



# Freight Flows and Logistics Solutions

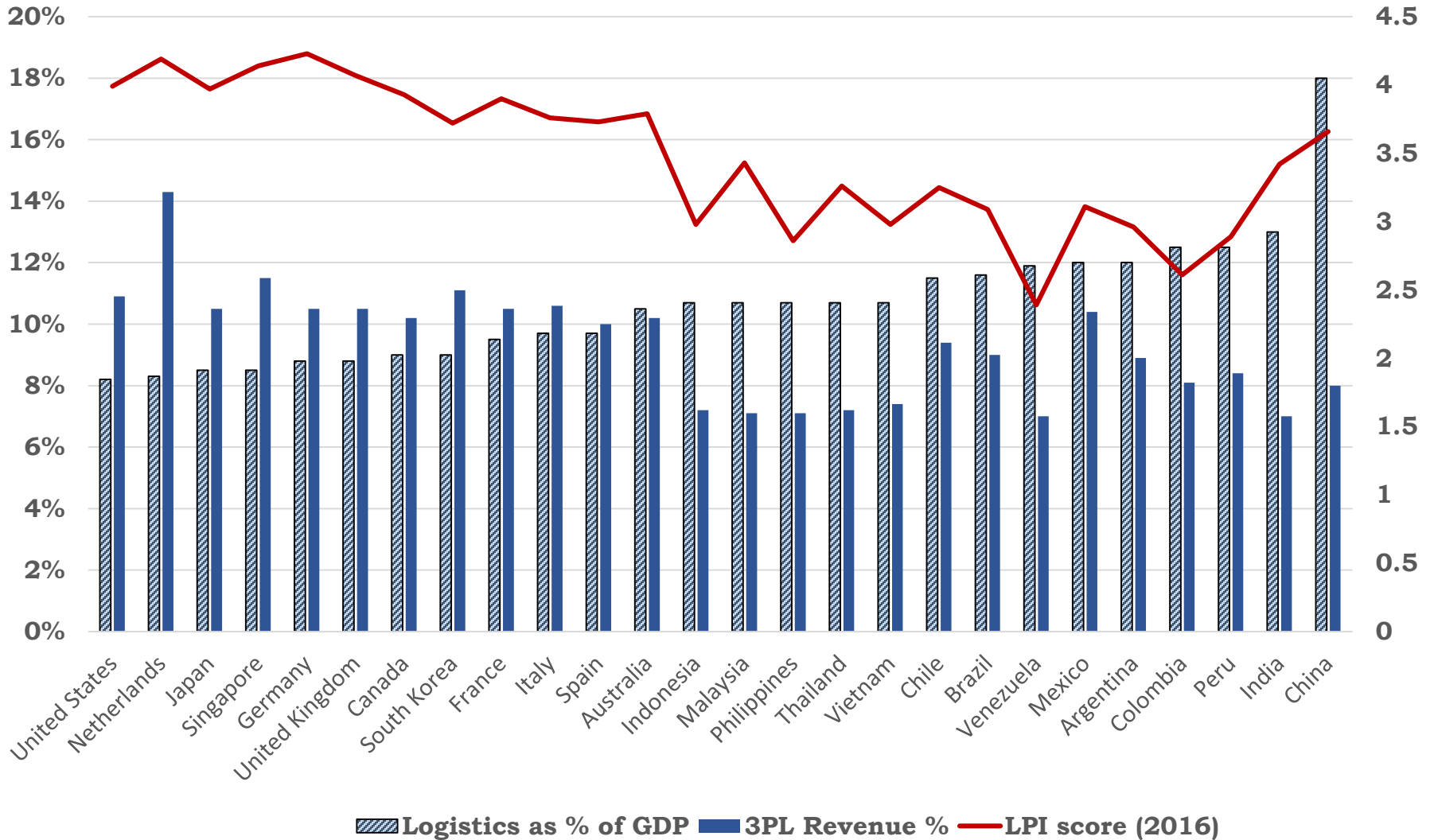
The Transport and ICT  
Global Practice  
Smart Connections for All

**Dr. Bernard Aritua**  
Senior Infrastructure Specialist

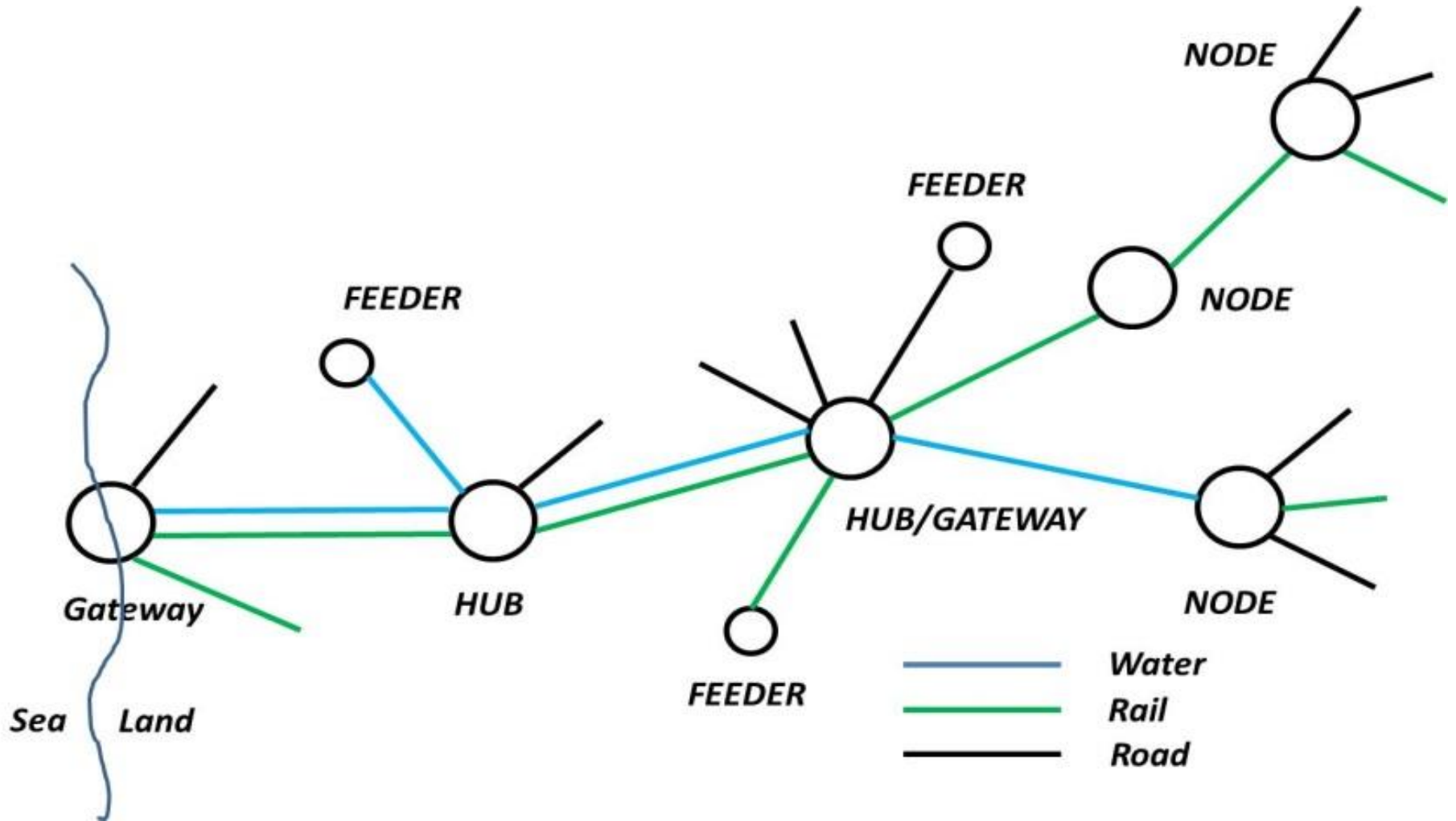
September 2017



# Country Comparisons



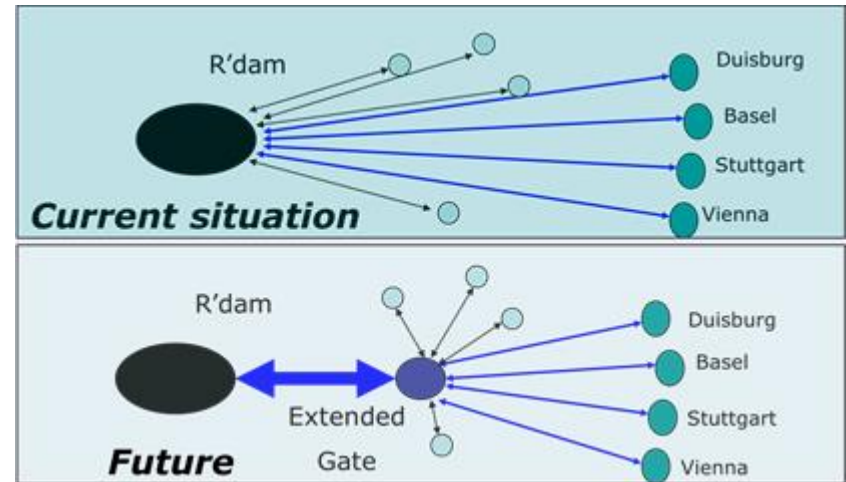
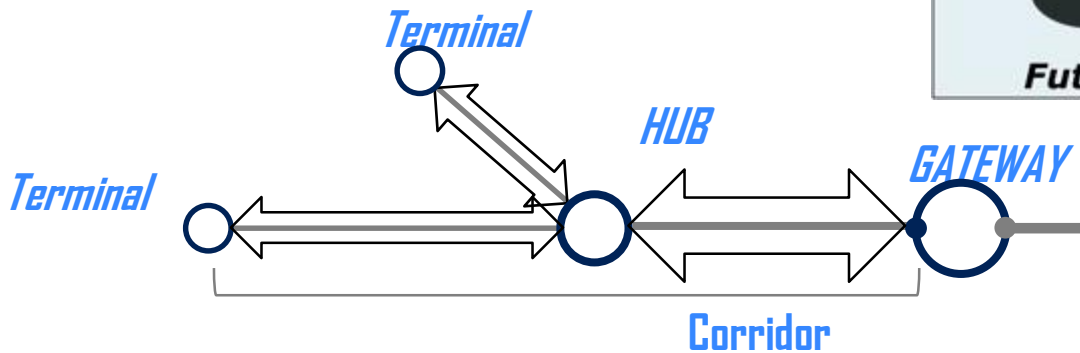
# Optimized Logistics and Transport Systems



# Smart terminals

## Aims:

- to bundle cargo and to optimise vessel size on different stretches
- seamless multimodal options through synchromodality
- extended gate concepts



## Lean and Green Initiative - Europe



Commit to reduce your emissions by 20% within 5 years, you will get a logo and award

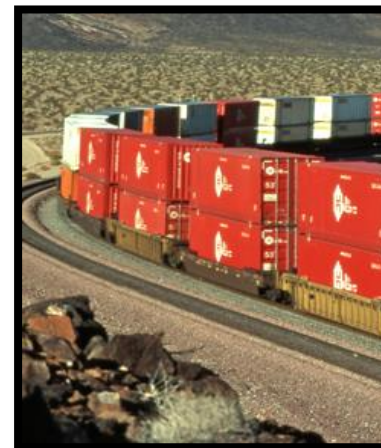
## BNSF becoming 3PL.....

