INDIAN RAILWAYS

YEAR BOOK
2016-17

सत्यमेव जयते

BHARAT SARKAR
GOVERNMENT OF INDIA
RAIL MANTRALAYA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

Contents

Key Statistics

		Unit	2015-16	2016-17
PLANT & EQUIPMENT				
Capital-at-charge		₹ in crore	2,75,135.23@	**3,02,457.78#**
Total Investment		"	4,19,123.61	**4,71,776.39**
Route Length		Kms.	66,687	**67,368**
Locomotives		Nos.	11,122	**11,461**
Passenger Service Vehicles		"	63,445*	**64,223**
Other Coaching Vehicles		"	6,704*	**6,714**
Wagons		"	2,51,295*	**2,77,987**
Railway Stations		"	7,216	**7,349**
OPERATION:				
Passenger:	Train Kms.	Millions	771.24	**788.45**
	Vehicle Kms.	"	25,327	**26,276**
Freight:	Train Kms.	"	397.05	**391.09**
	Wagon Kms.	"	18,708	**18,403**
VOLUME OF TRAFFIC:				
Passengers Originating		Millions	8,107	**8,116**
Passenger Kms.		"	11,43,039	**1,149,835**
Tonnes Originating:$				
Revenue Earning Traffic		"	1,101.51	**1,106.15**
Total Traffic (incl. non-revenue)		"	1,108.62	**1,110.95**
Net Tonne Kms.$				
Revenue Earning Traffic		"	6,54,481	**6,20,175**
Total Traffic (incl. non-revenue)		"	6,55,605	**6,20,858**
EMPLOYMENT AND WAGES:				
Regular Employees		Thousands	1,330*	**1,308**
Wage Bill Of Regular Employees		₹ in crore	93,001.24*	**1,15,271.27**
Average Annual Wage per Regular Employee		₹ in units	7,15,726*	**8,83,495**
FINANCIAL RESULTS:				
Revenue		₹ in crore	1,64,333.51	**1,65,292.20**
Expenses		"	1,47,835.93	**1,59,029.61**
Miscellaneous Transactions		"	2,730.90	**(-) 1,349.59**
Net Revenue (before dividend)		"	19,228.48	**4,913.00**
Rate of Return on Capital		Percent	6.99	**1.62**
Dividend on Capital		₹ in crore	8,722.51	**0****
Shortfall(-)/Excess(+)		"	10,505.97	**4,913.00**

* revised
@ Includes investment (₹ 50,449.91 crore) from Capital Fund.
# Includes investment (₹ 53,449.91 crore) from Capital Fund.
$ Excludes Konkan Railway.
** No dividend was payble duering 2016-17

Other Important Statistics

S.No.	Item	Unit	2015-16	2016-17
I	**Rail Network**			
1	Route Kilometres			
	(i) BG	Kms.	60,510	**61,680**
	(ii) MG	"	3,880	**3,479**
	(iii) NG	"	2,297	**2,209**
	(iv) Total (all gauges)	"	66,687	**67,368**
2	Running Track Kilometres (Total all gauges)	"	92,084	**93,902**
3	Total Track Kilometres (Total all gauges)	"	1,19,630	**1,21,407**
4	Electricfied Route Kilometre (Total all gauges)	"	23,555	**25,367**
II	**Rolling stock**			
1	Number of Locomotives	(in units)		
	(i) Steam	"	39	**39**
	(ii) Diesel	"	5,869	**6,023**
	(iii) Electric	"	5,214	**5,399**
	(iv) Total	"	11,122	**11,461**
2	Number of Wagons	"	2,51,295*	**2,77,987**
3	Number of Coaches-	(in units)		
	(i) Passenger Carriages (including DEMU/ DHMU)	"	54,609*	**55,068**
	(ii) Other Coaching Vehicles	"	6,704*	**6,714**
	(iii) EMU and MEMU Coaches	"	8,805	**9,125**
	(iv) Rail Cars	"	31	**30**
	(v) Total	"	70,149*	**70,937**
III	**Loco Utilisation**			
1	Tractive effort per loco			
	(i) BG	Kgs.	37,483	**37,808**
	(ii) MG	"	17,853	**17,746**
2	GTKMs (excl. wt. of engine & dept.) per kg. of tractive effort.			
	(i) BG	Kms.	4,314	**4,077**
	(ii) MG	"	1,240*	**461**
3	Engine kilometres per day per engine in use (Pass.) (B.G)			
	(i) Diesel	Kms.	607	**598**

S.No.	Item	Unit	2015-16	2016-17
	(ii) Electric	"	662	**709**
4	Engine kilometres per day per engine in use (Goods)(B.G)			
	(i) Diesel	Kms.	367	**377**
	(ii) Electric	"	380	**390**
5	NTKMs per engine hour (BG) All traction		17,507*	**16,337**
6	Ineffective percentage of locomotives (B.G)	Percent		
	(i) Diesel	"	8.76*	**8.93**
	(ii) Electric	"	6.97*	**7.43**
IV	**Wagon Utilisation**			
1	Wagon KMs in terms of 8 wheelers	Million	18,708	**18,403**
2	Total Carrying Capacity (All Gauges)	Million Tonnes	14.39	**15.99**
3	Average carrying capacity - wagon	Tonnes		
	BG	"	60.8	**60.9**
	MG	"	33.7*	**33.2**
4	Wagon Turn Round (in days) (BG)	Days	5.18	**5.32**
5	Wagon Kms. per wagon per day (BG)	Kms	214.5	**204.2**
6	NTKMs per wagon per day (BG)	Kms	7,510	**7,359**
7	Ineffective percentage of wagons (B.G)	%age	4.26	**3.63**
V	**Coach Utilisation**			
1	Vehicle Kms	Millions		
	(i) Suburban (EMU)	"	1,970	**2,002**
	(ii) Non Suburban	"	23,358	**24,274**
	(iii) Total	"	25,328	**26,276**
2	Vehicle Kms per vehicle day (B.G)	Kms.	569	**564**
3	Ineffective percentage of coaches(B.G) (Passenger Carriage)	Percent	6.1*	**5.95**
VI	**Train Utilisation**			
a.	**Passenger Train Performance**			
1	Number of Passenger trains runs daily	Nos.	13,313	**13,329**
4	Passenger Train Kms	Millions	771.25*	**788.44**
b.	**Goods Train Performance**			
1	Number of Goods trains runs daily	Nos.	9,212	**9,221**
2	Goods Train Kms.	Millions	397.02*	**391.09**
3	Average Speed of All Goods Train (B.G.)			
	(i) Diesel	Kms./Hour	23	**23.3**
	(ii) Electric	"	23.7	**24.0**

S.No.	Item	Unit	2015-16	2016-17
	(iii) All Traction	"	23.4	**23.7**
4	Average Net load of Goods train (B.G)(All traction)	Tonnes	1,664	**1,600**
5	Average Gross load of Goods train (B.G)(All traction)	Tonnes	2,955*	**2859**
VII	**Volume of traffic**			
a.	**Passenger Traffic (Suburban + Non-Suburban)**			
1	Passenger Originating	Millions	8,107	**8,116**
2	Passenger Kilometres	Millions	11,43,039	**11,49,835**
3	Average Lead	Kms.	141.0	**141.7**
4	Passenger Earnings	₹ in crore	44,283	**46,280**
5	Average rate per PKMs	Paise	38.74	**40.25**
6	Number of Passenger carried per day	Millions	22.21	**22.24**
b.	**Freight Traffic (Revenue)**			
1	Tonnes originating	Millions	1,101.51	**1,106.15**
2	Lead (originating)	Kms.	594	**561**
3	Freight Earnings excl. Demurrarge/Wharfage	₹ in crore	1,06,940.55	**1,02,027.82**
4	Frieght NTKMs	Millions	6,54,481	**6,20,175**
5	Average rate per NTKMs	Paise	163.4	**164.51**
6	Earnings per million tonne	₹ in crore	97.09	**92.21**
7	Freight carried per day (including non-revenue)	Millions Tonnes	3.03	**3.04**
VIII	**Train Accidents (Excl. KRCL)**	Nos.	106	**103**
1	Collisions	"	3	**5**
2	Derailment	"	64	**77**
3	Level Crossing	"	35	**20**
4	Fire in trains	"	-	**1**
5	Miscellaneus	"	4	**0**
6	Accident per million train kms		0.10	**0.09**
IX	**Density**			
1	Net Tonne Kms per route Km. (BG)	Km.	10.83	**10.06**
2	Passenger Kms per route Km. (BG)	"	18.66	**18.49**
3	Gross Tonne Kms per route Km. (BG)	"	32.35	**31.38**
X	**Comsumption of Fuel/Energy by Locomotive**			
	(i) Diesel	Million litres	2,874.95	**2793.20**
	(ii) Electric	Million KWH	15,701.25	**15,666.46**
	* revised			

Economic Review

Macroeconomic outcome

Amidst a subdued global economic scenario, as well as reduction of cash in circulation due to demonetization, Indian economy remains resilient relative to other major economies. According to the Central Statistical Office (CSO) May 2017 estimates, real GDP grew by 7.1 per cent in 2016-17 compared with 8 per cent in the previous year. Moreover, government initiatives of Demonetisation in 2016-17 and implementation of Goods and services tax (GST) recently are expected to have a positive impact on the Indian economy in coming years which will help foster a clean and digitised economy in the long run.

Although fixed capital formation (Investment) has been falling consistently, but private investment is expected to recover gradually in near future, with reduction in excess capacity, positive spinoffs associated with GST and the measures being taken by the Government to improve the ease of doing business. However, in the present scenario, when large non-performing loans and high leverage of some companies are holding back investment, monetary policy being tight on account of high inflation expectations and little scope for fiscal stimulus due to relatively high public-debt-to-GDP ratio, restoring credit discipline and cleaning up banks' balance sheets will be instrumental to support the credit growth needed to finance more business investment.

GDP Growth:

GDP at constant (2011-12) prices or real GDP in the year 2016-17 was estimated at ₹121.90 lakh crore (Provisional Estimate), as against the GDP of ₹113.81 lakh crore (First Revised Estimate) for the year 2015-16. The growth in real GDP during 2016-17 is estimated at 7.1 per cent as compared to the growth rate of 8.0 per cent in 2015-16. Real Gross Value Added (GVA) i.e GVA at basic constant (2011-12) prices for the year 2016-17 which reflects the production or supply side method of calculating GDP is estimated at ₹111.85 lakh crore in comparison with ₹104.90 lakh crore (First revised Estimate) for the year 2015-16. Thus registering a year-on-year growth rate of 6.6 per cent in 2016-17 as against 7.9 per cent in the year 2015-16 (Table 1). While growth in the manufacturing sector remained upbeat at 7.9 per cent during 2016-17, the agricultural sector also witnessed

a remarkable growth of 4.9 per cent over the previous year (Table 1).

The sectors which registered a growth rate of over 7.0 per cent in GVA at constant prices are manufacturing (7.9 per cent), 'electricity, gas, water supply and other utility services' (7.2 per cent), 'trade, hotels, transport, communication and services related to broadcasting' (7.8 per cent) and 'public administration, defence and other services' (11.3 per cent). The growth in the 'agriculture, forestry and fishing', 'mining and quarrying', 'construction' and 'financial, real estate and professional services' is estimated to be 4.9 per cent, 1.8 per cent, 1.7 per cent and 5.7 per cent respectively (Table 2). This mixed pattern of growth suggests that the economy was relatively resilient to the liquidity impact of demonetization.

GDP and GVA at constant prices 2011-12 (In Rs Crore)

	2013-14	2014-15	2015-16	**2016-17 PE**
GDP at constant	9801370	10536984	11381002	**12189854**
	(6.4)	(7.5)	(8.0)	**(7.1)**
GVA at basic Price	9084369	9719023	10490514	**11185440**
	(6.1)	(7.2)	(7.9)	**(6.6)**

Source: Central Statistics Office (CSO)
PE: Provisional Estimate
Growth rate over previous year indicated in brackets

Growth in GVA at Basic Price (%) at 2011-12 prices

	2014-15	**2015-16**	**2016-17 (PE)**
I. Agriculture, Forestry & Fishing	-0.2	0.7	**4.9**
II. Industry	7.5	8.8	**5.6**
Mining & Quarrying	11.7	10.5	**1.8**
Manufacturing	8.3	10.8	**7.9**
Electricity, Gas, Water Supply & other utility services	7.1	5.0	**7.2**
Construction	4.7	5.0	**1.7**
III. Services	9.7	9.7	**7.7**
Trade, Hotels, Transport, Communication and services related to broadcasting	9.0	10.5	**7.8**
Financing, Real Estate & Professional Services	11.1	10.8	**5.7**
Public Administration, defence and other services	8.1	6.9	**11.3**
GVA at Basic Price	7.2	7.9	**6.6**

Source: CSO
PE: Provisional Estimates

Agriculture

Agriculture and allied sector has registered fluctuating growth rates over the years. After reaching a high growth of 5.6 per cent in 2013-14, output in agriculture declined by 0.2 per cent in 2014-15, but thereafter increased by 0.7 per cent in 2015-16. According to the Central Statistics Office (CSO) estimates released on 31 May 2017, growth in the 'agriculture, forestry and fishing' sector is estimated at 4.9 per cent in 2016-17 (PE). A large part of

the growth in agriculture in 2016-17 can be attributed to the favourable monsoon which led to an increase in the area sown under most crops in 2016-17. One important aspect of the performance of the agriculture & allied sectors is that negative growth rates which were endemic prior to 2003-04 have almost disappeared. As per the 4th Advanced Estimates, the foodgrains production increased by 24.11 million tonnes (9.58 per cent) to 275.68 million tonnes in 2016-17 as compared to 251.57 million tonnes in 2015-16 (Table 3). All the major categories of foodgrains registered an increase in production in 2016-17 over the previous year.

Production of selected agricultural commodities (million tonnes)

Items	2012-13	2013-14	2014-15	2015-16	**2016-17 4th AE**
Food grains	257.13	265.04	252.02	251.57	**275.68**
Wheat	93.51	95.85	86.53	92.29	**98.38**
Rice	105.24	106.65	105.48	104.41	**110.15**
Coarse Cereals	40.04	43.29	42.86	38.52	**44.19**
Pulses	18.34	19.25	17.15	16.35	**22.95**

Source: Dept. of Agriculture, Cooperation and Farmers Welfare
AE: Advanced Estimate

Industry

As per the national accounts data of the CSO, while the growth in industry sector (incl. Construction) was lower during 2016-17 at 5.6 per cent as against 8.8 per cent in 2015-16, the Electricity, gas, water supply & other utility services sub-sector registered higher year-on-year growth in 2016-17 and even with the moderation in manufacturing sector growth, it was still comparable to the growth in 2015-16. Index of Industrial Production (IIP) which broadly comprises of mining, manufacturing and electricity registered a positive growth of 5.0 % in 2016-17 as compared to 3.4 % in 2015-16 (Table 4).

Sectoral Growth Rates of Industrial Sector based on IIP (%) (Base: 2011-12 = 100)

	Weight	2012-13	2013-14	2014-15	2015-16	**2016-17**
Industry Group						
General Index	100.00	3.3	3.4	4.0	3.4	**5.0**
Mining	14.373	-5.3	-0.1	-1.4	4.3	**5.3**
Manufacturing	77.633	4.8	3.6	3.9	3.0	**4.9**
Electricity	7.994	4.0	6.1	14.8	5.7	**5.8**

Source: CSO

In terms of use-based classification, Primary goods and capital goods witnessed a growth rate of 4.9 per cent and 3.2 per cent respectively in the year 2016-17, as against 5.0 per cent and 3.0 per cent in 2015-16. Intermediate goods recorded an increase of 3.3 per cent in 2016-17, as

against 1.5 per cent in 2015-16. Consumer durable goods recorded an increase of 2.9 per cent in 2016-17 as compared to 3.4 per cent in 2015-16. Consumer non durables grew by 7.9 per cent in 2016-17, as against the growth rate of 2.6 per cent in 2015-16.

Infrastructure

The index of 8 core infrastructure supportive industries (comprising coal, crude oil, natural gas, petroleum refinery products, fertilizers, finished carbon steel, cement and electricity) with a weight of 40.3 per cent in the IIP grew at 4.8 per cent in 2016-17 compared to 3.0 per cent in 2015-16. Crude oil output declined by 2.5 per cent and continued to be the poorly performing infrastructure industry in 2016-17 followed by cement and natural gas, which registered a decline in output of 1.2 and 1.0 per cent, respectively. Natural gas and crude oil production declined because of lack of major discoveries as well as problems associated with the old oilfields. From a decline in production of 1.3 per cent in 2015-16, the Steel industry registered an impressive growth at 10.7 per cent in the year 2016-17. From a growth rate of 7.0 per cent registered in 2015-16 Fertilizers industry registered a growth of 0.2 per cent only, in 2016-17. Electricity registered a robust growth rate of 5.8 per cent in 2016-17 over 5.7 per cent in 2015-16. Growth in coal industry was 3.2 per cent in 2016-17 as compared to 4.8 per cent in 2015-16. The Government's commitment to provide qualitative physical infrastructure has been reflected in global ranking of the World Bank's 2016 Logistics Performance, with India ranking at 36 in 2016 as compared to 58 in 2014.

Growth (%) in Core Industries (Base: 2011-12=100)

Sectors	Weight	2012-13	2013-14	2014-15	2015-16	**2016-17**
Coal	10.3335	3.2	1.0	8.0	4.8	**3.2**
Crude oil	8.9833	-0.6	-0.2	-0.9	-1.4	**-2.5**
Natural Gas	6.8768	-14.4	-12.9	-5.3	-4.7	**-1.0**
Refinery Products	28.0376	7.2	1.4	0.2	4.9	**4.9**
Fertilizers	2.6276	-3.3	1.5	1.3	7.0	**0.2**
Steel	17.9166	7.9	7.3	5.1	-1.3	**10.7**
Cement	5.3720	7.5	3.7	5.9	4.6	**-1.2**
Electricity	19.8530	4.0	6.1	14.8	5.7	**5.8**
Overall	100.000	3.8	2.6	4.9	3.0	**4.8**

Source: Office of the Economic Adviser, D/o Industrial Policy & Promotion
Refinery Products' yearly growth rates of 2012-13 are not comparable with other years on account of inclusion of RIL (SEZ) production data since April, 2012

External Sector

Foreign Trade

India's external sector witnessed a turnaround after two years of continuous negative growth with export growth becoming positive in 2016-17. India's trade deficit further narrowed down to 5 per cent of the GDP with import growth remaining marginally negative in the fourth year in succession. Merchandise export grew by 5.2 per cent in 2016-17 with positive growth in both Petroleum Oil and Lubricants (POL) and Non-POL exports. A sharp decline in gold and silver imports and fall in the crude oil prices helped lower merchandise trade deficit. India's merchandise exports which were valued at US$ 280.1 billion in the year 2016-17 (US$ 266.4 billion in 2015-16) registered an increase of 5.2 per cent. India's merchandise imports which were valued at US$ 392.6 billion in the year 2016-17 (US$ 396.4 billion in 2015-16) registered a modest decrease of 1.0 per cent. Trade deficit, accordingly, declined to US$ 112.4 billion from a level of US $ 130.1 billion in 2015-16 (Table 6).

Export, Import and Trade Deficit (in US $ billion)

Item	2015-16	Growth (%)	**2016-17**	**Growth (%)**
Exports	266.4	-15.8	**280.1**	**5.2**
Imports	396.4	-14.1	**392.6**	**-1.0**
Trade Balance#	-130.1		**-112.4**	

Source: Economic Survey 2016-17 Vol.2
#: Exports minus Imports

Current Account Deficit (CAD)

The improvement in trade deficit resulted in narrowing of current account deficit to US$ 15.3 billion (0.7 per cent of GDP) in 2016-17 overcoming the decline in net invisible receipt (US$ 97.1 billion) by 10 per cent in 2016-17 year-on-year. The CAD was comfortably financed by net capital flows in 2016-17 which was dominated by foreign direct investments.

Foreign Capital Inflows

Net foreign direct investments (FDI) decreased by 1.1 per cent from US$ 36.02 billion in 2015-16 to $ 35.60 billion in 2016-17 (Table 7). The country has now become an attractive destination for foreign direct investment. A new direction was given to FDI policy reforms in 2014 itself when sectors like Rail Infrastructure and Defence were liberalized. With a view to provide ease of doing business, licensed and non-sensitive activities were placed under automatic route and investment caps were raised. FDI policy provisions were radically overhauled across sectors such as Construction Development, Broadcasting, Retail Trading, Air Transport, Insurance and Pension among others.

A paradigm shift was made in the FDI policy on retail and other financial services sector. The Government permitted 100% FDI for retail trading of food products with unqualified condition that such food products have to be manufactured and/or produced in India. In the Financial services sector, Government promulgated that any financial sector activity which is regulated by any financial sector regulator will be eligible for 100% FDI under automatic route, and approval would be needed only for unregulated financial sector activities. FDI policy reforms were also undertaken in other sectors such as Defence, Airport Infrastructure, Broadcasting, Animal Husbandry and Retail Trading. Portfolio investment, which recorded a net outflow of US$ 4.1 billion in 2015-16 registered a net inflow of US$ 7.6 billion in the year 2016-17(Table 7).

Net Foreign Direct Investment (FDI) and Net Portfolio Investment

(In US$ billion)

	Net FDI	Net Portfolio Investment
2012-13	19.82	26.89
2013-14	21.56	4.82
2014-15	31.25	42.21
2015-16	36.02	-4.13
2016-17 (P)	**35.60**	**7.60**

Source: Reserve Bank of India
(P): Provisional

Foreign Exchange Reserves & Exchange rate

India's foreign exchange reserves increased from US$ 360.18 billion at the end of March 2016 to $ 369.96 billion at the end of March 2017. Exchange rate of rupee appreciated from ₹66.33 per US dollar as on March 31, 2016 to ₹64.84 per US dollar as on March 31, 2017. In 2016-17, the rupee performed better than most of the major currencies namely, US dollar, Euro, Japanese Yen and Pound Sterling. This was mainly on account of improvement in foreign portfolio flows in India with receding of global risk aversion and pro-reforms Union Budget and decisive outcome of State elections.

Fiscal outcome

Fiscal deficit as a per cent of GDP declined from 4.1 and 3.9 in the year 2014-15 and 2015-16 respectively to 3.5 per cent in 2016-17. This Fiscal consolidation in the last three years was made possible by buoyant tax revenues due to concerted additional revenue generation measures and subsidy reduction concomitant to reduced global petroleum prices. What is noteworthy is that the quality of spending improved with a gradual tilt towards capital expenditure, including in Railways. Total outstanding liabilities of the Central government as a proportion of the GDP fell to 49.4 per cent in 2016-17 (Revised Estimates) from 50.4 per cent in 2015-16 and

estimated to decline further to 47.3 per cent in 2017-18 (Budget Estimates). With the introduction of the goods and services tax, the public finances are poised to improve structurally yielding growth dividend.

Components of Revenue and Expenditure of the Central Government (as per cent of GDP)

	2012-13	2013-14	2014-15	2015-16	2016-17 PA	**2017-18 BE**
Revenue Receipts	8.8	9.0	8.9	8.7	9.1	**9.0**
Gross Tax Revenue	10.4	10.1	10.0	10.6	11.3	**11.3**
States share	2.9	2.8	2.7	3.7	4.0	**4.0**
Net tax revenue	7.5	7.3	7.3	6.9	7.3	**7.3**
Non-tax revenue	1.4	1.8	1.6	1.8	1.8	**1.7**
Non-debt capital receipts	0.4	0.4	0.4	0.5	0.4	**0.5**
Other receipts	0.3	0.3	0.3	0.3	0.3	**0.3**
Debt capital receipts	4.9	4.5	4.1	3.9	3.5	**3.2**
Total Expenditure	14.2	13.9	13.4	13.1	13.0	**12.7**
Revenue Expenditure	12.5	12.2	11.8	11.2	11.1	**10.9**
Capital Expenditure	1.7	1.7	1.6	1.8	1.9	**1.8**
Interest payment	3.1	3.3	3.2	3.2	3.2	**3.1**
Major subsidies	2.5	2.2	2.0	1.8	1.4	**1.4**
Revenue Deficit	3.7	3.2	2.9	2.5	2.0	**1.9**
Fiscal Deficit	4.9	4.5	4.1	3.9	3.5	**3.2**
Primary Deficit	1.8	1.1	0.9	0.7	0.4	**0.1**

Source: Economic Survey 2016-17, Vol-II
BE: Budget Estimate PA: Provisional Actuals

Inflation

Headline wholesale Price Index (WPI) increased to 1.7 per cent in 2016-17 from (-) 3.7 per cent in 2015-16 on account of hardening of global commodity prices. The largest major contributor to the increase was the Primary articles group which registered a sharp increase from (-) 0.4 per cent in 2015-16 to 3.5 per cent in 2016-17. Manufacturing inflation moderately increased to 1.4 per cent in 2016-17 whereas the inflation in fuel and power group subdued further to (-) 0.1 per cent in the year 2016-17.

Annual Inflation rate (%) based on WPI (Base 2011-12=100)

Items/Groups	**Weight (%)**	**April-March (Average)**	
		2015-16	**2016-17**
All Commodities	100	-3.7	**1.7**
1. Primary articles	22.6	-0.4	**3.5**
2. Fuel and Power Group	13.2	-19.7	**-0.1**
3. Manufactured Products	64.2	-1.8	**1.4**

Source: Computed from base data released by the Office of the Economic Adviser, D/o Industrial Policy & Promotion

Headline Inflation measured in terms of Consumer Price Index (CPI) combined, eased from 4.9 per cent in 2015-16 to 4.5 per cent in 2016-17. What is more heartening is that the fall in the inflation was broad-based and particularly in food items which had earlier exhibited frequent spikes leading

to inflation hovering close to double digit levels in 2012-13 and 2013-14.

Major commodities carried by Indian railways

The following Table shows the percentage of total production plus imports of some of the major commodities carried by the Indian Railways during the last 5 years.

Percentage of total production plus imports of select major commodities carried by the Indian Railways

	Coal	Iron Ore	Cement	Foodgrains	Fertilizers	Pol Products
2012-13	70.70	79.75	41.81	19.06	85.35	17.35
2013-14	69.35	81.46	42.74	20.79	86.06	17.33
2014-15	66.00	79.75	40.36	22.01	85.22	16.95
2015-16 (R)	65.45	70.78	36.99	18.13	87.53	16.54
2016-17 (P)	**62.41**	**69.93**	**36.63**	**15.92**	**87.01**	**15.21**

(P) Provisional (R) Revised

Source: Calculated on the basis of production and import data received from various Ministries and Railway loading data received from Directorate of Economics and Statistics of Ministry of Railways.

SELECTED ECONOMIC INDICATORS

ITEM			Unit / Base	2012-13	2013-14	2014-15	2015-16	2016-17 (PE)
I.	**(a)**	**Net National Income**						
	(i)	At 2011-12 prices	₹Crore	8094001	8578417	9231556	9982112	**10686776**
	(ii)	At current prices	₹Crore	8766345	9897663	10953761	12076882	**13408211**
	(b)	Per capita net national income						
	(i)	At 2011-12 prices	₹Crore	65538	68572	72862	77803	**82269**
	(ii)	At current prices	₹Crore	70983	79118	86454	94130	**103219**
II	**Gross Capital Formation**							
		Railways						
	(i)	At 2011-12 prices	₹Crore	40084	42700	61111	70122	**&**
	(ii)	At current prices	₹Crore	41732	46117	71078	81582	**&**

Source: National Accounts Data, Ministry of Statistics and Programme Implementation
PE-Provisional Estimates
&- Data not available from CSO

III	**Foreign Trade:**							
	(a)	Value of exports	₹Crore	1634318	1905011	1896348	1716378	**1849429**
		Value of imports	₹Crore	2669162	2715434	2737087	2490298	**2577666**
	(b)	Value of exports	US $ Million	300401	314405	310338	262290	**275852**
		Value of imports	US $ Million	490737	450200	448033	381007	**384356**

Source: Directorate General of Foreign Trade, Ministry of Commerce and Industry

IV.	**Index of Agricultural Production (Triennium ending 2007-08 =100)**							
			Weight					
	(a)	All Crops	(100.00)	124.0	129.8	124.0	121.4	**129.1***
	(b)	Foodgrains	(50.7)	119.4	123.3	115.9	116.8	**131.0**
	(c)	Non-foodgrains	(49.3)	128.6	136.4	132.2	126.1	**127.1**

Source: Ministry of Agriculture
* As per 4th Advance Estimate 2016-17 and 3rd Advance estimate of Horticulture crops 2016-17

V. Index of Industrial Production (2011-12=100)

		Weight					
(a)	General Index	(100.00)	103.3	106.7	111.0	114.7	**120.0**
(b)	Mining & Quarrying	(14.37)	94.7	94.6	93.3	97.3	**102.5**
(c)	Manufacturing	(77.63)	104.8	108.6	112.7	115.9	**121.0**
(d)	Electricity	(7.99)	104.0	110.3	126.6	133.8	**141.6**

Source: CSO, Ministry of Statistics and Programme Implementation

SELECTED ECONOMIC INDICATORS (Contd.)

	ITEM	Unit / Base	2012-13	2013-14	2014-15	2015-16	2016-17
VI.	Wholesale Price Index (Financial Year Average with weights) (Base 2011-12=100)	Weight					
(a)	All Commodities	(100.00)	106.9	112.5	113.9	109.7	**111.6**
(b)	Primary Articles	(22.62)	111.4	122.4	125.1	124.6	**128.9**
(c)	Fuel & Power	(13.15)	107.1	114.7	107.7	86.5	**86.3**
(d)	Manufactured Products	(64.23)	105.3	108.5	111.2	109.2	**110.7**
VII.	Wholesale Price Indices of Important Commodities used by Railways	Weight					
(a)	Non-coking coal	(1.40)	103.2	106.8	109.6	109.6	**110.5**
(b)	Minerals Oils	(7.95)	110.9	121.6	108.7	73.9	**73.3**
(c)	Electricity	(3.06)	100.5	103.6	105.7	105.3	**104.2**
(d)	Manufacture of Basic Metals	(9.65)	104.8	102.9	103.5	92.0	**91.1**
(i)	Inputs into Steel Making	(1.41)	107.8	103.5	104.6	85.4	**82.9**
(ii)	Ferrochrome	(0.11)	104.5	106.9	110.4	102.5	**114.4**
(iii)	Ferromanganese	(0.03)	107.3	110.7	114.3	95.2	**104.4**
(iv)	Ferrosilicon	(0.02)	104.7	111.9	115.2	99.3	**88.4**
(v)	Other Ferro alloys	(0.03)	107.3	106.9	111.8	96.2	**100**
(vi)	Manufacture of Non-Ferrous Metals	(1.69)	104.2	106.5	108.7	100.9	**100.1**
(e)	Manufacture of Electrical Equipment	(2.93)	103.4	104.8	109.5	109.0	**108.2**
(f)	Manufacture of Chemicals & Chemical Products	(6.47)	108.3	113.3	116.1	112.6	**111.0**
(g)	Manufacture of Non-metallic mineral products	(3.20)	107.2	107.5	111.3	110.5	**109.8**
(h)	Cotton dyed/printed Textile	(0.05)	99.8	104.9	113.5	114.9	**118.0**
(i)	Timber/wooden plank, sawn/re-sawn	(0.05)	111.1	114.4	120.0	121.5	**122.6**
(j)	Manufacture of Cement, Lime and plaster	(1.64)	107.8	106.4	110.9	109.9	**110.6**
(k)	Lube Oils	(0.29)	109.6	114.2	118.8	120.8	**116.8**
(l)	High Speed Diesel	(3.10)	111.6	126.3	114.8	73.4	**74.4**
VIII.	Consumer Price Index (Industrial Workers) (Base 2012=100)* as on Sep 15, 2017		215	236	251	265	**276**

Source: WPI data from Office of Economic Advisor
CPI data from Handbook of Statistic, RBI

Planning

Outlays in Five Year Plans:

IR draws up its Development Plans within the framework of National Five-Year Plans. Plan outlays for IR and the transport sector as a whole are given below:

(₹ in crore)

Sectors/Units	Upto V Plan ^ 1950-78	VI Plan 1980-85	VII Plan 1985-90	VIII Plan 1992-97	IX Plan 1997-02	X Plan 2002-07	XI Plan 2007-2012	XII Plan 2012-2017
Railways	4,723	6,585	16,549	32,306	45,725	84,003	*1,89,838@	4,19,221 @
Transport Sector	10,117	13,962	29,548	65,173	1,17,563	2,59,777	6,13,185	12,04,172
Total Plan Outlay	59,979	1,09,292	2,18,729	4,85,457	8,13,998	15,25,639#	36,76,936	76,69,807
Transport Sector as %age of Total Plan	16.9	12.8	13.5	13.4	14.4	17.0	16.7	15.7
Railways as % age of Total Plan	7.9	6.0	7.6	6.7	5.6	5.5	5.2	5.5

^ Excludes inter-plan period 1966-69. # Original Outlay. @ the outlay do not include funding from PPP or private source.

* revised

In the year 2016-17 the following assets were acquired and task accomplished.

	Heads		2016-17
1.	Locomotives	(Nos.)	658
2.	Wagons (BLC+ Private Wagons)	(”)	12323
3.	Coaches including	(”)	4321
	(i) EMUs	(”)	537
	(ii) MEMUs	(”)	152
	(iii) DMUs	(”)	241
4.	Route Kms of track electrified	(Kms.)	2013
5.	New lines constructed	(Kms.)	953
6.	Double/Multiple lines provided	(Kms.)	882
7.	Track renewals (both primary & secondary renewal)	(Kms.)	2487
8.	Gauge Conversion to BG from MG/NG	(Kms.)	1020

The Plan allocation (Revised Estimates) and Actual Net Expenditure for 2016-17 compared with 2015-16, were as follows:

(₹ in crore)

Plan Head		2015-16		2016-17	
		Allocation (R.E.)	Actual Net Expenditure	**Allocation (R.E.)**	**Actual Net Expenditure**
CIVIL ENGINEERING					
1	New Lines (Construction)	*1,3467.78	13,209.60	****18,546.68**	**14,319.89**
2	Gauge Conversion	@4,089.64	3,615.64	**@@5,171.97**	**3,769.92**
3	Doubling	!8,989.62	10,472.35	**!!20,504.84**	**9,093.22**
4	Traffic Facilities- Yard Remodelling and Others	$1,210.73	983.01	**$$1,369.61**	**910.68**
5	Road Safety Works - Level Crossings	517.70	468.00	**679.25**	**542.91**
6	Road Safety Works - Road Over/ Under Bridges	2,143.71	2,132.60	**>9,654.37**	**3,196.23**
7	Track Renewals	3,901.23	4,367.59	**6,683.80**	**5,076.33**
8	Bridge Works	485.58	517.20	**591.91**	**474.52**
9	Staff Quarters	322.12	282.54	**371.45**	**308.45**
10	Amenities for Staff	301.64	288.77	**263.08**	**235.70**
11	New Lines (const.)– Dividend free Projects	^1,500	2,580.13	**^ ^1,500.00**	**1,650.00**
	TOTAL	36,929.75	38,917.43	**65,336.96**	**39,577.85**
MECHANICAL					
1	Rolling Stock	&18,866.30	17,912.75	**&&26,181.62**	**19,610.99**
2	Leased Assets–Payment of Capital Component	6,293.00	6,324.74	**7,000.00**	**6,999.99**
3	Machinery and Plant	405.37	394.32	**507.80**	**430.65**
4	Workshops including Production Units	#2,105.16	1,526.82	**##3,326.96**	**1,534.35**
	TOTAL	27,669.83	26,158.63	**37,016.38**	**28,575.98**
ELECTRICAL ENGINEERING					
1	Electrification Projects	%2,260.22	2,265.19	**%%3,521.85**	**2,870.90**
2	Other Electrical Works excl. TRD	160.26	105.62	**(c)664.38**	**139.82**
3.	Traction Distribution Works	187.15	177.57	**253.28**	**220.11**
	TOTAL	2,607.63	2,548.38	**4,439.51**	**3,230.83**
SIGNAL AND TELECOMMUNICATION					
1	S and T Works	843.24	892.89	**952.53**	**951.56**
	TOTAL	843.24	892.89	**952.53**	**951.56**
OTHERS					
1	Computerization	294.19	239.89	**354.87**	**226.12**
2	Railway Research	24.43	24.92	**21.81**	**12.20**
3	User's Amenities	<1,211.84	1,080.83	**1,920.66**	**981.18**
4	Investment in PSUs	926.12	2,410.39	**513.53**	**46.33**
5	Investment in non-Government Undertakings including JVs/SPVs	£6,056.2	4,939.32	**££8,264.80**	**7,137.80**
6	Other Specified Works	384.73	353.98	**555.57**	**304.86**
7	Training/HRD	-	-	**18.72**	**-**
8	Inventories	(-)359.98	(-)470.50	**89.29**	**(-)978.60**
9	M.T.Ps.	s23,412.03	1,343.64	**1,534.09**	**1,389.94**
TOTAL		31,949.55	9,921.47	**13,254.62**	**9,119.83**
GRAND TOTAL		1,00,000.00	' 78,438.79	**Σ1,21000.00**	**" 81,456.05**

Revised Estimates

* Includes ₹4,799 crore for National Projects ₹54 crore for Projects of National Importance. It also includes ₹2,060.90 crore under EBR (P).
** Includes ₹5,610 crore for National Projects ₹101.48 crore under EBR(IF). It also includes ₹4,799.00 crore under EBR (P).
@ Includes ₹1,300 crore for National Projects and ₹603.61 crore under EBR (P).
@@ Includes provision of ₹843 crore for National Projects ₹1,182.28 crore under EBR(IF) and ₹321 crore under EBR(P).
! Includes ₹7,175.79 crore under EBR (P).
!! Includes ₹2,907 crore under EBR (P) ₹16,141.74 crore for EBR(IF) and ₹37.13 crore for IRFC Bonds.
$ Includes ₹131.19 crore under EBR(P).
$$ Includes ₹180.25 crore under EBR(P) and ₹155.96 crore for EBR(IF)
> Includes ₹6,592.26 crore under EBR(P).
^ Includes ₹1,500 crore for Udhampur Srinagar- Barmula New Line.
^ ^ Includes ₹1,500 crore for Udhampur Srinagar- Barmula New Line.
& Includes ₹11,591.67 crore for IRFC(Bond).
&& Includes ₹17,962.87 crore under IRFC(Bond) and ₹2,070.00 crore under EBR(P).
# Includes ₹429.99 crore under EBR(P).
Includes ₹1,345.69 crore under EBR(PPP) and 12.55 crore under EBR(IF).
% Includes ₹2,230.20 crore under EBR(P).
%% Includes ₹3,336 crore under EBR(IF) and ₹180 crore under under EBR(P).
(c) Includes ₹400 crore under EBR (P).
< Includes ₹12.10 crore under EBR (P).
£ Includes ₹2,217.40 crore under EBR(P).
££ Includes ₹1,202 crore under EBR(P).
S Includes ₹22,247 crore for under EBR(PPP).
Σ RE 2016-17 includes gross outlays under DRF on account of outlay against higher CRRM targets.

Actual Net Expenditure (2015-16) and (2016-17)

‘ Excluding actual expenditure of ₹15,081 crore under EBR(PPP)
‘’ Excluding actual expenditure of ₹26,834.09 crore under EBR(PPP)

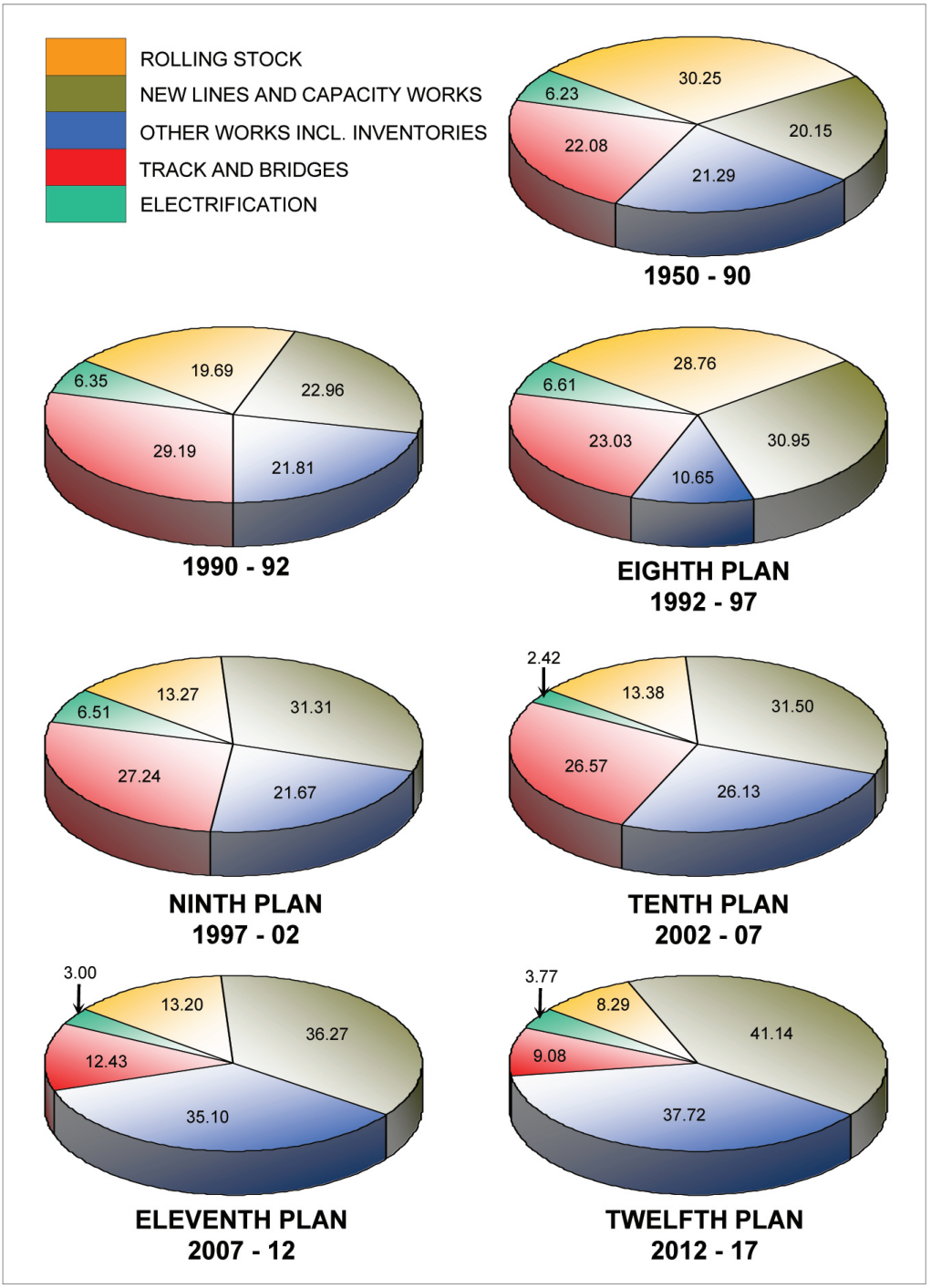
Productivity:

The following table shows the indices of growth of traffic output vis-à-vis input

Indices of Growth of Traffic Output and Inputs(1950-51=100)

Year	Traffic Output Indices		Investment Input Indices				
	Freight traffic (NTKms) (Rev+ Non rev.)	Passenger traffic (Non- suburban passenger kms.)	Wagon capacity	Passenger coaches	Route Kms.	Running track Kms	Tractive effort of locos
1950-51	100	100	100	100	100	100	100
1960-61	199	110	152	154	105	107	144
1970-71	289	159	226	188	112	121	178
1980-81	359	279	269	210	114	128	201
1990-91	550	394	278	219	116	133	192
2000-01	715	614	246	254	118	138	233
2012-13	1,475	1,512	325	367	122	150	390
2014-15	1,547	1,660	346	395	123	153	434
2015-16	1,486	1,664	347	405	124	154	456
2016-17	**1,407**	**1,675**	**385**	**409**	**125**	**155**	**473**

ANALYSIS OF PLAN EXPENDITURE
(PERCENTAGE)



(EXCLUDES EXPENDITURE UNDER MTP, IRFC, RVNL AND WAGON INVESTMENT SCHEME)

Passenger Business

Indian Railways is a commonly used mode of public transportation in the country. During 2016-17, it carried 8,116 million passengers as against 8,107 million in 2015-16. Passenger kilometres, which is calculated by multiplying the number of journeys by mean kilometric distance in case of each class was 1,150 billion as against 1,143 billion in the previous year. Passenger earnings increased by 1,997 crore (4.5%) in comparison with 2015-16.

