



## POLICY BRIEF

# Moving Towards Aggregation: Freight Forwarder Scheme of Railways



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# 1. Introduction

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In the recently presented Union Budget 2022, one of the strategies for increasing railways' market share in freight transportation aims at facilitating the integration of smaller goods through seamless solutions and multimodal logistics facilities at cargo terminals. Despite increasing railways' market share to 45% by 2030, a key transport decarbonization strategy for India, it continues to exhibit a gradual decline due to variety of reasons. Currently, the rail freight share is estimated to be about 27% of the total freight transport in the country.

Increasing the market share of railways has been a critical challenge due to capacity constraints and bottlenecks, lack of appropriate service designs that target specific commodities, uncertain transit time with no guaranteed delivery service, lack of commodity-specific wagons, absence of customer-oriented marketing policies characterised by 'take it or leave it' approach, etc. However, to be fair to railways, it may be conceded that there has been change in marketing approach in the last decade when efforts have been made to attract many commodities where railways' presence was negligible, for instance, automobiles and enhanced investments in capacity augmentation projects, including construction of dedicated freight corridors, particularly in last six years.

Indian Railways has been concentrating on bulk freight traffic since the early 1980s and therefore, non-bulk traffic gradually diminished from nearly 40% of the total traffic carried at the time to less than 5% by end of 1999–2000. Proactive policies towards containerisation that include opening of container traffic to the private operators have resulted in getting back low-volume freight traffic, however, the full potential of railways for carriage of non-bulk freight still remains untapped.

Rail is the most viable option for carrying out bulk transport, freight movement though road sector has been able to penetrate here as well, particularly in medium and low-distance segments. This study proposes to examine the role of aggregators or freight forwarders in order to expand the commodity basket and move beyond the traditional bulk commodities. Although, freight forwarders have been present in Indian Railways since the late 1950s, their contribution in carriage of piecemeal freight traffic has been very marginal, confined only to a few selected routes. With the growth in logistics industry, it is felt that a proactive and improved freight forwarder scheme may help railways in enlarging the commodity basket and bringing back elusive piecemeal freight traffic. The study undertakes an in-depth analysis of challenges and barriers in expansion of role of freight forwarders or aggregators and suggest measures to overcome them.

# 2. Background

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Railways is well-known to carry all kinds of goods, bulk, and non-bulk commodities, as it was the only mechanised mode of transport available since its advent in mid-19th century, for nearly 100 years. Railways designed their freight services for carrying all kinds of commodities, based on their nature and volume that was offered to them by the customers. They made arrangements for carriage of over-dimensional consignments in specially designed wagons as well as for low-volume, high-value goods, combining them in the wagon-loads. A typical four-wheeler covered wagon, the main goods-carrying vehicle, carried about 22 metric tonnes of goods.

Towards the mid-20th century, motor trucks gradually started carrying the non-bulk commodities. These road vehicles were more convenient and capable of providing door-to-door services, therefore they made a noticeable market penetration and resultantly the market got shared between railways and road transport. Both railway and road operated in an ever-expanding freight market on account of industrialisation and increasing trade and business activities in India.

In 1980, National Transport Policy Committee (NTPC), which examined future roles of different modes of transport to optimise the available resources

recommended that the primary role of railways is to carry over 70% of freight traffic as it was six times more energy efficient than road. However, railways was not prepared to carry the burden largely due to capacity constraints and as a conscious policy towards carriage of bulk commodities such as coal, iron ore, steel, fertiliser, cement etc., leaving carriage of low and medium-volume commodities to road, was adopted in the early 1980s. Gradually, Indian Railways gave up facilities that were needed for transporting piecemeal traffic and created facilities for carrying bulk commodities, giving little option to a large number of railway customers which offered low-volume piecemeal traffic and they started patronising road sector which was only option available to them.

As per National Transport Policy Development Committee (NTPDC, 2014), the share of Indian Railways in freight traffic had declined from 90% in 1950–51 to 30% in 2011–12. During the X and XI Five-year Plan from 2001–02 to 2011–12, the freight traffic growth on Indian Railways was significantly high, registering a compound annual growth rate (CAGR) of 9.2%. Perhaps, encouraged by this performance, NTPDC suggested a growth rate of 7% in the XII Five-year Plan (2012–17) and a constant growth of 9% till 2032. The Committee also recommended increased investments in transport from 2.6% in the XI Plan to 3.3% in XII Plan and stabilize at 3.7% till 2032. This signified a seven-fold increase in investments under transport sector from 2012 to 2032 but afterwards largely stagnated hovering around 2.5%. Figure 1 presents the change in freight modal share between road and rail.

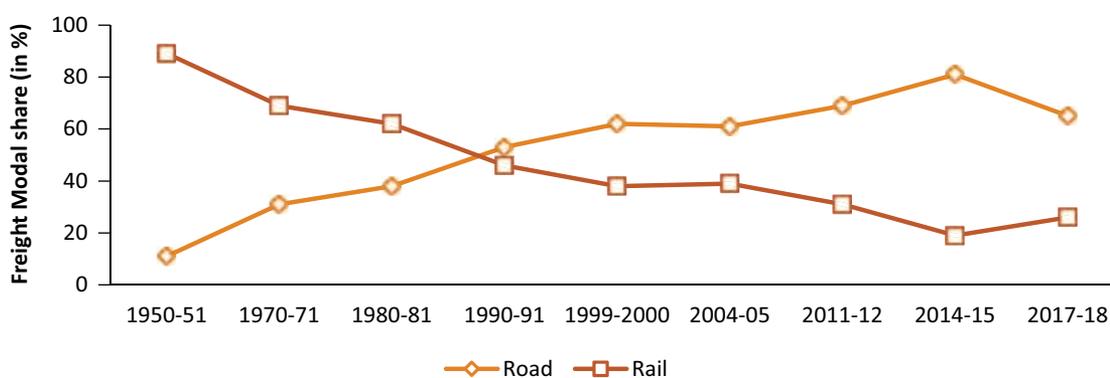


Figure 1 Freight modal share

Source Unlocking India's Logistics Potential, The Value of Disaggregated Macroscopic Freight Flow Analysis, The World Bank, Feb 2018<sup>1</sup>, National Rail Plan, 2020

### 3. Genesis of Aggregated Traffic in Indian Railways

Before the 1960s, there were primarily four-wheeler wagons, the most dominant was a covered wagon, with a carrying capacity of about 22 metric tonnes, which transported all kinds of commodities such as fertilisers, cement and high- and low-valued commodities which needed safety and protection from theft. The four-wheeler open wagon was used to transport low-value loose commodities such as coal, iron ore, and other minerals,

relatively easier for loading and unloading. The special types of wagons like tank wagons were used to carry liquid commodities such as oil, petroleum and chemicals, etc. The flat wagons carried commodities such as steel. Later, to increase productivity Indian Railways envisioned a shift towards eight-wheeler wagons. In the early 1960s, Indian Railways introduced eight-wheeler wagons using a bogie framework for the wheel sets.

<sup>1</sup> Details available at <<https://openknowledge.worldbank.org/bitstream/handle/10986/29371/WPS8337.pdf?sequence=1&isAllowed=y>>

In view of inherent advantages of bogie-based eight-wheeler wagons, Indian Railways moved towards converting majority of its wagon fleet from four-wheeler wagons to eight-wheeler wagons. The eight-wheeled wagons were equipped with a central buffer coupler (CBC). These couplers were able to absorb high-frequency forces caused during impact and dissipate low-frequency forces to protect the wagon from damage. With the increase in production of eight-wheeler wagons, the fleet of four-wheeler wagons gradually came down.

A four-wheeler covered wagon was a versatile wagon, capable of carrying all kinds of volume of goods, capable of aggregating low-volume commodities offered by the customers. Railways were responsible for stuffing and destuffing low-volume consignments in goods sheds and repacking sheds. A wagon being the unit of movement, trains were formed in marshalling yards for different destinations. However, eight-wheeler wagons were not amenable for frequent marshalling and were more convenient to move from origin to destination, particularly for bulk commodities like coal, iron, ore, etc.

In 1981, as demand of freight traffic grew, Indian Railways decided to shift from carrying wagonload to train-load that favoured carriage of bulk commodities capable of moving in higher volumes. As a result, both wagonloads and smalls traffic started declining and within 10 years Indian railways transformed itself into a bulk commodity carrier, leaving non-bulk traffic and low-volume bulk traffic to road sector.

### 3.1 Freight Forwarder Scheme

The railways' preference for wagonload or still better train-loads brought the concept of freight forwarders/aggregators in Indian Railways. A freight forwarder was defined as the one who collected 'smalls' consignment from the door step of individual traders, consolidates them and handovers to the railways in wagonload/container load/ parcel van load. The freight forwarder would be responsible for the last-mile connectivity and delivery of consignments to the consignee.

With the changes introduced to the railways' policies and prioritization of train-load movement, the definition of freight forwarders changed slightly. In 1994–95, an FF was referred as one who would collect 'smalls' and piecemeal wagonload traffic from the doorstep of individual traders, consolidated them, and offered to the railways in wagonload or train-load.

