa, as the route via NH 27 is longer. Further, the intention is to drive traffic along NH 17 and reduce dependency on NH 27. Hence, the expansion of NH 17 is preferable to widening of NH 27
2	By-pass around Guwahati City, from NH 17 to NH 27	This will allow traffic from NH 17 bound for other states to traverse directly to NH 27 without having to enter the City. This is expected to reduce congestion along NH 27 and within Guwahati
3	Dalu – Tura – Goalpara - Gelephu	Promotion of cross-border trade between Bangladesh and Bhutan, via India
4	Grade separated Interchange at Jogighopa	To ensure unhindered road and rail movement from and to the MMLP to NH 17 and to the proposed Jogighopa port; to obviate the need for the level crossings

Source: Planning & Technical Expert – ADB.

The truck terminal with adequate facilities and a robust system of internal roads within the MMLP will ensure an efficient movement of goods within the Logistics Park.

Railway

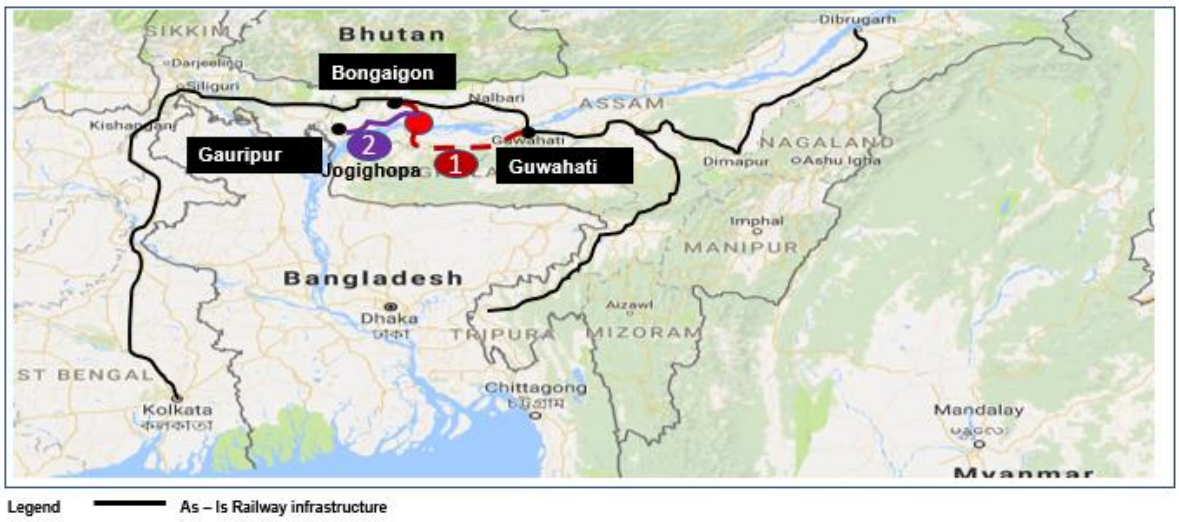
The MMLP is proposed to be connected with the New Bongaigaon Railway network at Jogighopa Railway Station. The erstwhile Ashok Paper Mills had existing railway connectivity from Jogighopa Railway Station and a Railway Siding within the Mill Complex. The condition of this infrastructure has to be assessed to determine the augmentation works needed to make this infrastructure functional. The existing alignment follows a 3.5 km curvilinear route to the MMLP, but for considerations of rail geometry and land acquisition requirements for a new alignment, it would be more prudent to develop the rail spur along

the existing alignment. There are two level crossings with the Saibari – Jogighopa Road in this stretch.

Within the MMLP arrangements for entry of the trains and railway sidings are proposed to be created for Break Bulk and Container Cargos with adequate loading and unloading facilities. It is estimated that 1 railway sidings will be adequate for Phase I; with 1 more railway siding may be added based on the development of the rail traffic before Phase II becomes functional.

The As-Is major railway lines are illustrated in Figure 6.3, including the connectivity between Kolkata – Bongaigaon and Kolkata – Guwahati. Further, the major rail lines in north east India are depicted, including Guwahati – Agartala and Guwahati – Dibrugarh. In the regional context, with rail bound traffic bound to increase as a result of the development of the proposed North East Economic Corridor and the trade routes between India, Bangladesh and Bhutan, it is proposed that specific railway augmentation projects be taken up. Rail projects are proposed to reduce dependency on the railway line on the northern bank of Brahmaputra, and to provide direct rail connectivity from Jogighopa to West Bengal and mainland India. The As-Is railway connectivity and proposed rail connectivity projects are highlighted in Figure 6.3.

Figure 6.3: Proposed Rail Connectivity Projects



List of Key Projects:

1. New Bongaigaon – Goalpara – Guwahati Railway Line (Doubling) – 176 km - Approved May 2015
2. Jogighopa to Gauripur (New Line) – 150 km - Part of Approved Project

Source: Planning & Technical Expert – ADB.

These projects are listed out in Table 6.2.

Table 6.2: Details and Rationale for proposed rail projects

S.No.	Proposed Project	Details	Rationale
1	New Bongaigaon – Goalpara – Guwahati Railway Line (Doubling) – 176 km	This section under Northeast Frontier Railway is currently single line. The project for the doubling of this line was approved in 2015, but the augmentation works have not been taken up yet.	This will provide double line connectivity to the MMLP with the railway network to the mainland as well as to the other North – Eastern states along the Southern Bank of the Brahmaputra, along the proposed North East Economic Corridor. This project is also expected to reduce congestion along the rail

S.No.	Proposed Project	Details	Rationale
			section to the Northern Bank of the Brahmaputra, providing an alternate route for trains to reach Guwahati
2	Jogighopa to Gauripur (New Line) – 150 km	This section under Northeast Frontier is a part of the Mainapuri – Jogighopa (268 km) line providing an alternate connection to West Bengal. Whereas the stretch in West Bengal has been completed in 2015, this stretch in Assam has not been taken up for implementation.	This line provides direct connectivity to MMLP site with West Bengal and to mainland India without having to take the existing circuitous route

Source: Planning & Technical Expert – ADB.

Waterways:

The IWAI is implementing projects for the development of national waterways in India, including NW 1 and NW 2. Movement via inland waterways is expected to be navigable 24x7, 365 days a year, from Varanasi to Silghat. An LAD of 2.5m is expected along this stretch.

With the development of Inland Waterways and the Jogighopa River Port, Jogighopa is suitably located to serve as a hub for freight movement between Indian mainland and north east India, trade between India and Bhutan, trade between India and Bangladesh and for the transit trade between Bhutan and Bangladesh, through India.

The Jogighopa port is located approximately 6 km south east to the proposed MMLP location. The port has road connectivity with NH 17 with a single lane road. Assuming that the Jogighopa river port will be developed as a permanent terminal to handle cargo on NW 2, it is proposed that this connection be developed as a 2/4 lane connection in the future depending on the waterways related traffic along the Brahmaputra. The port connection with NH 21 will be close to the Jogighopa Railway Station, and the proposed interchange at Jogighopa will have to consider the inbound / outbound traffic from the port as well.

For the effective utilization of the waterways mode following projects need to be implemented:

- Re-Development of the National Waterway No. 2 by IWAI as an all-weather river route. It is understood that works relating to river training, channelizing of the waterway and development of Identified ports – need to be carried out along a majority of the stretches of Brahmaputra in Assam.
- In the specific context of the MMLP, the river port at Jogighopa needs to be developed into a permanent terminal with mechanical handling facilities. As per IWAI, sufficient land is already available for development of a permanent terminal at the location. The extent of works to be carried out at the Jogighopa River Port will have to be established by way of a study focussing on the traffic, larger plans relating to the development of NW 2 and the issues relating to the Indo – Bangladesh Protocol on Inland Transit and Trade.

MMLP site connectivity

The connectivity of the Jogighopa MMLP to existing and planned infrastructure is depicted in Figure 6.4.

Figure 6.4: Connectivity infrastructure - Jogighopa MMLP Site

Railway Connectivity to MMLP

3 km Spur from Jogighopa Station on the New Bongaigaon – Goalpara Railway Line

Road Connectivity to MMLP from NH 17

- 3 km (4 lane) upgraded from current single lane along existing alignment from NH 17 to MMLP
- 3 km (2 lane) from existing river port to NH 17

Interchange to allow for the connection from NH 17 (including port connection) to MMLP over the railway line

Redevelopment of the River Port at Jogighopa: The existing port is proposed to be developed as permanent terminal with mechanised handling facilities.

Source: Planning & Technical Expert – ADB.

While the railway spur is expected to provide rail connectivity, and the road widening to provide last mile connectivity, the proposed interchange will allow for the connectivity from NH 17 (including port connection) to MMLP over the railway line for unhindered movement from any direction.

The summary of the prioritised connectivity projects is presented in Table 6.3.

Table 6.3: Summary of infrastructure Projects

S. No.	Project Name	Current Status	Indicative Investment
	Regional Connectivity Projects (RCI related)		
1	Connectivity between Dalu-Tura-Goalpara-Gelephu	Part of JCC MoU between India and Bangladesh, October 2017	Not Estimated
2	Interchange to allow for the connection from NH 17 (including port connection) to MMLP over the railway line	Proposed	20 million USD
3	Re-development of Jogighopa River Port as an all-weather port	Feasibility to be done	Not Estimated
4	Development of NW – 2, Channelization of Waterway, River Training and other related infrastructure	Feasibility to be done	Not Estimated
	National Development Projects		
1	National Highway 17 Widening between Goalpara and Guwahati – 150 km and	Planned	200 million USD
2	Bypass around Guwahati to provide further connectivity from NH17 to NH 27	Proposed	Not Estimated
3	New Bongaigaon – Goalpara – Guwahati Railway Line (Doubling) – 176 km	Approved - May 2015	345 million USD
4	Jogighopa to Gauripur (New Line) – 150 km	Part of Approved Project	280 million USD

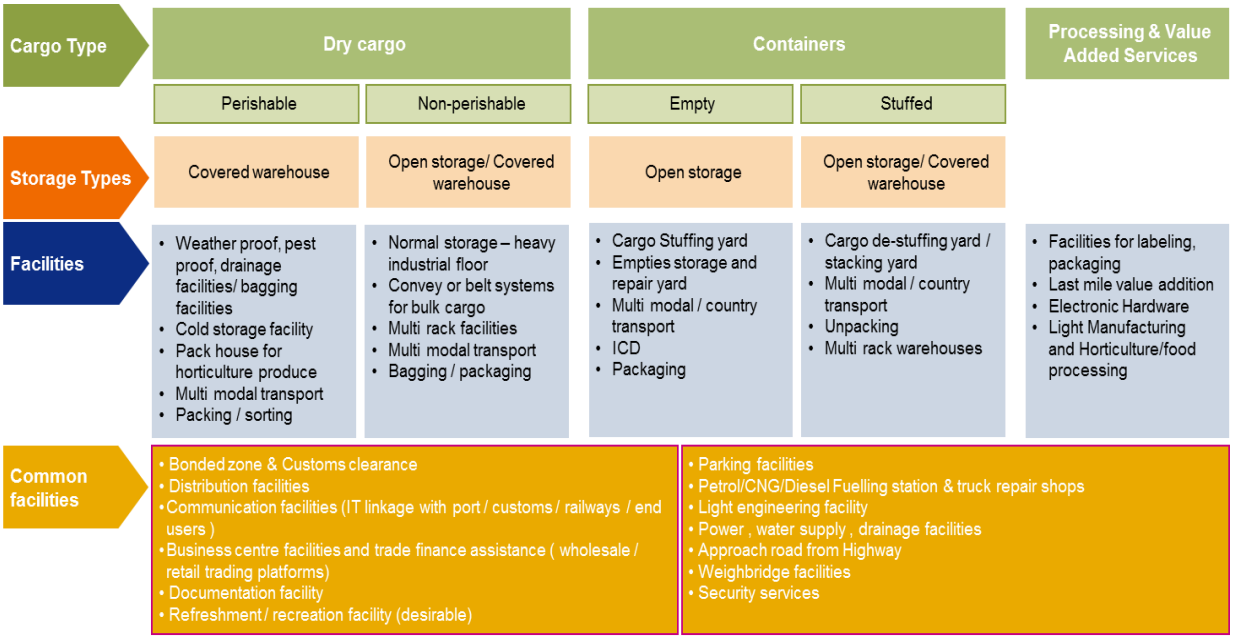
Source: Planning & Technical Expert – ADB.

6.2.2 Logistics Components

Proposed facilities in Jogighopa MMLP

Based on the commodity profile of the proposed MMLP in Jogighopa, the following are the facilities that may be considered for the logistics park (Figure 6.5).

Figure 6.5: Key Facilities and Recommendations



Sources: KPMG Analysis, Secondary Research

The principle infrastructure facilities in the logistics park would comprise storage infrastructure comprising storage for bulk and container and multi rack warehouses, Vehicle parking for trucks and other vehicles, equipment yards, business centres, office space for related firms, light sheds, open plots and support infrastructure, including road, water, sewerage, power, telecommunication etc.

Some of the key infrastructure would comprise:

- Bonded and un-bonded warehouses comprising atmosphere controlled warehouses for perishables - fruits, vegetables, milk, fish products etc., pack house for horticulture produce and multi rack warehouses for bulk cargo products.
- Warehousing for food-grains, engineering and other goods with electronically recorded data systems to permit ease of operations for transporters
- Container Freight Station combined with Dry Port/ Inland Container Depot
- Rail sidings with rail yard
- Repair and assembly activities and last mile value addition activities for transport cargo, including labeling, packaging, cataloguing etc.
- Office space for operators of the park facilities
- On site custom office for faster customs clearance
- Markets to provide wholesale and trading platforms
- Provision for truck parking along with refueling stations. A large truck terminal with enough open space for quick movement would be built closer to the entrance point of the approach way
- Trade facilitation centre where exporters and importers can meet, display their commodities and seek information from trade associations. Trade Facilitation Centre would be developed in partnership with trade associations and international trade organisations

- Repair and maintenance workshops for cargo handling equipment, trucks (truck repair and truck body building) and containers
- Fuel, Service Stations and Weighbridges
- Rest houses and hotels
- Common civic amenities - canteen, toilet blocks, and recreation centre etc.

The entire premises would be covered by boundary wall with sufficient illumination and adequate security would be provided for.

The facilities in the proposed MMLP in the Jogighopa region are based on the commodity profile of the region, and the mapping of the specific facilities to commodities are shown in Table 6.4.

Table 6.4: Commodity-wise services in Jogighopa

Commodity	Facilities
Food Grains & seeds, fruits & vegetables, and perishables	Atmosphere controlled warehouses
Tea	Temperature controlled warehouses
Construction material, iron goods & steel, machinery items & hardware, etc.	Warehouses and processing zones, multi-rack warehouses
Food items, FMCG products	Quality check and testing laboratory
Paper & forest goods	Dedicated warehouses
Fertilizers	Tankages for bulk storage, dry warehouses for large drums
EXIM cargo	On-site custom office for faster customs clearance

Source: KPMG Analysis.

Inland Container Depot

Considering the low Container Traffic in the region a limited facility with segregated area inside the MMLP has been planned for Phase I. However with increased traffic projections for the future, provisions of land area for adequate facilities for receipt / despatch and handling Containers for Rail and Road modes catering to Domestic and EXIM cargos for Phase II and beyond have been made.

The future facilities planned may include:

- Container stacking area equipped with tractor trailers/gantries/forklifts etc
- Container freight stations hosting stuffing / de-stuffing / packaging and inspection facilities
- Temporary Storage of Cargo and Containers
- Custom Clearance Facility
- Container and Equipment repair and maintenance areas

Following assumptions taken for the Planning of the Container Terminal:

- Container Storage Yard: Average dwell time of 10 days and a stack height of 1.
- Empty Container Yard: Average dwell time of 5 days and a stack height of 2.
- Custom Freight Station: Average dwell time of 10 days and a stack height of 1.
- Container Repair Facility: 2% Containers requiring repairs, dwell time 2 days.
- Truck Parking Area in the Container Yard with a dwell time of 4 hours.

The Container Terminal is proposed to be developed in two phases for the Traffic scenarios for FY 25 and FY 35 and the area requirement has been estimated based on the above benchmarks accordingly.

Warehousing
The MMLP will have Open and Covered Warehouses for catering to Domestic and EXIM Break Bulk Cargo. The facility will have General / Bonded / Customised / Cold Storage Warehousing.

The primary activities will be:

- Product Stockpiling
- Inbound operations (including receiving and returns) by Rail and Road (including Waterways) modes
- Outbound operations (including picking and staging) by Rail and Road (including Waterways) modes
- Product mixing

Apart from the Storage function, the MMLP will also house the following additional facilities:

- Air Cargo Centre: The MMLP will have a specific centre to handle both Inbound and Outbound Air Cargo. The centre will provide facilities for Stuffing / De-stuffing, Bonded Warehouse, Office Space & Amenities for Agents, etc.
- Value Added Services: The Value added services provided by the MMLP facility will be an important function in the service portfolio to establish its competitive advantage in the market. A few of the value added services offered include Packaging & Labelling, Assembling of Semi – Finished Goods, Inventory Management, Quality Checking, Planning for cost control, Reverse Logistics etc. Integration of similar, highly demanded value-added services at the warehouse level would greatly enhance the value proposition of the MMLP
- Domestic Distribution Zone: The primary role of a distribution centre will be to receive large quantities of products and ship small quantities to individual stores.
- Specialised Storages e.g. Cold Storages etc.