### Partnership with J.B. Hunt

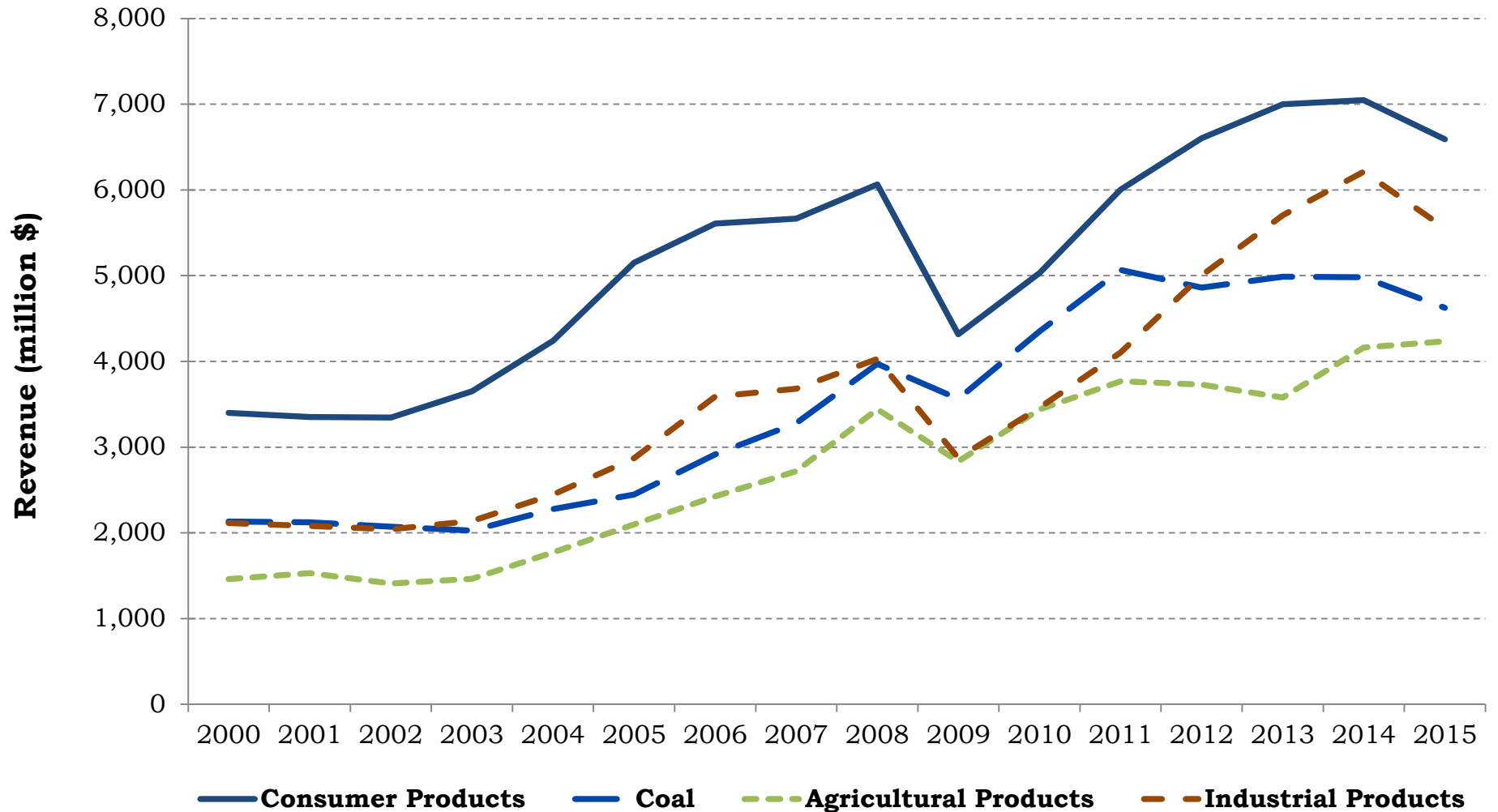
- Relationship began in 1989 and both companies stress its value on their websites
- When PETCO sought to reduce costs, J.B. Hunt and BSNF provided intermodal
- J.B. Hunt and BNSF have provided the same type of services to The Container Store

### Formation of BNSF subsidiaries

- BNSF Logistics is a subsidiary which describes itself as a 3PL
- BNSFL coordinates multimodal shipments including rail/truck/ship,
- BNSFL has helped Amazon, Frito Lay manage intermodal shipments
- BNSFL has cultivated a niche market in wind turbine transport, developing and acquiring specialized technology



# BNSF Railroad Revenues by Business Group



## Become 3PL Customer.....

### Developing an “inland port” serving BMW

- NS successfully promoted Greer as a site for BMW
- overnight service moving import and export containers over 235-miles
- Parts needed to build BMW’s X-series sport activity vehicles are shipped on ocean carriers from Europe to Charleston,
- NS moves containerized components from Greer to Charleston for export
- NS worked with ports authority to construct and operate inland port

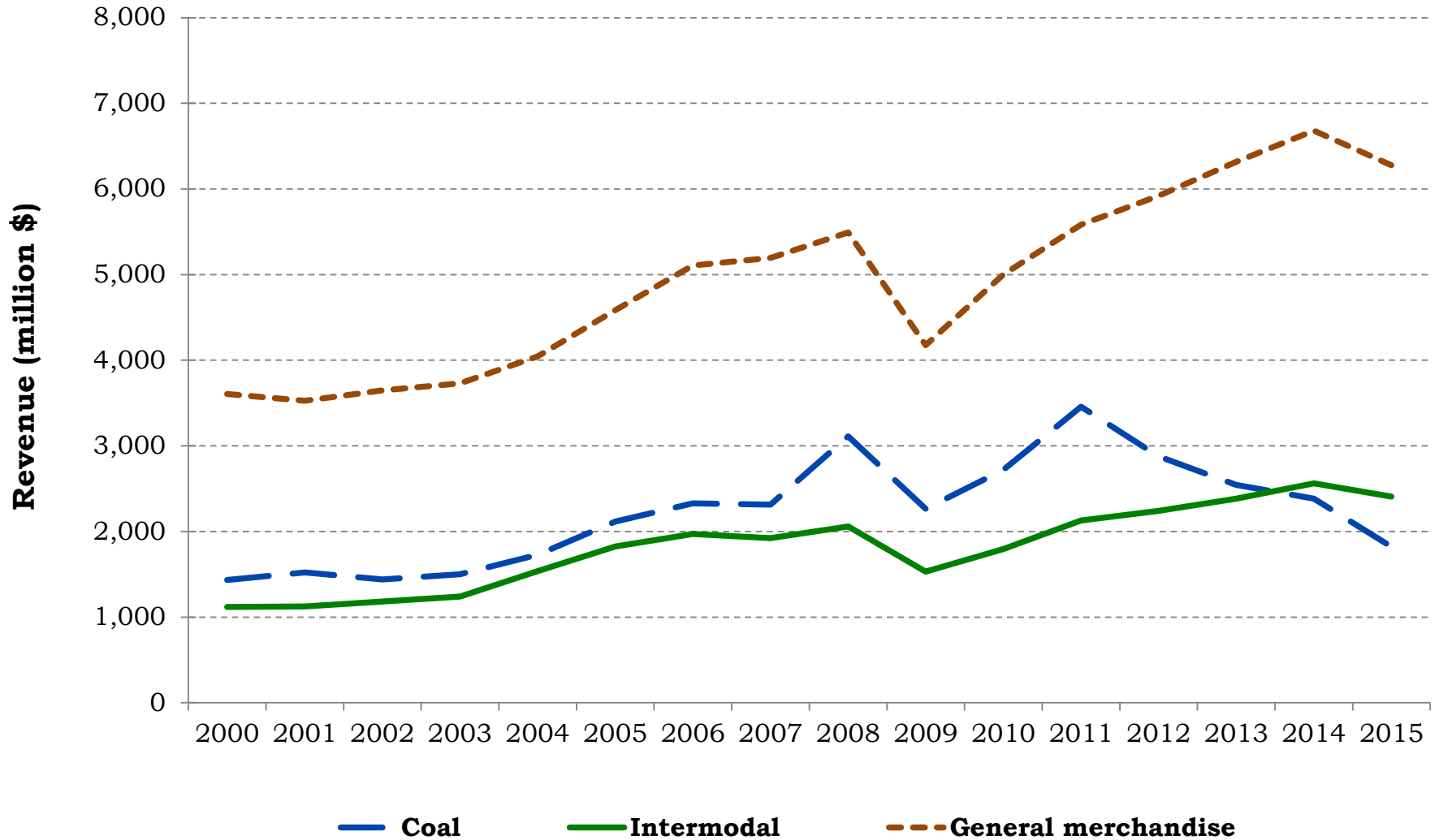
### Transporting Soybeans by container

- NS partnered to provide special service for premium soybeans to Asia
- Soy beans typically transported in bulk
- Customer demanded clear chain of custody which necessitated careful attention, and use of container shipping





# NS Railway Operating Revenues by Market Group



Follow the leaders – Companies that are championing innovative logistics solutions



PEUGEOT



# IWT promotion and stimulation – active Government Intervention

- A joint activity of government and private sector
- Examples:
- Barge to Business and River Dating
- Networks of logistics advisors (EU, France, Belgium, Netherlands)
  - Special focus: bundling and smart match
- Innovation vouchers (Netherlands)
  - Lean and green barge
  - Synchromodal initiatives
  - Chain control towers
- Quay wall support programme (Belgium)
- IWT promotion bureaus (many countries)
- Green Award scheme (Rhine area)
- Booking platforms, TEUbooker (Antwerp, Rotterdam)

**//Barge to Business**  
*Your Waterway Transport Solution*



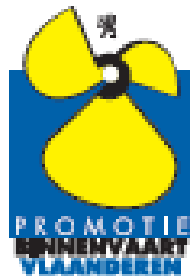
**Riverdating**  
9<sup>ème</sup> EDITION

Le 9 novembre 2016

ROUEN • Parc des Expositions



# IWT Promotion Bureaus – public-private platforms



# New business Concepts



**MARS**  
**Heinz**  
**Bavaria**



## Innovative Approaches to developing logistics facilities



# Examples of national-level studies on logistics costs using questionnaire-based or statistics-based approaches, and the type of data used in these

Questionnaire based surveys

**Finland**  
**Germany**  
**Thailand**  
**Switzerland**

Statistics based studies

**USA**  
**South Africa**  
**Brazil**  
**Norway**  
**Europe top 100**

Sweden

Supply-side data from logistics providers

Demand -side data from logistics users



Measurement of National-Level Logistics Costs and Performance

04

Discussion Paper 2012 • 04

Karri Rantasila\* and Lauri Ojala  
Turku School of Economics  
at the University of Turku, Finland  
\* also affiliated to VTT,  
Technical Research Centre of Finland

# India is currently one of the fastest growing major economies - 3 Big Trends and Opportunities

3 BIG OPPORTUNITIES

1.



**Urbanization  
Agglomeration**

**Facilitating  
Economic  
Transformation**

**Logistics Clusters  
Urban Logistics**

2.



**Manufacturing  
High Value + Low Cost**

**Export  
Domestic  
Investment**

**Ports and Connectivity  
Consolidation of Network**

3.



**Digital  
Advances**

**Continued  
growth in  
Service Sector**

**Skills and competences  
Digital Trading/3PLs/4PLs**

Implications



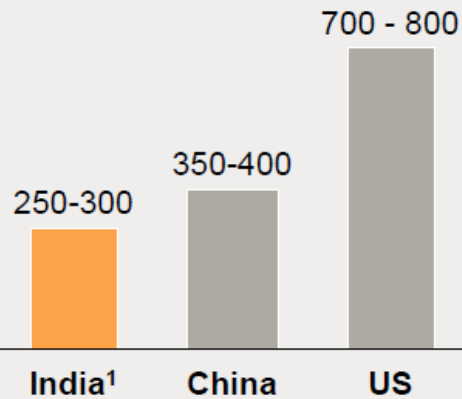
# Barriers to Trade and Logistics

- High Logistics costs relative to developed nations
- High freight transit times
- Extreme variability in transit times and speed
- Several inefficient procedures and onerous documentation
- Missing critical infrastructure – last mile and warehouses
- Poor service orientation of public institutions
- Sub-optimal logistics performance
- Unbalanced modal share

# High Transit Times and costs –Road Freight

## Transit Time Benchmarking

Average distance covered per day (km)



- Low average distance covered in India due to **multiple stoppages, check posts** and **congestion** in road networks