An FF would function as a consignor to the Indian Railways. The customers were charged at smalls rate by the FF; however, the FF was charged at wagonload rate by the Indian Railways which was lower than the smalls rate and, therefore, the difference between the two rates was the incentive offered to the FF. This reduced the overall burden of marketing for the railways, since they were getting smalls traffic without having to go the customers directly. Ultimately, the FF was responsible for the providing door-to-door connectivity to the customers at the origin and destination points. They had the liberty

## Smalls traffic in Indian Railways

Earlier in 1960s, Indian Railways had specifically categorized 'smalls' traffic as a part of their commodity basket. It was defined as the traffic which was less than wagonload or train-load. Railways used to nominate certain number of days for smalls traffic movement to ensure maximum utilisation of wagon and guaranteed transit times.

However, in the 1980s Railways discouraged the movement of smalls traffic through curtailing supply of wagons and closing down facilities at goods shed, repacking sheds, etc. This was facilitated by imposition of restrictions and prohibitive hike of rates for smalls traffic. Ultimately, these smalls traffic almost disappeared from the rail freight commodity basket. In 1991–92, 0.44 million tonnes of smalls traffic was moved, accounting for 0.17% of the total traffic of the Indian Railways. This accounted for INR 17 crore in the total earnings of the Indian Railways. After 1993, the smalls traffic was discontinued and it moved only as parcel traffic.

of carrying a single commodity or multiple commodities in a wagon.

However, Indian Railways were concerned by the rising number of claims in smalls traffic on account of theft and pilferage during transit as a wagon suffered detentions

due to preference to trainloads. A truck of carrying capacity of 9–10 tonnes was more amenable for carriage of smalls traffic. This resulted in a significant shift of smalls traffic to road and railways' policy of moving train-load helped the road sector to expand rapidly.

## 4. Freight Forwarder Scheme in Indian Railways

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The Freight Forwarder Scheme (FFS) of the Indian Railways dates back to the late 1960s, when Indian Railways started with the freight forwarder services on a few major routes to cater to the 'smalls' traffic bulked into wagonloads which had a potential to move away from railways to other competitive modes. The Scheme offered a freight forwarder to aggregate smalls traffic and transport them by rail between pre-defined terminals in wagonloads<sup>2</sup> at concessional, lump sum rate to the freight forwarders. Initially, the service was operational for conventional four-wheeler covered wagons between Mumbai–Howrah and Howrah–Chennai. Later, it became operational on a total of 15 routes and increased to 31 routes in 1972–73.

Within a span of 3 years, number of routes increased to 73 as it further gained popularity during 1975–76. However, in 1977–78, of the 99 operational routes, 9 routes were discontinued due to inadequate supply of traffic. From 1969 to 1979, there was a steady increase in the loading of wagons under Freight Forwarder Scheme (Figure 2). In 1980–81, there was an all-time high loading of 29,675 wagons corresponding to INR 12.36 crore in earnings. However, Railways saw a sharp decline in loading thereafter. Main reason was, as already mentioned, change in the policy of Railways of giving preference to train-loads carrying bulk commodities. Other reasons include closure of several Jute mills and other industries in West Bengal in 1986–87 due to labour problems, which offered considerable smalls traffic. The timeline has been presented in Growth of Freight Forwarder Scheme in the Indian Railways.

One of the main concerns in the Freight Forwarder Scheme was frequent changes in the procedures. The policy was altered very frequently, keeping operational convenience in view, that led to lack of stability. For instance, the Scheme was discontinued for soda ash on Western Railway though its share under the Scheme was significantly high. Other

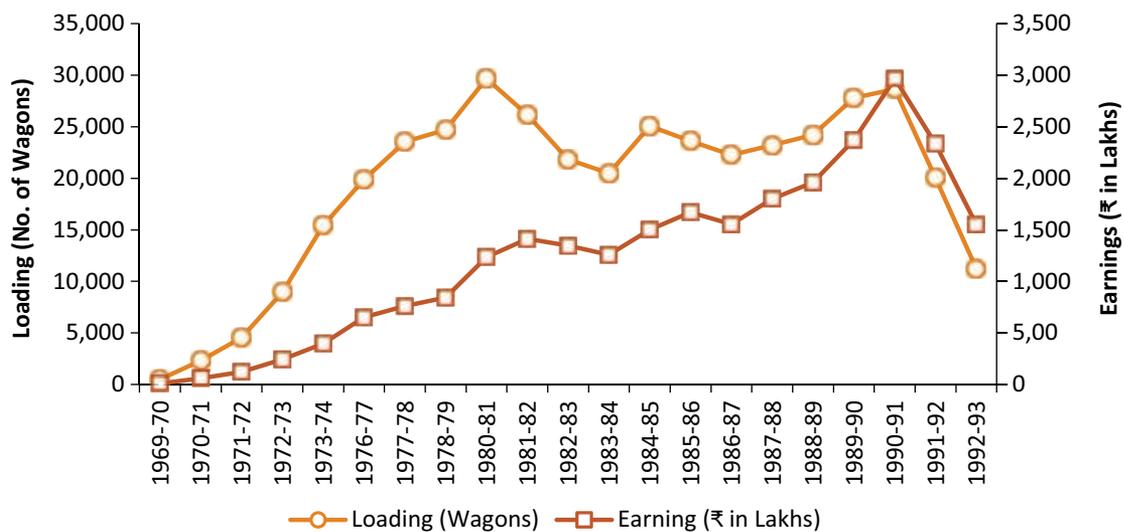
concerns of freight forwarders were unreliable schedules, irregular wagon supply, commodity-specific freight structure and lack of customer-oriented service. The main emphasis of the Railways was on expanding train-load traffic for bulk commodities, wagonload and small traffic were hardly a priority.

Indian Railways saw a significant decline in the earning from INR 29.57 crore in 1990–91 to INR 15.52 crore in 1992–93 in Freight Forwarder Scheme primarily on account of low priority accorded to the Scheme. However, some zonal railways were able to attract high-value commodities, for instance, from 1987–88 to 1991–92, the earnings of Northern Railways increased from INR 189 lakh to INR 607 lakh from Freight Forwarder Scheme.

In order to attract high-value commodities to railways, a specialized marketing organization, M&SO, Marketing and Sales Organisation was set on each zonal railway. However, though directly under this specialised organisation the Freight Forwarder Scheme continued to decline. The Scheme suffered adversely in physical and financial performance on Eastern, Central, and South Eastern Railways, primarily due to shortage of wagon and evidently the marketing organisation was not able to publicise it sufficiently.<sup>5</sup>

A revised Freight Forwarder Scheme was introduced in 1994–95, which offered some value additions in service such as guaranteed supply of wagons, identifiable path, direction-wise loading on nominated days, fixed transit time and incentive in freight for more loading. Again, it was significantly revised from 2006 to 2021.

The stated objective of Freight Forwarder Scheme as per Rate Circular No. 25 of 2006 was on increasing aggregations of goods by providing point-to-point connectivity between specific pair of terminals. The Scheme was applicable at all rail-side warehouses and



**Figure 2 No. of wagons loaded and earnings of Indian Railways under Freight Forwarder Scheme (1969–93)**

Sources Commercial Directorate, Railway Board, Railway Convention Committee (1973) – Social Burdens on Indian Railways, Indian Railways Year Books (1969–93)

goods sheds which were notified by the zonal railways for cargo aggregation and distribution. The Scheme was available throughout the year for only where both, origin and destination goods sheds had full rake terminals. While both, covered and open wagons were permitted in lean season, April to October, only covered wagons were allowed in busy season, from October to March. The Scheme is not available for lead less than 700 km.

The other conditions under the Scheme were, loading of single commodity or multiple commodities up to maximum of 10 wagons each, placement of indents was only for block rakes though all commodities were made eligible under the Scheme with no exclusions. For the lean and busy seasons, composite freight rate was at chargeable class 100 and 130, respectively. The freight forwarders were given stacking time at originating terminal up to 48 hours while removal time at destination station was 24 hours.

Responsibilities of the cargo aggregator included loading at forwarding goods sheds and unloading at destination goods sheds, identifying goods sheds between they intended to operate and proposing nomination of days for operation and ensuring not loading of contraband and dangerous goods; violations attracted punitive action. Railways' responsibility was notifying rail-side warehouses and goods sheds for aggregation and distribution on the basis of feasibility of operation at the terminals proposed by the aggregators. Railways also took responsibility for