The trend of passenger traffic since 1950-51 is shown below:

Table I. Number of Passengers Originating

(in millions)

Year	Suburban (All classes)	Non suburban					Grand Total
		Upper class	Second Class			Total Non-suburban	
			Mail/ Exp.#	Ordinary	Total		
1950-51	412	25	52	795	847	872	1,284
1960-61	680	15	96	803	899	914	1,594
1970-71	1,219	16	155	1,041	1,196	1,212	2,431
1980-81	2,000	11	260	1,342	1,602	1,613	3,613
1990-91	2,259	19	357	1,223	1,580	1,599	3,858
2000-01	2,861	40	472	1,460	1,932	1,972	4,833
2010-11	4,061	100	1,046	2,444	3,490	3,590	7,651
2014-15	4,505	138	1,277	2,304	3,580	3,719	8,224
2015-16	4,459	145	1,321	2,182	3,503	3,648	8,107
2016-17	**4,566**	**150**	**1,322**	**2,078**	**3,400**	**3,550**	**8,116**

Also includes Sleeper Class

Table II. Passenger Kilometres

(in millions)

Year	Suburban (All classes)	Upper Class	Non suburban Second Class			Total Non-suburban	Grand Total
			Mail/ Exp#	Ordinary	Total		
1950-51	6,551	3,790	12,537	43,639	56,176	59,966	66,517
1960-61	11,770	3,454	22,251	40,190	62,441	65,895	77,665
1970-71	22,984	4,394	37,856	52,886	90,742	95,136	118,120
1980-81	41,086	5,140	86,712	75,620	162,332	167,472	208,558
1990-91	59,578	8,712	138,054	89,300	227,354	236,066	295,644
2000-01	88,872	26,315	222,568	119,267	341,835	368,150	457,022
2010-11	137,127	62,203	500,631	278,547	779,178	841,381	978,508

2014-15	151,775	101,215	614,686	279,514	894,200	995,415	1,147,190
2015-16	145,253	105,315	634,604	257,867	892,471	997,786	1,143,039
2016-17	**145,417**	**110,355**	**634,039**	**260,024**	**894,063**	**1,004,418**	**1,149,835**

Also includes Sleeper Class.

Table III. Average Lead

(in kms.)

Year	Suburban (All classes)	Non suburban				Total Non-suburban	Grand Total
		Upper Class	Second Class				
			Mail/ Exp.#	Ordinary	Total		
1950-51	15.9	151.6	241.1	54.9	66.3	68.8	51.8
1960-61	17.3	203.3	232.4	50.0	69.5	72.1	48.7
1970-71	18.9	274.6	244.2	50.8	75.9	78.5	48.6
1980-81	20.5	484.0	333.3	56.4	101.3	103.9	57.7
1990-91	26.4	462.8	386.5	73.0	143.9	147.6	76.6
2000-01	31.1	659.3	471.3	81.7	176.9	186.7	94.6
2010-11	33.8	623.1	478.5	114.0	223.2	234.4	127.9
2014-15	33.7	731.9	481.6	121.3	249.7	267.7	139.5
2015-16	32.6	726.8	480.5	118.1	254.7	273.5	141.0
2016-17	**31.8**	**736.3**	**479.5**	**125.2**	**263.0**	**283.0**	**141.7**

#Also includes Sleeper Class.

Table IV. Proportion to total traffic-No. of Passengers (Percentage)

	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2015-16	2016-17
Non-Suburban:								
Second Class Ordinary	50.38	42.82	37.14	31.70	30.20	31.95	26.92	**25.60**
Second Class Mail/ Express#	6.02	6.38	7.20	9.26	9.77	13.67	16.29	**16.29**
Upper Class	0.94	0.66	0.30	0.49	0.83	1.30	1.79	**1.85**
Total	57.34	49.86	44.64	41.45	40.80	46.92	45.0	**43.74**
Suburban (all classes)	42.66	50.14	55.36	58.55	59.20	53.08	55.0	**56.26**
Grand Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	**100.00**

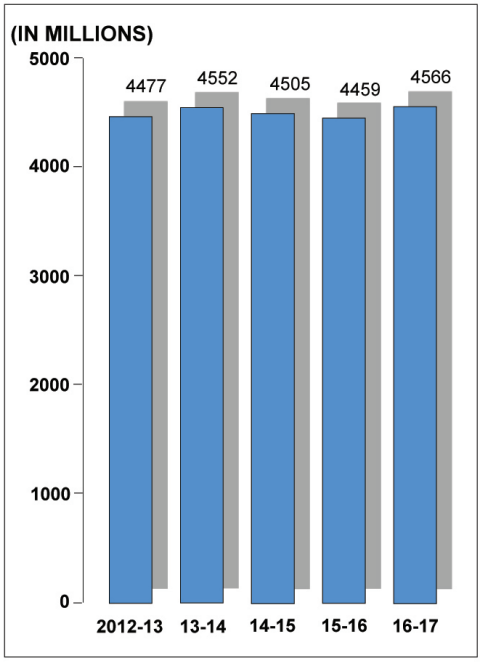
#Also includes Sleeper Class.

Table V. Proportion to total traffic – Passenger Kms. (Percentage)

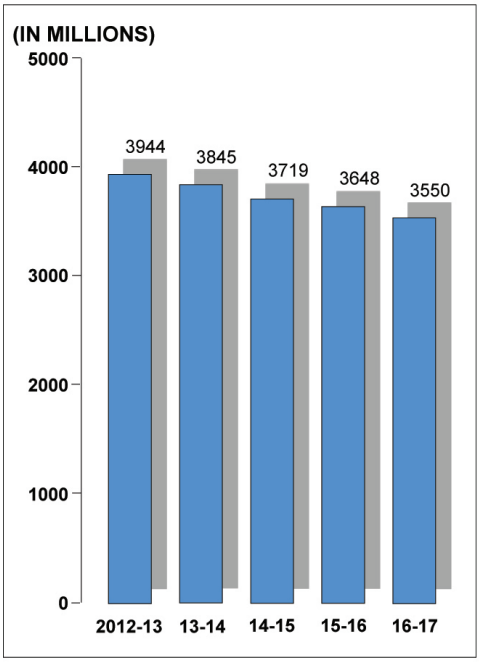
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2015-16	2016-17
Non-Suburban:								
Second Class Ordinary	51.75	44.77	36.26	30.20	26.10	28.47	22.56	**22.61**
Second Class Mail/Express#	28.65	32.05	41.58	46.70	48.70	51.16	55.52	**55.14**
Upper Class	4.45	3.72	2.46	2.95	5.75	6.36	9.21	**9.60**
Total	84.85	80.54	80.30	79.85	80.55	85.99	87.29	**87.35**
Suburban (all classes)	15.15	19.46	19.70	20.15	19.45	14.01	12.71	**12.65**
Grand Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	**100.00**

Also includes Sleeper Class.

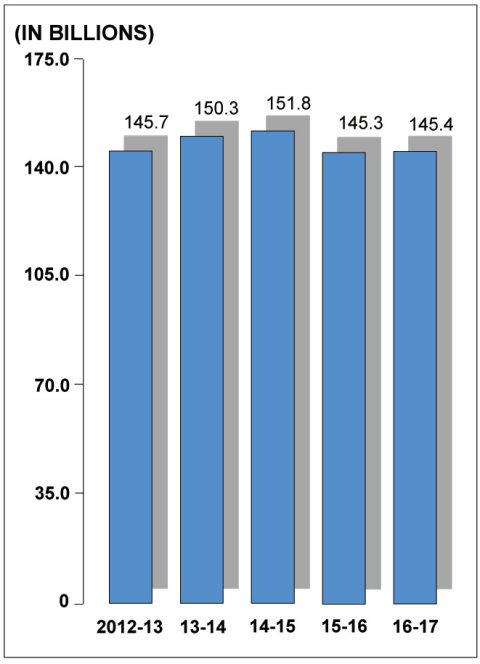
PASSENGERS ORIGINATING
SUBURBAN



PASSENGERS ORIGINATING
NON-SUBURBAN



PASSENGER KILOMETRES
SUBURBAN



PASSENGER KILOMETRES
NON-SUBURBAN

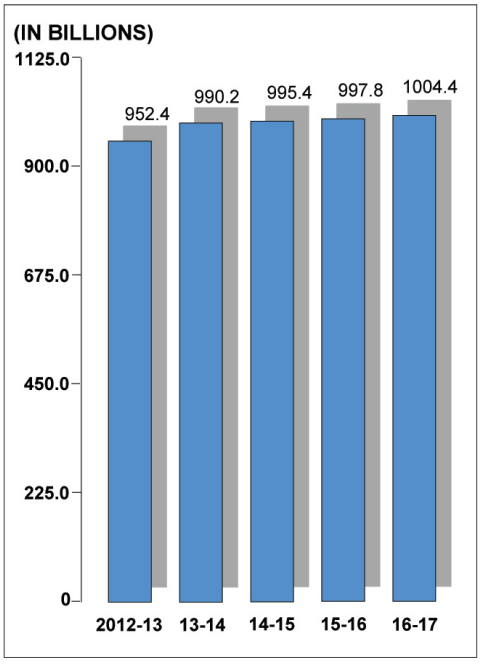


Table VI. Number of passenger trains run daily

Type of trains	Broad Gauge		Metre Gauge		Total (incl.NG)	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
EMU	5,128	**5,148**	0	**0**	5,128	**5,148**
Mail/Express	3,508	**3,524**	17	**6**	3,525	**3,530**
Ordinary Passenger Trains and Mixed Trains	4,366	**4,387**	168	**158**	4,660	**4,651**
Total	**13,002**	**13,059**	**185**	**164**	**13,313**	**13,329**

Table VII. Overall average speed including halts (Kms. /hr.)

Type of trains	Broad Gauge		Metre Gauge	
	2015-16	2016-17	2015-16	2016-17
EMU	41.0	**37.4**	-	**-**
Mail/Express	50.9	**50.6**	34.2	**31.4**
Ordinary Passenger Trains (incl. mixed)	33.9	**33.9**	25.3	**26.6**

Note: All figures shown in the above tables (I-VII) are inclusive of Metro Railway, Kolkata.

Passenger Revenue :

Passenger earnings in 2016-17 were ₹46,280.46 crore. This was ₹1,997.20crore (4.51 %) higher than the earnings in 2015-16. Suburban traffic contributed 5.81 % to the total earnings. The remaining 94.19 % came from non-suburban passengers. Earnings from Second and Sleeper Class Mail/Express passengers comprised 50.20 % of the total passenger earnings.

Passenger revenue in terms of earnings per passenger kilometre for different classes during 2015-16 and 2016-17 was as under:

		(In paise)
Segment	2015-16	**2016-17**
Non-suburban:		
Upper class	130.62	**135.60**
Second Class-Mail/Express (incl. sleeper class)	35.95*	**36.64**
Second Class-Ordinary	19.92	**20.75**
Non-suburban (all classes)	41.8	**43.4**
Suburban(all classes)	17.73	**18.49**
Overall average	38.74	**40.25**
* revised		

Passenger revenue in different classes with corresponding number of passengers and Passenger Kms. in 2016-17 is given below:

Segment	No. of passengers		Passenger kms.		Revenue	
	Million	Percentage	Million	Percentage	₹ in cr.	Percentage
Non-suburban:						
Upper Class	150	1.85	110,355	9.60	14,964.18	32.33
Second Class	1322	16.29	634,039	55.14	23,232.37	50.20
Mail/Express#						
Second Class	2078	25.6	260,024	22.61	5,394.47	11.66
Ordinary						
Total	3550	43.74	1,004,418	87.35	43,591.02	94.19
Suburban	4566	56.26	145,417	12.65	2,689.44	5.81
(all classes)						
Grand Total	**8116**	**100.00**	**1,149,835**	**100.00**	**46,280.46**	**100.00**

#Also includes Sleeper Class.

Passenger Services:

Train kilometres and vehicle kilometres along with density of traffic for some selected years were:

Year	Suburban (EMU)		Non-suburban		Train kms. per running track km. per day	
	Train kms. (Million)	Vehicle kms. (Million)	Train kms.+ (Million)	Vehicle kms.@ (Million)	Suburban (EMU)	Non-suburban+
1950-51	9.28	119.8	154	2,678	27.9	7.1
1960-61	14.05	196.8	190	3,594	28.7	8.2
1970-71	23.05	369.4	225	4,636	30.1	8.6
1980-81	35.55	601.5	258	5,582	36.6	9.7
1990-91	48.37	840.7	316	7,739	40.0	11.5
2000-01	56.04	1,029.5	397	11,035	47.1	13.8
2010-11	73.25	1,438.5	582	18,207	46.7	19.2
2014-15	85.81	1,942	674	22,860	45.8	21.6
2015-16	86.39*	1,970	684	23,356	50.0	21.6
2016-17	**87.30**	**2002**	**700**	**24,274**	**50.6**	**21.5**

@Includes Mainline EMUs, DEMUs, DHMUs and suburban services other than EMU but excluding Rail Cars/Bus and Departmental.
+ Excludes Departmental but includes Rail Cars/Bus, MEMU, DEMU and DHMU services.
* Revised

Passenger Service Improvements:

During the year 2016-17, Indian Railways introduced new trains, extended the runs and increased the frequency of existing trains, as given below:

	Trains introduced	Runs extended	Frequency increased	Total
Non-suburban	227 trains	134 trains	18 trains	379
Suburban	2 trains	19 trains	6 trains	27
Total	**229**	**153**	**24**	**406**

Ticketless Travel:

During 2016-17, 21.64 lakh checks were conducted against ticketless/ irregular travel (including carriage of unbooked luggage). About 265.95

lakh cases of ticketless/irregular travel/unbooked luggage were detected and ₹992.13 crore were realized on this account.

Passenger Amenities:

The allocation under the Plan Head "Passenger Amenities" in 2016-17 was ₹838.27 crore (Budget Estimate) and ₹1920.66 crore (Revised Estimate).

1,253 stations have so far been identified for development under the Adarsh Station Scheme up to 31.12.16 out of which 1038 stations have already been developed.

During the Year 2016-17, 154 stations were provided with water coolers, 81 stations were electrified, 36 passenger lifts and 38 escalators were provided at stations.

Passenger Reservation System (PRS):

New Generation e-Ticketing System (NGeT):

In order to improve user experience while booking Reserved Rail Tickets online on www.irctc.co.in., a new system (NGeT) with enhanced capacity and new features has been launched. The system has the capacity to book about 15000 tickets per minute. E-ticketing website for reserved tickets now handles about 62% of total reserved tickets. In order to improve website availability at the time of opening of booking of Tatkal tickets, staggering of Tatkal ticket booking time for AC and non-AC classes has been implemented. Mobile Apps on various platforms (Android and Windows) are also available for booking reserved tickets. Booking of e-tickets through International Credit/Debit Cards has also been enabled.

Mobile Application for train enquiry:

Train running status enquiry is now available through Mobile Applications. Railway Enquiry Application are available on Android, iOS and Windows Platforms. Train running enquiry status is also available on enquiry.indianrail.gov.in. Information about train schedule, trains between stations, cancelled trains, rescheduled trains and diverted trains is also available on the website.

Paperless Unreserved Ticketing through Mobile Phones:

Paperless Unreserved Ticketing on mobile phones was launched at Mumbai and has since been extended to suburban sections of Chennai, Kolkata and Secundrabad and New Delhi-Palwal section of Northern Railway. This has eliminated the need for passengers to stand in queue for getting tickets for journey in unreserved compartments of trains. The ticket

is delivered on the Mobile Phone and is embedded with QR Code. This service has added to passenger convenience.

Paperless Platform tickets have also been launched at several major stations like Mumbai Central, Dadar, Lokmanya Tilak Terminus, Sealdah, Chennai Central, New Delhi, Nizamuddin, etc.

Currency Coin-cum Card Operated Automatic Ticket Vending Machines(ATVMs):

Currency Coin-cum Card Operated ATVMs was launched at New Delhi. About 460 such ATVMs are now functional over Indian Railway network. These machines issue unreserved tickets and accept Cash as well as Smart Cards for payment. In addition, about 2600 Smart Card based ATVMs have also been commissioned.

Parcel Management System (PMS):

Computerised system for booking, labeling, tracking, loading/unloading and delivery of parcel packages is being implemented in place of the manual system. Computerised Parcel Management System has been implemented at Delhi-Howrah, Delhi-Mumbai, Delhi-Chennai, Howrah-Mumbai and Howrah-Chennai corridors.

Railway Users' Amenities:

Railway Users' Consultative Committees, at different levels, provide opportunities for formal consultations between the management and the rail users with a view to improve services for rail users. National Railway Users' Consultative Council (NRUCC), Zonal Railway Users' Consultative Committees (ZRUCCs), Divisional Railway Users' Consultative Committees (DRUCCs), Konkan Railway Users' Consultative Committee (KRUCC), Metro Railway Users' Consultative Committee (MRUCC), Suburban Railway Users' Consultative Committees and Station Consultative Committees at important stations provide useful inputs to Railway Administration.

NRUCC has been reconstituted for a two years term from 17.04.2017 to 16.04.2019. ZRUCCs, KRUCC, MRUCC & DRUCCs have been reconstituted for a two year term from 01.10.2017 to 30.09.2019.

LHB Coaches:

Consequent upon the introduction of the first rake of indigenously designed LHB Coach in December 2003 and pursuant to the decision taken to convert more & more conventional coaches in LHB, 144 pairs of train services have till now been converted/inducted with LHB coaches including

all the 21 pairs of Rajdhani Express train and 22 pairs of Shatabdi Express trains. Conversion of the rakes of the remaining train services to LHB design is in progress.

Improvement in Facilities inside Passenger Coaches:

Provision of dustbins in all coaches:

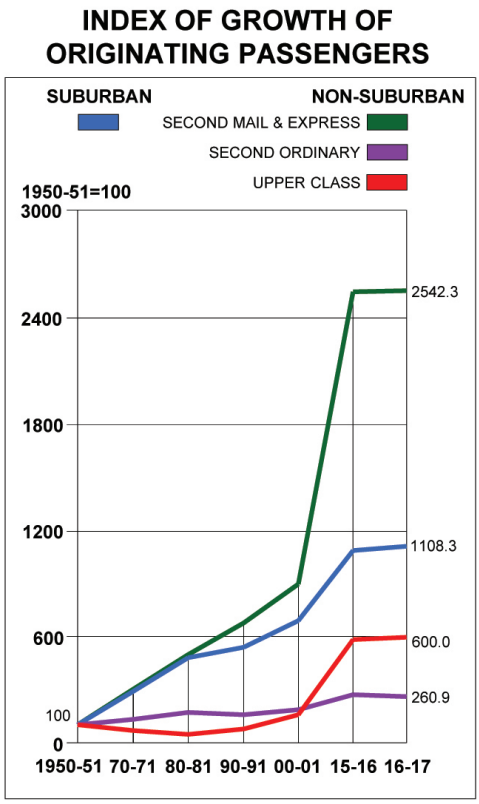
It has been now decided to provide suitable dustbins below the outside wash basin or on the end wall in all newly manufactured coaches including non-AC sleeper and second class coaches. Retrofitment on existing coaches has also been taken up in a phased manner.

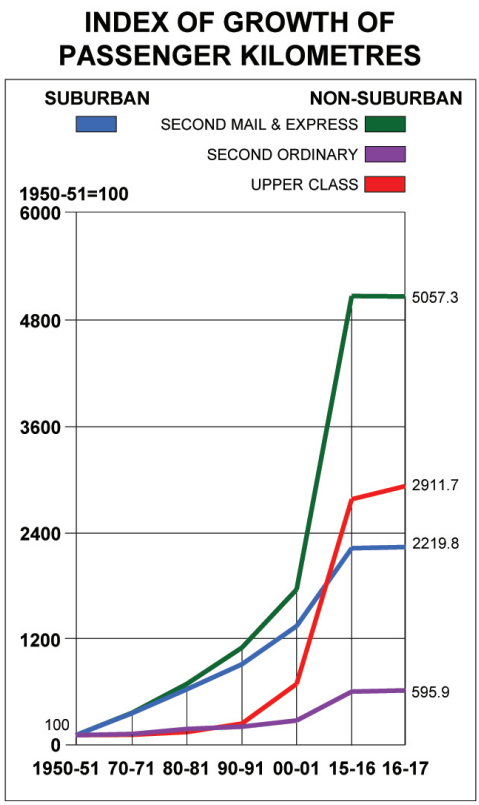
Provision of mug and chain arrangement in all coaches:

Previously mug and chain arrangement was being provided only in the toilets of AC coaches. Recently instructions have been issued for provision of mug and chain arrangement in non-AC coaches as well.

Refurbishing of model rake to start Mahamana Express

Some of the special features of the Model Rake include: Modular Panels, Superior material for panels, Ergonomically designed ladders, Aesthetically





appealing toilet modules, Large size mirrors, Platform washbasin, Controlled discharged water taps, Odour control system, Exhaust fans in toilets, Dustbin inside the toilet, use of LED Lighting to enhance illumination while minimizing energy consumption, Fire extinguisher in all coaches, Provision of electrically operated chimney in Pantry Car and Stainless Steel panelling in Luggage Compartment are provided in this rake. This rake has received wide appreciation from public at large. To make the passenger experience better and the journey more comfortable, Indian Railway has planned to improve the interior of the coaches. New interiors with more pleasing colours, aesthetically designed fittings, panelling, improved toilets, etc. will be provided in the existing coaches by refurbishing them during Mid-Life-Rehabilitation.

One such rake is already running in New Delhi-Varanasi Mahamana Express and similar rakes will be further introduced in more trains. Two Mahamana Express from Bhopal-Khajuraho Mahamana Super fast and Vadodara-Varanasi Mahamana Express has been introduced during this year.

Proliferation of Automatic Fire and Smoke Detection System in Coaches.

A pilot project for field trial with Automatic Fire and Smoke Detection system was taken up in one rake of New Delhi- Bhubaneswar Rajdhani. Besides, one LHB rake in New Delhi – Jammu Tawi Rajdhani train and one rake of LHB AC Double Decker rake running between Kacheguda-Tirupati/ Guntakal of South Central Railway have been provided with Automatic Fire and Smoke Detection system. The specifications have recently been revised with a view to interface the air brake system in the coaches with Fire and Smoke detection system for stoppage of trains in emergency situations. RSP sanction for provision of Automatic Fire and Smoke Detection System in 3250 Coaches has been taken and work has been completed in more than 200 coaches. Also, instructions have been issued that all newly manufactured AC coaches shall be provided with Automatic Fire and Smoke Detection System by the Production Units (PUs).

Provision of Braille signage in passenger coaches

Presently coaches are provided with signages, instructions, seat Nos. etc, which are mostly in the form of vinyl stickers/metallic plates and have no Braille characters. It has now been planned to provide signages incorporating the information in Braille form also for the aid of visually impaired passengers in all the coaches. ICF/Chennai has developed technical specification in

consultation with Blind Associations for implementation in different types of coaches. Provision of Braille signages has already been commenced in newly manufactured coaches. Besides, retrofitment of Braille signages in existing coaches is also being taken up in a phased manner.

Proposal for Integrated Solution for elderly and Disabled in Indian Railway Special Coach Design:

Indian Railways have manufactured about 3700 SLRD/SRD coaches which have a suitably designed compartment & toilet adapted to the needs of disabled / wheel chair borne passengers. In SLRD coaches, wider entrance door for wheel chair borne passengers, wider berths, wider compartments, space for provision of Wheel chair, larger lavatory and lavatory doors have been provided. Inside the toilets, additional grab rails on the side walls for support, wash basin and mirror at lower height have provided. It is endeavored to have at least one such coach in each Mail/Express train.

Further, the fully air conditioned Garib Rath trains have been provided with an Air conditioned disabled friendly compartment & toilets in the power cars.

Cleanliness and Hygiene:

1. Intensive mechanized cleaning of coaches

Mechanized cleaning of coaches is being carried out in the coaching depots through professional agencies. Heavy duty machines such as high pressure jet cleaners, floor scrubbers, vacuum suction cleaners etc. are deployed for the purpose.

2. Clean Train Stations scheme

'Clean Train Station' Scheme is provided for limited mechanized cleaning attention to passing through trains during their halts at selected stations enroute. 39 such Clean Train Stations have been made operational by 31.03.2017.

3. On Board House Keeping Service (OBHS)

On Board House Keeping Service (OBHS) has been prescribed in all Rajdhani, Shatabdi, Duronto & other important long distance Mail/ Express trains for cleaning of coach toilets, doorways, aisles & passenger compartments during the run of the trains. This scheme has been implemented on 864 pairs of trains till end of the year 2016-17. The scheme is further planned to be extended to cover all long distance Mail/Express vestibuled trains excluding purely overnight trains.

4. 'Clean My Coach' / 'Coach Mitra' service

'Clean My Coach' service was introduced in 2016 in OBHS trains. As per the scheme, for any cleaning requirement in the coach, passenger sends a Short Message Service (SMS) on a specified mobile number which is immediately acknowledged along with a code. A message is also sent by the server to the mobile number of On Board Housekeeping Service (OBHS) staff travelling on the same train along with the details of the passenger such as coach number, berth number. OBHS staff contacts the passenger and carries out the cleaning work as per demand.

Scope of 'Clean My Coach' has been extended to provide 'Coach Mitra' service in about 140 pairs of trains till March 2017 for providing single window assistance to train passengers regarding cleanliness, linen, disinfestation, watering and petty repair.

Setting up of mechanized laundries for washing of Linen:

To improve upon the quality of washing of linen supplied to the passengers in trains, Indian Railways have indentified 71 major coaching depot locations for setting up of mechanized laundries. 49 such laundries have been commissioned by the year 2016-17. Action is underway for setting up laundries at other identified coaching depots.

In addition, following steps have been taken on Cleanliness at Stations :

- Provision of Integrated Housekeeping Contracts at major stations.
- Enforcement of Indian Railways (Penalties for activities affecting cleanliness at railway premises) Rules, 2012 has been intensified.
- Use of CCTVs is being extended for monitoring cleanliness work at major Stations.
- Third party Survey of passenger perception on Cleanliness standards of 407 major railway stations completed in 2016.
- Social / Charitable Organisations / NGOs have also been associated in periodic cleanliness / awareness drives at about 70 railway stations.
- Railways have taken up a pilot project for disposal of Municipal Solid Waste (MSW) being generated at major railway terminals in an environment friendly manner including segregation of waste and conversion of bio-degradable waste to energy (bio-methanation).

Catering Services:

New Catering Policy has been issued on 27th February 2017 with the objective to provide quality food to rail passengers by unbundling of catering services on trains. IRCTC has been mandated to carry out the unbundling by creating a distinction primarily between food preparation and food distribution. In order to upgrade quality of food preparation IRCTC to set up new kitchens and upgrade existing ones. IRCTC to manage catering service on all mobile units. IRCTC not to outrightly outsource or issue licenses for provision of catering services to private licensees. IRCTC to retain the ownership and be fully accountable for all the issues pertaining to setting up and operation of the Base Kitchens and quality of food.

During the year 2016-17, Catering facilities were provided through:

- Pairs of trains with pantry car/mini pantries 360
- Food Plazas/Fast Food units 224
- Automatic Vending Machines 237
- Jan Ahaar Units 50
- Milk Stalls 972
- Other static catering units 8559
- Book Stalls 1016
- Curio stalls 339
- Exclusive Chemist stalls 22
- Bookstall cum chemist corner 15

Mass Rapid Transit System for Metropolitan Cities:

The various projects under execution in different Metropolitan Cities have been summarised below:

S. No.	Section	Kms.	Latest cost (₹ in Cr.)	Year of sanction	Year of completion	Sharing ratio
Kolkata :						
1	Extension between Noapara-Netaji Subhash Chandra Bose Airport(6.40 km), *Dum Dum-Noapara (2.54 km) and Noapara-Baranagar (1.93 km)	10.87	595.89	2009-10	Not fixed**	Railway 100%
2	Noapara-Barasat via Bimanbandar	18.00	3159.59	2010-11	Not fixed**	Railway 100%
3	Baranagar-Barrackpore & Dakshineshwar	14.50	2069.60	2010-11	Not fixed**	Railway 100%
4	NSCB Airport-New Garia via Rajarhat	32.00	4259.50	2010-11	Not fixed**	Railway 100%
5	Joka-Binay Badal Dinesh Bagh via Majerhat including Joka-Diamond Park Phase-I.	18.72	2619.02	2010-11 & 2012-13	Not fixed**	Railway 100%

6	Circular Railway including Extension from Remount Road to Santoshpur via Garden Reach (8.80 km).	8.80	268.52	2010-11	Not fixed**	Railway 100%
7	East-West Metro corridor, Kolkata from Howrah - Salt lake-Maidan	16.60	8996.96	2012-13	2019-20	74:26 (Rly. : MoUD)
Mumbai :						
1	Belapur-Seawood-Uran	27.00	1781.98	1996.97	Not fixed**	1:2 (Rly. : CIDCO)
2	Mumbai Urban Transport Project (MUTP) Ph.-II	63.89	8579.46	2008-09	2020-21	1:1 (Rly. : GoM)
3	Running of 12 car trains on Harbour lines	-	714.10	2012-13	Completed	1:1 (Rly. : GoM)
4	Mumbai Urban Transport Project (MUTP) Ph.-III	94.00	10947.00	2016-17	2021-22	46:54 (Rly.:GoM)
Chennai :						
1	Extension of MRTS Phase-II from Velachery to St. Thomas Mount	5.00	495.74	2006-07	Not fixed**	1:2 (Rly. : GoTN)
Hyderabad/Secunderabad:						
1	Hyderabad/Secunderabad Multi Model Transport System (MMTS) Phase-II	101.05	816.55	2012-13	Not fixed**	1:2 (Rly. : Go Telengana)

* Dum Dum-Noapara (2.54 km) has been completed on 10.07.2013.

**Target not fixed due to non availability encumbrance free land.

ATVM estabilished at Railway Station NWR

Freight Operation

Revenue earning freight traffic handled during 2016-17 was 1106.15 million tonnes. NTKMs earned during the year were 620 billion. Total loading and freight output, inclusive of non-revenue traffic, were 1110.95 million tonnes and 621 billion NTKMs respectively. Commodity-wise loading of revenue earning traffic was as follows:

	Tonnes carried* (Millions)		Absolute Variation over last year	Percentage to total
	2015-16	**2016-17**		
Coal				
i) for steel plants	52.06	**54.51**	2.45	4.93
ii) for washeries	1.09	**0.20**	- 0.89	0.02
iii) for thermal power houses	371.81	**245.27**	- 126.54	22.17
iv) for other public users	126.87	**232.85**	105.98	21.05
Total	551.83	**532.83**	-19.00	48.17
Raw material for steel plants except iron ore	20.29	**22.75**	2.46	2.06
Pig iron and finished steel				
i) from steel plants	29.59	**38.43**	8.84	3.48
ii) from other points	15.20	**13.98**	- 1.22	1.26
Total	44.79	**52.41**	7.62	4.74
Iron ore				
i) for export	2.13	**10.57**	8.44	0.95
ii) for steel plants	78.63	**83.70**	5.07	7.57
iii) for other domestic users	36.18	**43.28**	7.1	3.91
Total	116.94	**137.55**	20.61	12.43
Cement	105.35	**103.29**	- 2.06	9.34
Foodgrains	45.73	**44.86**	- 0.87	4.06
Fertilizers	52.23	**48.34**	- 3.89	4.37
Mineral Oil (POL)	43.24	**42.42**	- 0.82	3.83
Container service				
i) Domestic containers	9.04	**10.34**	1.30	0.93
ii) EXIM containers	36.79	**37.01**	0.22	3.35
Total	45.83	**47.35**	1.52	4.28
Balance other goods	75.28	**74.35**	-0.93	6.72
Total	1,101.51	**1,106.15**	4.64	100.00

* Excludes loading on Konkan Railway.

The following tables show the growth of freight traffic over the years:

I. Revenue earning freight traffic (excl. KRCL)

Year	Tonnes (Millions)	Index (1950-51 =100)	Net Tonne Kms (Millions)	Index (1950-51 =100	Lead (Kms)	Index (1950-51 =100
1950-51	73.2	100.0	37,565	100.0	513	100.0
1960-61	119.8	163.7	72,333	192.6	603	117.6
1970-71	167.9	229.4	110,696	294.7	659	128.5
1980-81	195.9	267.6	147,652	393.1	754	147.0
1990-91	318.40	435.0	235,785	627.7	741	144.4
2000-01	473.50	646.9	312,371	831.5	660	128.7
2013-14	1,051.64	1,436.7	665,810	1,772.4	633	123.4
2014-15	1,095.26	1,496.3	681,696	1,814.7	622	121.2
2015-16	1,101.51	1,504.80	654,481	1,742.26	594	115.79
2016-17	**1,106.15**	**1,511.13**	**6,20,175**	**1,650.94**	**561**	**109.36**

II. Movement of bulk commodities in the last four years

Sl. No.	Commodity group	2013-14		2014-15		2015-16		2016-17	
		Million Tonnes	Percentage	Million Tonnes	Percentage	Million Tonnes	Percentage	Million Tonnes	Percentage
1.	Coal	508.06	48.31	545.81	49.83	551.83	50.1	532.83	48.17
2.	Foodgrains	55.10	5.24	55.47	5.06	45.73	4.15	44.86	4.06
3.	Iron& Steel	38.95	3.70	42.84	3.91	44.79	4.07	52.41	4.74
4.	Iron ore	124.27	11.82	112.77	10.30	116.94	10.62	137.55	12.43
5.	Cement	109.80	10.44	109.80	10.03	105.35	9.56	103.29	9.34
6.	POL Mineral oils)	41.16	3.91	41.10	3.75	43.24	3.93	42.42	3.83
7.	Fertilizers (Chemical manures)	44.70	4.25	47.41	4.33	52.23	4.74	48.34	4.37
8.	Limestone and Dolomite	20.71	1.97	21.20	1.94	23.53	2.14	25.53	2.31
9.	Stones (including gypsum) other than marble	11.61	1.10	14.98	1.37	15.04	1.37	14.78	1.34
10.	Salt	4.65	0.44	4.99	0.46	5.02	0.46	4.97	0.45
11.	Sugar	3.00	0.29	2.69	0.25	3.39	0.31	2.35	0.21
	Total	**962.01**	**91.48**	**999.06**	**91.23**	**1007.09**	**91.43**	**1009.33**	**91.25**
12.	Commodities other than above	89.63	8.52	96.20	8.77	94.42	8.57	96.82	8.75
	Grand Total	**1,051.64**	**100.00**	**1,095.26**	**100.00**	**1,101.51**	**100.00**	**1106.15**	**100.00**

III. Freight Train Kilometres and Wagon Kilometres

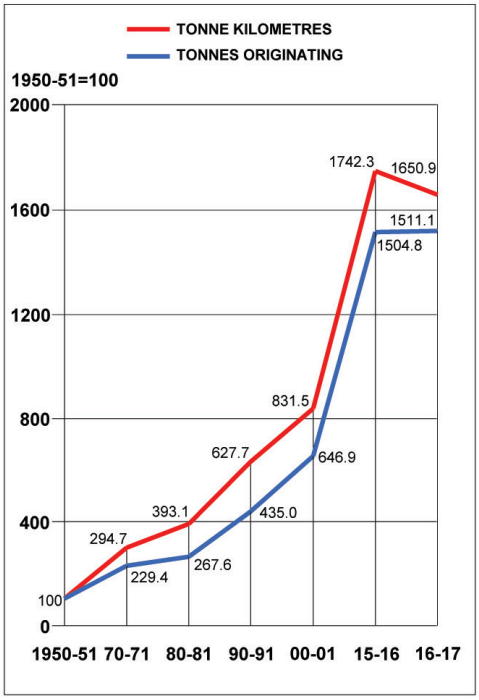
Year	Freight train kms.		Wagon kilometres@ (in terms of 4- wheelers)	
	Total(Million)	Per running track km per day	Total (Million)	Percentage of loaded to total
1950-51	112	5.2	4,370	70.7
1960-61	161	6.9	7,507	70.5
1970-71	202	7.7	10,999	69.7
1980-81	199	7.2	12,165	69.5
1990-91	245	8.5	19,230	65.5
2000-01	261	8.7	27,654	60.9
2010-11	368	11.6	17,749	66.5
2014-15	402	12.1	18,930	65.2
2015-16	393	11.7	18,708	64.0
2016-17	**391**	**11.4**	**18,403**	**64.0**

@ From 2010-11 onward figure in terms of 8 - wheelers

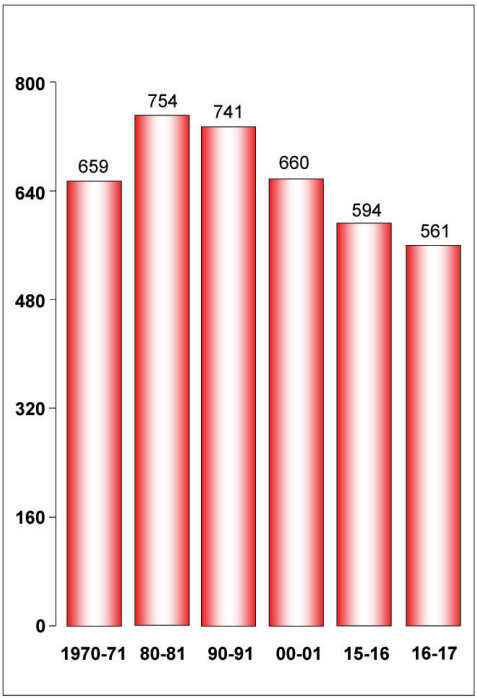
IV. Tonnes Originating, Net Tonne Kms. and Earnings from bulk commodities in 2016-17

S. No.	Commodity group	Tonnes originating		Net tonne kilometres		Earnings	
		In million	%age to total	In Million	%age to total	₹ incrore	%age to total
1	Coal	532.83	48.17	249,615	40.25	45228.57	44.33
2	Foodgrains	44.86	4.06	57,809	9.32	7505.76	7.36
3	Iron & steel	52.41	4.74	44,027	7.10	7672.34	7.52
4	Iron ore	137.55	12.43	39,743	6.41	8175.85	8.01
5	Cement	103.29	9.34	54,600	8.80	8629.89	8.46
6	POL (Mineral oils)	42.42	3.83	28,518	4.60	5686.28	5.57
7	Fertilizers (Chemical manures)	48.34	4.37	39,217	6.32	5561.15	5.45
8	Limestone & dolomite	25.53	2.31	12,911	2.08	2145.71	2.10
9	Stones (incl.gypsum) other than marble	14.78	1.00	6,223	1.01	1090.02	1.07
10	Salt	4.97	0.45	7,677	1.24	731.85	0.72
11	Sugar	2.35	0.21	4,486	0.72	487.66	0.48
	Total	**1,009.33**	**91.25**	**544,826**	**87.85**	**92,915.08**	**91.07**
12	Commodities other than above	96.82	8.75	75,349	12.15	9,112.74	8.93
	Grand Total	**1,106.15**	**100.00**	**620,175**	**100.00**	**1,02,027.82**	**100.00**

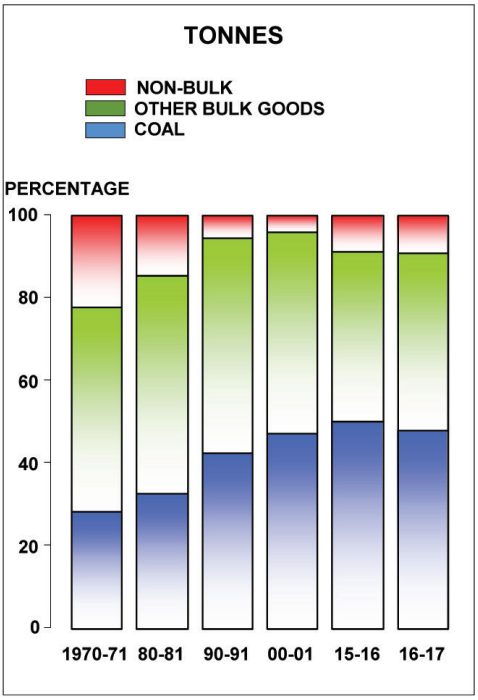
INDEX OF GROWTH OF FREIGHT
(REVENUE TRAFFIC)

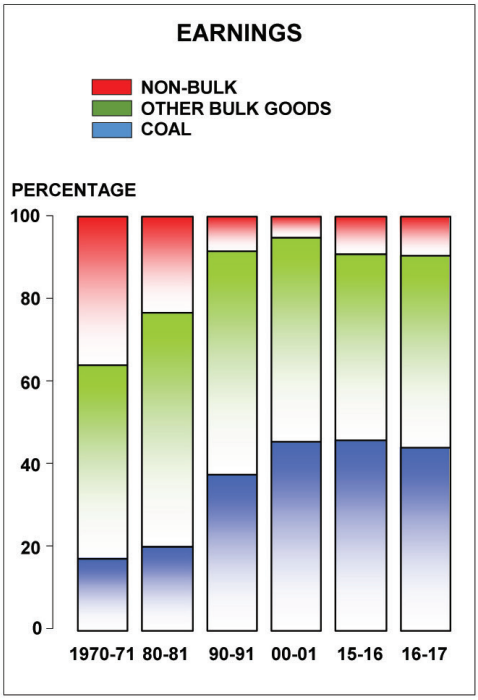


AVERAGE LEAD OF FREIGHT (KMS.)
(REVENUE TRAFFIC)



SHARE OF BULK COMMODITIES IN FREIGHT TRAFFIC





V. Some selected efficiency indices of freight operation during the last four years

			2013-14	2014-15	2015-16	**2016-17**
Net tonne kilometres per wagon per day@		BG	8,547	8,113	7,510	**7,359**
		MG	1,271	1,029	365	**-**
Wagon kilometres per wagon per day@		BG	264.5	220.0	214.5	**204.2**
		MG	52.8 &	27	16	**-**
Net tonne kilometres per engine hour	Diesel	BG	15,574	16,094	14,926	**14,122**
		MG	3,453	5,467	2,234	**-**
	Electric	BG	21,319	20,404	19,297	**17,885**
Net tonne kilometres per engine day on line	Diesel	BG	2,72,634	2,60,364	2,42,570	**2,36,241**
		MG	31,183	36,207	3,083	**-**
	Electric	BG	4,08,790	3,34,934	3,34,273	**3,28,105**

& revised @ From 2010-11 onward figure in terms of 8 - wheelers

VI. Share of Tonnage, Earnings and Net tonne kms. of 30 selected commodities in 2016-17

S No	Commodity group	Tonnes Originating		Earnings		Net Tonne Kms.	
		In thousand	% age to Total	in ₹ crore	% age to Total	in millions	%age to Total
1	Total coal	5,32,832	48.17	45,228.12	44.33	2,49,615.21	40.25
2	Iron ore	1,37,554	12.44	8,175.82	8.01	39,742.59	6.41
3	Cement	1,03,284	9.34	8,629.84	8.46	54,599.66	8.80
4	Iron & steel	52,413	4.74	7,672.29	7.52	44,027.19	7.10
5	Chemical manures	48,343	4.37	5,561.15	5.45	39,216.46	6.32
6	Food grains	44,856	4.06	7,505.76	7.36	57,809.27	9.32
7	Mineral oils	42,422	3.84	5,686.28	5.57	28,518.25	4.60
8	Total exim container	37,009	3.35	3,287.57	3.22	30,183.64	4.87
9	Limestone & dolomite	25,526	2.31	2,145.70	2.10	12,911.01	2.08
10	RMC carried in General Service Wagons	15,517	1.40	785.12	0.77	3,882.10	0.63
11	Stone other than marble and gypsum	11,082	1.00	656.97	0.64	3,654.60	0.59
12	Non-ferrous metal	10,672	0.96	829.35	0.81	4,270.22	0.69
13	Total domestic container	10,340	0.93	1,428.80	1.40	14,110.50	2.28
14	Ores other than manganese and iron	2,943	0.27	215.23	0.21	1,011.61	0.16
15	Salt	4,963	0.45	731.86	0.72	7,676.84	1.24

16	Gypsum	3,699	0.33	433.05	0.42	2,568.40	0.41
17	Jute manufactured	3,445	0.31	401.53	0.39	2,808.29	0.45
18	Cement manufactured	2,852	0.26	242.48	0.24	1,548.78	0.25
19	Sugar	2,353	0.21	487.66	0.48	4,485.68	0.72
20	Fruits & vegetable fresh	2,050	0.19	267.32	0.26	3,344.95	0.54
21	De-Oil Cakes in Pellet and Powder form	1,650	0.15	302.50	0.30	2,336.39	0.38
22	Edible oils	1,434	0.13	169.52	0.17	1,509.35	0.24
23	Manganese ores	1,048	0.09	101.48	0.10	573.72	0.09
24	Caustic soda	1,036	0.09	66.32	0.06	434.71	0.07
25	Wood unwrought (other than firewood)	721	0.07	54.21	0.05	651.99	0.11
26	Lime	451	0.04	69.85	0.07	482.17	0.08
27	Soda ash	398	0.04	85.32	0.08	646.66	0.10
28	Bamboos	264	0.02	14.05	0.01	198.89	0.03
29	Fodder oil cake	238	0.02	64.43	0.06	590.16	0.10
30	Opium & other narcotic drugs	184	0.02	40.05	0.04	306.69	0.05

Freight Structure:

There was no increase in Freight rates during 2016-17. However, to make the rail transportation attractive to its customers, various initiatives were taken in 2016-17 which include tariff rationalization, classification of new commodities, expansion of freight basket through containerization, new delivery models like RO-RO services, rationlisation and simplification of rate policies such as weighment policy, etc. All the policies launched in 2016-17 have further been extended upto March, 2018.