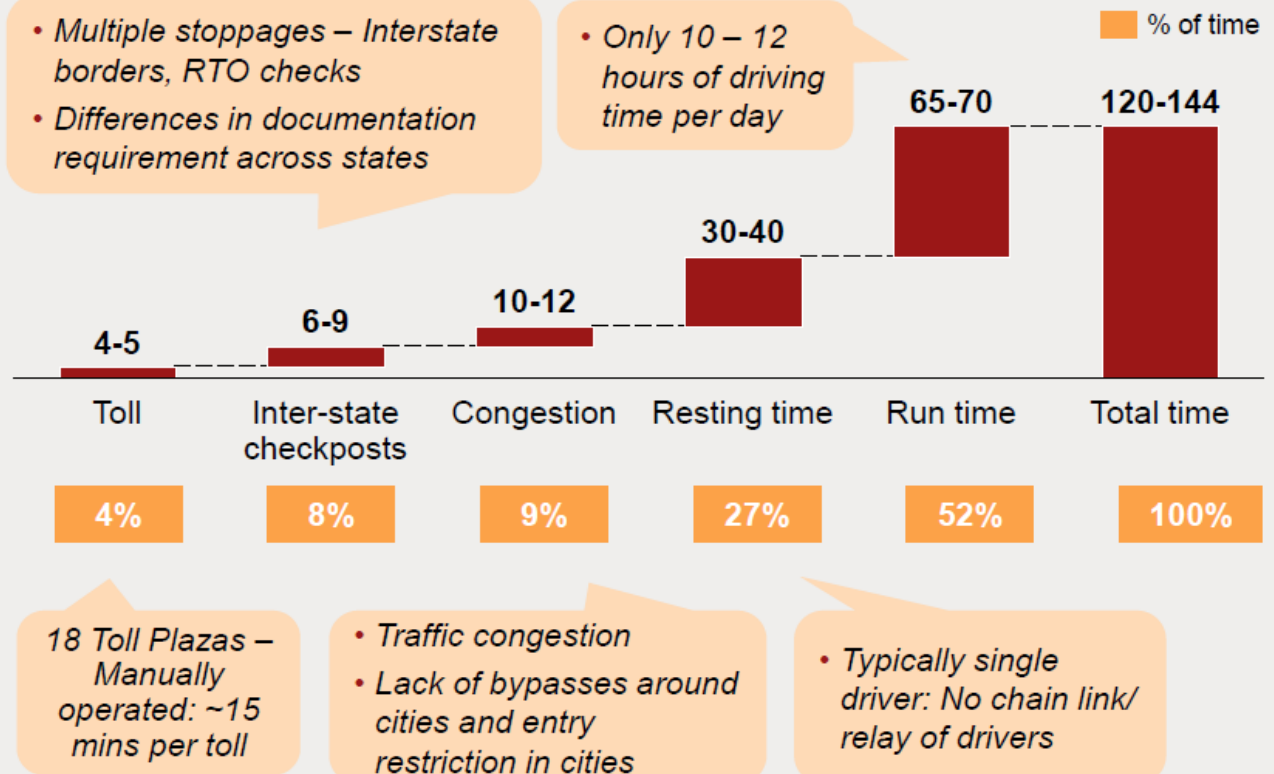
## Transit Time Assessment - India

Delhi – Kolkata (hrs)

1462 km

- Multiple stoppages – Interstate borders, RTO checks
- Differences in documentation requirement across states

- Only 10 – 12 hours of driving time per day

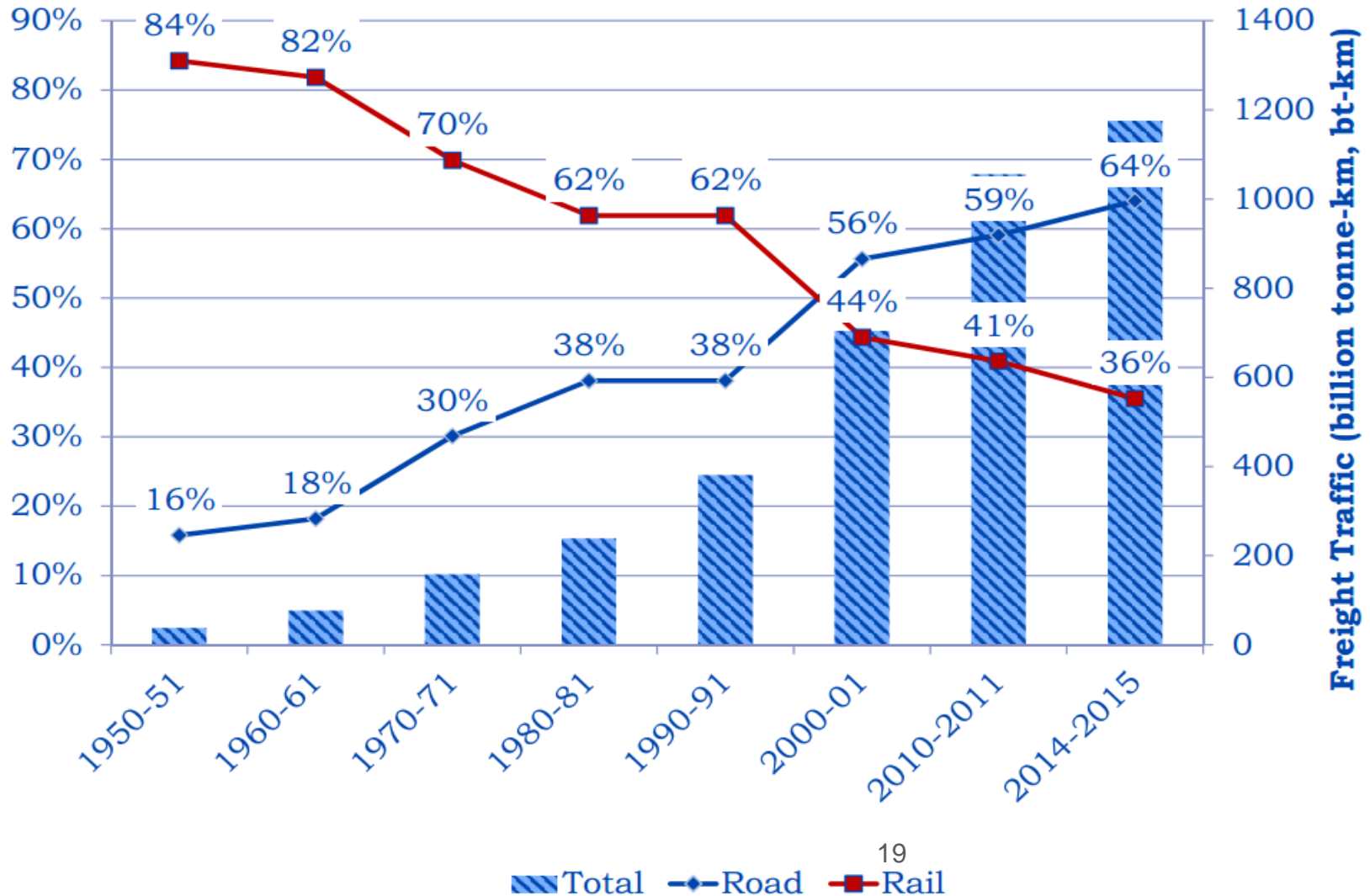


- 18 Toll Plazas – Manually operated: ~15 mins per toll

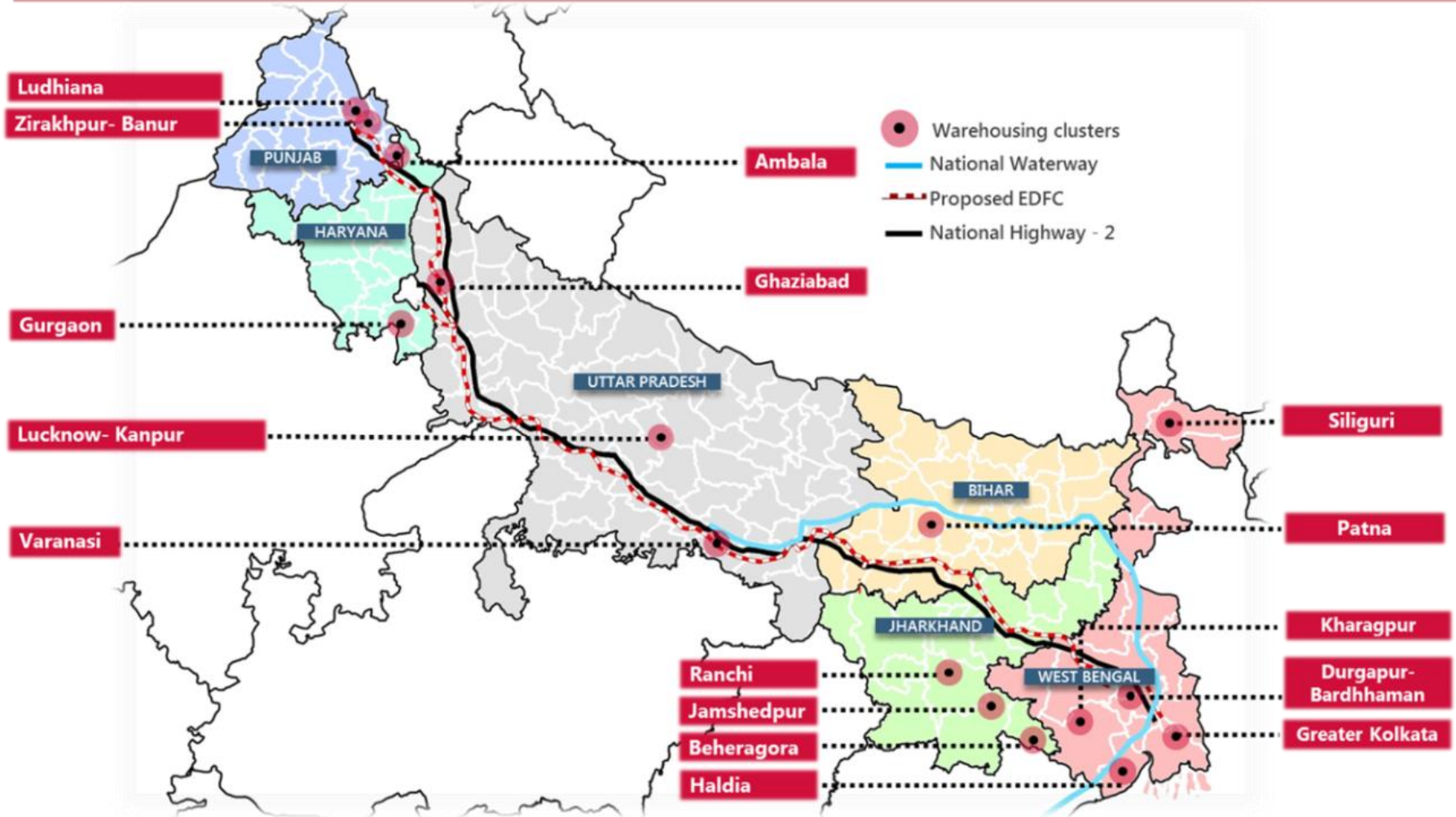
- Traffic congestion
- Lack of bypasses around cities and entry restriction in cities

- Typically single driver: No chain link/ relay of drivers

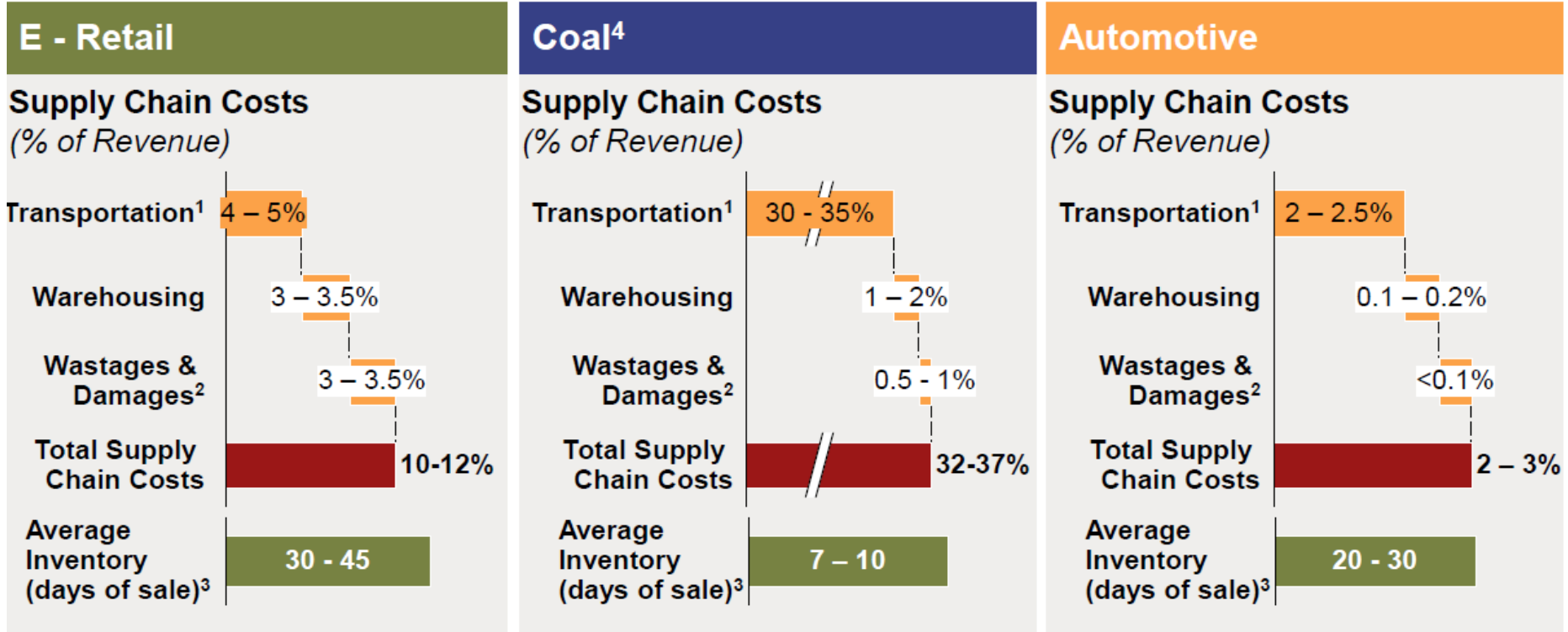
# Modal Share in India



# Development of Private Warehousing



# Impact on Logistics Cost varies by Commodity type



- Higher road transportation cost and need for higher service levels increases supply chain cost