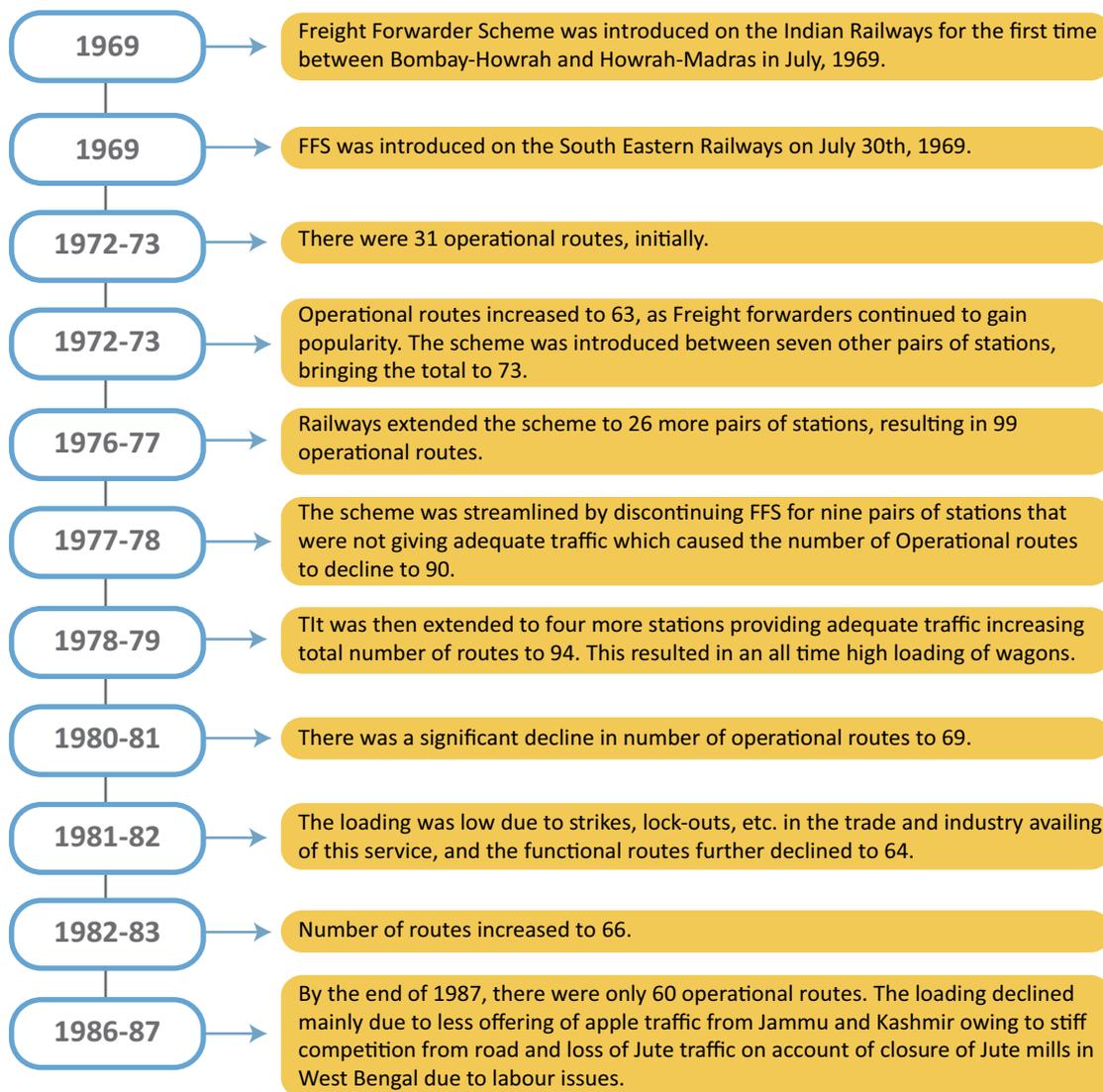


**Figure 4 Wagon loaded under Freight Forwarder Scheme at Shalimar station**

Source Indian Railways' Report and Accounts (1973-74)

supply of wagons as assured to the cargo operators on nominated days as mutually agreed upon.

The current freight forwarder policy was revised in 2021 (Rates Master Circular/FIS/2015/0) with similar objective, aiming at facilitating cargo aggregation and thereby expanding the commodity basket on Railways. The scheme is applicable for notified goods sheds and Private Freight Terminal s and available throughout the year. In addition to covered wagons, bogie open high sided with



**Figure 3 Growth of Freight Forwarder Scheme in the Indian Railways**

*Source Indian Railways' Report and Accounts (1972-87)*

air brakes (BOXN ) open wagons and flat wagons have been also included in the eligible wagons for the scheme. The distance restriction of 700 km has not been relaxed.

There has been relaxation in number of wagons to be loaded by single commodity, two commodities, and more than two commodities. For single commodity, any number of wagons can be loaded with train-load rate applicable for each wagon. For two commodities, again any number of wagons can be loaded but train-load rate for each wagon is now the higher-class rate of two commodities loaded. For more than two commodities, not more than 10 wagons can be loaded with composite class

rate of 120. The floor rate, that is, minimum chargeable rate should not be less than Normal Tariff Rate of Class LR-1 after availing all the concessions.

While in earlier policy, no commodity was excluded from Freight Forwarder Scheme, in the current policy, the following commodities that are generally carried by railways in trainloads have been excluded from the Scheme.

- Coal and all its variants including washed coal and imported coal
- Coke and all its varieties including metallurgical, petroleum, and imported coke

- Iron ore
- Petroleum, Oil, Lubricants
- Traffic moving in privately-owned wagons (including Own Your Wagon Scheme and Wagon Investment Scheme/Liberalized Wagon Investment Scheme wagons) such as cement in bulk in loose, food grain in bulk in loose, caustic soda, liquefied petroleum gas (LPG), ammonia, phosphoric acid, etc. availing freight concession under any other scheme
- Traffic loaded in ports
- Container traffic
- Military traffic
- Railway Material Consignment (RMC)
- Marine gypsum

In case, wagons are loaded with more than two commodities, the following commodities are not be permitted:

- All types of ores and minerals
- Cement
- Food grain
- Chemical manures
- Iron and steel

In the current scheme, the customers have to pay all other applicable surcharges, for instance, busy season surcharge, terminal charges, development charges, etc. over and above the composite rates.

While the responsibilities of the core aggregator remain largely the same, like loading and unloading, identifying originating and destination goods sheds, proposing nomination of days of operation, ensuring not loading of prohibited contraband and dangerous goods, two

additional conditions have been provided:

- In case of incorrect declaration, only those multi-commodity wagons will be charged at a class rate of 200, which are found mis-declared.
- Modified forwarding note to be submitted by the freight forwarder as the time of loading, showing the final status. However, up to 20% modification of the wagons for each commodity will be allowed.

Supply of wagons, however, will be done by railways, subject to availability.

The changes made in the current policy have made it more restrictive. Stacking time at originating terminal and unloading time at destination terminal has been omitted from the Freight Forwarder Scheme. While earlier policy permitted all commodities, now traditional bulk commodities capable of transported by railways in train-loads have been excluded. This restriction deprives railways of the traffic where the customer is unable to offer a trainload and for them the only option is to move by road. Railways have also withdrawn the facility of assured supply of wagons on the nominated days, causing uncertainty in availability of wagons when it is required. In submission of forwarding note by the freight forwarder prior to transportation and at the time of transportation, only 20% modification is allowed, depriving the flexibility to the freight forwarder in case of any change in circumstances after the indent has been made. Similarly, the penalty in case of incorrect declaration of a commodity at the maximum class rate of 200 is quite restrictive.

## Role of Freight Forwarder in Indian Railways

The freight forwarder in Indian Railways acts as consignor who aggregates and ultimately offers traffic to the railways. Railways has both individuals and companies that operate as forwarders under this scheme. Generally, these freight forwarders have long-term contracts with the consignors, this provides stability and confidence.

The freight forwarders under Indian Railways work as nodal entities for aggregating and transporting less than wagonload volume to specific destinations. These forwarders have a pre-defined volume that is promised to railways annually. They are responsible for informing Indian Railways about the type and volume of commodities being carried with respect to origin and destination points. This saves railways the trouble of transporting less than train-load volume while increasing the freight basket of the railways and shippers are able to transport small volumes at lower rates.

## 5. Current Scenario of Freight Forwarder Scheme on Indian Railways

There are presently 21 origin points and 28 destination points, forming a total 72 operational routes on Indian Railways. These have been presented in Table 1. Maximum destination points are located in the Northeast Frontier Railway zone.

**Table 1 Origin destination pairs operational under Freight Forwarder Scheme**

Origin	Destination	Destination Zone
Adarsh Nagar, Delhi	Azara	NF
	New Guwahati G/Shed	NF
Alwar Goods Shed	Azara	NF
	New Guwahati G/Shed	NF
	New Tinsukia	NF
	Shalimar Junction	SE
Baran	Chang Sari	NF
Bharatpur Junction	Azara	NF
	Baihata	NF
Bhupdeopur	Azara	NF
	Chang Sari	NF
Daurai	Chang Sari	NF
Delhi - Kishanganj	Azara	NF
	Chang Sari	NF
	Dimapur	NF
	Jorhat Town	NF
	M/S JSW Steel Limited Siding, Tornagallu	NF
	New Guwahati G/Shed	NF
	New Tinsukia	NF
Erode Junction	Delhi - Kishanganj	NR
	M/S JSW Steel Limited Siding, Tornagallu	NR
Godhra Junction	New Guwahati G/Shed	NF
Gud Market	New Guwahati G/Shed	NF
Kanakpura	Chang Sari	NF

