

# Wheels on Fire: A Study on Declining Freight Transportation Trends of Indian Railways in Comparison to Other Competitive Modes

## Abstract

The key activities of Indian Railways are transportation of freight and passengers. IR transports more than one billion of traffic annually. As against a growth rate of 4% to 4.5% in the last few years, IR is likely to achieve only 1% growth in 2016-17. This is indicative of a plateauing of the growth in freight traffic which accounts for nearly two-third of IR's revenue. IR is losing its market share in high rated freight commodities and it's overall share of freight has come down from 89% in 1950-1951 to 40% in 2000-01. This paper traces the factors leading to this decline and searches for a set of solutions.

**Keywords:** Freight, India, Railways, Transport, Growth, Traffic, Demand, Ministry.

## Introduction

"Railways, perhaps along with post offices, are the only two institutions in India with a deep network which if tapped judiciously can create substantial improvements in the hinterland. Railways was always considered only as a mode of transport in our country, we want to see Railways as the backbone of India's economic development."

-Shri Narendra Modi. Prime Minister of India December 25, 2014.

Indian Railways is the lifeline of the nation. It traverses the length and breadth of the country providing the required connectivity and integration for balanced regional development. The system never rests; it has been up and working unceasingly for the last several decades. It is an integral part of every Indian's being.

It is one of the pillars of the nation. In an earlier era, the Indian Railways have been described as "imperium in imperio", an empire within an empire. The size and scale is gigantic. The USA, China and Russia are the only countries that have longer railway lengths, measured in kilometres.

Transport Sector is the lifeline of any developing economy. The growth and development of any nation truly rests on the growth of its transport sector. Transport provides access to people, supports economic activities, and facilitates social interactions. India's transport sector is large and diverse and caters to the needs of about 1.03 billion people. In terms of modal share, road sector is much ahead of other forms of transport for both passengers as well as freight movement. In terms of passenger movement (passenger kilometre), the share of roads, railways and air is 86.70%, 12.90% and 0.40% respectively. The shares in freight movement (tonne kilometre) for roads, railways, air and water transport is 61.20%, 38.60%, 0.02% and 0.20% respectively. This study aims to discuss the competition issues in one of the most important transport sector- the Indian Railways. To identify and understand the aspects and results of competition, the study has referred to the Competition Assessment Framework (CAF) developed by Department of Internal Development (DFID).

## Problem

There has been a continuous decline in the share of rail in the total goods traffic. Between 1970-71 and 2004-05 share of railways in freight movement declined from 70% to 39%. Several factors have contributed to the decline in railways freight segment. There has been substantial development of motorized road transport in freight movement. The greater share of the road mode in transport demand is



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explained by inherent advantages in terms of accessibility, convenience, and door-to-door delivery. The decline of the market share of railways vis-à-vis roadways in freight can also be explained though the ratio of its freight fares to its passenger fares. Large scale cross-subsidisation of passenger services by overcharging certain categories of freight has led to the diversion of freight traffic towards road, preventing the railways from performing according to their comparative advantage. Lack of customer oriented services is also an important part of the problem. Transport models over the last few decades have been driven by cost reduction and increased speed of freight movement. The average speed of a freight train was 22.7 km per hour in 1989-90. At present a goods train's average is 24 km per hour which is very low as compared to other developing countries. In 2015-16, the railways have experienced negative growth in the traffic of cement, food grains, containers and steel. The only redeeming factor seems to be coal and fertiliser traffic, which has shown a healthy growth. The growth of freight traffic is largely a reflection of derived demand and combines both the supply side as well as the demand side aspects involving the activities of various stakeholders in the economy. Indian Railways may suffer a shortfall of almost 80 MT of freight loading than the target for the year 2016-17. Coal is going to give major setback, losing approximately 30 MT as indicated by the trend of loading till January, 2016 in the current fiscal. Moreover, the share of IR in coal transportation has also been lower despite some growth has been registered in overall coal consumption. These dampening factors is not likely to let the coal loading for IR to be more than 555 MT as against the targeted 585 MT, despite healthy growth of about 10 % shown by the coal India limited.