- Higher rail and road transportation cost increases supply chain cost

- Higher inventory holding coupled with higher value of goods impact supply chain cost

# Methodology

## How much of what moved where and how?

- Tonnage
- TEUs
- Tonne-km
- Imp/Exp/Dom
- Commodities
- Origins & Destinations
- Road/rail
- Containers/Bulk



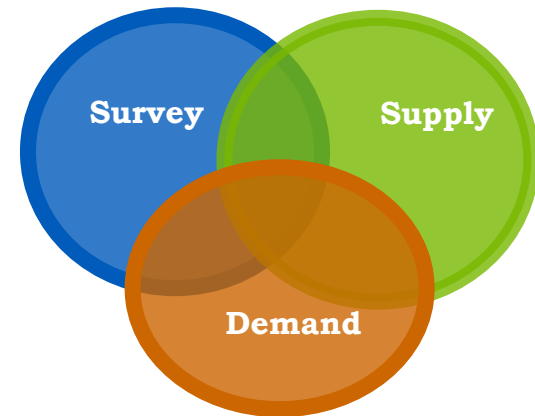
- **Least reliable overall, but good insight on industry dynamics**
- Interviews, intercept studies



- **Accurate but often commodity blind**
- Based on actual data:
  - Truck counts,
  - Rail traffic and
  - Port data



- **Powerful but complex and data intensive**
- Demand and supply of commodities
- Apply gravity modelling



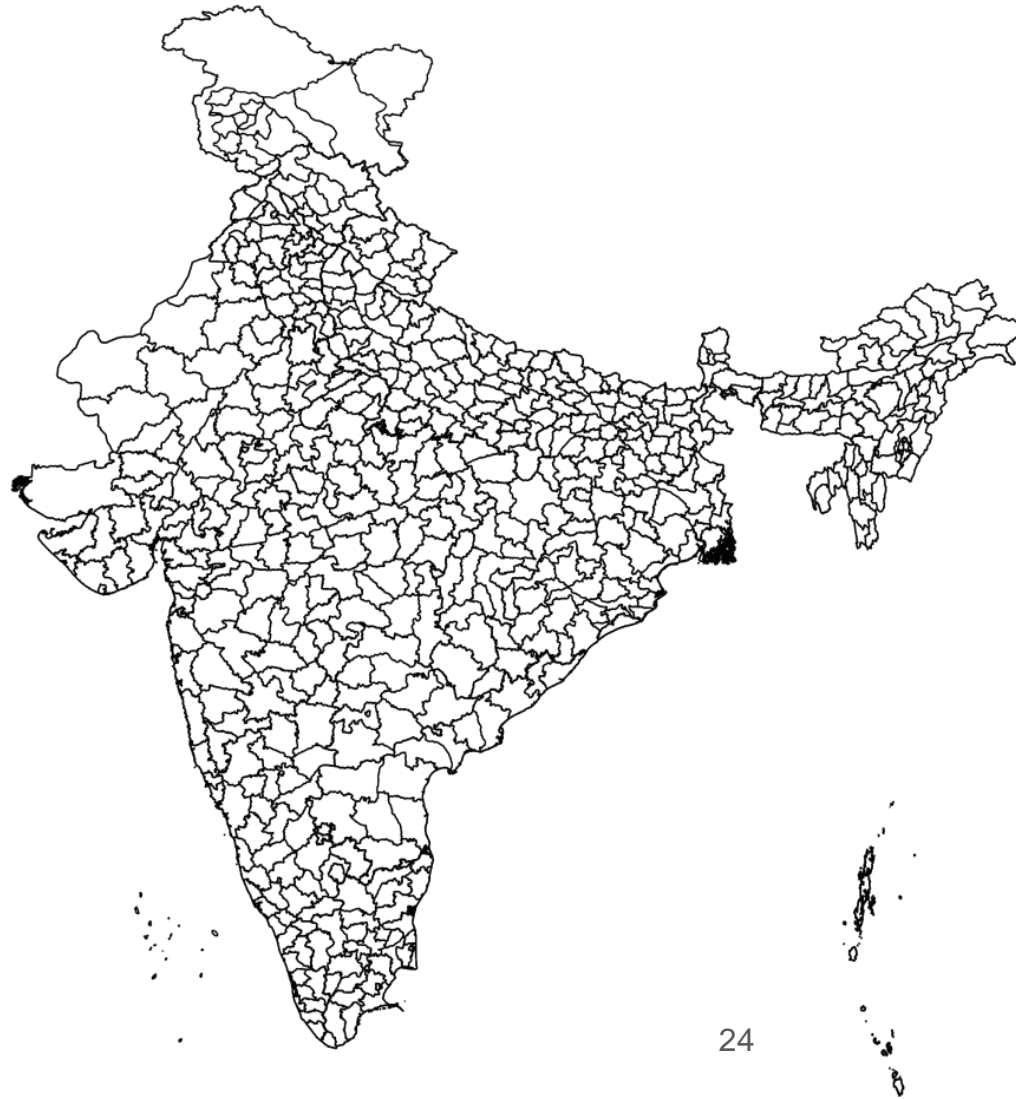
**HYBRID - triangulation to leverage the strengths of all three approaches**

# Commodities and Cargo Types

Cargo type	Commodities
Agricultural dry bulk	Cereal Grains
	Rice
	Sugar Cane
	Other Agriculture
	Green Leaf
Heavy break bulk	Wood Timber And Products
	Paper
	Chemicals
	Fertilizer
	Cement
	Iron & Steel
	Metal Products, Machinery and Electronic Equipment
	Transport Equipment
	Other Manufacturing Industries
Non-Ferrous Metal Products	
Light break bulk	Textile Products

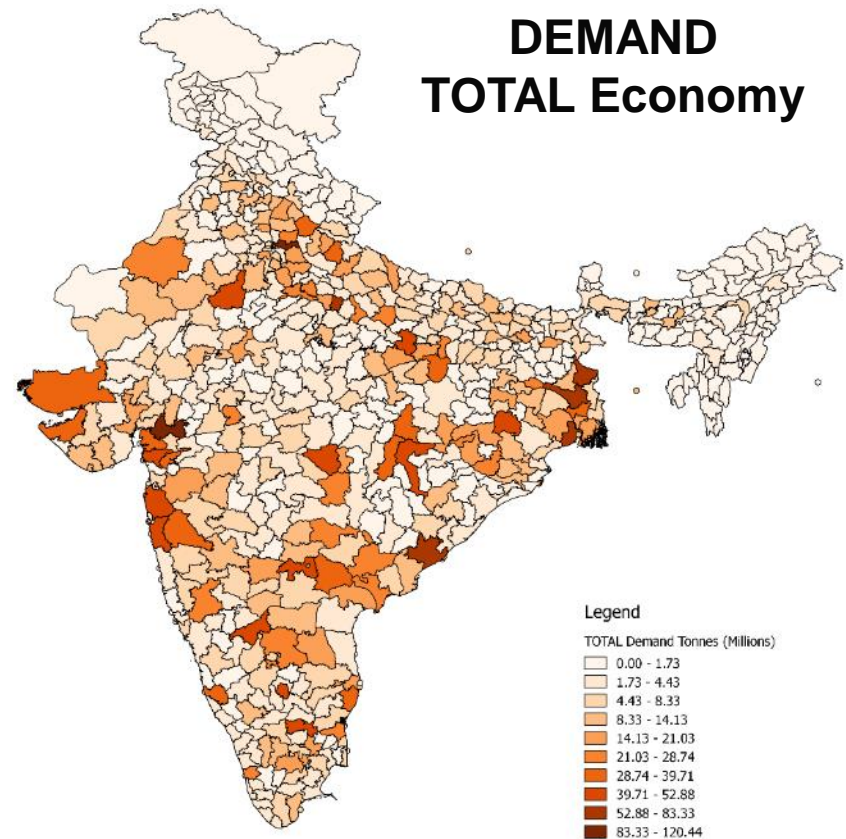
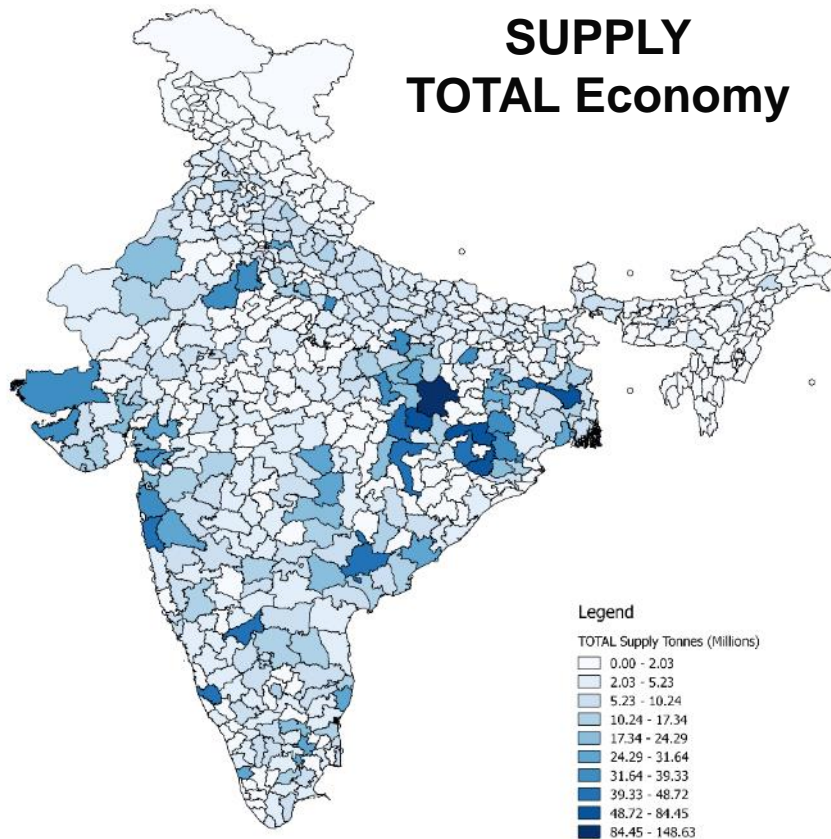
Cargo type	Commodities
Liquid bulk	Crude Oil
	Other Petroleum Products
	Natural Gas And Methane Rich Gas
Mining dry bulk	Coal Mining
	Iron Ore
	Other Non-Ferrous Metal Mining
	Other Mining
Other	Animals
	Animal Products
Palletisable	Processed Foods
	Beverages
	Pharmaceutical Products
Refrigerated	Fruit
	Vegetables
	Fish And Seafood And Meat