Origin	Destination	Destination Zone
Kankaria	Fatuha	EC
	Chang Sari	NF
	Jorhat Town	NF
	New Guwahati G/Shed	NF
	New Jalpai Guri Jn.	NF
	New Tinsukia	NF
	Salchapra	NF
	Sanathnagar New Goods Complex	SC
	Sankrail Goods Terminal Yard	SE
	Shalimar Junction	
Kota Junction	M/S Navkar Corporation Limited	CR
	Bangaon Junction	ER
	Gour Malda	ER
	Baihata	NF
	Chang Sari	NF
	M/S JSW Steel Limited Siding, Tornagallu	NF
	Gudivada Junction	SC
	Nuzvid	SC
	Erode Junction	SR
	Namakkal	SR
	Tiruppur	SR
	Trichur	SR
	Hassan Junction	SW
Linch	Azara	NF
	Bihara	NF
	Chang Sari	NF
	Jirinia	NF
	Jorhat Town	NF
	M/S JSW Steel Limited Siding, Tornagallu	NF
	New Guwahati G/Shed	NF
	New Jalpai Guri Junction	NF
	New Tinsukia	NF
	Rangapani	NF
	Salchapra	NF
	Sankrail Goods Terminal Yard	SE

Origin	Destination	Destination Zone
M/S J K Cement Works Limited Sdg.	Chang Sari	NF
M/S Continental Warehousing Corporation (Nhava Seva) Limited	Azara	NF
	New Guwahati G/Shed	NF
Palampur Junction	New Guwahati G/Shed	NF
Rajkot Goods Shed	New Guwahati G/Shed	NF
Ramgarh	Azara	NF
	New Guwahati G/Shed	NF
Siddhapur	Dimapur	NF
	Jorhat Town	NF
	New Guwahati G/Shed	NF
	New Jalpai Guri Junction	NF
Vapi	M/S JSW Steel Limited Siding, Tornagallu	NF
	New Guwahati G/Shed	NF

Sources Indian Railways, TERI Analysis

The overall loading under Freight Forwarder Scheme has varied significantly through the years. It peaked in 2015, where Indian Railways carried 2.8 million tonnes under Freight Forwarder Scheme. However, it has seen a decline in the loading ever since. The Scheme was significantly modified in 2009, wherein a large number of bulk commodities were restricted.

Owing to the composite class rate of 120 while loading more than two commodities, the commodities carried under Freight Forwarder Scheme are mainly in the range of Class LR3B to Class 180.

Figure 8 confirms that West Central Railway is the most active origin zone, transporting freight under Freight Forwarder Scheme to South Western railways, Southern Railways, South Central railways, Eastern Railways and Central Railways zones. However, the overall share of volume carried is less as compared to Northern Railway.

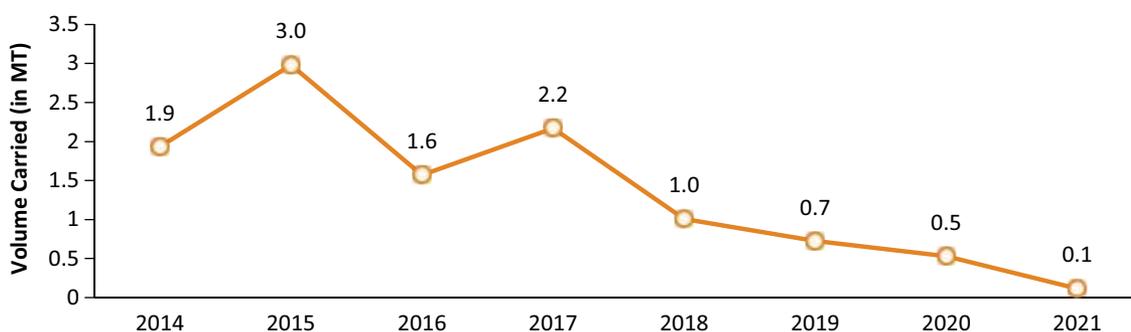
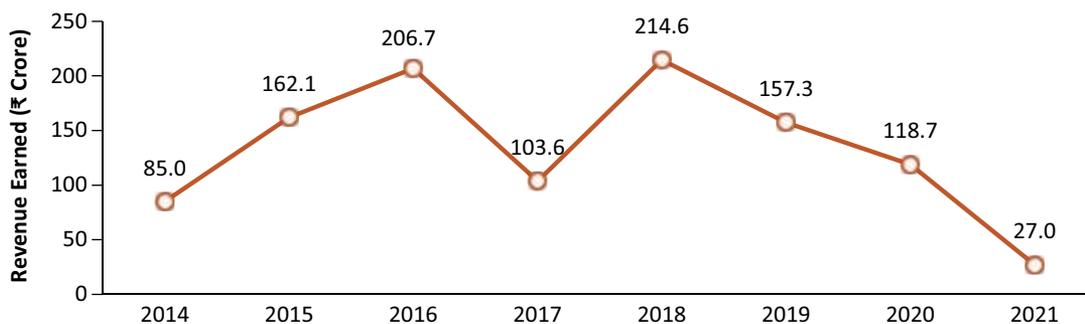


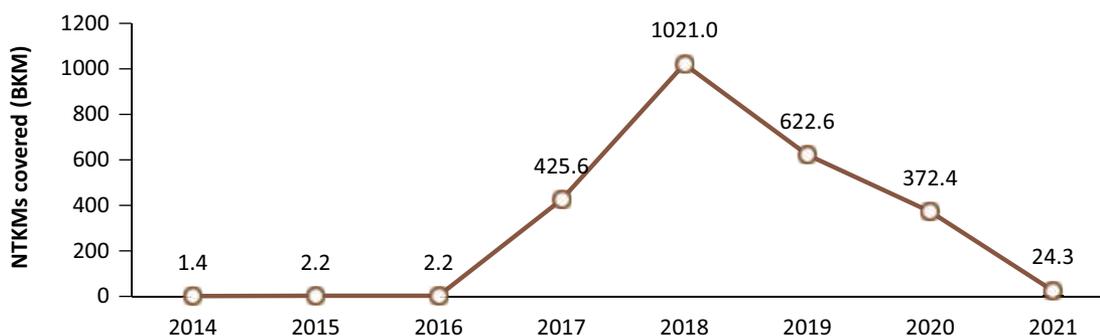
Figure 5 Overall volume carried under Freight Forwarder Scheme

Sources Indian Railways, TERI Analysis



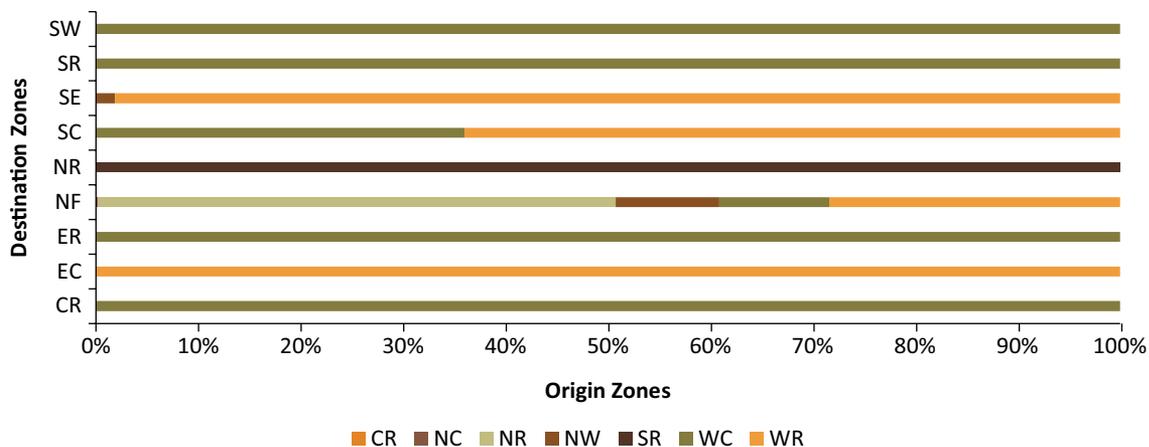
**Figure 6 Revenue earned under FFS**

Source: Indian Railways, TERI Analysis



**Figure 7 Net tonne kilometres (NTKMs) covered under Freight Forwarder Scheme**

Sources Indian Railways, TERI Analysis



**Figure 8 Zone-wise share of traffic movement**

Sources Indian Railways, TERI Analysis

## 6. Case Study | Kishanganj, New Delhi

Kishanganj Railway station is located at Beri Wala Bagh, Sarai Rohilla, New Delhi, Delhi. It falls under the jurisdiction of Northern Railway. Maximum volume is transported from Kishanganj under Freight Forwarder Scheme.



Figure 9 Kishanganj Railway Station, New Delhi

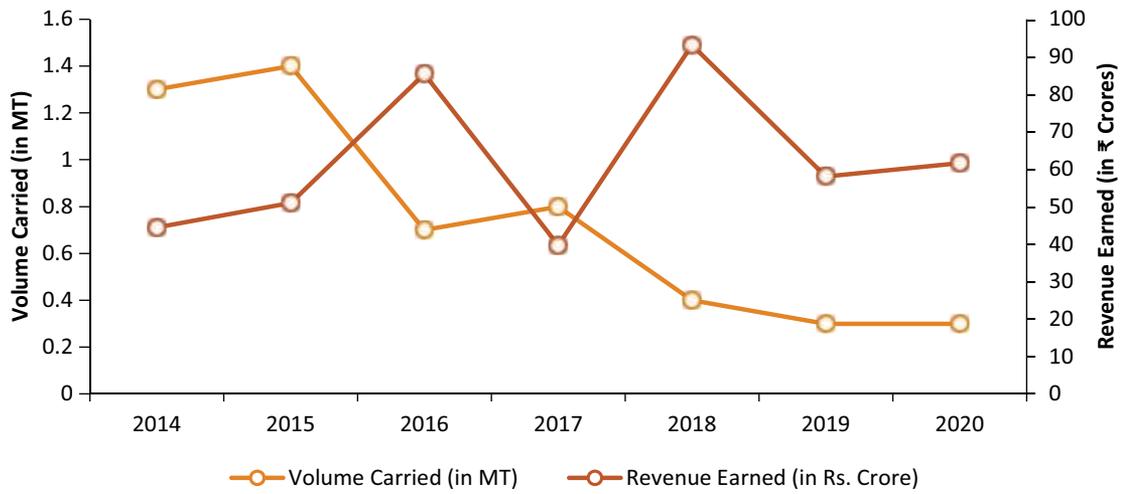
### 6.1 Current Scenario at Kishanganj

There is a single aggregator that functions as a host from Kishanganj under Freight Forwarder Scheme. It is seen that maximum traffic comes via road from Lawrence Road (Delhi) and GT Karnal Road. Some of the major destination points are Azara, Chang Sari, and New Guwahati.