Following assumptions taken for the Planning of the Warehousing Area:

- Based on Traffic Assumptions, 60% Covered and 40% Open areas considered.
- Average area requirement of 100 kgs / sqft and dwell time of 15 days considered.
- Domestic Distribution Area catering to 15% of Bulk Cargo Traffic.
- Value Added Services Area catering to 5% of Bulk Cargo Traffic.
- Air Cargo Area catering to 3% of Bulk Cargo Traffic.
- Cold Storage Area catering to 1% of Bulk Cargo Traffic, dwell time 15 days.
- Truck Parking Area in the Warehousing Area with a dwell time of 4 hours.

The Warehousing Facility is proposed to be developed in two phases for the Traffic scenarios for FY 25 and FY 35 and the area requirement has been estimated based on the above benchmarks accordingly.

Truck Terminal
By its very nature, a logistics park involves handling of bulk commodities and containers and it will be important to provide space for trucks in the premises. The need for truck terminal arises from the fact that in its absence trucks are parked on the roads creating congestion on the roads. Further, the park can also be used to give truck parking space to other trucks which are not using warehousing and container facility at the park. The Truck terminal will provide parking space for the trucks carrying bulk commodities and containers with support infrastructure for trucking industry like dedicated parking bays, lodging facilities for drivers, rest rooms, workshops etc.
Following assumptions taken for the Planning of the Truck Terminal:

- 100% of the Trucks / Trailers destined for the MMLP will use the facility.
- Average dwell time in the Terminal Parking is considered as 24 hours.

- 1000 Trucks require a parking of 10 acres with easy entry and exit access.
- Additional dwell time of 4 hours each considered for the trucks at Container Terminal / Warehousing.
- 5% of the trucks would utilise the repair facility with a dwell time of 24 hours.
- All inbound / outbound trucks will pass over the weigh bridges.
- 50 % of the trucks would tank up at the fuel stations in the facility.

6.2.3 Support and Social Infrastructure Facilities

The support and social infrastructure facilities include both essential infrastructure facilities for the effective functioning of the logistics park and other facilities that address the Social, Environmental and Land Use Regulations within the park.

Support Infrastructure
The facilities such as the Central Administration Building, Office Spaces and Amenities, Power Transmission & Distribution network, Power back-up, Water Treatment & Storage, Sewerage Treatment Plant, Recycled Water Networks, Storm Water together with Rain Water Harvesting Management, Solid Waste Management, Telecom network, etc. are necessary for the effective functioning of the logistics park. Integrating facilities like the Fire Station, Weigh Bridges, and Fuel Stations within the MMLP boundaries will contribute to the overall efficiency of the facility.

Social Infrastructure
The Social Infrastructure facilities of the MMLP have been planned to cater to the various users with a mix of Residential (Hotels / Guest Houses / Dormitories) and Commercial and Office Complexes together with Restaurants and Recreational facilities. The MMLP will have adequate Green Areas to provide the Interface between the Operational and Social Components.

6.3 Project Concept Layout

For this project, the concept master plan is based on the proposed facility for 100 Acres to cater to the Traffic Projections for FY35. The development of the MMLP is proposed over two phases. Phase I will entail a development over 60 Acres and cater to the Traffic projections for FY25. It is proposed that the master planning for the remaining area of Phase II will be done in future based on the envisaged requirement and the prevailing market dynamics. It is seen that in such strategic projects provision of land for future expansion is critical to render the facility expandable for future demand. Accordingly the land for Phase II of the Project should be secured during the development of the Phase I.

Area and Infrastructure assessment for the various facilities on the MMLP has been carried out considering a set of parameters. These were based upon real time scenarios by reviewing data from various similar facilities, performing literature review and undertaking stakeholder consultations.

The area and land use under various activities is summarised in Table 6.5 for both Phases.

Table 6.5: Land Use Summary Jogighopa MMLP

Land Use		Area (acres)		Total	
		Phase I – FY25	Phase II – FY35	Area (acres)	Share (%)
Transportation	Railway	8	0	8.0	8.0
	Road Network	9	3.8	12.8	12.8
Container Terminal		3	4	7.0	7.0

Land Use	Area (acres)		Total	
	Phase I – FY25	Phase II – FY35	Area (acres)	Share (%)
- Yard, EXIM, Repair Facility, Offices				
Warehousing **- Open, Covered, Air Cargo, Cold Storage, Offices**	19.2	18.5	37.7	37.7
Truck Terminal - **Parking, Repair Facility, Weigh Bridges, Fuel Stations, Dormitories**	2.6	2.4	5.0	5.0
Non – Cargo Processing - **Value Added Zone, Domestic Distribution**	3.6	3.5	7.1	7.1
Common Facilities **- Gate Complex, Administration Buildings, Fire Stations**	3.8	0.9	4.7	4.7
Social Infrastructure - **Commercial Complex, Restaurants, Hotels, Guest Houses, Entertainment**	2.4	1.4	3.8	3.8
Support Infrastructure and Utilities - **Power Supply, Water Supply**	3.0	2.1	5.1	5.1
Greens	6.6	2.2	8.8	8.8
Total Area (acres)	**61.2**	**38.8**	100	

Source: ADB.

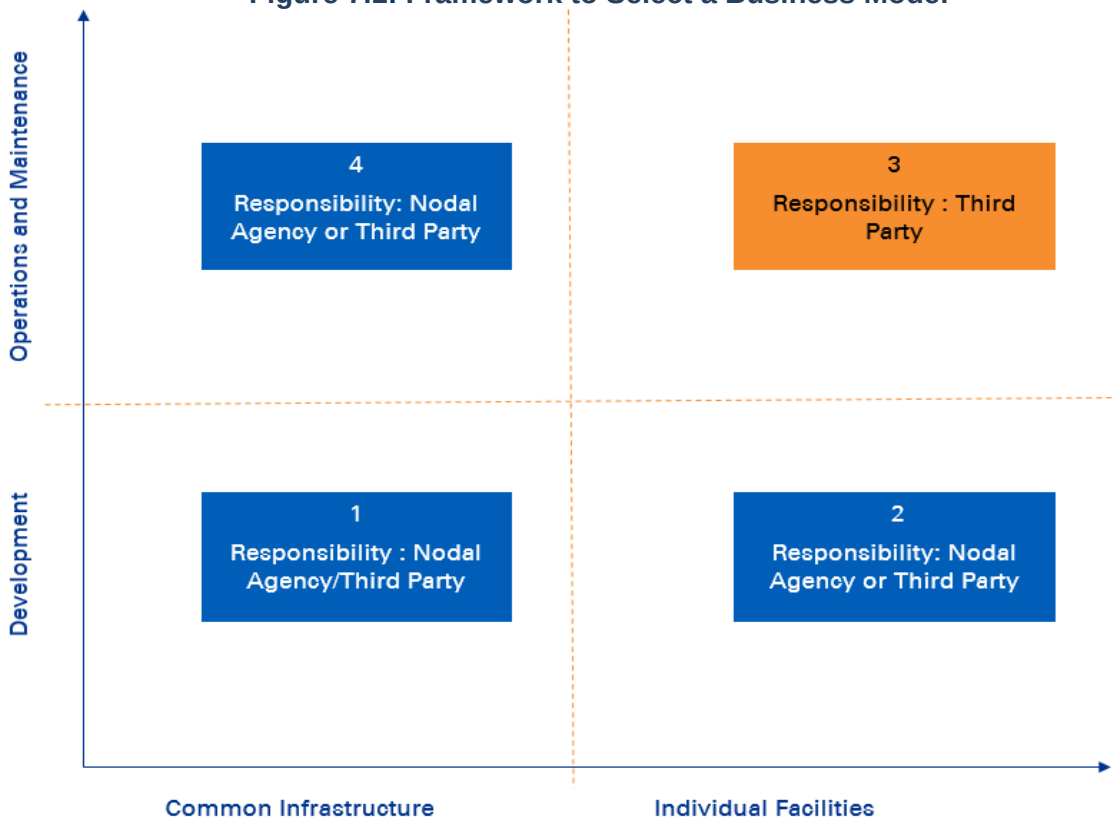
7 Potential Business Models

This section discusses the potential business models for developing the MMLP. The options primarily differ based on whether the facilities are developed and operated by the nodal agency or third-party developers.

7.1 Framework to Select a Business Model

Based on the options that evolve depending on the development and O&M responsibilities of the players (nodal agency and third-party developers), a framework has been developed to choose a business model (Figure 7.1).

Figure 7.1: Framework to Select a Business Model



Sources: KPMG analysis, secondary research.

7.1.1 Quadrant 1: Development of Common Infrastructure

Common infrastructure involves connecting and internal roads, railway infrastructure, sewerage facilities, and utilities like power and water supply. These facilities can either be developed by the nodal agency or through a PPP model in which the government provides land and the private players develop the amenities. Given that these facilities require support and coordination from the government in terms of approvals and clearances, development through a nodal agency would make it easier to implement by enabling effective coordination and interactions between multiple government agencies. The expertise of private players in development of similar infrastructure would make the quality of services more effective and efficient.

The risk allocation for in each of the scenarios is shown in Table 7.1.

Table 7.1: Risk Matrix for Development of Common Infrastructure

Type of Risk	Risk	Third Party	Nodal Agency
Political Risk	● Change in law	✓	✓
	● Change in taxation	✓	✓
Construction Risk	● Delays caused by state	✓	
	● Quality assurance and quality control	✓	
	● Approvals and clearances	✓	
Market Risk	● Interest Rate Risk	✓	✓
Site Risk	● Water, air, and soil pollution—unknown preexisting	✓	✓
	● Issues related to land acquisition	✓	✓
Design Risk	● Detailed design approvals and consents	✓	
Force Majeure Risk	● Natural disaster, terrorism, war	✓	✓
Performance Risk	● Equipment used becomes prematurely obsolescent		✓
	● Lack of expertise in development of similar facilities		✓

Sources: KPMG analysis, secondary research.

7.1.2 Quadrant 2: Development of Individual Facilities

The individual facilities in the logistics park like CFS, ICDs, and a truck terminal can either be developed by the nodal agency or a third party. The risk allocation for in each of the scenarios is shown in Table 7.2.

Table 7.2: Risk Matrix for Development of Individual Facilities

Type of Risk	Risk	Third Party	Nodal Agency
Political Risk	● Change in law	✓	✓
	● Change in taxation	✓	✓
Construction Risk	● Delays caused by state	✓	
	● Quality assurance and quality control	✓	
	● Damage and loss to utilities	✓	
Market Risk	● Interest rate risk	✓	✓

Type of Risk	Risk	Third Party	Nodal Agency
Site Risk	• Water, air, soil pollution—unknown preexisting	✓	✓
	• Issues related to land acquisition	✓	✓
Design Risk	• Detailed design approvals and consents	✓	
Force Majeure Risk	• Natural disaster, terrorism, war	✓	✓
Performance Risk	• Equipment used becomes prematurely obsolescent		✓
	• Lack of expertise in development of similar facilities		✓

Sources: KPMG analysis, secondary research.

The development of individual facilities by private players would mitigate risks in terms of expertise in development, leading to better quality facilities and usage of advanced equipment. However, there may be risks in terms of time and cost overruns and design risks as obtaining approvals may be harder for private developers.

If the nodal agency develops the individual facilities, there could better control time and cost overruns. In addition, design risks would also be mitigated. However, performance risks may be higher due to the nodal agency's lack of expertise in developing similar facilities.

7.1.3 Quadrant 3: Operations and Maintenance of Individual Facilities

As operations and maintenance of individual facilities require experience and expertise, it is recommended that third-party players operate and maintain the individual facilities. Market risks such as a change in traffic and tariffs would also be transferred to private players in this case. The model may be such that all the facilities are operated by one third-party operator or each of the facilities can be leased out to different operators based on their specific expertise. Revenue generation may be through either revenue sharing or lease rental.

7.1.4 Quadrant 4: Operations and Maintenance of Common Infrastructure

The common infrastructure can be operated and maintained by either the nodal agency or a third-party developer. The risks associated with both cases are shown in Table 7.3.

Table 7.3: Risk Matrix for Operations and Maintenance of Common Infrastructure

Type of Risk	Risk	Third Party	Nodal Agency
Political Risk	• Change in law	✓	✓
	• Change in taxation	✓	✓
Site Risk	• Damage and loss to utilities	✓	
	• Water, air, soil pollution—unknown preexisting	✓	✓

Type of Risk	Risk	Third Party	Nodal Agency
Force Majeure Risk	• Natural disaster, terrorism, war	✓	✓
Performance Risk	• Equipment used becomes prematurely obsolescent		✓
	• Lack of expertise in O&M of similar facilities		✓
Market Risk	• Utilization risk	✓	

Sources: KPMG analysis, secondary research.

Market and performance risks such as utilization of common infrastructure and efficiency in operations would be better addressed if the amenities were operated and maintained by third-party players. However, the risk of damage and loss to utilities is to be borne by the nodal agency if O&M is transferred to third-party developers.

7.2 Potential Business Models

As per the evaluation of the risk profile and efficiency of possible choices, the following two options have been recommended for development.

Option 1: The first option includes development and operation of the logistics park by third-party players, whereas the nodal agency would provide land and collect lease rentals.

Option 2: The second option is when the nodal agency develops and operates the common infrastructure and amenities and allows individual third-party players to develop and operate the facilities. The revenue in this case would be collected in the form of lease rentals or revenue sharing.

The summary of these models is shown in Table 7.4.

Table 7.4: Potential Business Models

Business Models	Investments		Operations		Revenue Source
	Facilities	Amenities	Facilities	Amenities	
PPP Model	3rd Party	3rd Party	3rd Party	3rd Party	Lease
Third-Party Development and Operations Model	3rd Party	Nodal Agency	3rd Party	Nodal Agency	Lease and Revenue Share

Source: KPMG analysis.

For each of the models, the risk allocation for the nodal agency and operational efficiencies has been assessed.

7.2.1 Option 1: PPP Model

Figure 7.2: Project Structure for the PPP Model

Source: KPMG analysis.

In the PPP model, as shown in Figure 7.2, the nodal agency would offer a land concession to a third-party private player for site development and operation, common infrastructure, connectivity, trunk infrastructure, and individual facilities like ICDs, CFS, and a truck terminal. The revenue for the nodal agency would be through lease rentals. The respective roles of the nodal agency and third-party players in this model is depicted in Table 7.5.

Table 7.5: Roles for Stakeholders in the PPP Model

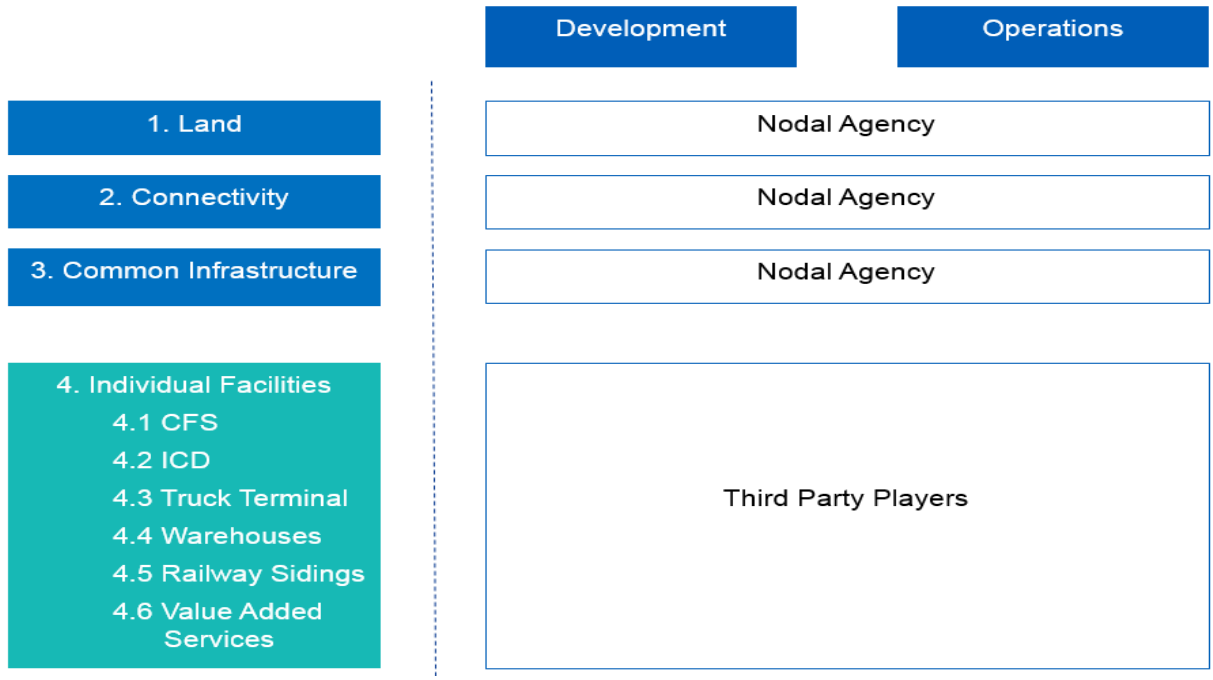
Stakeholder	Broad Role
Nodal Agency	• **Acquires land** • **Concession of land to third-party player** • **Collects lease rentals from third-party player**
Third-Party Player	• **Receives land from nodal agency and pays annual lease rentals** • **Receives revenue for the operations of the facilities and common amenities** • **Develops the basic internal infrastructure in the MMLP, which includes power and water supply, roads, parking, fuel station, fire station, security building, boundary wall, entrance gate, and green belt.** • **Operates and maintains the common infrastructure and individual facilities**

Sources: KPMG analysis, secondary research.