Other than coal, major commodities facing shortfall in loading on IR, are cement, iron ore & finished steel, food grain and containers. All these commodities together have given a dip of approximately 50 MT from the targeted quantum for the year 2016. Slowdown in demand due to various factors as seen by the trend of loading in the current fiscal is likely to cause a shortfall of about 15 MT in cement loading and almost 9 MT in the segment of iron ore and finished steel taken together. Global slowdown has been identified as the main cause of likely shortfall of about 9 MT in the container sector of IR loading. Another 18 MT of shortfall is likely to be in the food grain segment identified as an outcome of current food grain scenario in the country and adoption of decentralised procurement. Overall, the freight traffic of IR is likely to be at the level of 1107 MT, with the growth of around 1 % only, which is indicative of a plateauing of the growth of freight traffic.

### **Analysis and Findings Competitive Modes**

The overall share of freight of IR has come down from 86 % in 1950-51 to 30 % in 2015-16. It is evident that the road sector has captured the largest share of freight. In recent years, the pipeline has

captured some share through the POL movement. Coastal shipping has emerged as a potential competitor for IR. Due to lower prices, some bulk traffic like coal, iron ore, POL and even cement is now being moved by coastal shipping. Inland waterway transport is a probable mode though a lot more investment is needed to make it effective. IR's own freight policy had many inadequacies. The freight segment was overpriced without being sensitive to the pricing frame of the competitive modes. In order to deal with swelling costs, it was politically convenient to increase freight fares rather than passenger fares. Fares constitute but one element of the total logistics costs faced by the customers. The other cost elements are an outcome of the shipment volume, first mile and last mile inter-modal access, reliability in transit times, and the availability of wagons as per requirement. The fare-to-freight ratio chart gives a very good idea of how the freight segment subsidizes the passenger business. This has two major implications. On one hand, it makes the competitors of the railways in the freight business more competitive not because of latter doing anything but because the railways have priced themselves out. On the other hand, low passenger fares attract more and more demands for passenger services, which consume precious line capacity that would have otherwise allowed the running of more freight trains or the introduction of more long distance passenger services. By correcting this ratio, IR has a chance to regain its lost status as the prime mover of the country.

Two important considerations are worth mentioning here. The first is the decline in the prices of diesel that remain an important consideration for freight transportation and substitution by the roadways with the railways. During the period April-December 2015, diesel prices showed a continuous fall as compared to the price prevalent during the corresponding months of 2014. There has been a substantial investment in roads and one may observe the growth in the road length of the National Highways. This has had a substantial impact on decongestion in road sector and had led to higher freight movement and transportation.

The sectors that need intervention in terms of freight (basically the highly elastic sectors) may be handled with care, and the comparatively inelastic goods that may not go over to other modes of transport may be chosen for other forms of freight intervention by IR. In this regard, the following important points are worth mentioning: In India, 57% of the freight is transported by road, 36% by rail, 6% by water and less than 1% by air, according to a 2011 report by the global consultancy firm McKinsey. The infrastructure sector in India will witness massive changes and transformation during the next few years as the government is converting many four-lane roads and highways into eight lanes. A large number of national highways will also be turned into expressways. The necessary permissions and approvals to undertake such assignments have already been obtained. Traffic congestion has grown steadily. However, since the beginning of planned

railway development, the rail route kilometre length has increased by just 23%. Railway development needs commercial orientation and investment needs to be increased for attaining growth of freight traffic, which is the mainstay of IR's earnings. It has been observed that the railways have steadily lost their share in freight movement to road transport. For all freight, this share has dropped to 30% from a peak of 86% over the past 66 years. The NCAER analysis suggests that IR's share in freight transportation will fall to 26% by 2020. Considering that the average distance over which the railways carry a tonne of cargo is around 600 km, an increasing trend in freight rate over the years has cut into their share of goods traffic. With industrial units being increasingly set up near raw material sources, this advantage enjoyed by the railways may diminish in the future. Although the railways have enjoyed an advantage in bulk commodities, wherein they offer siding facilities, yet considering the service quality and a 20-kmph average speed of a freight train, this advantage would take a beating. Besides, while the roadways offer door-to-door service, railway movement sees the additional cost of door-bridging as well as the cost of handling involved at either end. In the case of railways, the freight rates are fixed on a distance basis without taking into consideration the geographical, directional or seasonal variations. The pricing continues to be based on uniform distance and commodity classification. Owing to the high cost of freight movement, the logistics cost in the country (including inventory control, transportation, warehousing, packaging, losses and related administration costs) is estimated at roughly 13% of the GDP. This is higher than the corresponding figures for other major economies, as per the Working Group report of the Planning Commission on logistics. The corresponding figures for US, Europe and Japan are 9.9%, 10% and 13.4% respectively. India's emergence as a manufactured products outsourcing hub is, therefore, threatened by costly logistics. It is imperative to reduce the freight rate and consider it for alignment with other key stakeholders while also promoting strong customer relations.