On an average, daily volume shipped is 2660 tonnes, that is, 33 wagons. Due to the nature of the commodities such as pulses, rice, etc., primarily covered wagons are used at this location, that is, BCN, BCNHL, and BCNA, to prevent

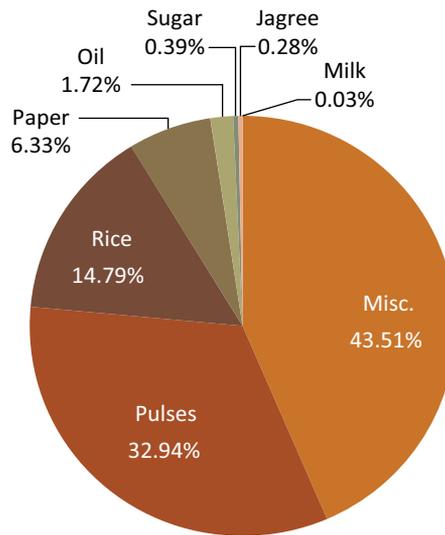
theft. Loading of goods takes approximately 18–20 hours per rake. Originating terminal charges and terminal access charges are INR 10 lakh per month and INR 53,000 respectively at Kishanganj.

Eight major commodity groups are transported from Kishanganj, of which pulses and rice account for nearly 48% of the overall share at Kishanganj, whereas other miscellaneous commodities account for 43% of the share which include grocery, cotton, alum, edible snacks, etc. The share of commodities for 2020–21 is presented in Figure 11.



**Figure 10 Volume carried and revenue earned: Kishanganj (2014–21)**

Source TERI Analysis



**Figure 11 Commodity share at Kishanganj (2020–21)**

Source TERI Analysis

# International Best Practices

## Deutsche Bahn Rail, Germany

### *Why is single wagonload essential?*

Owing to changes in the production processes and customization of industrial products, there has been a shift towards smaller volume goods. Prior to COVID, freight forwarders chose road over rail due to frequent incidences of late trains. The situation was improved by DB Cargo by offering additional trains services and increasing staff. They offered transportation of low-cargo volumes via rail in Germany and across Europe. They are equipping all the freight wagons with global positioning system (GPS) and sensors. Single wagonload service is essential in order to achieve the climate targets and reduce the traffic from road and is essential for small and medium freight forwarders. DB Cargo provides door-to-door service to companies with no private siding of their own. They offer complete service, from arranging the pre-carriage, onward carriage by road to provision of equipment.

### *Key Achievements*

- Transportation of approximately 15,000 wagons per day
- Reach stackers are used at private sidings for loading/ unloading wagons
- 100 railports, 42,00 railway sidings including inland ports in Europe
- Flexibility in terms of time, freight volume and routes, services up to five times a day
- Safe loading of goods in 45-foot containers
- Nearly two-thirds of carbon emissions savings as compared to road

### *Type of commodities transported*

- Containers and bulk goods
- Palletised goods
- Steel and metal products
- Chemical products
- Paper rolls

### *Advantage of single wagonload*

Reduced carbon dioxide emissions, particulate matter (PM), and other costs since customers don't have to book the entire train. This makes rail a greener alternative as compared to road.

### *Potential Issues of Single wagonload*

- It requires high-performance infrastructure and more access points along the network
- Requirement of equipment at warehouses for loading and unloading of wagons
- Introduction of new technologies such as digital automatic couplers.

## United States

### Comparison between railroads and trucks

In the USA, trucks are mostly used to transport goods on shorter routes or to transport expensive cargo. Trucking industry accounts for 86% as compared to 14% of railroad of the total tonnage carried. They have been fuelled by an annual average of \$25 billion for the past five years.

### Rail Intermodal

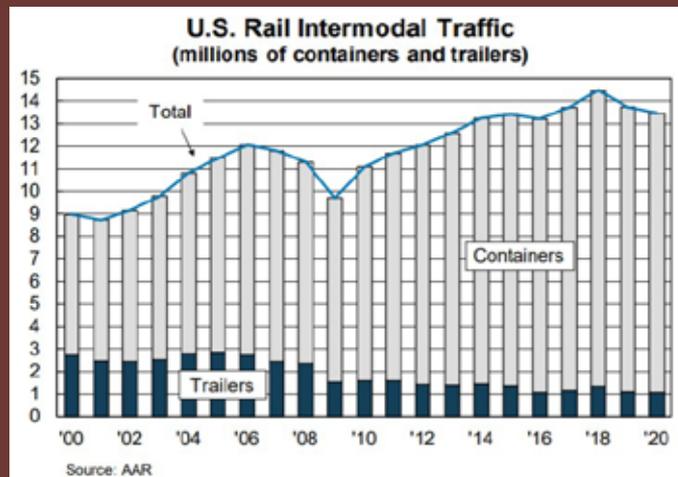
- Flexible service provided to the customers for long-haul movement at a competitive rate such that rail customers are paying the same price which was offered more than 40 years ago.
- It is combined with truck or waterways at both origin and destination points.
- Helps customers in tracking their shipment in real-time.
- Domestic share of intermodal traffic has increased as shippers wanted to take advantage of moving larger volumes of freight.
- Double-stacked containers increase the productivity and ensures traffic density to compete with truck movement. They can also be easily transferred from ships and trucks.
- One intermodal train can carry nearly 100 containers, thus reducing congestion on road and eliminating emissions, road costs, time, and fuel.

### Warehousing

Most warehouses in the US are equipped with warehouse management systems (WMSs) along with technologies such as radio-frequency identification (RFID), barcode, scanners, etc., this allows the company to have real-time information on inventory movement.

### Key Achievements

- It carries 61 tonnes of freight per American per year. In 2020, intermodal was nearly 25% of the major US railroads revenue; accounting for 13.5 million containers and trailers in 2020 as compared to 9 million in 2000.
- They have been able to provide new or expand existing inland terminals to facilitate transfer of containers and trailers between rail and road, increase track capacity to allow faster movement of trains, introducing new intermodal car and modernizing locomotive fleet.
- Intermodal terminals have upgraded the lift equipment that reduces emissions such as electric cranes.
- Provide information to the truck drivers about their gate entry before the time of arrival to check if the container is ready to pick up beforehand, which helps in reducing delays.



## Canada

### *Integrated Services*

Canadian Pacific Rail offers integrated services to its customers including railways, intermodal, trucking, freight forwarding, warehousing, and distribution.

It provides one-stop shopping for door-to-door transportation and has the ability to manage and plan logistics services using long-haul capabilities of railways and local abilities of trucking industry.

### *Intermodal Service*

They are responsible for first and last-mile connectivity of the shipment. They use standard containers and chassis for loading/unloading.

### *Key Achievements*

- They offer direct routes with 12 intermodal terminals strategically located at high-density areas.
- Extensive network of 100 transload facilities which allow containerization of goods.
- One of the largest fleets of refrigerated and heated containers.
- They have implemented portal live-lift for intermodal traffic moving between borders, which can lift single containers off of the trains for inspection by the authorities rather than the entire intermodal railcars – increasing the speed of shipping.