7.2.2 Option 2: Third-Party Development and Operations Model

The nodal agency would provide the land and do basic development of the land including clearing and leveling, and would also provide basic infrastructure and amenities such as internal road connectivity, plot segregation, water, sewage disposal, and power connections. Further, nodal agency will be involved in development and operation of river ports along inland waterways, as there is no policy for private sector involvement.

Figure 7.3: Project Structure for the Third-Party Development and Operator Model



Source: KPMG analysis.

This structure has two options for the nodal agency in terms of revenue generation.

The individual facilities would be developed and operated by third-party agencies and the nodal agency shall obtain a rental or revenue share from these operators:

- **Fixed rental.** Nodal agency shall obtain lease rental from these operators.
- **Revenue share.** Nodal agency shall obtain a revenue share from these operators.

The roles of the nodal agency and private players in this model is depicted in Table 7.6.

Table 7.6: Roles for Stakeholders for Third-Party Development and Operator Model

Stakeholder	Broad Role
Nodal Agency	• **Acquisition of land** • **Development of basic internal infrastructure in the MMLP, which includes power and water supply, roads, parking, fuel station, fire station, security building, boundary wall, entrance gate, and green belt** • **Operations and maintenance of basic infrastructure, either on its own or through suitable contractual arrangements with service providers** • **Planning, structuring, and sub-leasing of MMLP infrastructure components such as ICDs, warehousing, the processing of marine products, a truck terminal, and a railway yard to competent developers and operators**

	• **Receiving rentals and revenue share from sub-developers**
Project Developers and Operators	• **Development and operations of individual facilities under the MMLP** • **Payment of revenue share or lease rental**

Sources: KPMG analysis, secondary research.

7.3 Comparison between business models

The proposed business models have been analyzed and compared based on several parameters. This comparison is illustrated in Table 7.7.

Table 7.7: Comparison between business models

Parameter	Model 1: PPP	Model 2: Nodal Agency as Master Developer
Efficiency of operations	**Private players have expertise in development leading to better quality facilities and usage of advanced equipment**	
Risk management	Risks for private developers in terms of time and cost overruns for developing common infrastructure	**Better control over cost and time overruns**; **design risks would also be mitigated if common infra**structure is **developed by** the **nodal agency**
Obtaining approvals and clearances	Coordination with multiple stakeholders may be a challenge for private developers	**Easier to implement for** the n**odal** a**genc**y due to **effective coordination and interaction between multiple** government **agencies**
Attracting end users	Ability to engage proactively with end users and offer bundled services with scalability and flexibility in facility plan	**Requires flexibility from** the n**odal** a**gency to modiFYfacility plan** and **master plan layouts to align to end-user requirements**
Private sector investments	**Less attractive owing to high capital requirements and higher** financing costs	**More attractive for private developers due to lower risk perception and lower cost of funds. Further, there is no policy for private sector participation in development and operation of river ports along inland waterways**

Source: KPMG analysis.

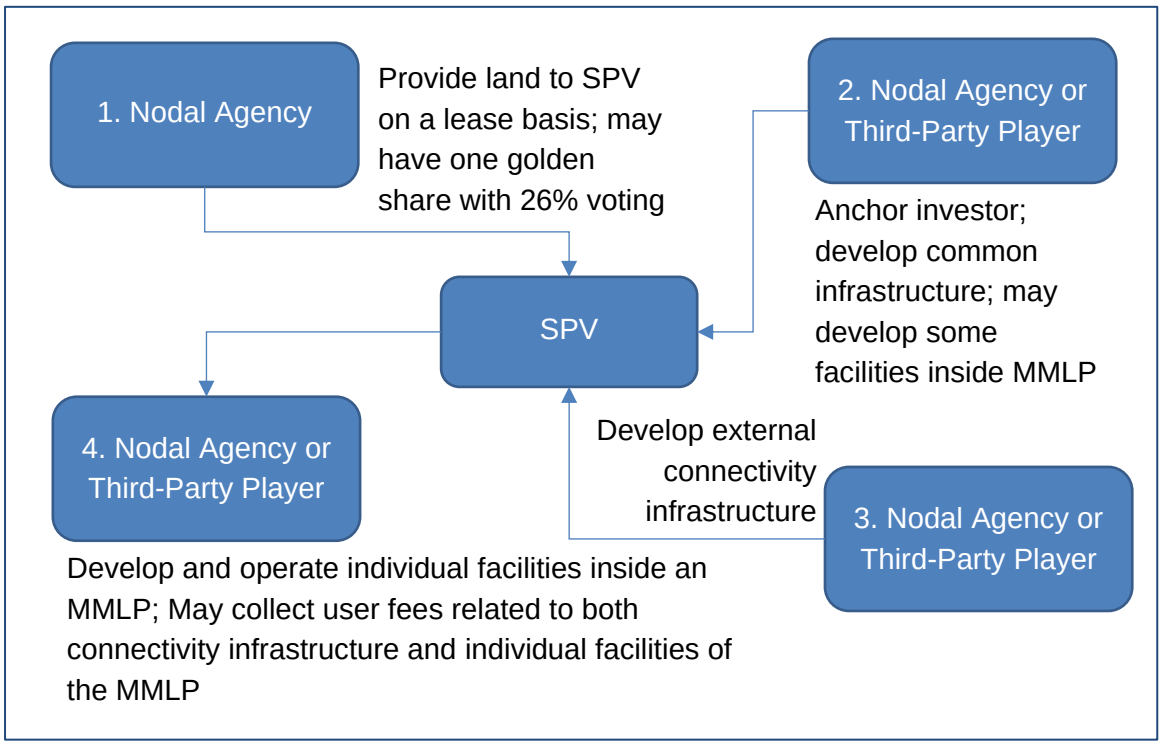
7.4 Suggested structure of SPV to develop and operate Jogighopa MMLP

An SPV is primarily a business association of entities eligible to participate in the association. SPVs are generally formed to raise funds from the market and investors, who have greater comfort in lending since the SPV is exposed to fewer risks when compared to the parent entity. This is because the assets and activities are distanced from the parent company and hence the performance of the new entity will not be affected by the ups and downs of the originating entity. Further, each of the participating entities will bring expertise in their field of operations or where they have particular advantages.

An SPV in the context of an MMLP is an agreement between the nodal agency and third-party operators, with each party playing a key role for the development and success of the MMLP. Each of the participating entities will have a stake in the success of the SPV and hence the project will have better chances of success. Further, it is important to establish that the parameters for the success of the SPV are individually aligned to the success of each of the participating entities.

Based on the comparative analysis of the business models identified in Figure 7.4, the following structure of for an SPV is suggested for implementation of the MMLP under the PPP model.

Figure 7.4: Suggested Structure of SPV



Entity 1. The first entity would be responsible for land acquisition and providing land on a lease rental basis. Further, in order to improve the viability of the project and also have control over key resolutions of the SPV, this being the primary nodal agency may have a golden share with 26% voting rights in the SPV. The golden share entitles the participating entity control over major decisions of the SPV and at the same time does not mandate it to invest in the equity of the SPV. In the case of the MMLP in Jogighopa, AIDC, being the land-owning authority, is best placed to acquire the required land for the MMLP and lease it out to the SPV on a long-term rental basis.

Entity 2. The second entity could be the anchor investor to develop the common or core infrastructure such as railway infrastructure, sewerage facilities, and utilities such as power and water. Further, depending upon the risk appetite and operational advantages of parent of the participating entity, this entity might also develop and operate specific facilities inside the MMLP.

Entity 3. The third set of entities would be responsible for developing the external connectivity infrastructure linking the MMLP, which would include the key highways and railway connectivity. These entities might be a part of the SPV with equity contribution or work together with the SPV for developing the external connectivity infrastructure. In return, the SPV may collect user charges such as toll revenues from the users of the MMLP and apportion a share of the charges to this third set of entities.

Entity 4. Finally, the fourth set of entities would be developing and/or operating the individual facilities in the MMLP such as ICDs, warehouses, a truck terminal, and a private freight terminal.

8 Financial Assessment

8.1 Capital Expenditure

For the purposes of Project Cost Estimates it has been assumed that the development of the MMLP will be carried out over two Phases for the Traffic scenarios for FY25 and FY35. The Project is proposed to be implemented under a Joint Development Model with the State Government/SPV facilitating the development of Core – Support Infrastructure and the Private Sector stepping in for Logistics Infrastructure.

All CAPEX Estimates included in this section for both Scenarios of FY25 and FY35 are at 2017 Price Levels.

8.1.1 Infrastructure Development by Government/SPV

Based on highlighted assumptions, the preliminary cost estimates for the support infrastructure to be developed for Jogighopa MMLP is illustrated in Table 8.1.

Table 8.1: Cost estimates for Support Infrastructure Development by Government / SPV

Component		Phase I – FY**25**	**Phase II** – FY**35**	**Total**	
		INR (Millions)	INR (Millions)	INR (Millions)	Share (%)
Transportation	*Railway*	132.45	0	132.45	12.7 %
	Road Network	66.00	54.00	120.00	11.5 %
Container Terminal		-	-	-	
Warehousing		-	-	-	
Truck Terminal		22.27	20.79	43.06	4.1 %
Non – Cargo Processing		-	-	-	
Common Facilities		90.82	26.18	117.01	11.2 %
Social Infrastructure		-	-	-	
Support Infrastructure / Utilities		347.83	243.68	591.50	56.7 %
Greens		22.00	18.00	40.00	3.8 %
Total (Millions INR)		**681.37**	**362.65**	**1044.02**	

Source: Planning & Technical Expert – ADB.

8.1.2 Logistics Infrastructure Development by Private Sector

It is assumed that the Private Sector will be provided with Trunk Infrastructure developed plots and will be responsible for developing the Logistics Infrastructure which would include all Structures and Facilities pertaining to Container Terminals, Warehousing, Non – Cargo processing and some of the Social Infrastructure which would include Hotels, Guest Houses and Commercial Complexes.

This involvement of the Private Sector is also considered in two Phases, concurrent with the Support Infrastructure.

The Preliminary Capital Costs to be incurred by the Private Sector for Phase I and II are summarised in Table 8.2.

Table 8.2: Cost estimates for Logistics Infrastructure Development by Private Sector

Component		Phase I – FY 25	Phase II – FY 35	Total	
		INR (Millions)	INR (Millions)	INR (Millions)	Share (%)
Transportation	*Railway*	-	-	-	-
	Road Network	-	-	-	-
Container Terminal		-	-	-	-
Warehousing		504.97	487.66	992.63	72.49 %
Truck Terminal		-	-	-	-
Non – Cargo Processing		141.22	136.38	277.59	20.27 %
Common Facilities		-	-	-	-
Social Infrastructure		62.00	37.17	99.17	7.24 %
Support Infrastructure / Utilities		-	-	-	-
Greens		-	-	-	-
Total (Millions INR)		**708.19**	**661.21**	**1369.40**	

Source: Planning & Technical Expert – ADB.

8.1.3 Equipment Deployment for Jogighopa MMLP

It is assumed that the Government / SPV and the Private Sector will be deploying the requisite equipment relating to the respective facilities being developed:

- All Equipment required for the operation of the Transportation Areas, Support Infrastructure and the Truck Terminal Area will be provided by the Government / SPV as per requirement. Capex / Opex for the equipment have been considered as if the ownership of such equipment rests with the Government / SPV.
- The Major Equipment requirement will relate to the Logistics Infrastructure being developed by the Private Sector.

A preliminary assessment of the equipment deployment has been made and accordingly the costs have been summarised in the Table 8.3.

Table 8.3: Cost estimates for Equipment Deployment

Component	Phase I – FY 25	Phase II – FY 35	Total	
	INR (Millions)	INR (Millions)	INR (Millions)	Share (%)
Government / SPV	16.50	13.50	30.00	10 %
Private Sector	148.50	121.50	270.00	90 %
Total (Millions INR)	**165.00**	**135.00**	**300.00**	

Source: Planning & Technical Expert – ADB.

8.2 Operating Expenditure

The operating expenditure for facilities has been estimated at a rate of INR75 per tonne.[24] Escalation costs of 5% year-on-year have also been taken into account.

8.3 Revenue Drivers

8.3.1 Traffic Estimate

The proposed MMLP is expected to handle container traffic of 1,536 TEUs per annum and bulk–break bulk traffic of 1.10 million metric tonnes per annum in FY20. The summary of projections is presented in Table 8.4.

Table 8.4: Overall Traffic Estimates

Year	FY20	FY25	FY30	FY35
Total Bulk–Break Bulk traffic (MMT)	1.10	1.67	2.31	2.88
Total Container Traffic ('000 TEUs)	1.54	1.88	2.13	2.25

Source: KPMG analysis.

8.3.2 Tariff Estimate

The tariff is based on market research and benchmarking based on tariffs from industry competition. Assumptions regarding tariffs are included in Tables 8.5–8.9. The detailed benchmarks are provided in Annexure 11.6.

a) ICD Tariff

Table 8.5: Tariff for ICD

For storage, a dwell time of 5 days have been considered for containers.

Benchmark Tariff	Units	Value
Container Type	20–40 ft.	20 ft.
Terminal Handling Charges	INR/TEU	3,417
Export Container	INR/TEU	3,233
Import Container	INR/TEU	3,600
Storage Charge	INR/TEU	297
Export Container	INR/TEU	156
Import Container	INR/TEU	438
Total Cost (excluding local transportation)	**INR/TEU**	**3714**

Sources: KPMG analysis, ICD TKD, ICD Bangalore, All Cargo Logistics.

The tariff for ICDs have been estimated based on benchmarks of ICD Tughlakabad and ICD Bangalore.

b) Warehousing Tariff

A dwell time of 15 days has been assumed for warehousing of bulk–break bulk commodities.

[24] ADB estimate.

Table 8.6: Warehousing Tariff

Benchmark Tariff	Units	Value
Storage Costs	INR/ton (15 days)	50
Cargo Handling Charges	INR/ton	22
Misc. Charges	INR/ton	13
Total Charges	**INR/Ton**	**85**

Sources: KPMG analysis, primary interactions.

c) Cold Storage Tariff

Table 8.7: Cold Storage Tariff

Benchmark Tariff	Units	Value
Storage Charges	INR/ton (1 month)	1,600.00
Cargo Handling Charges	INR/ton	400.00
Misc. Charges	INR/ton	200.00
Total Annual Charges	**INR/ton (1 month)**	**2,200.00**

Sources: KPMG analysis, primary interactions.

The warehousing tariff has been estimated based on benchmarking with warehousing tariff and primary interactions with warehousing players.

d) PFT and Truck Terminal

Table 8.8: Truck Terminal Tariff

Benchmark Tariff	Units	Value
Tonnage Handled per Truck	Ton/truck	20
Parking Fees	INR/truck (4 hours)	20.00
Misc. Charge	INR/truck	3.00
Total Charges	**INR/truck**	**23 .00**

Source: ADB.

Table 8.9: Private Freight Terminal Tariff

Benchmark Tariff	Units	Value
Terminal Access Charges	INR/ton	60
Terminal Handling Charges	INR/ton	85.00
Wagon to Platform	INR/ton	45.00
Platform to Truck or Trailer	INR/ton	45.00
Wagon to Truck or Trailer—Direct Loading	INR/ton	80.00
Misc. Charges	INR/ton	6.00
Total Charges	**INR/ton**	**151.0**

Sources: KPMG analysis, PFT KIIP Rewari, primary interactions.

e) **All rentals as well as handling charges are assumed to increase at 5% per annum.**

8.4 Other Key Assumptions

8.4.1 Modes of Financing

- The equity ratio has been determined to be 30%. Based on project viability, the remaining amount is divided between debt and viability gap funding.

- The interest rate on debt is estimated at 11% per annum and the cost of equity is assumed to be 16% per annum, based on discussions with project finance professionals.
- A loan tenure of 10 years is assumed, comprising a 2-year moratorium period and an 8-year repayment period.
- Cash flows have been projected until FY36 (15 years from 2021) to calculate NPV and IRR.
- Other modes of financing options for the project include
    - **Convertible debenture**. A convertible debenture is a type of loan issued by a company that can be converted into stock.
    - **Mezzanine financing**. Mezzanine financing is a hybrid of debt and equity financing that gives the lender the right to convert to an ownership or equity interest in the company in case of default after other senior lenders are paid.

8.4.2 Depreciation

Depreciation of 5% has been assumed on the asset value every year.

8.4.3 Tax

A corporate tax rate of 34% has been considered for tax computations.

8.4.4 Construction and Operation Period

Construction is to be carried out in two phases. Phase I of the project extends until FY25 and Phase II is from FY26 to FY35. The construction period for the first phase is assumed to be 24 months. Land shall be acquired in FY18 and the infrastructure development will take place during FY18–FY20 by the developing company. The MMLP will start operating in FY20. Similarly, the second phase of construction is assumed to be 2 years (FY25–FY26).