Freight Marketing :

I Procurement of goods rakes by inviting private investment (on PPP mode)

Liberalized Wagon Investment Scheme (LWIS):

The scheme allows investment by End users (viz. producers, manufacturers and consumers of goods) in Special Purpose Wagons (SPW) and High Capacity Wagons (HCW). So far, 41 rakes have been inducted under the scheme.

Special Freight Train Operator (SFTO):

To increase rail share of the non-traditional commodities like molasses,

fly ash, edible oil, caustic soda, chemical, petrochemicals, alumina & bulk cement, Special Freight Train Operator (SFTO) Scheme has been launched. So far, 5 rakes have been inducted under the scheme. Another 5 rakes are under process of procurement.

Automobiles Freight Train Operator Scheme (AFTO):

With a view to increase IR's market share in transportation of automobile sector, 'Automobile Freight Train Operator Scheme (AFTO)' scheme was launched, which permits procurement and operation of special purpose rakes by private parties. So far, 9 rakes have been inducted under the scheme. Another 12 rakes are under process of procurement.

Wagon Leasing Scheme (WLS):

The Wagon Leasing Scheme (WLS) aims for induction of rakes on lease basis through PPP route. As per the policy, the procurement of wagons through leasing route is permitted for only Special Purpose Wagons (SPW), High Capacity Wagons (HCW) and wagons for container movement. The leasing companies lease out rakes to end users, logistics providers. So far, 14 rakes have been inducted under the scheme. Further, 10 rakes are under process of procurement.

II Development of private freight terminals through private investment (on PPP mode)

Liberalized Private Freight Terminals (PFT) Policy :

Private Freight Terminal (PFT) facilitates rapid development of a network of freight terminals with private investment. The focus of the policy is to provide efficient and cost effective logistics services with warehousing solution to end users. The scheme has been liberalized during the year 2015. So far, 49 PFTs have been commissioned & functioning.

Claims:

IR paid ₹43.45 crores as claim compensation for goods/parcel/luggage in the year 2016-17 as compared to ₹11.56 crores paid in the year 2015-16. The trend of claims settlement in the preceding five years is given below:

Year	No. of claims received	No. of claims paid	Gross amount of compensation paid (₹in crore)
2012-13	18,715	3,305	26.15
2013-14	18,133	2,927	2.33
2014-15	15,450	2,561	6.69
2015-16	12,607	1,469	11.56
2016-17	**8,533**	**1,747**	**43.45**

Asset Utilisation

Some of the major efficiency indicators of IR's operational performance over the years is given in the following tables:

A. Engine kilometres per day per engine in use

(i) Goods

Year	Broad Gauge			Metre Gauge		
	Steam	Diesel	Electric	Steam	Diesel	Electric
1950-51	150	-	191	140	-	98
1960-61	155	300	156	140	273	171
1970-71	121	347	316	133	280	245
1980-81	89	303	274	107	276	206
1990-91	52	445	398	88	399	224
2000-01	-	398	450	18	345	203
2010-11	-	384	478	-	102	-
2014-15	-	368*	413*	-	152*	-
2015-16	-	367	380	-	65	-
2016-17	**-**	**377**	**390**	**-**	**0**	**-**

Passenger

Year	Broad Gauge			Metre Gauge		
	Steam	Diesel	Electric	Steam	Diesel	Electric
1950-51	249	-	397	211	-	130
1960-61	274	250	363	220	274	177
1970-71	250	669	437	228	383	376
1980-81	210	610	453	199	541	405
1990-91	189	673	482	185	569	382
2000-01	-	577	542	36	447	385
2010-11	-	594	671	34	390	-
2014-15	-	614	712*	29	361	-
2015-16	-	607	662	29	364	-
2016-17	**-**	**598**	**709**	**29**	**290**	**-**

Note: In view of the change in method of compilation of diesel and electric loco usage since 1981-82, the figures of earlier years are not strictly comparable.

* revised

B. GTKms. (excluding weight of engine and departmental traffic) per kg. of tractive effort:

Year	Broad Gauge	Metre Gauge
1950-51	1,525	1,191
1960-61	1,864	1,444
1970-71	2,147	1,714
1980-81	2,372	1,708
1990-91	3,873	2,263
2000-01	4,498	1,628
2014-15	4,642	1,337
2015-16	4,314	1,240*
2016-17	**4,077**	**461**

*revised

C. Density:

The density of traffic in terms of NTKms, PKms. and GTKms per route km. and per running track km. are given in the following two tables.

(Millions)

Year	Net Tonne Kms. Per Route Km.		Passenger Kms. Per Route Km.		Gross Tonne Kms. Per Route Km.	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G
1950-51	1.50	0.25	1.77	0.85	5.24	1.20
1960-61	2.76	0.54	2.03	0.89	8.32	2.18
1970-71	3.61	0.81	2.88	1.25	10.38	2.87
1980-81	4.34	0.80	5.15	1.72	12.55	2.76
1990-91	6.30	0.97	7.12	1.97	18.13	3.17
2000-01	6.96	0.24	9.49	2.08	21.95	1.79
2010-11	11.35	0.09	17.36	2.91	31.88	1.37
2014-15	11.60	0.10	19.24	2.98	33.75*	1.31
2015-16	10.83	0.02	18.66	3.40	32.35	1.23*
2016-17	**10.07**	**-**	**18.50**	**2.39**	**31.38**	**0.69**

*revised

(Millions)

Year	NTKMs Per Running Track Km.		Passenger Kms. Per Running Track Km.		Gross Tonne Kms. Per Running Track Km.	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	1.23	0.24	1.45	0.85	4.29	1.19
1960-61	2.19	0.54	1.61	0.87	6.59	2.15
1970-71	2.60	0.79	2.07	1.22	7.49	2.87
1980-81	3.06	0.76	3.63	1.64	8.84	2.63
1990-91	4.41	0.92	4.98	1.87	12.67	3.01
2000-01	4.93	0.24	6.73	2.03	15.55	1.75
2010-11	8.08	0.09	12.37	2.75	22.72	1.29
2014-15	8.19	0.09	13.59	2.79	23.85	1.23
2015-16	7.66*	0.01	13.19	3.16	22.86	1.14*
2016-17	**7.14**	**-**	**13.12**	**2.24**	**22.27**	**0.65**

*revised

D. Coach Utilisation:

In 2016-17 the vehicle Kms. per vehicle day was 564 on BG and 134 on MG.

Year	Vehicle Kms. Per Vehicle Day	
	BG	MG
1950-51	264	204
1960-61	252	177
1970-71	282	191
1980-81	314	186
1990-91	408	254
2000-01	461	269
2010-11	529	203
2014-15	581	89
2015-16	569	154
2016-17	**564**	**134**

E. Average freight train load:

The average net load per train in 2016-17 was 1,600 tonnes on BG. The average gross load per train was 2,859 tonnes on BG.

Year	Average Train Load (tonnes)			
	Net Load		Gross load (including weight of engine)	
	B.G.	M.G.	B.G.	M.G.
1950-51	489	185	1,068	435
1960-61	656	298	1,354	648
1970-71	737	378	1,507	753
1980-81	884	487	1,721	871
1990-91	1,079	562	2,122	962
2000-01	1,233	414	2,533	806
2010-11	1,702	488	3,063	902
2014-15	1,693	920	2,951	1,360
2015-16	1,664*	498*	2,955*	919*
2016-17	**1,600**	**0**	**2,859**	**0**

*revised

F. Average freight train speed (Kms./hour):

Traction-wise and gauge-wise average speed of goods trains over the years is indicated in the following table:

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	All traction	All traction
1950-51	-	20.8	17.4	15.0
1960-61	22.2	19.5	16.1	13.7
1970-71	22.9	25.2	17.9	14.7
1980-81	21.3	22.8	19.7	15.1
1990-91	22.6	23.1	22.7	17.6
2000-01	22.4	25.4	24.1	19.6
2010-11	23.5	27.0	25.6	14.7

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	All traction	All traction
2014-15	22.7	24.5	23.8	18.2
2015-16	23.0	23.7	23.4	19.9
2016-17	**23.3**	**24.0**	**23.7**	**0**

G. Net tonne Kms. per engine hour and per goods train hour:

During, 2016-17, NTKMs per engine hour stood at 16,337 for BG. NTKMs per goods train hour for BG was 37,342.

The table below shows the unit output measured by these indices in selected years:

Year	Net tonne Kms. per engine hour		Net tonne Kms. per goods train hour	
	B.G.	M.G.	B.G.	M.G.
1950-51	3,283	1,238	8,590	2,884
1960-61	4,170	1,766	10,808	4,232
1970-71	4,904	2,525	13,492	5,824
1980-81	6,295	3,345	17,677	7,562
1990-91	10,393	5,027	24,787	10,551
2000-01	12,850	3,773	29,752	8,539
2010-11	20,805	2,407	43,905	5,523
2012-13	19,468	2,386	41,112	5,585
2014-15	18,605	5,467	40,046	12,603
2015-16	17,507*	2,177	38,681	9,880
2016-17	**16,337**	**0**	**37,342**	**0**

*revised

H. Wagon Utilisation:

On an average, a wagon moved 204.2 kms. per day on BG in 2016-17. NTKMs per wagon per day on BG was 7,359. NTKMs per annum per tonne of wagon capacity on BG was 44,127. These indices of wagon utilization are given below:

(In terms of 4-wheelers)

Year	Net tonne kms. per tonne of wagon capacity per annum		Wagon kms. per wagon per day		Net tonne kms. per wagon per day	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	11,833	9,021	62.3	50.2	710	304
1960-61	16,558	10,125	76.9	51.6	998	405
1970-71	15,117	12,583	73.4	58.4	908	524
1980-81	16,285	11,013	73.4	47.3	986	522
1990-91	23,418	18,629	110.5	69.7	1,407	810
2000-01	33,289	7,981	179.0	43.8	2,042	394
2010-11 +	57,953	7,300	262.1	31.6	9,247	663

(In terms of 4-wheelers)						
Year	**Net tonne kms. per tonne of wagon capacity per annum**		**Wagon kms. per wagon per day**		**Net tonne kms. per wagon per day**	
	B.G.	**M.G.**	**B.G.**	**M.G.**	**B.G.**	**M.G.**
2014-15	49,362	11,364	220.0	27	8,113	1,029
2015-16	45,193	6,120	214.5	16	7,510	365
2016-17	**44,127**	**0**	**204.2**	**0**	**7,359**	**0**

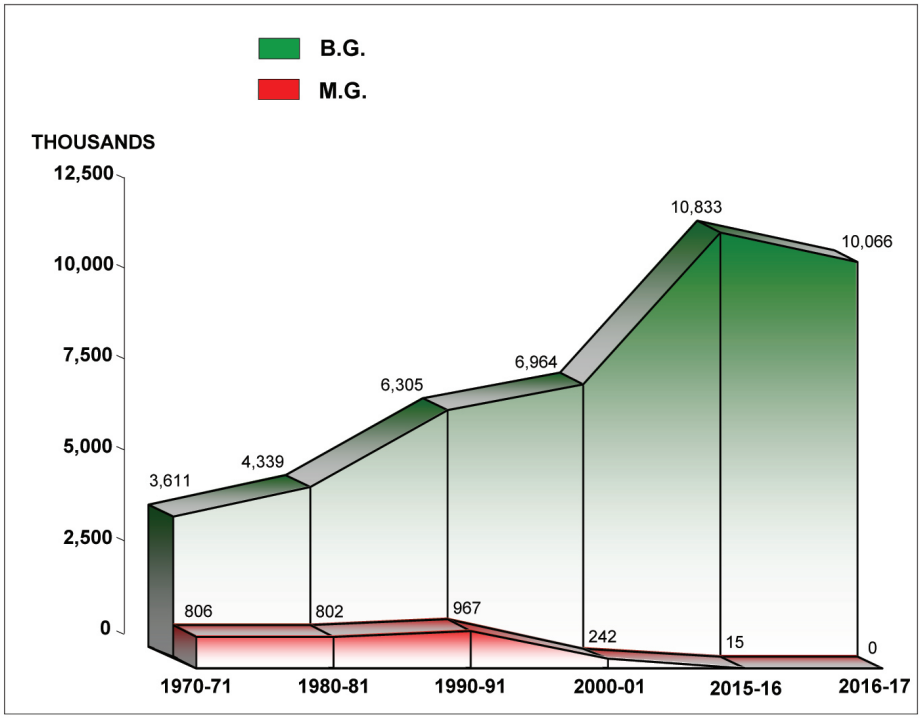
(+) in terms of 8 wheelers
* revised

Wagon turn-round (in days):

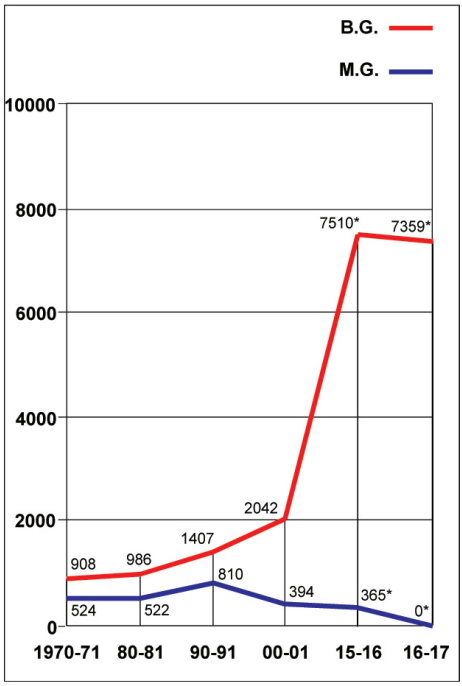
The turn-round time of wagons, representing operational cycle time is given in the following table:

Year	**B.G.**	**M.G.**
1950-51	11.0	NA
1960-61	11.2	7.2
1970-71	13.3	10.1
1980-81	15.2	15.3
1990-91	11.5	13.3
2000-01	7.5	12.9
2010-11	4.97	NA
2014-15	4.98	NA
2015-16	5.18	NA
2016-17	**5.32**	**NA**

NTKMS PER ANNUM PER ROUTE KM.

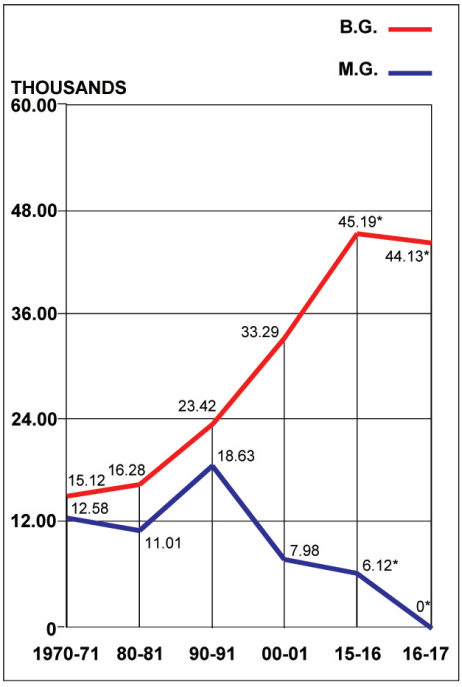


NET TONNE KILOMETRES PER WAGON PER DAY



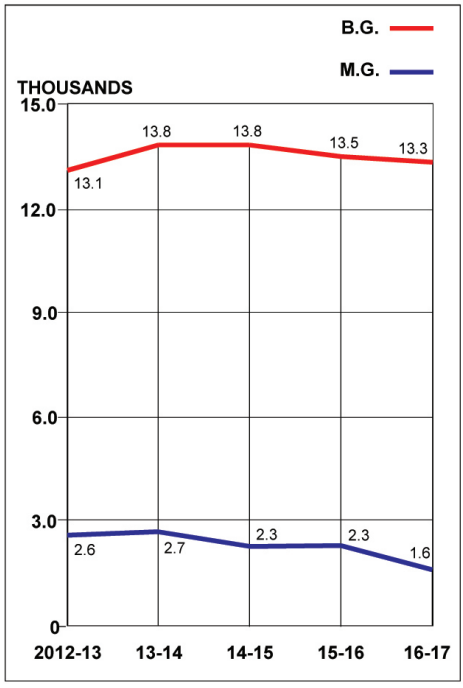
* In terms of eight wheelers

NET TONNE KILOMETRES PER ANNUM PER TONNE OF WAGON CAPACITY

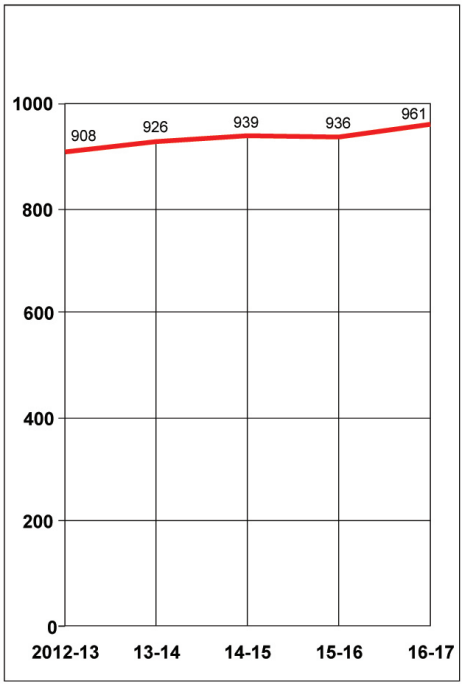


* In terms of eight wheelers

TRAIN KILOMETRES PER RUNNING TRACK KM



TRAIN KILOMETRES PER EMPLOYEE



Safety

There were 103* consequential train accidents in 2016-17 as compared to 106* accidents during 2015-16. Train accidents per million train Kms, an important index of safety, on IR dropped from 0.10 in 2015-16 to 0.09 in 2016-17.

Comparative position of train accidents during the last five years is as under:

Year	Collision	Derailments	Level Crossing Accidents	Fire in trains	Misc. Accidents	Total	Accident Per Million Train Kms.
2012-13	6	48	58	9	0	121	0.11
2013-14	4	52	51	7	3	117	0.10
2014-15	5	60	56	6	4	131	0.11
2015-16	3	64	35	0	4	106	0.10
2016-17*	**5**	**77**	**20**	**1**	**0**	**103**	**0.09**

*Excludes KRCL.

Casualties and Compensation:

The number of passengers injured or killed in train accidents and compensation paid in last five years are as under:

Year	No. of passengers		Casualties per million passengers carried	Compensation paid in lakh
	Killed	Injured		
2012-13	61	248	0.04	319.63
2013-14	42	94	0.02	149.22
2014-15	118	324	0.05	127.48
2015-16	40	126	0.02	263.00
2016-17#	**195**	**346**	**0.07**	**303.00**

#Excludes KRCL.

Causes of Train Accidents:

Out of 103 train accidents which occurred on IR during 2016-17, 86 (83.4%) were due to human failure. These include 64 accidents (62.1%) due to the failure of railway staff and 22 (21.4%) due to persons other than Railway staff. Equipment failure was the cause of 2 (1.9%) of the accidents. 6 (5.82%) accidents on Incidental factors and 2 (1.9%) accidents were due to Sabotage, 3 (2.9%) accidents were due to the combination of factors and 4 (3.9%) accidents are under investigations.

Damage to Railway Property:

The cost of damage to railway property and duration of interruption to through communication caused by consequential train accidents during 2015-16 and 2016-17 are as under:

Year	Cost of Damage (in Lakh)		Interruption to through communication (Hours)
	Rolling Stock	Permanent Way	
2015-16#	5089.42	834.33	922.45
2016-17#	**5457.04**	**7230.18**	**987.59**

#excludes KRCL.

Measures to Improve Safety

- **Safety Focus-** to reduce accidents caused by human errors, a multi-pronged approach with focus on introduction of newer technologies, mechanization of maintenance, early detection of flaws, etc. to reduce human dependence in the first place, alongwith upgrading the skills of the human resources were the prime drivers for accident prevention.
- **Periodical Safety Audits-** of different Divisions by multi-disciplinary teams of Zonal Railways as well as Inter-Railway Safety Inspections were conducted on regular basis. During 2016-17, 84 Internal Safety Audits and 31 Inter-Railway Safety Inspections were carried out.
- **Training facilities-** for drivers, guards and staff connected with train operation have been upgraded. Disaster Management Modules have also been upgraded. During 2016-17, 1,05,164 safety category employees attended refresher training.

Measures to avoid collisions

To increase Efficiency and to enhance Safety in train operations, Advanced Signalling System with Panel Interlocking/ Route Relay interlocking/ Electronic Interlocking (PI/RRI/EI) along with Multi Aspect Colour Light Signals have been progressively provided at 5,584 stations covering about 88 % of the interlocked Broad Gauge stations on Indian Railways, replacing the obsolete Multi Cabin Mechanical Signalling system, involving a large number of human interfaces. Route Relay Interlocking (RRI) at 12 major stations namely, Kurla, Akola, Erode Jn, Villupuram, Palakkad Jn, Dindigul, Tiruchchirapalli Jn, Vijaywada, Gamharia, Hajipur, Jhajha and Aligarh with Panel Interlocking at 169 Stations and Electronic Interlocking at 165 stations have been provided during the year 2016-17. It has been planned to replace the entire obsolete mechanical Signalling System with Electronic Interlocking/Relay interlocking by 2020.

To avoid collisions, technological aids are briefly enumerated below:

- **Complete Track Circuiting:** Complete Track Circuiting has been done upto 100%, 99.8%, 99.6% and 97.8% on A, B, C and D routes respectively. Fouling Mark to Fouling Mark track circuiting on 'A', 'B' 'C', 'D Special' and 'E Special' routes, where permissible speeds are more than 75 kilometers per hour on passenger line has been completed.
- **Block Proving Axle Counter (BPAC):** To enhance safety, automatic verification of complete arrival of train at a station, Block Proving Axle Counter (BPAC) is being provided at stations having centralized operation of points and signals. As on 31.03.2017 Block Proving Axle Counter (BPAC) have been provided on 4,976 block sections.
- **Axle Counter for Train detection:** Conventional D.C. track circuits are dependent on track and other engineering parameters. Therefore axle counters are being provided to improve reliability of train detection in line with Kakodkar Committee's recommendations.
- **Intermediate Block Signalling:** Provision of Intermediate Block Signalling (IBS) has proved very useful in enhancing line capacity without extra recurring revenue expenditure in form of manpower and amenities required while developing and operating a block station. As on 31.03.2017, Intermediate Block Signalling have been provided on 501 block sections on Indian Railways.
- **Automatic Block Signalling:** For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways, Signalling provides a low cost solution by provision of Automatic Block Signalling. As on 31.03.2017, Automatic Block Signalling has been provided on 2,866 Route Kms.
- Mini Integrated Power supply (IPS) has been developed to provide stable source of power supply for Signalling system at interlocked Level Crossing Gates, Intermediate Block Signalling and Automatic Signalling goomties.

Automatic Train Protection (ATP)

- **Train Protection & Warning System (TPWS):** TPWS has capability to control the speed of train in accordance with the sectional permitted speed and signal aspect ahead by automatic actuation of brakes, in case loco pilot fails to do so in time. Thus it mitigates safety risk of accidents/ collisions due to loco pilot's error of Signal Passing at Danger or over speeding. TPWS also reduces delays during foggy weather. It is based

on a proven European train protection technology which is deployed extensively on World Railways.

TPWS has been operationalized on 342 RKms on Indian Railways, Further, based on experience, introduction of this technology will be given priority on high density network of Indian Railway. TPWS works has been sanctioned on 3,330 Rkm for Automatic Signalling/High Density Routes on Eastern, South Eastern, Western, North Central, Central, Northern, Southern and South Central Railways.

- **Train Collision Avoidance System (TCAS):** TCAS is an indigenously developed Automatic Train Protection System. A developmental project is being undertaken on a limited section of Lingampalli – Vikarabad – Wadi - Bidar section (250 km) and 40 locos on South Central Railway.
- **Centralized Traffic Control (CTC) in Indian Railways:** In a first of its kind on Indian Railways, a Centralized Traffic Control (CTC) with electronic interlocking and automatic signalling system is being set up on the Ghaziabad-Kanpur route - one of the busiest sections of Indian Railways. This is a 410 Km long electrified route dealing with 200 trains per day. Its Central Control Centre is established at Tundla station. CTC System will help in real time monitoring and better management of trains. It provides for remote operation of signals from a centralized control office. The CTC system has been made operational for seven stations pilot section of Ghaziabad - Etawah - Kanpur section of NC Railway. The work for balance stations is in progress.
- **Train Management System (TMS):** TMS helps in real-time monitoring of trains in the control room. The arrival status of local trains is displayed on indicators installed on platforms in the form of a countdown timer (in minutes) to the train's arrival on the platform accompanied by automatic announcements on platforms.

TMS has been provided on Mumbai suburban section of Western and Central Railway. On WR, it covers the section from Churchgate to Virar extending over 60 km covering 28 stations and on CR it covers the suburban section from CST Mumbai to Kalyan extending over 54 km covering 26 stations.TMS work is almost complete on Howrah Division of Eastern Railway.

- **Interlocking of Level Crossing Gates:** This has been a major area of concern. Indian Railways have provided interlocking with Signals at 10,826 Level Crossing Gates to enhance the safety at Level Crossings. Initiative has been taken to Interlock Level Crossing gate with Train

Vehicle Units of 20,000 and above.

- **Sliding Boom:** Provision of Interlocked Sliding Boom has become very effective in minimising disruption to train services when Level Crossing Gates get damaged by road vehicles specially in suburban areas. With provision of Sliding Boom Interlocking, Signalling System continues to function normally with minimum effect on train operation. 2,991 Nos. of busy interlocked gate have been provided with Sliding booms in addition to lifting barrier and further busy gates are also being progressively covered.
- **Earth Leakage Detector (ELD):** With increasing traffic density, chances of getting disconnection for meggering of Signalling Cable have reduced. Cable meggering once in a year is a stipulated provision of Signal Engineering Manual. To overcome the problem of getting blocks for cable meggering, ELDs have been developed and are being provided over Indian Railways. ELD will detect low insulation in cables on line, so that signal staff can check the health condition of that cable group in advance and prevent a possible failure in future.
- **Self Sufficiency: Signalling Workshop:** Railway signalling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation in technology and shift towards electrical/electronic system of signalling, the demand for these equipment has gone up. To attain self sufficiency in meeting this increased demand, IR's Signal Workshops at Podanur on Southern Railway, Metaguda on South Central Railway, Gorakhpur on North Eastern Railway, Howrah on Eastern Railway, Byculla on Central Railway, Sabarmati on Western Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc.

Measures to Reduce Derailments

- **Upgradation of Track Structure** consisting of pre-stressed Concrete (PSC) sleepers, 52 Kg/ 60 Kg high strength (90 Kg/ mm^2 ultimate tensile strength) rails on concrete sleepers, fanshaped layout on PSC sleepers, Steel Channel Sleepers on girder bridges has been adopted on most of the routes.
- **Standardization of track structure with 60 Kg Rails and PSC Sleepers:** Track structure is being standardized with 60 kg rails and PSC sleepers on all the Broad Gauge routes, especially on high density routes to reduce fatigue of rails under higher axle-load traffic. New track

construction and replacement of over-aged tracks is being done by PSC sleepers only.

- **Long welded rails:** For improving maintenance and better asset reliability, Railways are consistently eliminating fish plated joints on tracks by welding the joints to convert all single rails into long welded rails to the extent possible. During relaying/construction of new lines/ gauge conversion also, long welded rails are laid on concrete sleepers to the extent possible. Mobile Flash Butt welding is being done on priority in construction projects and through weld renewal works. Mobile Butt welding plants are being arranged in Zonal railways for welding work of construction/Open line. Turnouts are also being improved systematically. Now Thick Web Switches are being used to improve asset reliability and to cope with higher axle load and increased volume of traffic. Now Weldable Cast Manganese Steel Crossings have been planned to be provided on identified routes in a phased manner to improve asset reliability and to cope with higher axle load and increased volume of traffic.
- **Flash Butt Welding:** There is progressive shifting to Flash Butt Welding which is superior in quality as compared to Alumino Thermic (AT) welding.
- **Ultrasonic testing of rails and welds:** Other measures taken in this direction include use of modern diagnostic aids like Digital Ultrasonic Rail Flaw Detectors (USFD), track recording cars, use of on-track machines for maintenance of track to higher standards controlling/reducing rails and weld failures and ensuring quality of rails during manufacture. Analogue type USFD machines have been replaced with digital type machines which have the facility of freezing scan and storing data during rail and weld testing.
- **Tie Tamping and Ballast Cleaning Machines:** There has been progressive use of Tie Tamping and ballast cleaning machines for track maintenance. Also, sophisticated Track Recording Cars, Oscillograph Cars and Portable Accelerometers are being used progressively.
- **Rail Grinding Machines:** Two Rail Grinding Machines are working on high density routes of Indian Railways for enhanced reliability of Rails.
- **Electronic monitoring of track geometry** is carried out to detect defects and plan maintenance.

Coaches

- **Centre Buffer Coupler:** Progressive fitment of tight lock Center Buffer

Couplers (CBC) in lieu of screw coupling on new manufacturing of ICF design coaches has been carried out with a view to prevent the coaches from climbing over each other in unfortunate event of an accident. So far, 6,331 LHB coaches, 425 Hybrid Stainless Steel Coaches & 1,340 conventional ICF design coaches have been manufactured with CBC. Design of CBC has been upgraded to mitigate problem of jerks during acceleration/ deceleration of trains.

- **Crashworthy features of Passengers Coaches:** To improve upon the standards of safety, a "crashworthy" ICF coach design, in conjunction with a Centre Buffer Coupler (CBC) , was evolved. Such a design enables absorption of significant amount of energy during the impact/collision. About 530 such crashworthy ICF design coaches have been manufactured so far. LHB AC Double Decker coaches introduced first time on Indian Railway have also been provided with enhanced crashworthy features.
- **Progressive use of Air Springs:** For enhancing safety and reliability of passenger coaches, the suspension systems are being redesigned with air springs at secondary stage capable to maintain constant height at variable loads. Air springs have been developed and are being fitted on all the newly built EMU & DMU coaches for sub-urban trains. Air springs have now been developed for mainline coaches as well and have been fitted in limited number of coaches. Production Units have been asked to use Air springs in all newly manufactured LHB coaches as proposed by RDSO.
- **Proliferation of LHB coaches for improving Safety:** LHB type coaches have superior crashworthy and anti climbing features. It has been decided to have complete switchover to production of LHB type coaches from 2018-19 onwards. Hitherto these coaches were inducted into premier services such as Rajdhani, Shatabdi and Durantos but now these are also being inducted into Mail & Express trains. All the Production Units have been asked to manufacture only LHB coach from 2018-19 onwards.
- **Provision of Automatic entrance doors and Bi directional swing doors in coaches:** Provision of Automatic entrance doors have been planned on coaches to prevent accidental falling of passengers from running trains. One air-conditioned EMU (Electric Multiple Unit) rake with Automatic doors, similar to Metro coaches for Mumbai, Western Railway has been manufactured at Integral Coach Factory, Chennai. Integral Coach Factory, Chennai has turned out coaches for Kolkata

Metro with Automatic door closure mechanism. Automatic entrance doors have been provided in the design of coaches of one Linke Hofmann Busch (LHB) rake with a higher speed potential of up to 200kmph.

Besides, for faster evacuation in case of emergency, AC compartment doors have been made with Bi- directional swing and fitment has started in new manufactured coaches. Retro fitment is also being done in all AC coaches in progressive manner. And RSP sanction of 425 Coaches in already available.

Measures taken to prevent Fire in Trains

- **Improving Fire Retardancy in Coaches:** Coaches are being provided with fire retardant furnishing materials such as Fire retardant curtains, partition paneling, roof ceiling, flooring, seat and berths along with cushioning material and seat covers, Windows and UIC Vestibules etc. The specifications of these items are being upgraded from time to time as a part of continual improvement. In the specification of major furnishing items, now a new parameter related to fire retardancy is heat release rate as per latest international norms.
- **Introduction of Automatic Fire and Smoke Detection System:** A pilot project for field trial with Automatic Fire and Smoke Detection system was taken up in one rake of New Delhi- Bhubaneswar Rajdhani. Besides, one LHB rake in New Delhi –Jammu Tawi Rajdhani train and one rake of LHB AC Double Decker rake running between Kacheguda-Tirupati/Guntakal of South Central Railway have been provided with Automatic Fire and Smoke Detection system. In the revised specification Air brake system has been interfaced with Fire and Smoke detection system for stoppage of trains in emergency situations. RSP sanction for provision of Automatic Fire and Smoke Detection System in 3,250 Coaches has been taken and work has been completed in more than 200 coaches. Also, instructions have been issued that all newly manufactured AC coaches shall be provided with Automatic Fire and Smoke Detection System by the Production Units (PUs).
- **Provision of Fire Extinguishers:** Dry chemical powder type fire extinguishers are provided in all Air-conditioned coaches, Second class- cum-guard and luggage van and Pantry cars. Besides, sanction for provision of fire extinguishers in 13,500 Non–AC passenger coaches has been obtained under RSP and the work is being carried out in a progressive manner.

- **Provision of Water mist type Fire Suppression in pantry cars and power cars:** Power cars and Pantry cars are relatively more prone to fire and therefore Fire suppression system based on water-mist technology is being tried out on limited numbers of coaches.

Measures to Curb Accident at Unmanned Level Crossings:

Various measures taken by Indian Railways to prevent accidents at level crossings, are as under:

- **Containing the proliferation of Level Crossings (LCs) at source:** A policy decision has been taken not to permit any new LC either on existing line or any new line/ gauge conversion to be commissioned henceforth. However, in exceptional cases, retention of manned LCs on new line or gauge conversion can be permitted with the approval of Railway Board.
- Ministry of Railways have decided to progressively eliminate all unmanned level crossings by:

  (i) Closure – Closing unmanned level crossings having NIL/ Negligible Train Vehicle Unit (TVU).

  (ii) Merger – Merger of unmanned level crossing gate to nearby manned or unmanned gates or subway or Road Under Bridge (RUB) or Road Over Bridge (ROB) by construction of diversion road.

  (iii) Provision of Subways/ RUBS

  (iv) Manning - The unmanned level crossings which cannot be eliminated by above means, will be progressively manned based on rail- road traffic volume, visibility conditions.

  (v) Level Crossing: Level crossings are meant to facilitate the smooth running of traffic in a regulated manner governed by specific rules & conditions, Status of level crossings on IR as on 01.04.2017 is as under:

Total Number of level crossings	:	27,181
Number of manned level crossings	:	19,480 (72%)
Number of unmanned level crossings	:	7,701 (28%)

Indian Railways has decided to progressively eliminate the level crossings for the safety of Road users and train passengers. During the year 2016-17, 1,503 Nos. of unmanned level crossings and 509 Nos. of manned level crossings have been eliminated.

- **Road Over/Under Bridges:** To improve safety of train operation and reduce inconvenience to road users, level crossings are being replaced by Road Over/Under Bridges/Subways (ROBs/RUBs) in a phased manner based on the quantum of traffic.

  There are 2,207 sanctioned works of ROBs/RUBs appearing in Pink Book 2017-18 which contains 1,670 ROBs and 6,213 RUBs/Subways. These are at various stages of planning, estimation and execution.

  During the year 2016-17, 171 ROBs and 1,183 RUBs/Subways have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT term and by NHAI over Indian Railways.

- **Bridge Inspection and Management System:** Modern Bridge Inspection techniques have been adopted, which includes testing by non-destructive testing equipments, under water inspections, monitoring the water level with the help of water level system etc. As on 01.04.2017, Indian Railway have 1,44,698 Bridges out of which 680 are important, 11,915 are major and 1,32,103 are minor Bridges. In the Year 2016-17, 753 Bridges were Strengthened/Rehabilitated/Rebuilt to enhance safety of train operations.

- **Patrolling of Railway Tracks:** During adverse weather conditions patrolling of railway tracks including night patrolling is carried out at vulnerable locations regularly.

Administrative Measures

- **Constant Review of Safety Performance at Board's apex level:** Safety performance is invariably reviewed as a first item on Agenda of Board Meeting at the apex level. All accidents are analyzed in detail so that remedial measures can be initiated.

- **Safety Review Meetings with Zonal Railways:** Chairman and Board Members have conducted Safety Review Meetings with General Managers and PHODs of zonal railways during their visits.

- **Intensive Footplate Night Inspections:** Intensive footplate inspections including night inspections have been conducted at the level of SAG and Branch officers and supervisors in the field.

- **Regular Safety Drives:** Safety drives have been launched from time to time, covering the lessons learnt from recent train accidents so as to prevent similar accidents in future.