### *Type of Commodities Transported*

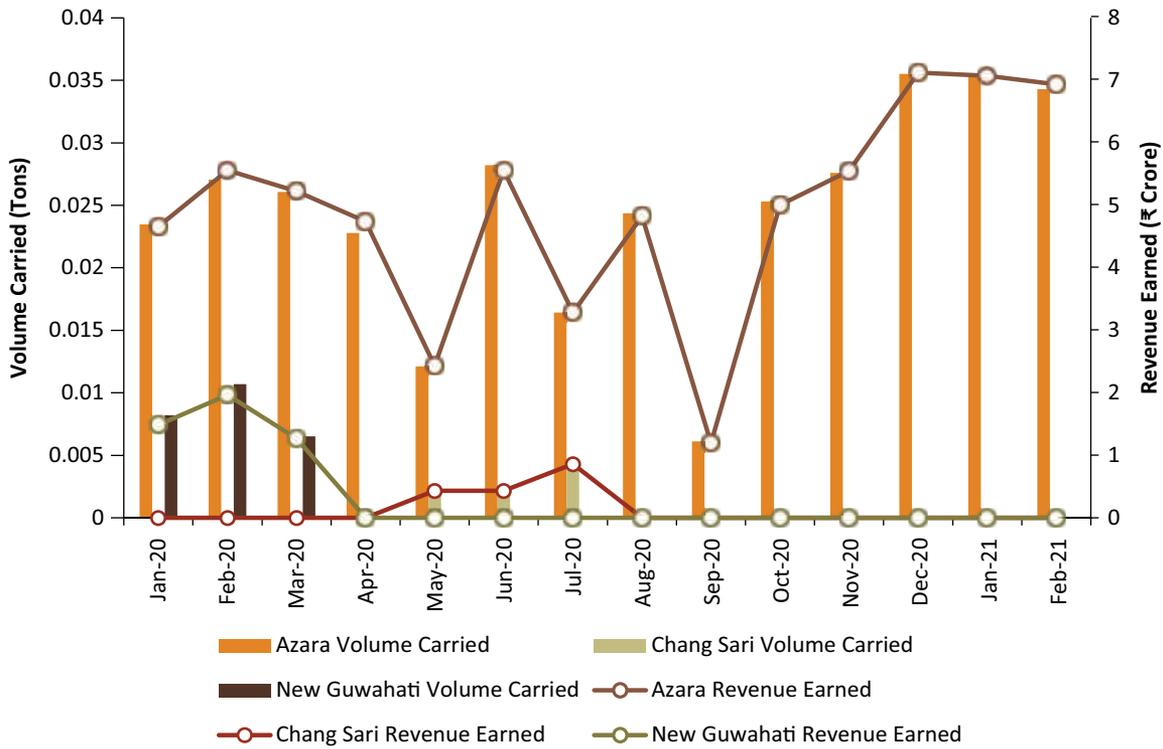
- Forest products
- Merchandise
- Steel
- Plastics
- Pulp and paper
- Liquids (regulated and non-regulated)
- Grain product

Three major destination points are located in North-East Zone, mainly Assam.

Figure 12 presents the month-wise volume carried and revenue earned for these destinations. Maximum volume is transported to Azara, Assam accounting for 0.34 MT, resulting in INR 69 crore in 2020–21, followed by New Guwahati (0.025 MT).

### **Facilities Provided**

Facilities
Office for freight forwarder
Labour shed
High-mast lighting
Loading and unloading areas
Railway safety seal



**Figure 12 Monthly volume carried and revenue earned (2020–21)**

Sources Indian Railways, TERI Analysis



Kishanganj Railway Station - Loading/Unloading Area



Unloading of goods - Truck to wagon



Doubling locking of the doors to avoid theft and loss



Lighting at Kishanganj

**Photo documentation of Kishanganj**

Source: TERI

## 6.2 Issues identified

Lack of basic amenities such as access to toilets and drinking water

Inadequate access to road – ultimately increases travel time and delays, causing more damage to the vehicles

## 6.3 Key requirements of the freight forwarder at Kishanganj

There should be provision of warehouses/specified locations close to the loading point for stacking 20%–25% of the goods at the railway terminals. Such a permission should be allotted to the freight forwarders at stations, depending on the amount of volume handled at that particular station.

## 7. Issues and Challenges

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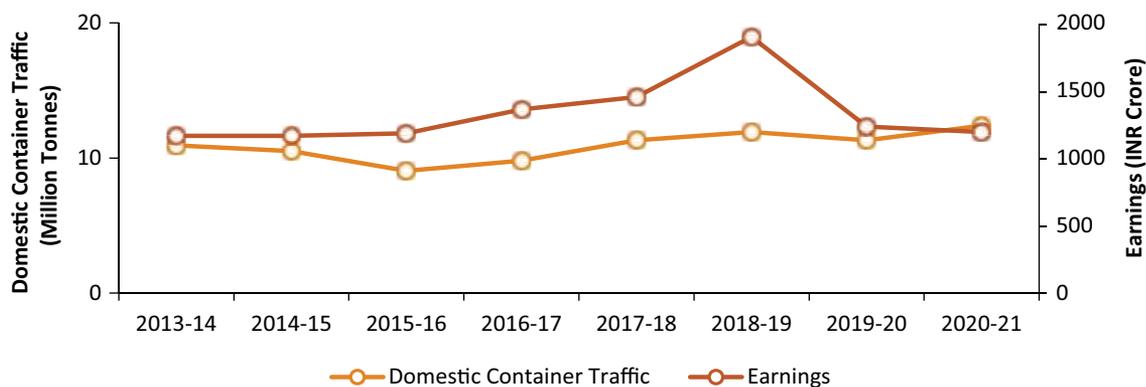
In a real sense, the Freight Forwarder Scheme was never able to take off despite many attempts in the past. The main reason has been Indian Railways' inability to meet the full demand of carriage of bulk commodities, particularly in the busy season because of capacity constraints. There are occasions, particularly in the lean season every year, when Railways is in a position to carry additional traffic since the traffic of bulk commodities declines. However, as soon as the busy season approaches, uncertainties of availability of wagons and congestion on important routes occur again. Railways' incapability to ensure availability of wagons throughout the year and their inability to assure the customer about likely transit time on account of route congestion do not provide much confidence to the shippers. Also, complicated rules and procedures deter the customers from patronising railway as a mode of transport and only option available to them is road, irrespective of occasional inferior service and higher freight rates.

**Domestic container operators:** As a strategy to attract non-bulk commodities in the late 1990s, Railways permitted Container Corporation of India to introduce domestic container service. Later in 2006, private container operators were allowed to provide similar domestic container services. It is one of the nine bulk commodities of the Indian Railways and currently accounts for about 4.7% of the overall freight traffic,

increasing at a compound annual growth rate (CAGR) of 6% from 2013 to 18, and about 5% of the freight earnings of Indian Railways. Domestic container operators, like the private freight forwarders, reported limited success and have similar issues and challenges to increase their presence due to stiff competition by road transport. Their inability to provide a reliable service on account of uncertainties in transit time which is invariably higher than road, abnormal terminal detentions, operational constraints, etc. have been the key reasons for limited success in the growth of business.

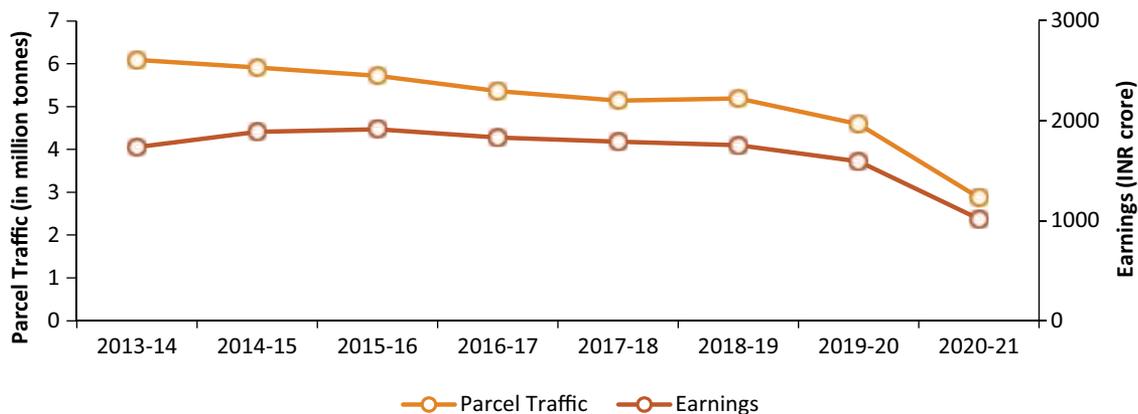
**Parcels:** One of the key approaches in order to enhance the role of freight forwarder is to address the concern of parcel segment in Indian Railways. Currently, the overall share of parcel in Indian Railways traffic is merely 0.23% and 0.87% of the total freight earnings (Indian Railways, 2021). Hard parcels and perishables including fruits, vegetables, etc., account for maximum share under parcel traffic, which demand faster transit and therefore are coupled with passenger trains for on-time delivery.

The Vision 2020 document suggested the need of a separate organisation to handle the marketing and sales aspects of the parcel services with guaranteed transit time and timetables and schedules. However, concrete decision on hiving off of parcel related activities is yet to be taken.



**Figure 13 Domestic container traffic and earnings on Indian Railways**

Sources Indian Railways, TERI Analysis



**Figure 14 Parcel traffic and earnings on Indian Railways**

Sources Indian Railways, TERI Analysis

Though the domestic container traffic has remained stagnant, the parcel traffic has rather declined. The inability of railways to address the capacity constraint has been the reason why parcel service is still coupled with the passenger business. An integrated approach through investments in rolling stock and handling facilities is the need of the hour, along with inclusion of freight forwarders for transportation of parcels. This is the only approach by which Indian Railways would be able to provide total logistics solutions to their customers and compete with the road sector as well.

Different heads and operations related to domestic containers, parcels traffic and freight forwarders should be merged under one institutional unit with a focus on moving piecemeal traffic while providing time-bound and safe delivery of the parcel traffic, by transporting it in containers. Essential goods, including newspaper, livestock, etc. could continue to be moved through Seating-cum-Luggage Rakes (SLRs). The remaining businesses should be segregated from the passenger business altogether.