# Districts of India

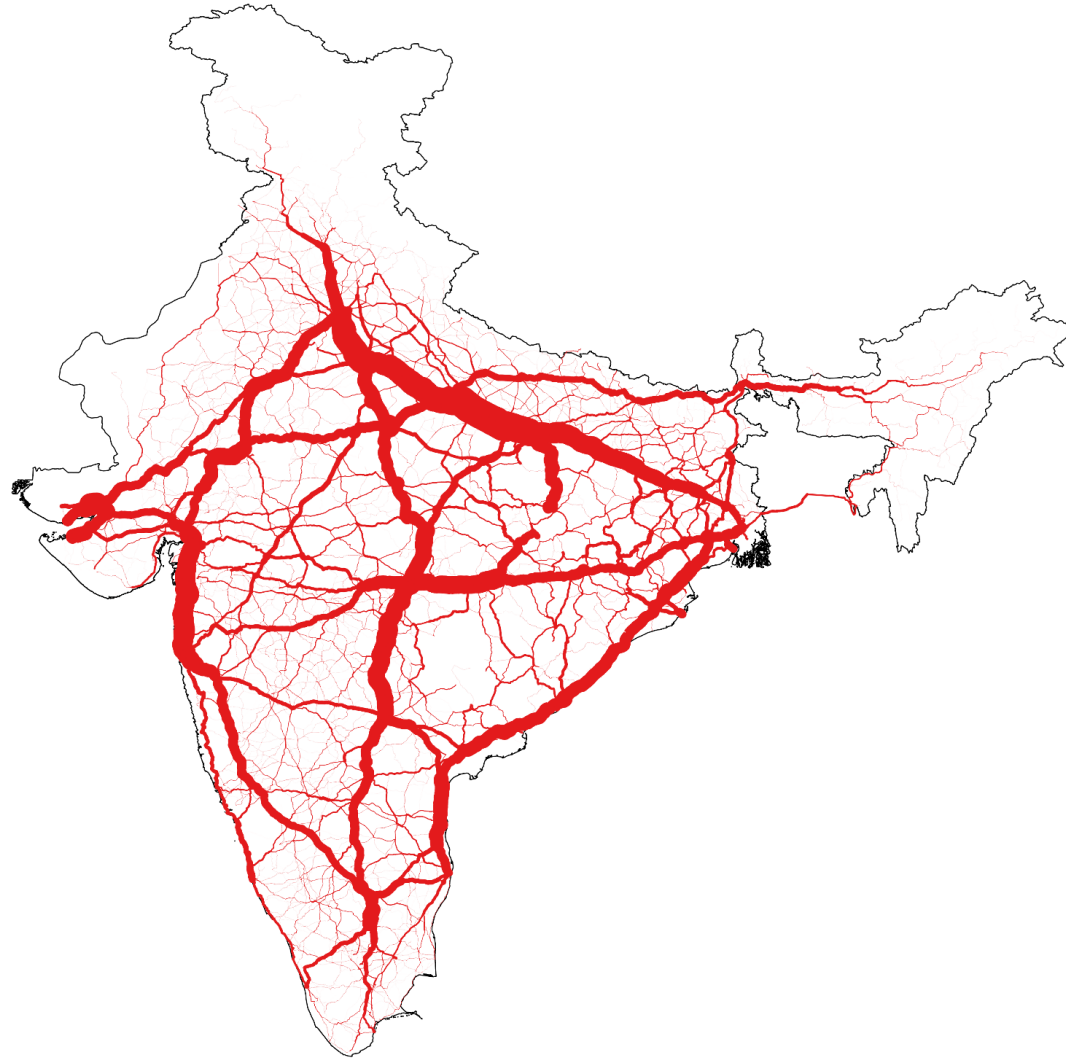




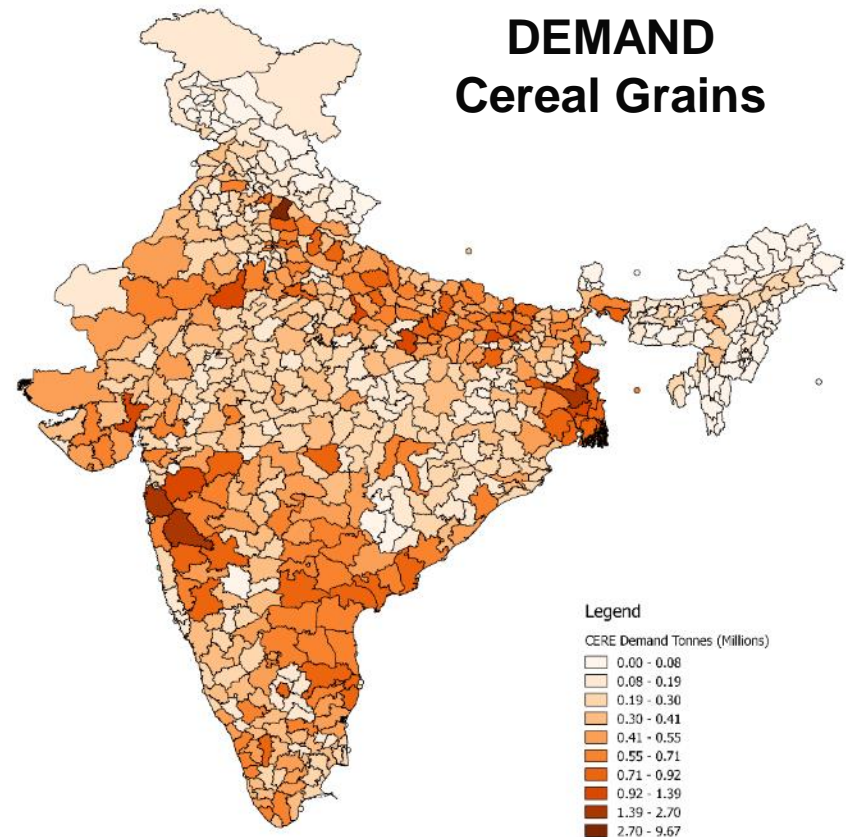
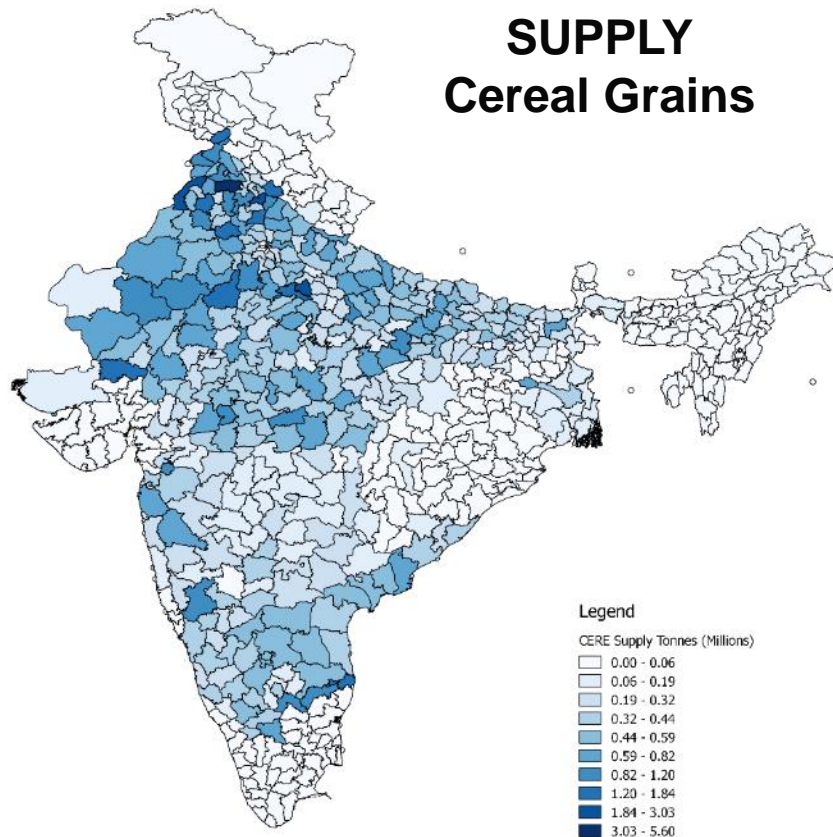
# What is the demand and supply for transport and logistics across India?



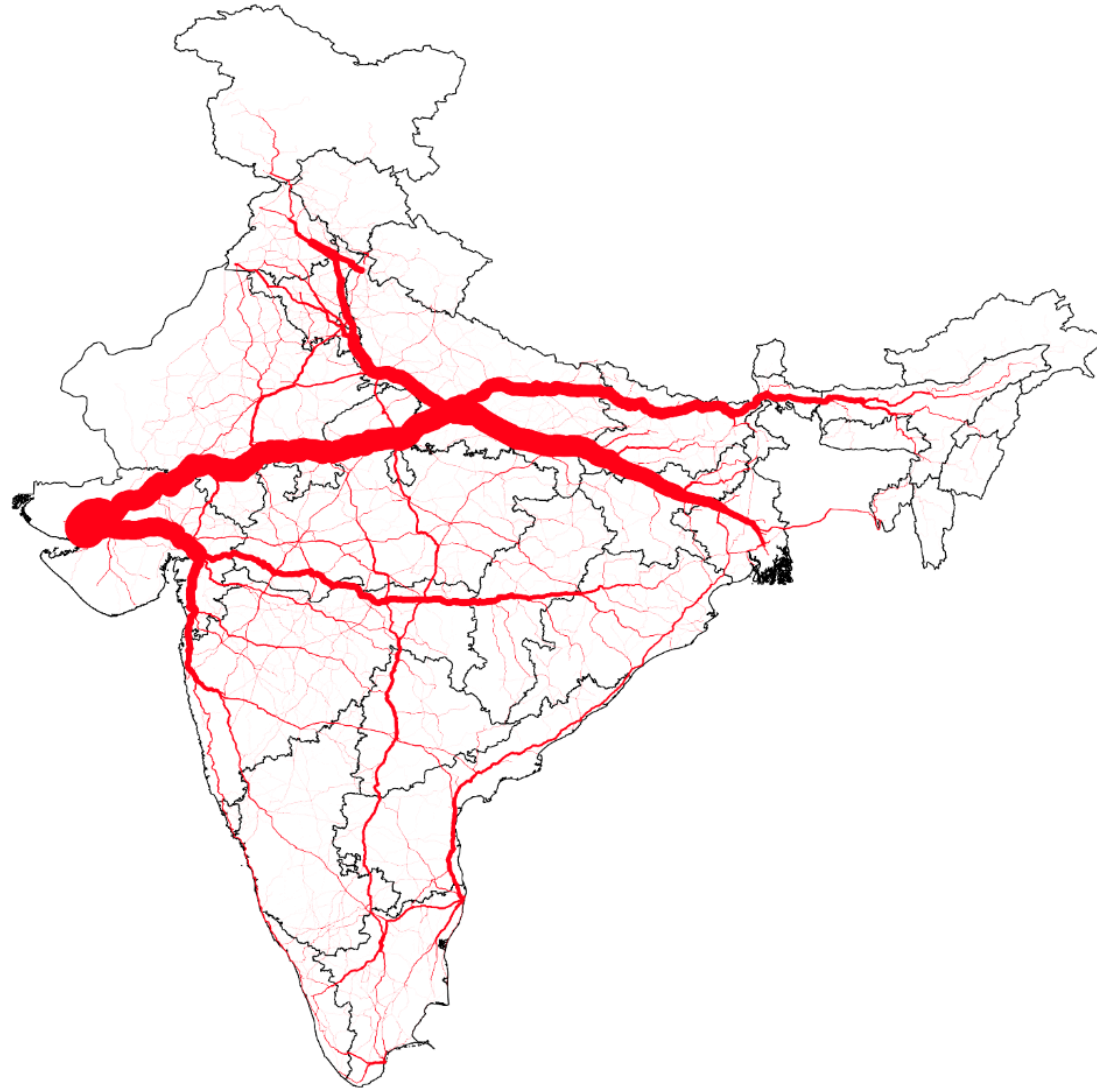
# Leading to total freight flows – also available per commodity