The Network

Indian Railways (IR) is one of the world's largest rail network with 67,368 route kilometres of route lengths. The size of the network - gauge-wise and zone-wise as on 31 March, 2017 is as follows:

Gauge	Route Kms.	Running Track Kms	Total Track Kms
Broad Gauge (1676 mm)	61,680	87,962	1,14,912
Metre Gauge (1000 mm)	3,479	3,731	4,099
Narrow Gauge (762 mm and 610 mm)	2,209	2,209	2,396
Total	67,368	93,902	1,21,407

Zones /Headquarters	Route Kms	Running Track Kms	Total track Kms
Central, Mumbai	4,102	6,310	8,565
Eastern, Kolkata	2,712	4,855	7,526
East Central, Hajipur	3,986	5,724	8,297
East Coast, Bhubaneshwar	2,746	4,147	5,562
Northern, New Delhi	7,301	9,636	13,141
North Central, Allahabad	3,523	5,128	6,279
North Eastern, Gorakhpur	3,881	4,649	5,269
Northeast Frontier, Maligaon, (Gauwahati)	4,098	4,514	6,099
North Western, Jaipur	5,551	7,126	7,547
Southern, Chennai	5,080	7,194	8,842
South Central, Secunderabad	6,168	8,385	10,280
South Eastern, Kolkata	2,712	5,121	6,796
South East Central, Bilaspur	2,512	3,773	5,158
South Western, Hubli	3,522	4,274	5,283
Western, Mumbai	6,449	8,131	10,337
West Central, Jabalpur	2,998	4,880	6,333
Metro Railway, Kolkata	27	55	93
Total	**67,368**	**93,902**	**1,21,407**

State-wise Route Kms/ Running Track Kms. /Total Track Kms.:

Following table shows Route Kms., Running Track Kms. & Total Track Kms. of railway lines across various States/Union Territories at the end of 2016-17.

State/Union Territory	Route Kms.	Running Track Kms.	Total Track Kms.
Andhra Pradesh	3,817	5,704	7,282
Arunachal Pradesh	12	12	26
Assam	2,440	2,552	3,450
Bihar	3,714	4,907	6,772
Chhatisgarh	1,216	2,032	2,800
Delhi	183	339	699
Goa	69	69	98
Gujarat	5,259	6,321	7,746
Haryana	1,710	2,441	3,156
Himachal Pradesh	296	301	358
Jammu & Kashmir	298	366	491
Jharkhand	2,455	3,975	6,105
Karnataka	3,424	4,361	5,417
Kerala	1,045	1,709	2,074
Madhya Pradesh	5,113	7,662	9,491
Maharashtra	5,784	8,303	11,188
Manipur	13	13	18
Meghalaya	9	9	13
Mizoram	2	2	6
Nagaland	11	11	22
Odisha	2,598	3,972	5,157
Punjab	2,269	2,744	3,603
Rajasthan	5,894	7,645	8,670
Tamil Nadu	4,028	5,358	6,606
Telangana	1,823	2,545	3,,146
Tripura	203	203	256
Uttarakhand	340	400	465
Uttar Pradesh	9,167	12,563	15,588
West Bengal	4,139	7,345	10,612
Union Territory			
Chandigarh	16	16	66
Pondicherry	22	22	26
Total	**67,368**	**93,902**	**1,21,407**

Note: The remaining States/Union Territories have no railway line.

The table below shows the changing size of IR's electrified rail network over the years.

Year	Route Kms.		Running Track Kms.		Total Track Kms.#	
	Electrified	Total	Electrified	Total	Electrified	Total
1950-51	388	53,596	937	59,315	1,253	77,609
1960-61	748	56,247	1,752	63,602	2,259	83,706
1970-71	3,706	59,790	7,447	71,669	9,586	98,546
1980-81	5,345	61,240	10,474	75,860	13,448	1,04,480
1990-91	9,968	62,367	18,954	78,607	25,305	1,08,858
2000-01	14,856	63,028	27,937	81,865	36,950	1,08,706
2010-11	19,607	64,460	36,007	87,114	49,489	1,13,993
2014-15	22,224	66,030	41,038	90,803	55,266	1,17,996
2015-16	23,555	66,687	43.357	92,081	57,738	1,19,630
2016-17	**25,367**	**67,368**	**48,239**	**93,902**	**62,522**	**1,21,407**

Includes track in yards, sidings, crossings at stations, etc.

With its more than 150 year old history, IR is a state-owned public utility of the Government of India under the Ministry of Railways.

As a national common carrier transporting passenger and goods over its vast network, Indian Railways has always played a key role in India's social and economic development. It is a cheap and affordable means of transportation for millions of passengers. As a carrier of bulk freight viz. ores and minerals, iron and steel, cement, mineral oils, food grains and fertilizers, containerized cargo etc., the importance of Indian Railways for agriculture, industry and the common man is well recognized. Indian Railways carried 22.24 million passengers and 3.04 million tonnes of freight each day during 2016-17.

IR, functioning as Ministry of Railways, is headed by the Minister for Railways. The apex body entrusted with the management of this mega enterprise is led by the Chairman, Railway Board (CRB). Members of the Railway Board include Financial Commissioner, Member Traffic, Member Engineering, Member Rolling Stock, Member Traction and Member Staff who represent their respective functional domains. For administrative purposes, IR is divided into 17 Zones, each headed by a General Manager. Zonal Railways are further divided into smaller operating units called Divisions. There are 68 Operating Divisions in IR at present, each under a Divisional Railway Manager. In addition, there are a number of Production Units, Training Establishments, Public Sector Enterprises and other Offices working under the control of Railway Board.

Track and Bridges

As on 31.3.2017, the Indian Railways had			(in Kms.)
(i)	Route length	-	67,368
(ii)	Running Track length	-	93,902
(iii)	Total Trackage	-	1,21,407
The following works were carried out during 2016-17			
(i)	Track renewal	-	2487
(ii)	Construction of New Line	-	953.20
(iii)	Gauge conversion from MG/NG to BG	-	1020
(iv)	Track conversion from single to double line	-	882

New Lines:

During 2016-17, passenger train services were introduced on 953 Kms. of new lines on the following projects/sections:-

Railway	Section	Km.
Central	Lonad-Phaltan	27
	Ahmednagar-Narayandoh	12
Eastern	Banka-Chandan	40.36
	Bye Pass Line Jamalpur	0.85
	Barapalasi-Hansdiha	28.5
East Central	Hazaribagh-Barkakana	57
	Jamalpur-Munger-Sabdalpur-Sahibpur Kamal + Sabdalpur-Umaheshnagar	22.89
East Coast	Rajsunakhala-Bolagarh	13
Northern	Jind-Sonipat	80
North Central/ West Central	Tikamgarh-Mawai- Chhatarpur-Khajuraho	114
	Etawah-Mainpuri	58
Northeast Frontier	New Maynaguri-New Domohani – Y Connection	6
	Agartala-Udaipur	44
	Jiribam-Vangaichungpas	12
South Central	Yerraguntla-Nossam-Banagana Palli	45
	Banagana Palli-Nandyal	28
	Lingampet Jagtiyal-Mortad	51
	Devarkadra-Jaklair	28
	Morthad-Nizamabad	45.6

Railway	Section	Km.
South Eastern	Barkichampi-Tori	30
South Western	Rayadurga-Kalyandurg	40
	Kadiridevarapalli-Kalyandurga	23
	Ginigera-Chikkabenakal	27
	Nelamangala- Shravanabelagola	111
Western	Rau-Tihi	9
	Total	**953.2**

Gauge Conversion:

During 2016-17, 1020 Kms of track was converted from MG/NG to BG and passenger train services were introduced as detailed below:-

Railway	Section	Km.
East Central	Banmakhi-Purnia	37
North Eastern	Bhojipura-Pilibhit	40
	Chhapra-Masrakh	40
	Ramganga-Bareilly City	9
	Thawe-Masrakh	63.5
	Pilibhit-Majhola Pakariya	25.5
Northeast Frontier	Kumarghat-Agartala	109
	Badarpur-Kumarghat	118
	Arunachal-Jiribam	50
	Katakhal-Bhairabi	84
	Karimganj-Maihshashan	10
	Baraigram-Dullabcherra	29
North Western	Suratpura-Hanumangarh	174
	Ratangarh-Sardarshahar	47
	Sikar-Fatehpur Shekhawat	47
Southern	Sengottai-Aryankavu	20
South East Central	Jabalpur(Kachhpura)-Garha-Sukrimangela-Nainpur	44
	Sukrimangela-Ghunsore	36
Southern (ERS)	Punalur-Edamann	8
Western	Indore –Mhow	23
	Dhowas Loop	6
	Total	**1020**

Doubling:

During 2016-17, 882 Kms. of double/multiple lines track were completed and passenger train services were introduced as detailed below:-

Railway	Section	Km.
Central	Mohol-Vakav	23
	Nagothane-Roha	13
Eastern	Sagardighi-Gosaingram	13.25
	Mathurapur Rd-Lakshmikantapur	7.92
	Jiaganj-Cossimbazar	14.3
	Azimganj-Poradanga	3
	Azimganj-Gosaingram-Sagardighi	3.4
	Lebutala-Champapukur	18
East Central	Gauchari-Pasrah-Narainpur	20
	Hajipur-Goshwar	5.5
	Cossimbazar-Beldanga	22
	Sasaram – Durgawati (Dn line)	56
East Coast	Jakhpura-Haridaspur 3rd line	24.17
	Jagdalpur-Tokopal	17
	Radhakishorepur-Machhapur	2.1
	Ghantikal-Chuvanga garh	13
	Sargipalli-Handapa	14
Northern	Bhadohi-Mondh-Suriawan	15.33
	Shivnagar-Adinpur	18.5
	Kotfateh- Bhatinda	16
	Lohta-Chokhandi-Sewapuri	17
	Asaoti-Ballabhgarh	10
North Eastern	Aunrihar-Sarnath	24
Northeast Frontier	New Alipurduar-Samuktala Rd	11
	Gumanihat-Ghoksadanga	8
North Western	Marwar-Sojat	21
North Western/ RVNL	Rewari-Kosli	28
Southern	Tiruchchirappalli Jn-Manaparai	28.26
	Dindigul-Tamaraipadi	8
	Mathur-Ariyalur	26
	Tiruvalla-Chenganur	10
	Piravam Rd-Kurupuntara	12.96
	Villupuram-Tiruvennainallur Road	16
	Ennore-Korukkupet 4th line	7
	Tiruvallur-Tiruvalagadu	17
South Eastern	Manoharpur-Posoita	11.6
	Pandrasali-Jhinkpani	25
	Sini-Gamharia	16
South Central	Mntralayam Road-Mtmari	10

Railway	Section	Km.
South East Central	Silyari-Urkura	18
	Harri-Pendra	9
	Salka Road-Tenganmada	17.5
Southern (ERS)	Tiruvalla-Changanacherry	8
Southern/RVNL	Vriddhachalam-Mathur	28
South Western	Kambarganvi-Alnavar	11.57
	Bannikoppa-Banapur	11
Western	Bardoli-Chaltan	16
	Chichpada-Khanbara-Nandurbar	41
	Vasadva-Dharangdhra	15
	Indore-Rau	12
West Central	Mandi-Bamora-Bina	17.4
	Sorai-Vidisha	5.6
	Guna-Ruthiyai	21
	Keshavpur-Mahisadal	8
West Central/ RVNL	Diwanganj-Salamtpur	9.57
	Salamtpur-Sanchi	
	Total	**881.86**

Gauge-wise Details:

Broad gauge, though forming 91.56% of the route, generated 100% of the freight output (NTKms) and 99.22% of the passenger output (Pkms).

Route length as on 31.03.2017 on each gauge, indicating double/multiple line, single line and electrified route, is given below:

Gauge	Single line			Double/multiple line			Grand Total
	Electrified	Non electrified	Total	Electrified	Non electrified	Total	
Broad (1676 mm)	7,190.49	32,468.77	39,659.26	18,176.79	3,844.18	22,020.97	61,680.23
Metre (1000 mm)	0	3,479.13	3,479.13	0	0	0	3,479.13
Narrow (762mm/ 610 mm)	0	2,208.46	2,208.46	0	0	0	2,208.46
Total	**7,190.49**	**38,156.36**	**45,346.85**	**18,176.79**	**18,176.79**	**22,020.97**	**67,367.82**

Almost all Double/Multiple Track sections and Electrified Routes are Broad Gauge. Metre and Narrow Gauges are mostly single line and non-electrified. Between 1950-51 and 2016-17, traffic density (million GTKms. per running track km.) increased from 4.29 to 22.00 on BG.

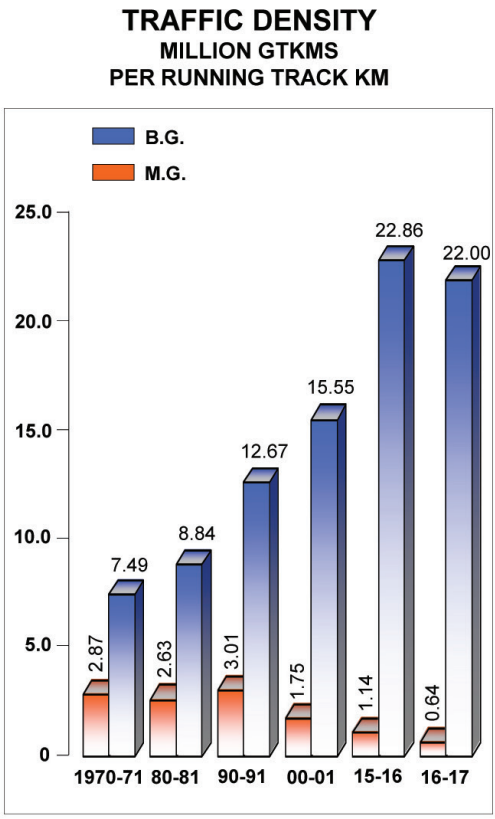
Track Renewal and Maintenance:

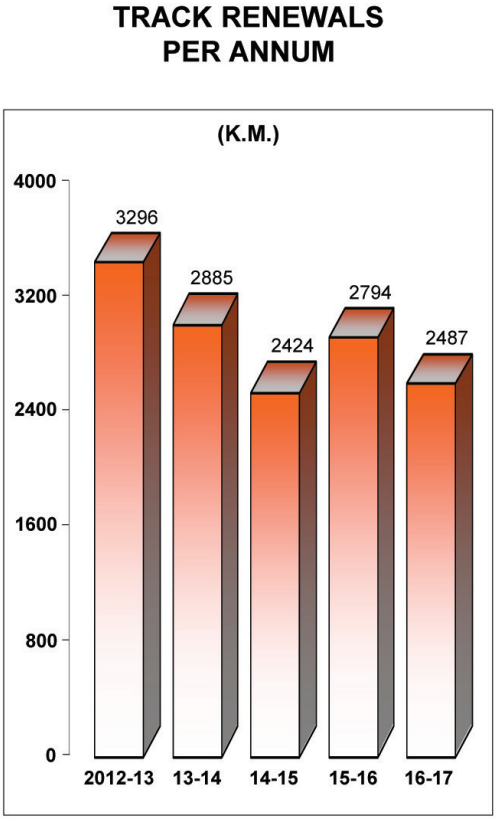
During 2016-17, 2487 kms of track renewal was carried out. The year wise details of Track Renewals done and expenditure incurred thereon are as under:

Year	Gross expenditure (₹ in cr.)	Track Renewal done (kms.)
2014-15	5371.55	2424
2015-16	5586.03	2794
2016-17	**6397.97**	**2487**

Track Upgradation:

The track constitutes the basic infrastructure of a railway system and bears the burden of coping with ever increasing traffic. Higher speed and heavy axle load operation of IR has necessitated up-gradation of the track structure. Several policy initiatives have been taken in order to modernize the track.





Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST-9 to PSC sleepers. Heavier section and high tensile strength 52kg/60kg 90UTS rails are used in place of 90R/52kg 72UTS rails. Similarly, long rail panels or welded rails are predominantly used in place of earlier fish plated joints. The sturdier turnouts using thick web switches is gradually introduced on trunk routes and high density routes. As on 31.03.2017, on BG main lines of IR, about 89.79% of the length is covered by long welded rails, 99.03% with PSC sleepers and 95.67% with 52kg/60kg 90 or higher UTS rails.

Welded Rails:

On most of BG track, rails have been converted into long welded rails. Short-welded rails of 39m length and single rails are limited to locations, where welded rails are not permitted on technical grounds. As on 31.03.2017, track of 76,791 km length on main lines of Indian Railways was with long welded rails and 9,956 km length of track on main lines was with short-welded rails.

Concrete Sleepers:

Concrete sleepers are economical and functionally best suited for high speed and heavy density traffic. Adequate capacity has been developed for production of concrete sleepers to meet the present requirement of IR and only concrete sleepers are being used for all renewals, new lines, doubling, gauge conversion etc.

Bridges:

As on 01.04.2017, IR has 1,44,698 bridges out of which 680 are important, 11,915 are major and 1,32,103 are minor bridges. In the year 2016-17, 753 bridges were strengthened/ rehabilitated/rebuilt.

Road Over/ Under Bridges:

To improve safety of train operation and reduce inconvenience to road users, level crossings are being replaced by Road Over/Under Bridges/ Subways (ROBs/RUBs) in a phased manner based on the quantum of traffic.

There are 2207 of sanctioned works of ROBs/RUBs appearing in Pink Book 2017-18 which contains 1670 ROBs and 6213 RUBs/Subways. These are at various stages of planning, estimation and execution.

During the year 2016-17, 171 ROBs and 1183 RUBs/subways have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT term and by NHAI over Indian Railway.

Level Crossings:

Level crossings are meant to facilitate the smooth running of traffic in regulated manner governed by specific rules & conditions. Status of level crossings on IR as on 01.04.2017 is as under:

Total number of level crossings	:	27,181	
Number of manned level crossings	:	19,480	(72%)
Number of unmanned level crossings	:	7,701	(28%)

Indian Railway has decided to progressively eliminate the level crossings for the safety of road users and train passengers. During the year 2016-17, 1503 Nos. of unmanned level crossings and 509 Nos. of manned level crossings have been eliminated.

Land Management:

As on 31.03.2017 Indian Railways (IR) owns about 4.76 lakh hectares of land. About 90% of this land is under Railways' operational and allied usages such as laying of new lines, doubling, gauge conversions, track, stations, workshops, staff colonies etc. The break-up of the land is as under:-

Description	Area (in lakh hectares)
Tracks and structures including Stations, colonies, etc.	3.66
Afforestation	0.41
'Grow More Food' scheme	0.03
Commercial Licensing	0.04
Other uses like pisiculture	0.09
Encroachment	0.01
Vacant land	0.52
Total	**4.76**

Creation of various infrastructure facilities for development of future rail network largely depends on the availability of land. Therefore, preservation and meaningful interim use of Railway land is the main objective of IR land-use policy.

During 2016-17, Railway did mass plantation of 1.25 crores trees. Now, Railway has finalized a model agreement with Ministry of Environment & Forest to be entered by Zonal Railways with State Forest Department, to protect Railway land being declared as protected forest by Forest Department. Moreover, now instructions have been issued to all Zonal Railways to make

provision of 1% in all estimates to environment related matter. This will help in meeting the cost of plantation.

Besides, Railway land is also licensed to Railway employees belonging to Group 'C' and 'D' category under 'Grow More Food' scheme, for growing vegetables, crops etc.

Licensing of railway land is permitted for the purposes directly connected with railway working. Plots of railway land at stations goods sheds and sidings are licensed to other parties for stacking/storing of goods either received or to be dispatched by rail. Railway land is also leased to Kendriya Vidyalaya Sangathan to open the Kendriya Vidyalayas. Apart from this, land is also leased to Central/State Governments/Public Sector Undertakings on long term basis for public utility purpose like ROB/RUB, construction/widening of roads etc.

Railways have also taken up commercial use of such land which may not be required by the Railways for its immediate future use. Through an amendment to Railways Act, 1989, Rail Land Development Authority (RLDA), under the Ministry of Railways has been constituted on 1st November 2006 to undertake all tasks related to commercial development on railway land/ air-space under the control of Ministry of Railways. At present, 49 sites have been entrusted to RLDA, for commercial development.

Necessary action for development of these sites is under process by RLDA. Besides, commercial development of vacant Railway land, RLDA has also been assigned the task of development of Multi Functional Complexes (MFCs).

Goods Train Crossing Kali Bridge near Karwar Station at Karnataka KRCL

Electrification

I Executive Summary of Railway Electrification

With a view to reduce the Nation's dependence on imported petroleum based energy and to enhance energy security to the Country, as well as to make the Railway System more eco- friendly and to modernize the system, Indian Railways have been progressively electrifying its rail routes.

In pre-independence period, electrification remained confined to 388 Route Kilometers (RKMs) and it is only in the post independence period that further electrification was taken up. While, 4556 RKM were electrified during XI Five Year Plan (2007-12) the progress increased to 7785 RKMs in the XII Five Year Plan, 2012-17(against the target of 6500 RKMs).

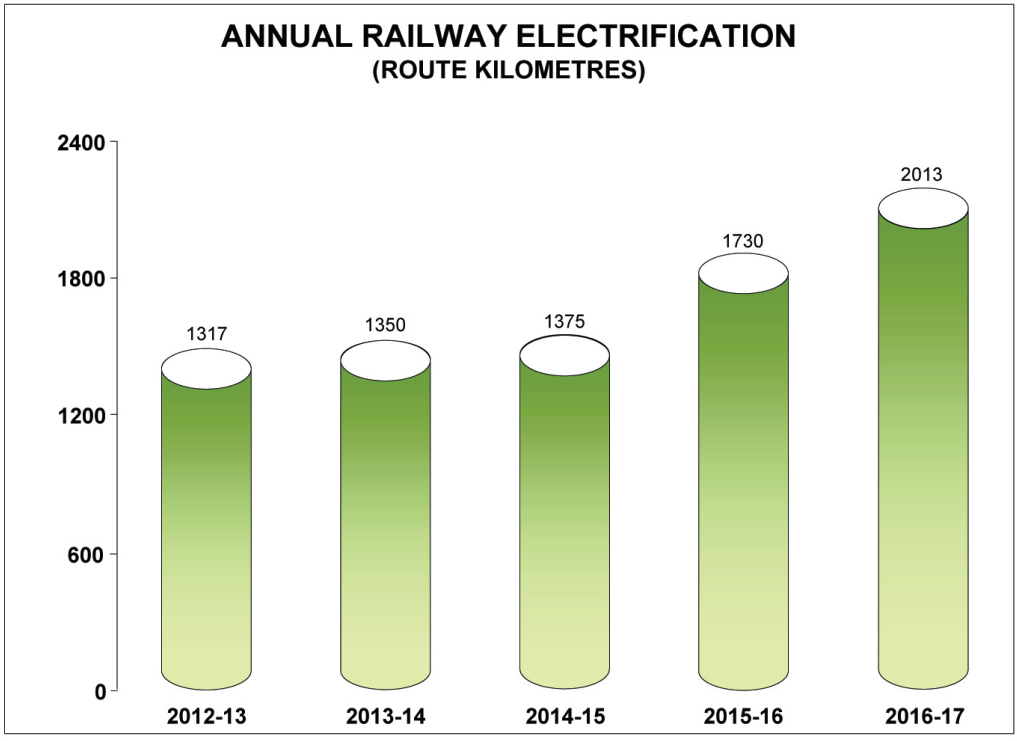
Further, Indian Railways have prepared an Action Plan for electrification of 90% of BG net work of Indian Railways by 2020-21. Accordingly, it has been planned to electrify 24,400 RKM in five years (2016-17 to 2020-21). Upto March 2017, 25,367 Route kilometers which is 37.65% of the total Railway network has been electrified. On this electrified route 65.10%. of freight traffic & 54.30% of Passenger traffic is hauled with fuel cost on electric traction being merely 36.14% of the total traction fuel cost on Indian Railways.

II Plan Period wise Progress of Railway Electrification

S.No.	Plan Period	RKM Electrified
1.	Pre-Independence - 1925-1947	388
2.	1st Five Year Plan - 1951-56	141
3.	2nd Five Year Plan - 1956-61	216
4.	3rd Five Year Plan - 1961-66	1,678
5.	Annual Plan - 1966-69	814
6.	4th Five Year Plan - 1969-74	954
7.	5th Five Year Plan - 1974-78	533
8.	Inter Plan - 1978-80	195
9.	6th Five Year Plan - 1980-85	1,522
10.	7th Five Year Plan - 1985-90	2,812
11.	Inter Plan - 1990-92	1,557
12.	8th Five Year Plan - 1992-97	2,708
13.	9th Five Year Plan - 1997-02	2,484
14.	10th Five Year Plan - 2002-07	1,810
15.	11th Five Year Plan - 2007-12	4,556
16.	12TH Five Year Plan 2012-17	7,785

III Sections Opened for Electric Traction After Inspection of Commissioner of Railway Safety in 2016-17.

S.No.	Section	Railway	State	RKM
1	Amla-Parasia	CR	Madhya Pradesh	85
2	Pune-Daund-Bhigvan	CR	Maharashtra	108
3	Khana-Sainthia-Pakur	ER	West Bengal	159
4	Andal-Sitarampur	ER	West Bengal	57
5	Arambag-Goghat	ER	West Bengal	9
6	Patliputra-Sonepur	ECR	Bihar	18
7	Mansi-Katihar	ECR	Bihar	115
8	Singapur Road-Lanjigarh	ECoR	Odisha	78
9	Sukinda-Jajpur Keonjhar Road	ECoR	Odisha	11
10	Kerejanga-Jarapada-Boinda	ECoR	Odisha	25
11	Jammu Tawi-Udhampur- Shri Mata Vaishno Devi Katra	NR	Jammu & Kashmir	78
12	Sitapur Cantt-Rosa	NR	Uttar Pradesh	80
13	Haridwar-Dehradun	NR	Uttarakhand	52
14	Delhi Shahdara-Noli	NR	Delhi	8
15	Rohtak-Jind	NR	Haryana	58
16	Chheoki-Shankargarh	NCR	Uttar Pradesh	39
17	Burhwal-Sitapur	NER	Uttar Pradesh	101
18	Basti-Domingarh	NER	Uttar Pradesh	60
19	Charvattur-Mangaluru	SR	Kerala	82
20	Wadi-Chiksugur	SCR	Karnataka	91
21	Kengeri-Ramanagram	SWR	Karnataka	30
22	Yelahanka-Dharmavaram	SWR	Karnataka & Andhra Pradesh	214
23	Indore-Mhow	WR	Madhya Pradesh	21
24	Itarsi-Pipariya	WCR	Madhya Pradesh	67
25	**Total**			**1,646**



IV Completion of Electrification from Jammu Tawi-Udhampur-Shri Mata Vaishno Devi Katra rail line.

In the year 2016-17, Railway Electrification of Jammu Tawi-Udhampur-Shri Mata Vaishno Devi Katra of Northern Railway, covering 78 Route Kilometers and passing through the State of Jammu & Kashmir has been completed. This important rail route is extension of Jalandhar-Jammu Tawi electrified route. Lakhs of devotees coming to visit Shri Mata Vaishno Devi Katra, will get eco-friendly and seamless journey from all parts of the country i.e. Kanyakumari, Howrah & Mumbai.

V Completion of Electrification of Rosa-Sitapur-Burhwal rail line.

In the year 2016-17, Railway Electrification of Rosa-Sitapur-Burhwal of Northern & North Eastern Railways, covering 181 Route Kilometers and passing through the State of Uttar Pradesh has been completed. It is a vital link for movement of freight traffic from Northern Railway to Northeast Frontier Railway. Electrification of this section has provided seamless flow of electric trains from Shri Mata Vaishno Devi Katra to Katihar without change of traction as electrification work of Moradabad-Lucknow & Barabanki-Gorakhpur-Barauni-Katihar section has been completed.

VI Completion of Electrification of Yelanhanka- Dharmavaram rail line.

In the year 2016-17, Railway Electrification of Yelahanka-Dharamavaram rail line of South Western Railway, covering 214 Route Kilometers and passing through the State of Karnataka has been completed. This has resulted in seamless movement of electric trains in this section, providing faster connectivity from Bengaluru to the northern part of India. Both passenger and freight trains passing through this route will move at higher speed and will result in substantially faster connectivity, in addition to improving traffic throughput in this route.

VII Completion of Electrification of Haridwar-Dehradun rail line.

In the year 2016-17, Railway Electrification of Haridwar-Dehradun rail line of Northern Railway, covering 52 Route Kilometers and passing through the State of Uttarakhand has been completed. With this, the entire branch line from Laksar to Dehradun has been commissioned on electric traction. This has resulted in seamless flow of electric trains in this section as traction change/detention at Laksar has been eliminated.

VIII Completion of Electrification of Basti –Gorakhpur (Domingarh) rail line.

In the year 2016-17, railway electrification of Basti-Gorakhpur (Domingarh) rail line of North Eastern Railway covering 60 Route Kilometers and passing through the state of Uttar Pradesh has been completed. This has resulted in seamless flow of electric trains from Sri Mata Vaishno Devi Katra to Barauni (via Ambala, Moradabad & Gorakhpur) and Mumbai to Gorakhpur(via Bhopal, Jhansi).

IX Major New Electrification Works Sanctioned in 2016-17, under Plan Head- Railway Electrification.

S. No.	Section	Railway	State	RKM
1	Pen-Roha	CR	Maharashtra	40
2	Pune-Miraj-Kolhapur	CR	Maharashtra	326
3	Jasai-Uran	CR	Maharashtra	10
4	Chalisgaon-Dhule	CR	Maharashtra	56
5	Mansi-Saharsa-Daura Madhepura	ECR	Bihar	63
6	Noli-Tapri	NR	Uttar Pradesh	143
7	Beas-Goindwal Sahib-Taran Taran-Amritsar	NR	Punjab	72
8	Chunar-Chopan	NCR	Uttar Pradesh	100
9	Kalyanpur – Kasganj – Mathura	NER	Uttar Pradesh	338
10	Gorakhpur Cantt - Kaptanganj - Valmikinagar	NER	Uttar Pradesh	96
11	Aunrihar-Jaunpur	NER	Uttar Pradesh	60
12	Ringas-Jaipur-Sawai Madhopur	NWR	Rajasthan	188
13	Ranchi- Lohardaga-Tori	SER	Jharkhand	116
14	Chhindwara-Nainpur-Mandla Fort	SECR	Madhya Pradesh	183
15	Gondia-Nainpur-Jabalpur	SECR	Maharashtra & Madhya Pradesh	229
16	Miraj-Londa	SWR	Maharashtra & Karnataka	189
17	Samakhiyali-Gandhidham-Kandla Port-Mundra Port	WR	Gujarat	63
18	Vijaipur-Maksi	WCR	Madhya Pradesh	188
Total				**2,460**

Signal and Telecom

Signalling

To increase Efficiency and to enhance Safety in train operations, Advanced Signalling System with Panel Interlocking/ Route Relay interlocking/ Electronic Interlocking (PI/RRI/EI) along with Multi Aspect Colour Light Signals have been progressively provided at 5584 stations covering about 88 % of the interlocked Broad Gauge stations on Indian Railways, replacing the obsolete Multi Cabin Mechanical Signalling system involving a large number of human interfaces. Route Relay Interlocking (RRI) at 12 major stations namely, Kurla, Akola, Erode Jn, Villupuram, Palakkad Jn, Dindigul,Tiruchchirapalli Jn, Vijaywada, Gamharia, Hajipur, Jhajha and Aligarh with Panel Interlocking at 169 Stations and Electronic Interlocking at 165 stations have been provided during the year 2016-17.

Complete Track Circuiting: has been done upto 100%, 99.8%, 99.6% and 97.8% on A, B, C and D routes respectively. Fouling Mark to Fouling Mark track circuiting on 'A', 'B' 'C', 'D Special' and 'E Special' routes, where permissible speeds are more than 75 kilometers per hour on passenger line has been completed.

Block Proving Axle Counter (BPAC): To enhance safety, automatic verification of complete arrival of train at a station, Block Proving Axle Counter (BPAC) is being provided at stations having centralized operation of points and signals. As on 31.03.2017 Block Proving Axle Counter (BPAC) has been provided on 4976 block sections.

Axle Counter for Train detection: Conventional D.C. track circuits are dependent on track and other engineering parameters. Therefore axle counters are being provided to improve reliability of train detection in line with Kakodkar Committee recommendations.

Intermediate Block Signalling: Provision of Intermediate Block Signalling (IBS) has proved very useful in enhancing line capacity without extra recurring revenue expenditure in the form of manpower and amenities required while developing and operating a block station. As on 31.03.2017, Intermediate Block Signalling has been provided in 501 block sections on Indian Railways.

Automatic Block Signalling: For augmenting line capacity and reducing

headway on existing High Density Routes on Indian Railways, Signalling provides a low cost solution by provision of Automatic Block Signalling. As on 31.03.2017, Automatic Block Signalling has been provided on 2,866 Route Kms.

Besides, mini Integrated Power supply (IPS) has been developed to provide stable source of power supply for Signalling system at interlocked Level Crossing Gates, Intermediate Block Signalling and Automatic Signalling goomties .

Automatic Train Protection (ATP)

(i) Train Protection & Warning System (TPWS)

Train Protection & Warning System (TPWS) has capability to control the speed of train in accordance with the sectional permitted speed and signal aspect ahead, by automatic actuation of brakes, in case loco pilot fails to do so in time. Thus, it mitigates safety risk of accidents/collisions due to loco pilot's error of Signal Passing at Danger or over speeding. TPWS also reduces delay during foggy weather. It is based on a proven European train protection technology which is deployed extensively on World Railways. TPWS based on this proven technology has been operationalzed on 342 RKMs on Indian Railways.

Introduction of this technology on high density network of Indian Railway is being given priority. TPWS works have been sanctioned on 3330 RKM for Automatic Signalling / High Density Routes on Eastern, South Eastern, Western, North Central, Central, Northern, Southern and South Central Railways.

(ii) Train Collision Avoidance System (TCAS)

TCAS is an indigenously developed Automatic Train Protection System. A developmental project is being undertaken on a limited section of Lingamapalli – Vikarabad – Wadi - Bidar section (250 km) and 40 locos on South Central Railway. Operational deployment of TCAS on Railways in Absolute Block Signalling sections will be taken-up after successful conclusion of the extended field trials and safety certification of system by ISA (Independent Safety Assessor).

Centralized Traffic Control (CTC) in Indian Railways:

In a first of its kind on Indian Railways, a Centralized Traffic Control (CTC) with electronic interlocking and automatic signalling system is being set up on the Ghaziabad - Kanpur route - one of the busiest sections of Indian Railways.

CTC System provides for remote operation of signals from a centralized

control office and will help in real time monitoring and better management of trains.

Train Management System (TMS): TMS helps in real-time monitoring of trains in the control room. The arrival status of local trains is displayed on indicators installed on platforms in the form of a countdown timer (in minutes) to the train's arrival on the platform accompanied by automatic announcements on platforms.

TMS has been provided on Mumbai suburban section of Western and Central Railway. On WR, it covers the section from Churchgate to Virar extending over 60 km covering 28 stations and on CR it covers suburban section from CST Mumbai to Kalyan extending over 54 km covering 26 stations. TMS work is also nearing completion on Howrah Division of Eastern Railway.

Interlocking of Level Crossing Gates:

This has been a major area of concern. Indian Railways have provided interlocking with Signals at 10,826 Level Crossing Gates to enhance the safety at Level Crossings. Initiative has been taken to Interlock Level Crossing gate with Train Vehicle Units of 20,000 and above.

Sliding Boom: Provision of Interlocked Sliding Boom has become very effective in minimising disruption to train services when Level Crossing Gates get damaged by road vehicles specially in suburban areas. 2,991 Nos. of busy interlocked gates have been provided with Sliding booms.

Earth Leakage Detector (ELD): To overcome the problem of getting blocks for cable meggering due to increasing traffic density, ELDs have been developed and are being provided over Indian Railways. ELD will detect low insulation in cables on line, so that signal staff can check the health conditions of that cable group in advance and prevent a possible failure in future.

Growth of deployment of Signalling on Indian Railways: **As on 31.03.2017**

Item	March,'14	March,'15	March,'16	March,'17
Panel Interlocking (Stations)	4200	4195	4107	4155
Route Relay Interlocking (Stations)	276	280	281	281
Electronic Interlocking(Stations)	735	842	1,005	1,148
PI/RRI/EI (Stations)	5,211	5,317	5,393	5,584
MACLS (Stations)	5,658	5,772	5,832	6,000
Track Circuiting (Locations)	30,509	31,073	31,737	33,054
Block Proving Axle Counter (Block sections)	4,175	4,585	4,640	4,976

Growth of deployment of Signalling on Indian Railways:				As on 31.03.2017
LED Lit Signals (No. of Stations)	5,449	5,599	5,732	5,917
Data logger(Stations)	5,292	5,460	5,587	5,758
Automatic Signalling (Route Kms)	2,623	2,715	2,752	2,866
Intermediate Block Signalling (Block sections)	449	475	489	501
Interlocked Level Crossing Gates (No.)	10,493	10,513	10,776	10,826

Telecommunication

Telecommunication plays an important role in train control, operation and safety on IR. Indian Railways has set up a State of the Art, nationwide telecom network for meeting its communication needs. RailTel, a Railways Central Public Sector Enterprise formed in September, 2000 is successfully exploiting surplus capacity of IR Telecom network commercially.

As on March 2017, Indian Railways has about 51,247 Route Kilometers of Optical Fibre Cable (OFC) that is carrying Gigabits of traffic. Railways Control Communication which is quintessential for train operation and control is also being transferred to OFC system. Till date, control communication on 48,893 Rkm has been shifted on OFC system. This OFC network is also contributing significantly in building National Knowledge Network through RailTel. It is also planning to provide Broadband connectivity to Panchayats through this OFC network. Railways have planned Wi-Fi facility to be provided at 709 stations for internet facility to passengers which will aid in "Digital India" initiatives of Govt. of India. RailTel Corporation of India in association with Google has planned for providing Wi-Fi internet facility at 405 stations without any expenditure by Ministry of Railways and with revenue sharing model.

To enhance the security of passengers & premises and to work as a strong deterrent to crime in station premises particularly those against women and children, IR has planned to provide Video Surveillance System at 983 A1, A, B & C category stations chargeable under 'Nirbhaya Fund'. In addition to these 983 stations, Video Surveillance System at 202 more stations has been sanctioned under ISS works, out of which 71 stations have been commissioned so far i.e. upto 31.08.2017.

Indian Railways have planned to provide a centrally managed Railway Display Network (RDN) at 2,000 stations consisting of more than one lakh display screens at stations. This system is useful for providing Train Information, Disaster Management through centrally broadcast emergency messages, socially relevant messages and advertisements to generate revenue.

Presently Proof of Concept (PoC) at 16 stations has been done. Indian Railways have decided to adopt Global System of Mobile Communication – Railways (GSM-R) based Mobile Train Radio Communication. The same has already been provided on 2,461 Route Kms and is being extended in balance 'A','B' & 'C' routes.

Indian Railways has its own satellite hub that is being utilized for connecting remote locations for Freight Operation Information System (FOIS), Unreserved Ticketing System (UTS), Disaster Management System as well as for other critical communication needs. Besides, IR network uses 16,318 data circuits that power its various data and voice networks across the country.

Railways have also established Multi-Protocol Level Switching (MPLS) based Next Generation Network (NGN) for voice traffic. This Next Generation Network (NGN) has been used to interconnect more than 100 exchanges of Railways carrying the administrative voice traffic. Common User Group (CUG) mobile phones have also been hired to enable communication while on the move to enhance safety, reliability and productivity. IR is also using 1.44 lakh VHF walkie-talkies sets to ensure safety and enhance reliability. Broadband has recently been provided on IR in all its major colonies in zonal and divisional headquarters. Telecom also plays a major role in ensuring passenger comfort. For the convenience of passengers, Train Information Boards have been provided at 1,090 Stations, Public Address (PA) Systems at 4,893 stations and Coach Guidance System at 556 stations.

RailTel Corporation is speeding the adoption of latest telecom technologies in Railways. Besides earning revenue from the spare capacity of Telecom Network of Railways, it is also modernizing the same. It has set up a State-of the- Art MPLS network that is used for providing Internet and L3-VPN services. The Enterprise WAN of Railway- Railnet Works as an L3-VPN on this MPLS network. It has also setup STM-4, STM-16, STM-64 and DWDM networks to carry data across the length and breadth of the country. It is involved in major Government projects like National Knowledge Network (NKN) & National OFC Network (NOFN), thereby contributing to the growth of the nation.

RailTel has also setup a next-generation- network to carry voice across the country. Point-of- interconnect has been established with all major telecom operators of the country. All zonal and divisional railway exchanges have also been connected to the NGN thereby modernizing the Railways voice STD network.

Important Telecom assets are tabulated below:

SNo.	Installation	Units	As on 31.03.2016	As on 31.03.2017
1.	Optical Fibre Cable	Rkms	49,434	**51,247**
2.	Quad Cable	Rkms	58,980	**60,458**
3.	Railway Telephone Subscribers Lines	No.	3,95,816	**3,95,816**
4.	No. of Control Sections provided with Dual Tone Multiple Frequency (DTMF) Control equipment	No.	322	**322**
5.	Mobile Train Radio communication System (Route kms.)			
	a. GSM (R) based	Rkms	2,461	**2,461**
	b. TETRA based	Rkms	53	**53**
6.	Digital Microwave (7 GHz)	Rkms	1,852	**1,812**
7.	Public Address System	No. of STNs	4,780	**4,893**
8.	Train Display Boards	No. of STNs	1,090	**1,090**
9.	Coach Guidance System	No. of STNs	534	**556**
10.	VHF Sets			
	a. 5 Watt sets (Hand held)	No.	1,45,947	**1,44,040**
	b. 25 Watt sets (At Stations)	No.	9,461	**9,425**
11.	V SAT	No.	1,117	**881**
12.	Railnet Connections \Nos.		1,30,185	**1,30,185**
13.	UTS/PRS Circuits	No.	10,760	**10,839**
14.	FOIS Circuits	No.	2,209	**2,219**
15.	NGN & Exchange Circuits	No.	2,429	**2,536**

VSAT Hub at New Delhi

Rolling Stock

Locomotives:

The size of IR's fleet of locomotive stock as on 31st March, 2017 consisted of 39 steam, 6,023 diesel and 5,399 electric locomotives. The number of locomotives, traction-wise, along with their average tractive effort is as follows:

Year	Number of locomotives				Tractive effort per loco (in kgs.)	
	Steam	Diesel	Electric	Total	B.G.	M.G.
1950-51	8,120	17	72	8,209	12,801	7,497
1960-61	10,312	181	131	10,624	14,733	8,201
1970-71	9,387	1,169	602	11,158	17,303	9,607
1980-81	7,469	2,403	1,036	10,908	19,848	10,429
1990-91	2,915	3,759	1,743	8,417	24,088	12,438
2000-01	54	4,702	2,810	7,566	29,203	18,537
2010-11	43	5,137	4,033	9,213	34,380	18,304
2014-15	43	5,714	5,016	10,773	36,954	17,950
2015-16	39	5,869	5,214	11,122	37,483	17,853
2016-17	**39**	**6,023**	**5,399**	**11,461**	**37,808**	**17,746**

Traction wise, average tractive effort per loco (Kgs.) for last four year is given below:

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	Diesel	Electric
2012-13	35,252	36,909	19,009	-
2014-15	36,520	37,420	18,974	-
2015-16	37,186	37,801	18,896	-
2016-17	**37,633**	**37,995**	**18,948**	**-**

Coach upkeep:

844 old coaches were given mid-life rehabilitation and 459 coaches were refurbished which brought substantial improvement in the condition of flooring, toilets and other passenger amenities."