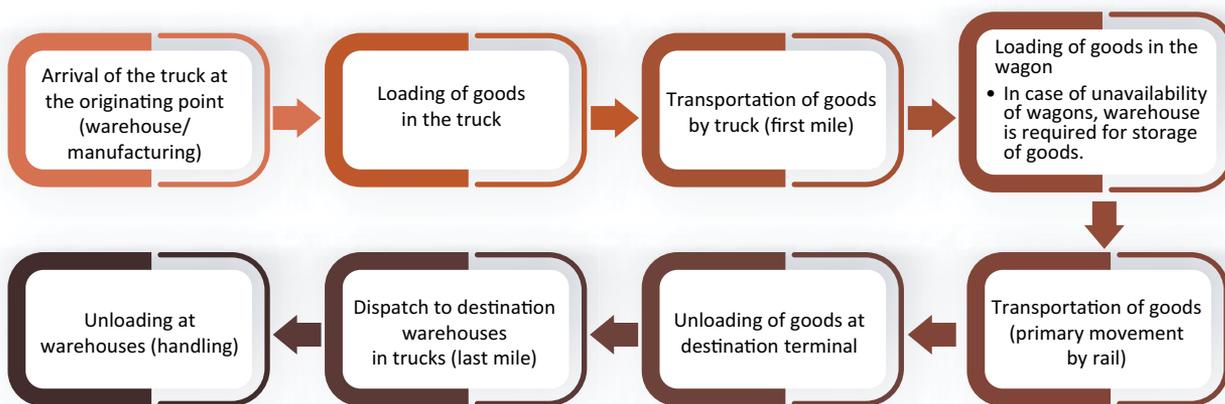


Figure 15 Process of transportation of freight by railways

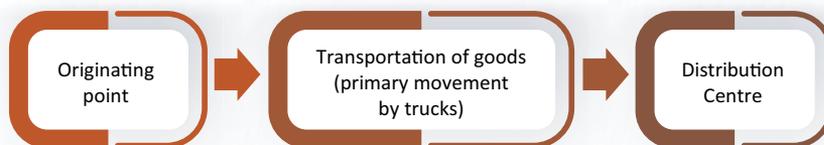


Figure 16 Process of transportation of freight by road

## 7.1 Comparison of Overall Cost of Freight Movement by Rail and Road

In absence of any competition by railways in non-bulk commodities, the road sector has been working as a monopoly; the only competition is between the service providers. Contrary to popular belief that railways have higher freight rates and they need to rationalise their freight structure, on most of the routes the road freight rates are higher as compared to railway rates. However, generally, the first preference of shipper of a non-bulk commodity is road over rail for a simple reason of complexities involved, multitude of conditions, lack of awareness of procedures, and even advantages of shipping by rail.

The overall cost of freight is divided into three categories—first and last-mile cost, handling cost at the loading and unloading terminals, and the haulage charges. Figure 15 and Figure 16 illustrate a general scheme of freight movement by rail and road.

### First and Last-mile secondary movement and handling cost

The total transport cost by rail involves two secondary movements by road to connect railheads at either end and multiple handling at the origination and destination point and the railheads. This gives inherent advantage to road over rail in both transit time and total transport cost borne by the shipper. The cost of transportation at either end by road and multiple handlings are reduced if the originating and destination points are located at railheads itself. Indian Railways offers a scheme under which the terminal operators can provide warehouses at the railheads to eliminate secondary movements with good results.

Analyses of bare freight rates without cost of handling and secondary movements by rail and road on selected routes are given in Comparison of freight rate: road versus rail. It is evident that the haulage road freight rates are significantly higher as compared to rail

freight rates. The table indicates that the road rates are 41%–67% higher than rail freight rates. Even if the cost of multiple handlings and first-mile and last-mile road movement are included, the total transportation cost by road will be comparable to rail in many cases. Apparently, there are other dominant factors that influence the shipper decisions of mode choice between road and rail.

As already stated, currently road sector is operating as a monopoly operator with little competition from rail, though there is competition among the service providers.

In addition to total transportation cost, other factors that influence the shipper’s mode choice are availability, reliability, transit time, and quality of service including safety and security of goods and access of information about transit of goods and procedures adopted at either end. The road has distinct advantage over rail in terms of availability, reliability, and access of information, though safety, security of goods, and frequently quality of service are suspects.

In order to attract non-bulk traffic, railways have to improve the quality of service, mainly in the form of guaranteed transit time, assured availability of wagons as per demand and provide access to information about transit. The freight forwarders can play a very important role by collaborating with railways by taking over value-added services at originating and destination points with specific objective of reducing the cost associated with multiple handling and detentions at loading and unloading terminals, inherent in a rail movement.

Secondly, the uniform rail freight rates throughout the Indian Railways network have not been able to compete with the dynamic freight rates adopted by the road sector. If not for the entire rail freight traffic, Indian Railways can establish a competitive freight rate structure, specifically for traffic handled by freight forwarders on a particular route. The simplification of rules and procedures at terminals would enhance the role of freight forwarders on railways and they can eventually increase the commodity basket by introducing new commodities that have little presence on railways.

### Transit Time

One of the most important factors determining the user’s modal choice is the transit time. Table 3 presents a comparison of transit time on various origin–destination points between road and rail. It illustrates that despite an inherent advantage of higher speeds, the transit time of railways is comparatively higher to the road sector on many sectors. It becomes a major discouraging factor, particularly when terminal delays are also added at loading and unloading points.

This would mean that the loading and unloading of goods would have to be swift with reduced turnaround time of the wagons. It would ultimately help in increasing the number of customers and the amount of volume being carried by the railways.

**Table 2 Comparison of freight rate: Road versus rail**

Origin	Destination	Road		Rail		Difference in freight rates
		Distance	Freight rate (Rs/tkm)	Distance	Freight rate (Rs/tkm)	
Delhi	Ahmedabad	950	3.0	871	1.3	58%
Delhi	Mumbai	1400	2.7	1368	1.2	54%
Delhi	Chennai	2000	2.1	2173	1.1	48%
Delhi	Bengaluru	2200	1.9	2227	1.1	44%
Delhi	Guwahati	2200	2.3	1831	1.2	49%
Delhi	Kolkata	1600	2.1	1451	1.2	41%
Delhi	Amritsar	460	3.1	453	1.3	57%
Ahmedabad	Guwahati	2500	3.1	2508	1.0	67%
Ahmedabad	Mumbai	540	3.0	497	1.3	57%

Sources Indian Railways, Indian Foundation of Transport Research and Training, TERI Analysis

**Table 3 Comparison of freight transit time: road versus rail**

Origin	Destination	Average transit time by rail (in hours)		Average transit time by road (in hours)
		To	Return	
Delhi	Ahmedabad	33	32	48
Delhi	Mumbai	62	59	72
Delhi	Chennai	109	114	96
Delhi	Bengaluru	153	102	96
Delhi	Guwahati	127	114	168
Delhi	Kolkata	81	78	96
Delhi	Amritsar	34	25	10
Ahmedabad	Guwahati	211	305	216
Ahmedabad	Mumbai	43	39	48

Sources FOIS, Indian Railways

### Lack of adequate facilities at rail terminals

Majority of railway goods sheds lack basic infrastructure facilities such as good road connectivity; as most of terminals are located in congested and dense city areas where the movement of heavy trucks are restricted during daytime. The quality of approach roads is generally far from satisfactory due to poor maintenance either by civic or railway authorities due to lack of adequate funds. Basic amenities like drinking water, wash rooms, electricity and security also are inadequate.

Maintenance of goods terminals has not been a priority area for railways. The handling facilities are generally non-mechanised as the consignor or consignee is responsible for loading and unloading at railway goods sheds. Mechanisation of handling facilities and provision of specialised material handling equipment that help in rapid loading and unloading and speedy clearance of goods from terminals, is generally absent. Although, new policies of provision of warehouses by private sector are in place, not much progress has been made in this regard. There is a lack of an integrated data set which would define the type and volume of commodities being handled at each freight forwarding terminal. Such an approach would directly help in understanding the



Access road to FFS terminal

Source: TERI

type of mechanization required (if any) at that particular terminal and warehouse.

Provision of railway land and plots on lease to the regular customers has also become cumbersome during last few years, possibly due to incidences of misuse of facilities and concessions putting genuine customers in difficulty. They have to look for private land nearby the railway terminals for setting up warehouses and other storage facilities, this will increase the overall cost of service.

## 8. Recommendations

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There is general recognition now that the Freight Forwarders or aggregators can play an important role in bringing back a large chunk of low volume non-bulk goods particularly low and medium goods. The Total Transport Study Report (2006) estimated a large movement of heavy trucks on routes linking metropolitan cities and other important cities. Railways can exploit its advantage of being able to provide lower transit time and freight rates as compared to road sector's heavy trucks by laying down enabling policies in collaboration with freight forwarders, aggregators and logistics operators. This will not only help its penetration in non-bulk goods transport market where its presence is almost non-existent, but also increase the freight basket of IR. Introduction of policies time and again will not help in achieving the ultimate goal which achieving 45% share of railways in the freight traffic. Therefore, the entire realm of rail freight aggregation needs to be looked from a different perspective, by a different body.