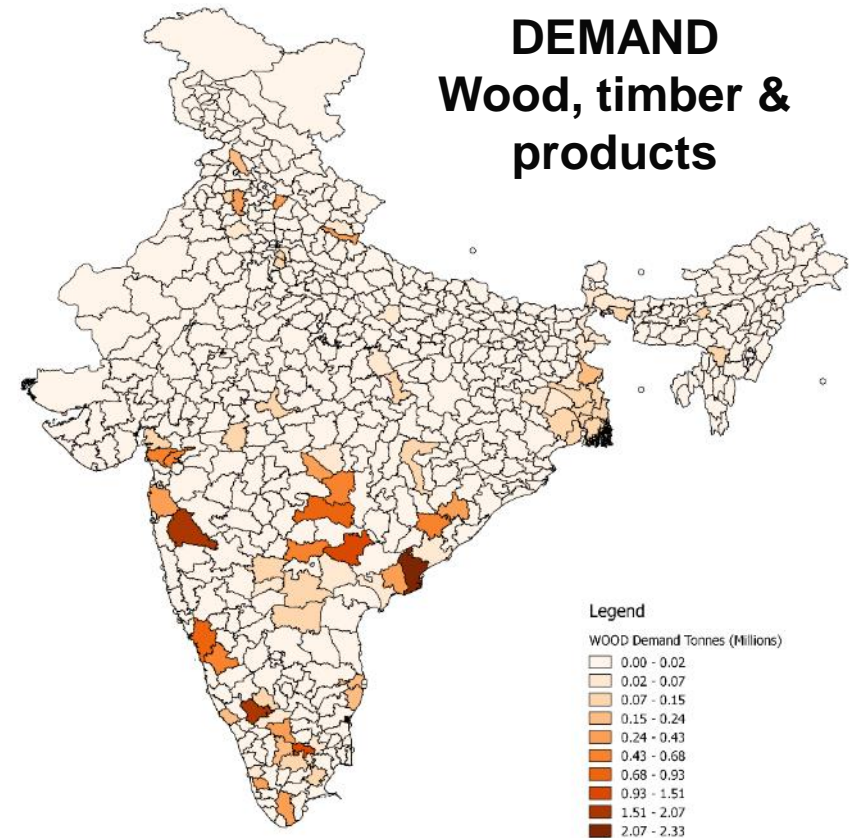
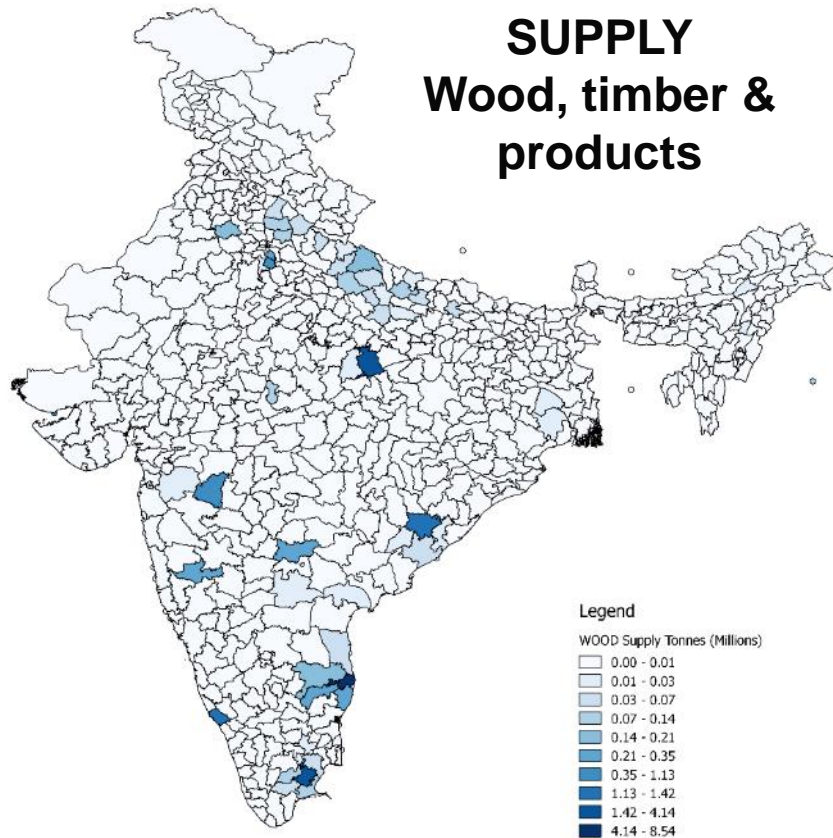
# Example – where are cereal grains produced and consumed across India?



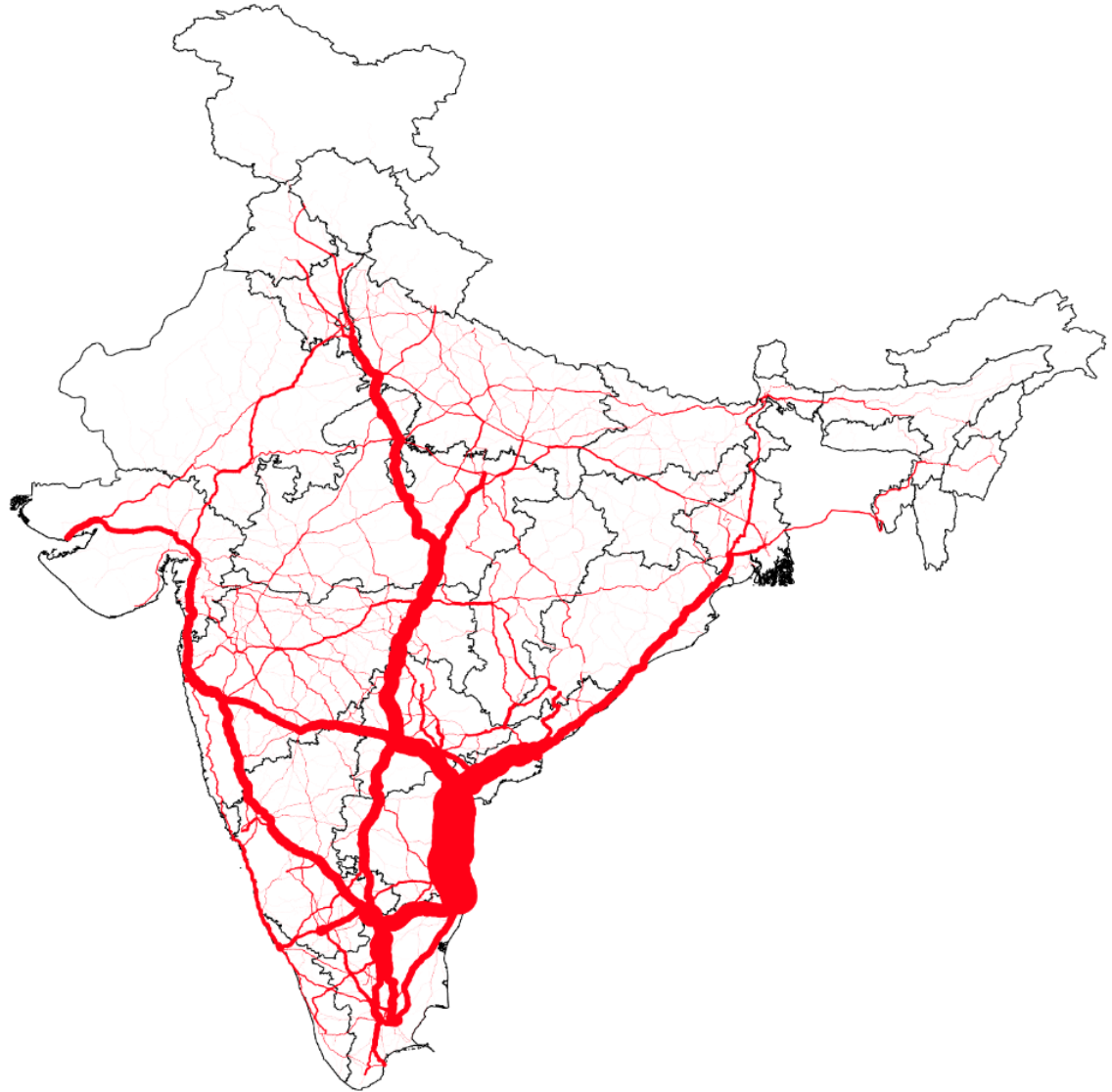
# Leading to Freight flow for Cereal grains

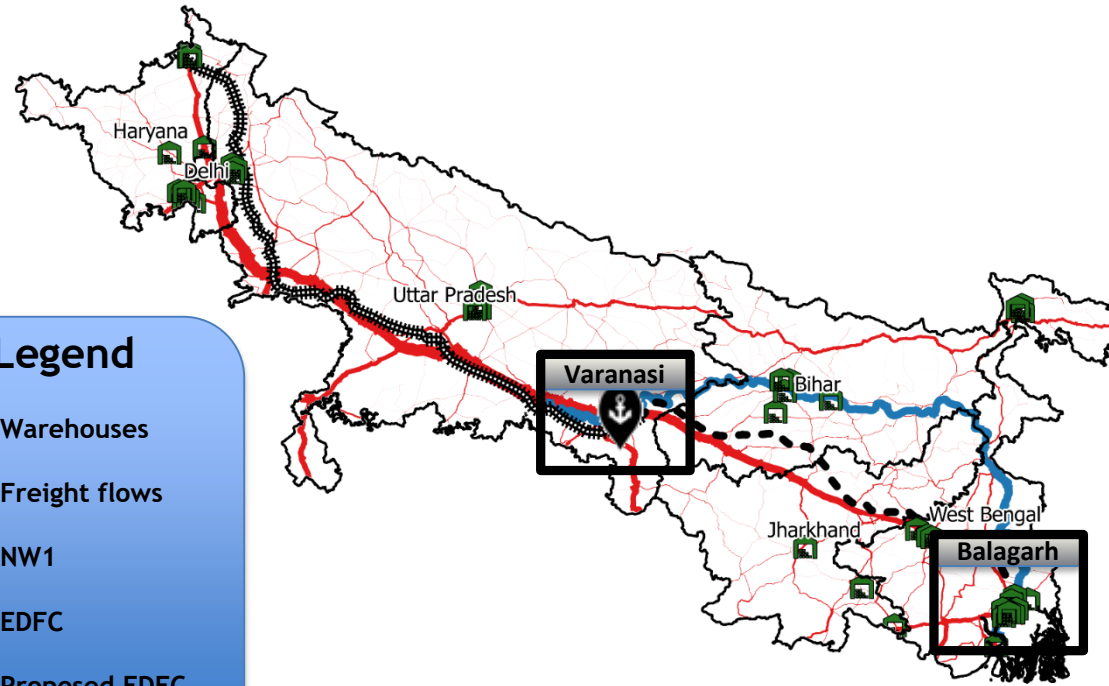
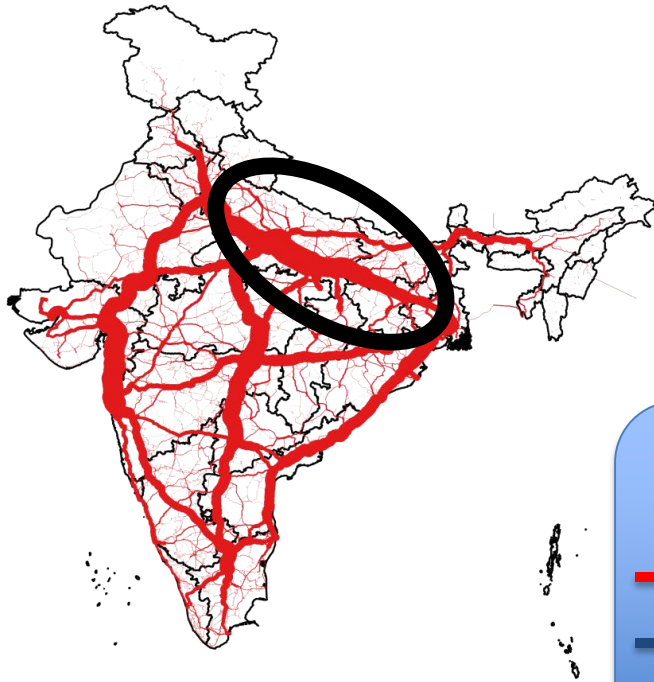


# Example – where are wood, timber and wood products produced and consumed across India?








# Leading to Freight flow for Wood, timber & products





**Legend**

-  Warehouses
-  Freight flows
-  NW1
-  EDFC
-  Proposed EDFC



# Two Macrologistics Business Cases

## Balagarh

Investment in DFC	Expected return to logistics savings per annum
\$4 billion	\$1 billion

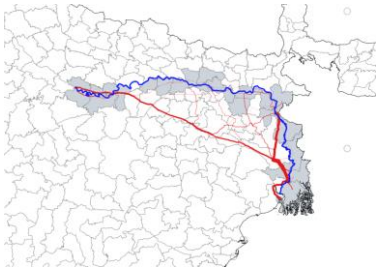
### Macrologistics issues

Connectivity to the port/Kolkata city logistics/Congestion/Alternative port use

Investment in an extended gate/hub	Additional expected return to logistics savings per annum
\$0.5 billion	\$2 billion