Passenger Carrying Vehicles (PCVs) with aggregate seating capacity in different years and availability of Other Coaching Vehicles (OCVs) are shown below:

Year	Passenger Coaches						Other Coaching Vehicles (Number+)
	EMU Coaches		Conventional Coaches		DMU/DHMU		
	Number	Capacity $	Number @	Seating capacity	Number	Seating capacity	
1950-51	460	87,986	13,109	854,678	-	-	6,059
1960-61	846	150,854	20,178	1,280,797	-	-	7,415
1970-71	1,750	340,541	24,676	1,505,047	-	-	8,719
1980-81	2,625	500,607	27,478	1,695,127	-	-	8,230
1990-91	3,142	609,042	28,701	1,864,136	-	-	6,668
2000-01	4,526	859,701	33,258	2,372,729	142	13,884	4,731
2010-11	7,292	13,64,948	45,082	32,54,555	761	74,097	6,500
2014-15	8,571	15,45,929	51,838	37,27,998	1,248	1,22,081	7,000
2015-16	8,805*	15,78,868*	53,171*	37,94,954*	1,469*	1,36,594	6,704*
2016-17	**9,125**	**16,46,880**	**53,483**	**39,37,039**	**1,615**	**1,60,127**	**6,714**

$ Includes standing accommodation.
@ Includes Rail Cars.
+ Includes luggage vans, mail vans, parcel vans, etc.
* revised

Wagons:

As on 31st March, 2017, the size of IR's wagon fleet consisted of 2,77,987 units 66,716 covered, 1,55,795 open high-sided, 15,115 open low-sided, 25,934 other types and 14,427 brake vans/departmental wagons:

Year	Total wagons on line (In units)	Percentage of total number of wagons					
		Covered	Open high sided	Open low sided	Other types	Depart-mental	Total
1950-51	205,596	58.9	25.5	3.4	7.2	5.0	100
1960-61	307,907	57.3	25.5	2.5	10.6	4.1	100
1970-71	383,990	53.4	25.6	1.8	13.0	4.2	100
1980-81	400,946	53.3	28.3	3.2	11.8	3.4	100
1990-91	346,102	49.1	29.6	3.6	14.4	3.3	100
2000-01	222,193	34.1	41.0	3.6	17.5	3.8	100
2010-11	229,987	26.6	52.8	3.1	12.0	5.6	100
2014-15	2,54,018	26.0	53.8	6.0	8.8	5.4	100
2015-16	2,51,295	24.9	55.0	5.5	9.3	5.3	100
2016-17	**2,77,987**	**24.0**	**56.1**	**5.4**	**9.3**	**5.2**	**100**

Carrying capacity per wagon on broad gauge and metre gauge are indicated below :

Year	All Gauges		Broad Gauge		Metre Gauge	
	Total number of wagons$ (000)	Total capacity (Million tonnes)	Number$ (000)	Average capacity (Tonnes)	Number$ (000)	Average capacity (Tonnes)
1950-51	195	4.14	149	22.6	43	17.1
1960-61	295	6.30	207	23.1	83	18.0
1970-71	368	9.35	271	27.8	91	19.1
1980-81	387	11.14	299	30.6	83	23.0
1990-91	335	11.50	276	36.9	55	22.9
2000-01	214	10.19	199	48.7	14	34.4
2010-11	217	12.18	213	56.6	4	33.0
2014-15	240	14.32	237	60.0	3	33.1
2015-16	237	14.39	235	60.8	2	33.7
2016-17	**263**	**15.98**	**261**	**60.9**	**1.9**	**33.2**

$ Excludes departmental service wagons and brake vans

Some of the major types of wagons held by IR as on 31.3.2017 are shown below:

Types of wagon fleet (B.G.)

Type of wagon	Units available	Brief description
BOX`N'	47,718	High-sided bogie open wagons with cast steel bogie, high tensile couplers, Cartridge Tapered Roller Bearings (CTRB), air brake, etc. for movement of bulk commodities like coal, iron ore etc.
BOXNHS	18,868	Bogie open wagon, air brake, high speed.
BOXNLW	2,182	Bogie open wagon, air brake, light weight.
BOXNCR	265	Bogie open wagon, air brake, made of corrosion resistant IRS M : 44 steel.
BOXNHA	767	Bogie open, air brake wagon of 22 t axle load with high side walls (higher than BOXN), designed for transportation of coal.
BOXNHL	53,404	Bogie open air brake, stainless steel wagon.
BOY	1,239	Standard Gondola wagon, air brake, to carry minerals/iron ore with an axle load of 22.9 t.
BCN/BCNA	41,211	Bogie covered wagon, air brake fully riveted/welded construction for transportation of bagged cement, food grains, fertilizers etc.
BCNAHS/ BCNHS	8,897	Bogie covered, air brake, all welded & riveted construction with High Speed, bogie CASNUB-22 HS BOGIE.
BCNHL	18,532	Bogie covered, air brake, micro - alloy (stainless steel wagon).
BRN	1,309	Bogie Rail wagon Heavy, air brake.

BRNA/HS	5,200	Bogie Rail wagon Heavy, air brake, High Speed bogie, riveted cum welded construction.
BRHNEHS	1,560	Bogie Rail wagon, air brake, high speed CASNUB BOGIE for engineering department.
BFNS	713	Bogie Flat, air brake wagon, high speed for transportation of H.R. coils, plates, sheets & billets loading.
BOST/HS	8,419	Longer BOXNHS, air brake, wagon for finished steel products.
BOBR/N/HS	14,028	Bogie open rapid discharge air brake wagon for coal.
BOBYN	6,041	Bogie Hopper, air brake, bottom discharge wagon.
BOBSN	1,671	Bogie open air brake, side discharge wagon for iron ore.
BTPN	11,285	Bogie Tank wagon, air brake, for liquid consignments like petrol, naptha, ATF and other petroleum products.
BTFLN	922	Bogie Tank wagon, air brake with frameless body.
BTPGLN	91	Bogie Tank wagon, air brake, for carrying Liquified Petroleum Gas.
BLCA/BLCB	13,237	Low Platform Container Flat wagon, 840 mm wheel diameter, AAR'E' type centre buffer coupler and slack less draw bar system (privately owned).
BLLA/BLLB	440	Container Flat wagon, same as BLCA/BLCB, but with a Longer Platform of 45ft. (privately owned).

Repair and Maintenance :

44 loco sheds and 212 carriage and wagons sick lines and central repair depots provide repair and maintenance facilities for the entire fleet of rolling stock. 45 workshops undertake periodic overhaul of Rolling Stocks.

The number of units of rolling stock given periodic overhaul (POH) in railway workshops during the year are given in the following table:

Type of Rolling Stock (BG+MG)	**Periodic overhaul (Nos.) undertaken during the year**	
	2015-16	**2016-17**
Diesel Locos	511	**486**
Electric Locos	465	**436**
Coaches	30415	**30649**
Wagons	49075	**49663**

COFMOW

Central Oragnisation for Modernisation of Workshops (COFMOW) was established under the Ministry of Railways by Government of India for modernizing Indian Railways Workshops. The modernization project was funded through World Bank credits. Since its establishment in 1979 COFMOW has assisted in modernizing Indian Railways Production Units and maintenance workshops. This has involved purchasing over 21,331

machines valued at ₹5,895 crores. It continues its endeavor to provide crucial technical support to the various manufacturing & maintenance units of Indian Railways. It has now taken up turnkey projects of setting up workshops/expansion of workshops.

COFMOW is in a position to offer its services to those needing modernization or up gradation of their manufacturing/maintenance activities with enhanced productivity. COFMOW provides professional advice and procurement of machine tools and allied equipment.

Salient Features

- Bringing in state of the art technologies available worldwide in the field of M&P.
- Professional expertise in training staff, in the required area, by interaction with firms and studying the field requirements.
- Supports not only Mechanical units, but all the departments of Indian Railways vis-à-vis their M&P requirements.
- Up-gradation and compilation of specifications of all machines used in various workshops, maintenance sheds and Production Units.
- E-tendering all M&P items.
- Reverse Auction.
- Successive efforts for indigenization have led to FOREX savings.
- Setting up complete plants on composite, turnkey basis.

Key Milestones :

S. No.	Year	Fund Utilization (in Crores of Rupees)	Contracts Awarded
1	2015-16	443	368.87 Crs.
2	**2016-17**	**481**	**526.71 Crs. 179.6 crs(works)**

Turnkey Projects :

COFMOW has recently embarked upon the journey of handling Turnkey composite works including machinery/plant, Civil and Electrical works, all executed in tandem.

ICF Expansion Project:

Composite Works contract for augmentation of production capacity for manufacturing of advanced LHB coaches (Cost. ₹127 Crores) has been

completed and handed over to ICF.

- More than 350 LHB shells have so far been manufactured from the facility.

Spring manufacturing facility for ICF:

- A composite turnkey project for manufacturing of Coiled Springs at ICF/ Chennai has been awarded @ ₹84 crores. Work is under progress.

Automatic Wheel and Axle Assembly Complex for RWF:

- Composite project has been awarded @ ₹49.42 crores in May 2016 and work is under progress.

Augmentation of Wheel Shop at Matunga Workshop, Central Railway, Mumbai :

- Project for Augmentation of Wheel Shop Capacity at Matunga Workshop has been awarded @ ₹62.00 crores and is under progress.

Creation of Wheels and Bogie Overhauling Facility /Central Railway, Mumbai:

- Turnkey Project basis for Creation of Wheels and Bogie Overhauling Facility at Sanpada EMU Car Shed, Central Railway, Mumbai has been awarded @ ₹33.64 Crores.

Setting up of BG Coach POH Shed with holding capacity of 27 Non AC Coaches, Nagpur /SECR:

- A Composite work on Turn Key basis for setting up of BG Coach POH Shed with holding capacity of 27 Non AC Coaches at Moti Bagh Workshop, Nagpur at the @ of ₹83.95 crores has been awarded and work in progress.

  Besides the above Modernization and augmentation works of POH capacity to 150 wagons at Dahod workshop (Western Railway) and Augmentation of BG Coach POH capacity from 50 to 100 coaches at Bhavnagar Workshop are under progress.

Simulators :

- A turnkey contract for 12 nos. Simulators have been awarded valued at ₹155 crores to enhance the skills of train drivers. 09 nos Simulators have been supplied and 06 have been commissioned.
- Another Turnkey project of 14 nos of Simulators at an estimated cost of ₹162.96 crs. has been floated.

Traction

Electric and Diesel traction constitute the principal modes of traction on IR. The share of traffic in terms of Train Kms. and GTKMs for passenger and freight services hauled under different traction types over the years is given in the following tables:

Percentage of Train Kms. by types of traction

Year	Passenger				Freight		
	Steam	Diesel@	Electric		Steam	Diesel	Electric
			Loco$	EMU			
1950-51	93	-	2	5	99	-	1
1960-61	91	-	2	7	94	5	1
1970-71	77	7	7	9	46	39	15
1980-81	49	25	14	12	18	62	20
1990-91	21.8	42.4	22.6	13.2	3	60.6	34.4
2000-01	-	56.2	31.2	12.7	-	43.5	56.5
2010-11	-	49.4	36.6	13.9	-	37.5	62.7
2014-15	-	47.7	38.4	13.9	-	36.6	63.4
2015-16	-	48.0*	37.9*	14.1*	-	37.5*	62.5*
2016-17	**-**	**45.9**	**39.9**	**14.1**	**-**	**38.3**	**61.7**

@ Includes DHMU & DEMU

$ Includes Rail Cars & Rail Buses

* revised

Percentage of Gross Tonne Kms. by types of traction

	Passenger				Freight		
	Steam	Diesel@	Electric		Steam	Diesel	Electric
			Loco	EMU			
1950-51	92.4	-	2.8	4.8	98.3	-	1.7
1960-61	91.9	-	2.7	5.4	90.5	8.1	1.4
1970-71	74.1	10.7	8.2	7.0	32.2	47.7	20.1
1980-81	41.2	33.0	17.2	8.6	9.0	67.0	24.0
1990-91	15.1	47.1	29.5	8.3	0.8	57.8	41.4
2000-01	-	52.8	40.2	7.0	-	40.2	59.8
2010-11	-	48.8	44.0	7.2	-	35.7	64.3
2014-15	-	47.7	44.1	8.2	-	35.2	64.8
2015-16	-	48.3*	44.3*	7.4*	-	34.9	65.1
2016-17	**-**	**46.3**	**46.3**	**7.4**	**-**	**35.5**	**64.5**

@ Includes DHMU & DEMU

* revised

Electric Traction:

Distributed Power Wireless control system for electric locomotives:

IR has developed successfully Distributed Power Wireless Control system (DPWCS) indigenously for electric locomotives. This system has a huge potential for hauling of longer and heavier freight train as two or more locos attached in the train either next to leading loco or in the middle or rear of the train are wirelessly controlled by leading loco. This arrangement not only enhances the haulage capacity but also improves the acceleration and simultaneously results in increase of line capacity and reduction of coupler forces. Further, only one crew is required to be deployed in leading loco and the rest are unmanned and wirelessly controlled by the leading loco, therefore saving of manpower and operating costs. It is decided to provide DPWCS on all three phase freight locomotives being manufactured by CLW.

Software for Loco Asset Management (SLAM):

A computer application 'Software for Loco Asset Management (SLAM)' has been successfully rolled out in two electric locos sheds namely Ghaziabad (NR) & Tuglakabad(WCR) in Phase-I. In Phase-II, software has been commissioned in Four Electric Loco Shed i.e. Vadodara (WR), Ajni (CR), Valsad (WR) & Katni (WCR) along with associated TLC's and Trip Sheds and is under data uploading/validation. It will help Indian Railways in the following:

- Sharing of data across IR electronically in standard formats on real time basis.
- Real time monitoring of electric loco under maintenance at all levels from anywhere.
- Improve reliability of locomotives through easy and automated monitoring.
- Repair cost & time optimization through benchmarking.
- Real time shed performance monitoring and redistribution of major equipment.

Water Closets

After successful development of water closet with inbuilt vacuum evacuation & anaerobic bio-dischargeable system for electric locomotives, one WAG-9 locomotive no. 31952 has been provided with Water Closet and put under field trials.

Procurement of Propulsion system in a SET:

It has been decided to procure propulsion system of three phase locomotives in a SET along with AMC. The SET will consist of Traction Converter, Auxiliary Converter and Vehicle Control Unit. It will help

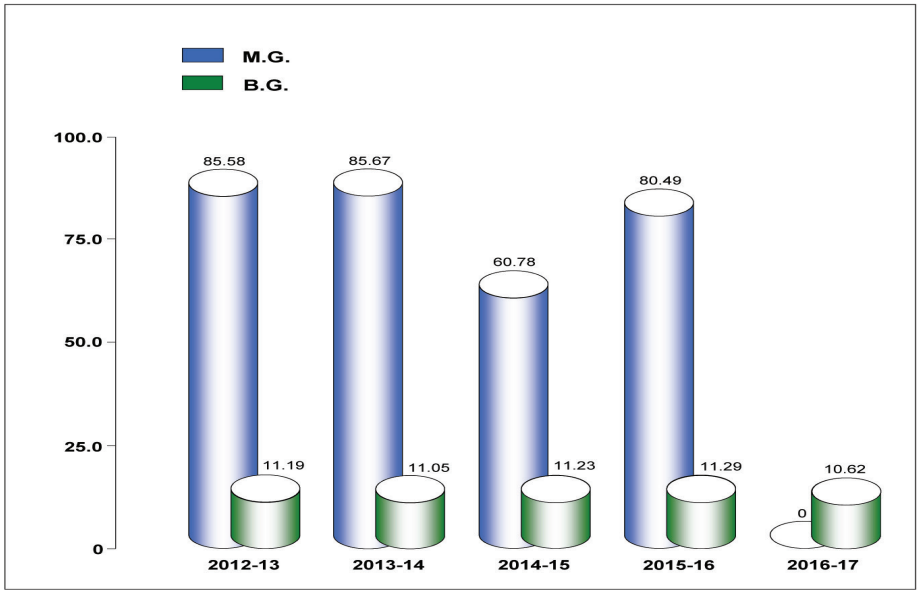
in reduction in price of propulsion equipment and also in improving the reliability of locomotive as OEM will be responsible to provide maintenance support after warranty period.

Diesel Traction:

Indian Railways has a fleet of about 5450 mainline BG diesel locos based in 44 Sheds. Following initiatives have been taken for improving availability & reliability and enhancing the safety concerning to diesel locomotives and train operation:-

- **Air Conditioning (AC) of locomotive cabs:** Loco Pilots are working in extreme weather conditions of heat, humidity and dust prevalent across the country. Provision of AC in loco cab will reduce fatigue level on run and will make working environment of crew better and improve their efficiency and thus, will improve the alertness level of the loco pilots. So far, ACs have been fitted in 674 Diesel Locos.
- **Bio – Diesel:** Indian Railways has started using HSD oil blended with 5% bio- diesel (B5) mixture on World Environment day i.e on 05.06.2015 at two locations Itarsi/ WCR and Sanathnagar/SCR. Subsequently it has now started at 63 locations on all Zonal Railways. Use of bio-diesel will result in reduction of Greenhouse Gases emissions, earning of carbon credits & saving of foreign exchange. Bio-diesel is expected to be 5-10 % cheaper than High Speed Diesel.

ENERGY CONSUMPTION (IN COAL EQUIVALENT)
GOODS SERVICES
(KGS. OF COAL/1000 GTKMS.)



- **CNG/LNG DEMU:** Presently, CNG DEMU rake are running in four sections viz., Rewari- Rohatak, Delhi-kurukshatra, Delhi- Samli and Farukhnagar- Garhi Harsaru (GHH) - Delhi Sarai Rohilla section of Northern Railway. A total of 100 DPCs have been sanctioned for conversion to dual mode with CNG/LNG under Rolling Stock Programme.
- CNG is not only cheaper fuel than diesel but is also more environment-friendly. In comparison to a diesel engine, a saving in fuel cost of 6% has been realised by use of CNG engines in dual fuel mode.
- **Auxiliary Power Unit (APU):** APU is a self-contained unit containing a small diesel engine coupled to a compressor and alternator for battery charging. It has its own set of controls, accessories and is integrated to the existing microprocessor control system of locomotive. In APU System, Main Engine shuts down and small 25 HP Engine starts and charges batteries and air brakes pipes, when loco idles for more than 10 minutes. The diesel engine of APU consumes only 3 litres of diesel per hour in comparison to 25 litres by the main engine of the locomotive. Expected savings per loco fitted with APU is Rs 20 lakhs/year on account of savings in fuel oil only. So far, APUs unit have been fitted in 427 Diesel Locomotives.

Remote Monitoring and Management of Locomotives and Trains (REMMLOT): REMMLOT enables remote monitoring of Diesel Locomotives. It specifically enables analysis of lapses on part of the loco pilot, when he is reported to have passed a signal at danger. This will enable focused counseling and training of such crew, who are prone to unsafe working. REMMLOT also monitors condition of locomotive and helps in preventive maintenance of locomotives. REMMLOT monitors shutting down of locomotives when idle for a long time and generates management information to ensure this. The above system is already running on about 3361 locomotives.

Guidance for Optimized Loco Driving (GOLD): This is a GPS based driver guidance system, which assists the loco pilot in optimizing fuel consumption with an eye on terrain ahead. It advises the loco pilot to lower throttle if there is a down gradient ahead or to throttle up if there is a climb ahead. It also warns the crew of signals, stations and level crossing gates ahead. Successful trials have been conducted and this system will be proliferated on the locomotives.

The following developments are also in hand with regard to Diesel Locomotives:

Dual-mode Locomotive: There are large numbers of stations / yards, where traction change takes place over IR due to mix of diesel and electric

tractions. These traction change points are inevitable since there will be large number of sections, which are uneconomical for electrification. With modern electronics, it is much easier to build an electro-diesel locomotive (Dual mode), which is equally capable of running at designated speeds both on electrified and non-electrified territory.

These dual mode locomotives are very useful and economical for operation in territories, where there are a number of traction change points. There will be huge cost savings due to reduction in the detention time of locomotive and rakes at the traction change points. This will eliminate shunting of locomotives at traction change points, improved flexibility of operation in the goods yards / sidings, increased throughput of the sections. In the event of major accident in natural calamities like cyclone and disturbed areas where OHE gets affected, dual mode loco will provide excellent operational flexibility to work on diesels until the normalcy is established.

A dual mode loco design has been developed by RDSO. 5 Dual mode locomotives are under developmental stage at DLW.

Noise level reduction in Diesel loco cabs: Existing Noise level in the cabin (rear) is around 96 dB (A). Reduction to 85 dB (A) has been envisaged, which will be at par with US norms. DLW has tried a new acoustic insulation scheme to reduce noise level in the crew cabin. Under trial results noise level has reduced to 90 dB (A) with new acoustic insulation. RDSO has awarded a consultancy contract for Noise source identification and control of HHP Locomotives to IIT/KGP.

Multi-genset locomotive: Multi-genset has been developed by RDSO and DMW in collaboration with NREC of USA. In a multi- genset locomotive, single large engine is replaced by three smaller engines. An on-board computer monitors the power requirement and shuts down/ starts engines as per load demands, which makes it more fuel-efficient. Two such locomotives have been turned out by DMW/PTA. Trials at Itarsi Diesel shed have shown saving up to 17% fuel in shunting and passenger operations. Besides fuel saving, there is a reduction of 85%-90% in NOx and particulate emissions compared to uncontrolled locomotive emissions.

Toilet onboard 4500 HP WDG4D Diesel Electric Locomotive: Keeping in view the inherent need for improving crew comfort, DLW has designed and manufactured a HHP Diesel Electric Freight locomotive fitted with Vacuum type toilet having microprocessor based controls and inbuilt safety interlocks onboard. It is equipped with environment friendly and self-sustaining bio-digester technology for onboard sewage treatment. First WDG4D HHP locomotive fitted with vacuum based toilet and bio-digester system has been flagged off on 06th May 2016.

DEMU with Solar Power: First 1600 HP DEMU rake with solar powered Panel hotel load system was dedicated to the nation on 14th July 2017 at Safdurjung railway station, New Delhi. Total 6 such trailer coaches are fitted by IROAF at ICF, Chennai.

Steam Locomotives:

Steam locomotives are the icons of IR's century old rich history. These gallant stalwarts of a bygone era are now part of IR's glorious heritage. Considering their heritage value and attractiveness to the tourists, the following sections have been earmarked for running of trains hauled by steam locomotives:

i. Broad Gauge Steam service between Delhi Cantt. and Rewari.
ii. Darjeeling Himalayan Railway (DHR), now in its 138th year and a UNESCO World Heritage Site.
iii. Nilgiri Mountain Railway (NMR), now in its 110th year and a UNESCO World Heritage Site.
iv. Kalka-Simla Railway (KSR) now in its 115th year and UNESCO World Heritage Site.
v. Neral-Matheran on Matheran Light Railway (MLR), now in its 111th year.
vi. Kangra Valley Railway (KVR), now in its 89th year.

Besides about 20 steam locomotives that are in regular operations, Indian Railways have also preserved about 16 Steam locomotives as working heritage. Although, not in regular service, these preserved steam locomotives are still capable of hauling tourist trains and ceremonial running. The Rewari Steam Shed has been rechristened as Rewari Heritage Steam Centre in 2002 for recreating the memories of working Steam Shed, a feat un-parallel in the World. Rewari Steam Centre now maintains six Broad Gauge and four Meter Gauge working steam locomotives, that include the iconic "Fairy Queen" (1855), placed in the Guinness Book of Record as being the oldest working locomotive in the World and "Akbar", that featured in many Bollywood movies like Sultan, Gadar etc.

Consumption of Fuel/Energy

	Quantity Consumed			
	For Traction		**For other than traction Purposes (excluding manufacturing units)**	
	2015-16	**2016-17**	2015-16	**2016-17**
Electricity (Million KWH)	15710.25*	**15666.46**	2497.77*	**2394.56**
HSD Oil (Million litres)	2,874.950	**2793.200**	58.695	**67.896**
Coal (Million tonnes)	0.001	**0.001**	0.0004	**0.0003**

* revised

Personnel

The number of regular employees on Indian Railways as on 31.3.2017 stood at 13,08,323.

The table below shows the strength of railway employees under various groups, together with total expenditure incurred on them, for some selected years:

Year	Number@ of staff as on 31st March (in thousands) Groups A&B	Group C	Group D	Total	Expenditure@ on staff (₹ in crore)
1950-51	2.3	223.5	687.8	913.6	113.8
1960-61	4.4	463.1	689.5	1,157.0	205.2
1970-71	8.1	583.2	782.9	1,374.2	459.9
1980-81	11.2	721.1	839.9	1,572.2	1,316.7
1990-91	14.3	891.4	746.1	1,651.8	5,166.3
2000-01	14.8	900.3	630.2	1,545.3	18,841.4
2010-11	16.9	1,079.2	235.9	1,332.0	51,776.6
2014-15	17.1	1,229.8	79.4	1,326.3	84,751.5
2015-16*	16.7	1,229.3*	84.3*	1,330.3*	93,001.24
2016-17	**16.3**	**1,211.4**	**80.6**	**1,308.3**	**1,15,271.27**

*revised

@ Includes number of Railway Protection Special Force (RPSF) personnel and expenditure on them from 1980-81 onwards. These were not included in earlier years.

Number of personnel (Groups A&B) constitute 1.2% of the total strength, while Group C and D account for 92.6% and 6.2% respectively. Of the employees in Group C and D, 3.53 lakhs (27.3%) are workshop employees and artisans and 9.4 lakhs (72.7%) from other categories including running staff. Railway Protection Force/RPSF personnel totalled 65,082.

In the non-gazetted cadres, the ratio of Group C to D changed from 25:75 in 1950-51 to 94:6 in 2016-17, indicating a shift towards induction of skilled manpower.

Representation of Scheduled Castes (SCs) and Scheduled Tribes (STs):

Representation of scheduled caste and scheduled tribe employees on IR (including MTP Railways)for the year 2016-17 as compared to the previous year is given below:

	Number of SC Employees		Number of ST Employees	
	As on 31.03.2016	**As on 31-3-2017**	As on 31.03.2016	**As on 31.03.2017**
Group A	1,286 (13.45%)	**1,314(13.48%)**	744 (7.78%)	**716(7.34%)**
Group B	1,254 (17.64%)	**1,155(17.49%)**	550 (7.74%)	**490(7.42%)**
Group C #	2,31,784 (17.64%)	**2,26,636(17.54%)**	1,08,352 (8.25%)	**1,03,901(8.04%)**
Grand Total	2,34,324 (17.61%)	**2,29,105(17.51%)**	1,09,646 (8.24%)	**1,05,107(8.03%)**

Including erstwhile Group 'D'

Note: Figures mentioned in brackets indicate the percentage of SCs/STs to total number of employees.

A fully dedicated reservation cell exists each at the level of Ministry/ Railway/Zones/ Divisions/Workshops/Production Units, for dealing with the reservation matters.

Wage Bill:

Wage bill including pension etc. during 2016-17 was ₹1,15,271.27 crore registering an increase of ₹22,270 crore over the previous year. The average wage per employee was up by 23.44% from ₹7,15,726 per annum in 2015-16 to ₹8,83,495 per annum in 2016-17. The ratio of staff cost on open line (excluding payment towards pension and gratuity) to ordinary working expenses (excluding appropriation to DRF and Pension Fund) was 60.8%.

The average annual wage (excluding fringe benefits) per employee paid under various categories in 2016-17 is given below:

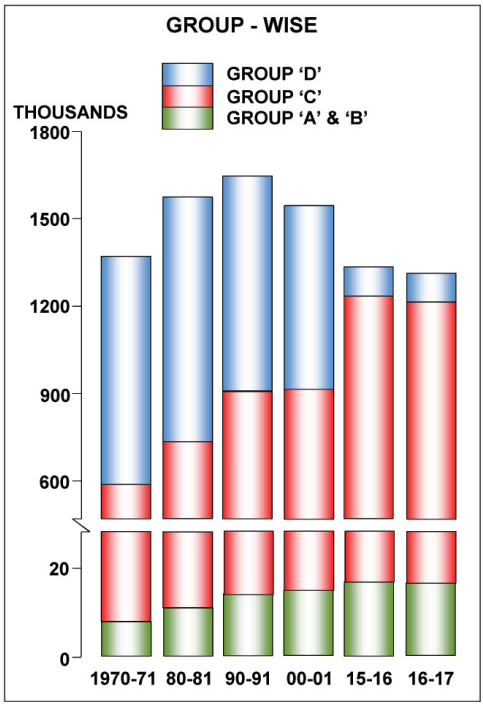
Category	Groups A&B (₹)	Group C (₹)	Group D (₹)	Total (₹)
Workshop and artisan	-	7,09,494	5,66,147	7,00,188
Running *	-	11,85,138	-	11,85,138
Others	-	9,15,608	5,46,239	8,89,795
Total	**24,41,369**	**8,84,360**	**5,51,888**	**8,83,495**

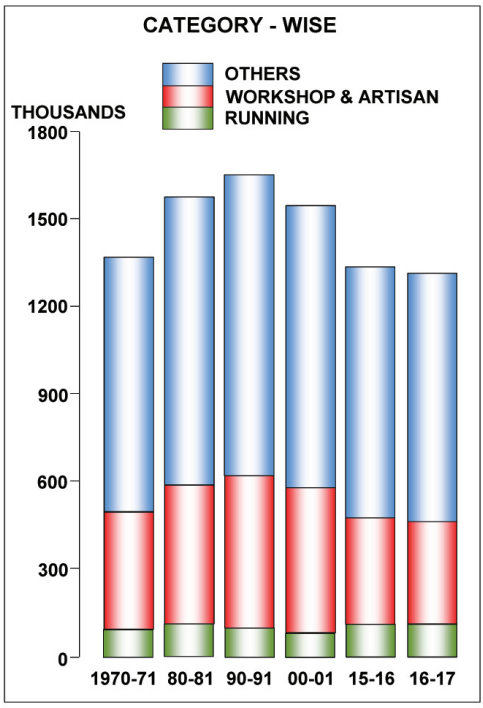
*Emoluments include running allowance.

Productivity Linked Bonus:

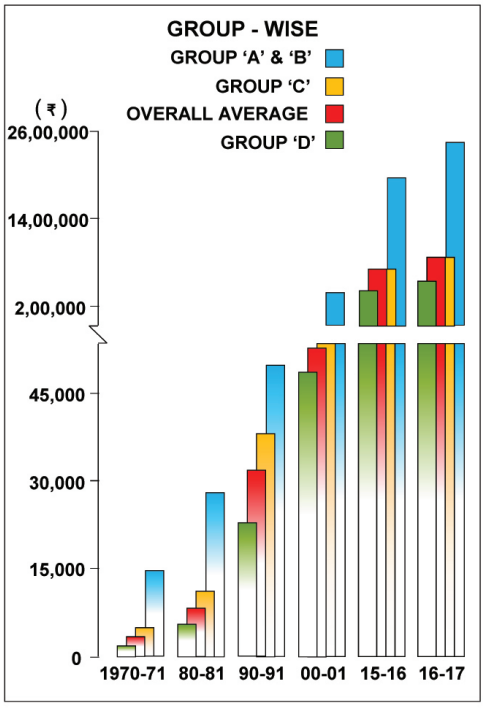
In 2016-17, all non-gazetted Railway employees (excluding RPF/RPSF personnel) were sanctioned Productivity Linked Bonus (PLB) for 78 days. This benefitted an estimated 12.30 lakh railway employees. Group 'C' and 'D' RPF/RPSF personnel have been sanctioned ad-hoc bonus equivalent to 30 days' emoluments for the year 2016-17. The PLB and ad-hoc bonus were both paid on an enhanced calculation ceiling of ₹7,000/- p.m. Financial implication for PLB and ad-hoc bonus was approximately ₹2,245.45 crore and ₹45.29 crore respectively.

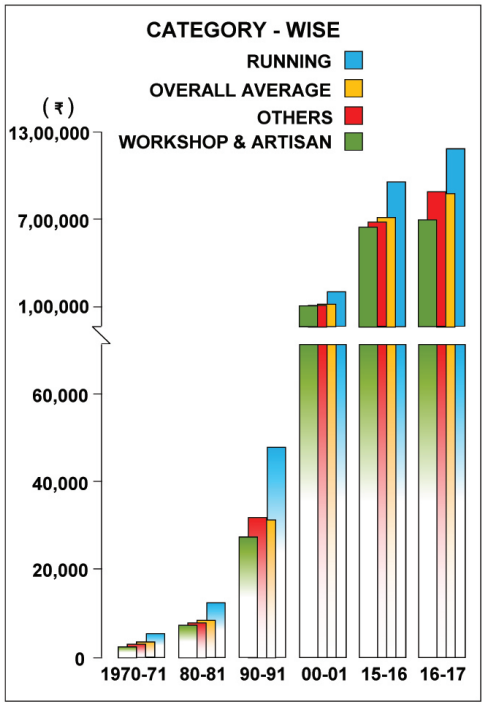
NUMBER OF PERSONNEL





AVERAGE ANNUAL WAGE PER EMPLOYEE





Human Resource Development (HRD) and Manpower Planning:

Human Resource Development strategies on IR have been re-oriented towards enhancing the competitiveness in the context of internal and external changes taking place. In addition to in-house training, railwaymen are being provided specialized training in other institutions in India and abroad. Railway employees are also encouraged to enhance their knowledge and skills by acquiring higher educational qualifications in the specified areas relevant to their work by granting incentives to them. Efforts are being made to improve the basic infrastructure for training to provide structured training programme in improved learning environment. Manpower planning system has been redesigned to regulate manpower intake with reference to emerging business need.

Following seven Centralised Training Institutes (CTI) cater to the training needs of Indian Railway Officers:

- National Academy of Indian Railways, Vadodara.
- Indian Railways Institute of Civil Engineering, Pune.
- Indian Railways Institute of Signal Engineering and Telecommunications, Secunderabad.
- Indian Railways Institute of Mechanical & Electrical Engineering, Jamalpur.
- Indian Railways Institute of Electrical Engineering, Nasik.
- Indian Railways Institute of Transport Management, Lucknow.
- Jagjivan Ram Railway Protection Force Academy, Lucknow.

The Centralized Training Institutes, apart from imparting probationary training, also cater to the various specialised training needs of IR officers. National Academy of Indian Railways provides inputs in General Management, Strategic Management and function-related areas for serving Railway Officers. Other CTIs conduct specialised technical training courses in respective functional areas including Training Programmes on Information Technology. The need based special courses conducted by CTIs and facilities offered by them to trainees from abroad and non-railway organizations in India have been well appreciated. The training programmes emphasize on learning with a purpose and professional approach. In addition to in-house faculty, outside experts with diverse experience in business, industry and government are utilized to relate academic concepts with practical problems to address the changing needs.

Training needs of non-gazetted staff are being taken care of by over

295 training centres located over Indian Railways. Mandatory training has been prescribed at different stages in an employee's career especially for staff belonging to the safety and technical categories. In fact some categories of staff overdue for refresher training are taken off duty, till completion of the said training. Efforts are constantly made to improve the living conditions in the hostel, provide better messing facilities, strengthen facilities for recreational and cultural activities, making good the deficiencies in respect of training aids and also upgrading the Model Rooms with working models, see through models etc.

As a policy, Railway Board has encouraged setting up of multi disciplinary training centers where cross-functional competencies could be imparted to railway employees from different functional areas.

During 2016-17, a total of 8,557 Gazetted Officers and 3,64,047 Non-Gazetted Staff underwent different types of training programmes.

Railway Recruitment Boards:

Group 'C' Recruitment on Indian Railways by RRBs :-

During the financial year 2016-17 & April-September (2017), many monumental and landmark initiatives have been launched and implemented so far. These have given positive results. Some such major initiatives are-

- Conduct of the world's largest computer based recruitment exam (for NTPC-Graduate level posts against CEN No. 03/2015).
- Recruitment at doorsteps of the candidates by setting up more than 1100 centres in 351 cities across India.
- Reaching out to remotest areas of India.
- Landmark Green Initiative: through On-line Application and Computer Based Exams.
- Transparency in Computer Based Tests (CBTs) as candidates are shown their Question paper, Answer Booklets alongwith correct Answer Keys.
- Integration of All 21 RRBs with RTI Request & Appeal Management Information System portal (RTI-MIS).
- Introduction of Aadhaar.
- Online Indenting and Recruitment Management System.

Computer Based Test for Aptitude (Psycho) Test.

Further, during 2016-17, panels of 19,587 candidates have been supplied to the Indenting Railway(s)/Production Unit(s) by 21 RRBs across India.

Staff welfare:

IR's welfare schemes cover a wide spectrum of activities in the areas of education, medical care, housing, sports, recreation and catering.

Staff Benefit Fund is an important channel for providing additional facilities to railway employees and their families in the spheres of education, recreation, medicare, sports, scouting and cultural activities. Dispensaries under the indigenous systems of medicine, viz. Ayurvedic and Homeopathic, are run with the help of this Fund.

Approximately 44.7% staff have been provided with railway quarters, 1,237 staff quarters were electrified during 2016-17.

canteens served subsidized meals and refreshments to employees during the year at their work-places.

Co-operative societies of various types are engaged as a part of welfare programme for employees on IR. There are 42 Thrift and Credit Societies, 146 registered Railwaymen's Consumer Co-operative Societies, 5 Railway men's Co-operative Housing Societies and 26 Labour Co-operative Societies functional on IR during 2016-17.

IR attaches due importance to recreation for its employees and provide excellent facilities through Institutes/Clubs for sports, libraries, etc. as also Holiday Homes to enable the employees and their families to enjoy holidays at nominal expense.

Indian Railway Medical Service:

From a humble beginning in 1853, Indian Railway Medical Service has taken great strides to become a modern well organized three tier Comprehensive Health Care System.

Indian Railway Medical Service was primarily constituted to look after the health of Railway employees. It provides medical faculties to the family members of the employee, retired employee & their family members as per pass rules.

Besides curative services Indian Railway Medical Service provides: - Preventive, Promotive, Occupational & Industrial health, Public health services also. It also plays a significant role in monitoring the quality of water & food within Railway premises.

With a sanctioned strength of 2597 Medical Officers it is the largest industrial health services in the world. It is running 24x7 round the year, 127 hospitals & 586 health units spread throughout the length & breadth of country. Indian Railway Medical Service also employees 41000 paramedical staff for the 13702 indoor beds. It attends to roughly 67 lakhs beneficiaries.

A number of zonal Railway hospitals are recognized centers of excellence in the field of medical care where post graduate medical students are also trained. Railway Medical Officers are regular contributors to international journals & conferences in the field of Medical Science.

Nine of our zonal hospitals are functioning as institutions for training for the very prestigious DNB program in most of the specialties and some super specialties. Many of our senior doctors are examiners for Diplomat of National Board (DNB). Every year our institutes are producing post graduate specialist and super specialist doctors who ultimately are the assets for the nation.

(A) Resources available

No. of Hospitals	127
No. of Indoor beds	13,702
No. Health Units/Polyclinic	586
No. of Lock Up Dispensaries	92
No. of Pvt. Hospitals recognized for Medical treatment	400 (approx)

(B) Beneficiaries

No. of RELHS Card Holders	6,19,607
No. of Beneficiaries	67,06,438

(C Performance during 2016-17

No. of patient treated in OPD	2,07,34,564
No. of patient treated as In patient (IPD)	4,69,293
Major & Special Surgeries performed	42,976
Total Surgeries performed	1,51,379
Candidates' pre placement Medical Examination	48,850
No. of Employee's periodical Examinations	1,33,761
No. of Medical Board held	2,809
No. of Railway accidents attended	982
Percentage of Man days lost due to sickness on RMC	1.25
No. of Passengers provided Medical Aid	68,340
No. of confinement (deliveries) in Rly Hospitals	8,890
No. of water samples for Bacteriological examination	68,617
No. of water samples for Residual Chlorine level	11,00,465
No. of Food samples collected under FSSA	2,163
No. of Food samples collected under (Quality control) Departmental check	18,102

Pension Adalats:

Long-standing disputes or delays in the settlement of dues of superannuated railway employees are decided on the spot in Pension Adalats organized at Zonal and Divisional Headquarters level. 7,111 cases were decided in the Pension Adalats held during the year.

Railway Minister's Welfare and Relief Fund:

The Fund provides financial assistance and relief to railway employees and their families in the times of distress. Voluntary contributions from the employees and Railway Women's Welfare Organizations constitute the primary sources of the Fund. In 2016-17, a sum of ₹1,615 was received as contributions from railway employees to this Fund. Financial assistance was provided to one Railway employee during this period.

Railway Schools:

IR runs and manages one Degree College and 116 Railway Schools which include 91 Senior/Secondary/High Schools. These schools provide quality education at subsidized cost to children of railway employees as well as non-railway wards. In addition to this, 83 Kendriya Vidyalayas are also functional on Railway land, which caters to the needs of the wards of Railway employees.

Promoting Hindi

In accordance with the provisions of the Official Languages Act, 1963 and the Official Language Rules, 1976 promotion of usage of Hindi is a continuing endeavour on IR. Till the end of 31st March, 2017 the total number of notified Railway offices is 3574. In these railway offices, employees proficient in Hindi have already been given directions to transact cent percent work in Hindi in the subjects specified under Official Language Rules. Besides this, Official language officers of Railway Board office and Zonal Railways regularly inspect the offices to monitor the implementation of Hindi. In the year 2016-17, a total number of 1140 inspections have been done by these officers and the second Sub-Committee of Parliamentary Committee on Official Language has inspected 15 railway offices and has appreciated the use of Hindi in these offices during inspections. In addition Grih-Patrika Rail Rajbhasha in Hindi is also regularly published by Railway Board office. Till now 120 editions of the patrika have been published and 120th edition was published in the form of "Special issue on woman", the copies of which have been circulated to all the Railway Offices. E-Rajbhasha magazine is also being brought out regularly in every quarter. Till now 15 edition of this patrika have been brought out. Grih-Patrika are also being published by Zonal Railways/Divisions etc. at their level.