8.4.5 Tax incentives for Infrastructure Projects

Infrastructure projects get tax rebates for the first 10 years of operations under Section 80-IA of the Income Tax Act. Since logistics parks do not have infrastructure status, they are not eligible for Section 80-IA benefits, leading to reduced viability. However, a draft of the Logistics Parks Policy envisages providing infrastructure status to logistics parks.

8.5 Key Financial Indicators

In the base case, viability gap funding of 25% is assumed for better viability of the project. The project returns are shown in Table 8.10.

Table 8.10: Financial Results

Parameters	Value
NPV–Firm (INR crore)	25.22
IRR–Firm (%)	12.40%
Viability Gap Funding	25%

8.5.1 Profit and Loss and Cash Flow Statement

As per the assumptions and revenue drivers indicated above, the profit-and-loss statement and cash flow statement of the project were derived and are presented in Table 8.11 and Table 8.12, respectively.

Table 8.11: Profit-and-Loss Statement

Year	FY21	FY26	FY31	FY36
Net Revenues	16.72	33.64	64.35	104.74
Operating Expenses	8.40	16.24	28.63	45.43
EBITDA	7.92	17.00	34.42	57.65
Depreciation	6.49	5.02	9.69	7.50
EBIT	1.43	11.98	24.72	50.15
Interest	6.80	2.55	5.45	-
EBT	(5.37)	9.43	19.27	50.15
Tax	-	3.21	6.55	17.05
PAT	(5.37)	6.22	12.72	33.10

Note: All figures are in INR crore and for the financial year ending on 31 March.
Source: KPMG analysis.

Table 8.12: Cash Flow Statement

Year	FY19	FY20	FY21	FY26	FY31	FY36
PAT	-	-	(5.4)	6.2	12.7	33.1
Add Depreciation	-	-	6.5	5.0	9.7	7.5
Less Capex	60.6	63.1	-	-	-	-
Add Loan Inflow	27.3	28.4	-	-	-	-
Less Loan Repayment	-	-	7.7	7.7	8.3	8.3
Viability Gap Funding	15.2	15.8	-	-	-	-
FCFF	(45.5)	(47.3)	7.9	13.8	27.9	183.1

Note: All figures are in INR crore and for the financial year ending on 31 March.
Source: KPMG analysis.

8.5.2 Sensitivity Analysis

Sensitivity analysis has been done on the financials to evaluate the sensitivity of the key financial ratios due to variation in the viability gap funding. The results are presented in Table 8.13. The sensitivity analysis for viability gap funding was done to understand and improve the viability of the project. Larger viability gap funding will be required in order to make the project viable.

Table 8.13: Sensitivity Analysis for Viability Gap Funding

S.No	Viability Gap Funding (%)	IRR	NPV (INR crore)
1	15%	9.6%	(1.64)
2	25%	12.4%	25.22
3	35%	15.9%	47.83

S.No	Viability Gap Funding (%)	IRR	NPV (INR crore)
4	40%	18.0%	57.43

Source: KPMG analysis.

Sensitivity analysis has also been done on the financials to evaluate the sensitivity of the key financial ratios due to variation in the key drivers such as Capex, Opex, and project revenues, while maintaining viability gap funding at 25%, and is presented in Tables 8.14, 8.15, and 8.16. The scenarios tested comprise an increase and decrease of Opex, Capex, and project revenues at 5% and 10% to assess how changing market scenarios impact the overall returns of the project.

Table 8.14: Sensitivity Analysis for a Change in Opex

Change in Opex	IRR	NPV (INR crore)
Base Case	12.4%	25.22
Increase of 5%	11.9%	20.74
Increase of 10%	11.4%	16.25
Decrease of 5%	12.8%	29.62
Decrease of 10%	13.3%	33.99

Source: KPMG analysis.

The viability of the project increases as the Opex decreases. A lower Opex could be achieved by performing efficient operations and bringing in technology to enhance productivity.

Table 8.15: Sensitivity Analysis for a Change in Capex

Change in Capex	IRR	NPV (INR crore)
Base Case	12.4%	25.22
Increase of 5%	11.9%	21.45
Increase of 10%	11.4%	17.68
Decrease of 5%	12.9%	28.90
Decrease of 10%	13.5%	32.55

Source: KPMG analysis.

An increase in Capex requirements, while having the same revenues and Opex, would lead to a decrease in the viability of the project. Additional requirements for debt and equity would hinder the viability of the project.

Table 8.16: Sensitivity Analysis for Change in Revenues

Change in Opex	IRR	NPV (INR crore)
Base Case	12.4%	25.22
Increase of 5%	13.2%	33.45
Increase of 10%	14.0%	41.65
Decrease of 5%	11.5%	16.81
Decrease of 10%	10.6%	8.40

Source: KPMG analysis.

An increase in traffic and corresponding revenues would lead to an increase in the viability of the project.

9 Logistics Regulatory and Policy Assessment

9.1 Need for a State Logistics Policy

In order to have a sustainable and robust logistics infrastructure there are numerous regulatory issues that need to be addressed. In addition to this, there are challenges such as land acquisition, quality of labour, environmental hazards, traffic congestions (especially in the cities), procedural delays in transportation, and lack of data-based decision making in the sector.

The above challenges may act as a deterrent to private investment in this sector (such as MMLPs) which is major concern. In order to address the above challenges it is desirable to draft a State Logistics Policy for Assam and also address the existing policy voids. The policy could be designed around the following principles:

- Encourage a balanced modal mix, with waterways gaining a larger share in future
- Support a Single Window clearance for setting up of MMLP
- Appoint single logistics inspector for various enforcement agencies such as police, Road and Transport Authority (RTA), tax, customs etc.
- Encourage development, manufacturing and selling of improved truck technology
- Mandate the use of data-driven decision-making using Telemetry to improve efficiency of logistics
- Introduce a MoRTH 'Single Toll Card' containing all relevant details about the vehicle (on-road permits, licenses, entry exit timings, pollution history, etc.)
- Develop regulatory framework for insurance of inland water cargo
- Ensure vibrancy in an MMLP by having lodging for drivers, first aid facilities, rest rooms, maintenance, repair and operations (MRO) facilities, essential item shops, entertainment zones, eco-friendly energy generation and other civic amenities
- Mandatory physical inspection of challans for surveillance against transportation of illegal good and undocumented immigrants

9.2 Areas of Policy Intervention for Logistics

The regulatory and policy interventions are required in all those areas which impact the setting up and effective operations of logistics parks, such as MMLPs.

9.2.1 Labour

The labour laws are intended to protect the interests of workers in general and those who constitute the poorer sections of the society. The labour related laws are illustrated in Table 9.1.

Table 9.1: Labour Laws in India

Broad Category	Acts
Laws relating to Industrial Relations	Industrial Disputes Act, 1947
	Trade Unions Act, 1926
Laws relating to Wages	Minimum Wages Act, 1948
	Payment of Wages Act, 1936
	Payment of Bonus Act, 1965

Broad Category	Acts
Laws relating to Social Security	Employees' Provident Funds and Miscellaneous Provisions Act, 1952
	Employees' State Insurance Act, 1948
	Labour Welfare Fund Act (of respective States)
	Payment of Gratuity Act, 1972
	Employee's Compensation Act, 1923
	Industrial Employment (Standing Orders) Act, 1946
	Shops and Commercial Establishments Act (of respective States)
	Factories Act 1948
	Contract Labour (Regulation and Abolition) Act, 1970
	Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.
	Weekly Holiday Act, 1942
	National and Festival Holidays Act (of respective States) 1963
	The Dock Workers (Safety, Health & Welfare) Act, 1986
Laws relating to Equality and Empowerment of Women	Equal Remuneration Act, 1976
	Maternity Benefits Act, 1961
Prohibitive Labour Laws	Bonded Labour System (Abolition), Act, 1976
	Child Labour (Prohibition & Regulation) Act, 1986
	The Sexual Harassment at the Workplace (Prevention, Prohibition and Redressal) Act, 2013
Laws relating to Employment and Training	Apprentices Act, 1961
	Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959

Source: Ministry of Labour & Employment, India

9.2.1.1 Labour challenges

In order to increase the efficiency in logistics, the MMLP at Jogighopa is expected to operate 24 hours. This would require the labour to work long hours or multiple shifts. Also, there could be safety and labour welfare related challenges in case of overnight shifts and employment of women.

Prevalence of labour exploitation

Due to abundance of unskilled labour in Assam, working conditions and working hours in labor-intensive sectors are not in compliance to the provisions of Assam Shops & Establishment Act. The owners exploit labour and have virtual control over decisions around wage, work hours, working conditions and dismissal of workers. The trade unions and transport unions are also not strong enough to fight for worker's rights

Lack of tracking of Driver Data

The number of driving hours for transport vehicle drivers is stipulated in the Motor Transport Workers (MTW) Act, 1961. Section 91 of the MWT Act limit the working hours for drivers at 8. However, this provision is not enforced strictly leading to driver fatigue which could potentially result in accidents. The Act is applicable only when the company employs 5 persons or more. Considering the present ownership pattern, many transport companies across India operates with a smaller staff count[25]. The truck owners do not maintain any record of duty hours of drivers, the expiry of driving license, illegal goods being traded, alcohol and substance abuse etc.

Shortage of skills
Multimodal Logistics is an unfamiliar concept in India. The operations of the MMLP would require dealing with advanced logistics technology like Electronic Data Interchange (EDI) and Telemetry. It would also involve a degree of regulatory knowledge of specific areas, such as cold storage, hazardous material, waste management and packaging services. The existing skill profile of the logistics sector workforce would require improvement to operate with advanced technology and complex regulations of multimodal logistics.

Lack of amenities within the premises
There exists a lack of dignified facilities to meet personal requirements of drivers like food, sanitation and lodging. Drivers often resort to cooking on sight which compromises the safety of the vehicle (especially in case of inflammable cargo) or offsite which compromises the security of the vehicle. Moreover the burden of cargo responsibility at layoff sites impairs rest of drivers and takes a toll on their mental health.

9.2.1.2 Labour related recommendations

Develop social infrastructure around the MMLP
The labour needs to be housed onsite or in close proximity to the MMLP. This would require the development of social infrastructure, such as housing, schools, hospitals and other public amenities in the area, leading to development of a smart city around the MMLP. Hence the policy would have to encourage labour welfare and safety provisions to be strictly enforced in and around the MMLP.

Enforce Assam Shops and Establishment Act 1971
The Government of Assam might consider ensuring stricter implementation of the provisions of the Assam Shops and Establishment Act, 1971 with regard to employment of female workers and working hours i.e. 8 hrs a day as per the act. The coverage of 24x7 functioning can happen by running three shifts in a day as against longer working hours without additional payments. The policy can mandate regular inspections from the local enforcement authority.

Introduce 'Digital Driver Card'
The MMLP can introduce a 'Digital Driver Card' which would record all relevant details of a driver to ensure regulatory compliance, such as the number of hours, license number, violation history, etc. The card can be swiped at the entry and exit gates of each MMLP which would be connected to a central database. The card data would be tallied with regulations of the Motor Transport Workers (MTW) Act to check for driver fatigue in order to minimize the risk of accidents. Data on health conditions and substance abuse history can also be linked to the driver card and the data could be made available online to transporters and enforcement authorities.

Introduce skill development programs

[25] http://lawmin.nic.in/ncrwc/finalreport/v2b3-5.htm

The MMLP might have to consider designing training programs for workers to get updated as per the requirements of multimodal logistics. This would include updating the existing training modules and partnering with technology institutions, engineering colleges and driver training institutes for regular classroom sessions.

The policy can enforce Apprentices Act 1961 and use technology to ensure/monitor the supply of skilled workers specially trained to the needs of MMLP. In addition to introducing compulsory training requirements, the policy might introduce certification schemes that encourage the companies to train their employees

Develop an online portal for reporting labour violations
The MMLP can design an online portal to enable employees to anonymously report instances of child labour, sexual harassment at workplace and other labour exploitation issues. The portal would enable the MMLP administration to identify patterns of labour grievances and demands

Create vibrancy within the MMLP
The MMLP can have onsite canteens, washrooms, medical facilities, MRO facilities for checking truck's health and tyre worn out situations, corner shops and free WiFi. This would create vibrancy and address the problem of driver welfare and fatigue.

9.2.2 Land acquisition and development

Land Acquisition in Assam is governed by the provisions of the following laws:

- Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation
- Resettlement Act, 2013
- Assam Land (Requisition & Acquisition) Act, 1964
- National Highways Act, 1956

Assam Industrial Development Corporation (AIDC) is planning to develop approximately 150 acres of land in Jogighopa. The land is already under industrial use being the site of Ashok Paper Mill Limited which was a government entity but defunct since 1980s. Therefore, there are no challenges in land acquisition for the MMLP in Jogighopa.

However, since there is a significant possibility of labour settlement around the MMLP area (as described in the labour section above). There is a possibility of decongesting Guwahati city with the development in Jogighopa. This creates the need to acquire more land upfront, which can lead to the following challenges:

- The land prices around the MMLP area will start to rise significantly after the first round of development. Therefore, a very high upfront capital investment will be required – a portion of which will be an idle investment for initial years
- Full operationalization of the MMLP would involve developing the spokes, which may require acquisition of land
- Legal disputes can arise from litigations over compensation for the acquired land. There is no dedicated grievance redressal mechanism for those displaced by land acquisition

9.2.2.1 Land related recommendations

To avoid heavy upfront capital requirement, and to avoid acquisition related legal challenges, the Assam government may choose to pool land as per the existing Assam Land Pooling Policy[26].

Options to manage the land price inflation in and around Jogighopa are as follows:

- Government can develop a mechanism to lock land price inflation in the first year
- Policy may consider allowing a part of the increase in land prices to go to the government
- Implement 'Betterment Levy' around Jogighopa

9.2.3 Environment

Assam has one of the highest concentrations of National Parks and Biodiversity reserves in India. This fragile ecosystem will be adversely affected from carbon emissions due to increased cargo traffic in the state. It is the State's responsibility (under Part IV Article 48A of the Indian Constitution) to protect the environment and to safeguard the forests, lakes, rivers and wildlife.

Also, many companies especially in the automobile sector have their own carbon footprint targets. To maintain reduced carbon footprints these companies would prefer a modal shift from road transport to railways or inland waterways both of which are more environment friendly. The policy might further encourage private players to make similar shifts.

The environment related laws applicable on Assam are listed in Table 9.2.

Table 9.2: Environment laws applicable on Assam

Broad Category	Acts/Laws/Regulations
National Laws	
Laws pertaining to Environment	Environment (Protection) Amendment Rules, 2008
	Environmental Impact Assessment Notification, 2012
	Emission Standards for Common Hazardous Waste Incinerator
	Loss of Ecology (Prevention and Payments of Compensation) Rules, 1996
	The National Environment Tribunal Act, 1995
	National Green Tribunal Act, 2010
Laws pertaining to Water	The Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003
	The Water (Prevention and Control of Pollution) Amendment Rules, 2011
Laws pertaining to Air	The Air (Prevention and Control of Pollution) Act, 1981
	The Air (Prevention and Control of Pollution) Amendment Rules, 1987

[26] http://gmda.assam.gov.in/frontimpotentdata/land-pooling-policy

	The Ozone Depleting Substances (Regulation and Control) Rules, 2000
Laws pertaining to Noise	The Noise Pollution (Regulation and Control) (Amendment) Rules, 2010
Laws pertaining to Forest & Wildlife	Forest (Conservation) Act, 1980
	Forest (Conservation) Amendment Rules, 1992
	The Wild Life (Protection) Amendment Act, 2006
Laws pertaining to Biodiversity	The Biological Diversity Act, 2002
	Biological Diversity Rules, 2004
Laws pertaining to Waste Management	The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
	The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
	The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000
	The Batteries (Management and Handling) Rules, 2001
	The Plastics (Manufacture, Usage and Waste Management) Rules, 2009
	E-waste Management and Handling Rules 2011
Assam State Laws	
Laws pertaining to Forest & Wildlife	Assam Forest Regulation (Amendment) Act, 1995
	The Assam Forest Protection Force Act, 1986
	Assam (Control of Felling & Removal of trees from Non-forest Land) Rules, 2002
	Assam Compensatory Afforestation Fund Rules, 1994
	Assam Government's Guidelines for Compensatory Afforestation, 2000
	Assam Forest Policy, 2004

Source: Ministry of Environment, Forest and Climate Change

9.2.3.1 Environment challenges

There is no Central Pollution Control Board (CPCB) guidance on how to establish accountability and measure State Pollution Control Board's performance. There is a lack of uniformity in data collection and compilation of data across the states. The lack of standard national indicators as well as limited encouragement becomes a major reason for states to not track environmental damage due to pollution.

9.2.3.2 Environment related recommendations

Adoption of a 'Green MMLP' Policy
In order to address the environmental challenges, the MMLP can consider adopting a 'Green MMLP' policy. Components of the policy could be as follows:

- **Encourage adoption of rooftop solar panels**
  The policy must mandate the warehouse operators to install photovoltaic panels to a prescribed percentage of the rooftops – to generate solar energy and make the MMLP self-sufficient. This has been successfully implemented by many warehouse operators,

such as Amazon. Adoption of photovoltaic technology would also contribute to the Government of India's national target of generating 40 GW of electricity from solar energy by 2022.