## Varanasi

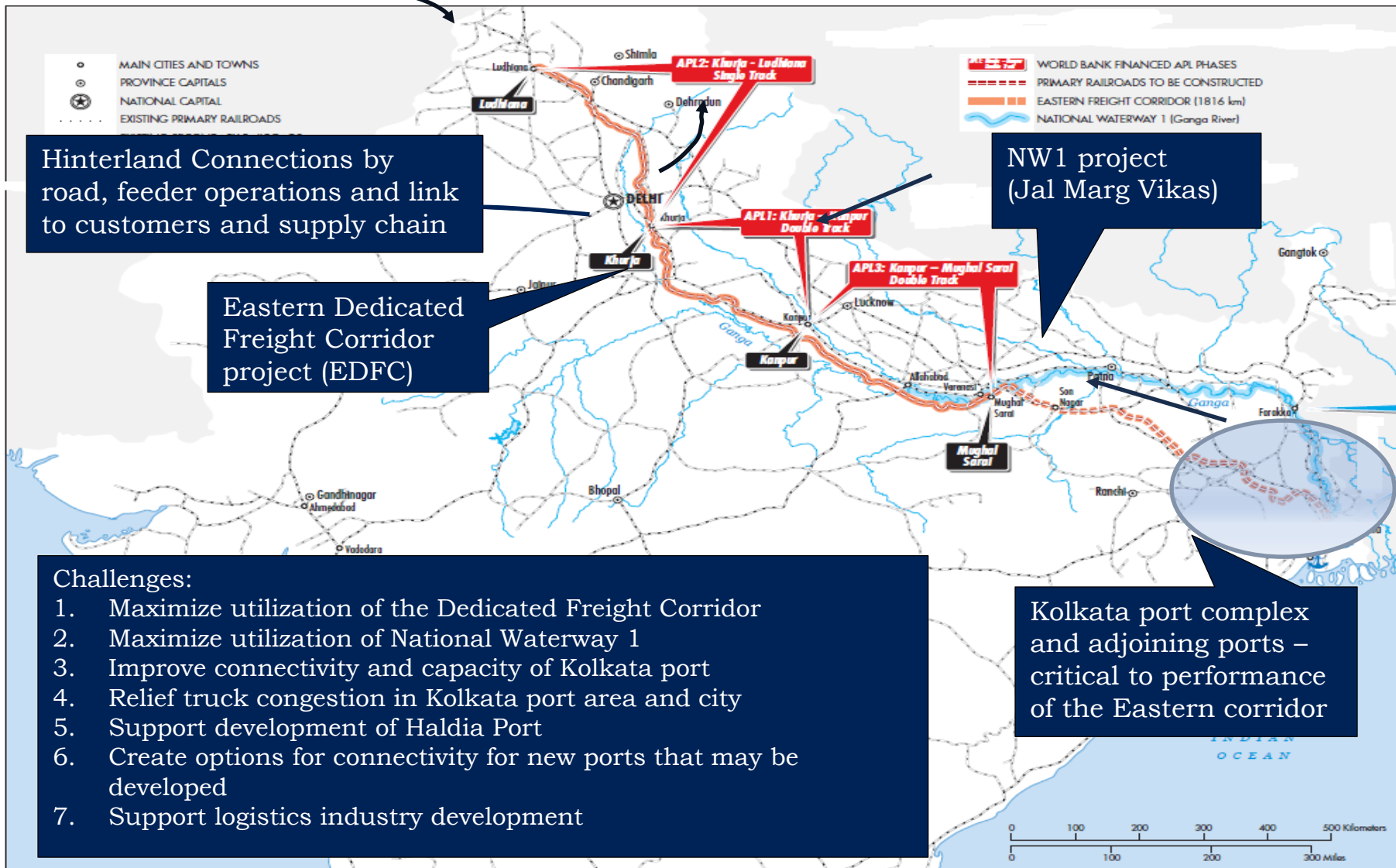
- Design of 0.5 million ton inland terminal



- Varanasi at the confluence of the Ganges and all modes
- To maximize logistics savings a 39 million ton design is needed



# The case of Eastern Corridor



# The Port Hinterland Connectivity Challenge

- Access roads through Kolkata city centre
- Queues of trucks waiting on roads to access port
- Accessibility to hinterland is hampered
- Inland rail/water links limited

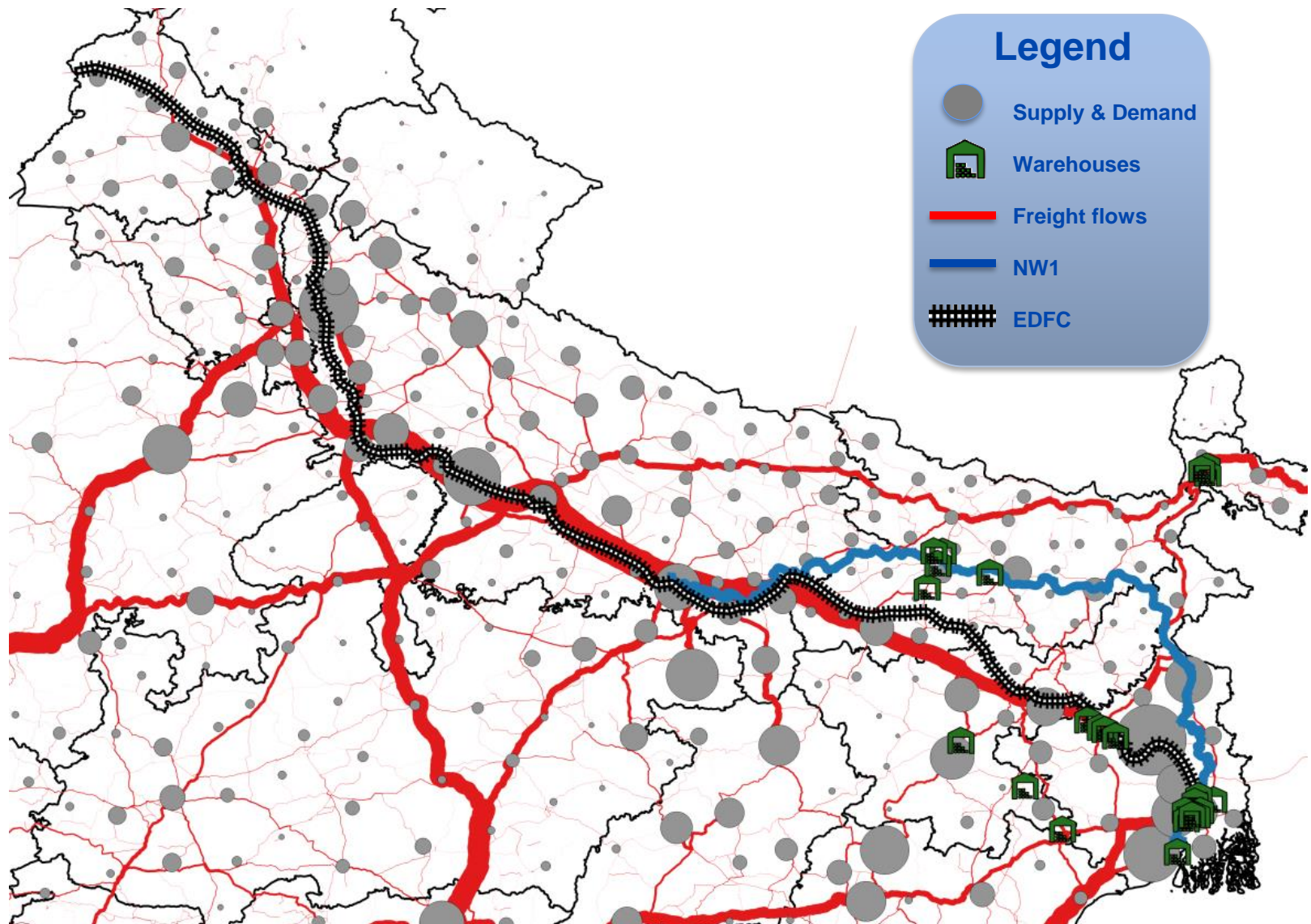


# The Port Hinterland Connectivity Challenge

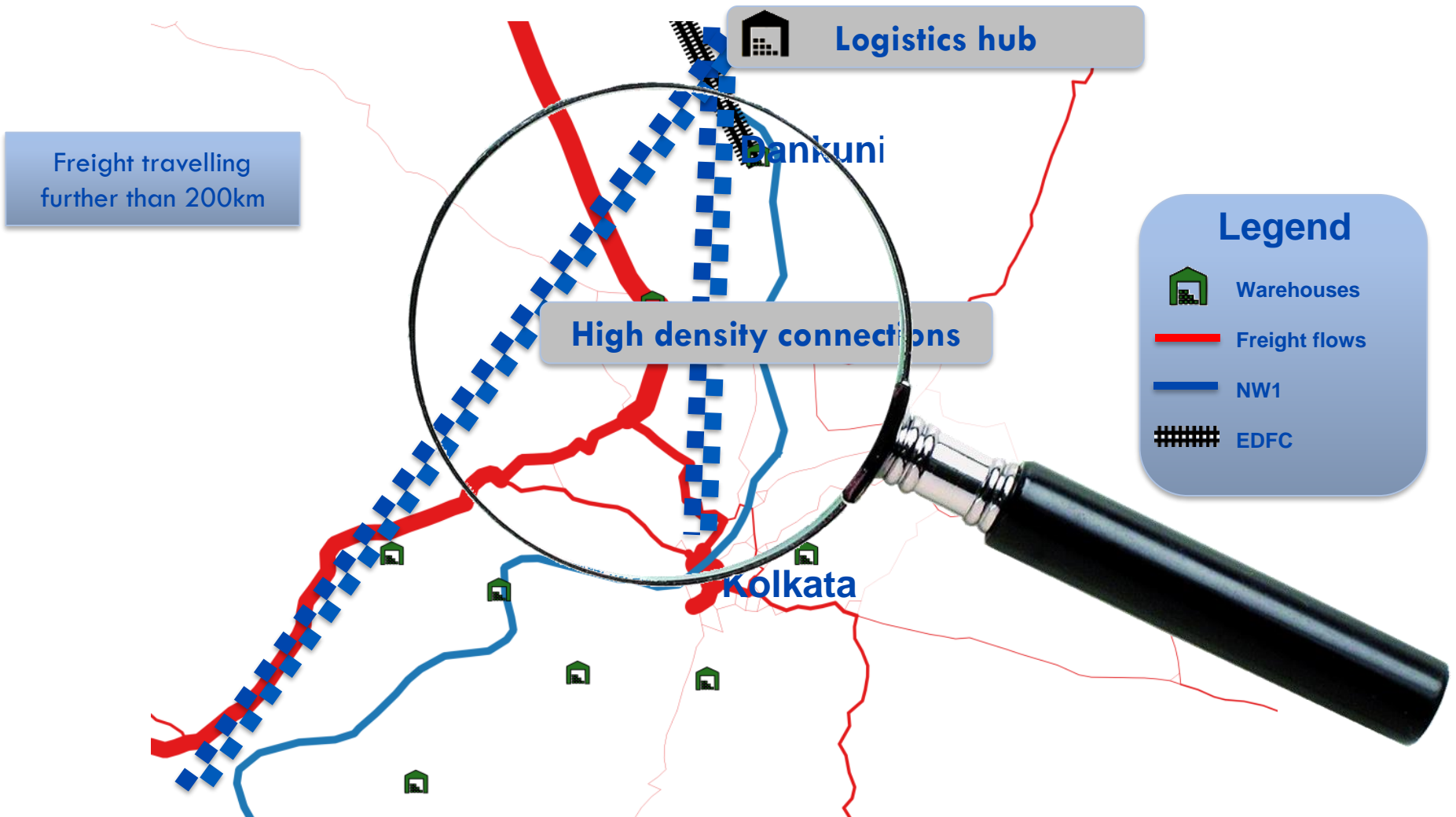
- Poor rail facilities in and outside port area, or using same line as passenger networks
- Inland vessels cannot access docks or be used to connect hinterland
- High logistics cost and underutilized assets