Training in Typewriting, Stenography and Hindi Language

In addition to the Training Centres set up by the Ministry of Home Affairs, arrangement are also made by IR to provide in-service training in Hindi language, Hindi typing and Hindi stenography. The number of employees trained at the end of 2016-17 as compared to 2015-16, as follows:

Activity	As on March 31, 2016	As on March 31, 2017
working knowledge in Hindi	8,49,536	**8,69,954**
Hindi Typewriting	6,766	**6,881**
Hindi Stenography	3,196	**3,165**

Other activities:

The existing policy of purchasing bilingual electronic equipments, like computers etc. is being followed. During 2016-17, 44,495 bilingual personal computers were available in various offices of Indian Railways. Websites of the Zonal Railways including Railway Board are also bi-lingual. In order to promote usage of Hindi in Railway offices, 912 Codes/Manual and 6256 Station-Working Rules have been published bilingually. Besides this, 26,425 Local, Statutory and Standard forms have been made available in bilingual form in Zonal Railways and Production Units etc. The Memorandum Of Understanding done with the various countries in connection with the Railway Co-operation by Indian Railway are prepared simultaneously in Hindi also. Presently, about 17 lacs books in Hindi are available in 976 Hindi libraries on Indian Railways and most of the libraries have been named after the names of famous litterateur of Hindi.

Official Language Implementation Committees

To review the progress of the use of Hindi, total 975 Official Language Implementation Committees are functioning on the Zonal Railways and in Production Units etc and meetings of these committees are being organized regularly. Besides this, Railway Board Official Language Implementation Committee has been constituted at Railway Board level also and its meetings are conducted under Chairmanship of Chairman, Railway Board in every quarter. The member of Railway Salahakar Samiti are also invited in these meetings as observer member.

Railway Hindi Salahakar Samiti

The meeting of Railway Hindi Salahakar Samiti is organized under the Chairmanship of Hon'ble Minister For Railways in order to propagate the use of Hindi in Ministry of Railways and Zonal Railways wherein honourable members of the Samiti give valuable suggestions to propagate the use of Hindi.

Incentive Schemes for the use of Hindi

Various incentive schemes have been implemented to encourage Railway personnel to work in Hindi. Prominent among them are the 'Individual

Rajbhasha Cash Awards', 'Group Award Scheme', 'Railway Minister Shield/ Trophy Scheme', 'Premchand and Maithili Sharan Gupt Award Scheme', "Rail Yatra Vritant Scheme" and other schemes for Elocution/Noting/Drafting. Under Rail Yatra Vritant Scheme Cash awards and Certificates were given to first three essayist. Further under 'Kamlapati Tripathi Rajbhasha Swarn Padak Scheme' Gold Medal and Cash awards were given. 30 silver medals to officers working in Railways under 'Rail Mantri Rajbhasha Rajat Puraskar Scheme' and three awards under 'Lal Bahadur Shastri Original Technical Books writing scheme' and under Individual Cash award 125 official/ employees on Indian Railways were given cash awards and certificates.

In order to promote usage of Hindi 'Rajbhasha Fortnight' was orgainsed from 14 to 27 September, 2016 in the Ministry of Railways. During this period Essay Writing Competition, Elocution and Noting & Drafting Competition, Vocabulary test, Antakshari. Hindi Prashan Manch, Kavi Sammelan, Hindi Typing Competition were organized. During this period Section Officers of Official Language Directorate imparted Table Training to officials/employees of various branches of Board office.

On 16.05.2016, a workshop on "Office Management" was organized. Hindi Workshop on 12.08.2016 and another Workshop on 'Anuvaad Saralikaran' were also organized for the officials/employees of Official Language Directorate on 20.02.2017.

During 5th December to 07th December 2016, All India Hindi Essay Competition, Elocution, Noting & Drafting Competition were conducted wherein Railway employees at all Indian Railways' level participated.

Five officers of Hindi Directorate on behalf of Ministry Of Railways (Rly.Bd.) were sent for training to participate in various seminars/Courses organized by Indian Railway National Academy, Vadodara on 13-15th June 2016, 21-25 November, 2016 and 27-31 March 2017.

On 1.8.2016 Munshi Premchand Jayanti was celebrated at Board's Office and on this occasion the exhibition of the compositions of Munshi Premchand were also organized.

Apart from this, a web application was developed to get the quarterly progress report on Hindi online in Board's office. On the occasion of Hindi Diwas on 14 September 2016, a message from Hon'able Minister of Railways was circulated to all the Zonal Railways to work in Hindi. Further, Greeting Cards were distributed to mark the occasion of Hindi New Year Shak Samvat 1939.

Outstanding Achievements in Sports:

1. At International Level :-

i) Shri Yogesh More, Shri P. Anand Kumar and Shri Appa Rao were part of Gold Medal winning Indian team in 3rd Asian Kho-Kho Championship held at Indore (M.P.) from 8th to 10th April, 2016.

ii) Ms. L. Bombayla Devi, Ms. Laxmirani Majhi and Shri Mangal Singh Champia won Silver Medal in Archery World Cup 2016 (Stage - 1) held at Shanghai (China) from 24.04.2016 to 01.05.2016.

iii) Indian Railway Cross Country (Men & Women) team won Gold Medal in USIC (World Railway) Cross Country (Men & Women) Championship held at Tisvildeleje (Denmark) from 10th May, 2016 to 13th May, 2016.

iv) Ms. Sonia Lather won Silver medal in AIBA Women's World Boxing Championship-2016 held at Astana, Kazakhstan from 16th to 28th May, 2016.

v) Shri E. Mahesh, Shri Jaspreet Singh and Ms. Mamta Rana won Bronze Medal, Ms. Mala Sukhwal and Ms. Ananya Gogai won Silver Medal in Asian Powerlifting Championship held at Udaipur (India) from 07.06.2016 to 12.06.2016.

vi) Indian Railway Chess team won Gold Medal in USIC (World Railway) Chess Championship held at St. Petersburg (Russia) from 4th July, 2016 to 9th July, 2016.

vii) Shri Kamal Chawla won Bronze Medal in IBSF World Team Snooker Championship (Men) held at Eygpt from 20th July, 2016 to 30th July, 2016.

viii) Shri Siddharth Parikh won Gold Medal in 1st ACBC Asian Billards Championship held at Al-Fujiarah (UAF) from 24.09.2016 to 02.10.2016.

ix) Shri Gopal Anbarasu won Bronze Medal and Ms. Rakhi Halder won Bronze Medal in Commonwealth Senior Weightlifting Championship held at Panang (Malaysia) from 25.10.2016 to 31.10.2016.

x) Indian Railway Shooting team won Gold Medal in USIC (World Railway) Championship held at Saint Mandrier (France) from 9th to 13th October, 2016.

xi) Indian Railway Hockey (Men) players - Shri Chinglensana Singh, Shri Talwinder Singh, Shri Affan Yousuf and Shri Jasjit Singh Kular represented Indian Hockey Men team in Asian Hockey Champions Trophy held at Kuantan (Malaysia) from 15.10.2016 to 31.10.2016 and Indian team won Gold Medal.

xii) Indian Railway Kabaddi (Men) players - Shri Mohit Chillar, Shri Manjit Chillar, and Shri D. Cheralachan represented Indian Kabaddi Men team in Senior World Cup held at Ahmandabad (India) from 07.10.2016 to 22.10.2016 and Indian team won Gold Medal.

xiii) Indian Railway Hockey (Men) players - Shri Ajit Pandey, Shri Manpreet Singh and Shri Nilkanta Sharma represented Indian Junior Hockey Men team in Junior Hockey World Cup held at Lucknow (India) from 01.12.2016 to 18.12.2016 and Indian team won Gold Medal.

xiv) Shri A. Boby Singh won Gold Medal in World Body-Building Championship held at Pattaya (Thailand) from 29.11.2016 to 05.12.2016.

2. At National Level :-

During 1st April, 2016 to 31st March, 2017, Indian Railway team won National titles in 22 disciplines and stood runners-up in 11 disciplines and podium third in 04 disciplines.

3. Following Railway players have been honored with National Sports Awards during 2016-17:-

S. No.	Name	Game	Award	Rly.
(i)	Ms. Lalita Shivai Babar	Athletics	Arjuna Award	CR
(ii)	Ms. Vinesh	Wrestling	Arjuna Award	NR
(iii)	Shri Sagarmal Dhayal	Boxing	Dronacharya Award	NWR
(iv)	Ms. Satti Geetha	Athletics	Dhyan Chand Award	SCR
(v)	Ms. Sakshi Mailk	Wrestling	Rajiv Gandhi Khel Ratna Award	NR

Internationl Yoga Day 6 June 2016

Finance

Indian Railways financial results for 2016-17 compared with the previous year are tabulated below:

		(₹ in crore)
	2015-16	**2016-17**
Capital-at-charge	**2,24,685.32	***2,49,007.87**
Investment from Capital Fund	50,449.91	**53,449.91**
Total	2,75,135.23	**3,02,457.78**
Passenger Earnings	44,283.26	**46,280.46**
Other Coaching Earnings	4,371.49	**4,312**
Goods Earnings	1,09,207.65	**1,04,338.54**
Sundry Earnings	5,928.55	**10,368.04**
Gross Earnings	1,63,790.95	**1,65,299.04**
Suspense	542.56	**-6.84**
Gross Traffic Receipts	1,64,333.51	**1,65,292.20**
Ordinary Working Expenses	1,07,735.93	**1,18,829.61**
Appropriation to Depreciation Reserve Fund	5,600.00	**5,200**
Appropriation to Pension Fund	34,500.00	**35,000**
Total Working Expenses	1,47,835.93	**1,59,029.61**
Net Traffic Receipts	16,497.58	**6,262.59**
Miscellaneous Transactions	2,730.90	**-1,349.59**
Net Revenue Receipts	19,228.48	**4,913.00**
Dividend payable to Genl Revenues $	8,722.51	**0.00**
Excess (+)/Shorfall (-)	10,505.97	**4,913.00**
Percentage of Net Revenue to Capital-at-charge including investment from Capital Fund	6.99	**1.62**
Operating Ratio (%)	90.48	**96.50**
Capital-at-charge (including investment from Capital Fund) per NTKM (in paise)	374	**431**

* Excludes ₹13,198.59 crore of MTPs, ₹607.02 crore of Circular Railways and ₹15,038.08 crore of Udhampur-Srinagar-Baramulla Project (National Project) and ₹11,954.00 crore of appropriation to SRSF and ₹11,538.51 crore investment in DFCCIL and includes ₹16,059.68 crore of Production Units.

** Excludes ₹11,873.47 crore of MTPs ₹540.80 crore of Circular Railways and ₹13,387.61 crore of Udhampur-Srinagar-Baramulla Project (National Project) and ₹1,1954.00 crores of appropriation to SRSF, and ₹4,400.71 crore investment in DFCCIL and includes ₹16,269.11 crore of Production Units.

$ Includes payment in lieu of Passenger Fare Tax of ₹23.12 crore and Contribution to Railway Safety Fund of ₹2.61 crore during 2015-16. No dividend was payble during 2016-17.

Revenue:

Revenue from Freight accounted for 63.12% of Gross Earnings. Passenger Earnings constituted 28.0% of the Gross Earnings, of which 5.81% was from Suburban Services, 82.53% from Express Long distance and 11.66 % from Ordinary Short Distance traffic. Bulk freight like coal, ores, iron & steel, cement, foodgrains, fertilizers, POL products, limestone, dolomite, stones other than marble, salt and sugar contributed 91.27 % of the total goods earnings, while commodities other than the above accounted for 6.50%. Miscellaneous realization like demurrage, wharfage, shunting and siding charges etc. made up the remaining 2.21%.

Balance Sheet:

A brief summary of Balance Sheet as on 31st March, 2017 compared with the previous year is given below:

(₹in crore)

	As on 31.03.2016	**As on 31.03.2017**	Variation
Assets			
Block Assets	4,19,123.61	**4,71,776.39**	52,652.78
Fund with Central Government			
(i) Reserve Fund	10,806.92	**2,577.04**	-8,229.88
(ii) Banking Accounts	53,145.46	**58,784.12**	5,638.66
Sundry Debtors	3,507.18	**3,856.37**	349.19
Cash in hand	1,082.83	**675.96**	-406.87
Total	4,87,666.00	**5,37,669.88**	50,003.88
Liabilities			
Represented by:			
Capital-at-charge	2,42,473.64**	**2,75,584.46***	33,110.82
Investment financed from internal resources etc.	1,76,649.97	**1,96,191.93**	19,541.96
Total (i)	4,19,123.61	**4,71,776.39**	52,652.78
Reserve Fund	10,806.92	**2,577.04**	-8,229.88
Total (ii)	10,806.92	**2,577.04**	-8,229.88
Banking Accounts			
i) Provident Fund	31,414.09	**35,003.54**	3,589.45
ii) Miscellaneous Deposits etc.	21,622.96	**23,699.98**	2,077.02
iii) Loans and Advances	108.41	**80.60**	-27.81
Total (iii)	53,145.46	**58,784.12**	5,638.66
Sundry Creditors etc. **(iv)**	4,590.01	**4,532.33**	-57.68
Total (i) to (iv)	4,87,666.00	**5,37,669.88**	50,003.88

* Excludes ₹13,198.59 crore of MTPs, ₹607.02 crore of Circular Railways ₹11,954 crore of appropriation to SRSF, includes ₹15,038.08 crore of Udhampur-Srinagar-Baramulla Project (National Project) and ₹11,538.51 crore investment in DFCCIL.

** Excludes ₹11,873.47 crore of MTPs, ₹540.80 crore of Circular Railway and ₹11,954 crore appropriation to SRSF and includes ₹13,387.61 crore of Udhampur-Srinagar-Baramulla Project (National Project) and ₹4,400.71 crore of investment in DFCCIL.

Cash Flow:	2016-17	(₹ in crore)
Acquisition of new assets and replacement of existing assets:		
Acquisition of new assets and improvement element in replacement of assets like replacement of assets	43,930.56	
By replacement of assets	1,601.30	**45,531.86**
Payments of interest on loans, repayment of loans and increase/ decrease in Reserve Funds		
Payments of interest on loan for Development Fund	0.00	
Repayment of loan for Development Fund	0.00	
Increase (+)/ Decrease (-) in Funds balances	-5,229.15	**- 5,229.15**
Payment for Accident Compensation	0.00	
	Total	**40,302.47**
Finance for these requirements was provided from the following sources:		
Internal sources:		
Contribution from Revenue/Capital to fund and interest occurring on the balances of the fund.	337.46	
Development Fund financed from Surplus	2,515.00	
Development Fund financed from General Revenue	0.00	
Capital Fund financed from surplus	2,398.00	
Capital Fund financed from Railway Revenue (for capital component of IRFC lease charges)	0.00	**15,982.49**
Railway Safety Fund financed from surplus	0.00	
Debt Service Fund financed from Surplus	0.00	
Railway Safety Fund financed from General Revenues (from Central Road Safety Fund)	10,732.03	
Spl. Railway Safety Fund financed from Surplus	0.00	
Spl. Railway Safety Fund financed from Genl. Revenues OLWR	0.00	
Cash Surplus - Working Results		**4,913.00**
Appropriation to Development Fund		**-2,515.00**
Appropriation to Capital Fund		**-2,398.00**
Appropriation to Debt service fund		**0.00**
Appropriation to Railway Safety Fund		**0.00**
Appropriation to Special Railway Safety Fund		**0.00**
Borrowing from General Revenues (excluding MTPs)*		**24,319.99**
	Total:	**40,302.47**

* Excludes ₹ 1,325.13crore (MTP), ₹66.22 crore (Circular Railway), ₹1,650.47 crore (Udhampur –Srinagar- Baramulla), DFCCIL ₹7,137.80crore and includes ₹ -110.03 crore of PUs.

With a view to reduce the burden on common man passenger fares and freight rates on products for mass consumption were kept low. The gap between the unit revenue and increase in input costs is given below:

(Base 2004-05=100)

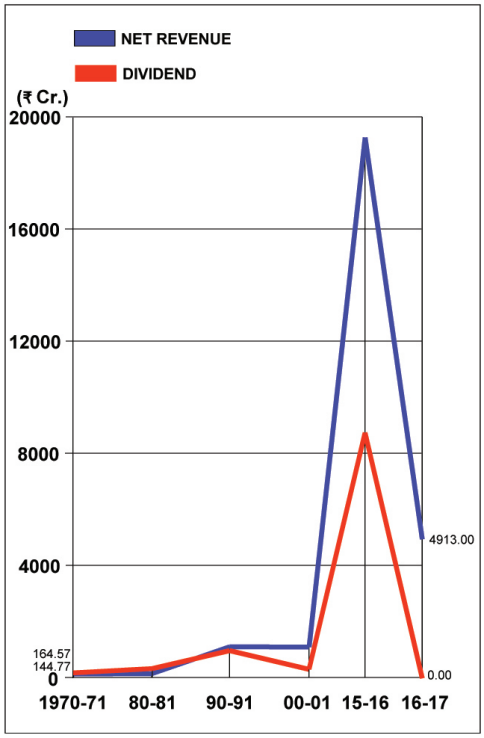
	2015-16		2016-17	
	Revenue Index	Cost Index	**Revenue Index**	**Cost Index**
Unit Revenue:				
Average receipt per pkm	162.7		**168.2#**	
Average receipt per ntkm	218.3		**219.8#**	
Inputs:£				
Average annual wage per employee @		452.6*		**558.7**
Diesel (H.S.D.)		186.9		**213.6**
Electricity (Railway traction)		162.6		**162.4**
Transport equipment and parts		138.1		**138.9**
Non ferrous metals		164.2		**164.9**
Electrical machinery, equipment & battery		138.2		**138.9**
Lub. Oil		277.5		**277.5**
Manufactured products		153.4		**157.4**
Ferrous metals (Ferro Alloys)		141.7		**142.0**
Composite weighted index of inputs		325.3*		**388.7**

@ Based on Annual Statistical Statement No.40

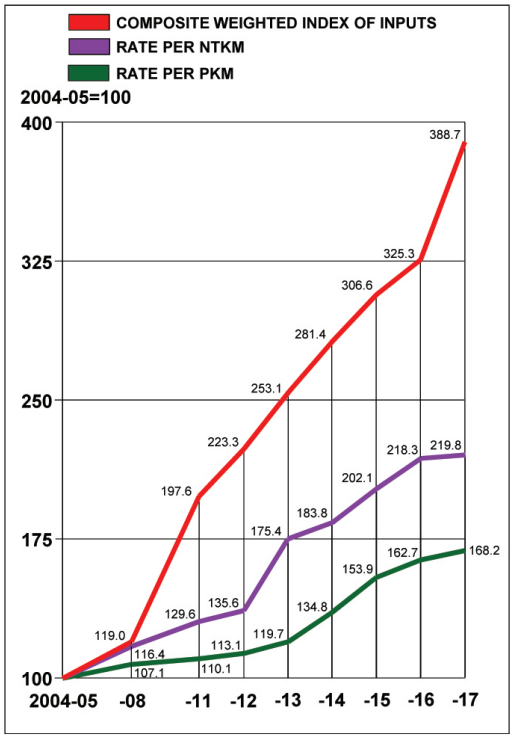
* revised

£. based on information received from Office of Economic Adviser, DIPP (except at @)

NET REVENUE AND DIVIDEND



UNIT RECOVERY VS UNIT OF INPUT COST



Social Service Obligation

Indian Railways (IR), carries out certain transport activities which are essentially uneconomic in nature in the larger interest of the economically disadvantaged sections of the society. Losses incurred on this account fall under Social Service Obligation of IR.

Net Social Service Obligation borne by IR in 2016-17 is assessed at ₹29,639.68 crore excluding staff welfare cost (₹5,704.24 crore) and law and order cost (₹4,263.53 crore). These costs impinge upon the viability of Indian Railways system.

Elements of Social Service Obligation:

The main elements of Social Service Obligation in IR are losses relating to:

Essential Commodities carried below cost;

Passenger and Other Coaching services;

Operation of Uneconomic Branch Lines;

New Lines opened for Traffic during the last 15 years.

Losses on transportation of Essential Commodities carried below cost:

As part of the Railway's Social Service Obligation, certain essential commodities of mass consumption like fruits and vegetables, sugarcane, paper, charcoal, bamboos, cotton raw pressed etc. are carried below cost of operation in order to contain their market prices. The total losses on the movement of these commodities in 2016-17 amounted to ₹42.06 crore.

Commodities	Losses(in Crore of ₹)
Fruit &Vegetables	24.47
Charcol	4.50
Glass Wares	4.37
Bamboos	3.82
Other Wood	2.22
Cotton Manufactured other than piece goods	1.32
Cotton Raw pressed	0.61
Paper	0.48
Wool Raw and Waste	0.25
Oil seeds other than Ground Nuts	0.01
Total	**42.06**

These commodities constituted 0.78% of the total revenue NTKMs and 0.37% of freight earnings in the year 2016-17.

Losses on Passenger and Other Coaching services:

Analysis of the profitability of Coaching Services in 2016-17 has revealed an overall loss of Rs.39,565.39 crore to which net suburban losses in Chennai, Kolkata, Mumbai and Secunderabad provided with EMU and Non-EMU services contributed ₹5,388.84 crore. While the lag in the rise of passenger fares with respect to inflationary pressures prevalent in the economy has contributed to coaching losses, other factors have also exacerbated the situation which include

Low Second Class Ordinary Fares in both suburban & non suburban passenger services:

These journeys constitute 78.6% of total traffic but provide only 16.7% of total passenger earnings.

	Suburban			Non-Suburban			Total (Suburban & Non-Suburban)		
	Total (all Classes)	IInd. Class Ordinary	% age	Total (all Classes)	IInd. Class Ordinary	% age	Total (all Classes)	IInd. Class Ordinary	% age
No. of Passengers (in million)	4566.43	4298.86	94.1	3549.67	2077.47	58.5	8116.10	6376.33	78.6
Passenger Earnings (₹in crore)	2689.44	2331.05	86.7	43591.02	5394.47	12.4	46280.46	7725.52	16.7

(ii) Non-Suburban commuters availing Season Ticket concessions up to a distance of 150 kilometres. These journeys constituted 22.8% of Non-Suburban Traffic but provide 1.2% of Non-Suburban passenger earnings only.

	Non-Suburban		
	Total (All Classes)	Season Tickets	% age
No. of Passengers (in million)	3549.67	810.95	**22.8**
Passenger Earnings (₹in crore)	43591.02	522.57	**1.2**

(iii) Commuters availing concession Monthly and Quarterly Season Tickets on Suburban Sections of Chennai, Kolkata, Mumbai and Secunderabad. Journeys performed by passengers holding season tickets formed 61.0%

of Suburban Traffic but provide 44.5% of Suburban passenger earnings only.

		Suburban	
	Total (All Classes)	**Season Tickets**	**% age**
No. of Passengers (in million)	4566.43	2785.90	**61.0**
Passenger Earnings (₹in crore)	2689.44	1196.45	**44.5**

(iv) Concessions in Fare extended to various categories such as (i) Senior citizens (ii) Physically challenged persons (iii) Patients suffering from cancer, thalassemia, heart, kidney, tuberculosis and other serious diseases (iv) Recipients of gallantry awards (v) Shram awardees (vi) Teachers honored with National awards (vii) War widows (viii) National sports awards (ix) Participants in National and State sports tournaments (x) Students (xi) Youths (xii) Kisans (xiii) Press correspondents (xiv) Film technicians etc.

(v) Concessions are also extended to (i) Military traffic (ii) Postal traffic (iii) Transportation of registered newspapers & magazines etc. and (iv) Traffic to the North East. IR also steps in to provide emergency relief by transporting materials like food, water, fodder etc. to areas affected by natural disasters like drought, cyclone, earthquake etc.

Compensation for Social Service Obligations in Other Countries:

Railways, the world over, are called upon to meet certain public service obligations at lower tariffs for which they are adequately compensated for by the government. Such support is provided in various forms and for different purposes like:

(i) Compensation for losses on account of concessional tariffs;

(ii) Out-right grant to cover deficits;

(iii) Soft loans to meet the deficits;

(iv) Financial support to maintain viability of the system and to earn marginal profits;

(v) Writing off of accumulated debts and unproductive capital; and

(vi) Support for investment and infrastructure maintenance.

Indian Railways incur losses every year by performing a variety of unremunerative services. These losses are mostly due to (a) Low ordinary second class fare (b) Suburban and non-suburban season fare (c) A variety

of concessions granted on passenger ticket and (d) Transportation of certain commodities below cost. Working of uneconomic branch lines, too, imposes a heavy burden on IR's finances. A gap is thus created between the revenue income generated through these services and their running costs.

The Net Social Service Obligation borne by IR in 2016-17 assessed at ₹29,639.68 crore, constitutes 17.9% of the total revenue earnings and 18.6% of the total working expenditure.

Uneconomic Branch Lines:

Despite concerted efforts to enhance earnings on branch lines, most of such lines remain commercially unviable. The Railway Reforms Committee recommended closure of 40 such lines but due to stiff public resistance and opposition of State Governments towards withdrawal of such services, only 15 lines have been closed permanently by the Railways. A review of the financial results of existing 99 uneconomic branch lines for the year 2016-17 shows that, on an original investment on these lines of the order of ₹4,476 crore, loss during the year 2016-17 amounted to ₹1,855 crore.

New lines opened for traffic during the last 15 years:

The Railway Convention Committee (RCC) in its 9th Report on this subject has noted that in the present state of Railway finances and prevalent high costs of construction, the Railways are not in a position to inject adequate capital investment in under-developed areas. Therefore, they have felt that reliefs like making available land free of cost and waiver of dividend payment on such lines for a minimum period of twenty years are justified. Periodic reviews have revealed that of the 17 lines examined in 2016-17, as part of Social Service Obligations of the Railways for development of backward areas, all lines are showing either negative or unremunerative returns.

FINANCIAL RESULTS OF NEW LINES FOR THE YEAR 2016-17

S.No	Name of the branch line	Date of opening	Cost (₹ in crore)	Expected return on investment	Actual return on investment		
				(%)	2014-15 (%)	2015-16 (%)	**2016-17 (%)**
	Developmental Lines						
1	Lanjigarh-Bhawanipatna-Junagarh (BG) 54.30 Kms.	11.8.2012	291.02	2	-5.75	-4.2	**-3.5**
2	Abohar-Fazilka (BG) 34 Kms.	16.7.2012	232.50	-7.44	-14	-11	**-13**
3	Taran Trn-Govindwal (BG) 21.416 Kms.	06.8.2011	81.44	NA	-25	-20	**-23**
4	Ludhiana-Sahnewal (BG) 15.11 Kms.	17.11.2012	289.40	-2.26	-5	-4	**-4**
5	Udhampur-SVDK (BG) 25 Kms	04.7.2014	1231.09	NA	0.44	-2	**-2**

6	Jammu Tawi-Udhampur (BG) 53 Kms.	2004	521.00	0.50	-3	-6	**-8**
7	Banihal-Baramula (BG) 13.7 Kms.	26.6.2013	4917.00	-1.30	-2	-2	**-2**
8	Churaru Takrala-Amb Andaura (BG) 11.17 Kms.	2011-12	257.64	0.18	-5	-4	**-5**
9	New Morinda-Sahnewal (BG) 52.18 Kms.	2013-14	716.67	-2.26	-8	-7	**-8**
10	Chandigarh-Morinda (BG) 43.89 Kms.	2006-07	309.52	-2.26	-17	-14	**-16**
11	Una Himachal-Churaru Takrala (BG) 16.5 Kms.	2005-06	385.59	0.18	-6	-4	**-5**
12	Rewari-Jhajjar-Rohtak (BG) 81.257 Kms.	08.1.2013	321.74	-4.78	-2	-2	**-2**
13	Kolayat-Phalodi (BG)112 Kms.	2006-07	170.78	-3.06	-14.64	-19.76	**-27.56**
14	Madar-Pushkar (BG) 25.7 Kms.	23.1.2012	1.32	-4.06	-123.29	-125.78	**-153.83**
15	Kakinada-Kotipalli (BG) 44.7 Kms.	13.5.2005	153.58	19.87	-7	-6.86	**-9.51**
16	Penukonda-Dharmavaram via Puttaparthi (BG) 53 Kms.	2002	64.50	14.14	-56	-52	**-54**
17	Chikkabanavara-Nelamangala (BG) 14 Kms.	2002	77.71	NA	-11.91	-10.33	**-11.13**

Medical Service, KRCL

Research and Development

RDSO was setup by the merger of the Railway Testing and Research Centre, RTRC and the Central Standards Organization (CSO) in the year 1957. This is a premier research, design and standards organization set up with the view to evolve appropriate design of Railway equipments and systems for improved safety, reliability, and maintainability.

RDSO, being the central pillar for technology on Indian Railways, is fully involved in development, adoption and absorption of new technologies; development of new and improved designs of equipment and systems and setting standards for adoption on Indian Railways. RDSO is also involved in technical reviews, statutory clearances and testing, apart from giving technical guidance to Zonal Railways. Vendor development with approval and inspection of major items is also part of the mandate of RDSO, an ISO 9000:2008 organisation. RDSO also functions as international platform for interaction with bodies such as UIC and AAR.

Some of the important activities during the year are given as:-

Safety

VHF Based Approaching Train Warning System for Track Maintainers (Rakshak): The system works through VHF Transmitter & a Hand held VHF Receiver (HHR) available with maintenance staff. This unit will be normally installed in a Relay Room or Station Master's Room.

Advance Warning System for UMLC: RDSO has developed GPS based "Advance Warning System (Radio & RFID Based) to Pre-Warn Road User about Approaching Trains at Unmanned Level Crossing Gate".

Development of Train Collision Avoidance System (TCAS): Train Collision Avoidance System (TCAS) is an Automatic Train protection (ATP) System with cab-signalling, meant to provide protection by preventing trains to pass signal at Danger (Red), excessive speed over turnouts / Speed restrictions and to avoid the situation in which more than one train is on the same track. TCAS provides features of ACD & ETCS at much lower cost.

Development of Train Protection & Warning System: Train Protection & Warning System (TPWS) is a continuous supervision system that eliminates risks of Signal Passing at Danger (SPAD). The system has been

commissioned on 116 RKM on SR, 192 RKM on NCR/NR and 28 RKM on Kolkata Metro.

Development of FIBA (Failure Indication cum Brake Application) Device: FIBA Device has been developed on IR and introduced successfully in coaches of important trains having Hybrid, (LHB shell & ICF bogies), LHB and Double Decker coaches fitted with Air Suspension in secondary stage.

Ultrasonic Broken Rail Detection System: The UBRD system, designed to inspect rail status for continuity at frequent intervals through guided ultrasound waves between stations spaced at approximately one km interval, has been commissioned in NR and NCR (25 kms each) in April, 2016.

Screening of Experienced Loco Pilots for Their Deployment as High Speed Train Drivers on Trains Having Speed > 110 kmph Including Rajdhani/Shatabdi: It is being done on indigenously developed Computer Aided Drivers Aptitude Test equipment comprising of different tests for assessment of psycho-physical, cognitive and personality attributes, crucial for the job of high speed train driving.

Development of Drawings for Derailing Switch for Throughput Enhancement: RDSO has developed two drawings of derailing switch of 52 Kg rail section. These drawings have been issued to all Zones.

Passenger Amenities

IR-DRDO Bio Toilets in IR BG Coaches: To overcome the environmental degradation and maintain hygiene in railway premises, RDSO in association with DRDO (DRDE/Gwalior) has developed IR-DRDO Bio-toilets which is being fitted on existing & new coaches.

Development of World Class Interior in Coaches: First model rake of world class AC and Non AC coaches was flagged off by the Prime minister of India and is running between Varanasi and New Delhi in Mahamana Exp.

Water Purification System in Indian Railway Passenger Coaches: RDSO has developed and MCF/RBL has fitted Water Purification System in 22 numbers Antyodaya Coaches (LWS) for trial.

First Indigenous Air-conditioned EMU: First Indigenous Air-conditioned EMU for Mumbai sub-urban with 3-phase propulsion system has been developed and manufactured by ICF for operation in Western Railway.

Air Conditioned Metro for Kolkata Metro: Air conditioned metro with 3-phase electric and bolsterless bogie similar to other metro coaches has

been manufactured by ICF and one rake has been turned out in July, 2017.

Operational Efficiency

Development of LHB Rake Fit to Run at 200 Kmph on Existing Track: RDSO in association with RCF, Kapurthala has developed LHB rake fit to run at 200 kmph on existing track. This rake has been provided with automatic closing door, improved EP assist stainless steel brake system and sintered brake pad.

Prototype Development of Newly Designed 25T Open Wagon: RDSO has developed the next version of the BOXN25 designated as BOXNS incorporating indigenously developed Light Weight Low Height bogie. Final speed certificate of the wagon has been issued at 85 kmph (E)/65lmph (L).

Design Development of 25T Container Flat Wagon: RDSO has developed the design of container flat type wagons (BCSA & BCSB) fit for 25T axle load operations. Board has placed order for manufacture of 03 no. prototype wagons (02 'A' car and 01 'B' car) on GOC workshop.

Prototype Development of New Design High Capacity Parcel Wagon: RDSO has recently developed a parcel van, with increased volumetric capacity, designed to operate as dedicated freight vehicle/ freight trains.

Development of Ballastless Track with Indigenous Fastening System (BLT-IFS): Design for Ballastless track (BLT) design has been developed using indigenous fastening system (IFS)for full speed(110) for 25T axle load.

New Initiatives in Design and Fabrication of Railway Bridges

- Design of 91.44m span has been standardized.
- Bow string girders for NHAI drawings of 42m span bow string ROBs have been issued for one way two lane.
- Design of 60m Bow Arch Bridge for NHAI one way two lane is in progress.
- Design of 72m Bow Arch girder has been completed.

Indigenous Development

Development of Micro Processor Based Governor for HHP Diesel Electric Locomotives: This would facilitate Import substitution and Indigenization of Governor.

Modelling and Validation of Interlocking for Railway Signalling Systems: An MoU has been signed between RDSO & IIT/ KGP for Modelling and Validation of Interlocking for Railway Signalling Systems.

OFC Based Backup Interlocked Signalling System: RDSO has developed a scheme which involves controlling outdoor signalling functions on OFC with a standby system for running trains operation in emergency from location box. Entire interlocking software is duplicated in an intelligent safety controller.

Inspection and Quality Audit

Quality Assurance/Civil Directorate is the inspection agency for GRSP/ CGRSP, GFN Liners, Dowels, CMS Crossings & AT Welding Portions. Now, total On-line system for product inspection has been adopted and inspection certificates are uploaded on website. During the year 2016-17, total value of product inspected was ₹ 406.64 crores.

QA/Civil Directorate is dealing with fresh approval, up-gradation, quality audit of approved vendors etc. In the year 2016-17 the directorate has done Quality Audit of 84 firms, up - gradation of 15 firms and fresh approval of 21 firms.

Consultancy

During the year 2016-17, eight consultancy/Inspection Reports have been issued to Zonal Railways for various track formation related problems at different locations.

Test and Trials

Lucknow Metro: Detailed Oscillation & EBD trials were conducted by RDSO for Lucknow Metro Rail Corporation Standard Gauge coaches.

Talgo Train: RDSO conducted following trials.

- Riding, Safety and Stability assessment trial of BG TALGO Aluminium Coaches fitted with integrated suspension on articulated wheel set upto maximum test speed of 180 kmph over Palwal-Mathura section of North Central Railway and upto maximum test speed of 115 kmph over Bareilly-Moradabad-Saharanpur section of Northern Railway
- Emergency Braking Distance (EBD) trial with speed of 160 and 150 kmph over Palwal-Mathura section of North Central Railway
- Train Timing trials up to maximum test speed of 150kmph over New Delhi – Mumbai section.

Export

Design & Development of Fabricated Bogie frame for MG Diesel Locomotive for Export to Myanmar Railways: Design of bogie frame has been developed and verified by simulating with existing load cases on FEA software.

Research and Collaboration

Strategic Technology & Holistic Advancement (SRESTHA): Setting up of a 'Special Railway Establishment for Strategic Technology & Holistic Advancement' (SRESTHA), a world class institution to undertake the various Research and Development projects in Indian Railways was announced in Budget 2016 with the following objectives:

- It shall engage itself in building new products for Indian Railways, based on available technology in the world and in newer areas, R&D shall be initiated in synergy with the needs of Indian Railways along with focus on applied research and development.
- It shall be design Centre for Railways as a 'System of Systems' along with being a Technology Incubation & Commercialization Centre and shall assist to build Design Centres at Production Units of Indian Railways and other Centres of Excellence in Academic Institutions.
- It aims to transform Indian Railways from a net technology Importer to its Exporter in ten years, and work towards a modal 'Shift to Rail' in India.

The Project Management Unit (PMU) for setting up SRESTHA has been set up.

InnoRail International Exhibition and Conference: 2nd Innorail International Conference was organized by RDSO in association with CII for 3 days from 01.12.2016 to 03.12.2016 at RDSO, Lucknow.

Global Technology Conference: RDSO organized a two-day Global Technology Conference on 3rd & 4th May 2017 at Manekshaw Centre in New Delhi, Critical areas of Safety, Reliability, Capacity enhancement and Customer service were the focus of various discussion during the conference.

Undertakings and other Organizations

As many as 16 Public Sector Undertakings and other Organizations are functioning under the Ministry of Railways, as detailed below:-

S. No.	Name	Year of Incorporation/ Inception	Core competence
1	RITES	1974	To design, establish, provide, operate, maintain and perform engineering, technical and consultancy services for development of projects/ systems of all types and descriptions pertaining to Railways and Other Sectors/Industries in India and outside India.
2	IRCON	1976	To undertake construction activities in India and abroad on turnkey basis or otherwise in various fields of infrastructure like Railways, Bridges, Roads, Highways, Industrial and Residential Complexes, Airports, etc.
3	CRIS	1986	CRIS is the IT arm of Indian Railways. It designs, develops, implements and maintains centralized IT system for all departments of Indian Railways.
4	IRFC	1986	To raise funds from the market to part finance the Plan Outlay of IR.
5	CONCOR	1988	To develop multi-modal logistics support for India's international and domestic containerized cargo and trade.
6	KRCL	1990	To construct and operate railway lines, construct Road Over Bridges and rail line projects.
7	RCIL (RailTel)	2000	To utilize the surplus telecom capacity and right of way available with the IR to build nationwide optical fibre cable based broadband telecom and multimedia network.
8	IRCTC	2001	To undertake catering and tourism activities of the Railways. Also facilitates internet ticketing through its website.
9	PRCL	2001	To execute the Surendranagar-Rajula-Pipavav Port gauge conversion and new line projects in Gujarat.
10	RVNL	2003	To create and augment the capacity of rail infrastructure. To mobilize resources mainly through multilateral/bilateral funding agencies and also through domestic market for successful implementation of projects.

11	RLDA	2005	To develop vacant railway land for commercial use for the purpose of generating revenue by non-tariff measures for IR.
12	DFCCIL	2006	To plan and construct Dedicated Rail Freight Corridors (DFCs) for movement of freight trains on the corridors.
13	MRVC	1999	To plan and implement rail projects in the Mumbai Metropolitan Region.
14	BWEL	1978 (In MOR from 2008)	To manufacture wagons and undertake structural fabrication jobs
15	BSCL	1976 (In MOR from 2010)	To manufacture Railway Rolling Stock.
16	BCL	1976 (In MOR from 2010)	To manufacture wagons, undertake structural fabrication jobs and manufacturing, retrofitting of EOT crane.

Rail India Technical and Economic Services Limited (RITES):

RITES, a Mini Ratna Enterprise, Schedule 'A', an ISO 9001-2008 certified multidisciplinary organisation of consultants, engineers and project managersin transport and infrastructure sectors, offers comprehensive services from concept to commissioning inrailways, urban transport,highways, bridges, tunnels, ports, inland waterways, airports, ropeways, institutional buildings, renewable energy andexport packages of rolling stock and railway related equipment.It has operational experience of 43years in over 62 countries of SAARC, ASEAN, Africa, Latin America and Middle East region.

Capabilities

Its capabilities include feasibility, design and detailed engineering, project management, quality assurance, workshop management, operation and maintenance, railway electrification, signalling and telecommunication, environmental impact assessment, training and human resource development It hasrecognition by multi-lateral funding agencies - the World Bank, Asian Development Bank, UNDP and AFDB.

Overseas Projects

Bangladesh - Feasibility study for setting up a new coach manufacturing unit and supply of 120 BG stainless steel passenger coaches and 26 new BG diesel locomotives - Bangladesh Railways

Botswana - Consultancy services for pre-contract services and construction supervision of Tshesebe to Masunga Road Project

Mauritius - Supervision consultancy for LRT project and DPR for Trident Port Project

Myanmar - Supply of 18 new YDM4 locomotives to Myanmar Railways.

Senegal - Supply of 6 in-service YDM4 locomotives to M/s Indorama Energy Pvt. Ltd.

Mozambique - Wet Leasing of 15 1350 HP Diesel Locomotives

Sri Lanka - Supply of 6 sets of 1800 HP Microprocessor Controlled AC-AC DMUs (13 coaches per set) and 10 3000 HP Microprocessor controlled AC-AC EMD Diesel Locomotives for Sri Lanka Railways

Integrated Check Posts at the borders of neighbouring countries is a first of its kind project in India. These are world-class facilities for passenger and cargo movement in an airport like set up with state of the art immigration and custom facilities. RITES is offering Project Management Consultancy services for Integrated Check Posts along international borders at Jogbani, Biratnagar, Birgunj along Indo- Nepal Border; Dawaki &; Moreh along Indo-Myanmar border. RITES has completed Integrated Check Post at Attari on India-Pakistan border, Petropole on Indo-Bangladesh border, Agartala along Indo-Myanmar border and Raxaul on Indo-Nepal border.