#### **Cross Subsidization - The Dissonance between Rail and Road**

Of course, Indian Railways retains its dual role as a public utility and a commercial organization. This is also reflected in the tariff policy, which has also been dual over the years, with passenger fares moving up just 28% over the last decade compared to a 91% increase in freight rates. Hence, over the years, the railways have increased cross-subsidization in order to offset the losses incurred on passengers through additional revenues (by fare hikes) from freight.

A study by the World Bank of the largest railway systems in the world in 2012 showed that adjusted for PPP, India had both the highest freight costs and the lowest passenger fares, thus clearly indicating the burden that the railways are trying to shift onto their freight customers, which is accelerating the shift onto the roads for Indian industry. The preference for passengers in rail is not

just in terms of fares. It also extends to priority, with freight trains moving at around half the speed that passenger trains do (25.9km/hour in F2014 vs. 50.6km/hour for mail / express passenger trains). This has resulted in faster growth in passengers, and crowding out of freight – share of freight as a percentage of movement by rail has been falling consistently for the last 60 years. With the share of freight (passengers + freight) movement down to just 39% in 2014, India has fallen behind not only countries with large land masses (USA, Russia and China) but also even much smaller ones. Of great interest, the same logic of cross-subsidization seems to reverse when applied to the roads sector. Despite the recent catch-up, the tax on diesel has consistently been kept lower than that on petrol, ostensibly because higher diesel prices would have a cascading effect on the prices of all goods transported by trucks and railways, and on farm produce. Hence, in roads, freight is afforded preference over passengers, while it is the opposite in rail.

#### **Underinvestment in Railways**

The railways have been suffering from chronic under-investment over the last 60+ years. This is probably a combination of the strong rail network, India had at the time of independence, vs. the weak road network and the state + central nature of roads investments, vs. the railways, which rely only on funding from the latter. Taking the rail network for granted, Indian administrations have allocated (in budgets) nearly 5x the amount spent on rail on roads over the last 15 years. In fact, the dividend paid out by the railways to the government (the budget allocation is accounted for as perpetual debt, and interest paid out on it) has been 30-50% of the allocation over the last 15 years, meaning that the net contribution to the railways from government funding has been even smaller. This has meant that while the physical road network has grown 12.5x (national highways have grown 3.6x) over the last 64 year, the rail network (in route km) has grown just 21%.

Of course, while the underinvestment vs. roads is fairly clear, it is also important to have a global context for the size of the underinvestment. Overall, if the trend across the globe on rail vs. Roads' spending is similar, and then this argument might lose most of its strength even in the Indian context. However, on a global comparison, we can clearly see that not only is India one of the worst economies on this front, but that the last decade has also been characterized by an increasing share of rail spending (within rail and road spending) across the globe.

#### **Poor Utilisation of the Available Rail Funding**

Though railways haven't got their fair share of funds from the government, it is important to remember that unlike in the case of roads, internal funding was actually more important for railways, contributing as much as 65-70% in the first Five-year Plan, even as recently as 20 years back. However, we believe that there has been a constant misallocation of resources, led by politics and the social service obligations of the railways,

leading to constant announcement of newer projects (lines, stations, trains, etc.) The railways have been used as a source for dispensing political largesse (traditionally factories, trains, jobs and stations) in the key constituencies for every administration, without any regard for profitability of such capex.