- **Mandate the installation of ETP and STP**
  The proximity of the MMLP at Jogighopa to the Brahmaputra River makes the issue of effluence an important environmental hazard. To address the problem of liquid waste management the policy may enforce installation of Effluent Treatment Plant (ETP) and Sewage treatment Plant (STP) in an MMLP. Adoption of Zero Liquid Discharge technology would play an important role in protecting the Brahmaputra ecosystem against pollution.

- **Enforce zero discharge policy**
  The policy may encourage (or mandate) the reuse of clean water in an MMLP.

- **Support waste management initiatives**
  The Government of Assam might ensure that the MMLP adopts best practices of treating e-waste, hazardous waste and solid waste.

- **Rainwater harvesting**
  Assam receives an annual average rainfall of 2,782 mm which is higher than India's national average. The MMLP can use this opportunity to reduce its dependency on the state by collecting, storing and using rainwater by installing Rainwater Harvesting (RWH) techniques.

Monitor air quality in the MMLP premises
The traffic of high emission vehicles in the MMLP is likely to cause air pollution in an MMLP which creates a health hazard for the workers. The MMLP can use technology sensors to monitor the air quality inside its premises.

Penalize littering within the MMLP
The MMLP might have to adopt a policy of zero tolerance for littering inside the premises.

Install electric charging stations
To encourage transporters to shift from trucks running on fossil fuels to electric vehicles the Assam MMLP can mandate at least one charging station for electric trucks coming into the logistics park.

9.2.4 Inland Waterways Policy

Despite its relatively small size, Assam has the longest navigable length of waterways in India at 5290 km and also the largest number of waterways at 16. The Brahmaputra – the arterial river of north east India has been designated as the National Waterway 2 (NW2) by the Government of India.

The cost of transporting cargo through water is one-third as compared to the road transport and half of rail transport. Further, it is also the most environmentally sustainable mode of freight transport as 1HP can transport 4000 kg of cargo through water, whereas the same can pull 500 kg on rail and only 150 kg on road making an average barge equivalent of 15 rail wagons and 60 standard truck[27].

[27] '*Sustainable Transport: Greener route for navigating India Inc.'s logistics*', Aparna Khandelwal, Sustainable Business Leadership Forum, October 2014

The inland waterways laws in India are listed out in Table 9.3.

Table 9.3: Inland Waterways Laws in India

Broad Category	Acts/Laws/Regulations
National Laws	
IWAI	Inland Waterways Authority of India Act, 1985
	Inland Waterways Authority of India Rules, 1986
Navigation	The National Waterways Act, 2016
	Inland Vessels Act, 1917
	Inland Vessels Rules, 1917

Source: Ministry of Shipping

9.2.4.1 Inland waterways challenges

Outdated policy framework
Despite recent efforts of the Government of India to boost inland water traffic there is only a single policy framework of inland navigation in India - the Inland Water Transport Policy 2001 – which is outdated by 16 years

Lack of cargo insurance regulations
The only act providing insurance to cargo carried on water is the Marine Insurance Act, 1963. However, it only covers cargo carried on coastal waters. The National Waterways Act, 2016 does not have any provisions for offering insurance to cargo carried on inland waters. Certain banks like the State Bank of India, Cholamandalam MS and IFFCO-Tokoi offer schemes of insuring inland water cargo however, these schemes are void of any regulatory framework at present.

Ambiguous environmental clearance requirements
Accordingly NIWAI notification from October 2016, inland water jetties and multi modal terminals are not subjected to environmental impact assessments (EIA) unless their maintenance involved dredging. This creates an ambiguity about the stage at which EIA should be conducted and whether or not clearance should be obtained before operationalizing a waterway

Lack of salvaging regulations
The issue of salvaging (rescue of a wrecked or disabled ship, its cargo and crew) is currently addressed under the Merchant Shipping (Wrecks and Salvage) Rules, 1974. However, the law explicitly concerns ‘Indian Territorial Waters” (coastal waters up to 12 nautical miles from the Indian shore) and does not extend to the Inland Waterways. The National Waterways Act, 2016 and the Indian Vessels Act of 1917 do not address the issue of salvaging.

Lack of definition of Over Dimensional Cargo (ODC)
Central Motor Vehicles Rules, Section 93 gives a clear measurements of ‘Over Dimensional Cargo’ for road transport. However, the National Waterways Act, 2016 and the Inland Vessels Act, 1917 do not provide any definition of ‘Over Dimensional Cargo’ in case of inland water transport. This creates a major policy void. Moreover, the National Waterway 2 is expected to facilitate connectivity with Bangladesh. At present there is no framework which provides a transnational definition of ‘Over Dimensional Cargo’.

Lack of leakage liability regime

The issue of fuel leakage from vessels and leakage of hazardous cargo is not covered under the Inland Waterways Act 2016. The only law which defines a liability regime for leakage from a vessel is the Merchant Shipping (Prevention of Pollution of the Sea by Oil) Rules, 2010 which does not include inland waterways in its purview. This poses a serious threat for the National Waterway 2 in Assam as it flows through several protected natural reserves which will be adversely affected by leakage of fuels from vessels. From an enforcement perspective, this creates a major lack of a framework to map responsibilities and levy penalty in case of violation.

Trade Facilitation Obstacles
South Asia needs to be fully integrated under a single trade facilitation system. However, there are several challenges to achieve a complete integration. Leading non-tariff barriers (NTBs) like bottlenecks in trade facilitation due to slow documentation process, inadequate implementation of modern customs procedures, and only partial compliance with World Customs Organization's Revised Kyoto Convention act as obstacles to cross-border trade facilitation. This might affect the potential of the Assam MMLP to facilitate trade between India, Bhutan and Bangladesh. The existing customs clearance procedure involves extensive paperwork, making the process slow, complex and demands excessive storage space.

At present, the Inland Waterway Act does not have any legal provision that encourages private investment into development of waterways

9.2.4.2 Inland waterways related recommendations

Encourage private investment in waterways development
Governments both at the Centre and the State can encourage private investments into the sector to develop, operate and maintain inland waterways. There is a need to create a clear PPP model.

Draft State Inland Waterway Policy
National Law University, Assam is in the process of drafting the inland waterway policy for Assam. Once it is accepted in Assam (after iterations and reviews), it is expected to become a modal policy for other states to follow. The policy might also conclusively address the existing ambiguities in the current policy frameworks regarding control over waterways and devolution of rights and responsibilities over waterways to local governments.

Mandate EIA at the stage of planning
Development of Inland Waterways are likely to result in a sharp increase in cargo vessels along designated rivers. This would understandably lead to an increase in built infrastructure along waterways. The existing ambiguity in the policy calls for extension of the Environmental Impact Assessment (EIA) and the stage of the development process at which the assessment should be conducted. To prevent development of environmentally adverse infrastructure along rivers, the Inland Waterways Act 2016 might have to be amended with a clause mandating EIA clearance for operationalization of inland waterways.

Draft leakage liability regime
The Inland Waterways Act 2016 might have to be amended to include detailed guidelines to restrict leakage of fuel from vehicles. The Assam MMLP is expected to handle vessels from Bangladesh which might be outdated and in a state disrepair causing excessive leakage of fuel into river. The regulation against leakage might have to be drafted keeping in mind the bilateral aspects of inland waterways.

Enforcing ODC Regulations

National Waterways Act, 2016 could stipulate strict measurements for 'Over Dimension Cargo' in the context of inland navigation. This definition can take into account the fact that hydrological conditions like depth, water level and width of rivers may be different for individual waterways and could be affected by seasonal variations. For international waterways like river Brahmaputra, the ODC measurements might have to be agreed upon by both India and Bangladesh.

Draft salvaging regulations

The Merchant Shipping (Wrecks and Salvage) Rules, 1974 can be amended to bring inland waterways within its purview. Alternatively, the National Waterways Act, 2016 and the Inland Vessels Act, 1917 can be amended to address the issue of salvaging.

Draft cargo insurance regulations

The Inland Waterways Act, 2016 can be amended to include provisions of insuring cargo carried across inland waterways. The law might have to also regulate banks and other financial institutions providing cargo insurance on inland waterways. Moreover, since the Assam MMLP is expected to handle waterways cargo to and from Bangladesh, the legal provisions would have to be designed to address cross border transportation issues.

Promote trade facilitation

Electronic Data Interchange (EDI) for Customs Clearance

One of the principal obstacles to cross-border shipment of cargo through inland waterways is the absence of a one-stop electronic portal to handle all customs related clearance. Within a National Logistics Single Window system, the Assam MMLP can develop an EDI system through which all approvals could be obtained electronically. Ideally, this system can provide the following services:

- Electronic filing and clearance of export import documents
- e-Payment of custom duties and charges of ports, airports, CONCOR, etc.
- Filing and processing of licenses for Directorate General of Foreign Trade (DGFT)
- e-Payment of license fee for DGFT
- Electronic exchange of documents between partners such as Customs, ports, airports, DGFT, CONCOR, Banks, etc.

Introducing an EDI system would reduce the need for paper work, make the process faster and less complex and reduce the need for physical storage of records

Adopt SASEC Trade Facilitation Strategy, 2014-2018

Once fully operationalized, the Assam MMLP would be a nodal transshipment point for cross-border cargo travelling between Bhutan and Bangladesh. To facilitate the shipment of cargo between the Assam MMLP and Bangladesh through shared waterways, Government of India might mandate the enforcement of the Trade Facilitation Strategy (TFS) of the South Asia Sub regional Economic Cooperation (SASEC).

The SASEC TFS is a framework to modernize and simplify customs. To ensure this the Government of India needs to implement the Revised Kyoto Convention and the Secure and Facilitate Global Trade (SAFE) framework. In order to expedite border formalities to facilitate the smooth movement for goods, vehicles, and people, the framework also recommends increased use of ICT and development of National Single Windows that would link all border agencies with the trading community. The SASEC TFS includes provisions for establishing customs service inside major trade facilitation centers like the Assam MMLP. In order to ensure this the SASEC framework recommends adoption of the Secure Cross-Border Transport Model developed by UNESCAP.

9.2.5 Road transportation

Transportation of goods through trucks is the key component for any logistics park. Majority of goods in India are carried via road. There are multiple areas in northeast with difficult terrains and hence railways and waterways are unsuitable. The concept of multi modal logistics does not exist without understanding the importance of road transport. However, there are multiple hurdles that a transporter faces, starting from approvals to managing the low skilled drivers.

The transport related laws applicable to Assam are listed in Table 9.4.

Table 9.4: Transport Laws applicable to Assam

Broad Category	Acts/Laws/Regulations
National Laws	Motor Vehicles Act, 1988
	Carriage by Road Act, 2007
	Control of National Highways (Land and Traffic) Act, 2002
	Central Road Fund Act, 2000
	National Highways Act, 1956
	Road Transport Corporations Act, 1956
	National Highways Authority of India (Amendment) Act, 2013
Assam State Laws	Assam Motor Vehicles Rules, 2003
	Assam Public Works (Regulation of Road Development & Road Transport) Act, 2010
	Assam Requisition and Control of Vehicles Act, 1968

Source: Department of Transport, Assam

9.2.5.1 Transportation challenges

Passage restriction for trucks in the city

Majority of logistics operators used large trucks to transport cargo. However, larger vehicles are subjected to restrictions on passage through cities. For example, the city of Guwahati enforces the following restrictions on the passage of trucks through the city:

Table 9.5: Passage restrictions in Guwahati City

Vehicle Type	Route	No-Entry Time
6-wheeler Trucks	Entry into Guwahati city	6 am to 11 pm
	Via Express Highway, Sixth Mile and Tripura Road	7:30 am to 11:30 am 1:30 pm to 4 pm 5 pm to 9:30 pm

Vehicle Type	Route	No-Entry Time
Petroleum/LPG Tankers	From New Guwahati to Khanapara via Mathgharia, Zoo Narengi Road, RG Baruah Road and Ganeshguri	7.30 am to 11.30 am 1.30 pm to 4.00 pm 5 pm to 9.30 pm
4-wheeler trucks & Mini trucks	Entry into Guwahati city	7.30 am to 11.30 am 1.30 pm to 4 pm 5 pm to 9.30
	All other routes	No restrictions

Source: Police Commissionerate, Guwahati

Congestion due to roadside parking
Roadside parking is a common problem in India as drivers often lack knowledge of legal restrictions. Moreover existing regulations do not get fully implemented by enforcement authorities. Roadside parking around the MMLP will create congestion and disrupt the smooth entry and exit of vehicles.

Lack of business critical monitoring of trucks
Due to lack of monitoring of a truck while on-road, transporters often violate cargo restrictions. This also makes it possible transportation illegal cargo which are either loaded or unloaded while the truck is on road. Also, drivers often load undocumented cargo above the permissible weight limits. These violations of weight restrictions never get penalized due to lack of on-road weight monitoring

Theft on the way
Trucks face safety related emergencies like theft on the way. Many areas in India do not have lightings or even policing which makes the truck vulnerable to theft.

Lack of health records of vehicles
Due to unavailability of data on the heath and on-road record of trucks, transporters often run unfit vehicles with outdated engines, brakes and emission standards. These vehicles cause pollution, take longer to cover distances and are often met with accidents.

Cash dependency of drivers
All on-road compliance charges and penalties are required to be paid in cash. Truck drivers have to carry lump-sum amount of cash with them which compromises their own safety and security of the vehicle. Currently there is no policy directives that either discourages cash payments or promotes electronic payments.

Transport of hazardous goods through populated areas
Trucks carrying hazardous cargo like petroleum, chemicals and e-waste often pass through densely populated areas. This creates a threat to human safety in case of an accident or cargo spillage.

Promote electric vehicles for last mile connectivity

9.2.5.2 Transportation related recommendations

Use smaller ecofriendly trucks
Transporters can be encouraged to use smaller trucks and ecofriendly which face relatively less passage restrictions. This would encourage 24x7 goods delivery services like Amazon,

Flipkart etc. to use fleets of smaller and cleaner vehicles. This would result in lower carbon emission and less congestion during rush hours inside the city.

Strict prohibition of roadside parking
There can be CCTV monitoring of access roads within a 5 mile radius around the MMLP to ensure trucks are not parked on these. The MMLP might have to enforce strict penalties against parking of trucks on access roads.

Real-time monitoring using Telemetry
Trucks travelling between two MMLPs can be installed with Electronic Logging Device (ELD) devices which synchronizes with a truck engine to automatically record driving time. The data would be communicated to the central control system through telemetry which would enable effective real-time monitoring of trucks while on road.

Install weigh-in-motion
There can be mandatory installation of weigh-in-motion devices at the entry and exist of each MMLP connected to central monitoring system. This would ensure that truckers do not load or unload undocumented cargo while on road.

Install SOS button in trucks
Trucks travelling between MMLPs can be fitted with an 'SOS Button'. Pressing this button would immediately notify the central control of the MMLP who can relay the information to the nearest police station to ensure swift mitigation and rescue.

Introduce MoRTH 'Single Toll Card'
Introduction of a MoRTH 'Single Toll Card' containing all relevant details about the vehicle's health, environmental clearance record and accident history. This card will also keep the necessary permits and approvals required for the truck to have a smoother journey to its destination with minimum inspection.

Mandate electronic tolling
Electronic tolling has started across 300 national highways from April 1, 2016. State Bank of India, ICICI and Axis Bank has collaborated with NHAI to introduce collection of payments through handheld devices. This might have to be extended to all National and State Highways to ensure a shift from cash payments to electronic payments.

GPS based route optimization
The policy can recommend mandatory GPS-based route optimization for trucks carrying hazardous cargo. These trucks should avoid (as much possible) movement through populous areas. Data from the tax department can be utilized to attain such analysis.

10 Conclusion

MoRTH launched LEEP to improve freight movement in the country and significantly raise India's Logistics Performance Index score by developing 35 MMLPs across the country. As lead partner, ADB has agreed to conduct pre-feasibility studies for setting up MMLPs in four locations, including Jogighopa (Assma). With regard to the latter, NHAI, CONCOR, IWAI and AIDC signed a memorandum of understanding at the India Integrated Transport and Logistics Summit in May 2017 for the implementation of an MMLP in Jogighopa (Assam), with AIDC and the Government of Assam mobilizing land for the project.

The total relevant market in the region in FY17, including both container and bulk–break bulk traffic, both domestic and EXIM cargo, is ~11.96 MMT. ~94% of the total relevant market is domestic cargo. The domestic cargo is mostly bulk–break bulk cargo, and ~67% of the domestic bulk–break bulk cargo is transported by road. The total market in the region is expected to grow to 33.74 MMT of container and bulk-break bulk cargo by FY35.

Warehousing facilities in Guwahati are concentrated along NH 27, causing congestion. Warehousing availability in Guwahati is limited, with high capacity utilization and limited possible expansion. There is a need for a warehousing hub outside the boundaries of Guwahati. There is a need for an effective MMLP, which is an integrated, large-scale facility providing value-added services through streamlined processes, driven by technology and with access to multi-modal transport.