Domestic Projects:

- At home, RITES is involved in mega transportation projects like dedicated freight corridors, metros, high speed rail studies, logistics parks, rail infrastructure and green energy etc.
- RITES has been associated with the National High Speed Railway Corporation for Ahmedabad-Mumbai high speed passenger corridor, India's first high-speed rail corridor under implementation, detailed design consultancy for six elevated metro stations for Metro Link Express for Gandhinagar, GC for Ahmedabad and feasibility study for high-speed rail corridor between Delhi-Chandigarh-Amritsar.
- Corridor optimization through digital elevation modelling and geological appraisal for Bilaspur-Manali-Leh new broad gauge railway project covering a distance of about 650 km, which is one of the four strategic border lines
- Final report of the Preliminary Engineering-cum-Traffic Study (PETS) of East-Coast DFC (1,122 km) between Kharagpur and Vijayawada and study for the Southern Corridor (885 km) between Chennai and Goa.
- Project management consultancy services for the construction of double line electrified track and related infrastructure for Western Dedicated Freight Corridor (1477 KM) Dadri-Rewari-JNPT Mumbai as a member of consortium.
- Design and designer's association services for rail cum road bridge over river Brahmaputra at Bogibeel near Dibrugarh, Assam for NF Railway
- Consultancy for the country's key metro rail projects like Delhi,

Bengaluru, Ahmedabad and Nagpur and feasibility study & DPR for metros in Kochi, Patna, Guwahati, Kanpur, Varanasi, Agra, Lucknow & Chennai

- Setting up of design, development and testing centre at RWF (Bengaluru), Self Propelled Accident Relief Train (SPART) on Indian Railways (IR) system, setting up of waste energy plants for IR, fatigue testing of metro bogies at BEML, consultancy study for setting up of emission standards for IR diesel locomotives.
- Wet leasing of locos to non-railway customers and operation and maintenance of more than 100 locos and 1200 wagons owned by clients.
- Turnkey projects for the third line in Pendra Road- Anuppur section of Bilaspur division of South East Central Railway and Gooty- Dharmavaram doubling works for South Central Railway.
- Turnkey works of construction, supply, installation and commissioning of Machinery & Plant for upgrading / modernization of Railway Workshops such as setting up a FIAT bogie frame manufacturing plant at Budge-Budge for RCF- Kapurthala. Turnkey execution of a new factory at Vidisha for manufacturing of traction alternators for Indian Railways,
- Setting up of State-of-the-Art wagon factory, at Kulti, West Bengal as a 50:50 JV between RITES and SAIL, a "Make in India" initiative of the Indian Railways. An assured off-take Agreement has also been signed with Railways for manufacture of 1200 wagons/annum and rehabilitation of a minimum of 300 wagons/annum.
- Rail infrastructure connectivity projects in steel, aluminum, power, mining and ports including NTPC's mega project management works at Lara in Chhattisgarh state.
- Deep water port facilities with port connectivity (Sagar Island), setting up new green field ports in Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Odisha and West Bengal
- Developmental works of Inland Waterways Transport on major National Waterways of India.
- RITES and the Indian Railways Joint Venture Company, Railway Energy Management Company Ltd. (REMCL) for renewable energy projects, bilateral purchases, power trading and energy efficiency projects, in a record time of 10 months, has commissioned 26 MW Wind Mill in Jaisalmer and also concluded power procurement contracts for 1200 MW in different states.

Financial Performance:

The comparative financial performance of RITES during the last 2 years

is as follows:

		(₹in crore)
	2015-16	**2016-17**
Total Income	1,278	**1,509**
Net profit after tax	339	**331**
Net worth	1,878*	**2,034**

* revised

Ircon International Limited (IRCON)

Ircon International Limited (formally known as Indian Railway Construction Company Limited), a Mini Ratna and Schedule 'A' PSU, was incorporated on 28th April, 1976, mainly for the purpose of construction and development of Railway Infrastructure in India and abroad with the expertise from Indian Railways. During its operation of 41 years the company has diversified and developed core competence in other areas like Highways, Tunnels, Bridges, Flyovers, ROBs, Airport Hangar & Runways, Metro rail and Buildings, EHV Transmission Line & Grid Sub-stations, Industrial Electrification, Signaling and Telecom Systems etc. Considering its major share of business from projects abroad, its name was changed to "Ircon International Limited" w.e.f. 17th October 1995.

IRCON has emerged as front ranking construction company of international repute having executed prestigious projects during the last 41 years of its operations. It has so far completed about 376 infrastructure projects in India and 121 projects across the globe in more than 24 countries. As per 2016 edition of Engineering News Record (ENR) of USA, IRCON is among the only four Indian companies to make it to the list of top 250 International Contractors.

Foreign Projects

IRCON is actively engaged in infrastructure development in several Asian and African countries. The journey abroad began with Samawa high speed railway line project in Iraq in 1980 in which the Company proved its mettle by constructing world-class railway lines designed for trains running at a speed of 250 Kmph on standard gauge. Since then, the Company has never looked back.

The Company's expertise coupled with its experience has helped in successful completion and commissioning of a mega project valuing over USD 1 billion in Malaysia, the largest ever Transportation project completed by any Indian company abroad. In Bangladesh, IRCON has completed projects of "Construction of 2nd Bhairab Railway Bridge with Approach Rail Lines" and "Turnkey Contract of 2x20 MVA, 66/33 KV Sub-station at Paro

in Bhutan." Some other Key Railway Projects are also under execution in Algeria, Bangladesh and South Africa. IRCON has also signed an MoU with Construction and Development of Transportation Infrastructure Company (CDTIC), a company owned by Government of Iran for the financing and execution of Chabahar-Zahedan Railway Project.

International Rail Connectivity Projects

As close neighbours, India shares a unique relationship of friendship and cooperation with Nepal and Bangladesh. Taking the bilateral relationship to new heights, IRCON is executing Rail connectivity projects to Nepal and Bangladesh. These projects are New Broad Gauge Railway Line between Jogbani (India) and Biratnagar (Nepal), & Jayanagar (India) and Bardibas (Nepal) besides the work of design and construction of Akhaura (Bangladesh)-Agartala (India) rail link.

Strategic Projects in India

In India, IRCON has undertaken various prestigious projects which are emblematic to the country's rise on global infrastructural map. The Company is involved in the biggest Railway construction project in Jammu & Kashmir. IRCON is also constructing a new Broad Gauge railway line from Sivok in North Bengal to Rangpo in Sikkim to provide a rail connectivity to Sikkim.

During the year 2016-17, major projects completed include:

- 4.5 km long Rail-cum-Road Bridge across the river Ganges at Patna
- Design, Supply, Installation, Testing and Commissioning of Ballastless Track of Standard Gauge in elevated section of Aluva to Petta corridor of Kochi Metro.

Among the ongoing projects, some of the key projects are:

- Civil and Track Works of DFCCIL in three packages between JNPT - Vaitarana, Vaitarana - Sachin and Sachin - Vadodara sections
- Construction of Railway lines of approx. 300 km length at an estimated cost of ₹4,500 Crores in Chhattisgarh
- Construction of Modern Coach Factory at Rae Bareilly
- Construction of RoBs in the states of Rajasthan and Bihar
- Supply, Installation, Testing and Commissioning of Ballastless Track of Standard Gauge and sub-stationworks for Delhi Metro under phase-III
- Four laning of Bikaner-Phalodi section in Rajasthan
- Four laning of Shivpuri-Guna section in Madhya Pradesh
- Power Supply Distribution works (R-APDRP) at Meerut in the state of Uttar Pradesh and at Jammu in Jammu & Kashmir for the respective State Governments.

The company is also engaged in construction of rural Roads under Pradhan Mantri Gram Sadak Yojna (PMGSY) and has contributed significantly in the road sector by completing about 5,000 km of roads and about 100 nos. of Road over Rail Bridges.

Awards & Recognition

A number of Awards & Accolades were received during the year 2016-17. Some of them are Dun & Bradstreet Awards for 'India's Top PSUs 2016', 'Infra Awards 2016 for Best Infrastructure Project: Setting up of Modern Coach Factory, Rae Bareli Phase-I', 'CIDC Vishwakarma Awards 2016 for the Best Construction Project to 'Modern Coach Factory, Rae Bareli'.

Centre for Railway Information System (CRIS)

The Centre for Railway Information Systems(CRIS) is an Autonomous Organization of the Ministry of Railways, with its headquarters in New Delhi and Regional Offices in Delhi, Kolkata, Mumbai and Chennai. It develops and manages the IT systems of the Indian Railways, with terminals and counters spread across the country from Kargil to Kanniyakumari, and from Tawang to Port Blair.

CRIS's portfolio of projects covers the gamut of Indian Railways' functions such as Passenger ticketing, Passenger enquiry services, Freight operations, Train dispatching and control, Crew management, e-Procurement & Materials management, management and protection of Railways' Fixed and Moving Assets, Parcel management, comprehensive Financial management system, and Production of rolling stock. Mobile apps provide information at the passengers' fingertips.

CRIS is currently developing systems to cover emerging needs of the Railways including management of the Overhead Electrification System, employees' Health Management, Tracking of Rolling Stock using Radio Frequency Identification, setting up a Geo-spatial database, Track Machine maintenance & management system, Bridge Management System, Traffic Accounts Management System, Workshop Accounts Management System, Data Analytics Unit for Indian Railways, Fuel Management System, CRS Sanction Management System, and building a state-of-the-art Data Centre.

The idea "Congestion Prediction and Network Optimization for Indian Railways using Big Data Analytics and Operational Research Tools", presented by CRIS team, won the award for the best idea under the theme "Modernise Indian Railways by using best-in-class technology" in the three-day Rail Vikas Shivir, held from November 18th to 20th, 2016, at the initiative of the hon'ble Prime Minister, to generate innovative and practical ideas across critical areas of railway operation.

Achievements and Developments:

Ticketing and Passenger facilitation

Passenger Reservation System (PRS) provides reserved accommodation for passengers, in various classes of travel, Tatkal tickets, and special trains; including dynamic pricing. Railways is leading Government of India's cashless effort with nearly three-fourth of its reserved ticket earnings now coming from cashless sources.

Next Generation E-ticketing system (NGeT) provides the web-based front-end application to handle all the Internet ticket bookings for IRCTC.

National Train Enquiry System (NTES) is the official Indian Railways app for travelers needing train-running related information and real-time status queries for all trains of India.

Hand-held terminals for TTEs (HHT) will enable TTEs to report on-board vacancies and to provide on-train services integrated with PRS.

A Ticketing Data Warehouse provides insights into ticketing data and helps to develop better passenger services.

Unreserved Ticketing System (UTS) provides cluster–to–anywhere booking of unreserved tickets at all stations.

Automatic Ticket Vending Machines (ATVM/CoTVM) are smart card-based or coin/ currency operated user-driven ticket vending machines, primarily for suburban sections.

UTS through mobile phones has been provided in paperless mode in Mumbai, Chennai, Kolkata, Delhi, Secunderabad, etc. The user can buy and display the ticket on his/her phone itself.

Automatic Fare Collection System for Kolkata Metro has replaced the old magnetic ticket based AFC system with the new Smart Card & Token based system.

The Web Portal for Indian Railways is the single point of interaction for Rail Users.

The Complaint Management System with bilingual Web-based and SMS-based interfaces enables passengers to lodge their complaints and track them as they are addressed.

A WAP/SMS gateway provides information to passengers about change in PNR status, train position, etc. via push mode as well as query mode.

Parcel Management Information System (PMIS) has computerized the booking and delivery of parcels at major parcel booking stations, with provision for bar-code tracking.

The Commercial Contract management system is being designed and developed for commercial contracts entered at stations and other units of Indian Railways

Computerization of coaching refunds is a system to simplify coaching refunds.

Operations

Freight Operations Information System (FOIS) is an online system for monitoring and management of Freight movement. It enables freight customers to obtain the status of consignments in transit and helps in monitoring and managing the movement of freight trains.

Pipeline Management System is linked to FOIS and helps to forecast congestion at terminals.

The Control Office Application (COA) assists the Section Controller in ensuring smooth movement of scheduled and unscheduled trains. COA prepares computerized control charts.

Software Aided Train Scheduling system (SATSaNG) is a comprehensive system to aid scheduling of passenger trains, identifying paths for freight trains and providing a tool for path management.

Crew Management System (CMS) a browser-based application, automates and optimizes crew booking on all Freight, Shunting and Coaching services and enables booking of Drivers, Guards, Assistant drivers and Shunters.

Computerization of TTE lobbies at interchange/major stations on 67 divisions will streamline the deployment of TTEs.

Integrated Coaching Management System (ICMS) provides a single window for all coaching operations, together with real time and comprehensive Punctuality Reports for all levels of management.

Web enablement of claims (Web claims) is a web-based system to simplify claims lodging and processing.

Safety Information Management System is a web-based application through which safety related information can be communicated among users.

Asset Management

Track Management System (TMS) is a comprehensive system including maintenance and inspection, track materials, track welds and their testing, and reporting.

A Bridge Management System and Track Machines Management System will supplement the TMS to provide a suite of applications for maintenance and operation of Civil Engineering assets.

System for rail-road crossing GAD Approval, Way Leave Easement rights, and private sidings provides an integrated inter-ministry work-flow for approval of general arrangement drawings and other technical documents for Rail/Road over bridges/under bridges and private sidings, greatly reducing the time taken to plan such works.

Locomotive Asset Management System (LAMS) provides comprehensive information for Diesel and Electric Loco Sheds and provides functionality for Power and Traction controllers.

Coaching Maintenance Management System (CMM) captures data during maintenance activities in depot and provides assistance to the managers and maintainers in the depots and Divisions. The centralized application provides all relevant information to facilitate maintenance work.

Freight Maintenance Management System (FMM) is a comprehensive maintenance management system for freight wagons.

Workshop Management Information system (WISE) is a user-friendly IT system for Mechanical workshops with automated data capture to provide secure, reliable and timely information.

Centralized information systems in Production units viz. DLW (Varanasi), RWP (Bela), and RCF (Rae Bareli) will provide information on the production shop floor as well as for supporting functions.

Radio frequency identification (RFID) will be used to provide an automated wagon identification system.

Electrical Energy Management System (EEMS) demonstrates energy efficient technology through 500 AMP meters

Materials Management, Financial Management, and Resource management

E-Procurement System (IREPS) enables fully secure central e-tendering for supply contracts and e-auctions for scrap material for all Indian Railways' zones and units. It has been extended for Works contracts also, and to divisions and units.

A centralized Material Management Information system (MMIS) includes all Purchase and Depot functions. Vendors will be managed through the Vendor Interface Management System.

The Accounting Information Management System (AIMS/I-PAS) is a centralized financial management system, based on the I-PAS (Integrated Payroll and Accounting System) rolled out across Indian Railways.

The Railway Budget Compilation System provides a web- based interface for Budget compilation.

Indian Railways Projects Sanctions & Management (IRPSM) is

a web based System to manage the creation and sanction process of projects under the Annual Works Program.

RPF Security Management System (RSMS) provides comprehensive information for security of Railway assets.

Conclusion

Implementation of effective IT systems has proved to be the quickest and cheapest way to increase the efficiency and effectiveness of Railway working. CRIS has been working to ensure that IT systems are implemented in all areas of Railway working, for improving Railway working further.

Indian Railway Finance Corporation Limited (IRFC)

Set up as a public limited company in December, 1986 with the sole objective of raising money from the market to part-finance the plan outlay of Ministry of Railways and for meeting their developmental needs, IRFC has been successfully meeting the borrowing targets set for it year after year. Funds are raised through issue of bonds, Term loans from banks/financial institutions and through external commercial borrowings/export credit etc.

The Company has leased rolling stock assets worth ₹1,51,318 crore to the Railways upto 31st March, 2017. Assets worth about ₹14,280.84 crore were financed during 2016-17. Funding has been made by IRFC in locomotives, wagons and coaches. The acquisition has helped in increasing traffic output and revenue growth in Indian Railways over the years. IRFC has also funded Railway projects through Institutional Finance to the extent of ₹22,600 crore till March.

Rolling Stock assets funded by IRFC are leased to Ministry of Railways. IRFC has successfully brought down lease rentals from 17.5% p.a. in 1996-97 to 10.905% p.a. in 2016-17 which compares favourably with the borrowing of the Government of India. The Ministry has been making lease payments to IRFC regularly.

The Company has also disbursed loans amounting to ₹3,188.93 crore to Rail Vikas Nigam Ltd. (RVNL) till the end of fiscal year 2016-17 for development of Railway Projects.

IRFC has consistent profit earning track record. It has so far paid ₹2,749 crore as dividend to the Government. Based on its strong financial strength and credit standing, it has got the highest possible rating from three prominent domestic Credit Rating Agencies and investment grade at par with 'Sovereign' from four major International Credit rating Agencies.

Container Corporation of India Limited (CONCOR)

Container Corporation of India Limited (CONCOR) a Navratna undertaking of Government of India, was incorporated in 1988 with the

objective of providing multi modal logistics support for India's domestic and international containerized cargo and trade. It manages the largest dry port network of India and acts as a carrier, terminal operator and warehouse/CFS operator.

CONCOR prides itself of having the highest market presence in industry which is corroborated in the form of 75% market share presently held by it. The company owns 285 high speed rakes & 1,340 BFKHN wagons which interconnect a vast spread network of its 68 terminals, catering to both domestic and international containerized cargo. In terms of performance, CONCOR achieved a gross operating turnover of ₹5,606.13 crore while handling a total of 3.10 million TEUs. In terms of tonnage, the company carried a total tonnage of 38.12 million tons in the year 2016-17.

CONCOR's terminals provide a spectrum of facilities in terms of warehousing, container parking, repair facilities, reefer container plug-in facilities etc. As a CFS operator, CONCOR adds value to the logistics chain by offering services such as transit warehousing, bonded warehousing, Less than Container Load (LCL) consolidation and reworking of consolidated cargo at nominated hubs, and air cargo clearance using bonded trucking. The customers can track the location of their containers through internet or even through an SMS empowering them to take better decisions. CONCOR maintains high integrity standards and utmost transparency in all its operations and public dealings benefiting all the stakeholders.

CONCOR has attempted to diversify its business by venturing into Air Cargo and port terminal operations through JVs with private corporates. A wholly owned subsidiary of CONCOR, CONCOR Air Ltd. was launched in 2012, which deals with air cargo.

Huge investments have been made towards creation of state of the art infrastructure facilities called Multi Modal Logistics Parks which in future shall be the answer to all transportation, warehousing, clearance needs of the trade.

With the upcoming Dedicated Freight Corridor and export favouring policy being adopted by the government, coupled with the fact that India is set to become favourite trade destination of the world, CONCOR shall play a very important role by connecting ports with the hinterland and providing ready infrastructure for handling the load.

Konkan Railway Corporation Limited (KRCL)

The Corporation was established in the year 1990, with equity share capital participation by Ministry of Railways (51%), Maharashtra (22%), Karnataka (15%), Kerala (6%) and Goa (6%) for the purpose of construction and operation of Railway along the Western Coast of India i.e. from Roha

(in the State of Maharashtra) to Thokur near Mangalore (in the State of Karnataka) with a length of 741 Kms. The completion cost of the project was ₹3,555 crore inclusive of ₹1,035 crore on project financing. The Corporation became a fully operational Railway on 26th January, 1998 and since then it has been successfully operating passenger and freight trains. The Corporation has expertise in construction of turnkey Railway Projects and at present is undertaking part of Udhampur-Srinagar-Baramulla Rail Link (USBRL) project at J&K including a few others.

Train Operating Performance:

On an average, during the year 2016-17, 51 Passenger Trains per day were run and one new train was introduced. The passenger earnings during the year was ₹606 crore registering an increase of 9% over the last year.

On the freight front, on an average, 17 freight trains were run per day including Roll on - Roll off (RORO) services, during the year 2016-17. The freight earnings during the year was ₹440 crore, as compared to last year's freight earnings of ₹459 crore. A drop in earnings was majorly due to reduction in freight rates of certain items.

Financial Performance:

		(₹ in crore)
	2015-16	**2016-17**
Total Income	1,625.00	**2,153.00**
Operating Margin	314.00	**265.00**
Profit After Tax	129.50	**62.00**
Net Worth	1,483.00	**1,496.00**

The Corporation has achieved "Excellent" rating in MoU targets set with the Ministry of Railways for the year 2015-16.

Ongoing Projects:

USBRL PROJECT, J&K - So far, the Corporation has completed 25.84 km tunnel excavation, out of a total of 41 km of the construction of Katra-Dharam Section of USBRL Project, J&K. Concrete lining in 03 tunnels has been completed totaling nearly 3.25 km during the year. A turnover of ₹808 crore in USBRL Project was achieved in the year which is the highest ever and 75.62% higher than ₹460 crore of 2015-16. The cumulative turnover achieved up to 2016-17 is ₹3,675 crore.

Jaigad Digni Rail Connectivity Project – The project is being executed by the JV (Joint Venture) Company "Jaigad Digni Rail Limited". The work of land acquisition is in progress. The work of critical Tunnels andBridges has started.

Track Doubling-Roha-Veer Section (47 km): Track doubling of this

section is expected to increase line capacity of the Corporation. The project is expected to be completed in 36 months, with the estimated project cost of ₹340 crore.

Route Electrification of Konkan Railway Route: With complete electrification, the Corporation is expected to save approx. ₹120 crore per annum on fuel cost.

Rajbhasha Award:

Hon'ble President of India had awarded first prize of "Rajbhasha Kirti Puraskaar" Shield to the Company on 14/09/2016.

Rail Tel Corporation of India Limited (RailTel)

RailTel was formed in September 2000 with the objective of creating nationwide Broadband Telecom and Multimedia Network in all parts of the country, to facilitate Railways in 'expeditious' modernization of their operation and safety systems and network by providing state-of-the-art communication infrastructure, and to generate revenue through commercial exploitation of its telecom network.

RailTel is holding Internet Service Provider (ISP) Category 'A' license, National Long Distance (NLD) service license and Unified License authorized for International Long Distance service from DoT. In addition, registration as Infrastructure Provider Category- I (IP-I) has also been obtained from DoT by RailTel.

RailTel has deployed state of the art STM-16/64/DWDM network on more than 45,000 RKMs OFC backbone across the country.

The Company is now expanding the telecom network by laying 12000 KM of OFC network in 6 North Eastern States (Mizoram, Tripura, Meghalaya under NE I and Arunachal Pradesh, Manipur and Nagaland under NE II) under the USOF (Universal Service Obligation Fund) project of DoT.

The Company as a part of NOFN (National Optical Fiber Network) project is laying OFC on behalf of BBNL for providing broadband connectivity to 8768 grampanchayats (under Ph-I) in 11 States/UTs of country for providing minimum 100 Mbps broadband to panchayats.

Performance during last three years.

a. In the last three years, the Company has earned more than ₹100 crore profit before tax during the last three years.
b. The Company is a Mini Ratna Category 1 since May, 2012.
c. The Company has earned "Excellent" rating during last three years
d. The Company pays revenue share to Railways and license fee to DoT from its income. During the last two years, such revenue share and license fee paid are as under:

		(₹ in crore)
	2015-16	**2016-17**
Revenue share to Railways	22.15	**27**
License fee to DoT	34.69	**41.17**

Towards its Corporate Social Responsibility (CSR) , the company has incurred an expenditure of ₹3.59 crores in CSR activities during the year 2016-17.

The important financial parameters over last two years are as under:

Financial Performance

			(₹ in crore)
S. No	Particulars	2015-16	**2016-17**
1	Share Capital	321	**321**
2	Gross Income	642*	**899**
3	Gross Operating Margin	275	**309**
4	Net Profit after Tax	104	**129**
5	Net Worth	1,059	**1,157**
6	Dividend paid to Ministry of Railways	42	**51.53**

* revised

Focus Areas:

Station Wi-Fi

Rail Tel has partnered with Google to provide fast Wi-Fi across 400 railways stations bringing internet access to millions of Rail commuters. Presently, the service has been commissioned at 193 stations.

Rail Cloud

Rail Tel has been entrusted with setting up of Rail Cloud – the cloud service to Indian Railways to create a common IT infrastructure platform, which will enable hosting of all future IT applications and rapid development of IT applications. RailTel is hosting the Rail Cloud in its Tier III Data Centres at Secunderabad and Gurugram. The Rail Cloud will reduce procurement/ provisioning of IT infrastructure (IT hardware/platform) to less than 24 hours which will revolutionize the pace of IT deployment on IR.

Railway Display Network

RailTel has conceptualized an integrated railway display network of more than 1 lakh screens spread across 2,000 stations equipped with an array of connected LED screens and video-walls. These screens shall be connected using RailTel's extensive fiber network and managed centrally from data center. The screens shall enable relevant passenger and train information, travel & tourism related information and local station guides among others.

Being centrally controlled, it will also enable providing relevant social messages and emergency communication while being fully integrated with social platforms.

Content on Demand

RailTel has started working on Content on Demand (CoD) services for providing entertainment video content in 1300 premium trains under initial phase. Under this project, entertainment in the form of video content will be provided as a service to the passengers on trains using the intra-train Wi-Fi service.

Nirbhaya Project

RailTel has been entrusted with the execution of 'Nirbhaya project' - Indian Railways' endeavour to set up high-tech surveillance system at 983 stations of A1, A, B and C category Railway stations for providing safe, secure and pleasant experience to Railway passengers especially women and children. The project envisages to network all cameras on RailTel's optic fiber cable and providing central view console at Zonal/Divional HQs for use by RPF and senior management.

Rural Station Wi-Fi project

RailTel has started a project of providing RailWire Wi-Fi at 200 rural stations as a pilot project as it will cater to rural areas where the internet service is either unavailable or not upto the mark. A Digital Service centre will be set up in these stations to extend digital literacy and various online services to rural population.

RailWire - Retail Broadband Service

It is a collaborative model in partnership with local entrepreneurs & local cable operators for providing access network. Presently, there are more than 1 lakh Railwire broadband customers in the SMEs/household segment. Due to high SLAs & last mile connectivity, this is suitable for providing rural connectivity at Gram Panchayat/village levels as well as for connecting banks and other Government institutions.

Tele-presence as a Service

RailTel in partnership with OEM has started providing Tele-presence service on an OPEX model to various customers. RailTel's plan is to leverage this platform for providing services to various Government Departments/ PSUs and Enterprises on annual rental model thereby saving capex for the customer. Railways have utilized this infrastructure effectively for over a year now with RailTel enabling over 110 functions of Railways for various passengers services and train inaugurations and presently connecting all Zonal, Divisional Headquarters and Production Units.

Pursuing diversification of business, RailTel based on its expertise developed in the field of Telecom & networking is focusing in system integration projects for its various customers specially in Government/PSU department in the field of ICT(Information Communication Technology). Presently, RailTel is operating and maintaining the IT infrastructure (network, data center, IT applications, etc.) of ECIS which is one of the largest ICT setup in the country.

Indian Railway Catering and Tourism Corporation Limited (IRCTC)

Indian Railway Catering and Tourism Corporation Limited (IRCTC), was incorporated on 27th September 1999 under the Companies Act, 1956 as an extended arm of the Indian Railways to upgrade, professionalize and manage the catering and hospitality services at stations, on trains and other locations and to promote domestic and international tourism through development of budget hotels, special tour packages, information & commercial publicity and global reservation systems. The authorised share capital of the company is ₹50 crore and paid up share capital is ₹40 crore, fully subscribed by Ministry of Railways, Government of India.

Financial Performance Highlights

		(₹ in crore)
	2015-16	**2016-17**
Total Income	1,523.41*	**1,599.73**
Profit before Tax	306.79*	**328.47**
Dividend	75.45	**84.68**

*revised

Catering & Hospitality:

During the year 2016-17, IRCTC had 134 mobile units (including 17 Duronto), 4 Base Kitchens, 09 Jan Aahaars and 2 Refreshment Rooms. IRCTC also managed on-board catering services in 93 Mail/Express, 9 Rajdhani and 5 Shatabdi trains through award of temporary licenses for onboard catering services. As on 31.03.2017, IRCTC operated 01 Shatabdi and 06 Mail Express trains through departmental operations. Ministry of Railways introduced Gatiman and Humsafar trains and IRCTC was mandated to manage the onboard catering services in these trains.

Under Catering Policy 2017 issued by Ministry of Railways, IRCTC has been mandated to upgrade the quality of food preparation and shall be setting up new kitchens and upgrade existing ones. IRCTC has undertaken unbundling process in 04 phases including partial unbundling. Presently, IRCTC is in 2nd phase i.e. partial unbundling through temporary licenses. As on 31.03.2017, IRCTC managed 10 Duronto and 8 Rajdhani trains on

partial unbundling model.

The Company commissioned 18 Food Plazas and 26 Fast Food Units, making the total number of operational units to 223. The company also awarded 54 units at annual license fee of ₹24 crore during 2016-17. The total earning from FPs/FFUs for the year 2016-17 stood at ₹38.16 crore. At present, IRCTC is operating 229 Food Plazas and Fast Food Units over Indian Railways.

Under E-Catering, around 250 stations have already been made live and Self Help Groups from 10 stations are also serving meals through E-Catering. The average meals booked per day has now increased to more than 5,947 meals per day (June 2017). The web page for E-Catering has also been upgraded and made more user friendly by incorporating innovative upgrades for improved user engagement.

During the year, Executive Lounges at Visakhapatnam, New Delhi and Jaipur have been commissioned by IRCTC. The revenue collection from Executive Lounges for the year 2016-17 stood at ₹2.71 crore.

The Company is presently operating two Rail Yatri Niwas (Ginger Rail Yatri Niwas, New Delhi & Sampath Rail Yatri Niwas Howrah) and two Budget Hotels at Puri and Ranchi, from which, the revenue collection for the year 2016-17 stood at ₹1.13 crore.

IRCTC takes consistent steps to improve the quality of catering services through ISO certification. During the year 2016-17, 20 Food Plazas/Fast Food Units were certified with ISO 22000:2005 certification, taking the total number to 131 out of 190 licensee-operated units, as on 31st March, 2017. A total of 1073 complaints were received from train passengers during 2016-17 as against 1252 in the previous year, thereby posting a reduction of 14.3%.

The total Revenue from Departmental catering was ₹234.98 crore in 2016-17 as compared to ₹255.56 crore in 2015-16. The Total Revenue from Licensee catering was ₹161.63 crore in 2016-17 as compared to ₹76.09 crore in 2015-16. The NRC units contributed ₹15.87 crore to the total revenue in 2016-17 as compared to ₹27.28 crore in 2015-16.

Internet Ticketing:

E-ticketing now accounts for 62% of reserved tickets in India booked online, leaving behind several high profile e-commerce sites worldwide. On an average, more than ₹5.73 lakh tickets were sold daily through IRCTC's website during 2016-17.

Number of E-tickets booked, number of passengers booked through E-tickets, E-ticketing Revenue Collection from users and service charge collected on E-tickets excluding service tax during the year as against previous year are as under:

Year	2015-16	**2016-17**
No. of E-Tickets Booked (in Lakhs)	1,992.80	**2,092.95**
No. of Passengers Booked E-tickets (in Lakhs)	3,595.82	**3,730.87**
E-ticketing Revenue Collection (₹in Crores)	23,395.03*	**24,485.21**
Service Charge (₹ in Crores)	627.62*	**416.14**

*revised

During the year, the following have been the highlights of Internet Ticketing segment:

- During the year 2016-17, the NGeT booked a total of ₹2,092.95 lakh tickets.
- Under NGeT system, booking of 16,555 tickets per minute was achieved on 14th August, 2016.
- Optional Travel Insurance started online on 01st September 2016 and free insurance is being provided to all Confirmed/RAC passengers w.e.f 10th December 2016.
- Counter/System ticket online cancellation started from 29th April, 2016.
- Booking through International Credit Cards was launched for international users on 29th April, 2016.

The total Revenue in Internet Ticketing is ₹466.05 crore in 2016-17 as compared to ₹632.15 crore in 2015-16. There is approximate 26% decrease in revenue as compared to previous year due to temporary withdrawal of Service Charge on tickets booked through IRCTC website w.e.f. 22.11.2016.

Travel & Tourism:

During the year 2016-17, IRCTC launched Gatiman type Rail Tour packages, Aastha Circuit Special Train, Semi Luxury Trains i.e. Tiger Express, Udaipur- City of Lakes and Tiger Express with City of Lakes- Udaipur Circuits, Gandhi Express Train, Photo Gallery, Ayurvedic Treatment Packages etc. through IRCTC's Tourism Portal www.irctctourism.com.

IRCTC is also operating all inclusive Tour packages including Rail, Land and Domestic/ International Air packages across India as well as abroad, which includes confirmed Rail travel/ air ticket, road transfers, accommodation, meals and sightseeing.

In co-ordination with State Governments, IRCTC has operated 260 State Special Trains for elderly residents of respective States such as Madhya Pradesh, Rajasthan, Punjab, Odisha, Chhattisgarh and Jharkhand.

Approximate 3,500 air tickets were booked daily in 2016-17 in IRCTC's air portal www.air.irctc.co.in in comparison to approximte 2,700 air tickets per day in 2015- 16.

The Maharajas' Express has been awarded as the World's leading Luxury Tourist Train consecutively for 5 years from the year 2012 to 2016 at the World Travel Awards.

During the year 2016- 17, IRCTC made tie ups with:

- M/s Santhigiri Ashram for Ayurvedic treatment packages.
- Rail Museum, Chennai for handling entry tickets, School & College Mktg, Tourist Information Facilitation Centre(TIFC) & Operation of Food court.
- Odisha State Government for operation of State Special Trains for elderly residents of the state.
- MOUs with various State Tourism Development Corporations for developing tourism from & to the States.

During the year 2016-17, a total of approximate 3.70 lac passengers availed of IRCTC tour packages i.e. Rail Tour packages, Holiday packages, Tourist Trains, Customised and Special tour packages.

Travel & Tourism Business of IRCTC has generated an income of ₹527.8 crore in the year 2016-17 as compared to ₹375.02 crore in the year 2015-16 recording a growth of 40.71%. The profit of Tourism department doubled from ₹28.15 crores in 2015-16 to ₹55.45 crores in 2016-17.

Packaged Drinking Water (Rail Neer) & Water Vending Machines:

At present, IRCTC has seven operational Railneer plants located at Delhi, Patna, Palur, Ambernath, Amethi, Parassala and Bilaspur, out of which Rail Neer Plants at Amethi and Parassala are under PPP mode.

The total production of Rail Neer at Nangloi, Danapur, Palur, Ambernath, Amethi, Parassala & Bilaspur plants was 18.70 crore bottles against total production of 15.76 crore bottles in previous year. Commercial production at Rail Neer Plant Bilaspur was started in March, 2017.

Rail Neer Plant, Danapur, Nangloi, Palur and Ambernath are accredited with ISO: 9001-2008 quality management system certification. Rail Neer Plant, Ambernath is also accredited with 22000:2015 certification. The result of the test, carried out by accredited laboratories on Rail Neer Packaged Drinking Water indicates that the quality of Rail Neer conforms to European Economic Community (EEC) norms for pesticide residue.

During the year, to reduce the cost of manufacturing, the neck size of bottle has been changed from 30 mm to 27 mm at Nangloi and Palur plants.

The Company has identified installation of 2500 Water Vending Machines across Indian Railways and commissioned 1011 Water Vending Machines during the year. Around 80% of A-1 category stations have been provided with Water Vending Machines.

The total Revenue of Rail Neer was ₹159.10 crore in FY 2016-17 as compared to ₹133.38 crore in FY 2015-16. This does not include sale of Rail Neer through departmental catering, amounting to ₹13.20 crore as against ₹15.54 crore in the previous year 2015-16. The increase in revenue is mainly attributed to increase in demand of railneer by the licensees and operation of new Parsala Plant.

Pipavav Railway Corporation Limited (PRCL)

Pipavav Railway Corporation Limited (PRCL), the flagship joint venture Company of Ministry of Railways and Gujarat Pipavav Port Limited (GPPL) with equal equity participation was formed to execute the Surendranagar–Rajula–Pipavav Port (APM Terminals, Pipavav) gauge conversion & new line project. This is the first railway infrastructure project executed through private sector participation. PRCL has concessionaire rights to construct, operate and maintain this project line for 33 years. PRCL has been given the status of a Railway Administration enumerated in the Railways Act, 1989.

PRCL has permission to run container trains on rail corridors serving the Ports of Pipavav, Mundra, Chennai, Ennore, Vizag and Kochi and their hinterlands.

During 2016-17, company declared and paid 5% dividend to its shareholders. The comparative figures of performance during 2015-16 and 2016-17 are:

	2015-16	**2016-17**
Number of Container trains	4,109	**3,422**
Number of Double Stack containers train	1,058	**1,390**
Number of Bulk trains	697	**546**
Number of empty trains run	611	**451**
Total number of trains run	6,475	**5809**
Cargo (in Million Tonnes)	8.55	**7.57**
Gross Apportioned revenue (₹in crore)	250.42	**217.45**
Net Profit (₹in crore)	85.72*	**78.56**
Net Worth (₹in crore)	355.51*	**422.26**
Number of passenger trains	15 pairs**	**15 pairs****

*revised

** includes 4 mail/express trains, which are running weekly and 11 mail/express/ passenger trains run daily

Apart from container transportation, PRCL handles bulk traffic of food-grain, onion, salt, soda ash, cement, gypsum, fertilizers and coal.

Innovation – Market Expansion

In the first phase of enhancing track capacity on the section, the work

of construction of one loop each at Kundli and Lathidad stations has been undertaken at an estimated cost of approx ₹8.90 crore, to cater to the increased traffic on PRCL Section and completed in 2015.

Under its Corporate Social Responsibility, Company has taken up rural development activities in Raska Village, which included construction of 25,000 litters capacity overhead water tank and 100 bio-toilets for the village. A Community Centre at Raska Village was also provided and handed over to the Panchayat in September, 2017. Other CSR activities include projects related to education of girl child, welfare of senior citizens, etc.

Rail Vikas Nigam Limited (RVNL)

Rail Vikas Nigam Limited (RVNL), a CPSE under the Ministry of Railways was incorporated in 2003 to raise non-budgetary resources for implementation of rail capacity augmentation projects and their implementation on a fast track basis.

Cumulatively, up to 31.03.2017, RVNL has completed 6994.21 km of project length covering 213.82 km of New Lines, 2353.32 km of Doubling, 1590 km of Gauge Conversation and 2837.07 km of Railway Electrification,5 Railway Workshops and 1 Cable Stayed Bridge at Bardhhaman. 57 projects assigned to RVNL have been fully completed. During 2016-17, RVNL completed 713.73 km of project length including 355.73 km of Doubling and 358 km of Railway Electrification works and an additional 199.71 km of electrification as part of doubling and other projects. For the past five years, RVNL has been contributing more than 1/3rd of total project length completed on Indian Railways under Doubling & Railway Electrification Plan Heads.

During 2016-17, the Company has been able to build on the foundation of project planning and award of contracts of projects assigned to RVNL for execution in previous years. With the resultant take off in project execution, the Turnover of the Company reached a figure of ₹5919.62 crore in 2016-17 as compared to ₹4541.30 crore in 2015-16, i.e. an increase of 30.35%. The Gross Profit of the Company increased from ₹363.56 crore in 2015-16 to ₹484.79 crore in 2016-17.

The Profit after Tax (PAT) of the Company for the year was ₹385.03 crore as on 31st March, 2017as compared to ₹304.02* crore in previous year i.e. an increase of 26.64%.In view of the improved financial performance in 2016-17, RVNL has paid a Dividend of ₹154.50 crore as compared to ₹115.16* crore in the previous year. The cumulative dividend paid to Ministry of Railways by RVNL is `408.30crore.

In addition to borrowings from IRFC for implementation of projects, comprising of ₹3151.8 crore, RVNL's role in resource mobilization has

resulted in the setting up of 6 project specific Special Purpose Vehicles (SPVs) with a total anticipated cost of ₹6,139 crore against which the equity contribution of RVNL is ₹625 crore, i.e.10%. Balance funds of ₹5,524 crore will be provided by the equity share of stakeholders and through debt raised from Financial Institutions. The SPVs of RVNL include Kutch Railway Company Ltd., Krishnapatnam Railway Company Ltd., Bharuch Dahej Railway Company Ltd., Haridaspur Paradip Company Ltd., Angul Sukinda Railway Ltd. & Dighi Port Railway Company Ltd.of which Kutch Railway Company Ltd. and Bharuch Dahej Railway Company Ltd. are fully functional while Krishnapatnam Railway Company Ltd. is partially functional. RVNL has also become an Equity Partner in Indian Port Rail Corporation Limited (IPRCL) with 12 Major Ports under Ministry of Shipping for undertaking railway related projects and activities in major ports.

RVNL, with the approval of President of India, has incorporated a fully owned subsidiary, High Speed Rail Corporation of India Ltd. (HSRC) in July 2012 for development and implementation of High Speed Rail Projects in the country. HSRC has been assigned the task of carrying out a number of pre-feasibility/feasibility studies for High Speed Corridors.

In addition to its regular activities, RVNL is making special efforts to meet its responsibility to the marginalized communities where its projects are located by implementing various "Corporate Social Responsibility" projects with a focus on health & education related activities in which an amount of ₹6.12 crore was spent during 2016-17 (around 2.31% of the average net profit of last three financial years) on CSR initiatives, compared to ₹5.94 crore in the previous year.

* revised

Rail Land Development Authority (RLDA)

Rail Land Development Authority (RLDA) is a statutory Authority, under the Ministry of Railways, set-up by an Amendment to the Railways Act, 1989, for development of Railway Land as entrusted by the Central Government for commercial use for the purpose of generating revenue by non-tariff measures. RLDA has been constituted in terms of Extraordinary Gazette Notification dated 31.10.2006, as amended on 05.01.2007.

Business of the Authority:

- **Commercial Development of Vacant Railway Land:** Sites for commercial development are entrusted to RLDA by the Ministry of Railways. During the year 2016-17, total earning of ₹17.15 crore have been realized by RLDA.

  The number of sites for commercial development with RLDA is 49 in 2016-2017.

- **Construction of Multi Functional Complexes (MFCs):** From 2009-10 onwards, RLDA has been assigned the responsibility of developing Multi Functional Complexes (MFCs) through IRCON, RITES, RVNL and Private developers, with an aim to provide multiple facilities like shopping, food stalls/restaurants, book stalls, PCO booths, ATMs, Medicines and variety stores, budget hotels, parking spaces and other similar amenities to rail users at Railway stations. Land for MFCs are leased to PSUs on 30 to 45 years lease on revenue sharing model. However RLDA adopted combination model (upfront lease Premium and fixed Annual Lease Rent model) for development through private developers for which bidders are selected through open competitive and transparent bidding process. In all, 40 MFCs were assigned to PSUs for development [IRCON (24), RITES (14), and RVNL (2)], out of these 38 MFCs have been completed by them & 20 MFCs have been commissioned by IRCON. Further, RLDA has been entrusted 123 MFCs for development through private developers.
- **Redevelopment of Stations:** For redeveloping railway stations, Indian Railway Stations Development Corporation Ltd. (IRSDC) was created as a Special Purpose Vehicle, Joint Venture of IRCON & RLDA, with an authorized share capital of ₹100 crore and paid up share capital of ₹40 crore. IRSDC has been entrusted 12 stations for redevelopment till the end of the year 2016-17. A further 400 stations are proposed to be developed as per international standards through Swiss Challenge Method.