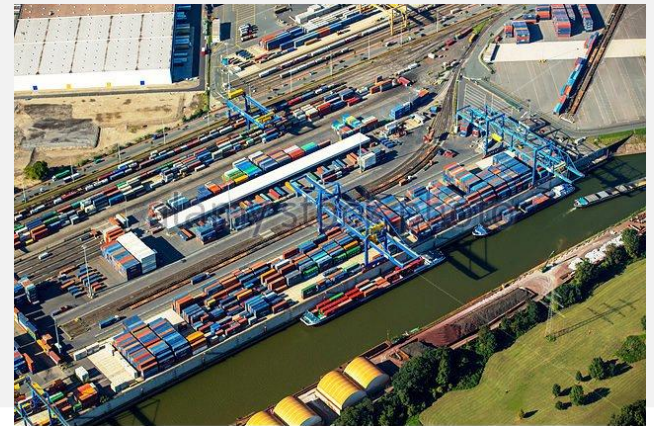
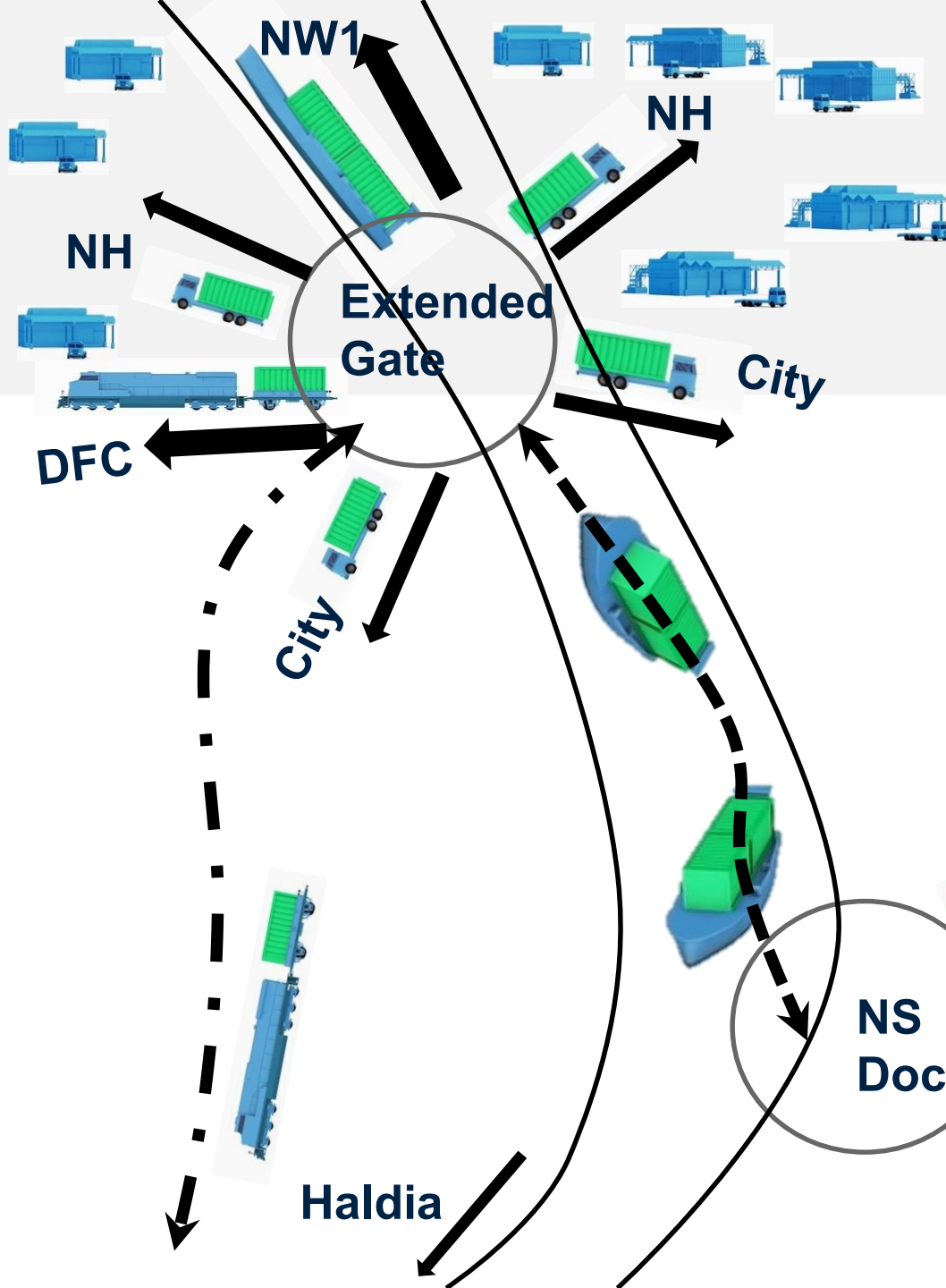


# Eastern Corridor

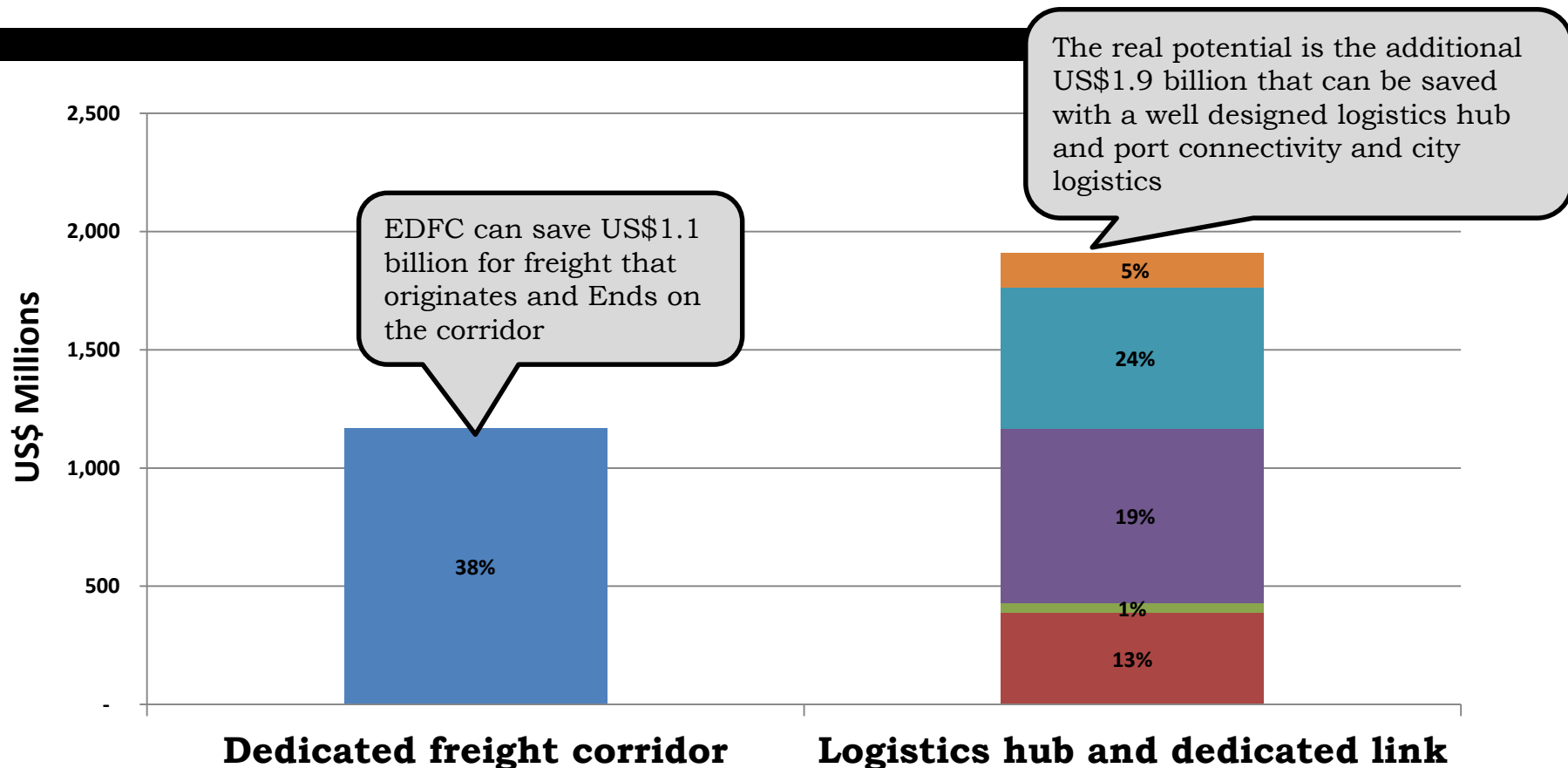


# Kolkata as hinterland port



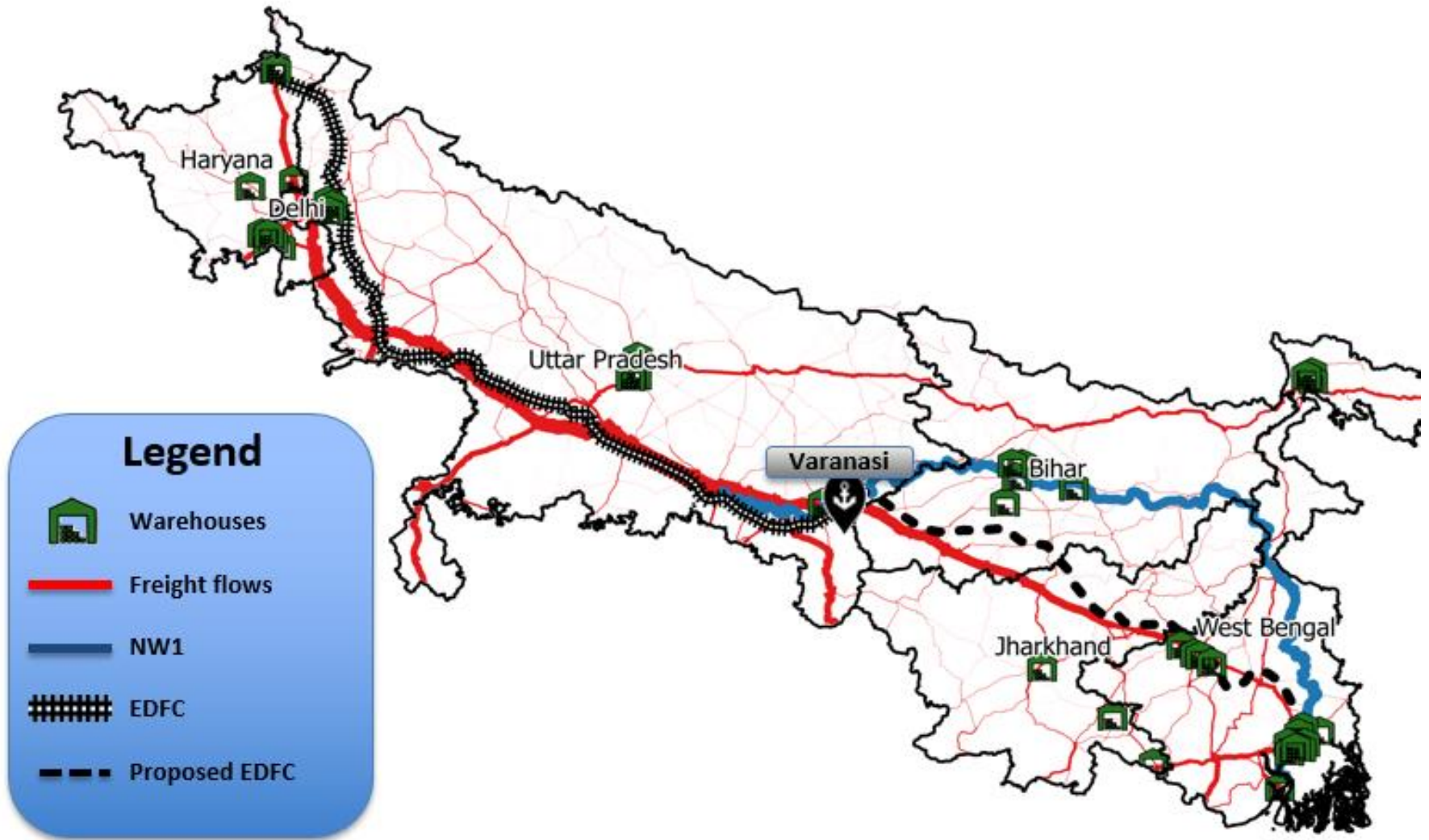


# Eastern Corridor savings potential of US\$3 billion



**Only 38% of EDFC potential will be achieved without additional interventions and investments**

# Strategically located Freight Villages and Logistics Hubs





# Understanding freight flows and logistics Costs is a means to an end.....

- Structured approach that enables integrated evidence based decisions – infrastructure planning, optimizing logistics, strategy, etc.
- Pragmatic discussions with industry on reduction of logistics costs
- Bottom up analysis to inform specific supply chains and policies