The Government of Assam has identified land at Jogighopa for the proposed MMLP. A 760-acre site is currently under owned by the Government of Assam, of which about 100 acres may be used to develop the proposed MMLP, over 2 phases – till FY35. The location is approximately 110 km (aerial distance) west of Guwahati and approximately 10 km (aerial distance) North West of the nearest town, Goalpara.

The proposed MMLP in Jogighopa is strategically located with a potential to offer multimodal connectivity through road, rail and inland waterway modes, can develop as a distribution / aggregation centre for the North - Eastern states besides serving as a hub for the cross-border trade with Bangladesh, Bhutan, Nepal and Myanmar.

The site has connectivity to the road, rail and inland waterways network. The proposed regional connectivity projects will provide the site access to various regions, including Guwahati, rest of north east, mainland India, and Bangladesh and Bhutan.

The proposed Jogighopa MMLP shall provide an integrated platform and facilities for logistics with sufficient capacity for next 20 years to meet the requirements of end users in the region. The projected traffic potential of the MMLP is expected to grow to 2.91 MMT in FY35.

Key infrastructure projects have been prioritized for the success of the Jogighopa MMLP. These include the widening of NH 17 between Goalpara and Guwahati, doubling of New Bongaigaon – Goalpara – Guwahati Railway Line, new railway line from Jogighopa to Gauripur, Re-development of Jogighopa River Port as an all-weather port, and interchange to allow for the connection from NH 17 (including port connection) to MMLP over the railway line.

The Jogighopa MMLP is proposed to be developed in two phases, with a Capex of ~USD 34 million in Phase I and ~USD 58 million in Phase II, excluding the cost of land. It is suggested that land for further expansion (Phase III) may be acquired to cater for needs beyond 2035.

The business model options for the Jogighopa MMLP include

- **PPP.** The nodal agency would provide the land and there would be a master developer (third party) building and operating the common infrastructure and individual facilities.
- **Nodal agency as master developer.** The nodal agency makes investments and maintains operations of the common infrastructure, while a third party develops and operates individual facilities on a fixed-lease-rental or revenue-sharing model.

Based on the comparative analysis of the identified business models, an SPV is suggested. An SPV in the context of an MMLP is an agreement between the nodal agency and third-party operators, with each party playing a key role for the development and success of the MMLP.

A base case for this SPV has been established with a viability funding gap of 25%. The project returns in the base case would be an IRR of 12.40% and an NPV of INR25.22crore.

Strengthening the current soft infrastructure (regulations and policy) is identified as one of the critical ingredient to the effective functioning of the MMLP. It is essential to draft a State Logistics Policy which enhances the role of critical processes, pave ways for multiple authorities to work together, introduce smart technologies and promote ease of doing business.

11 Annexures

11.1 Study Milestones & Status

The activities for pre-feasibility study for the identified location in Jogighopa is summarized in the Table 11.1

Table 11.1: Summary of Activities

S. No.	Activities	Assam
1	Primary interactions to validate traffic flows, projects, analyses of existing studies	✓
2	Stakeholder workshop to verify the findings	✓
3	Preparation of a broad list of the range of services required by industrial players in the facility	✓
4	Traffic assessment and projections	✓
5	Preparation of market assessment report	✓
6	Project costing and infra requirements from planning and technical expert	✓
7	Prepare options for business model	✓
8	Regulatory experts to provide inputs to incorporate in the pre-feasibility report	✓
9	Submission of Draft Final Pre-feasibility Report for Jogighopa location	November 2017
10	Submission of Final Pre-feasibility Report	November 2017

11.2 Logistics Sector in India: Overview and Challenges

Logistics form an essential part of the Supply Chain Management which facilitates in getting products and services to end consumers based on their demand, thereby, acting as a bridge between the manufacturer and the end user.

India's logistics cost as a % of its Gross Domestic Product (GDP) stands at 13-14% in 2014**Error! Bookmark not defined.** and the proportion has doubled over the last 15 years, compared to logistics cost being 7-8% in 2000. The logistics costs as a % of GDP in developed countries, such as the United States, is ~8-10%[28] which is significantly lesser than that of India.

A key reason for the higher spending on logistics in India is the lower average distance of ~250-300 km per day covered in India by a truck compared to United States where the distance travelled is ~700-800 km. This is due to multiple stoppages, check posts and congestions on the roads of India, adding up to 20-25% of the total trip time. This, combined with the fact that the Indian fleet is old with lower average speeds leads to 50-60% lower average per day distance travelled by trucks in India, compared to the US**Error! Bookmark not defined.**.

The key reasons for the inefficiency in the Indian logistics sector are:

11.2.1 Unfavourable Freight Modal Mix

The current freight movement in the country is heavily skewed towards road movement - comprising 58% of the overall freight movement, which is higher compared to other similar continental sized economies such as United States and China.

[28] Ministry of Road Transport & Highways

The T-Km freight cost for road transport is ~ INR 2.1[29] in comparison to ~ INR 1.4[30] for railways. In spite of the lesser freight cost of ~50% of railways in comparison to roads, it is interesting to see that there is an increase in the share of road transport share in the overall modal mix. The share of road transport was ~31% in 1990[31] compared to ~58% in 2012.

India's dependence on roads and increasing share of roads in the modal mix is driven by:

- Limited investments in railway infrastructure in comparison to road infrastructure and
- Cross subsidization of passenger fares which has made freight movement costlier

Thus, unfavorable inter-modal split of freight movement increases the cost of freight movement in India.

11.2.2 Under-developed Material Handling Infrastructure

Logistics facilities in India currently lack adequate, good-quality material handling infrastructure preventing freight aggregation/ disaggregation as well as inter-modal movement, leading to higher cost of freight transportation.

Globally, material handling is typically taken care of at logistics parks, which typically have the following six facilities:

1. **Storage space**: Warehousing, stacking facilities
2. **Handling**: Mechanized loading/unloading facilities, security and maintenance of the premises.
3. **Amenities**: Parking bays, fuel refilling station, truck service centers; Resting area, restaurants, office space, ATM
4. **Value added services (VAS)**: Packaging and processing services
5. **Inter-modal connectivity**: Seamless intermodal (road/ rail/ waterways) freight transition
6. **EXIM capability**: Customs clearance, bonded storage space

The following are the current logistics facilities in India and the facilities provided by them.

Figure 11.1: Characteristics of existing facilities in India

Existing Facilities	Storage	Handling	Amenities	Inter-Modal	VAS	EXIM
ICD						
Warehouses						
FTWZ						
PFT						
Logistics Parks						

Legend

Facility Available | Facility Not Available | Partially Available

Source: KPMG Analysis

[29] TCI – IIM C Report 3rd Edition for Delhi – Mumbai route
[30] https://www.fois.indianrail.gov.in
[31] OECD Database, World Bank

As observed in the Figure 11.1, none of the existing logistics facilities provide the entire range of services as expected in logistics parks. There is hence, a need to develop and operationalize logistics facilities that offer breadth of services to enable economies of scale of scope.

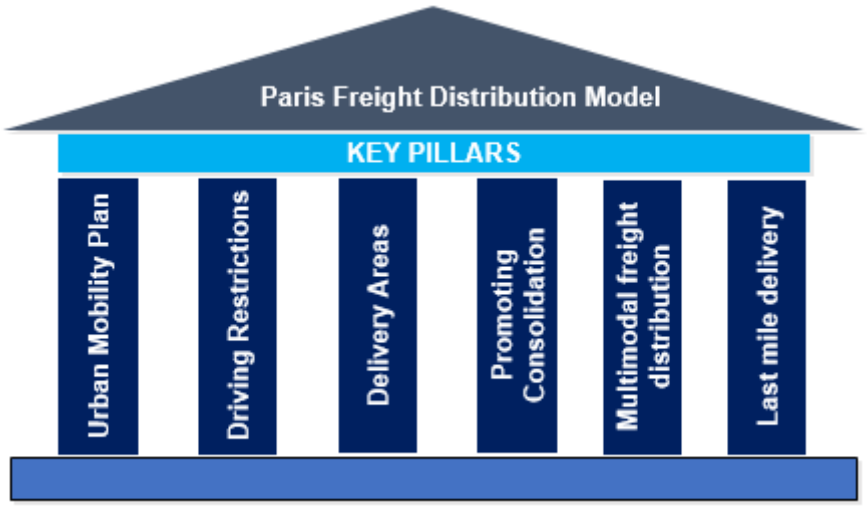
11.3 Case Studies of City Freight Distribution Model

Cities are major consumption hubs, characterized by increasing population, purchasing power and disposable income. The transport of freight into cities involves movement to commercial and industrial establishments. Effective freight distribution methods are needed to make the cities livable by minimizing negative impacts on the commercial/industrial establishments. The issues that need to be addressed include efficiency of goods distribution, problems of road congestion, air quality, greenhouse gas emissions and noise pollution.

11.3.1 Paris Freight Distribution Model (Europe)

Paris is a part of one of the largest and economically developed metropolitan areas of Europe. With high commercial density, it has numerous stores for consumption items including retailers, food stores, hotels, restaurants, etc. Paris has one of the more efficient urban freight management models in Europe. The key features of the Paris Freight Distribution Model are illustrated in Figure 11.2.

Figure 11.2: Paris Freight Distribution Model



Source: Secondary Research

Urban Mobility Plan
Paris' Urban Mobility Plan called Le Plan de déplacements urbains d'Île-de-France (PDUIF) involves governing the organization of passenger and freight transport and parking policies. The Urban Mobility Plan is re-evaluated every five years to incorporate best practices. The PDUIF encourages modal shift to rail and waterway, developing sites including logistics vocation, railway and river junctions and dedicates 15% of parking space to freight vehicles.

Driving Restrictions
Paris has had complex truck regulations that link the trucks' characteristics, including surface, to specific time-windows of authorized delivery in the cities. Table 11.2 reflects the current regulations and driving restrictions in Paris[32].

Table 11.2: Driving Restrictions in Paris

Characteristics	Authorized Delivery
surface of less than 29m^2 and propelled by electric, gas or hybrid engine	24 hours of a day
surface of less than 29m^2	From 22:00 hrs. To 17:00 hrs.
surface of 43 m^2 or less	From 22:00 hrs. To 07:00 hrs.

Source: Driving Restrictions, Goods Transport, 2017, France

As it is evident from the illustration on driving restrictions in Table 10.2, Paris promotes night deliveries for large vehicles, and it incentivizes smaller and environmental-friendly delivery vehicles.

Delivery Areas
Street space in Paris has been redesigned to accommodate on-street delivery areas, with new rules and regulations to be adhered to for usage of these areas. The dimensions of these delivery areas were controlled based on the type and quantity of stores and the requirements of these stores along the respective street. Home delivery areas were also incorporated into residential streets. In Paris, on-street delivery areas must be at least 10 meter long to facilitate maneuverability of vehicles and handling of goods.

Also, specific time durations have been identified for limiting the use of these delivery areas. Technology has been used in the form of delivery discs to monitor time of utilization of these delivery areas.

Sufficient off-site delivery spaces have been notified, with one for each 1000 m^2 of retail space, 100 m^2 for offices and more than 6000 m^2 for other activities[33].

Promoting Consolidation
Consolidation is encouraged to reduce traffic by finding ways to combine pickups and deliveries of transporters. Paris has adopted consolidation schemes to promote consolidation, targeting urban supply chains. Shared freight storages in municipal parking garages are promoted at subsidized rental rates to promote consolidation. This provides economic and environment benefits.

Multimodal freight distribution
Paris promotes alternatives to road transport through railways and waterways.

Monoprix, a major French retailer, has been dispatching its goods to its retail outlets using the railway network. Monoprix uses an average of 17 train wagons, each with a capacity of 46

[32] http://www.confetra.it/it/prontuari/DivietiCircolazioneInt.li/Francia.pdf, Driving Restrictions, Goods Transport, 2017, France
[33] '*Three Paris Master Plans, where does freight fit in?'*, French Institute of Science and Technology for Transport, March 2015

pallets. This service uses about 260 trains a year, equivalent to 12,000 trucks[34]. This solution has resulted in significant reductions in CO_2 and NO_x emissions and reduced the need for warehouse space.

The Seine River flows centrally through Paris, and river barges are also used in freight transportation into the city. River barges are used to carry freight volumes, promoting last mile delivery from the barge station to the end user.

Last mile delivery
Last mile freight delivery from a warehouse, distribution center in the city to the end user is promoted through environment-friendly solutions like bikes, e-cargo bikes, tricycles, etc. Bikes are increasingly used in Paris as alternatives to trucks and vans for last mile delivery.

11.3.2 Asian Freight Distribution Model (Motomachi, Yokohama)

Motomachi is a district of Naka Ward in Yokohama, Japan, located immediately west of Yamate and east of Chinatown. It consists mainly of the Motomachi Shopping Street, a five-block long stretch of boutiques and shops, well known in Japan for its cosmopolitan atmosphere, original fashion, and Western influence

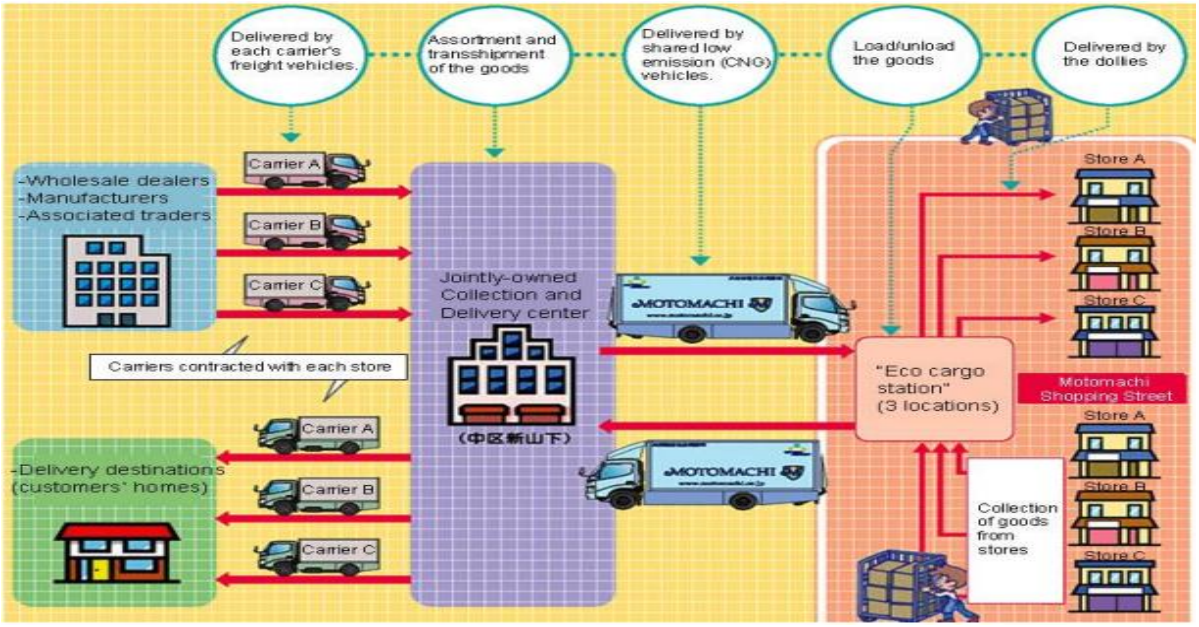
The city adopted an urban freight transport management system called the Joint Delivery System (JDS). The purpose of the system was to increase the efficiency of urban goods distribution by consolidating goods of competitive carriers and reducing the negative environmental impacts, alleviating congestion, improving safety and security conditions[35].

The benefits of the system includes:
- Reducing costs, number of vehicles, number of drivers
- Improving the environment
- Reducing level of congestion
- Increasing the frequency of visits at customers

The Joint delivery system in Yokohama is given in the Figure 11.3.

[34] Eltis – The Urban mobility observatory, May 2015
[35]http://2012.internationaltransportforum.org/sites/itforum2012/files/documents/en/WCTR_Side_Event_UrbanFreight_Taniguchi_20120502.pdf

Figure 11.3: Joint Delivery System in Yokohama



Source: Concepts of city logistics for sustainable and livable cities, 2014

Key Highlights of the project is as follows:

- Started in 2004, the objective was reducing CO_2 emissions and congestion as well as maintaining good atmosphere of streets
- No subsidies were given by public authorities and only parking space on streets were provided
- Whole area of Motomachi is covered by the system - 500 shops and 850 individual homes
- Motomachi Shopping Street Association financially supports the neutral carrier with 2.4 million yen (17,000 Euro) per year which was earned in other business
- There was a presence of urban consolidation centre for cargo aggregation

The key improvements post implementation are provided in Table 11.3.

Table 11.3: Improvements post implementation of Joint delivery System

Type	Before Implementation	After Implementation
Number of Carriers	17 (participating carriers)	1 (jointly owned carrier)
Total number of vehicle days	40 vehicles 30 days	20 vehicles 30 days
Type of vehicle	Diesel Truck	CNG Truck
Number of participating stores	-	Almost all stores
Goods of Exclusion	-	Directly delivered goods from manufacturers, High Value Items

Source: Concepts of city logistics for sustainable and livable cities, 2014

11.4 Case Studies of Logistics Parks

11.4.1 The DP World London Gateway

DP World London Gateway combines one of Europe's largest logistics parks with the UK's most advanced deep-sea port, creating the ultimate facility in port-centric logistics. The facility exhibits fast and efficient port-centric distribution opportunities with a single management team for both port and logistics park. The facility is situated 25 miles east of central London on the north bank of the River Thames in Stanford-Le-Hope, Essex.