Dedicated Freight Corridor Corporation of India Limited (DFCCIL)

Dedicated Freight Corridor Corporation of India (DFCCIL) is a Special Purpose Vehicle set up under the administrative control of Ministry of Railways to undertake planning & development, mobilization of financial resources and construction, maintenance and operation of the Dedicated Freight Corridors. DFCCIL was incorporated on 30th October 2006 under Indian Companies Act 1956.

Dedicated Freight Corridors (DFC) is one of the most ambitious rail infrastructure projects undertaken by the Government of India. In the first phase, two corridors-the Eastern DFC (1856 route km) and Western DFC (1504 route km) spanning a total length of 3360 route km are being constructed. The Eastern Dedicated Freight Corridor starts from Ludhiana and terminates at Dankuni near Kolkata, traversing states of Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand and West Bengal. It will largely serve coal and steel traffic to northern parts of India. The Western Dedicated Freight corridor originates from Dadri (Uttar Pradesh) and terminates at

Jawaharlal Nehru Port Trust (Mumbai) passing through Uttar Pradesh, Haryana, Rajasthan, Gujarat and Maharashtra. This corridor will mainly meet requirements of container traffic.

Advantages & Features of DFC

Implementation of DFCs is expected to generate two major impacts on the freight movement- shift of freight from road thereby leading to increase in rail share and improvement in energy efficiency of freight rail through adoption of improved technologies leading to significant reduction in carbon footprints. The difference of rail transported freight over the road transported freight can easily be judged as one DFC train will be able to take as many as 1300 trucks off the roads.

DFCC is designed to be a very lean organization with higher efficiency and cost effectiveness. As a result, the operation and maintenance cost is expected to be substantially low as compared to present Railway system.

Achievements during the year 2016-17

The Dedicated Freight Corridor is achieving new milestones with every passing day. Some of the highlights of achievements made till date are as follows:

Award of Contracts

Year 2016-17 saw major progress in the award of Civil, Electrical, S&T and other contracts in DFCCIL. Contracts worth ₹11,643 crores were awarded/signed taking the cumulative value of contracts awarded to ₹48,954 crores. As a result, Civil contracts for 2,600 kms (92%), Electrical contracts for 2,315 kms (82%) and S&T contracts for 2,315 kms (82%) length have been finalized.

Finance

During the year 2016-17, capital expenditure of DFCCIL was ₹9,915 crore, an increase of 16% as compared to ₹8,516 crores in 2015-16. Loan Agreement for EDFC-3 amounting to 650 million US$ was signed with World Bank during the year 2016-17. With this complete funding arrangements for EDFC & WDFC have been finalized.

Progress of Work

Civil works in different sections of EDFC and WDFC are progressing well. Earthwork is progressing in more than 180 Km stretch of Bhaupur-Mughalsarai section of EDFC. Work on 28 Major bridges & more than 275 Minor bridges is also in progress in this section. Mechanized track linking work is on full swing on both the corridors. More than 30% of track linking has been completed in this section till September 2017. Similarly, 276 kms of tracks have been linked in the Bhaupur-Khurja section of EDFC

till September 2017. DFCCIL's contribution towards the environment and sustainable development is being recognised worldwide. DFCCIL has been awarded the prestigious 'Golden Peacock Award for Sustainability' in transport sector for the year 2016.

Land Acquisition

DFC is passing through 9 states, 61 districts and 2100 villages. A number of hurdles/impediments have been removed and considerable progress in land acquisition has been achieved. As a result, 97.3% of land (excluding the PPP portion of Sonnagar-Dankuni) and overall 93.5% has been acquired till September 2017. Compensation amounting to ₹12,317crore. (WDFC: 5,768 crore, EDFC: 6,549 crore) has been awarded till September, 2017.

Other Activities

During 2016-17, various CSR activities have been carried out under Corporate Social Responsibility (CSR). Skill development training leading to employment/self-employment is being imparted through Confederation of Indian Industries (CII). A total of 1,450 candidates have been imparted training under the program. Filtered water coolers and segregated dustbins provided at Railway stations in Mumbai, Delhi and Mughalsarai divisions._

DFC paving the way of Industrial Growth

Industrial Corridors have been planned using the backbone of the DFC. Delhi Mumbai Industrial Corridor(DMIC)/Amritsar Kolkata Industrial Corridor(AKIC) and DFCCIL are complementary to each other while Industrial Corridor will get benefits from the World-Class Rail Infrastructure of the DFC, the traffic originating from the Industrialized Corridor will contribute significantly to traffic on the DFC.

Future Corridors

In Budget 2016-17, three new DFC's were announced which include 2328 km long East-West Corridor from Kolkata to Mumbai, 2,327 km long North-South Corridor connecting Delhi & Chennai and 1,114 km long East Coast Corridor from Kharagpur to Vijaywada. Preliminary Engineering & Traffic Survey (PETS) for these corridors has already been completed.

The DFC project will be a game changer in transport and logistics sector. Both the corridors, excluding the PPP section, are aimed to be fully completed by 2020.

Mumbai Railway Vikas Corporation Ltd. (MRVC)

Mumbai Railway Vikas Corporation Ltd (MRVC Ltd), a PSU of the Government of India under Ministry of Railways (MOR) was incorporated under Companies Act 1956 on 12.07.1999, with an equity capital of ₹25 crore shared in the ratio of 51:49 between Ministry of Railways and Government

of Maharashtra to implement the Rail Component of the integrated rail-cum-road urban transport project called 'Mumbai Urban Transport Project (MUTP),' with a vision to developing modern infrastructure for efficient, safe and sustainable Railway system in Mumbai suburban section so as to provide adequate train services to the commuters.

Mumbai Urban Transport Project:

Railway projects were identified through the project preparatory studies with the main objective of bringing down over crowding during peak hour and segregating the suburban train operation from the main line passenger and freight services.

Mumbai Urban Transport Project – I:

All works have been completed and MUTP I has been closed in March 2012.

Major Infrastructural Inputs in Mumbai Urban Transport Project Phase-I (Rail Component):

- Addition of 93 track Kms. (5th & 6th line Kurla-Thane, 3rd & 4th line Borivali-Virar)
- Induction of 101 new 9-car rakes (909 coaches)
- Resettlement & Rehabilitation of 15,857 Project affected households.
- Running of 12-car rakes on all lines (excluding Harbour Line) by lengthening of all platforms
- 1500 V DC to 25 kV AC traction conversion on Central & Western Railway – traction conversion was completed on entire WR.

Major benefits accrued after completion of Mumbai Urban Transport Project - I :

- 559 additional services were introduced on Central & Western Railway
- 1216 services were augmented from nine-car rakes to twelve-car.
- Due to induction of additional rakes, it was possible to increase in the number of coaches during the peak hours by 36%.
- The vehicle km per day increased by 36% after induction of new rakes.
- Conversion of existing 1500 V DC to 25 kV AC on WR has provided better train operation, energy saving etc.
- Saving of 30-35% energy due to State of the art 3 phase technology EMU rakes.
- Saving of Electrical Energy of more than 35% due to introduction of regenerative braking in new technology of DC/AC rakes.
- Resettlement & Rehabilitation–more than 15000 Project Affected Households.

Mumbai Urban Transport Project– II:

MUTP II was sanctioned by the Parliament in the budget of 2008-09 at the total cost of ₹5,300 crore. which is likely to be revised to ₹8,087 crore. (approx) at the time of completion of all Projects. MUTP II is partly funded by World Bank loan of ₹1,910 crore (USD 309 million) and balance from Government of Maharashtra and Ministry of Railways on 50:50 sharing basis. The work includes network expansion & capacity enhancement of Mumbai Suburban on Western & central Railways. Most of the works have already commenced under MUTP II.

Major Inputs in Mumbai Urban Transport Project- Phase II :

- Addition of 88 track Kms.
- 72 new 12-car rakes (864 coaches) procured.
- 1500 V DC to 25 kV AC conversion on Central Railway (172 Track km), completed in June 2015.
- Resettlement & Rehabilitation of 2,839 Project affected households.

Expected benefits of Mumbai Urban Transport Project-II :

- 200 additional suburban services
- 20% additional carrying capacity will be created
- Segregation of main-line and suburban rail operation
- Energy saving of around 35%.
- Additional infrastructure to prevent trespass control works

Running of 12 - Coach Electrical Multiple Unit (EMU) Trains on Harbour Line (MUTP2C):

The project involves infrastructure works for extending the platforms at 16 stations on CR and 5 stations on WR, and procurement of 153 coaches, at the cost of ₹714.10 crores which was sanctioned separately during the Rail Budget 2012-13 to be funded by Government of Maharashtra and Ministry of Railways on 50:50 basis. The project was completed in April, 2016 and all the services presently running on Harbour line with 12 Coach EMU.

Mumbai Urban Transport Project-III

MUTP III has been included in the Pink Book (item no. 597) 2015-16 at the total cost of ₹10,947 crore. The works under MUTP III are as follows :

SN	Name of the work
1	Doubling of Panvel-Karjat on Central Railway
2	New Suburban corridor link between Airoli-Kalwa (elevated) on Central Railway
3	Quadrupling of the Virar-Dahanu Road on Western Railway
4	Procurement of Rolling Stock

5 Trespass Control on mid-section on Central & Western Railways

6 Technical Assistance

Benefits of Mumbai Urban Transport Project-III

The following benefits are expected to accrue after completion of MUTP-III

- Expansion of suburban network towards north of Mumbai
- Induction of 564 EMU coaches in the system.
- 300 additional suburban services i.e. additional 10% over existing services
- Trespass control measures at 22 vulnerable mid section locations.

Way Ahead

New Suburban Corridors

- Virar-Vasai -Panvel section
- 3rd & 4th line between Pune & Lonavala

Premium Corridors

- Fast elevated corridor between CSTM–Panvel with spur to Navi Mumbai International Airport (NMIA)
- Bandra to Virar

Augmentation of Corridors

- 3rd and 4th Lines Kalyan-Kasara
- 3rd and 4th Lines Kalyan-Karjat
- 5th & 6th additional lines between Borivali-Virar on Western Railway

Capacity Augmentation

- Communication Based Train Control (CBTC) on Harbour line from CST-Panvel
- CBTC on slow corridors of main lines of CR & WR (cost including conventional rolling stock for additional services)

Braithwaite at a Glance & its Performance:

Braithwaite & Co. Ltd (BCL) is a leading Heavy Engineering Company in India, having its three manufacturing units located in West Bengal. Administrative control of BCL was transferred to Ministry of Railways on 06.08.2010 from Ministry of Heavy Industries & Public Enterprises. BCL's major product range includes manufacturing of newly built Wagons, Repairing of Wagons, Structural Steelwork, Cranes and Steel Castings (Bogie & Coupler). The Company got accredited with ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 standards.

BCL's core competency is in developing & manufacturing of various types of wagon mainly for Indian Railways. Recently BCL has executed a

contract awarded by M/s IRCON International Ltd. for fabrication of 19 x 123 m span Bridge Girder for Railway cum Road Bridge over river Ganga at Patna, having a project cost of Rs. 230 Cr (Approx). The Company is also pioneer of manufacturing of various types of Cranes and supplied the same in major Ports and Steel / Power Plants etc The Company also undertakes the job of upgradation / revamping / AMC of different types of cranes. Major performance highlights are as follows:

Particulars	2015-16	**2016-17**
Production of Newly Built Wagons (No)	526	**777**
Production of Repair Wagon (No)	1269	**915**
Sales (Rs Lakhs)	12,070.32	**15,418.54**
Net Profit (after tax) (Rs Lakhs)	64.48	**(895.50)**

BCL completed and delivered 915 repairing wagon in 2016-17 and achieved excellent rating in MoU 2016-17 in this parameter. Substantial increase of Newly Built Wagons also took place in 2016-17 compared to production in 2015-16. However, the year 2016-17 could not be a year of success due to various unforeseen constraints mainly due to Involvement of several prototype wagons hindering bulk productions, non-availability of critical inputs for production of wagon and low price of wagons, inadequate remunerative order in hand resulting into low production etc.

Technological developments, innovations and activities of importance:

BCL is making continuous efforts to develop its products commensurate with new technologies coming up in the market. In such developmental process the company could achieve the following in the year 2016-17 under review.

A) Approval of Prototype 25T BOXN Wagon received from RDSO after completion of various tests successfully including Oscillation Trials. The type of wagon with higher axle load is manufactured for the first time in India for operating in dedicated routes of Indian Railways.

B) Approval of Prototype Milk Tank Van received from RDSO on successful completion of field Trials. The Milk Tank Van manufactured by the Company is of latest & upgraded design made by RITES with modern technologies.

C) Approval of Prototype BOBRNHSM1 Wagon received from RDSO which enabled commencing series production. This wagon is against order from NTPC. The wagon is an upgraded design of conventional BOBRN wagon with improvements like BMBS, CRF in centre sill, 70 BD Coupler etc.

The company could complete manufacture and obtain approval of most of the Prototype wagons in 2016-17. This enabled the company to concentrate series production in 2017-18.

The future outlook for the segment of wagon repairing / rehabilitation job is also bright keeping in view the expected order of repairing of 2200 nos. BOXN wagons for S.E. Railway in the year 2017-18.

Taking into consideration of experiences of previous years, the company has emphasized to execute the only remunerative orders of railway wagons. The company has also made plans to reduce dependence on the business only in wagon segment. The expansion & diversification plans include entry into civil sector and going for business in a large volume in the field of structural fabrications & cranes apart from other possible areas of business. The company is also giving thrust in the following areas for new business:

a) Exploring more opportunities of wagon repair / rehabilitation business in various zonal railways.
b) To enter into infrastructure projects in the field of Civil Construction.
c) To manufacture specialized high capacity Rail Cranes through foreign collaboration. In this regard, the company has recently entered into MOU with an organization of international repute, M/s. Kirow Ardelt GmbH, Germany, for technical knowhow.
d) To execute high valued Structure Fabrication orders.

With various steps taken for development and expansion as well as giving more focus on existing core products, the company foresees bright future ahead.

Self – Sufficiency

Stores imported by IR constitute 3.45% of the total stores purchased. The cost of stores imported in the last three years are as under:

(₹ in crore)

Item	2014-15	2015-16	**2016-17**
Diesel loco parts and fittings	1,006.62	900.53	**932.09**
Electric loco parts and fittings	110.31	42.70	**176.77**
Carriage, Wagon and EMU parts and fittings	100.01	205.65	**278.65**
Electrical stores	4.44	46.87	**6.93**
Engineering stores	5.18	2.38	**4.31**
Ball and Roller Bearings	0.95	0.37	**0**
General stores covering acids, chemicals, drugs, etc.	89.61	99.19	**67.03**
Other items including metal ferrous, complete units of rolling stock i.e. bogies, wheel -sets, couplers, etc.	97.63	32.80	**27.87**
Grand Total	1,414.75	1330.49	**1493.65**

Strategy for Self-Sufficiency:

Steps have been taken by Indian Railways in developing indigenous sources in the country for the items presently being imported. Simultaneously, adequate capacity has been developed for manufacturing a range of components in workshops owned by IR as well as in public/private sector units with indigenous designs and competency.

The import content of raw material/components, in terms of percentage of total production cost (excluding Performa charges) for different types of rolling stock manufactured in Indian Railway Production Units for the year 2016-17 is furnished below:

	LOCOMOTIVES/COACHES	**2015-16**	**2016-17**
DLW	WDP-4D	19.76	**12.39**
	WDG-4D	21.21	**12.63**
	WDG-5	74.84	**74.19**
	WDG-4D (NRC loco)	-	**12.63**
	WDG-3A (NRC loco)	-	**1.44**
RCF	ACCN/LHB (3 Tier AC LHB)	3.54	**1.99**

	ACCN/LHB (3 Tier AC LHB) (HUMSAFAR)	-	**1.95**
	ACCW/LHB (2 Tier AC LHB)	2.72	**2.05**
	FAC/LHB (1st AC LHB)	2.73	**2.03**
	WLRRM/LHB	3.18	**1.59**
	WLRRM/LHB (HUMSAFAR)	-	**1.55**
	CBAC/LHB	-	**2.12**
	FCZAC/LHB	2.74	**2.08**
	FCZAC/LHB (HUMSAFAR)	-	**1.63**
	SCZAC/LHB	2.74	**2.07**
	SCZAC/LHB (HUMSAFAR)	-	**1.40**
	FACWAC	-	**2.06**
	LWSCN	5.61	**2.86**
	LWSCZ	3.47	**2.62**
	LGS	4.91	**2.05**
CLW	WAG-9	2.44	**3.66**
	WAP-7	2.57	**3.53**
	WAP-5	3.15	**4.20**
MCF	LWACCW	3.59	**3.30**
	LWACCN	4.74	**3.31**
	LWSCN	7.12	**6.96**
	HUMSAFAR	-	**3.00**
	LS(GEN)	-	**7.20**
	LS-5	-	**4.39**
	ANTYODYA	-	**5.75**
ICF	LGS	1.32	**-**
	LSCN	1.37	**4.01**
	LACCW	1.13	**3.75**
	LACCN	0.92	**4.33**
	LWLRRM	0.78	**3.20**
	LS-ANTODAYA	-	**2.81**

* non- railway customers

Locomotives:

Locomotives are manufactured by Chittaranjan Locomotive Works (CLW), Chittaranjan and Diesel Locomotive Works (DLW), Varanasi.

During 2016-17, CLW manufactured 292 state-of-the-art 3-phase 6000 HP BG electric locomotives. DLW manufactured 334 indigenous High Horse Power BG diesel locomotives including 02 BG High Horse Power Electric Locomotives and 16 Diesel Locomotives for non-railway Customers.

Diesel Loco Modernisation Works:

DMW, Patiala rebuilt & upgraded 114 diesel electric locomotives from 2600 HP to 3100 HP. DMW also manufactured 32 shunting Locomotives for Indian Railways.

Passenger Service Vehicles:

During the year, Integral Coach Factory (ICF), Chennai manufactured 2215 coaches including 528 EMUs, 241 DEMUs and 21 High Speed Self Propelled Accident Relief Trains (SPART). Rail Coach Factory (RCF), Kapurthala manufactured 1489 coaches including 493 Light Weight LHB coaches with higher passenger comfort & amenities. Modern Coach Factory set up at Raebareli manufactured 576 LHB coaches during 2016-17.

Wheels and Axles:

RWF, Bengaluru produced 45,940 wheel-sets during 2016-17. It also manufactured 130033 wheels and 74444 axles. A new Rail Wheel Plant set up at Bela produced 23,770 wheels during 2016-17.

Wagons:

The bulk of wagon requirement of IR is met from wagon manufacturing units in both public and private sectors supplemented by Railway workshops. During the year 2016-17, total 12,323 wagons were inducted in Indian Railway system. Out of these, 1,030 wagons (including 462 BLC wagons) were manufactured by Railway Workshops and the remaining 11,293 wagons including 80 BLC wagons were manufactured by Wagon Industry.

Signalling :

Railway signalling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation in technology and shift towards electrical/electronic system of signalling, the demand for these equipments has gone up. To attain self sufficiency in meeting this increased demand, IR's Signal Workshops at Podanur on Southern Railway, Metaguda on South Central Railway, Gorakhpur on North Eastern Railway, Howrah on Eastern Railway, Byculla on Central Railway, Sabarmati on Western Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line

Block Instruments, Axle Counters, various types of Relays, etc. The out turn achieved by these S&T workshops during 2014-15, 2015-16 and 2016-17 are as under:

Year Wise out Turn Signal and Telecommunication Workshop

Year	Out Turn in Lakhs
2014-15	20732.01
2015-16	22098.3
2016-17	**22513.21**

Traction Motor Shops:

IR has in-house facility for rewinding, repairing and re-shafting of traction motors of conventional electric locomotives and EMU/MEMU at its workshops at Nasik Road, Kanpur, Tatanagar and Kancharapara. Work of rewinding, repairing and re-shafting of traction motors of 'state-of-the-art' three phase electric locomotives is being carried out in Traction Motor Shop, Nasik Road.

The quantum of important jobs carried out by theses shops are as under:

Item	No. of jobs undertaken	
	2015-16	**2016-17**
Rewinding		
TAO 659 TM armature	210	**127***
HS15250A TM armature	394	**525**
EMU TM armature	551	**659**
3-Phase TM stator	43	**67**
3-Phase TM rotor	102	**106**
Re-shafting		
TAO 659/HS15250A TM armature	693	**578***
3-Phase TM rotor repairs	62	**154**
EMU TM armature	259	**233***

*Due to reduction in arisings.

Materials Management

Stocking Depots

In order to ensure uninterrupted supply of materials, the Zonal Railways and Production Units have 262 stocking depots spread all over the Railway Network. These depots stock over 1.3 lakh components.

Disposal of unserviceable Items

Another important function of the Material Management is generation of revenue through disposal of surplus and obsolete items and industrial waste. Total revenue generated through disposal of various unserviceable items and other items was ₹2,717.90 crores during 2016-17.

Expenditure on Purchases

Expenditure on procurement of material needed for operation, maintenance and production etc. (excluding cost of ballast, track related items, material supplied by contractors for civil construction works) was ₹43,347.32 crores in 2016-17.

A broad analysis of purchases made is given below:-

		(₹ in Crores)
	2015-16	**2016-17**
Stores for operation, repairs and maintenance	11,700	**11,403**
Stores for construction	1,445	**1,264**
Fuel	13,036	**11,949**
Stores for manufacture of Rolling Stock and purchase of Complete units	16,951	**18,731**
Total	**43,132**	**43,347**

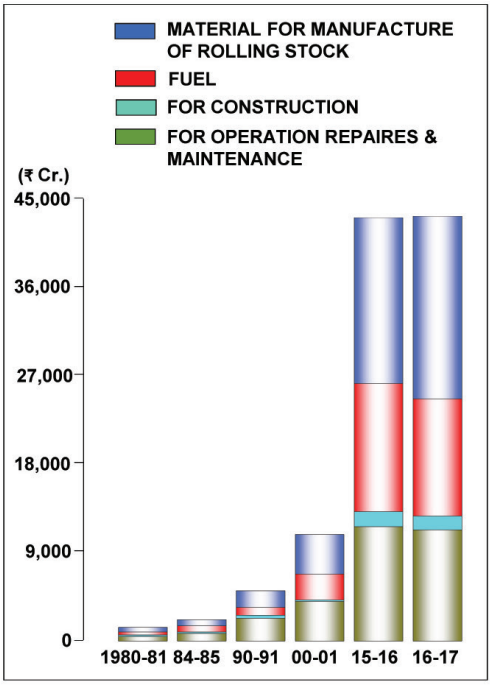
Modernisation:

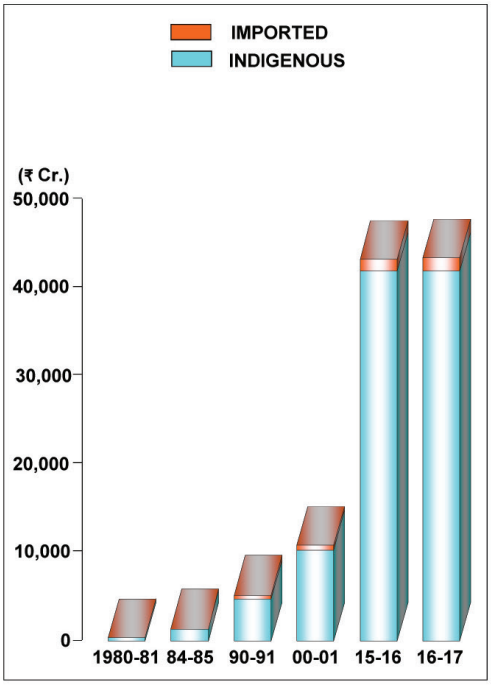
IR started e-auction during 2012-13. During 2016-17, 100% scrap sale was through e-auction. E-procurement was expanded to all the Zonal Railways and Production Units. In line with government directive all procurement by Stores Directorate (except cash purchase) is now done by e-procurement. E-procurement includes purchase of Machinery & Plant, imported purchase etc.

Agency of Procurement

Zonal Railways and Production Units mostly procure the materials they need but depend on Railway Board for purchase of a few items. Certain purchases are reserved for procurement through the Director General of

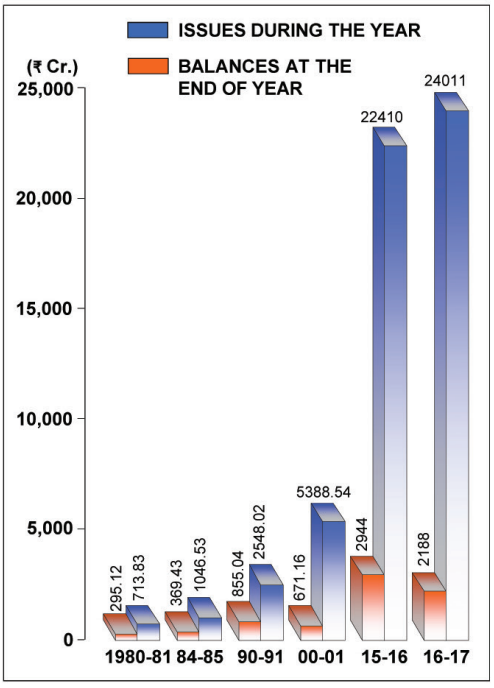
VALUE OF STORES PURCHASED



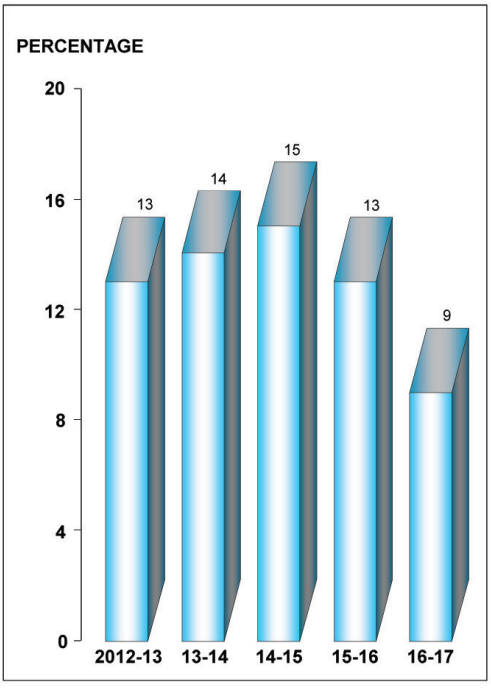


STORES-BALANCES & ISSUES (TOTAL WITHOUT FUEL)

(ZONAL RAILWAYS AND PRODUCTION UNITS)



INVENTORY TURNOVER RATIO (EXCLUDING FUEL)



supplies and Disposals (DGS&D). Out of ₹43,347.32 crores worth of stores procured in 2016-17, 70% was done by Zonal Railways and Production Units, 28% by Railway Board and the balance 2% through DGS&D and other sources.

Stores worth ₹4,027.95 crores were bought from Small Scale Sector and Khadi and Village Industries in 2016-17. Public Sector Undertakings contributed 26% and other industries contributed 74% towards supplies.

Indigenous Vendor Development

The value of Indigenous stores (₹41,853.70 crores) in 2016-17 constituted almost 97% of the total purchases. However, Indian Railway has to depend on imports for certain high technology components for its recently acquired diesel and electric locomotives, coaches, and also for sophisticated signal & telecom equipments and raw materials which are not available in adequate quantity with required quality within the country.

Inventories

During 2016-17, the Turn Over Ratio (TOR)-the main efficiency indicator for Inventory Management-was 9% (without fuel) and 8% (with fuel).

Inventory as on 31.03.2017, (without fuel) held by the Stores Departments on Indian Railways as a whole was ₹2,188.41 crores (₹ 2,753.23 crores with fuel) during the period against total issues of ₹ 24,011.38 crores (₹34,757.21 crores with fuel).

Printing and Stationery:

Ten General Printing Presses, Three Ticket Printing Presses and 'Books and Forms Depots' on Indian Railways, meet the entire requirement of passengers traffic for Card Tickets, Blank Computer Stationery, SPTM Rolls, PRS Ticket Rolls for Shatabdi and Rajdhani Tickets and Money Value Books and Forms.

General Printing Presses gave an out-turn of 50.99 crore A-2 standard size impressions in 2016-17. Considerable progress was made in implementing Government's directive to print Forms and Rule Books in bilingual form by expanding the capacity for Hindi composing through DTP. In order to avoid loss of revenue to the Railways, the availability of vital money value items like Parcel Way Bill, Railway Receipts, Excess Fare Tickets, Luggage Tickets, Blank Paper Tickets including Time Tables etc. has been ensured throughout the year by all Zonal Railways. The Ticket Printing Presses printed 12.65 crore Card Tickets in 2016-17. The Book and Form Depots stocked 5474 different items. Transactions of receipts and issues at these Depots were worth ₹56.13 crore and ₹68.87 crore, respectively, in 2016-17.

Security

The Railway Protection Force (RPF) has been constituted under the RPF Act, 1957 (as amended in the year 1985 and 2003) for better protection and security of railway property, passenger area, passengers and matters connected therewith. RPF functions under the Ministry of Railways.

RPF is empowered under the 'Railway Property (Unlawful Possession) Act, 1966' to deal with cases of theft, dishonest misappropriation and unlawful possession of railway property. RPF is also empowered under the Railways Act 1989 to deal with offences related to roof traveling, touting, unauthorized entry into coaches earmarked for ladies, unauthorized vending, trespass etc.

The Sanctioned strength of RPF is 76,563. The administrative set-up of the Railway Protection Force is as per the administrative set-up of the Indian Railways. RPF has a Special Force called Railway Protection Special Force (RPSF) which is organised on Battalion pattern. At present there are 15 battalions of RPSF located in the various parts of the country. Out of the above, three Battalions, including one Mahila Battalion, have been recently set up.

Separate specialized intelligence units in the name of Special Intelligence Branch (SIB) and Crime Intelligence Branch (CIB) also function from Divisional as well as Zonal Railways for collection of special and criminal intelligence. Besides above, Stores, Dog Squad and Band are other constituent units of the Force at Divisional and Zonal Railways.

Policing on the Railways is the statutory responsibility of States which is discharged through the Government Railway Police (GRP), which functions in respective States for registration of cases, their investigation and maintenance of law & order within railway premises as well as in running trains. 50% of the expenditure on GRPs is shared by the Railways with respective States.

Round the clock security related assistance to passengers by RPF:

- **All India Security Help-Line:** Security Helpline 182 has been set up to provide round the clock security related assistance to passengers. Another Security Helpline i.e. 1800111322 is also functioning from Railway Board/

New Delhi to render security related assistance to passengers.

- **Twitter:** Complaints/suggestions, relating to Security, received through MR Twitter handle @ Rail Min India are swiftly attended and necessary follow-up action is initiated.
- **Rescue of children:** A Standard Operating Procedure (SOP) on care and protection of children on railways has been prepared jointly by the Ministry of Railways and the Ministry of Women and Child Development (MWCD). 35 railway stations have been identified for setting up of Child Help Desks/Kiosks to be manned by the Child-line India Foundation, (CIF) an NGO nominated by the Ministry of WCD.
- **Tourists Security Help Desks:** They have been set up at Allahabad, Varanasi, Ayodhya, Dehradun, Haridwar and Dwarka in first phase to assist tourists. Apart from providing for security related assistance to tourists, all possible help & assistance on other matters are also being extended to passengers.
- **Surveillance through CCTV Cameras:** CCTV cameras have been provided at about 363 railway stations for round the clock surveillance to check incidents of crime against passengers. These include 102 railway stations where CCTV cameras have been provided under an Integrated Security System. 983 stations have been further identified to provide "Integrated Emergency Response Management System(Video Surveillance System)" with approval of budget under "Nirbhaya Fund".

Measures initiated by the RPF for security of passengers and passenger area:

- Escorting of about 2500 important Mail/Express trains daily in addition to escorting of 2200 important Mail/Express trains by the GRP personnel.
- Access control at important railway stations.
- Keeping vigil at station platforms, yards and circulating areas and surveillance through CCTV cameras, provided at about 363 railway stations over Indian Railways.
- Prosecution of offenders for unauthorized vending/hawking, entry into ladies and reserved compartments, touting of tickets, trespassing, roof travelling, alarm chain pulling etc. under relevant provisions of the Railways Act.
- Detection of passenger related crime, arrest of criminals and handing over to GRP for further legal action.

- Performance of RPF under the provisions of the Railways Act during the year 2015-16 and 2016-17 is as under-

Year	No. of persons prosecuted (in lakh)	No. of persons convicted (in lakh)	Amount of fine realized (₹ in crore)
2015-16	22.47	21.33	63.87
2016-17	**23.85**	**22.78**	**69.40**

- RPF/RPSF personnel have been deployed in vulnerable sections, Naxal affected areas and Northeast Region to ensure smooth transportation of goods & passengers and to secure Railways during bandh, dharna, agitation etc.
- Liaison/coordination has been maintained with GRP/State Police/ Central Intelligence Agencies to strengthen railway security.

Special measures for women security:

- Escorting of ladies special trains running in metropolitan cities by lady RPF personnel.
- Escorting of ladies compartments of suburban trains by RPF and GRP.
- Prosecution of offenders travelling in ladies compartments under relevant provisions of the Railways Act.
- Public awareness programmes with regard to security of women passengers.
- To improve representation of women in the Force, 10% of all posts advertised in the rank of Constable & Sub Inspector are earmarked to be filled up by women.

Protection and security of railway property:

Since the year 1966, RPF is prosecuting offenders under relevant provisions of the 'Railway Property (Unlawful Possession) Act, 1966' for unlawful possession of the railway property. This Act was amended in the year 2012 with widening of the ambit of penal sections. Performance of the RPF under the RP (UP) Act 1966 during the year 2015-16 and 2016-17 is as under-

Year	No. of cases detected under the RP(UP) Act	Value of property recovered (` in crore)	No. of persons arrested
2015-16	4,636	4.79	5,321
2016 -17	**4,730**	**3.10**	**6,015**

Training

At present 14 RPF Training Centres, including one Centralised Training Institute (CTI) are catering to the training needs of RPF personnel. Initial as well as on the job refresher courses are conducted for RPF personnel to enhance capability and skill development. Training curriculum includes Outdoor drill, PT, Parade, weapons training, field craft etc. and indoor training includes Law, Railway working, Passenger interface, Soft skill, Yoga, Gender sensitization, Human-rights, Computers etc. Specialized training/ courses are also conducted for RPF Officers and staff at training institutes of other CPOs, CBI etc. RPF personnel are also undergoing training as per the schedule chalked out by Bureau of Police Research & Development for Police/Central Armed Police Force.

RPF at overseas:

Railway Protection Force forms part of Security Division of International Union of Railways (UIC), Paris, France, as the representative of Indian Railways for coordination with security agencies engaged in railway security in the member countries. RPF personnel are also working overseas under the aegis of UN Peace Keeping Missions in countries like Kosovo, Sudan, Haiti, etc. They are also rendering invaluable services at Indian Missions abroad under the Ministry of External Affairs in China, Russia, Bangladesh, Kenya among other countries.

Meritorious Service:

63 RPF/RPSF personnel have been awarded with Police Medals for distinguished and meritorious services by the Hon'ble President of India in the year 2016 and 2017. During the year 2016, ' Railway Minister's Medal for Best Investigation' and 'Railway Minister's Medal for Bravery' was awarded to 02 RPF personnel each.

Railway Protection Force is toiling 24x7 to secure the Indian Railways in every possible manner so as to ensure smooth movement of freight and passenger traffic. The efforts of the Force are well coordinated with the sister Departments of Railways, Government Railway Police/District Police and the Civil Administration which lead to realization of the essence of its motto "Yasho Labhasva".

Vigilance

Vigilance Organisation plays a very important role in the administration of the Railways. It investigates complaints, conducts sample checks in respect of managerial decisions, with a view to determine their conformity to objectivity, transparency and concordance with extant rules and procedures.

Vigilance working has four facets: (i) Preventive Vigilance (ii) Participative Vigilance (iii) Punitive Vigilance and (iv) Pro-active Vigilance.

Preventive Vigilance:

The aim here is to disseminate knowledge across a wide cross section of railway officials, suggest system rationalization measures for imparting greater transparency and predictability, catalyze use of technology in decision making and create greater awareness amongst the public on issues relating to corruption mitigation.

Some of the steps taken in this direction during the year 2016-17 were:

- A total of 18,279 preventive checks were conducted throughout the Railways.
- A total of 27 Vigilance bulletins, including "Chetna Ahwan" by the Railway Board, were released for circulation. These bulletins contain case studies, dos & don't etc. related to various departments.
- Print and electronic media was extensively utilized by all Zonal Railways, Production Units and Public Sector for conducting extensive public campaigns during Vigilance Awareness Week, 2016.

Participative Vigilance:

- **24 Hour Vigilance Helpline:** Vigilance Helpline (Helpline No.155210) of the Railways is available 24 hours. In addition to this, the email addresses of vigilance officers are posted on the website.
- **Vigilance Awareness Week:** is celebrated every year during the last week of October or first week of November to educate the general public regarding the facilities available in the department and also ways and means to lodge complaints. The same was observed during 31st October to 5th November in the year 2016.

- **Counseling:** As many as 247 workshops/ seminars/ interactive sessions were conducted on topical issues by Vigilance in 2016-17 in which officers, senior supervisors and other railway personnel representing various levels and disciplines participated; the primary focus was to inculcate greater awareness of rules, procedures and most importantly, the pitfalls that need to be steered clear of.

In the training programme that is conducted annually for Vigilance Inspectors and Investigating Inspectors at the Diesel Loco Shed/Tughlakabad, a total of 71 personnel participated in two schedules from 18th-22nd July, 2016 and 25th - 29th July, 2016.

Punitive Vigilance:

A statement showing number of officials against whom disciplinary action in vigilance-investigated cases was initiated/finalized during April 2016 to March 2017 is given below:

Vigilance investigated cases	April 2016 – March 2017
Number of officials against whom disciplinary proceedings were initiated.	**6,550**
Number of officials against whom disciplinary proceedings resulted in imposition of major penalty	**1,096**
Number of officials against whom disciplinary proceedings resulted in imposition of minor penalty	**6,016**

Proactive Vigilance:

- Conducting of surprise checks in areas of mass contact (like reservation offices, ticket booking counters, luggage/parcel and goods booking offices, on-board passenger-carrying trains etc), in the accountal/ disposal of scrap, loading of freight wagons and parcel vans (primarily with a view to detect/control incidences of overloading) etc. During the calendar year 2016, these measures resulted in realization of revenues to the tune of ₹110.03 crores.
- Scrutinizing of more than 3,469 Annual Property Returns filed by officers.

Preserving Indian Railways' Heritage

Indian Railways with more than 160 years of rich history; presents a wide spectrum of both tangible and intangible heritage. Indian Railways is proud owner of four UNESCO accorded World Heritage Sites namely Darjeeling Himalayan Railway (1999), Nilgiri Mountain Railway (2005), Kalka Shimla Railway (2008) and Chhatrapati Shivaji Terminus, Mumbai (2004). There are two more in waiting or in the tentative list namely Matheran Light Railway and Kangra Valley Railway.

Indian Railways, in addition to being a special industrial relic, occupy a special place within the national heritage spectrum of India. The remains of rolling mill, cupola, brake block foundry, forging anvils of any old Railway Workshop are not only historical evidences or industrial relics but sense of belonging to the workshop.

Similarly iconic station and office buildings at Mumbai (Victoria Terminus, Bandra Suburban, Churchgate), Howrah, Garden Reach (BNR Office), Chennai Egmore, Royapuram, Lucknow, Madurai etc. bear identities of their respective cities.

The Station and Office buildings, locomotives, coaches, wagons, equipment, artifacts etc. when appropriately preserved and open for public display create memories of the past in the heart of the future generation and thus help maintaining a continuity of human experience.

Indian Railways, over the years, have been endeavoring sustained and focused approach for safeguarding its industrial as well as living heritage and to transmit it intact to future generations.

Today, Indian Railways maintain 34 Museums, Heritage Parks and Heritage galleries, spread all over India, for creating unique and rich experience to visitors about Railway heritage in India. The National Rail Museum in New Delhi, Regional Rail Museums at Chennai, Mysore and Howrah, are iconic tourist destinations in their region.

Indian Railways have also preserved about 230 Steam Locomotives, 110 vintage coaches and wagons at prominent places including museums, heritage park etc., for public display. Many of these rolling stocks are more than 100 years old and they bring back memories of old glory to the mind of the visitors.

Indian Railways are also preserving about 16 Steam locomotives as working heritage. Although, not in regular service, these preserved steam locomotives are still capable of hauling tourist trains and ceremonial running. The Rewari Steam Shed has been rechristened as Rewari Heritage Steam Centre in 2002 for recreating the memories of working Steam Shed, a feat un-parallel in the World. Rewari Steam Centre now maintains six Broad Gauge and four Meter Gauge working steam locomotives, that include the iconic "Fairy Queen" (1855), placed in the Guinness Book of Record as being the oldest working locomotive in the World and "Akbar", that featured in many Bollywood movies like Sultan, Gadar etc.

The Darjeeling Himalayan Railway (DHR) and Nilgiri Mountain Railway (NMR), both UNESCO accorded World Heritage Sites, operate Steam services on regular basis. DHR and NMR, with working steam locomotive holding of fourteen and six respectively, attract steam lovers from India and abroad. The sight and sound of Steam Locomotives recreate smell and romance of a by-gone era.

Indian Railways have a large repository of built heritage like buildings, bridges, via ducts etc. As of now, about 25 bridges and 70 buildings are designated as Heritage Assets by Indian Railways. Notable among them are Jubilee Bridge near Kolkata, Yamuna bridge near Naini, Sonenagar Bridge, Pamban via duct, Bandra suburban station, Pratap Vilas Palace, Vadodara, Glenogle Bungalow in Mumbai, SER (erstwhile BNR) Headquarter, Kolkata etc. Indian Railways have been making special efforts to conserve these built heritages.

Preservation of Railway Heritage and unlocking its potential for making significant and meaningful contributions to India's knowledge society and Incredible India Campaign shall remain one of the prime social responsibilities of Indian Railways and its associated Public Sector Undertakings.

A slew of measures has been initiated recently to institutionalize rail heritage preservation. These include compilation of heritage inventory and publishing it on the website, collaboration with institutions and stakeholders for digitizing and providing online access to rail heritage inventory and visual tour of museums, capacity building of railway officers and introducing modules for training courses etc.