In 2013, the Planning Commission looked at the profitability of ongoing projects in the railways (as of April 1, 2011). It found that even though projects for new lines were the worst avenue for investment, with only 8% of the projects meeting the railways' target rate of return (14%), they still received the lion's share of the investment. Given the significant investments in projects which actually have a negative rate of return (62% of total), internal generation has been getting choked. Even worse, personnel expenses have constantly risen (especially after the Sixth Pay Commission), which has brought internal generation down to just 28% in FY2014. We expect the Seventh Pay Commission to hit internal generation further; media articles (e.g., Financial Express, November 20, 2015) indicate that the railways would have to bear ~ 25% of the total burden imposed on the government.

#### **Suggestion**

#### **Dedicated Freight Corridors (DFC) – A Slow Beginning, But Key to Growth**

Of course the DFC will be a significant part of this ramp up, with projections by the Ministry of Railways indicating that it will carry 305mn tons (including both the eastern and western corridors) of cargo by FY2022. This is a 2,788km (excluding the 534km Dankuni-Sonnagar section to be built through PPP funding) dedicated freight corridor (no passenger trains) that the Railways are constructing with funding support (67-80% of projects capex) from Japan International Co-operation Agency (Rs387bn on Western corridor) and the World Bank (US\$2.73bn on Eastern Corridor) at cost of Rs 815bn .

Around 85% of the land required for the Eastern and Western DFC has been acquired already, though our discussions with the Rail Ministry indicate that 100% of the land is now in possession of the railways, clearing the DFC's biggest potential stumbling block. Though only 65% of the DFC (in track length) has been awarded as of now, the awards process has picked up in 2015 (between January to August 2015, the DFC awarded contracts worth Rs170bn vs. Rs130bn in the 10 years prior to that). Our discussions with the Rail Ministry indicate that the award process has completed by June 30, 2016, setting the stage for both corridors to be fully operational by December 2020, though part of the Eastern DFC (a 55km section between Durgawati-Sasaram) will become operational in FY2016. The railways also plan to follow this up with another four dedicated freight corridors. They have already asked DFCCIL (Dedicated Freight Corridor Corporation of India).

The implementing body for the current corridors, to do traffic surveys for them: East-West Corridor (Kolkata-Mumbai) - 2330km , North-South

Corridor (Delhi-Chennai) - 2343km , East Coast Corridor (Kharagpur-Vijaywada) - 1100km , Southern Corridor (Chennai-Goa)- 899kms ,Of course, if the new corridors are to make a difference, they will need to be implemented a lot faster than the Eastern and Western corridors, which – if the current timetable holds – will have taken 15 years between traffic studies (May 2005) and becoming operational (December 2020). According to our latest interaction with the DFCCIL , it has already completed the traffic surveys for three of four new proposed corridors and believes that the returns on at least two of them are higher than for the Eastern and Western corridors. Though the first two corridors have taken longer, management believes that the learning value from those will ensure that the others can be completed in 7 to 10 years.

#### **Expand Railways' Capacity Substantially**

The reason that the railways have been losing share to roads despite all the advantages they have as a mode of transport is overcrowding. The Committee for Mobilization of Resources , which submitted its final report in June 2015, highlighted that 60% of Indian Railways' lines were running above a capacity utilization of 80% . The situation on the High Density Network was worse. Even though it makes up only 18% of the total IR network, it carries 56% of the traffic, with 88% of the lines above the optimum utilization. Of course, historically, instead of going into doubling, investments have gone into new lines, despite lower returns and rolling stock. However, the plan for the next five years is rather different, with network decongestion finally to get as much investment as network expansion vs. the past 10 years, where investments in doubling were half the investments in new lines. The target set by the Rail Ministry over FY15-19 is to lift annual freight carried from 1 billion to 1.5 billion tonnes. The Ministry indicates that it also plans to bring capacity utilization down from around 100% at the moment to below 80% (optimal). Hence the capacity expansion in play is more like 80-90%, rather than the 40-50% implied by the freight targets. Part of this would be through the promised 20% increase in track length (from 114,000km to 138,000km) over the same time frame. In addition, the railways have announced plans to: Fast-track 7,000kms of double/third/fourth lines with 1200km out of that being commissioned in FY2016 itself (investment of Rs87bn), Start 77 new projects for doubling/tripling/quadrupling another 9,400km along with their electrification (investment of Rs962bn) ,Prioritize construction of longer loops, creating smaller block sections, building bypass lines, making crossing stations, augmenting terminals– all with the aim of decongestion.