The Logistics Park is truly multi-modal in nature – with connectivity via sea, rail and road:

- Connectivity to an 8-lane motorway
- On-site rail terminal connects directly to UK's strategic rail freight network (W10)
- Adjacent to UK's most advanced deep-sea port

There is quick, direct access to the UK's road and rail network and the port terminal provides connectivity worldwide to across the globe, including Eastern and Central Asia, Australia, South Africa, The Americas, Continental Europe and Far East. Approximately 30% of port traffic to the DP London Gateway is expected to be by rail. The port is now linked on a weekly-basis with 51 countries and more than 90 ports all over the world, including Asia, Australia, the USA, South America, Africa, India and southern Europe.

This logistics hub is closer to 78% of the UK market compared with the country's next largest port –including the Midlands and the North West, where 30% of UK deep sea containers are destined. The Logistics Park is situated closer to the Midlands and the North than competing ports, hence reducing supply chain costs.

Figure 11.4: DP World London Gateway, United Kingdom

Source: DP World

The facility is spread over an estimated 316,946 sq. ft., with warehousing space of 28,005 sq.mt. The facility is still under development, with construction starting in February 2010, and the port and logistics parks being completed in stages:

- Phase I was completed in early 2015, and provides 207,000 sq. ft. of warehouse and office space

- Phase II, which is available for occupation from 2017, adds another 155,000 sq. ft. of warehouse accommodation, plus 10,000 sq. ft. of conjoined office space

The facility, on complete development, will have the capacity to handle 3.5 million TEUs/annum.

11.4.2 Bhiwandi Warehousing Hub[36]

Background

A consumption driven warehouse cluster, Bhiwandi Warehousing Hub (BWH) is strategically located in the Mumbai Metropolitan Region (MMR) with close proximity to the densely populated consumption markets of Mumbai, Thane and Navi Mumbai. This geographic advantage makes Bhiwandi a preferred choice of consumer based industries of the MMR territory. Specifically, it has been a prominent textile hub on account of the largest number of power looms in India, the growth also being contributed to the thriving textile industry and availability of affordable land and labor.

Figure 11.5: Map of Bhiwandi Warehousing Hub

Source: India Warehousing & Logistics Report, 2014, Knight Frank

Key Facilities and Features

The warehouses are concentrated in Kalher, Kasheli, Purna and Anjur on the Old Agra Road and the Mankoli to Padgha stretch of the NH-3 (Mumbai Nasik Highway). This connects Bhiwandi with Thane and Mumbai while NH-4 and Thane- Belapur Road connects it to Navi Mumbai. The approximate transit time to locations like Mumbai, NAVI Mumbai, JNPT port, Mumbai Port, Mumbai International Airport from BWH is between 1.5-2 hours, with the average distance ranging 25-50 km.

The total warehousing space in the Bhiwandi warehousing hub is approximately 60 million sq. ft. leased out to a large number of small unorganized warehouse developers. Significant warehouse projects have been established by **Indian Logistics Group, Acorn-Milestone, Arham Logiparc, Shree Sai Dhara, Sumeet Logistics and Renaissance Infra**. Besides,

[36] India Warehousing & Logistics Report, 2014, Knight Frank

prominent 3PL operators like **DHL, Blue Dart, TCI, Fedex, XPS, Gati and Allcargo** have leased space in this hub, too.

Further, a diversified set of consumer (B2C) oriented industries like retail, pharmaceutical, FMCG, textile and electronics have a presence in Bhiwandi. The need for reducing 'delivery time to consumer' makes it a preferred warehouse location in the MMR.

Table 11.4: Major industries catered by Bhiwandi Warehousing Hub

Industry	Companies
Textiles	Raymond, Peter England, Pepe Jeans
FMCG	Pepsi, Henkel, Reckitt Benckiser, HUL
Auto & auto ancillary	Goodyear Tyres, Tata Motors
Consumer durables	Samsung, Videocon, Phillips, LG, Toshiba, Sansui, Kelvinator, Electrolux, Vijay Sales
Home furnishing	Asian Paints, Berger paints, Nippon Paint, Nilkamal
Retail	Tesco, Croma, Future Group, Shoppers Stop, Hypercity, Flipkart
Pharmaceutical	Cipla, GSK, Novartis, Wyeth
Logistics	DHL, Blue Dart, TCI, Fedex, XPS, Gati, Allcargo

Source: India Warehousing & Logistics Report, 2014, Knight Frank

Competitive Strength[37]

Warehouses on the Old Agra Road and Dapode Road are primarily dominated by textile, pharmaceutical, consumer durables and electronics with rentals being INR 9-12/ sq. ft. / month for ground floor and INR 4-6/ sq. ft. / month for the first floor. On the other hand, warehouses along the NH-3 can be categorized as modern warehouse complexes with sizes in excess of 1 million sq. ft. The rent is slightly higher, ranging between INR 10-15 / sq. ft. / month, on account of quality PEB structures with supporting internal infrastructure comprising of sewage treatment plant, adequate internal roads for truck and trailer movement, fire-fighting equipment, parking and security. The rentals in Bhiwandi are significantly attractive in comparison to competing warehousing hubs like Panvel that command rentals of INR 18- 23/ sq. ft. /month.

Another factor that lends competitive strength to the Bhiwandi warehouse is availability of man power, MMR is a densely populated urban agglomeration and presence of residential catchments for all income groups in and around Bhiwandi ensures an abundant supply of skilled, semi-skilled as well as unskilled workers.

Other factor like proximity to the country's largest container port Jawaharlal Nehru Port Trust (JNPT) as well as the Mumbai Port attracts occupiers who import cargo from international production centers and set up a distribution center in Bhiwandi, the imported container cargo later unloaded in Bhiwandi and transported across the country.

[37] India Warehousing & Logistics Report, 2014, Knight Frank

Challenges

However, Bhiwandi warehouse market has its fair share of challenges, the key one being identifying a contiguous land parcel of the relevant size (minimum 30 acres) for warehouse development on account of tiny and scattered land holdings in the hands of several villagers. Another issue is change of land use in favor of residential development. With rising population in the MMR, housing has received the top most priority for land development and residential prices are significantly higher in comparison to warehouse developments. Thus, land prices in this hub are being influenced and will stifle the growth of upcoming warehouse projects.

Charges borne by warehouse occupiers for employing either local labor or have its own employees is an additional cost for occupiers and is payable over and above the rent and any other outgoings such as maintenance and taxes. This has an adverse impact on the cost competitiveness of this hub.

Further, on account of large number of individuals and owners with small land holdings having built warehouses in Bhiwandi, return expectations are as low as 8-12% for warehouse development projects. It, thus, becomes extremely difficult for institutional players to operate in this market at such sub-optimal return expectation given the associated risk.

Key Takeaway

Thus, Bhiwandi Warehouse Hub, considered as one of the most vibrant and largest warehousing area in Mumbai, is a good example of a cluster catering to varied industries and leveraging the geographical location to its advantage, along with other factors like rental and cheap labor. The warehousing rentals in Bhiwandi today are in the range of INR 9 - 15/ sq. ft. /month. Although location of retail distribution centers is dependent upon multiple factors such as transportation cost, proximity to retail markets, quality of warehouse, supporting infrastructure and availability of manpower among others, the most critical factor is the rental cost. Even a small difference in rents can have an overbearing effect on the choice of location and Bhiwandi is not expected to witness significant rent increments on account of abundant availability of warehouse space. Thus, Bhiwandi being the preferred location for most of the top FMCG, retail, logistics companies, the warehousing eco-system in Bhiwandi has thrived well and expected to flourish further in the future.

Future Outlook

The Bhiwandi warehousing hub is, however, on the road to transformation both in characteristics and geography. Large warehouse parks with leasing area in excess of a million square feet bundled with support infrastructure and utilities are gaining momentum. Further, going forward the location that would emerge as a hub for new warehouse development would be the 15 km. stretch extending from Rajnoli (junction of NH-3 and Bhiwandi Kalyan Road) to Padgha until the toll point. Besides land availability, through NH-3 (Mumbai- Nashik), the region has good road connectivity with the MMR consumption center. Further, being a region with poor suburban train connectivity will work in favor of warehouse developments as residential markets flourish in locations with connectivity through mass rapid transport system (MRTS) which is the suburban train network in case of the MMR. Thus, with residential prices at a considerable premium to that of warehouses, land rates become unviable for warehouse developments.

Further, ‘Make in Bhiwandi’, an initiative inspired by ‘Make in India’, has garnered investments of over INR 80 crore from 25 small and medium enterprises like Knowledge (INR 8 crore), TM Printers (INR 8 crore), Toppler (INR 7.3 crore) and Nirman Corp (INR 4.9 crore), among others, who plan to set up manufacturing facilities at Bhumi World Industrial Park at Bhiwandi over the next two years. The companies have signed MoUs with the Maharashtra government and committed to invest in Bhiwandi. The government plans to create infrastructure linking

Bhiwandi to JNPT and the new international airport at Navi Mumbai and has also allocated INR 150 crore for two new business districts near Bhiwandi and Kalyan[38].

Thus, Bhiwandi's warehouses spread over seven crore sq. ft., shall enable Bhiwandi not only to remain one of the largest warehouse but leveraging other advantages, Bhiwandi is gearing to become one of Maharashtra's most sought after manufacturing destinations, too.

Thus, it is seen that the Indian Logistics is witnessing a transformation and the need of the hour is improvement in road and rail infrastructure, creation of modern warehouse facilities and adoption of newer facilities like a MMLP besides provision of value added services, targeting e-commerce customers and levering the locational advantage of India to the fullest.

11.5 Commodity-wise Projections

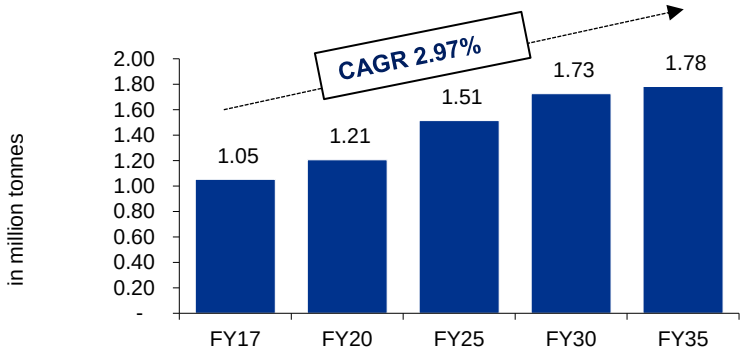
11.5.1 Tea

India is the 2nd largest producer of India in the world and is one of the world's largest consumers of tea, with about three-fourths of the country's total produce consumed locally. Further, tea is a major export commodity of India - India has a significant share in the international tea market with a 12% share of world tea exports in FY14[39].

Assam is a major producing state of India; the tea produced and processed in Upper Assam and rest of north east is transported to Guwahati via road, warehoused in Guwahati, and is sold at the Guwahati Tea Auction.

Tea is transported in container form to Kolkata and in bulk–break bulk form via road. With the north east being a major tea producing region in India, the tea movement in the region is expected to grow at a rate that is equivalent to the expected growth of tea exports. The projected tea movement through the region is depicted in Figure 11.6.

Figure 11.6: Projected Tea Movement through the region



Source: Secondary Research, KPMG Analysis

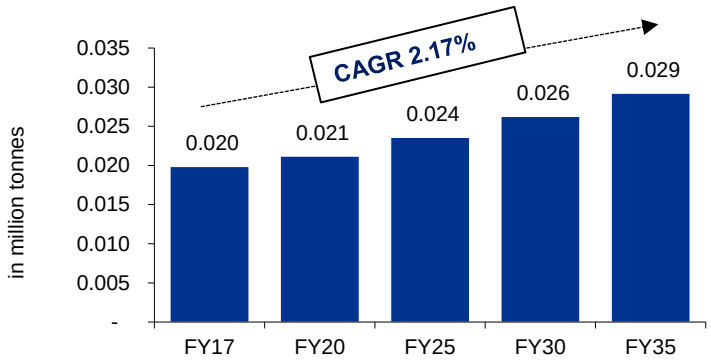
Tea cargo through the region are projected to grow from 1.05 MMT in FY17 to 1.78 MMT in FY35, growing at a CAGR of 2.97%.

[38] Maharashtra: Investors line up INR 80 crore for 'Make in Bhiwandi', The Indian Express, 27 February, 2016
[39] India Brand Equity Foundation

11.5.2 Betel Nuts

The north east states are a major producer of betel nuts, producing ~26% of the betel nuts produced in India in FY15[40]. Betel nuts produced in the region are mainly transported in containers, for domestic movement to the rest of India. The commodity is expected to grow at a rate that is equivalent to the historical growth rate of agricultural production in the north east region. The projected movement of betel nuts through the region is depicted in Figure 11.7.

Figure 11.7: Projected Betel Nuts Movement through the region



Source: Secondary Research, KPMG Analysis

The betel nuts through the region is projected to grow from 0.02 MMT in FY17 to 0.029 MMT in FY35, growing at a CAGR of 2.17%.

11.5.3 Construction Material

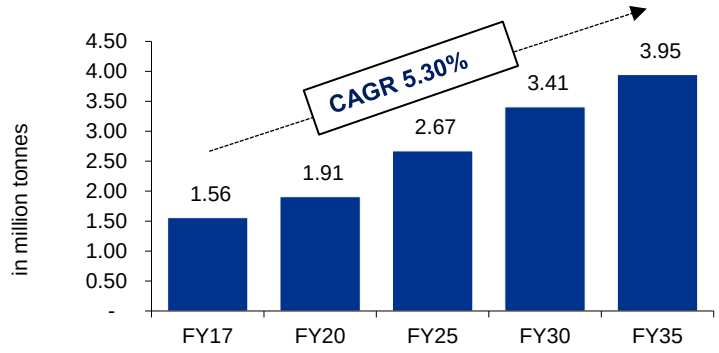
Construction material comprises of cement, construction towers, and plywood, used in the construction industry. India is the 2nd largest producer of cement in the world, accounting for 6.7% of the overall global cement output in FY16[41].

Industrial growth in the north east is expected to increase the demand for cement and tiles may increase owing to increase in demand for infrastructure, commercial and retail space. Further, increasing urbanization and rising household income is expected to increase demand for residential properties, impacting the overall demand.

Cement is mainly transported in bulk–break bulk form, primarily by road and also in rakes. Cement is also containerized and transported by rail. The projected construction material moving through the region is depicted in Figure 11.8.

[40] Directorate of Arecanut and Spices Development, Karnataka
[41] Cement Sector Report, India Brand Equity Foundation, 2017

Figure 11.8: Projected Construction Material Movement through the region



Source: Secondary Research, KPMG Analysis

The construction material moving through the region is expected to grow from 1.56 MMT in FY17 to 3.95 MMT in FY35, at a CAGR of 5.30%.

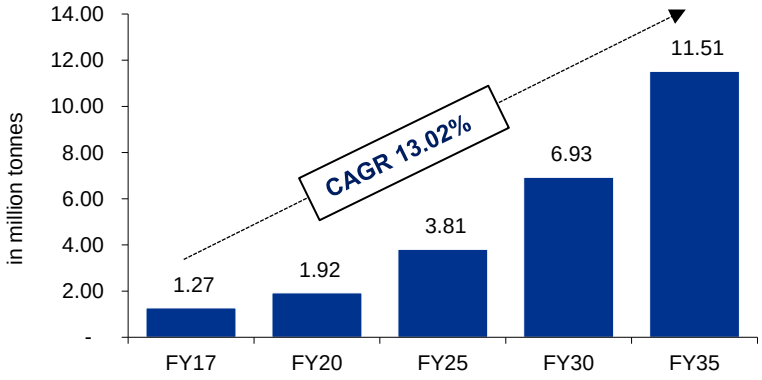
11.5.4 FMCG Products

India's FMCG sector faced a temporarily slowdown with demonetization, and is now expected to pick up and exhibit strong growth[42]. Factors that affect the growth of the sector include favorable demographics and increase in household income. Assam, comprising ~70% of the population of the north east, and being the most industrialized state of the North East, is expected to drive demand for FMCG products.

With robust population growth, investment activity and government initiatives, the north east's FMCG requirements are expected to growth consistently over the next few decades.

FMCG products in the region are primarily transported in break bulk form. The projected movement of FMCG products is illustrated in Figure 11.9.

Figure 11.9: Projected FMCG Products Movement through the region



Source: Secondary Research, KPMG Analysis

[42] Macroeconomic Impact of Demonetization, Reserve Bank of India, March 2017

The FMCG products moving through the region is expected to grow from 1.27 MMT in FY17 to 11.51 MMT in FY35, at a CAGR of 13.02%.