Currently, the domestic container operators and freight forwarders are engaged in similar activities with same objective of attracting non-bulk traffic to railways. Although, historically the parcel traffic was a component of coaching services, a parcel is defined as a good carried by passenger train or separate parcel train due to its nature and need for faster and assured delivery. However, now all goods traffic except low value goods requires assured delivery.

There is a general feeling among railways that parcel traffic is a loss-making business and it has been sometimes argued to give up this business. Stacking of parcels for loading and unloading on the passenger platforms is also an irritant to the passengers and many a time a cause of avoidable detention to passenger trains, particularly road-side stations. Essentially the freight forwarders, domestic container operators and parcel operators perform similar functions. It is an appropriate time to classify parcels as a good and no longer a part of coaching services, The parcels should be dealt at goods terminals except small components like newspapers, books and magazines, courier services etc. that requires to be carried by passenger trains.

The domestic containers, parcels and other non-bulk traffic that is carried by freight forwarders should be

brought under one policy framework bringing synergy in their operations. As of now, all of them are operating under different policies as there were introduced at different times.

A freight forwarder should be viewed as a strategic partner who would assist railways in the following ways:

- Collect low and medium volume bulk traffic which is not amenable to forming of a train-load by the shipper. The freight forwarder would combine such shipments in to train-loads and offer it for carriage by railways.
- Collect non-bulk traffic of any shipment size, both high-value and low-value goods and offer to railways as train-loads for carriage.
- Arrange for delivery of goods at destination points.
- Take responsibility for compliance of packing conditions, following all the commercial formalities and also for settlement of claims in case of any damage or pilferage during transit.

### 8.1 Guaranteed delivery of service

The modal choice decision of the customers is undoubtedly based on how fast can a transport mode delivers their goods in least time, in a safe and secure manner, and at low-transport cost. Railways' inability to provide a guaranteed delivery service is the biggest handicap in attracting customers. Wherever the railways have laid down time schedules for specialised services, it was not able to adhere to its own schedules. With the expansion and augmentation of capacity on many routes, it may be possible for railways to provide guaranteed delivery time with better monitoring and supervision. Guaranteed delivery service will improve the credibility of railways and instil confidence in transport users.

### 8.2 Terminal Facilities

Provision of terminal facilities will help in cutting down terminal detentions and the overall time at either ends as it may become comparable to road sector, which has inherent advantage of providing door-to-door service. For this, railways will have to adopt a proactive approach, giving up their traditional practice of passing

on all responsibilities of loading, unloading, storage, and removal of goods to the consignor and consignee.

Secondly, Indian Railways should make railway land available at nominal lease rent and permit them to provide warehouses/storage spaces for a reasonable time of 10–15 years. They should also be encouraged to provide mechanisation of handling operations either by themselves or third-party operators.

At many goods sheds that are located in city areas where not only space is limited for expansion of facilities but even movement of heavy trucks is restricted during day-time, a suitable location at any other railhead may be developed in consultation with stakeholders.

### 8.3 Access Facilities

Adequate all-weather roads should be constructed as per city's master plan, depending on the road hierarchy. Street lighting, road signages, and markings would act as supplementary infrastructure while accessing the terminals. Planning and designing of access roads should be viewed as a primary aspect of terminal facilities. If resources are a constraint, a terminal operator should be roped-in for providing facilities and should be levied a user charge on mutually agreed terms. The user charges should be collected by railways from the shippers and paid to the terminal operator responsible for construction, maintenance, and operation of facilities.

### 8.4 Facilities for handling

The railways would have to incur additional cost for warehousing, which should be incorporated in the budget. In case of lack of space at the freight-forwarding terminal itself, railway land (if available) should be provided near the freight-forwarding terminal at a cheaper rate. The freight-forwarding policies should emphasise on the need of setting up aggregation facilities by the railways either themselves or through investments from private players, without which the role of an aggregator would remain limited. Since the flow of trucks within a developed-compact city may hinder the overall traffic flow of the city, proactive policies should establish guidelines for the location, size and design of freight-forwarding terminals.

## 8.5 Standardization of warehousing facility

For freight forwarders to prosper and increase their impact on the Indian Railways, it is essential to provide them with a warehousing facility. Warehouses or storage facilities at railheads is an important element in transportation of non-bulk commodities. The following facilities are needed for setting up a warehouse at railway goods sheds:

- Design
  - Area
- Safety
  - Secured gated facility
- Types of facilities
  - Shared warehousing
  - Single-product storage facilities, for instance, coal
  - Equipment sharing
- Amenities of warehouses
  - Type of equipment
  - Type of technology
- Supporting infrastructure
  - Labour shed
  - Truck maintenance yard
  - Weigh bridge

## 8.6 Mechanization in warehouses

For speeding up the process of loading/unloading of goods from trucks to warehouses and warehouses to wagons could be addressed through introduction of pallet jacks, forklifts, hand trucks, stackers (for heavy goods). Liftgates can be used to load and unload goods from and into the trucks. It would save transit time and the damage to the goods caused by manual movement.

Palletization would facilitate optimum utilization of the warehouses, create a systematic and efficient method of loading of consignments, making it easier for the mechanized-handling equipment to transport goods. It prevents workers from moving goods manually, which increases the safety of goods and workers. The stock can be strictly monitored since the aggregators would have an idea of each stock level.

## 8.7 Need of increased investments in warehouses

Railways may strengthen their existing policy of permitting private players to invest in the warehouses and facilitate at railway goods sheds. It may help them to attract more traffic and will provide a great support to the freight forwarders for collection, storage, stuffing, and destuffing at the warehouses.

Investment in rolling stock, storage facilities, handling facilities at loading and unloading points, would increase the efficiency of the aggregators and ultimately help to offer more traffic to Indian Railways.

## 8.8 Design of wagons

Indian Railways should invest in designing a service which is commodity specific. This could be segregated into three categories: bagged commodities (covered wagons), liquid commodities (tank wagons), and unbagged commodities (open wagons) and special wagons that are suitable to a particular commodity.

Railways' policy of providing special wagons through private investors and wagon-leasing companies has a limited success for variety of reasons, mainly delays in development of a wagon which involves railways' approval at a number of stages causing avoidable delays. Instead, railways should take responsibility of developing and offering it to the users for carriage.

Further, the wagons should be designed in a manner that the space is optimally utilized for transportation of smalls, parcels, FMCG traffic. It could be further segregated into low-value and high-value traffic as low-value commodities can bear longer transit time as compared to high-value traffic which requires faster movement and quick delivery.

The size of a wagon should be standardized with respect to the height, size, capacity and should be equipped with latest technologies. Railways could encourage investments from private players to accelerate the process of manufacturing and leasing of wagons once a special wagon is put in service.

## Addressing need of on-demand wagons

One of the main aspects of guaranteed delivery is the on-time supply of wagons, which is a major shortcoming of Indian Railways, which the trucking industry has

been able to capture. If the Indian Railways is able to offer guaranteed time through freight aggregators, it would increase the reliability of goods on railways along with customer loyalty. Technology-based solutions to determine the availability on wagons on routes would be key in addressing the concept of on-demand wagons.

The railways should ensure that unnecessary delays in running of freight train should be eliminated so that assured delivery schedules could be adhered to. Since railways face stiff competition from road in freight traffic, improved transit time of freight trains would be able to increase the operational efficiency. Customers may be willing to pay more, if they are guaranteed assured delivery time which is an essential requirement of today's logistics operators. Additionally, terminal detentions should be kept to minimal for ensuring the safety and security of goods. Building a credibility of railways among the shippers is a necessary element for enhancing the share of railways in highly competitive non-bulk freight traffic market.

## 8.9 Defining the roles

In a system where railways work as transporter, a terminal operator looks after the terminal operation and freight forwarders perform marketing function, bringing the freight traffic to the railheads and also clearing it from destination terminals, their roles should be clearly defined.

### Role of Railways

The Indian Railways should take responsibility for all commercial functions including acceptance and delivery of goods and collection of freight and other charges from the freight forwards and other consignors. No cost of commercial staff may be passed on to either the terminal operator or the freight forwarder. The user charges for terminal operator should be also collected by railways and later reimbursed to them.

Railways should also share the infrastructure improvement costs if proposed user charges are not adequate to take care of cost incurred by the terminal operator to minimise the terminal detentions as in long run it is going to be beneficial for attracting more traffic. Identification of railway terminals or private freight terminals which are suitable for freight forwarding operations should be carried out by railways.

## **Role of Freight Aggregator**

The aggregator is responsible for bringing the goods and offer it to railways after observing packing conditions and other rules and also ensure taking delivery by paying all dues to railways on account of freight charges and other applicable charges such as monthly terminal charges, first-and last-mile cost, cost of packing and repacking, loading/unloading charges, labour charges to the railways and the terminal operator.

Aggregators would be responsible for ensuring the safety of the goods loaded at origin point and unloading at the destination point. They should be given the liberty of

bringing in both bulk and non-bulk commodities that are being transported in smaller volume. They should not be constrained in terms of capacity, which being the basis of Freight Forwarder Scheme, should be completely removed.

## **Role of Terminal Operator**

The terminal manager would be responsible for terminal operation including any activity that is mutually agreed with railways and the freight forwarder. They should ensure proper stacking of goods at the warehouses and loading from the warehouse to the wagons.



For more information, please visit: <http://www.teriin.org/>