#### **Make Railways Financially Self-Sustainable**

This is probably the single most challenging objective for the IR, because it means generating surpluses from operations that are large enough not only to service the debt needed to fund the current capacity expansion but also to invest in renewal of assets. Getting to such a stage will require significant improvement in both the revenue

stream of the railways and strong cost control measures. To achieve this objective, the railways have announced several measures: Fuel cost (21% of FY2014 gross receipts): Given the significant cost advantage electricity has over diesel, India has already moved to running 51% of passenger trains and 63% of freight trains on electric traction. The railways are adopting a twin approach to lower the energy bill by Rs50bn annually over the next five years.

The railways plan to accelerate electrification— In FY2016; they have sanctioned electrification of 6,608km vs. The sanction of 462 km in FY2015. To understand the difficulty in reaching this goal, it is important to remember that IR managed to execute only 4,111km on this front in the last decade.

The move from diesel to electricity will help, but the railways are also trying to lower electricity costs (35% of total fuel costs), by bidding out for medium-term (3 year) power supply contracts in the open market. The first such agreement for supply of 50 MW was signed with Adani Power in October 2015 at Rs3.69 per unit, a 45% discount to the current costs of Rs6.75 a unit paid by the railways to state utilities. Tenders have already been floated for another 585 MW, while media reports (e.g., Live Mint, July 13, 2015) indicate a tie-up with NTPC in Maharashtra for another 500 MW (at Rs4.70 a unit). The railways consume around 2.5 GW of power, so bidding it out entirely could mean that savings target of the railways can be met just from this initiative.

Higher utilization to boost revenues: To reduce empty flows of wagons, the railways are rolling out (on an all-India basis) an Automatic Freight Rebate Scheme for traffic loaded in empty flow direction which they had launched as a pilot (in October 2014) on the NF Railway and Southern Railways.

Increased speed to boost revenues: The railways plan to try to enhance the speeds of freight trains to between 75-100kmph vs. The current 25 kmph. This would massively (3-4x) increase revenue potential, though we think that given the clogged networks, it is likely to be feasible only on the DFCs, though technology enhancements should help increase speed to some extent on the main network. As an example, the train sets that the railways plan to introduce will enable a train to stop in 1.5 minutes vs. The 6-7 minutes it takes now.

However, the railways have not announced any plans to deal with its wage expenses, which are the biggest challenge at 56% of the last five years' gross traffic receipts. Of course, even though the railways are the largest employer in India (employing 1.33mn people), since the peak in FY1992, the railways workforce has declined 20% in absolute terms. When combined with the consistent increase in traffic, this has meant that productivity has moved up significantly. In addition, with 60,000 employees (4.5% of total employee strength) set to retire annually over FY16-18, the trend toward increasing productivity should continue.

However, a study by the Planning Commission in FY2007 had indicated that employee productivity in India was amongst the worst in the world, leaving massive room for improvement.

#### **Conclusion**

An awake, alive and kicking Indian Railways can lead the country to greater heights of accomplishment. However, today, it is mired in a state of ennui, a state of cynicism that things cannot change. Its network is congested and finances are not easy to come by. Resources for development and replacement are stressed. It is finding it difficult to even meet its operational expenses. But, the spirit is still alive. To make an attempt at resurrecting itself, IR has drawn up an ambitious five year action plan. The realization is there that if the vicious cycle of underinvestment is to be turned into a virtuous cycle of prosperity; crutches of support will have to be abandoned. IR will have to generate its own resources for its development. The next five years should change the face of IR. Faster trains, modern trains, swanky stations, skilled staff, should be the Railways of tomorrow. IR looks forward to becoming the nation's carrier and a multi-modal integrator; making travel affordable, happy, convenient and reliable – a world class experience! IR also looks forward to become self-sustainable! By 2020, IR would make all efforts towards delivering safe and punctual services, increase average speed by 50% and increase loading to 1.5 billion tonnes. Indian Railways, like the mythical Phoenix, will rise again to scale new heights.

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