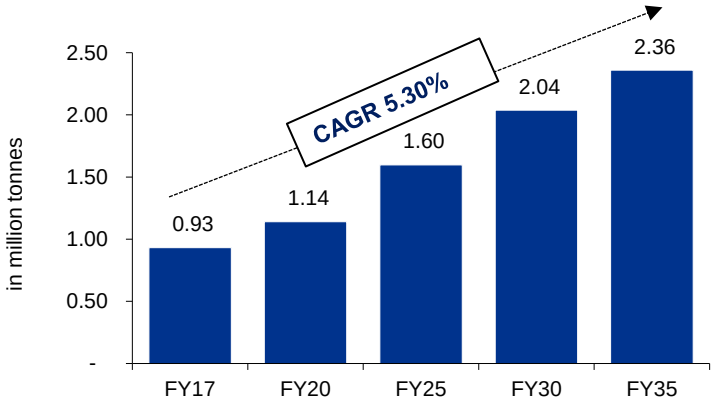
11.5.5 Iron Goods & Steel

This commodity bucket comprises iron goods and iron & steel. Iron and steel industry is considered as the backbone for downstream industries such as railways, ships, heavy and light engineering, construction, etc.

With expected infrastructure development in the north east region, the demand for Iron & steel is expected to rise. It is expected that the sector will grow at a rate equivalent to the Assam's manufacturing and urbanization growth rate of ~6.98% till FY25. The growth rate is deducted by 2% every five years till FY35.

Iron goods are transported by rail, via rakes, in bulk–break bulk form. Iron & Steel are transported primarily by road. The projected movement of iron goods & steel is depicted in Figure 11.10.

Figure 11.10: Projected Iron Goods & Steel Movement through the region



Source: Secondary Research, KPMG Analysis

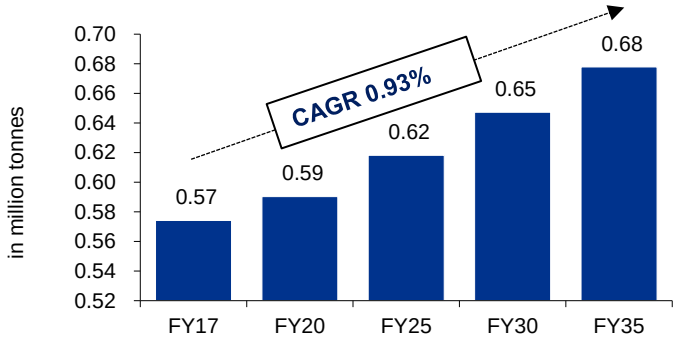
Iron Goods & Steel movement through the region is expected to grow from 0.93 MMT in FY17 to 2.36 MMT in FY35, growing at a CAGR of 5.30%.

11.5.6 Food Grains & Seeds

The food grain requirements are heavily dependent on the expected increase in urbanization and increase in population in the surrounding regions.

Food grains & seeds through the region are transported in bulk–break bulk form, with over ~51% of it transported in rakes, by rail, while the rest is transported by road. Food grains are expected to grow at the rate of growth of the population of the north east region. The projected movement of food grains & seeds through the region is illustrated in Figure 11.11.

Figure 11.11: Projected Food Grains & Seeds Movement through the region



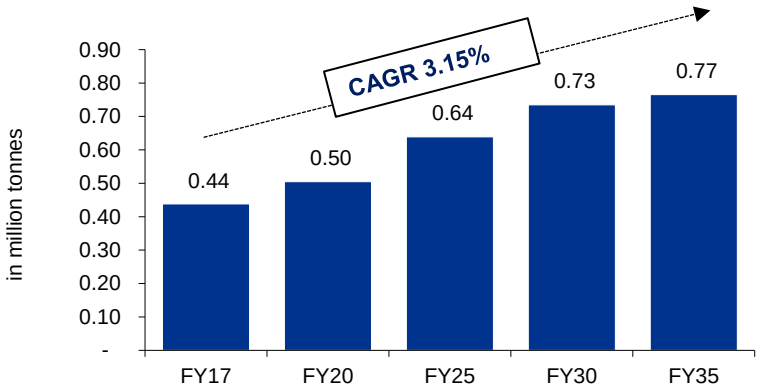
Source: Secondary Research, KPMG Analysis

The movement of food grains & seeds through the region is expected to grow from 0.57 MMT in FY17 to 0.68 MMT in FY35, at a CAGR of 0.93% over this period.

11.5.7 Machinery items & Hardware

Machinery items are transported in bulk–break bulk form through the region. The cargo through the region is expected to grow at a rate equivalent to growth in Assam's manufacturing sector. The projected cargo movement is illustrated in Figure 11.12.

Figure 11.12: Projected Machinery Items & Hardware Movement through the region



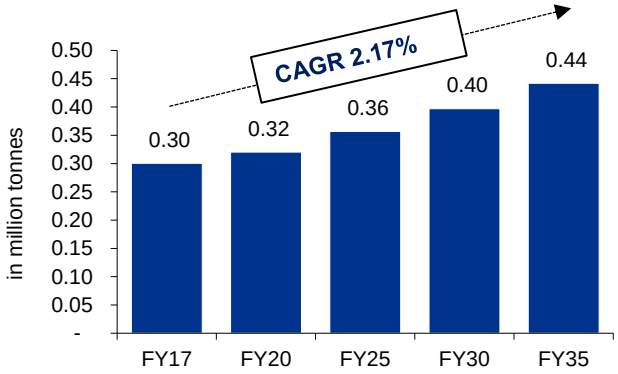
Source: Secondary Research, KPMG Analysis

The projected machinery items & hardware through the region are expected to grow from 0.44 MMT in FY17 to 0.77 MMT in FY35, growing at a CAGR of 3.15% over this period.

11.5.8 Fruits & Vegetables

Fruits & vegetables through the region are transported in bulk–break bulk form. The cargo is projected to grow at a rate that is equivalent to the growth of agricultural production of the north east region. This projected cargo through the region till FY35 is depicted in Figure 11.13.

Figure 11.13: Projected Fruits & Vegetables Movement through the region



Source: Secondary Research, KPMG Analysis

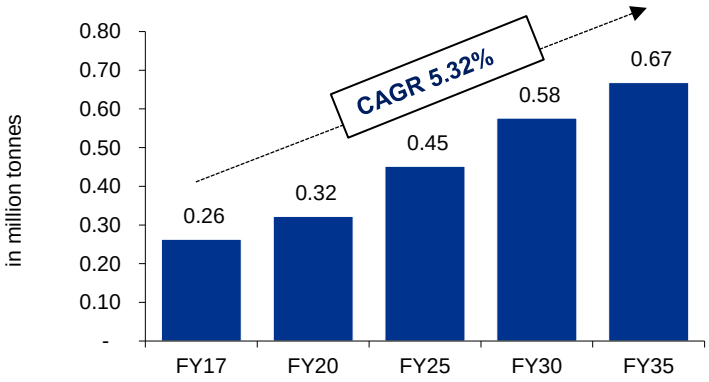
The fruits & vegetables movement through the region is forecasted to grow from 0.3 MMT in FY17 to 0.44 MMT in FY35, growing at a CAGR of 2.17% over this duration.

11.5.9 Paper & forest goods

The Indian paper industry accounted for nearly 3% of the global production of paper in FY15[43]. Though the per capita consumption of paper in India stands at 11 kg, it is relatively lower compared to other developed and developing nations[44].

Paper & forest goods, including agarbatti, is transported through the region in bulk–break bulk form, and is primarily transported by road. The estimated paper & forest goods movement through the region is depicted in Figure 11.14.

Figure 11.14: Projected Paper & Forest Goods Movement through the region



Source: Secondary Research, KPMG Analysis

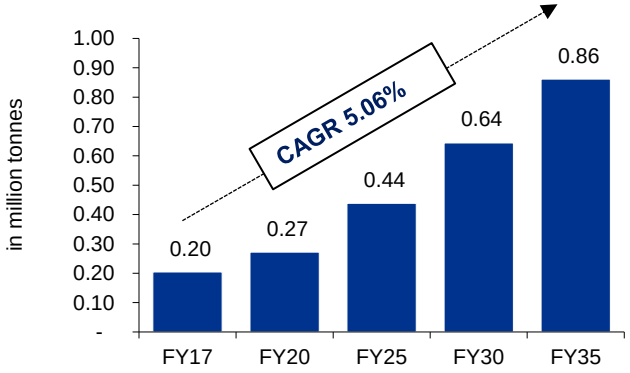
The paper & forest goods cargo through the region is expected to grow from 0.26 MMT in FY17 till 0.67 MMT in FY35, growing at a CAGR of 5.32% over this period.

11.5.10 Plastics

[44] 'Indian Paper Industry: out of the woods', CARE Ratings, 2016

Plastics is transported through the region in bulk–break bulk form. It is projected to grow at a rate of 10% per annum till FY25, and at a rate that is deducted by 2% every 5 years till FY35. The estimated plastics movement through the region till FY35 is illustrated in Figure 11.15.

Figure 11.15: Projected Plastics Movement through the region



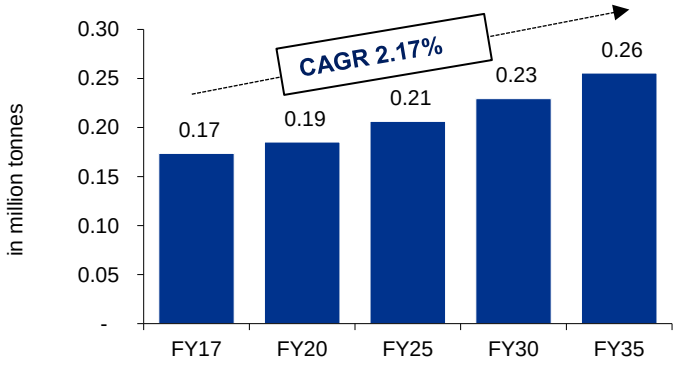
Source: Secondary Research, KPMG Analysis

The plastics movement through the region is projected to grow from 0.20 MMT in FY17 till 0.86 MMT in FY35, growing at a CAGR of 5.06% over this duration.

11.5.11 Fertilizers

Fertilizers through the region is transported in bulk–break bulk form, with ~67% of the cargo transported in rakes, via rail, while the rest is transported by road. Growth in fertilizers movement is directly linked to the agricultural sector of the region. The fertilizers movement through the region is expected to grow at a rate that is equivalent to the historical growth rate of the agricultural production in the north east region. The estimated movement of cargo is depicted in Figure 11.16.

Figure 11.16: Projected Fertilizers Movement through the region



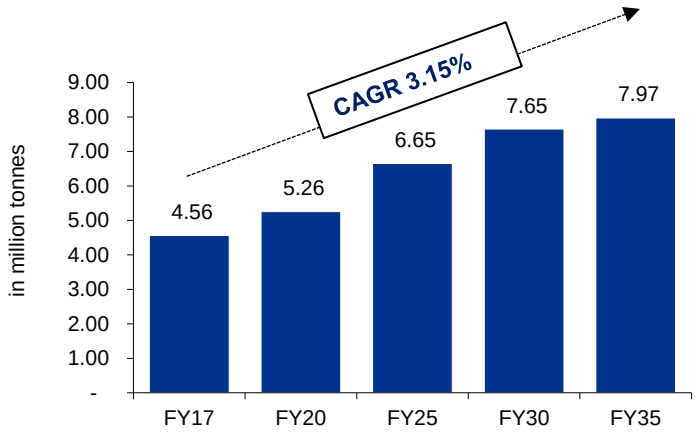
Source: Secondary Research, KPMG Analysis

The fertilizers movement through the region is expected to grow from 0.17 MMT in FY17 to 0.26 MMT in FY35, growing at a CAGR of 2.17% over this period.

11.5.12 Miscellaneous

Miscellaneous commodities include textiles, cycle and auto parts, etc. which are transported in bulk–break bulk form, and jute and other commodities that are transported in containerized form. These commodities are expected to grow at a rate that is equivalent to Assam's manufacturing growth rate till FY25, and at a rate that is deducted by 2% every 5 years till FY35. The estimated miscellaneous cargo movement through the region is depicted in Figure 11.17.

Figure 11.17: Projected Miscellaneous Cargo Movement through the region



Source: Secondary Research, KPMG Analysis

The miscellaneous cargo movement through the region is expected to grow from 4.56 MMT in FY17 to 7.97 MMT in FY35, growing at a CAGR of 3.15% over this period.

11.6 Benchmarks for Revenues and O&M Costs

O&M Benchmarks

Table 11.5: O&M Benchmarks

Metric	Value	Source
Operating and Maintenance Expenses for Warehousing Facilities (% of revenues)	68%	Central Warehousing Corporation—Warehouse operations (FY15)
Operating and Maintenance Expenses for ICD (% of revenues)	67%	CONCOR ICD (FY15)
Operating and Maintenance Expenses for Processing and Cold Storage (% of revenues)	66%	Snowman (FY15)
Operating and Maintenance Expenses for FTWZ (% of revenues)	56%	Arshiya international—FTWZ operations (FY15, FY16)
Operating and Maintenance Expenses for Truck Terminal (% of revenues)	60%	Adani, primary interactions
Annual lease land Rentals (% of land acquisition cost)	2%	This can be the bid parameter in case of PPP model and currently assumed as 2%
D/E Ratio	60:40	Industry standard for logistics facilities
Cost of Debt	11%	Industry standard for logistics facilities
Cost of Equity	16%	Industry standard for logistics facilities

Revenue Benchmarks

ICD Tariffs

Table 11.6: ICD Tariff Benchmarks

Parameter	Unit	ICD Tughlakabad		ICD Bangalore	
		20 Ft.	40 Ft.	20 Ft.	40 Ft.
Terminal Handling Charges					
Export Cycles					
Terminal Container Handling	INR	2,600	4,700	2,700	4,600
Mechanized WH De-Stuffing	INR	600	800		
Mechanized Direct De-Stuffing	INR	600	800		
Factory Container Handling	INR	2,700	4,700		
Satellite CFS Handling	INR	2,100	3,600		
Empty Export	INR	1,000	1,800		
Import Cycles					
Terminal Container Handling	INR	3,300	6,000	4,000	6,000
Mechanized WH De-Stuffing	INR	700	900		
Mechanized Direct De-Stuffing	INR	700	900		
Factory Container Handling –With Arrival Permit	INR	3,900	6,600		
Factory Container Handling –Without Arrival Permit	INR	3,700	6,200		
Satellite CFS Handling	INR	2,400	4,200		
Empty Export	INR	1,000	1,800		
Inventory Management of Cargo					
Supervision and Preparation of Tally Sheet for the Cargo	INR	300	400		
Storage Charges					
Import Cargo	INR/day	400		300	600
Export cargo	INR/day	150	300	100	200
Local Transportation	INR				

Sources: ICD Bangalore, ICD Tughlakabad.

Warehousing Tariffs

Table 11.7: Warehousing Tariff Benchmarks

S.No	Name of Commodity	Type of PKG	Per bag WT (KG)	Stack Height	Bag Equivalent	Remarks
1	Iron and Steel	Bulk	per tonne			
2	Rice	Bag	up to 25	16.00	0.42	
		Bag	26 to 50	13.00	0.67	
		Bag	51 to 75	14.00	0.81	
		Bag	76 to 100	15.00	1.00	
3	Wheat	Bag	up to 50	20.00	0.56	
		Bag	51 to 75	18.00	0.83	

S.No	Name of Commodity	Type of PKG	Per bag WT (KG)	Stack Height	Bag Equivalent	Remarks
		Bag	76 to 100	15.00	1.00	
	Miscellaneous Charges (Food Grains, Marine, Steel and Granite)					10% of storage charges
	Cargo Handling Charges					20% of the storage Charges–Assumed
	Internal Transportation (Railway yard to warehouses)					INR500 per truck
4	Granite	Bulk	INR per tonne/month			Primary interactions
5	Marine products (Storage)	Bulk	INR per tonne/month			SSF Seafoods
	Marine products (Processing)	Bulk	INR per tonne			Devi Sea foods, Padmanabham

Source: CWC Warehousing Tariff.

PFT and Truck Terminal Tariff

Table 11.8: PFT and Truck Terminals Tariff Benchmarks

S.No	Description	Unit	Amount (INR)
	Steel		
1	Terminal access charges	Per tonne	60
2	Terminal handling charges		
	Wagon to platform	Per tonne	45
	Platform to truck/trailer	Per tonne	45
	Wagon to truck/trailer—direct loading	Per tonne	80
	Granite		
1	Terminal access charges	Per tonne	60
2	Terminal handling charges		
	Wagon to platform	Per tonne	45
	Platform to truck/trailer	Per tonne	45
	Wagon to truck/trailer—direct loading	Per tonne	80
	Marine products		
1	Terminal access charges	Per tonne	60
2	Terminal handling charges		
	Wagon to platform	Per tonne	45
	Platform to truck/trailer	Per tonne	45
	Wagon to truck/trailer—direct loading	Per tonne	80
	Food Grains		
1	Terminal access charges	Per tonne	60
2	Terminal handling charges		
	Wagon to Platform	Per tonne	45
	Platform to truck/trailer	Per tonne	45
	Wagon to truck/trailer—direct loading	Per tonne	80
	Truck Terminal		
1	Area required per trailer	Sq. m	100

S.No	Description	Unit	Amount (INR)
2	Total area of truck terminal	Acre	3.5
	Acre to sq. meter	Sq. meter	4046.86
	Average parking time	Hours	6
	Total parking time available	Hours	24
	Total number of turns	Number of turns	4
	Total number of truck slots	No of slots	113.3
	Parking fees	INR/6 hours	30

Source: KIIP Rewari.